

US EPA ARCHIVE DOCUMENT

	B	C	D
1	<b>Source Description</b>		
2			
3	Phase II ID No.	910	
4	EPA ID No.	TXD000461533	
5	Facility Name	Union Carbide Corporation	
6	Facility Location		
7	City	Texas City	
8	State	TX	
9	Unit ID Name/No.	Boiler 5	
10	Other Sister Facilities	None (Boiler 4 no longer burning hazardous waste)	
11	Number of Sister Facilities	0	
12	Combustor Class	Liquid-fired boiler	
13	Combustor Type	Liquid-fired	
14	Combustor Characteristics	Watertube boiler. Babcox and Wilcox Type FH Integral, 4 liquid burners, 160,000 lb/hr of steam @ 600 psig and 750°F, 200 MMBtu/hr	
15	Capacity (MMBtu/hr)	200	
16	Soot Blowing	Yes. During Cond 1, Run 3 for 12 min	
17	APCS Detailed Acronym	None	
18	APCS General Class		
19	APCS Characteristics	NA	
20	Hazardous Wastes	Liq	
21	Haz Waste Description	Liquid wastes. Propionic acid heads residue, ethanol residue, hazardous ignitable	
22	Supplemental Fuel	Process Gas	
23		Fuel gas	
24	Stack Characteristics		
25	Diameter (ft)	6	
26	Height (ft)	97	
27	Gas Velocity (ft/sec)	52.1	
28	Gas Temperature (°F)	379.5	
29			
30	Permitting Status	Tier I for all metals (except Cr+6)	
31	HWC Burn Status (Date if Terminated)		

	B	C
1	<b>Cond Description</b>	
2		
3	<b>910C1</b>	
4		
5	Report Name/Date	Certification of Compliance Boilers 4 and 5, July 1999; Boiler 5 Trial Burn Report, Volume I of VII, August 1999
6	Report Prepare	TRC Environmental Corporation
7	Testing Firm	TRC Environmental Corporation
8	Testing Dates	May 19-20, 1999
9	Cond Dates	May-99
10	Condition Descr	CoC/trial burn, max liquid waste feed, max prod rate
11	Content	PM, HCl, Cl <sub>2</sub> , and Cr+6, DRE (toluene and chlorobenzene)
12		
13	<b>910C2</b>	
14		
15	Report Name/Date	Certification of Compliance Boilers 4 and 5, July 1999; Boiler 5 Trial Burn Report, Volume I of VII, August 1999
16	Report Prepare	TRC Environmental Corporation
17	Testing Firm	TRC Environmental Corporation
18	Testing Dates	May 21, 1999
19	Cond Dates	May-99
20	Condition Descr	CoC/trial burn, min comb temp
21	Content	CO, DRE (toluene, and chlorobenzene)
22		
23	<b>910C3</b>	
24		
25	Report Name/Date	Certification of Compliance Boilers 4 and 5, July 1999; Boiler 5 Trial Burn Report, Volume I of VII, August 1999
26	Report Prepare	TRC Environmental Corporation
27	Testing Firm	TRC Environmental Corporation
28	Testing Dates	May 25-26, 1999
29	Cond Dates	May-99
30	Condition Descr	Risk burn, max liquid waste
31	Content	PCDD/F, other organics, particle size distribution

