ATTACHMENT U-3

SOIL GAS EVALUATION

TABLES

Table U.A3-1.
Inhalation/Burrow Air Toxicity Reference Values

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
1,1,1-Trichloroethane																											
	133	Acute	Rat	NR	0.17	-	-	38,000	206,708	NR	NR	38,000	206,708	NR	NR	Mortality	100	10	1	1	100	2,067	10	20,671	ATSDR	Clark and Trinston 1982	LC50
	133	Acute	Rat	M	6	-	-	10,305	56,056	NR	NR	10,305	56,056	NR	NR	Mortality	100	10	1	1	100	561	10	5,606	ATSDR	Bonnet et al. 1980	LC50
	133	Acute	Mouse	M	2	-	-	3,911	21,275	NR	NR	3,911	21,275	NR	NR	Mortality	100	10	1	1	100	**213**	10	**2,127**	ATSDR	Horiguchi and Horiuchi 1971	LC50
	133	Acute	Rat	M	1.5	-	-	NR	NR	18,000	97,914	NR	NR	18,000	97,914	Mortality	100	10	1	1	100	979	10	9,791	ATSDR	Adams et al. 1950	LT50
	133	Subchronic	Mouse	NR	6	5	13	NR	NR	2,000	10,879	NR	NR	47,500	1,943	Reproductive	1	1	2	1	2	971	2	1,943	ATSDR	Calhoun et al. 1981	No changes in reproductive tissues
	133	Subchronic	Rat	M	7	5	6.3	NR	NR	5,000	27,198	NR	NR	138,542	5,666	Reproductive	1	1	2	1	2	2,833	2	5,666	ATSDR	Adams et al. 1950	Testicular degeneration
	133	Chronic	Rat	NR	6	5	104	NR	NR	1,500	8,160	NR	NR	35,625	1,457	Reproductive	1	1	1	1	1	1,457	1	1,457	ATSDR	Quast et al. 1988	No lesions in reproductive tissues and organs
	133	Chronic	Mouse	NR	6	5	104	NR	NR	1,500	8,160	NR	NR	35,625	1,457	Reproductive	1	1	1	1	1	1,457	1	1,457	ATSDR	Quast et al. 1988	No lesions in reproductive tissues and organs
	133	Subchronic	Rat	F	4	7	1.3	6,000	32,638	3,000	16,319	133,000	5,440	66,500	2,720	Developmental	1	1	2	1	2	1,360	2	2,720	ATSDR	BRRC 1987	Decreased female fetal weight, delayed ossification
	133	Subchronic	Mouse	F	7	7	1.3	NR	NR	875	4,760	NR	NR	33,943	1,388	Developmental	1	1	2	1	2	694	2	1,388	ATSDR	Schwetz et al. 1975	No increase in liver weight
	133	Subchronic	Mouse	NR	17	5	1	2,000	10,879	NR	NR	134,583	5,504	NR	NR	Developmental	1	1	2	1	2	2,752	2	2,752	ATSDR	Jones et al. 1996	18% decreased litter weight
	133	Subchronic	Rat	F	6	6.2	4.9	2,100	11,423	NR	NR	61,610	2,520	NR	NR	Developmental	1	1	2	1	2	1,260	2	1,260	ATSDR	York et al., 1982	Delayed ossification, reduced clavicle
1,1,2-Trichloroethane																											
	133	Acute	Rat	NR	2	-	-	2,080	11,315	890	4,841	2,080	11,315	890	4,841	Mortality	100	10	1	1	100	113	10	1,131	ATSDR	Carlson 1973	3 out of 5 rats died
	133	Acute	Rat	NR	8	-	-	500	2,720	NR	NR	500	2,720	NR	NR	Mortality	100	10	1	1	100	27.2	10	272	ATSDR	Smyth et al. 1969	4 out of 6 rats died
	133	Acute	Mouse	NR	6	-	-	416	2,263	NR	NR	416	2,263	NR	NR	Mortality	100	10	1	1	100	**22.6**	10	**226**	ATSDR	Gradiski et al. 1978	LC50
1,1-Dichloroethane																											
	99	Acute	Rat	NR	6	5	13	NR	NR	1,000	4,049	NR	NR	17,679	723	Mortality	100	10	1	1	100	40	10	405	ATSDR	Hofmann et al. 1971	No mortality was observed
	99	Acute	Rat	M	4	-	-	13,000	52,638	NR	NR	13,000	52,638	NR	NR	Mortality	100	10	1	1	100	**526**	10	**5,264**	HSDB	ACGIH 1991	LC 50
	99	Chronic	Rat	NR	7	7	1.4	6,000	24,294	3,800	15,387	173,250	7,086	109,725	4,488	Developmental	1	1	1	1	1	4,488	1	7,086	ATSDR	Schwetz et al. 1974	Gd 6-15; Skeletal anomalies
1,1-Dichloroethene																											
	97	Acute	Rat	M	4	1	-	415	1,645	NR	NR	415	1,645	NR	NR	Mortality	100	10	1	1	100	16	10	165	ATSDR	Zeller et al. 1979	LC50 (rats were fasted prior to exposure)
	97	Acute	Rat	F	4	1	-	6,545	25,950	NR	NR	6,545	25,950	NR	NR	Mortality	100	10	1	1	100	259	10	2,595	ATSDR	Zeller et al. 1979	LC50 (ats were fasted prior to exposure)
	97	Subchronic	Ginuea pig	NR	24	7	12.9	15	59	NR	NR	1,454	59	NR	NR	Mortality	1	1	2	5	10	**5.95**	2	**29.7**	ATSDR	Prendergast et al. 1967	3 out of 15 ginuea pigs died
	97	Subchronic	Mouse	M	22	4	1	40	159	NR	NR	2,031	83	NR	NR	Mortality	1	1	2	5	10	8.31	2	41.5	ATSDR	Short et al. 1977	70% Mortality
	97	Subchronic	Rat	NR	6	5	11	NR	NR	55	218	NR	NR	952	39	Reproductive	1	1	2	1	2	19.5	2	38.9	ATSDR	Short et al. 1977	No adverse effect on fertility
	97	Subchronic	Mouse	NR	6	5	1	NR	NR	30	119	NR	NR	519	21	Reproductive	1	1	2	1	2	10.6	2	21.2	ATSDR	Anderson et al. 1977	No adverse effect on fertility
	97	Chronic	Rat	NR	7	7	1.4	80	317	20	79	2,262	93	565	23	Developmental	1	1	1	1	1	23.1	1	92.5	ATSDR	Murray et al. 1979	Gd 6-15; Wavy ribs and delayed ossification of skull
	97	Chronic	Rat	NR	23	7	1.6	15	59	NR	NR	1,394	57	NR	NR	Developmental	1	1	1	10	10	5.70	1	57.0	ATSDR	Short et al. 1977	Gd 6-16; Lateral ventrical hydrocephalus
	97	Chronic	Mouse	NR	23	7	1.6	15	59	NR	NR	1,394	57	NR	NR	Developmental	1	1	1	10	10	5.70	1	57.0	ATSDR	Short et al. 1977	Gd 6-16; Unossified incus, incompletely ossified sternebrae
1,2,4-Trimethylbenzene																											
	120	Subchronic	Rat	M/F	6	5	4.0	NR	480	NR	49.0	NR	86	NR	8.8	Developmental	1	1	2	1	2	**4.4**	2	**42.9**	PPTRV	IBT, 1981	testicular atrophy, deceased body weight, increased liver weight
	120	Subchronic	Rat	M	6	5	4.0	NR	491	NR	123	NR	430	NR	22	Neurotoxicity	1	1	2	1	2	11.0	2	215	PPTRV	Gralewicz et al. 1997a	increased motor activity, increases in fearfulness
	120	Subchronic	Rat	M	6	5	4.0	NR	NR	NR	491	NR	NR	NR	88	Neurotoxicity	1	1	2	1	2	43.8	2	87.7	PPTRV	Gralewicz et al. 1997b	No significant neurotoxic effects
	120	Subchronic	Rat	M	6	5	12.8	NR	1,227	NR	491	NR	219	NR	88	Neurotoxicity	1	1	2	1	2	43.8	2	110	PPTRV	Korsak and Rydzynski 1996	Neurotoxicity and behavioral effects observed

