

Comparison Values for Acute Inhalation Exposure at Bridgeton Landfill

All results in parts per billion (ppb)

Comparison values for acute inhalation exposures are developed to be protective for varying exposure times and are also developed based on varying levels of effect; therefore, the comparison values listed below are values available from multiple sources and represent the noted varying exposure times and levels of effect. In evaluating acute inhalation data, DHSS initially compares to the most conservative available value. If the most conservative comparison level is exceeded, DHSS may also compare to other comparison values that more accurately represent the exposure period being assessed. Additionally, in the absence of available comparison values for acute exposure, DHSS may compare to levels protective for chronic exposure.

	Compound	¹ ATSDR Acute MRL (1-14 days)	² CalEPA Acute REL (1-hr unless noted otherwise)	³ NAC AEGL-1 (10-min)	³ NAC AEGL-1 (8-hr)	⁴ AIHA ERPG-1 (1-hr)	⁵ NIOSH REL (10-hr)	⁶ OSHA PEL (8-hr)	⁷ NAAQS
Aldehydes	Acetaldehyde	na	260 (1-hr); 160 (8-hr)	45,000	45,000	10,000	na	200,000	na
	Acetone	26,000	na	200,000	200,000	na	250,000	1,000,000	na
	Acrolein	3	1.1 (1-hr); 0.3 (8-hr)	30	30	50	100	100	na
	Benzaldehyde	na	na	na	na	na	na	na	na
	Crotonaldehyde (total)	na	na	190	190	200	2,000	2,000	na
	Formaldehyde	40	44 (1-hr); 7 (8-hr)	900	900	1,000	16	750	na
	Hexaldehyde	na	na	na	na	na	na	na	na
	MEK & Butyraldehyde	na	4,500	200,000	200,000	na	200,000	200,000	na
	Methacrolein	na	na	200	200	na	na	na	na
	m-Tolualdehyde	na	na	na	na	na	na	na	na
	Propionaldehyde	na	na	45,000	45,000	na	na	na	na
Valeraldehyde	na	na	na	na	na	50,000	na	na	
Amines	Butylamine and isomers	na	na	na	na	na	na	na	na
	Cyclohexylamine	na	na	1,800	1,800	na	10,000	na	na
	Diethanolamine	na	na	na	na	na	3,000	na	na
	Diethylamine	na	na	na	na	na	10,000	25,000	na
	Diethylenetriamine	na	na	na	na	na	1,000	na	na
	Dimethylamine	na	na	10,000	10,000	600	10,000	10,000	na
	Ethanolamine	na	na	na	na	na	3,000	3,000	na
	Ethylamine	na	na	7,500	7,500	na	10,000	10,000	na
	Ethylenediamine	na	na	AEGL-1: na; AEGL-2: 12,000	AEGL-1: na; AEGL-2: 4,800	na	10,000	10,000	na
	Ethylhexylamine	na	na	na	na	na	na	na	na
	Isobutylamine	na	na	na	na	na	na	na	na
	Isopropylamine / Propylamine	na	na	na	na	na	na	5,000	na
	Methylamine	na	na	15,000	15,000	10,000	10,000	10,000	na
Triethylamine	na	680	na	na	na	na	25,000	na	
Trimethylamine	na	na	8,000	8,000	100	10,000	na	na	

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Ammonia	Ammonia	1,700	4,500	30,000	30,000	25,000	25,000	50,000	na
Carbon Monoxide	Carbon Monoxide	na	20,000	AEGL-1: na; AEGL-2: 420,000	AEGL-1: na; AEGL-2: 27,000	200,000	35,000	50,000	9,000 (8-hr primary); 35,000 (1-hr primary)
Carboxylic Acids	2-Ethylhexanoic Acid	na	na	na	na	na	na	na	na
	2-Methylbutanoic Acid	na	na	na	na	na	na	na	na
	2-Methylpentanoic Acid	na	na	na	na	na	na	na	na
	2-Methylpropanoic Acid (Isobutyric)	na	na	na	na	na	na	na	na
	3-Methylbutanoic Acid (Isovaleric)	na	na	na	na	na	na	na	na
	3-Methylpentanoic Acid	na	na	na	na	na	na	na	na
	4-Methylpentanoic Acid (Isocaproic)	na	na	na	na	na	na	na	na
	Acetic Acid	na	na	na	na	5,000	10,000	10,000	na
	Benzoic Acid	na	na	na	na	na	na	na	na
	Butanoic Acid (Butyric)	na	na	na	na	na	na	na	na
	Cyclohexanecarboxylic Acid	na	na	na	na	na	na	na	na
	Heptanoic Acid (Enanthoic)	na	na	na	na	na	na	na	na
	Hexanoic Acid (Caproic)	na	na	na	na	na	na	na	na
	Nonanoic Acid (Pelargonic)	na	na	na	na	na	na	na	na
	Octanoic Acid (Caprylic)	na	na	na	na	na	na	na	na
Pentanoic Acid (Valeric)	na	na	na	na	na	na	na	na	
Propionic Acid (Propanoic)	na	na	na	na	na	10,000	na	na	
⁸ Dioxins/Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	na	na	na	na	na	na	na	na
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	na	na	na	na	na	na	na	na
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	na	na	na	na	na	na	na	na
	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	na	na	na	na	na	na	na	na
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	na	na	na	na	na	na	na	na
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	na	na	na	na	na	na	na	na
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	na	na	na	na	na	na	na	na
	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	na	na	na	na	na	na	na	na
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	na	na	na	na	na	na	na	na
	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	na	na	na	na	na	na	na	na

