TITLE V
OPERATING PERMIT
APPLICATION

U. S. PIPE AND FOUNDRY
COMPANY, INC.

CHATTANOOGA
VALVE & FITTINGS
PLANT

BOOK 3 of 4

10946589

MWPS008842

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AVERY READY INDEX INDEXING SYSTEM

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F001 - CHARGE HANDLING
E001 - CHARGE HANDLING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F001
Emission Unit ID:	E001
Source Desc:	CHARGE HANDLING
Building No.:	MELTING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	CHARGING EQUIPMENT: LOADERS, CHARGE BUCKETS, CONVEYORS, SHAKERS.
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 214,200 TPY OF COMBINED METAL AND NONMETALS

Description of Operation:

PARTICULATE EMISSIONS ARE GENERATED FROM THE RAW MATERIALS (METAL AND NONMETALS) UNLOADING AND CHARGING TO THE CUPOLA MELTING PROCESS. THIS EMISSIONS POINT IS DESIGNATED AS S001.

THE AVERAGE ANNUAL RAW MATERIAL CHARGE TONNAGES ARE APPROXIMATELY 59,764 TONS (WITH 10,928 TON/YR OF NONMETALS AND 48,836 TON/YR OF SCRAP METAL). THE MAXIMUM ANNUAL RAW MATERIAL CHARGE TONNAGES ARE 214,200 TON/YR (OR 39,200 TON/YR OF NONMETALS AND 175,000 TON/YR OF SCRAP METAL).

FOR THE CHARGING PROCESS, THE AVERAGE HOURS OF OPERATION ARE APPROXIMATELY THE SAME AS THE OPERATING HOURS OF THE CUPOLA MELTING PROCESS OR 1,742.9 HR/YR (9.27 HR/DAY, 4 DAY/WK, AND 47 WK/YR); AND THE MAXIMUM HOURS OF OPERATION ARE 20 HR/DAY, 5 DAY/WK, AND 50 WK/YR OR 5,000 HR/YR.

PARTICULATE EMISSIONS FROM THE CHARGE HANDLING PROCESS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE (CAPCO), SECTION 4-41, RULE 10.2 (SCHEDULE 1 OF TABLE 2 FOR SOURCES BUILT OR INSTALLED BEFORE 1/1/73).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S001	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS FROM THE CHARGE HANDLING PROCESS.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CHARGE HANDLING	30400315	1.743	5.000	59,764.00	214,200.00	42.84	43.125

Comments: AVERAGE HOURLY CHARGE OF BOTH METAL (28.02 TPH) AND NONMETALS (6.27 TPH) ARE BASED ON 1996 FISCAL YEAR REPORT FOR CV&F. AVERAGE HOURS OF OPERATION ARE 1,742.9 HR/YR (OR 9.27 HR/YR * 4 DAY/WK * 47 WK/YR); THEREFORE, THE AVERAGE ANNUAL CHARGES ARE 48,836 TPY OF METAL AND 10,928 TPY OF NONMETALS FOR A TOTAL OF 59,764 TPY.

THE CUPOLA IS DESIGNED TO HANDLE 35 TPH OF METAL CHARGE. BASED ON THE MAXIMUM 35 TPH OF METAL, THE MAXIMUM HOURLY NONMETAL CHARGE IS 7.84 TPH FOR A TOTAL OF 42.84 TPH. BASED ON THE MAXIMUM 5,000 HR/YR, THE MAXIMUM ANUAL CHARGE IS 175,000 TPH OF METAL AND 39,200 TPY FOR A TOTAL OF 214,200 TPY.

THE INPUT PROCESS WEIGHT OF 42.84 TPH OR 85,680 LB/HR IS USED TO DETERMINE THE MAXIMUM ALLOWABLE TSP EMISSION RATE PURSUANT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2 (SCHEDULE 1 OF TABLE 2 FOR SOURCES BUILT OR INSTALLED BEFORE 1/1/73).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F001 - CHARGE HANDLING
E001 - CHARGE HANDLING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0001	PARTICULATE MATTER (TSP)	0.2	lb/ton Handled	DIPRA REF # 1,2.

Comments: THE ABOVE EMISSION FACTOR IS FOR UNCONTROLLED FUGITIVE DUST EMISSIONS FOR CHARGE HANDLING FROM THE DIPRA EMISSION FACTOR REPORT. DIPRA REF #1-AP-42 FACTOR = 0.6 WHICH INCLUDES HEATING. DIPRA REF#2-MAYSILLES' CORRESPONDENCE WITH AFS INCLUDES A PREHEAT FACTOR OF 0.41.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F001 - CHARGE HANDLING
E001 - CHARGE HANDLING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S001	Fugitive	0%	0%	☐	6.859	8.568	43.125	5.976	21.42	188.887
Total Emissions of PARTICULATE MATTER (TSP) from CHARGE HANDLING:							6.859	8.568	43.125	5.976	21.42	188.887

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S001

Segment No: 01, CHARGE HANDLING

Actual Annual:	.2 lb/ton Handled * 59,764 tons * 1 ton/2,000 lb = 5.976 TPY.
Maximum Annual:	.2 lb/ton Handled * 214,200 tons * 1 ton/2,000 lb = 21.42 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 43.125 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 188.887 TPY.
Average Hourly:	Actual annual emissions of 5.976 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 6.859 lb/hr.
Maximum Hourly:	Maximum annual emissions of 21.42 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.568 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 42.84 ton/hr or 85,680 lb/hr. Calculation : 42.5 lb/hr + (85,680 - 80,000) * (1.1 / 10,000) lb/hr = 43.125 lb/hr.

End Page Report for CHARGE HANDLING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F002 - CUPOLA MELTING
E002 - CUPOLA

General Source Information

Facility:	CV&F
Process ID:	F002
Equipment Desc:	CUPOLA
Building No.:	MELTING BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400301-40C

Equipment Information

Cupola Type:	ABOVE CHARGE TAKE-OFF CUPOLA
Manufacturer:	USPIPE
Model No.:	USPIPE DESIGN
Serial No.:	
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 175,000 TPY OF METAL CHARGE AND 39,200 TPY OF NONMETAL CHARGE.

Description of Operation

A CUPOLA FURNACE IS USED FOR IRON MELTING. THE PRECONTRUCTION PERMIT LIMITS THE CUPOLAS'S HOURS OF OPERATION TO A TOTAL OF 5,000 HR/YR. THE CUPOLA IS CAPABLE OF MELTING 35 TONS PER HOUR OF METAL.

THE CONTROL DEVICES FOR THE CUPOLA EMISSIONS INCLUDE AN AFTER BURNER AND A BAGHOUSE. PARTICULATE EMISSIONS FROM THE CUPOLAS ARE CONTROLLED BY BAGHOUSE. CO, VOC AND VOHAP EMISSIONS ARE CONTROLLED BY THE AFTER BURNER UNIT WHICH IS INSTALLED UPSTREAM FROM THE BAGHOUSE.

THE MAJORITY OF THE POLLUTANT EMITTED FROM THE CUPOLA MELTING PROCESS IS DISCHARGED THROUGH THE CUPOLA BAGHOUSE (S002) AS DESCRIBED ABOVE. DURING NORMAL OPERATION, 99.5% OF THE TIME THE EMISSIONS ARE 100-PERCENT CAPTURED AND DISCHARGED THROUGH THE S002 CUPOLA BAGHOUSE OUTLETS. FOR THE REMAINING 0.5% OF TIME, ABOUT 1 PERCENT OF THE CUPOLA EMISSIONS ARE RELEASED AS FUGITIVE EMISSIONS (DESIGNATED AS S004).

EQUIVALENTLY, THE CUPOLA-STACK-EMITTED POLLUTANTS ACCOUNT FOR 99.995% OF THE TOTAL EMISSIONS FROM THE CUPOLA MELTING PROCESS WITH THE REMAINING 0.005% DISCHARGE AS FUGITIVE EMISSIONS (AT S004). THUS, THE TOTAL POTENTIAL-TO-EMIT (PTE) OF EACH POLLUTANT FROM THE CUPOLA MELTING PROCESS INCLUDES THE CUPOLA-BAGHOUSE-STACK-EMITTED EMISSIONS AND THE CUPOLA FUGITIVE EMISSIONS. DETAILED BACKUP EMISSION CALCULATIONS ARE PROVIDED.

BASED ON 1996 FISCAL YEAR REPORT, THE AVERAGE HOURS OF OPERATION FOR THE CUPOLA ARE 1,742.9 HR/YR (APPROXIMATELY 9.27 HR/DAY * 4 DAY/WK * 47 WK/YR).

THE MAXIMUM ALLOWABLE TSP EMISSION RATE IS SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 26.12 (1)., TSP EMISSIONS DO NOT EXCEED 0.020 GR/DSF.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S002	99.995%	59	[N/A]	[N/A]	[N/A]	83,200	CD001	AFTERBURNER, DIRECT FLAME WITH HEAT EXCHANGER	CD002	FABRIC FILTER - HIGH TEMPERATURE
	Comments:	CUPOLA BAGHOUSE STACK.								
S004	0.005%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]
	Comments:	FUGITVE EMISSIONS FROM THE MELTING BUILDING.								

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CUPOLA MELTING	30400301	1,743	5,000	48,836	175,000	42.84	6.620

Comments: AVERAGE HOURLY CHARGE OF BOTH METAL (28.02 TPH) AND NONMETALS (6.27 TPH) ARE BASED ON 1996 FISCAL YEAR REPORT FOR CV&F. AVERAGE HOURS OF OPERATION ARE 1,742.9 HR/YR (OR 9.27 HR/YR * 4 DAY/WK * 47 WK/YR); THEREFORE, THE AVERAGE ANNUAL CHARGES ARE 48,836 TPY OF METAL AND 10,928 TPY OF NONMETALS FOR A TOTAL OF 59,764 TPY.

THE CUPOLA IS DESIGNED TO HANDLE 35 TPH OF METAL CHARGE. BASED ON THE MAXIMUM 35

TPH OF METAL, THE MAXIMUM HOURLY NONMETAL CHARGE IS 7.84 TPH FOR A TOTAL OF 42.84 TPH. BASED ON THE MAXIMUM 5,000 HR/YR, THE MAXIMUM ANUAL CHARGE IS 175,000 TPH OF METAL AND 39,200 TPY FOR A TOTAL OF 214,200 TPY.

THE MAXIMUM ALLOWABLE TSP EMISSION RATE IS SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 26.12 (1).

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0027	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	2.1E-09	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 85% CONTROL EFFICIENCY FOR 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN.			
01	0027	2,3,7,8-TETRACHLORODIBENZOFURAN	2E-08	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 85% CONTROL EFFICIENCY FOR 2,3,7,8-TETRACHLORODIBENZOFURAN.			
01	0027	ARSENIC COMPOUNDS	5.2E-05	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM "FIRE" AND JCDH. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR ARSENIC COMPOUNDS.			
01	0027	BENZENE	0.00909	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION RATES FROM "FIRE". EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			
01	0027	BERYLLIUM COMPOUNDS	4.3E-07	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE BURLINGTON (NJ) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR BERYLLIUM COMPOUNDS.			
01	0027	CADMIUM COMPOUNDS	0.0018	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM THREE IRON FOUNDRIES'S EMISSION TEST RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR CADMIUM COMPOUNDS.			
01	0027	CARBON MONOXIDE (CO)	145	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION RATES BASED ON AFSEF394.XLS ON EPA BBS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			
01	0027	CHROMIUM COMPOUNDS	0.0012	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TEST RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR CHROMIUM COMPOUNDS.			
01	0027	LEAD COMPOUNDS	0.015	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR LEAD COMPOUNDS.			

01	0027	MANGANESE COMPOUNDS	0.045	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR MANGANESE COMPOUNDS.			
01	0027	MERCURY COMPOUNDS	0.0019	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM THREE EMISSION TEST RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 45% CONTROL EFFICIENCY FOR MERCURY COMPOUNDS.			
01	0027	NAPHTHALENE	6.5E-05	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE'S BURLINGTON (NJ) PLANT'S EMISSION TEST RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 85% CONTROL EFFICIENCY FOR NAPHTHALENE.			
01	0027	NICKEL COMPOUNDS	0.00054	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE'S BURLINGTON (NJ) PLANT'S EMISSION TEST RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR NICKEL COMPOUNDS.			
01	0027	NITROGEN OXIDES (NOx)	0.5	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION FACTOR. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			
01	0027	PARTICULATE MATTER (PM10)	25.2	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION FACTOR ASSUMING THAT 90% OF UNCONTROLLED PM EMISSIONS ARE PM-10 EMISSIONS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			
01	0027	PARTICULATE MATTER (TSP)	28	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION RATES AVERAGED FOR THREE IRON FOUNDRIES'S MASS BALANCE CALCULATIONS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			
01	0027	POM (POLYCYCLIC ORGANIC MATTER)	9.6E-05	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 85% CONTROL EFFICIENCY FOR POM (POLYCYCLIC ORGANIC MATTER).			
01	0027	SELENIUM COMPOUNDS	3.2E-06	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE BURLINGTON (NJ) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 98.5% CONTROL EFFICIENCY FOR SELENIUM COMPOUNDS.			
01	0027	SULFUR DIOXIDE (SO2)	0.1	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION FACTOR BASED ON TWO IRON FOUNDRIES'S STACK TEST RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			

01	0027	TETRACHLORODIBENZO-P-DIOXINS, TOTAL	1.6E-07	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 85% CONTROL EFFICIENCY FOR TETRACHLORODIBENZO-P-DIOXINS, TOTAL.			
01	0027	TETRACHLORODIBENZOFURANS, TOTAL	7.4E-07	lb/ton	DIPRA EF REPORT
	Comments:	CONTROLLED EMISSION FACTOR FROM USPIPE UNION CITY (CA) PLANT'S EMISSION TESTING RESULTS. EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED. ASSUMED THAT THIS EF VALUE IS BASED ON 85% CONTROL EFFICIENCY FOR TETRACHLORODIBENZOFURANS, TOTAL.			
01	0027	VOLATILE ORGANIC COMPOUNDS (VOC)	2	lb/ton	DIPRA EF REPORT
	Comments:	UNCONTROLLED EMISSION FACTOR BASED ON REVERSE CALCULATION FROM 0.3 LB/TON CONTROLLED EMISSION AND ASSUME 85% CONTROLL (0.3 / 0.15 = 2 LB/TON). EF UNIT BASIS IS LB OF POLLUTANT EMITTED PER TON OF METAL CHARGED.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	01	S002	Stack	0%	0%	☒	5.88E-08	7.35E-08	Not Appl.	5.13E-08	1.84E-07	1.84E-07
	01	S004	2nd Fug.	0%	0%	☒	2.94E-12	3.68E-12	Not Appl.	2.56E-12	9.19E-12	9.19E-12
Total Emissions of 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN from CUPOLA:							**5.88E-08**	**7.35E-08**	**Not Appl.**	**5.13E-08**	**1.84E-07**	**1.84E-07**
2,3,7,8-TETRACHLORODIBENZOFURAN	01	S002	Stack	0%	0%	☐	5.60E-07	7.00E-07	Not Appl.	4.88E-07	1.75E-06	1.75E-06
	01	S004	2nd Fug.	0%	0%	☐	2.80E-11	3.50E-11	Not Appl.	2.44E-11	8.75E-11	8.75E-11
Total Emissions of 2,3,7,8-TETRACHLORODIBENZOFURAN from CUPOLA:							**5.60E-07**	**7.00E-07**	**Not Appl.**	**4.88E-07**	**1.75E-06**	**1.75E-06**
ARSENIC COMPOUNDS	01	S002	Stack	0%	0%	☒	.001	.002	Not Appl.	.001	.005	.005
	01	S004	2nd Fug.	0%	0%	☒	7.29E-08	9.10E-08	Not Appl.	6.35E-08	2.28E-07	2.28E-07
Total Emissions of ARSENIC COMPOUNDS from CUPOLA:							**.001**	**.002**	**Not Appl.**	**.001**	**.005**	**.005**
BENZENE	01	S002	Stack	85%	0%	☒	.038	.048	Not Appl.	.033	.119	.119
	01	S004	2nd Fug.	0%	0%	☒	1.27E-05	1.59E-05	Not Appl.	1.11E-05	3.98E-05	3.98E-05
Total Emissions of BENZENE from CUPOLA:							**.038**	**.048**	**Not Appl.**	**.033**	**.119**	**.119**
BERYLLIUM COMPOUNDS	01	S002	Stack	0%	0%	☒	1.20E-05	1.50E-05	Not Appl.	1.05E-05	3.76E-05	3.76E-05
	01	S004	2nd Fug.	0%	0%	☒	6.02E-10	7.52E-10	Not Appl.	5.25E-10	1.88E-09	1.88E-09
Total Emissions of BERYLLIUM COMPOUNDS from CUPOLA:							**1.20E-05**	**1.51E-05**	**Not Appl.**	**1.05E-05**	**3.76E-05**	**3.76E-05**
CADMIUM COMPOUNDS	01	S002	Stack	0%	0%	☒	.05	.063	Not Appl.	.044	.157	.157
	01	S004	2nd Fug.	0%	0%	☒	2.52E-06	3.15E-06	Not Appl.	2.20E-06	7.88E-06	7.88E-06
Total Emissions of CADMIUM COMPOUNDS from CUPOLA:							**.05**	**.063**	**Not Appl.**	**.044**	**.158**	**.158**
CARBON MONOXIDE (CO)	01	S002	Stack	99%	0%	☐	40.63	50.747	Not Appl.	35.404	126.869	126.869
	01	S004	2nd Fug.	0%	0%	☐	.203	.254	Not Appl.	.177	.634	.634
Total Emissions of CARBON MONOXIDE (CO) from CUPOLA:							***40.833***	***51.001***	***Not Appl.***	***35.581***	***127.503***	***127.503***
CHROMIUM COMPOUNDS	01	S002	Stack	0%	0%	☒	.034	.042	Not Appl.	.029	.105	.105
	01	S004	2nd Fug.	0%	0%	☒	1.68E-06	2.10E-06	Not Appl.	1.47E-06	5.25E-06	5.25E-06
Total Emissions of CHROMIUM COMPOUNDS from CUPOLA:							**.034**	**.042**	**Not Appl.**	**.029**	**.105**	**.105**
LEAD COMPOUNDS	01	S002	Stack	0%	0%	☒	.42	.525	Not Appl.	.366	1.312	1.312

	01	S004	2nd Fug.	0%	0%	☒	2.10E-05	2.63E-05	Not Appl.	1.83E-05	6.56E-05	6.56E-05
Total Emissions of LEAD COMPOUNDS from CUPOLA:							**.42**	**.525**	**Not Appl.**	**.366**	**1.313**	**1.313**
MANGANESE COMPOUNDS	01	S002	Stack	0%	0%	☒	1.261	1.575	Not Appl.	1.099	3.937	3.937
	01	S004	2nd Fug.	0%	0%	☒	6.30E-05	7.88E-05	Not Appl.	5.49E-05	1.97E-04	1.97E-04
Total Emissions of MANGANESE COMPOUNDS from CUPOLA:							**1.261**	**1.575**	**Not Appl.**	**1.099**	**3.938**	**3.938**
MERCURY COMPOUNDS	01	S002	Stack	0%	0%	☒	.053	.066	Not Appl.	.046	.166	.166
	01	S004	2nd Fug.	0%	0%	☒	2.66E-06	3.33E-06	Not Appl.	2.32E-06	8.31E-06	8.31E-06
Total Emissions of MERCURY COMPOUNDS from CUPOLA:							**.053**	**.067**	**Not Appl.**	**.046**	**.166**	**.166**
NAPHTHALENE	01	S002	Stack	0%	0%	☒	.002	.002	Not Appl.	.002	.006	.006
	01	S004	2nd Fug.	0%	0%	☒	9.11E-08	1.14E-07	Not Appl.	7.94E-08	2.84E-07	2.84E-07
Total Emissions of NAPHTHALENE from CUPOLA:							**.002**	**.002**	**Not Appl.**	**.002**	**.006**	**.006**
NICKEL COMPOUNDS	01	S002	Stack	0%	0%	☒	.015	.019	Not Appl.	.013	.047	.047
	01	S004	2nd Fug.	0%	0%	☒	7.57E-07	9.45E-07	Not Appl.	6.59E-07	2.36E-06	2.36E-06
Total Emissions of NICKEL COMPOUNDS from CUPOLA:							**.015**	**.019**	**Not Appl.**	**.013**	**.047**	**.047**
NITROGEN OXIDES (NOx)	01	S002	Stack	0%	0%	☐	14.01	17.499	Not Appl.	12.208	43.748	43.748
	01	S004	2nd Fug.	0%	0%	☐	7.01E-04	8.75E-04	Not Appl.	6.10E-04	.002	.002
Total Emissions of NITROGEN OXIDES (NOx) from CUPOLA:							**14.011**	**17.5**	**Not Appl.**	**12.209**	**43.75**	**43.75**
PARTICULATE MATTER (PM10)	01	S002	Stack	0%	99.5%	☐	3.531	4.41	Not Appl.	3.077	11.024	11.024
	01	S004	2nd Fug.	0%	0%	☐	.035	.044	Not Appl.	.031	.11	.11
Total Emissions of PARTICULATE MATTER (PM10) from CUPOLA:							**3.566**	**4.454**	**Not Appl.**	**3.107**	**11.135**	**11.135**
PARTICULATE MATTER (TSP)	01	S002	Stack	0%	99.5%	☐	3.923	4.9	6.62	3.418	12.249	16.551
	01	S004	2nd Fug.	0%	0%	☐	.039	.049	Not Appl.	.034	.123	Not Appl.
Total Emissions of PARTICULATE MATTER (TSP) from CUPOLA:							**3.962**	**4.949**	**6.62**	**3.453**	**12.372**	**16.551**
POM (POLYCYCLIC ORGANIC MATTER)	01	S002	Stack	0%	0%	☒	.003	.003	Not Appl.	.002	.008	.008
	01	S004	2nd Fug.	0%	0%	☒	1.35E-07	1.69E-07	Not Appl.	1.18E-07	4.21E-07	4.21E-07
Total Emissions of POM (POLYCYCLIC ORGANIC MATTER) from CUPOLA:							**.003**	**.003**	**Not Appl.**	**.002**	**.008**	**.008**
SELENIUM COMPOUNDS	01	S002	Stack	0%	0%	☒	8.97E-05	1.12E-04	Not Appl.	7.81E-05	2.80E-04	2.80E-04
	01	S004	2nd Fug.	0%	0%	☒	4.48E-09	5.60E-09	Not Appl.	3.91E-09	1.40E-08	1.40E-08

Total Emissions of SELENIUM COMPOUNDS from CUPOLA:							**8.97E-05**	**1.12E-04**	**Not Appl.**	**7.81E-05**	**2.80E-04**	**2.80E-04**
SULFUR DIOXIDE (SO2)	01	S002	Stack	0%	0%	☐	2.802	3.5	Not Appl.	2.442	8.75	8.75
	01	S004	2nd Fug.	0%	0%	☐	1.40E-04	1.75E-04	Not Appl.	1.22E-04	4.38E-04	Not Appl.
Total Emissions of SULFUR DIOXIDE (SO2) from CUPOLA:							**2.802**	**3.5**	**Not Appl.**	**2.442**	**8.75**	**8.75**
TETRACHLORODIBENZO-P-DIOXINS, TOTAL	01	S002	Stack	0%	0%	☐	4.48E-06	5.60E-06	Not Appl.	3.91E-06	1.40E-05	1.40E-05
	01	S004	2nd Fug.	0%	0%	☐	2.24E-10	2.80E-10	Not Appl.	1.95E-10	7.00E-10	7.00E-10
Total Emissions of TETRACHLORODIBENZO-P-DIOXINS, TOTAL from CUPOLA:							**4.48E-06**	**5.60E-06**	**Not Appl.**	**3.91E-06**	**1.40E-05**	**1.40E-05**
TETRACHLORODIBENZOFURANS, TOTAL	01	S002	Stack	0%	0%	☐	2.07E-05	2.59E-05	Not Appl.	1.81E-05	6.47E-05	6.47E-05
	01	S004	2nd Fug.	0%	0%	☐	1.04E-09	1.30E-09	Not Appl.	9.03E-10	3.24E-09	3.24E-09
Total Emissions of TETRACHLORODIBENZOFURANS, TOTAL from CUPOLA:							**2.07E-05**	**2.59E-05**	**Not Appl.**	**1.81E-05**	**6.48E-05**	**6.48E-05**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S002	Stack	85%	0%	☐	8.406	10.499	Not Appl.	7.325	26.249	26.249
	01	S004	2nd Fug.	0%	0%	☐	.003	.004	Not Appl.	.002	.009	.009
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from CUPOLA:							**8.409**	**10.503**	**Not Appl.**	**7.327**	**26.257**	**26.257**

Supporting Emission Calculations

Emission Calculations for 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (CAS 1746-01-6)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 2.10E-09 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 5.13E-08 TPY.
Maximum Annual:	175,000 tons/yr * 2.10E-09 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.84E-07 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.84E-07 TPY.
Average Hourly:	*Actual annual emissions of 5.13E-08 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 5.88E-08 lb/hr.*
Maximum Hourly:	Maximum annual emissions of 1.84E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.35E-08 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (CAS 1746-01-6)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 2.10E-09 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.56E-12 TPY.
Maximum Annual:	175,000 tons/yr * 2.10E-09 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 9.19E-12 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 9.19E-12 TPY.
Average Hourly:	*Actual annual emissions of 2.56E-12 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.94E-12 lb/hr.*
Maximum Hourly:	Maximum annual emissions of 9.19E-12 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.68E-12 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for 2,3,7,8-TETRACHLORODIBENZOFURAN (CAS 51207-31-9)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 2.00E-08 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 4.88E-07 TPY.
Maximum Annual:	175,000 tons/yr * 2.00E-08 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.75E-06 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.75E-06 TPY.
Average Hourly:	*Actual annual emissions of 4.88E-07 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 5.60E-07 lb/hr.*
Maximum Hourly:	Maximum annual emissions of 1.75E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.00E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for 2,3,7,8-TETRACHLORODIBENZOFURAN (CAS 51207-31-9)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 2.00E-08 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.44E-11 TPY.
Maximum Annual:	175,000 tons/yr * 2.00E-08 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 8.75E-11 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 8.75E-11 TPY.
Average Hourly:	Actual annual emissions of 2.44E-11 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.80E-11 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.75E-11 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.50E-11 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 5.20E-05 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	175,000 tons/yr * 5.20E-05 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .005 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 5.20E-05 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 6.35E-08 TPY.
Maximum Annual:	175,000 tons/yr * 5.20E-05 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.28E-07 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 2.28E-07 TPY.
Average Hourly:	Actual annual emissions of 6.35E-08 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 7.29E-08 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.28E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 9.10E-08 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .00909 lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 85% control eff.) * 1 ton/2,000 lb = .033 TPY.
Maximum Annual:	175,000 tons/yr * .00909 lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 85% control eff.) * 1 ton/2,000 lb = .119 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .119 TPY.
Average Hourly:	Actual annual emissions of .033 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .038 lb/hr.
Maximum Hourly:	Maximum annual emissions of .119 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .048 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .00909 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.11E-05 TPY.
Maximum Annual:	175,000 tons/yr * .00909 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = 3.98E-05 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 3.98E-05 TPY.
Average Hourly:	Actual annual emissions of 1.11E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.27E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.98E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.59E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 4.30E-07 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.05E-05 TPY.
Maximum Annual:	175,000 tons/yr * 4.30E-07 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 3.76E-05 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 3.76E-05 TPY.
Average Hourly:	Actual annual emissions of 1.05E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.20E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.76E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.50E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 4.30E-07 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 5.25E-10 TPY.
Maximum Annual:	175,000 tons/yr * 4.30E-07 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.88E-09 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.88E-09 TPY.
Average Hourly:	Actual annual emissions of 5.25E-10 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 6.02E-10 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.88E-09 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.52E-10 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .0018 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .044 TPY.
Maximum Annual:	175,000 tons/yr * .0018 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .157 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .157 TPY.
Average Hourly:	Actual annual emissions of .044 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .05 lb/hr.
Maximum Hourly:	Maximum annual emissions of .157 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .063 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .0018 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.20E-06 TPY.
Maximum Annual:	175,000 tons/yr * .0018 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 7.88E-06 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 7.88E-06 TPY.
Average Hourly:	Actual annual emissions of 2.20E-06 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.52E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.88E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.15E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 145. lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 99% control eff.) * 1 ton/2,000 lb = 35.404 TPY.
Maximum Annual:	175,000 tons/yr * 145. lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 99% control eff.) * 1 ton/2,000 lb = 126.869 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 126.869 TPY.
Average Hourly:	Actual annual emissions of 35.404 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 40.63 lb/hr.
Maximum Hourly:	Maximum annual emissions of 126.869 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 50.747 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 145. lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .177 TPY.
Maximum Annual:	175,000 tons/yr * 145. lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .634 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .634 TPY.
Average Hourly:	Actual annual emissions of .177 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .203 lb/hr.
Maximum Hourly:	Maximum annual emissions of .634 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .254 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .0012 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .029 TPY.
Maximum Annual:	175,000 tons/yr * .0012 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .105 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .105 TPY.
Average Hourly:	Actual annual emissions of .029 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .034 lb/hr.
Maximum Hourly:	Maximum annual emissions of .105 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .042 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .0012 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.47E-06 TPY.
Maximum Annual:	175,000 tons/yr * .0012 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 5.25E-06 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 5.25E-06 TPY.
Average Hourly:	Actual annual emissions of 1.47E-06 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.68E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.25E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.10E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .015 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .366 TPY.
Maximum Annual:	175,000 tons/yr * .015 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.312 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.312 TPY.
Average Hourly:	Actual annual emissions of .366 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .42 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.312 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .525 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .015 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.83E-05 TPY.
Maximum Annual:	175,000 tons/yr * .015 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 6.56E-05 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 6.56E-05 TPY.
Average Hourly:	Actual annual emissions of 1.83E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.10E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.56E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.63E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .045 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.099 TPY.
Maximum Annual:	175,000 tons/yr * .045 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 3.937 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 3.937 TPY.
Average Hourly:	Actual annual emissions of 1.099 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.261 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.937 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.575 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .045 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 5.49E-05 TPY.
Maximum Annual:	175,000 tons/yr * .045 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.97E-04 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.97E-04 TPY.
Average Hourly:	Actual annual emissions of 5.49E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 6.30E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.97E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.88E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .0019 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .046 TPY.
Maximum Annual:	175,000 tons/yr * .0019 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .166 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .166 TPY.
Average Hourly:	Actual annual emissions of .046 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .053 lb/hr.
Maximum Hourly:	Maximum annual emissions of .166 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .066 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .0019 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.32E-06 TPY.
Maximum Annual:	175,000 tons/yr * .0019 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 8.31E-06 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 8.31E-06 TPY.
Average Hourly:	Actual annual emissions of 2.32E-06 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.66E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.31E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.33E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 6.50E-05 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	175,000 tons/yr * 6.50E-05 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .006 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .006 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .006 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 6.50E-05 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 7.94E-08 TPY.
Maximum Annual:	175,000 tons/yr * 6.50E-05 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.84E-07 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 2.84E-07 TPY.
Average Hourly:	Actual annual emissions of 7.94E-08 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 9.11E-08 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.84E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.14E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .00054 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .013 TPY.
Maximum Annual:	175,000 tons/yr * .00054 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .047 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .047 TPY.
Average Hourly:	Actual annual emissions of .013 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .015 lb/hr.
Maximum Hourly:	Maximum annual emissions of .047 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .019 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .00054 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 6.59E-07 TPY.
Maximum Annual:	175,000 tons/yr * .00054 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 2.36E-06 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 2.36E-06 TPY.
Average Hourly:	Actual annual emissions of 6.59E-07 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 7.57E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.36E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 9.45E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .5 lb/ton uncontrolled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 12.208 TPY.
Maximum Annual:	175,000 tons/yr * .5 lb/ton uncontrolled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 43.748 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 43.748 TPY.
Average Hourly:	Actual annual emissions of 12.208 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 14.01 lb/hr.
Maximum Hourly:	Maximum annual emissions of 43.748 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 17.499 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .5 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = 6.10E-04 TPY.
Maximum Annual:	175,000 tons/yr * .5 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .002 TPY.
Average Hourly:	Actual annual emissions of 6.10E-04 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 7.01E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.75E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 25.2 lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 3.077 TPY.
Maximum Annual:	175,000 tons/yr * 25.2 lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 11.024 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 11.024 TPY.
Average Hourly:	Actual annual emissions of 3.077 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 3.531 lb/hr.
Maximum Hourly:	Maximum annual emissions of 11.024 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.41 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 25.2 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .031 TPY.
Maximum Annual:	175,000 tons/yr * 25.2 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .11 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .11 TPY.
Average Hourly:	Actual annual emissions of .031 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .035 lb/hr.
Maximum Hourly:	Maximum annual emissions of .11 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .044 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 28. lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 3.418 TPY.
Maximum Annual:	175,000 tons/yr * 28. lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 12.249 TPY.
Potential Annual:	Maximum allowable hourly emissions of 6.62 lb/hr * 5,000 hr/yr maximum * 1 ton/2,000 lb = 16.551 TPY.
Average Hourly:	Actual annual emissions of 3.418 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 3.923 lb/hr.
Maximum Hourly:	Maximum annual emissions of 12.249 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.9 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 38,619 dscf/min * 60 min/hr = 6.62 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 28. lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .034 TPY.
Maximum Annual:	175,000 tons/yr * 28. lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .123 TPY.
Potential Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of .034 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .039 lb/hr.
Maximum Hourly:	Maximum annual emissions of .123 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .049 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

Emission Calculations for POM (POLYCYCLIC ORGANIC MATTER)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 9.63E-05 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	175,000 tons/yr * 9.63E-05 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = .008 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .008 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .008 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for POM (POLYCYCLIC ORGANIC MATTER)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 9.63E-05 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.18E-07 TPY.
Maximum Annual:	175,000 tons/yr * 9.63E-05 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 4.21E-07 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 4.21E-07 TPY.
Average Hourly:	Actual annual emissions of 1.18E-07 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.35E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.21E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.69E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for SELENIUM COMPOUNDS
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 3.20E-06 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 7.81E-05 TPY.
Maximum Annual:	175,000 tons/yr * 3.20E-06 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 2.80E-04 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 2.80E-04 TPY.
Average Hourly:	Actual annual emissions of 7.81E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 8.97E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.80E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.12E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for SELENIUM COMPOUNDS
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 3.20E-06 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 3.91E-09 TPY.
Maximum Annual:	175,000 tons/yr * 3.20E-06 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.40E-08 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.40E-08 TPY.
Average Hourly:	Actual annual emissions of 3.91E-09 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 4.48E-09 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.40E-08 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.60E-09 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .1 lb/ton uncontrolled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 2.442 TPY.
Maximum Annual:	175,000 tons/yr * .1 lb/ton uncontrolled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 8.75 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 8.75 TPY.
Average Hourly:	Actual annual emissions of 2.442 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.802 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.75 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.5 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * .1 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.22E-04 TPY.
Maximum Annual:	175,000 tons/yr * .1 lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = 4.38E-04 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 4.38E-04 TPY.
Average Hourly:	Actual annual emissions of 1.22E-04 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.40E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.38E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.75E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for TETRACHLORODIBENZO-P-DIOXINS, TOTAL
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 1.60E-07 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 3.91E-06 TPY.
Maximum Annual:	175,000 tons/yr * 1.60E-07 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.40E-05 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 1.40E-05 TPY.
Average Hourly:	Actual annual emissions of 3.91E-06 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 4.48E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.40E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.60E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for TETRACHLORODIBENZO-P-DIOXINS, TOTAL
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 1.60E-07 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 1.95E-10 TPY.
Maximum Annual:	175,000 tons/yr * 1.60E-07 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 7.00E-10 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 7.00E-10 TPY.
Average Hourly:	Actual annual emissions of 1.95E-10 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.24E-10 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.00E-10 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.80E-10 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for TETRACHLORODIBENZOFURANS, TOTAL
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 7.40E-07 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 1.81E-05 TPY.
Maximum Annual:	175,000 tons/yr * 7.40E-07 lb/ton controlled * 99.995% (stack capture eff.) * 1 ton/2,000 lb = 6.47E-05 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 6.47E-05 TPY.
Average Hourly:	Actual annual emissions of 1.81E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.07E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.47E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.59E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for TETRACHLORODIBENZOFURANS, TOTAL
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 7.40E-07 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 9.03E-10 TPY.
Maximum Annual:	175,000 tons/yr * 7.40E-07 lb/ton controlled * .005% (stack capture eff.) * 1 ton/2,000 lb = 3.24E-09 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 3.24E-09 TPY.
Average Hourly:	Actual annual emissions of 9.03E-10 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.04E-09 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.24E-09 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.30E-09 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S002, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 2. lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 85% control eff.) * 1 ton/2,000 lb = 7.325 TPY.
Maximum Annual:	175,000 tons/yr * 2. lb/ton uncontrolled * 99.995% (stack capture eff.) * (1 - 85% control eff.) * 1 ton/2,000 lb = 26.249 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 26.249 TPY.
Average Hourly:	Actual annual emissions of 7.325 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 8.406 lb/hr.
Maximum Hourly:	Maximum annual emissions of 26.249 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 10.499 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S004, STACK EMISSIONS
Segment No: 01, CUPOLA MELTING

Actual Annual:	48,836 tons/yr * 2. lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	175,000 tons/yr * 2. lb/ton uncontrolled * .005% (stack capture eff.) * 1 ton/2,000 lb = .009 TPY.
Potential Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .009 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for CUPOLA

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F002 - CUPOLA MELTING
CD001 - AFTER BURNER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F002
Emission Unit ID:	CD001
Source Desc:	AFTER BURNER
Building No.:	MELTING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400301-40C

Equipment Information

Manufacturer:	USPIPE
Model No.:	USPIPE DESIGN
Serial No.:	[Not Available]
Firing Type:	AFTERBURNER
Rated Heat Input Capacity:	18 MMBtu/hr
Maximum Heat Input Capacity:	18 MMBtu/hr
Avg. Oper. Heat Input Capacity:	18 MMBtu/hr

Description of Operation

THE AFTER BURNER IS USED TO CONTROL CARBON MONOXIDE EMISSIONS FROM THE CUPOLA. THE AFTER BURNER IS EQUIPPED WITH DUAL FUEL BURNERS FIRING NATURAL GAS AND BACKUP WITH NO. 2 FUEL OIL. THE BURNERS ARE USED PRIMARILY TO IGNITE AND TO MAINTAIN THE CARBON MONOXIDE COMBUSTION. THE BURNERS RATED CAPACITY ARE 18 MMBTU/HR FOR NATURAL GAS FIRING AND 15 MMBTU/HR FOR OIL FIRING. DURING NORMAL OPERATION, NATURAL GAS IS USED 3 DAYS PER WEEK, AND FUEL OIL IS USED 1 DAY PER WEEK. THE BURNERS ARE ON APPROXIMATELY 10 HOUR A DAY, HALF OF WHICH ON HIGH FIRING AND THE BALANCE ON LOW FIRING.

TOTAL HEAT INPUT FOR THE 96 FISCAL YEAR ARE APPROXIMATELY 21,710 MMBTU/YR ON NATURAL GAS FIRING (OR 21.71 MMCF/YR) AND APPROXIMATELY 6,030.5 MMBTU/YR ON FUEL OIL FIRING (OR 43,075 GAL/YR). MAXIMUM ANNUAL FUEL USAGES ARE BASED ON 5,000 HR/YR: APPROXIMATELY 90 MMCF/YR OF NATURAL GAS AND 535,714 GAL/YR OF NO.2 FUEL OIL.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S002	59	[N/A]	[N/A]	[N/A]	83,200	CD001	AFTERBURNER, DIRECT FLAME WITH HEAT EXCHANGER	CD002	FABRIC FILTER - HIGH TEMPERATURE

Comments: CUPOLA BAGHOUSE STACK.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	10200602	1,307	5,000	21.71	90.00

Comments: ACTUAL ANNUAL NATURAL GAS USAGE OF 21.710 MMCF/YR WAS BASED ON ACTUAL 96 FY ESTIMATE. MAXIMUM ANNUAL NATURAL USAGE IS CALCULATED AS FOLLOWS: 18 MMBTU/HR * 5,000 HR/YR * 1 CF/1000 BTU = 90 MMCF/YR.

02	NO. 2 FUEL OIL FIRING	10200501	436	5,000	43.08	535.71

Comments: ACTUAL ANNUAL NO. 2 FUEL OIL USAGE FOR THE 96 FY IS BASED ON THE REPORTED NATURAL GAS USAGE: 21,710 MMBTU/YR * 1E6/MM * 1/3 (OIL/NATURAL GAS) * 15/18 * 1 GAL/140,000 BTU = 43,075 GAL/YR. MAXIMUM ANNUAL NATURAL USAGE IS CALCULATED AS FOLLOWS: 15 MMBTU/HR * 1E6/MM * 5,000 HR/YR * 1 GAL/140,000 BTU = 535,714 GAL/YR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0017	BENZENE	0.112	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. REF: SPECIATE V1.5, PROFILE 0003.			
01	0017	CARBON MONOXIDE (CO)	35	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95)
Comments:		UNCONTROLLED EMISSION FACTOR. REF:			
01	0017	FORMALDEHYDE	0.22	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. REF: SPECIATE V1.5, PROFILE 0003.			
01	0017	NITROGEN OXIDES (NOx)	140	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95)
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0017	PARTICULATE MATTER (PM10)	7.5	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95)
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0017	PARTICULATE MATTER (TSP)	13.7	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95)
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0017	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95)
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0017	TOLUENE	0.056	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. REF: SPECIATE V1.5, PROFILE 0003.			
01	0017	VOLATILE ORGANIC COMPOUNDS (VOC)	2.8	lb/MMcf	AP 42 Table 1.4-3 (JAN 95)
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP 42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 5.8 LB/MMCF OF TOC - 52% OF METHANE.			
02	0024	CARBON MONOXIDE (CO)	5	lb/1000 Gal	AP 42 Table 1.3-2
Comments:					
02	0024	FORMALDEHYDE	0.17	lb/1000 Gal	Speciate V1.5, Profile 0002
Comments:					
02	0024	HEXANE	0.037	lb/1000 Gal	Speciate V1.5, Profile 0002
Comments:					
02	0024	NITROGEN OXIDES (NOx)	20	lb/1000 Gal	AP 42 Table 1.3-2
Comments:					

02	0024	PARTICULATE MATTER (PM10)	1.08	lb/1000 Gal	EPA 450/4-90-003
Comments:					
02	0024	PARTICULATE MATTER (TSP)	2	lb/1000 Gal	EPA 450/4-90-003
Comments:					
02	0024	SULFUR DIOXIDE (SO2)	142	lb/1000 Gal/%S	AP 42 Table 1.3-2
Comments:					
02	0024	VOLATILE ORGANIC COMPOUNDS (VOC)	0.34	lb/1000 Gal	AP 42 Table 1.3-4
Comments:					

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S002	Stack	85%	0%	☒	2.79E-04	3.02E-04	Not Appl.	1.82E-04	7.56E-04	.001
Total Emissions of BENZENE from AFTER BURNER:							**2.79E-04**	**3.02E-04**	**Not Appl.**	**1.82E-04**	**7.56E-04**	**.001**
CARBON MONOXIDE (CO)	01	S002	Stack	99%	0%	☐	.006	.006	Not Appl.	.004	.016	.028
	02	S002	Stack	99%	0%	☐	.005	.005	Not Appl.	.001	.013	.023
Total Emissions of CARBON MONOXIDE (CO) from AFTER BURNER:							**.011**	**.012**	**Not Appl.**	**.005**	**.029**	**.028**
FORMALDEHYDE	01	S002	Stack	85%	0%	☒	5.48E-04	5.94E-04	Not Appl.	3.58E-04	.001	.003
	02	S002	Stack	85%	0%	☒	.003	.003	Not Appl.	5.49E-04	.007	.012
Total Emissions of FORMALDEHYDE from AFTER BURNER:							**.003**	**.003**	**Not Appl.**	**9.07E-04**	**.008**	**.012**
HEXANE	02	S002	Stack	85%	0%	☒	5.49E-04	5.95E-04	Not Appl.	1.20E-04	.001	.003
Total Emissions of HEXANE from AFTER BURNER:							**5.49E-04**	**5.95E-04**	**Not Appl.**	**1.20E-04**	**.001**	**.003**
NITROGEN OXIDES (NOx)	01	S002	Stack	0%	0%	☐	2.325	2.52	Not Appl.	1.52	6.3	11.038
	02	S002	Stack	0%	0%	☐	1.977	2.143	Not Appl.	.431	5.357	9.386
Total Emissions of NITROGEN OXIDES (NOx) from AFTER BURNER:							**4.303**	**4.663**	**Not Appl.**	**1.95**	**11.657**	**11.038**
PARTICULATE MATTER (PM10)	01	S002	Stack	0%	99.5%	☐	6.23E-04	6.75E-04	Not Appl.	4.07E-04	.002	.003
	02	S002	Stack	0%	99.5%	☐	5.34E-04	5.79E-04	Not Appl.	1.16E-04	.001	.003
Total Emissions of PARTICULATE MATTER (PM10) from AFTER BURNER:							**.001**	**.001**	**Not Appl.**	**5.23E-04**	**.003**	**.003**
PARTICULATE MATTER (TSP)	01	S002	Stack	0%	99.5%	☐	.001	.001	7.781	7.44E-04	.003	34.081
	02	S002	Stack	0%	99.5%	☐	9.89E-04	.001	7.781	2.15E-04	.003	34.081
Total Emissions of PARTICULATE MATTER (TSP) from AFTER BURNER:							**.002**	**.002**	**7.781**	**9.59E-04**	**.006**	**34.081**
SULFUR DIOXIDE (SO2)	01	S002	Stack	0%	0%	☐	.01	.011	72.	.007	.027	315.36
	02	S002	Stack	0%	0%	☐	2.808	3.043	72.	.612	7.607	315.36
Total Emissions of SULFUR DIOXIDE (SO2) from AFTER BURNER:							**2.818**	**3.054**	**72.**	**.618**	**7.634**	**315.36**
TOLUENE	01	S002	Stack	85%	0%	☒	1.40E-04	1.51E-04	Not Appl.	9.12E-05	3.78E-04	6.62E-04
Total Emissions of TOLUENE from AFTER BURNER:							**1.40E-04**	**1.51E-04**	**Not Appl.**	**9.12E-05**	**3.78E-04**	**6.62E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S002	Stack	85%	0%	☐	.007	.008	Not Appl.	.005	.019	.033
	02	S002	Stack	85%	0%	☐	.005	.005	Not Appl.	.001	.014	.024
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from AFTER BURNER:							**.012**	**.013**	**Not Appl.**	**.006**	**.033**	**.033**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 0.112 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = 1.82E-04 TPY.
Maximum Annual:	90. MMcf/yr * 0.112 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = 7.56E-04 TPY.
Potential Annual:	7.56E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.82E-04 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = 2.79E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.56E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.02E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 35 lb/MMcf * (1 - 99% control eff.) * 1 ton/2,000 lb = .004 TPY.
Maximum Annual:	90. MMcf/yr * 35 lb/MMcf * (1 - 99% control eff.) * 1 ton/2,000 lb = .016 TPY.
Potential Annual:	.016 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .028 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .004 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .016 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 5 lb/1000 Gal * (1 - 99% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 5 lb/1000 Gal * (1 - 99% control eff.) * 1 ton/2,000 lb = .013 TPY.
Potential Annual:	.013 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .023 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 435.7 hr/yr act. * 2,000 lb/ton = .005 lb/hr.
Maximum Hourly:	Maximum annual emissions of .013 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .005 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 0.22 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = 3.58E-04 TPY.
Maximum Annual:	90. MMcf/yr * 0.22 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.58E-04 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = 5.48E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.94E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 0.17 lb/1000 Gal * (1 - 85% control eff.) * 1 ton/2,000 lb = 5.49E-04 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 0.17 lb/1000 Gal * (1 - 85% control eff.) * 1 ton/2,000 lb = .007 TPY.
Potential Annual:	.007 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .012 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.49E-04 TPY / 435.7 hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .007 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for HEXANE (CAS 110-54-3)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 0.037 lb/1000 Gal * (1 - 85% control eff.) * 1 ton/2,000 lb = 1.20E-04 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 0.037 lb/1000 Gal * (1 - 85% control eff.) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.20E-04 TPY / 435.7 hr/yr act. * 2,000 lb/ton = 5.49E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.95E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 140 lb/MMcf * 1 ton/2,000 lb = 1.52 TPY.
Maximum Annual:	90. MMcf/yr * 140 lb/MMcf * 1 ton/2,000 lb = 6.3 TPY.
Potential Annual:	6.3 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 11.038 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.52 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = 2.325 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.3 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.52 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 20 lb/1000 Gal * 1 ton/2,000 lb = .431 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 20 lb/1000 Gal * 1 ton/2,000 lb = 5.357 TPY.
Potential Annual:	5.357 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.386 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .431 TPY / 435.7 hr/yr act. * 2,000 lb/ton = 1.977 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.357 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.143 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 7.5 lb/MMcf * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 4.07E-04 TPY.
Maximum Annual:	90. MMcf/yr * 7.5 lb/MMcf * (1 - 99.5% control eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.07E-04 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = 6.23E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 6.75E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 1.08 lb/1000 Gal * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 1.16E-04 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 1.08 lb/1000 Gal * (1 - 99.5% control eff.) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.16E-04 TPY / 435.7 hr/yr act. * 2,000 lb/ton = 5.34E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.79E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 13.7 lb/MMcf * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 7.44E-04 TPY.
Maximum Annual:	90. MMcf/yr * 13.7 lb/MMcf * (1 - 99.5% control eff.) * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	Maximum allowable hourly emissions of 7.781 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 34.081 TPY.
Average Hourly:	Actual annual emissions of 7.44E-04 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = 2.16 * 18^ 0.4434 = 7.781 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 2 lb/1000 Gal * (1 - 99.5% control eff.) * 1 ton/2,000 lb = 2.15E-04 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 2 lb/1000 Gal * (1 - 99.5% control eff.) * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	Maximum allowable hourly emissions of 7.781 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 34.081 TPY.
Average Hourly:	Actual annual emissions of 2.15E-04 TPY / 435.7 hr/yr act. * 2,000 lb/ton = 9.89E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = 2.16 * 18^ 0.4434 = 7.781 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	90. MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .027 TPY.
Potential Annual:	Maximum allowable hourly emissions of 72. lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 315.36 TPY.
Average Hourly:	Actual annual emissions of .007 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = .01 lb/hr.
Maximum Hourly:	Maximum annual emissions of .027 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .011 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 18 MMBtu/hr = 72 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 142 lb/1000 Gal * 1 ton/2,000 lb * 0.2% sulfur content = .612 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 142 lb/1000 Gal * 1 ton/2,000 lb * 0.2% sulfur content = 7.607 TPY.
Potential Annual:	Maximum allowable hourly emissions of 72. lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 315.36 TPY.
Average Hourly:	Actual annual emissions of .612 TPY / 435.7 hr/yr act. * 2,000 lb/ton = 2.808 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.607 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.043 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 18 MMBtu/hr = 72 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 0.056 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = 9.12E-05 TPY.
Maximum Annual:	90. MMcf/yr * 0.056 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = 3.78E-04 TPY.
Potential Annual:	3.78E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.62E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 9.12E-05 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = 1.40E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.78E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.51E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S002
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	21.71 MMcf/yr * 2.8 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = .005 TPY.
Maximum Annual:	90. MMcf/yr * 2.8 lb/MMcf * (1 - 85% control eff.) * 1 ton/2,000 lb = .019 TPY.
Potential Annual:	.019 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .033 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .005 TPY / 1,307.1 hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .019 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .008 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S002
Segment No: 02, NO. 2 FUEL OIL FIRING

Actual Annual:	43.075 x 1,000 gal/yr * 0.34 lb/1000 Gal * (1 - 85% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	535.714 x 1,000 gal/yr * 0.34 lb/1000 Gal * (1 - 85% control eff.) * 1 ton/2,000 lb = .014 TPY.
Potential Annual:	.014 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .024 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 435.7 hr/yr act. * 2,000 lb/ton = .005 lb/hr.
Maximum Hourly:	Maximum annual emissions of .014 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .005 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for AFTER BURNER

3

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F003 - HOT METAL TRANSFER - MELTING
E003 - HMT MELTING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F003
Emission Unit ID:	E003
Source Desc:	HMT MELTING
Building No.:	MELTING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3911
Air Permit No.:	N/A

Equipment Information

Equip. Type:	CUPOLA RUNNERS, DUCKS NEST, AND 23-TON LADLES
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	1/1/77
Max. Capacity:	MAXIMUM OF 37.2 TPH OR 186,000 TPY OF HOT METAL (GREY IRON AND SLAG)

Description of Operation

GREY IRON FLOWS FROM THE CUPOLAS THROUGH THE CUPOLA RUNNERS, DUCKS NEST, AND 15-TON HOLDING BOTTLES (LADLES). EMISSIONS FROM THE MELTING HOT METAL TRANSFER (HMT) PROCESS ARE FROM THE TAPPING PROCESS AND THE SLAGGING PROCESS THAT TAKE PLACE DURING THE TRANSFER.

BASED ON THE 1996 FISCAL YEAR PRODUCTION REPORT, THE AVERAGE ANNUAL TONNAGE OF HOT METAL TRANSFER IS 51,904 TPY, CONSISTING OF 50,248 TPY OF GRAY IRON AND 1,656 TPY OF SLAG. THE MAXIMUM ANNUAL TONNAGE OF HOT METAL TRANSFER IS 186,000 TPY, CONSISTING OF 180,050 TPY OF GRAY IRON AND 5,950 TPY OF SLAG. THE OPERATION IS DIRECTLY AFFECTED BY THE CUPOLA MELTING PROCESS. THUS, AVERAGE HOURS OF OPERATION ARE 1,742.9 HR/YR (OR APPROXIMATELY 9.27 HR/DAY, 4 DAY/WK, AND 47 WK/YR); AND THE MAXIMUM HOURS OF OPERATION ARE 5,000 HR/YR LIMITED BY THE CUPOLA PERMIT.

EMISSIONS FROM BOTH THE TAPPING AND SLAGGING PROCESSES ARE CONSIDERED AS PROCESS FUGITIVE EMISSIONS FROM THE MELTING BUILDING (S004). THE MAXIMUM ALLOWABLE TSP EMISSION RATE IS SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.3, SCHEDULE 2 OF TABLE 2.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S004	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITVE EMISSIONS FROM THE MELTING BUILDING.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	HOT METAL TRANSFER - MELTING, TAPPING	30400320	1,743	5,000	50,248	180,050	36.01	30.721

Comments: AVERAGE AND MAXIMUM ANNUAL GREY IRON PROCESSED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 28.83 TPH AND 36.01 TPH, RESPECTIVELY.

FOR THE (GREY IRON) TAPPING PROCESS, THE INPUT PROCESS WEIGHT OF 36.01 TPH OR 72,020 LB/HR IS USED TO DETERMINE THE MAXIMUM ALLOWABLE TSP EMISSION RATE PURSUANT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.3.

MWPS008886

02	HOT METAL TRANSFER - MELTING, SLAGGING	30400320	1,743	5,000	1,656	5,950	1.19	3.993

Comments: AVERAGE AND MAXIMUM ANNUAL SLAG PROCESSED ARE 1,656 TPY AND 5,950 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY SLAG PROCESSED ARE 0.95 TPH AND 1.19 TPH, RESPECTIVELY.

FOR THE SLAGGING PROCESS, THE INPUT PROCESS WEIGHT OF 1.19 TPH OR 2,380 LB/HR IS USED TO DETERMINE THE MAXIMUM ALLOWABLE TSP EMISSION RATE PURSUANT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.3.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	S3S5	PARTICULATE MATTER (PM10)	0.028	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
01	S3S5	PARTICULATE MATTER (TSP)	0.056	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
02	S3S5	PARTICULATE MATTER (PM10)	0.028	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
02	S3S5	PARTICULATE MATTER (TSP)	0.056	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S004	Fugitive	0%	0%	☐	.807	1.008	Not Appl.	.703	2.521	4.416
	02	S004	Fugitive	0%	0%	☐	.027	.033	Not Appl.	.023	.083	.146
Total Emissions of PARTICULATE MATTER (PM10) from HMT MELTING:							**.834**	**1.042**	**Not Appl.**	**.727**	**2.604**	**4.562**
PARTICULATE MATTER (TSP)	01	S004	Fugitive	0%	0%	☐	1.615	2.017	30.721	1.407	5.041	134.559
	02	S004	Fugitive	0%	0%	☐	.053	.067	3.993	.046	.167	17.488
Total Emissions of PARTICULATE MATTER (TSP) from HMT MELTING:							**1.668**	**2.083**	**34.714**	**1.453**	**5.208**	**152.047**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S004
Segment No: 01, HOT METAL TRANSFER - MELTING, TAPPING

Actual Annual:	50,248 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .703 TPY.
Maximum Annual:	180,050 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 2.521 TPY.
Potential Annual:	2.521 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.416 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .703 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .807 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.521 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.008 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S004
Segment No: 02, HOT METAL TRANSFER - MELTING, SLAGGING

Actual Annual:	1,656 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .023 TPY.
Maximum Annual:	5,950 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .083 TPY.
Potential Annual:	.083 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .146 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .023 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .027 lb/hr.
Maximum Hourly:	Maximum annual emissions of .083 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .033 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S004
Segment No: 01, HOT METAL TRANSFER - MELTING, TAPPING

Actual Annual:	50,248 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 1.407 TPY.
Maximum Annual:	180,050 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 5.041 TPY.
Potential Annual:	Maximum allowable hourly emissions of 30.721 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 134.559 TPY.
Average Hourly:	Actual annual emissions of 1.407 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.615 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.041 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.017 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 36.01 ton/hr or 72,020 lb/hr. Calculation : 30.6 lb/hr + (72,020 - 70,000) * (.6 / 10,000) lb/hr = 30.721 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S004
Segment No: 02, HOT METAL TRANSFER - MELTING, SLAGGING

Actual Annual:	1,656 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .046 TPY.
Maximum Annual:	5,950 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .167 TPY.
Potential Annual:	Maximum allowable hourly emissions of 3.993 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 17.488 TPY.
Average Hourly:	Actual annual emissions of .046 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .053 lb/hr.
Maximum Hourly:	Maximum annual emissions of .167 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .067 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 1.19 ton/hr or 2,380 lb/hr. Calculation : 3.59 lb/hr + (2,380 - 2,000) * (0.53 / 500) lb/hr = 3.993 lb/hr.

End Fact Sheet for HMT MELTING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F004 - DESULFURIZATION & HOLDING FURNACES
E004 - DESULFURIZATION

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F004
Emission Unit ID:	E004
Source Desc:	DESULFURIZATION
Building No.:	TREATING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	15-TON BOTTLES (LADLES)
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 36.01 TPH AND 180,050 TPY OF GREY IRON.

Description of Operation

MOLTEN IRON TAPPED INTO THE 15-TON BOTTLES (LADLES) AT THE MELTING BUILDING IS CARRIED OVER TO THE TREATING BUILDING VIA LIFT TRUCK. THEN THE DESULFURIZATION PROCESS IS PERFORMED IN THE 15-TON BOTTLES USING CALCIUM CARBIDE. THE CARBIDE IS WEIGHED ON A SCALE, THEN ADDED INTO THE BOTTLE. A STIRRER ATTACHED TO THE LADLE COVER IS USED TO MIX THE CARBIDE INTO THE HOT METAL. FOLLOWING THE DESULFURIZATION PROCESS, SLAGGING IS ALSO PERFORMED AT THE DESULFURIZING LADLE BEFORE THE HOT METAL TRANSFER TO TO THE INDUCTION HOLDING FURNACE.

EMISSIONS EVOLVED FROM THE DESULFURIZATION PROCESS AND THE SLAGGING PROCESS ARE EMITTED AS FUGITIVE EMISSIONS THROUGH THE NORTH AND SOUTH GABLE EXHAUST VENTS OF THE TREATING BUILDING.

AVERAGE AND MAXIMUM ANNUAL GREY IRON PROCESSED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 28.83 TPH AND 36.01 TPH, RESPECTIVELY.

PARTICULATE EMISSIONS FROM THE DESULFURIZATION AND SLAGGING PROCESS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S005-S006	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS THROUGH HOT METAL BUILDING NORTH AND SOUTH GABLE EXAUSTS.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	DESULFURIZATION	30400398	1,743	5,000	50,248	180,050	36.01	41.542

Comments: AVERAGE AND MAXIMUM ANNUAL GREY IRON PROCESSED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 28.83 TPH AND 36.01 TPH, RESPECTIVELY. THE INPUT PROCESS WEIGHT OF 36.01 TPH OR 72,020 LB/HR IS USED TO DETERMINE THE MAXIMUM ALLOWABLE TSP EMISSION RATE PURSUANT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2.

02	SLAGGING	30400398	1,743	5,000	50,248	180,050		Not Appl.

Comments: AVERAGE AND MAXIMUM ANNUAL GREY IRON PROCESSED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. ALLOWABLE TSP EMISSIONS ARE INCLUDED IN EMISSION SEGMENT 01.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	S4	ARSENIC COMPOUNDS	2.8E-05	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	BERYLLIUM COMPOUNDS	1.6E-06	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	CADMIUM COMPOUNDS	2.8E-05	lb/ton	DIPRA REF:11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	CHROMIUM COMPOUNDS	0.00018	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	LEAD COMPOUNDS	0.0098	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	MANGANESE COMPOUNDS	0.00074	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	NICKEL COMPOUNDS	1.4E-06	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
01	S4	PARTICULATE MATTER (PM10)	0.49	lb/ton	DIPRA REF:5,12,19
	Comments:	UNCONTROLLED EMISSION FACTOR FROM USPIPE BURLINGTON (NJ) PLANT'S SOURCE TEST DATA. ASSUMING PM-10 = 51% OF PM(TSP).			
01	S4	PARTICULATE MATTER (TSP)	0.98	lb/ton	DIPRA REF:5,12,19
	Comments:	UNCONTROLLED EMISSION FACTOR FROM USPIPE BURLINGTON (NJ) PLANT'S SOURCE TEST DATA. (1.5 -0.46DUC - 0.056HMT) = 0.98.			
01	S4	SELENIUM COMPOUNDS	1.3E-06	lb/ton	DIPRA REF: 11
	Comments:	UNCONTROLLED EMISSION FACTOR FROM ACIPCO'S MATERIAL BALANCE CALCULATIONS.			
02	S3S5	PARTICULATE MATTER (PM10)	0.028	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
02	S3S5	PARTICULATE MATTER (TSP)	0.056	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			

Emission Source Fact Sheet

F004 - DESULFURIZATION & HOLDING FURNACES
E004 - DESULFURIZATION

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
ARSENIC COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	2.66E-04	3.33E-04	Not Appl.	2.32E-04	8.32E-04	.001
Total Emissions of ARSENIC COMPOUNDS from DESULFURIZATION:							**2.66E-04**	**3.33E-04**	**Not Appl.**	**2.32E-04**	**8.32E-04**	**.001**
BERYLLIUM COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	1.52E-05	1.90E-05	Not Appl.	1.33E-05	4.75E-05	8.33E-05
Total Emissions of BERYLLIUM COMPOUNDS from DESULFURIZATION:							**1.52E-05**	**1.90E-05**	**Not Appl.**	**1.33E-05**	**4.75E-05**	**8.33E-05**
CADMIUM COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	2.66E-04	3.33E-04	Not Appl.	2.32E-04	8.32E-04	.001
Total Emissions of CADMIUM COMPOUNDS from DESULFURIZATION:							**2.66E-04**	**3.33E-04**	**Not Appl.**	**2.32E-04**	**8.32E-04**	**.001**
CHROMIUM COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	.002	.002	Not Appl.	.001	.005	.009
Total Emissions of CHROMIUM COMPOUNDS from DESULFURIZATION:							**.002**	**.002**	**Not Appl.**	**.001**	**.005**	**.009**
LEAD COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	.093	.116	Not Appl.	.081	.291	.51
Total Emissions of LEAD COMPOUNDS from DESULFURIZATION:							**.093**	**.116**	**Not Appl.**	**.081**	**.291**	**.51**
MANGANESE COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	.007	.009	Not Appl.	.006	.022	.039
Total Emissions of MANGANESE COMPOUNDS from DESULFURIZATION:							**.007**	**.009**	**Not Appl.**	**.006**	**.022**	**.039**
NICKEL COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	1.33E-05	1.66E-05	Not Appl.	1.16E-05	4.16E-05	7.29E-05
Total Emissions of NICKEL COMPOUNDS from DESULFURIZATION:							**1.33E-05**	**1.66E-05**	**Not Appl.**	**1.16E-05**	**4.16E-05**	**7.29E-05**
PARTICULATE MATTER (PM10)	01	S005-S006	Fugitive	67%	0%	☐	4.662	5.823	Not Appl.	4.063	14.557	25.504
	02	S005-S006	Fugitive	67%	0%	☐	.266	.333	Not Appl.	.232	.832	1.457
Total Emissions of PARTICULATE MATTER (PM10) from DESULFURIZATION:							**4.929**	**6.156**	**Not Appl.**	**4.295**	**15.389**	**26.961**
PARTICULATE MATTER (TSP)	01	S005-S006	Fugitive	67%	0%	☐	9.324	11.646	41.542	8.125	29.114	181.956
	02	S005-S006	Fugitive	67%	0%	☐	.533	.665	Included in Segm. 01	.464	1.664	2.915
Total Emissions of PARTICULATE MATTER (TSP) from DESULFURIZATION:							**9.857**	**12.311**	**41.542**	**8.589**	**30.778**	**184.87**
SELENIUM COMPOUNDS	01	S005-S006	Fugitive	67%	0%	☒	1.24E-05	1.54E-05	Not Appl.	1.08E-05	3.86E-05	6.77E-05
Total Emissions of SELENIUM COMPOUNDS from DESULFURIZATION:							**1.24E-05**	**1.54E-05**	**Not Appl.**	**1.08E-05**	**3.86E-05**	**6.77E-05**

Supporting Emission Calculations

Emission Calculations for ARSENIC COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.000028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.32E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.32E-04 TPY.
Potential Annual:	8.32E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.32E-04 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.66E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.32E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.33E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.33E-05 TPY.
Maximum Annual:	180,050 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.75E-05 TPY.
Potential Annual:	4.75E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.33E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.33E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.52E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.75E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.90E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.000028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.32E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.32E-04 TPY.
Potential Annual:	8.32E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.32E-04 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 2.66E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.32E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.33E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.00018 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	180,050 tons/yr * 0.00018 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	.005 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .009 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.0098 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .081 TPY.
Maximum Annual:	180,050 tons/yr * 0.0098 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .291 TPY.
Potential Annual:	.291 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .51 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .081 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .093 lb/hr.
Maximum Hourly:	Maximum annual emissions of .291 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .116 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.00074 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .006 TPY.
Maximum Annual:	180,050 tons/yr * 0.00074 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .022 TPY.
Potential Annual:	.022 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .039 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .006 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .022 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.0000014 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.16E-05 TPY.
Maximum Annual:	180,050 tons/yr * 0.0000014 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.16E-05 TPY.
Potential Annual:	4.16E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 7.29E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.16E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.33E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.16E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.66E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.49 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.063 TPY.
Maximum Annual:	180,050 tons/yr * 0.49 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 14.557 TPY.
Potential Annual:	14.557 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 25.504 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.063 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 4.662 lb/hr.
Maximum Hourly:	Maximum annual emissions of 14.557 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.823 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S005-S006
Segment No: 02, SLAGGING

Actual Annual:	50,248 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .232 TPY.
Maximum Annual:	180,050 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .832 TPY.
Potential Annual:	.832 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.457 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .232 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .266 lb/hr.
Maximum Hourly:	Maximum annual emissions of .832 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .333 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.98 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.125 TPY.
Maximum Annual:	180,050 tons/yr * 0.98 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 29.114 TPY.
Potential Annual:	Maximum allowable hourly emissions of 41.542 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 181.956 TPY.
Average Hourly:	Actual annual emissions of 8.125 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 9.324 lb/hr.
Maximum Hourly:	Maximum annual emissions of 29.114 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 11.646 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 36.01 ton/hr or 72,020 lb/hr. Calculation : 41.3 lb/hr + (72,020 - 70,000) * (1.2 / 10,000) lb/hr = 41.542 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S005-S006
Segment No: 02, SLAGGING

Actual Annual:	50,248 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .464 TPY.
Maximum Annual:	180,050 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.664 TPY.
Potential Annual:	1.664 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.915 TPY. This PTE is the emission rates over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .464 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .533 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.664 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .665 lb/hr.
Allowable Emissions:	Allowable emission rate is already calculated in Emission Segment 01.

Emission Calculations for SELENIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DESULFURIZATION

Actual Annual:	50,248 tons/yr * 0.0000013 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.08E-05 TPY.
Maximum Annual:	180,050 tons/yr * 0.0000013 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.86E-05 TPY.
Potential Annual:	3.86E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.77E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.08E-05 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = 1.24E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.86E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.54E-05 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for DESULFURIZATION

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F004 - DESULFURIZATION & HOLDING FURNACES
E005 - HMT TO HOLDING FURNACES

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F004
Emission Unit ID:	E005
Source Desc:	HMT TO HOLDING FURNACES
Building No.:	TREATING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400303-41C

Equipment Information

Equip. Type:	30-TON HOLDING FURNACES
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 36.01 TPH AND 180,050 TPY OF GREY IRON.

Description of Operation

HOT METAL ARE TRANSFERRED INTO HOLDING FURNACES FOLLOWING THE DESULFURIZATION AND SLAGGING PROCESS. THREE 30-TON HOLDING FURNACES ARE USED FOR MAINTAINING THE MOLTEN IRON BY SUPERHEATING. TWO UNITS ARE ACTIVELY IN SERVICE AND ONE UNIT SERVES AS STANDBY.

EMISSIONS FROM THIS HOT METAL TRANSFER INTO THE HOLDING FURNACES ARE CONSIDERED AS FUGITIVE EMISSIONS WHICH ESCAPE FROM THE TREATING BUILDING THROUGH THE NORTH AND SOUTH GABLE EXHAUSTS.

EMISSION CALCULATIONS FOR THIS PROCESS ARE BASED ON THE AMOUNT OF GREY IRON PROCESSED. AVERAGE AND MAXIMUM ANNUAL TONNAGES OF DESULFURIZED (MOLTEN) IRON TRANSFERRED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 28.83 TPH AND 36.01 TPH, RESPECTIVELY.

THE MAXIMUM ALLOWABLE TSP EMISSION RATE IS SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.3.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S005-S006	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS THROUGH HOT METAL BUILDING NORTH AND SOUTH GABLE EXAUSTS.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	HOT METAL TRANSFER TO THE HOLDING FURNACES	30400320	1,743	5,000	50,248	180,050	36.01	41.542

Comments: AVERAGE AND MAXIMUM ANNUAL GREY IRON PROCESSED ARE 51,908 TPY AND 186,018 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 29.78 TPH AND 37.20 TPH, RESPECTIVELY.

THE INPUT PROCESS WEIGHT OF 36.01 TPH OR 72,020 LB/HR IS USED TO DETERMINE THE MAXIMUM ALLOWABLE TSP EMISSION RATE PURSUANT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.3.

MWPS008901

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	S3S5	PARTICULATE MATTER (PM10)	0.028	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
01	S3S5	PARTICULATE MATTER (TSP)	0.056	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			

Emission Source Fact Sheet

F004 - DESULFURIZATION & HOLDING FURNACES
E005 - HMT TO HOLDING FURNACES

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S005-S006	Fugitive	67%	0%	☐	.266	.333	Not Appl.	.232	.832	1.457
Total Emissions of PARTICULATE MATTER (PM10) from HMT TO HOLDING FURNACES:							**.266**	**.333**	**Not Appl.**	**.232**	**.832**	**1.457**
PARTICULATE MATTER (TSP)	01	S005-S006	Fugitive	67%	0%	☐	.533	.665	41.542	.464	1.664	181.956
Total Emissions of PARTICULATE MATTER (TSP) from HMT TO HOLDING FURNACES:							**.533**	**.665**	**41.542**	**.464**	**1.664**	**181.956**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S005-S006
Segment No: 01, HOT METAL TRANSFER TO THE HOLDING FURNACES

Actual Annual:	50,248 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .232 TPY.
Maximum Annual:	180,050 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .832 TPY.
Potential Annual:	.832 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.457 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .232 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .266 lb/hr.
Maximum Hourly:	Maximum annual emissions of .832 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .333 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S005-S006
Segment No: 01, HOT METAL TRANSFER TO THE HOLDING FURNACES

Actual Annual:	50,248 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .464 TPY.
Maximum Annual:	180,050 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.664 TPY.
Potential Annual:	Maximum allowable hourly emissions of 41.542 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 181.956 TPY.
Average Hourly:	Actual annual emissions of .464 TPY / 1,742.8 hr/yr act. * 2,000 lb/ton = .533 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.664 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .665 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 36.01 ton/hr or 72,020 lb/hr. Calculation : 41.3 lb/hr + (72,020 - 70,000) * (1.2 / 10,000) lb/hr = 41.542 lb/hr.