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
1,2-Dichloropropane																											
	113	Subchronic	Rat	NR	7	5	1	1,000	4,622	NR	NR	23,542	963	NR	NR	Mortality	1	1	2	5	10	96.3	2	481	ATSDR	Heppel et al. 1946	6-10 exposures; Degeneration of the nasal mucosa
	113	Acute	Mouse	NR	10	-	-	480	2,218	NR	NR	NR	NR	NR	NR	Mortality	100	10	1	1	100	**22.2**	10	**222**	ATSDR	Dow Chem. 1982	LC50
	113	Subchronic	Mouse	NR	6	4	2	NR	NR	300	1,387	NR	NR	4,843	198	Mortality	1	1	2	1	2	99.0	2	198	ATSDR	Nitschke and Johnson 1983	Actual range 4-5 days
	113	Subchronic	Rat	NR	6	4	2	NR	NR	1,000	4,622	NR	NR	16,143	660	Reproductive	1	1	2	1	2	330	2	660	ATSDR	Nitschke and Johnson 1983	Actual range 4-5 days
	113	Subchronic	Rat	M/F	6	5	13	NR	NR	150	693	NR	NR	3,027	124	Reproductive	1	1	2	1	2	61.9	2	124	IRIS, ATSDR	Nitschke et al. 1988	No changes in reproductive tissues and organs
	113	Subchronic	Mouse	NR	6	4	2	NR	NR	300	1,387	NR	NR	4,843	198	Reproductive	1	1	2	1	2	99.0	2	198	ATSDR	Nitschke and Johnson 1983	Actual range 4-5 days
	113	Subchronic	Mouse	M/F	6	5	13	NR	NR	150	693	NR	NR	3,027	124	Reproductive	1	1	2	1	2	61.9	2	124	IRIS, ATSDR	Nitschke et al. 1988	No changes in reproductive tissues and organs
1,3-Butadiene																											
	54	Chronic	Rat	NR	6	5	105 - 111	8,000	17,669	1,000	2,209	77,143	3,155	9,643	394	Mortality	1	1	1	1	1	394	1	3,155	ATSDR	Owen et al. 1987	Increased mortality
	54	Subchronic	Rat	NR	6	5	13	NR	NR	8,000	17,669	NR	NR	77,143	3,155	Mortality	1	1	2	1	2	1,578	2	3,155	ATSDR	Crouch et al. 1979	No mortality was observed
	54	Subchronic	Mouse	NR	6	5	14	5,000	11,043	2,500	5,521	48,214	1,972	24,107	986	Mortality	1	1	2	1	2	493	2	986	ATSDR	NTP 1984	Increased mortality
	54	Chronic	Mouse	NR	6	5	61	625	1,380	NR	NR	6,027	246	NR	NR	Mortality	1	1	1	10	10	24.6	1	246	ATSDR	NTP 1984	Increased mortality
	54	Chronic	Mouse	NR	6	5	65	20	44	6.25	14	193	8	60	2	Mortality	1	1	1	1	1	2.46	1	7.89	ATSDR	Melnick et al. 1989	Increased mortality
	54	Chronic	Mouse	NR	6	5	61.0	625	1,380	NR	NR	6,027	246	NR	NR	Reproductive	1	1	1	10	10	24.6	1	246	ATSDR	NTP 1984	Gonadal atrophy
	54	Chronic	Mouse	NR	6	5	65	6.25	14	NR	NR	60	2	NR	NR	Reproductive	1	1	1	10	10	**0.246**	1	**2.46**	ATSDR	Melnick et al. 1989	Ovarian atrophy
	54	Chronic	Rat	NR	6	7	1.4	1,000	2,209	200	442	13,500	552	2,700	110	Developmental	1	1	1	1	1	110	1	552	ATSDR	Irvine 1981	Gd 6-15; Wavy ribs; a LOAEL of 8000 skeletal abnormalities were observed.
	54	Chronic	Mouse	NR	6	7	1.4	40	88	NR	NR	540	22	NR	NR	Developmental	1	1	1	10	10	2.2	1	22.1	ATSDR	Hackett et al. 1988	Gd 6-15; Decreased fetal weight
1,3,5-Trimethylbenzene																											
	120	Subchronic	Rat	M	6	5	4.0	NR	491	NR	123	NR	430	NR	22	Neurotoxicity	1	1	2	1	2	**11.0**	2	**215**	PPTRV	Limited data; 1,2,4-trimethylbenzene used as a surrogate; Gralewicz et al. 1997a	increased motor activity, increases in fearfulness
1,4-Dichlorobenzene																											
	147	Chronic	Rat	M	6	5	104.0	300	1,804	NR	NR	7,875	322	NR	NR	Mortality	1	1	1	1	1	322	1	322	ATSDR	Aiso et al. 2005b	30% reduced survival
	147	Subchronic	Rat	M/F	8	5	9.0	798	4,798	NR	NR	27,930	1,142	NR	NR	Mortality	1	1	2	1	2	571	2	571	ATSDR	Hollingsworth et al. 1956	2/19 males dies; 2/15 females died.
	147	Subchronic	GnPig	M	8	5	4.0	798	4,798	NR	NR	27,930	1,142	NR	NR	Mortality	1	1	2	1	2	571	2	571	ATSDR	Hollingsworth et al. 1956	2/16 males died.
	147	Subchronic	Rabbit	M/F	8	5	12.0	798	4,798	NR	NR	27,930	1,142	NR	NR	Mortality	1	1	2	1	2	571	2	571	ATSDR	Hollingsworth et al. 1956	3/8 males and 1/8 female died.
	147	Subchronic	Rat	M/F	8	5	9.0	798	4,798	NR	NR	27,930	1,142	NR	NR	Neurotoxicity	1	1	2	1	2	571	2	571	ATSDR	Hollingsworth et al. 1956	tremors, weakness, unconsciousness
	147	Subchronic	GnPig	M	8	5	4.0	798	4,798	NR	NR	27,930	1,142	NR	NR	Neurotoxicity	1	1	2	1	2	571	2	571	ATSDR	Hollingsworth et al. 1956	tremors, weakness, unconsciousness
	147	Subchronic	Rabbit	M/F	8	5	12.0	798	4,798	NR	NR	27,930	1,142	NR	NR	Neurotoxicity	1	1	2	1	2	571	2	571	ATSDR	Hollingsworth et al. 1956	tremors, weakness, unconsciousness
	147	Chronic	Rat	M/F	6	5	10.0	538	3,235	211	1,269	14,123	578	NR	NR	Neurotoxicity	1	1	1	1	1	578	1	578	ATSDR	Tyl and Neeper-Bradley, 1989	tremors, ataxia F0 and F1 gen tested during10 weeks prior to mating, Gd 1-19, and PNd 5-27.
	147	Subchronic	Rat	M	7	5	21.0	NR	NR	158	950	NR	NR	4,839	198	Reproductive	1	1	2	1	2	99	2	198	ATSDR	Hollingsworth et al. 1956	no change in organ wt. or histopath
	147	Subchronic	Rat	M	7	5	2.0	NR	NR	173	1,040	NR	NR	5,298	217	Reproductive	1	1	2	1	2	108	2	217	ATSDR	Hollingsworth et al. 1956	no change in organ wt. or histopath
	147	Subchronic	GnPig	M	7	5	2.0	NR	NR	173	1,040	NR	NR	5,298	217	Reproductive	1	1	2	1	2	108	2	217	ATSDR	Hollingsworth et al. 1956	no change in organ wt. or histopath
	147	Subchronic	GnPig	M	7	5	21.0	NR	NR	158	950	NR	NR	4,839	198	Reproductive	1	1	2	1	2	99.0	2	198	ATSDR	Hollingsworth et al. 1956	no change in organ wt. or histopath
	147	Chronic	Rat	M/F	6	5	10.0	NR	NR	538	3,235	NR	NR	14,123	578	Reproductive	1	1	1	1	1	578	1	578	ATSDR	Tyl and Neeper-Bradley, 1989	F0 tested during10 weeks prior to mating, Gd 1-19, and PNd 5-27.
	147	Chronic	Rat	F	6	7	1.4	NR	NR	500	3,006	NR	NR	18,375	752	Reproductive	1	1	1	1	1	752	1	752	ATSDR	Hodge et al. 1977	no maternal or developmental toxicity
	147	Chronic	Rabbit	F	6	7	1.7	NR	NR	800	4,810	NR	NR	29,400	1,202	Reproductive	1	1	1	1	1	1,202	1	1,202	ATSDR	Hayes et al. 1985	slight maternal weight loss
	147	Chronic	Mouse	M/F	6	5	104.0	NR	NR	300	1,804	NR	NR	7,875	322	Reproductive	1	1	1	1	1	322	1	322	ATSDR	Aiso et al. 2005b	no histopath changes in repro. tissues
	147	Chronic	Rat	M/F	6	5	104.0	NR	NR	300	1,804	NR	NR	7,875	322	Reproductive	1	1	1	1	1	322	1	322	ATSDR	Aiso et al. 2005b	no histopath changes in repro. tissues

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Days/ Week	Weeks	Study Dose: LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
	147	Chronic	Rat	NR	6	**5**	10.0	538	3,235	93	559	14,123	578	2,441	100	Developmental	1	1	1	1	1	**100**	1	**578**	ATSDR	Tyl and Neeper-Bradley, 1989	F0 tested during10 weeks prior to mating, Gd 1-19, and PNd 5-27. increased stillbirths and reduced survival in F1
	147	Chronic	Rat	F	6	**7**	1.4	NR	NR	500	3,006	NR	NR	18,375	752	Reproductive	1	1	1	1	1	752	1	752	ATSDR	Hodge et al. 1977	no maternal or developmental toxicity
	147	Chronic	Rabbit	F	6	**7**	1.7	800	4,810	300	1,804	NR	NR	29,400	1,202	Reproductive	1	1	1	1	1	1,202	1	1,202	ATSDR	Hayes et al. 1985	alterations in circulatory development
1,4-Dioxane																		1									
	88	Acute	Rat	F	4	**1**	0.1	14,261	51,328	NR	NR	29,880	1,222	NR	NR	Mortality	100	10	1	1	100	513	10	122	ATSDR	Pozzani et al. 1959	4-hr LC50
	88	Subchronic	Rabbit	NR	3	**5**	12.0	2,000	7,198	NR	NR	15,714	643	NR	NR	Mortality	1	1	2	1	2	**321**	2	**321**	ATSDR	Fairley et al. 1934	25% mortality by wk 3.
	88	Subchronic	Rabbit	NR	8	**5**	4.9	2,700	9,718	1,350	4,859	56,571	2,314	28,286	1,157	Mortality	1	1	2	1	2	578	2	1,157	HSDB	ACGIH, 2001	frank renal and hepatic toxicity observed before death.
	88	Subchronic	Cat	NR	8	**5**	4.9	2,701	9,721	1,351	4,862	56,592	2,315	28,307	1,158	Mortality	1	1	2	1	2	579	2	1,157	HSDB	ACGIH, 2001	frank renal and hepatic toxicity observed before death.
	88	Subchronic	GnPig	NR	8	5	4.9	2,702	9,725	1,352	4,866	56,613	2,315	28,328	1,159	Mortality	1	1	2	1	2	579	2	1,158	HSDB	ACGIH, 2001	frank renal and hepatic toxicity observed before death.
	88	Subchronic	Rat	F	4	5	2.0	3,000	10,798	1,500	5,399	31,429	1,285	15,714	643	Neurotoxicity	1	1	2	1	2	**321**	2	643	ATSDR	Goldberg et al. 1964	depressed avoidance response
	88	Chronic	Rat	M/F	7	5	104.0	NR	NR	111	400	NR	NR	2,035	83	Neurotoxicity	1	1	1	1	1	83.2	1	83.2	ATSDR	Torkelson et al. 1974	No altered behvior; no brain alterations
	88	Chronic	Rat	M/F	7	5	104.0	NR	NR	111	400	NR	NR	2,035	83	Reproductive	1	1	1	1	1	83.2	1	83.2	ATSDR	Torkelson et al. 1974	No gross or microscopic alterations in repro. organs
2-Butanone (MEK)																											
	72	Subchronic	Rat	NR	8	7	7	6,000	17,696	NR	NR	144,220	5,899	NR	NR	Mortality	1	1	2	5	10	**590**	2	**2,949**	ATSDR	Altenkirch et al 1978	5 out of 5 rats died
	72	Subchronic	Rat	NR	6	5	12.9	NR	NR	5,000	14,746	NR	NR	64,384	2,633	Mortality	1	1	2	1	2	1,317	2	2,633	ATSDR	Cavender et al. 1983	No mortality was observed
	72	Acute	Mouse	NR	1	-	-	103,000	303,776	NR	NR	103,000	303,776	NR	NR	Mortality	100	10	1	1	100	3,038	10	30,378	ATSDR	LaBelle and Brieger 1955	Mean survival time was 43 minutes
	72	Chronic	Rat	NR	6	5	90	NR	NR	5,000	14,746	NR	NR	64,384	2,633	Reproductive	1	1	1	1	1	2,633	1	2,633	ATSDR	Cavender and Casey 1981, Cavender et al 1983	No exposure related lesions were observed in reproductive tissues and organs
	72	Chronic	Rat	NR	7	7	1.4	3,000	8,848	1,000	2,949	63,096	2,581	21,032	860	Developmental	1	1	1	1	1	860	1	2,581	ATSDR	Deacon et al. 1981	Gd 6-15; Extra ribs, delayed ossification
	72	Chronic	Mouse	NR	7	7	1.4	3,000	8,848	1,000	2,949	63,096	2,581	21,032	860	Developmental	1	1	1	1	1	860	1	2,581	ATSDR	Mast et al. 1989	Gd 6-15; Decreased fetal body weight, sternebral anomalies
2-Hexanone																											
	100	Subchronic	Rat	NR	18	3	11	700	2,868	NR	NR	22,536	922	NR	NR	Reproductive	1	1	2	5	10	**92.2**	2	**461**	ATSDR	Katz et al. 1980	Decreased testes weight, histopathology
	100	Chronic	Rat	NR	6	7	3.0	1,000	4,097	NR	NR	25,040	1,024	NR	NR	Developmental	1	1	1	10	10	102	1	1,024	ATSDR	Peters et al. 1981	Gd 21; Behavioral effects in offspring
	100	Chronic	Rat	NR	6	7	3.0	2,000	8,193	NR	NR	50,080	2,048	NR	NR	Developmental	1	1	1	10	10	205	1	2,048	ATSDR	Peters et al. 1981	Gd 21; Decreased pup survival and weight

