

AMENDMENT TO
AIR DISPERSION MODELING REPORT
ESTIMATED VOLATILE ORGANIC COMPOUNDS EMISSIONS
FOR THE
DEFENSE THREAT REDUCTION AGENCY
PROPOSED EXPLOSIVE EXPERIMENT AT
THE NEVADA TEST SITE

Volatile organic compounds (VOCs), nitrogen oxides (NO_x), and carbon monoxide are considered as precursor compounds for ozone, which is formed via a photochemical reaction. The emission rates for ozone precursors are regulated to minimize the formation rate of ozone and other photochemical reaction products. The "VOC/NO_x Point Source Screening Tables" (Screening Tables) developed by Richard D. Scheffe are a screening method for predicting ozone impacts from sources that emit VOCs and NO_x. The tables are based on a series of applications of a photochemical model known as the Reactive Plume Model-II. Of note from the Introduction to the Screening Tables: "The ozone increment estimates produced from this analysis should be interpreted as conservative predictions which would exceed ozone formation produced by actual episodic events."

Table 5, "Estimated Volatile Organic Compounds (VOCs) from the DIVINE STRAKE Experiment," lists the VOCs that were identified from the results of the POLU4WN Model run. As noted in the table, some of those VOCs are considered hazardous air pollutants and were addressed as such in a previous submittal. As requested, NNSA/NSO used the Screening Tables, inputting into the calculation the total annual VOCs and NO_x emissions for the NTS plus the total annual VOCs and NO_x emissions that would result from the Divine Strake Experiment. This resulted in an ozone increment of 0.51866. The ambient air quality standard (1 hour parts per million) is 0.12 for a model-calculated percentage of 43.22. This result indicates that NTS air emissions, including the Divine Strake Experiment, would be well within Nevada Ambient Air Quality Standards and in compliance with the NTS AQOP. A copy of the Screening Tables results is attached.

Table 5 Estimated Volatile Organic Compounds (VOC) from the DIVINE STRAKE Experiment

Hazardous Air Pollutant (HAP)	VOC Name	Chemical Formula	Emissions (lbs)	
	Tetrachloromethane	CCl4	2,387.2146	
	Trichloromethyl	CCl3	1,837.0065	
	Carbonic Dichloride	COCl2	1,535.0802	
	Dichloroethyne	C2Cl2	1,473.1805	
	Dichloromethylene	CCl2	1,286.7893	
	2-Butynedinitrile	C4N2	1,180.2698	
HAP	Chloroethyne	C2HCl	938.6141	
	Ethanedinitrile	C2N2	807.5057	
	Chloromethylene	CHCl	752.2320	
HAP	Hydrogen Isocyanate	CNHO	667.6765	
	CCO Radical	C2O	621.0460	
	Carbon	C3	559.1462	
HAP	Formaldehyde	CH2O	465.9475	
	Ethene	C2H4	435.3312	
	Ethyne	C2H2	404.0477	
	Carbon	C2	372.7642	
	Methyl	CH3	233.3073	
HAP	Hexachloroethane	C2Cl6	3,674.0129	
HAP	Tetrachloroethane	C2Cl4	2,573.5967	
	Chloromethylidyne	CCl	736.5903	
	Oxirane	C2H4O	683.6130	
HAP	CNN Radical	CN2	621.1236	
HAP	CNC Radical	C2N	590.1349	
HAP	Cyanogen	CN	403.7529	
	Methylidyne	CH	202.0238	
	Carbon Suboxide	C3O2	1,055.7100	
	Carbonyl Chloride	COCl	984.8721	
HAP	Cyanogen Chloride	CNCl	953.9609	
	Carbon	C5	931.9104	
HAP	Chloromethane	CH3Cl	783.5154	
	Carbon	C4	745.5283	
	NCO Radical	CNO	652.0347	
	Formyl	CHO	450.3057	
HAP	Hydrogen Cyanide	CNH	419.3946	
	Ethynyl	C2H	388.4059	
	Methylene	CH2	217.6656	
	Carbon	C	186.3821	
			Total lbs	33,211.6931
			Total tons	16.6058
			Non-HAP Total lbs	21,119.9631
			Non-HAP Total tons	10.5600

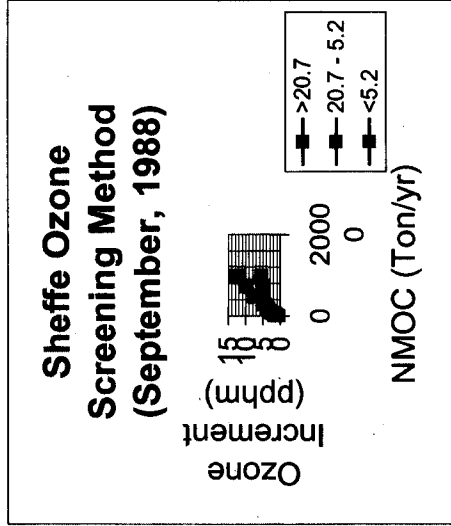
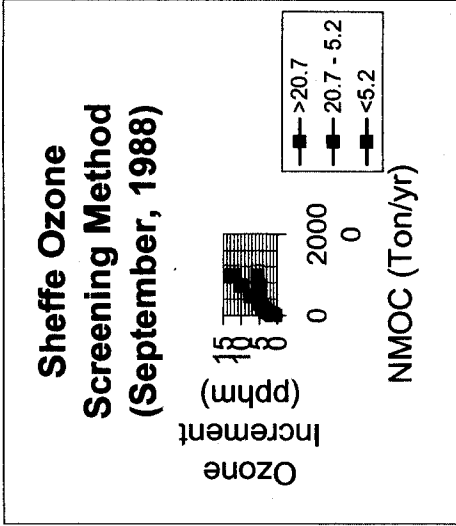
Notes:

- 1 HAPS column denotes compounds that are both hazardous air pollutants and VOCs
- 2 VOCs were determined using the definition from the Clark County DAQEM Regulations, Section "0"

NTS EMISSIONS INVENTORY
SCHEFFE SCREEN MODEL
JULY 2004

Sheffe Screening Table (9/88)
Rural O3 Increment Table
pphm

Information Input for Screening Calculation		RURAL
Annual NMOC Emission for Facility	88.97 ST/yr	
Annual NOx for Facility	76.1 ST/yr	
Maximum NMOC Emiss. Rate	45048 LB/day 8221.3 ST/yr	
Calculations & Output		
NMOC/NOx Ratio		1.17
Lower Bound Max. NMOC Emiss. Rate	7500	
Upper Bound Max. NMOC Emiss. Rate	10000	
Lower Increment Value (pphm)	5.1	
Upper Increment Value (pphm)	5.4	
Interpolated Increment Value (pphm)	5.187	
Ozone Increment (pphm * 100)	0.051866	
Ambient Air Quality Standard (1-hour, ppm)	0.12	
% of Standard	43.22	



Max NMOC Tons/yr	>20.7	20.7 - 5.2	<5.2	NMOC/NOx Ratio
50	0.4	0.4	1.1	1.1
75	0.4	0.4	1.2	1.2
100	0.4	0.5	1.4	1.4
300	0.8	1	1.7	1.7
500	1.1	1.4	1.9	1.9
750	1.6	1.9	2.3	2.3
1000	2	2.4	2.7	2.7
1500	2.7	3	3.3	3.3
2000	3.4	3.8	3.7	3.7
3000	4.8	5.2	4.3	4.3
5000	7	7.5	4.8	4.8
7500	9.8	10.1	5.1	5.1
10000	12.2	12.9	5.4	5.4