End Fact Sheet for HMT TO HOLDING FURNACES

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F004 - DESULFURIZATION & HOLDING FURNACES
E006 - HOLDING FURNACE PREHEAT

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F004
Emission Unit ID:	E006
Source Desc:	HOLDING FURNACE PREHEAT
Building No.:	TREATING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	NORTH AMERICAN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	GAS LANCES
Rated Heat Input Capacity:	5 MMBtu/hr
Maximum Heat Input Capacity:	5 MMBtu/hr
Avg. Oper. Heat Input Capacity:	0.673 MMBtu/hr

Description of Operation

PREHEATING OF THE INDUCTION HOLDING FURNACES ARE PERFORMED IN THE TREATING BUILDING. A GAS BURNER IS INSERTED INTO THE FURNACE DURING THE PREHEATING PROCESS. THIS PREHEATING PROCESS IS MAINTAINED CONTINOUSLY FOR 24 HR/DAY, 7 DAY/WK, AND 48 WK/YR BASIS OR 8,064 HR/YR. THE BURNER USED IS RATED 5-10 MMBTU/HR; HOWEVER, THE AVERAGE FIRING RATE IS APPROXIMATELY 0.673 MMBTU/HR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S005-S006	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS THROUGH HOT METAL BUILDING NORTH AND SOUTH GABLE EXAUSTS.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400398	8,064	8,400	5.43	5.65

Comments: AVERAGE NATURAL GAS USAGE IS 5.428 MMCF/YR BASED ON 1996 FISCAL YEAR REPORT. THE MAXIMUM NATURAL GAS USAGE IS 5.428 MMBTU/HR * 8,400 HRS / 8,064 HRS = 5.654 MMBTU/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S005-S006	Fugitive	0%	0%	☒	1.43E-04	1.43E-04	Not Appl.	5.75E-04	5.99E-04	6.25E-04
Total Emissions of BENZENE from HOLDING FURNACE PREHEAT:							**1.43E-04**	**1.43E-04**	**Not Appl.**	**5.75E-04**	**5.99E-04**	**6.25E-04**
CARBON MONOXIDE (CO)	01	S005-S006	Fugitive	0%	0%	☐	.014	.014	Not Appl.	.057	.059	.062
Total Emissions of CARBON MONOXIDE (CO) from HOLDING FURNACE PREHEAT:							**.014**	**.014**	**Not Appl.**	**.057**	**.059**	**.062**
FORMALDEHYDE	01	S005-S006	Fugitive	0%	0%	☒	2.83E-04	2.83E-04	Not Appl.	.001	.001	.001
Total Emissions of FORMALDEHYDE from HOLDING FURNACE PREHEAT:							**2.83E-04**	**2.83E-04**	**Not Appl.**	**.001**	**.001**	**.001**
NITROGEN OXIDES (NOx)	01	S005-S006	Fugitive	0%	0%	☐	.067	.067	Not Appl.	.271	.283	.295
Total Emissions of NITROGEN OXIDES (NOx) from HOLDING FURNACE PREHEAT:							**.067**	**.067**	**Not Appl.**	**.271**	**.283**	**.295**
PARTICULATE MATTER (TSP)	01	S005-S006	Fugitive	67%	0%	☐	.003	.003	3.	.011	.011	13.14
Total Emissions of PARTICULATE MATTER (TSP) from HOLDING FURNACE PREHEAT:							**.003**	**.003**	**3.**	**.011**	**.011**	**13.14**
SULFUR DIOXIDE (SO2)	01	S005-S006	Fugitive	0%	0%	☐	4.04E-04	4.04E-04	20.	.002	.002	87.6
Total Emissions of SULFUR DIOXIDE (SO2) from HOLDING FURNACE PREHEAT:							**4.04E-04**	**4.04E-04**	**20.**	**.002**	**.002**	**87.6**
TOLUENE	01	S005-S006	Fugitive	0%	0%	☒	7.14E-05	7.13E-05	Not Appl.	2.88E-04	3.00E-04	3.13E-04
Total Emissions of TOLUENE from HOLDING FURNACE PREHEAT:							**7.14E-05**	**7.13E-05**	**Not Appl.**	**2.88E-04**	**3.00E-04**	**3.13E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S005-S006	Fugitive	0%	0%	☐	.004	.004	Not Appl.	.014	.015	.016
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from HOLDING FURNACE PREHEAT:							**.004**	**.004**	**Not Appl.**	**.014**	**.015**	**.016**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 5.75E-04 TPY.
Maximum Annual:	5.654 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 5.99E-04 TPY.
Potential Annual:	5.99E-04 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = 6.25E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.75E-04 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 1.43E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.99E-04 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 1.43E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .057 TPY.
Maximum Annual:	5.654 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .059 TPY.
Potential Annual:	.059 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .062 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .057 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .014 lb/hr.
Maximum Hourly:	Maximum annual emissions of .059 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .014 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	5.654 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 2.83E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 2.83E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .271 TPY.
Maximum Annual:	5.654 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .283 TPY.
Potential Annual:	.283 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .295 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .271 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .067 lb/hr.
Maximum Hourly:	Maximum annual emissions of .283 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .067 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .011 TPY.
Maximum Annual:	5.654 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .011 TPY.
Potential Annual:	Maximum allowable hourly emissions of 3. lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 13.14 TPY.
Average Hourly:	Actual annual emissions of .011 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .011 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.1, Schedule 1 of Table 1 for equipment built or installed before January 1, 1973. Q = .6 * 5 = 3 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	5.654 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	Maximum allowable hourly emissions of 20. lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 87.6 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 4.04E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 4.04E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 5 MMBtu/hr = 20 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 2.88E-04 TPY.
Maximum Annual:	5.654 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 3.00E-04 TPY.
Potential Annual:	3.00E-04 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = 3.13E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.88E-04 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 7.14E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.00E-04 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 7.13E-05 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .014 TPY.
Maximum Annual:	5.654 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .015 TPY.
Potential Annual:	.015 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .016 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .014 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .004 lb/hr.
Maximum Hourly:	Maximum annual emissions of .015 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for HOLDING FURNACE PREHEAT

5

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F005 - DUCTILE TREATING
E007 - TREATING LADLES

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F005
Emission Unit ID:	E007
Source Desc:	TREATING LADLES
Building No.:	TREATING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3911
Air Permit No.:	3321-30400301-39C

Equipment Information

Equip. Type:	5-TON TREATING LADLES
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 36.01 TPH AND 180,050 TPY OF GREY IRON.

Description of Operation

IN THE DUCTILE TREATING PROCESS, THE HOT METAL FROM THE HOLDING LADLES IS POURED INTO THE 5-TON LADLES CONTAINING MAGNESIUM ALLOYS TO PRODUCE DUCTILE IRON. EMISSIONS FROM THE DUCTILE TREATING PROCESS IS CAPTURED BY THE LOCAL DUCTILE TREATING EXHAUST HOOD.

EMISSIONS FROM THE DUCTILE TREATING PROCESS ARE 90-PERCENT CAPTURED AND CONTROLLED BY A BAGHOUSE (CD003) AND THEN DISCHARGED THROUGH ITS OUTLET (S007). THE REMAINING 10-PERCENT EMISSIONS ARE FUGITIVE EMISSIONS WHICH VENT THROUGH THE TREATING BUILDING GABLE EXHAUSTS (S005-S006).

THE AVERAGE AND MAXIMUM ANNUAL TONNAGES OF GREY IRON TRANSFERRED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. THE AVERAGE AND MAXIMUM HOURS OF OPERATION ARE 1,880 HR/YR AND 5,000 HR/YR. THUS, AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 26.73 TPH AND 36.01 TPH, RESPECTIVELY.

THE MAXIMUM ALLOWABLE TSP EMISSION RATE IS SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 26.12.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S005-S006	10%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS THROUGH HOT METAL BUILDING NORTH AND SOUTH GABLE EXAUSTS.									
S007	90%	48	[N/A]	[N/A]	[N/A]	96,925	CD003	BAGHOUSE	[N/A]	[No Sec. Control]
Comments:	DUCTILE TREATING AND #9 UNIT SHAKEOUT BAGHOUSE STACK.									

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	DUCTILE TREATING	30400399	1,880	5,000	50,248	180,050	--	12.857

Comments: AVERAGE AND MAXIMUM ANNUAL GREY IRON PROCESSED ARE 50,248 TPY AND 180,050 TPY, RESPECTIVELY. THE AVERAGE AND MAXIMUM HOURS OF OPERATION ARE 1,880 HR/YR AND 5,000 HR/YR. THUS, AVERAGE AND MAXIMUM HOURLY GREY IRON PROCESSED ARE 26.73 TPH AND 36.01 TPH, RESPECTIVELY.

THE MAXIMUM ALLOWABLE TSP EMISSIONS IS SUBJECT TO RULE 26.12 OR 0.020 GR/DSCF.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	S5	ANTIMONY COMPOUNDS	3.0E-05	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE NORTH BIRMINGHAM PLANT DUST CATCH AND ANALYSIS.			
01	S5	ARSENIC COMPOUNDS	0.00013	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE NORTH BIRMINGHAM PLANT DUST CATCH AND ANALYSIS.			
01	S5	CADMIUM COMPOUNDS	0.00063	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE UNION CITY PLANT (CALIFORNIA) SOURCE TEST.			
01	S5	CHROMIUM COMPOUNDS	0.0008	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE UNION CITY PLANT (CALIFORNIA) SOURCE TEST.			
01	S5	COBALT COMPOUNDS	8.2E-06	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE NORTH BIRMINGHAM PLANT DUST CATCH AND ANALYSIS.			
01	S5	LEAD COMPOUNDS	0.00266	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE NORTH BIRMINGHAM PLANT DUST CATCH AND ANALYSIS.			
01	S5	MANGANESE COMPOUNDS	0.00066	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE NORTH BIRMINGHAM PLANT DUST CATCH AND ANALYSIS.			
01	S5	MERCURY COMPOUNDS	0.0003	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE UNION CITY PLANT (CALIFORNIA) SOURCE TEST.			
01	S5	NICKEL COMPOUNDS	0.0007	lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE UNION CITY PLANT (CALIFORNIA) SOURCE TEST.			
01	S5	PARTICULATE MATTER (PM10)	0.25	lb/ton	DIPRA REF: 21
	Comments:	SOURCE: MCWANE MATERIAL BALANCE ON DUST CATCH FROM DESULFURIZATION AND DUCTILE TREATING. PM-10 IS 51% OF TSP.			
01	S5	PARTICULATE MATTER (TSP)	0.5	lb/ton	DIPRA REF: 21
	Comments:	SOURCE: MCWANE MATERIAL BALANCE ON DUST CATCH FROM DESULFURIZATION AND DUCTILE TREATING.			

01	S5	SELENIUM COMPOUNDS	1.8E-06 lb/ton	DIPRA REF: 12
	Comments:	UNCONTROLLED EMISSION FACTOR FOR DUCTILE TREATING. SOURCE: BASED ON USPIPE NORTH BIRMINGHAM PLANT DUST CATCH AND ANALYSIS.		

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
ANTIMONY COMPOUNDS	01	S005-S006	2nd Fug.	0%	0%	☒	8.10E-05	1.09E-04	Not Appl.	7.61E-05	2.73E-04	4.78E-04
	01	S007	Stack	99%	0%	☒	7.29E-06	9.82E-06	Not Appl.	6.85E-06	2.45E-05	4.30E-05
Total Emissions of ANTIMONY COMPOUNDS from TREATING LADLES:							**8.83E-05**	**1.19E-04**	**Not Appl.**	**8.30E-05**	**2.97E-04**	**5.21E-04**
ARSENIC COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	1.17E-04	1.58E-04	Not Appl.	1.10E-04	3.95E-04	6.92E-04
	01	S007	Stack	99%	0%	☒	3.20E-05	4.31E-05	Not Appl.	3.01E-05	1.08E-04	1.89E-04
Total Emissions of ARSENIC COMPOUNDS from TREATING LADLES:							**1.49E-04**	**2.01E-04**	**Not Appl.**	**1.40E-04**	**5.03E-04**	**8.81E-04**
CADMIUM COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	5.51E-04	7.43E-04	Not Appl.	5.18E-04	.002	.003
	01	S007	Stack	99%	0%	☒	1.50E-04	2.03E-04	Not Appl.	1.41E-04	5.06E-04	8.87E-04
Total Emissions of CADMIUM COMPOUNDS from TREATING LADLES:							**7.02E-04**	**9.45E-04**	**Not Appl.**	**6.60E-04**	**.002**	**.004**
CHROMIUM COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	7.06E-04	9.51E-04	Not Appl.	6.63E-04	.002	.004
	01	S007	Stack	99%	0%	☒	1.92E-04	2.59E-04	Not Appl.	1.81E-04	6.48E-04	.001
Total Emissions of CHROMIUM COMPOUNDS from TREATING LADLES:							**8.98E-04**	**.001**	**Not Appl.**	**8.44E-04**	**.003**	**.005**
COBALT COMPOUNDS	01	S005-S006	2nd Fug.	0%	0%	☒	2.20E-05	2.96E-05	Not Appl.	2.07E-05	7.41E-05	1.30E-04
	01	S007	Stack	99%	0%	☒	1.98E-06	2.67E-06	Not Appl.	1.86E-06	6.67E-06	1.17E-05
Total Emissions of COBALT COMPOUNDS from TREATING LADLES:							**2.40E-05**	**3.23E-05**	**Not Appl.**	**2.25E-05**	**8.08E-05**	**1.41E-04**
LEAD COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	.002	.003	Not Appl.	.002	.008	.014
	01	S007	Stack	0%	0%	☒	.064	.086	Not Appl.	.06	.216	.378
Total Emissions of LEAD COMPOUNDS from TREATING LADLES:							**.066**	**.089**	**Not Appl.**	**.062**	**.223**	**.391**
MANGANESE COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	5.80E-04	7.82E-04	Not Appl.	5.46E-04	.002	.003
	01	S007	Stack	99%	0%	☒	1.58E-04	2.13E-04	Not Appl.	1.49E-04	5.33E-04	9.34E-04
Total Emissions of MANGANESE COMPOUNDS from TREATING LADLES:							**7.39E-04**	**9.95E-04**	**Not Appl.**	**6.94E-04**	**.002**	**.004**
MERCURY COMPOUNDS	01	S005-S006	2nd Fug.	0%	0%	☒	8.02E-04	.001	Not Appl.	7.54E-04	.003	.005
	01	S007	Stack	0%	0%	☒	.007	.01	Not Appl.	.007	.024	.043
Total Emissions of MERCURY COMPOUNDS from TREATING LADLES:							**.008**	**.011**	**Not Appl.**	**.008**	**.027**	**.047**
NICKEL COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	6.17E-04	8.32E-04	Not Appl.	5.80E-04	.002	.004
	01	S007	Stack	99%	0%	☒	1.68E-04	2.27E-04	Not Appl.	1.58E-04	5.67E-04	9.94E-04

Total Emissions of NICKEL COMPOUNDS from TREATING LADLES:							**7.86E-04**	**.001**	**Not Appl.**	**7.39E-04**	**.003**	**.005**
PARTICULATE MATTER (PM10)	01	S005-S006	2nd Fug.	67%	0%	☐	.221	.297	Not Appl.	.207	.743	1.301
	01	S007	Stack	99%	0%	☐	.06	.081	Not Appl.	.057	.203	.355
Total Emissions of PARTICULATE MATTER (PM10) from TREATING LADLES:							**.281**	**.378**	**Not Appl.**	**.264**	**.945**	**1.656**
PARTICULATE MATTER (TSP)	01	S005-S006	2nd Fug.	67%	0%	☐	.441	.594	Not Appl.	.415	1.485	Not Appl.
	01	S007	Stack	99%	0%	☐	.12	.162	12.857	.113	.405	56.314
Total Emissions of PARTICULATE MATTER (TSP) from TREATING LADLES:							**.561**	**.756**	**12.857**	**.528**	**1.891**	**5.63E+01**
SELENIUM COMPOUNDS	01	S005-S006	2nd Fug.	67%	0%	☒	1.57E-06	2.12E-06	Not Appl.	1.48E-06	5.29E-06	9.26E-06
	01	S007	Stack	99%	0%	☒	4.28E-07	5.77E-07	Not Appl.	4.02E-07	1.44E-06	2.53E-06
Total Emissions of SELENIUM COMPOUNDS from TREATING LADLES:							**2.00E-06**	**2.69E-06**	**Not Appl.**	**1.88E-06**	**6.73E-06**	**1.18E-05**

Supporting Emission Calculations

Emission Calculations for ANTIMONY COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0000303 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 7.61E-05 TPY.
Maximum Annual:	180,050 tons/yr * 0.0000303 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 2.73E-04 TPY.
Potential Annual:	2.73E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.78E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 7.61E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 8.10E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.73E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.09E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ANTIMONY COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0000303 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 6.85E-06 TPY.
Maximum Annual:	180,050 tons/yr * 0.0000303 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 2.45E-05 TPY.
Potential Annual:	2.45E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.30E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.85E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 7.29E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.45E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 9.82E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.000133 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.10E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000133 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.95E-04 TPY.
Potential Annual:	3.95E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.92E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.10E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.17E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.95E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.58E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.000133 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 3.01E-05 TPY.
Maximum Annual:	180,050 tons/yr * 0.000133 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.08E-04 TPY.
Potential Annual:	1.08E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.89E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.01E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.20E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.08E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.31E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.000625 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.18E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000625 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.18E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.51E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.43E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.000625 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.41E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000625 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 5.06E-04 TPY.
Potential Annual:	5.06E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.87E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.41E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.50E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.06E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.03E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0008 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.63E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.0008 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .004 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.63E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 7.06E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 9.51E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0008 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.81E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.0008 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 6.48E-04 TPY.
Potential Annual:	6.48E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.81E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.92E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.48E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.59E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for COBALT COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.00000823 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 2.07E-05 TPY.
Maximum Annual:	180,050 tons/yr * 0.00000823 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 7.41E-05 TPY.
Potential Annual:	7.41E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.30E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.07E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.20E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.41E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.96E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for COBALT COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.00000823 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.86E-06 TPY.
Maximum Annual:	180,050 tons/yr * 0.00000823 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 6.67E-06 TPY.
Potential Annual:	6.67E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.17E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.86E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.98E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.67E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.67E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.00266 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	180,050 tons/yr * 0.00266 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .008 TPY.
Potential Annual:	.008 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .014 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .002 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .008 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.00266 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .06 TPY.
Maximum Annual:	180,050 tons/yr * 0.00266 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .216 TPY.
Potential Annual:	.216 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .378 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .064 lb/hr.
Maximum Hourly:	Maximum annual emissions of .216 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .086 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.000658 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.46E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000658 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.46E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.80E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.82E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.000658 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.49E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.000658 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 5.33E-04 TPY.
Potential Annual:	5.33E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.34E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.49E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.58E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.33E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.13E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0003 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 7.54E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.0003 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	.003 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .005 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 7.54E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 8.02E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0003 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	180,050 tons/yr * 0.0003 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .024 TPY.
Potential Annual:	.024 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .043 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .007 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .024 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0007 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.80E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.0007 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .004 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.80E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.17E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.32E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.0007 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.58E-04 TPY.
Maximum Annual:	180,050 tons/yr * 0.0007 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 5.67E-04 TPY.
Potential Annual:	5.67E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.94E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.58E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.68E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.67E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.27E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.25 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .207 TPY.
Maximum Annual:	180,050 tons/yr * 0.25 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .743 TPY.
Potential Annual:	.743 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.301 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .207 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .221 lb/hr.
Maximum Hourly:	Maximum annual emissions of .743 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .297 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.25 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .057 TPY.
Maximum Annual:	180,050 tons/yr * 0.25 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .203 TPY.
Potential Annual:	.203 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .355 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .057 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .06 lb/hr.
Maximum Hourly:	Maximum annual emissions of .203 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .081 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.5 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .415 TPY.
Maximum Annual:	180,050 tons/yr * 0.5 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.485 TPY.
Potential Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of .415 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .441 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.485 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .594 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.5 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .113 TPY.
Maximum Annual:	180,050 tons/yr * 0.5 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .405 TPY.
Potential Annual:	Maximum allowable hourly emissions of 12.857 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 56.314 TPY.
Average Hourly:	Actual annual emissions of .113 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .12 lb/hr.
Maximum Hourly:	Maximum annual emissions of .405 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .162 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 75,000 dscf/min * 60 min/hr = 12.857 lb/hr.

Emission Calculations for SELENIUM COMPOUNDS
Stack ID or Designation: S005-S006
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.00000178 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.48E-06 TPY.
Maximum Annual:	180,050 tons/yr * 0.00000178 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.29E-06 TPY.
Potential Annual:	5.29E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.26E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.48E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.57E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.29E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.12E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for SELENIUM COMPOUNDS
Stack ID or Designation: S007
Segment No: 01, DUCTILE TREATING

Actual Annual:	50,248 tons/yr * 0.00000178 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 4.02E-07 TPY.
Maximum Annual:	180,050 tons/yr * 0.00000178 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.44E-06 TPY.
Potential Annual:	1.44E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.53E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.02E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.28E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.44E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.77E-07 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for TREATING LADLES

6

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F006 - INOCULATION
E008 - #9 UNIT

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F006
Emission Unit ID:	E008
Source Desc:	#9 UNIT
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	3500-LB POURING LADLES
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 26.25 TPH AND 131,256 TPY OF DUCTILE IRON.

Description of Operation

FOLLOWING THE DUCTILE TREATING PROCESS, THE DUCTILE IRON IS DIVIDED AMONG THREE CASTING UNITS: A CONVEYORIZED SEMI-AUTOMATIC #9 UNIT AND THE LARGE CASTING #4 AND #10 UNITS. THE CASTING DISTRIBUTIONS BASED ON THE 1996 FISCAL YEAR PRODUCTION REPORT ARE AS FOLLOWS: 72.9% FOR THE #9 UNIT, 21.5% FOR THE #4 UNIT, AND 5.6% FOR THE #10 UNIT.

THE MOLTEN IRON IS INOCULATED PRIOR TO THE POURING PROCESS. THE INOCULATION TAKES PLACE WHEN FERROSILICON IS ADDED TO THE MOLTEN IRON AS IT IS BEING POURED FROM THE 5-TON TREATING LADLE INTO THE POURING LADLES. A 3,500-LB LADLE IS USED AS THE POURING LADLE FOR THE #9 UNIT. A 20-TON POURING LADLE IS USED FOR THE LARGE CASTING #4 AND #10 UNITS.

AFTER THE INOCULATION PROCESS, THE POURING LADLES (3500-LB LADLE AND THE 20-TON LADLE) ARE MOVED BY OVERHEAD CRANE TO TEMPORARY REST STATIONS. SLAGS ARE THEN REMOVED FROM THE SURFACE OF THE MOLTEN IRON. FINALLY, THE POURING LADLES ARE MANEUVERED INTO POSITION FOR POURING.

EMISSIONS FROM THE INOCULATION AND SLAGGING PROCESSES ARE CONSIDERED AS FUGITIVE EMISSIONS. THE EVOLVED EMISSIONS ARE FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING, THEN ESCAPE THE BUILDING VIA THE BUILDING ROOF MONITOR (S008 WHICH HAS NO FORCED DRAFT FLOW). THE PROCESSES DESCRIBED ARE SUBJECT TO THE PROCESS WEIGHT EMISSION LIMIT PURSUANT TO RULE 10.2 OF THE CHATTANOOGA AIR POLLUTION ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	INOCULATION, #9 UNIT	30400310	1,880	5,000	36,631	131,256	26.25	36.550

Comments: THE #9 UNIT (HERMAN MOLD CASTING) PROCESSES ABOUT 72.9% OF THE MOLTEN IRON OR 36,631 TPY (FROM 50,248 TPY * 72.9%). THE MAXIMUM ANNUAL TONNAGES PROCESSED BY THE #9 UNIT ARE 180,050 TPY * 72.9% OR 131,256 TPY.

THE #9 UNIT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE HOURLY PROCESS WEIGHT RATES ARE 19.48 TPH AVERAGE (FROM 36,631 TPY / 1,880 HR/YR) AND 26.25 TPH MAXIMUM (FROM 131,256 TPY / 5,000 HR/YR).

SINCE THE EMISSIONS FROM THE #9 UNIT ARE CONSIDERED AS FUGITIVE EMISSIONS RELEASED THROUGH THE MAIN FOUNDRY BUILDING ROOF MONITOR, THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2. THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 26.25 TPH OR 52,500 LB/HR.

02	SLAGGING #9 UNIT	30400310	1,880	5,000	36,631	131,256	26.25	Not Appl.

Comments: THE ANNUAL AND HOURLY TONNAGES OF DUCTILE IRON PROCESSED ARE THE SAME AS THOSE IN EMISSION SEGMENT 01. THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE ALSO ACCOUNTED FOR IN SEGMENT 01.

Emission Source Fact Sheet

F006 - INOCULATION
E008 - #9 UNIT

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0009	PARTICULATE MATTER (PM10)	0.681	lb/ton	ENGINEERING ESTIMATES
	Comments:	51% OF TSP.			
01	0009	PARTICULATE MATTER (TSP)	1.336	lb/ton	JCDH
	Comments:	UNCONTROLLED EMISSION FACTORS FOR INOCULATION. SOURCE: JEFFERSON COUNTY DEPARTMENT OF HEALTH, BIRMINGHAM, ALABAMA.			
02	S3S5	PARTICULATE MATTER (PM10)	0.028	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
02	S3S5	PARTICULATE MATTER (TSP)	0.056	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			

Emission Source Fact Sheet

F006 - INOCULATION
E008 - #9 UNIT

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S008	Fugitive	67%	0%	☐	4.379	5.899	Not Appl.	4.116	14.749	25.84
	02	S008	Fugitive	67%	0%	☐	.18	.243	Not Appl.	.169	.606	1.062
Total Emissions of PARTICULATE MATTER (PM10) from #9 UNIT:							**4.559**	**6.142**	**Not Appl.**	**4.285**	**15.355**	**26.902**
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	8.59	11.574	36.55	8.075	28.934	160.089
	02	S008	Fugitive	67%	0%	☐	.36	.485	Included in Segm. 01	.338	1.213	2.125
Total Emissions of PARTICULATE MATTER (TSP) from #9 UNIT:							**8.95**	**12.059**	**36.55**	**8.413**	**30.147**	**162.214**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, INOCULATION, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.681 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.116 TPY.
Maximum Annual:	131,256 tons/yr * 0.681 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 14.749 TPY.
Potential Annual:	14.749 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 25.84 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.116 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.379 lb/hr.
Maximum Hourly:	Maximum annual emissions of 14.749 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.899 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 02, SLAGGING #9 UNIT

Actual Annual:	36,631 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .169 TPY.
Maximum Annual:	131,256 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .606 TPY.
Potential Annual:	.606 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.062 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .169 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .18 lb/hr.
Maximum Hourly:	Maximum annual emissions of .606 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .243 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, INOCULATION, #9 UNIT

Actual Annual:	36,631 tons/yr * 1.336 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.075 TPY.
Maximum Annual:	131,256 tons/yr * 1.336 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 28.934 TPY.
Potential Annual:	Maximum allowable hourly emissions of 36.55 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 160.089 TPY.
Average Hourly:	Actual annual emissions of 8.075 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 8.59 lb/hr.
Maximum Hourly:	Maximum annual emissions of 28.934 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 11.574 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 26.25 ton/hr or 52,500 lb/hr. Calculation : 35.4 lb/hr + (52,500 - 50,000) * (4.6 / 10,000) lb/hr = 36.55 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 02, SLAGGING #9 UNIT

Actual Annual:	36,631 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .338 TPY.
Maximum Annual:	131,256 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.213 TPY.
Potential Annual:	1.213 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.125 TPY. This PTE is the emission rates over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .338 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .36 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.213 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .485 lb/hr.
Allowable Emissions:	Allowable emission rate is already calculated in Emission Segment 01.

End Fact Sheet for #9 UNIT

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F006 - INOCULATION
E009 - #4 & #10 UNITS

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F006
Emission Unit ID:	E009
Source Desc:	#4 & #10 UNITS
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	20-TON POURING LADLES
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 9.76 TPH AND 48,794 TPY OF DUCTILE IRON.

Description of Operation

FOLLOWING THE DUCTILE TREATING PROCESS, THE DUCTILE IRON IS DIVIDED AMONG THREE CASTING UNITS: A CONVEYORIZED SEMI-AUTOMATIC #9 UNIT AND THE LARGE COASTING #4 AND #10 UNITS. THE CASTING DISTRIBUTIONS BASED ON THE 1996 FISCAL YEAR PRODUCTION REPORT ARE AS FOLLOWS: 72.9% FOR THE #9 UNIT, 21.5% FOR THE #4 UNIT, AND 5.6% FOR THE #10 UNIT.

THE MOLTEN IRON IS INOCULATED PRIOR TO THE POURING PROCESS. THE INOCULATION TAKES PLACE WHEN FERROSILICON IS ADDED TO THE MOLTEN IRON AS IT BEING POURED FROM THE 5-TON TREATING LADLE INTO THE POURING LADLES. A 3,500-LB LADLE IS USED AS THE POURING LADLE FOR THE #9 UNIT. A 20-TON POURING LADLE IS USED FOR THE LARGE CASTING #4 AND #10 UNITS.

AFTER THE INOCULATION PROCESS, THE POURING LADLES (3500-LB LADLE AND THE 20-TON LADLE) ARE MOVED BY OVERHEAD CRANE TO TEMPORARY REST STATIONS. SLAGS ARE THEN REMOVED FROM THE SURFACE OF THE MOLTEN IRON. FINALLY, THE POURING LADLES ARE MANEUVERED INTO POSITION FOR POURING.

EMISSIONS FROM THE INOCULATION AND SLAGGING PROCESSES ARE CONSIDERED AS FUGITIVE EMISSIONS. THE EVOLVED EMISSIONS ARE FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING, THEN ESCAPE THE BUILDING VIA THE BUILDING ROOF MONITOR (S008 WHICH HAS NO FORCED DRAFT FLOW). THE PROCESSES DESCRIBED ARE SUBJECT TO THE PROCESS WEIGHT EMISSION LIMIT PURSUANT TO RULE 10.2 OF THE CHATTANOOGA AIR POLLUTION ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	INOCULATION, #4 AND #10 UNITS	30400310	1,880	5,000	13,617	48,794	9.76	18.888

Comments: FOR THE LARGE CASTING UNITS, THE #4 UNIT PROCESSES ABOUT 21.5% OF THE MOLTEN IRON AND THE #10 UNIT PROCESSES ABOUT 5.6% OF THE MOLTEN IRON FOR A COMBINED 27.1% OR 13,617 TPY (FROM 50,248 TPY * 27.1%). THE MAXIMUM ANNUAL TONNAGES PROCESSED BY THE LARGE CASTING UNITS ARE 180,050 TPY * 27.1% OR 48,794 TPY.

THE LARGE CASTING UNITS OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE HOURLY PROCESS WEIGHT RATES ARE 7.24 TPH AVERAGE (FROM 13,617 TPY / 1,880 HR/YR) AND 9.76 TPH MAXIMUM (FROM 48,794 TPY / 5,000 HR/YR).

SINCE THE EMISSIONS FROM THE #4 AND #10 UNITS ARE CONSIDERED AS FUGITIVE EMISSIONS RELEASED THROUGH THE MAIN FOUNDRY BUILDING ROOF MONITOR, THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2. THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 9.76 TPH OR 19,520 LB/HR.

02	SLAGGING, #4 AND #10 UNITS	30400310	1,880	5,000	13,617	48,794	9.76	Not Appl.

Comments: THE ANNUAL AND HOURLY TONNAGES OF DUCTILE IRON PROCESSED ARE THE SAME AS THOSE IN EMISSION SEGMENT 01. THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE ALSO ACCOUNTED FOR IN SEGMENT 01.

Emission Source Fact Sheet

F006 - INOCULATION
E009 - #4 & #10 UNITS

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0009	PARTICULATE MATTER (PM10)	0.681	lb/ton	ENGINEERING ESTIMATES
	Comments:	51% OF TSP.			
01	0009	PARTICULATE MATTER (TSP)	1.336	lb/ton	JCDH
	Comments:	UNCONTROLLED EMISSION FACTORS FOR INOCULATION. SOURCE: JEFFERSON COUNTY DEPARTMENT OF HEALTH, BIRMINGHAM, ALABAMA.			
02	S3S5	PARTICULATE MATTER (PM10)	0.028	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			
02	S3S5	PARTICULATE MATTER (TSP)	0.056	lb/ton	DIPRA REF: 19
	Comments:	JEFFERSON COUNTY (ALABAMA) DEPARTMENT OF HEALTH'S EMISSION FACTOR.			

Emission Source Fact Sheet

F006 - INOCULATION
E009 - #4 & #10 UNITS

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S008	Fugitive	67%	0%	☐	1.628	2.193	Not Appl.	1.53	5.483	9.606
	02	S008	Fugitive	67%	0%	☐	.067	.09	Not Appl.	.063	.225	.395
Total Emissions of PARTICULATE MATTER (PM10) from #4 & #10 UNITS:							**1.695**	**2.283**	**Not Appl.**	**1.593**	**5.708**	**10.001**
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	3.193	4.302	18.888	3.002	10.756	82.729
	02	S008	Fugitive	67%	0%	☐	.134	.18	Included in Segm. 01	.126	.451	.79
Total Emissions of PARTICULATE MATTER (TSP) from #4 & #10 UNITS:							**3.327**	**4.483**	**18.888**	**3.128**	**11.207**	**83.519**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, INOCULATION, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.681 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.53 TPY.
Maximum Annual:	48,794 tons/yr * 0.681 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.483 TPY.
Potential Annual:	5.483 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.606 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.53 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.628 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.483 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.193 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 02, SLAGGING, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .063 TPY.
Maximum Annual:	48,794 tons/yr * 0.028 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .225 TPY.
Potential Annual:	.225 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .395 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .063 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .067 lb/hr.
Maximum Hourly:	Maximum annual emissions of .225 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .09 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, INOCULATION, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 1.336 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.002 TPY.
Maximum Annual:	48,794 tons/yr * 1.336 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 10.756 TPY.
Potential Annual:	Maximum allowable hourly emissions of 18.888 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 82.729 TPY.
Average Hourly:	Actual annual emissions of 3.002 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.193 lb/hr.
Maximum Hourly:	Maximum annual emissions of 10.756 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.302 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 9.76 ton/hr or 19,520 lb/hr. Calculation : 17.9 lb/hr + (19,520 - 18,000) * (1.3 / 2,000) lb/hr = 18.888 lb/hr.

Emission Source Fact Sheet

F006 - INOCULATION
E009 - #4 & #10 UNITS

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 02, SLAGGING, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .126 TPY.
Maximum Annual:	48,794 tons/yr * 0.056 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .451 TPY.
Potential Annual:	.451 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .79 TPY. This PTE is the emission rates over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .126 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .134 lb/hr.
Maximum Hourly:	Maximum annual emissions of .451 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .18 lb/hr.
Allowable Emissions:	Allowable emission rate is already calculated in Emission Segment 01.

End Fact Sheet for #4 & #10 UNITS

7

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E010 - POURING #9

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F007
Emission Unit ID:	E010
Source Desc:	POURING #9
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	POURING LADLE AND VARIOUS CASTING MOLDS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM OF 26.89 TPH AND 134,450 TPY OF DUCTILE IRON.

Description of Operation

METAL FROM THE 3500-LB LADLE IS USED FOR POURING INTO THE #9 UNIT. EMISSIONS FROM THIS PROCESS ARE FUGITIVE EMISSIONS PARTLY RELEASED INSIDE THE MAIN FOUNDRY BUILDING (VENTING TO S008), AND PARTLY EXHAUSTED TO THE ATMOSPHERE VIA 3 EXHAUST VENTS (S009-S011) LOCATED ALONG THE POURING FLATFORM.

GASEOUS EMISSIONS ARE CALCULATED BASED ON WISCONSIN'S DATA FOR GREENSAND COOLING. PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12 (1) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	50%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.									
S009-S011	50%	60	3.33	[N/A]	8.705	31,000	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]
Comments:	EMISSION STACKS FOR THE #9 UNIT POURING LINE (SOUTH, CENTER AND NORTH STACKS). ALL THREE STACK PARAMETERS ARE IDENTICAL. TOTAL FLOW RATES ARE 93,000 DSCFM FOR ALL THREE EXHAUST.									

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	GREENSAND POURING, #9 UNIT	30400320	1,880	5,000	36,631	131,256	--	15.943

Comments: THE HOURLY AND ANNUAL QUANTITIES OF DUCTILE IRON PROCESSED BY THE #9 UNIT AS SHOWN ABOVE ARE THE SAME AS THOSE FROM THE #9 UNIT INOCULATION (E008). BASED ON AN AVERAGE SAND/IRON RATIO OF 9, THE AVERAGE AND MAXIMUM ANNUAL GREENSAND MOLDS PROCESSED ARE 329,679 TPY AND 1,181,304 TPY, RESPECTIVELY.

THE #9 UNIT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE HOURLY PROCESS WEIGHT RATES FOR IRON ARE 19.48 TPH AVERAGE (FROM 36,631 TPY / 1,880 HR/YR) AND 26.25 TPH MAXIMUM (FROM 131,256 TPY / 5,000 HR/YR). THE PROCESS WEIGHT RATES FOR SAND ARE 175.32 TPH AVERAGE AND 236.25 TPH MAXIMUM.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0011	ANTIMONY	1.6E-06	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	ARSENIC	2E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	BENZENE	0.0057	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREEN SAND POURING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0011	BERYLLIUM	8E-08	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	CADMIUM	1.6E-06	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM SHAKEOUT REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	CHROMIUM	0.00013	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	COBALT	7E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	FORMALDEHYDE	0.0032	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREEN SAND POURING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			

01	0011	LEAD	2.2E-05	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	MANGANESE	0.00013	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	MERCURY	2.2E-05	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	NICKEL	0.00005	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	PARTICULATE MATTER (PM10)	0.55	lb/ton	EPA-340/1-80-020
	Comments:	100% OF TSP.			
01	0011	PARTICULATE MATTER (TSP)	0.55	lb/ton	EPA-340/1-80-020
	Comments:	UNCONTROLLED TSP EMISSION FACTOR FOR COMBINED POURING AND COOLING. SOURCE: WALLACE ET AL, SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME I, FINAL REPORT, EPA-340/1-80-020, JANUARY 1981.			
01	0011	SELENIUM	2E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0011	VOLATILE ORGANIC COMPOUNDS (VOC)	0.14	lb/ton	EPA-600/2-90-044
	Comments:	UNCONTROLLED VOC EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E010 - POURING #9

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
ANTIMONY	01	S008	Fugitive	67%	0%	☒	5.14E-06	6.93E-06	Not Appl.	4.84E-06	1.73E-05	3.04E-05
	01	S009-S011	Stack	0%	0%	☒	1.56E-05	2.10E-05	Not Appl.	1.47E-05	5.25E-05	9.20E-05
Total Emissions of ANTIMONY from POURING #9:							**2.07E-05**	**2.79E-05**	**Not Appl.**	**1.95E-05**	**6.98E-05**	**1.22E-04**
ARSENIC	01	S008	Fugitive	67%	0%	☒	6.43E-07	8.66E-07	Not Appl.	6.04E-07	2.17E-06	3.79E-06
	01	S009-S011	Stack	0%	0%	☒	1.95E-06	2.63E-06	Not Appl.	1.83E-06	6.56E-06	1.15E-05
Total Emissions of ARSENIC from POURING #9:							**2.59E-06**	**3.49E-06**	**Not Appl.**	**2.44E-06**	**8.73E-06**	**1.53E-05**
BENZENE	01	S008	Fugitive	0%	0%	☒	.056	.075	Not Appl.	.052	.187	.328
	01	S009-S011	Stack	0%	0%	☒	.056	.075	Not Appl.	.052	.187	.328
Total Emissions of BENZENE from POURING #9:							**.111**	**.15**	**Not Appl.**	**.104**	**.374**	**.655**
BERYLLIUM	01	S008	Fugitive	67%	0%	☒	2.57E-07	3.47E-07	Not Appl.	2.42E-07	8.66E-07	1.52E-06
	01	S009-S011	Stack	0%	0%	☒	7.79E-07	1.05E-06	Not Appl.	7.33E-07	2.63E-06	4.60E-06
Total Emissions of BERYLLIUM from POURING #9:							**1.04E-06**	**1.40E-06**	**Not Appl.**	**9.74E-07**	**3.49E-06**	**6.12E-06**
CADMIUM	01	S008	Fugitive	67%	0%	☒	5.14E-06	6.93E-06	Not Appl.	4.84E-06	1.73E-05	3.04E-05
	01	S009-S011	Stack	0%	0%	☒	1.56E-05	2.10E-05	Not Appl.	1.47E-05	5.25E-05	9.20E-05
Total Emissions of CADMIUM from POURING #9:							**2.07E-05**	**2.79E-05**	**Not Appl.**	**1.95E-05**	**6.98E-05**	**1.22E-04**
CHROMIUM	01	S008	Fugitive	67%	0%	☒	4.24E-04	5.72E-04	Not Appl.	3.99E-04	.001	.003
	01	S009-S011	Stack	0%	0%	☒	.001	.002	Not Appl.	.001	.004	.008
Total Emissions of CHROMIUM from POURING #9:							**.002**	**.002**	**Not Appl.**	**.002**	**.006**	**.01**
COBALT	01	S008	Fugitive	67%	0%	☒	2.25E-06	3.03E-06	Not Appl.	2.12E-06	7.58E-06	1.33E-05
	01	S009-S011	Stack	0%	0%	☒	6.82E-06	9.19E-06	Not Appl.	6.41E-06	2.30E-05	4.02E-05
Total Emissions of COBALT from POURING #9:							**9.07E-06**	**1.22E-05**	**Not Appl.**	**8.53E-06**	**3.05E-05**	**5.35E-05**
FORMALDEHYDE	01	S008	Fugitive	0%	0%	☒	.031	.042	Not Appl.	.029	.105	.184
	01	S009-S011	Stack	0%	0%	☒	.031	.042	Not Appl.	.029	.105	.184
Total Emissions of FORMALDEHYDE from POURING #9:							**.062**	**.084**	**Not Appl.**	**.059**	**.21**	**.368**
LEAD	01	S008	Fugitive	67%	0%	☒	7.07E-05	9.53E-05	Not Appl.	6.65E-05	2.38E-04	4.17E-04
	01	S009-S011	Stack	0%	0%	☒	2.14E-04	2.89E-04	Not Appl.	2.01E-04	7.22E-04	.001
Total Emissions of LEAD from POURING #9:							**2.85E-04**	**3.84E-04**	**Not Appl.**	**2.68E-04**	**9.60E-04**	**1.68E-03**
MANGANESE	01	S008	Fugitive	67%	0%	☒	4.24E-04	5.72E-04	Not Appl.	3.99E-04	.001	.003
	01	S009-S011	Stack	0%	0%	☒	.001	.002	Not Appl.	.001	.004	.008
Total Emissions of MANGANESE from POURING #9:							**.002**	**.002**	**Not Appl.**	**.002**	**.006**	**.01**
MERCURY	01	S008	Fugitive	0%	0%	☒	2.14E-04	2.89E-04	Not Appl.	2.01E-04	7.22E-04	.001
	01	S009-S011	Stack	0%	0%	☒	2.14E-04	2.89E-04	Not Appl.	2.01E-04	7.22E-04	.001
Total Emissions of MERCURY from POURING #9:							**4.29E-04**	**5.78E-04**	**Not Appl.**	**4.03E-04**	**.001**	**.003**

NICKEL	01	S008	Fugitive	67%	0%	☒	1.61E-04	2.17E-04	Not Appl.	1.51E-04	5.41E-04	9.49E-04
	01	S009-S011	Stack	0%	0%	☒	4.87E-04	6.56E-04	Not Appl.	4.58E-04	.002	.003
Total Emissions of NICKEL from POURING #9:							**6.48E-04**	**8.73E-04**	**Not Appl.**	**6.09E-04**	**.002**	**3.82E-03**
PARTICULATE MATTER (PM10)	01	S008	Fugitive	67%	0%	☐	1.768	2.382	Not Appl.	1.662	5.956	10.434
	01	S009-S011	Stack	0%	0%	☐	5.358	7.219	Not Appl.	5.037	18.048	31.62
Total Emissions of PARTICULATE MATTER (PM10) from POURING #9:							**7.126**	**9.601**	**Not Appl.**	**6.699**	**24.003**	**42.054**
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	1.768	2.382	Not Appl.	1.662	5.956	Not Appl.
	01	S009-S011	Stack	0%	0%	☐	5.358	7.219	15.943	5.037	18.048	69.83
Total Emissions of PARTICULATE MATTER (TSP) from POURING #9:							**7.126**	**9.601**	**15.943**	**6.699**	**24.003**	**6.98E+01**
SELENIUM	01	S008	Fugitive	67%	0%	☒	6.43E-07	8.66E-07	Not Appl.	6.04E-07	2.17E-06	3.79E-06
	01	S009-S011	Stack	0%	0%	☒	1.95E-06	2.63E-06	Not Appl.	1.83E-06	6.56E-06	1.15E-05
Total Emissions of SELENIUM from POURING #9:							**2.59E-06**	**3.49E-06**	**Not Appl.**	**2.44E-06**	**8.73E-06**	**1.53E-05**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S008	Fugitive	0%	0%	☐	1.364	1.838	Not Appl.	1.282	4.594	8.049
	01	S009-S011	Stack	0%	0%	☐	1.364	1.838	Not Appl.	1.282	4.594	8.049
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from POURING #9:							**2.728**	**3.675**	**Not Appl.**	**2.564**	**9.188**	**16.097**

Supporting Emission Calculations

Emission Calculations for ANTIMONY (CAS 7440-36-0)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.84E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.73E-05 TPY.
Potential Annual:	1.73E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.04E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.84E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.14E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.73E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 6.93E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ANTIMONY (CAS 7440-36-0)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 1.47E-05 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 5.25E-05 TPY.
Potential Annual:	5.25E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.20E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.47E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.56E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.25E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.10E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC (CAS 7440-38-2)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.04E-07 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.17E-06 TPY.
Potential Annual:	2.17E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.79E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.04E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.43E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.17E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.66E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC (CAS 7440-38-2)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 1.83E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 6.56E-06 TPY.
Potential Annual:	6.56E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.15E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.83E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.95E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.56E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.63E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0057 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .052 TPY.
Maximum Annual:	131,256 tons/yr * 0.0057 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .187 TPY.
Potential Annual:	.187 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .328 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .052 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .056 lb/hr.
Maximum Hourly:	Maximum annual emissions of .187 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .075 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0057 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .052 TPY.
Maximum Annual:	131,256 tons/yr * 0.0057 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .187 TPY.
Potential Annual:	.187 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .328 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .052 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .056 lb/hr.
Maximum Hourly:	Maximum annual emissions of .187 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .075 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM (CAS 7440-41-7)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00000008 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.42E-07 TPY.
Maximum Annual:	131,256 tons/yr * 0.00000008 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.66E-07 TPY.
Potential Annual:	8.66E-07 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.52E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.42E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.57E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.66E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.47E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM (CAS 7440-41-7)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00000008 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 7.33E-07 TPY.
Maximum Annual:	131,256 tons/yr * 0.00000008 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 2.63E-06 TPY.
Potential Annual:	2.63E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.60E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 7.33E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 7.79E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.63E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.05E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.84E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.73E-05 TPY.
Potential Annual:	1.73E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.04E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.84E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.14E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.73E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 6.93E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 1.47E-05 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000016 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 5.25E-05 TPY.
Potential Annual:	5.25E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.20E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.47E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.56E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.25E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.10E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.99E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.99E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.24E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.72E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	131,256 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	.004 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .008 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for COBALT (CAS 7440-48-4)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000007 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.12E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000007 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 7.58E-06 TPY.
Potential Annual:	7.58E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.33E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.12E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.25E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.58E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.03E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for COBALT (CAS 7440-48-4)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000007 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 6.41E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000007 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 2.30E-05 TPY.
Potential Annual:	2.30E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.02E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.41E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.82E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.30E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 9.19E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0032 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .029 TPY.
Maximum Annual:	131,256 tons/yr * 0.0032 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .105 TPY.
Potential Annual:	.105 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .184 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .029 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .031 lb/hr.
Maximum Hourly:	Maximum annual emissions of .105 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .042 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0032 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .029 TPY.
Maximum Annual:	131,256 tons/yr * 0.0032 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .105 TPY.
Potential Annual:	.105 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .184 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .029 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .031 lb/hr.
Maximum Hourly:	Maximum annual emissions of .105 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .042 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD (CAS 7439-92-1)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.65E-05 TPY.
Maximum Annual:	131,256 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.38E-04 TPY.
Potential Annual:	2.38E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.17E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.65E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 7.07E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.38E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 9.53E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD (CAS 7439-92-1)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 2.01E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 7.22E-04 TPY.
Potential Annual:	7.22E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.01E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.14E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.22E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.89E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.99E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.99E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.24E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.72E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	131,256 tons/yr * 0.000132 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	.004 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .008 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY (CAS 7439-97-6)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 2.01E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 7.22E-04 TPY.
Potential Annual:	7.22E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.01E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.14E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.22E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.89E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY (CAS 7439-97-6)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 2.01E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.000022 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 7.22E-04 TPY.
Potential Annual:	7.22E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.01E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.14E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.22E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.89E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL (CAS 7440-02-0)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00005 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.51E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.00005 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.41E-04 TPY.
Potential Annual:	5.41E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.49E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.51E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.61E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.41E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.17E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL (CAS 7440-02-0)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00005 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 4.58E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.00005 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.58E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.87E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 6.56E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.662 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.956 TPY.
Potential Annual:	5.956 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 10.434 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.662 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.768 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.956 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.382 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 5.037 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 18.048 TPY.
Potential Annual:	18.048 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 31.62 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.037 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.358 lb/hr.
Maximum Hourly:	Maximum annual emissions of 18.048 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.219 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.662 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.956 TPY.
Potential Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of 1.662 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.768 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.956 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.382 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 5.037 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 18.048 TPY.
Potential Annual:	Maximum allowable hourly emissions of 15.943 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 69.83 TPY.
Average Hourly:	Actual annual emissions of 5.037 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.358 lb/hr.
Maximum Hourly:	Maximum annual emissions of 18.048 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.219 lb/hr.
Allowable Emissions:	TSP emissions discharged through this stack are subject to Rule 26.12 (1). Thus, allowable TSP emissions = 0.020 gr/dscf * 1 lb/7,000 gr * 93,000 dscf/min * 60 min/hr = 15.943 lb/hr.

Emission Calculations for SELENIUM (CAS 7782-49-2)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.04E-07 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.17E-06 TPY.
Potential Annual:	2.17E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.79E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.04E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.43E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.17E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.66E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for SELENIUM (CAS 7782-49-2)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 1.83E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.0000002 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 6.56E-06 TPY.
Potential Annual:	6.56E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.15E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.83E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.95E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.56E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.63E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.14 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 1.282 TPY.
Maximum Annual:	131,256 tons/yr * 0.14 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 4.594 TPY.
Potential Annual:	4.594 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.049 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.282 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.364 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.594 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.838 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S009-S011
Segment No: 01, GREENSAND POURING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.14 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 1.282 TPY.
Maximum Annual:	131,256 tons/yr * 0.14 lb/ton * 50% (capture efficiency) * 1 ton/2,000 lb = 4.594 TPY.
Potential Annual:	4.594 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.049 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.282 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.364 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.594 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.838 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for POURING #9

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E011 - COOLING #9

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F007
Emission Unit ID:	E011
Source Desc:	COOLING #9
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	3500-LB POURING LADLE, GREENSAND MOLD.
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 26.25 TPH OR 131,256 TPY OF MOLTEN IRON; AND 236.25 TPH OR 1,181,304 TPY OF GREENSAND MOLD.

Description of Operation

FOLLOWING THE POURING PROCESS, THE MOLDS FILLED WITH IRON ARE CONVEYED THROUGH A COOLING LOOP TO THE SHAKE OUT AREA. EMISSIONS FROM THIS PROCESS ARE FUGITIVE EMISSIONS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING AND BASEMENT AREA, AND THEN EXHAUSTED TO THE ATMOSPHERE VIA 4 EXHAUST VENTS LOCATED ALONG THE COOLING LOOP. THE COOLING LOOP EXHAUST STACKS (S012-S015) VENT 60-PERCENT OF THE COOLING LOOP. THE REMAINING 40-PERCENT EMISSIONS ARE RELEASED THROUGH THE MAIN FOUNDRY BUILDING ROOF MONITOR (S008) AND ARE CONSIDERED AS FUGITIVE EMISSIONS.

GASEOUS EMISSIONS ARE CALCULATED BASED ON WISCONSIN'S DATA FOR GREENSAND COOLING. PARTICULATE EMISSIONS FROM THE 4 COOLING LOOP EXHAUST HOOD ARE SUBJECT TO RULE 26.12 (1) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	40%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.									
S012	10%	50	2.5	[N/A]	4.906	15,000	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]
Comments:	FIRST OF FOUR EMISSION STACKS FOR THE #9 UNIT COOLING LOOP.									
S013	15%	50	3	[N/A]	7.065	20,000	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]
Comments:	SECOND OF FOUR EMISSION STACKS FOR THE #9 UNIT COOLING LOOP.									
S014	25%	50	4	[N/A]	12.560	38,000	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]
Comments:	THIRD OF FOUR EMISSION STACKS FOR THE #9 UNIT COOLING LOOP.									
S015	10%	50	2.5	[N/A]	4.906	15,000	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]
Comments:	FOURTH OF FOUR EMISSION STACKS FOR THE #9 UNIT COOLING LOOP.									

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	GREENSAND COOLING, #9 UNIT	30400320	1,880	5,000	36,631	131,256	–	15.086

Comments: THE HOURLY AND ANNUAL QUANTITIES OF DUCTILE IRON PROCESSED BY THE #9 UNIT AS SHOWN ABOVE ARE THE SAME AS THOSE FROM THE #9 UNIT INOCULATION (E008). BASED ON AN AVERAGE SAND/IRON RATIO OF 9, THE AVERAGE AND MAXIMUM ANNUAL GREENSAND MOLDS PROCESSED ARE 329,679 TPY AND 1,181,304 TPY, RESPECTIVELY.

THE #9 UNIT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE

HOURLY PROCESS WEIGHT RATES FOR IRON ARE 19.48 TPH AVERAGE (FROM 36,631 TPY / 1,880 HR/YR) AND 26.25 TPH MAXIMUM (FROM 131,256 TPY / 5,000 HR/YR). THE PROCESS WEIGHT RATES FOR SAND ARE 175.32 TPH AVERAGE AND 236.25 TPH MAXIMUM.

PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12 (1) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0012	BENZENE	0.045	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREEN SAND COOLING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0012	FORMALDEHYDE	0.0014	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREEN SAND COOLING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0012	PARTICULATE MATTER (PM10)	0.55	lb/ton	EPA-340/1-80-020
	Comments:	100% OF TSP.			
01	0012	PARTICULATE MATTER (TSP)	0.55	lb/ton	EPA-340/1-80-020
	Comments:	UNCONTROLLED TSP EMISSION FACTOR FOR COMBINED POURING AND COOLING. SOURCE: WALLACE ET AL, SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME I, FINAL REPORT, EPA-340/1-80-020, JANUARY 1981.			
01	0012	VOLATILE ORGANIC COMPOUNDS (VOC)	0.0787	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	TOTAL OF HAP EMISSION FACTORS FOR GREEN SAND COOLING (UNCONTROLLED, INCLUDING STD. DEV.). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S012	Stack	0%	0%	☒	.088	.118	Not Appl.	.082	.295	.517
	01	S015	Stack	0%	0%	☒	.088	.118	Not Appl.	.082	.295	.517
	01	S013	Stack	0%	0%	☒	.132	.177	Not Appl.	.124	.443	.776
	01	S014	Stack	0%	0%	☒	.219	.295	Not Appl.	.206	.738	1.294
	01	S008	2nd Fug.	0%	0%	☒	.351	.473	Not Appl.	.33	1.181	2.07
Total Emissions of BENZENE from COOLING #9:							**.877**	**1.181**	**Not Appl.**	**.824**	**2.953**	**5.174**
FORMALDEHYDE	01	S012	Stack	0%	0%	☒	.003	.004	Not Appl.	.003	.009	.016
	01	S015	Stack	0%	0%	☒	.003	.004	Not Appl.	.003	.009	.016
	01	S013	Stack	0%	0%	☒	.004	.006	Not Appl.	.004	.014	.024
	01	S014	Stack	0%	0%	☒	.007	.009	Not Appl.	.006	.023	.04
	01	S008	2nd Fug.	0%	0%	☒	.011	.015	Not Appl.	.01	.037	.064
Total Emissions of FORMALDEHYDE from COOLING #9:							**.027**	**.037**	**Not Appl.**	**.026**	**.092**	**.161**
PARTICULATE MATTER (PM10)	01	S012	Stack	0%	0%	☐	1.072	1.444	Not Appl.	1.007	3.61	6.324
	01	S015	Stack	0%	0%	☐	1.072	1.444	Not Appl.	1.007	3.61	6.324
	01	S013	Stack	0%	0%	☐	1.607	2.166	Not Appl.	1.511	5.414	9.486
	01	S014	Stack	0%	0%	☐	2.679	3.61	Not Appl.	2.518	9.024	15.81
	01	S008	2nd Fug.	67%	0%	☐	1.415	1.906	Not Appl.	1.33	4.765	8.348
Total Emissions of PARTICULATE MATTER (PM10) from COOLING #9:							**7.844**	**10.569**	**Not Appl.**	**7.374**	**26.422**	**46.291**
PARTICULATE MATTER (TSP)	01	S012	Stack	0%	0%	☐	1.072	1.444	2.571	1.007	3.61	11.263
	01	S015	Stack	0%	0%	☐	1.072	1.444	2.571	1.007	3.61	11.263
	01	S013	Stack	0%	0%	☐	1.607	2.166	3.429	1.511	5.414	15.017
	01	S014	Stack	0%	0%	☐	2.679	3.61	6.514	2.518	9.024	28.533
	01	S008	2nd Fug.	67%	0%	☐	1.415	1.906	Not Appl.	1.33	4.765	Not Appl.
Total Emissions of PARTICULATE MATTER (TSP) from COOLING #9:							**7.844**	**10.569**	**15.086**	**7.374**	**26.422**	**66.075**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S012	Stack	0%	0%	☐	.153	.207	Not Appl.	.144	.516	.905
	01	S015	Stack	0%	0%	☐	.153	.207	Not Appl.	.144	.516	.905
	01	S013	Stack	0%	0%	☐	.23	.31	Not Appl.	.216	.775	1.357
	01	S014	Stack	0%	0%	☐	.383	.516	Not Appl.	.36	1.291	2.262
	01	S008	2nd Fug.	0%	0%	☐	.613	.826	Not Appl.	.577	2.066	3.62
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from COOLING #9:							**1.533**	**2.066**	**Not Appl.**	**1.441**	**5.165**	**9.049**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S008
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.045 lb/ton * 40% (capture efficiency) * 1 ton/2,000 lb = .33 TPY.
Maximum Annual:	131,256 tons/yr * 0.045 lb/ton * 40% (capture efficiency) * 1 ton/2,000 lb = 1.181 TPY.
Potential Annual:	1.181 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.07 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .33 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .351 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.181 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .473 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S012
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.045 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .082 TPY.
Maximum Annual:	131,256 tons/yr * 0.045 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .295 TPY.
Potential Annual:	.295 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .517 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .082 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .088 lb/hr.
Maximum Hourly:	Maximum annual emissions of .295 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .118 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S013
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.045 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = .124 TPY.
Maximum Annual:	131,256 tons/yr * 0.045 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = .443 TPY.
Potential Annual:	.443 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .776 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .124 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .132 lb/hr.
Maximum Hourly:	Maximum annual emissions of .443 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .177 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S014
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.045 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = .206 TPY.
Maximum Annual:	131,256 tons/yr * 0.045 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = .738 TPY.
Potential Annual:	.738 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.294 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .206 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .219 lb/hr.
Maximum Hourly:	Maximum annual emissions of .738 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .295 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S015
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.045 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .082 TPY.
Maximum Annual:	131,256 tons/yr * 0.045 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .295 TPY.
Potential Annual:	.295 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .517 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .082 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .088 lb/hr.
Maximum Hourly:	Maximum annual emissions of .295 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .118 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S008
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0014 lb/ton * 40% (capture efficiency) * 1 ton/2,000 lb = .01 TPY.
Maximum Annual:	131,256 tons/yr * 0.0014 lb/ton * 40% (capture efficiency) * 1 ton/2,000 lb = .037 TPY.
Potential Annual:	.037 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .064 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .01 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .011 lb/hr.
Maximum Hourly:	Maximum annual emissions of .037 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .015 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S012
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0014 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	131,256 tons/yr * 0.0014 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .009 TPY.
Potential Annual:	.009 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .016 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S013
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0014 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = .004 TPY.
Maximum Annual:	131,256 tons/yr * 0.0014 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = .014 TPY.
Potential Annual:	.014 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .024 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .004 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .004 lb/hr.
Maximum Hourly:	Maximum annual emissions of .014 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S014
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0014 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = .006 TPY.
Maximum Annual:	131,256 tons/yr * 0.0014 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = .023 TPY.
Potential Annual:	.023 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .006 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .023 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S015
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0014 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	131,256 tons/yr * 0.0014 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .009 TPY.
Potential Annual:	.009 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .016 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 40% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.33 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 40% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.765 TPY.
Potential Annual:	4.765 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.348 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.33 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.415 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.765 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.906 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S012
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 1.007 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 3.61 TPY.
Potential Annual:	3.61 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.324 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.007 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.072 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.61 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.444 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S013
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = 1.511 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = 5.414 TPY.
Potential Annual:	5.414 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 9.486 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.511 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.607 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.414 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.166 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S014
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = 2.518 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = 9.024 TPY.
Potential Annual:	9.024 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 15.81 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.518 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.679 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.024 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.61 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S015
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 1.007 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 3.61 TPY.
Potential Annual:	3.61 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.324 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.007 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.072 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.61 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.444 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 40% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.33 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 40% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.765 TPY.
Potential Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of 1.33 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.415 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.765 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.906 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S012
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 1.007 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 3.61 TPY.
Potential Annual:	Maximum allowable hourly emissions of 2.571 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 11.263 TPY.
Average Hourly:	Actual annual emissions of 1.007 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.072 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.61 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.444 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 15,000 dscf/min * 60 min/hr = 2.571 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S013
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = 1.511 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = 5.414 TPY.
Potential Annual:	Maximum allowable hourly emissions of 3.429 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 15.017 TPY.
Average Hourly:	Actual annual emissions of 1.511 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.607 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.414 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.166 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 20,000 dscf/min * 60 min/hr = 3.429 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S014
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = 2.518 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = 9.024 TPY.
Potential Annual:	Maximum allowable hourly emissions of 6.514 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 28.533 TPY.
Average Hourly:	Actual annual emissions of 2.518 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.679 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.024 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.61 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 38,000 dscf/min * 60 min/hr = 6.514 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S015
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 1.007 TPY.
Maximum Annual:	131,256 tons/yr * 0.55 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 3.61 TPY.
Potential Annual:	Maximum allowable hourly emissions of 2.571 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 11.263 TPY.
Average Hourly:	Actual annual emissions of 1.007 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.072 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.61 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.444 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 15,000 dscf/min * 60 min/hr = 2.571 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0787 lb/ton * 40% (capture efficiency) * 1 ton/2,000 lb = .577 TPY.
Maximum Annual:	131,256 tons/yr * 0.0787 lb/ton * 40% (capture efficiency) * 1 ton/2,000 lb = 2.066 TPY.
Potential Annual:	2.066 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.62 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .577 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .613 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.066 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .826 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S012
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0787 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .144 TPY.
Maximum Annual:	131,256 tons/yr * 0.0787 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .516 TPY.
Potential Annual:	.516 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .905 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	*Actual annual emissions of .144 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .153 lb/hr.*
Maximum Hourly:	Maximum annual emissions of .516 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .207 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S013
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0787 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = .216 TPY.
Maximum Annual:	131,256 tons/yr * 0.0787 lb/ton * 15% (capture efficiency) * 1 ton/2,000 lb = .775 TPY.
Potential Annual:	.775 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.357 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .216 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .23 lb/hr.
Maximum Hourly:	Maximum annual emissions of .775 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .31 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S014
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0787 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = .36 TPY.
Maximum Annual:	131,256 tons/yr * 0.0787 lb/ton * 25% (capture efficiency) * 1 ton/2,000 lb = 1.291 TPY.
Potential Annual:	1.291 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.262 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .36 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .383 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.291 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .516 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S015
Segment No: 01, GREENSAND COOLING, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0787 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .144 TPY.
Maximum Annual:	131,256 tons/yr * 0.0787 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .516 TPY.
Potential Annual:	.516 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .905 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .144 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .153 lb/hr.
Maximum Hourly:	Maximum annual emissions of .516 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .207 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for COOLING #9

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E012 - POURING & COOLING #4

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F007
Emission Unit ID:	E012
Source Desc:	POURING & COOLING #4
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	20-TON POURING LADLE AND GREENSAND MOLDS.
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM APPROX. 7.74 TPH AND 38,711 TPY OF DUCTILE IRON.

Description of Operation

METAL FROM THE 20-TON LADLE IS USED FOR POURING THE #4 UNIT GREENSAND MOLDS AND THE #10 UNIT AIRSET MOLDS. THE LARGE CASTINGS REMAIN IN PLACE FOR THE COOLING PROCESS. EMISSIONS FROM THIS PROCESS ARE FUGITIVE EMISSIONS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING AND VENTED TO THE ATMOSPHERE THROUGH THE BUILDING ROOF MONITOR (S008).

GASEOUS EMISSIONS ARE CALCULATED BASED ON WISCONSIN'S DATA FOR POURING/COOLING OF GREENSAND MOLD AND NO-BAKE MOLD. PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 (FOR EMISISON SOURCES BUILT OR INSTALLED BEFORE 1/1/73) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	POURING AND COOLING, #4 UNIT	30400320	1,880	5,000	10,803	38,711	77.40	48.688

Comments: THE #4 UNIT PROCESSES ABOUT 21.5% OF THE MOLTEN IRON OR APPROXIMATELY 10,803 TPY (FROM 50,248 TPY * 21.5%). THE MAXIMUM ANNUAL TONNAGES PROCESSED BY #4 UNIT ARE 180,050 TPY * 21.5% OR APPROXIMATELY 38,711 TPY. BASED ON AN AVERAGE MOLD/IRON RATIO OF 9, THE AVERAGE AND MAXIMUM ANNUAL MOLD PROCESSED ARE 97,227 TPY AND 348,399 TPY, RESPECTIVELY.

THE #4 UNIT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE HOURLY PROCESS WEIGHT RATES FOR IRON ARE 5.75 TPH AVERAGE (FROM 10,803 TPY / 1,880 HR/YR) AND 7.74 TPH MAXIMUM (FROM 38,711 TPY / 5,000 HR/YR). THE PROCESS WEIGHT RATES FOR MOLD ARE 51.75 TPH AVERAGE AND 69.66 TPH MAXIMUM.

SINCE THE EMISSIONS FROM THE #4 UNIT ARE CONSIDERED AS FUGITIVE EMISSIONS RELEASED THROUGH THE MAIN FOUNDRY BUILDING ROOF MONITOR, THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2 (FOR SOURCE BUILT OR INSTALL BEFORE 1/1/73). THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 77.4 TPH (7.74 TPH OF IRON AND 69.66 TPH OF MOLD) OR 154,800 LB/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0014	ANTIMONY	1.6E-06	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	ARSENIC	2E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	BENZENE	0.0507	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR (COMBINED) GREEN SAND POURING AND COOLING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0014	BERYLLIUM	8E-08	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	CADMIUM	1.6E-06	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	CHROMIUM	0.00013	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	COBALT	7E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	FORMALDEHYDE	0.0046	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR (COMBINED) GREEN SAND POURING AND COOLING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			

01	0014	LEAD	2.2E-05	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	MANGANESE	0.00013	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	MERCURY	2.2E-05	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	NICKEL	0.00005	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	PARTICULATE MATTER (PM10)	0.55	lb/ton	EPA-340/1-80-020.
	Comments:	100% OF TSP.			
01	0014	PARTICULATE MATTER (TSP)	0.55	lb/ton	EPA-340/1-80-020.
	Comments:	UNCONTROLLED TSP EMISSION FACTOR FOR COMBINED POURING AND COOLING. SOURCE: WALLACE ET AL, SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME I, FINAL REPORT, EPA-340/1-80-020, JANUARY 1981.			
01	0014	SELENIUM	2E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0014	VOLATILE ORGANIC COMPOUNDS (VOC)	0.14	lb/ton	EPA-600/2-90-044
	Comments:	UNCONTROLLED VOC EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E012 - POURING & COOLING #4

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
ANTIMONY	01	S008	Fugitive	67%	0%	☒	3.03E-06	4.09E-06	Not Appl.	2.85E-06	1.02E-05	1.79E-05
Total Emissions of ANTIMONY from POURING & COOLING #4:							**3.03E-06**	**4.09E-06**	**Not Appl.**	**2.85E-06**	**1.02E-05**	**1.79E-05**
ARSENIC	01	S008	Fugitive	67%	0%	☒	3.79E-07	5.11E-07	Not Appl.	3.56E-07	1.28E-06	2.24E-06
Total Emissions of ARSENIC from POURING & COOLING #4:							**3.79E-07**	**5.11E-07**	**Not Appl.**	**3.56E-07**	**1.28E-06**	**2.24E-06**
BENZENE	01	S008	Fugitive	0%	0%	☒	.291	.393	Not Appl.	.274	.981	1.719
Total Emissions of BENZENE from POURING & COOLING #4:							**.291**	**.393**	**Not Appl.**	**.274**	**.981**	**1.719**
BERYLLIUM	01	S008	Fugitive	67%	0%	☒	1.52E-07	2.04E-07	Not Appl.	1.43E-07	5.11E-07	8.95E-07
Total Emissions of BERYLLIUM from POURING & COOLING #4:							**1.52E-07**	**2.04E-07**	**Not Appl.**	**1.43E-07**	**5.11E-07**	**8.95E-07**
CADMIUM	01	S008	Fugitive	67%	0%	☒	3.03E-06	4.09E-06	Not Appl.	2.85E-06	1.02E-05	1.79E-05
Total Emissions of CADMIUM from POURING & COOLING #4:							**3.03E-06**	**4.09E-06**	**Not Appl.**	**2.85E-06**	**1.02E-05**	**1.79E-05**
CHROMIUM	01	S008	Fugitive	67%	0%	☒	2.50E-04	3.37E-04	Not Appl.	2.35E-04	8.43E-04	.001
Total Emissions of CHROMIUM from POURING & COOLING #4:							**2.50E-04**	**3.37E-04**	**Not Appl.**	**2.35E-04**	**8.43E-04**	**.001**
COBALT	01	S008	Fugitive	67%	0%	☒	1.33E-06	1.79E-06	Not Appl.	1.25E-06	4.47E-06	7.83E-06
Total Emissions of COBALT from POURING & COOLING #4:							**1.33E-06**	**1.79E-06**	**Not Appl.**	**1.25E-06**	**4.47E-06**	**7.83E-06**
FORMALDEHYDE	01	S008	Fugitive	0%	0%	☒	.026	.036	Not Appl.	.025	.089	.156
Total Emissions of FORMALDEHYDE from POURING & COOLING #4:							**.026**	**.036**	**Not Appl.**	**.025**	**.089**	**.156**
LEAD	01	S008	Fugitive	67%	0%	☒	4.17E-05	5.62E-05	Not Appl.	3.92E-05	1.41E-04	2.46E-04
Total Emissions of LEAD from POURING & COOLING #4:							**4.17E-05**	**5.62E-05**	**Not Appl.**	**3.92E-05**	**1.41E-04**	**2.46E-04**
MANGANESE	01	S008	Fugitive	67%	0%	☒	2.50E-04	3.37E-04	Not Appl.	2.35E-04	8.43E-04	.001
Total Emissions of MANGANESE from POURING & COOLING #4:							**2.50E-04**	**3.37E-04**	**Not Appl.**	**2.35E-04**	**8.43E-04**	**.001**
MERCURY	01	S008	Fugitive	0%	0%	☒	1.26E-04	1.70E-04	Not Appl.	1.19E-04	4.26E-04	7.46E-04
Total Emissions of MERCURY from POURING & COOLING #4:							**1.26E-04**	**1.70E-04**	**Not Appl.**	**1.19E-04**	**4.26E-04**	**7.46E-04**
NICKEL	01	S008	Fugitive	67%	0%	☒	9.48E-05	1.28E-04	Not Appl.	8.91E-05	3.19E-04	5.60E-04
Total Emissions of NICKEL from POURING & COOLING #4:							**9.48E-05**	**1.28E-04**	**Not Appl.**	**8.91E-05**	**3.19E-04**	**5.60E-04**
PARTICULATE MATTER (PM10)	01	S008	Fugitive	67%	0%	☐	1.043	1.405	Not Appl.	.98	3.513	6.155
Total Emissions of PARTICULATE MATTER (PM10) from POURING & COOLING #4:							**1.043**	**1.405**	**Not Appl.**	**.98**	**3.513**	**6.155**
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	1.043	1.405	48.688	.98	3.513	213.253

Total Emissions of PARTICULATE MATTER (TSP) from POURING & COOLING #4:							**1.043**	**1.405**	**48.688**	**.98**	**3.513**	**213.253**
SELENIUM	01	S008	Fugitive	67%	0%	☒	3.79E-07	5.11E-07	Not Appl.	3.56E-07	1.28E-06	2.24E-06
Total Emissions of SELENIUM from POURING & COOLING #4:							**3.79E-07**	**5.11E-07**	**Not Appl.**	**3.56E-07**	**1.28E-06**	**2.24E-06**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S008	Fugitive	0%	0%	☐	.804	1.084	Not Appl.	.756	2.71	4.748
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from POURING & COOLING #4:							**.804**	**1.084**	**Not Appl.**	**.756**	**2.71**	**4.748**

Supporting Emission Calculations

Emission Calculations for ANTIMONY (CAS 7440-36-0)

Stack ID or Designation: S008

Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.85E-06 TPY.
Maximum Annual:	38,711 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.02E-05 TPY.
Potential Annual:	1.02E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.79E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.85E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.03E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.02E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.09E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC (CAS 7440-38-2)

Stack ID or Designation: S008

Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.56E-07 TPY.
Maximum Annual:	38,711 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.28E-06 TPY.
Potential Annual:	1.28E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.24E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.56E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.79E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.28E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.11E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)

Stack ID or Designation: S008

Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0507 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .274 TPY.
Maximum Annual:	38,711 tons/yr * 0.0507 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .981 TPY.
Potential Annual:	.981 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.719 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .274 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .291 lb/hr.
Maximum Hourly:	Maximum annual emissions of .981 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .393 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM (CAS 7440-41-7)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.00000008 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.43E-07 TPY.
Maximum Annual:	38,711 tons/yr * 0.00000008 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.11E-07 TPY.
Potential Annual:	5.11E-07 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.95E-07 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.43E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.52E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.11E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.04E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.85E-06 TPY.
Maximum Annual:	38,711 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.02E-05 TPY.
Potential Annual:	1.02E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.79E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.85E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.03E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.02E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.09E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.35E-04 TPY.
Maximum Annual:	38,711 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.43E-04 TPY.
Potential Annual:	8.43E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.35E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.50E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.43E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.37E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for COBALT (CAS 7440-48-4)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0000007 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.25E-06 TPY.
Maximum Annual:	38,711 tons/yr * 0.0000007 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.47E-06 TPY.
Potential Annual:	4.47E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 7.83E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.25E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.33E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.47E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.79E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0046 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .025 TPY.
Maximum Annual:	38,711 tons/yr * 0.0046 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .089 TPY.
Potential Annual:	.089 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .156 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .025 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .026 lb/hr.
Maximum Hourly:	Maximum annual emissions of .089 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .036 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD (CAS 7439-92-1)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.92E-05 TPY.
Maximum Annual:	38,711 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.41E-04 TPY.
Potential Annual:	1.41E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.46E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.92E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.17E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.41E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.62E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.35E-04 TPY.
Maximum Annual:	38,711 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.43E-04 TPY.
Potential Annual:	8.43E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.35E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.50E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.43E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.37E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY (CAS 7439-97-6)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 1.19E-04 TPY.
Maximum Annual:	38,711 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 4.26E-04 TPY.
Potential Annual:	4.26E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 7.46E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.19E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.26E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.26E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.70E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL (CAS 7440-02-0)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.00005 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.91E-05 TPY.
Maximum Annual:	38,711 tons/yr * 0.00005 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.19E-04 TPY.
Potential Annual:	3.19E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 5.60E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.91E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 9.48E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.19E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.28E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .98 TPY.
Maximum Annual:	38,711 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.513 TPY.
Potential Annual:	3.513 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.155 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .98 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.043 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.513 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.405 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .98 TPY.
Maximum Annual:	38,711 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.513 TPY.
Potential Annual:	Maximum allowable hourly emissions of 48.688 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 213.253 TPY.
Average Hourly:	Actual annual emissions of .98 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.043 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.513 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.405 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 77.4 ton/hr or 154,800 lb/hr. Calculation : 47.8 lb/hr + (154,800 - 140,000) * (1.2 / 20,000) lb/hr = 48.688 lb/hr.