	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<b>Stack Gas Emissions</b>												
2													
3		Comments	Units	7% O2									
4										Soot Blowing			
5													
6	<b>910C1</b>					R1	R2	R3		Cond Avg			
7													
8	PM	E1	gr/dscf	y		0.0354	0.0379	0.1204		0.0409			
9	CO (MHRA)	E1	ppmv	y		16.46	11.4	31.91		19.9			
10	HCl		g/hr			29044	28033	24045					
11	Cl2		g/hr			16.6	36.4	12.7					
12	Chromium (Hex)		g/hr			3.13	2.62	5.56		2.98			
13	Chromium		g/hr			4.6	5.1	58		6.97			
14													
15	Sampling Train	PM	E1										
16	Stack Gas Flowrate		dscfm			47723	48877	45952		47517			
17	O2		%			6.9	7.5	7.5		7.3			
18	Moisture		%			15.1	15.57	15.5		15.4			
19	Temperature		°F			372.2	380.9	385.5		379.5			
20													
21	Sampling Train	Cr+6	E2										
22	Stack Gas Flowrate		dscfm			45760	46961	45301		46007			
23	O2		%			8.8	8.2	8.1		8.4			
24	Moisture		%			14.4	15.3	15.8		15.2			
25	Temperature		°F			364.4	371.1	374.5		370.0			
26													
27	Sampling Train	HCl/Cl2	E3										
28	Stack Gas Flowrate		dscfm			46952	44373	43924		45083			
29	O2		%			6.9	7.5	7.5		7.3			
30	Moisture		%			15.3	16.3	16.4		16.0			
31	Temperature		°F			364.9	370.1	373		369.3			
32													
33	HCl	E3	ppmv	y		241.6	257.7	223.3		240.8			
34	Cl2	E3	ppmv	y		0.1	0.2	0.1		0.1			
35	Total Chlorine	E3	ppmv	y		241.7	258.0	223.4		241.0			
36	Chromium (Hex)	E2	µg/dscm	y		46.2	35.9	78.4		42.3			
37	Chromium	E2	µg/dscm	y		67.9	70.0	818.3		98.9			
38	LVM	E2	µg/dscm	y		67.9	70.0	818.3		98.9 only Cr			
39													
40	POHC DRE	Chlorobenzene											
41	POHC Feedrate		g/hr			18137	18137	18137					
42	Emission Rate	E1	g/hr			0.096	0.192	0.267					
43	DRE	E1	%			99.9995	99.9989	99.9985					
44													
45	POHC DRE	Toluene											
46	POHC Feedrate		g/hr			18140	18127	18131					
47	Emission Rate	E1	g/hr			1.796	1.196	1.673					
48	DRE	E1	%			99.9901	99.9934	99.9908					
49													
50	<b>910C2</b>					R1	R2	R3		Cond Avg			
51													
52	CO (MHRA)	E1	ppmv	y		3.29	2.75	2.77		2.94			
53													
54	Sampling Train	CO	E1										
55	Stack Gas Flowrate		dscfm			40853	40970	42472		41432			
56	O2		%			11.7	12.3	12		12.0			
57	Moisture		%			10.94	11.25	10.87		11.0			
58	Temperature		°F			354.6	343.9	356.6		351.7			
59													
60													
61	POHC DRE	Chlorobenzene											
62	POHC Feedrate		g/hr			18133	18142	18137					
63	Emission Rate	E1	g/hr			0.264	0.185	0.093					
64	DRE	E1	%			99.9985	99.999	99.9995					
65													
66	POHC DRE	Toluene											
67	POHC Feedrate		g/hr			18126	18126	18127					
68	Emission Rate	E1	g/hr			0.454	0.487	0.628					
69	DRE	E1	%			99.9975	99.9973	99.9965					
70													
71	<b>910C3</b>	<b>Risk Burn</b>				R1	R2	R3		Cond Avg			

	B	C	D	E	F	G	H	I	J	K	L	M	N
72													
73	CO (MHRA)	E1	ppmv	y		1.53		3.46		3.68		2.9	
74													
75	Sampling Train	PCDD/PCDE1											
76	Stack Gas Flowrate		dscfm			40431		43960		44452		42948	
77	O2		%			6.8		6.7		7.3		6.9	
78	Moisture		%			14.71		14.4		14.3		14.5	
79	Temperature		°F			362.2		363.3		362.9		362.8	
80													
81	Particle Size Distribution	in microns						Cumulative %					
82	> 10		% wt			100.0							
83	10-9.5		% wt			12.6							
84	9.5-6.4		% wt			11							
85	6.4-4.4		% wt			6.3							
86	4.4-2.8		% wt			4.5							
87	2.8-1.4		% wt			4.2							
88	1.4-0.88		% wt			0							
89	0.88-0.6		% wt			0							
90	< 0.6		% wt			0							

