

## NE? IMPACT:

Without Chloromethane: Condition 1 minus Condition 3

Degr/Dist	600	700	800	900	1000	1100	1200	1300	1400
337.5	0.638813	0.593211	0.57014	0.553779	0.537949	0.526573	0.515399	0.502349	0.490327
315	0.544017	0.522279	0.513557	0.511312	0.506983	0.502371	0.49701	0.490461	0.47989
292.5	0.241924	0.252276	0.261208	0.270481	0.27274	0.275999	0.277874	0.278205	0.277636
270	0.345145	0.353693	0.365374	0.371279	0.368758	0.368075	0.366722	0.363747	0.36035
247.5	0.559117	0.534632	0.513625	0.499106	0.483066	0.466708	0.451559	0.436568	0.421269
225	0.721374	0.665334	0.640602	0.612282	0.586518	0.560585	0.538087	0.516459	0.494175
202.5	0.808374	0.753127	0.728986	0.705305	0.677683	0.651526	0.627443	0.603973	0.581393
180	0.769701	0.703652	0.676293	0.65804	0.642806	0.625023	0.607322	0.589562	0.570716
157.5	0.5308	0.474462	0.449204	0.420659	0.415723	0.406322	0.396662	0.387477	0.377273
135	0.68681	0.608317	0.596254	0.569149	0.554723	0.540024	0.524981	0.509965	0.494378
112.5	2.351532	2.03111	1.861821	1.722328	1.605541	1.504887	1.416917	1.336327	1.26483
90	1.224331	1.101571	1.102379	1.096112	1.057468	1.037907	1.013347	0.988168	0.96235
67.5	1.85655	1.644521	1.54842	1.460542	1.380549	1.310099	1.247003	1.187745	1.131528
45	2.486138	2.242697	2.115579	1.991149	1.878817	1.772941	1.678099	1.586765	1.504877
22.5	2.667152	2.490433	2.382729	2.286297	2.185308	2.094812	2.00791	1.92514	1.843251
0	1.696192	1.599481	1.515738	1.450363	1.399672	1.34917	1.303106	1.25925	1.214674

MAX : 2.667152 2.490433 2.382729 2.286297 2.185308 2.094812 2.00791 1.92514 1.843251

KIF rule

Worst Case stack

$$K = HVT$$

H - stack height, m

V - stack gas flow rate,  $m^3/sec$

T - stack gas T,  $^{\circ}K$

Worst K is worst case

✓  
bypass

$$H = 17 \text{ m}$$

$$V = 45 \text{ m}^3/s$$

$$T = 466^{\circ}K$$

$$K = 17 \text{ m} (45 \text{ m}^3/s) (466^{\circ}K) = \begin{matrix} 356490 \\ \cancel{198050} \end{matrix}$$

main

$$H = 44 \text{ m}$$

$$V = 90 \text{ m}^3/s$$

$$T = 391^{\circ}K$$

$$K = 44 \text{ m} (90 \text{ m}^3/s) (391^{\circ}K) = \begin{matrix} 1548360 \\ \cancel{980628} \end{matrix}$$

Worst - case stack

$$K = HVT$$

clinker cooler

$$H = 19.8 \text{ m}$$

$$V = 54.3 \text{ m}^3/\text{s}$$

$$T = 397 \text{ }^\circ\text{K}$$

$$K = 19.8 \text{ m} (54.3 \text{ m}^3/\text{s}) (397 \text{ }^\circ\text{K})$$

$$= 426831$$

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calc. TE Stack Height for bypass

$$17 \text{ m} + 32 \text{ m} = 49 \text{ m}$$

↑  
physical  
stack  
height

↑  
est.  
plume  
rise

Revised 9/30/91 This is the sorted version of R1C1-ER.WQ1

is to determine one emission rate for each stack.

