

US EPA ARCHIVE DOCUMENT

	B	C
1	Source Description	
2		
3	Phase II ID No.	851
4	EPA ID No.	CAD076528678
5	Facility Name	The Dow Chemical Company
6	Facility Location	
7	City	Pittsburg
8	State	CA
9	Unit ID Name/No.	MS HAF
10	Other Sister Facilities	None
11	Number of Sister Facilities	0
12	Combustor Class	HCl Production Furnace
13	Combustor Type	
14	Combustor Characteristics	Manufacturing Services HAF
15	Capacity (MMBtu/hr)	5.5
16	Soot Blowing	None
17	APCS Detailed Acronym	Q/HClABS/WS
18	APCS General Class	WQ,LEWS
	APCS Characteristics	Quench, acid absorber, caustic scrubber. Acid absorber includes two falling-film absorbers and a wetted packed bed column; dilute aqueous NaOH in caustic scrubber
19		
20	Hazardous Wastes	Liq
21	Haz Waste Description	Chlorinated liquids and gas streams
22	Supplemental Fuel	Natural gas
23		
24	Stack Characteristics	
25	Diameter (ft)	0.678
26	Height (ft)	74.50
27	Gas Velocity (ft/sec)	
28	Gas Temperature (°F)	154
29		
	Permitting Status	Tier I for all metals except As, Cd, and Cr+6 (Tier III). Nickel spiked but not Tier III?
30		
	HWC Burn Status (Date if Terminated)	
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	B	C
1	Cond Description	
2		
3	851C1	
4		
5	Report Name/Date	Trail Burn Report For The Dow Chemical Company Manufacturing Services Halogen Acid Furnace; Volume 1 of 5, January 2000
6	Report Prepar	Radian International
7	Testing Firm	Radian International
8	Testing Dates	November 1-3, 1999
9	Cond Dates	Nov-99
10	Cond Description	Trial burn, max comb chamber temp
11	Content	PM, HCl/Cl ₂ , DRE, CO, PCDD/F
12		
13	851C2	
14		
15	Report Name/Date	Trail Burn Report For The Dow Chemical Company Manufacturing Services Halogen Acid Furnace; Volume 1 of 5, January 2000
16	Report Prepar	Radian International
17	Testing Firm	Radian International
18	Testing Dates	October 25-27, 1999
19	Cond Dates	Oct-99
20	Cond Description	Trial burn, min comb chamber temp
21	Content	DRE, CO, PCDD/F
22		
23	851C3	
24		
25	Report Name/Date	Trail Burn Report For The Dow Chemical Company Manufacturing Services Halogen Acid Furnace; Volume 1 of 5, January 2000
26	Report Prepar	Radian International
27	Testing Firm	Radian International
28	Testing Dates	October 19-21, 1999
29	Cond Dates	Oct-99
30	Cond Description	Risk burn, normal operating conditions
31	Content	PM, HCl/Cl ₂ , metals, Cr+6, organics, PCDD/F

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Stack Gas Emissions														
2															
3			Comr Units		7% O2										
4															
5															
6	1	851C1	Trial Burn				R1		R2		R3		Cond Avg		
7															
8		PM	E1	gr/dscf	y		0.011		0.010		0.012		0.011		
9		HC (RA)	E1	ppmv	y		0.1		0.5		0.5		0.4		
10		CO (MHRA)	E1	ppmv	y		25		34		28		29		
11		HCl		ppmv	n		22.1		26.4		37.6				
12		Cl2		ppmv	n		0.075		1.41		0.198				
13		Chromium (Hex)		lb/hr			0.00002		0.00001		0.00001				
14		Chromium		lb/hr			0.00010		0.00009		0.00022				
15		Arsenic		lb/hr			0.000002		0.000003	nd	0.000002				
16		Cadmium		lb/hr			0.00002		0.00002		0.00002				
17		Nickel		lb/hr			0.00166		0.00154		0.00190				
18															
19		Chromium (Hex)	E3	µg/dscm	y		3.2		2.6		1.4		2.4		
20		Chromium	E2	µg/dscm	y		20.4		19.7		43.1		27.7		
21		Arsenic	E2	µg/dscm	y		0.5		0.5	nd	0.4	27	0.5		
22		Cadmium	E2	µg/dscm	y		4.3		3.3		3.3		3.6		
23		Nickel	E2	µg/dscm	y		356.3		322.3		378.9		352.5		
24		LVM	E2	µg/dscm	y		20.9		20.2	1	43.5	0.6	21.4		No Be
25		SVM	E2	µg/dscm	y		4.3		3.3		3.3		3.6		No Pb
26															
27		HCl	E1	ppmv	y		18.3		21.5		30.4		23.4		
28		Cl2	E1	ppmv	y		0.1		1.1		0.2		0.5		
29		Total Chlorine	E1	ppmv	y		18.4		23.8		30.7		24.3		
30															
31		POHC DRE	MCB												
32		POHC Feedrate		lb/hr			2.88		2.84		2.88				
33		Emission Rate	E4	lb/hr		nd	5.65E-06	nd	5.78E-06	nd	5.47E-06				
34		DRE	E4	%		>	99.999	>	99.999	>	99.999				
35															