Table U.A3-1.
Inhalation/Burrow Air Toxicity Reference Values

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
2-Propanol																											
	60	Chronic	Rat	NR	6	5	104	5,000	12,290	NR	NR	53,661	2,195	NR	NR	Mortality	1	1	1	10	10	**219**	1	**2,195**	HSDB	IARC 1999	Mortality increased 18%
	60	Chronic	Rat	F	7	7	2.7	10,000	24,581	NR	NR	175,292	7,169	NR	NR	Developmental	1	1	1	10	10	717	1	7,169	HSDB	Clayton, GD, FE Clayton 1993-1994	Gd 1-19; Reduced food consumption, reduced weight gain
4-Ethyltoluene																											
	92	Chronic	Mouse	NR	3	5	1.0	2,000	7,526	400	1,505	16,429	672	3,286	134	Developmental	1	1	1	1	1	**134**	1	**672**	ATSDR	Limited data; toleuene used as a surrogate; Jones and Balster 1997	Gd 12-17; gained less weight, significant performance deficit in neurobehavioral tests of reflex development, muscle strength, and motor coordination
4-Methyl-2-pentanone																											
	100	Subchronic	Rat	NR	6	7	1.4	NR	NR	3,000	12,290	NR	NR	75,120	3,072	Mortality	1	1	2	1	2	1,536	2	3,072	HSDB	Bushy Run Research C enter 1984	No study description was available
	100	Subchronic	Rat & Mous	NR	6	5	14	NR	NR	2,000	8,193	NR	NR	35,771	1,463	Mortality	1	1	2	1	2	732	2	1,463	HSDB	O'Donoghue et al. 1988	No study description was available
	100	Chronic	Mouse	NR	6	7	1.4	3,000	12,290	NR	NR	75,120	3,072	NR	NR	Mortality	1	1	1	10	10	**307**	1	**3,072**	HSDB	Bushy Run Research C enter 1984	Gd 6-15; 3 out of 25 mice died
	100	Chronic	Rat	F	6	7	1.4	3,000	12,290	NR	NR	75,120	3,072	NR	NR	Reproductive	1	1	1	10	10	**307**	1	**3,072**	HSDB	Bushy Run Research C enter 1984	Gd 6-15; Maternal Toxicity
	100	Chronic	Mouse	NR	6	7	1.4	3,000	12,290	NR	NR	75,120	3,072	NR	NR	Developmental	1	1	1	10	10	**307**	1	**3,072**	HSDB	Bushy Run Research C enter 1984	GD 6-15; Skeletal malformations, reduced fetal body weights, visceral malformations
Acetone																											
	58	Acute	Rat	NR	4	-	-	16,000	37,955	NR	NR	16,000	37,955	NR	NR	Mortality	100	10	1	1	100	**380**	10	**3,796**	ATSDR	Smyth et al. 1968	LC50; 1 out of 6 rats died.
	58	Chronic	Rat	F	6	7	2.0	NR	NR	11,000	26,094	NR	NR	159,500	6,524	Reproductive	1	1	1	1	1	6,524	1	6,524	ATSDR	NTP 1988	Gd 6-19; no effects on number of litter, percent live pups, mean percent resorptions
	58	Chronic	Mouse	F	6	7	1.7	NR	NR	6,600	15,656	NR	NR	95,700	3,914	Reproductive	1	1	1	1	1	3,914	1	3,914	ATSDR	NTP 1988	Gd 6-17; no effects on number of litter, percent live pups, mean percent resorptions
	58	Chronic	Rat	NR	6	7	2.0	11,000	26,094	2,200	5,219	159,500	6,524	31,900	1,305	Developmental	1	1	1	1	1	1,305	1	6,524	ATSDR	NTP 1988	Gd 6-19, Decreased fetal weight
	58	Chronic	Mouse	NR	6	7	1.7	6,600	15,656	2,200	5,219	95,700	3,914	31,900	1,305	Developmental	1	1	1	1	1	1,305	1	3,914	ATSDR	NTP 1988	Gd 6-17; Significantly increased incidence of late resporption, decreased fetal weight, reduced sternabral ossification
Benzene																											
	78	Acute	Rat	NR	4	-	-	13,700	43,762	NR	NR	13,700	43,762	NR	NR	Mortality	100	10	1	1	100	438	10	4,376	ATSDR	Drew and Fouts 1974	LC50
	78	Chronic	Rat	NR	4	5	104	200	639	NR	NR	1,860	76	NR	NR	Mortality	1	1	1	10	10	**7.6**	1	76.1	ATSDR	Maltoni et al. 1982	61% died versus 46% in controls; actual range 4-7 hours
	78	Chronic	Mouse	M	6	5	16	300	958	NR	NR	4,184	171	NR	NR	Mortality	1	1	1	10	10	17	1	171	ATSDR	Cronkite 1986	97% mortality
	78	Chronic	Rat	F	6	5	10	NR	NR	300	958	NR	NR	4,184	171	Reproductive	1	1	1	1	1	171	1	171	ATSDR	Kuna et al. 1992	Gd 0-20; LD 5-20
	78	Subchronic	Rat	F	24	7	1.0	NR	NR	125	399	NR	NR	9,763	399	Reproductive	1	1	2	1	2	200	2	399	ATSDR	Tatrai et al. 1980	Gd 7-14; no effect on implantation number
	78	Chronic	Rat	F	6	7	1.4	NR	NR	2,200	7,027	NR	NR	42,955	1,757	Reproductive	1	1	1	1	1	1,757	1	1,757	ATSDR	Green et al. 1978	Gd 6-15; no effects on resorption
	78	Subchronic	Mouse	NR	6	5	13	300	958	30	96	4,184	171	418	17	Reproductive	1	1	2	1	2	8.6	2	85.6	IRIS, ATSDR	Ward et al. 1985	Bilateral cyst in ovaries; atrophy/degeneration of testes; decrease in spermatozoa; increase in abnormal sperm
	78	Chronic	Mouse	F	7	7	1.4	NR	NR	500	1,597	NR	NR	11,390	466	Reproductive	1	1	1	1	1	466	1	466	ATSDR	Murray et al. 1979	Gd 6-15; no effects on resorption
	78	Chronic	Rat	NR	6	7	1.4	100	319	40	128	1,953	80	781	32	Developmental	1	1	1	1	1	32	1	79.9	ATSDR	Coate et al. 1984	Gd 6-15; Decreased fetal weight
	78	Chronic	Rat	NR	24	7	1.1	125	399	NR	NR	9,763	399	NR	NR	Developmental	1	1	1	10	10	40	1	399	ATSDR	Tatrai et al. 1980	GD 7-14; Decreased mean fetal weight; increased fetal weight retardation; skeletal retardation; 17% decrease in mean placental weight
	78	Chronic	Rat	NR	7	7	1.4	50	160	10	32	1,139	47	228	9	Developmental	1	1	1	1	1	9.3	1	46.6	ATSDR	Kuna and Kapp 1981	Gd 6-15; Decreased fetal weight
	78	Chronic	Mouse	NR	6	7	1.4	20	64	10	32	391	16	195	8	Developmental	1	1	1	1	1	8.0	1	16.0	ATSDR	Keller and Snyder 1988	Gd 6-15; Decreased circulating erythroid presursors, elevation of granulocytic precourser cells in neonates and 6-wk old offspring
Bromomethane																											
	95	Acute	Rat	NR	22	-	-	260	1,010	110	427	260	1,010	110	427	Mortality	100	10	1	1	100	10.1	10	101	ATSDR	Irish et al. 1940	LC100
	95	Acute	Rat	NR	4	-	-	780	3,029	700	2,718	780	3,029	700	2,718	Mortality	100	10	1	1	100	30.3	10	303	ATSDR	Kato et al. 1986	LC50

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration Hours/ Day	Days/ Week	Weeks	Study Dose LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b] LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
	95	Subchronic	Rat	NR	6	5	3.0	160	621	NR	NR	2,713	111	NR	NR	Mortality	1	1	2	5	10	11.1	2	55.5	ATSDR	Eustis et al. 1988	50% lethality after 3 weeks
	95	Chronic	Rat	NR	6	5	128	90	350	NR	NR	1,526	62	NR	NR	Mortality	1	1	1	10	10	6.2	1	62.4	ATSDR	Reuzel et al. 1987	Early mortality
	95	Subchronic	Rat	NR	6	5	36	NR	NR	55	214	NR	NR	933	38	Mortality	1	1	2	1	2	19.1	2	38.1	ATSDR	Anger et al. 1981	Study description was not available
	95	Subchronic	Mouse	NR	6	5	13	120	466	80	311	2,035	83	1,356	55	Mortality	1	1	2	1	2	27.7	2	41.6	ATSDR	Drew 1984	Increased mortality
	95	Subchronic	Mouse	M	6	5	20	100	388	NR	NR	1,696	69	NR	NR	Mortality	1	1	2	5	10	6.9	2	34.7	ATSDR	Haber 1987	48% of males died
	95	Subchronic	Rat	NR	7	5	3.0	NR	NR	70	272	NR	NR	1,385	57	Reproductive	1	1	2	1	2	28.3	2	56.6	IRIS	Sikov et al. 1981 & Hardin et al. 1981	Reproductive toxicity
	95	Subchronic	Rat	NR	6	5	3 -6	160	621	NR	NR	2,713	111	NR	NR	Reproductive	1	1	2	5	10	11.1	2	55.5	ATSDR	Eustis et al. 1988	Testicular degeneration
	95	Subchronic	Rat	NR	4	5	6	400	1,553	300	1,165	4,521	185	3,391	139	Reproductive	1	1	2	1	2	69.3	2	92.5	ATSDR	Kato et al. 1986	Testicular atrophy
	95	Subchronic	Mouse	NR	6	5	13	120	466	80	311	2,035	83	1,356	55	Reproductive	1	1	2	1	2	27.7	2	41.6	ATSDR	Drew 1984	Decreased sperm density
	95	Chronic	Rat	NR	6	5	Generation	30	117	3	12	509	21	51	2	Developmental	1	1	1	1	1	**2.08**	1	**20.8**	ATSDR	Enloe et al. 1986	Reduced pup weight
	95	Subchronic	Rat	NR	7	5	6	NR	NR	70	272	NR	NR	1,385	57	Develpomental	1	1	2	1	2	28.3	2	56.6	ATSDR	Sikov et al. 1980	No significant developmental effects during gestation even with severe maternal toxicity
	95	Subchronic	Rat	NR	6	5	103	100	388	33	128	1,696	69	560	23	Developmental	1	1	2	1	2	11.4	2	34.7	IRIS	NTP 1990	Toxicity in multiple organs
	95	Subchronic	Rats & Mice	NR	6	5	13	NR	NR	80	311	NR	NR	1,356	55	Developmental	1	1	2	1	2	27.7	2	55.5	IRIS	Eustis et al. 1988 & NTP 1990	Nasal olfactory epithelial changes
Carbon disulfide																											
	76	Chronic	Rat	F	6	7	1.3	624	1,940	NR	NR	11,856	485	NR	NR	Mortality	1	1	1	10	10	**48.5**	1	**485**	ATSDR	Lehotsky et al. 1985	Gd 7 -15; 33% mortality
	76	Subchronic	Mouse	NR	6	5	13	800	2,487	NR	NR	10,857	444	NR	NR	Mortality	1	1	2	5	10	44.4	2	222	ATSDR	Toxigenics 1983	4/22 Died
	76	Acute	Mouse	M	1	-	-	220	684	NR	NR	220	684	NR	NR	Mortality	100	10	1	1	100	6.8	10	68.4	ATSDR	Gibson and Roberts	LC50
	76	Subchronic	Rat	M	6	5	10	600	1,865	350	1,088	8,143	333	4,750	194	Reproductive	1	1	2	1	2	97.1	2	167	ATSDR	Tepe and Zenick 1984	Reduced plasma testosterone; slightly lower sperm counts
	76	Subchronic	Rat	NR	7	5	3	NR	NR	40	125	NR	NR	637	26	Developmental	1	1	2	1	2	13.0	2	26.0	IRIS	Beliles et al 1980	No effect on maternal weight gain or histology of the liver and kidney; no significant effcest on uterine content in litters.
	76	Chronic	Rat	F	7	7	2.7	NR	NR	40	124	NR	NR	887	36	Developmental	1	1	1	1	1	36.3	1	36.3	ATSDR	Hardin et al. 1981	Gd 1-19; no maternal or fetal toxicity
	76	Chronic	Rat	NR	6	7	2.1	400	1,243	200	622	7,600	311	3,800	155	Developmental	1	1	1	1	1	155	1	311	IRIS, ATSDR	Saillenfait et al. 1989	GD 6-20; Reduced female weight