Emission Calculations for SELENIUM (CAS 7782-49-2)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.56E-07 TPY.
Maximum Annual:	38,711 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.28E-06 TPY.
Potential Annual:	1.28E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.24E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.56E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.79E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.28E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.11E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Source Fact Sheet

F007 - POURING AND COOLING
E012 - POURING & COOLING #4

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #4 UNIT

Actual Annual:	10,803 tons/yr * 0.14 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .756 TPY.
Maximum Annual:	38,711 tons/yr * 0.14 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 2.71 TPY.
Potential Annual:	2.71 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.748 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	*Actual annual emissions of .756 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .804 lb/hr.*
Maximum Hourly:	Maximum annual emissions of 2.71 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.084 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for POURING & COOLING #4

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E013 - POURING & COOLING #10

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F007
Emission Unit ID:	E013
Source Desc:	POURING & COOLING #10
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	20-TON POURING LADLE AND AIRSET MOLDS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 2.02 TPH AND 10,083 TPY OF MOLTEN METAL.

Description of Operation

METAL FROM THE 20-TON LADLE IS USED FOR POURING THE #4 UNIT GREENSAND MOLDS AND THE #10 UNIT AIRSET MOLDS. THE LARGE CASTINGS REMAIN IN PLACE FOR THE COOLING PROCESS. EMISSIONS FROM THIS PROCESS ARE FUGITIVE EMISSIONS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING AND VENTED TO THE ATMOSPHERE THROUGH THE BUILDING ROOF MONITOR (S008).

GASEOUS EMISSIONS ARE CALCULATED BASED ON WISCONSIN'S DATA FOR POURING/COOLING OF GREENSAND MOLD AND NO-BAKE MOLD. PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 (FOR EMISISON SOURCES BUILT OR INSTALLED BEFORE 1/1/73) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	POURING AND COOLING, #10 LARGE CASTING	30400325	1,880	5,000	2,814	10,083	20.20	30.696

Comments: THE #10 UNIT PROCESSES ABOUT 5.6% OF THE MOLTEN IRON OR APPROXIMATELY 2,814 TPY (FROM 50,248 TPY * 5.6%). THE MAXIMUM ANNUAL TONNAGES PROCESSED BY #4 UNIT ARE 180,050 TPY * 5.6% OR APPROXIMATELY 10,083 TPY. BASED ON AN AVERAGE MOLD/IRON RATIO OF 9, THE AVERAGE AND MAXIMUM ANNUAL MOLD PROCESSED ARE 25,326 TPY AND 90,747 TPY, RESPECTIVELY.

THE #10 UNIT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE HOURLY PROCESS WEIGHT RATES FOR IRON ARE 1.50 TPH AVERAGE (FROM 2,814 TPY / 1,880 HR/YR) AND 2.02 TPH MAXIMUM (FROM 10,083 TPY / 5,000 HR/YR). THE PROCESS WEIGHT RATES FOR MOLD ARE 13.5 TPH AVERAGE AND 18.18 TPH MAXIMUM.

SINCE THE EMISSIONS FROM THE #10 UNIT ARE CONSIDERED AS FUGITIVE EMISSIONS RELEASED THROUGH THE MAIN FOUNDRY BUILDING ROOF MONITOR, THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2 (FOR SOURCE BUILT OR INSTALL BEFORE 1/1/73). THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 20.2 TPH (2.02 TPH OF IRON AND 18.18 TPH OF MOLD) OR 40,400 LB/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0015	ANTIMONY	1.6E-06	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	ARSENIC	2E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	BENZENE	0.043	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR (COMBINED) NO-BAKE POURING AND COOLING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0015	BERYLLIUM	8E-08	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	CADMIUM	1.6E-06	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	CHROMIUM	0.00013	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	COBALT	7E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	FORMALDEHYDE	0.009	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR (COMBINED) NO-BAKE POURING AND COOLING (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			

01	0015	LEAD	2.2E-05	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	MANGANESE	0.00013	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	MERCURY	2.2E-05	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	NICKEL	0.00005	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	PARTICULATE MATTER (PM10)	0.55	lb/ton	EPA-340/1-80-020.
	Comments:	100% OF TSP.			
01	0015	PARTICULATE MATTER (TSP)	0.55	lb/ton	EPA-340/1-80-020.
	Comments:	UNCONTROLLED TSP EMISSION FACTOR FOR COMBINED POURING AND COOLING. SOURCE: WALLACE ET AL, SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME I, FINAL REPORT, EPA-340/1-80-020, JANUARY 1981.			
01	0015	SELENIUM	2E-07	lb/ton	EPA-660/2-90-44
	Comments:	UNCONTROLLED EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			
01	0015	VOLATILE ORGANIC COMPOUNDS (VOC)	0.14	lb/ton	EPA-600/2-90-044
	Comments:	UNCONTROLLED VOC EMISSIONS FROM POURING REPORTED BY GSCHWANDTNER AND FAIRCHILD, EMISSIONS FACTORS FOR IRON FOUNDRIES - CRITERIA AND TOXIC POLLUTANTS, EPA-600/2-90-004. (ORIGINAL SOURCE: STOCKTON AND STELLING, CRITERIA POLLUTANT EMISSION FACTORS FOR THE 1985 NAPAP EMISSIONS INVENTORY, EPA-600/7-87-015, NTIS PB87-198735, 1987).			

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F007 - POURING AND COOLING
E013 - POURING & COOLING #10

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
ANTIMONY	01	S008	Fugitive	67%	0%	☒	7.90E-07	1.06E-06	Not Appl.	7.43E-07	2.66E-06	4.66E-06
Total Emissions of ANTIMONY from POURING & COOLING #10:							**7.90E-07**	**1.06E-06**	**Not Appl.**	**7.43E-07**	**2.66E-06**	**4.66E-06**
ARSENIC	01	S008	Fugitive	67%	0%	☒	9.88E-08	1.33E-07	Not Appl.	9.29E-08	3.33E-07	5.83E-07
Total Emissions of ARSENIC from POURING & COOLING #10:							**9.88E-08**	**1.33E-07**	**Not Appl.**	**9.29E-08**	**3.33E-07**	**5.83E-07**
BENZENE	01	S008	Fugitive	0%	0%	☒	.064	.087	Not Appl.	.061	.217	.38
Total Emissions of BENZENE from POURING & COOLING #10:							**.064**	**.087**	**Not Appl.**	**.061**	**.217**	**.38**
BERYLLIUM	01	S008	Fugitive	67%	0%	☒	3.95E-08	5.32E-08	Not Appl.	3.71E-08	1.33E-07	2.33E-07
Total Emissions of BERYLLIUM from POURING & COOLING #10:							**3.95E-08**	**5.32E-08**	**Not Appl.**	**3.71E-08**	**1.33E-07**	**2.33E-07**
CADMIUM	01	S008	Fugitive	67%	0%	☒	7.90E-07	1.06E-06	Not Appl.	7.43E-07	2.66E-06	4.66E-06
Total Emissions of CADMIUM from POURING & COOLING #10:							**7.90E-07**	**1.06E-06**	**Not Appl.**	**7.43E-07**	**2.66E-06**	**4.66E-06**
CHROMIUM	01	S008	Fugitive	67%	0%	☒	6.52E-05	8.78E-05	Not Appl.	6.13E-05	2.20E-04	3.85E-04
Total Emissions of CHROMIUM from POURING & COOLING #10:							**6.52E-05**	**8.78E-05**	**Not Appl.**	**6.13E-05**	**2.20E-04**	**3.85E-04**
COBALT	01	S008	Fugitive	67%	0%	☒	3.46E-07	4.66E-07	Not Appl.	3.25E-07	1.16E-06	2.04E-06
Total Emissions of COBALT from POURING & COOLING #10:							**3.46E-07**	**4.66E-07**	**Not Appl.**	**3.25E-07**	**1.16E-06**	**2.04E-06**
FORMALDEHYDE	01	S008	Fugitive	0%	0%	☒	.013	.018	Not Appl.	.013	.045	.079
Total Emissions of FORMALDEHYDE from POURING & COOLING #10:							**.013**	**.018**	**Not Appl.**	**.013**	**.045**	**.079**
LEAD	01	S008	Fugitive	67%	0%	☒	1.09E-05	1.46E-05	Not Appl.	1.02E-05	3.66E-05	6.41E-05
Total Emissions of LEAD from POURING & COOLING #10:							**1.09E-05**	**1.46E-05**	**Not Appl.**	**1.02E-05**	**3.66E-05**	**6.41E-05**
MANGANESE	01	S008	Fugitive	67%	0%	☒	6.52E-05	8.78E-05	Not Appl.	6.13E-05	2.20E-04	3.85E-04
Total Emissions of MANGANESE from POURING & COOLING #10:							**6.52E-05**	**8.78E-05**	**Not Appl.**	**6.13E-05**	**2.20E-04**	**3.85E-04**
MERCURY	01	S008	Fugitive	0%	0%	☒	3.29E-05	4.44E-05	Not Appl.	3.10E-05	1.11E-04	1.94E-04
Total Emissions of MERCURY from POURING & COOLING #10:							**3.29E-05**	**4.44E-05**	**Not Appl.**	**3.10E-05**	**1.11E-04**	**1.94E-04**
NICKEL	01	S008	Fugitive	67%	0%	☒	2.47E-05	3.33E-05	Not Appl.	2.32E-05	8.32E-05	1.46E-04
Total Emissions of NICKEL from POURING & COOLING #10:							**2.47E-05**	**3.33E-05**	**Not Appl.**	**2.32E-05**	**8.32E-05**	**1.46E-04**
PARTICULATE MATTER (PM10)	01	S008	Fugitive	67%	0%	☐	.272	.366	Not Appl.	.255	.915	1.603
Total Emissions of PARTICULATE MATTER (PM10) from POURING & COOLING #10:							**.272**	**.366**	**Not Appl.**	**.255**	**.915**	**1.603**
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	.272	.366	30.696	.255	.915	134.448

Total Emissions of PARTICULATE MATTER (TSP) from POURING & COOLING #10:							**.272**	**.366**	**30.696**	**.255**	**.915**	**134.448**
SELENIUM	01	S008	Fugitive	67%	0%	☒	9.88E-08	1.33E-07	Not Appl.	9.29E-08	3.33E-07	5.83E-07
Total Emissions of SELENIUM from POURING & COOLING #10:							**9.88E-08**	**1.33E-07**	**Not Appl.**	**9.29E-08**	**3.33E-07**	**5.83E-07**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S008	Fugitive	0%	0%	☐	.21	.282	Not Appl.	.197	.706	1.237
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from POURING & COOLING #10:							**.21**	**.282**	**Not Appl.**	**.197**	**.706**	**1.237**

Supporting Emission Calculations

Emission Calculations for ANTIMONY (CAS 7440-36-0)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 7.43E-07 TPY.
Maximum Annual:	10,083 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.66E-06 TPY.
Potential Annual:	2.66E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.66E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 7.43E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 7.90E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.66E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.06E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for ARSENIC (CAS 7440-38-2)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 9.29E-08 TPY.
Maximum Annual:	10,083 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.33E-07 TPY.
Potential Annual:	3.33E-07 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 5.83E-07 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 9.29E-08 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 9.88E-08 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.33E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.33E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.043 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .061 TPY.
Maximum Annual:	10,083 tons/yr * 0.043 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .217 TPY.
Potential Annual:	.217 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .38 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .061 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .064 lb/hr.
Maximum Hourly:	Maximum annual emissions of .217 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .087 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BERYLLIUM (CAS 7440-41-7)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.00000008 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.71E-08 TPY.
Maximum Annual:	10,083 tons/yr * 0.00000008 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.33E-07 TPY.
Potential Annual:	1.33E-07 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.33E-07 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.71E-08 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.95E-08 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.33E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.32E-08 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 7.43E-07 TPY.
Maximum Annual:	10,083 tons/yr * 0.0000016 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.66E-06 TPY.
Potential Annual:	2.66E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.66E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 7.43E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 7.90E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.66E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.06E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.13E-05 TPY.
Maximum Annual:	10,083 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.20E-04 TPY.
Potential Annual:	2.20E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.85E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.13E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.52E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.20E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.78E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for COBALT (CAS 7440-48-4)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.0000007 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.25E-07 TPY.
Maximum Annual:	10,083 tons/yr * 0.0000007 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.16E-06 TPY.
Potential Annual:	1.16E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.04E-06 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.25E-07 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.46E-07 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.16E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.66E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.009 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .013 TPY.
Maximum Annual:	10,083 tons/yr * 0.009 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .045 TPY.
Potential Annual:	.045 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .079 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .013 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .013 lb/hr.
Maximum Hourly:	Maximum annual emissions of .045 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .018 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for LEAD (CAS 7439-92-1)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.02E-05 TPY.
Maximum Annual:	10,083 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.66E-05 TPY.
Potential Annual:	3.66E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 6.41E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.02E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.09E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.66E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.46E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.13E-05 TPY.
Maximum Annual:	10,083 tons/yr * 0.000132 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.20E-04 TPY.
Potential Annual:	2.20E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.85E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.13E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.52E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.20E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.78E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MERCURY (CAS 7439-97-6)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 3.10E-05 TPY.
Maximum Annual:	10,083 tons/yr * 0.000022 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 1.11E-04 TPY.
Potential Annual:	1.11E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.94E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.10E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.29E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.11E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.44E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for NICKEL (CAS 7440-02-0)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.00005 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.32E-05 TPY.
Maximum Annual:	10,083 tons/yr * 0.00005 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 8.32E-05 TPY.
Potential Annual:	8.32E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.46E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.32E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.47E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.32E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.33E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .255 TPY.
Maximum Annual:	10,083 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .915 TPY.
Potential Annual:	.915 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.603 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .255 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .272 lb/hr.
Maximum Hourly:	Maximum annual emissions of .915 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .366 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .255 TPY.
Maximum Annual:	10,083 tons/yr * 0.55 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .915 TPY.
Potential Annual:	Maximum allowable hourly emissions of 30.696 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 134.448 TPY.
Average Hourly:	Actual annual emissions of .255 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .272 lb/hr.
Maximum Hourly:	Maximum annual emissions of .915 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .366 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 20.2 ton/hr or 40,400 lb/hr. Calculation : 30.5 lb/hr + (40,400 - 40,000) * (4.9 / 10,000) lb/hr = 30.696 lb/hr.

Emission Calculations for SELENIUM (CAS 7782-49-2)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 9.29E-08 TPY.
Maximum Annual:	10,083 tons/yr * 0.0000002 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.33E-07 TPY.
Potential Annual:	3.33E-07 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 5.83E-07 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 9.29E-08 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 9.88E-08 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.33E-07 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.33E-07 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 01, POURING AND COOLING, #10 LARGE CASTING

Actual Annual:	2,814 tons/yr * 0.14 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .197 TPY.
Maximum Annual:	10,083 tons/yr * 0.14 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .706 TPY.
Potential Annual:	.706 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.237 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .197 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .21 lb/hr.
Maximum Hourly:	Maximum annual emissions of .706 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .282 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for POURING & COOLING #10

8

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F008 - SHAKEOUT
E014 - #9 UNIT SHAKEOUT

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F008
Emission Unit ID:	E014
Source Desc:	#9 UNIT SHAKEOUT
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400301-39C

Equipment Information

Equip. Type:	#9 UNIT SHAKEOUT APPARATUS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 26.25 TPH AND 131,256 TPY OF CASTINGS; AND 236.25 TPH AND 1,181,304 TPY OF MOLDS.

Description of Operation

#9 UNIT SHAKEOUT IS PERFORMED BY THE HERMAN MOLDING APPARATUS LOCATED IN THE MAIN FOUNDRY BUILDING. THE MOLD/CASTING RETURNED TO THE HERMAN MOLDING MACHINE FROM THE COOLING LOOP ARE SHAKEN LOOSE FROM THE MOLD FLASK AND THE CASTING, CORE, AND GREENSAND ARE SUBSEQUENTLY DUMPED ONTO A CONVEYOR SYSTEM INSTALLED BELOW THE HERMAN MOLD MACHINE (IN THE BUILDING BASEMENT). GREENSAND RECOVERED IS ROUTED TO THE #9 GREENSAND MOLD SYSTEM (F010 PROCESS FLOW). THE CASTINGS AND CORE BUTTS ARE CONVEYED THROUGH THE CASTING HANDLING AREA.

THE #9 SHAKEOUT AREA IS ENCLOSED. EMISSIONS GENERATED INSIDE THE ENCLOSURE ARE DUCTED TO THE SAME BAGHOUSE (CD003) AS THE DUCTILE TREATING PROCESS AND VENTED THROUGH THIS BAGHOUSE STACK (S007). IT IS ESTIMATED THAT 10 PERCENT OF SHAKEOUT EMISSIONS ARE FUGITVE EMISSIONS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING AND EVENTUALLY DISCHARGED TO THE ATMOSPHERE THROUGH THE BUILDING ROOF MONITOR (S008). EMISSION CALCULATIONS FOR THIS SHAKEOUT PROCESS INCLUDED A BUILDING SETTLING FACTOR OF 67% FOR THE FUGITIVE EMISSIONS FROM THIS OPERATION.

PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 (FOR EMISISON SOURCES BUILT OR INSTALLED BEFORE 1/1/73) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41. THE ALLOWABLE EMISSIONS ARE CALCULATED BASED ON THE MAXIMUM HOURLY PROCESS WEIGHT RATE OF THE #9 UNIT CASTINGS AND MOLDS. EMISSIONS DISCHARGED THROUGH THE BAGHOUSE STACK AT S007 ARE SUBJECT TO RULE 26.12. (1) WHICH LIMITS THE OUTLET DUST LOADING RATE TO 0.020 GR/DSCF.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S007	90%	48	[N/A]	[N/A]	[N/A]	96,925	CD003	BAGHOUSE	[N/A]	[No Sec. Control]
Comments:	DUCTILE TREATING AND #9 UNIT SHAKEOUT BAGHOUSE STACK.									
S008	10%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.									

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SHAKEOUT, #9 UNIT	30400320	1,880	5,000	36,631	131,256	--	12.857

Comments: THE HOURLY AND ANNUAL QUANTITIES OF CASTINGS AND MOLDS PROCESSED BY THE #9 UNIT SHAKEOUT (SHOWN ABOVE) ARE THE SAME AS THOSE FROM THE #9 UNIT COOLING (E010). THE #9 UNIT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM.

THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2 (SCHEDULE 1 OF TABLE 2 FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/73). THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 262.5 TPH (26.25 TPH OF IRON AND 236.25 TPH OF MOLD) OR 525,000 LB/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0013	BENZENE	0.0083	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREENSAND SHAKEOUT (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0013	CADMIUM	2.7E-06	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR GREENSAND SHAKEOUT. SOURCE: MAYSILLES'S REF. 24.			
01	0013	CHROMIUM	0.00052	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR SHAKEOUT. SOURCE: MAYSILLES'S REF. 8			
01	0013	FORMALDEHYDE	0.0039	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREENSAND SHAKEOUT (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0013	MANGANESE	0.00022	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR SHAKEOUT. SOURCE: MAYSILLES'S REF. 8			
01	0013	PARTICULATE MATTER (PM10)	4.62	lb/ton	ENGINEERING ESTIMATES
	Comments:	UNCONTROLLED PM-10 EMISSIONS (70% OF TSP PER AP-42).			
01	0013	PARTICULATE MATTER (TSP)	6.6	lb/ton	EPA SOURCES
	Comments:	UNCONTROLLED TSP EMISSIONS FROM SHAKEOUT (AVERAGE OF 10 LB/TON FROM MAYSILLES'S REVIEW AND 3.2 LB/TON FROM AP-42).			
01	0013	VOLATILE ORGANIC COMPOUNDS (VOC)	1.228	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR SHAKEOUT. SOURCE: MAYSILLES'S REF. 13.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S008	2nd Fug.	0%	0%	☒	.016	.022	Not Appl.	.015	.054	.095
	01	S007	Stack	0%	0%	☒	.146	.196	Not Appl.	.137	.49	.859
Total Emissions of BENZENE from #9 UNIT SHAKEOUT:							**.162**	**.218**	**Not Appl.**	**.152**	**.545**	**.954**
CADMIUM	01	S008	2nd Fug.	67%	0%	☒	1.70E-06	2.30E-06	Not Appl.	1.60E-06	5.74E-06	1.01E-05
	01	S007	Stack	0%	0%	☒	4.65E-05	6.26E-05	Not Appl.	4.37E-05	1.57E-04	2.74E-04
Total Emissions of CADMIUM from #9 UNIT SHAKEOUT:							**4.82E-05**	**6.49E-05**	**Not Appl.**	**4.53E-05**	**1.62E-04**	**2.84E-04**
CHROMIUM	01	S008	2nd Fug.	67%	0%	☒	3.34E-04	4.50E-04	Not Appl.	3.14E-04	.001	.002
	01	S007	Stack	99%	0%	☒	9.12E-05	1.23E-04	Not Appl.	8.57E-05	3.07E-04	5.38E-04
Total Emissions of CHROMIUM from #9 UNIT SHAKEOUT:							**4.26E-04**	**5.73E-04**	**Not Appl.**	**4.00E-04**	**.001**	**.003**
FORMALDEHYDE	01	S008	2nd Fug.	0%	0%	☒	.008	.01	Not Appl.	.007	.026	.045
	01	S007	Stack	0%	0%	☒	.068	.092	Not Appl.	.064	.23	.404
Total Emissions of FORMALDEHYDE from #9 UNIT SHAKEOUT:							**.076**	**.102**	**Not Appl.**	**.071**	**.256**	**.448**
MANGANESE	01	S008	2nd Fug.	67%	0%	☒	1.41E-04	1.91E-04	Not Appl.	1.33E-04	4.76E-04	8.35E-04
	01	S007	Stack	99%	0%	☒	3.86E-05	5.20E-05	Not Appl.	3.63E-05	1.30E-04	2.28E-04
Total Emissions of MANGANESE from #9 UNIT SHAKEOUT:							**1.80E-04**	**2.43E-04**	**Not Appl.**	**1.69E-04**	**6.06E-04**	**1.06E-03**
PARTICULATE MATTER (PM10)	01	S008	2nd Fug.	67%	0%	☐	2.971	4.002	Not Appl.	2.792	10.006	17.53
	01	S007	Stack	99%	0%	☐	.81	1.092	Not Appl.	.762	2.729	4.781
Total Emissions of PARTICULATE MATTER (PM10) from #9 UNIT SHAKEOUT:							**3.781**	**5.094**	**Not Appl.**	**3.554**	**12.734**	**22.311**
PARTICULATE MATTER (TSP)	01	S008	2nd Fug.	67%	0%	☐	4.244	5.718	Not Appl.	3.989	14.294	Not Appl.
	01	S007	Stack	99%	0%	☐	1.157	1.559	12.857	1.088	3.898	56.314
Total Emissions of PARTICULATE MATTER (TSP) from #9 UNIT SHAKEOUT:							**5.401**	**7.277**	**12.857**	**5.077**	**18.192**	**5.63E+01**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S008	2nd Fug.	0%	0%	☐	2.393	3.224	Not Appl.	2.249	8.059	14.12
	01	S007	Stack	0%	0%	☐	21.534	29.013	Not Appl.	20.242	72.532	127.076
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from #9 UNIT SHAKEOUT:							**23.927**	**32.236**	**Not Appl.**	**22.491**	**80.591**	**141.196**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0083 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .137 TPY.
Maximum Annual:	131,256 tons/yr * 0.0083 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .49 TPY.
Potential Annual:	.49 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .859 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .137 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .146 lb/hr.
Maximum Hourly:	Maximum annual emissions of .49 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .196 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0083 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .015 TPY.
Maximum Annual:	131,256 tons/yr * 0.0083 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .054 TPY.
Potential Annual:	.054 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .095 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .015 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .016 lb/hr.
Maximum Hourly:	Maximum annual emissions of .054 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .022 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00000265 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = 4.37E-05 TPY.
Maximum Annual:	131,256 tons/yr * 0.00000265 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = 1.57E-04 TPY.
Potential Annual:	1.57E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.74E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.37E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.65E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.57E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 6.26E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00000265 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.60E-06 TPY.
Maximum Annual:	131,256 tons/yr * 0.00000265 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.74E-06 TPY.
Potential Annual:	5.74E-06 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 1.01E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.60E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.70E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.74E-06 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.30E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00052 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 8.57E-05 TPY.
Maximum Annual:	131,256 tons/yr * 0.00052 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 3.07E-04 TPY.
Potential Annual:	3.07E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 5.38E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.57E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 9.12E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.07E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.23E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00052 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.14E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.00052 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.14E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.34E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.50E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0039 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .064 TPY.
Maximum Annual:	131,256 tons/yr * 0.0039 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = .23 TPY.
Potential Annual:	.23 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .404 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .064 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .068 lb/hr.
Maximum Hourly:	Maximum annual emissions of .23 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .092 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.0039 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	131,256 tons/yr * 0.0039 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = .026 TPY.
Potential Annual:	.026 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .045 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .007 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .008 lb/hr.
Maximum Hourly:	Maximum annual emissions of .026 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00022 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 3.63E-05 TPY.
Maximum Annual:	131,256 tons/yr * 0.00022 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.30E-04 TPY.
Potential Annual:	1.30E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 2.28E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.63E-05 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.86E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.30E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.20E-05 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 0.00022 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.33E-04 TPY.
Maximum Annual:	131,256 tons/yr * 0.00022 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.76E-04 TPY.
Potential Annual:	4.76E-04 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 8.35E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.33E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.41E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.76E-04 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.91E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 4.62 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .762 TPY.
Maximum Annual:	131,256 tons/yr * 4.62 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 2.729 TPY.
Potential Annual:	2.729 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.781 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .762 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .81 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.729 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.092 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 4.62 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.792 TPY.
Maximum Annual:	131,256 tons/yr * 4.62 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 10.006 TPY.
Potential Annual:	10.006 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 17.53 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.792 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.971 lb/hr.
Maximum Hourly:	Maximum annual emissions of 10.006 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 4.002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 6.6 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.088 TPY.
Maximum Annual:	131,256 tons/yr * 6.6 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = 3.898 TPY.
Potential Annual:	Maximum allowable hourly emissions of 12.857 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 56.314 TPY.
Average Hourly:	Actual annual emissions of 1.088 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.157 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.898 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.559 lb/hr.
Allowable Emissions:	TSP emissions discharged through this stack are subject to Rule 26.12 (1). Thus, allowable TSP emissions = 0.020 gr/dscf * 1 lb/7,000 gr * 75,000 dscf/min * 60 min/hr = 12.857 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 6.6 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.989 TPY.
Maximum Annual:	131,256 tons/yr * 6.6 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 14.294 TPY.
Potential Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of 3.989 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 4.244 lb/hr.
Maximum Hourly:	Maximum annual emissions of 14.294 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.718 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S007
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 1.228 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = 20.242 TPY.
Maximum Annual:	131,256 tons/yr * 1.228 lb/ton * 90% (capture efficiency) * 1 ton/2,000 lb = 72.532 TPY.
Potential Annual:	72.532 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 127.076 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 20.242 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 21.534 lb/hr.
Maximum Hourly:	Maximum annual emissions of 72.532 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 29.013 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 01, SHAKEOUT, #9 UNIT

Actual Annual:	36,631 tons/yr * 1.228 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 2.249 TPY.
Maximum Annual:	131,256 tons/yr * 1.228 lb/ton * 10% (capture efficiency) * 1 ton/2,000 lb = 8.059 TPY.
Potential Annual:	8.059 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 14.12 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.249 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.393 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.059 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.224 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for #9 UNIT SHAKEOUT

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F008 - SHAKEOUT
E015 - #4 & #10 UNITS SHAKEOUT

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F008
Emission Unit ID:	E015
Source Desc:	#4 & #10 UNITS SHAKEOUT
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	SHAKEOUT APPARATUS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 9.76 TPH AND 48,794 TPY OF IRON CASTINGS.

Description of Operation

#4 AND #10 UNITS SHAKEOUT IS PERFORMED IN THE SAME AREA IN THE MAIN FOUNDRY BUILDING. THE MOLD/CASTING IS PLACED ON A VIBRATING SCREEN WHERE CASTING, CORE, AND MOLD SAND ARE SEPARATED FROM EACH OTHER. GREENSAND RECOVERED FROM THE #4 CASTING IS ROUTED TO THE #4 GREENSAND MOLD SYSTEM (F011 PROCESS FLOW). AIRSET MOLD AND CORE BUTTS ARE CARRIED TO THE SAND RECLAMATION SYSTEM (F012 PROCESS FLOW). INITIALLY, EMISSIONS ARE RELEASED IN THE SHAKEOUT AREA INSIDE THE MAIN FOUNDRY BUILDING AND ENVENTUALLY ESCAPE TO THE ATMOSPHERE THROUGH THE BUILDING ROOF MONITOR (S008).

EMISSION CALCULATIONS FOR THIS SHAKEOUT PROCESS INCLUDED A SETTLING FACTOR OF 67% FOR PARTICULATE EMISSIONS. PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 (FOR EMISISON SOURCES BUILT OR INSTALLED BEFORE 1/1/73) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41. THE ALLOWABLE EMISSIONS ARE CALCULATED BASED ON THE MAXIMUM HOURLY PROCESS WEIGHT RATE OF CASTINGS AND MOLDS.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS	30400331	1,880	5,000	13,617	48,794	97.60	50.936

Comments: THE LARGE CASTING UNITS (COMBINED #4 AND #10) PROCESS ABOUT 27.1% OF THE MOLTEN IRON OR APPROXIMATELY 13,617 TPY (FROM 50,248 TPY * 27.1%). THE MAXIMUM ANNUAL TONNAGES PROCESSED BY #4 UNIT ARE 180,050 TPY * 27.1% OR APPROXIMATELY 48,794 TPY. BASED ON AN AVERAGE SAND/IRON RATIO OF 9, THE AVERAGE AND MAXIMUM ANNUAL SAND PROCESSED ARE 122,553 TPY AND 439,146 TPY, RESPECTIVELY.

THE #4 AND #10 UNITS SHAKEOUT OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THUS, THE AVERAGE HOURLY PROCESS WEIGHT RATES DURING SHAKEOUT ARE 7.24 TPH OF IRON CASTINGS (FROM 13,617 TPY / 1,880 HR/YR) AND 65.16 TPH OF MOLDS (FROM 7.24 TPH * 9 METAL/SAND RATIO). THE MAXIMUM HOURLY PROCESS WEIGHT RATES ARE 9.76 TPH OF IRON CASTINGS (FROM 48,794 TPY / 1,880 HR/YR) AND 87.84 TPH OF SAND (FROM 9.76 TPH * 9 SAND/IRON RATIO).

THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2 (SCHEDULE 1 OF TABLE 2 FOR SOURCE BUILT OR INSTALL BEFORE 1/1/73). THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 97.6 TPH (9.76 TPH OF IRON AND 87.84 TPH OF MOLD) OR 195,200 LB/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0013	BENZENE	0.0083	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREENSAND SHAKEOUT (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0013	CADMIUM	2.7E-06	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR GREENSAND SHAKEOUT. SOURCE: MAYSILLES'S REF. 24.			
01	0013	CHROMIUM	0.00052	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR SHAKEOUT. SOURCE: MAYSILLES'S REF. 8			
01	0013	FORMALDEHYDE	0.0039	lb/ton	WISCONSINS DNR PUB, AUG. 1996.
	Comments:	EMISSION FACTOR FOR GREENSAND SHAKEOUT (UNCONTROLLED). SOURCE: SUSAN LINDEM, WISCONSINS DNR, BUREAU OF AIR MANAGEMENT, "WISCONSINS HAZARDOUS AIR POLLUTANT PROGRAM, PREPARED FOR AFS ENVIRONMENTAL AFFAIRS CONFERENCE, AUGUST, 1996.			
01	0013	MANGANESE	0.00022	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR SHAKEOUT. SOURCE: MAYSILLES'S REF. 8			
01	0013	PARTICULATE MATTER (PM10)	4.62	lb/ton	ENGINEERING ESTIMATES
	Comments:	UNCONTROLLED PM-10 EMISSIONS (70% OF TSP PER AP-42).			
01	0013	PARTICULATE MATTER (TSP)	6.6	lb/ton	EPA SOURCES
	Comments:	UNCONTROLLED TSP EMISSIONS FROM SHAKEOUT (AVERAGE OF 10 LB/TON FROM MAYSILLES'S REVIEW AND 3.2 LB/TON FROM AP-42).			
01	0013	VOLATILE ORGANIC COMPOUNDS (VOC)	1.228	lb/ton	MAYSILLES'S REVIEW
	Comments:	UNCONTROLLED EMISSION FACTOR FOR SHAKEOUT. SOURCE: MAYSILLES'S REF. 13.			

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F008 - SHAKEOUT
E015 - #4 & #10 UNITS SHAKEOUT

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S008	Fugitive	0%	0%	☒	.06	.081	Not Appl.	.057	.202	.355
Total Emissions of BENZENE from #4 & #10 UNITS SHAKEOUT:							**.06**	**.081**	**Not Appl.**	**.057**	**.202**	**.355**
CADMIUM	01	S008	Fugitive	67%	0%	☒	6.33E-06	8.53E-06	Not Appl.	5.95E-06	2.13E-05	3.74E-05
Total Emissions of CADMIUM from #4 & #10 UNITS SHAKEOUT:							**6.33E-06**	**8.53E-06**	**Not Appl.**	**5.95E-06**	**2.13E-05**	**3.74E-05**
CHROMIUM	01	S008	Fugitive	67%	0%	☒	.001	.002	Not Appl.	.001	.004	.007
Total Emissions of CHROMIUM from #4 & #10 UNITS SHAKEOUT:							**.001**	**.002**	**Not Appl.**	**.001**	**.004**	**.007**
FORMALDEHYDE	01	S008	Fugitive	0%	0%	☒	.028	.038	Not Appl.	.027	.095	.167
Total Emissions of FORMALDEHYDE from #4 & #10 UNITS SHAKEOUT:							**.028**	**.038**	**Not Appl.**	**.027**	**.095**	**.167**
MANGANESE	01	S008	Fugitive	67%	0%	☒	5.26E-04	7.08E-04	Not Appl.	4.94E-04	.002	.003
Total Emissions of MANGANESE from #4 & #10 UNITS SHAKEOUT:							**5.26E-04**	**7.08E-04**	**Not Appl.**	**4.94E-04**	**.002**	**.003**
PARTICULATE MATTER (PM10)	01	S008	Fugitive	67%	0%	☐	11.043	14.878	Not Appl.	10.38	37.196	65.167
Total Emissions of PARTICULATE MATTER (PM10) from #4 & #10 UNITS SHAKEOUT:							**11.043**	**14.878**	**Not Appl.**	**10.38**	**37.196**	**65.167**
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	15.775	21.255	50.936	14.829	53.137	223.1
Total Emissions of PARTICULATE MATTER (TSP) from #4 & #10 UNITS SHAKEOUT:							**15.775**	**21.255**	**50.936**	**14.829**	**53.137**	**223.1**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S008	Fugitive	0%	0%	☐	8.895	11.984	Not Appl.	8.361	29.96	52.489
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from #4 & #10 UNITS SHAKEOUT:							**8.895**	**11.984**	**Not Appl.**	**8.361**	**29.96**	**52.489**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)

Stack ID or Designation: S008

Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.0083 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .057 TPY.
Maximum Annual:	48,794 tons/yr * 0.0083 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .202 TPY.
Potential Annual:	.202 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .355 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .057 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .06 lb/hr.
Maximum Hourly:	Maximum annual emissions of .202 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .081 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CADMIUM (CAS 7440-43-9)

Stack ID or Designation: S008

Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.00000265 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.95E-06 TPY.
Maximum Annual:	48,794 tons/yr * 0.00000265 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.13E-05 TPY.
Potential Annual:	2.13E-05 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 3.74E-05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.95E-06 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 6.33E-06 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.13E-05 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 8.53E-06 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for CHROMIUM (CAS 7440-47-3)

Stack ID or Designation: S008

Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.00052 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	48,794 tons/yr * 0.00052 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	.004 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .007 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S008
Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.0039 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .027 TPY.
Maximum Annual:	48,794 tons/yr * 0.0039 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = .095 TPY.
Potential Annual:	.095 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .167 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .027 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .028 lb/hr.
Maximum Hourly:	Maximum annual emissions of .095 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .038 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for MANGANESE (CAS 7439-96-5)
Stack ID or Designation: S008
Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 0.00022 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.94E-04 TPY.
Maximum Annual:	48,794 tons/yr * 0.00022 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.94E-04 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 5.26E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 7.08E-04 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S008
Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 4.62 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 10.38 TPY.
Maximum Annual:	48,794 tons/yr * 4.62 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 37.196 TPY.
Potential Annual:	37.196 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 65.167 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 10.38 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 11.043 lb/hr.
Maximum Hourly:	Maximum annual emissions of 37.196 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 14.878 lb/hr.
Allowable Emissions:	Not Applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 6.6 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 14.829 TPY.
Maximum Annual:	48,794 tons/yr * 6.6 lb/ton * 100% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 53.137 TPY.
Potential Annual:	Maximum allowable hourly emissions of 50.936 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 223.1 TPY.
Average Hourly:	Actual annual emissions of 14.829 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 15.775 lb/hr.
Maximum Hourly:	Maximum annual emissions of 53.137 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 21.255 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 97.6 ton/hr or 195,200 lb/hr. Calculation : 49.0 lb/hr + (195,200 - 160,000) * (2.2 / 40,000) lb/hr = 50.936 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 01, LARGE CASTING UNITS SHAKEOUT, #4 AND #10 UNITS

Actual Annual:	13,617 tons/yr * 1.228 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 8.361 TPY.
Maximum Annual:	48,794 tons/yr * 1.228 lb/ton * 100% (capture efficiency) * 1 ton/2,000 lb = 29.96 TPY.
Potential Annual:	29.96 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 52.489 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.361 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 8.895 lb/hr.
Maximum Hourly:	Maximum annual emissions of 29.96 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 11.984 lb/hr.
Allowable Emissions:	Not Applicable.

End Fact Sheet for #4 & #10 UNITS SHAKEOUT

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E016 - LARGE CASTING BURN-OFF

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F009
Emission Unit ID:	E016
Source Desc:	LARGE CASTING BURN-OFF
Building No.:	BURN-OFF BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400299-50C

Equipment Information

Equip. Type:	OXYGEN-FUEL ARC FOR IRON CUTTING
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM OF 7.32 TPH OR 29,276 TPY OF CASTINGS.

Description of Operation

LARGE CASTINGS ARE PROCESSED THROUGH THE BURN-OFF OPERATION TO REMOVED RISERS, RUNNERS, AND EXCESS IRON FROM CASTINGS. EMISSIONS FROM THE BURN-OFF OPERATION ARE CONTROLLED BY A BAGHOUSE (CD004) AND VENTED THROUGH THIS BAGHOUSE STACK (S016). IT IS ESTIMATED THAT 10 PERCENT OF THE BURN-OFF EMISSIONS ARE FUGITVE EMISSIONS FIRST RELEASED INSIDE THE BURN-OFF BUILDING AND EVENTUALLY DISCHARGED TO THE ATMOSPHERE THROUGH THE BUILDING EAVES (S017). EMISSION CALCULATIONS FOR THIS PROCESS INCLUDED A BUILDING SETTLING FACTOR OF 67% FOR THE FUGITIVE EMISSIONS.

PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.3 (FOR EMISISON SOURCES BUILT OR INSTALLED ON OR AFTER 1/1/73) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41. THE ALLOWABLE EMISSIONS FOR THE LARGE CASTING BURN-OFF OPERATION ARE CALCULATED BASED ON THE MAXIMUM HOURLY PROCESS WEIGHT RATE. EMISSIONS DISCHARGED THROUGH THE BAGHOUSE STACK AT S016 ARE SUBJECT TO RULE 26.12. (1) WHICH LIMITS THE OUTLET DUST LOADING RATE TO 0.020 GR/DSCF. RULE 26.12 APPLIES IN THIS CASE BECAUSE 90% OF THE EMISSIONS ARE CONTROLLED BY A BAGHOUSE (CD004).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S016	90%	36	2.3	[N/A]	4.153	15,000	CD004	FABRIC FILTER - MEDIUM TEMPERATURE	[N/A]	[No Sec. Control]
Comments:	LARGE CASTING BURN-OFF BAGHOUSE STACK.									
S017	10%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS DISCHARGE THROUGH THE BURN-OFF BUILDING EAVES.									

Molten Material Handling Operational Parameter

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CUTTING IRON WITH OXYGEN-FUELED ARC	30400398	1,920	4,000	8,170	29,276	--	2.571

Comments: APPROXIMATELY 60 PERCENT OF THE LARGE CASTINGS (FROM #4 AND #10 UNITS) ARE PROCESSED THROUGH THIS OPERATION. THE AVERAGE ANNUAL TONNAGE PROCESSED IS 13,617 TPY OF LARGE CASTINGS * 60% OR 8,170 TPY. THE MAXIMUM ANNUAL TONNAGE PROCESSED IS 48,794 TPY OF LARGE CASTINGS * 60% OR 29,276 TPY. THE AVERAGE AND MAXIMUM ANNUAL OPERATING HOURS ARE 1,920 HR/YR AND 4,000 HR/YR, RESPECTIVELY. THE AVERAGE AND MAXIMUM HOURLY PROCESSING RATES ARE 4.26 TPH (FROM 8,170 TPY * 1 YR/1,920 HR) AND 7.32 TPH (FROM 29,276 TPY * 1 YR/4,000 HR).

THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 26.12. (1).

Emission Source Fact Sheet

F009 - CASTING CLEANING
E016 - LARGE CASTING BURN-OFF

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0019	PARTICULATE MATTER (TSP)	2	lb/ton	ENGINEERING ESTIMATE
	Comments:	UNCONTROLLED EMISSION RATE OF 2 LB/TON OF BURN-OFF METAL PROCESSED IS THE BASIS OF THE EXISTING PRECONSTRUCTION PERMIT.			

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E016 - LARGE CASTING BURN-OFF

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S017	2nd Fug.	67%	0%	☐	.281	.483	Not Appl.	.27	.966	Not Appl.
	01	S016	Stack	99%	0%	☐	.077	.132	2.571	.074	.263	11.263
Total Emissions of PARTICULATE MATTER (TSP) from LARGE CASTING BURN-OFF:							**.357**	**.615**	**2.571**	**.343**	**1.23**	**1.13E+01**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S016
Segment No: 01, CUTTING IRON WITH OXYGEN-FUELED ARC

Actual Annual:	8,170 tons/yr * 2 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .074 TPY.
Maximum Annual:	29,276 tons/yr * 2 lb/ton * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .263 TPY.
Potential Annual:	Maximum allowable hourly emissions of 2.571 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 11.263 TPY.
Average Hourly:	Actual annual emissions of .074 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .077 lb/hr.
Maximum Hourly:	Maximum annual emissions of .263 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .132 lb/hr.
Allowable Emissions:	TSP emissions discharged through this stack are subject to Rule 26.12 (1). Thus, allowable TSP emissions = 0.020 gr/dscf * 1 lb/7,000 gr * 15,000 dscf/min * 60 min/hr = 2.571 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S017
Segment No: 01, CUTTING IRON WITH OXYGEN-FUELED ARC

Actual Annual:	8,170 tons/yr * 2 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .27 TPY.
Maximum Annual:	29,276 tons/yr * 2 lb/ton * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .966 TPY.
Potential Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of .27 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .281 lb/hr.
Maximum Hourly:	Maximum annual emissions of .966 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .483 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

End Fact Sheet for LARGE CASTING BURN-OFF

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E017 - LARGE CASTING 12-FT ROTOBLAST TABLE

General Source Information

Facility Abrev:	CV&F
Process/Equip. ID:	F009 E017
Source Desc:	LARGE CASTING 12-FT ROTOBLAST TABLE
Building No.:	#2 CLEANING SHED
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400340-16C

Equipment Information

Equipment Type:	PANGBORN 12' ROTOBLAST TABLE	
Manufacturer:	PANGBORN	
Model No.:	TYPE LK 1	
Serial No.:		
Air Pressure:	Ave:	Max:
Nozzle Diam:	Min:	Max:

Description of Operation

LARGE CASTINGS FROM THE #4 AND #10 UNITS ARE PROCESSED THROUGH THIS OPERATION. THE EMISSION CALCULATIONS ARE BASED ON STAPPA/ALAPCO EMISSION FACTOR FOR STEEL SHOT BLASTING (LB OF EMISSIONS PER LB OF ABRASIVE MATERIAL USED).

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S018	20	2	[N/A]	3.140	10,120	CD005	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: BAGHOUSE STACK FOR THE LARGE CASTING 12-FT ROTOBLAST TABLE.

Abrasive Blasting Operational Data

Segment ID	Description	SCC Code	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Material Usage (TPY) Actual	Material Usage (TPY) Maximum	Material Reclaimed (TPY) Actual	Material Reclaimed (TPY) Maximum
01	12-FT ROTOBLAST TABLE, STEEL SHOT	30400340	2,000	4,000	68	136		

Comments: STEEL SHOT USAGE BASED ON 1996 FISCAL YEAR IS 68.1 TPY. MAXIMUM ANNUAL USAGE IS 68.1 TPY * (4.000 HR/YR / 2,000 HR/YR) = 136.2 TPY.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0003	PARTICULATE MATTER (PM10)	0.00344	lb/lb Abrasive	STAPPA/ALAPCO, 1991

Comments: EMISSION FACTOR FOR STEEL SHOT BLASTING. SOURCE: STAPPA/ALAPCO 1991 MANUAL "AIR QUALITY PERMITS".

01	0003	PARTICULATE MATTER (TSP)	0.004	lb/lb Abrasive	STAPPA/ALAPCO, 1991

Comments: EMISSION FACTOR FOR STEEL SHOT BLASTING. SOURCE: STAPPA/ALAPCO 1991 MANUAL "AIR QUALITY PERMITS".

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E017 - LARGE CASTING 12-FT ROTOBLAST TABLE

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S018	Stack	99%	0%	☐	.002	.002	Not Appl.	.002	.005	.01
Total Emissions of PARTICULATE MATTER (PM10) from LARGE CASTING 12-FT ROTOBLAST TABLE:							**.002**	**.002**	**Not Appl.**	**.002**	**.005**	**0.010**
PARTICULATE MATTER (TSP)	01	S018	Stack	99%	0%	☐	.003	.003	1.735	.003	.005	7.599
Total Emissions of PARTICULATE MATTER (TSP) from LARGE CASTING 12-FT ROTOBLAST TABLE:							**.003**	**.003**	**1.735**	**.003**	**.005**	**7.599**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S018
Segment No: 01, 12-FT ROTOBLAST TABLE, STEEL SHOT

Actual Annual:	68.1 TPY * 2,000 lb/ton * 0.00344 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	136.2 TPY * 2,000 lb/ton * 0.00344 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	.005 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .01 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .002 TPY / 2,000. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S018
Segment No: 01, 12-FT ROTOBLAST TABLE, STEEL SHOT

Actual Annual:	68.1 TPY * 2,000 lb/ton * 0.004 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	136.2 TPY * 2,000 lb/ton * 0.004 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	Maximum allowable hourly emissions of 1.735 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 7.599 TPY.
Average Hourly:	Actual annual emissions of .003 TPY / 2,000. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 10,120 dscf/min * 60 min/hr = 1.735 lb/hr.

End Fact Sheet for LARGE CASTING 12-FT ROTOBLAST TABLE

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E018 - #9 CASTING HANDLING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F009
Emission Unit ID:	E018
Source Desc:	#9 CASTING HANDLING
Building No.:	MAIN FOUNDRY BUILDING BASEMENT
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	CONVEYOR SYSTEM HANDLING #9 CASTINGS AND CORE BUTTS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 52.5 TPH AND 262,512 TPY OF #9 CASTINGS AND CORE BUTTS.

Description of Operation:

THE #9 UNIT CASTING HANDLING OPERATION IS A CONVEYOR BELT SYSTEM THAT MOVES CASTINGS AND CORE BUTTS FROM THE MAIN FOUNDRY BUILDING BASEMENT TO THE PICK-OFF BUILDING. EMISSION FACTOR USED IS THE SAME AS THAT FOR CHARGE HANDLING SINCE LOOSE SAND PRESENT HERE IS NEGLIGIBLE.

EMISSIONS FROM THIS OPERATION ARE CONSIDERED AS FUGITIVE EMISSIONS FIRST RELEASED INSIDE THE MAIN FOUNDRY AND PICK-OFF BUILDINGS AND EVENTUALLY VENTED TO THE ATMOSPHERE THROUGH THE BUILDING ROOF VENTILATORS (S020) AND ROOF MONITOR (S021).

EMISSION CALCULATIONS FOR THE #9 CASTING HANDLING INCLUDED A SETTLING FACTOR OF 67% FOR PARTICULATE EMISSIONS. PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 (FOR EMISISON SOURCES BUILT OR INSTALLED BEFORE 1/1/73) OF THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41. THE ALLOWABLE EMISSIONS ARE CALCULATED BASED ON THE MAXIMUM HOURLY PROCESS WEIGHT RATE OF CASTINGS AND CORE BUTTS.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S020	51%	25	3	[N/A]	7.065	18,000	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	EMISSIONS DISCHARGES FROM 17 POWERED VENTILATORS IN PICK-OFF BUILDING.									
S021	49%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS FROM ROOF MONITOR OVER #9 CASTING COOLING LINE.									

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#9 UNIT CASTINGS AND CORES HANDLING	30400357	1,880	5,000	73,262.00	262,512.00	52.50	45.025

Comments: THE HOURLY AND ANNUAL QUANTITIES OF CASTINGS PROCESSED BY THE #9 UNIT CASTING HANDLING ARE SAME AS THOSE FROM THE #9 UNIT SHAKEOUT (36,631 TPY AVERAGE; 131,256 TPY MAXIMUM; 19.48 TPH AVERAGE; AND 26.25 TPH MAXIMUM). THE OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM. THE CORE WEIGHT IS APPROXIMATELY 75% TO 83% OF THE METAL WEIGHT. THUS, IT IS CONSERVATIVE TO ASSUME THAT WEIGHT OF THE CORE BUTTS ARE THE SAME AS THAT OF THE CASTINGS.

THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 10.2 (SCHEDULE 1 OF TABLE 2 FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/73). THE MAXIMUM ALLOWABLE EMISSIONS WILL BE DETERMINED BASED ON THE INPUT PROCESS WEIGHT OF 52.5 TPH (26.25 TPH OF CASTINGS AND 26.25 TPH OF CORE BUTTS) OR 105,000 LB/HR.

Emission Source Fact Sheet

F009 - CASTING CLEANING
E018 - #9 CASTING HANDLING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C038	PARTICULATE MATTER (TSP)	0.6	lb/ton Handled	AP-42

Comments: THE ABOVE EMISSION FACTOR IS FOR UNCONTROLLED FUGITIVE DUST EMISSIONS FOR AP-42 CHARGE HANDLING EMISSION FACTOR WHICH INCLUDES A PREHEAT FACTOR OF 0.41.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E018 - #9 CASTING HANDLING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S020	Fugitive	67%	0%	☐	3.935	5.302	45.025	3.699	13.254	197.21
	01	S021	2nd Fug.	67%	0%	☐	3.781	5.094	Not Appl.	3.554	12.734	Not Appl.
Total Emissions of PARTICULATE MATTER (TSP) from #9 CASTING HANDLING:							**7.716**	**10.395**	**45.025**	**7.253**	**25.989**	**197.21**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S020
Segment No: 01, #9 UNIT CASTINGS AND CORES HANDLING

Actual Annual:	.6 lb/ton Handled * 73,262 tons * 51% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.699 TPY.
Maximum Annual:	.6 lb/ton Handled * 262,512 tons * 51% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 13.254 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 45.025 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 197.21 TPY.
Average Hourly:	Actual annual emissions of 3.699 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.935 lb/hr.
Maximum Hourly:	Maximum annual emissions of 13.254 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.302 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 52.5 ton/hr or 105,000 lb/hr. Calculation : 44.6 lb/hr + (105,000 - 100,000) * (1.7 / 20,000) lb/hr = 45.025 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S021
Segment No: 01, #9 UNIT CASTINGS AND CORES HANDLING

Actual Annual:	.6 lb/ton Handled * 73,262 tons * 49% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.554 TPY.
Maximum Annual:	.6 lb/ton Handled * 262,512 tons * 49% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = 12.734 TPY.
Allowable Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of 3.554 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.781 lb/hr.
Maximum Hourly:	Maximum annual emissions of 12.734 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 5.094 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

End Page Report for #9 CASTING HANDLING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E019 - #9 CASTING SECONDARY SHAKEOUT

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F009
Emission Unit ID:	E019
Source Desc:	#9 CASTING SECONDARY SHAKEOUT
Building No.:	PICK-OFF BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400301-38C

Equipment Information

Equip. Type:	SECONDARY SHAKEOUT APPARATUS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 52.5 TPH AND 262,512 TPY OF COMBINED #9 CASTINGS AND CORE BUTTS.

Description of Operation:

THE #9 UNIT SECONDARY SHAKEOUT OPERATION IS A VIBRATING CONVEYOR BELT SYSTEM DESIGNED TO REMOVE EXCESS SAND FROM CASTINGS AND CORE BUTTS. EMISSIONS FROM THIS OPERATION ARE CONTROLLED BY A BAGHOUSE (CD006) VENTED TO THE ATMOSPHERE THROUGH THE BAGHOUSE EMISSION STACK (S022).

PARTICULATE EMISSIONS FROM THE SECONDARY SHAKEOUT BAGHOUSE STACK ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 26.12. (1). THUS, THE ALLOWABLE EMISSIONS ARE CALCULATED BASED ON AN OUTLET DUST LOADING RATE OF 0.020 GR/DSCF.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S022	100%	17	2.33	[N/A]	4.262	15,000	CD006	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: #9 UNIT SECONDARY SHAKEOUT BAGHOUSE STACK.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#9 CASTING SECONDARY SHAKEOUT	30400331	1,880	5,000	73,262.00	262,512.00	52.50	2.571

Comments: THE HOURLY AND ANNUAL QUANTITIES OF CASTINGS AND CORE BUTTS PROCESSED BY THE #9 UNIT CASTING SECONDARY SHAKEOUT (SHOWN ABOVE) ARE SAME AS THOSE FROM THE #9 UNIT CASTING HANDLING (E018). THE OPERATING HOURS ARE 1,880 HR/YR AVERAGE AND 5,000 HR/YR MAXIMUM.

THE MAXIMUM ALLOWABLE TSP EMISSIONS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION ORDINANCE, SECTION 4-41, RULE 26.12. (2) OR AN OUTLET DUST LOADING RATE OF 0.02 GR/DSCF.

Emission Source Fact Sheet

F009 - CASTING CLEANING
E019 - #9 CASTING SECONDARY SHAKEOUT

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C039	PARTICULATE MATTER (PM10)	1.75	lb/ton Handled	ENGINEERING ESTIMATE.
	Comments:	UNCONTROLLED PM-10 EMISSIONS (70% OF TSP).			
01	C039	PARTICULATE MATTER (TSP)	2.5	lb/ton Handled	ENGINEERING ESTIMATE.
	Comments:	UNCONTROLLED EMISSION RATE. THE SECONDARY SHAKEOUT EMPLOYS A VIBRATING CONVEYORIZED SCREEN AND THE EMISSION RATE SHOURLD BE EQUIVALENT TO OR LESS THAN THOSE FOR CLEANING, GRINDING AND SAWING. SOURCE: DIPRA EMISSION FACTOR FOR CLEANING, GRINDING AND SAWING.			

Emission Source Fact Sheet

F009 - CASTING CLEANING
E019 - #9 CASTING SECONDARY SHAKEOUT

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S022	Stack	99%	0%	☐	.682	.919	Not Appl.	.641	2.297	4.024
Total Emissions of PARTICULATE MATTER (PM10) from #9 CASTING SECONDARY SHAKEOUT:							**.682**	**.919**	**Not Appl.**	**.641**	**2.297**	**4.024**
PARTICULATE MATTER (TSP)	01	S022	Stack	99%	0%	☐	.974	1.313	2.571	.916	3.281	11.263
Total Emissions of PARTICULATE MATTER (TSP) from #9 CASTING SECONDARY SHAKEOUT:							**.974**	**1.313**	**2.571**	**.916**	**3.281**	**11.263**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)

Stack ID or Designation: S022

Segment No: 01, #9 CASTING SECONDARY SHAKEOUT

Actual Annual:	1.75 lb/ton Handled * 73,262 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .641 TPY.
Maximum Annual:	1.75 lb/ton Handled * 262,512 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 2.297 TPY.
Allowable Annual:	2.297 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 4.024 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .641 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .682 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.297 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .919 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S022

Segment No: 01, #9 CASTING SECONDARY SHAKEOUT

Actual Annual:	2.5 lb/ton Handled * 73,262 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .916 TPY.
Maximum Annual:	2.5 lb/ton Handled * 262,512 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 3.281 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 2.571 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 11.263 TPY.
Average Hourly:	Actual annual emissions of .916 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .974 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.281 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.313 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (1): 0.020 gr/dscf * 1 lb/7,000 gr * 15,000 dscf/min * 60 min/hr = 2.571 lb/hr.

End Page Report for #9 CASTING SECONDARY SHAKEOUT

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E020 - #9 CASTING ROTOBLAST BARRELS

General Source Information

Facility Abrev:	CV&F
Process/Equip. ID:	F009 E020
Source Desc:	#9 CASTING ROTOBLAST BARRELS
Building No.:	#1 CLEANING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400340-30C

Equipment Information

Equipment Type:	PANGBORN ROTOBLAST BARRELS	
Manufacturer:	PANGBORN	
Model No.:	#34 TYPE GN	
Serial No.:		
Air Pressure:	Ave:	Max:
Nozzle Diam:	Min:	Max:

Description of Operation

#9 UNIT CASTINGS ARE PROCESSED THROUGH THREE PANGBORN ROTOBLAST BARRELS WHERE THE CASTINGS ARE CLEANED WITH STEEL SHOT. EMISSIONS FROM THE ROTOBLAST BARRELS #1, #2 AND #3 ARE DUCTED AND CONTROLLED BY A BAGHOUSE (CD007).

EMISSION CALCULATIONS ARE BASED ON STAPPA/ALAPCO EMISSION FACTORS FOR STEEL SHOT BLASTING (LB OF EMISSIONS PER LB OF ABRASIVE MATERIAL USED).

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S023	18	3.25	[N/A]	8.292	29,100	CD007	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: PANGBORN TYPE 34GN ROTOBLAST BARRELS BAGHOUSE STACK.

Abrasive Blasting Operational Data

Segment ID	Description	SCC Code	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Material Usage (TPY) Actual	Material Usage (TPY) Maximum	Material Reclaimed (TPY) Actual	Material Reclaimed (TPY) Maximum
01	12-FT ROTOBLAST TABLE STEEL SHOT	30400340	2,000	4,000	68	136		

Comments: STEEL SHOT USAGE BASED ON 1996 FISCAL YEAR IS 68.1 TPY. MAXIMUM ANNUAL USAGE IS 68.1 TPY * (4.000 HR/YR / 2,000 HR/YR) = 136.2 TPY.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0003	PARTICULATE MATTER (PM10)	0.00344	lb/lb Abrasive	STAPPA/ALAPCO, 1991

Comments: EMISSION FACTOR FOR STEEL SHOT BLASTING. SOURCE: STAPPA/ALAPCO 1991 MANUAL "AIR QUALITY PERMITS".

01	0003	PARTICULATE MATTER (TSP)	0.004	lb/lb Abrasive	STAPPA/ALAPCO, 1991

Comments: EMISSION FACTOR FOR STEEL SHOT BLASTING. SOURCE: STAPPA/ALAPCO 1991 MANUAL "AIR QUALITY PERMITS".

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S023	Stack	99%	0%	☐	.002	.002	Not Appl.	.002	.005	.01
Total Emissions of PARTICULATE MATTER (PM10) from #9 CASTING ROTOBLAST BARRELS:							**.002**	**.002**	**Not Appl.**	**.002**	**.005**	**0.010**
PARTICULATE MATTER (TSP)	01	S023	Stack	99%	0%	☐	.003	.003	4.989	.003	.005	21.85
Total Emissions of PARTICULATE MATTER (TSP) from #9 CASTING ROTOBLAST BARRELS:							**.003**	**.003**	**4.989**	**.003**	**.005**	**21.850**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S023
Segment No: 01, 12-FT ROTOBLAST TABLE, STEEL SHOT

Actual Annual:	68.1 TPY * 2,000 lb/ton * 0.00344 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	136.2 TPY * 2,000 lb/ton * 0.00344 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	.005 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .01 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .002 TPY / 2,000. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S023
Segment No: 01, 12-FT ROTOBLAST TABLE, STEEL SHOT

Actual Annual:	68.1 TPY * 2,000 lb/ton * 0.004 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	136.2 TPY * 2,000 lb/ton * 0.004 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	Maximum allowable hourly emissions of 4.989 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 21.85 TPY.
Average Hourly:	Actual annual emissions of .003 TPY / 2,000. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 29,100 dscf/min * 60 min/hr = 4.989 lb/hr.

End Fact Sheet for #9 CASTING ROTOBLAST BARRELS

UNITED STATES PIPE & FOUNDRY COMPANY

Attachment to Form 70-28
Emission Summary

F009 - CASTING CLEANING
E020 - #9 CASTING ROTOBLAST BARRELS

Regulated air pollutants.

Air Pollutant	Maximum allowable emissions		Actual Emissions	
	Tons per year	Pounds per hour	Tons per year	Pounds per hour
PARTICULATE MATTER (PM10)	.01	.002	.002	.002
PARTICULATE MATTER (TSP)	21.85	4.989	.003	.003

End of emission summary for F009 CASTING CLEANING, E020#9 CASTING ROTOBLAST BARRELS. Calculations and emission factor references are provided in the Emission Source Fact Sheet for the same emission source.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F009 - CASTING CLEANING
E021 - #9 CASTING ROTOBLAST MONORAIL & TABLE

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (PM10)	01	S024	Stack	99%	0%	☐	.008	.008	Not Appl.	.008	.021	.037
Total Emissions of PARTICULATE MATTER (PM10) from #9 CASTING ROTOBLAST MONORAIL & TABLE:							**.008**	**.008**	**Not Appl.**	**.008**	**.021**	**0.037**
PARTICULATE MATTER (TSP)	01	S024	Stack	99%	0%	☐	.01	.01	2.362	.009	.024	10.347
Total Emissions of PARTICULATE MATTER (TSP) from #9 CASTING ROTOBLAST MONORAIL & TABLE:							**.01**	**.01**	**2.362**	**.009**	**.024**	**10.347**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S024
Segment No: 01, STEEL SHOT CLAST CLEANING

Actual Annual:	229.4 TPY * 2,000 lb/ton * 0.00344 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .008 TPY.
Maximum Annual:	610.1 TPY * 2,000 lb/ton * 0.00344 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .021 TPY.
Potential Annual:	.021 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = .037 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .008 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .008 lb/hr.
Maximum Hourly:	Maximum annual emissions of .021 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .008 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S024
Segment No: 01, STEEL SHOT CLAST CLEANING

Actual Annual:	229.4 TPY * 2,000 lb/ton * 0.004 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .009 TPY.
Maximum Annual:	610.1 TPY * 2,000 lb/ton * 0.004 lb/lb abrasive * (1 - 99% control eff.) * 1 ton/2,000 lb = .024 TPY.
Potential Annual:	Maximum allowable hourly emissions of 2.362 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 10.347 TPY.
Average Hourly:	Actual annual emissions of .009 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .01 lb/hr.
Maximum Hourly:	Maximum annual emissions of .024 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 13,780 dscf/min * 60 min/hr = 2.362 lb/hr.

End Fact Sheet for #9 CASTING ROTOBLAST MONORAIL & TABLE

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E022 - SAND CONVEYING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E022
Source Desc:	SAND CONVEYING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	SAND CONVEYOR BELT SYSTEM
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 236.26 TPH AND 1,181,304 TPY OF RETURNED GREENSAND.

Description of Operation:

GREENSAND FROM THE #9 UNIT SHAKEOUT IS PROCESSED THROUGH THE GREENSAND SYSTEM BEFORE BEING RETURNED TO THE #9 UNIT MOLDS. THE FIRST SEGMENT OF THIS GREENSAND SYSTEM IS THE SAND CONVEYING TO THE SAND SCREENING PROCESS.

EMISSIONS FROM THE SAND CONVEYING IS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING AND EVENTUALLY DISCHARGED TO THE ATMOSPHERE THROUGH THE BUILDING ROOF MONITOR (S008). PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.3, SCHEDULE 2 OF TABLE 2, OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CONVEYOR FOR GREENSAND	30400399	1,880	5,000	329,679.00	1,181,304.00	236.26	39.711

Comments: BASED ON MOLD SAND TO METAL RATIO OF 9:1, THE ACTUAL ANNUAL #9 UNIT GREENSAND TONNAGE PROCESSED FOR FISCAL YEAR '96 IS 36,631 TPY OF METAL POURED * 9 = 329,679 TPY OF GREENSAND. MAXIMUM ANNUAL TONNAGE IS ALSO BASED ON METAL POURED OR 131,256 TPY * 9 = 1,181,304 TPY.

AVERAGE AND MAXIMUM ANNUAL OPERATING HOURS ARE 1,880 HR/YR AND 5,000 HR/YR, RESPECTIVELY; WHICH ARE THE SAME OPERATING HOURS OF THE #9 UNIT. THUS, THE HOURLY PROCESSING RATES ARE 175.36 TPH (FROM 329,679 TPY / 1,880 HR/YR) AND 236.26 TPH (FROM 1,181,304 TPY / 5,000 HR/YR).

PARTICULATE EMISSIONS FROM SAND CONVEYING IS SUBJECT TO RULE 10.3 SCHEDULE 2 OF TABLE 2.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E022 - SAND CONVEYING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	1.678	2.261	39.711	1.578	5.653	173.934
Total Emissions of PARTICULATE MATTER (TSP) from SAND CONVEYING:							1.678	2.261	39.711	1.578	5.653	173.934

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008

Segment No: 01, CONVEYOR FOR GREENSAND

Actual Annual:	.029 lb/ton Handled * 329,679 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.578 TPY.
Maximum Annual:	.029 lb/ton Handled * 1,181,304 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.653 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 39.711 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 173.934 TPY.
Average Hourly:	Actual annual emissions of 1.578 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.678 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.653 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.261 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 236.26 ton/hr or 472,520 lb/hr. Calculation : 36.1 lb/hr + (472,520 - 200,000) * (10.6 / 800,000) lb/hr = 39.711 lb/hr.

End Page Report for SAND CONVEYING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E023 - SAND SCREENING DRUM

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E023
Source Desc:	SAND SCREENING DRUM
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400358-46C

Equipment Information

Equip. Type:	SAND SCREENING DRUM
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 236.26 TPH AND 1,181,304 TPY OF RETURNED GREENSAND.

Description of Operation:

EMISION LIMIT PER PERMIT IS 0.75 LB/HR. OPERATING HOURS PER PERMIT IS 4,000 HR/YR. PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12. (2).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S025	100%	42	2	[N/A]	3.140	15,910	CD009	CYCLONES	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FOR THE #9 GREENSAND SCREENING DRUM CYCLONE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND SCREENING	30400398	1,880	4,000	329,679.00	1,181,304.00	236.26	2.571

Comments: SAND PROCESSING RATES ARE THE SAME AS THOSE IN SAND CONVEYING E022.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C040	PARTICULATE MATTER (TSP)	0.75	lb/hr	PERMIT LIMIT

Comments: PERMIT LIMIT FOR SAND SCREENING.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E023 - SAND SCREENING DRUM

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S025	Stack	98%	0%	☐	.75	.75	2.571	.705	1.5	11.263
Total Emissions of PARTICULATE MATTER (TSP) from SAND SCREENING DRUM:							.75	.75	2.571	.705	1.5	11.263

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S025

Segment No: 01, SAND SCREENING

Actual Annual:	0.75 lb/hr * 1,880 hr/yr act. * 1 ton/2,000 lb = .705 TPY.
Maximum Annual:	0.75 lb/hr (specified emission factor) * 4,000 hr/yr maximum * 1 ton/2,000 lb = 1.5 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 2.571 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 11.263 TPY.
Average Hourly:	Actual annual emissions of .705 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .75 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.5 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .75 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 15,000 dscf/min * 60 min/hr = 2.571 lb/hr.

End Page Report for SAND SCREENING DRUM

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E024 - SAND RETURNING TO STORAGE SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E024
Source Desc:	SAND RETURNING TO STORAGE SILO
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	RETURNED CONVEYOR, SAND STORAGE SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 236.26 TPH AND 1,181,304 TPY OF RETURNED GREENSAND.

Description of Operation:

SAND RETURING FROM SAND SCREENING DRUM VIA CONVEYOR AND LOADING TO SAND SILO. EMISSIONS ARE FIRST RELEASED INSIDE THE BUILDING AT THE GREENSAND STORAGE AREA AND EVENTUALLY DISCHARGED TO THE ATMOSPHERE VIA BUILDING ROOF MONITOR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S026	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS FROM BUIDLING ROOF MONITOR FOR SAND RETURNING TO STORAGE SILO.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	RETURNING (LOADING) GREENSAND TO STORAGE SILO	30400399	1,880	5,000	329,679.00	1,181,304.00	236.26	39.711

Comments: BASED ON MOLD SAND TO METAL RATIO OF 9:1, THE ACTUAL ANNUAL #9 UNIT GREENSAND TONNAGE PROCESSED FOR FISCAL YEAR '96 IS 36,631 TPY OF METAL POURED * 9 = 329,679 TPY OF GREENSAND. MAXIMUM ANNUAL TONNAGE IS ALSO BASED ON METAL POURED OR 131,256 TPY * 9 = 1,181,304 TPY.

AVERAGE AND MAXIMUM ANNUAL OPERATING HOURS ARE 1,880 HR/YR AND 5,000 HR/YR, RESPECTIVELY; WHICH ARE THE SAME OPERATING HOURS OF THE #9 UNIT. THUS, THE HOURLY PROCESSING RATES ARE 175.36 TPH (FROM 329,679 TPY / 1,880 HR/YR) AND 236.26 TPH (FROM 1,181,304 TPY / 5,000 HR/YR).