SWPC Condition1 Run2 April 1991: HWP, Tires, &amp; Coal

Emission Rate units: lb/hr

## WITH CHLOROMETHANE EMISSION RATES

Condition 1, run 2 Name	Emissions.....			....."Risks".....				Total "Risk"	% of Total
	Main	ABypass	CCooler	1/(ug/m3) URV	Main*URV	ABP*URV	CC*URV		
PCDD/PCDF	8.440E-08	7.000E-08		3.300E+01	2.785E-06	2.310E-06		5.0952E-06	27.70
Cr-VI	2.060E-04	9.630E-05	1.000E-04	1.200E-02	2.472E-06	1.156E-06	1.2E-06	4.8276E-06	26.25
cd	1.860E-04	9.500E-04	2.530E-04	1.800E-03	3.348E-07	1.710E-06	4.554E-07	2.5002E-06	13.59
chloromethane	6.240E-01	2.860E-03		3.600E-06	2.246E-06	1.030E-08		2.256696E-06	12.27
As	8.280E-05	9.950E-05	2.260E-04	4.300E-03	3.560E-07	4.279E-07	9.718E-07	1.75569E-06	9.55
benzene	1.110E-01	1.320E-03		8.300E-06	9.213E-07	1.096E-08		9.32256E-07	5.07
dibenz (a,h) anthracene	1.020E-05	2.220E-05		1.400E-02	1.428E-07	3.108E-07		4.536E-07	2.47
TCE	4.240E-02	9.030E-02		1.300E-06	5.512E-08	1.174E-07		1.7251E-07	a94
methylene chloride	1.070E-02	1.210E-02		4.100E-06	4.387E-08	4.961E-08		9.348E-08	0.51
BaP	1.020E-05	1.720E-05		3.300E-03	3.366E-08	5.676E-08		9.042E-08	a49
1,2,4-trichlorobenzene	6.480E-05	6.310E-05		4.600E-04	2.981E-08	2.903E-08		5.8834E-08	0.32
chloroform	7.330E-04	9.220E-04		2.300E-05	1.686E-08	2.121E-08		3.8065E-08	a21
bis(2-chloroethyl) e	5.570E-05	5.670E-05		3.300E-04	1.838E-08	1.871E-08		3.7092E-08	0.20
Be	4.290E-06	1.880E-06	3.640E-06	2.400E-03	1.030E-08	4.512E-09	8.736E-09	2.3544E-08	0.13
1,1,2,2-tetrachloroethane	1.410E-04	1.050E-04		5.800E-05	8.178E-09	6.090E-09		1.4268E-08	0.08
	7.950E-06	5.910E-06		8.900E-04	7.076E-09	5.260E-09		1.23354E-08	0.07
1CA	1.330E-04	1.770E-04		1.600E-05	2.128E-09	2.832E-09		4.96E-09	am
1,3-dichloropropene	8.390E-05	5.040E-05		3.500E-05	2.937E-09	1.764E-09		4.7005E-09	0.03
hexachlorobutadiene	1.320E-04	8.470E-05		2.000E-05	2.640E-09	1.694E-09		4.334E-09	0.02
1,2-dichloroethane	8.690E-05	7.100E-05		2.600E-05	2.259E-09	1.846E-09		4.1054E-09	0.02
1,1-dichloroethane	7.510E-05	4.490E-05		2.600E-05	1.953E-09	1.167E-09		3.12E-09	0.02
vinyl chloride	2.950E-04	1.260E-04		7.100E-06	2.095E-09	8.946E-10		2.9891E-09	0.02
CCl4	1.080E-04	7.420E-05		1.500E-05	1.620E-09	1.113E-09		2.733E-09	0.01
bis(2-chloroisopropyl) e	4.660E-05	4.980E-05		2.000E-05	9.320E-10	9.960E-10		1.928E-09	0.01
hexachloroethane	1.260E-04	1.440E-04		4.000E-06	5.040E-10	5.760E-10		LOBE-09	aoi
2,4,6-trichlorophenol	9.550E-05	6.700E-05		5.700E-06	5.444E-10	3.819E-10		9.2625E-10	0.01
bromoform	3.020E-04	2.970E-04		1.100E-06	3.322E-10	3.267E-10		6.589E-10	aoo
tetrachloroethene	1.470E-04	8.030E-05		4.800E-07	7.056E-11	3.854E-11		1.09104E-10	aoo
styrene	6.790E-05	9.250E-05		5.700E-07	3.870E-11	5.273E-11		9.1428E-11	0.00
Sum					Main*URV 9.500E-06	ABP*URV 6.258E-06	CC*URV 2.636E-06	1.839353E-05	
G/S = Sum X .126					1.19698E-06	7.884765E-07	3.321279E-07		

lb/hr to g/s ==&gt;

0.126 &lt;==

We should use the SUM row as a risk emission rate for the model so that the output is risk, but note that conversion of lb/hr to g/s will be required, so use

row marked G/S.