Table U.A3-1.
Inhalation/Burrow Air Toxicity Reference Values

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
Carbon tetrachloride																											
	154	Acute	Rat	NR	8	-	-	3,000	18,896	NR	NR	3,000	18,896	NR	NR	Mortality	100	10	1	1	100	189	10	1,890	ATSDR	Adams et al. 1952	1 out of 50 rats died; actual range 8-10hours/day
	154	Subchronic	Rat	NR	7	5	25-29	200	1,260	NR	NR	6,417	262	NR	NR	Mortality	1	1	2	5	10	**26.2**	2	**131**	ATSDR	Adams et al. 1952	9/15 males, 6-15 females died
	154	Acute	Mouse	NR	8	-	-	9,500	59,836	NR	NR	9,500	59,836	NR	NR	Mortality	100	10	1	1	100	598	10	5,984	ATSDR	Svirbey et al. 1947	LC50
	154	Subchronic	Rat	NR	8	5	42	200	1,260	100	630	7,333	300	3,667	150	Reproductive	1	1	2	1	2	75.0	2	150	ATSDR	Smyth et al. 1936	Decreased litters
	154	Chronic	Rat	NR	7	7	1.4	330	2,079	NR	NR	14,823	606	NR	NR	Developmental	1	1	1	10	10	60.6	1	606	ATSDR	Schwetz et al. 1974	Gd 6-15; Decreased fetal body weight and crown to rump length
Chloroethane																											
	65	Acute	Mouse	NR	2	-	-	56,860	151,162	NR	NR	56,860	151,162	NR	NR	Mortality	100	10	1	1	100	1,512	10	15,116	ATSDR	Lazarew 1929	Minimum lethal concentration
	65	Chronic	Mouse	NR	6	5	100	15,000	39,877	NR	NR	174,107	7,121	NR	NR	Mortality	1	1	1	10	10	**712**	1	**7,121**	ATSDR	NTP 1989	Decreased survival; urinary tract infection (M); uterine cancer (F)
	65	Subchronic	Rat	NR	6	5	1.0	15,000	39,877	NR	NR	174,107	7,121	NR	NR	Reproductive	1	1	2	5	10	712	2	3,560	ATSDR	Fedtke et al. 1994	Significant decrease in glutathione levels; approximately 35% decrease in uterine weight
	65	Chronic	Rat	NR	6	5	102	NR	NR	15,000	39,877	NR	NR	174,107	7,121	Reproductive	1	1	1	1	1	7,121	1	7,121	ATSDR	NTP 1989	**On the ATSDR chart the value is listed as a LOAEL, but in the text it is described as a NOAEL.
	65	Subchronic	Mouse	NR	6	5	13	NR	NR	19,000	50,511	NR	NR	220,536	9,020	Reproductive	1	1	2	1	2	4,510	2	9,020	ATSDR	NTP 1989	No histopathological changes in reproductive organs
	65	Subchronic	Mouse	F	6	5	1.0	NR	NR	15,000	39,877	NR	NR	174,107	7,121	Reproductive	1	1	2	1	2	3,560	2	7,121	ATSDR	Fedtke et al. 1994	Approximately 35% decrease in uterine weight
	65	Subchronic	Mouse	NR	23	7	1.6	NR	NR	4,843	12,875	NR	NR	301,679	12,339	Reproductive	1	1	2	1	2	6,169	2	12,339	ATSDR	Landry et al. 1985	No histopathological changes in reproductive organs
	65	Chronic	Mouse	NR	6	7	1.4	4,946	13,149	1,504	3,998	80,373	3,287	24,440	1,000	Developmental	1	1	1	1	1	1,000	1	3,287	ATSDR	Scortichini et al. 1986	Gd 6-15; increased incidence of small centers of unossified bone in the skull
Chloroform																											
	119	Cronic	Rat	F	1	7	1.1	4,117	20,038	NR	NR	20,413	835	NR	NR	Mortality	1	1	1	10	10	83.5	1	835	ATSDR	Newell and Dilley 1978	Gd 7-14; mortality of 1 animal on Gd 12
	119	Chronic	Rat	M	7	5	26	85	414	NR	NR	2,107	86	NR	NR	Mortality	1	1	1	10	10	8.6	1	86.2	ATSDR	Torkelson et al. 1976	Increased mortalitiy; 4 out of 10 rats died
	119	Acute	Mouse	M	1	-	-	692	3,368	NR	NR	692	3,368	NR	NR	Mortality	100	10	1	1	100	33.7	10	337	ATSDR	Deringer et al. 1953	3 out of 6 mice died; actual range 1-3 hours/day
	119	Chronic	Rat	F	7	7	1.4	300	1,460	100	487	10,413	426	3,471	142	Reproductive	1	1	1	1	1	142	1	426	ATSDR	Schwetz et al. 1974	Gd 6-15; 73% decreased conception rate; increased incidence of fetal resorptions
	119	Chronic	Rat	F	7	7	1.4	30	146	NR	NR	1,041	43	NR	NR	Reproductive	1	1	1	10	10	**4.26**	1	**42.6**	ATSDR	Baeder and Hofmann 1988	Gd 7-16; Empty implantations in 2/20 dams
	119	Subchronic	Rat	M	7	5	26	NR	NR	25	122	NR	NR	620	25	Reproductive	1	1	2	1	2	12.7	2	25.3	ATSDR	Torkelson et al. 1976	No histopathological changes in testicular tissues
	119	Chronic	Mouse	F	7	7	1.1	100	487	NR	NR	3,471	142	NR	NR	Reproductive	1	1	1	10	10	14.2	1	142	ATSDR	Murray et al. 1979	Gd 1-7, Gd 6-15, or Gd 8-15; increased incidence of resorptions; decrease in % pregnancies
	119	Chronic	Rat	NR	7	7	1.4	100	487	30	146	3,471	142	1,041	43	Developmental	1	1	1	1	1	42.6	1	142	ATSDR	Schwetz et al. 1974	Gd 6-15; Delayed ossification and wavy ribs; missing ribs, acaudate fetuses with imperforate anus
	119	Chronic	Mouse		7	7	1.1	100	487			3,471	142			Developmental	1	1	1	1	1	142	1	142	ATSDR	Murray et al. 1979	Gd 1-7, Gd 6-15, or Gd 8-15; Increased incidence of resorptions; decrease in % pregnancies

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
Chloromethane																											
	51	Subchronic	Rat	NR	24	2	1	1,000	2,086	NR	NR	14,571	596	NR	NR	Mortality	1	1	2	5	10	59.6	2	298	ATSDR	Burek et al. 1981	6to 8 out of 10 rats died by day 12 post-exposure to 1000 ppm for 72 hours, Actual range 2-3days/week
	51	Subchronic	Mouse	F	22	7	1.6	150	313	NR	NR	7,013	287	NR	NR	Mortality	1	1	2	5	10	28.7	2	143	ATSDR	Landry et al. 1985	Killed in extremis
	51	Chronic	Mouse	NR	6	5	104	997	2,080	NR	NR	9,080	371	NR	NR	Mortality	1	1	1	10	10	**37.1**	1	**371**	ATSDR	CIIT 1981	Increased mortality
	51	Chronic	Mouse	F	6	7	1.7	1,492	3,112			19,023	778			Mortality	1	1	1	1	1	778	1	778	ATSDR	Wolkowski-Tyl et al. 1983	Gd 6-17; all animals terminated early; 2 died prior to necropsy
	51	Subchronic	Rat	M	24	2	1.0	500	1,043	200	417	7,286	298	2,914	119	Reproductive	1	1	2	1	2	59.6	2	149	ATSDR	Burek et al. 1981	Actual range 2-3 days/week; Sperm granulomas, decreased sperm in the tubule lumen, interstitial edema, coagulated proteinaceous obstruction of lumen
	51	Chronic	Rat	M	6	5	104	997	2,080	224	467	9,080	371	2,040	83	Reproductvive	1	1	1	1	1	83.4	1	371	ATSDR	CIIT 1981	Degeneration and atrophy of seminiferous tubules; sperm granulomas
	51	Chronic	Rat	F	6	7	1.9	NR	NR	1,492	3,112	NR	NR	19,023	778	Reproductive	1	1	1	1	1	778	1	778	ATSDR	Wolkowski-Tyl et al. 1983	GD 7-19
	51	Subchronic	Rat	NR	6	5	10	475	991	150	313	4,326	177	1,366	56	Reproductive	1	1	2	1	2	27.9	2	88	ATSDR	Hamm et al. 1985	Actual range 5-7 days/week; Decreased F1 generation male fertility and number of litters in F1 females
	51	Chronic	Mouse	F	6	7	1.7	500	1,043	250	521	6,375	261	3,188	130	Reproductive	1	1	1	1	1	130	1	261	ATSDR	Wolkowski-Tyl et al. 1983	Teratogenic effects seen at 500 ppm and no effects at 250 ppm
	51	Subchronic	Mouse	M	6	5	26	997	2,080	224	467	9,080	371	2,040	83	Reproductive	1	1	2	1	2	41.7	2	186	ATSDR	CIIT 1981	Testicular degeneration and atrophy
	51	Chronic	Rat	NR	6	7	1.9	1,492	3,112	479	999	19,023	778	6,107	250	Developmental	1	1	1	1	1	250	1	778	ATSDR	Wolkowski-Tyl et al. 1983	Gd 7-19; Retarded skeletal development; decreased fetal body weight and crown-rump length in females
	51	Chronic	Mouse	NR	6	7	1.7	479	999	102	213	6,107	250	1,301	53	Developmental	1	1	1	1	1	53.2	1	250	ATSDR	Wolkowski-Tyl et al. 1983	Gd 6-17; Heart defects in fetuses
	51	Chronic	Mouse	NR	6	7	1.7	500	1,043	250	521	6,375	261	3,188	130	Developmental	1	1	1	1	1	130	1	261	ATSDR	Wolkowski-Tyl et al. 1983	GD 6-17; Heart defect in fetuses
cis-1,2,-Dichloroethene																											
	97	Acute	Mouse	F	6	-	-	21,723	86,137	NR	NR	21,723	86,137	NR	NR	Mortality	100	10	1	1	100	**861**	10	**8,614**	ATSDR	Gradiski et al. 1978	LC 50
	97	Subchronic	Rat	NR	6	7	1.4	12,000	47,583	6,000	23,791	290,850	11,896	145,425	5,948	Developmental	1	1	2	1	2	2,974	2	5,948	ATSDR	Hurtt et al. 1993	Significant decrease in mean fetal weight
Cyclohexane																											
	84	Subchronic	Rat	NR	9	5	7	NR	NR	2,500	8,607	NR	NR	56,371	2,306	Developmental	1	1	2	1	2	**1,153**	2	**2,306**	HSDB	Frontali N et al. 1981	Actual range: 9-10hours/day; 5-6days/week; 7-30 weeks
Ethanol																											
	46	Chronic	Rat	NR	7	7	2.9	NR	NR	16,000	30,148	NR	NR	214,993	8,793	Reproductive	1	1	1	1	1	**8,793**	1	**8,793**	HSDB	Nelson BK et al. 1985	Gd 1-20; offspring not affected; no behavioral changes
Ethylbenzene																											
	106	Subchronic	Rat	M	6	4	1.0	2,400	10,425	NR	NR	36,411	1,489	NR	NR	Mortality	1	1	2	5	10	149	2	745	ATSDR	Biodynamics 1986; Cragg et al. 1989	100% mortality by day 3
	106	Chronic	Rat	M	6	5	104	750	3,258	NR	NR	14,223	582	NR	NR	Mortality	1	1	1	10	10	**58**	1	**582**	ATSDR	NTP 1996	2 out of 50 rats survived
	106	Subchronic	Mouse	M	6	4	1.0	1,200	5,212	NR	NR	18,206	745	NR	NR	Mortality	1	1	2	5	10	74.5	2	372	ATSDR	Biodynamics 1986; Cragg et al. 1989	4 out of 5 mice died by day 3
	106	Subchronic	Rat	M	6	4	1.0	NR	NR	2,400	10,425	NR	NR	36,411	1,489	Reproductive	1	1	2	1	2	745	2	1,489	ATSDR	Biodynamics 1986; Cragg et al. 1989	No significant effects on reproductive tissues; mortality was observed
	106	Chronic	Rat	NR	24	7	1.1	138	599	NR	NR	14,656	599	NR	NR	Reproductive	1	1	1	10	10	59.9	1	599	ATSDR	Ungvary and Tatrai 1985	Gd 7-15; Resorptions
	106	Subchronic	Rat	M	6	5	4.0	NR	NR	782	3,397	NR	NR	14,830	607	Reproductive	1	1	2	1	2	303	2	607	ATSDR	Cragg et al. 1989	No histopathological testicular abnormalities
	106	Chronic	Rat	M	6	5	104	750	3,258	250	1,086	14,223	582	4,741	194	Reproductive	1	1	1	1	1	194	1	582	ATSDR	NTP 1996	Interstitial cell adenoma, bilateral testicula adenoma
	106	Subchronic	Mouse	M	6	4	1.0	1,200	5,212	NR	NR	18,206	745	NR	NR	Reproductive	1	1	2	5	10	74.5	2	372	ATSDR	Biodynamics 1986; Cragg et al. 1989	No significant effects on reproductive tissues; mortality was observed
	106	Chronic	Mouse	F	24	7	1.3	NR	NR	115	500	NR	NR	12,213	500	Reproductive	1	1	1	1	1	500	1	500	ATSDR	Ungvary and Tatrai 1985	Gd 6-15; no adverse reproductive effects observed
	106	Subchronic	Mouse	NR	6	5	13	NR	NR	975	4,235	NR	NR	18,490	756	Reproductive	1	1	2	1	2	378	2	756	ATSDR	NTP 1992	No effect on sperm or testicular morphology
	106	Chronic	Rat	F	24	7	1.1	138	599	NR	NR	14,656	599	NR	NR	Developmental	1	1	1	10	10	59.9	1	599	ATSDR	Ungvary and Tatrai 1985	Gd 7-15; Skeletal retardation and fetal resorptions