PARTICULATE EMISSIONS FROM SAND CONVEYING IS SUBJECT TO RULE 10.3 SCHEDULE 2 OF TABLE 2.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E024 - SAND RETURNING TO STORAGE SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E024 - SAND RETURNING TO STORAGE SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S026	Stack	67%	0%	☐	1.678	2.261	39.711	1.578	5.653	173.934
Total Emissions of PARTICULATE MATTER (TSP) from SAND RETURNING TO STORAGE SILO:							**1.678**	**2.261**	**39.711**	**1.578**	**5.653**	**173.934**

MWPS009052

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S026

Segment No: 01, RETURNING (LOADING) GREENSAND TO STORAGE SILO

Actual Annual:	.029 lb/ton Handled * 329,679 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.578 TPY.
Maximum Annual:	.029 lb/ton Handled * 1,181,304 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.653 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 39.711 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 173.934 TPY.
Average Hourly:	Actual annual emissions of 1.578 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.678 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.653 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 2.261 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 236.26 ton/hr or 472,520 lb/hr. Calculation : 36.1 lb/hr + (472,520 - 200,000) * (10.6 / 800,000) lb/hr = 39.711 lb/hr.

End Page Report for SAND RETURNING TO STORAGE SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E025 - GREENSAND MULLORS A & B

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E025
Source Desc:	GREENSAND MULLORS A & B
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	GREENSAND MULLORS A & B
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 238 TPH AND 1,189,051 TPY OF GREENSAND/BINDER COMBINED.

Description of Operation:

MATERIALS MIXED IN THE GREEANSAND MULLERS INCLUDE GREENSAND FROM SAND SILO (E024), BINDER MATERIAL FROM BINDER CONVEYOR (E028) AND LIQUID ADDITIVES.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S027-S028	100%	45	[N/A]	[N/A]	[N/A]	30,000	WET PROC	MISCELLANEOUS CONTROL DEVICES	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACKS FOR #9 UNIT GREENSAND MULLORS A & B, RESPECTIVELY.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#9 GREENSAND MULLING PROCESS	30400398	1,880	5,000	331,841.00	1,189,051.00	237.88	57.336

Comments: PROCESS WEIGHT RATES ARE FOR COMBINED TOTAL WEIGHTS OF GREENSAND AND BINDER.
AVERAGE FY '96 USAGES = 329,679 TPY OF GREENSAND + 2,162 TPY OF BINDER = 331,841 TPY.
MAXIMUM ANNUAL USAGES = 1,181,304 TPY OF GREENSAND + 7,747 TPY OF BINDER = 1,189,051 TPY.
LIQUID ADDITIVE (MODALL) USAGES ARE 100.8 TPY AVERAGE AND 361.2 TPY MAXIMUM. HOURLY PROCESS WEIGHT RATE = (237.81 TPH + 0.072 TPH) * 2,000 LB/TON = 475,764 LB/HR.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E025 - GREENSAND MULLORS A & B

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0017	PARTICULATE MATTER (TSP)	1.5	lb/ton Handled	MAYSILLES'S REVIEW

Comments: SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E025 - GREENSAND MULLORS A & B

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S027-S028	Stack	99%	0%	☐	2.648	3.567	57.336	2.489	8.918	251.131
Total Emissions of PARTICULATE MATTER (TSP) from GREENSAND MULLORS A & B:							**2.648**	**3.567**	**57.336**	**2.489**	**8.918**	**251.131**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S027-S028

Segment No: 01, #9 GREENSAND MULLING PROCESS

Actual Annual:	1.5 lb/ton Handled * 331,841 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 2.489 TPY.
Maximum Annual:	1.5 lb/ton Handled * 1,189,051 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 8.918 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 57.336 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 251.131 TPY.
Average Hourly:	Actual annual emissions of 2.489 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.648 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.918 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.567 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 237.882 ton/hr or 475,764 lb/hr. Calculation : 51.2 lb/hr + (475,764 - 200,000) * (17.8 / 800,000) lb/hr = 57.336 lb/hr.

End Page Report for GREENSAND MULLORS A & B

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E026 - HERMAN MOLD MACHINE

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E026
Source Desc:	HERMAN MOLD MACHINE
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	#9 UNIT HERMAN MOLD MACHINE
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 237.88 TPH AND 1,189,412 TPY OF GREENSAND/BINDER/MOLDALL ADDITIVE.

Description of Operation:

EMISSIONS FROM THE #9 HERMAN MOLDING MACHINE ARE RELEASED AS FUGITIVE EMISSIONS, FIRST RELEASED INSIDE THE BUILDING THEN VENTED TO THE ATMOSPHERE VIA THE BUILDING ROOF MONITOR (S008).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#9 GREENSAND MOLDING PROCESS	30400398	1,880	5,000	331,941.80	1,189,412.00	237.88	57.336

Comments: PROCESS WEIGHT RATES ARE FOR COMBINED TOTAL WEIGHTS OF GREENSAND AND BINDER. AVERAGE '96 FY USAGES = 329,679 TPY OF GREENSAND + 2,162 TPY OF BINDER + 100.8 TPY OF MOLDALL = 331,941.8 TPY. MAXIMUM ANNUAL USAGES = 1,181,304 TPY OF GREENSAND + 7,747 TPY OF BINDER + 361.2 TPY OF MOLDALL = 1,189,412 TPY. AVERAGE AND MAXIMUM HOURLY USAGES ARE 176.56 TPH AND 237.88 TPH, RESPECTIVELY. PROCESS WEIGHT RATE = 237.88 TPH * 2000 = 475,760 LB/HR.

02	PARTING OIL FOR MOLD FORMING	30400398	1,880	5,000	37.11	132.97	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL USAGE BASED ON 1996 FISCAL YEAR REPORT IS 11,314 GAL/YR * 6.56 LB/GAL * 1 TON/2000 LB = 37.11 TPY. MAXIMUM ANNUAL USAGE = 37.11 TPY * (131,256/36,631) = 132.97 TPY.

MWPS009060

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E026 - HERMAN MOLD MACHINE

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0018	PARTICULATE MATTER (TSP)	0.05	lb/ton Handled	JIM MAYSILLES'S REVIEW.
	Comments:	UNCONTROLLED EMISSION RATE FOR MULLING. SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA.			
02	C041	VOLATILE ORGANIC COMPOUND	1860	lb/ton Handled	MATERIAL BALANCE
	Comments:	HYDROCARBON (VOLATILE ORGANIC COMPOUND) INGREDIENT IN THE PARTING OIL IS LISTED AS 93% BY WEIGHT OR APPROXIMATELY 1,860 LB/TON (2,000 * 0.93). THIS MATERIAL BALANCE IS BASED ON MSDS NO CVF070, NILES CHEMICALS PARTING OIL.			

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E026 - HERMAN MOLD MACHINE

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	2.913	3.925	57.336	2.739	9.813	251.13
Total Emissions of PARTICULATE MATTER (TSP) from HERMAN MOLD MACHINE:							**2.913**	**3.925**	**57.336**	**2.739**	**9.813**	**251.13**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S008	Fugitive	0%	0%	☐	36.715	49.465	Not Appl.	34.512	123.662	216.656
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from HERMAN MOLD MACHINE:							**36.715**	**49.465**	**Not Appl.**	**34.512**	**123.662**	**216.656**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S008
Segment No: 01, #9 GREENSAND MOLDING PROCESS

Actual Annual:	.05 lb/ton Handled * 331,942 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.739 TPY.
Maximum Annual:	.05 lb/ton Handled * 1,189,412 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 9.813 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 57.336 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 251.13 TPY.
Average Hourly:	Actual annual emissions of 2.739 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.913 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.813 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 3.925 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 237.88 ton/hr or 475,760 lb/hr. Calculation : 51.2 lb/hr + (475,760 - 200,000) * (17.8 / 800,000) lb/hr = 57.336 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S008
Segment No: 02, PARTING OIL FOR MOLD FORMING

Actual Annual:	1,860 lb/ton Handled * 37 tons * 1 ton/2,000 lb = 34.512 TPY.
Maximum Annual:	1,860 lb/ton Handled * 133 tons * 1 ton/2,000 lb = 123.662 TPY.
Allowable Annual:	123.662 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 216.656 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 34.512 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 36.715 lb/hr.
Maximum Hourly:	Maximum annual emissions of 123.662 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 49.465 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for HERMAN MOLD MACHINE

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E027 - BINDER UNLOADING TO STORAGE SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E027
Source Desc:	BINDER UNLOADING TO STORAGE SILO
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	GREENSAND BINDER STORAGE SILOS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 50 TPH UNLOADING AND 7,747 TPY OF GREENSAND BINDER.

Description of Operation:

THE UNLOADING PROCESS TAKES ABOUT 30 MINUTES FOR A 25-TON TRUCK. THE BINDER TANK IS CONTROLLED BY A BIN VENT. THE FLOW RATE IS ABOUT 1,000 CFM BASED ON THE TRANSFER RATE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S029	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	CD010	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FOR GREENSAND BINDER STORAGE SILO.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	UNLOADING OF BINDER FROM TANK TRUCK INTO STORAGE SILOS	30400398	44	155	2,162.00	7,747.00	50.00	0.171

Comments: ACTUAL FY '96 PURCHASE 2,162 TPY OF BINDER. MAXIMUM ANNUAL 2,162 TPY OF BINDER * (131,256 TPY MAX/36,631 TPY AVG) OF IRON = 7,747 TPY. A 25-TON TRUCK IS UNLOADED IN 30 MINUTE. AVERAGE UNLOADING HOURS = 2,162 TON/YR * 0.5 HR/25 TON = APPROXIMATELY 44 HR/YR. MAXIMUM UNLOADING HOURS = 7,747 TON/YR * 0.5 HR/25 TON = APPROXIMATELY 155 HR/YR.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E027 - BINDER UNLOADING TO STORAGE SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0016	PARTICULATE MATTER (TSP)	0.27	lb/ton Handled	AP-42, TABLE 11.12-2, 01/95

Comments: EMISSION FACTOR FOR PNEUMATIC CEMENT UNLOADING. SOURCE: AP-42, 5TH EDITION, 01/95, CHAPTER 11.12 - CONCRETE BATCHING, TABLE 11.12-2. RATED D.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E027 - BINDER UNLOADING TO STORAGE SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S029	Stack	99%	0%	☐	.133	.135	.171	.003	.01	.751
Total Emissions of PARTICULATE MATTER (TSP) from BINDER UNLOADING TO STORAGE SILO:							**.133**	**.135**	**.171**	**.003**	**.01**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S029

Segment No: 01, UNLOADING OF BINDER FROM TANK TRUCK INTO STORAGE SILOS

Actual Annual:	.27 lb/ton Handled * 2,162 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	.27 lb/ton Handled * 7,747 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .01 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .003 TPY / 44. hr/yr act. * 2,000 lb/ton = .133 lb/hr.
Maximum Hourly:	Maximum annual emissions of .01 TPY / 155 hr/yr max. * 2,000 lb/ton = .135 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for BINDER UNLOADING TO STORAGE SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E028 - BINDER CONVEYING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F010
Emission Unit ID:	E028
Source Desc:	BINDER CONVEYING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	GREENSAND BINDER CONVEYING SYSTEM
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 1.55 TPH AND 7,747 TPY OF GREENSAND BINDER

Description of Operation:

GREENSAND BINDER IS TRANSFERRED TO THE #9 GREENSAND MULLORS TO PREPARE NEW GREENSAND FOR THE HERMAN MOLDING MACHINE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S031-S032	100%	[N/A]	[N/A]	[N/A]	[N/A]	2,666	CD12-13	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACKS FOR GREENSAND BINDER CONVEYOR BAGHOUSES.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	BINDER CONVEYING SYSTEM	30400398	1,880	5,000	2,162.00	7,747.00	1.55	0.457

Comments: AVERAGE AND MAXIMUM ANNUAL USAGE RATES ARE 2,162 TPY AND 7,747 TPY, RESPECTIVELY.
AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE 1.15 TPH AND 1.55 TPH, RESPECTIVELY.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E028 - BINDER CONVEYING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0016	PARTICULATE MATTER (TSP)	0.27	lb/ton Handled	AP-42, TABLE 11.12-2, 01/95

Comments: EMISSION FACTOR FOR PNEUMATIC CEMENT UNLOADING. SOURCE: AP-42, 5TH EDITION, 01/95, CHAPTER 11.12 - CONCRETE BATCHING, TABLE 11.12-2. RATED D.

Emission Source Fact Sheet

F010 - #9 UNIT GREENSAND MOLD SYSTEM
E028 - BINDER CONVEYING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S031-S032	Stack	99%	0%	☐	.003	.004	.457	.003	.01	2.002
Total Emissions of PARTICULATE MATTER (TSP) from BINDER CONVEYING:							**.003**	**.004**	**.457**	**.003**	**.01**	**2.002**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S031-S032
Segment No: 01, BINDER CONVEYING SYSTEM

Actual Annual:	.27 lb/ton Handled * 2,162 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	.27 lb/ton Handled * 7,747 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .01 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .457 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 2.002 TPY.
Average Hourly:	Actual annual emissions of .003 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .01 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 2,666 dscf/min * 60 min/hr = .457 lb/hr.

End Page Report for BINDER CONVEYING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E029 - SAND CONVEYING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E029
Source Desc:	SAND CONVEYING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400399-31C

Equipment Information

Equip. Type:	SAND CONVEYOR FOR #4 GREENSAND
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 69.68 TPH OR 348,399 TPY OF RETURNED GREENSAND.

Description of Operation:

THE GREENSAND PORTION OF THE #4 & #10 UNITS SHAKEOUT IS RETURNED TO THE #4 GREENSAND MOLD SYSTEM (F011). THE AVERAGE AND MAXIMUM ANNUAL TONNAGES OF GREENSAND PROCESSED ARE 92,227 TPY AND 348,399 TPY, RESPECTIVELY. EMISSIONS FROM THE SAND CONVEYOR IS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING, AND EVENTUALLY VENTED TO THE ATMOSPHERE THROUGH THE BUILDING ROOF MONITOR.

PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 SCHEDULE 1 OF TABLE 2 FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/1973. MAXIMUM ALLOWABLE EMISSIONS ARE CALCULATED FROM 69.68 TPH OR 139,360 LB/HR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CONVEYING #4 GREENSAND RETURNED FROM SHAKEOUT	30400398	1,880	5,000	97,227.00	348,399.00	69.68	47.752

Comments: THE AVERAGE AND MAXIMUM ANNUAL TONNAGES OF GREENSAND PROCESSED ARE 92,227 TPY AND 348,399 TPY, RESPECTIVELY. MAXIMUM ALLOWABLE EMISSIONS ARE CALCULATED FROM 69.68 TPH OR 139,360 LB/HR.

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E029 - SAND CONVEYING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E029 - SAND CONVEYING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008	Stack	67%	0%	☐	.495	.667	47.752	.465	1.667	209.154
Total Emissions of PARTICULATE MATTER (TSP) from SAND CONVEYING:							**.495**	**.667**	**47.752**	**.465**	**1.667**	**209.154**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008

Segment No: 01, CONVEYING #4 GREENSAND RETURNED FROM SHAKEOUT

Actual Annual:	.029 lb/ton Handled * 97,227 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .465 TPY.
Maximum Annual:	.029 lb/ton Handled * 348,399 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.667 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 47.752 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 209.154 TPY.
Average Hourly:	Actual annual emissions of .465 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .495 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.667 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .667 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 69.68 ton/hr or 139,360 lb/hr. Calculation : 46.3 lb/hr + (139,360 - 120,000) * (1.5 / 20,000) lb/hr = 47.752 lb/hr.

End Page Report for SAND CONVEYING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E030 - SAND SCREENING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E030
Source Desc:	SAND SCREENING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400399-31C

Equipment Information

Equip. Type:	SAND SCREENING APPARATUS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 69.68 TPH OR 348,399 TPY OF RETURNED GREENSAND.

Description of Operation:

THE RETURNED SAND FROM THE #4 AND #10 SHAKEOUT THAT FALLS ONTO THE CONVEYOR BELT IN THE BASEMENT (JUST BELOW THE SHAKEOUT FLATFORM) IS TRANSFERRED BY THE SAND CONVEYOR BELT TO THE SAND SCREENING APPARATUS. EMISSIONS FROM THE GREENSAND SCREENING ARE CONTROLLED BY A BAGHOUSE (CD014) AND DISCHARGED THROUGH THE BAGHOUSE STACK (S033).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S033	100%	10	[N/A]	[N/A]	[N/A]	[N/A]	CD014	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FOR THE #4 SAND SCREENING BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND SCREENING	30400398	1,880	5,000	97,227.00	348,399.00	69.68	2.571

Comments: THE AVERAGE AND MAXIMUM ANNUAL TONNAGES OF GREENSAND PROCESSED ARE 92,227 TPY AND 348,399 TPY, RESPECTIVELY. EMISSIONS FROM THE SAND SCREENING BAGHOUSE STACK ARE SUBJECT TO RULE 26.12. (2) OF THE CHATTANOOGA POLLUTION CONTROL ORDINANCE. MAXIMUM ALLOWABLE TSP EMISSION RATE IS CALCULATED FROM 0.02 GR/DSCF.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0025	PARTICULATE MATTER (TSP)	1.03	lb/ton Handled	MAYSILLES'S REVIEW

Comments: SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR SAND HANDLING.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E030 - SAND SCREENING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S033	Stack	99%	0%	☐	.533	.718	2.571	.501	1.794	11.263
Total Emissions of PARTICULATE MATTER (TSP) from SAND SCREENING:							**.533**	**.718**	**2.571**	**.501**	**1.794**	**11.263**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S033
Segment No: 01, SAND SCREENING

Actual Annual:	1.03 lb/ton Handled * 97,227 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .501 TPY.
Maximum Annual:	1.03 lb/ton Handled * 348,399 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.794 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 2.571 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 11.263 TPY.
Average Hourly:	Actual annual emissions of .501 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .533 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.794 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .718 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 15,000 dscf/min * 60 min/hr = 2.571 lb/hr.

End Page Report for SAND SCREENING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E031 - SAND STORAGE SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E031
Source Desc:	SAND STORAGE SILO
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400399-31C

Equipment Information

Equip. Type:	#4 UNIT RETURNED SAND STORAGE SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 69.68 TPH AND 348,399 TPY OF RETURNED GREENSAND.

Description of Operation:

#4 UNIT GREENSAND FROM THE SAND SCREENING IS RETURNED (BEING LOADED) TO THE SAND STORAGE SILO. EMISSIONS FROM THIS PROCESS IS FIRST RELEASED INSIDE THE MAIN FOUNDRY BUILDING AND THEN VENTED TO THE ATMOSPHERE VIA THE BUILDING ROOF MONITOR.

PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 SCHEDULE 1 OF TABLE 2 FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/73.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	LOADING RETURNED GREENSAND TO STORAGE SILO	30400398	1,880	5,000	97,227.00	348,399.00	69.68	47.752

Comments: THE AVERAGE AND MAXIMUM ANNUAL TONNAGES PROCESSED ARE 97,227 TPY AND 348,399 TPY, RESPECTIVELY. MAXIMUM ALLOWABLE TSP EMISSIONS ARE BASED ON 69.68 TPH OR 139,360 LB/HR.

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E031 - SAND STORAGE SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E031 - SAND STORAGE SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008	Stack	67%	0%	☐	.495	.667	47.752	.465	1.667	209.154
Total Emissions of PARTICULATE MATTER (TSP) from SAND STORAGE SILO:							**.495**	**.667**	**47.752**	**.465**	**1.667**	**209.154**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008

Segment No: 01, LOADING RETURNED GREENSAND TO STORAGE SILO

Actual Annual:	.029 lb/ton Handled * 97,227 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .465 TPY.
Maximum Annual:	.029 lb/ton Handled * 348,399 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.667 TPY.
Allowable Annual:	*Maximum allowable hourly emissions of 47.752 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 209.154 TPY.*
Average Hourly:	Actual annual emissions of .465 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .495 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.667 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .667 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 69.68 ton/hr or 139,360 lb/hr. Calculation : 46.3 lb/hr + (139,360 - 120,000) * (1.5 / 20,000) lb/hr = 47.752 lb/hr.

End Page Report for SAND STORAGE SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E032 - GREENSAND MULLORS EAST & WEST

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E032
Source Desc:	GREENSAND MULLORS EAST & WEST
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400399-31C

Equipment Information

Equip. Type:	#4 UNIT GREENSAND MULLORS EAST & WEST
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 70.50 TPH AND 352,500.6 TPY OF RETURNED SAND AND BINDER.

Description of Operation:

GREENSAND, BINDER, AND MOLDALL ADDITIVE ARE MIXED IN THE GREENSAND MULLORS. IN ADDITION, WATER IS ADDED TO THE MIXTURE; THEREFORE , EMISSIONS FROM THE MULLING PROCESS ARE CONSIDERED TO BE 99% CONTROLLED. EMISSIONS FROM THIS PROCESS ARE VENTED THROUGH STACK S034-S035. THE MULLING PROCESS PARTICULATE EMISSIONS ARE SUBJECT TO RULE 10.2 SCHEDULE 1 OF TABLE 2 FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/73.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S034-S035	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	WET PROC	MISCELLANEOUS CONTROL DEVICES	[N/A]	[No Sec. Control]

Comments: EMISSIONS FROM THE #4 GREENSAND MULLORS EAST AND WEST.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#4 GREENSAND MULLING PROCESS	30400398	1,880	5,000	98,369.60	352,500.60	70.50	47.860

Comments: PROCESS WEIGHT RATES ARE FOR COMBINED TOTAL WEIGHTS OF GREENSAND AND BINDER. AVERAGE '96 FY USAGES = 97,227 TPY OF GREENSAND + 1,109 TPY OF BINDER + 33.6 TPY OF MOLDALL = 98,369.6 TPY. MAXIMUM ANNUAL USAGES = 348,399 TPY OF GREENSAND + 3,981 TPY OF BINDER + 120.6 TPY OF MOLDALL = 352,500.6 TPY. AVERAGE AND MAXIMUM HOURLY USAGES ARE 52.32 TPH AND 70.50 TPH, RESPECTIVELY. PROCESS WEIGHT RATE = 70.50 TPH * 2000 = 141,000 LB/HR.

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E032 - GREENSAND MULLORS EAST & WEST

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0017	PARTICULATE MATTER (TSP)	1.5	lb/ton Handled	MAYSILLES'S REVIEW

Comments: SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E032 - GREENSAND MULLORS EAST & WEST

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S034-S035	Stack	99%	0%	☐	.785	1.058	47.86	.738	2.644	209.627
Total Emissions of PARTICULATE MATTER (TSP) from GREENSAND MULLORS EAST & WEST:							**.785**	**1.058**	**47.86**	**.738**	**2.644**	**209.627**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S034-S035
Segment No: 01, #4 GREENSAND MULLING PROCESS

Actual Annual:	1.5 lb/ton Handled * 98,370 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .738 TPY.
Maximum Annual:	1.5 lb/ton Handled * 352,501 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 2.644 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 47.86 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 209.627 TPY.
Average Hourly:	Actual annual emissions of .738 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .785 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.644 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.058 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 70.5 ton/hr or 141,000 lb/hr. Calculation : 47.8 lb/hr + (141,000 - 140,000) * (1.2 / 20,000) lb/hr = 47.86 lb/hr.

End Page Report for GREENSAND MULLORS EAST & WEST

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E033 - #4 UNIT MOLD MAKING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E033
Source Desc:	#4 UNIT MOLD MAKING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400399-31C

Equipment Information

Equip. Type:	MOLD FORMING EQUIPMENT AND PROCESS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 70.50 TPH OR 352,500.6 TPY OF GREENSAND/BINDER/ADDITIVE MIX

Description of Operation:

EMISSIONS FROM THE #4 MOLD MAKING ARE RELEASED AS FUGITIVE EMISSIONS, FIRST RELEASED INSIDE THE BUILDING THEN VENTED TO THE ATMOSPHERE VIA THE BUILDING ROOF MONITOR (S008).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#4 UNIT GREENSAND MOLDING PROCESS	30400398	1,880	5,000	98,369.60	352,500.60	70.50	47.860

Comments: PROCESS WEIGHT RATES ARE FOR COMBINED TOTAL WEIGHTS OF GREENSAND AND BINDER. AVERAGE '96 FY USAGES = 97,227 TPY OF GREENSAND + 1,109 TPY OF BINDER + 33.6 TPY OF MOLDALL = 98,369.6 TPY. MAXIMUM ANNUAL USAGES = 348,399 TPY OF GREENSAND + 3,981 TPY OF BINDER + 120.6 TPY OF MOLDALL = 352,500.6 TPY. AVERAGE AND MAXIMUM HOURLY USAGES ARE 52.32 TPH AND 70.50 TPH, RESPECTIVELY. PROCESS WEIGHT RATE = 70.50 TPH * 2000 = 141,000 LB/HR.

02	LIQUID PARTING OIL	30400398	1,880	5,000	12.37	44.41	Not Appl.	Not Appl.

Comments: AVERAGE AND MAXIMUM AMOUNT OF PARTING OIL USED ARE 12.37 TPY AND 44.41 TPY, RESPECTIVELY.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0018	PARTICULATE MATTER (TSP)	0.05	lb/ton Handled	JIM MAYSILLES'S REVIEW.
	Comments:	UNCONTROLLED EMISSION RATE FOR MULLING., SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA.			
02	C041	VOLATILE ORGANIC COMPOUND	1860	lb/ton Handled	MATERIAL BALANCE
	Comments:	HYDROCARBON (VOLATILE ORGANIC COMPOUND) INGREDIENT IN THE PARTING OIL IS LISTED AS 93% BY WEIGHT OR APPROXIMATELY 1,860 LB/TON (2,000 * 0.93). THIS MATERIAL BALANCE IS BASED ON MSDS NO CVF070, NILES CHEMICALS PARTING OIL.			

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E033 - #4 UNIT MOLD MAKING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	.863	1.163	47.86	.812	2.908	209.627
Total Emissions of PARTICULATE MATTER (TSP) from #4 UNIT MOLD MAKING:							**.863**	**1.163**	**47.86**	**.812**	**2.908**	**209.627**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S008	Fugitive	0%	0%	☐	12.238	16.521	Not Appl.	11.504	41.301	72.36
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from #4 UNIT MOLD MAKING:							**12.238**	**16.521**	**Not Appl.**	**11.504**	**41.301**	**72.36**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008

Segment No: 01, #4 UNIT GREENSAND MOLDING PROCESS

Actual Annual:	.05 lb/ton Handled * 98,370 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .812 TPY.
Maximum Annual:	.05 lb/ton Handled * 352,501 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.908 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 47.86 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 209.627 TPY.
Average Hourly:	Actual annual emissions of .812 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .863 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.908 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 1.163 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 70.5 ton/hr or 141,000 lb/hr. Calculation : 47.8 lb/hr + (141,000 - 140,000) * (1.2 / 20,000) lb/hr = 47.86 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)

Stack ID or Designation: S008

Segment No: 02, LIQUID PARTING OIL

Actual Annual:	1,860 lb/ton Handled * 12 tons * 1 ton/2,000 lb = 11.504 TPY.
Maximum Annual:	1,860 lb/ton Handled * 44 tons * 1 ton/2,000 lb = 41.301 TPY.
Allowable Annual:	41.301 TPY maximum annual * (8,760 potential hours / 5,000 maximum hours) = 72.36 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 11.504 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 12.238 lb/hr.
Maximum Hourly:	Maximum annual emissions of 41.301 TPY / 5,000 hr/yr max. * 2,000 lb/ton = 16.521 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for #4 UNIT MOLD MAKING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E034 - BINDER UNLOADING TO STORAGE SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E034
Source Desc:	BINDER UNLOADING TO STORAGE SILO
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	#4 GREENSAND BINDER STORAGE TANK
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 50 TPH UNLOADING AND 3,981 TPY OF GREENSAND BINDER.

Description of Operation:

THE UNLOADING PROCESS TAKES ABOUT 30 MINUTES FOR A 25-TON TRUCK. THE BINDER TANK IS CONTROLLED BY A BIN VENT. THE FLOW RATE IS ABOUT 1,000 CFM BASED ON THE TRANSFER RATE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S036	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	CD015	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FROM #4 GREENSAND BINDER STORAGE BIN VENT.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	UNLOADING OF BINDER FROM TANK TRUCK INTO STORAGE SILO	30400398	23	80	1,109.00	3,981.00	50.00	0.171

Comments: ACTUAL FY '96 PURCHASE 1,109 TPY OF BINDER. MAXIMUM ANNUAL 1,109 TPY OF BINDER * (38,771 TPY MAX/10,803 TPY AVG) OF IRON = 3,981 TPY. A 25-TON TRUCK IS UNLOADED IN 30 MINUTE. AVERAGE UNLOADING HOURS = 1,109 TON/YR * 0.5 HR/25 TON = APPROXIMATELY 22.5 HR/YR. MAXIMUM UNLOADING HOURS = 3,981 TON/YR * 0.5 HR/25 TON = APPROXIMATELY 80 HR/YR.

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E034 - BINDER UNLOADING TO STORAGE SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0016	PARTICULATE MATTER (TSP)	0.27	lb/ton Handled	AP-42, TABLE 11.12-2, 01/95

Comments: EMISSION FACTOR FOR PNEUMATIC CEMENT UNLOADING. SOURCE: AP-42, 5TH EDITION, 01/95, CHAPTER 11.12 - CONCRETE BATCHING, TABLE 11.12-2. RATED D.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E034 - BINDER UNLOADING TO STORAGE SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S036	Stack	99%	0%	☐	.133	.134	.171	.001	.005	.751
Total Emissions of PARTICULATE MATTER (TSP) from BINDER UNLOADING TO STORAGE SILO:							**.133**	**.134**	**.171**	**.001**	**.005**	**.751**

MWPS009101

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S036

Segment No: 01, UNLOADING OF BINDER FROM TANK TRUCK INTO STORAGE SILO

Actual Annual:	.27 lb/ton Handled * 1,109 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	.27 lb/ton Handled * 3,981 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 22.5 hr/yr act. * 2,000 lb/ton = .133 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 80 hr/yr max. * 2,000 lb/ton = .134 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for BINDER UNLOADING TO STORAGE SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E035 - BINDER CONVEYING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F011
Emission Unit ID:	E035
Source Desc:	BINDER CONVEYING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400399-31C

Equipment Information

Equip. Type:	BINDER CONVEYOR
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 0.80 TPH AND 3,981 TPY OF GREENSAND BINDER.

Description of Operation:

GREENSAND BINDER IS TRANSFERRED TO THE #4 GREENSAND MULLORS TO PREPARE NEW GREENSAND FOR THE #4 UNIT MOLD FORMING PROCESS. PARTICULATE EMISISONS ARE SUBJECT TO RULE 10.2 SCHEDULE 1 (FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/73).

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	BINDER CONVEYING SYSTEM	30400398	1,880	5,000	1,109.00	3,981.00	0.80	3.524

Comments: AVERAGE AND MAXIMUM ANNUAL USAGE RATES ARE 2,162 TPY AND 7,747 TPY, RESPECTIVELY. AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE 0.59 TPH AND 0.80 TPH, RESPECTIVELY. PARTICULATE EMISISONS ARE SUBJECT TO RULE 10.2 SCHEDULE 1 (FOR SOURCE BUILT OR INSTALLED BEFORE 1/1/73). MAXIMUM ALLOWABLE IS CALCULATED FROM PROCESS WEIGHT RATE OF 0.08 TPH OR 1,600 LB/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0016	PARTICULATE MATTER (TSP)	0.27	lb/ton Handled	AP-42, TABLE 11.12-2, 01/95

Comments: EMISSION FACTOR FOR PNEUMATIC CEMENT UNLOADING. SOURCE: AP-42, 5TH EDITION, 01/95, CHAPTER 11.12 - CONCRETE BATCHING, TABLE 11.12-2. RATED D.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F011 - #4 UNIT GREENSAND MOLD SYSTEM
E035 - BINDER CONVEYING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008	Fugitive	67%	0%	☐	.053	.071	3.524	.049	.177	15.435
Total Emissions of PARTICULATE MATTER (TSP) from BINDER CONVEYING:							**.053**	**.071**	**3.524**	**.049**	**.177**	**15.435**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008

Segment No: 01, BINDER CONVEYING SYSTEM

Actual Annual:	.27 lb/ton Handled * 1,109 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .049 TPY.
Maximum Annual:	.27 lb/ton Handled * 3,981 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .177 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 3.524 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 15.435 TPY.
Average Hourly:	Actual annual emissions of .049 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .053 lb/hr.
Maximum Hourly:	Maximum annual emissions of .177 TPY / 5,000 hr/yr max. * 2,000 lb/ton = .071 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of .8 ton/hr or 1,600 lb/hr. Calculation : 3.38 lb/hr + (1,600 - 1,500) * (0.72 / 500) lb/hr = 3.524 lb/hr.

End Page Report for BINDER CONVEYING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E036 - SIZE REDUCTION PROCESSING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F012
Emission Unit ID:	E036
Source Desc:	SIZE REDUCTION PROCESSING
Building No.:	SAND RECLAMATION BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-44C

Equipment Information

Equip. Type:	SAND RECLAMATION PROCESSING EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 22.69 TPH AND 90,745 TPY OF AIRSET MOLDS AND CORES PROCESSED.

Description of Operation:

THE #10 UNIT AIRSET MOLDS AND CORES FROM THE LARGE CASTING SHAKEOUT AREA ARE LOADED INTO THE SAND RECLAMATION EQUIPMENT VIA FRONT END LOADER. FIRST, THE LARGE CHUNKS OF MOLDS AND CORES PASS THROUGH THE CRUSHER FOR SIZE REDUCTION. FOLLOWING THE CRUSHER, SAND DUST PARTICLES ARE SEPARATED FROM THE SAND GRAINS IN THE CLASSIFIER. THE OVERALL RECOVERY RATE OF USABLE SAND IS ABOUT 41 PERCENT OF THE AIRSET MOLDS AND CORES.

THE EMISSIONS FROM THIS SAND RECLAMATION OPERATION ARE CONTROLLED BY A FINES BAGHOUSE (CD016) FOR THE SIZE REDUCTION PROCESSING AND A CLASSIFIER BAGHOUSE (CD017) FOR THE CLASSIFYING PROCESS. THE DISCHARGES FROM THE FINES BAGHOUSE AND THE CLASSIFIER BAGHOUSE ARE S037 AND S038. A SMALL AMOUNT OF EMISSIONS FROM THE SIZE REDUCTION PROCESSING ARE RELEASED AS FUGITIVE DUST EMISSIONS FROM THE SAND RECLAIMATION BUILDING (S039).

THIS SAND RECLAMATION OPERATION IS PERMITTED FOR 4,000 HR/YR. BASED ON PERMIT CONDITIONS, THE ALLOWABLE EMISSION RATES ARE LIMITED TO 0.38 LB/HR FOR THE FINES BAGHOUSE AND 0.02 LB/HR FOR THE CLASSIFIER BAGHOUSE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S037	90%	20	2.8	[N/A]	6.154	22,500	CD016	BAGHOUSE	[N/A]	[No Sec. Control]
Comments:	EMISSIONS STACK FOR #10 UNIT SAND RECLAMATION FINES BAGHOUSE.									
S039	10%	30	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS FROM #10 UNIT SAND RECLAMATION BUILDING									

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND RECLAMATION, FINES FROM SIZE REDUCTION	30400350	1,880	4,000	25,325.00	90,745.00	22.69	0.000

Comments: THE AVERAGE ANNUAL TONNAGES OF MOLDS AND CORES PROCESSED THROUGH THE SAND RECLAMATION PROCESS IN FY '96 ARE : 50,248 TPY OF METAL POURED * 5.6% OF #10 UNIT METAL * 9 SAND TO METAL RATIO = 25,325 TPY. MAXIMUM ANNUAL TONNAGES ARE 180,050 TPY * 5.6% * 9 = 90,745 TPY.

THE AVERAGE HOURLY PROCESSING RATE IS 25,325 TPY / 1,880 HR/YR = 13.47 TPH. THE MAXIMUM HOURLY PROCESSING RATE IS 90,745 TPY / 4,000 HR/YR = 22.69 TPH.

FROM PERMIT CONDITION, THE MAXIMUM ALLOWABLE PARTICULATE EMISSION RATE FORM THIS SOURCE SHALL BE 0.38 LB/HR FROM THE FINES BAGHOUSE. THE OPERATION IS ALSO LIMITED TO 4,000 HOURS OVER ANY CONSECUTIVE 365-DAY PERIOD.

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E036 - SIZE REDUCTION PROCESSING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0020	PARTICULATE MATTER (TSP)	0.043	lb/ton Handled	ENGINEERING ESTIMATE.

Comments: FROM MAYSILLES'S REVIEW EMISSION FACTOR OF 0.3 LB/TON OF METAL MELT FOR RECLAMATION. ASSUMING A MINIMUM SAND TO METAL RATIO OF 7 AND CONVERT THE 0.3 LB/TON OF MELT BY DIVIDING BY 7 OR 0.043 LB/TON SAND.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S037	Stack	99%	0%	☐	.005	.009	.38	.005	.018	.76
	01	S039	2nd Fug.	67%	0%	☐	.019	.032	Not Appl.	.018	.064	Not Appl.
Total Emissions of PARTICULATE MATTER (TSP) from SIZE REDUCTION PROCESSING:							**.024**	**.041**	**.38**	**.023**	**.082**	**.76**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S037
Segment No: 01, SAND RECLAMATION, FINES FROM SIZE REDUCTION

Actual Annual:	.043 lb/ton Handled * 25,325 tons * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Maximum Annual:	.043 lb/ton Handled * 90,745 tons * 90% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .018 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .38 lb/hr * 4,000 hr/yr maximum * 1 ton/2,000 lb = .76 TPY.
Average Hourly:	Actual annual emissions of .005 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .005 lb/hr.
Maximum Hourly:	Maximum annual emissions of .018 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.
Allowable Emissions:	Maximum allowable emissions is the same as the permit limit of .38 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S039
Segment No: 01, SAND RECLAMATION, FINES FROM SIZE REDUCTION

Actual Annual:	.043 lb/ton Handled * 25,325 tons * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .018 TPY.
Maximum Annual:	.043 lb/ton Handled * 90,745 tons * 10% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .064 TPY.
Allowable Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of .018 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .019 lb/hr.
Maximum Hourly:	Maximum annual emissions of .064 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .032 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

End Page Report for SIZE REDUCTION PROCESSING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E037 - CLASSIFIER PROCESSING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F012
Emission Unit ID:	E037
Source Desc:	CLASSIFIER PROCESSING
Building No.:	SAND RECLAMATION BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-44C

Equipment Information

Equip. Type:	MOLDING SAND RECLAMATION EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 22.69 TPH AND 90,745 TPY OF AIRSET MOLDS AND CORES PROCESSED.

Description of Operation:

THE #10 UNIT AIRSET MOLDS AND CORES FROM THE LARGE CASTING SHAKEOUT AREA ARE LOADED INTO THE SAND RECLAMATION EQUIPMENT VIA FRONT END LOADER. FIRST, THE LARGE CHUNKS OF MOLDS AND CORES PASS THROUGH THE CRUSHER FOR SIZE REDUCTION. FOLLOWING THE CRUSHER, SAND DUST PARTICLES ARE SEPARATED FROM THE SAND GRAINS IN THE CLASSIFIER. THE OVERALL RECOVERY RATE OF USABLE SAND IS ABOUT 30 PERCENT OF THE AIRSET MOLDS AND CORES.

THE EMISSIONS FROM THIS SAND RECLAMATION OPERATION ARE CONTROLLED BY A FINES BAGHOUSE (CD016) FOR THE SIZE REDUCTION PROCESSING AND A CLASSIFIER BAGHOUSE (CD017) FOR THE CLASSIFYING PROCESS. THE DISCHARGES FROM THE FINES BAGHOUSE AND THE CLASSIFIER BAGHOUSE ARE S037 AND S038. A SMALL AMOUNT OF EMISSIONS FROM THE SIZE REDUCTION PROCESSING ARE RELEASED AS FUGITIVE DUST EMISSIONS FROM THE SAND RECLAIMATION BUILDING (S039).

THIS SAND RECLAMATION OPERATION IS PERMITTED FOR 4,000 HR/YR. BASED ON PERMIT CONDITIONS, THE ALLOWABLE EMISSION RATES ARE LIMITED TO 0.38 LB/HR FOR THE FINES BAGHOUSE AND 0.02 LB/HR FOR THE CLASSIFIER BAGHOUSE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S038	100%	15	0.7	[N/A]	0.385	1,500	CD017	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FOR #10 UNIT SAND RECLAMATION CLASSIFIER BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND RECLAMATION PROCESS, CLASSIFIER	30400350	1,880	4,000	25,325.00	90,745.00	22.69	0.020

Comments: THE AVERAGE ANNUAL TONNAGES OF MOLDS AND CORES PROCESSED THROUGH THE SAND RECLAMATION PROCESS IN FY '96 ARE : 50,248 TPY OF METAL POURED * 5.6% OF #10 UNIT METAL * 9 SAND TO METAL RATIO = 25,325 TPY. MAXIMUM ANNUAL TONNAGES ARE 180,050 TPY * 5.6% * 9 = 90,745 TPY.

THE AVERAGE HOURLY PROCESSING RATE IS 25,325 TPY / 1,880 HR/YR = 13.47 TPH. THE MAXIMUM HOURLY PROCESSING RATE IS 90,745 TPY / 4,000 HR/YR = 22.69 TPH.

FROM PERMIT CONDITION, THE MAXIMUM ALLOWABLE PARTICULATE EMISSION RATE FORM THIS SOURCE SHALL BE 0.02 LB/HR FROM THE FINES BAGHOUSE. THE OPERATION IS ALSO LIMITED TO 4,000 HOURS OVER ANY CONSECUTIVE 365-DAY PERIOD.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0020	PARTICULATE MATTER (TSP)	0.043	lb/ton Handled	ENGINEERING ESTIMATE.

Comments: FROM MAYSILLES'S REVIEW EMISSION FACTOR OF 0.3 LB/TON OF METAL MELT FOR RECLAMATION. ASSUMING A MINIMUM SAND TO METAL RATIO OF 7 AND CONVERT THE 0.3 LB/TON OF MELT BY DIVIDING BY 7 OR 0.043 LB/TON SAND.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E037 - CLASSIFIER PROCESSING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S038	Stack	99%	0%	☐	.006	.01	.02	.005	.02	.04
Total Emissions of PARTICULATE MATTER (TSP) from CLASSIFIER PROCESSING:							**.006**	**.01**	**.02**	**.005**	**.02**	**.04**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S038

Segment No: 01, SAND RECLAMATION PROCESS, CLASSIFIER

Actual Annual:	.043 lb/ton Handled * 25,325 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .005 TPY.
Maximum Annual:	.043 lb/ton Handled * 90,745 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .02 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .02 lb/hr * 4,000 hr/yr maximum * 1 ton/2,000 lb = .04 TPY.
Average Hourly:	Actual annual emissions of .005 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .02 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Maximum allowable emissions is the same as the permit limit of .02 lb/hr.

End Page Report for CLASSIFIER PROCESSING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E038 - #1 BULK SILO, RECLAIMED SAND

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F012
Emission Unit ID:	E038
Source Desc:	#1 BULK SILO, RECLAIMED SAND
Building No.:	ADJACENT TO THE AIRSET CORE ROOM
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-35C

Equipment Information

Equip. Type:	MACCAWBER PNEUMATIC SAND TRANSPORTER AND RECLAIMED SAND #1 BULK SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 6.81 TPH AND 27,224 TPY OF RECLAIMED SAND.

Description of Operation:

APPROXIMATELY 30 PERCENT OF THE SAND FROM THE #10 UNIT AIRSET MOLDS AND CORES IS RECLAIMED. THUS, THE MAXIMUM TONNAGE OF SAND LOADING INTO THE #1 BULK SAND SILO IS 90,745 TPY * 30% OR 27,224 TPY OVER 4,000 HOURS OF OPERATION.

EMISSIONS FROM THE SAND LOADING PROCESS IS CONTROLLED BY A BAGHOUSE (CD018). THE EMISSION FACTOR IS BASED ON AP-42 FOR SAND LOADING TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED). THE ALLOWABLE PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12. (2) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S040	100%	10	0.5	[N/A]	0.196	1,000	CD018	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FROM THE 300-TON #1 AND #3 BULK SAND SILOS BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	RECLAINED SAND LOADING TO #1 BULK SILO	30400350	1,880	4,000	7,598.00	27,224.00	6.81	0.171

Comments: ABOUT 30 PERCENT OF THE AIRSET CORE AND MOLD SAND IS RECOVERED, THE AVERAGE ANNUAL AMOUNT OF RECLAIMED SAND LOADING INTO THE #1 SAND SILO IS 25,325 TPY * 0.30 = 7,598 TPY. MAXIMUM ANNUAL TONNAGE RECLAIMED = 90,745 TPY * 0.30 = 27,224 TPY. MAXIMUM AND AVERAGE HOURLY RATES ARE 4.04 TPH (7,598 TPY / 1,880 HR/YR) AND 6.81 TPH (27,224 / 4,000 HR/YR). THE ALLOWABLE PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12. (2) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E038 - #1 BULK SILO, RECLAIMED SAND

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S040	Stack	99%	0%	☐	.001	.002	.171	.001	.004	.751
Total Emissions of PARTICULATE MATTER (TSP) from #1 BULK SILO, RECLAIMED SAND:							**.001**	**.002**	**.171**	**.001**	**.004**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S040

Segment No: 01, RECLAINED SAND LOADING TO #1 BULK SILO

Actual Annual:	.029 lb/ton Handled * 7,598 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	.029 lb/ton Handled * 27,224 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .004 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for #1 BULK SILO, RECLAIMED SAND

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E039 - #2 BULK SILO, NEW SAND

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F012
Emission Unit ID:	E039
Source Desc:	#2 BULK SILO, NEW SAND
Building No.:	ADJACENT TO THE AIRSET CORE ROOM
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-35C

Equipment Information

Equip. Type:	MACCAWBER PNEUMATIC SAND TRANSPORTER AND NEW SAND #2 BULK SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 25 TPH AND 67,451 TPY OF NEW SAND.

Description of Operation:

NEW SAND IS DELIVERED TO THE FACILITY VIA RAIL CARS. THE SAND IS LOADED INTO THE #2 BULK SAND SILO (300-TON CAPACITY) AND IS USED IN THE AIRSET CORES SYSTEM, AIRSET MOLDS SYSTEM, AND CEMENT LINING.

THE TONNAGE OF NEW SAND DELIVERED TO THE #2 BULK SAND SILO FOR FISCAL YEAR 96 WAS 18,824 TONS. MAXIMUM ANNUAL TONNAGE IS ESTIMATED BY 18,824 TONS * (180,050/50,248) OR APPROXIMATELY 67,451 TONS.

EMISSIONS FROM THE SAND LOADING PROCESS IS CONTROLLED BY A BAGHOUSE (CD018). THE EMISSION FACTOR IS BASED ON AP-42 FOR SAND LOADING TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED). THE ALLOWABLE PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12. (2) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S040	100%	10	0.5	[N/A]	0.196	1,000	CD018	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSIONS STACK FROM THE 300-TON #1 AND #3 BULK SAND SILOS BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	LOADING NEW SAND FROM RAIL CAR TO #3 BULK SILO	30400350	752	2,700	18,824.00	67,451.00	25.00	0.171

Comments: TOTAL ANNUAL TONNAGE OF NEW SAND DELIVERED FOR THE 96 FISCAL YEAR WAS APPROXIMATELY 18,824 TONS. MAXIMUM ANNUAL TONNAGE = 18,824 TONS * (180,050/50,248) = 67,451 TONS. EACH RAIL CAR IS 100-TON CAPACITY AND IT TAKES 4 HOURS TO UNLOAD EACH RAIL CAR OR 25 TPH. THE AVERAGE AND MAXIMUM ANNUAL HOURS OF UNLOADING ARE APPROXIMATELY 752 HR/YR AND 2,700 HR/YR, RESPECTIVELY. THE ALLOWABLE PARTICULATE EMISSIONS ARE SUBJECT TO RULE 26.12. (2) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F012 - #10 UNIT SAND RECLAMATION
E039 - #2 BULK SILO, NEW SAND

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S040	Stack	99%	0%	☐	.007	.007	.171	.003	.01	.751
Total Emissions of PARTICULATE MATTER (TSP) from #2 BULK SILO, NEW SAND:							**.007**	**.007**	**.171**	**.003**	**.01**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S040

Segment No: 01, LOADING NEW SAND FROM RAIL CAR TO #3 BULK SILO

Actual Annual:	.029 lb/ton Handled * 18,824 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	.029 lb/ton Handled * 67,451 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .01 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .003 TPY / 752. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .01 TPY / 2,700 hr/yr max. * 2,000 lb/ton = .007 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for #2 BULK SILO, NEW SAND

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E040 - MOLD SAND SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F013
Emission Unit ID:	E040
Source Desc:	MOLD SAND SILO
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-35

Equipment Information

Equip. Type:	PNEUMATIC SAND TRANSPORTER AND #10 UNIT SAND SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 15.12 TPH OR 60,497 TPY OF MIXED SAND.

Description of Operation:

THE AVERAGE AND MAXIMUM TONNAGES OF SAND USED FOR THE #10 UNIT AIRSET MOLD ARE 16,883 TPY AND 60,883 TPY, RESPECTIVELY. THESE PROCESS WEIGHT RATES ARE BASED ON SAND TO METAL RATIO OF APPROXIMATELY 6:1 FOR #10 UNIT AIRSET MOLD. BOTH NEW SAND (70%) AND RECLAIMED SAND (30%) ARE FIRST TRANSFERRED FROM THE #1 AND #2 BULK SAND SILOS INTO THE MOLD SAND SILO (E040).

EMISSIONS FROM THE SAND TRANFER PROCESS IS CONTROLLED BY A BAGHOUSE (CD019). THE EMISSION FACTOR USED IS BASED ON AP-42 FOR PNEUMATIC LOADING OF SAND TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED).

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE MOLD SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S041	100%	25	0.5	[N/A]	0.196	1,000	CD019	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM #10 UNIT SAND SILO BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	MIXED SAND LOADING TO #10 UNIT MOLD SAND SILO	30400350	1,880	4,000	16,883.00	60,497.00	15.12	0.171

Comments: APPROXIMATELY 16,883 TONS OF MIXED SAND (11,818 TONS OF NEW SAND AND 5,065 TPY OF RECLAIMED SAND) WERE USED IN FISCAL YEAR 96 TO PREPARE #10 UNIT AIRSET MOLD. MAXIMUM ANNUAL TONNAGES OF MIXED SAND ARE 60,497 TPY (42,348 TPY OF NEW SAND AND 18,149 TPY OF RECLAIMED SAND. THE AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE 8.98 TPH AND 15.12 TPH, RESPECTIVELY.

THE HOURS OF OPERATION ARE 1,880 HR/YR AVERAGE AND 4,000 HR/YR MAXIMUM.

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E040 - MOLD SAND SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S041	Stack	99%	0%	☐	.003	.004	.171	.002	.009	.751
Total Emissions of PARTICULATE MATTER (TSP) from MOLD SAND SILO:							**.003**	**.004**	**.171**	**.002**	**.009**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S041

Segment No: 01, MIXED SAND LOADING TO #10 UNIT MOLD SAND SILO

Actual Annual:	.029 lb/ton Handled * 16,883 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	.029 lb/ton Handled * 60,497 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .009 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for MOLD SAND SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E041 - SAND HEATER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F013
Emission Unit ID:	E041
Source Desc:	SAND HEATER
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	ELECTRIC SAND HEATERS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM OF 15.12 TPH AND 60,497 TPY OF SAND.

Description of Operation:

PARTICULATE EMISSIONS ARE GENERATED BY THE ELECTRIC FLUIDIZED SAND HEATER. A CYCLONE (CD020) IS INSTALLED TO RECOVER SAND FROM THE FLUIDIZED HEATER. EMISSION ESTIMATE IS BASED ON AP-42 EMISSION FACTOR FOR PNEUMATIC SAND TRANSFER OF 0.029 LB/TON OF SAND HANDLED.

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE MOLD SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008B	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	CD020	CYCLONES	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS FROM THE MAIN FOUNDRY BUILDING ROOF MONITOR. THIS SEGMENT COVERS PARTICULATE DUST EMISSIONS FROM #10 UNIT AIRSET MOLD SAND HEATERS CYCLONES. THE MINIMUM DISCHARGE FLOW RATES FROM THE CYCLONES ARE 300 DSCFM EACH FOR A MINIMUM TOTAL OF 600 DSCFM.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND HEATER	30400350	1,880	4,000	16,883.00	60,497.00	15.12	0.103

Comments: THE AVERAGE AND MAXIMUM TONNAGES OF SAND HANDLED ARE THE SAME AS THOSE TRANSFER INTO THE MOLD SAND SILO (E040) OR 16,883 TPY AND 60,497 TPY, RESPECTIVELY. SIMILARLY, THE AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE 8.98 TPH AND 15.12 TPH, RESPECTIVELY.

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E041 - SAND HEATER

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E041 - SAND HEATER

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S008B	Fugitive	98%	0%	☐	.005	.009	.103	.005	.018	.451
Total Emissions of PARTICULATE MATTER (TSP) from SAND HEATER:							**.005**	**.009**	**.103**	**.005**	**.018**	**.451**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008B

Segment No: 01, SAND HEATER

Actual Annual:	.029 lb/ton Handled * 16,883 tons * (1 - 98% control eff.) * 1 ton/2,000 lb = .005 TPY.
Maximum Annual:	.029 lb/ton Handled * 60,497 tons * (1 - 98% control eff.) * 1 ton/2,000 lb = .018 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .103 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .451 TPY.
Average Hourly:	Actual annual emissions of .005 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .005 lb/hr.
Maximum Hourly:	Maximum annual emissions of .018 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 600 dscf/min * 60 min/hr = .103 lb/hr.

End Page Report for SAND HEATER

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E042 - SAND MIXERS

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F013
Emission Unit ID:	E042
Source Desc:	SAND MIXERS
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	SAND AND BINDER MIXERS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 15.347 TPH SAND, BINDER AND CATALYST.

Description of Operation:

TWO MIXERS ARE USED TO COMBINE THE BINDER AND ACID CATALYST WITH THE SAND. ONCE THERE INGREDIENTS ARE MIXED, THE COATED SAND HAS A CERTAIN SET TIME FOR MOLD FORMING BEFORE BECOMING HARDENED OR SET.

PARTICULATE EMISSIONS FROM THESE SAND MIXERS ARE BASED ON SAND HANDLING EMISSION FACTOR. THE TOTAL TONNAGE PROCESSED IS THE TOTAL OF MIXED SAND, BINDER, AND ACID CATALYST USED (APPROXIMATLEY 16,883 TONS OF SAND, 171 TONS OF BINDER, AND 82.2 TONS OF ACID CATALYST. MAXIMUM ANNUAL USAGES ARE 60,497 TPY OF MIXED SAND, 613 TPY OF BINDER, AND 295 TPY OF ACID CATALYST BASED ON 4,000 HOURS OF OPERATION.

VOLATILE COMPONENTS OF THE BINDER AND CATALYST MATERIALS USED ARE ALSO ESTIMATED BASED ON MATERIAL BALANCE. EACH SAND MIXER IS CONTROLLED BY A BAGHOUSE. EXHAUSTS FROM THE BAGHOUSE ARE DISCHARGED INSIDE THE MAIN FOUNDRY BUILDING.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S042	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	CD021-22	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: SAND AND BINDER MIXERS BAGHOUSE STACKS. THESE STACKS ARE DISCHARGED INSIDE THE MAIN FOUNDRY BUILDING.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND, BINDER AND CATALYST MIXING	30400350	1,880	4,000	16,883.00	60,497.00	15.35	36.168

Comments: APPROXIMATLEY 16,883 TONS OF MIXED NEW AND RECLAIMED SAND WERE USED IN FISCAL YEAR 96 FOR THE #10 UNIT AIRSET MOLD. MAXIMUM TONNAGE OF SAND USED IS 60,497 TONS. THE MAXIMUM HOURLY SAND USAGE RATE IS 15.12 TPH. THE HOURLY AMOUNT OF BINDER MATERIALS (BINDER AND CATALYST) USED IS APPROXIMATELY 0.135 TPH AVERAGE AND 0.227 TPH MAXIMUM. THE MAXIMUM HOURLY PROCESS WEIGHT IS 15.347 TPH (FROM 15.12 TPH + 0.227 TPH) OR 30,694 LB/HR.

02	VOLATILES FROM NO-BAKE PHENOLIC BINDER	30400350	1,880	4,000	171.00	613.00	Not Appl.	Not Appl.

Comments: APPROXIMATLEY 171 TONS OF LIQUID PHENOLIC BINDER WERE USED IN FISCAL YEAR 96 FOR THE #10 UNIT AIRSET MOLD. MAXIMUM TONNAGE OF PHENOLIC BINDER USED IS 613 TONS. THE MAXIMUM HOURLY PHENOLIC BINDER USAGE RATE IS 0.153 TPH.

03	VOLATILES FROM NO-BAKE ACID CATALYST	30400350	1,880	4,000	82.20	295.00	Not Appl.	Not Appl.

Comments: APPROXIMATLEY 82.2 TONS OF SULFONIC ACID CATALYST WERE USED IN FISCAL YEAR 96 FOR THE #10 UNIT AIRSET MOLD. MAXIMUM TONNAGE OF SULFONIC ACID CATALYST USED IS 295 TONS. THE MAXIMUM HOURLY PHENOLIC BINDER USAGE RATE IS 0.074 TPH.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0022	PARTICULATE MATTER (TSP)	1.5	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR MULLING (EQUIVALENT TO MIXING) RANGING FROM 0.3 TO 2.1. RATED "E". 1.5 LB/TON IS THE BEST ESTIMATE.			
02	0023	FORMALDEHYDE	18	lb/ton Handled	MATERIAL BALANCE
	Comments:	FORMALDEHYDE INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 0.9% BY WEIGHT OR APPROXIMATELY 18 LB/TON (2000 * 0.009). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0017, BORDEN SUPER SET 975 LIQUID PHENOLIC RESIN.			
02	0023	PHENOL	2.6	lb/ton Handled	MATERIAL BALANCE
	Comments:	PHENOL INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 12.99% BY WEIGHT OR APPROXIMATELY 259.8 LB/TON (2,000 * 0.1299). PHENOL IS A REACTIVE COMPONENT DESIGN FOR GREATER THAN 99% REACTION. THUS, FREE PHENOL IS ESTIMATED TO BE LESS THAN 1 % OR 2.60 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0017, BORDEN SUPER SET 975 LIQUID PHENOLIC RESIN.			
02	0023	VOLATILE ORGANIC COMPOUND	20.6	lb/ton Handled	MATERIAL BALANCE
	Comments:	BOTH FORMALDEHYDE AND PHENOL ARE CONSIDERED AS VOC. THUS, 18 LB/TON + 2.6 LB/TON = 10.6 LB/TON.			
03	0024	BENZENE	0.074	lb/ton Handled	MATERIAL BALANCE
	Comments:	BENZENE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 0.12% BY WEIGHT OR APPROXIMATELY 24 LB/TON (2,000 * 0.012), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (2.4 LB/TON * 0.031 = 0.074 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 021, BORDEN SUPER SET BC61 NO-BAKE ACID CATALYST. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
03	0024	METHANOL	6.082	lb/ton Handled	MATERIAL BALANCE
	Comments:	METHANOL INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 9.81% BY WEIGHT OR APPROXIMATELY 196.2 LB/TON (2,000 * 0.0981), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (196.2 LB/TON * 0.031 = 6.082 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 021, BORDEN SUPER SET BC61 NO-BAKE ACID CATALYST. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
03	0024	VOLATILE ORGANIC COMPOUND	62	lb/ton Handled	MATERIAL BALANCE
	Comments:	BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%). VOC EMISSIONS = 2,000 LB * 0.031 = 62 LB/TON.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	03	S042	Fugitive	0%	0%	☒	.003	.005	Not Appl.	.003	.011	.024
Total Emissions of BENZENE from SAND MIXERS:							**.003**	**.005**	**Not Appl.**	**.003**	**.011**	**.024**
FORMALDEHYDE	02	S042	Fugitive	0%	0%	☒	1.637	2.759	Not Appl.	1.539	5.517	12.082
Total Emissions of FORMALDEHYDE from SAND MIXERS:							**1.637**	**2.759**	**Not Appl.**	**1.539**	**5.517**	**12.082**
METHANOL	03	S042	Fugitive	0%	0%	☒	.266	.449	Not Appl.	.25	.897	1.965
Total Emissions of METHANOL from SAND MIXERS:							**.266**	**.449**	**Not Appl.**	**.25**	**.897**	**1.965**
PARTICULATE MATTER (TSP)	01	S042	Fugitive	99%	0%	☐	.135	.227	36.168	.127	.454	158.415
Total Emissions of PARTICULATE MATTER (TSP) from SAND MIXERS:							**.135**	**.227**	**36.168**	**.127**	**.454**	**158.415**
PHENOL	02	S042	Fugitive	0%	0%	☒	.236	.398	Not Appl.	.222	.797	1.745
Total Emissions of PHENOL from SAND MIXERS:							**.236**	**.398**	**Not Appl.**	**.222**	**.797**	**1.745**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S042	Fugitive	0%	0%	☐	1.874	3.157	Not Appl.	1.761	6.314	13.827
	03	S042	Fugitive	0%	0%	☐	2.711	4.573	Not Appl.	2.548	9.145	20.028
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from SAND MIXERS:							**4.585**	**7.729**	**Not Appl.**	**4.31**	**15.459**	**33.855**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S042
Segment No: 03, VOLATILES FROM NO-BAKE ACID CATALYST

Actual Annual:	.074 lb/ton Handled * 82 tons * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	.074 lb/ton Handled * 295 tons * 1 ton/2,000 lb = .011 TPY.
Allowable Annual:	.011 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .024 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .011 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .005 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S042
Segment No: 02, VOLATILES FROM NO-BAKE PHENOLIC BINDER

Actual Annual:	18 lb/ton Handled * 171 tons * 1 ton/2,000 lb = 1.539 TPY.
Maximum Annual:	18 lb/ton Handled * 613 tons * 1 ton/2,000 lb = 5.517 TPY.
Allowable Annual:	5.517 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 12.082 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.539 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.637 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.517 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 2.759 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S042
Segment No: 03, VOLATILES FROM NO-BAKE ACID CATALYST

Actual Annual:	6.082 lb/ton Handled * 82 tons * 1 ton/2,000 lb = .25 TPY.
Maximum Annual:	6.082 lb/ton Handled * 295 tons * 1 ton/2,000 lb = .897 TPY.
Allowable Annual:	.897 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.965 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .25 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .266 lb/hr.
Maximum Hourly:	Maximum annual emissions of .897 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .449 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S042
Segment No: 01, SAND, BINDER AND CATALYST MIXING

Actual Annual:	1.5 lb/ton Handled * 16,883 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .127 TPY.
Maximum Annual:	1.5 lb/ton Handled * 60,497 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .454 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 36.168 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 158.415 TPY.
Average Hourly:	Actual annual emissions of .127 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .135 lb/hr.
Maximum Hourly:	Maximum annual emissions of .454 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .227 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 15.347 ton/hr or 30,694 lb/hr. Calculation : 25.2 lb/hr + (30,694 - 30,000) * (5.3 / 10,000) lb/hr = 36.168 lb/hr.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S042
Segment No: 02, VOLATILES FROM NO-BAKE PHENOLIC BINDER

Actual Annual:	2.6 lb/ton Handled * 171 tons * 1 ton/2,000 lb = .222 TPY.
Maximum Annual:	2.6 lb/ton Handled * 613 tons * 1 ton/2,000 lb = .797 TPY.
Allowable Annual:	.797 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.745 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .222 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .236 lb/hr.
Maximum Hourly:	Maximum annual emissions of .797 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .398 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S042
Segment No: 02, VOLATILES FROM NO-BAKE PHENOLIC BINDER

Actual Annual:	21 lb/ton Handled * 171 tons * 1 ton/2,000 lb = 1.761 TPY.
Maximum Annual:	21 lb/ton Handled * 613 tons * 1 ton/2,000 lb = 6.314 TPY.
Allowable Annual:	6.314 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 13.827 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.761 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 1.874 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.314 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 3.157 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S042
Segment No: 03, VOLATILES FROM NO-BAKE ACID CATALYST

Actual Annual:	62 lb/ton Handled * 82 tons * 1 ton/2,000 lb = 2.548 TPY.
Maximum Annual:	62 lb/ton Handled * 295 tons * 1 ton/2,000 lb = 9.145 TPY.
Allowable Annual:	9.145 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 20.028 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.548 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 2.711 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.145 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 4.573 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for SAND MIXERS

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F013 - #10 UNIT AIRSET MOLD SYSTEM
E043 - MOLD FORMING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F013
Emission Unit ID:	E043
Source Desc:	MOLD FORMING
Building No.:	MAIN FOUNDRY BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	MOLD FORMING EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 16.013 TPH OF AIRSET MOLD SAND, AIR SET CORES AND REFACTORY COATING.

Description of Operation:

MATERIALS USED FOR FORMING #10 UNIT MOLD INCLUDES AIRSET MOLD SAND, AIR SET CORES, RELEASE AGENT SPRAYED ON MOLD PATTERNS, AND REFRACTORY COATING/SOLVENT APPLIED ONTO SURFACES OF MOLDS. FOR FISCAL YEAR 96, AMOUNT OF THESE MATERIALS USED WERE 16,883 TONS OF MOLD SAND; 968.4 TONS OF AIRSET CORES; 38.792 TONS OF REFRACTORY COATING; AND 8.241 TPY OF ISOPROPYL ALCOHOL.

THE MAXIMUM ANNUAL TONNAGES OF MATERIALS USED ARE 60,497 TPY OF AIRSET MOLD SAND; 3,470 TPY OF AIRSET CORES; 69.5 TPY OF REFACTORY COATING AND 29.53 TPY OF IPA.

EMISSIONS FROM THE #10 MOLD FORMING ARE RELEASED AS FUGITIVE EMISSIONS. EMISSIONS OF VOLATILES ARE CALCULATED AS 100 PERCENT OF USAGES. EMISSIONS OF TSP FROM SAND HANDLING ARE EFFECTED (REDUCED) BY THE 67% SETTLING FACTOR FOR THE MAIN FOUNDRY BUILDING.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S008	100%	55	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: MAIN FOUNDRY BUILDING ROOF MONITOR. EMISSIONS DISCHARGED THROUGH S008 INCLUDE A 67% SETTLING FACTOR FOR PARTICULATE MATTER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	#10 UNIT MOLD FORMING OPERATION	30400350	1,880	4,000	16,883.00	60,497.00	16.01	36.874

Comments: AVERAGE TONNAGE OF AIRSET MOLD SAND PROCESSED IS 16,883 TPY BASED ON FISCAL YEAR 96 REPORT. MAXIMUM ANNUAL TONNAGE IS 60,497 TPY (FROM 180,050 * 0.056 * 6). MAXIMUM HOURLY MATERIAL PROCESS IS THE TOTAL OF 15.12 TPH OF AIRSET MOLD SAND, 0.868 TPH OF AIRSET CORES, AND 0.025 TPH OF REFRACTORY COATING OR APPROXIMATELY 16.013 TPH. THE 16.013 TPH OR 32,026 LB/YR IS USED TO CALCULATE THE ALLOWALBLE EMISSION (OF TSP) RATE FROM THE #10 UNIT MOLD FORMING OPERATION.

02	VOLATILES FROM MOLD RELEASE AGENT	30400350	1,880	4,000	1.00	3.58	Not Appl.	Not Appl.

Comments: APPROXIMATLEY 1 TONS OF REFRACTIVE COATING WERE USED IN FISCAL YEAR 96 FOR THE #10 UNIT AIRSET MOLD FORMING. MAXIMUM TONNAGE OF REFRACTIVE COATING USED IS 3.58 TONS (1 TONS * 180,050 / 50,248).