Condition 3, run 1: Coal only

Emissions.....	"Risks".....							Total	% of Total
	Main	ABypass	CCooler	1/(ug/m3) URV	Main*URV	ABP*URV	CC*URV		
chloromethane	2.08	0.00037		3.600E-06	7.488E-06	1.332E-09		7.489332E-06	47.93
Cr-VI	0.000167	9.86E-05	8.3E-05	1.200E-02	2.004E-06	1.1832E-06	9.96E-07	4.1832E-06	26.77
As	6.4E-05	0.000113	0.000134	4.300E-03	2.752E-07	4.859E-07	5.762E-07	1.3373E-06	8.56
Cd	0.000176	0.000152	0.000156	1.800E-03	3.168E-07	2.736E-07	2.808E-07	8.712E-07	5.58
dibenz (a,b) anthracene	3.53E-05	6.99E-06		1.400E-02	4.942E-07	9.786E-08		5.9206E-07	3.79
benzene	0.0559	0.00206		8.300E-06	4.6397E-07	1.7098E-08		4.81068E-07	3.08
PCDD/PCDF	5.55E-09	1.67E-09		3.300E+01	1.8315E-07	5.511E-08		2.3826E-07	1.52
BaP	2.94E-05	6.99E-06		3.300E-03	9.702E-08	2.3067E-08		1.20087E-07	a n
1,2,4-trichlorobenzene	0.000184	5.09E-05		4.600E-04	8.464E-08	2.3414E-08		1.08054E-07	a69
bis(2-chloroethyl) e	5.53E-05	4.2E-05		3.300E-04	1.8249E-08	1.386E-08		3.2109E-08	a21
1,1,2,2-tetrachloroethane	0.000338	0.000191		5.800E-05	1.9604E-08	1.1078E-08		3.0682E-08	a m
Be	4.05E-06	3.97E-06	2.98E-06	2.400E-03	9.72E-09	9.528E-09	7.152E-09	264E-m	a17
BaA	2.12E-05	6.49E-06		8.900E-04	1.8868E-08	5.7761E-09		2.46441E-08	0.16
methylene chloride	0.00272	0.00225		4.100E-06	1.1152E-08	9.225E-09		2.0377E-08	a13
hexachlorobutadiene	awo383	aool		2.000E-05	7.66E-09	2E-09		9.66E-09	0.06
1,2-dichloroethane	0.000245	0.00012		2.600E-05	6.37E-09	3.12E-09		9.49E-w	0.06
CCl4	0.00021	awoo338		1.500E-05	3.15E-09	5.07E-09		8.22E-09	0.05
vinyl chloride	0.000731	0.000352		7.100E-06	5.1901E-09	2.4992E-09		7.6893E-09	0.05
1,3-dichloropropene	0.000147	6.96E-05		3.500E-05	5.145E-09	2.436E-09		7.581E-09	0.05
TCA	0.000289	0.000137		1.600E-05	4.624E-09	2.192E-09		6.816E-09	0.04
1,1-dichloroethane	0.000167	8.08E-05		2.600E-05	4.342E-09	2.1008E-09		6.4428E-09	0.04
chloroform	0.000178	8.95E-05		2.300E-05	4.094E-09	2.0585E-09		6.1525E-09	0.04
bis(2-chloroisopropyl) e	0.000101	3.5E-05		2.000E-05	2.02E-09	7E-10		2.72E-09	0.02
2,4,6-trichlorophenol	0.000264	7.44E-05		5.700E-06	1.5048E-09	4.2408E-10		1.92888E-09	0.01
1,1,2-trichloroethane	aow367	9.54E-05		4.000E-06	1.468E-09	3.816E-10		1.8496E-09	0.01
bromoform	0.000447	0.000216		1.100E-06	4.917E-10	2.376E-10		7.293E-10	a w
TCE	0.000222	0.000214		1.300E-06	2.886E-10	2.782E-10		5.668E-10	0.00
styrene	0.000267	5.36E-05		5.700E-07	1.5219E-10	3.0552E-11		1.82742E-10	0.00
tetrachloroethene	0.000224	0.000135		4.800E-07	1.0752E-10	6.48E-11		1.7232E-10	a w
risk emissions, (lb/hr)*(m3/ug)					1.153118E-05	2.233641E-06	1.860152E-06	1.562497E-05	
risk emissions, (g/s)*(m3/ug)					1.45421E-06	2.81687E-07	2.345858E-07		