36		POHC DRE	TCE												
37		POHC Feedrate		lb/hr			2.8		2.79		2.82				
38		Emission Rate	E4	lb/hr		nd	1.34E-05	nd	1.63E-05	nd	1.91E-05				
39		DRE	E4	%		>	99.999	>	99.999	>	99.999				
40															
41		Sampling Train	PM, E1												
42		Stack Gas Flowrate		dscfm			1032		1040		1085		1052		
43		O2		%			4.1		3.8		3.7		3.9		
44		Moisture		%			4.8		4.7		4.3		4.6		
45		Temperature		°F			158		157		146		154		
46															
47		Sampling Train	Metal E2												
48		Stack Gas Flowrate		dscfm			1043		1037		1050		1043		
49		O2		%			4.1		3.8		3.7		3.9		
50		Moisture		%			4.6		4.4		4.1		4.4		
51		Temperature		°F			159		153		147		153		
52															
53		Sampling Train	Cr + E3												
54		Stack Gas Flowrate		dscfm			1082		1077		1052		1070		
55		O2		%			4.1		3.8		3.7		3.9		
56		Moisture		%			4.1		4.6		4.2		4.3		
57		Temperature		°F			158		160		145		154		
58															
59		Sampling Train	PCDIE4												
60		Stack Gas Flowrate		dscfm			1157		1068		1110		1112		
61		O2		%			4.1		3.8		3.7		4		
62		Moisture		%			4.1		3.9		3.6		4		
63		Temperature		°F			157		152		145		151		
64															
65															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
66	2	851C2	Trial Burn				R1		R2		R3		Cond Avg		
67															
68		CO (MHRA)	E1	ppmv	y		9		9		9		9		
69		HC (RA)	E1	ppmv	y		0.1		0.1		0.1		0.1		
70															
71		POHC DRE	MCB												
72		POHC Feedrate		lb/hr			2.8		2.8		2.8				
73		Emission Rate	E1	lb/hr		nd	3.91E-06	nd	4.14E-06	nd	3.96E-06				
74		DRE	E1	%		>	99.999	>	99.999	>	99.999				
75															
76		POHC DRE	TCE												
77		POHC Feedrate		lb/hr			2.68		2.67		2.64				
78		Emission Rate	E1	lb/hr		nd	1.19E-05	nd	1.36E-05	nd	3.90E-05				
79		DRE	E1	%		>	99.999	>	99.999	>	99.999				
80															
81		Sampling Train	PCDIE1												
82		Stack Gas Flowrate		dscfm			1064		1117		1086		1089		
83		O2		%			8.7		7.9		7.9		8.2		
84		Moisture		%			3.5		3.4		3.3		3.4		
85		Temperature		°F			152		149		149		150		
86															
87															
88	3	851C3					R1		R2		R3		Cond Avg		
89															
90		PM	E1	gr/dscf	y		0.0006		0.0002		0.0006		0.0004		
91		CO (MHRA)	E1	ppmv	y		9		9		31		16.3		
92		HC (RA)	E1	ppmv	y		0.1		0.1		0.1		0.1		
93		HCl		ppmv	n		10.4		14.2		19.6		14.7		
94		Cl2		ppmv	n		0.039		0.035		0.033		0.04		
95		Chromium (Hex)		lb/hr			0.000005		0.000002		0.000003		0.000003		
96		Chromium		lb/hr			0.000014		0.000014		0.000015		0.000014		
97		Arsenic		lb/hr			0.000001		0.000001		0.000003		0.000002		
98		Cadmium		lb/hr			0.000004		0.000005		0.000003		0.000004		
99		Nickel		lb/hr			0.000018		0.000016		0.000019		0.000017		
100															
101		Chromium (Hex)	E3	µg/dscm	y		1.4		0.5		0.6		0.9		
102		Chromium	E2	µg/dscm	y		3.8		3.5		3.6		3.6		
103		Arsenic	E2	µg/dscm	y		0.3		0.3		0.6		0.4		
104		Cadmium	E2	µg/dscm	y		1.0		1.2		0.8		1.0		
105		Nickel	E2	µg/dscm	y		4.7		3.8		4.6		4.4		
106		SVM	E2	µg/dscm	y		1.0		1.2		0.8		1.0		No Cd
107		LVM	E2	µg/dscm	y		4.1		3.8		4.2		4.0		No Be
108															
109		HCl	E1	ppmv	y		10.9		14.3		19.7		15.0		
110		Cl2	E1	ppmv	y		0.04		0.04		0.03		0.04		
111		Total Chlorine	E1	ppmv	y		10.9		14.4		19.8		15.1		
112															
113		Sampling Train	PM, E1												
114		Stack Gas Flowrate		dscfm			1063		1117		1095		1091.7		
115		O2		%			7.6		7.1		7.1		7.3		
116		Moisture		%			4.9		4.5		4.9		4.8		
117		Temperature		°F			165		162		162		163		
118															
119		Sampling Train	Metal E2												
120		Stack Gas Flowrate		dscfm			1081		1097		1039		1072		
121		O2		%			7.6		7.1		7.1		7		
122		Moisture		%			4.7		4.4		5		5		
123		Temperature		°F			165		164		162		164		
124															
125		Sampling Train	Cr +ε E3												
126		Stack Gas Flowrate		dscfm			1061		1100		1098		1086		
127		O2		%			7.6		7.1		7.1		7.3		
128		Moisture		%			3.5		4		3.6		3.7		
129		Temperature		°F			147		155		159		154		