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0025	PARTICULATE MATTER (TSP)	1.03	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR SAND HANDLING.			
02	0027	LIGHT ALIPHATIC SOLVENT NAP	1800	lb/ton Handled	MATERIAL BALANCE
	Comments:	NAPHTHA SOLVENT INGREDIENT IN THE REFRACTIVE COATING IS LISTED AS 90% BY WEIGHT OR APPROXIMATELY 1,800 LB/TON (2,000 * 0.90). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0002, FISHER SUPPLY CO, BLACK DIAMOND B-500X LIQUID PARTING OIL.			
02	0027	VOLATILE ORGANIC COMPOUND	1800	lb/ton Handled	MATERIAL BALANCE
	Comments:	NAPHTHA SOLVENT IS ALSO CONSIDERED AS VOC.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
LIGHT ALIPHATIC SOLVENT NAPHTHA	02	S008	Stack	0%	0%	☐	.957	1.611	Not Appl.	.9	3.222	7.056
Total Emissions of LIGHT ALIPHATIC SOLVENT NAPHTHA from MOLD FORMING:							**.957**	**1.611**	**Not Appl.**	**.9**	**3.222**	**7.056**
PARTICULATE MATTER (TSP)	01	S008	Stack	67%	0%	☐	3.052	5.141	36.874	2.869	10.281	161.507
Total Emissions of PARTICULATE MATTER (TSP) from MOLD FORMING:							**3.052**	**5.141**	**36.874**	**2.869**	**10.281**	**161.507**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S008	Stack	0%	0%	☐	.957	1.611	Not Appl.	.9	3.222	7.056
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from MOLD FORMING:							**.957**	**1.611**	**Not Appl.**	**.9**	**3.222**	**7.056**

Supporting Emission Calculations

Emission Calculations for LIGHT ALIPHATIC SOLVENT NAPHTHA (CAS 8032-32-4)

Stack ID or Designation: S008

Segment No: 02, VOLATILES FROM MOLD RELEASE AGENT

Actual Annual:	1,800 lb/ton Handled * 1. tons * 1 ton/2,000 lb = .9 TPY.
Maximum Annual:	1,800 lb/ton Handled * 3.58 tons * 1 ton/2,000 lb = 3.222 TPY.
Allowable Annual:	3.222 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 7.056 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .9 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .957 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.222 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.611 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S008

Segment No: 01, #10 UNIT MOLD FORMING OPERATION

Actual Annual:	1.03 lb/ton Handled * 16,883 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.869 TPY.
Maximum Annual:	1.03 lb/ton Handled * 60,497 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 10.281 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 36.874 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 161.507 TPY.
Average Hourly:	Actual annual emissions of 2.869 TPY / 1,880. hr/yr act. * 2,000 lb/ton = 3.052 lb/hr.
Maximum Hourly:	Maximum annual emissions of 10.281 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 5.141 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 16.013 ton/hr or 32,026 lb/hr. Calculation : 25.2 lb/hr + (32,026 - 30,000) * (5.3 / 10,000) lb/hr = 36.874 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)

Stack ID or Designation: S008

Segment No: 02, VOLATILES FROM MOLD RELEASE AGENT

Actual Annual:	1,800 lb/ton Handled * 1. tons * 1 ton/2,000 lb = .9 TPY.
Maximum Annual:	1,800 lb/ton Handled * 3.58 tons * 1 ton/2,000 lb = 3.222 TPY.
Allowable Annual:	3.222 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 7.056 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .9 TPY / 1,880. hr/yr act. * 2,000 lb/ton = .957 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.222 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.611 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for MOLD FORMING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E046 - AIRSET BINDER BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F014
Equipment Desc:	AIRSET BINDER BULK STORAGE TANK
Building No.:	ADJACENT TO CORE ROOM
UTM Location:	**East:** 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	12	9.5	ft
Tank Vol. Capacity:	6350		gals
Average Liquid Height:	6		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	BROWN		
Vapor Recovery Installed?	☐		

General Source Comments

THE AIRSET BINDER BULK STORAGE TANK IS A 6,350-GALLON CAPACITY TANK. IT HOLDS BINDER RESIN USED FOR AIRSET MOLD (#10 UNIT), AIRSET CORE, AND PETSET CORE. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S043	20	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM THE AIRSET BINDER STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	AIRSET BINDER BULK STORAGE	30400398	97.555	351.20

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
FORMALDEHYDE	01	S043	0%	☒	Negligible	Negligible	1.0E-04	2.1E-04	2.1E-04
Total Emissions of FORMALDEHYDE from AIRSET BINDER BULK STORAGE TANK:							**1.0E-04**	**2.1E-04**	**2.1E-04**
PHENOL	01	S043	0%	☒	Negligible	Negligible	7.0E-05	1.4E-04	1.4E-04
Total Emissions of PHENOL from AIRSET BINDER BULK STORAGE TANK:							**7.0E-05**	**1.4E-04**	**1.4E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S043	0%	☐	Negligible	Negligible	2.1E-03	4.2E-03	4.2E-03
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from AIRSET BINDER BULK STORAGE TANK:							**2.1E-03**	**4.2E-03**	**4.2E-03**

Supporting Emission Calculations

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S043
Segment No: 01

Actual Annual:	Actual annual emissions are 0.20 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.41 lb/yr.
Potential Annual:	Potential annual emissions are 0.41 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S043
Segment No: 01

Actual Annual:	Actual annual emissions are 0.14 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.28 lb/yr.
Potential Annual:	Potential annual emissions are 0.28 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S043
Segment No: 01

Actual Annual:	Actual annual emissions are 4.15 lb/yr.
Maximum Annual:	Maximum annual emissions are 8.38 lb/yr.
Potential Annual:	Potential annual emissions are 8.38 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for AIRSET BINDER BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E046 - AIRSET BINDER BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F014
Equipment Desc:	AIRSET BINDER BULK STORAGE TANK
Building No.:	ADJACENT TO CORE ROOM
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	12	9.5	ft
Tank Vol. Capacity:	6350		gals
Average Liquid Height:	6		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	BROWN		
Vapor Recovery Installed?	☐		

General Source Comments

THE AIRSET BINDER BULK STORAGE TANK IS A 6,350-GALLON CAPACITY TANK. IT HOLDS BINDER RESIN USED FOR AIRSET MOLD (#10 UNIT), AIRSET CORE, AND PETSET CORE. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S043	20	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM THE AIRSET BINDER STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Maximum
01	AIRSET BINDER BULK STORAGE	30400398	97.555	351.20

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
FORMALDEHYDE	01	S043	0%	☒	Negligible	Negligible	1.0E-04	2.1E-04	2.1E-04
Total Emissions of FORMALDEHYDE from AIRSET BINDER BULK STORAGE TANK:							**1.0E-04**	**2.1E-04**	**2.1E-04**
PHENOL	01	S043	0%	☒	Negligible	Negligible	7.0E-05	1.4E-04	1.4E-04
Total Emissions of PHENOL from AIRSET BINDER BULK STORAGE TANK:							**7.0E-05**	**1.4E-04**	**1.4E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S043	0%	☐	Negligible	Negligible	2.1E-03	4.2E-03	4.2E-03
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from AIRSET BINDER BULK STORAGE TANK:							**2.1E-03**	**4.2E-03**	**4.2E-03**

Supporting Emission Calculations

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S043
Segment No: 01

Actual Annual:	Actual annual emissions are 0.20 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.41 lb/yr.
Potential Annual:	Potential annual emissions are 0.41 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S043
Segment No: 01

Actual Annual:	Actual annual emissions are 0.14 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.28 lb/yr.
Potential Annual:	Potential annual emissions are 0.28 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S043
Segment No: 01

Actual Annual:	Actual annual emissions are 4.15 lb/yr.
Maximum Annual:	Maximum annual emissions are 8.38 lb/yr.
Potential Annual:	Potential annual emissions are 8.38 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for AIRSET BINDER BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E048 - AIRSET ACID BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F014
Equipment Desc:	AIRSET ACID BULK STORAGE TANK
Building No.:	ADJACENT TO CORE ROOM
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	11.58	10	ft
Tank Vol. Capacity:	5854		gals
Average Liquid Height:	6		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	WHITE		
Vapor Recovery Installed?	☐		

General Source Comments

THE AIRSET ACID BULK STORAGE TANK IS A 5,850-GALLON CAPACITY TANK. IT HOLDS ACID CATALYST USED FOR AIRSET MOLD (#10 UNIT), AIRSET CORE, AND PETSET CORE. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S044	30	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM THE AIRSET ACID CATALYST STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	AIRSET ACID BULK STORAGE TANK	30400398	47.195	169.90

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
BENZENE	01	S044	0%	☒	Negligible	Negligible	1.3E-04	3.5E-04	3.5E-04
Total Emissions of BENZENE from AIRSET ACID BULK STORAGE TANK:							**1.3E-04**	**3.5E-04**	**3.5E-04**
METHANOL	01	S044	0%	☒	Negligible	Negligible	1.3E-02	3.6E-02	3.6E-02
Total Emissions of METHANOL from AIRSET ACID BULK STORAGE TANK:							**1.3E-02**	**3.6E-02**	**3.6E-02**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S044	0%	☐	Negligible	Negligible	1.8E-02	5.0E-02	5.0E-02
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from AIRSET ACID BULK STORAGE TANK:							**1.8E-02**	**5.0E-02**	**5.0E-02**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S044
Segment No: 01

Actual Annual:	Actual annual emissions are 0.25 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.69 lb/yr
Potential Annual:	Potential annual emissions are 0.69 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S044
Segment No: 01

Actual Annual:	Actual annual emissions are 35.95 lb/yr.
Maximum Annual:	Maximum annual emissions are 99.75 lb/yr
Potential Annual:	Potential annual emissions are 99.75 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S044
Segment No: 01

Actual Annual:	Actual annual emissions are 25.63 lb/yr.
Maximum Annual:	Maximum annual emissions are 71.10 lb/yr
Potential Annual:	Potential annual emissions are 99.75 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for AIRSET ACID BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E048 - AIRSET ACID BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F014
Equipment Desc:	AIRSET ACID BULK STORAGE TANK
Building No.:	ADJACENT TO CORE ROOM
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	11.58	10	ft
Tank Vol. Capacity:	5854		gals
Average Liquid Height:	6		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	WHITE		
Vapor Recovery Installed?	☐		

General Source Comments

THE AIRSET ACID BULK STORAGE TANK IS A 5,850-GALLON CAPACITY TANK. IT HOLDS ACID CATALYST USED FOR AIRSET MOLD (#10 UNIT), AIRSET CORE, AND PETSET CORE. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S044	30	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM THE AIRSET ACID CATALYST STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	AIRSET ACID BULK STORAGE TANK	30400398	47.195	169.90

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
BENZENE	01	S044	0%	☒	Negligible	Negligible	1.3E-04	3.5E-04	3.5E-04
Total Emissions of BENZENE from AIRSET ACID BULK STORAGE TANK:							**1.3E-04**	**3.5E-04**	**3.5E-04**
METHANOL	01	S044	0%	☒	Negligible	Negligible	1.3E-02	3.6E-02	3.6E-02
Total Emissions of METHANOL from AIRSET ACID BULK STORAGE TANK:							**1.3E-02**	**3.6E-02**	**3.6E-02**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S044	0%	☐	Negligible	Negligible	1.8E-02	5.0E-02	5.0E-02
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from AIRSET ACID BULK STORAGE TANK:							**1.8E-02**	**5.0E-02**	**5.0E-02**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S044
Segment No: 01

Actual Annual:	Actual annual emissions are 0.25 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.69 lb/yr
Potential Annual:	Potential annual emissions are 0.69 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S044
Segment No: 01

Actual Annual:	Actual annual emissions are 35.95 lb/yr.
Maximum Annual:	Maximum annual emissions are 99.75 lb/yr
Potential Annual:	Potential annual emissions are 99.75 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S044
Segment No: 01

Actual Annual:	Actual annual emissions are 25.63 lb/yr.
Maximum Annual:	Maximum annual emissions are 71.10 lb/yr
Potential Annual:	Potential annual emissions are 99.75 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for AIRSET ACID BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E050 - CORE SAND SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F014
Emission Unit ID:	E050
Source Desc:	CORE SAND SILO
Building No.:	AIRSET CORE ROOM
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-35C

Equipment Information

Equip. Type:	PNEUMATIC SAND TRANSPORTER AND AIRSET CORE SAND SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 5.783 TPH OR 23,133 TPY OF AIRSET CORE SAND.

Description of Operation:

APPROXIMATELY 6,456 TONS OF NEW SAND WERE USED FOR PREPARING AIRSET CORES. MAXIMUM ANNUAL TONNAGE OF NEW SAND TRANSFERRED THROUGH THIS SILO IS 6,456 TONS * (180,050/50,248) OR APPROXIMATELY 23,133 TPY.

EMISSIONS FROM THE SAND LOADING PROCESS IS CONTROLLED BY A BAGHOUSE (CD023). THE EMISSION FACTOR IS BASED ON AP-42 FOR SAND LOADING TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED).

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE CORE SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S045	100%	10	0.6	[N/A]	0.283	1,000	CD023	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE AIRSET CORE SAND SILO BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	PNEUMATIC LOADING INTO THE AIRSET CORE SAND SILO	30400356	1,920	4,000	6,456.00	23,133.00	5.78	0.171

Comments: APPROXIMATELY 6,456 TONS OF NEW SAND WERE USED IN FISCAL YEAR 1996 TO PREPARE AIRSET CORES. MAXIMUM TONNAGE = 6,456 TPY OF SAND * (180,050/50,248) = 23,133 TPY. THE AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE APPROXIMATELY 3.363 TPH AND 5.783 TPH, RESPECTIVELY.

THE HOURS OF OPERATION ARE 1,920 HR/YR AVERAGE AND 4,000 HR/YR MAXIMUM.

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E050 - CORE SAND SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E050 - CORE SAND SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S045	Stack	99%	0%	☐	9.75E-04	.002	.171	9.36E-04	.003	.751
Total Emissions of PARTICULATE MATTER (TSP) from CORE SAND SILO:							**9.75E-04**	**.002**	**.171**	**9.36E-04**	**.003**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S045

Segment No: 01, PNEUMATIC LOADING INTO THE AIRSET CORE SAND SILO

Actual Annual:	.029 lb/ton Handled * 6,456 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 9.36E-04 TPY.
Maximum Annual:	.029 lb/ton Handled * 23,133 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of 9.36E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 9.75E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for CORE SAND SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E051 - SAND HEATER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F014
Emission Unit ID:	E051
Source Desc:	SAND HEATER
Building No.:	AIRSET CORE ROOM
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400398-33C

Equipment Information

Equip. Type:	ELECTRIC SAND HEATER
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM OF 5.783 TPH AND 23,133 TPY OF CORE SAND.

Description of Operation:

PARTICULATE EMISSIONS ARE GENERATED BY THE ELECTRIC FLUIDIZED SAND HEATER. A CYCLONE (CD024) IS INSTALLED TO RECOVER SAND FROM THE FLUIDIZED HEATER. DISCHARGE FROM THE CYCLONE IS ROUTED THROUGH THE AIRSET CORE SAND SILO BAGHOUSE (CD023). EMISSION ESTIMATE IS BASED ON AP-42 EMISSION FACTOR FOR PNEUMATIC SAND TRANSFER OF 0.029 LB/TON OF SAND HANDLED.

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE MOLD SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S045	100%	10	0.6	[N/A]	0.283	1,000	CD023	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE AIRSET CORE SAND SILO BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND HEATER	30400352	1,920	4,000	6,456.00	23,133.00	5.78	0.171

Comments: THE AVERAGE AND MAXIMUM TONNAGES OF SAND HANDLED ARE THE SAME AS THOSE TRANSFER INTO THE CORE SAND SILO (E050) OR 6,456 TPY AND 23,133 TPY, RESPECTIVELY. SIMILARLY, THE AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE 3.363 TPH AND 5.783 TPH, RESPECTIVELY.

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E051 - SAND HEATER

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E051 - SAND HEATER

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S045	Stack	99%	0%	☐	9.75E-04	.002	.171	9.36E-04	.003	.751
Total Emissions of PARTICULATE MATTER (TSP) from SAND HEATER:							**9.75E-04**	**.002**	**.171**	**9.36E-04**	**.003**	**.751**

MWPS009169

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S045
Segment No: 01, SAND HEATER

Actual Annual:	.029 lb/ton Handled * 6,456 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 9.36E-04 TPY.
Maximum Annual:	.029 lb/ton Handled * 23,133 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of 9.36E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 9.75E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for SAND HEATER

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E052 - SAND MIXER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F014
Emission Unit ID:	E052
Source Desc:	SAND MIXER
Building No.:	AIRSET CORE ROOM
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400398-33C

Equipment Information

Equip. Type:	AIRSET CORE SAND AND BINDER MATERIALS MIXER
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 6.204 TPH OR 24,815.9 TPY OF SAND AND NO-BAKE BINDER MATERIALS.

Description of Operation:

A MIXER IS USED TO COMBINE THE BINDER AND ACID CATALYST WITH THE CORE SAND. ONCE THERE INGREDIENTS ARE MIXED, THE COATED SAND HAS A CERTAIN SET TIME FOR CORE FORMING BEFORE BECOMING HARDENED OR SET.

PARTICULATE EMISSIONS FROM THE SAND MIXER ARE BASED ON SAND HANDLING EMISSION FACTOR. THE TOTAL TONNAGE PROCESSED IS THE TOTAL OF MIXED SAND, BINDER, AND ACID CATALYST USED (APPROXIMATLEY 6,456 TONS OF SAND, 317.5 TONS OF BINDER, AND 152.2 TONS OF ACID CATALYST OR 6,925.7 TONS TOTAL. MAXIMUM ANNUAL USAGES ARE 23,133 TPY OF NEW SAND, 1,137.6 TPY OF BINDER, AND 545.3 TPY OF ACID CATALYST BASED ON 4,000 HOURS OF OPERATION.

VOLATILE COMPONENTS OF THE BINDER AND CATALYST MATERIALS USED ARE ALSO ESTIMATED BASED ON MATERIAL BALANCE. EMISSIONS FROM THE AIRSET CORE SAND MIXER ARE UNCONTROLLED AND ARE INITIALLY RELEASED INSIDE THE AIRSET CORE BUILDING. TSP EMISSIONS FROM THE SAND MIXING IS ESTIMATED USING 67% BUILDING SETTLING FACTOR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S046	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE POWERED VENTILATORS IN THE AIRSET CORE BUILDING. TOTAL OF 8 POWERED VENTILATORS.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND, BINDER, AND ACID CATALYST MIXING	30400350	1,920	4,000	6,456.00	23,133.00	6.20	13.896

Comments: APPROXIMATELY 6,456 TONS OF NEW SAND WERE USED IN FISCAL YEAR 1996 FOR MAKING AIRSET CORES. MAXIMUM TONNAGE OF SAND USED IS 23,133 TONS (6,456 TONS * 180,050/50,248). THE MAXIMUM HOURLY SAND USAGE RATE IS 5.783 TPH. THE HOURLY AMOUNT OF BINDER MATERIALS USAGE RATES ARE APPROXIMATELY 0.245 TPH AVERAGE AND 0.421 TPH MAXIMUM. THE ALLOWABLE EMISSIONS FOR TSP IS BASED ON 5.783 TPH + 0.421 TPH OR 6.204 TPH (12,408 LB/HR).

02	VOLATILES FROM NO-BAKE PHENOLIC BINDER	30400350	1,920	4,000	317.50	1,137.60	Not Appl.	Not Appl.

Comments: APPROXIMATELY 317.5 TONS OF LIQUID PHENOLIC BINDER WERE USED IN FISCAL YEAR 1996 FOR MAKING AIRSET CORES. MAXIMUM TONNAGE OF PHENOLIC BINDER USED IS 1,137.7 TONS (317.5 TONS * 3.5832 MAX-TO-AVG METAL RATIO). THE AVERAGE AND MAXIMUM HOURLY PHENOLIC BINDER USAGE RATES ARE 0.165 TPH AND 0.284 TPH, RESPECTIVELY.

03	VOLATILES FROM NO-BAKE ACID CATALYST	30400350	1,920	4,000	152.20	545.40	Not Appl.	Not Appl.

Comments: APPROXIMATELY 152.2 TONS OF LIQUID PHENOLIC BINDER WERE USED IN FISCAL YEAR 1996 FOR MAKING AIRSET CORES. MAXIMUM TONNAGE OF PHENOLIC BINDER USED IS 545.4 TONS (152.2 TONS * 3.5832 MAX-TO-AVG METAL RATIO). THE AVERAGE AND MAXIMUM HOURLY PHENOLIC BINDER USAGE RATES ARE 0.079 TPH AND 0.136 TPH, RESPECTIVELY.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0022	PARTICULATE MATTER (TSP)	1.5	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR MULLING (EQUIVALENT TO MIXING) RANGING FROM 0.3 TO 2.1. RATED "E". 1.5 LB/TON IS THE BEST ESTIMATE.			
02	0023	FORMALDEHYDE	18	lb/ton Handled	MATERIAL BALANCE
	Comments:	FORMALDEHYDE INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 0.9% BY WEIGHT OR APPROXIMATELY 18 LB/TON (2000 * 0.009). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0017, BORDEN SUPER SET 975 LIQUID PHENOLIC RESIN.			
02	0023	PHENOL	2.6	lb/ton Handled	MATERIAL BALANCE
	Comments:	PHENOL INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 12.99% BY WEIGHT OR APPROXIMATELY 259.8 LB/TON (2,000 * 0.1299). PHENOL IS A REACTIVE COMPONENT DESIGN FOR GREATER THAN 99% REACTION. THUS, FREE PHENOL IS ESTIMATED TO BE LESS THAN 1 % OR 2.60 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0017, BORDEN SUPER SET 975 LIQUID PHENOLIC RESIN.			
02	0023	VOLATILE ORGANIC COMPOUND	20.6	lb/ton Handled	MATERIAL BALANCE
	Comments:	BOTH FORMALDEHYDE AND PHENOL ARE CONSIDERED AS VOC. THUS, 18 LB/TON + 2.6 LB/TON = 10.6 LB/TON.			
03	0024	BENZENE	0.074	lb/ton Handled	MATERIAL BALANCE
	Comments:	BENZENE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 0.12% BY WEIGHT OR APPROXIMATELY 24 LB/TON (2,000 * 0.012), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (2.4 LB/TON * 0.031 = 0.074 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 021, BORDEN SUPER SET BC61 NO-BAKE ACID CATALYST. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
03	0024	METHANOL	6.082	lb/ton Handled	MATERIAL BALANCE
	Comments:	METHANOL INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 9.81% BY WEIGHT OR APPROXIMATELY 196.2 LB/TON (2,000 * 0.0981), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (196.2 LB/TON * 0.031 = 6.082 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 021, BORDEN SUPER SET BC61 NO-BAKE ACID CATALYST. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
03	0024	VOLATILE ORGANIC COMPOUND	62	lb/ton Handled	MATERIAL BALANCE
	Comments:	BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%). VOC EMISSIONS = 2,000 LB * 0.031 = 62 LB/TON.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	03	S046	Stack	0%	0%	☒	.006	.01	Not Appl.	.006	.02	.044
Total Emissions of BENZENE from SAND MIXER:							**.006**	**.01**	**Not Appl.**	**.006**	**.02**	**.044**
FORMALDEHYDE	02	S046	Stack	0%	0%	☒	2.977	5.119	Not Appl.	2.858	10.238	22.422
Total Emissions of FORMALDEHYDE from SAND MIXER:							**2.977**	**5.119**	**Not Appl.**	**2.858**	**10.238**	**22.422**
METHANOL	03	S046	Stack	0%	0%	☒	.482	.829	Not Appl.	.463	1.659	3.632
Total Emissions of METHANOL from SAND MIXER:							**.482**	**.829**	**Not Appl.**	**.463**	**1.659**	**3.632**
PARTICULATE MATTER (TSP)	01	S046	Stack	67%	0%	☐	1.664	2.863	13.896	1.598	5.725	60.864
Total Emissions of PARTICULATE MATTER (TSP) from SAND MIXER:							**1.664**	**2.863**	**13.896**	**1.598**	**5.725**	**60.864**
PHENOL	02	S046	Stack	0%	0%	☒	.43	.739	Not Appl.	.413	1.479	3.239
Total Emissions of PHENOL from SAND MIXER:							**.43**	**.739**	**Not Appl.**	**.413**	**1.479**	**3.239**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S046	Stack	0%	0%	☐	3.407	5.859	Not Appl.	3.27	11.717	25.661
	03	S046	Stack	0%	0%	☐	4.915	8.454	Not Appl.	4.718	16.907	37.027
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from SAND MIXER:							**8.321**	**14.312**	**Not Appl.**	**7.988**	**28.625**	**62.688**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S046
Segment No: 03, VOLATILES FROM NO-BAKE ACID CATALYST

Actual Annual:	.074 lb/ton Handled * 152 tons * 1 ton/2,000 lb = .006 TPY.
Maximum Annual:	.074 lb/ton Handled * 545 tons * 1 ton/2,000 lb = .02 TPY.
Allowable Annual:	.02 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .044 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .006 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .02 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S046
Segment No: 02, VOLATILES FROM NO-BAKE PHENOLIC BINDER

Actual Annual:	18 lb/ton Handled * 318 tons * 1 ton/2,000 lb = 2.858 TPY.
Maximum Annual:	18 lb/ton Handled * 1,138 tons * 1 ton/2,000 lb = 10.238 TPY.
Allowable Annual:	10.238 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 22.422 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.858 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 2.977 lb/hr.
Maximum Hourly:	Maximum annual emissions of 10.238 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 5.119 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S046
Segment No: 03, VOLATILES FROM NO-BAKE ACID CATALYST

Actual Annual:	6.082 lb/ton Handled * 152 tons * 1 ton/2,000 lb = .463 TPY.
Maximum Annual:	6.082 lb/ton Handled * 545 tons * 1 ton/2,000 lb = 1.659 TPY.
Allowable Annual:	1.659 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 3.632 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .463 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .482 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.659 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .829 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S046
Segment No: 01, SAND, BINDER, AND ACID CATALYST MIXING

Actual Annual:	1.5 lb/ton Handled * 6,456 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.598 TPY.
Maximum Annual:	1.5 lb/ton Handled * 23,133 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 5.725 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 13.896 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 60.864 TPY.
Average Hourly:	Actual annual emissions of 1.598 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.664 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.725 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 2.863 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 6.204 ton/hr or 12,408 lb/hr. Calculation : 13.6 lb/hr + (12,408 - 12,000) * (2.9 / 4,000) lb/hr = 13.896 lb/hr.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S046
Segment No: 02, VOLATILES FROM NO-BAKE PHENOLIC BINDER

Actual Annual:	2.6 lb/ton Handled * 318 tons * 1 ton/2,000 lb = .413 TPY.
Maximum Annual:	2.6 lb/ton Handled * 1,138 tons * 1 ton/2,000 lb = 1.479 TPY.
Allowable Annual:	1.479 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 3.239 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .413 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .43 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.479 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .739 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S046
Segment No: 02, VOLATILES FROM NO-BAKE PHENOLIC BINDER

Actual Annual:	21 lb/ton Handled * 318 tons * 1 ton/2,000 lb = 3.27 TPY.
Maximum Annual:	21 lb/ton Handled * 1,138 tons * 1 ton/2,000 lb = 11.717 TPY.
Allowable Annual:	11.717 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 25.661 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.27 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 3.407 lb/hr.
Maximum Hourly:	Maximum annual emissions of 11.717 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 5.859 lb/hr.
Allowable Emissions:	Not applicable.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E052 - SAND MIXER

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)

Stack ID or Designation: S046

Segment No: 03, VOLATILES FROM NO-BAKE ACID CATALYST

Actual Annual:	62 lb/ton Handled * 152 tons * 1 ton/2,000 lb = 4.718 TPY.
Maximum Annual:	62 lb/ton Handled * 545 tons * 1 ton/2,000 lb = 16.907 TPY.
Allowable Annual:	16.907 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 37.027 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.718 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 4.915 lb/hr.
Maximum Hourly:	Maximum annual emissions of 16.907 TPY / 4.000 hr/yr max. * 2,000 lb/ton = 8.454 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for SAND MIXER

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E053 - CORE FORMING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F014
Emission Unit ID:	E053
Source Desc:	CORE FORMING
Building No.:	AIRSET CORE ROOM
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400398-33C

Equipment Information

Equip. Type:	CORE FORMING EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 6.2078 TPH OF CORE SAND & ADDITIVES.

Description of Operation:

MATERIALS USED FOR MAKING AIRSET CORES INCLUDES NO-BAKE COATED SAND, RELEASE AGENT SPRAYED ON MOLD PATTERNS, ADHESIVES USED FOR HALVES CORES, AND REFRACTORY COATING APPLIED ONTO SURFACES OF COMPLETED CORES. FOR FISCAL YEAR 96, AMOUNT OF THESE MATERIALS USED WERE 6,456 TONS OF COATED CORE SAND; 3.52 TONS OF MOLD RELEASE AGENT; 1,404 LBS OF CORE ADHESIVES; AND 45.257 TONS OF REFRACTORY COATING. THE MAXIMUM ANNUAL TONNAGES OF MATERIALS USED ARE ESTIMATED FROM MULTIPLYING THE AVERAGE ANNUAL USAGES WITH A RATIO OF 180,050/50,248 OR 3.5832.

EMISSION CALCULATIONS FOR THE AIRSET CORE FORMING INCLUDES THE PROCESSES OF CORE SAND HANDLING AND THE USAGES OF CORE ADHESIVE AND MOLD RELEASE AGENT/PARTING OIL. EMISSIONS FROM THE REFRACTORY COATING PROCESS ARE SHOWN SEPARATELY.

EMISSIONS FROM THE AIRSET CORE FORMING ARE RELEASED AS FUGITIVE EMISSIONS. EMISSIONS OF VOLATILES ARE CALCULATED AS 100 PERCENT OF USAGES. EMISSIONS OF TSP FROM SAND HANDLING ARE EFFECTED (REDUCED) BY THE 67% SETTLING FACTOR FOR THE AIRSET CORE BUILDING. PARTICULATE EMISSIONS FROM THE CORE FORMING ARE SUBJECT TO THE CHATTANOOGA RULE 10.2, SCHEDULE 2 OF TABLE 2.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S046	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE POWERED VENTILATORS IN THE AIRSET CORE BUILDING. TOTAL OF 8 POWERED VENTILATORS.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	AIRSET CORE FORMING	30400350	1,920	4,000	6,925.70	24,816.10	6.21	13.900

Comments: AVERAGE ANNUAL TONNAGE OF AIRSET CORE SAND (SAND & BINDER MATERIALS) PROCESSED WERE 6,925.7 TONS FOR FISCAL YEAR 1996. MAXIMUM TONNAGE OF AIRSET CORE SAND IS 24,816.1 TPY. THE ALLOWABLE EMISSION RATE OF TSP IS BASED ON 6.204 TPH OF CORE SAND + 0.0032 TPH OF MOLD RELEASE AGENT + 0.0006 TPH OF CORE ADHESIVES OR 6.2078 TPH (12,416 LB/HR).

02	PARTING COMPOUND NIX STIX 32	30400350	1,920	4,000	1.98	7.10	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL AMOUNT OF NIX STIX 32 PARTING COMPOUND USED WAS 1.98 TONS FOR FISCAL YEAR 1996. MAXIMUM ANNUAL USAGE IS CALCULATED AS FOLLOWS 1.98 TPY * 3.5832 = 7.10 TPY. EMISSION CALCULATIONS ASSUMED THAT 100% USAGES OF VOLATILE COMPOUNDS ARE RELEASED AS EMISSIONS.

03	RELEASE AGENT NIX STIX 93	30400350	1,920	4,000	1.54	5.52	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL AMOUNT OF NIX STIX 93 RELEASE AGENT USED WAS 1.54 TONS FOR FISCAL YEAR 1996. MAXIMUM ANNUAL USAGE IS CALCULATED AS FOLLOWS 1.54 TPY * 3.5832 = 5.52 TPY. EMISSION CALCULATIONS ASSUMED THAT 100% USAGES OF VOLATILE COMPOUNDS ARE RELEASED AS EMISSIONS.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0025	PARTICULATE MATTER (TSP)	1.03	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR SAND HANDLING.			
02	0029	LIGHT ALIPHATIC SOLVENT NAP	1400	lb/ton Handled	MATERIAL BALANCE
	Comments:	NAPHTHA INGREDIENT IS LISTED AS 70% BY WEIGHT OR APPROXIMATELY 1,400 LB/TON (2,000 * 0.70). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
02	0029	PROPYLENE CARBONATE	60	lb/ton Handled	MATERIAL BALANCE
	Comments:	PROPYLENE CARBONATE INGREDIENT IS LISTED AS 3% BY WEIGHT OR APPROXIMATELY 60 LB/TON (2,000 * 0.03). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
02	0029	VM&P NAPHTHA	60	lb/ton Handled	MATERIAL BALANCE
	Comments:	VM&P NAPHTHA INGREDIENT IS LISTED AS 3% BY WEIGHT OR APPROXIMATELY 60 LB/TON (2,000 * 0.03). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
02	0029	VOLATILE ORGANIC COMPOUND	1520	lb/ton Handled	MATERIAL BALANCE
	Comments:	TOTAL VOC = 60 + 60 + 1,400 = 1,520 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
03	0030	SILICON BASED COMPOUNDS	90	lb/ton Handled	MATERIAL BALANCE
	Comments:	SILICON INGREDIENT IS ESTIMATED AS 15% BY WEIGHT AND 30% OF OVERSPRAY OR APPROXIMATELY 90 LB/TON (2,000 * 15% * 30%). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0158, BORDEN NIX STIX 93 RELEASE AGENT. MSDS SHOWS NO HAZARDOUS INGREDIENT. BORDEN'S REPRESENTATIVE (BRENDA DUKE AT 708-524-3152) CONFIRMED THAT THE MATERIAL IS A MIXTURE OF SILICON BASED MATERIALS AND WATER.			
04					
	Comments:				

Emission Source Fact Sheet

F014 - AIRSET CORE SYSTEM
E053 - CORE FORMING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
LIGHT ALIPHATIC SOLVENT NAPHTHA	02	S046	Stack	0%	0%	☐	1.444	2.485	Not Appl.	1.386	4.97	10.884
Total Emissions of LIGHT ALIPHATIC SOLVENT NAPHTHA from CORE FORMING:							**1.444**	**2.485**	**Not Appl.**	**1.386**	**4.97**	**10.884**
PARTICULATE MATTER (TSP)	01	S046	Stack	67%	0%	☐	1.226	2.109	13.9	1.177	4.217	60.884
Total Emissions of PARTICULATE MATTER (TSP) from CORE FORMING:							**1.226**	**2.109**	**13.9**	**1.177**	**4.217**	**60.884**
PROPYLENE CARBONATE	02	S046	Stack	0%	0%	☐	.062	.107	Not Appl.	.059	.213	.466
Total Emissions of PROPYLENE CARBONATE from CORE FORMING:							**.062**	**.107**	**Not Appl.**	**.059**	**.213**	**.466**
SILICON BASED COMPOUNDS	03	S046	Stack	0%	0%	☐	.072	.124	Not Appl.	.069	.248	.544
Total Emissions of SILICON BASED COMPOUNDS from CORE FORMING:							**.072**	**.124**	**Not Appl.**	**.069**	**.248**	**.544**
VM&P NAPHTHA	02	S046	Stack	0%	0%	☐	.062	.107	Not Appl.	.059	.213	.466
Total Emissions of VM&P NAPHTHA from CORE FORMING:							**.062**	**.107**	**Not Appl.**	**.059**	**.213**	**.466**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S046	Stack	0%	0%	☐	1.568	2.698	Not Appl.	1.505	5.396	11.817
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from CORE FORMING:							**1.568**	**2.698**	**Not Appl.**	**1.505**	**5.396**	**11.817**

Supporting Emission Calculations

Emission Calculations for LIGHT ALIPHATIC SOLVENT NAPHTHA (CAS 8032-32-4)
Stack ID or Designation: S046
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	1,400 lb/ton Handled * 1.98 tons * 1 ton/2,000 lb = 1.386 TPY.
Maximum Annual:	1,400 lb/ton Handled * 7.1 tons * 1 ton/2,000 lb = 4.97 TPY.
Allowable Annual:	4.97 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 10.884 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.386 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.444 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.97 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 2.485 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S046
Segment No: 01, AIRSET CORE FORMING

Actual Annual:	1.03 lb/ton Handled * 6,926 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.177 TPY.
Maximum Annual:	1.03 lb/ton Handled * 24,816 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.217 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 13.9 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 60.884 TPY.
Average Hourly:	Actual annual emissions of 1.177 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.226 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.217 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 2.109 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 6.207 ton/hr or 12,414 lb/hr. Calculation : 13.6 lb/hr + (12,414 - 12,000) * (2.9 / 4,000) lb/hr = 13.9 lb/hr.

Emission Calculations for PROPYLENE CARBONATE (CAS 108-32-7)
Stack ID or Designation: S046
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	60 lb/ton Handled * 1.98 tons * 1 ton/2,000 lb = .059 TPY.
Maximum Annual:	60 lb/ton Handled * 7.1 tons * 1 ton/2,000 lb = .213 TPY.
Allowable Annual:	.213 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .466 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .059 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .062 lb/hr.
Maximum Hourly:	Maximum annual emissions of .213 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .107 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for SILICON BASED COMPOUNDS
Stack ID or Designation: S046
Segment No: 03, RELEASE AGENT NIX STIX 93

Actual Annual:	90 lb/ton Handled * 1.54 tons * 1 ton/2,000 lb = .069 TPY.
Maximum Annual:	90 lb/ton Handled * 5.52 tons * 1 ton/2,000 lb = .248 TPY.
Allowable Annual:	.248 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .544 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .069 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .072 lb/hr.
Maximum Hourly:	Maximum annual emissions of .248 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .124 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VM&P NAPHTHA (CAS 64742-89-8)
Stack ID or Designation: S046
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	60 lb/ton Handled * 1.98 tons * 1 ton/2,000 lb = .059 TPY.
Maximum Annual:	60 lb/ton Handled * 7.1 tons * 1 ton/2,000 lb = .213 TPY.
Allowable Annual:	.213 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .466 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .059 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .062 lb/hr.
Maximum Hourly:	Maximum annual emissions of .213 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .107 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S046
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	1,520 lb/ton Handled * 1.98 tons * 1 ton/2,000 lb = 1.505 TPY.
Maximum Annual:	1,520 lb/ton Handled * 7.1 tons * 1 ton/2,000 lb = 5.396 TPY.
Allowable Annual:	5.396 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 11.817 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.505 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.568 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.396 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 2.698 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for CORE FORMING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E054 - ISOCURE PART 1 BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F015
Equipment Desc:	ISOCURE PART 1 BULK STORAGE TANK
Building No.:	ADJACENT TO SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	16	8	ft
Tank Vol. Capacity:	6000		gals
Average Liquid Height:	8		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	HORIZONTAL AG		
Tank Function:	STORAGE		
Tank Shell Color:	WHITE		
Vapor Recovery Installed?	☐		

General Source Comments

THE ISOCURE PART 1 BULK STORAGE TANK IS A 6,000-GALLON CAPACITY TANK. IT HOLDS PART I RESIN FOR THE ISOCURE CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S051	15	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE ISOCURE PART 1 BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Maximum
01	ISOCURE PART 1 STORAGE TANK	30400371	29.964	107.37

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
BIS(2-ETHYLHEXYL) ADIPATE	01	S051	0%	☐	Negligible	Negligible	1.0E-05	1.5E-05	1.5E-05
Total Emissions of BIS(2-ETHYLHEXYL) ADIPATE from ISOCURE PART 1 BULK STORAGE TANK:							**1.0E-05**	**1.5E-05**	**1.5E-05**
NAPHTHA	01	S051	0%	☐	Negligible	Negligible	3.0E-04	3.6E-04	3.6E-04
Total Emissions of NAPHTHA from ISOCURE PART 1 BULK STORAGE TANK:							**3.0E-04**	**3.6E-04**	**3.6E-04**
PHENOL	01	S051	0%	☒	Negligible	Negligible	1.0E-05	1.0E-05	1.0E-05
Total Emissions of PHENOL from ISOCURE PART 1 BULK STORAGE TANK:							**1.0E-05**	**1.0E-05**	**1.0E-05**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S051	0%	☐	Negligible	Negligible	5.1E-04	6.0E-04	6.0E-04
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ISOCURE PART 1 BULK STORAGE TANK:							**5.1E-04**	**6.0E-04**	**6.0E-04**

Supporting Emission Calculations

Emission Calculations for BIS(2-ETHYLHEXYL) ADIPATE (CAS 627-93-0)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 0.02 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.03 lb/hr.
Potential Annual:	Potential annual emissions are 0.03 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 0.59 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.71 lb/hr.
Potential Annual:	Potential annual emissions are 0.71 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 0.02 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.02 lb/hr.
Potential Annual:	Potential annual emissions are 0.02 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E054 - ISOCURE PART 1 BULK STORAGE TANK

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 1.01 lb/yr.
Maximum Annual:	Maximum annual emissions are 1.20 lb/hr.
Potential Annual:	Potential annual emissions are 1.20 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ISOCURE PART 1 BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E054 - ISOCURE PART 1 BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F015
Equipment Desc:	ISOCURE PART 1 BULK STORAGE TANK
Building No.:	ADJACENT TO SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	16	8	ft
Tank Vol. Capacity:	6000		gals
Average Liquid Height:	8		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	HORIZONTAL AG		
Tank Function:	STORAGE		
Tank Shell Color:	WHITE		
Vapor Recovery Installed?	☐		

General Source Comments

THE ISOCURE PART 1 BULK STORAGE TANK IS A 6,000-GALLON CAPACITY TANK. IT HOLDS PART I RESIN FOR THE ISOCURE CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S051	15	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE ISOCURE PART 1 BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Maximum
01	ISOCURE PART 1 STORAGE TANK	30400371	29.964	107.37

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
BIS(2-ETHYLHEXYL) ADIPATE	01	S051	0%	☐	Negligible	Negligible	1.0E-05	1.5E-05	1.5E-05
Total Emissions of BIS(2-ETHYLHEXYL) ADIPATE from ISOCURE PART 1 BULK STORAGE TANK:							**1.0E-05**	**1.5E-05**	**1.5E-05**
NAPHTHA	01	S051	0%	☐	Negligible	Negligible	3.0E-04	3.6E-04	3.6E-04
Total Emissions of NAPHTHA from ISOCURE PART 1 BULK STORAGE TANK:							**3.0E-04**	**3.6E-04**	**3.6E-04**
PHENOL	01	S051	0%	☒	Negligible	Negligible	1.0E-05	1.0E-05	1.0E-05
Total Emissions of PHENOL from ISOCURE PART 1 BULK STORAGE TANK:							**1.0E-05**	**1.0E-05**	**1.0E-05**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S051	0%	☐	Negligible	Negligible	5.1E-04	6.0E-04	6.0E-04
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ISOCURE PART 1 BULK STORAGE TANK:							**5.1E-04**	**6.0E-04**	**6.0E-04**

Supporting Emission Calculations

Emission Calculations for BIS(2-ETHYLHEXYL) ADIPATE (CAS 627-93-0)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 0.02 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.03 lb/hr.
Potential Annual:	Potential annual emissions are 0.03 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 0.59 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.71 lb/hr.
Potential Annual:	Potential annual emissions are 0.71 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 0.02 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.02 lb/hr.
Potential Annual:	Potential annual emissions are 0.02 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S051
Segment No: 01

Actual Annual:	Actual annual emissions are 1.01 lb/yr.
Maximum Annual:	Maximum annual emissions are 1.20 lb/hr.
Potential Annual:	Potential annual emissions are 1.20 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ISOCURE PART 1 BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E057 - ISOCURE PART 2 BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F015
Equipment Desc:	ISOCURE PART 2 BULK STORAGE TANK
Building No.:	ADJACENT TO SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	16	8	ft
Tank Vol. Capacity:	6000		gals
Average Liquid Height:	8		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	HORIZONTAL AG		
Tank Function:	STORAGE		
Tank Shell Color:	RED PRIMER		
Vapor Recovery Installed?	☐		

General Source Comments

THE ISOCURE PART 2 BULK STORAGE TANK IS A 6,000-GALLON CAPACITY TANK. IT HOLDS PART II RESIN FOR THE ISOCURE CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S052	15	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE ISOCURE PART 2 BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	ISOCURE PART 2 STORAGE TANK	30400371	25.665	91.97

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
NAPHTHA	01	S052	0%	☐	Negligible	Negligible	2.8E-04	3.3E-04	3.3E-04
Total Emissions of NAPHTHA from ISOCURE PART 2 BULK STORAGE TANK:							**2.8E-04**	**3.3E-04**	**3.3E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S052	0%	☐	Negligible	Negligible	4.1E-04	4.9E-04	4.9E-04
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ISOCURE PART 2 BULK STORAGE TANK:							**4.1E-04**	**4.9E-04**	**4.9E-04**

Supporting Emission Calculations

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation:
Segment No: 01

Actual Annual:	Actual annual emissions are 0.55 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.65 lb/yr.
Potential Annual:	Potential annual emissions are 0.65 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation:
Segment No: 01

Actual Annual:	Actual annual emissions are 0.83 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.98 lb/yr.
Potential Annual:	Potential annual emissions are 0.98 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ISOCURE PART 2 BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E057 - ISOCURE PART 2 BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F015
Equipment Desc:	ISOCURE PART 2 BULK STORAGE TANK
Building No.:	ADJACENT TO SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	16	8	ft
Tank Vol. Capacity:	6000		gals
Average Liquid Height:	8		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	HORIZONTAL AG		
Tank Function:	STORAGE		
Tank Shell Color:	RED PRIMER		
Vapor Recovery Installed?	☐		

General Source Comments

THE ISOCURE PART 2 BULK STORAGE TANK IS A 6,000-GALLON CAPACITY TANK. IT HOLDS PART II RESIN FOR THE ISOCURE CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S052	15	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE ISOCURE PART 2 BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	ISOCURE PART 2 STORAGE TANK	30400371	25.665	91.97

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
NAPHTHA	01	S052	0%	☐	Negligible	Negligible	2.8E-04	3.3E-04	3.3E-04
Total Emissions of NAPHTHA from ISOCURE PART 2 BULK STORAGE TANK:							**2.8E-04**	**3.3E-04**	**3.3E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S052	0%	☐	Negligible	Negligible	4.1E-04	4.9E-04	4.9E-04
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ISOCURE PART 2 BULK STORAGE TANK:							**4.1E-04**	**4.9E-04**	**4.9E-04**

Supporting Emission Calculations

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation:
Segment No: 01

Actual Annual:	Actual annual emissions are 0.55 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.65 lb/yr.
Potential Annual:	Potential annual emissions are 0.65 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation:
Segment No: 01

Actual Annual:	Actual annual emissions are 0.83 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.98 lb/yr.
Potential Annual:	Potential annual emissions are 0.98 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ISOCURE PART 2 BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E060 - #3 BULK SAND SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E060
Source Desc:	#3 BULK SAND SILO
Building No.:	CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400350-34C

Equipment Information

Equip. Type:	ISOCURE MACAWER PNEUMATIC SAND TRANSPORTER AND A 900-TON SAND SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 25 TPH OR 80,587 TPY OF NEW SAND TRANSFERRED

Description of Operation:

A 900-TON SAND SILO IS USED TO STORE NEW SAND FOR THE ISOCURE CORES AND THE PEPSET CORES. EMISSIONS FROM THE SAND TRANSFER PROCESS ARE CONTROLLED BY A BAGHOUSE (CD025). THE EMISSION FACTOR IS BASED ON AP-42 FOR SAND LOADING TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED).

APPROXIMATELY 22,490 TONS OF NEW SAND WERE TRANSFERRED INTO THE 900-TON SILO IS FISCAL YEAR 1996. MAXIMUM ANNUAL TONNAGE OF SAND PROCESSED IS 22,490 TONS * (180,050/50,248 RATIO OF MAXIMUM TO AVERAGE METAL TONNAGES) OR APPROXIMATELY 80,587 TPY. AVERAGE HOURS OF OPERATION WERE 900 HR/YR FOR FISCAL YEAR 1996 AND MAXIMUM HOURS OF OPERATION ARE APPROXIMATELY 3,240 HR/YR.

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE CORE SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S048	100%	10	0.5	[N/A]	0.196	1,000	CD025	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM THE BAGHOUSE CONTROLLING THE NEW SAND SILO (900-TON SILO) AND THE PEPSET CORE SAND HEATER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND TRANSFER INTO THE 900-TON SAND SILO	30400350	900	3,240	22,490.00	80,587.00	25.00	0.171

Comments: APPROXIMATELY 22,490 TONS OF NEW SAND WERE TRANSFERRED INTO THE 900-TON SILO IS FISCAL YEAR 1996. MAXIMUM ANNUAL TONNAGE OF SAND PROCESSED IS 22,490 TONS * (180,050/50,248) OR APPROXIMATELY 80,587 TPY.

THE HOURS OF OPERATION ARE 900 HR/YR AVERAGE AND 3,240 HR/YR MAXIMUM BASED ON AN AVERAGE 4 HR PER 100-TON RAIL CAR. ALLOWABLE EMISSION RATE OF TSP IS BASED ON 0.02 GR/DSCF OF THE OUTLET DUST LOADING RATE FROM THE BAGHOUSE DISCHARGE.

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E060 - #3 BULK SAND SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E060 - #3 BULK SAND SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S048	Stack	99%	0%	☐	.007	.007	.171	.003	.012	.751
Total Emissions of PARTICULATE MATTER (TSP) from #3 BULK SAND SILO:							**.007**	**.007**	**.171**	**.003**	**.012**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S048

Segment No: 01, SAND TRANSFER INTO THE 900-TON SAND SILO

Actual Annual:	.029 lb/ton Handled * 22,490 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	.029 lb/ton Handled * 80,587 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .012 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .003 TPY / 900. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .012 TPY / 3,240 hr/yr max. * 2,000 lb/ton = .007 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for #3 BULK SAND SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E061 - #3 & #4 ISOCURE SAND SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E061
Source Desc:	#3 & #4 ISOCURE SAND SILO
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400371-54C

Equipment Information

Equip. Type:	ISOCURE PNEUMATIC SAND TRANSPORTER AND ISOCURE SAND SILO FOR #3 & #4 ISOCURE MACHINES
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 6.716 TPH AND 38,682 TPY OF SAND

Description of Operation:

THE #3 AND #4 ISOCURE MACHINES ARE SERVED BY THE SAME SAND SILO WHICH RECEIVED SAND FROM THE 900-TON #3 BULK SAND SILO VIA THE ISOCURE PNEUMATIC SAND TRANSPORTER. AVERAGE HOURS OF OPERATION WERE 1,920 HR/YR FOR FISCAL YEAR 1996. THE MAXIMUM HOURS OF OPERATION ARE LIMITED TO 5,760 HR/YR BASED ON PERMITS ISSUED FOR #3 AND #4 ISOCURE MACHINES.

APPROXIMATELY 10,795 TONS OF SAND WERE USED FOR PREPARING ISOCURE CORES IN ISOCURE MACHINES #3 AND #4. MAXIMUM ANNUAL TONNAGE OF NEW SAND TRANSFERRED THROUGH THIS SILO IS 10,795 TONS * (180,050/50,248) OR APPROXIMATELY 38,682 TPY. EMISSIONS FROM THE SAND TRANSFERRED PROCESS IS CONTROLLED BY A BAGHOUSE (CD026). THE EMISSION FACTOR IS BASED ON AP-42 FOR SAND LOADING TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED).

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE CORE SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S049	100%	40	0.5	[N/A]	0.196	1,000	CD026	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE #3 & #4 ISOCURE SAND SILO AND SAND HEATER CYCLONE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND TRANSFERRED INTO #3 & #4 ISOCURE SAND SILO	30400350	1,920	5,760	10,795.00	38,681.00	6.72	0.171

Comments: APPROXIMATELY 10,795 TONS OF NEW SAND WERE USED IN FISCAL YEAR 1996 TO PREPARE ISOCURE CORES IN ISOCURE CORE MACHINES #3 AND #4. MAXIMUM TONNAGE = 10,795 * (3.5832 MAX-TO-AVG METAL POURED) = 38,681 TPY. THE AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE APPROXIMATELY 5.622 TPH AND 6.716 TPH, RESPECTIVELY. MAXIMUM HOURS OF OPERATION ARE APPROXIMATELY 5,760 HR/YR.

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E061 - #3 & #4 ISOCURE SAND SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E061 - #3 & #4 ISOCURE SAND SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S049	Stack	99%	0%	☐	.002	.002	.171	.002	.006	.751
Total Emissions of PARTICULATE MATTER (TSP) from #3 & #4 ISOCURE SAND SILO:							**.002**	**.002**	**.171**	**.002**	**.006**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S049

Segment No: 01, SAND TRANSFERRED INTO #3 & #4 ISOCURE SAND SILO

Actual Annual:	.029 lb/ton Handled * 10,795 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	.029 lb/ton Handled * 38,681 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .006 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .006 TPY / 5,760 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for #3 & #4 ISOCURE SAND SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E062 - #5 ISOCURE SAND SILO

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E062
Source Desc:	#5 ISOCURE SAND SILO
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400371-56C

Equipment Information

Equip. Type:	PNEUMATIC SAND TRANSPORTER AND #5 ISOCURE SAND SILO
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 4.477 TPH AND 25,788 TPY OF SAND

Description of Operation:

THE #5 ISOCURE MACHINE IS SERVED BY A SEPARATE SAND SILO WHICH RECEIVED SAND FROM THE 900-TON #3 BULK SAND SILO VIA THE ISOCURE PNEUMATIC SAND TRANSPORTER. AVERAGE HOURS OF OPERATION WERE 1,920 HR/YR FOR FISCAL YEAR 1996. THE MAXIMUM HOURS OF OPERATION ARE LIMITED TO 5,760 HR/YR BASED ON PERMITS ISSUED FOR #5 ISOCURE MACHINE.

APPROXIMATELY 7,197 TONS OF SAND WERE USED FOR PREPARING ISOCURE CORES IN ISOCURE MACHINE #5. MAXIMUM ANNUAL TONNAGE OF NEW SAND TRANSFERRED THROUGH THIS SILO IS 7,197 TONS * (180,050/50,248) OR APPROXIMATELY 25,788 TPY. EMISSIONS FROM THE SAND TRANSFERRED PROCESS IS CONTROLLED BY A BAGHOUSE (CD027). THE EMISSION FACTOR IS BASED ON AP-42 FOR SAND LOADING TO ELEVATED SILO (AN UNCONTROLLED EMISSION RATE OF 0.029 LB/TON OF SAND TRANSFERRED).

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATION IS BASED ON 0.02 GR/DSCF. EMISSIONS FROM SAND TRANSFER INTO THE CORE SAND SILO ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THIS PROCESS IS CONSIDERED AS AN INSIGNIFICANT ACTIVITY PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S050	100%	10	0.5	[N/A]	0.196	1,000	CD027	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE #5 ISOCURE SAND SILO AND SAND HEATER CYCLONE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	PNEUMATIC SAND TRANSFERRED INTO #5 ISOCURE SAND SILO	30400350	1,920	5,760	7,197.00	25,788.00	4.48	0.171

Comments: APPROXIMATELY 7,197 TONS OF NEW SAND WERE USED IN FISCAL YEAR 1996 TO PREPARE ISOCURE CORES IN THE #5 ISOCURE MACHINE. MAXIMUM TONNAGE = 7,197 * (3.5832 MAX-TO-AVG METAL POURED) = 25,788 TPY. THE AVERAGE AND MAXIMUM HOURLY USAGE RATES ARE APPROXIMATELY 3.748 TPH AND 4.477 TPH, RESPECTIVELY. MAXIMUM HOURS OF OPERATION ARE LIMITTED TO 5,760 HR/YR BASED ON PERMITS ISSUED FOR THE #5 ISOCURE MACHINE.

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E062 - #5 ISOCURE SAND SILO

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E062 - #5 ISOCURE SAND SILO

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S050	Stack	99%	0%	☐	.001	.001	.171	.001	.004	.494
Total Emissions of PARTICULATE MATTER (TSP) from #5 ISOCURE SAND SILO:							**.001**	**.001**	**.171**	**.001**	**.004**	**.494**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S050

Segment No: 01, PNEUMATIC SAND TRANSFERRED INTO #5 ISOCURE SAND SILO

Actual Annual:	.029 lb/ton Handled * 7,197 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	.029 lb/ton Handled * 25,788 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .004 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 5,760 hr/yr maximum * 1 ton/2,000 lb = .494 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 5,760 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for #5 ISOCURE SAND SILO

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E063-E065 - ISOCURE SAND HEATERS

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E063-E065
Source Desc:	ISOCURE SAND HEATERS
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400371-54-56

Equipment Information

Equip. Type:	ELECTRIC SAND HEATERS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 64,469 TPY OF SAND.

Description of Operation:

THE ISOCURE SAND FROM ITS STORAGE SILOS IS TRANSFERRED TO ELECTRIC HEATERS BEFORE BEING PROCESSED IN THE SAND MIXERS. BECAUSE OF THE FLUIDIZED EFFECT, THE SAND HEATERS ARE EQUIPPED WITH CYCLONES (CD028, CD 029, AND CD030) TO RECOVER THE HEATED SAND. DISCHARGES FROM THE THREE SAND HEATERS ARE ROUTED THROUGH THE SAND SILO BAGHOUSES (CD026 AND CD027) PRIOR TO BEING DISCHARGED.

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATIONS ARE BASED ON 0.02 GR/DSCF FROM THE BAGHOUSE DISCHARGES (S049 AND S050). EMISSIONS DUE TO THE FLUIDIZED HEATING IN THE SAND HEATERS ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THESE HEATING PROCESSES ARE CONSIDERED AS INSIGNIFICANT ACTIVITIES PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S049	60%	40	0.5	[N/A]	0.196	1,000	CD026	BAGHOUSE	[N/A]	[No Sec. Control]
Comments:	EMISSION STACK FOR THE #3 & #4 ISOCURE SAND SILO AND SAND HEATER CYCLONE.									
S050	40%	10	0.5	[N/A]	0.196	1,000	CD027	BAGHOUSE	[N/A]	[No Sec. Control]
Comments:	EMISSION STACK FOR THE #5 ISOCURE SAND SILO AND SAND HEATER CYCLONE.									

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	ISOCURE CORE SAND HEATING (ELECTRIC)	30400371	1,920	5,760	17,992.00	64,469.00	11.19	0.171

Comments: THE TOTAL SAND HANDLED THROUGH THE THREE SAND HEATERS ARE APPROXIMATELY 17,992 TONS OF NEW SAND FOR FISCAL YEAR 1996. MAXIMUM ANNUAL TONNAGES OF SAND PROCESSED THROUGH THE HEATERS ARE 17,992 TONS * (180,050/50,248 RATIO OF MAXIMUM TO AVERAGE METAL TONNAGES) OR APPROXIMATELY 64,469 TPY. (NOTE: THE MAXIMUM 64,469 TPY OF SAND IS THE LIMIT FOR THE SAND HEATERS ONLY. THE MAXIMUM SAND PROCESSED BY THE ISOCURE MACHINES ARE LIMITTED BY THE ALLOWABLE AMOUNT OF ISOCURE RESINS AS SPECIFIED BY PERMITS FOR THE ISOCURE PROCESS.) THE AVERAGE HOURS OF OPERATION ARE 1,920 HR/YR FOR FISCAL YEAR 1996. THE MAXIMUM HOURS OF OPERATION ARE APPROXIMATELY 5,760 HR/YR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S049	Stack	99%	0%	☐	.002	.002	.171	.002	.006	.751
	01	S050	Stack	99%	0%	☐	.001	.001	.171	.001	.004	.751
Total Emissions of PARTICULATE MATTER (TSP) from ISOCURE SAND HEATERS:							**.003**	**.003**	**.343**	**.003**	**.009**	**1.502**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S049
Segment No: 01, ISOCURE CORE SAND HEATING (ELECTRIC)

Actual Annual:	.029 lb/ton Handled * 17,992 tons * 60% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	.029 lb/ton Handled * 64,469 tons * 60% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .006 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .006 TPY / 5,760 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S050
Segment No: 01, ISOCURE CORE SAND HEATING (ELECTRIC)

Actual Annual:	.029 lb/ton Handled * 17,992 tons * 40% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	.029 lb/ton Handled * 64,469 tons * 40% (capture efficiency) * (1 - 99% control eff.) * 1 ton/2,000 lb = .004 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 5,760 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for ISOCURE SAND HEATERS

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E066-E068 - SAND MIXERS

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E066-E068
Source Desc:	SAND MIXERS
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400371-54-56

Equipment Information

Equip. Type:	#3, #4 AND #5 SAND MIXERS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 375 TPY OF ISOCURE RESINS AND 25,953.75 TPY OF SAND.

Description of Operation:

THREE MIXERS (E066, E067, AND E068 FOR THE #3, #4, AND #5 UNITS, RESPECTIVELY) ARE USED TO COMBINE THE ISOCURE RESINS PART 1 (BINDER) AND PART 2 (ACID) WITH THE CORE SAND PRIOR TO THE CORE FORMING AND GAS CURING PROCESSES. PARTICULATE EMISSIONS FROM THE SAND MIXERS ARE BASED ON MAYSILLES'S EMISSION FACTOR FOR MULLING. TSP EMISSIONS FROM THESE SAND MIXERS ARE UNCONTROLLED. INITIALLY, PARTICULATE EMISSIONS ARE RELEASED INSIDE THE SHELL CORE BUILDING AND THEN VENTED TO THE ATMOSPHERE VIA THE BUILDING EXHAUST VENTS (S053). THUS, TSP EMISSIONS FROM THE SAND MIXING IS ESTIMATED USING 67% BUILDING SETTLING FACTOR.

THE TOTAL TONNAGES PROCESSED ARE THE TOTAL OF SAND AND ISOCURE RESINS (PART 1 AND PART 2) USED IN ALL THREE ISOCURE MACHNES. FOR FISCAL YEAR 1996, APPROXIMATELY 17,992 TONS OF SAND, 140.03 TONS OF ISOCURE PART 1, AND 119.94 TONS OF ISOCURE PART 2 OR A TOTAL OF 18,251.97 TONS. THE SAND TO ISOCURE RESINS RATIO IS 17,992 / (140.03 + 119.94) = 69.21. MAXIMUM ANNUAL USAGES OF ISOCURE CORE RESINS ARE LIMITED TO 375 TONS (750,000 LBS) PER 365 CONSECUTIVE DAYS (OR APPROXIMATELY 202 TPY OF ISOCURE PART 1 AND 173 TPY OF ISOCURE PART 2 OVER THE SAME TIME LIMIT). BASED ON THE SAND TO RESIN RATIO, THE MAXIMUM ANNUAL TONNAGE OF SAND PROCESSED THROUGH THE MIXERS ARE EXPECTED TO BE 375 TONS * 69.21 OR 25,953.75 TPY.

PARTICULATE EMISSIONS FROM THE MIXERS ARE SUBJECT TO RULE 10.3 OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE. ALLOWABLE EMISSIONS AREA CALCULATED BASED ON THE MAXIMUM 6,650 LB/HR PROCESSING RATE FOR ALL THREE MIXERS.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	MULLING OF SAND AND ISOCURE RESINS	30400350	5,500	7,918	17,992.00	25,953.75	3.33	7.558

Comments: IN FISCAL YEAR 1996, THE AVERAGE ANNUAL SAND AND ISOCURE RESIN USAGES FOR ALL THREE SAND MIXERS ARE 17,992 TPY OF SAND, 140.03 TONS OF ISOCURE PART 1, AND 119.94 TONS OF ISOCURE PART 2 FOR A TOTAL OF 18,251.97 TONS. THE MAXIMUM ANNUAL (OVER 365 CONSECUTIVE DAYS) ISOCURE RESIN USAGE IS LIMITED TO 375 TPY. THUS, THE MAXIMUM ANNUAL TONNAGE OF SAND PROCESSED THROUGH THE MIXERS ARE EXPECTED TO BE 375 TONS * 69.21 OR 25,953.75 TPY.

THE TOTAL AVERAGE HOURS OF OPERATION FOR ALL THREE MIXING UNITS ARE ABOUT 5,500 HR/YR (FROM 18,251.97 TPY * 2,000 LB/TON / 6,650 LB/HR). THE TOTAL MAXIMUM HOURS OF OPERATION FOR ALL THREE MIXING UNITS ARE ABOUT 7,918 HR/YR (FROM 26,328.75 TPY * 2,000 LB/TON / 6,650 LB/HR). THE ALLOWABLE TSP EMISSION RATE IS BASED ON 3.278 TPY OF SAND AND 0.047 TPH OF ISOCURE RESIN OR 3.325 TPH OR 6,650 LB/HR.

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E066-E068 - SAND MIXERS

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0017	PARTICULATE MATTER (TSP)	1.5	lb/ton Handled	MAYSILLES'S REVIEW

Comments: SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA.

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E066-E068 - SAND MIXERS

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S053	Fugitive	67%	0%	☐	1.619	1.623	7.558	4.453	6.424	33.104
Total Emissions of PARTICULATE MATTER (TSP) from SAND MIXERS:							**1.619**	**1.623**	**7.558**	**4.453**	**6.424**	**33.104**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S053

Segment No: 01, MULLING OF SAND AND ISOCURE RESINS

Actual Annual:	1.5 lb/ton Handled * 17,992 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 4.453 TPY.
Maximum Annual:	1.5 lb/ton Handled * 25,954 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 6.424 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 7.558 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 33.104 TPY.
Average Hourly:	Actual annual emissions of 4.453 TPY / 5,500. hr/yr act. * 2,000 lb/ton = 1.619 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.424 TPY / 7,918 hr/yr max. * 2,000 lb/ton = 1.623 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 3.325 ton/hr or 6,650 lb/hr. Calculation : 7.09 lb/hr + (6,650 - 6,000) * (0.72 / 1,000) lb/hr = 7.558 lb/hr.

End Page Report for SAND MIXERS

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E069-E071 - ISOCURE MACHINES

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E069-E071
Source Desc:	ISOCURE MACHINES
Building No.:	SHELL CORE BUILDING
UTM Location:	**East:** 653395 m **North:** 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400371-54-56

Equipment Information

Equip. Type:	ISOCURE MACHINES #3, #4, AND #5
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 25,953.75 TPY OF SAND, 375 TPY OF ISOCURE RESINS, AND 22.5 TPY OF TRIETHYLAMINE CATALYST.

Description of Operation:

THE ISOCURE MACHINES NOS. 3, 4, AND 5 WERE ISSUED PERMIT NOS. 54C, 55C, AND 56C, RESPECTIVELY. THE TOTAL EMISSIONS AND MATERIAL USAGES LIMITATIONS SPECIFIED IN THESE PERMIT ARE FOR ALL THREE ISOCURE CORE MACHINES. THEREFORE, THE CALCULATIONS FOR ALL THREE ISOCURE MACHINES ARE COMBINED IN THIS EMISSION SOURCE FACT SHEET.

THE PRODUCTION PROCESS FOR THREE ISOCURE MACHINES ARE DISTRIBUTED AS FOLLOWS: 30% PRODUCTION FOR NO. 3 MACHINE, 30% FOR NO. 4 MACHINE, AND 40% FOR NO. 5 MACHINE. PARTICULATE EMISSIONS ARE EXPECTED TO BE NEGLIGIBLE BECAUSE THE CORE FORMING PROCESS IS PERFORMED WITH WETTED SAND. EMISSIONS OF CHEMICAL INGREDIENTS FROM THE TWO-PART URETHANE SYSTEM ARE ALSO NEGLIGIBLE, BECAUSE MOST INGREDIENTS ARE FORMULATED FOR NEAR STOICHIOMETRIC (100%) REACTION. IT IS ALSO ASSUMED BASED ON ENGINEERING ESTIMATE THAT ONLY 40 PERCENT OF ANY FREE CHEMICAL INGREDIENT OR SOLVENT ARE RELEASED AS EMISSIONS DURING THIS CORE FORMING STEP.

PARTICULATE AND VOC EMISSIONS FROM THE ISOCURE MACHINES (OR CORE FORMING PROCESS) ARE ESSENTIALLY UNCONTROLLED. HOWEVER, THE TRIETHYLAMINE GAS USED AS CATALYST IN THE CURING PROCESS IS CONTROLLED THROUGH TWO WET ACID SCRUBBER UNITS.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S054	60%	30	0.79	0.92	0.727	1,900	CD031	WET SCRUBBER - MEDIUM EFFICIENCY	[N/A]	[No Sec. Control]
Comments:	EMISSION STACK FROM THE PACKED TOWER ACID SCRUBBER #3-#4.									
S055	40%	33	0.625	0.71	0.444	1,900	CD032	WET SCRUBBER - MEDIUM EFFICIENCY	[N/A]	[No Sec. Control]
Comments:	EMISSION STACK FROM THE ACID SCRUBBER #5.									

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	ISOCURE MACHINES, ISOCURE CORE FORMING	30400371	5,500	8,760	18,251.97	26,328.75	3.32	7.549

Comments: AVERAGE ANNUAL SAND AND RESINS USAGES ARE FROM SAND MIXERS: 17,992 TPY + 259.97 TPY = 18,251.97 TPY. MAXIMUM ANNUAL SAND AND RESINS USAGES ARE FROM SAND MIXERS: 25,935.75 TPY + 375 TPY = 26,328.75 TPY. THE ALLOWABLE TSP EMISSION RATE IS BASED ON 3.325 TPH OF COATED SAND OR 6,650 LB/HR.

02	ISOCURE/SIGMA CURE RESIN, PART 1	30400371	5,500	8,760	140.03	202.00	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL RESIN USAGES FOR ALL THREE ISOCURE MACHINES ARE 140.03 TPY BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ALLOWABLE 365-DAY USAGES ARE 202 TPY FOR PART 1 (TOTAL 375 TPY FOR BOTH PARTS 1 AND 2 RESIN).

03	ISOCURE/SIGMA CURE RESIN, PART 2	30400371	5,500	8,760	119.94	173.00	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL RESIN USAGES FOR ALL THREE ISOCURE MACHINES ARE 119.94 TPY BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ALLOWABLE 365-DAY USAGES ARE 173 TPY FOR PART 2 (TOTAL 375 TPY FOR BOTH PARTS 1 AND 2 RESIN).

04	ISOCURE TRIETHYLAMINE CATALYST	30400371	5,500	8,760	11.22	22.50	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL TRIETHYLAMINE USAGES FOR ALL THREE ISOCURE MACHINES ARE 11.22 TPY BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ALLOWABLE 365-DAY USAGES ARE 22.5 TPY. TRIETHYLAMINE EMISSIONS ARE REMOVED THROUGH THE ACID SCRUBBERS. THE REMOVAL EFFICIENCY IS APPROXIMATELY 95%.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0025	PARTICULATE MATTER (TSP)	1.03	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR SAND HANDLING.			
02	C044	BIS(2-ETHYLHEXYL) ESTER, ADIP	0.6	lb/ton Handled	MATERIAL BALANCE
	Comments:	DIMETHYL ADIPATE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 7.5% BY WEIGHT OR APPROXIMATELY 150 LB/TON (2,000 * 0.075). THIS INGREDIENT IS FORMULATED AS A REACTIVE INGREDIENT; THUS, THE FREE DIMETHYL GADIPATE IS LESS THAN 1 PERCENT OR 150 * 0.01 = 1.5 LB/TON, OF WHICH 40% MAY BE EVAPORATED DURING MOLD FORMING (1.5 LB/TON * 0.4 = 0.6 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 25, ACME SIGMA CURE 7110 RESIN PART 1.			
02	C044	DIMETHYL GLUTARATE	0.6	lb/ton Handled	MATERIAL BALANCE
	Comments:	DIMETHYL GLUTARATE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 7.5% BY WEIGHT OR APPROXIMATELY 150 LB/TON (2,000 * 0.075). THIS INGREDIENT IS FORMULATED AS A REACTIVE INGREDIENT; THUS, THE FREE DIMETHYL GLUTARATE IS LESS THAN 1 PERCENT OR 150 * 0.01 = 1.5 LB/TON, OF WHICH 40% MAY BE EVAPORATED DURING MOLD FORMING (1.5 LB/TON * 0.4 = 0.6 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 25, ACME SIGMA CURE 7110 RESIN PART 1.			
02	C044	DIMETHYL SUCCINATE	0.24	lb/ton Handled	MATERIAL BALANCE
	Comments:	DIMETHYL SUCCINATE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS ~3% BY WEIGHT OR APPROXIMATELY 60 LB/TON (2,000 * 0.03). THIS INGREDIENT IS FORMULATED AS A REACTIVE INGREDIENT; THUS, THE FREE DIMETHYL SUCCINATE IS LESS THAN 1 PERCENT OR 60 * 0.01 = 0.6 LB/TON, OF WHICH 40% MAY BE EVAPORATED DURING MOLD FORMING (0.6 LB/TON * 0.4 = 0.24 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 25, ACME SIGMA CURE 7110 RESIN PART 1.			
02	C044	HEAVY AROMATIC NAPHTHA	12.958	lb/ton Handled	MATERIAL BALANCE
	Comments:	HEAVY AROMATIC NAPHTHA INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 20.9% BY WEIGHT OR APPROXIMATELY 418 LB/TON (2,000 * 0.209), OF WHICH 3.1% MAY BE EVAPORATED DURING MOLD FORMING (418 LB/TON * 0.031 = 12.958 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 25, ACME SIGMA CURE 7110 RESIN PART 1. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
02	C044	PHENOL	0.439	lb/ton Handled	MATERIAL BALANCE
	Comments:	PHENOL INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 5.49% BY WEIGHT OR APPROXIMATELY 109.8 LB/TON (2,000 * 0.0549). THIS INGREDIENT IS FORMULATED AS A REACTIVE INGREDIENT; THUS, THE FREE PHENOL IS LESS THAN 1 PERCENT OR 109.8 * 0.01 = 1.098 LB/TON, OF WHICH 40% MAY BE EVAPORATED DURING MOLD FORMING (1.098 LB/TON * 0.4 = 0.439 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 25, ACME SIGMA CURE 7110 RESIN PART 1.			
02	C044	VOLATILE ORGANIC COMPOUND	62	lb/ton Handled	MATERIAL BALANCE
	Comments:	BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%). VOC EMISSIONS = 2,000 LB * 0.031 = 62 LB/TON.			

03	C045	4,4-DIPHENYL METHANE DIISOC	2.409	lb/ton Handled	MATERIAL BALANCE

Comments: 4,4-DIPHENYL METHANE DIISOCYANATE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 30.11% BY WEIGHT OR APPROXIMATELY 602.2 LB/TON (2,000 * 0.3011). THIS INGREDIENT IS FORMULATED AS A REACTIVE INGREDIENT; THUS, THE FREE 4,4-DIPHENYL METHANE DIISOCYANATE IS LESS THAN 1 PERCENT OR 602.2 * 0.01 = 6.022 LB/TON, OF WHICH 40% MAY BE EVAPORATED DURING MOLD FORMING (6.022 LB/TON * 0.4 = 2.409 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 199, ACME SIGMA CURE 7611 PART 2 RESIN.

03	C045	HEAVY AROMATIC NAPHTHA	12.958	lb/ton Handled	MATERIAL BALANCE

Comments: HEAVY AROMATIC NAPHTHA INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 18.5% BY WEIGHT OR APPROXIMATELY 370 LB/TON (2,000 * 0.185), OF WHICH 3.1% MAY BE EVAPORATED DURING MOLD FORMING (370 LB/TON * 0.031 = 11.47 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 199, ACME SIGMA CURE 7611 RESIN PART 2. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).

03	C045	VOLATILE ORGANIC COMPOUND	62	lb/ton Handled	MATERIAL BALANCE

Comments: BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%). VOC EMISSIONS = 2,000 LB * 0.031 = 62 LB/TON.

04	C046	TRIETHYLAMINE	2000	lb/ton Handled	MATERIAL BALANCE

Comments: TRIETHYLAMINE IS 100% BY WEIGHT AND IT IS USED AS A TRUE CATALYST WITHOUT BEING CONSUMED IN THE URETHANE CURING PROCESS. THUS, THE FREE TRIETHYLAMINE IS 100% OF ITS USAGE OR 2,000 LB/TON (UNCONTROLLED).

