Appendix C
Tables

Appendix C. Tables

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Table C-1. Data Points

Data Point	Tag Number	Function
Quench Brine System	FT/FE-1014	Makeup Water Supply
	FT/FE-003	Quench Brine Flow
	TE-1015	Quench/Venturi Brine Temperature
Venturi Brine System	FT/FE-001	Venturi Brine Flow
	PDT-001	Clear Liquor Temperature
	TI-21	Venturi Exhaust Temperature
Clear Liquor System (Clear Liquor makeup water not measured)	FT/FE-002	Clear Liquor Flow
	TI-1025	Clear Liquor Temperature
	FT/FE-1018	Scrubber Makeup Water
Caustic Supply	FT/FE-1017A	Caustic Supply to System
Sparge Air System	FT/FE-1006B	Sparge Airflow
	TE-1006	Sparge Air Temperature
Demister Vessel	PDT-003	Differential Pressure
Entry Air Lock	PT-502	Entry Air Lock Pressure
PCC[1] Zone 1	TI-205	Zone Temperature
	TI-205AL	Zone Alarm Temperature
	PT-503	Zone Draft Pressure
	PT-504	Zone Draft Pressure (absolute)
	FT/FE-1003A	Combustion Airflow Burner 5
	FT/FE-1003B	Combustion Airflow Burner 6
	FT/FE-1003C	Combustion Airflow Burner 7
	FT/FE-1003D	Combustion Airflow Burner 8
	FT/FE-1003E	Combustion Airflow Burner 9
	FT/FE 1003F	Combustion Airflow Burner 10
	TI-1003	Combustion Air Temperature

(1) Primary Combustion Chamber

Table C-1. Data Points (Continued)

Data Point	Tag Number	Function
PCC Zone 2	TI-207	Zone Temperature
	TI-207AL	Zone Alarm Temperature
	FT/FE-1005A	Combustion Airflow Burner 13
	FT/FE-1005B	Combustion Airflow Burner 14
	FT/FE-1005C	Combustion Airflow Burner 15
	FT/FE-1005D	Combustion Airflow Burner 16
SCC(2) Zone 1	TI-202	Zone Temperature
	TI-202AL	Zone Alarm Temperature
	PT-501	Zone Draft Pressure (absolute)
	FT/FE-1012A	Combustion Airflow Burner 1
	FT/FE-1012B	Combustion Airflow Burner 2
	TE-1003A	Combustion Airflow Temperature
	FT/FE-1010	Agent Airflow (Combustion Air)
	TI-1010	Agent Air Temperature
SCC Zone 2	TI-201	Zone Temperature
	TI-201AL	Zone Alarm Temperature
	FT/FE-1012C	Combustion Airflow Burner 3
	FT/FE-1012D	Combustion Airflow Burner 4
SCC Exhaust (Natural gas flow in all burners for MPF)	AI-13A	%(3) O_2(4)
	AI-13B	% CO(5)
	AI-13C	% CO_2(6)
	AI-13D	% NO_X(7)
	AI-13E	% SO_2(8)
Furnace Exhaust Stack	AI-19A	% O_2
	AI-19B	% CO
	AI-19C	% CO_2
	AI-19D	% NO_X
	AI-19E	% SO_2
	FT-005	Stack Flow
	TT-1019	Stack Temperature
	PT-1019	Stack Pressure (absolute)
	Station 15, a,b,c,d	DAAMS (agent H, HD, HT)

(2) Secondary Combustion Chamber (3) percent (4) Oxygen (5) Carbon Monoxide (6) Carbon Dioxide (7) Oxides of Nitrogen (8) Sulfur Dioxide

Table C-2. Metal Parts Furnace Anticipated Final Permitted Operating Conditions

Parameter	Condition	Operating Limit
Primary Combustion Chamber		
Zone 1	High Temperature	1,750° F(1)
	Low Temperature	950° F
Zone 2	High Temperature	1,750° F
	Low Temperature	950° F
Draft	High	6.00 iwc(2)
	Low	0.10 iwc
Secondary Combustion Chamber		
Zone 1	High Temperature	2,250° F
	Low Temperature	1,400° F
Zone 2	High Temperature	2,250° F
	Low Temperature	1,450° F
Venturi Scrubber		
Pressure Drop	High	50 iwc
	Low	20 iwc
Brine Flow	High	80 gpm(3)
	Low	30 gpm
pH(4)	Low	7.0
Packed Bed Scrubber		
Brine Flow	High	325 gpm
	Low	150 gpm
pH	Low	7.0
Stack		
Stack Gas Flow	High	10,000 scfm(5)

(1) degrees Fahrenheit (2) inches water column (3) gallons per minute
(4) Log of the Reciprocal of Hydrogen Ion Concentration (5) standard cubic feet per minute