	Compound	¹ ATSDR Acute MRL (1-14 days)	² CalEPA Acute REL (1-hr unless noted otherwise)	³ NAC AEGL-1 (10-min)	³ NAC AEGL-1 (8-hr)	⁴ AIHA ERPG-1 (1-hr)	⁵ NIOSH REL (10-hr)	⁶ OSHA PEL (8-hr)	⁷ NAAQS
Hydrogen Chloride	Hydrogen Chloride	na	1,400	1,800	1,800	3,000	na	na	na
Hydrogen Cyanide	Hydrogen Cyanide	na	300	2,500	1,000	ERPG-1: na; ERPG-2: 10,000	na	10,000	na
Mercury	Mercury (elemental)	na	0.07 (1-hr); 0.007 (8-hr)	AEGL-1: na; AEGL-2: 380	AEGL-1: na; AEGL-2: 40	ERPG-1: na; ERPG-2: 250	6	12	na
PAHs	1-Methylnaphthalene	na	na	na	na	na	na	na	na
	2-Methylnaphthalene	na	na	na	na	na	na	na	na
	Acenaphthene	na	na	na	na	na	na	na	na
	Acenaphthylene	na	na	na	na	na	na	na	na
	Anthracene	na	na	na	na	na	na	na	na
	Benzo(a)anthracene	na	na	na	na	na	na	na	na
	Benzo(a)pyrene	na	na	na	na	na	na	na	na
	Benzo(b)fluoranthene	na	na	na	na	na	na	na	na
	Benzo(e)pyrene	na	na	na	na	na	na	na	na
	Benzo(g,h,i)perylene	na	na	na	na	na	na	na	na
	Benzo(k)fluoranthene	na	na	na	na	na	na	na	na
	Chrysene	na	na	na	na	na	na	na	na
	Dibenz(a,h)anthracene	na	na	na	na	na	na	na	na
	Fluoranthene	na	na	na	na	na	na	na	na
	Fluorene	na	na	na	na	na	na	na	na
	Indeno(1,2,3-cd)pyrene	na	na	na	na	na	na	na	na
Napthalene	na	na	na	na	na	10,000	10,000	na	
Phenanthrene	na	na	na	na	na	na	na	na	
Pyrene	na	na	na	na	na	na	na	na	
Reduced Sulfur Compounds	2-Methylthiophene	na	na	na	na	na	na	na	na
	3-Methylthiophene	na	na	na	na	na	na	na	na
	Bromothiophene	na	na	na	na	na	na	na	na
	Carbon Disulfide	na	2,000 (6-hr)	17,000	6,700	1,000	1,000	20,000	na
	Carbonyl Sulfide	na	na	AEGL-1: na; AEGL-2: 69,000	AEGL-1: na; AEGL-2: 23,000	na	na	na	na
	Diethyl Disulfide	na	na	na	na	na	na	na	na
	Diethyl Sulfide	na	na	na	na	na	na	na	na
	Dimethyl Disulfide	na	na	na	na	10	na	na	na
	Dimethyl Sulfide	na	na	na	na	500	na	na	na
	Ethyl Mercaptan	na	na	1,000	1,000	na	na	na	na
Hydrogen Sulfide	70	30	750	330	100	na	na	na	