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
4,4-DIPHENYL METHANE DIISOCYANATE	03	S054	Stack	0%	0%	☒	.032	.029	Not Appl.	.087	.125	.125
	03	S055	Stack	0%	0%	☒	.021	.019	Not Appl.	.058	.083	.083
Total Emissions of 4,4-DIPHENYL METHANE DIISOCYANATE from ISOCURE MACHINES:							**.053**	**.048**	**Not Appl.**	**.144**	**.208**	**.208**
BIS(2-ETHYLHEXYL) ESTER, ADIPIC ACID	02	S054	Stack	0%	0%	☐	.009	.008	Not Appl.	.025	.036	.036
	02	S055	Stack	0%	0%	☐	.006	.006	Not Appl.	.017	.024	.024
Total Emissions of BIS(2-ETHYLHEXYL) ESTER, ADIPIC ACID from ISOCURE MACHINES:							**.015**	**.014**	**Not Appl.**	**.042**	**.061**	**.061**
DIMETHYL GLUTARATE	02	S054	Stack	0%	0%	☐	.009	.008	Not Appl.	.025	.036	.036
	02	S055	Stack	0%	0%	☐	.006	.006	Not Appl.	.017	.024	.024
Total Emissions of DIMETHYL GLUTARATE from ISOCURE MACHINES:							**.015**	**.014**	**Not Appl.**	**.042**	**.061**	**.061**
DIMETHYL SUCCINATE	02	S054	Stack	0%	0%	☐	.004	.003	Not Appl.	.01	.015	.015
	02	S055	Stack	0%	0%	☐	.002	.002	Not Appl.	.007	.01	.01
Total Emissions of DIMETHYL SUCCINATE from ISOCURE MACHINES:							**.006**	**.006**	**Not Appl.**	**.017**	**.024**	**.024**
HEAVY AROMATIC NAPHTHA	02	S054	Stack	0%	0%	☐	.198	.179	Not Appl.	.544	.785	.785
	02	S055	Stack	0%	0%	☐	.132	.12	Not Appl.	.363	.524	.524
	03	S054	Stack	0%	0%	☐	.17	.154	Not Appl.	.466	.673	.673
	03	S055	Stack	0%	0%	☐	.113	.102	Not Appl.	.311	.448	.448
Total Emissions of HEAVY AROMATIC NAPHTHA from ISOCURE MACHINES:							**.612**	**.555**	**Not Appl.**	**1.684**	**2.43**	**2.43**
PARTICULATE MATTER (TSP)	01	S054	Stack	0%	0%	☐	2.051	1.857	7.549	5.64	8.136	33.066
	01	S055	Stack	0%	0%	☐	1.367	1.238	7.549	3.76	5.424	33.066
Total Emissions of PARTICULATE MATTER (TSP) from ISOCURE MACHINES:							**3.418**	**3.096**	**15.099**	**9.4**	**13.559**	**66.132**
PHENOL	02	S054	Stack	0%	0%	☒	.007	.006	Not Appl.	.018	.027	.027
	02	S055	Stack	0%	0%	☒	.004	.004	Not Appl.	.012	.018	.018
Total Emissions of PHENOL from ISOCURE MACHINES:							**.011**	**.01**	**Not Appl.**	**.031**	**.044**	**.044**
TRIETHYLAMINE	04	S054	Stack	95%	0%	☒	.122	.154	Not Appl.	.337	.675	.675
	04	S055	Stack	95%	0%	☒	.082	.103	Not Appl.	.224	.45	.45
Total Emissions of TRIETHYLAMINE from ISOCURE MACHINES:							**.204**	**.257**	**Not Appl.**	**.561**	**1.125**	**1.125**

VOLATILE ORGANIC COMPOUNDS (VOC)	02	S054	Stack	0%	0%	☐	.947	.858	Not Appl.	2.605	3.757	3.757
	02	S055	Stack	0%	0%	☐	.631	.572	Not Appl.	1.736	2.505	2.505
	03	S054	Stack	0%	0%	☐	.811	.735	Not Appl.	2.231	3.218	3.218
	03	S055	Stack	0%	0%	☐	.541	.49	Not Appl.	1.487	2.145	2.145
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ISOCURE MACHINES:							**2.931**	**2.654**	**Not Appl.**	**8.059**	**11.625**	**11.625**

Supporting Emission Calculations

Emission Calculations for 4,4-DIPHENYL METHANE DIISOCYANATE (CAS 101-68-8)
Stack ID or Designation: S054
Segment No: 03, ISOCURE/SIGMA CURE RESIN, PART 2

Actual Annual:	2.409 lb/ton Handled * 120 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .087 TPY.
Maximum Annual:	2.409 lb/ton Handled * 173 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .125 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .125 TPY.
Average Hourly:	Actual annual emissions of .087 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .032 lb/hr.
Maximum Hourly:	Maximum annual emissions of .125 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .029 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for 4,4-DIPHENYL METHANE DIISOCYANATE (CAS 101-68-8)
Stack ID or Designation: S055
Segment No: 03, ISOCURE/SIGMA CURE RESIN, PART 2

Actual Annual:	2.409 lb/ton Handled * 120 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .058 TPY.
Maximum Annual:	2.409 lb/ton Handled * 173 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .083 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .083 TPY.
Average Hourly:	Actual annual emissions of .058 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .021 lb/hr.
Maximum Hourly:	Maximum annual emissions of .083 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .019 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for BIS(2-ETHYLHEXYL) ESTER, ADIPIC ACID (CAS 103-23-1)
Stack ID or Designation: S054
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.6 lb/ton Handled * 140 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .025 TPY.
Maximum Annual:	.6 lb/ton Handled * 202 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .036 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .036 TPY.
Average Hourly:	Actual annual emissions of .025 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .009 lb/hr.
Maximum Hourly:	Maximum annual emissions of .036 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .008 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for BIS(2-ETHYLHEXYL) ESTER, ADIPIC ACID (CAS 103-23-1)
Stack ID or Designation: S055
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.6 lb/ton Handled * 140 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .017 TPY.
Maximum Annual:	.6 lb/ton Handled * 202 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .024 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .024 TPY.
Average Hourly:	Actual annual emissions of .017 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .024 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for DIMETHYL GLUTARATE (CAS 1119-40-0)
Stack ID or Designation: S054
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.6 lb/ton Handled * 140 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .025 TPY.
Maximum Annual:	.6 lb/ton Handled * 202 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .036 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .036 TPY.
Average Hourly:	Actual annual emissions of .025 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .009 lb/hr.
Maximum Hourly:	Maximum annual emissions of .036 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .008 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for DIMETHYL GLUTARATE (CAS 1119-40-0)
Stack ID or Designation: S055
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.6 lb/ton Handled * 140 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .017 TPY.
Maximum Annual:	.6 lb/ton Handled * 202 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .024 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .024 TPY.
Average Hourly:	Actual annual emissions of .017 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .024 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for DIMETHYL SUCCINATE (CAS 106-65-0)
Stack ID or Designation: S054
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.24 lb/ton Handled * 140 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .01 TPY.
Maximum Annual:	.24 lb/ton Handled * 202 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .015 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .015 TPY.
Average Hourly:	*Actual annual emissions of .01 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .004 lb/hr.*
Maximum Hourly:	Maximum annual emissions of .015 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for DIMETHYL SUCCINATE (CAS 106-65-0)
Stack ID or Designation: S055
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.24 lb/ton Handled * 140 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	.24 lb/ton Handled * 202 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .01 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .01 TPY.
Average Hourly:	Actual annual emissions of .007 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .01 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for HEAVY AROMATIC NAPHTHA (CAS 64742-94-5)
Stack ID or Designation: S054
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	13 lb/ton Handled * 140 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .544 TPY.
Maximum Annual:	13 lb/ton Handled * 202 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .785 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .785 TPY.
Average Hourly:	Actual annual emissions of .544 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .198 lb/hr.
Maximum Hourly:	Maximum annual emissions of .785 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .179 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for HEAVY AROMATIC NAPHTHA (CAS 64742-94-5)
Stack ID or Designation: S055
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	13 lb/ton Handled * 140 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .363 TPY.
Maximum Annual:	13 lb/ton Handled * 202 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .524 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .524 TPY.
Average Hourly:	Actual annual emissions of .363 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .132 lb/hr.
Maximum Hourly:	Maximum annual emissions of .524 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .12 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for HEAVY AROMATIC NAPHTHA (CAS 64742-94-5)
Stack ID or Designation: S054
Segment No: 03, ISOCURE/SIGMA CURE RESIN, PART 2

Actual Annual:	13 lb/ton Handled * 120 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .466 TPY.
Maximum Annual:	13 lb/ton Handled * 173 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .673 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .673 TPY.
Average Hourly:	Actual annual emissions of .466 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .17 lb/hr.
Maximum Hourly:	Maximum annual emissions of .673 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .154 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for HEAVY AROMATIC NAPHTHA (CAS 64742-94-5)
Stack ID or Designation: S055
Segment No: 03, ISOCURE/SIGMA CURE RESIN, PART 2

Actual Annual:	13 lb/ton Handled * 120 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .311 TPY.
Maximum Annual:	13 lb/ton Handled * 173 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .448 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .448 TPY.
Average Hourly:	Actual annual emissions of .311 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .113 lb/hr.
Maximum Hourly:	Maximum annual emissions of .448 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .102 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S054
Segment No: 01, ISOCURE MACHINES, ISOCURE CORE FORMING

Actual Annual:	1.03 lb/ton Handled * 18,252 tons * 60% (capture efficiency) * 1 ton/2,000 lb = 5.64 TPY.
Maximum Annual:	1.03 lb/ton Handled * 26,329 tons * 60% (capture efficiency) * 1 ton/2,000 lb = 8.136 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 7.549 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 33.066 TPY.
Average Hourly:	Actual annual emissions of 5.64 TPY / 5,500. hr/yr act. * 2,000 lb/ton = 2.051 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.136 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.857 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 3.319 ton/hr or 6,638 lb/hr. Calculation : 7.09 lb/hr + (6,638 - 6,000) * (0.72 / 1,000) lb/hr = 7.549 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S055
Segment No: 01, ISOCURE MACHINES, ISOCURE CORE FORMING

Actual Annual:	1.03 lb/ton Handled * 18,252 tons * 40% (capture efficiency) * 1 ton/2,000 lb = 3.76 TPY.
Maximum Annual:	1.03 lb/ton Handled * 26,329 tons * 40% (capture efficiency) * 1 ton/2,000 lb = 5.424 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 7.549 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 33.066 TPY.
Average Hourly:	Actual annual emissions of 3.76 TPY / 5,500. hr/yr act. * 2,000 lb/ton = 1.367 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.424 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.238 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 3.319 ton/hr or 6,638 lb/hr. Calculation : 7.09 lb/hr + (6,638 - 6,000) * (0.72 / 1,000) lb/hr = 7.549 lb/hr.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S054
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.439 lb/ton Handled * 140 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .018 TPY.
Maximum Annual:	.439 lb/ton Handled * 202 tons * 60% (capture efficiency) * 1 ton/2,000 lb = .027 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .027 TPY.
Average Hourly:	Actual annual emissions of .018 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .027 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S055
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	.439 lb/ton Handled * 140 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .012 TPY.
Maximum Annual:	.439 lb/ton Handled * 202 tons * 40% (capture efficiency) * 1 ton/2,000 lb = .018 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .018 TPY.
Average Hourly:	*Actual annual emissions of .012 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .004 lb/hr.*
Maximum Hourly:	Maximum annual emissions of .018 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for TRIETHYLAMINE (CAS 121-44-8)
Stack ID or Designation: S054
Segment No: 04, ISOCURE TRIETHYLAMINE CATALYST

Actual Annual:	2,000 lb/ton Handled * 11 tons * 60% (capture efficiency) * (1 - 95% control eff.) * 1 ton/2,000 lb = .337 TPY.
Maximum Annual:	2,000 lb/ton Handled * 23 tons * 60% (capture efficiency) * (1 - 95% control eff.) * 1 ton/2,000 lb = .675 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .675 TPY.
Average Hourly:	Actual annual emissions of .337 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .122 lb/hr.
Maximum Hourly:	Maximum annual emissions of .675 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .154 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for TRIETHYLAMINE (CAS 121-44-8)
Stack ID or Designation: S055
Segment No: 04, ISOCURE TRIETHYLAMINE CATALYST

Actual Annual:	2,000 lb/ton Handled * 11 tons * 40% (capture efficiency) * (1 - 95% control eff.) * 1 ton/2,000 lb = .224 TPY.
Maximum Annual:	2,000 lb/ton Handled * 23 tons * 40% (capture efficiency) * (1 - 95% control eff.) * 1 ton/2,000 lb = .45 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or .45 TPY.
Average Hourly:	Actual annual emissions of .224 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .082 lb/hr.
Maximum Hourly:	Maximum annual emissions of .45 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .103 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S054
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	62 lb/ton Handled * 140 tons * 60% (capture efficiency) * 1 ton/2,000 lb = 2.605 TPY.
Maximum Annual:	62 lb/ton Handled * 202 tons * 60% (capture efficiency) * 1 ton/2,000 lb = 3.757 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 3.757 TPY.
Average Hourly:	Actual annual emissions of 2.605 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .947 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.757 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .858 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S055
Segment No: 02, ISOCURE/SIGMA CURE RESIN, PART 1

Actual Annual:	62 lb/ton Handled * 140 tons * 40% (capture efficiency) * 1 ton/2,000 lb = 1.736 TPY.
Maximum Annual:	62 lb/ton Handled * 202 tons * 40% (capture efficiency) * 1 ton/2,000 lb = 2.505 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 2.505 TPY.
Average Hourly:	Actual annual emissions of 1.736 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .631 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.505 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .572 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S054
Segment No: 03, ISOCURE/SIGMA CURE RESIN, PART 2

Actual Annual:	62 lb/ton Handled * 120 tons * 60% (capture efficiency) * 1 ton/2,000 lb = 2.231 TPY.
Maximum Annual:	62 lb/ton Handled * 173 tons * 60% (capture efficiency) * 1 ton/2,000 lb = 3.218 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 3.218 TPY.
Average Hourly:	Actual annual emissions of 2.231 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .811 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.218 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .735 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S055
Segment No: 03, ISOCURE/SIGMA CURE RESIN, PART 2

Actual Annual:	62 lb/ton Handled * 120 tons * 40% (capture efficiency) * 1 ton/2,000 lb = 1.487 TPY.
Maximum Annual:	62 lb/ton Handled * 173 tons * 40% (capture efficiency) * 1 ton/2,000 lb = 2.145 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 2.145 TPY.
Average Hourly:	*Actual annual emissions of 1.487 TPY / 5,500. hr/yr act. * 2,000 lb/ton = .541 lb/hr.*
Maximum Hourly:	Maximum annual emissions of 2.145 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .49 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for ISOCURE MACHINES

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E072 - REFRACTORY COATING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F015
Emission Unit ID:	E072
Source Desc:	REFRACTORY COATING
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200601-57C

Equipment Information

Equip. Type:	REFRACTORY COATING
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 274.315 TPY OF REFRACTORY COATING AND 80.45 TPY OF IPA.

Description of Operation:

REFRACTORY COATINGS ARE APPLIED TO BOTH MOLDS (#4 AND #10 MOLDS) AND CORES (AIRSET, ISOCURE AND PEPSET CORES). CURRENT REFRACTORY MATERIALS ARE DURATHERM 4117 AND ACRO-LITE 4416. BOTH MATERIALS ARE PASTE AND THEY ARE MIXED WITH ISOPROPYL ALCOHOL BEFORE BEING APPLIED ONTO MOLD OR CORE PARTS. THE REFRACTORY COATING IS APPLIED BY SPRAYING AT THE ISOCURE CORE, #4 MOLD AND #10 MOLD. MANUAL BRUSH-ON PROCESS IS USED IN THE AIRSET CORE AND PEPSET CORE OPERATIONS.

ALLOWABLE PARTICULATE EMISSIONS ARE BASED ON THE TOTAL AMOUNT OF REFACTIVE COATING USED OR 131.671 TPY / 1,920 HR/YR = 0.069 TPH (OR 138 LB/HR).

VOC USAGES ARE THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED AS THINNER FOR THE REFACTORY MATERIALS. VOC EMISSIONS ARE 100 PERCENT OF VOC USAGES FOR THE ISOCURE CORE AND #4 MOLD OR 28% OF THE TOTAL VOC USAGES. VOC EMISSIONS ARE 50% REDUCED BECAUSE OF FLAME-OFF FOR USAGES IN AIRSET CORE, PEPSET CORE, AND #10 MOLD OR 72% OF THE TOTAL VOC USAGES. EMISSION REDUCTION FROM FLAME-OFF IS ESTIMATED AT 65%.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	28%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).									
S056	72%	35	0.67	[N/A]	0.352	1,900	FLAMEOFF	MISCELLANEOUS CONTROL DEVICES	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS FROM ISOCURE REFRACTORY COATING PROCESS.									

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	REFACTORY COATINGS	30400398	1,920	4,000	131.67	274.32	0.07	0.668
Comments:	1996 USAGE WAS 131.671 TONS FOR DURATHERM AND ACRO-LITE. MAXIMUM ANNUAL USAGE = 274.315 TPY. ALLOWABLE EMISSION RATE OF 0.069 TPH OR 138 LB/HR.							
02	ISOPROPANOL	30400398	1,920	4,000	54.88	80.45	Not Appl.	Not Appl.
Comments:	1996 USAGE WAS 54.875 TONS. MAXIMUM ANNUAL USAGE IS 80.45 TPY.							

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0031	PARTICULATE MATTER (TSP)	0.46	lb/hr	PERMIT LIMIT
	Comments:	PERMIT LIMIT FOR PARTICULATE EMISSIONS FROM SPRAY GUN APPLICATION OF REFRACTORY COATING.			
02	0028	ISOPROPANOL	2000	lb/ton Handled	MATERIAL BALANCE
	Comments:	ISOPROPANOL IS 100 PERCENT.			
02	0028	VOLATILE ORGANIC COMPOUND	2000	lb/ton Handled	MATERIAL BALANCE
	Comments:	ISOPROPANOL IS ALSO 100 PERCENT VOC.			

Emission Source Fact Sheet

F015 - ISOCURE CORE SYSTEM
E072 - REFRACTORY COATING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
ISOPROPANOL	02	S053	Stack	0%	0%	☐	16.005	11.263	Not Appl.	15.365	22.526	22.526
	02	S056	Stack	65%	0%	☐	14.405	10.137	Not Appl.	13.829	20.273	20.273
Total Emissions of ISOPROPANOL from REFRACTORY COATING:							**30.41**	**21.4**	**Not Appl.**	**29.194**	**42.799**	**42.799**
PARTICULATE MATTER (TSP)	01	S053	Stack	67%	0%	☐	.46	.46	.668	.442	.92	2.925
	01	S056	Stack	0%	0%	☐	.46	.46	.668	.442	.92	2.925
Total Emissions of PARTICULATE MATTER (TSP) from REFRACTORY COATING:							**.92**	**.92**	**1.336**	**.883**	**1.84**	**5.85**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S053	Stack	0%	0%	☐	16.005	11.263	Not Appl.	15.365	22.526	22.526
	02	S056	Stack	65%	0%	☐	14.405	10.137	Not Appl.	13.829	20.273	20.273
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from REFRACTORY COATING:							**30.41**	**21.4**	**Not Appl.**	**29.194**	**42.799**	**42.799**

Supporting Emission Calculations

Emission Calculations for ISOPROPANOL (CAS 67-63-0)
Stack ID or Designation: S053
Segment No: 02, ISOPROPANOL

Actual Annual:	2,000 lb/ton Handled * 55 tons * 28% (capture efficiency) * 1 ton/2,000 lb = 15.365 TPY.
Maximum Annual:	2,000 lb/ton Handled * 80 tons * 28% (capture efficiency) * 1 ton/2,000 lb = 22.526 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 22.526 TPY.
Average Hourly:	Actual annual emissions of 15.365 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 16.005 lb/hr.
Maximum Hourly:	Maximum annual emissions of 22.526 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 11.263 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for ISOPROPANOL (CAS 67-63-0)
Stack ID or Designation: S056
Segment No: 02, ISOPROPANOL

Actual Annual:	2,000 lb/ton Handled * 55 tons * 72% (capture efficiency) * (1 - 65% control eff.) * 1 ton/2,000 lb = 13.829 TPY.
Maximum Annual:	2,000 lb/ton Handled * 80 tons * 72% (capture efficiency) * (1 - 65% control eff.) * 1 ton/2,000 lb = 20.273 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 20.273 TPY.
Average Hourly:	Actual annual emissions of 13.829 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 14.405 lb/hr.
Maximum Hourly:	Maximum annual emissions of 20.273 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 10.137 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S053
Segment No: 01, REFACTORY COATINGS

Actual Annual:	0.46 lb/hr * 1,920 hr/yr act. * 1 ton/2,000 lb = .442 TPY.
Maximum Annual:	0.46 lb/hr (specified emission factor) * 4,000 hr/yr maximum * 1 ton/2,000 lb = .92 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .668 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 2.925 TPY.
Average Hourly:	Actual annual emissions of .442 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .46 lb/hr.
Maximum Hourly:	Maximum annual emissions of .92 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .46 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of .069 ton/hr or 138 lb/hr. Calculation : 0.55 lb/hr + (138 - 100) * (0.31 / 100) lb/hr = .668 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S056
Segment No: 01, REFACTORY COATINGS

Actual Annual:	0.46 lb/hr * 1,920 hr/yr act. * 1 ton/2,000 lb = .442 TPY.
Maximum Annual:	0.46 lb/hr (specified emission factor) * 4,000 hr/yr maximum * 1 ton/2,000 lb = .92 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .668 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 2.925 TPY.
Average Hourly:	Actual annual emissions of .442 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .46 lb/hr.
Maximum Hourly:	Maximum annual emissions of .92 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .46 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of .069 ton/hr or 138 lb/hr. Calculation : 0.55 lb/hr + (138 - 100) * (0.31 / 100) lb/hr = .668 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S053
Segment No: 02, ISOPROPANOL

Actual Annual:	2,000 lb/ton Handled * 55 tons * 28% (capture efficiency) * 1 ton/2,000 lb = 15.365 TPY.
Maximum Annual:	2,000 lb/ton Handled * 80 tons * 28% (capture efficiency) * 1 ton/2,000 lb = 22.526 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 22.526 TPY.
Average Hourly:	Actual annual emissions of 15.365 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 16.005 lb/hr.
Maximum Hourly:	Maximum annual emissions of 22.526 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 11.263 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S056
Segment No: 02, ISOPROPANOL

Actual Annual:	2,000 lb/ton Handled * 55 tons * 72% (capture efficiency) * (1 - 65% control eff.) * 1 ton/2,000 lb = 13.829 TPY.
Maximum Annual:	2,000 lb/ton Handled * 80 tons * 72% (capture efficiency) * (1 - 65% control eff.) * 1 ton/2,000 lb = 20.273 TPY.
Allowable Annual:	Permit is federally enforceable; therefore, allowable emissions or potential-to-emit (PTE) is equal to maximum annual emission rate calculated above or 20.273 TPY.
Average Hourly:	Actual annual emissions of 13.829 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 14.405 lb/hr.
Maximum Hourly:	Maximum annual emissions of 20.273 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 10.137 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for REFRACTORY COATING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E073 - PEPSET BINDER BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F016
Equipment Desc:	PEPSET BINDER BULK STORAGE TANK
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	12	5.5	ft
Tank Vol. Capacity:	1850		gals
Average Liquid Height:	6		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	RED PRIMER		
Vapor Recovery Installed?	☐		

General Source Comments

THE PEPSET BINDER BULK STORAGE TANK IS A 1,850-GALLON CAPACITY TANK. IT HOLDS PEPSET BINDER RESIN FOR THE PEPSET CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S057	25	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE PEPSET BINDER BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Maximum
01	PEPSET BINDER BULK STORAGE TANK	30400398	11.782	42.22

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
FORMALDEHYDE	01	S057	0%	☒	Negligible	Negligible	2.5E-05	5.0E-05	5.0E-05
Total Emissions of FORMALDEHYDE from PEPSET BINDER BULK STORAGE TANK:							**2.5E-05**	**5.0E-05**	**5.0E-05**
PHENOL	01	S057	0%	☒	Negligible	Negligible	1.5E-05	3.0E-05	3.0E-05
Total Emissions of PHENOL from PEPSET BINDER BULK STORAGE TANK:							**1.5E-05**	**3.0E-05**	**3.0E-05**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S057	0%	☐	Negligible	Negligible	4.0E-04	8.6E-04	8.6E-04
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from PEPSET BINDER BULK STORAGE TANK:							**4.0E-04**	**8.6E-04**	**8.6E-04**

Supporting Emission Calculations

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S057
Segment No: 01

Actual Annual:	Actual annual emissions are 0.05 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.10 lb/yr.
Potential Annual:	Potential annual emissions are 0.10 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S057
Segment No: 01

Actual Annual:	Actual annual emissions are 0.03 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.06 lb/yr.
Potential Annual:	Potential annual emissions are 0.06 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S057
Segment No: 01

Actual Annual:	Actual annual emissions are 0.79 lb/yr.
Maximum Annual:	Maximum annual emissions are 1.72 lb/yr.
Potential Annual:	Potential annual emissions are 1.72 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for PEPSET BINDER BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E073 - PEPSET BINDER BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F016
Equipment Desc:	PEPSET BINDER BULK STORAGE TANK
Building No.:	SHELL CORE BUILDING
UTM Location:	**East:** 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	12	5.5	ft
Tank Vol. Capacity:	1850		gals
Average Liquid Height:	6		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	RED PRIMER		
Vapor Recovery Installed?	☐		

General Source Comments

THE PEPSET BINDER BULK STORAGE TANK IS A 1,850-GALLON CAPACITY TANK. IT HOLDS PEPSET BINDER RESIN FOR THE PEPSET CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S057	25	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE PEPSET BINDER BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	PEPSET BINDER BULK STORAGE TANK	30400398	11.782	42.22

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
FORMALDEHYDE	01	S057	0%	☒	Negligible	Negligible	2.5E-05	5.0E-05	5.0E-05
Total Emissions of FORMALDEHYDE from PEPSET BINDER BULK STORAGE TANK:							**2.5E-05**	**5.0E-05**	**5.0E-05**
PHENOL	01	S057	0%	☒	Negligible	Negligible	1.5E-05	3.0E-05	3.0E-05
Total Emissions of PHENOL from PEPSET BINDER BULK STORAGE TANK:							**1.5E-05**	**3.0E-05**	**3.0E-05**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S057	0%	☐	Negligible	Negligible	4.0E-04	8.6E-04	8.6E-04
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from PEPSET BINDER BULK STORAGE TANK:							**4.0E-04**	**8.6E-04**	**8.6E-04**

Supporting Emission Calculations

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S057
Segment No: 01

Actual Annual:	Actual annual emissions are 0.05 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.10 lb/yr.
Potential Annual:	Potential annual emissions are 0.10 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S057
Segment No: 01

Actual Annual:	Actual annual emissions are 0.03 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.06 lb/yr.
Potential Annual:	Potential annual emissions are 0.06 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S057
Segment No: 01

Actual Annual:	Actual annual emissions are 0.79 lb/yr.
Maximum Annual:	Maximum annual emissions are 1.72 lb/yr.
Potential Annual:	Potential annual emissions are 1.72 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for PEPSET BINDER BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E075 - PEPSET ACID BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F016
Equipment Desc:	PEPSET ACID BULK STORAGE TANK
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	7	8	ft
Tank Vol. Capacity:	2500		gals
Average Liquid Height:	3.5		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. CONE ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	WHITE		
Vapor Recovery Installed?	☐		

General Source Comments

THE PEPSET ACID BULK STORAGE TANK IS A 2,500-GALLON CAPACITY TANK. IT HOLDS PEPSET ACID FOR THE PEPSET CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S058	25	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE PEPSET ACID BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	PEPSET ACID BULK STORAGE TANK	30400398	6.129	22.06

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
BENZENE	01	S058	0%	☒	Negligible	Negligible	3.0E-05	6.0E-05	6.0E-05
Total Emissions of BENZENE from PEPSET ACID BULK STORAGE TANK:							**3.0E-05**	**6.0E-05**	**6.0E-05**
METHANOL	01	S058	0%	☒	Negligible	Negligible	3.1E-03	6.1E-03	6.1E-03
Total Emissions of METHANOL from PEPSET ACID BULK STORAGE TANK:							**3.1E-03**	**6.1E-03**	**6.1E-03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S058	0%	☐	Negligible	Negligible	4.4E-03	8.5E-03	8.5E-03
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from PEPSET ACID BULK STORAGE TANK:							**4.4E-03**	**8.5E-03**	**8.5E-03**

Supporting Emission Calculations

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S058
Segment No: 01

Actual Annual:	Actual annual emissions are 8.78 lb/yr.
Maximum Annual:	Maximum annual emissions are 17.06 lb/yr.
Potential Annual:	Potential annual emissions are 17.06 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S058
Segment No: 01

Actual Annual:	Actual annual emissions are 6.25 lb/yr.
Maximum Annual:	Maximum annual emissions are 12.16 lb/yr.
Potential Annual:	Potential annual emissions are 12.16 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S058
Segment No: 01

Actual Annual:	Actual annual emissions are 0.06 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.12 lb/yr.
Potential Annual:	Potential annual emissions are 0.12 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for PEPSET ACID BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E075 - PEPSET ACID BULK STORAGE TANK

General Source Information

Facility:	CV&F
Process ID:	F016
Equipment Desc:	PEPSET ACID BULK STORAGE TANK
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	7	8	ft
Tank Vol. Capacity:	2500		gals
Average Liquid Height:	3.5		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. CONE ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	WHITE		
Vapor Recovery Installed?	☐		

General Source Comments

THE PEPSET ACID BULK STORAGE TANK IS A 2,500-GALLON CAPACITY TANK. IT HOLDS PEPSET ACID FOR THE PEPSET CORE PROCESS. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S058	25	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE PEPSET ACID BULK STORAGE TANK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	PEPSET ACID BULK STORAGE TANK	30400398	6.129	22.06

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
BENZENE	01	S058	0%	☒	Negligible	Negligible	3.0E-05	6.0E-05	6.0E-05
Total Emissions of BENZENE from PEPSET ACID BULK STORAGE TANK:							**3.0E-05**	**6.0E-05**	**6.0E-05**
METHANOL	01	S058	0%	☒	Negligible	Negligible	3.1E-03	6.1E-03	6.1E-03
Total Emissions of METHANOL from PEPSET ACID BULK STORAGE TANK:							**3.1E-03**	**6.1E-03**	**6.1E-03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S058	0%	☐	Negligible	Negligible	4.4E-03	8.5E-03	8.5E-03
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from PEPSET ACID BULK STORAGE TANK:							**4.4E-03**	**8.5E-03**	**8.5E-03**

Supporting Emission Calculations

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S058
Segment No: 01

Actual Annual:	Actual annual emissions are 8.78 lb/yr.
Maximum Annual:	Maximum annual emissions are 17.06 lb/yr.
Potential Annual:	Potential annual emissions are 17.06 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S058
Segment No: 01

Actual Annual:	Actual annual emissions are 6.25 lb/yr.
Maximum Annual:	Maximum annual emissions are 12.16 lb/yr.
Potential Annual:	Potential annual emissions are 12.16 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S058
Segment No: 01

Actual Annual:	Actual annual emissions are 0.06 lb/yr.
Maximum Annual:	Maximum annual emissions are 0.12 lb/yr.
Potential Annual:	Potential annual emissions are 0.12 lb/yr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for PEPSET ACID BULK STORAGE TANK

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E077 - PEPSET SAND HEATER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F016
Emission Unit ID:	E077
Source Desc:	PEPSET SAND HEATER
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400398-32C

Equipment Information

Equip. Type:	ELECTRIC SAND HEATER
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 4.029 TPH AND 16,117 TPY OF SAND

Description of Operation:

THE PEPSET CORE SAND FROM THE #3 BULK SAND STORAGE SILO (E060) IS TRANSFERRED TO AN ELECTRIC HEATER (E077) BEFORE BEING PROCESSED IN THE SAND MIXER (E078). BECAUSE OF THE FLUIDIZED EFFECT, THE SAND HEATER IS EQUIPPED WITH A CYCLONE (CD033) TO RECOVER THE HEATED SAND. DISCHARGE FROM THE PEPSET CORE SAND HEATER IS ROUTED THROUGH THE #3 BULK SAND SILO BAGHOUSE (CD025) PRIOR TO BEING DISCHARGED.

PARTICULATE EMISSIONS FROM THIS PROCESS ARE SUBJECT TO CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, SECTION 4-41, RULE 26.12 (2). THE ALLOWABLE EMISSION CALCULATIONS ARE BASED ON 0.02 GR/DSCF FROM THE BAGHOUSE DISCHARGE (S048). EMISSIONS DUE TO THE FLUIDIZED HEATING IN THE SAND HEATERS ARE LESS THAN 0.5 TPH OF PARTICULATES; THEREFORE THESE HEATING PROCESSES ARE CONSIDERED AS INSIGNIFICANT ACTIVITIES PURSUANT TO RULE 4-56 (c) (12) (ii) OF THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S048	100%	10	0.5	[N/A]	0.196	1,000	CD025	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM THE BAGHOUSE CONTROLLING THE NEW SAND SILO (900-TON SILO) AND THE PEPSET CORE SAND HEATER.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	PEPSET CORE SAND HEATING (ELECTRIC)	30400398	1,920	4,000	4,498.00	16,117.00	4.03	0.171

Comments: THE TOTAL SAND HANDLED THROUGH THE THREE SAND HEATERS ARE APPROXIMATELY 4,498 TONS OF NEW SAND FOR FISCAL YEAR 1996. MAXIMUM ANNUAL TONNAGES OF SAND PROCESSED THROUGH THE HEATERS ARE 4,498 TONS * (180,050/50,248 RATIO OF MAXIMUM TO AVERAGE METAL TONNAGES) OR APPROXIMATELY 16,117 TPY. THE AVERAGE HOURS OF OPERATION ARE 1,920 HR/YR FOR FISCAL YEAR 1996. THE MAXIMUM HOURS OF OPERATION ARE APPROXIMATELY 4,000 HR/YR. ALLOWABLE EMISSION RATE IS BASED ON 16,117 TPY / 4,000 HR/YR OR 4.029 TPH (8,058 LB/HR).

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E077 - PEPSET SAND HEATER

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E077 - PEPSET SAND HEATER

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S048	Stack	99%	0%	☐	6.79E-04	.001	.171	6.52E-04	.002	.751
Total Emissions of PARTICULATE MATTER (TSP) from PEPSET SAND HEATER:							**6.79E-04**	**.001**	**.171**	**6.52E-04**	**.002**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S048

Segment No: 01, PEPSET CORE SAND HEATING (ELECTRIC)

Actual Annual:	.029 lb/ton Handled * 4,498 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = 6.52E-04 TPY.
Maximum Annual:	.029 lb/ton Handled * 16,117 tons * (1 - 99% control eff.) * 1 ton/2,000 lb = .002 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of 6.52E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 6.79E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for PEPSET SAND HEATER

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E078 - SAND MIXER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F016
Emission Unit ID:	E078
Source Desc:	SAND MIXER
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400398-34C

Equipment Information

Equip. Type:	SAND MIXER
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 16,117 TPY OF SAND AND 317.08 TPY OF PEPSET BINDER AND ACID.

Description of Operation:

A MIXER IS USED TO COMBINE THE PEPSET PHENOLIC BINDER AND ACID CATALYST WITH THE PEPSET CORE SAND. ONCE THERE INGREDIENTS ARE MIXED, THE COATED SAND HAS A CERTAIN SET TIME FOR CORE FORMING BEFORE BECOMING HARDENED OR SET.

PARTICULATE EMISSIONS FROM THE SAND MIXER ARE BASED ON SAND HANDLING EMISSION FACTOR. THE TOTAL TONNAGE PROCESSED IS THE TOTAL OF MIXED SAND, BINDER, AND ACID CATALYST USED (APPROXIMATLEY 4,498 TONS OF SAND, 58.60 TONS OF PHENOLIC BINDER, AND 30.43 TONS OF ACID CATALYST OR 4,587.03 TONS TOTAL. MAXIMUM ANNUAL USAGES ARE 16,117 TPY OF NEW SAND, 208.04 TPY OF PHENOLIC BINDER, AND 109.04 TPY OF ACID CATALYST BASED ON 4,000 HOURS OF OPERATION.

VOLATILE COMPONENTS OF THE BINDER AND CATALYST MATERIALS USED ARE ALSO ESTIMATED BASED ON MATERIAL BALANCE. EMISSIONS FROM THE PEPSET CORE SAND MIXER ARE UNCONTROLLED AND ARE INITIALLY RELEASED INSIDE THE SHELL CORE BUILDING. TSP EMISSIONS FROM THE SAND MIXING IS ESTIMATED USING 67% BUILDING SETTLING FACTOR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	MULLING OF SAND AND PEPSET RESINS	30400398	1,920	4,000	4,498.00	16,117.00	4.11	10.573

Comments: APPROXIMATELY 4,498 TONS OF NEW SAND WERE USED IN FISCAL YEAR 1996 FOR MAKING PEPSET CORES. MAXIMUM TONNAGE OF SAND USED IS 16,117 TONS (4,498 TONS * 180,050/50,248). THE MAXIMUM HOURLY SAND USAGE RATE IS 4.029 TPH. THE HOURLY AMOUNT OF RESIN MATERIALS USAGE RATES ARE APPROXIMATELY 0.022 TPH AVERAGE AND 0.079 TPH MAXIMUM. THE ALLOWABLE EMISSIONS FOR TSP IS BASED ON 4.029 TPH + 0.079 TPH OR 4.108 TPH (8,216 LB/HR).

02	VOLATILES FROM PEPSET BINDER RESIN	30400398	1,920	4,000	58.60	208.04	Not Appl.	Not Appl.

Comments: APPROXIMATELY 58.60 TONS OF PEPSET NO BAKE BINER RESIN WERE USED IN FISCAL YEAR 1996 FOR MAKING PEPSET CORES. MAXIMUM TONNAGE OF PEPSET NO BAKE BINDER RESIN USED IS 208.04 TONS (58.60 TONS * 180,050/50,248). THE HOURLY AMOUNT OF RESIN MATERIALS USAGE RATES ARE APPROXIMATELY 0.031 TPH AVERAGE AND 0.052 TPH MAXIMUM.

03	VOLATILES FROM PEPSET NO-BAKE ACID	30400398	1,920	4,000	30.43	109.04	Not Appl.	Not Appl.

Comments: APPROXIMATELY 30.43 TONS OF PEPSET NO BAKE ACID WERE USED IN FISCAL YEAR 1996 FOR MAKING PEPSET CORES. MAXIMUM TONNAGE OF PEPSET NO BAKE ACID USED IS 109.04 TONS (30.43 TONS * 180,050/50,248). THE HOURLY AMOUNT OF RESIN MATERIALS USAGE RATES ARE APPROXIMATELY 0.016 TPH AVERAGE AND 0.027 TPH MAXIMUM.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0017	PARTICULATE MATTER (TSP)	1.5	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA.			
02	C047	FORMALDEHYDE	0.242	lb/ton Handled	MATERIAL BALANCE
	Comments:	FORMALDEHYDE INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 1.10% BY WEIGHT OR APPROXIMATELY 22 LB/TON (2,000 * 0.011), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (22 LB/TON * 0.011 = 0.242 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 022, BORDEN SUPER SET 324 NO-BAKE PHENOLIC RESIN. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
02	C047	PHENOL	0.083	lb/ton Handled	MATERIAL BALANCE
	Comments:	PHENOL INGREDIENT IN THE PHENOLIC BINDER BINDER IS LISTED AS 13.39% BY WEIGHT OR APPROXIMATELY 267.8 LB/TON (2,000 * 0.1339). THIS INGREDIENT IS FORMULATED AS A REACTIVE INGREDIENT; THUS, THE FREE PHENOL IS LESS THAN 1 PERCENT OR 267.8 * 0.01 = 2.678 LB/TON, OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (2.678 LB/TON * 0.031 = 0.083 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 022, BORDEN SUPER SET 324 NO-BAKE PHENOLIC RESIN. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
02	C047	VOLATILE ORGANIC COMPOUND	62	lb/ton Handled	MATERIAL BALANCE
	Comments:	BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%). VOC EMISSIONS = 2,000 LB * 0.031 = 62 LB/TON.			
03	0024	BENZENE	0.074	lb/ton Handled	MATERIAL BALANCE
	Comments:	BENZENE INGREDIENT IN THE ISOCURE BINDER IS LISTED AS 0.12% BY WEIGHT OR APPROXIMATELY 24 LB/TON (2,000 * 0.012), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (2.4 LB/TON * 0.031 = 0.074 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 021, BORDEN SUPER SET BC61 NO-BAKE ACID CATALYST. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
03	0024	METHANOL	6.082	lb/ton Handled	MATERIAL BALANCE
	Comments:	METHANOL INGREDIENT IN THE NO-BAKE PHENOLIC RESIN IS LISTED AS 9.81% BY WEIGHT OR APPROXIMATELY 196.2 LB/TON (2,000 * 0.0981), OF WHICH 3.1% MAY BE EVAPORATED DURING MIXING AND MOLD FORMING (196.2 LB/TON * 0.031 = 6.082 LB/TON). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 021, BORDEN SUPER SET BC61 NO-BAKE ACID CATALYST. ADDITIONAL INFORMATION ARE FROM BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%).			
03	0024	VOLATILE ORGANIC COMPOUND	62	lb/ton Handled	MATERIAL BALANCE
	Comments:	BORDEN'S CHEMIST ESTIMATES THAT APPROXIMATELY 0.62 LB OF VOC IS RELEASED FOR 20 LB OF RESIN USED (OR 3.1%). VOC EMISSIONS = 2,000 LB * 0.031 = 62 LB/TON.			

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E078 - SAND MIXER

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	03	S053	Fugitive	0%	0%	☒	.001	.002	Not Appl.	.001	.004	.009
Total Emissions of BENZENE from SAND MIXER:							**.001**	**.002**	**Not Appl.**	**.001**	**.004**	**.009**
FORMALDEHYDE	02	S053	Fugitive	0%	0%	☒	.007	.013	Not Appl.	.007	.025	.055
Total Emissions of FORMALDEHYDE from SAND MIXER:							**.007**	**.013**	**Not Appl.**	**.007**	**.025**	**.055**
METHANOL	03	S053	Fugitive	0%	0%	☒	.096	.166	Not Appl.	.093	.332	.726
Total Emissions of METHANOL from SAND MIXER:							**.096**	**.166**	**Not Appl.**	**.093**	**.332**	**.726**
PARTICULATE MATTER (TSP)	01	S053	Fugitive	67%	0%	☐	1.16	1.994	10.573	1.113	3.989	46.309
Total Emissions of PARTICULATE MATTER (TSP) from SAND MIXER:							**1.16**	**1.994**	**10.573**	**1.113**	**3.989**	**46.309**
PHENOL	02	S053	Fugitive	0%	0%	☒	.003	.004	Not Appl.	.002	.009	.019
Total Emissions of PHENOL from SAND MIXER:							**.003**	**.004**	**Not Appl.**	**.002**	**.009**	**.019**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S053	Fugitive	0%	0%	☐	1.892	3.225	Not Appl.	1.817	6.449	14.124
	03	S053	Fugitive	0%	0%	☐	.983	1.69	Not Appl.	.943	3.38	7.403
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from SAND MIXER:							**2.875**	**4.915**	**Not Appl.**	**2.76**	**9.829**	**21.527**

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S053
Segment No: 03, VOLATILES FROM PEPSET NO-BAKE ACID

Actual Annual:	.074 lb/ton Handled * 30 tons * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	.074 lb/ton Handled * 109 tons * 1 ton/2,000 lb = .004 TPY.
Allowable Annual:	.004 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .009 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S053
Segment No: 02, VOLATILES FROM PEPSET BINDER RESIN

Actual Annual:	.242 lb/ton Handled * 59 tons * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	.242 lb/ton Handled * 208 tons * 1 ton/2,000 lb = .025 TPY.
Allowable Annual:	.025 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .055 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .007 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .025 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .013 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for METHANOL (CAS 67-56-1)
Stack ID or Designation: S053
Segment No: 03, VOLATILES FROM PEPSET NO-BAKE ACID

Actual Annual:	6.082 lb/ton Handled * 30 tons * 1 ton/2,000 lb = .093 TPY.
Maximum Annual:	6.082 lb/ton Handled * 109 tons * 1 ton/2,000 lb = .332 TPY.
Allowable Annual:	.332 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .726 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .093 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .096 lb/hr.
Maximum Hourly:	Maximum annual emissions of .332 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .166 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S053
Segment No: 01, MULLING OF SAND AND PEPSET RESINS

Actual Annual:	1.5 lb/ton Handled * 4,498 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.113 TPY.
Maximum Annual:	1.5 lb/ton Handled * 16,117 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.989 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 10.573 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 46.309 TPY.
Average Hourly:	Actual annual emissions of 1.113 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.16 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.989 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.994 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 4.108 ton/hr or 8,216 lb/hr. Calculation : 10.4 lb/hr + (8,216 - 8,000) * (0.8 / 1,000) lb/hr = 10.573 lb/hr.

Emission Calculations for PHENOL (CAS 108-95-2)
Stack ID or Designation: S053
Segment No: 02, VOLATILES FROM PEPSET BINDER RESIN

Actual Annual:	.083 lb/ton Handled * 59 tons * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	.083 lb/ton Handled * 208 tons * 1 ton/2,000 lb = .009 TPY.
Allowable Annual:	.009 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .019 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .002 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S053
Segment No: 02, VOLATILES FROM PEPSET BINDER RESIN

Actual Annual:	62 lb/ton Handled * 59 tons * 1 ton/2,000 lb = 1.817 TPY.
Maximum Annual:	62 lb/ton Handled * 208 tons * 1 ton/2,000 lb = 6.449 TPY.
Allowable Annual:	6.449 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 14.124 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.817 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.892 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.449 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 3.225 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S053
Segment No: 03, VOLATILES FROM PEPSET NO-BAKE ACID

Actual Annual:	62 lb/ton Handled * 30 tons * 1 ton/2,000 lb = .943 TPY.
Maximum Annual:	62 lb/ton Handled * 109 tons * 1 ton/2,000 lb = 3.38 TPY.
Allowable Annual:	3.38 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 7.403 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .943 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .983 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.38 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.69 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for SAND MIXER

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E079 - CORE FORMING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F016
Emission Unit ID:	E079
Source Desc:	CORE FORMING
Building No.:	SHELL CORE BUILDING
UTM Location:	East: [Not Available North: [Not Available]
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400398-32C

Equipment Information

Equip. Type:	CORE FORMING EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 4.1112 TPH OR 16,442.87 TPY OF CORE SAND AND ADDITIVES.

Description of Operation:

MATERIALS USED FOR MAKING PEPSET CORES INCLUDES NO-BAKE COATED SAND, RELEASE AGENT SPRAYED ON MOLD PATTERNS, ADHESIVES USED FOR HALVES CORES, AND REFRACTORY COATING APPLIED ONTO SURFACES OF COMPLETED CORES. FOR FISCAL YEAR 96, AMOUNT OF THESE MATERIALS USED WERE 4,587.03 TONS OF COATED CORE SAND; AND 2.45 TONS OF MOLD RELEASE AGENTS. (EMISSIONS FROM ADHESIVE USAGES ARE NEGLIGIBLE; AND EMISSIONS FROM REFRACTORY COATING ARE CALCULATED ELSEWHERE, SEE E072). THE MAXIMUM ANNUAL TONNAGES OF MATERIALS USED ARE ESTIMATED FROM MULTIPLYING THE AVERAGE ANNUAL USAGES WITH A RATIO OF 180,050/50,248 OR 3.5832.

EMISSION CALCULATIONS FOR THE PEPSET CORE FORMING INCLUDES THE PROCESSES OF CORE SAND HANDLING AND THE USAGES OF MOLD RELEASE AGENT/PARTING OIL.

EMISSIONS FROM THE PEPSET CORE FORMING ARE RELEASED AS FUGITIVE EMISSIONS. EMISSIONS OF VOLATILES ARE CALCULATED AS 100 PERCENT OF USAGES. EMISSIONS OF TSP FROM SAND HANDLING ARE EFFECTED (REDUCED) BY THE 67% SETTLING FACTOR FOR THE SHELL CORE BUILDING. PARTICULATE EMISSIONS FROM THE CORE FORMING ARE SUBJECT TO THE CHATTANOOGA RULE 10.2, SCHEDULE 2 OF TABLE 2.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	PEPSET CORE FORMING	30400398	1,920	4,000	4,587.03	16,434.08	4.11	10.578

Comments: AVERAGE ANNUAL TONNAGE OF PEPSET CORE SAND (SAND & BINDER MATERIALS) PROCESSED WERE 4,587.03 TONS FOR FISCAL YEAR 1996. MAXIMUM TONNAGE OF PEPSET CORE SAND IS 16,434.08 TPY. THE ALLOWABLE EMISSION RATE OF TSP IS BASED ON 4.109 TPH OF CORE SAND + 0.0022 TPH OF MOLD RELEASE AGENT OR 4.1112 TPH (8,222.4 LB/HR).

02	PARTING COMPOUND NIX STIX 32	30400398	1,920	4,000	1.38	4.94	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL AMOUNT OF NIX STIX 32 PARTING COMPOUND USED WAS 1.38 TONS FOR FISCAL YEAR 1996. MAXIMUM ANNUAL USAGE IS CALCULATED AS FOLLOWS 1.38 TPY * 3.5832 = 4.94 TPY. EMISSION CALCULATIONS ASSUMED THAT 100% USAGES OF VOLATILE COMPOUNDS ARE RELEASED AS EMISSIONS.

03	PARTING COMPOUND NIX STIX 32	30400398	1,920	4,000	1.07	3.85	Not Appl.	Not Appl.

Comments: AVERAGE ANNUAL AMOUNT OF NIX STIX 32 PARTING COMPOUND USED WAS 1.07 TONS FOR FISCAL YEAR 1996. MAXIMUM ANNUAL USAGE IS CALCULATED AS FOLLOWS 1.07 TPY * 3.5832 = 3.85 TPY. EMISSION CALCULATIONS ASSUMED THAT 100% USAGES OF VOLATILE COMPOUNDS ARE RELEASED AS EMISSIONS.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0025	PARTICULATE MATTER (TSP)	1.03	lb/ton Handled	MAYSILLES'S REVIEW
	Comments:	SOURCE: JIM MAYSILLES, EPA, REVIEW OF FOUNDRY EMISSIONS DATA. UNCONTROLLED EMISSION FACTORS FOR SAND HANDLING.			
02	0029	LIGHT ALIPHATIC SOLVENT NAP	1400	lb/ton Handled	MATERIAL BALANCE
	Comments:	NAPHTHA INGREDIENT IS LISTED AS 70% BY WEIGHT OR APPROXIMATELY 1,400 LB/TON (2,000 * 0.70). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
02	0029	PROPYLENE CARBONATE	60	lb/ton Handled	MATERIAL BALANCE
	Comments:	PROPYLENE CARBONATE INGREDIENT IS LISTED AS 3% BY WEIGHT OR APPROXIMATELY 60 LB/TON (2,000 * 0.03). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
02	0029	VM&P NAPHTHA	60	lb/ton Handled	MATERIAL BALANCE
	Comments:	VM&P NAPHTHA INGREDIENT IS LISTED AS 3% BY WEIGHT OR APPROXIMATELY 60 LB/TON (2,000 * 0.03). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
02	0029	VOLATILE ORGANIC COMPOUND	1520	lb/ton Handled	MATERIAL BALANCE
	Comments:	TOTAL VOC = 60 + 60 + 1,400 = 1,520 LB/TON. THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0148, BORDEN NIX STIX 32 LIQUID PARTING COMPOUND.			
03	0030	SILICON BASED COMPOUNDS	90	lb/ton Handled	MATERIAL BALANCE
	Comments:	SILICON INGREDIENT IS ESTIMATED AS 15% BY WEIGHT AND 30% OF OVERSPRAY OR APPROXIMATELY 90 LB/TON (2,000 * 15% * 30%). THIS MATERIAL BALANCE IS BASED ON MSDS NO. 0158, BORDEN NIX STIX 93 RELEASE AGENT. MSDS SHOWS NO HAZARDOUS INGREDIENT. BORDEN'S REPRESENTATIVE (BRENDA DUKE AT 708-524-3152) CONFIRMED THAT THE MATERIAL IS A MIXTURE OF SILICON BASED MATERIALS AND WATER.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
LIGHT ALIPHATIC SOLVENT NAPHTHA	02	S053	Fugitive	0%	0%	☐	1.006	1.729	Not Appl.	.966	3.458	7.573
Total Emissions of LIGHT ALIPHATIC SOLVENT NAPHTHA from CORE FORMING:							**1.006**	**1.729**	**Not Appl.**	**.966**	**3.458**	**7.573**
PARTICULATE MATTER (TSP)	01	S053	Fugitive	67%	0%	☐	.812	1.396	10.578	.78	2.793	46.331
Total Emissions of PARTICULATE MATTER (TSP) from CORE FORMING:							**.812**	**1.396**	**10.578**	**.78**	**2.793**	**46.331**
PROPYLENE CARBONATE	02	S053	Fugitive	0%	0%	☐	.043	.074	Not Appl.	.041	.148	.325
Total Emissions of PROPYLENE CARBONATE from CORE FORMING:							**.043**	**.074**	**Not Appl.**	**.041**	**.148**	**.325**
SILICON BASED COMPOUNDS	03	S053	Fugitive	0%	0%	☐	.05	.087	Not Appl.	.048	.173	.379
Total Emissions of SILICON BASED COMPOUNDS from CORE FORMING:							**.05**	**.087**	**Not Appl.**	**.048**	**.173**	**.379**
VM&P NAPHTHA	02	S053	Fugitive	0%	0%	☐	.043	.074	Not Appl.	.041	.148	.325
Total Emissions of VM&P NAPHTHA from CORE FORMING:							**.043**	**.074**	**Not Appl.**	**.041**	**.148**	**.325**
VOLATILE ORGANIC COMPOUNDS (VOC)	02	S053	Fugitive	0%	0%	☐	1.093	1.877	Not Appl.	1.049	3.754	8.222
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from CORE FORMING:							**1.093**	**1.877**	**Not Appl.**	**1.049**	**3.754**	**8.222**

Supporting Emission Calculations

Emission Calculations for LIGHT ALIPHATIC SOLVENT NAPHTHA (CAS 8032-32-4)
Stack ID or Designation: S053
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	1,400 lb/ton Handled * 1.38 tons * 1 ton/2,000 lb = .966 TPY.
Maximum Annual:	1,400 lb/ton Handled * 4.94 tons * 1 ton/2,000 lb = 3.458 TPY.
Allowable Annual:	3.458 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 7.573 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .966 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.006 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.458 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.729 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S053
Segment No: 01, PEPSET CORE FORMING

Actual Annual:	1.03 lb/ton Handled * 4,587 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .78 TPY.
Maximum Annual:	1.03 lb/ton Handled * 16,434 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 2.793 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 10.578 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 46.331 TPY.
Average Hourly:	Actual annual emissions of .78 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .812 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.793 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.396 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of 4.111 ton/hr or 8,222 lb/hr. Calculation : 10.4 lb/hr + (8,222 - 8,000) * (0.8 / 1,000) lb/hr = 10.578 lb/hr.

Emission Calculations for PROPYLENE CARBONATE (CAS 108-32-7)
Stack ID or Designation: S053
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	60 lb/ton Handled * 1.38 tons * 1 ton/2,000 lb = .041 TPY.
Maximum Annual:	60 lb/ton Handled * 4.94 tons * 1 ton/2,000 lb = .148 TPY.
Allowable Annual:	.148 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .325 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .041 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .043 lb/hr.
Maximum Hourly:	Maximum annual emissions of .148 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .074 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for SILICON BASED COMPOUNDS
Stack ID or Designation: S053
Segment No: 03, PARTING COMPOUND NIX STIX 32

Actual Annual:	90 lb/ton Handled * 1.07 tons * 1 ton/2,000 lb = .048 TPY.
Maximum Annual:	90 lb/ton Handled * 3.85 tons * 1 ton/2,000 lb = .173 TPY.
Allowable Annual:	.173 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .379 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .048 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .05 lb/hr.
Maximum Hourly:	Maximum annual emissions of .173 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .087 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VM&P NAPHTHA (CAS 64742-89-8)
Stack ID or Designation: S053
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	60 lb/ton Handled * 1.38 tons * 1 ton/2,000 lb = .041 TPY.
Maximum Annual:	60 lb/ton Handled * 4.94 tons * 1 ton/2,000 lb = .148 TPY.
Allowable Annual:	.148 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .325 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .041 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .043 lb/hr.
Maximum Hourly:	Maximum annual emissions of .148 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .074 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S053
Segment No: 02, PARTING COMPOUND NIX STIX 32

Actual Annual:	1,520 lb/ton Handled * 1.38 tons * 1 ton/2,000 lb = 1.049 TPY.
Maximum Annual:	1,520 lb/ton Handled * 4.94 tons * 1 ton/2,000 lb = 3.754 TPY.
Allowable Annual:	3.754 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 8.222 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.049 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.093 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.754 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.877 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for CORE FORMING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F016 - PEPSET CORE SYSTEM
E081 - FLAME-OFF

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F016
Emission Unit ID:	E081
Source Desc:	FLAME-OFF
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	LAZY FLAME TORCH
Rated Heat Input Capacity:	0.565 MMBtu/hr
Maximum Heat Input Capacity:	0.565 MMBtu/hr
Avg. Oper. Heat Input Capacity:	0.565 MMBtu/hr

Description of Operation

A LAZY FLAME IS USED TO FLAME-OFF ALCOHOL EMISSIONS FROM REFRACTORY COATING PROCESS FOR AIRSET CORE MAKING, PEPSET CORE MAKING, AND THE #10 MOLD AREA. THE FLAME IS FUEL BY NATURAL GAS AND THE AVERAGE HEAT INPUT IS 0.565 MMBTU/HR (FROM 1.085 MMCF/YR * 1,000 BTU/CF * 1 YR/1,920 HR).

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400398	1,920	4,000	1.09	2.26

Comments: AVERAGE ANNUAL NATURAL GAS USAGE IS 1.085 MMCF/YR BASED ON 1996 FISCAL YEAR REPORT. THE MAXIMUM ANNUAL NATURAL GAS USAGE IS 1.085 MMCF/YR * 4,000 HR/YR / 1,920 HR/YR = 2.260 MMCF/YR. THUS, THE AVERAGE BURNER HEAT INPUT IS 1.085 MMCF/YR * 1,000 BTU/CF * 1 YR/1,920 HR OR APPROXIMATELY 0.565 MMBTU/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S053	Stack	0%	0%	☒	1.20E-04	1.20E-04	Not Appl.	1.15E-04	2.40E-04	5.25E-04
Total Emissions of BENZENE from FLAME-OFF:							**1.20E-04**	**1.20E-04**	**Not Appl.**	**1.15E-04**	**2.40E-04**	**5.25E-04**
CARBON MONOXIDE (CO)	01	S053	Stack	0%	0%	☐	.012	.012	Not Appl.	.011	.024	.052
Total Emissions of CARBON MONOXIDE (CO) from FLAME-OFF:							**.012**	**.012**	**Not Appl.**	**.011**	**.024**	**.052**
FORMALDEHYDE	01	S053	Stack	0%	0%	☒	2.37E-04	2.37E-04	Not Appl.	2.28E-04	4.75E-04	.001
Total Emissions of FORMALDEHYDE from FLAME-OFF:							**2.37E-04**	**2.37E-04**	**Not Appl.**	**2.28E-04**	**4.75E-04**	**.001**
NITROGEN OXIDES (NOx)	01	S053	Stack	0%	0%	☐	.057	.056	Not Appl.	.054	.113	.247
Total Emissions of NITROGEN OXIDES (NOx) from FLAME-OFF:							**.057**	**.056**	**Not Appl.**	**.054**	**.113**	**.247**
PARTICULATE MATTER (TSP)	01	S053	Stack	67%	0%	☐	.002	.002	.339	.002	.004	1.485
Total Emissions of PARTICULATE MATTER (TSP) from FLAME-OFF:							**.002**	**.002**	**.339**	**.002**	**.004**	**1.485**
SULFUR DIOXIDE (SO2)	01	S053	Stack	0%	0%	☐	3.39E-04	3.39E-04	2.26	3.26E-04	6.78E-04	9.899
Total Emissions of SULFUR DIOXIDE (SO2) from FLAME-OFF:							**3.39E-04**	**3.39E-04**	**2.26**	**3.26E-04**	**6.78E-04**	**9.899**
TOLUENE	01	S053	Stack	0%	0%	☒	5.99E-05	5.99E-05	Not Appl.	5.75E-05	1.20E-04	2.62E-04
Total Emissions of TOLUENE from FLAME-OFF:							**5.99E-05**	**5.99E-05**	**Not Appl.**	**5.75E-05**	**1.20E-04**	**2.62E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S053	Stack	0%	0%	☐	.003	.003	Not Appl.	.003	.006	.013
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from FLAME-OFF:							**.003**	**.003**	**Not Appl.**	**.003**	**.006**	**.013**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 1.15E-04 TPY.
Maximum Annual:	2.26 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 2.40E-04 TPY.
Potential Annual:	2.40E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 5.25E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.15E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.20E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.40E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.20E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .011 TPY.
Maximum Annual:	2.26 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .024 TPY.
Potential Annual:	.024 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .052 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .011 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .012 lb/hr.
Maximum Hourly:	Maximum annual emissions of .024 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .012 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 2.28E-04 TPY.
Maximum Annual:	2.26 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 4.75E-04 TPY.
Potential Annual:	4.75E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.28E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 2.37E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.75E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 2.37E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .054 TPY.
Maximum Annual:	2.26 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .113 TPY.
Potential Annual:	.113 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .247 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .054 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .057 lb/hr.
Maximum Hourly:	Maximum annual emissions of .113 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .056 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	2.26 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	Maximum allowable hourly emissions of .339 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 1.485 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.1, Schedule 1 of Table 1 for equipment built or installed before January 1, 1973. Q = .6 * .565 = .339 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = 3.26E-04 TPY.
Maximum Annual:	2.26 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = 6.78E-04 TPY.
Potential Annual:	Maximum allowable hourly emissions of 2.26 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 9.899 TPY.
Average Hourly:	Actual annual emissions of 3.26E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 3.39E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.78E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 3.39E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * .565 MMBtu/hr = 2.26 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 5.75E-05 TPY.
Maximum Annual:	2.26 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 1.20E-04 TPY.
Potential Annual:	1.20E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 2.62E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.75E-05 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 5.99E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.20E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 5.99E-05 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	2.26 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .006 TPY.
Potential Annual:	.006 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .013 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .006 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for FLAME-OFF

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F017 - SHELL CORE SYSTEM
E082 - SHELL CORE SAND HANDLING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F017
Emission Unit ID:	E082
Source Desc:	SHELL CORE SAND HANDLING
Building No.:	SHELL CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	SHELL CORE MACHINES
Make/Model:	USPIPE DESIGN
Mfg Date:	.
Installed Date:	
Max. Capacity:	MAXIMUM 0.5 TPH AND 75 TPY OF COATED SHELL CORE SAND

Description of Operation:

SHELL CORES ARE PREPARED USING FOUR SHELL CORE MACHINE UNITS DESIGNED AS 180-1, 180-2, 360-1 AND 360-2. AT ANY GIVEN TIME, TWO UNITS ARE USED IN THE MANUFACTURING OF SHELL CORES, WHILE THE OTHER TWO UNITS ARE ON STANDBY. THESE MACHINES USE PRECOATED SAND. IN FISCAL YEAR 96, APPROXIMATELY 33 TONS OF PRECOATED SAND WERE PROCESSED OVER 1,760 HOURS OF OPERATION. THE MAXIMUM PRODUCTION OF SHELL CORES IS ESTIMATED AT 75 TONS PER YEAR OVER 4,000 HOURS.

EMISSIONS FROM THE SHELL CORE MANUFACTURING PROCESS ARE FROM SAND HANDLING, AND FROM FUEL COMBUSTION FOR HEAT CURING IN THE SHELL CORE MACHINES. THESE EMISSIONS ARE CONSIDERED AS FUGITIVE EMISSIONS FROM THE SHELL CORE BUILDING AND ARE RELEASED TO THE ATMOSPHERE VIA THE POWERED ROOF VENTILATORS.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	100%	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	SAND HANDLING FOR SHELL CORE MAKING PROCESS	30400370	1,760	4,000	33.00	75.00	0.02	0.194

Comments: AVERAGE SHELL CORE SAND USED IN FY '96 WAS 33 TPY. MAXIMUM ANNUAL SHELL CORE SAND PROCESS = 33 TPY * 4,000 HR/YR / 1,760 HR/YR = 75 TPY. MAXIMUM AND AVERAGE HOURLY SAND USAGES ARE APPROXIMATELY 0.019 TPH OR 38 LB/HR.

Emission Source Fact Sheet

F017 - SHELL CORE SYSTEM
E082 - SHELL CORE SAND HANDLING

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0006	PARTICULATE MATTER (TSP)	0.029	lb/ton Handled	AP-42, JAN. 95.

Comments: UNCONTROLLED EMISSION FACTOR FOR SAND AND AGGREGATE TRANSFER TO ELEVATED BIN FROM AP-42, EMISSION FACTORS FOR CONCRETE BATCHING, TABLE 11.12-2 (1/95).

Emission Source Fact Sheet

F017 - SHELL CORE SYSTEM
E082 - SHELL CORE SAND HANDLING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S053	Fugitive	67%	0%	☐	1.79E-04	1.79E-04	.194	1.58E-04	3.59E-04	.851
Total Emissions of PARTICULATE MATTER (TSP) from SHELL CORE SAND HANDLING:							**1.79E-04**	**1.79E-04**	**.194**	**1.58E-04**	**3.59E-04**	**.851**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S053

Segment No: 01, SAND HANDLING FOR SHELL CORE MAKING PROCESS

Actual Annual:	.029 lb/ton Handled * 33 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.58E-04 TPY.
Maximum Annual:	.029 lb/ton Handled * 75 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.59E-04 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .194 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .851 TPY.
Average Hourly:	Actual annual emissions of 1.58E-04 TPY / 1,760. hr/yr act. * 2,000 lb/ton = 1.79E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.59E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.79E-04 lb/hr.
Allowable Emissions:	*Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of .019* ton/hr or 38 lb/hr. Calculation : 38 * 0.511 / 100 = .194 lb/hr.

End Page Report for SHELL CORE SAND HANDLING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F017 - SHELL CORE SYSTEM
E083 - SHELL CORE HEATING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F017
Emission Unit ID:	E083
Source Desc:	SHELL CORE HEATING
Building No.:	CORE BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	180 AND 360 SHELL CORE UNITS
Serial No.:	[Not Available]
Firing Type:	SHELL CORE MACHINES
Rated Heat Input Capacity:	1.85 MMBtu/hr
Maximum Heat Input Capacity:	1.85 MMBtu/hr
Avg. Oper. Heat Input Capacity:	1.85 MMBtu/hr

Description of Operation

GAS FIRING IS USED TO GENERATE HEAT FOR THE SHELL CORE CURING PROCESS. THE MAXIMUM HOURLY HEAT INPUT IS APPROXIMATELY 1.85 MMBTU/HR. THIS IS THE TOTAL HEAT INPUT FOR ANY GIVEN HOUR

NATURAL GAS IS USED AS THE PRIMARY FUEL. AVERAGE NATURAL GAS USED FOR THE FISCAL YEAR 96 IS 3.257 MMCF. MAXIMUM ANNUAL NATURAL GAS USAGE IS APPROXIMATELY 7.4 MMCF/YR (1.85 MMBTU/HR * 4,000 HR/YR * 1 CF/1000 BTU).

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S053	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: EMISSION EXHAUSTS FROM THE SHELL CORE BUILDING POWERED ROOF VENTILATORS (9 UNITS).

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400370	1,760	4,000	3.26	7.40

Comments: AVERAGE NATURAL GAS USAGE REPORTED FOR THE FISCAL YEAR 96 IS 3.257 MMCF. MAXIMUM ANNUAL NATURAL GAS USAGE IS APPROXIMATELY 7.4 MMCF/YR (1.85 MMBTU/HR * 4,000 HR/YR * 1 CF/1000 BTU).

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F017 - SHELL CORE SYSTEM
E083 - SHELL CORE HEATING

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S053	Stack	0%	0%	☒	3.92E-04	3.92E-04	Not Appl.	3.45E-04	7.84E-04	.002
Total Emissions of BENZENE from SHELL CORE HEATING:							**3.92E-04**	**3.92E-04**	**Not Appl.**	**3.45E-04**	**7.84E-04**	**.002**
CARBON MONOXIDE (CO)	01	S053	Stack	0%	0%	☐	.039	.039	Not Appl.	.034	.078	.17
Total Emissions of CARBON MONOXIDE (CO) from SHELL CORE HEATING:							***.039***	***.039***	***Not Appl.***	***.034***	***.078***	***.17***
FORMALDEHYDE	01	S053	Stack	0%	0%	☒	7.77E-04	7.77E-04	Not Appl.	6.84E-04	.002	.003
Total Emissions of FORMALDEHYDE from SHELL CORE HEATING:							**7.77E-04**	**7.77E-04**	**Not Appl.**	**6.84E-04**	**.002**	**.003**
NITROGEN OXIDES (NOx)	01	S053	Stack	0%	0%	☐	.185	.185	Not Appl.	.163	.37	.81
Total Emissions of NITROGEN OXIDES (NOx) from SHELL CORE HEATING:							**.185**	**.185**	**Not Appl.**	**.163**	**.37**	**.81**
PARTICULATE MATTER (TSP)	01	S053	Stack	67%	0%	☐	.007	.007	1.11	.006	.015	4.862
Total Emissions of PARTICULATE MATTER (TSP) from SHELL CORE HEATING:							**.007**	**.007**	**1.11**	**.006**	**.015**	**4.862**
SULFUR DIOXIDE (SO2)	01	S053	Stack	0%	0%	☐	.001	.001	7.4	9.77E-04	.002	32.412
Total Emissions of SULFUR DIOXIDE (SO2) from SHELL CORE HEATING:							**.001**	**.001**	**7.4**	**9.77E-04**	**.002**	**32.412**
TOLUENE	01	S053	Stack	0%	0%	☒	1.96E-04	1.96E-04	Not Appl.	1.73E-04	3.92E-04	8.59E-04
Total Emissions of TOLUENE from SHELL CORE HEATING:							**1.96E-04**	**1.96E-04**	**Not Appl.**	**1.73E-04**	**3.92E-04**	**8.59E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S053	Stack	0%	0%	☐	.01	.01	Not Appl.	.009	.02	.043
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from SHELL CORE HEATING:							**.01**	**.01**	**Not Appl.**	**.009**	**.02**	**.043**

1 *This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.*

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 3.45E-04 TPY.
Maximum Annual:	7.4 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 7.84E-04 TPY.
Potential Annual:	7.84E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.45E-04 TPY / 1,760. hr/yr act. * 2,000 lb/ton = 3.92E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.84E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 3.92E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .034 TPY.
Maximum Annual:	7.4 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .078 TPY.
Potential Annual:	.078 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .17 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .034 TPY / 1,760. hr/yr act. * 2,000 lb/ton = .039 lb/hr.
Maximum Hourly:	Maximum annual emissions of .078 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .039 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 6.84E-04 TPY.
Maximum Annual:	7.4 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.84E-04 TPY / 1,760. hr/yr act. * 2,000 lb/ton = 7.77E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 7.77E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .163 TPY.
Maximum Annual:	7.4 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .37 TPY.
Potential Annual:	.37 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .81 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .163 TPY / 1,760. hr/yr act. * 2,000 lb/ton = .185 lb/hr.
Maximum Hourly:	Maximum annual emissions of .37 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .185 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .006 TPY.
Maximum Annual:	7.4 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .015 TPY.
Potential Annual:	Maximum allowable hourly emissions of 1.11 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 4.862 TPY.
Average Hourly:	Actual annual emissions of .006 TPY / 1,760. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .015 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .007 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.1, Schedule 1 of Table 1 for equipment built or installed before January 1, 1973. Q = .6 * 1.85 = 1.11 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = 9.77E-04 TPY.
Maximum Annual:	7.4 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	Maximum allowable hourly emissions of 7.4 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 32.412 TPY.
Average Hourly:	Actual annual emissions of 9.77E-04 TPY / 1,760. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 1.85 MMBtu/hr = 7.4 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 1.73E-04 TPY.
Maximum Annual:	7.4 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 3.92E-04 TPY.
Potential Annual:	3.92E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 8.59E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.73E-04 TPY / 1,760. hr/yr act. * 2,000 lb/ton = 1.96E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.92E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.96E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S053
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.257 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .009 TPY.
Maximum Annual:	7.4 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .02 TPY.
Potential Annual:	.02 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .043 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .009 TPY / 1,760. hr/yr act. * 2,000 lb/ton = .01 lb/hr.
Maximum Hourly:	Maximum annual emissions of .02 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for SHELL CORE HEATING

UNITED STATES PIPE & FOUNDRY COMPANY

Attachment to Form 70-28
Emission Summary

V001 - BRASS MELTING
EV004 - LADLE PREHEAT

Regulated air pollutants.

Air Pollutant	Maximum allowable emissions		Actual Emissions	
	Tons per year	Pounds per hour	Tons per year	Pounds per hour
CARBON MONOXIDE (CO)	.052	.012	.017	.012
NITROGEN OXIDES (NOx)	.247	.056	.081	.056
PARTICULATE MATTER (TSP)	1.48	.338	.003	.002
SULFUR DIOXIDE (SO2)	9.864	2.252	4.86E-04	3.38E-04
VOLATILE ORGANIC COMPOUNDS (VOC)	.013	.003	.004	.003

Calculations and emission factor references are provided in the Emission Source Fact Sheet for the same emission source.

Regulated air pollutants that are hazardous air pollutant(s).

Air Pollutant & CAS	Maximum allowable emissions		Actual Emissions	
	Tons per year	Pounds per hour	Tons per year	Pounds per hour
BENZENE, 71-43-2	5.23E-04	1.19E-04	1.72E-04	1.19E-04
FORMALDEHYDE, 50-00-0	.001	2.36E-04	3.40E-04	2.36E-04
TOLUENE, 108-88-3	2.61E-04	5.97E-05	8.59E-05	5.97E-05

End of emission summary for V001 BRASS MELTING, EV004 LADLE PREHEAT. Calculations and emission factor references are provided in the Emission Source Fact Sheet for the same emission source.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E084 - CASTING FINISHING AREA #1

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F018
Emission Unit ID:	E084
Source Desc:	CASTING FINISHING AREA #1
Building No.:	#1 AND #3 CLEANING SHEDS
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400360-18C

Equipment Information

Equip. Type:	GRINDING EQUIPMENT (HAND GRINDERS, SWING WHEEL GRINDERS, SWING BELT GRINDERS, AND PEDESTAL GRINDERS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 10.237 TPH OF CASTINGS PROCESSED.

Description of Operation:

CASTING FINISHING #1 COVERS GRINDING OPERATIONS IN THE #1 AND #3 CLEANING SHEDS. THESE ARE MANUAL OPERATIONS AND INCLUDE HAND GRINDERS, SWING FROME WHEEL GRINDERS, SWING FRAM BELT GRINDERS, AND PESDESTAL GRINDERS.

THE CASTINGS THAT ARE PROCESSED IN THESE AREAS RANGE IN SIZE FROM THE SMALLEST CASTINGS PRODUCED ON THE #9 UNIT TO 24-INCH CASTINGS PRODUCED ON #9 UNIT AND #4 UNIT. TYPICAL OPERATIONS ARE AS FOLLOWS: THE CASTINGS ARE PLACED ON A PALLET IN FRONT OF A GRINDING BOOTH, THE WORKER TRANSFERS IT TO HIS GRINDING TABLE, PERFORMS ALL NECESSARY GRINDING, AND PUTS IT ON A CONVEYOR BELT FOR PACKAGING BY OTHERS.

PARTICULATE EMISSIONS FROM THIS AREA ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, RULE 10.3, SCHEDULE 2 OF TABLE 2. ALLOWABLE EMISSIONS ARE CALCULATED FROM A PROCESS WEIGHT RATE OF 10.237 TPH OR 20,474 LB/HR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S059	100%	30	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: POWERED ROOF VENTILATORS (6) IN THE #1 CLEANING SHED AREA.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CASTING FINISHING, GRINDING	30400360	1,920	6,490	18,541.00	66,437.00	10.24	15.199

Comments: AVERAGE ANNUAL TONNAGE OF CASTINGS PROCESSED IS 18,541 TPY BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ANNUAL CASTING TONNAGE IS 66,437 TPY. ALLOWABLE EMISSIONS ARE SUBJECT TO RULE 10.3, SCHEDULE 2 OF TABLE 2 BASED ON 20,474 LB/HR.