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Days/ Week	Weeks	Study Dose: LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
	106	Chronic	Rat	F	6	7	1.1	NR	NR	138	599	NR	NR	3,664	150	Developmental	1	1	1	1	1	150	1	150	ATSDR	Ungvary and Tatrai 1985	Gd 7-15; no skeletal retardation and fetal resorptions
	106	Chronic	Rat	NR	7	5	3.0	959	4,165	97	421	21,218	868	2,146	88	Developmental	1	1	1	1	1	87.8	1	868	IRIS, ATSDR	Andrew et al. 1981	Gd 1-19; Skeletal anomalies, supernumerary ribs
	106	Chronic	Mouse	F	24	7	1.3	115	500	NR	NR	12,213	500	NR	NR	Developmental	1	1	1	10	10	50.0	1	500	IRIS, ATSDR	Ungvary and Tatrai 1985	Gd 6-15; Anomalies of uropoetic apparatus
	106	Subchronic	Rat	NR	6	5	12	NR	NR	100	434	NR	NR	1,896	78	Developmental	1	1	2	1	2	38.8	2	78	IRIS	Clark 1983	no significant effects or changes in body weight, food intake, hematology, urinalysis, organ weights, and histopathology of all major organs (including the lung and nasal cavity)
Freon 11																											
	137	Acute	Rat	NR	0.5	-	-	100,000	561,840	NR	NR	100,000	561,840	NR	NR	Mortality	100	10	1	1	100	5,618	10	56,184	HSDB	Verscheuren 1983	LD50
	137	Acute	Mouse	NR	0.5	-	-	10,000	56,184	NR	NR	10,000	56,184	NR	NR	Mortality	100	10	1	1	100	**562**	10	**5,618**	HSDB	Lewis 1996	LC50
	137	Subchronic	Rat	NR	3.5	7	4.0	NR	NR	25,000	140,460	NR	NR	500,828	20,484	Developmental	1	1	2	1	2	10,242	2	20,484	HSDB	ACGIH 1991	Showed no specific abnormalities attributed to Freon 11
	137	Subchronic	Rat	NR	8	7	6.0	NR	NR	10,250	57,589	NR	NR	469,348	19,196	Developmetnal	1	1	2	1	2	9,598	2	19,196	HSDB	ACGIH 1991	Showed no specific abnormalities attributed to Freon 11
Freon 113																											
	187	Acute	Rat	NR	6	-	-	87,000	666,751	NR	NR	87,000	666,751	NR	NR	Mortality	100	10	1	1	100	6,668	10	66,675	HSDB	ACGIH 1979	pulmonary response was observed 39,000 ppm but no mortality until 87,000 ppm
	187	Acute	Rat	NR	4	-	-	52,000	398,518	NR	NR	52,000	398,518	NR	NR	Mortality	100	10	1	1	100	3,985	10	39,852	HSDB	ACGIH 1991	LC 50
	187	Subchronic	Rat	NR	7	5	4.3	NR	NR	2,520	19,313	NR	NR	98,375	4,023	Developmental	1	1	2	1	2	**2,012**	2	**4,023**	HSDB	ACGIH 1979	No mortality or other effects of exposure; effects were observed at at 5,000 ppm
	187	Subchronic	Rat	NR	7	7	4.3	5,000	38,319	NR	NR	273,263	11,176	NR	NR	Developmental	1	1	2	5	10	1,118	2	5,588	HSDB	ACGIH 1991	Body weight gain depressed
Heptane																											
	100	Acute	Mouse	NR	0.5	-	-	15,000	61,350	NR	NR	15,000	61,350	NR	NR	Mortality	100	10	1	1	100	613	10	6,135	HSDB	ACGIH 1986	Convultions and death
	100	Acute	Mouse	NR	0.25	-	-	13,000	53,170	NR	NR	13,000	53,170	NR	NR	Mortality	100	10	1	1	100	**532**	10	**5,317**	HSDB	Synder 1987	Convultions and death; prostration and loss of reflexes prior to death
Hexane																											
	86	Subchronic	Rat	M	24	6	11	1,000	3,517	NR	NR	73,714	3,015	NR	NR	Mortality	1	1	2	5	10	**301**	2	**1,507**	ATSDR	Howd et al. 1983	5 out of 10 rats died in young adult group
	86	Subchronic	Rat	NR	6	5	13	10,000	35,174	NR	NR	153,571	6,281	NR	NR	Reproductive	1	1	2	5	10	628	2	3,141	ATSDR	Cavender et al. 1984	No lesions in reproductive tissues and organs
	86	Subchronic	Rat	NR	6	5	13	NR	NR	10,000	35,174	NR	NR	153,571	6,281	Reproductive	1	1	2	1	2	3,141	2	6,281	ATSDR	Cavender et al. 1984	No lesions in reproductive tissues and organs
	86	Subchronic	Rat	M	16	6	1 - 6	5,000	17,587	NR	NR	245,714	10,050	NR	NR	Reproductive	1	1	2	5	10	1,005	2	5,025	ATSDR	De Martino et al. 1987	Testicular aplasia
	86	Subchronic	Rat	M	18	7	28 - 61	1,000	3,517	NR	NR	64,500	2,638	NR	NR	Reproductive	1	1	2	5	10	264	2	1,319	ATSDR	Nylen et al.1989	Actual range 18-21 hours/day; Testicular atrophy
	86	Subchronic	Mouse	M	20	5	1.0	5,000	17,587	1,000	3,517	255,952	10,468	51,190	2,094	Reproductive	1	1	2	1	2	1,047	2	5,234	ATSDR	Mast et al. 1989	Maternal toxicity; reduced weight gain in dams
	86	Subchronic	Mouse	M	6	5	13	NR	NR	10,000	35,174	NR	NR	153,571	6,281	Reproductive	1	1	2	1	2	3,141	2	6,281	ATSDR	Dunnick et al. 1989, NTP 1991	No lesions in reproductive tissues and organs
	86	Chronic	Rat	NR	6	7	1.3	1,000	3,517	NR	NR	21,500	879	NR	NR	Developmental	1	1	1	10	10	87.9	1	879	ATSDR	Bus et al. 1979	Gd 8-16; Temporary decrease in pup growth rate
	86	Chronic	Mouse	NR	20	7	1.7	1,000	3,517	200	703	71,667	2,931	14,333	586	Developmental	1	1	1	1	1	586	1	2,931	IRIS	Mast et al. 1987	GD 6-19; decreased live fetuses per litter, reduced female fetus weight, and reduced gravid uterine weight
Methylene chloride																											
	85	Acute	Rat	NR	4	-	-	17,250	59,969	NR	NR	17,250	59,969	NR	NR	Mortality	100	10	1	1	100	600	10	5,997	ATSDR	NTP 1986	2 out of 15 rats died
	85	Chronic	Rat	NR	6	5	104	3,500	12,168	NR	NR	53,125	2,173	NR	NR	Mortality	1	1	1	10	10	217	1	2,173	ATSDR	Burek et al. 1984	90% mortality
	85	Subchronic	Mouse	F	24	7	4.0	5,000	17,382	NR	NR	425,000	17,382	NR	NR	Mortality	1	1	2	5	10	1,738	2	8,691	ATSDR	MacEwen et al. 1972	LC30
	85	Chronic	Rat	NR	Generation	-	-	NR	NR	1,500	5,215	NR	NR	NR	NR	Reproductive	1	1	1	10	10	521	1	521	ATSDR	Nitschke et al. 1988	Noadverse effects on reproduction were observed
	85	Subchronic	Rat	NR	Intermittent		10	475	1,651	150	521	NR	NR	NR	NR	Reproductive	1	1	2	5	10	52.1	2	104	IRIS	Hamm et al, 1985	
	85	Subchronic	Mouse	M	2	5	6.0	NR	NR	200	695	NR	NR	1,012	41	Reproductive	1	1	2	1	2	20.7	2	41.4	ATSDR	Raje et al. 1988	No microlesions on testes
	85	Chronic	Rat	NR	6	5	78	1,000	3,476	225	782	15,179	621	3,415	140	Developmental	1	1	1	1	1	**140**	1	**621**	IRIS	CIIT 1981	seminiferous tubule degeneration and atrophy in the absence of age-related degeneration
	85	Chronic	Rat	NR	7	7	1.3	1,250	4,346	NR	NR	30,990	1,267	NR	NR	Developmental	1	1	1	10	10	127	1	1,267	ATSDR	Schwetz et al. 1975	Gd 6-15; Increased incidence of dilated renal pelvis and delayed ossification of sternebra
	85	Chronic	Mouse	NR	7	7	1.3	1,250	4,346	NR	NR	30,990	1,267	NR	NR	Developmental	1	1	1	10	10	127	1	1,267	ATSDR	Schwetz et al. 1975	GD 6-15; Increased incidence of extra sternal ossification center