130															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
131		Sampling Train	PCDIE4												
132		Stack Gas Flowrate	dscfm				1097	1098			1051		1106		
133		O2	%				7.6	7.1			7.1		7.3		
134		Moisture	%				3.6	3.6			3.7		3.9		
135		Temperature	°F				148	150			153		151		

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Feedstreams																						
2																							
3																							
4	851C1	Trial Burn		R1		R2		R3		Cond Avg	R1		R2		R3		Cond Avg			R1		R2	
5				F1		F1		F1		F1		F2		F2		F2		F2		F3		F3	
6	Feedstream Number			Liq HW		Liq HW		Liq HW		Liq HW		NG		NG		NG		NG		Spike		Spike	
7	Feed Class			HW		HW		HW		HW		MF		MF		MF		MF		Spike		Spike	
8	Feed Class 2			Liq Waste		Liq Waste		Liq Waste		Liq Waste		Natural Gas		Natural Gas		Natural Gas		Natural Gas		Spike		Spike	
9	Feedstream Description																						
10	Feed Rate	lb/hr		472		455		452		460		460		460		460		460					
11	Heating Value	Btu/lb								8232													
12	Heat Content	MMBtu/hr		4.2		4		4.1		4.1		4.1		4.1		4.1		4.1					
13	Ash	lb/hr		0.0472	nd	0.0455	nd	0.0452		0.46		0.46		0.46		0.46		0.46		2.2328		2.2345	
14	Chlorine	lb/hr		292.2		352.6		280.7		309		309		309		309		309		1125		1065	
15	Arsenic	g/hr		0.636		0.735		0.806		0.729		0.729		0.729		0.729		0.729		0.18		0.08	
16	Barium	g/hr		0.094		0.038		0.038		0.038		0.038		0.038		0.038		0.038					
17	Beryllium	g/hr		0.013		0.008		0.006		0.009		0.009		0.009		0.009		0.009					
18	Cadmium	g/hr		0.020	nd	0.019	nd	0.020		0.020		0.020		0.020		0.020		0.020					
19	Chromium	g/hr		0.043		0.033		0.024		0.044		0.044		0.044		0.044		0.044					
20	Copper	g/hr		0.025	nd	0.024	nd	0.024		0.024		0.024		0.024		0.024		0.024					
21	Lead	g/hr		0.446		0.421		0.484		0.451		0.451		0.451		0.451		0.451					
22	Manganese	g/hr		0.047		0.040		0.040		0.042		0.042		0.042		0.042		0.042					
23	Nickel	g/hr		0.071	nd	0.069	nd	0.071		0.070		0.070		0.070		0.070		0.070					
24	Selenium	g/hr		2.893		2.789		2.770		2.819		2.819		2.819		2.819		2.819					
25	Thallium	g/hr		0.973	nd	0.938	nd	0.932		0.948		0.948		0.948		0.948		0.948					
26	Zinc	g/hr		0.069	nd	0.066	nd	0.066		0.067		0.067		0.067		0.067		0.067					
27	Mercury	g/hr		0.003		0.007		0.008		0.006		0.006		0.006		0.006		0.006					
28																							
29	Stack Gas Flowrate	dscfm		1032		1040		1085		1052.3		1052.3		1052.3		1052.3		1052.3					
30	Oxygen	%		4.1		3.8		3.7		3.9		3.9		3.9		3.9		3.9					
31																							
32	Thermal Feedrate	MMBtu/hr		4.2		4		4.1		4.1		4.1		4.1		4.1		4.1					
33	Estimated Firing Rate	MMBtu/hr																					
34																							
35	Feedrate MTEC Calculations																						
36	Ash	mg/dscfm		10.1	100	9.5	100	9.0	100	9.6		9.6		9.6		9.6		9.6		479.2		467.6	
37	Chlorine	ug/dscfm		62706484		73790001		55975811		64157432.0		64157432.0		64157432.0		64157432.0		64157432.0		241488328		222799940	
38	Arsenic	ug/dscfm		301		339		354		331.4		331.4		331.4		331.4		331.4		85.4		37.6	
39	Barium	ug/dscfm		45		18		17		26.2		26.2		26.2		26.2		26.2					
40	Beryllium	ug/dscfm		6		4		3		4.2		4.2		4.2		4.2		4.2					
41	Cadmium	ug/dscfm		10	100	9	100	9	100	9.1		9.1		9.1		9.1		9.1		27		27	
42	Chromium	ug/dscfm		20		15		24		19.8		19.8		19.8		19.8		19.8		1632		1596	
43	Cumene	ug/dscfm		12	100	11	100	11	100	11.2		11.2		11.2		11.2		11.2					
44	Lead	ug/dscfm		211		194		213		205.9		205.9		205.9		205.9		205.9					
45	Manganese	ug/dscfm		22		19		17		19.4		19.4		19.4		19.4		19.4					
46	Nickel	ug/dscfm		34	100	32	100	31	100	32.1		32.1		32.1		32.1		32.1		7672		7481	
47	Selenium	ug/dscfm		1368		1285		1217		1289.9		1289.9		1289.9		1289.9		1289.9					
48	Thallium	ug/dscfm		460	100	432	100	409	100	433.8		433.8		433.8		433.8		433.8					
49	Zinc	ug/dscfm		32	100	30	100	29	100	30.6		30.6		30.6		30.6		30.6					
50	Mercury	ug/dscfm		1		3		3		2.5		2.5		2.5		2.5		2.5					
51	SVM	ug/dscfm		220.2	4	203.2	4	221.6	4	215.0		215.0		215.0		215.0		215.0		27		27	