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E084 - CASTING FINISHING AREA #1

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C050	PARTICULATE MATTER (TSP)	0.32	lb/ton Handled	MAYSILLES'S REVIEW

Comments: UNCONTROLLED EMISSION FACTOR FOR GRINDING. SOURCE: MAYSILLES'S REVIEW OF EMISSION FACTORS FOR IRON FOUNDRY. ORIGINAL EF FROM WALLACE ET. AL., SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME 1 - TEXT, FINAL REPORT, EPA-340/1-80-020, JAN. 1981.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E084 - CASTING FINISHING AREA #1

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S059	Fugitive	67%	0%	☐	1.02	1.081	15.199	.979	3.508	66.572
Total Emissions of PARTICULATE MATTER (TSP) from CASTING FINISHING AREA #1:							**1.02**	**1.081**	**15.199**	**.979**	**3.508**	**66.572**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S059

Segment No: 01, CASTING FINISHING, GRINDING

Actual Annual:	.32 lb/ton Handled * 18,541 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .979 TPY.
Maximum Annual:	.32 lb/ton Handled * 66,437 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 3.508 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 15.199 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 66.572 TPY.
Average Hourly:	Actual annual emissions of .979 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.02 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.508 TPY / 6,490 hr/yr max. * 2,000 lb/ton = 1.081 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 10.237 ton/hr or 20,474 lb/hr. Calculation : 15.0 lb/hr + (20,474 - 20,000) * (4.2 / 10,000) lb/hr = 15.199 lb/hr.

End Page Report for CASTING FINISHING AREA #1

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E085 - CASTING FINISHING AREA #2

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F018
Emission Unit ID:	E085
Source Desc:	CASTING FINISHING AREA #2
Building No.:	#2 CLEANING SHED
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400360-19C

Equipment Information

Equip. Type:	GRINDING EQUIPMENT: HAND GRINDERS AND SWING FRAME GRINDERS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 3.496 TPY OF CASTINGS PROCESSED.

Description of Operation:

CASTING FINISHING #2 COVERS GRINDING OPERATIONS IN THE #2 CLEANING SHED AND IN THE ATTACHED LEAN-TOS. THESE ARE MANUAL OPERATIONS AND INCLUDE HAND GRINDERS AND SWING FRAME GRINDERS.

THE CASTINGS THAT ARE PROCESSED IN THIS AREA ARE LARGE CASTINGS FROM #4 AND #10 UNITS. TYPICALLY, THE LARGE CASTINGS ARE WORKED ON AS THEY LIE IN THE FLOOR.

PARTICULATE EMISSIONS FROM THIS AREA ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, RULE 10.3, SCHEDULE 2 OF TABLE 2. ALLOWABLE EMISSIONS ARE CALCULATED FROM A PROCESS WEIGHT RATE OF 3.496 TPH OR 6,992 LB/HR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S060	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: #2 CLEANING SHED ROOF EAVES.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CASTING FINISHING, GRINDING	30400360	1,920	6,490	6,332.00	22,686.00	3.50	7.804

Comments: AVERAGE ANNUAL TONNAGE OF CASTINGS PROCESSED IS 6,332 TPY BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ANNUAL CASTING TONNAGE IS 22,686 TPY.

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E085 - CASTING FINISHING AREA #2

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C050	PARTICULATE MATTER (TSP)	0.32	lb/ton Handled	MAYSILLES'S REVIEW

Comments: UNCONTROLLED EMISSION FACTOR FOR GRINDING. SOURCE: MAYSILLES'S REVIEW OF EMISSION FACTORS FOR IRON FOUNDRY. ORIGINAL EF FROM WALLACE ET. AL., SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME 1 - TEXT, FINAL REPORT, EPA-340/1-80-020, JAN. 1981.

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E085 - CASTING FINISHING AREA #2

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S060	Fugitive	67%	0%	☐	.348	.369	7.804	.334	1.198	34.183
Total Emissions of PARTICULATE MATTER (TSP) from CASTING FINISHING AREA #2:							**.348**	**.369**	**7.804**	**.334**	**1.198**	**34.183**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S060

Segment No: 01, CASTING FINISHING, GRINDING

Actual Annual:	.32 lb/ton Handled * 6,332 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = .334 TPY.
Maximum Annual:	.32 lb/ton Handled * 22,686 tons * (1 - 67% control eff.) * 1 ton/2,000 lb = 1.198 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 7.804 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 34.183 TPY.
Average Hourly:	Actual annual emissions of .334 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .348 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.198 TPY / 6,490 hr/yr max. * 2,000 lb/ton = .369 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 3.496 ton/hr or 6,992 lb/hr. Calculation : 7.09 lb/hr + (6,992 - 6,000) * (0.72 / 1,000) lb/hr = 7.804 lb/hr.

End Page Report for CASTING FINISHING AREA #2

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E086-E087 - CASTING FINISHING AREAS #3 AND #4

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F018
Emission Unit ID:	E086-E087
Source Desc:	CASTING FINISHING AREAS #3 AND #4
Building No.:	OLD BOND STORAGE BLDG AND OLD HEA
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400360-25C

Equipment Information

Equip. Type:	GRINDING EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 2.913 TPH OF CASTINGS PROCESSED

Description of Operation:

CASTING FINISHING #3 AND #4 COVER GRINDING OPERATIONS IN THE OLD BOND STORAGE BUILDING AND IN THE OLD HEAT TREAT BUILDING, RESPECTIVELY. THESE ARE MANUAL OPERATIONS AND INCLUDE MOSTLY HAND GRINDERS. THE CASTINGS THAT ARE PROCESSED IN THIS AREA ARE ALL LARGER COASTINGS FROM #9 UNIT.

EMISSIONS FROM GRINDING OPERATIONS ARE LARGE PARTICULATE MATER (TSP). THESE EMISSIONS ARE FIRST RELEASED INSIDE THE BUILDING WHERE THE GRINDING/CLEANING OPERATIONS ARE PERFORMED, THEN RELEASED TO THE ATMOSPHERE VIA BUILDING EXHAUST VENTS. A SETTLING FACTOR OF 67% IS USED TO ESTIMATE TSP EMISSIONS FROM GRINDING OPERATIONS.

PARTICULATE EMISSIONS FROM THESE AREAS ARE SUBJECT TO THE CHATTANOOGA AIR POLLUTION CONTROL ORDINANCE, RULE 10.3, SCHEDULE 2 OF TABLE 2. ALLOWABLE EMISSIONS ARE CALCULATED FROM A PROCESS WEIGHT RATE OF 2.913 TPH OR 5,826 LB/HR.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S061	51%	10	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS DISCHARGING THROUGH THE WALL FAN OF THE OLD BOND STORAGE BUILDING.									
S062	49%	10	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]
Comments:	FUGITIVE EMISSIONS DISCHARGING THROUGH THE WALL FAN OF THE OLD HEAT TREATING BUILDING.									

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CASTING FINISHING, GRINDING	30400360	1,920	6,490	5,275.80	18,905.00	2.91	0.000

Comments: AVERAGE ANNUAL TONNAGE OF CASTINGS PROCESSED IS 5,275.8 TPY BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ANNUAL CASTING TONNAGE IS 18,905 TPY.

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E086-E087 - CASTING FINISHING AREAS #3 AND #4

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C050	PARTICULATE MATTER (TSP)	0.32	lb/ton Handled	MAYSILLES'S REVIEW

Comments: UNCONTROLLED EMISSION FACTOR FOR GRINDING. SOURCE: MAYSILLES'S REVIEW OF EMISSION FACTORS FOR IRON FOUNDRY. ORIGINAL EF FROM WALLACE ET. AL., SUMMARY OF FACTORS AFFECTING COMPLIANCE BY FERROUS FOUNDRIES, VOLUME 1 - TEXT, FINAL REPORT, EPA-340/1-80-020, JAN. 1981.

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E086-E087 - CASTING FINISHING AREAS #3 AND #4

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S061	Fugitive	67%	0%	☐	.148	.157	6.96	.142	.509	30.483
	01	S062	2nd Fug.	67%	0%	☐	.142	.151	Not Appl.	.136	.489	Not Appl.
Total Emissions of PARTICULATE MATTER (TSP) from CASTING FINISHING AREAS #3 AND #4:							**.29**	**.308**	**6.96**	**.279**	**.998**	**30.483**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S061
Segment No: 01, CASTING FINISHING, GRINDING

Actual Annual:	.32 lb/ton Handled * 5,276 tons * 51% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .142 TPY.
Maximum Annual:	.32 lb/ton Handled * 18,905 tons * 51% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .509 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 6.96 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 30.483 TPY.
Average Hourly:	Actual annual emissions of .142 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .148 lb/hr.
Maximum Hourly:	Maximum annual emissions of .509 TPY / 6,490 hr/yr max. * 2,000 lb/ton = .157 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 2 of Table 2 using a hourly input weight rate of 2.913 ton/hr or 5,826 lb/hr. Calculation : 6.34 lb/hr + (5,826 - 5,000) * (0.75 / 1,000) lb/hr = 6.96 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S062
Segment No: 01, CASTING FINISHING, GRINDING

Actual Annual:	.32 lb/ton Handled * 5,276 tons * 49% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .136 TPY.
Maximum Annual:	.32 lb/ton Handled * 18,905 tons * 49% (capture efficiency) * (1 - 67% control eff.) * 1 ton/2,000 lb = .489 TPY.
Allowable Annual:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.
Average Hourly:	Actual annual emissions of .136 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .142 lb/hr.
Maximum Hourly:	Maximum annual emissions of .489 TPY / 6,490 hr/yr max. * 2,000 lb/ton = .151 lb/hr.
Allowable Emissions:	Not applicable for secondary fugitive emissions. Allowable emissions are calculated at the primary discharge point.

End Page Report for CASTING FINISHING AREAS #3 AND #4

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F018 - GRINDING / FINISHING / PRIMING
E088 - PRIMER DIP COATING OPERATION

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F018
Emission Unit ID:	E088
Source Desc:	PRIMER DIP COATING OPERATION
Building No.:	#1 CLEANING SHED
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200101-51C

Source Information

IRON CASTINGS TO BE USED IN THE HYDRANT PRODUCTION ARE COATED WITH A PRIMER COATING FOLLOWING THE CLEANING STEP. THE PRIMING PROCESS IS PERFORMED IN THE #1 CLEANING SHED WHERE THE ENTIRE CASTING IS IMERGED IN THE DIP TANK. THERE ARE NO PARTICULATE EMISSIONS EXPECTED FROM THE PRIMER DIP COATING OPERATION. EMISSIONS OF VOLATILE ORGANIC COMPUNDS (VOC) AND VOLATILE HAZARDOUS AIR POLLUTANTS (VOCHAP) ARE CALCULATED FROM MATERIAL BALANCE OF THE PRIMER/SOLVENT TYPES AND THEIR USAGES.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S063	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS DISCHARGE FROM THE CEMENT LINING BUILDING.

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF074	GREY VOC-COMPLIANT AIRDRY ORGANIC COATING	10.849	100%	1,920	8,760	440	2,008

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	2.45%	☒	☐	☐
VM&P NAPHTHA	64742-89-8	19.44%	☐	☐	☐
MEDIUM ALIPHATIC HYDROCARBON	8052-41-3	7.97%	☐	☐	☐
	Total Weight %:	29.86%			

Comments: AVERAGE ANNUAL PRIMER USAGE IS 440 GALLONS. BASED ON FISCAL YEAR 1996. MAXIMUM ANNUAL USAGE = 440 * (8,760 HR / 1,920 HR) = 2,008 GAL/YR.

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
02	CVF241	SURE SOL-150	7.469	0%	1,920	8,760	85	388

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
NAPHTHALENE	91-20-3	1%	☒	☐	☐
C8 & C10 AROMATIC HYDROCARBON	64742-95-6	99%	☐	☐	☐
	Total Weight %:	100%			

Comments: AVERAGE ANNUAL MAKEUP AND CLEANING SOLVENT USAGES ARE 85 GALLONS BASED ON FISCAL YEAR 1996. MAXIMUM ANNUAL USAGE = 85 GAL * (8,760 HR / 1,920 HR) = 388 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
C8 & C10 AROMATIC HYDROCARBON	02	S063	0%	0%	☐	.327	.328	.314	1.434	1.434
Total Emissions of C8 & C10 AROMATIC HYDROCARBON from PRIMER DIP COATING OPERATION:								**.314**	**1.434**	**1.434**
MEDIUM ALIPHATIC HYDROCARBON	01	S063	0%	0%	☐	.198	.198	.19	.868	.868
Total Emissions of MEDIUM ALIPHATIC HYDROCARBON from PRIMER DIP COATING OPERATION:								**.19**	**.868**	**.868**
NAPHTHALENE	02	S063	0%	0%	☒	.003	.003	.003	.014	.014
Total Emissions of NAPHTHALENE from PRIMER DIP COATING OPERATION:								**.003**	**.014**	**.014**
VM&P NAPHTHA	01	S063	0%	0%	☐	.483	.483	.464	2.117	2.117
Total Emissions of VM&P NAPHTHA from PRIMER DIP COATING OPERATION:								**.464**	**2.117**	**2.117**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S063	0%	0%	☐	.742	.743	.713	3.252	3.252
	02	S063	0%	0%	☐	.331	.331	.317	1.449	1.449
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from PRIMER DIP COATING OPERATION:								**1.03**	**4.701**	**4.701**
XYLENES (MIXED ISOMERS)	01	S063	0%	0%	☒	.061	.061	.058	.267	.267
Total Emissions of XYLENES (MIXED ISOMERS) from PRIMER DIP COATING OPERATION:								**.058**	**.267**	**.267**

Supporting Emission Calculations

Emission Calculations for C8 & C10 AROMATIC HYDROCARBON (CAS 64742-95-6)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	85 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .314 TPY.
Maximum Annual:	388 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.434 TPY.
Potential Annual:	1.434 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 1.434 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .314 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .327 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.434 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .328 lb/hr.

Emission Calculations for MEDIUM ALIPHATIC HYDROCARBON (CAS 8052-41-3)
Stack ID or Designation: S063
Segment No: 01, USING GREY VOC-COMPLIANT AIRDRY ORGANIC COATING

Actual Annual:	440 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (7.97 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .19 TPY.
Maximum Annual:	2,008 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (7.97 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .868 TPY.
Potential Annual:	.868 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .868 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .19 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .198 lb/hr.
Maximum Hourly:	Maximum annual emissions of .868 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .198 lb/hr.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	85 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	388 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .014 TPY.
Potential Annual:	.014 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .014 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .014 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .003 lb/hr.

Emission Calculations for VM&P NAPHTHA (CAS 64742-89-8)
Stack ID or Designation: S063
Segment No: 01, USING GREY VOC-COMPLIANT AIRDRY ORGANIC COATING

Actual Annual:	440 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (19.44 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .464 TPY.
Maximum Annual:	2,008 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (19.44 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 2.117 TPY.
Potential Annual:	2.117 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 2.117 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .464 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .483 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.117 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .483 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S063
Segment No: 01, USING GREY VOC-COMPLIANT AIRDRY ORGANIC COATING

Actual Annual:	440 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (29.86 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .713 TPY.
Maximum Annual:	2,008 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (29.86 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 3.252 TPY.
Potential Annual:	3.252 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 3.252 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .713 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .742 lb/hr.
Maximum Hourly:	Maximum annual emissions of 3.252 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .743 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	85 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .317 TPY.
Maximum Annual:	388 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.449 TPY.
Potential Annual:	1.449 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 1.449 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .317 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .331 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.449 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .331 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S063
Segment No: 01, USING GREY VOC-COMPLIANT AIRDRY ORGANIC COATING

Actual Annual:	440 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (2.45 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .058 TPY.
Maximum Annual:	2,008 gal/yr * 1.3 (sp. grav.) * 8.345 lb/gal * (2.45 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .267 TPY.
Potential Annual:	.267 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .267 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .058 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .061 lb/hr.
Maximum Hourly:	Maximum annual emissions of .267 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .061 lb/hr.

End Fact Sheet for PRIMER DIP COATING OPERATION

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E089-E095 - CEMENT MIXING AND LINING STATIONS

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E089-E095
Source Desc:	CEMENT MIXING AND LINING STATIONS
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Equip. Type:	MIXERS AND CEMENT LINING OPERATIONS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 0.573 TPH AND 2,292 TPY OF CEMENT AND SAND.

Description of Operation:

FOLLOWING THE GRINDING, REPAIR AND PRIMING OPERATIONS, THE FITTINGS ARE PROCESS THROUGH THE CEMENT LINING AND ASPHALT COATING OPERATIONS.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S063	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS DISCHARGE FROM THE CEMENT LINING BUILDING.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CEMENT HANDLING IN MIXING AND LINING OPERATIONS	30400398	1,920	4,000	1,100.00	2,292.00	0.57	2.814

Comments: AVERAGE ANNUAL USAGES WERE 550 TPY OF CEMENT AND 550 TPY OF SAND BASED ON FISCAL YEAR 96 REPORT, OR A TOTAL OF 1,100 TPY. MAXIMUM ANNUAL USAGES ARE 1,100 TPY * 4,000 HR/YR / 1,920 HR/YR = 2,292 TPY.

ALLOWABLE EMISSIONS ARE CALCULATED BASED ON PROCESS WEIGHT RATE OF 0.573 TPH OR 1,146 LB/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	S11C	PARTICULATE MATTER (TSP)	0.27	lb/ton Handled	DIPRA REF:18

Comments: EMISSION FACTOR FOR CEMENT HANDLING. ORIGINAL SOURCE: AP-42 FOR CEMENT BATCHING OPERATIONS.

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E089-E095 - CEMENT MIXING AND LINING STATIONS

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S063	Fugitive	0%	0%	☐	.155	.155	2.814	.149	.309	12.324
Total Emissions of PARTICULATE MATTER (TSP) from CEMENT MIXING AND LINING STATIONS:							**.155**	**.155**	**2.814**	**.149**	**.309**	**12.324**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S063

Segment No: 01, CEMENT HANDLING IN MIXING AND LINING OPERATIONS

Actual Annual:	.27 lb/ton Handled * 1,100 tons * 1 ton/2,000 lb = .149 TPY.
Maximum Annual:	.27 lb/ton Handled * 2,292 tons * 1 ton/2,000 lb = .309 TPY.
Allowable Annual:	Maximum allowable hourly emissions of 2.814 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 12.324 TPY.
Average Hourly:	Actual annual emissions of .149 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .155 lb/hr.
Maximum Hourly:	Maximum annual emissions of .309 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .155 lb/hr.
Allowable Emissions:	Allowable TSP emissions are determined (linear extrapolation) from Schedule 1 of Table 2 using a hourly input weight rate of .573 ton/hr or 1,146 lb/hr. Calculation : 2.58 lb/hr + (1,146 - 1,000) * (0.8 / 500) lb/hr = 2.814 lb/hr.

End Page Report for CEMENT MIXING AND LINING STATIONS

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E096-E098 - CEMENT LINING DRYING OVENS #1, #3 & #4

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E096-E098
Source Desc:	CEMENT LINING DRYING OVENS #1, #3 & #4
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	DRYING OVENS
Rated Heat Input Capacity:	2.1 MMBtu/hr
Maximum Heat Input Capacity:	2.1 MMBtu/hr
Avg. Oper. Heat Input Capacity:	2.04 MMBtu/hr

Description of Operation

THE CEMENT LINING PROCESS INCLUDES THREE DRYING OVENS: DRYING OVEN #1 FOR THE CEMENT LINING WEST RUN (E096), DRYING OVEN #3 FOR THE CEMENT LINING NORTH RUN (E097), AND DRYING OVEN #4 FOR THE CEMENT LINING NORTH RUN (E098). THESE OVENS ARE RATED 0.8 MMBTU/HR, 0.8 MMBTU/HR, AND 0.5 MMBTU/HR FOR A TOTAL OF 2.1 MMBTU/HR.

THE OVENS ARE FIRED WITH NATURAL GAS. THE TOTAL NATURAL GAS USAGE FOR FISCAL YEAR 1996 IS 8.141 MMCF/YR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S064-S066	20	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACKS FOR CEMENT LINING OVEN NOS. #1, #3 AND #4.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400398	3,875	8,760	8.14	18.40

Comments: AVERAGE ANNUAL NATURAL GAS USAGE IS 8.141 MMCF/YR BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ANNUAL NATURAL GAS USAGE IS 8.141 MMCF/YR * 8,760 HR / 3,875 HR = 18.404 MMCF/YR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S064-S066	Stack	0%	0%	☒	4.45E-04	4.45E-04	Not Appl.	8.63E-04	.002	.002
Total Emissions of BENZENE from CEMENT LINING DRYING OVENS #1, #3 & #4:							**4.45E-04**	**4.45E-04**	**Not Appl.**	**8.63E-04**	**.002**	**.002**
CARBON MONOXIDE (CO)	01	S064-S066	Stack	0%	0%	☐	.044	.044	Not Appl.	.085	.193	.193
Total Emissions of CARBON MONOXIDE (CO) from CEMENT LINING DRYING OVENS #1, #3 & #4:							**.044**	**.044**	**Not Appl.**	**.085**	**.193**	**.193**
FORMALDEHYDE	01	S064-S066	Stack	0%	0%	☒	8.82E-04	8.82E-04	Not Appl.	.002	.004	.004
Total Emissions of FORMALDEHYDE from CEMENT LINING DRYING OVENS #1, #3 & #4:							**8.82E-04**	**8.82E-04**	**Not Appl.**	**.002**	**.004**	**.004**
NITROGEN OXIDES (NOx)	01	S064-S066	Stack	0%	0%	☐	.21	.21	Not Appl.	.407	.92	.92
Total Emissions of NITROGEN OXIDES (NOx) from CEMENT LINING DRYING OVENS #1, #3 & #4:							**.21**	**.21**	**Not Appl.**	**.407**	**.92**	**.92**
PARTICULATE MATTER (TSP)	01	S064-S066	Stack	0%	0%	☐	.025	.025	1.26	.049	.11	5.519
Total Emissions of PARTICULATE MATTER (TSP) from CEMENT LINING DRYING OVENS #1, #3 & #4:							**.025**	**.025**	**1.26**	**.049**	**.11**	**5.519**
SULFUR DIOXIDE (SO2)	01	S064-S066	Stack	0%	0%	☐	.001	.001	8.4	.002	.006	36.792
Total Emissions of SULFUR DIOXIDE (SO2) from CEMENT LINING DRYING OVENS #1, #3 & #4:							**.001**	**.001**	**8.4**	**.002**	**.006**	**36.792**
TOLUENE	01	S064-S066	Stack	0%	0%	☒	2.23E-04	2.23E-04	Not Appl.	4.31E-04	9.75E-04	9.75E-04
Total Emissions of TOLUENE from CEMENT LINING DRYING OVENS #1, #3 & #4:							**2.23E-04**	**2.23E-04**	**Not Appl.**	**4.31E-04**	**9.75E-04**	**9.75E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S064-S066	Stack	0%	0%	☐	.011	.011	Not Appl.	.021	.049	.049
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from CEMENT LINING DRYING OVENS #1, #3 & #4:							**.011**	**.011**	**Not Appl.**	**.021**	**.049**	**.049**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 8.63E-04 TPY.
Maximum Annual:	18.404 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.63E-04 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 4.45E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 4.45E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .085 TPY.
Maximum Annual:	18.404 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .193 TPY.
Potential Annual:	.193 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .193 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .085 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .044 lb/hr.
Maximum Hourly:	Maximum annual emissions of .193 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .044 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	18.404 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	.004 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .004 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .002 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 8.82E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 8.82E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .407 TPY.
Maximum Annual:	18.404 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .92 TPY.
Potential Annual:	.92 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .92 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .407 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .21 lb/hr.
Maximum Hourly:	Maximum annual emissions of .92 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .21 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .049 TPY.
Maximum Annual:	18.404 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .11 TPY.
Potential Annual:	Maximum allowable hourly emissions of 1.26 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 5.519 TPY.
Average Hourly:	Actual annual emissions of .049 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .025 lb/hr.
Maximum Hourly:	Maximum annual emissions of .11 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .025 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = .6 * 2.1 = 1.26 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	18.404 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .006 TPY.
Potential Annual:	Maximum allowable hourly emissions of 8.4 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 36.792 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .006 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 2.1 MMBtu/hr = 8.4 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 4.31E-04 TPY.
Maximum Annual:	18.404 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 9.75E-04 TPY.
Potential Annual:	9.75E-04 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 9.75E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.31E-04 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 2.23E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.75E-04 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 2.23E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S064-S066
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	8.141 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .021 TPY.
Maximum Annual:	18.404 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .049 TPY.
Potential Annual:	.049 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .049 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .021 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .011 lb/hr.
Maximum Hourly:	Maximum annual emissions of .049 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .011 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for CEMENT LINING DRYING OVENS #1, #3 & #4

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E099 - #1 DIP PAINT LINE

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E099
Source Desc:	#1 DIP PAINT LINE
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200101-36C

Source Information

THE #1 DIP PAINT LINE SERVES THE CEMENT LINING WEST RUN. NO PARTICULATE EMISSIONS ARE EXPECTED FROM THIS DIP COATING OPERATIONS. EMISSIONS ARE MAINLY VOLATILES EVAPORATED FROM THE OPERATION, FIRST EMITTED INSIDE THE BUILDING OF THE COATING AREA, THEN DISCHARGED TO THE ATMOSPHERE THROUGH THE BUILDING VENTILATORS.

COATING IS SUBJECT TO VOC CONTENT OF 3.5 LB/GAL OF COATING AS APPLIED.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S063	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS DISCHARGE FROM THE CEMENT LINING BUILDING.

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF394	B-523 R-17-A-73 CUTBACK ASPHALT	7.452	100%	2,500	8,760	11,000	38,544

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	4.78%	☒	☐	☐
NAPHTHA	8030-30-6	38.22%	☐	☐	☐
ASPHALT	8052-42-4	57%	☐	☒	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 13,000 11,000 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 11,000 * 8,760 HR / 2,500 HR = 38,544 GAL/YR.

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
02	CVF241	SURE SOL-150	7.469	0%	2,500	8,760	3,050	10,687

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
NAPHTHALENE	91-20-3	1%	☒	☐	☐
C8 & C10 AROMATIC HYDROCARBON	64742-95-6	99%	☐	☐	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 3,050 GALLONS OF MAKEUP AND CLEANING SOLVENT. MAXIMUM ANNUAL USAGE IS 3,050 * 8,760 HR / 2,500 HR = 10,687 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
C8 & C10 AROMATIC HYDROCARBON	02	S063	0%	0%	☐	9.021	9.021	11.276	39.51	39.51
Total Emissions of C8 & C10 AROMATIC HYDROCARBON from #1 DIP PAINT LINE:								**11.276**	**39.51**	**39.51**
NAPHTHA	01	S063	0%	0%	☐	12.532	12.532	15.665	54.89	54.89
Total Emissions of NAPHTHA from #1 DIP PAINT LINE:								**15.665**	**54.89**	**54.89**
NAPHTHALENE	02	S063	0%	0%	☒	.091	.091	.114	.399	.399
Total Emissions of NAPHTHALENE from #1 DIP PAINT LINE:								**.114**	**.399**	**.399**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S063	0%	0%	☐	14.099	14.099	17.624	61.755	61.755
	02	S063	0%	0%	☐	9.112	9.112	11.39	39.909	39.909
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from #1 DIP PAINT LINE:								**29.014**	**101.665**	**101.665**
XYLENES (MIXED ISOMERS)	01	S063	0%	0%	☒	1.567	1.567	1.959	6.865	6.865
Total Emissions of XYLENES (MIXED ISOMERS) from #1 DIP PAINT LINE:								**1.959**	**6.865**	**6.865**

Supporting Emission Calculations

Emission Calculations for C8 & C10 AROMATIC HYDROCARBON (CAS 64742-95-6)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	3,050 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 11.276 TPY.
Maximum Annual:	10,687 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 39.51 TPY.
Potential Annual:	39.51 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 39.51 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 11.276 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 9.021 lb/hr.
Maximum Hourly:	Maximum annual emissions of 39.51 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 9.021 lb/hr.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S063
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	11,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 15.665 TPY.
Maximum Annual:	38,544 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 54.89 TPY.
Potential Annual:	54.89 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 54.89 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 15.665 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 12.532 lb/hr.
Maximum Hourly:	Maximum annual emissions of 54.89 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 12.532 lb/hr.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	3,050 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .114 TPY.
Maximum Annual:	10,687 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .399 TPY.
Potential Annual:	.399 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .399 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .114 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .091 lb/hr.
Maximum Hourly:	Maximum annual emissions of .399 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .091 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S063
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	11,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 17.624 TPY.
Maximum Annual:	38,544 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 61.755 TPY.
Potential Annual:	61.755 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 61.755 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 17.624 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 14.099 lb/hr.
Maximum Hourly:	Maximum annual emissions of 61.755 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 14.099 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	3,050 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 11.39 TPY.
Maximum Annual:	10,687 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 39.909 TPY.
Potential Annual:	39.909 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 39.909 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 11.39 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 9.112 lb/hr.
Maximum Hourly:	Maximum annual emissions of 39.909 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 9.112 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S063
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	11,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.959 TPY.
Maximum Annual:	38,544 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 6.865 TPY.
Potential Annual:	6.865 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 6.865 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.959 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 1.567 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.865 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.567 lb/hr.

End Fact Sheet for #1 DIP PAINT LINE

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E100 - BINKS SPRAY PAINT BOOTH

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E100
Source Desc:	BINKS SPRAY PAINT BOOTH
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200101-37C

Source Information

THE BINKS SPRAY PAINT BOOTH IS ONE OF TWO SPRAY PAINT BOOTHS THAT SERVE THE CEMENT LINING EAST RUN. PARTICULATE EMISSIONS FROM THE SPRAY PAINTING OF ASPHALT COATING ARE CONTROLLED BY DRY PAINT FILTER. EMISSIONS ARE THEN DISCHARGED TO THE ATMOSPHERE THROUGH THE SPRAY PAINT BOOTH STACK (S067).

THE SOLID TRANSFER EFFICIENCY FOR THE SPRAYING OPERATION IS ESTIMATED AT 60 PERCENT. THE ASPHALT COATING USED IS SUBJECT TO VOC CONTENT OF 3.5 LB/GAL OF COATING AS APPLIED.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S067	100%	28	2.83	[N/A]	6.287	10,000	CD034	DRY FILTERS	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE BINKS SPRAY PAINT BOOTH (CEMENT LINING EAST RUN SPRAY BOOTH #1).

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF394	B-523 R-17-A-73 CUTBACK ASPHALT	7.452	60%	2,500	8,760	3,500	12,264

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	4.78%	☒	☐	☐
NAPHTHA	8030-30-6	38.22%	☐	☐	☐
ASPHALT	8052-42-4	57%	☐	☒	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 3,500 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 3,500 * 8,760 HR / 2,500 HR = 12,264 GAL/YR.

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
02	CVF241	SURE SOL-150	7.469	0%	2,500	8,760	200	701

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
NAPHTHALENE	91-20-3	1%	☒	☐	☐
C8 & C10 AROMATIC HYDROCARBON	64742-95-6	99%	☐	☐	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 200 GALLONS OF MAKEUP AND CLEANING SOLVENT. MAXIMUM ANNUAL USAGE IS 200 * 8,760 HR / 2,500 HR = 770.8 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
ASPHALT	01	S067	99%	0%	☐	.024	.024	.03	.104	.104
Total Emissions of ASPHALT from BINKS SPRAY PAINT BOOTH:								**.03**	**.104**	**.104**
C8 & C10 AROMATIC HYDROCARBON	02	S067	0%	0%	☐	.592	.592	.739	2.591	2.591
Total Emissions of C8 & C10 AROMATIC HYDROCARBON from BINKS SPRAY PAINT BOOTH:								**.739**	**2.591**	**2.591**
NAPHTHA	01	S067	0%	0%	☐	3.987	3.987	4.984	17.465	17.465
Total Emissions of NAPHTHA from BINKS SPRAY PAINT BOOTH:								**4.984**	**17.465**	**17.465**
NAPHTHALENE	02	S067	0%	0%	☒	.006	.006	.007	.026	.026
Total Emissions of NAPHTHALENE from BINKS SPRAY PAINT BOOTH:								**.007**	**.026**	**.026**
PARTICULATE MATTER (TSP)	01	S067	99%	0%	☐	.024	.024	.03	.104	.104
Total Emissions of PARTICULATE MATTER (TSP) from BINKS SPRAY PAINT BOOTH:								**.03**	**.104**	**.104**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S067	0%	0%	☐	4.486	4.486	5.608	19.649	19.649
	02	S067	0%	0%	☐	.598	.598	.747	2.617	2.617
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from BINKS SPRAY PAINT BOOTH:								**6.355**	**22.266**	**22.266**
XYLENES (MIXED ISOMERS)	01	S067	0%	0%	☒	.499	.499	.623	2.184	2.184
Total Emissions of XYLENES (MIXED ISOMERS) from BINKS SPRAY PAINT BOOTH:								**.623**	**2.184**	**2.184**

Supporting Emission Calculations

Emission Calculations for ASPHALT (CAS 8052-42-4)
Stack ID or Designation: S067
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,500 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .03 TPY.
Maximum Annual:	12,264 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .104 TPY.
Potential Annual:	.104 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .104 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .03 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .024 lb/hr.
Maximum Hourly:	Maximum annual emissions of .104 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .024 lb/hr.

Emission Calculations for C8 & C10 AROMATIC HYDROCARBON (CAS 64742-95-6)
Stack ID or Designation: S067
Segment No: 02, USING SURE SOL-150

Actual Annual:	200 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .739 TPY.
Maximum Annual:	701 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 2.591 TPY.
Potential Annual:	2.591 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 2.591 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .739 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .592 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.591 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .592 lb/hr.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S067
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,500 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 4.984 TPY.
Maximum Annual:	12,264 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 17.465 TPY.
Potential Annual:	17.465 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 17.465 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.984 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 3.987 lb/hr.
Maximum Hourly:	Maximum annual emissions of 17.465 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 3.987 lb/hr.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S067
Segment No: 02, USING SURE SOL-150

Actual Annual:	200 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	701 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .026 TPY.
Potential Annual:	.026 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .026 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .007 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .026 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .006 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S067
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,500 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .03 TPY.
Maximum Annual:	12,264 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .104 TPY.
Potential Annual:	.104 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .104 TPY. This PTE is the emission rates over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .03 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .024 lb/hr.
Maximum Hourly:	Maximum annual emissions of .104 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .024 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S067
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,500 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 5.608 TPY.
Maximum Annual:	12,264 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 19.649 TPY.
Potential Annual:	19.649 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 19.649 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.608 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 4.486 lb/hr.
Maximum Hourly:	Maximum annual emissions of 19.649 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 4.486 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S067
Segment No: 02, USING SURE SOL-150

Actual Annual:	200 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .747 TPY.
Maximum Annual:	701 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 2.617 TPY.
Potential Annual:	2.617 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 2.617 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .747 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .598 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.617 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .598 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S067
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,500 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .623 TPY.
Maximum Annual:	12,264 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 2.184 TPY.
Potential Annual:	2.184 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 2.184 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .623 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .499 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.184 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .499 lb/hr.

End Fact Sheet for BINKS SPRAY PAINT BOOTH

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E101 - LARGE FITTINGS PAINT BOOTH

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E101
Source Desc:	LARGE FITTINGS PAINT BOOTH
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200101-52C

Source Information

THE LARGE FITTINGS SPRAY PAINT BOOTH IS ONE OF TWO SPRAY PAINT BOOTHS THAT SERVE THE CEMENT LINING EAST RUN. PARTICULATE EMISSIONS FROM THE SPRAY PAINTING OF ASPHALT COATING ARE CONTROLLED BY DRY PAINT FILTER. EMISSIONS ARE THEN DISCHARGED TO THE ATMOSPHERE THROUGH THE SPRAY PAINT BOOTH STACK (S068).

THE SOLID TRANSFER EFFICIENCY FOR THE SPRAYING OPERATION IS ESTIMATED AT 60 PERCENT. THE ASPHALT COATING USED IS SUBJECT TO VOC CONTENT OF 3.5 LB/GAL OF COATING AS APPLIED.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S068	100%	28	2.83	[N/A]	6.287	10,000	CD035	DRY FILTERS	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE LARGE FITTINGS SPRAY PAINT BOOTH (CEMENT LINING EAST RUN SPRAY BOOTH #2).

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF394	B-523 R-17-A-73 CUTBACK ASPHALT	7.452	60%	2,500	8,760	1,000	3,504

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	4.78%	☒	☐	☐
NAPHTHA	8030-30-6	38.22%	☐	☐	☐
ASPHALT	8052-42-4	57%	☐	☒	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 1,000 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 1,000 * 8,760 HR / 2,500 HR = 3,504 GAL/YR.

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
02	CVF241	SURE SOL-150	7.469	0%	2,500	8,760	75	263

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
NAPHTHALENE	91-20-3	1%	☒	☐	☐
C8 & C10 AROMATIC HYDROCARBON	64742-95-6	99%	☐	☐	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 75 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 75 * 8,760 HR / 2,500 HR = 262.8 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
ASPHALT	01	S068	99%	0%	☐	.007	.007	.008	.03	.03
Total Emissions of ASPHALT from LARGE FITTINGS PAINT BOOTH:								**.008**	**.03**	**.03**
C8 & C10 AROMATIC HYDROCARBON	02	S068	0%	0%	☐	.222	.222	.277	.972	.972
Total Emissions of C8 & C10 AROMATIC HYDROCARBON from LARGE FITTINGS PAINT BOOTH:								**.277**	**.972**	**.972**
NAPHTHA	01	S068	0%	0%	☐	1.139	1.139	1.424	4.99	4.99
Total Emissions of NAPHTHA from LARGE FITTINGS PAINT BOOTH:								**1.424**	**4.99**	**4.99**
NAPHTHALENE	02	S068	0%	0%	☒	.002	.002	.003	.01	.01
Total Emissions of NAPHTHALENE from LARGE FITTINGS PAINT BOOTH:								**.003**	**.01**	**.01**
PARTICULATE MATTER (TSP)	01	S068	99%	0%	☐	.007	.007	.008	.03	.03
Total Emissions of PARTICULATE MATTER (TSP) from LARGE FITTINGS PAINT BOOTH:								**.008**	**.03**	**.03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S068	0%	0%	☐	1.282	1.282	1.602	5.614	5.614
	02	S068	0%	0%	☐	.224	.224	.28	.981	.981
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from LARGE FITTINGS PAINT BOOTH:								**1.882**	**6.595**	**6.595**
XYLENES (MIXED ISOMERS)	01	S068	0%	0%	☒	.142	.142	.178	.624	.624
Total Emissions of XYLENES (MIXED ISOMERS) from LARGE FITTINGS PAINT BOOTH:								**.178**	**.624**	**.624**

Supporting Emission Calculations

Emission Calculations for ASPHALT (CAS 8052-42-4)
Stack ID or Designation: S068
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	1,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .008 TPY.
Maximum Annual:	3,504 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .03 TPY.
Potential Annual:	.03 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .03 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .008 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .03 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .007 lb/hr.

Emission Calculations for C8 & C10 AROMATIC HYDROCARBON (CAS 64742-95-6)
Stack ID or Designation: S068
Segment No: 02, USING SURE SOL-150

Actual Annual:	75 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .277 TPY.
Maximum Annual:	263 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .972 TPY.
Potential Annual:	.972 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .972 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .277 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .222 lb/hr.
Maximum Hourly:	Maximum annual emissions of .972 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .222 lb/hr.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S068
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	1,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.424 TPY.
Maximum Annual:	3,504 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 4.99 TPY.
Potential Annual:	4.99 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 4.99 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.424 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 1.139 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.99 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.139 lb/hr.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S068
Segment No: 02, USING SURE SOL-150

Actual Annual:	75 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	263 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .01 TPY.
Potential Annual:	.01 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .01 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .01 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .002 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S068
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	1,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .008 TPY.
Maximum Annual:	3,504 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = .03 TPY.
Potential Annual:	.03 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .03 TPY. This PTE is the emission rates over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .008 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .03 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .007 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S068
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	1,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.602 TPY.
Maximum Annual:	3,504 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 5.614 TPY.
Potential Annual:	5.614 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 5.614 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.602 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 1.282 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.614 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.282 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S068
Segment No: 02, USING SURE SOL-150

Actual Annual:	75 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .28 TPY.
Maximum Annual:	263 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .981 TPY.
Potential Annual:	.981 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .981 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .28 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .224 lb/hr.
Maximum Hourly:	Maximum annual emissions of .981 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .224 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S068
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	1,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .178 TPY.
Maximum Annual:	3,504 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .624 TPY.
Potential Annual:	.624 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .624 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .178 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .142 lb/hr.
Maximum Hourly:	Maximum annual emissions of .624 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .142 lb/hr.

End Fact Sheet for LARGE FITTINGS PAINT BOOTH

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E102 - #3 DIP PAINT LINE

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E102
Source Desc:	#3 DIP PAINT LINE
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200101-43C

Source Information

THE #3 DIP PAINT LINE SERVES THE CEMENT LINING NORTH RUN. NO PARTICULATE EMISSIONS ARE EXPECTED FROM THIS DIP COATING OPERATIONS. EMISSIONS ARE MAINLY VOLATILES EVAPORATED FROM THE OPERATION, FIRST EMITTED INSIDE THE BUILDING OF THE COATING AREA, THEN DISCHARGED TO THE ATMOSPHERE THROUGH THE BUILDING VENTILATORS.

COATING IS SUBJECT TO VOC CONTENT OF 3.5 LB/GAL OF COATING AS APPLIED.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S063	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS DISCHARGE FROM THE CEMENT LINING BUILDING.

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF394	B-523 R-17-A-73 CUTBACK ASPHALT	7.452	100%	2,500	8,760	8,668	30,373

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	4.78%	☒	☐	☐
NAPHTHA	8030-30-6	38.22%	☐	☐	☐
ASPHALT	8052-42-4	57%	☐	☒	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 8,668 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 8,668 * 8,760 HR / 2,500 HR = 30,373 GAL/YR.

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
02	CVF241	SURE SOL-150	7.469	0%	2,500	8,760	2,270	7,954

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
NAPHTHALENE	91-20-3	1%	☒	☐	☐
C8 & C10 AROMATIC HYDROCARBON	64742-95-6	99%	☐	☐	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 9,668 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 2,270 * 8,760 HR / 2,500 HR = 7,954 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
C8 & C10 AROMATIC HYDROCARBON	02	S063	0%	0%	☐	6.714	6.714	8.392	29.406	29.406
Total Emissions of C8 & C10 AROMATIC HYDROCARBON from #3 DIP PAINT LINE:								**8.392**	**29.406**	**29.406**
NAPHTHA	01	S063	0%	0%	☐	9.875	9.875	12.344	43.254	43.254
Total Emissions of NAPHTHA from #3 DIP PAINT LINE:								**12.344**	**43.254**	**43.254**
NAPHTHALENE	02	S063	0%	0%	☒	.068	.068	.085	.297	.297
Total Emissions of NAPHTHALENE from #3 DIP PAINT LINE:								**.085**	**.297**	**.297**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S063	0%	0%	☐	11.11	11.11	13.888	48.664	48.664
	02	S063	0%	0%	☐	6.782	6.782	8.477	29.703	29.703
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from #3 DIP PAINT LINE:								**22.365**	**78.367**	**78.367**
XYLENES (MIXED ISOMERS)	01	S063	0%	0%	☒	1.235	1.235	1.544	5.41	5.41
Total Emissions of XYLENES (MIXED ISOMERS) from #3 DIP PAINT LINE:								**1.544**	**5.41**	**5.41**

Supporting Emission Calculations

Emission Calculations for C8 & C10 AROMATIC HYDROCARBON (CAS 64742-95-6)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	2,270 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 8.392 TPY.
Maximum Annual:	7,954 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 29.406 TPY.
Potential Annual:	29.406 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 29.406 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.392 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 6.714 lb/hr.
Maximum Hourly:	Maximum annual emissions of 29.406 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 6.714 lb/hr.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S063
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	8,668 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 12.344 TPY.
Maximum Annual:	30,373 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 43.254 TPY.
Potential Annual:	43.254 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 43.254 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 12.344 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 9.875 lb/hr.
Maximum Hourly:	Maximum annual emissions of 43.254 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 9.875 lb/hr.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	2,270 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .085 TPY.
Maximum Annual:	7,954 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .297 TPY.
Potential Annual:	.297 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .297 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .085 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .068 lb/hr.
Maximum Hourly:	Maximum annual emissions of .297 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .068 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S063
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	8,668 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 13.888 TPY.
Maximum Annual:	30,373 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 48.664 TPY.
Potential Annual:	48.664 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 48.664 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 13.888 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 11.11 lb/hr.
Maximum Hourly:	Maximum annual emissions of 48.664 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 11.11 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S063
Segment No: 02, USING SURE SOL-150

Actual Annual:	2,270 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 8.477 TPY.
Maximum Annual:	7,954 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 29.703 TPY.
Potential Annual:	29.703 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 29.703 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.477 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 6.782 lb/hr.
Maximum Hourly:	Maximum annual emissions of 29.703 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 6.782 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S063
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	8,668 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.544 TPY.
Maximum Annual:	30,373 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4,78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 5.41 TPY.
Potential Annual:	5.41 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 5.41 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.544 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 1.235 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.41 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.235 lb/hr.

End Fact Sheet for #3 DIP PAINT LINE

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F019 - CEMENT LINING AND ASPHALT COATING
E103-E104 - COATING DRYING OVENS #1 AND #3

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F019
Emission Unit ID:	E103-E104
Source Desc:	COATING DRYING OVENS #1 AND #3
Building No.:	CEMENT LINING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	DRYING OVENS
Rated Heat Input Capacity:	1.4 MMBtu/hr
Maximum Heat Input Capacity:	1.4 MMBtu/hr
Avg. Oper. Heat Input Capacity:	1.4 MMBtu/hr

Description of Operation

THE ASPHALT COATING PROCESS INCLUDES TWO DRYING OVENS: COATING DRYING OVEN #1 FOR THE CEMENT LINING WEST RUN (E103), AND COATING DRYING OVEN #3 FOR THE CEMENT LINING NORTH RUN (E104). THESE OVENS ARE RATED 1.4 MMBTU/HR TOTAL.

THE OVENS ARE FIRED WITH NATURAL GAS. THE TOTAL NATURAL GAS USAGE FOR FISCAL YEAR 1996 IS 5.428 MMCF/YR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S069-S070	25	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE COATING DRYING OVENS #1 AND #3

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400398	3,875	8,760	5.43	12.27

Comments: AVERAGE ANNUAL NATURAL GAS USAGE IS 5.428 MMCF/YR BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ANNUAL NATURAL GAS USAGE IS 5.428 MMCF/YR * 8,760 HR / 3,875 HR = 12.271 MMCF/YR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S069-S070	Stack	0%	0%	☒	2.97E-04	2.97E-04	Not Appl.	5.75E-04	.001	.001
Total Emissions of BENZENE from COATING DRYING OVENS #1 AND #3:							**2.97E-04**	**2.97E-04**	**Not Appl.**	**5.75E-04**	**.001**	**.001**
CARBON MONOXIDE (CO)	01	S069-S070	Stack	0%	0%	☐	.029	.029	Not Appl.	.057	.129	.129
Total Emissions of CARBON MONOXIDE (CO) from COATING DRYING OVENS #1 AND #3:							**.029**	**.029**	**Not Appl.**	**.057**	**.129**	**.129**
FORMALDEHYDE	01	S069-S070	Stack	0%	0%	☒	5.88E-04	5.88E-04	Not Appl.	.001	.003	.003
Total Emissions of FORMALDEHYDE from COATING DRYING OVENS #1 AND #3:							**5.88E-04**	**5.88E-04**	**Not Appl.**	**.001**	**.003**	**.003**
NITROGEN OXIDES (NOx)	01	S069-S070	Stack	0%	0%	☐	.14	.14	Not Appl.	.271	.614	.614
Total Emissions of NITROGEN OXIDES (NOx) from COATING DRYING OVENS #1 AND #3:							**.14**	**.14**	**Not Appl.**	**.271**	**.614**	**.614**
PARTICULATE MATTER (TSP)	01	S069-S070	Stack	0%	0%	☐	.017	.017	.84	.033	.074	3.679
Total Emissions of PARTICULATE MATTER (TSP) from COATING DRYING OVENS #1 AND #3:							**.017**	**.017**	**.84**	**.033**	**.074**	**3.679**
SULFUR DIOXIDE (SO2)	01	S069-S070	Stack	0%	0%	☐	8.40E-04	8.40E-04	5.6	.002	.004	24.528
Total Emissions of SULFUR DIOXIDE (SO2) from COATING DRYING OVENS #1 AND #3:							**8.40E-04**	**8.40E-04**	**5.6**	**.002**	**.004**	**24.528**
TOLUENE	01	S069-S070	Stack	0%	0%	☒	1.48E-04	1.48E-04	Not Appl.	2.88E-04	6.50E-04	6.50E-04
Total Emissions of TOLUENE from COATING DRYING OVENS #1 AND #3:							**1.48E-04**	**1.48E-04**	**Not Appl.**	**2.88E-04**	**6.50E-04**	**6.50E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S069-S070	Stack	0%	0%	☐	.007	.007	Not Appl.	.014	.032	.032
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from COATING DRYING OVENS #1 AND #3:							**.007**	**.007**	**Not Appl.**	**.014**	**.032**	**.032**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 5.75E-04 TPY.
Maximum Annual:	12.271 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.75E-04 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 2.97E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 2.97E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .057 TPY.
Maximum Annual:	12.271 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .129 TPY.
Potential Annual:	.129 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .129 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .057 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .029 lb/hr.
Maximum Hourly:	Maximum annual emissions of .129 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .029 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	12.271 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	.003 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 5.88E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 5.88E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .271 TPY.
Maximum Annual:	12.271 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .614 TPY.
Potential Annual:	.614 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .614 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .271 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .14 lb/hr.
Maximum Hourly:	Maximum annual emissions of .614 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .14 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .033 TPY.
Maximum Annual:	12.271 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .074 TPY.
Potential Annual:	Maximum allowable hourly emissions of .84 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 3.679 TPY.
Average Hourly:	Actual annual emissions of .033 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .017 lb/hr.
Maximum Hourly:	Maximum annual emissions of .074 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .017 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = .6 * 1.4 = .84 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	12.271 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	Maximum allowable hourly emissions of 5.6 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 24.528 TPY.
Average Hourly:	Actual annual emissions of .002 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 8.40E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 8.40E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 1.4 MMBtu/hr = 5.6 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 2.88E-04 TPY.
Maximum Annual:	12.271 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 6.50E-04 TPY.
Potential Annual:	6.50E-04 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 6.50E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.88E-04 TPY / 3,875. hr/yr act. * 2,000 lb/ton = 1.48E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.50E-04 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.48E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S069-S070
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	5.428 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .014 TPY.
Maximum Annual:	12.271 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .032 TPY.
Potential Annual:	.032 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .032 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .014 TPY / 3,875. hr/yr act. * 2,000 lb/ton = .007 lb/hr.
Maximum Hourly:	Maximum annual emissions of .032 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .007 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for COATING DRYING OVENS #1 AND #3

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MWPS009356

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F020 - SPECIAL COATING
E105 - SPECIAL COATING SPRAY BOOTH

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F020
Emission Unit ID:	E105
Source Desc:	SPECIAL COATING SPRAY BOOTH
Building No.:	SHIPPING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200801-42C

Source Information

SPECIAL COATINGS ARE APPLIED ON A PORTION OF THE FITTINGS. THE APPLICATION IS PERFORMED AT THE SPECIAL COATING SPRAY BOOTH LOCATED IN THE SHIPPING BUILDING. THE SPRAY BOOTH IS EQUIPPED WITH DRY PAINT FILTER TO CONTROL PARTICULATE EMISSIONS FROM THE SPRAYING PROCESS. EMISSIONS ARE THEN DISCHARGED TO THE ATMOSPHERE THROUGH THE SPRAY PAINT BOOTH STACK (S071).

THE SOLID TRANSFER EFFICIENCY FOR THE SPRAYING OPERATION IS ESTIMATED AT 60 PERCENT. THE SPECIAL COATINGS USED ARE SUBJECT TO VOC CONTENT OF 3.5 LB/GAL OF COATING AS APPLIED.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S071	100%	30	2.8	[N/A]	6.154	16,100	CD036	DRY FILTERS	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE SPECIAL COATING SPRAY BOOTH.

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF577	9448 POLYESTER RESIN	10.999	60%	1,920	4,000	15	31

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
LEAD CHROMATE	7758-97-6	15%	☒	☒	☐
XYLENES (MIXED ISOMERS)	1330-20-7	10%	☒	☐	☐
METHYL N-AMYL KETONE	110-43-0	5%	☐	☐	☐
METHYL ETHYL KETONE	78-93-3	10%	☒	☐	☐
PROPYLENE GLYCOL METHYL ETHER ACETATE	108-65-6	10%	☐	☐	☐
	Total Weight %:	50%			

Comments: ACTUAL USAGE IS 15 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 15 GAL * 4,000 HR / 1,920 HR = 31.25 GAL/YR.

02	CVF579	HS9401 ACTIVATOR	8.804	60%	1,920	4,000	15	31

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
HEXAMETHYLENE DIISOCYANATE	28182-81-2	1%	☒	☒	☐
XYLENES (MIXED ISOMERS)	1330-20-7	30%	☒	☐	☐
	Total Weight %:	31%			

Comments: ACTUAL USAGE IS 15 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 15 GAL * 4,000 HR / 1,920 HR = 31.25 GAL/YR.

03	CVF621	NO. 4 THINNER	6.908	0%	1,920	4,000	250	521

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
METHYL ISOBUTYL KETONE	108-10-1	38.62%	☒	☐	☐
XYLENES (MIXED ISOMERS)	1330-20-7	33.58%	☒	☐	☐
ETHYL BENZENE	100-41-4	8.4%	☒	☐	☐
N-BUTANOL	71-36-3	19.38%	☐	☐	☐
	Total Weight %:	99.98%			

Comments: ACTUAL USAGE IS 250 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 250 GAL * 4,000 HR / 1,920 HR = 521 GAL/YR.

04	CVF195	VOC-COMPLIANT INDUSTRIAL ENAMEL, B54V	8.679	60%	1,920	4,000	27	56

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	2%	☒	☐	☐
MINERAL SPIRITS	64742-88-7	20%	☐	☐	☐
ETHYLENE GLYCOL	107-21-1	16%	☒	☐	☐
	Total Weight %:	38%			

Comments: ACTUAL USAGE IS 27 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 27 GAL * 4,000 HR / 1,920 HR = 56.25 GAL/YR.

05	CVF326	H1058 INDURUST PRIMER	11.032	60%	1,920	4,000	31	65

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
METHYL ETHYL KETONE	78-93-3	0.5%	☒	☐	☐
XYLENES (MIXED ISOMERS)	1330-20-7	0.19%	☒	☐	☐
MINERAL SPIRITS	64742-88-7	30%	☐	☐	☐
	Total Weight %:	30.69%			

Comments: ACTUAL USAGE IS 31 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 31 GAL * 4,000 HR / 1,920 HR = 64.5 GAL/YR.

06	CVF347	54-G-161A PONAMID GRAY	11.900	60%	1,920	4,000	51	106

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	9%	☒	☐	☐
TOLUENE	108-88-3	9%	☒	☐	☐
METHYL ISOBUTYL KETONE	108-10-1	9%	☒	☐	☐
	Total Weight %:	27%			

Comments: ACTUAL USAGE IS 51 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 51 GAL * 4,000 HR / 1,920 HR = 106.25 GAL/YR.

07	CVF567	51-P-1A PONAMID RED PRIMER	13.402	60%	1,920	4,000	40	83

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
CRYSTALLINE SILICA	1317-95-9	11.1%	☐	☐	☐
XYLENES (MIXED ISOMERS)	1330-20-7	13%	☒	☐	☐
METHYL ISOBUTYL KETONE	108-10-1	8.7%	☒	☐	☐
PROPYLENE GLYCOL METHYL ETHER ACETATE	108-65-6	4.3%	☐	☐	☐
	Total Weight %:	37.1%			

Comments: ACTUAL USAGE IS 40 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 40 GAL * 4,000 HR / 1,920 HR = 83 GAL/YR.

08	CVF265	TNEMEC 066 HI BUILD EPOXOLINE PART A (TYPICAL)	14.303	60%	1,920	4,000	458	954

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	13.14%	☒	☐	☐
N-BUTANOL	71-36-3	9%	☐	☐	☐
	Total Weight %:	22.14%			

Comments: ACTUAL USAGE IS 458 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 458 GAL * 4,000 HR / 1,920 HR = 954 GAL/YR.

09	CVF305	TNEMEC F066-1251B EPOXY CONVERTER	10.723	60%	1,920	4,000	458	954

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
METHYL ETHYL KETONE	78-93-3	15.61%	☒	☐	☐
XYLENES (MIXED ISOMERS)	1330-20-7	11.24%	☒	☐	☐
	Total Weight %:	26.85%			

Comments: ACTUAL USAGE IS 458 GAL/YR FOR FY 96. MAXIMUM ANNUAL USAGE IS 458 GAL * 4,000 HR / 1,920 HR = 954 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowabl
CRYSTALLINE SILICA	07	S071	Stack	99%	0%	☐	1.24E-04	1.23E-04	–	1.19E-04	2.47E-04	5.41E-04
Total Emissions of CRYSTALLINE SILICA from SPECIAL COATING SPRAY BOOTH:							**1.24E-04**	**1.23E-04**	**Not Appl.**	**1.19E-04**	**2.47E-04**	**5.41E-04**
ETHYL BENZENE	03	S071	Stack	0%	0%	☒	.076	.076	–	.073	.151	.331
Total Emissions of ETHYL BENZENE from SPECIAL COATING SPRAY BOOTH:							**.076**	**.076**	**Not Appl.**	**.073**	**.151**	**.331**
ETHYLENE GLYCOL	04	S071	Stack	0%	0%	☒	.02	.02	–	.019	.039	.086
Total Emissions of ETHYLENE GLYCOL from SPECIAL COATING SPRAY BOOTH:							**.02**	**.02**	**Not Appl.**	**.019**	**.039**	**.086**
HEXAMETHYLENE DIISOCYANATE	02	S071	Stack	0%	0%	☒	6.88E-04	6.88E-04	–	6.60E-04	.001	.003
Total Emissions of HEXAMETHYLENE DIISOCYANATE from SPECIAL COATING SPRAY BOOTH:							**6.88E-04**	**6.88E-04**	**Not Appl.**	**6.60E-04**	**.001**	**.003**
LEAD CHROMATE	01	S071	Stack	99%	0%	☒	5.16E-05	5.16E-05	–	4.95E-05	1.03E-04	2.26E-04
Total Emissions of LEAD CHROMATE from SPECIAL COATING SPRAY BOOTH:							**5.16E-05**	**5.16E-05**	**Not Appl.**	**4.95E-05**	**1.03E-04**	**2.26E-04**
METHYL ETHYL KETONE	01	S071	Stack	0%	0%	☒	.009	.009	–	.008	.017	.038
	05	S071	Stack	0%	0%	☒	8.91E-04	8.89E-04	–	8.55E-04	.002	.004
	09	S071	Stack	0%	0%	☒	.399	.399	–	.383	.798	1.749
Total Emissions of METHYL ETHYL KETONE from SPECIAL COATING SPRAY BOOTH:							**.409**	**.409**	**Not Appl.**	**.392**	**.817**	**1.749**
METHYL ISOBUTYL KETONE	03	S071	Stack	0%	0%	☒	.347	.347	–	.333	.695	1.522
	06	S071	Stack	0%	0%	☒	.028	.028	–	.027	.057	.125
	07	S071	Stack	0%	0%	☒	.024	.024	–	.023	.048	.106
Total Emissions of METHYL ISOBUTYL KETONE from SPECIAL COATING SPRAY BOOTH:							**.4**	**.4**	**Not Appl.**	**.384**	**.8**	**1.522**
METHYL N-AMYL KETONE	01	S071	Stack	0%	0%	☐	.004	.004	–	.004	.009	.019
Total Emissions of METHYL N-AMYL KETONE from SPECIAL COATING SPRAY BOOTH:							**.004**	**.004**	**Not Appl.**	**.004**	**.009**	**.019**
MINERAL SPIRITS	04	S071	Stack	0%	0%	☐	.024	.024	–	.023	.049	.107
	05	S071	Stack	0%	0%	☐	.053	.053	–	.051	.107	.234
Total Emissions of MINERAL SPIRITS from SPECIAL COATING SPRAY BOOTH:							**.078**	**.078**	**Not Appl.**	**.075**	**.156**	**.234**
N-BUTANOL	03	S071	Stack	0%	0%	☐	.174	.174	–	.167	.349	.764
	08	S071	Stack	0%	0%	☐	.307	.307	–	.295	.614	1.345

Total Emissions of N-BUTANOL from SPECIAL COATING SPRAY BOOTH:							**.481**	**.481**	**Not Appl.**	**.462**	**.963**	**1.345**
PARTICULATE MATTER (PM10)	01	S071	Stack	0%	0%	☐	.022	.022	–	.021	.045	.098
	02	S071	Stack	0%	0%	☐	.018	.018	–	.017	.036	.078
	04	S071	Stack	0%	0%	☐	.029	.029	–	.028	.059	.129
	05	S071	Stack	0%	0%	☐	.049	.049	–	.047	.099	.216
	06	S071	Stack	0%	0%	☐	.092	.092	–	.089	.185	.404
	07	S071	Stack	0%	0%	☐	.083	.082	–	.079	.165	.361
	08	S071	Stack	0%	0%	☐	.993	.993	–	.953	1.985	4.347
	09	S071	Stack	0%	0%	☐	.741	.741	–	.711	1.481	3.244
Total Emissions of PARTICULATE MATTER (PM10) from SPECIAL COATING SPRAY BOOTH:							**2.027**	**2.027**	**Not Appl.**	**1.946**	**4.053**	**4.347**
PROPYLENE GLYCOL METHYL ETHER ACETATE	01	S071	Stack	0%	0%	☐	.009	.009	–	.008	.017	.038
	07	S071	Stack	0%	0%	☐	.012	.012	–	.012	.024	.052
Total Emissions of PROPYLENE GLYCOL METHYL ETHER ACETATE from SPECIAL COATING SPRAY BOOTH:							**.021**	**.021**	**Not Appl.**	**.02**	**.041**	**.052**
TOLUENE	06	S071	Stack	0%	0%	☒	.028	.028	–	.027	.057	.125
Total Emissions of TOLUENE from SPECIAL COATING SPRAY BOOTH:							**.028**	**.028**	**Not Appl.**	**.027**	**.057**	**.125**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S071	Stack	0%	0%	☐	.03	.03	–	.029	.06	.132
	02	S071	Stack	0%	0%	☐	.024	.024	–	.023	.048	.105
	03	S071	Stack	0%	0%	☐	.899	.9	–	.863	1.8	3.941
	04	S071	Stack	0%	0%	☐	.049	.049	–	.047	.097	.212
	05	S071	Stack	0%	0%	☐	.055	.055	–	.052	.109	.239
	06	S071	Stack	0%	0%	☐	.085	.085	–	.082	.171	.374
	07	S071	Stack	0%	0%	☐	.073	.072	–	.07	.145	.317
	08	S071	Stack	0%	0%	☐	.76	.759	–	.729	1.519	3.326
	09	S071	Stack	0%	0%	☐	.706	.706	–	.678	1.412	3.092
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from SPECIAL COATING SPRAY BOOTH:							**2.68**	**2.68**	**Not Appl.**	**2.573**	**5.36**	**3.941**
XYLENES (MIXED ISOMERS)	01	S071	Stack	0%	0%	☒	.009	.009	–	.008	.017	.038
	02	S071	Stack	0%	0%	☒	.021	.021	–	.02	.041	.09
	03	S071	Stack	0%	0%	☒	.302	.302	–	.29	.604	1.323
	04	S071	Stack	0%	0%	☒	.002	.002	–	.002	.005	.011
	05	S071	Stack	0%	0%	☒	3.38E-04	3.38E-04	–	3.25E-04	6.76E-04	.001
	06	S071	Stack	0%	0%	☒	.028	.028	–	.027	.057	.125
	07	S071	Stack	0%	0%	☒	.036	.036	–	.035	.072	.158
	08	S071	Stack	0%	0%	☒	.448	.448	–	.43	.897	1.963
	09	S071	Stack	0%	0%	☒	.288	.287	–	.276	.575	1.259
Total Emissions of XYLENES (MIXED ISOMERS) from SPECIAL COATING SPRAY BOOTH:							**1.135**	**1.134**	**Not Appl.**	**1.089**	**2.269**	**1.963**

Supporting Emission Calculations

Emission Calculations for CRYSTALLINE SILICA (CAS 1317-95-9)
Stack ID or Designation: S071
Segment No: 07, USING 51-P-1A PONAMID RED PRIMER

Actual Annual:	40 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (11.1 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.19E-04 TPY.
Maximum Annual:	83 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (11.1 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = 2.47E-04 TPY.
Potential Annual:	2.47E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 5.41E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.19E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 1.24E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.47E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 1.23E-04 lb/hr.

Emission Calculations for ETHYL BENZENE (CAS 100-41-4)
Stack ID or Designation: S071
Segment No: 03, USING NO. 4 THINNER

Actual Annual:	250 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (8.4 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .073 TPY.
Maximum Annual:	521 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (8.4 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .151 TPY.
Potential Annual:	.151 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .331 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .073 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .076 lb/hr.
Maximum Hourly:	Maximum annual emissions of .151 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .076 lb/hr.

Emission Calculations for ETHYLENE GLYCOL (CAS 107-21-1)
Stack ID or Designation: S071
Segment No: 04, USING VOC-COMPLIANT INDUSTRIAL ENAMEL, B54V

Actual Annual:	27 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (16 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .019 TPY.
Maximum Annual:	56 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (16 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .039 TPY.
Potential Annual:	.039 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .086 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .019 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .02 lb/hr.
Maximum Hourly:	Maximum annual emissions of .039 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .02 lb/hr.

Emission Calculations for HEXAMETHYLENE DIISOCYANATE (CAS 28182-81-2)
Stack ID or Designation: S071
Segment No: 02, USING HS9401 ACTIVATOR

Actual Annual:	15 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 6.60E-04 TPY.
Maximum Annual:	31 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.60E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 6.88E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 6.88E-04 lb/hr.

Emission Calculations for LEAD CHROMATE (CAS 7758-97-6)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (15 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = 4.95E-05 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (15 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * (1 - 99% control eff.) * 1 ton/2,000 lb = 1.03E-04 TPY.
Potential Annual:	1.03E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 2.26E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.95E-05 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 5.16E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.03E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 5.16E-05 lb/hr.

Emission Calculations for METHYL ETHYL KETONE (CAS 78-93-3)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (10 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .008 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (10 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .017 TPY.
Potential Annual:	.017 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .038 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .008 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .009 lb/hr.
Maximum Hourly:	Maximum annual emissions of .017 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.

Emission Calculations for METHYL ETHYL KETONE (CAS 78-93-3)
Stack ID or Designation: S071
Segment No: 05, USING H1058 INDURUST PRIMER

Actual Annual:	31 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (.5 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 8.55E-04 TPY.
Maximum Annual:	65 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (.5 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .004 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 8.55E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 8.91E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 8.89E-04 lb/hr.

Emission Calculations for METHYL ETHYL KETONE (CAS 78-93-3)
Stack ID or Designation: S071
Segment No: 09, USING TNEMEC F066-1251B EPOXY CONVERTER

Actual Annual:	458 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (15.61 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .383 TPY.
Maximum Annual:	954 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (15.61 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .798 TPY.
Potential Annual:	.798 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.749 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .383 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .399 lb/hr.
Maximum Hourly:	Maximum annual emissions of .798 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .399 lb/hr.

Emission Calculations for METHYL ISOBUTYL KETONE (CAS 108-10-1)
Stack ID or Designation: S071
Segment No: 03, USING NO. 4 THINNER

Actual Annual:	250 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (38.62 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .333 TPY.
Maximum Annual:	521 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (38.62 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .695 TPY.
Potential Annual:	.695 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.522 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .333 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .347 lb/hr.
Maximum Hourly:	Maximum annual emissions of .695 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .347 lb/hr.

Emission Calculations for METHYL ISOBUTYL KETONE (CAS 108-10-1)
Stack ID or Designation: S071
Segment No: 06, USING 54-G-161A PONAMID GRAY

Actual Annual:	51 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .027 TPY.
Maximum Annual:	106 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .057 TPY.
Potential Annual:	.057 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .125 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .027 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .028 lb/hr.
Maximum Hourly:	Maximum annual emissions of .057 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .028 lb/hr.

Emission Calculations for METHYL ISOBUTYL KETONE (CAS 108-10-1)
Stack ID or Designation: S071
Segment No: 07, USING 51-P-1A PONAMID RED PRIMER

Actual Annual:	40 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (8.7 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .023 TPY.
Maximum Annual:	83 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (8.7 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .048 TPY.
Potential Annual:	.048 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .106 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .023 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .024 lb/hr.
Maximum Hourly:	Maximum annual emissions of .048 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .024 lb/hr.

Emission Calculations for METHYL N-AMYL KETONE (CAS 110-43-0)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (5 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .004 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (5 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .009 TPY.
Potential Annual:	.009 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .019 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .004 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .004 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .004 lb/hr.

Emission Calculations for MINERAL SPIRITS (CAS 64742-88-7)
Stack ID or Designation: S071
Segment No: 04, USING VOC-COMPLIANT INDUSTRIAL ENAMEL, B54V

Actual Annual:	27 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (20 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .023 TPY.
Maximum Annual:	56 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (20 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .049 TPY.
Potential Annual:	.049 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .107 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .023 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .024 lb/hr.
Maximum Hourly:	Maximum annual emissions of .049 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .024 lb/hr.

Emission Calculations for MINERAL SPIRITS (CAS 64742-88-7)
Stack ID or Designation: S071
Segment No: 05, USING H1058 INDURUST PRIMER

Actual Annual:	31 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (30 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .051 TPY.
Maximum Annual:	65 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (30 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .107 TPY.
Potential Annual:	.107 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .234 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .051 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .053 lb/hr.
Maximum Hourly:	Maximum annual emissions of .107 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .053 lb/hr.

Emission Calculations for N-BUTANOL (CAS 71-36-3)
Stack ID or Designation: S071
Segment No: 03, USING NO. 4 THINNER

Actual Annual:	250 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (19.38 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .167 TPY.
Maximum Annual:	521 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (19.38 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .349 TPY.
Potential Annual:	.349 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .764 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .167 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .174 lb/hr.
Maximum Hourly:	Maximum annual emissions of .349 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .174 lb/hr.

Emission Calculations for N-BUTANOL (CAS 71-36-3)
Stack ID or Designation: S071
Segment No: 08, USING TNEMEC 066 HI BUILD EPOXOLINE PART A (TYPICAL)

Actual Annual:	458 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .295 TPY.
Maximum Annual:	954 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .614 TPY.
Potential Annual:	.614 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.345 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .295 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .307 lb/hr.
Maximum Hourly:	Maximum annual emissions of .614 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .307 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (65 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .021 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (65 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .045 TPY.
Potential Annual:	.045 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .098 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .021 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .022 lb/hr.
Maximum Hourly:	Maximum annual emissions of .045 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .022 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 02, USING HS9401 ACTIVATOR

Actual Annual:	15 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (65 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .017 TPY.
Maximum Annual:	31 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (65 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .036 TPY.
Potential Annual:	.036 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .078 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .017 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .018 lb/hr.
Maximum Hourly:	Maximum annual emissions of .036 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .018 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 04, USING VOC-COMPLIANT INDUSTRIAL ENAMEL, B54V

Actual Annual:	27 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (60.25 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .028 TPY.
Maximum Annual:	56 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (60.25 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .059 TPY.
Potential Annual:	.059 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .129 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .028 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .029 lb/hr.
Maximum Hourly:	Maximum annual emissions of .059 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .029 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 05, USING H1058 INDURUST PRIMER

Actual Annual:	31 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (69.31 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .047 TPY.
Maximum Annual:	65 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (69.31 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .099 TPY.
Potential Annual:	.099 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .216 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .047 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .049 lb/hr.
Maximum Hourly:	Maximum annual emissions of .099 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .049 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 06, USING 54-G-161A PONAMID GRAY

Actual Annual:	51 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (73 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .089 TPY.
Maximum Annual:	106 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (73 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .185 TPY.
Potential Annual:	.185 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .404 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .089 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .092 lb/hr.
Maximum Hourly:	Maximum annual emissions of .185 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .092 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 07, USING 51-P-1A PONAMID RED PRIMER

Actual Annual:	40 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (74 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .079 TPY.
Maximum Annual:	83 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (74 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .165 TPY.
Potential Annual:	.165 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .361 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .079 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .083 lb/hr.
Maximum Hourly:	Maximum annual emissions of .165 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .082 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 08, USING TNEMEC 066 HI BUILD EPOXOLINE PART A (TYPICAL)

Actual Annual:	458 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (72.737 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .953 TPY.
Maximum Annual:	954 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (72.737 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = 1.985 TPY.
Potential Annual:	1.985 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 4.347 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .953 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .993 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.985 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .993 lb/hr.

Emission Calculations for PARTICULATE MATTER (PM10)
Stack ID or Designation: S071
Segment No: 09, USING TNEMEC F066-1251B EPOXY CONVERTER

Actual Annual:	458 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (72.399 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = .711 TPY.
Maximum Annual:	954 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (72.399 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = 1.481 TPY.
Potential Annual:	1.481 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 3.244 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .711 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .741 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.481 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .741 lb/hr.

Emission Calculations for PROPYLENE GLYCOL METHYL ETHER ACETATE (CAS 108-65-6)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (10 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .008 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (10 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .017 TPY.
Potential Annual:	.017 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .038 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .008 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .009 lb/hr.
Maximum Hourly:	Maximum annual emissions of .017 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.