WITHOUT CHLOROMETHANE EMISSION RATES

Condition 1, run 2

e	l/(ug/m3)			l/(ug/m3)			Total "Risk"	% of Total	
	Main	ABypass	CCooler	URV	Main*URV	ABPURV			CC*URV
PCDD/PCDF	8.440E-08	7.000E-08		3.300E+01	2.785E-06	2.310E-06	5.0952E-06	31.57	
Cr-VI	2.060E-04	9.630E-05	1.000E-04	1.200E-02	2.472E-06	1.156E-06	1.200E-06	4.8276E-06	29.92
Cd	1.860E-04	9.500E-04	2.530E-04	1.800E-03	3.348E-07	1.710E-06	4.554E-07	2.5002E-06	15.49
As	8.280E-05	9.950E-05	2.260E-04	4.300E-03	3.560E-07	4.279E-07	9.718E-07	1.75569E-06	10.88
benzene	1.110E-01	1.320E-03		8.300E-06	9.213E-07	1.096E-08		9.32256E-07	5.78
dibenz (a,h) anthracene	1.020E-05	2.220E-05		1.400E-02	1.428E-07	3.108E-07		4.536E-07	281
TCE	4.240E-02	9.030E-02		1.300E-06	5.512E-08	1.174E-07		1.7251E-07	Lo7
methylene chloride	1.070E-02	1.210E-02		4.100E-06	4.387E-08	4.961E-08		9.348E-M	0.58
BaP	1.020E-05	1.720E-05		3.300E-03	3.366E-08	5.676E-08		9.042E-08	0.56
1,2,4-trichlorobenzene	6.480E-05	6.310E-05		4.600E-04	2.981E-08	2.903E-08		5.8834E-08	a36
chloroform	7.330E-04	9.220E-04		2.300E-05	1.686E-08	2.121E-08		3.8065E-08	a24
bis(2-chloroethyl) e	5.570E-05	5.670E-05		3.300E-04	1.838E-08	1.871E-08		3.7092E-08	a23
Be	4.290E-06	1.880E-06	3.640E-06	2.400E-03	1.030E-08	4.512E-09	8.736E-09	2.3544E-08	0.15
1,1,2,2-tetrachloroethane	1.410E-04	1.050E-04		5.800E-05	8.178E-09	6.090E-09		1.4268E-08	0.09
BaA	7.950E-06	5.910E-06		8.900E-04	7.076E-09	5.260E-09		1.23354E-08	0.08
TCA	1.330E-04	1.770E-04		1.600E-05	2.128E-09	2.832E-09		4.96E-09	0.03
1,3-dichloropropene	8.390E-05	5.040E-05		3.500E-05	2.937E-09	1.764E-09		4.7005E-09	0.03
hexachlorobutadiene	1.320E-04	8.470E-05		2.000E-05	2.640E-09	1.694E-09		4.334E-09	0.03
1,2-dichloroethane	8.690E-05	7.100E-05		2.600E-05	2.259E-09	1.846E-09		4.1054E-09	0.03
1,1-dichloroethane	7.510E-05	4.490E-05		2.600E-05	1.953E-09	1.167E-09		3.12E-09	0.02
vinyl chloride	2.950E-04	1.260E-04		7.100E-06	2.095E-09	8.946E-10		2.9891E-09	0.02
CCl4	1.080E-04	7.420E-05		1.500E-05	1.620E-09	1.113E-09		2.733E-09	0.02
bis(2-chloroisopropyl) e	4.660E-05	4.980E-05		2.000E-05	9.320E-10	9.960E-10		1.928E-09	0.01
chloroethane	1.260E-04	1.440E-04		4.000E-06	5.040E-10	5.760E-10		1.08E-09	0.01
2,4,6-trichlorophenol	9.550E-05	6.700E-05		5.700E-06	5.444E-10	3.819E-10		9.262.w10	0.01
bromoform	3.020E-04	2.970E-04		1.100E-06	3.322E-10	3.267E-10		6.589E-10	a00
tetrachloroethene	1.470E-04	8.030E-05		4.800E-07	7.056E-11	3.854E-11		1.09104E-10	0.00
styrene	6.790E-05	9.250E-05		5.700E-07	3.870E-11	5.273E-11		9.1428E-11	a00
chloromethane									