52	LVM	ug/dscfm		0		358.2	0	380.7	0	355.4		355.4		355.4		355.4		355.4		1718		1634	
53																							
54																							
55	851C2	Trial Burn		R1		R2		R3		Cond Avg	R1		R2		R3		Cond Avg			R1		R2	
56				F1		F1		F1		F1		F2		F2		F2		F2		F3		F3	
57	Feedstream Number			Liq HW		Liq HW		Liq HW		Liq HW		NG		NG		NG		NG		Total		Total	
58	Feed Class																			Total		Total	

	B	Y	Z	AA	AB	AD	AE	AF	AG	AH	AI	AJ	AK
1	Feedstreams												
2													
3													
4	851C1		R3	Cond Avg	R1	R2	R3	Cond Avg					
5													
6	Feedstream Number		F3	F3	F4	F4	F4	F4					
7	Feed Class		Spike	Spike	Total	Total	Total	Total					
8	Feed Class 2		Spike	Spike	Total	Total	Total	Total					
9	Feedstream Description		Spike	Spike	Total	Total	Total	Total					
10	Feed Rate												
11	Heating Value												
12	Heat Content												
13	Ash		2.2348	1.82	2.28	2.28	2.28	2.28					
14	Chlorine		1137	1108	1417	1417	1417	1417					
15	Arsenic		0.01	0.09	0.82	0.82	0.82	0.82					
16	Barium												
17	Beryllium												
18	Cadmium		0.06	0.06	0.08	0.08	0.08	0.08					
19	Chromium		3.4	3.5	3.50	3.50	3.50	3.50					
20	Copper												
21	Lead												
22	Manganese												
23	Nickel												
24	Selenium												
25	Thallium												
26	Zinc												
27	Mercury												
28													
29	Stack Gas Flowrate												
30	Oxygen												
31													
32	Thermal Feedrate												
33	Estimated Firing Rate												
34													
35	<i>Feedrate MTEC Calculations</i>												
36	Ash		445.7	377.9	489.3	2	477.1	2	454.7	2	473.7		
37	Chlorine		226669876	230102537	304194811.2	0	296589941.0	0	282645686.8	0	294259968.5		
38	Arsenic		4.6	40.3	386.2	0	376.6	0	358.9	0	371.7		
39	Barium				44.6	0	17.5	0	16.6	0	26.2		
40	Beryllium				6.1	0	3.8	0	2.8	0	4.2		
41	Cadmium		25	26	36.4	25	35.5	26	33.8	26	35.2		
42	Chromium		1512	1579	1652.7	0	1611.4	0	1535.6	0	1598.6		
43	Cumene			100	11.9	100	11.1	100	10.5	100	11.2		
44	Lead				210.7	0	194.2	0	212.7	0	205.9		
45	Manganese				22.2	0	18.7	0	17.5	0	19.4		
46	Nickel		7129	7422	7705.7	0	7513.0	0	7159.8	0	7453.8		
47	Selenium				1367.6	0	1285.4	0	1216.9	0	1289.9		
48	Thallium			100	459.9	100	432.3	100	409.2	100	433.8		
49	Zinc			100	32.4	100	30.5	100	28.8	100	30.6		
50	Mercury			100	1.2	0	3.1	0	3.3	16	2.5		
51	SVM		25	26	247.1	4	229.7	4	246.5	4	241.1		
52	LVM		1517	1619	2045.0	0	1991.8	0	1897.3	0	1974.5		
53													
54													
55	851C2		R3	Cond Avg									
56													
57	Feedstream Number		F3	F3	F3	F3	F3	F3					
58	Feed Class		Total	Total	Total	Total	Total	Total					

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
59	Feed Class 2																					
60	Feedstream Description																					
61	Feed Rate																					
62	Heating Value																					
63	Heat Content																					
64	Ash																					
65	Chlorine																					
66																						
67	Stack Gas Flowrate																					
68	Oxygen																					
69																						
70	Thermal Feedrate																					
71	Estimated Firing Rate																					
72																						
73	Feedrate MTEC Calculations																					
74	Ash																					
75	Chlorine																					
76																						
77																						
78	851C3																					
79																						
80	Feedstream Number																					
81	Feed Class																					
82	Feed Class 2																					
83	Feedstream Description																					
84	Feed Rate																					
85	Heating Value																					
86	Heat Content																					
87	Ash																					
88	Chlorine																					
89	Arsenic																					
90	Barium																					
91	Beryllium																					
92	Cadmium																					