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	<b>Feedstreams</b>																									
2																										
3	<b>910C1</b>																									
4																										
5	Feedstream Number																									
6	Feed Class																									
7	Feed Class 2																									
8	Feedstream Description																									
9	Feed Rate																									
10	Heating Value																									
11	Moisture																									
12	Ash																									
13	Chlorine																									
14	Antimony																									
15	Arsenic																									
16	Barium																									
17	Beryllium																									
18	Cadmium																									
19	Chromium																									
20	Lead																									
21	Mercury																									
22	Silver																									
23	Thallium																									
24																										
25	Gas Flowrate																									
26	Oxygen																									
27																										
28	Thermal Feedrate																									
29	Estimated Firing Rate																									
30																										
31	<b>Feedrate MTEC Calculations</b>																									
32	Ash																									
33	Chlorine																									
34	Antimony																									
35	Arsenic																									
36	Barium																									
37	Beryllium																									
38	Cadmium																									
39	Chromium																									
40	Lead																									
41	Mercury																									
42	Silver																									
43	Thallium																									
44	SVM																									
45	LVM																									
46																										
47																										
48	<b>910C2</b>																									
49																										
50	Feedstream Number																									
51	Feed Class																									
52	Feed Class 2																									
53	Feedstream Description																									
54	Feed Rate																									
55	Heating Value																									
56																										
57	Thermal Feedrate																									
58																										
59																										
60	<b>910C3</b>																									

B		AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1	Feedstreams																									
2																										
3	910C1	Cond Avg	R1		R2		R3		R1		R2		R3		R1		R2		R3		R1		R2		R3	
4																										
5	Feedstream Number																									
6	Feed Class																									
7	Feed Class 2																									
8	Feedstream Description	HW																								
9	Feed Rate																									
10	Heating Value																									
11	Moisture																									
12	Ash			12484		12484		12472		12478																
13	Chlorine			29101		29097		29090		29096																
14	Antimony																									
15	Arsenic																									
16	Barium																									
17	Beryllium																									
18	Cadmium			28.4		28.3		28.4		28.4																
19	Chromium																									
20	Lead																									
21	Mercury																									
22	Silver																									
23	Thallium																									
24																										
25	Gas Flowrate			47723		48877		45952		47517		47723		48877		45952		47517		46000		46000		46000		46000
26	Oxygen			6.9		7.5		7.5		7.3		6.9		7.5		7.5		7.3		7.3		7.3		7.3		7.3
27	Thermal Feedrate																									
28	Estimated Firing Rate			52.0																						
29																										
30																										
31	Feedrate MTEC Calculatic																									
32	Ash			153.0		156.0		165.8		158.2																
33	Chlorine			304.2		363580.2		386630.3		368928.7																
34	Antimony			1.4																						
35	Arsenic			6.1																						
36	Barium			0.5																						
37	Beryllium			0.1																						
38	Cadmium			0.1																						
39	Chromium			0.3		353.6		377.5		359.7																
40	Lead			2.2																						
41	Mercury			0.3																						
42	Silver			0.3																						
43	Thallium			3.9																						
44	SVM			2.2		0.0		0.0		0.0																
45	LVM			348.0		353.6		377.5		359.7																
46																										
47																										
48	910C2	Cond Avg																								
49																										
50	Feedstream Number																									
51	Feed Class																									
52	Feed Class 2																									
53	Feedstream Description	HW																								
54	Feed Rate																									
55	Heating Value																									
56																										
57	Thermal Feedrate			40.0																						
58																										
59	910C3	Cond Avg																								
60																										

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
61																									
62	Feedstream Number																								
63	Feed Class																								
64																									
65	Feedstream Description																								
66	Feed Rate	lb/hr	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039	4039
67	Viscosity	cSt	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62
68	Density	g/ml	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139	1.0139
69	Heating Value	Btu/lb	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303	7303
70	C	wt. %	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65
71	Hydrogen	wt. %	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16	9.16
72	N	wt. %	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
73	O	wt. %	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88	50.88
74	Sulfur	wt. %	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
75																									
76	Thermal Feedrate	MMBtu/hr	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
77																									
78	<b>BIF Feedrate Limits</b>																								
79																									
80	Antimony	g/hr																							
81	Arsenic	g/hr																							
82	Barium	g/hr																							
83	Beryllium	g/hr																							
84	Cadmium	g/hr																							
85	Chromium	g/hr																							
86	Lead	g/hr																							
87	Mercury	g/hr																							
88	Silver	g/hr																							
89	Thallium	g/hr																							





	A	B	C
1	<b>Process Information</b>		
2			
3	<b>910C1</b>		Cond Avg
4			
5	Max. Comb. Temp.	°F	674.8
6	Max. Steam Prod.	lb/hr	136200
7			
8	<b>910C2</b>		
9			
10	Min. Comb. Temp.	°F	572.6
11	Steam Prod.	lb/hr	67030
12			
13	<b>910C3</b>		
14			
15	Comb. Temp.	°F	644.46
16	Steam Prod.	lb/hr	109950