L6136KIE-M

	Main*URV	ABP*URV	CC*URV
Sum	7.253E-06	6.247E-06	2.636E-06
G/S = sum X .126	9.139E-07	7.872E-07	3.321E-07

lb/hr to g/s ==> 1.260E-01 <==

We will use the SUM row as a risk emission rate for the model so that the output is risk.

Note that conversion of lb/hr to g/s will be required, so use the row marked G/S.

Condition 3, run 1

Name	I/(ug/m3)								Total "Risk"	% of Total
	Main	ABypass	CCooler	URV	Main*URV	ABP*URV	CC*URV			
...VI	1.670E-04	9.860E-05	8.300E-05	1.200E-02	2.004E-06	1.183E-06	9.960E-07	4.1832E-06	51.42	
As	6.400E-05	1.130E-04	1.340E-04	4.300E-03	2.752E-07	4.859E-07	5.762E-07	1.3373E-06	1644	
Cd	1.760E-04	1.520E-04	1.560E-04	1.800E-03	3.168E-07	2.736E-07	2.808E-07	8.712E-07	1471	
dibenz (a,h) anthracene	3.530E-05	6.990E-06		1.400E-02	4.942E-07	9.786E-m		5.9206E-07	7.28	
benzene	5.590E-02	2.060E-03		8.300E-06	4.640E-07	1.710E-08		4.81068E-07	5.91	
PCDD/PCDF	5.550E-09	1.670E-09		3.300E+01	1.832E-07	5.511E-08		2.3826E-07	293	
BaP	2.940E-05	6.990E-06		3.300E-03	9.702E-08	2.307E-08		1.20087E-07	1.48	
1,2,4-trichlorobenzene	1.840E-04	5.090E-05		4.600E-04	8.464E-08	2341E-W		1.08054E-07	1.33	
bis(2-chloroethyl) e	5.530E-05	4.200E-05		3.300E-04	1.825E-08	1.386E-08		3.2109E-08	0.39	
1,1,2,2-tetrachloroethane	3.380E-04	1.910E-04		5.800E-05	1.960E-08	1.108E-08		3.0682E-08	0.38	
Be	4.050E-06	3.970E-06	2.980E-06	2.400E-03	9.720E-09	9.528E-09	7.152E-09	2.64E-08	0.32	
BaA	2.120E-05	6.490E-06		8.900E-04	1.887E-08	5.776E-09		2.46441E-08	0.30	
methylene chloride	2.720E-03	2.250E-03		4.100E-06	1.115E-08	9.225E-09		2.0377E-08	a25	
hexachlorobutadiene	3.830E-04	1.000E-04		2.000E-05	7.660E-09	2.000E-09		9.66E-09	0.12	
1,2-dichloroethane	2.450E-04	1.200E-04		2.600E-05	6.370E-09	3.120E-09		9.49E-09	0.12	
CCl4	2.100E-04	3.380E-04		1.500E-05	3.150E-09	5.070E-09		8.22E-09	0.10	
vinyl chloride	7.310E-04	3.520E-04		7.100E-06	5.190E-09	2499E-w		7.6893E-09	0.09	
1,3-dichloropropene	1.470E-04	6.960E-05		3.500E-05	5.145E-09	2.436E-09		7.581E-09	0.09	
TCA	2.890E-04	1.370E-04		1.600E-05	4.624E-09	2.192E-09		6.816E-09	0.08	
1,1-dichloroethane	1.670E-04	8.080E-05		2.600E-05	4.342E-09	2.101E-09		6.4428E-09	0.08	
chloroform	1.780E-04	8.950E-05		2.300E-05	4.094E-09	2.059E-09		6.1525E-09	a08	
bis(2-chloroisopropyl) e	1.010E-04	3.500E-05		2.000E-05	2.020E-09	7.000E-10		2.72E-09	0.03	
2,4,6-trichlorophenol	2.640E-04	7.440E-05		5.700E-06	1.505E-09	4.241E-10		1.92888E-09	0.02	
hexachloroethane	3.670E-04	9.540E-05		4.000E-06	1.468E-09	3.816E-10		1.8496E-09	0.02	
oform	4.470E-04	2.160E-04		1.100E-06	4.917E-10	2376E10		7.293510	0.01	
TCE	2.220E-04	2.140E-04		1.300E-06	2.886E-10	2.782E-10		5.668E-10	0.01	
styrene	2.670E-04	5.360E-05		5.700E-07	1.522E-10	3.055E-11		1.82742E-10	a00	
tetrachloroethene	2.240E-04	1.350E-04		4.800E-07	1.075E-10	6.480E-11		1.7232E-10	0.00	
chloromethane								8.135642E-06		
risk emissions, (lb/hr)*(m3/ug)					4.043E-06	2.232506	1.860E-06			
risk emissions, (g/s)*(m3/ug)					5.099E-07	2.815E-07	2.346E-07			