93	Chromium																					
94	Copper																					
95	Lead																					
96	Manganese																					
97	Nickel																					
98	Selenium																					
99	Thallium																					
100	Zinc																					
101	Mercury																					
102																						
103	Stack Gas Flowrate																					
104	Oxygen																					
105																						
106	Thermal Feedrate																					
107	Estimated Firing Rate																					
108																						
109	Feedrate MTEC Calculations																					
110	Ash																					
111	Chlorine																					
112	Arsenic																					
113	Barium																					
114	Beryllium																					
115	Cadmium																					

	B	Y	Z	AA	AB	AD	AE	AF	AG	AH	AI	AJ	AK
59	Feed Class 2		Total		Total								
60	Feedstream Description		Total		Total								
61	Feed Rate												
62	Heating Value												
63	Heat Content												
64	Ash												
65	Chlorine												
66													
67	Stack Gas Flowrate												
68	Oxygen												
69													
70	Thermal Feedrate		2.9		2.9								
71	Estimated Firing Rate		4.5		4.4								
72													
73	Feedrate MTEC Calculations												
74	Ash		5.3		5.4								
75	Chlorine		171813887		171954863								
76													
77													
78	851C3		R3		Cond Avg								
79													
80	Feedstream Number		F3		F3								
81	Feed Class		Total		Total								
82	Feed Class 2		Total		Total								
83	Feedstream Description		Total		Total								
84	Feed Rate												
85	Heating Value												
86	Heat Content												
87	Ash												
88	Chlorine												
89	Arsenic												
90	Barium												
91	Beryllium												
92	Cadmium												
93	Chromium												
94	Copper												
95	Lead												
96	Manganese												
97	Nickel												
98	Selenium												
99	Thallium												
100	Zinc												
101	Mercury												
102													
103	Stack Gas Flowrate												
104	Oxygen												
105													
106	Thermal Feedrate		3.5		3.4								
107	Estimated Firing Rate		4.8		4.8								
108													
109	Feedrate MTEC Calculations												
110	Ash	100	7.7	100	3.8								
111	Chlorine	0	48418604.3	0	45801194.9								
112	Arsenic	0	82.4	0	177.4								
113	Barium	0	28.5	0	28.1								
114	Beryllium	0	3.6	0	4.2								
115	Cadmium	100	8.9	100	7.8								

US EPA ARCHIVE DOCUMENT

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
116	Chromium		ug/dscm		29		29			25	27.7									0	29.0	0	29.4
117	Cumene		ug/dscm		45		42		44	44	43.7									0	45.0	0	41.9
118	Lead		ug/dscm		84		107		47	47	79.2									0	83.5	0	107.0
119	Manganese		ug/dscm		58		53		54	54	55.1									0	57.9	0	53.1
120	Nickel		ug/dscm	100	12	100	11	100	11	100	11.0								100	100	11.6	100	10.6
121	Selenium		ug/dscm		735		686		725	725	715.4									0	735.2	0	685.9
122	Thallium		ug/dscm	100	76	100	71	100	75	100	74.4								100	100	76.4	100	71.3
123	Zinc		ug/dscm	100	27	100	25	100	26	100	25.9								100	100	26.6	100	24.8
124	Mercury		ug/dscm	100	0.5	100	0.4	100	0.6	100	0.5								100	100	0.5	100	0.4
125																							
126	SVM		ug/dscm	8	91.2	6	114.0	16	55.8	9	87.0								8	8	91.2	6	114.0
127	LVM		ug/dscm	0	193.8	0	323.4	0	110.7	0	209.3								0	0	193.8	0	323.4
128																							
129																							
130																							
131																							

	B	Y	Z	AA	AB	AD	AE	AF	AG	AH	AI	AJ	AK
116	Chromium	0	24.8	0	27.7								
117	Cumene	0	44.3	0	43.7								
118	Lead	0	47.0	0	79.2								
119	Manganese	0	54.2	0	55.1								
120	Nickel	100	10.8	100	11.0								
121	Selenium	0	725.1	0	715.4								
122	Thallium	100	75.4	100	74.4								
123	Zinc	100	26.2	100	25.9								
124	Mercury	100	0.6	100	0.5								
125													
126	SVM	16	55.8	9	87.0								