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:	Union Carbide Corporation, Texas City, TX, 910															
4	Condition ID:	910C3															
5	Condition/Test Date:	Maximum liquid residue, May 25-26, 1999															
6																	
7																	
8																	
9																	
10	Detected in sample volume (ng)																
11	2,3,7,8-TCDD	1	nd	0.0036	0.0036	0.0018	0.0018	nd	0.0031	0.0031	0.002	0.0016	nd	0.0032	0.00320	0.0016	0.00160
12	1,2,3,7,8-PCDD	0.5	nd	0.0097	0.0049	0.0049	0.0024	nd	0.0073	0.0073	0.004	0.0037	nd	0.0051	0.00255	0.0026	0.00128
13	1,2,3,4,7,8-HxCDD	0.1	nd	0.0035	0.0004	0.0018	0.0002	nd	0.0038	0.0004	0.002	0.0002	nd	0.0035	0.00035	0.0018	0.00018
14	1,2,3,6,7,8-HxCDD	0.1	nd	0.0046	0.0005	0.0046	0.0005	nd	0.0034	0.0003	0.002	0.0002	nd	0.0031	0.00031	0.0016	0.00016
15	1,2,3,7,8,9-HxCDD	0.1	nd	0.0056	0.0006	0.0028	0.0003	nd	0.0036	0.0004	0.002	0.0002	nd	0.0044	0.00044	0.0044	0.00044
16	1,2,3,4,6,7,8-HpCDD	0.01		0.032	0.0003	0.0320	0.0003		0.031	0.00031	0.031	0.00031		0.0160	0.00016	0.0160	0.00016
17	OCDD	0.001		0.15	0.0002	0.1500	0.0002		0.11	0.0001	0.110	0.0001		0.0480	0.00005	0.0480	0.00005
18	2,3,7,8-TCDF	0.1		0.024	0.0024	0.0240	0.0024		0.02	0.0020	0.020	0.0020		0.0190	0.00190	0.0190	0.00190
19	1,2,3,7,8-PCDF	0.05		0.0076	0.0004	0.0076	0.0004		0.0059	0.0003	0.006	0.0003		0.0060	0.00030	0.0060	0.00030
20	2,3,4,7,8-PCDF	0.5		0.014	0.0070	0.0140	0.0070		0.011	0.0055	0.011	0.0055		0.0085	0.00425	0.0085	0.00425
21	1,2,3,4,7,8-HxCDF	0.1		0.034	0.0034	0.0340	0.0034		0.018	0.0018	0.018	0.0018		0.0100	0.00100	0.0100	0.00100
22	1,2,3,6,7,8-HxCDF	0.1		0.014	0.0014	0.0140	0.0014		0.0074	0.0007	0.007	0.0007		0.0045	0.00045	0.0045	0.00045
23	2,3,4,6,7,8-HxCDF	0.1		0.025	0.0025	0.0250	0.0025		0.014	0.0014	0.014	0.0014		0.0074	0.00074	0.0074	0.00074
24	1,2,3,7,8,9-HxCDF	0.1	nd	0.0036	0.0004	0.0018	0.0002	nd	0.0037	0.0004	0.002	0.0002	nd	0.0039	0.00039	0.0020	0.00020
25	1,2,3,4,6,7,8-HpCDF	0.01		0.14	0.0014	0.1400	0.0014		0.072	0.0007	0.072	0.0007		0.0420	0.00042	0.0420	0.00042
26	1,2,3,4,7,8,9-HpCDF	0.01		0.0093	0.0001	0.0093	0.0001	nd	0.0072	0.0001	0.004	0.0000		0.0050	0.00005	0.0050	0.00005
27	OCDF	0.001		0.089	0.0001	0.0890	0.0001		0.054	0.0001	0.054	0.0001		0.0270	0.00003	0.0270	0.00003
28																	
29	Gas sample volume (dscf)			148.58	6.80	148.58	6.80		160.40	6.70	160.40	6.70		159.62	7.30	159.62	7.30
30	O2 (%)																
31																	
32	PCDD/PCDF (ng in sample)			0.03	0.0069	0.03	0.0069		0.0249	0.0054	0.0249	0.0054		0.0166	0.0038	0.0166	0.0038
33	PCDD/PCDF (ng/dscm @ 7% O2)	33.2						48.0					41.0				
34																	
35	TEQ Cond Avg	0.0043															