	pounds per hour		grams per second	
	Cond 1		Cond 1	
	main	bypass	main	bypass
tetra CDDs	1.293-08	9.403-09	1.623-09	<b>1.19E-09</b>
<b>penta CDDs</b>	3.303-08	<b>3.76E-08</b>	4.163-09	<b>4.75E-09</b>
hexa CDDs	<b>1.21E-07</b>	1.423-07	<b>1.53E-08</b>	1.793-08
hepta CDDs	3.603-07	<b>3.91E-07</b>	<b>4.54E-08</b>	<b>4.93E-08</b>
<b>octa CDD</b>	<b>6.57E-07</b>	<b>6.57E-07</b>	8.293-08	8.293-08
tetra CDFs	9.503-08	<b>5.51E-08</b>	<b>1.20E-08</b>	6.953-09
<b>penta CDFs</b>	<b>1.12E-07</b>	8.883-08	<b>1.41E-08</b>	<b>1.12E-08</b>
hexa CDFs	<b>2.68E-07</b>	2.283-07	3.383-08	2.883-08
hepta CDFs	<b>3.15E-07</b>	2.653-07	3.973-08	3.343-08
<b>octa CDF</b>	2.623-07	<b>2.24E-07</b>	<b>3.30E-08</b>	<b>2.83E-08</b>
	pounds per hour		grams per second	
	Cond 3		Cond 3	
	main	bypass	main	bypass
tetra CDDs	1.943-09	<b>1.12E-09</b>	2.453-10	<b>1.42E-10</b>
<b>penta CDDs</b>	8.953-09	3.343-09	<b>1.13E-09</b>	<b>4.21E-10</b>
hexa CDDs	<b>2.75E-08</b>	<b>1.61E-08</b>	3.463-09	<b>2.03E-09</b>
hepta CDDs	<b>4.46E-08</b>	3.823-08	5.633-09	<b>4.82E-09</b>
<b>octa CDD</b>	<b>5.61E-08</b>	6.623-08	7.083-09	8.353-09
tetra CDFs	1.433-08	4.823-09	<b>1.81E-09</b>	<b>6.08E-10</b>
<b>penta CDFs</b>	1.433-08	<b>7.39E-09</b>	<b>1.80E-09</b>	9.323-10
hexa CDFs	3.483-08	3.473-08	4.393-09	4.373-09
hepta CDFs	<b>2.55E-08</b>	5.523-08	3.223-09	6.963-09
<b>octa CDF</b>	<b>1.52E-08</b>	5.133-08	1.923-09	<b>6.47E-09</b>

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