127	LVM	0	110.7	0	209.3								
128													
129													
130													
131													

	A	B	C
1	Process Information		
2			
3		Cond Avg	
4			
5	851C1	Trial burn	
6			
7	Combustion Temp	°F	2323
8	Anhydrous HCl Production Rate	lb/hr	1417
9	NaOH Scrubber		
10	Scrubber pH	pH	7.6
11	Scrubber L/G	gal/1000scf	33.2
12	Scrubber Blowdown	lb/hr	728
13			
14	851C2	Trial burn	
15			
16	Combustion Temp	°F	1808.6
17	Anhydrous HCl Production Rate	lb/hr	640
18	NaOH Scrubber		
19	Scrubber pH	pH	8.4
20	Scrubber L/G	gal/1000scf	51.5
21	Scrubber Blowdown	lb/hr	1513
22			
23	851C3	Risk burn	
24			
25	Combustion Temp	°F	1947
26	Anhydrous HCl Production Rate	lb/hr	610
27	NaOH Scrubber		
28	Scrubber pH	pH	8.4
29	Scrubber L/G	gal/1000scf	47.8

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	PCDD/PCDF																
2	N																
3	Facility Name and ID:	The Dow Chemical Company, CAD076528678															
4	Condition ID:	851C1															
5	Condition/Test Date:	Max comb chamber temperature November 1-3, 1999															
6																	
7		I-TEF															
8		Wght Fact															
9																	
10	Detected in sample volume (ng)																
11	2,3,7,8-TCDD	1	0.022	0.0218	0.022	0.0218	0.022	0.0218	0.022	0.0218	0.022	0.0218	0.020	0.0200	0.020	0.020	0.0200
12	TCDD Other	0	0.108	0	0.108	0	0.108	0	0.108	0	0.108	0	0.110	0	0.110	0	0
13	1,2,3,7,8-PCDD	0.5	0.034	0.0168	0.034	0.0168	0.034	0.0168	0.034	0.0168	0.034	0.0168	0.028	0.0141	0.028	0.0141	0.0141
14	PCDD Other	0	0.146	0.0000	0.146	0.0000	0.146	0.0000	0.146	0.0000	0.146	0.0000	0.092	0	0.092	0	0
15	1,2,3,4,7,8-HxCDD	0.1	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.0014
16	1,2,3,6,7,8-HxCDD	0.1	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.014	0.0014	0.012	0.0012	0.012	0.0012	0.0012
17	1,2,3,7,8,9-HxCDD	0.1	0.008	0.0008	0.008	0.0008	0.008	0.0008	0.008	0.0008	0.008	0.0008	0.007	0.0007	0.007	0.0007	0.0007
18	HxCDD Other	0	0.105	0	0.105	0	0.105	0	0.105	0	0.105	0	0.078	0	0.078	0	0
19	1,2,3,4,6,7,8-HpCDD	0.01	0.024	0.0002	0.024	0.0002	0.024	0.0002	0.024	0.0002	0.024	0.0002	0.023	0.0002	0.023	0.0002	0.0002
20	HpCDD Other	0	0.025	0	0.025	0	0.025	0	0.025	0	0.025	0	0.021	0	0.021	0	0
21	OCDD	0.001	0.046	0	0.046	0	0.046	0	0.046	0	0.046	0	0.042	0	0.042	0	0
22	2,3,7,8-TCDF	0.1	0.200	0.0200	0.200	0.0200	0.200	0.0200	0.200	0.0200	0.200	0.0200	0.170	0.0170	0.170	0.0170	0.0170
23	TCDF Other	0	7.302	0	7.302	0	7.302	0	7.302	0	7.302	0	6.436	0	6.436	0	0
24	1,2,3,7,8-PCDF	0.05	0.330	0.0165	0.330	0.0165	0.330	0.0165	0.330	0.0165	0.330	0.0165	0.270	0.0135	0.270	0.0135	0.0135
25	2,3,4,7,8-PCDF	0.5	0.300	0.1499	0.300	0.1499	0.300	0.1499	0.300	0.1499	0.300	0.1499	0.250	0.1248	0.250	0.1248	0.1248
26	PCDF Other	0	7.072	0.0000	7.072	0.0000	7.072	0.0000	7.072	0.0000	7.072	0.0000	5.887	0	5.887	0	0
27	1,2,3,4,7,8-HxCDF	0.1	0.410	0.0410	0.410	0.0410	0.410	0.0410	0.410	0.0410	0.410	0.0410	0.330	0.0330	0.330	0.0330	0.0330
28	1,2,3,6,7,8-HxCDF	0.1	0.230	0.0230	0.230	0.0230	0.230	0.0230	0.230	0.0230	0.230	0.0230	0.180	0.0180	0.180	0.0180	0.0180
29	2,3,4,6,7,8-HxCDF	0.1	0.120	0.0120	0.120	0.0120	0.120	0.0120	0.120	0.0120	0.120	0.0120	0.098	0.0098	0.098	0.0098	0.0098
30	1,2,3,7,8,9-HxCDF	0.1	0.045	0.0045	0.045	0.0045	0.045	0.0045	0.045	0.0045	0.045	0.0045	0.041	0.0041	0.041	0.0041	0.0041
31	HxCDF Other	0	2.092	0	2.092	0	2.092	0	2.092	0	2.092	0	1.847	0	1.847	0	0
32	1,2,3,4,6,7,8-HpCDF	0.01	0.559	0.0056	0.559	0.0056	0.559	0.0056	0.559	0.0056	0.559	0.0056	0.450	0.0045	0.450	0.0045	0.0045
33	1,2,3,4,7,8,9-HpCDF	0.01	0.056	0.0006	0.056	0.0006	0.056	0.0006	0.056	0.0006	0.056	0.0006	0.042	0.0004	0.042	0.0004	0.0004
34	HpCDF Other	0	0.224	0.0000	0.224	0.0000	0.224	0.0000	0.224	0.0000	0.224	0.0000	0.169	0	0.169	0	0
35	OCDF	0.001	0.370	0.0004	0.370	0.0004	0.370	0.0004	0.370	0.0004	0.370	0.0004	0.280	0.0003	0.280	0.0003	0.0003
36																	