Table U.A3-1.
Inhalation/Burrow Air Toxicity Reference Values

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
Styrene																											
	104	Acute	Rat	NR	3-40+	-	-	1,300	5,540	NR	NR	1,300	5,540	NR	NR	Mortality	100	10	1	1	100	**55**	10	554	ATSDR	Spencer et al. 1942	LC100
	104	Acute	Rat	NR	4	-	-	2,770	11,805	NR	NR	2,770	11,805	NR	NR	Mortality	100	10	1	1	100	118	10	1,181	ATSDR	Shugaev 1969	LC50
	104	Acute	Mouse	NR	2	-	-	4,940	21,053	NR	NR	4,940	21,053	NR	NR	Mortality	100	10	1	1	100	211	10	2,105	ATSDR	Shugaev 1969	LC50
	104	Subchronic	Mouse	M	6	5	1.0	300	1,279	NR	NR	300	1,279	NR	NR	Reproductive	1	1	2	5	10	128	2	639	ATSDR	Salomaa et al. 1985	Significant increase in abnormal sperm heads
	104	Subchronic	Rat	NR	7	7	1.4	NR	NR	600	2,557	NR	NR	18,235	746	Developmental	1	1	2	1	2	373	2	746	ATSDR	Murray et al. 1978	No teratological effects
	104	Subchronic	Hamster	NR	6	7	1.7	1,000	4,262	750	3,196	26,050	1,065	19,538	799	Developmental	1	1	2	1	2	400	2	533	IRIS, ATSDR	Kankaanpaa et al. 1980	Fetal deaths or resorptions
	104	Subchronic	Rat	NR	14	7	3.0	466	1,988	NR	NR	28,354	1,160	NR	NR	Developmental	1	1	2	5	10	116	2	580	IRIS	Pryor et al 1987	Hearing loss
Tetrachloroethene																											
	166	Chronic	Rat	M	6	5	103	400	2,713	NR	NR	11,845	484	NR	NR	Mortality	1	1	1	10	10	48.4	1	484	ATSDR	Mennear et al. 1986; NTP 1986	Reduced survival
	166	Chronic	Mouse	M	6	5	103	100	678	NR	NR	2,961	121	NR	NR	Mortality	1	1	1	10	10	**12.1**	1	**121**	ATSDR	Mennear et al. 1986; NTP 1986	Reduced survival
	166	Subchronic	Rat	NR	6	5	2.0	1,750	11,869	NR	NR	51,822	2,120	NR	NR	Mortality	1	1	2	5	10	212	2	1,060	ATSDR	NTP 1986	5 out of 10 rats died
	166	Subchronic	Rat	NR	6	5	19	1,000	6,782	300	2,035	29,613	1,211	8,884	363	Reproductive	1	1	2	1	2	182	2	606	ATSDR	Tinston 1995	11 of the 19 weeks during mating/lactation; Significant reduction in the number of live born pups; decreased pup survival during lactation.
	166	Chronic	Rat	NR	7	7	1.0	900	6,104	100	678	43,530	1,780	4,837	198	Developmental	1	1	1	1	1	198	1	1,780	ATSDR	Nelson et al. 1980	Gd 14-20; Transient decreased performance ascent test; decreased brain acetylcholinesterase; increased open-field actvitiy
	166	Chronic	Rat	NR	7	7	1.1	300	2,035	NR	NR	14,510	593	NR	NR	Developmental	1	1	1	10	10	59.3	1	593	ATSDR	Schwetz et al. 1975	Gd 6-15; increased fetal resorptions
	166	Chronic	Mouse	NR	7	7	1.1	300	2,035	NR	NR	14,510	593	NR	NR	Developmental	1	1	1	10	10	59.3	1	593	ATSDR	Schwetz et al. 1975	Gd 6-15; Decreased fetal weight; delayed ossification

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Days/ Week	Weeks	Study Dose: LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	LOAEL mg/m^3	NOAEL ppm	NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
Tetrahydrofuran																											
	72	Subchronic	Mouse	NR	6	7	1.7	5,000	14,746	NR	NR	90,138	3,687	NR	NR	Mortality	1	1	2	5	10	369	2	1,843	HSDB	Mast TJ et al. 1992	6-17 days of Gestation; 27% Died
	72	Subchronic	Mouse	NR	6	6	1.0	5,000	14,746	NR	NR	77,261	3,160	NR	NR	Mortality	1	1	2	5	10	316	2	1,580	HSDB	NTP 2002	27% of pregnant mice, 30% virgin mice died
	72	Acute	Rat	NR	3	-	-	21,000	61,935	NR	NR	21,000	61,935	NR	NR	Mortality	100	10	1	1	100	619	10	6,193	HSDB	Lewis, RJ 1996	LC 50
	72	Chronic	Mouse	NR	6	7	2.6	5,000	14,746	1,800	5,309	90,138	3,687	32,450	1,327	Reproductive	1	1	1	1	1	1,327	1	3,687	HSDB	Mast TJ et al. 1992	6-17 days of Gestation; Reduction in the percentage of live fetuses/litter, 95% resorption; Maternal weight gain not affected
	72	Subchronic	Rat	NR	6	6	1	NR	NR	1,800	5,309	NR	NR	27,814	1,138	Reproductive	1	1	2	1	2	569	2	1,138	HSDB	Mast TJ et al. 1992	Maternal toxicity not effected
	72	Chronic	Mouse	NR	6	7	2.6	NR	NR	600	1,770	NR	NR	10,817	442	Developmental	1	1	1	1	1	442	1	442	HSDB	Mast TJ et al. 1992	Gd 6-17; no embryotoxic effects observed
	72	Chronic	Rat	NR	6	6	1.0	5,000	14,746	1,800	5,309	77,261	3,160	27,814	1,138	Developmental	1	1	1	1	1	1,138	1	3,160	HSDB	Mast TJ et al. 1992	Gd 6-19; reduced weights of pregnant rats; fetal body weight was significantly reduced
	72	Chronic	Mouse	F	6	7	2.0	1,800	5,309	NR	NR	32,450	1,327	NR	NR	Developmental	1	1	1	10	10	**133**	1	**1,327**	HSDB	NTP 2002	Gd 6-19; significant reduction in the mean % f live pups/litter
Toluene																											
	92	Acute	Mouse	F	6.5	5	14	625	2,352	NR	NR	11,124	455	NR	NR	Mortality	100	10	1	1	100	**24**	10	**45.5**	ATSDR	NTP 1990	1 out of 10 mice died
	92	Subchronic	Rat	M	6.5	5	15	2,500	9,407	1,250	4,703	44,494	1,820	22,247	910	Mortality	1	1	2	1	2	455	2	910	IRIS, ATSDR	NTP 1990	8 out of10 rats died; ATSDR listed the LOAEL at 3000
	92	Subchronic	Rat	F	8	7	1.0	625	2,352	NR	NR	19,167	784	NR	NR	Reproductive	1	1	2	5	10	78.4	2	392	ATSDR	Tap et al. 1996	Structural variations in antral follicles in ovary
	92	Subchronic	Rat	M	6.5	5	15	2,500	9,407	1,250	4,703	44,494	1,820	22,247	910	Reproductive	1	1	2	1	2	455	2	910	ATSDR	NTP 1990	Increased testes weight
	92	Subchronic	Rat	F	6.5	5	15	3,000	11,288	NR	NR	53,393	2,184	NR	NR	Reproductive	1	1	2	5	10	218	2	1,092	ATSDR	NTP 1990	No significant effects on reproductive organs
	92	Subchronic	Rat	M	6	7	13	600	2,258	NR	NR	13,800	564	NR	NR	Reporductive	1	1	2	5	10	56.4	2	282	ATSDR	Ono et al. 1996	Slightly decreased sperm count (13%)
	92	Chronic	Rat and Mou	M/F	6.5	5	104	NR	NR	1,200	4,515	NR	NR	21,357	874	Reproductive	1	1	1	1	1	874	1	874	ATSDR	NTP 1990	No histopathological lesions in ovaries or testes
	92	Chronic	Mouse	M/F	6.5	5	14	NR	NR	2,500	9,407	NR	NR	44,494	1,820	Reproductive	1	1	1	1	1	1,820	1	1,820	ATSDR	NTP 1990	No significant effects on reproductive organs
	92	Subchronic	Rat	NR	12	7	3.9	100	376	NR	NR	4,600	188	NR	NR	Developmental	1	1	2	5	10	18.8	2	94	ATSDR	Slomianka et al. 1990	PPD 1-28; Decreased growth of hippocampus
	92	Chronic	Rat	NR	6	7	1.3	1,500	5,644	750	2,822	34,500	1,411	17,250	706	Developmental	1	1	1	1	1	706	1	1,411	ATSDR	Huntingdon Research Center 1992	Gd 6-15; Decreased fetal bodyweight
	92	Chronic	Mouse	NR	24	7	1.0	133	500	NR	NR	12,236	500	NR	NR	Developmental	1	1	1	10	10	50.0	1	500	IRIS, ATSDR	Hudak and Ungvary 1978	Gd 6-13; Decreased fetal body weight
	92	Chronic	Mouse	NR	3	5	1.0	2,000	7,526	400	1,505	16,429	672	3,286	134	Developmental	1	1	1	1	1	134	1	672	ATSDR	Jones and Balster 1997	Gd 12-17; gained less weight, significant performance deficit in neurobehavioral tests of reflex development, muscle strength, and motor coordination
	92	Subchronic	Rat	NR	14	7	2.0	133	500	700	2,634	7,138	292	37,567	1,536	Developmental	1	1	2	1	2	768	2	146	IRIS	Pryor et al. 1984	Hearing loss
	92	Chronic	Rat	NR	6.5	5	103	600	2,258	NR	NR	10,679	437	NR	NR	Developmental	1	1	1	10	10	43.7	1	437	IRIS	NTP 1990	Erosion of the olfactory epithelium in Male rats and degeneration of the respiratory epithelium in both sexes.