Table C-3. MPF Automatic Furnace Waste Feed Cutoff Setpoints

Tag No.(1)	*Group*	Parameter	Instrument	Action	Set Point
TI-205	A	PCC(2), Zone 1 Temperature, High	Thermocouple	Stop HW(3) Feed	>(4) 1,750° F(5)
TI-205	A	PCC, Zone 1 Temperature, Low	Thermocouple	Stop HW Feed	<(6) 950° F
TI-202	A	SCC(7), Zone 1 Temperature, High	Thermocouple	Stop HW Feed	> 2,175° F
TI-202	A	SCC, Zone 1 Temperature, Low	Thermocouple	Stop HW Feed	< 1,450° F
PDI-503	C	PCC Draft Pressure, Low	Dp(8) Cell	Stop HW Feed	< 0.25 iwc(9)
PDT-001	A	Venturi Pressure Drop, Low	Pressure Transmitter	Stop HW Feed	< 36 iwc
FT-001	A	Venturi Brine Flow Rate, Low	Flow Orifice/ Transducer	Stop HW Feed	< 30 gpm(10)
FT-002	A	Clear Liquor Brine Flow Rate, Low	Flow Orifice/ Transducer	Stop HW Feed	< 150 gpm
AI-4	A	Scrubber Brine pH(11)	pH Meter	Stop HW Feed	< 7 pH
AI-3	A	Clear Liquor pH	pH Meter	Stop HW Feed	< 7 pH
TI-21	C	Venturi Exit Temperature, High	Thermocouple	Stop HW Feed	> 190° F
AI-19A	A	Stack O_2(12) Concentration, High	O_2 Analyzer	Stop HW Feed	> 18%(13) O_2
AI-19A	A	Stack O_2 Concentration, Low	O_2 Analyzer	Stop HW Feed	< 3% O_2
AI-19B	A	CO(14) Concentration High	CO Analyzer	Stop HW Feed	< 100 ppm(15)
FI-005A	A	Combustion Gas Velocity, High	Velocity Transducer	Stop HW Feed	> 13,600 acfm(16)
FI-005A	A	Combustion Gas Velocity, Low	Velocity Transducer	Stop HW Feed	< 6,500 acfm
CEM-759-AG	A	Stack Agent HD Concentration	ACAMS	Stop HW Feed	> 0.006 mg/m^3

(1) Number (2) Primary Combustion Chamber (3) Hazardous Waste (4) greater than (5) degrees Fahrenheit (6) less than
(7) Secondary Combustion Chamber (8) Differential Pressure (9) inches water column (when Discharge door is closed)
(10) gallons per minute (11) Log of the Reciprocal of the Hydrogen ion (12) Oxygen (13) percent (14) Carbon Monoxide
(15) parts per million at 7% O_2 on a dry volume basis for a 60 minute rolling average
(16) actual cubic feet per minute. Measured Combustion Gas Velocity is converted to volumetric flow rate

Table C-4. Furnace Capacity Chemical Agent HD Testing[1]

Day	Agent Run	Heel (Pounds)	Zone 1[2] (Minutes)	Zone 2 (Minutes)	Monitoring Station (Minutes)
1	1	58	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400
2	2	75	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400
3	3	92	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400
4	4	109	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400
5	5	126	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400
6	6	143	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400
7	7	160	40	80	120
			80	120	160
			120	160	200
			160	200	240
			200	240	280
			320	360	400

(1) Example of test schedule if testing continued to maximum heel. Test will stop when any permit limit is reached or furnace capacity is exceeded. (2) Total time from start of daily testing.

Table C-5. Heat of Combustion, Metal Parts Furnace (SCC and PCC)

Combustible Feed Component	Formula	Feed Rate (lbs/hr)	Heat of Combustion (btu/hr)	Heat of Combustion (btu/hr)
Natural Gas	CH_4	208.7	23,861	4,979,790.7
HD (Mustard)	$C_4H_8Cl_2S$	81.75	8,500	694,875.0
Total				**5,674,665.7**

Table C-6. Testing of the Metal Parts Furnace Pollution Abatement System Brine

Parameters	Sampling Location(1)	Sampling Method	Analytical Methods
HRA(2) Metals (Brine)	4	grab	M3020A(3), 6010B(4), 7470A(5)
Full TCLP(6)	4	grab	M1311(7), 8151A(8), 8081A(7), 8260B(9), 8270C(10)
Specific Gravity, Free Liquids	4	grab	ATM (11) D70/D854
Sodium (Na) Salts	4	grab	M6010B (Na as Na salts)
pH	4	grab	M9045C
Agent H, HD, HT	4	grab	LAB SOP LAB 66-03-01-02

(1) Sampling locations are shown on Drawing SK05-072, page F-3, Appendix F.
(2) Health Risk Assessment
(3) Digestion
(4) Metals
(5) Mercury
(6) Toxicity Characteristic Leaching Procedure (TCLP)
(7) TCLP Pesticides
(8) TCLP, Herbicides
(9) TCLP, Volatile Organic Compounds (VOCs)
(10) TCLP, Slightly Volatile Organic Compounds (SVOCs)
(11) American Society for Testing and Materials

Note: Sampling frequencies are defined in the Standard Sampling Operating Procedure (SSOP) provided in Appendix K.