37	Stack Gas Flowrate(dscfm)			1068										1110.0			1110.0
38	Gas sample volume (dscf)			128.3										133.8			133.8
39	O2 (%)			3.8										3.7			3.7
40																	
41	PCDD/PCDF (ng in sample)			0.3157										0.2632			0.2632
42	PCDD/PCDF (ng/dscm @ 7% O2)		0.0	0.0708										0.0563			0.0563
43																	
44	TEQ Cond Avg			19.9										32.2			32.2
45	Total Cond Avg			4.451										6.87			6.87

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	PCDD/PCDF																
2	N																
3	Facility Name and ID:	The Dow Chemical Company, CAD076528678															
4	Condition ID:	851C2 Trial burn															
5	Condition/Test Date:	Min comb chamber temperature October 25-27, 1999															
6																	
7		I-TEF															
8		Wght Fact															
9																	
10	Detected in sample volume (ng)																
11	2,3,7,8-TCDD	1	0.0157	0.0157	0.0157	0.0157	0.0157	0.0157	0.01	0.0138	0.014	0.0138	0.014	0.0138	0.014	0.0138	0.0138
12	TCDD Other	0	0.0996	0	0.0996	0	0	0	0.08	0	0.083	0	0.070	0	0.070	0	0
13	1,2,3,7,8-PCDD	0.5	0.0221	0.0111	0.0221	0.0111	0.0111	0.0111	0.02	0.0092	0.018	0.0092	0.018	0.0092	0.018	0.0092	0.0092
14	PCDD Other	0	0.1669	0	0.1669	0	0	0	0.12	0	0.122	0	0.121	0	0.121	0	0
15	1,2,3,4,7,8-HxCDD	0.1	0.0092	0.0009	0.0092	0.0009	0.0009	0.0009	0.01	0.0009	0.009	0.0009	0.008	0.0008	0.008	0.0008	0.0008
16	1,2,3,6,7,8-HxCDD	0.1	0.0092	0.0009	0.0092	0.0009	0.0009	0.0009	0.01	0.0007	0.007	0.0007	0.007	0.0007	0.007	0.0007	0.0007
17	1,2,3,7,8,9-HxCDD	0.1	0.0048	0.0005	0.0048	0.0005	0.0005	0.0005	0.00	0.0005	0.005	0.0005	0.004	0.0004	0.004	0.0004	0.0004
18	HxCDD Other	0	0.0579	0	0.0579	0	0	0	0.06	0	0.064	0	0.060	0	0.060	0	0
19	1,2,3,4,6,7,8-HpCDD	0.01	0.0129	0.0001	0.0129	0.0001	0.0001	0.0001	0.01	0.0001	0.010	0.0001	0.010	0.0001	0.010	0.0001	0.0001
20	HpCDD Other	0	0.012	0	0.012	0	0	0	0.01	0	0.010	0	0	0.0000	0	0.017	0
21	OCDD	0.001	0.0212	0	0.0212	0	0	0	0.020	0	0.020	0	0.120	0.012	0.120	0.012	0.012
22	2,3,7,8-TCDF	0.1	0.13	0.0130	0.1300	0.0130	0.0130	0.0130	0.12	0.0120	0.120	0.0120	0.120	0.012	0.120	0.012	0.012
23	TCDF Other	0	4.4721	0	4.4721	0	0	0	3.88	0	3.878	0	3.580	0	3.580	0	0
24	1,2,3,7,8-PCDF	0.05	0.2195	0.0110	0.2195	0.0110	0.0110	0.0110	0.20	0.0100	0.200	0.0100	0.190	0.0095	0.190	0.0095	0.0095
25	2,3,4,7,8-PCDF	0.5	0.1798	0.0899	0.1798	0.0899	0.0899	0.0899	0.18	0.0899	0.180	0.0899	0.160	0.0801	0.160	0.0801	0.0801
26	PCDF Other	0	4.5993	0	4.5993	0	0	0	4.32	0	4.325	0	4.049	0	4.049	0	0
27	1,2,3,4,7,8-HxCDF	0.1	0.2896	0.0290	0.2896	0.0290	0.0290	0.0290	0.24	0.0240	0.240	0.0240	0.230	0.0230	0.230	0.0230	0.0230
28	1,2,3,6,7,8-HxCDF	0.1	0.1596	0.0160	0.1596	0.0160	0.0160	0.0160	0.14	0.0140	0.140	0.0140	0.130	0.0130	0.130	0.0130	0.0130
29	2,3,4,6,7,8-HxCDF	0.1	0.0765	0.0077	0.0765	0.0077	0.0077	0.0077	0.06	0.0064	0.064	0.0064	0.062	0.0062	0.062	0.0062	0.0062
30	1,2,3,7,8,9-HxCDF	0.1	0.0286	0.0029	0.0286	0.0029	0.0029	0.0029	0.02	0.0024	0.024	0.0024	0.025	0.0025	0.025	0.0025	0.0025
31	HxCDF Other	0	1.447	0	1.4470	0	0	0	1.33	0.0	1.329	0.0	1.155	0	1.155	0	0
32	1,2,3,4,6,7,8-HpCDF	0.01	0.3698	0.0037	0.3698	0.0037	0.0037	0.0037	0.33	0.0033	0.330	0.0033	0.300	0.0030	0.300	0.0030	0.0030
33	1,2,3,4,7,8,9-HpCDF	0.01	0.0286	0.0003	0.0286	0.0003	0.0003	0.0003	0.02	0.0002	0.024	0.0002	0.026	0.0003	0.026	0.0003	0.0003
34	HpCDF Other	0	0.1319	0	0.1319	0	0	0	0.12	0	0.116	0	0.114	0.0000	0.114	0.0000	0.0000
35	OCDF	0.001	0.1596	0.0002	0.1596	0.0002	0.0002	0.0002	0.15	0.0002	0.150	0.0002	0.150	0.0002	0.150	0.0002	0.0002
36																	
37	Stack Gas Flowrate(dscfm)		1064		1064					1117		1117		1086		1086	1086
38	Gas sample volume (dscf)		129.8		129.8					135.5		135.5		132.20		132.20	132.20
39	O2 (%)		8.7		8.7					7.9		7.9		7.90		7.90	7.90
40																	
41	PCDD/PCDF (ng in sample)		0.2027		12.7		0.2027			0.1876		11.5		0.1876		10.6	0.1747