Table U.A3-1.
Inhalation/Burrow Air Toxicity Reference Values

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration: Hours/ Day	Study Exposure Duration: Days/ Week	Study Exposure Duration: Weeks	Study Dose: LOAEL ppm	Study Dose: LOAEL mg/m^3	Study Dose: NOAEL ppm	Study Dose: NOAEL mg/m^3	Adjusted Dose (for 24-hour day and 7-day week)[b]: LOAEL ppm	Adjusted Dose: LOAEL mg/m^3	Adjusted Dose: NOAEL ppm	Adjusted Dose: NOAEL mg/m^3	Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
Trichloroethene																											
	131	Acute	Rat	M	4	-	-	12,500	67,173	NR	NR	12,500	67,173	NR	NR	Mortality	100	10	1	1	100	672	10	6,717	ATSDR	Siegel et al. 1971	LC50
	131	Acute	Mouse	NR	4	-	-	6,400	34,392	NR	NR	6,400	34,392	NR	NR	Mortality	100	10	1	1	100	344	10	3,439	ATSDR	Kylin et al.	2 out of 10 mice died
	131	Subchronic	Mouse	M	6	5	1.0	NR	NR	500	2,687	NR	NR	11,731	480	Reproductive	1	1	2	1	2	240	2	480	ATSDR	Allen et al. 1994	No effects on spermatid micronuclei frequency
	131	Subchronic	Mouse	M	7	5	1.0	100	537	NR	NR	2,737	112	NR	NR	Reproductive	1	1	2	5	10	11.2	2	56.0	ATSDR	Beliles et al. 1980	6% increase in abnormal sperm morphology
	131	Chronic	Rat	NR	7	5	2.6	NR	NR	500	2,687	NR	NR	13,686	560	Developmental	1	1	1	1	1	560	1	560	ATSDR	Beliles et al. 1980; Hardin et al. 1981	Gd 0-18; no significant increases in skeletal, visceral, or external malformations in pups or rat dams
	131	Chronic	Rat	NR	6	7	2.9	1,800	9,673	NR	NR	59,126	2,418	NR	NR	Developmetnal	1	1	1	10	10	**242**	1	**2,418**	ATSDR	Dorfmueller et al. 1979	Gd 0-20; Decreased fetal weight, incomplete skeletal ossification
	131	Chronic	Mouse	NR	6	7	1.4	NR	NR	300	1,612	NR	NR	9,854	403	Developmental	1	1	1	1	1	403	1	403	ATSDR	Schwetz et al. 1975	Gd 6-15; no significant increases in skeletal, visceral, or external malformations in pups or rat dams
m-Xylene																											
	106	Subchronic	Rat	F	24	7	1.0	700	3,035	NR	NR	74,200	3,035	NR	NR	Mortality	1	1	2	5	10	**303**	2	**1,517**	ATSDR	Ungvary et al. 1980	4 out of 30 rats died
	106	Acute	Mouse	F	6	-	-	5,267	22,834	NR	NR	5,267	22,834	NR	NR	Mortality	100	10	1	1	100	228	10	2,283	ATSDR	Bonnet et al. 1979	LC50
	106	Acute	Mouse	NR	24	-	-	2,010	8,714	NR	NR	NR	NR	NR	NR	Mortality	100	10	1	1	100	87.1	10	871	ATSDR	Cameron et al. 1938	6 out of 10 mice died
	106	Chronic	Rat	F	24	7	1.1	700	3,035	350	1,517	74,200	3,035	37,100	1,517	Developmental	1	1	1	1	1	1,517	1	3,035	ATSDR	Ungvary et al, 1980	Gd 7-14; Fetal and maternal weight decreased, decreased implantation
p-Xylene																											
	106	Acute	Rat	F	4	-	-	4,740	20,550	NR	NR	4,740	20,550	NR	NR	Mortality	100	10	1	1	100	205	10	2,055	ATSDR	Harper et al. 1975	LC50
	106	Acute	Mouse	F	6	-	-	3,907	16,938	NR	NR	3,907	16,938	NR	NR	Mortality	100	10	1	1	100	169	10	1,694	ATSDR	Bonnet et al. 1979	LC50
	106	Chronic	Rat	F	6	7	1.4	NR	NR	1,612	6,989	NR	NR	42,718	1,747	Developmental	1	1	1	1	1	1,747	1	1,747	ATSDR	Rosen et al. 1986	Gd 7-16; no effects on fetal weight and no skeletal retardation
	106	Chronic	Rat	NR	24	7	1.1	35	152	NR	NR	3,710	152	NR	NR	Developmental	1	1	1	10	10	**15.2**	1	**152**	ATSDR	Ungvary et al, 1980	Gd 7-14; Skeletal retardation obserserved
o-Xylene																											
	106	Acute	Mouse	F	6	-	-	4,595	19,921	NR	NR	4,595	19,921	NR	NR	Mortality	100	10	1	1	100	199	10	1,992	ATSDR	Bonnet et al. 1979	LC50
	106	Subchronic	Rat	NR	8	5	6	780	3,382	NR	NR	19,686	805	NR	NR	Mortality	1	1	2	5	10	**80.5**	2	**403**	ATSDR	Jenkins et al. 1970	3 out of 15 rats died
	106	Chronic	Rat	NR	24	7	1.1	350	1,517	35	152	37,100	1,517	3,710	152	Developmental	1	1	1	1	1	152	1	1,517	ATSDR	GD 7-14; Ungvary et al. 1980	9% decrease in fetal weight
Mixed Xylenes																											
	106	Acute	Rat	M	4	-	-	6,700	29,047	NR	NR	6,700	29,047	NR	NR	Mortality	100	10	1	1	100	290	10	2,905	ATSDR	Carpenter et al. 1975	LC50
	106	Acute	Rat	M	4	-	-	6,350	27,530	NR	NR	6,350	27,530	NR	NR	Mortality	100	10	1	1	100	275	10	2,753	ATSDR	Hine and Zuidema 1970	LC 50
	106	Chronic	Rat	NR	24	7	1.1	775	3,360	NR	NR	82,150	3,360	NR	NR	Reproductive	1	1	1	5	5	672	1	3,360	ATSDR	Balogh et al. 1982	Gd 7 -15; reduced number of resorptions and reduced fertility
	106	Subchronic	Rat	NR	18	7	8.7	NR	NR	1,000	4,335	NR	NR	79,500	3,252	Reproductive	1	1	2	1	2	1,626	2	3,252	ATSDR	Nylen et al. 1989	8% decrease in fertility; increase in resorptions
	106	Chronic	Rat	NR	24	7	1.3	58	251	NR	NR	6,148	251	NR	NR	Developmental	1	1	1	10	10	**25.1**	1	**251**	ATSDR	Ungvary and Tatrai 1985	Gd 7-15; Reduced ossification
	106	Subchronic	Rat	F	6	7	23.7	500	2,168	250	1,084	13,250	542	6,625	271	Developmental	1	1	2	1	2	135	2	271	IRIS, ATSDR	Bio/dynamics 1983	No adverse reproductive effects

Table U.A3-1.
Inhalation/Burrow Air Toxicity Reference Values

Chemical	M.W.	Study[a]	Species	Sex	Study Exposure Duration			Study Dose				Adjusted Dose (for 24-hour day and 7-day week)[b]				Endpoint[c]	Acute LOAEL to Chronic NOAEL UF = 100	Acute LOAEL to Chronic LOAEL UF = 10	Sub-chronic to Chronic Exposure UF = 2	LOAEL to NOAEL UF[d] = 5	NOAEL - Total UF[e]	NOAEL-based TRV (mg/m^3)	LOAEL - Total UF[e]	LOAEL-based TRV[f] (mg/m^3)	Source[g]	Reference	Effects/Notes
								LOAEL		NOAEL		LOAEL		NOAEL													
					Hours/ Day	Days/ Week	Weeks	ppm	mg/m^3	ppm	mg/m^3	ppm	mg/m^3	ppm	mg/m^3												
Vinyl chloride																											
	63	Subchronic	Rat	NR	6	5	4 - 40	50	129	NR	NR	563	23	NR	NR	Mortality	1	1	2	5	10	2.30	2	11.5	ATSDR	Hong et al. 1981	15 out of 16 rats died
	63	Chronic	Mouse	F	7	7	1.4	500	1,288	NR	NR	9,188	376	NR	NR	Mortality	1	1	1	10	10	**37.6**	1	**376**	ATSDR	John et al. 1977, 1981	Gd 6-15; 17% maternal death
	63	Subchronic	Mouse	M	6	5	26.0	500	1,288	NR	NR	5,625	230	NR	NR	Mortality	1	1	2	5	10	23	2	115	ATSDR	Adkins et al. 1986	37 out of 70 mice died
	63	Chronic	Rat	M	6	6	52.0	100	258	10	26	1,350	55	135	6	Reproductive	1	1	1	1	1	5.52	1	55.2	ATSDR	Bi et al. 1985	Degenerative seminiferous tubutle changes
	63	Subchronic	Rat	M	5	5	44.0	500	1,288	50	129	4,688	192	469	19	Reproductive	1	1	2	1	2	9.59	2	95.9	IRIS, ATSDR	Sokal et al. 1980	Hepatocellular and testicular histopathology, spermatogenic epithelial necrosis
	63	Subchronic	Rat	F	6	7	13.0	NR	NR	1,100	2,834	NR	NR	17,325	709	Reproductive	1	1	2	1	2	354	2	709	ATSDR	Thorton et al. 2002	No adverse effects on mating capability in a 2 generation study
	63	Subchronic	Mouse	M	6	5	1.0	NR	NR	30,000	77,301	NR	NR	337,500	13,804	Reproductive	1	1	2	1	2	6,902	2	13,804	ATSDR	Anderson et al. 1976	No effect on male fertility and on pre- and post-implantation loss
	63	Chronic	Rat	NR	4	7	2.0	NR	NR	1,100	2,834	NR	NR	11,550	472	Developmental	1	1	1	1	1	472	1	472	ATSDR	John et al. 1977, 1981	Gd 6-15; no significant developmental effects like maternal toxicity
	63	Chronic	Rat	F	7	7	1.4	2,500	6,442	NR	NR	45,938	1,879	NR	NR	Developmental	1	1	1	10	10	188	1	1,879	ATSDR	John et al. 1977, 1981	Gd 6-15; Ureter dilation
	63	Chronic	Mouse	F	7	7	1.4	500	1,288	50	129	9,188	376	919	38	Developmental	1	1	1	1	1	**37.6**	1	**376**	ATSDR	John et al. 1977, 1981	Gd 6-15; Delayed ossification

Table U.A3-1.

Inhalation/Burrow Air Toxicity Reference Values

Note:	Bolded values are the TRVs selected for the risk evaluation.
	NOAEL-based TRVs selected based on approach described in Attachment 3 text.
%	Percent.
-	Not applicable or not reported.
F	Female.
Gd x-y	Day x through day y of gestation.
LCx	Lethal concentration; the concentration of chemical that causes x percent mortality of the population in the study
LOAEL	Lowest Observable Adverse Effect Level.
LTx	Lethal time; the time required to kill x percent of the population in the study.
M	Male.
MEK	Methyl ethyl ketone.
M.W.	Molecular weight.
mg/m3	miligrams per cubic meter.
NOAEL	No Observable Adverse Effect Level.
NR	Not reported.
ppm	parts per million.
TRV	Toxicity reference value.
UF	Uncertainty factor.

[a] Exposure Study Definitions:

Acute: Exposure duration was less than 1 day.

Subchronic: Exposure duration was greater than 1 day but less than a lifetime.

Chronic: Exsposure duration was over approximately a lifetime or occurred during a critical period of time (i.e., reproductive or developmental studies conducted during gestation).

[b] For acute exposure studies, the adjusted dose was similar to the study dose.

[c] Study endpoints are highlighted as follows:

	Mortality
	Developmental
	Reproductive
	Others

[d] If a LOAEL and a LOAEL exist for the same study, the UF was adjusted for the NOAEL only.

[e] Total UF is the product of all Ufs for NOAEL or LOAEL-based TRVs.

[f] LOAEL-based TRVs were developed based on study selected for NOAEL-based TRVs but using the Adjusted Dose LOAELs and UFs.

[g] Sources:

ACGIH	American Conference of Governmenal Industiral Hygienists
ATSDR	Agency for Toxic Substances and Disease Registry.
IRIS	Integrated Risk Information System.
HSDB	Hazardous Substances Database.

