



**WESTINGHOUSE ELECTRIC CORPORATION  
WIPP PROJECT - CARLSBAD, NM  
COMPLIANCE AND PERMITTING**

**FACSIMILE TRANSMITTAL SHEET**

**FAX NUMBER: (505) 234-8854**

PAGES -- INCLUDE COVER	3	DATE	5-17-96	TIME	11:15am
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**SPECIAL INSTRUCTIONS:** Steve -

I'm also sending Table D-6, which  
 contained a few errors. Please call  
 if you have any other questions.  
 Thanks,  
 Karen Day



RCRA Part B Permit Application  
DOE/WIPP 91-006  
Revision 6

1 **D9-5.3.2 Non-Carcinogens**

2 As for carcinogens, noncarcinogen VOC contaminant concentrations in air for the Surface  
3 Worker and the Underground Worker and OSHA 8 hour TWAs are presented (Table D9-9).  
4 This information provides a mechanism for evaluating occupational exposures in addition to  
5 the risk assessment approach. The receptor concentrations for the Surface Worker are  
6 seven orders of magnitude below the TWAs and those for the Underground Worker are more  
7 than six orders of magnitude below the TWAs.

8 Human health risk from non-carcinogens can be calculated using equation D9-23 with EF =  
9 1920 hours/year for the surface worker and 33 hours per year for the underground worker,  
10 ED = 10 years, and EC = ECS in Table 9-9. The calculated hazard quotient from  
11 Chlorobenzene is 4E-01 for the surface worker and 3E-02 for the underground worker. The  
12 risk from Toluene, the hazard quotient is 3E-02 for the surface worker and 3E-03 for the  
13 underground worker.

14 **TABLE D9-8**  
15 **VOC CONTAMINANT CONCENTRATIONS IN AIR FOR THE SURFACE WORKER AND**  
16 **THE UNDERGROUND WORKER**

Compound	$ECS_{max}$ Exhaust Shaft Concentration for Surface Worker ( $\mu\text{g}/\text{m}^3$ )	$ECU_{max}$ Exposure Concentration for Underground Worker ( $\mu\text{g}/\text{m}^3$ )	Receptor Concentration		
			(ECS x ADF) Surface Worker (ppmv)	Underground Worker (ppmv)	OSHA TWA <sup>a</sup> (ppmv)
18 Carbon Tetrachloride	1.54E+02	7.70E+01	3.00E-04	1.22E-02	10
19 Chloroform	1.06E+02	5.03E+01	2.67E-04	1.03E-02	50
20 1,1,-Dichloroethylene	4.01E+02	1.86E+02	1.24E-03	4.68E-02	5 <sup>b</sup>
21 1,2-Dichloroethane	1.25E+02	6.00E+01	3.81E-04	1.48E-01 ✓	100
22 Methylene Chloride	1.26E+02	5.66E+02	4.45E-03	1.63E-02 ✓	500
23 1,1,2,2-Tetrachloroethane	1.77E+02	8.86E+01	3.17E-04	1.29E-02 ✓	5
24 1,1,1-Trichloroethane	1.77E+03 ✓	8.89E+02 ✓	4.00E-03	1.63E-01	350

25 a. 8 hour TWAs except chloroform TWA for up to a 10 hour day in a 40 hour work week.

**TABLE D-6  
MAXIMUM ESTIMATED OCCUPATIONAL AND PUBLIC EXPOSURE FROM  
UNDERGROUND WASTE VOC EMISSIONS**

Indicator Volatile Organic Compounds (ppmv)	Worker Receptor Concentration		OSHA 8 Hour TWA <sup>b</sup> (ppmv)	Estimated Risk for Carcinogens and Hazard Quotients for Non-Carcinogens for Public Exposure to Waste Emissions	Acceptable Level of Risk <sup>f</sup>
	Surface	Underground			
Carbon Tetrachloride	3.0E-04	1.2E-02	10	3E-08	1E-06
Chlorobenzene <sup>a</sup>	6.9E-04	2.9E-02	75	4E-06 <sup>e</sup>	1
Chloroform	2.7E-04	1.0E-02	50 <sup>c</sup>	2E-09	1E-06
1,1-Dichloroethylene	1.2E-03	4.7E-02	5 <sup>d</sup>	2E-09	1E-05
1,2-Dichloroethane	3.8E-04	1.5E-01 ✓	100	8E-10	1E-06
Methylene Chloride	4.5E-03	1.6E-02 ✓	500	6E-10	1E-06
1,1,2,2-Tetrachloroethane	3.2E-04	1.3E-02 ✓	5	3E-09	1E-05
Toluene <sup>a</sup>	1.6E-03	6.7E-02	200	3E-07 <sup>e</sup>	1
1,1,1-Trichloroethane	4.0E-03	1.6E-01	350	2E-08	1E-05

- a. Non-Carcinogen (all others are class B2 or C carcinogens)
- b. 8 hour time weighted averages (TWA) except for chloroform
- c. TWA for up to a 10 hour day in a 40 hour workweek
- d. TWA from ACGIH
- e. Non-Carcinogen hazard quotient
- f. Acceptable level of risk for carcinogens is the probability of developing cancer, and for non-carcinogens is a hazard quotient less than or equal to 1