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Reduced Sulfur Compounds	Isobutyl Mercaptan	na	na	na	na	na	na	na	na
	Isopropyl Mercaptan	na	na	na	na	na	na	na	na
	Methyl Mercaptan	na	na	AEGL-1: na; AEGL-2: 59,000	AEGL-1: na; AEGL-2: 19,000	5	na	na	na
	Methylethylsulfide	na	na	na	na	na	na	na	na
	n-Butyl Mercaptan	na	na	na	na	na	na	10,000	na
	n-Propyl Mercaptan	na	na	na	na	na	na	na	na
	sec-Butyl Mercaptan	na	na	na	na	na	na	na	na
	Sulfur Dioxide	10	250	200	200	300	2,000	5,000	75 (1-hr primary); 500 (3-hr secondary)
	tert-Butyl Mercaptan	na	na	na	na	na	na	na	na
	Tetrahydrothiophene	na	na	na	na	na	na	na	na
	Thiophene	na	na	na	na	na	na	na	na
	Thiophenol	na	na	AEGL-1: na; AEGL-2: 1,000	AEGL-1: na; AEGL-2: 170	na	na	na	na
	Total Unidentified Sulfur	na	na	na	na	na	na	na	na
	VOCs	1,1,1-Trichloroethane	2,000	12,500	230,000	230,000	350,000	na	350,000
1,1,2,2-Tetrachloroethane		na	na	na	na	na	1,000	5,000	na
1,1,2-Trichloroethane		na	na	na	na	na	10,000	10,000	na
1,1-Dichloroethane		na	na	na	na	na	100,000	100,000	na
1,1-Dichloroethene		na	na	na	na	ERPG-1: na; ERPG-2: 500,000	na	na	na
1,2,4-Trichlorobenzene		na	na	na	na	na	na	na	na
1,2,4-Trimethylbenzene		na	na	180,000	45,000	na	25,000	na	na
1,2-Dibromomethane		na	na	52,000	4,600	na	45	20,000	na
1,2-Dichlorobenzene		na	na	na	na	na	na	na	na
1,2-Dichloroethane		na	na	na	na	50,000	1,000	50,000	na
1,2-Dichloropropane		50	na	na	na	na	na	75,000	na
1,3,5-Trimethylbenzene		na	na	180,000	45,000	na	25,000	na	na
1,3-Butadiene		na	na	670,000	670,000	10,000	na	1,000	na
1,3-Dichlorobenzene		na	na	na	na	na	na	na	na
1,4-Dichlorobenzene		2,000	na	na	na	na	na	75,000	na
1,4-Dioxane		2,000	800	17,000	17,000	na	na	100,000	na
2,2,4-Trimethylpentane		na	na	na	na	na	na	na	na
2-Butanone (Methyl-Ethyl-Ketone)		na	4,500	200,000	200,000	na	200,000	200,000	na
2-Hexanone		na	na	na	na	na	1,000	100,000	na
2-Propanol (IPA)		na	1,300	na	na	na	400,000	400,000	na
4-Ethyltoluene	na	na	na	na	na	na	na	na	
4-Methyl-2-Pentanone (MiBK)	na	na	na	na	na	50,000	100,000	na	

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Acetone	26,000	na	200,000	200,000	na	250,000	1,000,000	na
Acrylonitrile	100	na	4,600	4,600	10,000	1,000	2,000	na
Allyl Chloride	na	na	2,800	2,800	3,000	1,000	1,000	na
Benzene	9	400 (6-hr)	130,000	9,000	50,000	100	1,000	na
Benzyl Chloride	na	46	na	na	1,000	na	1,000	na
Bromodichloromethane	na	na	na	na	na	na	na	na
Bromoform	na	na	na	na	na	500	500	na
Bromomethane	50	1,000	AEGL-1: na; AEGL-2: 940,000	AEGL-1: na; AEGL-2: 67,000	ERPG-1: na; ERPG-2: 500,000	na	na	na
Carbon Disulfide	na	2,000 (6-hr)	17,000	6,700	1,000	1,000	20,000	na
Carbon Tetrachloride	na	300 (7-hr)	58,000	19,000	20,000	na	10,000	na
Chlorobenzene	na	na	10,000	10,000	na	na	75,000	na
Chlorodifluoromethane	na	na	na	na	na	1,000,000	na	na
Chloroethane	15,000	na	na	na	na	na	1,000,000	na
Chloroform	100	30 (7-hr)	AEGL-1: na; AEGL-2: 120,000	AEGL-1: na; AEGL-2: 29,000	ERPG-1: na; ERPG-2: 500,000	na	na	na
Chloromethane	500	na	AEGL-1: na; AEGL-2: 1,100,000	AEGL-1: na; AEGL-2: 380,000	ERPG-1: na; ERPG-2: 400,000	na	100,000	na
cis-1,2-Dichloroethene	na	na	140,000	140,000	na	na	na	na
cis-1,3-Dichloropropene	na	na	na	na	na	na	na	na
Cyclohexane	na	na	na	na	na	300,000	300,000	na
Dibromochloromethane	na	na	na	na	na	na	na	na
Dichlorodifluoromethane (R12)	na	na	na	na	na	1,000,000	1,000,000	na
Dichlorofluoromethane	na	na	na	na	na	10,000	1,000,000	na
Dichlorotetrafluoroethane	na	na	na	na	na	1,000,000	1,000,000	na
Ethanol	na	na	na	na	1,800,000	1,000,000	1,000,000	na
Ethyl Acetate	na	na	na	na	na	400,000	400,000	na
Ethylbenzene	5,000	na	33,000	33,000	na	100,000	100,000	na
Heptane	na	na	na	na	na	85,000	500,000	na
Hexachlorobutadiene	na	na	na	na	1,000	20	na	na
Hexane	na	na	AEGL-1: na; AEGL-2: 4,000,000 (higher than 10% of the LEL)	AEGL-1: na; AEGL-2: 2,900,000 (higher than 10% of the LEL)	na	50,000	500,000	na
Methanol	na	21,000	670,000	270,000	200,000	200,000	200,000	na
Methyl tert-Butyl Ether	2,000	na	50,000	50,000	5,000	na	na	na