Table U.A3-2

Measured Onsite Soil Gas Concentrations and Estimated Burrow Air Risks

Chemical	Number of Analyses	Number of Detects	FOD (%)	CPEC?	Location of Maximum Detect	Soil Gas Concentration[a] (mg/m3)[b] Maximum	Soil Gas Concentration[a] (mg/m3)[b] EPC[c]	NOAEl-based TRVs (RfCs)[d] (mg/m^3)	LOAEL-based TRVs (RfCs)[d] (mg/m^3)	NOAEL-based Hazard Quotient[e] (unitless) based on Maximum	NOAEL-based Hazard Quotient[e] (unitless) based on EPC	LOAEL-based Hazard Quotients (unitless) based on Maximum	LOAEL-based Hazard Quotients (unitless) based on EPC
1,1,1-Trichloroethane	40	14	35	Y	RISVCD-01	928	68.3	213	2,127	**4**	0.3	0.4	0.03
1,1,2-Trichloroethane	40	1	3		--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	40	16	40	Y	RISVCD-01	486	38.6	526	5,264	0.9	0.07	0.09	0.007
1,1-Dichloroethene	40	14	35	Y	RISVCD-01	389	41.5	6	30	**65**	**7**	**13**	1
1,2,4-Trimethylbenzene	40	16	40	Y	RISVCL-01	0.138	0.0419	4	43	0.03	0.01	0.003	0.0010
1,2-Dichloropropane	40	3	8	Y	RISVCD-02	1.29	Max	22	222	0.06	Max	0.006	Max
1,3,5-Trimethylbenzene	40	5	13	Y	RISVCD-05	0.0290	0.0236	11	215	0.003	0.002	0.0001	0.0001
1,3-Butadiene	40	15	38	Y	RISVCL-05B	0.119	0.0341	0	2	0.5	0.1	0.05	0.01
1,4-Dichlorobenzene	40	2	5	Y	RISVCD-05	0.04	Max	100	578	0.000	Max	0.0001	Max
1,4-Dioxane	40	0	0		--	--	--	--	--	--	--	--	--
2-Hexanone	40	33	83	Y	RISVLT-02	1.11	0.490	92	461	0.01	0.005	0.002	0.001
2-Propanol (Isopropyl)	40	18	45	Y	RISVCL-05	0.836	0.162	219	2,195	0.004	0.0007	0.0004	0.00007
4-Ethyltoluene	40	5	13	Y	RISVCD-04	0.0461	0.0313	134	672	0.0003	0.0002	0.00007	0.00005
4-Methyl-2-pentanone (MIBK)	40	3	8	Y	RISVPB-03	0.0634	Max	307	3,072	0.0002	Max	0.00002	Max
Acetone	40	36	90	Y	RISVCL-05	7.13	3.15	380	3,796	0.02	0.008	0.0019	0.0008
Benzene	40	21	53	Y	RISVCD-05	0.0990	0.0243	8	76	0.01	0.003	0.001	0.0003
Bromomethane	40	3	8	Y	RISVCL-04	0.0101	Max	2	21	0.005	Max	0.0005	Max
Carbon disulfide	40	7	18	Y	RISVBC-03	0.0311	0.0165	48	485	0.0006	0.0003	0.00006	0.00003
Carbon tetrachloride	40	5	13	Y	RISVBC-03	220	16.3	26	131	**8**	0.6	**2**	0.1
Chloroethane	40	2	5	Y	RISVCL-05	0.00528	Max	712	7,121	0.000007	Max	0.000001	Max
Chloroform	40	10	25	Y	RISVCD-01	53.7	5.12	4	43	**13**	1	1	0.1
Chloromethane	40	8	20	Y	RISVCL-05	0.0537	0.00888	37	371	0.0014	0.0002	0.0001	0.00002
cis-1,2,-Dichloroethene	40	8	20	Y	RISVCD-02	135	10.4	861	8,614	0.2	0.01	0.02	0.001
Cyclohexane	40	7	18	Y	RISVCL-08B	0.344	0.0672	1,153	2,306	0.0003	0.00006	0.0001	0.00003
Ethanol	40	33	83	Y	RISVCD-06	0.754	0.270	8,793	8,793	0.0001	0.00003	0.00009	0.00003
Ethylbenzene	40	8	20	Y	RISVPB-03	0.135	0.0178	58	582	0.002	0.0003	0.0002	0.00003
Freon 11	40	25	63	Y	RISVBC-03	371	110	562	5,618	0.7	0.2	0.1	0.02
Freon 113	40	32	80	Y	RISVCD-01	7,664	2,420	2,012	4,023	**4**	1	**2**	0.6
Heptane	40	16	40	Y	RISVCD-05	0.135	0.0441	532	5,317	0.0003	0.0001	0.00003	0.00001
Hexane	40	18	45	Y	RISVBC-06	2.01	0.229	301	1,507	0.007	0.0008	0.001	0.0002
m,p-Xylene	40	24	60	Y	RISVPB-03	0.521	0.0816	25	251	0.021	0.003	0.002	0.0003
Methyl Ethyl Ketone (2-Butanone)	40	36	90	Y	RISVLT-02	12.4	4.34	590	2,949	0.02	0.007	0.004	0.001
Methylene chloride	40	4	10	Y	RISVBC-06	10.1	Max	140	621	0.07	Max	0.02	Max
o-Xylene	40	17	43	Y	RISVPB-03	0.139	0.0292	81	403	0.002	0.0004	0.0003	0.00007
Styrene	40	1	3		--	--	--	--	--	--	--	--	--
Tetrachloroethene	40	20	50	Y	RISVCD-03	373	112	12	121	**31**	**9**	**3**	0.9
Tetrahydrofuran	40	3	8	Y	RISVBC-06	2.18	Max	133	1,327	0.016	Max	0.002	Max
Toluene	40	24	60	Y	RISVCD-05	0.170	0.0386	24	45	0.007	0.0016	0.004	0.0008
Trichloroethene	40	15	38	Y	RISVBC-06	806	260	242	2,418	**3**	1	0.3	0.1
Vinyl chloride	40	14	35	Y	RISVCD-01	13.3	1.24	38	376	0.4	0.03	0.04	0.003

mg/m^3 milligrams per cubic meter.
ppbv parts per billion by volume.
% percent.

CSC

Table U.A3-2

Measured Onsite Soil Gas Concentrations and Estimated Burrow Air Risks

"--"	not applicable; risks were not estimated as chemical is not a CPEC.
EPC	Exposure point concentration
CPEC?	chemical of potential ecological concern ?
FOD	frequency of detects.
Y	yes; chemical detected in 5% or greater samples analyzed.
Max	in the "Soil Gas Concentration" column, the maximum detected concentration is lesser than the 95UCL; see footnote c.
	in the "Hazard Quotient" column, the HQ based on EPC is the same as the HQ based on the maximum detected concentration.
	Hazard Quotient > 1.

[a] Soil gas concentrations assumed to be equivalent to burrow air.

[b] Soil gas data reported in parts per billion volume (ppbv) converted to mg/m^3 using the ideal gas law equation:

mg/m^3 = (ppbv/1000) *(molecular weight/24.45)

[c] based on the lesser of the maximum detected concentration and 95 percent upper confidence limit (95UCL).

[d] See Table 1 for derivation of Toxicity Reference Values (TRVs), expressed as Reference Concentrations (RfCs).

[e] Hazard quotient (HQ) = soil gas concentration / TRV. HQs >1 are bolded.

Table U.A3-3

Measured Offsite Soil Gas Concentrations and Estimated Burrow Air Risks

Chemical	Number of Analyses	Number of Detects	Location of Maximum Detect	Soil Gas Concentration[a] (mg/m^3)[b] Maximum	NOAEL-based TRVs (RfCs)[c] (mg/m^3)	LOAEL-based TRVs (RfCs)[c] (mg/m^3)	NOAEL-based Hazard Quotient[d] (unitless) based on Maximum	LOAEL-based Hazard Quotient[d] (unitless) based on Maximum
1,1,1-Trichloroethane	3	0	--	--	--	--	--	--
1,1,2-Trichloroethane	3	0	--	--	--	--	--	--
1,1-Dichloroethane	3	0	--	--	--	--	--	--
1,1-Dichloroethene	3	0	--	--	--	--	--	--
1,2,4-Trimethylbenzene	3	2	RISVCL-8D	0.014	4.4	42.9	0.003	0.0003
1,2-Dichloropropane	3	0	--	--	--	--	--	--
1,3,5-Trimethylbenzene	3	2	RISVCL-8D	0.0044	11.0	215.2	0.0004	0.00002
1,3-Butadiene	3	2	RISVCL-8D	0.018	0.246	2.465	0.07	0.007
1,4-Dichlorobenzene	3	0	--	--	--	--	--	--
1,4-Dioxane	3	1	RISVCL-8D	0.0058	321	321	0.00002	0.00002
2-Hexanone	3	2	RISVCL-8D RISVCL-	0.070	92.2	460.9	0.0008	0.0002
2-Propanol (Isopropyl)	3	2	RISVCL-8D	0.037	219	2,195	0.0002	0.00002
4-Ethyltoluene	3	0	--	--	--	--	--	--
4-Methyl-2-pentanone (MIBK)	3	0	--	--	--	--	--	--
Acetone	3	3	RISVCL-3D	5.2	380	3,796	0.014	0.0014
Benzene	3	3	RISVCL-8D	0.048	7.61	76.05	0.006	0.001
Bromomethane	3	0	--	--	--	--	--	--
Carbon disulfide	3	2	RISVCL-5D	0.0087	48	485	0.0002	0.00002
Carbon tetrachloride	3	0	--	--	--	--	--	--
Chloroethane	3	0	--	--	--	--	--	--
Chloroform	3	2	RISVCL-5D	0.0038	4.3	42.6	0.0009	0.00009
Chloromethane	3	2	RISVCL-8D	0.0066	37	371	0.0002	0.00002
cis-1,2,-Dichloroethene	3	0	--	--	--	--	--	--
Cyclohexane	3	0	--	--	--	--	--	--
Ethanol	3	3	RISVCL-8D	0.14	8,793	8,793	0.00002	0.00002
Ethylbenzene	3	2	RISVCL-8D	0.010	58	582	0.0002	0.00002
Freon 11	3	0	--	--	--	--	--	--
Freon 113	3	0	--	--	--	--	--	--
Heptane	3	2	RISVCL-8D	0.074	532	5317	0.0001	0.00001
Hexane	3	2	RISVCL-8D	0.018	301	1507	0.00006	0.00001
m,p-Xylene	3	2	RISVCL-8D	0.041	25.1	251.5	0.002	0.0002
Methyl Ethyl Ketone (2-Butanone)	3	3	RISVCL-3D	0.50	590	2949	0.0009	0.0002
Methylene chloride	3	2	RISVCL-8D	0.0026	140	621	0.00002	0.000004
o-Xylene	3	2	RISVCL-8D	0.017	81	403	0.0002	0.00004
Styrene	3	2	RISVCL-8D	0.0028	55	554	0.00005	0.000005
Tetrachloroethene	3	2	RISVCL-8D	0.0075	12	121	0.0006	0.00006
Tetrahydrofuran	3	0	--	--	--	--	--	--
Toluene	3	3	RISVCL-8D	0.049	24	45	0.002	0.00108
Trichloroethene	3	1	RISVCL-8D	0.0037	242	2418	0.00002	0.000002
Vinyl chloride	3	0	--	--	--	--	--	--

mg/m^3	milligrams per cubic meter.
ppbv	parts per billion by volume.
%	percent.
"--"	not applicable; risks were not estimated as chemical was not detected.
LOAEL	Lowest Observable Adverse Effect Level.
NOAEL	No Observable Adverse Effect Level.

[a] Soil gas concentrations assumed to be equivalent to burrow air.

[b] Soil gas data reported in parts per billion volume (ppbv) converted to mg/m^3 using the ideal gas law equation:

mg/m^3 = (ppbv/1000) *(molecular weight/24.45)

[c] See Table 1 for derivation of Toxicity Reference Values (TRVs), expressed as Reference Concentrations (RfCs).

[d] Hazard quotient (HQ) = soil gas concentration / TRV. HQs >1 are bolded.