42	PCDD/PCDF (ng/dscm @ 7% O2)		0.0628		3.94		0.0628			0.0523		3.20		0.0523		3.03	0.050
43																	
44	TEQ Cond Avg		0.05														
45	Total Cond Avg		3.39														

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	PCDD/PCDF																
2	N																
3	Facility Name and ID:	The Dow Chemical Company, CAD076528678															
4	Condition ID:	851C3 Risk burn															
5	Condition/Test Date:	Normal conditions October 19-21, 1999															
6																	
7		I-TEF															
8		Wght Fact															
9																	
10		Detected in sample volume (ng)															
11		2,3,7,8-TCDD	1	0.01	0.0144	0.0144	0.0144	0.0144	0.020	0.0197	0.0197	0.0197	0.018	0.0181	0.0181	0.0181	0.0181
12		TCDD Other	0	0.07	0	0.0687	0	0	0.067	0	0.0672	0	0.063	0	0.0634	0	0
13		1,2,3,7,8-PCDD	0.5	0.01	0.0064	0.0127	0.0064	0.024	0.024	0.0121	0.0242	0.0121	0.026	0.0131	0.0263	0.0131	0.0131
14		PCDD Other	0	0.07	0	0.0747	0	0.126	0.126	0	0.1263	0	0.113	0	0.1133	0	0
15		1,2,3,4,7,8-HxCDD	0.1	0.01	0.0009	0.0093	0.0009	0.010	0.010	0.0010	0.0099	0.0010	0.009	0.0009	0.0091	0.0009	0.0009
16		1,2,3,6,7,8-HxCDD	0.1	0.01	0.0008	0.0085	0.0008	0.012	0.012	0.0012	0.0116	0.0012	0.010	0.0010	0.0100	0.0010	0.0010
17		1,2,3,7,8,9-HxCDD	0.1	0.01	0.0006	0.0062	0.0006	0.006	0.006	0.0006	0.0056	0.0006	0.008	0.0008	0.0038	0.0004	0.0004
18		HxCDD Other	0	0.04	0	0.0388	0	0.083	0.083	0	0.0830	0	0.073	0	0.0731	0	0
19		1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.0001	0.0127	0.0001	0.014	0.014	0.0001	0.0143	0.0001	0.014	0.0001	0.0136	0.0001	0.0001
20		HpCDD Other	0	0.02	0	0.0161	0	0.019	0.019	0	0.0188	0	0.019	0	0.0190	0	0
21		OCDD	0.001	0.06	0.0001	0.0628	0.0001	0.086	0.086	0.0001	0.0860	0.0001	0.052	0.0001	0.0517	0.0001	0.0001
22		2,3,7,8-TCDF	0.1	0.08	0.0082	0.0823	0.0082	0.140	0.140	0.0140	0.1397	0.0140	0.130	0.0130	0.1296	0.0130	0.0130
23		TCDF Other	0	2.92	0	2.9209	0	4.061	4.061	0	4.0614	0	3.568	0.0000	3.5682	0.0000	0.0000
24		1,2,3,7,8-PCDF	0.05	0.13	0.0065	0.1298	0.0065	0.220	0.220	0.0110	0.2204	0.0110	0.220	0.0110	0.2202	0.0110	0.0110
25		2,3,4,7,8-PCDF	0.5	0.09	0.0467	0.0933	0.0467	0.160	0.160	0.0802	0.1603	0.0802	0.170	0.0852	0.1704	0.0852	0.0852
26		PCDF Other	0	2.78	0	2.7800	0	4.519	4.519	0.0000	4.5192	0.0000	4.712	0	4.7120	0	0
27		1,2,3,4,7,8-HxCDF	0.1	0.18	0.018	0.1798	0.018	0.280	0.280	0.0280	0.2804	0.0280	0.330	0.033	0.3299	0.033	0.033
28		1,2,3,6,7,8-HxCDF	0.1	0.10	0.010	0.1001	0.010	0.170	0.170	0.0170	0.1702	0.0170	0.200	0.020	0.2003	0.020	0.020
29		2,3,4,6,7,8-HxCDF	0.1	0.05	0.0049	0.0492	0.0049	0.071	0.071	0.0071	0.0708	0.0071	0.083	0.0083	0.0834	0.0083	0.0083
30		1,2,3,7,8,9-HxCDF	0.1	0.02	0.0023	0.0229	0.0023	0.032	0.032	0.0032	0.0322	0.0032	0.033	0.0033	0.0326	0.0033	0.0033
31		HxCDF Other	0	0.95	0	0.9459	0	1.444	1.444	0	1.4440	0	1.756	0	1.7556	0	0
32		1,2,3,4,6,7,8-HpCDF	0.01	0.25	0.0025	0.2503	0.0025	0.380	0.380	0.0038	0.3798	0.0038	0.420	0.0042	0.4196	0.0042	0.0042
33		1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.0001	0.0059	0.0001	0.027	0.027	0.0003	0.0269	0.0003	0.032	0.0003	0.0317	0.0003	0.0003
34		HpCDF Other	0	0.09	0	0.0882	0	0.104	0.104	0	0.1039	0	0.089	0	0.0888	0	0
35		OCDF	0.001	0.18	0.0002	0.1798	0.0002	0.200	0.200	0.0002	0.1998	0.0002	0.220	0.0002	0.2202	0.0002	0.0002
36																	
37		Stack Gas Flowrate(dscfm)			1097		1097			1098.0		1098.0			1051		1051
38		Gas sample volume (dscf)			123.10	123.10	123.10			130.1	130.1	130.1			126		126
39		O2 (%)			7.60	7.60	7.60			7.10	7.10	7.10			7.1		7.1
40																	
41		PCDD/PCDF (ng in sample)			0.1228	8.2	0.1227			0.1995	12.3	0.1995			0.2126		0.2123
42		PCDD/PCDF (ng/dscm @ 7% O2)			0.0368	2.45	0.0368			0.0546	3.36	0.0546			0.0601		0.0600
43																	
44		TEQ Cond Avg	0.05														
45		Total Cond Avg	3.10														
46																	
47																	