VOCs

Compound	¹ ATSDR Acute MRL (1-14 days)	² CalEPA Acute REL (1-hr unless noted otherwise)	³ NAC AEGL-1 (10-min)	³ NAC AEGL-1 (8-hr)	⁴ AIHA ERPG-1 (1-hr)	⁵ NIOSH REL (10-hr)	⁶ OSHA PEL (8-hr)	⁷ NAAQS
Methylene Chloride	600	4,000	290,000	AEGL-1: na; AEGL-2: 60,000	300,000	na	25,000	na
Propene	na	na	na	na	na	na	na	na
Styrene	5,000	5,100	20,000	20,000	50,000	50,000	100,000	na
Tetrachloroethylene (PCE)	200	2,900	35,000	35,000	100,000	na	100,000	na
Tetrahydrofuran	na	na	na	na	100,000	200,000	200,000	na
Toluene	1,000	9,800	200,000	200,000	50,000	100,000	200,000	na
trans-1,2-Dichloroethylene	200	na	280,000	280,000	na	na	na	na
trans-1,3-Dichloropropene	na	na	na	na	na	na	na	na
Trichloroethylene (TCE)	na	na	260,000	77,000	100,000	na	100,000	na
Trichlorofluoromethane	na	na	na	na	na	na	1,000,000	na
Trichlorotrifluoroethane	na	na	na	na	na	1,000,000	1,000,000	na
Vinyl Acetate	na	na	6,700	6,700	5,000	na	na	na
Vinyl Bromide	na	na	na	na	na	na	na	na
Vinyl Chloride	500	72,000	450,000	70,000	500,000	na	1,000	na
Xylenes (technical mixture of o-xylene (95-47-6), m-xylene (108-38-3) and p-xylene (106-42-3))	2,000	5,000	130,000	130,000	na	100,000	100,000	na
Total VOCs (tVOC) ⁹	5,000	na	na	na	na	na	na	na

BOLD values indicate the most conservative value for that compound.

na = not available/not applicable

¹Agency for Toxic Substances and Disease Registry (ATSDR) Acute Minimal Risk Levels (MRLs), March 2013. An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects. Acute MRLs are for exposures lasting from 1-14 days.

²California Environmental Protection Agency (CalEPA) Acute Reference Exposure Levels (RELs), February 2012. An acute REL is an exposure that is not likely to cause adverse effects in a human population, including sensitive subgroups, exposed to that concentration for the specified time period on an intermittent basis.

³National Advisory Committee (NAC) for Acute Exposure Guideline Levels (AEGLs), April 2013. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. AEGL-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure. AEGL-2 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

⁴American Industrial Hygiene Association (AIHA) Emergency Response Planning Guidelines (ERPGs), 2011. The ERPG-1 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor. The ERPG-2 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

⁵National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs), 2010. RELs are occupational exposure limits that represent a time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek.

⁶Occupational Safety and Health Administration Permissible Exposure Limits (PELs), 2010. PELs are occupational exposure limits that represent time-weighted average concentrations that must not be exceeded during any 8-hour workshift of a 40-hour workweek.

⁷National Ambient Air Quality Standards (NAAQS). Primary standards provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

⁸Because comparison values are not available for evaluating acute exposure to dioxins and furans, sample concentrations were converted to toxic equivalent (TEQ) values and compared to a screening level established for chronic exposure to 2,3,7,8-TCDD.

⁹Total VOC concentrations are compared to ATSDR's guidelines for public health actions in response to landfill fires (ATSDR Landfill Gas Primer, 2001). According to these guidelines, sustained total VOC concentrations exceeding 1-5 ppm above background levels may be cause for concern in residential areas. These exceedances indicate a need for compound-specific sampling for verification of the data and evaluation of public health concerns.