Emission Calculations for PROPYLENE GLYCOL METHYL ETHER ACETATE (CAS 108-65-6)
Stack ID or Designation: S071
Segment No: 07, USING 51-P-1A PONAMID RED PRIMER

Actual Annual:	40 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (4.3 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .012 TPY.
Maximum Annual:	83 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (4.3 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .024 TPY.
Potential Annual:	.024 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .052 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .012 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .012 lb/hr.
Maximum Hourly:	Maximum annual emissions of .024 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .012 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S071
Segment No: 06, USING 54-G-161A PONAMID GRAY

Actual Annual:	51 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .027 TPY.
Maximum Annual:	106 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .057 TPY.
Potential Annual:	.057 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .125 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .027 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .028 lb/hr.
Maximum Hourly:	Maximum annual emissions of .057 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .028 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (35 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .029 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (35 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .06 TPY.
Potential Annual:	.06 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .132 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .029 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .03 lb/hr.
Maximum Hourly:	Maximum annual emissions of .06 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .03 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 02, USING HS9401 ACTIVATOR

Actual Annual:	15 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (35 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .023 TPY.
Maximum Annual:	31 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (35 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .048 TPY.
Potential Annual:	.048 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .105 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .023 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .024 lb/hr.
Maximum Hourly:	Maximum annual emissions of .048 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .024 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 03, USING NO. 4 THINNER

Actual Annual:	250 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .863 TPY.
Maximum Annual:	521 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.8 TPY.
Potential Annual:	1.8 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 3.941 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .863 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .899 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.8 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .9 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 04, USING VOC-COMPLIANT INDUSTRIAL ENAMEL, B54V

Actual Annual:	27 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (39.75 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .047 TPY.
Maximum Annual:	56 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (39.75 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .097 TPY.
Potential Annual:	.097 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .212 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .047 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .049 lb/hr.
Maximum Hourly:	Maximum annual emissions of .097 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .049 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 05, USING H1058 INDURUST PRIMER

Actual Annual:	31 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (30.69 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .052 TPY.
Maximum Annual:	65 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (30.69 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .109 TPY.
Potential Annual:	.109 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .239 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .052 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .055 lb/hr.
Maximum Hourly:	Maximum annual emissions of .109 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .055 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 06, USING 54-G-161A PONAMID GRAY

Actual Annual:	51 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (27 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .082 TPY.
Maximum Annual:	106 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (27 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .171 TPY.
Potential Annual:	.171 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .374 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .082 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .085 lb/hr.
Maximum Hourly:	Maximum annual emissions of .171 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .085 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 07, USING 51-P-1A PONAMID RED PRIMER

Actual Annual:	40 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (26 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .07 TPY.
Maximum Annual:	83 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (26 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .145 TPY.
Potential Annual:	.145 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .317 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .07 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .073 lb/hr.
Maximum Hourly:	Maximum annual emissions of .145 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .072 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 08, USING TNEMEC 066 HI BUILD EPOXOLINE PART A (TYPICAL)

Actual Annual:	458 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (22.263 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .729 TPY.
Maximum Annual:	954 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (22.263 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.519 TPY.
Potential Annual:	1.519 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 3.326 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .729 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .76 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.519 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .759 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S071
Segment No: 09, USING TNEMEC F066-1251B EPOXY CONVERTER

Actual Annual:	458 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (27.601 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .678 TPY.
Maximum Annual:	954 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (27.601 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.412 TPY.
Potential Annual:	1.412 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 3.092 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .678 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .706 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.412 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .706 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 01, USING 9448 POLYESTER RESIN

Actual Annual:	15 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (10 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .008 TPY.
Maximum Annual:	31 gal/yr * 1.318 (sp. grav.) * 8.345 lb/gal * (10 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .017 TPY.
Potential Annual:	.017 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .038 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .008 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .009 lb/hr.
Maximum Hourly:	Maximum annual emissions of .017 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .009 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 02, USING HS9401 ACTIVATOR

Actual Annual:	15 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (30 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .02 TPY.
Maximum Annual:	31 gal/yr * 1.055 (sp. grav.) * 8.345 lb/gal * (30 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .041 TPY.
Potential Annual:	.041 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .09 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .02 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .021 lb/hr.
Maximum Hourly:	Maximum annual emissions of .041 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .021 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 03, USING NO. 4 THINNER

Actual Annual:	250 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (33.58 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .29 TPY.
Maximum Annual:	521 gal/yr * 0.8278 (sp. grav.) * 8.345 lb/gal * (33.58 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .604 TPY.
Potential Annual:	.604 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.323 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .29 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .302 lb/hr.
Maximum Hourly:	Maximum annual emissions of .604 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .302 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 04, USING VOC-COMPLIANT INDUSTRIAL ENAMEL, B54V

Actual Annual:	27 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (2 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .002 TPY.
Maximum Annual:	56 gal/yr * 1.04 (sp. grav.) * 8.345 lb/gal * (2 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	.005 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .011 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .002 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .002 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 05, USING H1058 INDURUST PRIMER

Actual Annual:	31 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (.19 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 3.25E-04 TPY.
Maximum Annual:	65 gal/yr * 1.322 (sp. grav.) * 8.345 lb/gal * (.19 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 6.76E-04 TPY.
Potential Annual:	6.76E-04 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 3.25E-04 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 3.38E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 6.76E-04 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 3.38E-04 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 06, USING 54-G-161A PONAMID GRAY

Actual Annual:	51 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .027 TPY.
Maximum Annual:	106 gal/yr * 1.426 (sp. grav.) * 8.345 lb/gal * (9 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .057 TPY.
Potential Annual:	.057 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .125 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .027 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .028 lb/hr.
Maximum Hourly:	Maximum annual emissions of .057 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .028 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 07, USING 51-P-1A PONAMID RED PRIMER

Actual Annual:	40 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (13 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .035 TPY.
Maximum Annual:	83 gal/yr * 1.606 (sp. grav.) * 8.345 lb/gal * (13 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .072 TPY.
Potential Annual:	.072 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = .158 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .035 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .036 lb/hr.
Maximum Hourly:	Maximum annual emissions of .072 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .036 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 08, USING TNEMEC 066 HI BUILD EPOXOLINE PART A (TYPICAL)

Actual Annual:	458 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (13.14 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .43 TPY.
Maximum Annual:	954 gal/yr * 1.714 (sp. grav.) * 8.345 lb/gal * (13.14 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .897 TPY.
Potential Annual:	.897 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.963 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .43 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .448 lb/hr.
Maximum Hourly:	Maximum annual emissions of .897 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .448 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S071
Segment No: 09, USING TNEMEC F066-1251B EPOXY CONVERTER

Actual Annual:	458 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (11.24 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .276 TPY.
Maximum Annual:	954 gal/yr * 1.285 (sp. grav.) * 8.345 lb/gal * (11.24 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .575 TPY.
Potential Annual:	.575 TPY maximum annual * (8,760 potential hours / 4,000 maximum hours) = 1.259 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .276 TPY / 1,920. hr/yr act. * 2,000 lb/ton = .288 lb/hr.
Maximum Hourly:	Maximum annual emissions of .575 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .287 lb/hr.

End Fact Sheet for SPECIAL COATING SPRAY BOOTH

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F020 - SPECIAL COATING
E106 - SPECIAL COATING DRYING OVEN

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F020
Emission Unit ID:	E106
Source Desc:	SPECIAL COATING DRYING OVEN
Building No.:	SHIPPING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-40200801-42C

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	DRYING OVENS
Rated Heat Input Capacity:	1 MMBtu/hr
Maximum Heat Input Capacity:	1 MMBtu/hr
Avg. Oper. Heat Input Capacity:	1 MMBtu/hr

Description of Operation

THE SPECIAL COATING DRYING OVEN IS RATED AT 1 MMBTU/HR. THE OVEN IS USED FOR DRYING FITTINGS PAINTED IN THE SPECIAL COATING SPRAY BOOTH. THE DRYING OVEN IS FIRED WITH NATURAL GAS ONLY, AND IT IS OPERATED APPROXIMATELY 1,085 HOURS DURING THE 1996 FISCAL YEAR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S072	18	0.833	[N/A]	0.545	830	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FOR THE SPECIAL COATING DRYING OVEN.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	40200801	1,085	8,760	1.09	8.76

Comments: AVERAGE HOURS OF OPERATION = 1.085 MMCF/YR / (1 MMBTU/HR) * 1,000 BTU/CF = 1,085 HR/YR. AVERAGE NATURAL GAS USAGE IS 1.085 MMCF/YR BASED ON FISCAL YEAR 1996 REPORT. MAXIMUM ANNUAL USAGE = 1 MMBTU/HR * 8,760 HR/YR * CF/1000 BTU = 8.760 MMCF/YR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Emission Source Fact Sheet

F020 - SPECIAL COATING
E106 - SPECIAL COATING DRYING OVEN

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S072	Stack	0%	0%	☒	2.12E-04	2.12E-04	Not Appl.	1.15E-04	9.29E-04	9.29E-04
Total Emissions of BENZENE from SPECIAL COATING DRYING OVEN:							**2.12E-04**	**2.12E-04**	**Not Appl.**	**1.15E-04**	**9.29E-04**	**9.29E-04**
CARBON MONOXIDE (CO)	01	S072	Stack	0%	0%	☐	.021	.021	Not Appl.	.011	.092	.092
Total Emissions of CARBON MONOXIDE (CO) from SPECIAL COATING DRYING OVEN:							**.021**	**.021**	**Not Appl.**	**.011**	**.092**	**.092**
FORMALDEHYDE	01	S072	Stack	0%	0%	☒	4.20E-04	4.20E-04	Not Appl.	2.28E-04	.002	.002
Total Emissions of FORMALDEHYDE from SPECIAL COATING DRYING OVEN:							**4.20E-04**	**4.20E-04**	**Not Appl.**	**2.28E-04**	**.002**	**.002**
NITROGEN OXIDES (NOx)	01	S072	Stack	0%	0%	☐	.1	.1	Not Appl.	.054	.438	.438
Total Emissions of NITROGEN OXIDES (NOx) from SPECIAL COATING DRYING OVEN:							**.1**	**.1**	**Not Appl.**	**.054**	**.438**	**.438**
PARTICULATE MATTER (TSP)	01	S072	Stack	0%	0%	☐	.012	.012	.6	.007	.053	2.628
Total Emissions of PARTICULATE MATTER (TSP) from SPECIAL COATING DRYING OVEN:							**.012**	**.012**	**.6**	**.007**	**.053**	**2.628**
SULFUR DIOXIDE (SO2)	01	S072	Stack	0%	0%	☐	6.00E-04	6.00E-04	4.	3.26E-04	.003	17.52
Total Emissions of SULFUR DIOXIDE (SO2) from SPECIAL COATING DRYING OVEN:							**6.00E-04**	**6.00E-04**	**4.**	**3.26E-04**	**.003**	**17.52**
TOLUENE	01	S072	Stack	0%	0%	☒	1.06E-04	1.06E-04	Not Appl.	5.75E-05	4.64E-04	4.64E-04
Total Emissions of TOLUENE from SPECIAL COATING DRYING OVEN:							**1.06E-04**	**1.06E-04**	**Not Appl.**	**5.75E-05**	**4.64E-04**	**4.64E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S072	Stack	0%	0%	☐	.005	.005	Not Appl.	.003	.023	.023
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from SPECIAL COATING DRYING OVEN:							**.005**	**.005**	**Not Appl.**	**.003**	**.023**	**.023**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 1.15E-04 TPY.
Maximum Annual:	8.76 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 9.29E-04 TPY.
Potential Annual:	9.29E-04 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 9.29E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.15E-04 TPY / 1,085. hr/yr act. * 2,000 lb/ton = 2.12E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.29E-04 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 2.12E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .011 TPY.
Maximum Annual:	8.76 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .092 TPY.
Potential Annual:	.092 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .092 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .011 TPY / 1,085. hr/yr act. * 2,000 lb/ton = .021 lb/hr.
Maximum Hourly:	Maximum annual emissions of .092 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .021 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 2.28E-04 TPY.
Maximum Annual:	8.76 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.28E-04 TPY / 1,085. hr/yr act. * 2,000 lb/ton = 4.20E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 4.20E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .054 TPY.
Maximum Annual:	8.76 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .438 TPY.
Potential Annual:	.438 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .438 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .054 TPY / 1,085. hr/yr act. * 2,000 lb/ton = .1 lb/hr.
Maximum Hourly:	Maximum annual emissions of .438 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .1 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	8.76 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .053 TPY.
Potential Annual:	Maximum allowable hourly emissions of .6 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 2.628 TPY.
Average Hourly:	Actual annual emissions of .007 TPY / 1,085. hr/yr act. * 2,000 lb/ton = .012 lb/hr.
Maximum Hourly:	Maximum annual emissions of .053 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .012 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = .6 * 1 = .6 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = 3.26E-04 TPY.
Maximum Annual:	8.76 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	Maximum allowable hourly emissions of 4. lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 17.52 TPY.
Average Hourly:	Actual annual emissions of 3.26E-04 TPY / 1,085. hr/yr act. * 2,000 lb/ton = 6.00E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 6.00E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 1 MMBtu/hr = 4 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 5.75E-05 TPY.
Maximum Annual:	8.76 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 4.64E-04 TPY.
Potential Annual:	4.64E-04 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 4.64E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.75E-05 TPY / 1,085. hr/yr act. * 2,000 lb/ton = 1.06E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.64E-04 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.06E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S072
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.085 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	8.76 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .023 TPY.
Potential Annual:	.023 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .023 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 1,085. hr/yr act. * 2,000 lb/ton = .005 lb/hr.
Maximum Hourly:	Maximum annual emissions of .023 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .005 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for SPECIAL COATING DRYING OVEN

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F021 - SHIPPING

E107 - ASPHALT COATING BULK STORAGE TANK #1

General Source Information

Facility:	CV&F
Process ID:	F021
Equipment Desc:	ASPHALT COATING BULK STORAGE TA
Building No.:	ADJACENT TO SHIPPING YARD
UTM Location:	**East:** 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	15	9.5	ft
Tank Vol. Capacity:	8000		gals
Average Liquid Height:	7.5		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	SILVER		
Vapor Recovery Installed?	☐		

General Source Comments

THE ASPHALT COATING BULK STORAGE TANK #1 IS AN 8,000-GALLON CAPACITY TANK. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S073	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: ASPHALT COATING BULK STORAGE TANK #1 STACK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Maximum
01	ASPHALT COATING		14.834	51.92

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Maximum	Annual Emissions (TPY) Actual	Maximum	Potential
NAPHTHA	01	S073	0%	☐	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of NAPHTHA from ASPHALT COATING BULK STORAGE TANK #1:							**1.1E-03**	**1.9E-03**	**1.9E-03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S073	0%	☐	Negligible	Negligible	1.7E-02	3.0E-02	3.0E-02
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ASPHALT COATING BULK STORAGE TANK #1:							**1.7E-02**	**3.0E-02**	**3.0E-02**
XYLENES (MIXED ISOMERS)	01	S073	0%	☒	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of XYLENES (MIXED ISOMERS) from ASPHALT COATING BULK STORAGE TANK #1:							**1.1E-03**	**1.9E-03**	**1.9E-03**

Supporting Emission Calculations

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S073
Segment No: 01

Actual Annual:	Actual annual emissions are 2.19 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.79 lb/yr.
Potential Annual:	Potential annual emissions are 3.79 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S073
Segment No: 01

Actual Annual:	Actual annual emissions are 2.23 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.87 lb/yr.
Potential Annual:	Potential annual emissions are 3.87 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S073
Segment No: 01

Actual Annual:	Actual annual emissions are 34.89 lb/yr.
Maximum Annual:	Maximum annual emissions are 60.45 lb/yr.
Potential Annual:	Potential annual emissions are 60.45 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ASPHALT COATING BULK STORAGE TANK #1

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F021 - SHIPPING

E107 - ASPHALT COATING BULK STORAGE TANK #1

General Source Information

Facility:	CV&F
Process ID:	F021
Equipment Desc:	ASPHALT COATING BULK STORAGE TA
Building No.:	ADJACENT TO SHIPPING YARD
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	15	9.5	ft
Tank Vol. Capacity:	8000		gals
Average Liquid Height:	7.5		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	SILVER		
Vapor Recovery Installed?	☐		

General Source Comments

THE ASPHALT COATING BULK STORAGE TANK #1 IS AN 8,000-GALLON CAPACITY TANK. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S073	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: ASPHALT COATING BULK STORAGE TANK #1 STACK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Maximum
01	ASPHALT COATING		14.834	51.92

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Maximum	Annual Emissions (TPY) Actual	Maximum	Potential
NAPHTHA	01	S073	0%	☐	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of NAPHTHA from ASPHALTA COATING BULK STORAGE TANK #1:							**1.1E-03**	**1.9E-03**	**1.9E-03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S073	0%	☐	Negligible	Negligible	1.7E-02	3.0E-02	3.0E-02
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ASPHALT COATING BULK STORAGE TANK #1:							**1.7E-02**	**3.0E-02**	**3.0E-02**
XYLENES (MIXED ISOMERS)	01	S073	0%	☒	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of XYLENES (MIXED ISOMERS) from ASPHALT COATING BULK STORAGE TANK #1:							**1.1E-03**	**1.9E-03**	**1.9E-03**

Supporting Emission Calculations

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S073
Segment No: 01

Actual Annual:	Actual annual emissions are 2.19 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.79 lb/yr.
Potential Annual:	Potential annual emissions are 3.79 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S073
Segment No: 01

Actual Annual:	Actual annual emissions are 2.23 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.87 lb/yr.
Potential Annual:	Potential annual emissions are 3.87 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S073
Segment No: 01

Actual Annual:	Actual annual emissions are 34.89 lb/yr.
Maximum Annual:	Maximum annual emissions are 60.45 lb/yr.
Potential Annual:	Potential annual emissions are 60.45 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ASPHALT COATING BULK STORAGE TANK #1

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F021 - SHIPPING
E108 - ASPHALT COATING BULK STORAGE TANK #2

General Source Information

Facility:	CV&F
Process ID:	F021
Equipment Desc:	ASPHALT COATING BULK STORAGE TA
Building No.:	ADJACENT TO THE SHIPPING YARD
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	15	9.5	ft
Tank Vol. Capacity:	8000		gals
Average Liquid Height:	7.5		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	SILVER		
Vapor Recovery Installed?	☐		

General Source Comments

THE ASPHALT COATING BULK STORAGE TANK #2 IS AN 8,000-GALLON CAPACITY TANK. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S074	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: ASPHALT COATING BULK STORAGE TANK #2 STACK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	ASPHALT COATING		14.834	51.92

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
NAPHTHA	01	S074	0%	☐	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of NAPHTHA from ASPHALT COATING BULK STORAGE TANK #2:							**1.1E-03**	**1.9E-03**	**1.9E-03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S074	0%	☐	Negligible	Negligible	1.7E-02	3.0E-02	3.0E-02
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ASPHALT COATING BULK STORAGE TANK #2:							**1.7E-02**	**3.0E-02**	**3.0E-02**
XYLENES (MIXED ISOMERS)	01	S074	0%	☒	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of XYLENES (MIXED ISOMERS) from ASPHALT COATING BULK STORAGE TANK #2:							**1.1E-03**	**1.9E-03**	**1.9E-03**

Supporting Emission Calculations

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S074
Segment No: 01

Actual Annual:	Actual annual emissions are 2.19 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.79 lb/yr.
Potential Annual:	Potential annual emissions are 3.79 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S074
Segment No: 01

Actual Annual:	Actual annual emissions are 2.23 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.87 lb/yr.
Potential Annual:	Potential annual emissions are 3.87 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S074
Segment No: 01

Actual Annual:	Actual annual emissions are 34.89 lb/yr.
Maximum Annual:	Maximum annual emissions are 60.45 lb/yr.
Potential Annual:	Potential annual emissions are 60.45 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ASPHALT COATING BULK STORAGE TANK #2

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F021 - SHIPPING
E108 - ASPHALT COATING BULK STORAGE TANK #2

General Source Information

Facility:	CV&F
Process ID:	F021
Equipment Desc:	ASPHALT COATING BULK STORAGE TA
Building No.:	ADJACENT TO THE SHIPPING YARD
UTM Location:	East: 653395 m
	North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Other Tank Information:

Tank Ht/Length & Dia.:	15	9.5	ft
Tank Vol. Capacity:	8000		gals
Average Liquid Height:	7.5		ft
Liq. Bulk Temp, if heated	0		R
Tank Type:	VERT. DOME ROOF		
Tank Function:	STORAGE		
Tank Shell Color:	SILVER		
Vapor Recovery Installed?	☐		

General Source Comments

THE ASPHALT COATING BULK STORAGE TANK #2 IS AN 8,000-GALLON CAPACITY TANK. EMISSIONS CALCULATIONS ARE BASED ON AP-42, CHAPTER 7.1, LIQUID STORAGE TANKS, REVISED ON JAN. 1995 AND UPDATED ON FEB. 1996.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S074	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: ASPHALT COATING BULK STORAGE TANK #2 STACK.

Storage Tank/Fueling Operational Data

Segment ID	Description	SCC Code	Tank Throughput (kgal/yr) Actual	Tank Throughput (kgal/yr) Maximum
01	ASPHALT COATING		14.834	51.92

Calculated Emission Rates

Pollutant	Seg ID	Stack ID	Cont Eff	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
NAPHTHA	01	S074	0%	☐	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of NAPHTHA from ASPHALT COATING BULK STORAGE TANK #2:							**1.1E-03**	**1.9E-03**	**1.9E-03**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S074	0%	☐	Negligible	Negligible	1.7E-02	3.0E-02	3.0E-02
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ASPHALT COATING BULK STORAGE TANK #2:							**1.7E-02**	**3.0E-02**	**3.0E-02**
XYLENES (MIXED ISOMERS)	01	S074	0%	☒	Negligible	Negligible	1.1E-03	1.9E-03	1.9E-03
Total Emissions of XYLENES (MIXED ISOMERS) from ASPHALT COATING BULK STORAGE TANK #2:							**1.1E-03**	**1.9E-03**	**1.9E-03**

Supporting Emission Calculations

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S074
Segment No: 01

Actual Annual:	Actual annual emissions are 2.19 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.79 lb/yr.
Potential Annual:	Potential annual emissions are 3.79 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S074
Segment No: 01

Actual Annual:	Actual annual emissions are 2.23 lb/yr.
Maximum Annual:	Maximum annual emissions are 3.87 lb/yr.
Potential Annual:	Potential annual emissions are 3.87 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S074
Segment No: 01

Actual Annual:	Actual annual emissions are 34.89 lb/yr.
Maximum Annual:	Maximum annual emissions are 60.45 lb/yr.
Potential Annual:	Potential annual emissions are 60.45 lb/hr.
Average Hourly:	Negligible.
Maximum Hourly:	Negligible.

End Fact Sheet for ASPHALT COATING BULK STORAGE TANK #2

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F021 - SHIPPING
E109 - TOUCHUP COATING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F021
Emission Unit ID:	E109
Source Desc:	TOUCHUP COATING
Building No.:	SHIPPING YARD
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Source Information

ASPHALT PAINT IS USED FOR TOUCHUP FITTINGS AND PARTS PRIOR TO SHIPPING. TOUCHUP COATING OPERATIONS ARE PERFORMED IN THE OPEN AIR WHERE THE PARTS LIE. THE SOLID TRANSFER EFFICIENCY FOR THE SPRAY COATING OPERATION IS ESTIMATED AT 60 PERCENT. THE ASPHALT COATING USED IS SUBJECT TO VOC CONTENT OF 3.5 LB/GAL OF COATING AS APPLIED.

Stack/Discharge Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S075	100%	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS FROM TOUCHUP COATING IN THE SHIPPING YARD.

Coating/Thinner Usage Data

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
01	CVF394	B-523 R-17-A-73 CUTBACK ASPHALT	7.452	60%	2,500	8,760	3,000	10,512

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
XYLENES (MIXED ISOMERS)	1330-20-7	4.78%	☒	☐	☐
NAPHTHA	8030-30-6	38.22%	☐	☐	☐
ASPHALT	8052-42-4	57%	☐	☒	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 3,000 GALLONS OF ASPHALT COATING. MAXIMUM ANNUAL USAGE IS 3,000 * 8,760 HR / 2,500 HR = 10,512 GAL/YR.

Segment ID	MSDS ID	Description	Density (lb/gal)	Transfer Efficiency	Hours of Operation (hr/yr) Actual	Hours of Operation (hr/yr) Maximum	Annual Usages (gal/yr) Actual	Annual Usages (gal/yr) Maximum
02	CVF241	SURE SOL-150	7.469	0%	2,500	8,760	30	105

Pollutant Name	CAS Number	Weight %	HAP?	PM?	VOC?
NAPHTHALENE	91-20-3	1%	☒	☐	☐
C8 & C10 AROMATIC HYDROCARBON	64742-95-6	99%	☐	☐	☐
	Total Weight %:	100%			

Comments: FISCAL YEAR 1996 USAGE IS APPROXIMATELY 30 GALLONS OF MINERAL SPIRITS AS MAKEUP AND CLEANING SOLVENT. MAXIMUM ANNUAL USAGE IS 30 * 8,760 HR / 2,500 HR = 105.12 GAL/YR OR APPROXIMATELY 105 GAL/YR.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Average	Hourly Emissions (lb/hr) Maximum	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
ASPHALT	01	S075	0%	0%	☐	2.039	2.039	2.549	8.93	8.93
Total Emissions of ASPHALT from TOUCHUP COATING:								**2.549**	**8.93**	**8.93**
C8 & C10 AROMATIC HYDROCARBON	02	S075	0%	0%	☐	.089	.089	.111	..388	.388
Total Emissions of C8 & C10 AROMATIC HYDROCARBON from TOUCHUP COATING:								**.111**	**.388**	**.388**
NAPHTHA	01	S075	0%	0%	☐	3.418	3.418	4.272	14.97	14.97
Total Emissions of NAPHTHA from TOUCHUP COATING:								**4.272**	**14.97**	**14.97**
NAPHTHALENE	02	S075	0%	0%	☒	8.96E-04	8.95E-04	.001	.004	.004
Total Emissions of NAPHTHALENE from TOUCHUP COATING:								**.001**	**.004**	**.004**
PARTICULATE MATTER (TSP)	01	S075	0%	0%	☐	2.039	2.039	2.549	8.93	8.93
Total Emissions of PARTICULATE MATTER (TSP) from TOUCHUP COATING:								**2.549**	**8.93**	**8.93**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S075	0%	0%	☐	3.845	3.845	4.807	16.842	16.842
	02	S075	0%	0%	☐	.09	.09	.112	.392	.392
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from TOUCHUP COATING:								**4.919**	**17.234**	**17.234**
XYLENES (MIXED ISOMERS)	01	S075	0%	0%	☒	.427	.427	.534	1.872	1.872
Total Emissions of XYLENES (MIXED ISOMERS) from TOUCHUP COATING:								**.534**	**1.872**	**1.872**

Supporting Emission Calculations

Emission Calculations for ASPHALT (CAS 8052-42-4)
Stack ID or Designation: S075
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = 2.549 TPY.
Maximum Annual:	10,512 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = 8.93 TPY.
Potential Annual:	8.93 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 8.93 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.549 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 2.039 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.93 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 2.039 lb/hr.

Emission Calculations for C8 & C10 AROMATIC HYDROCARBON (CAS 64742-95-6)
Stack ID or Designation: S075
Segment No: 02, USING SURE SOL-150

Actual Annual:	30 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .111 TPY.
Maximum Annual:	105 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (99 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .388 TPY.
Potential Annual:	.388 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .388 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .111 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .089 lb/hr.
Maximum Hourly:	Maximum annual emissions of .388 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .089 lb/hr.

Emission Calculations for NAPHTHA (CAS 8030-30-6)
Stack ID or Designation: S075
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 4.272 TPY.
Maximum Annual:	10,512 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (38.22 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 14.97 TPY.
Potential Annual:	14.97 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 14.97 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.272 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 3.418 lb/hr.
Maximum Hourly:	Maximum annual emissions of 14.97 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 3.418 lb/hr.

Emission Calculations for NAPHTHALENE (CAS 91-20-3)
Stack ID or Designation: S075
Segment No: 02, USING SURE SOL-150

Actual Annual:	30 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	105 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (1 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .004 TPY.
Potential Annual:	.004 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .004 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .001 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 8.96E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .004 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 8.95E-04 lb/hr.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S075
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = 2.549 TPY.
Maximum Annual:	10,512 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (57 Wt.% ingredient) * (40% overspray) * (100% of stack capture) * 1 ton/2,000 lb = 8.93 TPY.
Potential Annual:	8.93 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 8.93 TPY. This PTE is the emission rates over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.549 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 2.039 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.93 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 2.039 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S075
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 4.807 TPY.
Maximum Annual:	10,512 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (43 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 16.842 TPY.
Potential Annual:	16.842 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 16.842 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.807 TPY / 2,500. hr/yr act. * 2,000 lb/ton = 3.845 lb/hr.
Maximum Hourly:	Maximum annual emissions of 16.842 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 3.845 lb/hr.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S075
Segment No: 02, USING SURE SOL-150

Actual Annual:	30 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .112 TPY.
Maximum Annual:	105 gal/yr * 0.895 (sp. grav.) * 8.345 lb/gal * (100 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .392 TPY.
Potential Annual:	.392 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .392 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .112 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .09 lb/hr.
Maximum Hourly:	Maximum annual emissions of .392 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .09 lb/hr.

Emission Calculations for XYLENES (MIXED ISOMERS) (CAS 1330-20-7)
Stack ID or Designation: S075
Segment No: 01, USING B-523 R-17-A-73 CUTBACK ASPHALT

Actual Annual:	3,000 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = .534 TPY.
Maximum Annual:	10,512 gal/yr * 0.893 (sp. grav.) * 8.345 lb/gal * (4.78 Wt.% ingredient) * (100% of stack capture) * 1 ton/2,000 lb = 1.872 TPY.
Potential Annual:	1.872 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 1.872 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .534 TPY / 2,500. hr/yr act. * 2,000 lb/ton = .427 lb/hr.
Maximum Hourly:	Maximum annual emissions of 1.872 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .427 lb/hr.

End Fact Sheet for TOUCHUP COATING

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UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E110 - CUPOLA BAGHOUSE DUST SOLIDIFICATION

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E110
Source Desc:	CUPOLA BAGHOUSE DUST SOLIDIFICATIO
Building No.:	MELTING AREA
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30400301-47C

Equipment Information

Equip. Type:	CUPOLA BAGHOUSE DUST SOLIDIFICATION PROCESS
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 2,419 LB/HR OF CUPOLA BAGHOUSE DUST AND CEMENT.

Description of Operation:

CUPOLA BAGHOUSE DUST TREAMENT AREA. FLYASH FROM CUPOLA BAGHOUSE IS LOADED PNEUMATIC INTO AN ELEVATED STORAGE SILO. THE SILO IS CONTROLLED BY A BAGHOUSE INSTALLED ON TOP OF THE SILO. THE SOLIDIFICATION PROCESS COMBINES CUPOLA BAGHOUSE DUST, CEMENTEOUS MATERIALS AND WATER AND MIXES THESE INGREDIENTS TO FORM A SOLID LEACH PROOF MATERIAL.

THE CUPOLA BAGHOUSE DUST SOLIDIFICATION PROCESS IS PERMITTED. EMISSION FROM THIS SOURCE IS LIMITTED TO 0.01 LB/HR OF PARTICULATE DUST.

Emission Point Information

Stack ID	Dischrg % By Stack	Stack Ht. (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S076	100%	60	0.5	[N/A]	0.196	1,000	CD037	BAGHOUSE	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM CUPOLA DUST SOLIDIFICATION BAGHOUSE.

Operational Parameters

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr) Actual	Process Rate (ton/yr) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	CUPOLA BAGHOUSE DUST SOLIDIFICATION	30400398	2,000	4,000	2,419.00	4,838.00	1.21	0.171

Comments: AVERAGE HOURLY PROCESSING RATE IS 2,419 LB/HR OR 1.210 TPH. AVERAGE ANNUAL PROCESSING RATE IS 2,419 LB/HR * 2,000 HR/YR * 1TON/2,000 LB = 2,419 TPY. THE MAXIMUM ANNUAL PROCESSING RATE IS 2,419 LB/HR * 4,000 HR/YR * 1TON/2,000 LB = 4,838 TPY.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C035	PARTICULATE MATTER (TSP)	0.01	lb/hr	PERMIT LIMIT

Comments: SOURCE: PRECONSTRUCTION PERMIT LIMIT OF 0.010 LB/HR.

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E110 - CUPOLA BAGHOUSE DUST SOLIDIFICATION

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
PARTICULATE MATTER (TSP)	01	S076	Stack	99%	0%	☐	.01	.01	.171	.01	.02	.751
Total Emissions of PARTICULATE MATTER (TSP) from CUPOLA BAGHOUSE DUST SOLIDIFICATION:							**.01**	**.01**	**.171**	**.01**	**.02**	**.751**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S076

Segment No: 01, CUPOLA BAGHOUSE DUST SOLIDIFICATION

Actual Annual:	0.01 lb/hr * 2,000 hr/yr act. * 1 ton/2,000 lb = .01 TPY.
Maximum Annual:	0.01 lb/hr (specified emission factor) * 4,000 hr/yr maximum * 1 ton/2,000 lb = .02 TPY.
Allowable Annual:	Maximum allowable hourly emissions of .171 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = .751 TPY.
Average Hourly:	Actual annual emissions of .01 TPY / 2,000. hr/yr act. * 2,000 lb/ton = .01 lb/hr.
Maximum Hourly:	Maximum annual emissions of .02 TPY / 4,000 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Allowable TSP emissions are subject to Rule 26.12 (2): 0.02 gr/dscf * 1 lb/7,000 gr * 1,000 dscf/min * 60 min/hr = .171 lb/hr.

End Page Report for CUPOLA BAGHOUSE DUST SOLIDIFICATION

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E111 - CUPOLA DRYING

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E111
Source Desc:	CUPOLA DRYING
Building No.:	MELTING BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	PORTABLE BURNER
Rated Heat Input Capacity:	1.1 MMBtu/hr
Maximum Heat Input Capacity:	1.1 MMBtu/hr
Avg. Oper. Heat Input Capacity:	1.1 MMBtu/hr

Description of Operation

THE CUPOLA MELTING PROCESS IS OPERATED 4 OUT OF 7 DAYS PER WEEK. DURING THE DAYS WHEN MELTING IS NOT PERFORMED, THE CUPOLA IS KEPT DRIED BY PLACING AND MAINTAINING A BURNER IN THE BREAST OF THE CUPOLA.

AVERGE NATURAL GAS USAGE IS 3.80 MMCF/YR BASED ON 1996 FISCAL YEAR REPORT. AVERAGE HOURS OF OPERATION WAS 24 HR/DAY * 3 DAY/WK * 48 WK/YR OR 3,456 HR/YR. THUS, THE AVERAGE BURNER HEAT INPUT IS 3.80 MMCF/YR * 1,000 BTU/CF * 1 YR/3,456 HR OR APPROXIMATELY 1.1 MMBTU/HR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S004	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: FUGITVE EMISSIONS FROM THE MELTING BUILDING.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400398	3,456	3,744	3.80	4.12

Comments: AVERGE NATURAL GAS USAGE IS 3.80 MMCF/YR BASED ON 1996 FISCAL YEAR REPORT.
AVERAGE HOURS OF OPERATION WAS 24 HR/DAY * 3 DAY/WK * 48 WK/YR OR 3,456 HR/YR.
MAXIMUM NATURAL GAS USAGE IS 3.80 MMCF/YR * 3,744 HRS / 3,456 HR = 4.117 MMCF/YR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
	Comments:	UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
	Comments:	UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
	Comments:	UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S004	Fugitive	0%	0%	☒	2.33E-04	2.33E-04	Not Appl.	4.03E-04	4.36E-04	.001
Total Emissions of BENZENE from CUPOLA DRYING:							**2.33E-04**	**2.33E-04**	**Not Appl.**	**4.03E-04**	**4.36E-04**	**.001**
CARBON MONOXIDE (CO)	01	S004	Fugitive	0%	0%	☐	.023	.023	Not Appl.	.04	.043	.101
Total Emissions of CARBON MONOXIDE (CO) from CUPOLA DRYING:							**.023**	**.023**	**Not Appl.**	**.04**	**.043**	**.101**
FORMALDEHYDE	01	S004	Fugitive	0%	0%	☒	4.62E-04	4.62E-04	Not Appl.	7.98E-04	8.65E-04	.002
Total Emissions of FORMALDEHYDE from CUPOLA DRYING:							**4.62E-04**	**4.62E-04**	**Not Appl.**	**7.98E-04**	**8.65E-04**	**.002**
NITROGEN OXIDES (NOx)	01	S004	Fugitive	0%	0%	☐	.11	.11	Not Appl.	.19	.206	.482
Total Emissions of NITROGEN OXIDES (NOx) from CUPOLA DRYING:							**.11**	**.11**	**Not Appl.**	**.19**	**.206**	**.482**
PARTICULATE MATTER (TSP)	01	S004	Fugitive	0%	0%	☐	.013	.013	.66	.023	.025	2.891
Total Emissions of PARTICULATE MATTER (TSP) from CUPOLA DRYING:							**.013**	**.013**	**.66**	**.023**	**.025**	**2.891**
SULFUR DIOXIDE (SO2)	01	S004	Fugitive	0%	0%	☐	6.60E-04	6.60E-04	4.4	.001	.001	19.272
Total Emissions of SULFUR DIOXIDE (SO2) from CUPOLA DRYING:							**6.60E-04**	**6.60E-04**	**4.4**	**.001**	**.001**	**19.272**
TOLUENE	01	S004	Fugitive	0%	0%	☒	1.17E-04	1.17E-04	Not Appl.	2.01E-04	2.18E-04	5.11E-04
Total Emissions of TOLUENE from CUPOLA DRYING:							**1.17E-04**	**1.17E-04**	**Not Appl.**	**2.01E-04**	**2.18E-04**	**5.11E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S004	Fugitive	0%	0%	☐	.006	.006	Not Appl.	.01	.011	.025
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from CUPOLA DRYING:							**.006**	**.006**	**Not Appl.**	**.01**	**.011**	**.025**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 4.03E-04 TPY.
Maximum Annual:	4.117 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 4.36E-04 TPY.
Potential Annual:	4.36E-04 TPY maximum annual * (8,760 potential hours / 3,744 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.03E-04 TPY / 3,456. hr/yr act. * 2,000 lb/ton = 2.33E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.36E-04 TPY / 3,744 hr/yr max. * 2,000 lb/ton = 2.33E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .04 TPY.
Maximum Annual:	4.117 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .043 TPY.
Potential Annual:	.043 TPY maximum annual * (8,760 potential hours / 3,744 maximum hours) = .101 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .04 TPY / 3,456. hr/yr act. * 2,000 lb/ton = .023 lb/hr.
Maximum Hourly:	Maximum annual emissions of .043 TPY / 3,744 hr/yr max. * 2,000 lb/ton = .023 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 7.98E-04 TPY.
Maximum Annual:	4.117 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 8.65E-04 TPY.
Potential Annual:	8.65E-04 TPY maximum annual * (8,760 potential hours / 3,744 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 7.98E-04 TPY / 3,456. hr/yr act. * 2,000 lb/ton = 4.62E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.65E-04 TPY / 3,744 hr/yr max. * 2,000 lb/ton = 4.62E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .19 TPY.
Maximum Annual:	4.117 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .206 TPY.
Potential Annual:	.206 TPY maximum annual * (8,760 potential hours / 3,744 maximum hours) = .482 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .19 TPY / 3,456. hr/yr act. * 2,000 lb/ton = .11 lb/hr.
Maximum Hourly:	Maximum annual emissions of .206 TPY / 3,744 hr/yr max. * 2,000 lb/ton = .11 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .023 TPY.
Maximum Annual:	4.117 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .025 TPY.
Potential Annual:	Maximum allowable hourly emissions of .66 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 2.891 TPY.
Average Hourly:	Actual annual emissions of .023 TPY / 3,456. hr/yr act. * 2,000 lb/ton = .013 lb/hr.
Maximum Hourly:	Maximum annual emissions of .025 TPY / 3,744 hr/yr max. * 2,000 lb/ton = .013 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = .6 * 1.1 = .66 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	4.117 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	Maximum allowable hourly emissions of 4.4 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 19.272 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 3,456. hr/yr act. * 2,000 lb/ton = 6.60E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 3,744 hr/yr max. * 2,000 lb/ton = 6.60E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 1.1 MMBtu/hr = 4.4 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 2.01E-04 TPY.
Maximum Annual:	4.117 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 2.18E-04 TPY.
Potential Annual:	2.18E-04 TPY maximum annual * (8,760 potential hours / 3,744 maximum hours) = 5.11E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.01E-04 TPY / 3,456. hr/yr act. * 2,000 lb/ton = 1.17E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.18E-04 TPY / 3,744 hr/yr max. * 2,000 lb/ton = 1.17E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S004
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	3.8 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .01 TPY.
Maximum Annual:	4.117 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .011 TPY.
Potential Annual:	.011 TPY maximum annual * (8,760 potential hours / 3,744 maximum hours) = .025 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .01 TPY / 3,456. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .011 TPY / 3,744 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for CUPOLA DRYING

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E112 - CARPENTER SHOP

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E112
Source Desc:	CARPENTER SHOP
Building No.:	R/S VALVE ASSEMBLY BUILDING
UTM Location:	**East:** 653395 m **North:** 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30799999-20C

Equipment Information

Equip. Type:	WOOD WORKING EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 400 LB/HR.

Source Comments

TYPICAL WOOD WORKING OPERTIONS SUCH AS CUTTING, SURFACING AND SANDING ARE PERFORMED IN THE CARPENTER SHOP. EMISSIONS FROM VARIOUS EQUIPMENT IS VENT THROUGH A CYCLONE DESIGNED TO CONTROL SAW DUST GENERATING FROM THESE OPERATIONS. EMISSION ESTIMATES IS BASED ON PERMIT LIMIT OF 0.03 GR/DSCF.

Stack/Discharge Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S077	20	2.75	[N/A]	5.937	18,000	CD038	CYCLONES	[N/A]	[No Sec. Control]

Comments: EMISSION STACK FROM CARPENTER SHOP CYCLONE.

Mechanical Operations Usage Data

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr or 1000gal) Actual	Process Rate (ton/yr or 1000gal) Maximum	Stack Flow Rate (cfm) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	WOOD WORKING, SAW DUST	30700803	1,920	4,000	384	800	18,000	Not Appl.	4.629

Comments: AVERAGE HOURLY PROCESSING RATE IS 400 LB/HR. EMISSIONS ARE BASED ON PERMIT LIMIT OF 0.03 GR/DSCF AND A MAXIMUM STACK FLOW RATE OF 18,000 DSCFM. AVERAGE AND MAXIMUM HOURS OF OPERATION ARE 1,920 HR/YR AND 4,000 HR/YR, RESPECTIVELY.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C020	PARTICULATE MATTER (TSP)	0.03	gr/dscf	PERMIT LIMIT

Comments: PERMIT LIMIT FOR THE CARPENTER SHOP AND THE PATTERN SHOP.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Avg.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
PARTICULATE MATTER (TSP)	01	S077	95%	0%	☐	4.629	4.629	4.629	4.443	9.257	20.273
Total Emissions of PARTICULATE MATTER (TSP) from CARPENTER SHOP:									**4.443**	**9.257**	**20.273**

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)

Stack ID or Designation: S077

Segment No: 01, WOOD WORKING, SAW DUST

Actual Annual:	18,000 dscfm * 0.03 gr/dscf * 60 min/1 hr * 1,920 hr/yr actual * 1 lb/7,000 gr * 1 ton/2,000 lb = 4.443 TPY.
Maximum Annual:	18,000 dscfm * 0.03 gr/dscf * 60 min/1 hr * 4,000 hr/yr maximum * 1 lb/7,000 gr * 1 ton/2,000 lb = 9.257 TPY.
Potential Annual:	Maximum allowable hourly emissions of 4.629 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 20.273 TPY.
Average Hourly:	Actual annual emissions of 4.443 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 4.629 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.257 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 4.629 lb/hr.
Allowable Emissions:	Allowable TSP emission rate: .03 gr/dscf * 18,000 dscfm * 60 min/hr * 1 lb/7,000 gr = 4.629 lb/hr.

End Fact Sheet for CARPENTER SHOP

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E113 - PATTERN SHOP

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E113
Source Desc:	PATTERN SHOP
Building No.:	PATTERN SHOP BUILDING
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	3321-30799999-21

Equipment Information

Equip. Type:	PATTERN SHOP EQUIPMENT
Make/Model:	USPIPE DESIGN
Mfg Date:	
Installed Date:	
Max. Capacity:	MAXIMUM 100 LB/HR.

Source Comments

TYPICAL WOOD WORKING OPERTIONS SUCH AS CUTTING, SURFACING AND SANDING ARE PERFORMED IN THE PATTERN SHOP. EMISSIONS FROM VARIOUS EQUIPMENT IS VENT THROUGH A CYCLONE DESIGNED TO CONTROL SAW DUST GENERATING FROM THESE OPERATIONS. EMISSION ESTIMATES IS BASED ON PERMIT LIMIT OF 0.03 GR/DSCF.

Stack/Discharge Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S078	20	2.5	[N/A]	4.906	15,000	CD039	CYCLONES	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS FROM THE PATTERN SHOP BUILDING.

Mechanical Operations Usage Data

Segment ID	Description	SCC Code	Operation Hour (hr/yr) Actual	Operation Hour (hr/yr) Maximum	Process Rate (ton/yr or 1000gal) Actual	Process Rate (ton/yr or 1000gal) Maximum	Stack Flow Rate (cfm) Maximum	Process Weight Rate (ton/hr)	Allowable Emissions (lb/hr)
01	WOOD WORKING, SAW DUST	30700803	1,920	4,000	96	200	15,000	Not Appl.	3.857

Comments: AVERAGE HOURLY PROCESSING RATE IS 100 LB/HR. EMISSIONS ARE BASED ON PERMIT LIMIT OF 0.03 GR/DSCF AND A MAXIMUM STACK FLOW RATE OF 15,000 DSCFM. AVERAGE AND MAXIMUM HOURS OF OPERATION ARE 1,920 HR/YR AND 4,000 HR/YR, RESPECTIVELY.

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E113 - PATTERN SHOP

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	C020	PARTICULATE MATTER (TSP)	0.03	gr/dscf	PERMIT LIMIT

Comments: PERMIT LIMIT FOR THE CARPENTER SHOP AND THE PATTERN SHOP.

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Avg.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Potential
PARTICULATE MATTER (TSP)	01	S078	95%	0%	☐	3.857	3.857	3.857	3.703	7.714	16.894
Total Emissions of PARTICULATE MATTER (TSP) from PATTERN SHOP:									3.703	7.714	16.894

Supporting Emission Calculations

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S078
Segment No: 01, WOOD WORKING, SAW DUST

Actual Annual:	15,000 dscfm * 0.03 gr/dscf * 60 min/1 hr * 1,920 hr/yr actual * 1 lb/7,000 gr * 1 ton/2,000 lb = 3.703 TPY.
Maximum Annual:	15,000 dscfm * 0.03 gr/dscf * 60 min/1 hr * 4,000 hr/yr maximum * 1 lb/7,000 gr * 1 ton/2,000 lb = 7.714 TPY.
Potential Annual:	Maximum allowable hourly emissions of 3.857 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 16.894 TPY.
Average Hourly:	Actual annual emissions of 3.703 TPY / 1,920. hr/yr act. * 2,000 lb/ton = 3.857 lb/hr.
Maximum Hourly:	Maximum annual emissions of 7.714 TPY / 4,000 hr/yr max. * 2,000 lb/ton = 3.857 lb/hr.
Allowable Emissions:	Allowable TSP emission rate: .03 gr/dscf * 15,000 acfm * 60 min/hr * 1 lb/7,000 gr = 3.857 lb/hr.

End Fact Sheet for PATTERN SHOP

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E114 - LADLE PREHEAT

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E114
Source Desc:	LADLE PREHEAT
Building No.:	VARIOUS WORK AREAS
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	NORTH AMERICAN
Model No.:	GENERIC
Serial No.:	[Not Available]
Firing Type:	GAS BURNER
Rated Heat Input Capacity:	0.538 MMBtu/hr
Maximum Heat Input Capacity:	0.538 MMBtu/hr
Avg. Oper. Heat Input Capacity:	0.538 MMBtu/hr

Description of Operation

PREHEATING OF LADLES ARE PERFORMED IN THE TREATING BUILDING AND THE MELTING BUILDING. A GAS BURNERS ARE INSERTED INTO THE COVERED LADLE DURING THE PREHEATING PROCESS. THIS PREHEATING PROCESS IS MAINTAINED CONTINOUSLY FOR 24 HR/DAY, 7 DAY/WK, AND 48 WK/YR BASIS OR 8,064 HR/YR.

AVERAGE NATURAL GAS USAGE IS 4.342 MMCF/YR BASED ON 1996 FISCAL YEAR REPORT. THUS, THE AVERAGE BURNER HEAT INPUT IS 4.342 MMCF/YR * 1,000 BTU/CF * 1 YR/8,064 HR OR APPROXIMATELY 0.538 MMBTU/HR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S005-S006	35	[N/A]	[N/A]	[N/A]	[N/A]	EBSF	SETTLING FACTOR	[N/A]	[No Sec. Control]

Comments: FUGITIVE EMISSIONS THROUGH HOT METAL BUILDING NORTH AND SOUTH GABLE EXAUSTS.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	30400398	8,064	8,400	4.34	4.52

Comments: AVERAGE NATURAL GAS USAGE IS 4.342 MMCF/YR BASED ON 1996 FISCAL YEAR REPORT. THE AVERAGE HOURS OF OPERATION WERE 24 HR/DAY * 7 DAY/WK * 48 WK/YR. THUS, THE AVERAGE BURNER HEAT INPUT IS 4.342 MMCF/YR * 1,000 BTU/CF * 1 YR/8,064 HR OR APPROXIMATELY 0.538 MMBTU/HR. THE MAXIMUM NATURAL GAS USAGE IS 4.342 MMBTU/HR * 8,400 HRS / 8,064 HRS = 4.523 MMBTU/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S005-S006	Fugitive	0%	0%	☒	1.14E-04	1.14E-04	Not Appl.	4.60E-04	4.79E-04	5.00E-04
Total Emissions of BENZENE from LADLE PREHEAT:							**1.14E-04**	**1.14E-04**	**Not Appl.**	**4.60E-04**	**4.79E-04**	**5.00E-04**
CARBON MONOXIDE (CO)	01	S005-S006	Fugitive	0%	0%	☐	.011	.011	Not Appl.	.046	.047	.05
Total Emissions of CARBON MONOXIDE (CO) from LADLE PREHEAT:							**.011**	**.011**	**Not Appl.**	**.046**	**.047**	**.05**
FORMALDEHYDE	01	S005-S006	Fugitive	0%	0%	☒	2.26E-04	2.26E-04	Not Appl.	9.12E-04	9.50E-04	9.91E-04
Total Emissions of FORMALDEHYDE from LADLE PREHEAT:							**2.26E-04**	**2.26E-04**	**Not Appl.**	**9.12E-04**	**9.50E-04**	**9.91E-04**
NITROGEN OXIDES (NOx)	01	S005-S006	Fugitive	0%	0%	☐	.054	.054	Not Appl.	.217	.226	.236
Total Emissions of NITROGEN OXIDES (NOx) from LADLE PREHEAT:							**.054**	**.054**	**Not Appl.**	**.217**	**.226**	**.236**
PARTICULATE MATTER (TSP)	01	S005-S006	Fugitive	67%	0%	☐	.002	.002	.323	.009	.009	1.414
Total Emissions of PARTICULATE MATTER (TSP) from LADLE PREHEAT:							**.002**	**.002**	**.323**	**.009**	**.009**	**1.414**
SULFUR DIOXIDE (SO2)	01	S005-S006	Fugitive	0%	0%	☐	3.23E-04	3.23E-04	2.152	.001	.001	9.426
Total Emissions of SULFUR DIOXIDE (SO2) from LADLE PREHEAT:							**3.23E-04**	**3.23E-04**	**2.152**	**.001**	**.001**	**9.426**
TOLUENE	01	S005-S006	Fugitive	0%	0%	☒	5.71E-05	5.71E-05	Not Appl.	2.30E-04	2.40E-04	2.50E-04
Total Emissions of TOLUENE from LADLE PREHEAT:							**5.71E-05**	**5.71E-05**	**Not Appl.**	**2.30E-04**	**2.40E-04**	**2.50E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S005-S006	Fugitive	0%	0%	☐	.003	.003	Not Appl.	.011	.012	.012
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from LADLE PREHEAT:							**.003**	**.003**	**Not Appl.**	**.011**	**.012**	**.012**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 4.60E-04 TPY.
Maximum Annual:	4.523 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 4.79E-04 TPY.
Potential Annual:	4.79E-04 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = 5.00E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 4.60E-04 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 1.14E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 4.79E-04 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 1.14E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .046 TPY.
Maximum Annual:	4.523 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .047 TPY.
Potential Annual:	.047 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .05 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .046 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .011 lb/hr.
Maximum Hourly:	Maximum annual emissions of .047 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .011 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 9.12E-04 TPY.
Maximum Annual:	4.523 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 9.50E-04 TPY.
Potential Annual:	9.50E-04 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = 9.91E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 9.12E-04 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 2.26E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 9.50E-04 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 2.26E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .217 TPY.
Maximum Annual:	4.523 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .226 TPY.
Potential Annual:	.226 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .236 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .217 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .054 lb/hr.
Maximum Hourly:	Maximum annual emissions of .226 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .054 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .009 TPY.
Maximum Annual:	4.523 MMcf/yr * 12 lb/MMcf * (1 - 67% control eff.) * 1 ton/2,000 lb = .009 TPY.
Potential Annual:	Maximum allowable hourly emissions of .323 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 1.414 TPY.
Average Hourly:	Actual annual emissions of .009 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .002 lb/hr.
Maximum Hourly:	Maximum annual emissions of .009 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .002 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.1, Schedule 1 of Table 1 for equipment built or installed before January 1, 1973. Q = .6 * .538 = .3228 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Maximum Annual:	4.523 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	Maximum allowable hourly emissions of 2.152 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 9.426 TPY.
Average Hourly:	Actual annual emissions of .001 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 3.23E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 3.23E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * .538 MMBtu/hr = 2.152 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 2.30E-04 TPY.
Maximum Annual:	4.523 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 2.40E-04 TPY.
Potential Annual:	2.40E-04 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = 2.50E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.30E-04 TPY / 8,064. hr/yr act. * 2,000 lb/ton = 5.71E-05 lb/hr.
Maximum Hourly:	Maximum annual emissions of 2.40E-04 TPY / 8,400 hr/yr max. * 2,000 lb/ton = 5.71E-05 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S005-S006
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	4.342 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .011 TPY.
Maximum Annual:	4.523 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .012 TPY.
Potential Annual:	.012 TPY maximum annual * (8,760 potential hours / 8,400 maximum hours) = .012 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .011 TPY / 8,064. hr/yr act. * 2,000 lb/ton = .003 lb/hr.
Maximum Hourly:	Maximum annual emissions of .012 TPY / 8,400 hr/yr max. * 2,000 lb/ton = .003 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for LADLE PREHEAT

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E115 - FITTINGS PLANT BATHHOUSE BOILER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E115
Source Desc:	FITTINGS PLANT BATHHOUSE BOILER
Building No.:	FITTINGS PLANT BATHHOUSE
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	BATHHOUSE BOILER
Rated Heat Input Capacity:	1.8 MMBtu/hr
Maximum Heat Input Capacity:	1.8 MMBtu/hr
Avg. Oper. Heat Input Capacity:	1.8 MMBtu/hr

Description of Operation

BATHHOUSE BOILER IS GAS FIRED. HOURS OF OPERATION (FOR WHEN NATURAL GAS) ARE APPROXIMATELY 6 HR/DAY, 5 DAY/WK, AND 48 WK/YR OR 1,440 HR/YR. MAXIMUM HOURS OF OPERATION ARE 8,760 HR/YR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S079	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: BATHHOUSE BOILER STACK.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	10200603	1,440	8,760	2.59	15.77

Comments: AVERAGE NATURAL GAS USAGE IS 1.8 MMBTU/HR * 1 CF/1000 BTU * 1,440 HR/YR OR 2.592 MMBTU/HR. MAXIMUM NATURAL GAS USAGE IS 1.8 MMBTU/HR * 1 CF/1000 BTU * 8,760 HR/YR OR 15.768 MMBTU/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
	Comments:	UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
	Comments:	UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
	Comments:	UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
	Comments:	UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S079	Stack	0%	0%	☒	3.82E-04	3.82E-04	Not Appl.	2.75E-04	.002	.002
Total Emissions of BENZENE from FITTINGS PLANT BATHHOUSE BOILER:							**3.82E-04**	**3.82E-04**	**Not Appl.**	**2.75E-04**	**.002**	**.002**
CARBON MONOXIDE (CO)	01	S079	Stack	0%	0%	☐	.038	.038	Not Appl.	.027	.166	.166
Total Emissions of CARBON MONOXIDE (CO) from FITTINGS PLANT BATHHOUSE BOILER:							**.038**	**.038**	**Not Appl.**	**.027**	**.166**	**.166**
FORMALDEHYDE	01	S079	Stack	0%	0%	☒	7.56E-04	7.56E-04	Not Appl.	5.44E-04	.003	.003
Total Emissions of FORMALDEHYDE from FITTINGS PLANT BATHHOUSE BOILER:							**7.56E-04**	**7.56E-04**	**Not Appl.**	**5.44E-04**	**.003**	**.003**
NITROGEN OXIDES (NOx)	01	S079	Stack	0%	0%	☐	.18	.18	Not Appl.	.13	.788	.788
Total Emissions of NITROGEN OXIDES (NOx) from FITTINGS PLANT BATHHOUSE BOILER:							**.18**	**.18**	**Not Appl.**	**.13**	**.788**	**.788**
PARTICULATE MATTER (TSP)	01	S079	Stack	0%	0%	☐	.022	.022	1.08	.016	.095	4.73
Total Emissions of PARTICULATE MATTER (TSP) from FITTINGS PLANT BATHHOUSE BOILER:							**.022**	**.022**	**1.08**	**.016**	**.095**	**4.73**
SULFUR DIOXIDE (SO2)	01	S079	Stack	0%	0%	☐	.001	.001	7.2	7.78E-04	.005	31.536
Total Emissions of SULFUR DIOXIDE (SO2) from FITTINGS PLANT BATHHOUSE BOILER:							**.001**	**.001**	**7.2**	**7.78E-04**	**.005**	**31.536**
TOLUENE	01	S079	Stack	0%	0%	☒	1.91E-04	1.91E-04	Not Appl.	1.37E-04	8.36E-04	8.36E-04
Total Emissions of TOLUENE from FITTINGS PLANT BATHHOUSE BOILER:							**1.91E-04**	**1.91E-04**	**Not Appl.**	**1.37E-04**	**8.36E-04**	**8.36E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S079	Stack	0%	0%	☐	.01	.01	Not Appl.	.007	.042	.042
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from FITTINGS PLANT BATHHOUSE BOILER:							**.01**	**.01**	**Not Appl.**	**.007**	**.042**	**.042**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 2.75E-04 TPY.
Maximum Annual:	15.768 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.75E-04 TPY / 1,440. hr/yr act. * 2,000 lb/ton = 3.82E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 3.82E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .027 TPY.
Maximum Annual:	15.768 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .166 TPY.
Potential Annual:	.166 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .166 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .027 TPY / 1,440. hr/yr act. * 2,000 lb/ton = .038 lb/hr.
Maximum Hourly:	Maximum annual emissions of .166 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .038 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 5.44E-04 TPY.
Maximum Annual:	15.768 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	.003 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .003 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 5.44E-04 TPY / 1,440. hr/yr act. * 2,000 lb/ton = 7.56E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 7.56E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .13 TPY.
Maximum Annual:	15.768 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .788 TPY.
Potential Annual:	.788 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .788 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .13 TPY / 1,440. hr/yr act. * 2,000 lb/ton = .18 lb/hr.
Maximum Hourly:	Maximum annual emissions of .788 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .18 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .016 TPY.
Maximum Annual:	15.768 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .095 TPY.
Potential Annual:	Maximum allowable hourly emissions of 1.08 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 4.73 TPY.
Average Hourly:	Actual annual emissions of .016 TPY / 1,440. hr/yr act. * 2,000 lb/ton = .022 lb/hr.
Maximum Hourly:	Maximum annual emissions of .095 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .022 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = .6 * 1.8 = 1.08 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = 7.78E-04 TPY.
Maximum Annual:	15.768 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .005 TPY.
Potential Annual:	Maximum allowable hourly emissions of 7.2 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 31.536 TPY.
Average Hourly:	Actual annual emissions of 7.78E-04 TPY / 1,440. hr/yr act. * 2,000 lb/ton = .001 lb/hr.
Maximum Hourly:	Maximum annual emissions of .005 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .001 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 1.8 MMBtu/hr = 7.2 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 1.37E-04 TPY.
Maximum Annual:	15.768 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 8.36E-04 TPY.
Potential Annual:	8.36E-04 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 8.36E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.37E-04 TPY / 1,440. hr/yr act. * 2,000 lb/ton = 1.91E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 8.36E-04 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.91E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S079
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	2.592 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	15.768 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .042 TPY.
Potential Annual:	.042 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .042 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .007 TPY / 1,440. hr/yr act. * 2,000 lb/ton = .01 lb/hr.
Maximum Hourly:	Maximum annual emissions of .042 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .01 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for FITTINGS PLANT BATHHOUSE BOILER

UNITED STATES PIPE & FOUNDRY COMPANY

Emission Source Fact Sheet

F022 - ANCILLARY FITTINGS PLANT OPERATIONS
E116 - ASPHALT TANKS HOT OIL HEATER

General Source Information

Facility Abrev:	CV&F
Process Area ID:	F022
Emission Unit ID:	E116
Source Desc:	ASPHALT TANKS HOT OIL HEATER
Building No.:	PAINT TANK SHED
UTM Location:	East: 653395 m North: 3877376 m
Source POC:	DENNIS URBANIAK
POC Phone:	(423)752-3912
Air Permit No.:	N/A

Equipment Information

Manufacturer:	USPIPE DESIGN
Model No.:	[Not Available]
Serial No.:	[Not Available]
Firing Type:	HOT OIL BOILER
Rated Heat Input Capacity:	1.2 MMBtu/hr
Maximum Heat Input Capacity:	1.2 MMBtu/hr
Avg. Oper. Heat Input Capacity:	1.2 MMBtu/hr

Description of Operation

THE HOT OIL BOILER IS USED TO HEAT AND MAINTAIN WORKING TEMPERATURE OF THE ASPHALT PAINT STORED IN THE BULK STORAGE TANKS. THE BOILER IS FIRED WITH NATURAL GAS. TYPICAL HOURS OF OPERATION ARE 4 HR/DAY, 5 DAY/WK AND 48 WK/YR OR 960 HR/YR.

Emission Point Information

Stack ID	Stack Height (ft)	Stack Dia./Width (ft)		Stack Area (ft2)	Flowrate (acfm)	Primary Emission Ctrl Device ID	Primary Emission Ctrl Device Description.	Secondary Emission Ctrl Device ID	Secondary Emission Ctrl Device Description.
S080	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[N/A]	[No Prim. Control]	[N/A]	[No Sec. Control]

Comments: HOT OIL BOILER STACK.

Fuel Usages Information

Segment ID	Description	SCC Code	Operation Hours (hr/yr) Actual	Operation Hours (hr/yr) Maximum	Fuel Usages (MMcf/yr or 1,000 gal/yr) Actual	Fuel Usages (MMcf/yr or 1,000 gal/yr) Maximum
01	NATURAL GAS FIRING	10200603	960	8,760	1.15	10.51

Comments: AVERAGE NATURAL GAS USAGE IS 1.2 MMBTU/HR * 1 CF/1000 BTU * 960 HR/YR OR 1.152 MMBTU/HR. MAXIMUM NATURAL GAS USAGE IS 1.2 MMBTU/HR * 1 CF/1000 BTU * 8,760 HR/YR OR 10.512 MMBTU/HR.

Emission Factors

Segment ID	EF Set	Pollutant Name	Value	Units	References
01	0029	BENZENE	0.212	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	CARBON MONOXIDE (CO)	21	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	FORMALDEHYDE	0.42	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	NITROGEN OXIDES (NOx)	100	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	PARTICULATE MATTER (TSP)	12	lb/MMcf	AP-42 TABLE 1.4-1 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-1 (JAN 95).			
01	0029	SULFUR DIOXIDE (SO2)	0.6	lb/MMcf	AP-42 TABLE 1.4-2 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 TABLE 1.4-2 (JAN 95).			
01	0029	TOLUENE	0.106	lb/MMcf	SPECIATE V1.5, PROFILE 0003.
Comments:		UNCONTROLLED EMISSION FACTOR. SPECIATE V1.5, PROFILE 0003.			
01	0029	VOLATILE ORGANIC COMPOUNDS (VOC)	5.28	lb/MMcf	AP-42 Table 1.4-3 (JAN 95).
Comments:		UNCONTROLLED EMISSION FACTOR. REF: AP-42 Table 1.4-3 (JAN 95). EMISSION FACTOR FOR VOC = 8 LB/MMCF OF TOC - 34% OF METHANE.			

Calculated Emission Rates

Pollutant	Segment ID	Stack ID	Emission Type	Control Eff. Prim.	Control Eff. Sec.	HAP?	Hourly Emissions (lb/hr) Act.	Hourly Emissions (lb/hr) Max.	Hourly Emissions (lb/hr) Allowable	Annual Emissions (TPY) Actual	Annual Emissions (TPY) Maximum	Annual Emissions (TPY) Allowable
BENZENE	01	S080	Stack	0%	0%	☒	2.54E-04	2.54E-04	Not Appl.	1.22E-04	.001	.001
Total Emissions of BENZENE from ASPHALT TANKS HOT OIL HEATER:							**2.54E-04**	**2.54E-04**	**Not Appl.**	**1.22E-04**	**.001**	**.001**
CARBON MONOXIDE (CO)	01	S080	Stack	0%	0%	☐	.025	.025	Not Appl.	.012	.11	.11
Total Emissions of CARBON MONOXIDE (CO) from ASPHALT TANKS HOT OIL HEATER:							**.025**	**.025**	**Not Appl.**	**.012**	**.11**	**.11**
FORMALDEHYDE	01	S080	Stack	0%	0%	☒	5.04E-04	5.04E-04	Not Appl.	2.42E-04	.002	.002
Total Emissions of FORMALDEHYDE from ASPHALT TANKS HOT OIL HEATER:							**5.04E-04**	**5.04E-04**	**Not Appl.**	**2.42E-04**	**.002**	**.002**
NITROGEN OXIDES (NOx)	01	S080	Stack	0%	0%	☐	.12	.12	Not Appl.	.058	.526	.526
Total Emissions of NITROGEN OXIDES (NOx) from ASPHALT TANKS HOT OIL HEATER:							**.12**	**.12**	**Not Appl.**	**.058**	**.526**	**.526**
PARTICULATE MATTER (TSP)	01	S080	Stack	0%	0%	☐	.014	.014	.72	.007	.063	3.154
Total Emissions of PARTICULATE MATTER (TSP) from ASPHALT TANKS HOT OIL HEATER:							**.014**	**.014**	**.72**	**.007**	**.063**	**3.154**
SULFUR DIOXIDE (SO2)	01	S080	Stack	0%	0%	☐	7.20E-04	7.20E-04	4.8	3.46E-04	.003	21.024
Total Emissions of SULFUR DIOXIDE (SO2) from ASPHALT TANKS HOT OIL HEATER:							**7.20E-04**	**7.20E-04**	**4.8**	**3.46E-04**	**.003**	**21.024**
TOLUENE	01	S080	Stack	0%	0%	☒	1.27E-04	1.27E-04	Not Appl.	6.11E-05	5.57E-04	5.57E-04
Total Emissions of TOLUENE from ASPHALT TANKS HOT OIL HEATER:							**1.27E-04**	**1.27E-04**	**Not Appl.**	**6.11E-05**	**5.57E-04**	**5.57E-04**
VOLATILE ORGANIC COMPOUNDS (VOC)	01	S080	Stack	0%	0%	☐	.006	.006	Not Appl.	.003	.028	.028
Total Emissions of VOLATILE ORGANIC COMPOUNDS (VOC) from ASPHALT TANKS HOT OIL HEATER:							**.006**	**.006**	**Not Appl.**	**.003**	**.028**	**.028**

1 This footnote is applied to the operating scenario in which more than one fuel is fired in this emission unit. The highest pollutant emissions for actual annual emissions are the sum total of all fuel segments. For the maximum and potential annual emissions, the highest pollutant emissions are the worse-case (highest value) of all fuel firing scenarios, if the same pollutant is emitted for all fuel segment IDs.

Supporting Emission Calculations

Emission Calculations for BENZENE (CAS 71-43-2)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = 1.22E-04 TPY.
Maximum Annual:	10.512 MMcf/yr * 0.212 lb/MMcf * 1 ton/2,000 lb = .001 TPY.
Potential Annual:	.001 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .001 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 1.22E-04 TPY / 960. hr/yr act. * 2,000 lb/ton = 2.54E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .001 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 2.54E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for CARBON MONOXIDE (CO) (CAS 630-08-0)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .012 TPY.
Maximum Annual:	10.512 MMcf/yr * 21 lb/MMcf * 1 ton/2,000 lb = .11 TPY.
Potential Annual:	.11 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .11 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .012 TPY / 960. hr/yr act. * 2,000 lb/ton = .025 lb/hr.
Maximum Hourly:	Maximum annual emissions of .11 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .025 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for FORMALDEHYDE (CAS 50-00-0)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = 2.42E-04 TPY.
Maximum Annual:	10.512 MMcf/yr * 0.42 lb/MMcf * 1 ton/2,000 lb = .002 TPY.
Potential Annual:	.002 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .002 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 2.42E-04 TPY / 960. hr/yr act. * 2,000 lb/ton = 5.04E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .002 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 5.04E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for NITROGEN OXIDES (NOx)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .058 TPY.
Maximum Annual:	10.512 MMcf/yr * 100 lb/MMcf * 1 ton/2,000 lb = .526 TPY.
Potential Annual:	.526 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .526 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .058 TPY / 960. hr/yr act. * 2,000 lb/ton = .12 lb/hr.
Maximum Hourly:	Maximum annual emissions of .526 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .12 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for PARTICULATE MATTER (TSP) (CAS 01791)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .007 TPY.
Maximum Annual:	10.512 MMcf/yr * 12 lb/MMcf * 1 ton/2,000 lb = .063 TPY.
Potential Annual:	Maximum allowable hourly emissions of .72 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 3.154 TPY.
Average Hourly:	Actual annual emissions of .007 TPY / 960. hr/yr act. * 2,000 lb/ton = .014 lb/hr.
Maximum Hourly:	Maximum annual emissions of .063 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .014 lb/hr.
Allowable Emissions:	Maximum allowable particulate emissions from fuel burning are based on Rule 8.2, Schedule 2 of Table 1 for equipment built or installed on and after January 1, 1973. Q = .6 * 1.2 = .72 lb/hr.

Emission Calculations for SULFUR DIOXIDE (SO2) (CAS 7446-09-5)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = 3.46E-04 TPY.
Maximum Annual:	10.512 MMcf/yr * 0.6 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Potential Annual:	Maximum allowable hourly emissions of 4.8 lb/hr * 8,760 hr/yr maximum * 1 ton/2,000 lb = 21.024 TPY.
Average Hourly:	Actual annual emissions of 3.46E-04 TPY / 960. hr/yr act. * 2,000 lb/ton = 7.20E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of .003 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 7.20E-04 lb/hr.
Allowable Emissions:	Maximum allowable sulfur dioxide emissions from fuel burning are based on Rule 13.2 or 4 pounds per million Btu of fuel consumed: 4 lb/MMBtu * 1.2 MMBtu/hr = 4.8 lb/hr.

Emission Calculations for TOLUENE (CAS 108-88-3)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 6.11E-05 TPY.
Maximum Annual:	10.512 MMcf/yr * 0.106 lb/MMcf * 1 ton/2,000 lb = 5.57E-04 TPY.
Potential Annual:	5.57E-04 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = 5.57E-04 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of 6.11E-05 TPY / 960. hr/yr act. * 2,000 lb/ton = 1.27E-04 lb/hr.
Maximum Hourly:	Maximum annual emissions of 5.57E-04 TPY / 8,760 hr/yr max. * 2,000 lb/ton = 1.27E-04 lb/hr.
Allowable Emissions:	Not applicable.

Emission Calculations for VOLATILE ORGANIC COMPOUNDS (VOC) (CAS 01615)
Stack ID or Designation: S080
Segment No: 01, NATURAL GAS FIRING

Actual Annual:	1.152 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .003 TPY.
Maximum Annual:	10.512 MMcf/yr * 5.28 lb/MMcf * 1 ton/2,000 lb = .028 TPY.
Potential Annual:	.028 TPY maximum annual * (8,760 potential hours / 8,760 maximum hours) = .028 TPY. This annual allowable emission rates are over 8,760 hours for a nonfederally enforceable emission unit.
Average Hourly:	Actual annual emissions of .003 TPY / 960. hr/yr act. * 2,000 lb/ton = .006 lb/hr.
Maximum Hourly:	Maximum annual emissions of .028 TPY / 8,760 hr/yr max. * 2,000 lb/ton = .006 lb/hr.
Allowable Emissions:	Not applicable.

End Page Report for ASPHALT TANKS HOT OIL HEATER