Table C-7. Planned Parameter, Sampling Methods, and Analytical Methods

Parameter	Sample Location[1]	Sampling Method	Analytical Method
Hydrofluoric Acid (HF), Hydrochloride Acid (HCl) and Chlorine (Cl_2)	6	[2]M26A	M9057
Chromium	6	M0061	M7199
HRA[3] Metals	6	M29	M6020[4], M7470A[5]
Particulate Matter	6	M5I	M5I
Volatile Organic Compounds (VOC)	6	M0031 (VOST)[6]	M5041A
Semi-Volatile Organic Compounds (SVOC)	6	M0010	M8270C
PCDD[7]/PCDF[8]	6	M0023A	M8290
Volatile Compounds - Total Organic Carbon (TOC)	6	M0010	GC[9]/FID[10]
Semi-Volatile Compounds (TOC)	6	M0040	GC/FID
Non-Volatile Compounds (TOC)	6	M0010	
Oxygen (O_2) and Carbon Dioxide (CO_2)	6	CEMS[11] - M3	CEMS
Carbon Monoxide (CO)	6	CEMS	CEMS
Principal Organic Hazardous Constituent (POHC) Waste	6	M0030 (VOST)	M5041/8260B (condensate)
Hydrocarbon	6	CEMS	CEMS
Agent H, HD, HT	12	DAAMS	DAAMS

(1) See Drawing SK05-072, page F-3, Appendix F (2) Method (3) Health Risk Assessment (4) Metals (5) Mercury (6) Volatile Organic Sampling Train
(7) Polychlorinated Dibenzodioxins (8) Polychlorinated Dibenzofurans (9) Gas Chromatograph (10) Flame Ionization Detector
(11) Continuous Emissions Monitoring System (12) Stack, Station 15.

Table C-8. Ash Sampling

Parameter		Sampling Location	Sampling Method	Analytical Method
FULL TCLP	Volatiles	10	5004, ASTM[2] D4057	SW1311/SW8151A/ 8081A/8260B/8270C/ 6010B/7470A
	Semi Volatiles			
	Pesticides			
	Herbicides			
	HRA[1] Metals			
Dioxins			5004, ASTM D4057	8290
Agent HD		Ton Containers	Lab SOP LAB 66-03-01-02	Lab SOP LAB 66-03-01-02

(1) Health Risk Assessment (2) American Society for Testing and Materials

Notes: 1. Sampling frequencies are defined in the Standard Sampling Operating Procedure (SSOP) provided in Appendix K
2. Full TCLP analytical methods identified in Table C-9, page C-10

Table C-9. Anticipated Processing Sequence of Ton Containers through the Metal Parts Furnace

Time[1] (Minutes)	Position Number (Zone 1)	Position Number (Zone 2)	Monitoring Station
0	TC 1 Moved to Zone 1		
40		TC 1 Moved to Zone 2	
80	TC 2 Moved to Zone 1	TC 1 in Zone 2	
120		TC 2 Moved to Zone 2	TC 1 Moved to Monitoring Station
160	TC 3 Moved to Zone 1	TC 2 in Zone 2	
200		TC 3 Moved to Zone 2	TC 2 Moved to Monitoring Station
240	TC 4 Moved to Zone 1	TC 3 in Zone 2	
280		TC 4 Moved to Zone 2	TC 3 Moved to Monitoring Station
320	TC 5 Moved to Zone 1	TC 4 in Zone 2	
360		TC 5 Moved to Zone 2	TC 4 Moved to Monitoring Station
400	TC 6 Moved to Zone 1	TC 5 in Zone 2	
440		TC 6 Moved to Zone 2	TC 5 Moved to Monitoring Station
480	TC 7 Moved to Zone 1	TC 6 in Zone 2	
520		TC 7 in Zone 1	TC 6 Moved to Monitoring Station
560		TC 7 Moved to Zone 2	
600			TC 7 Moved to Monitoring Station

(1) The minimum time in zone/station to be established by the PM. The maximum time will not exceed the minimum time by more than 5 minutes