

**Table 1. Human Health Effects – Metals and Organics\*****Heavy Metals**

Name	EPA TSCA Inventory	ACGIH TLV	MCL or TT Water	Health Effects
Arsenic	Y	0.2 mg/m <sup>3</sup>	0.005 mg/L	Confirmed human carcinogen producing liver tumors; skin and gastrointestinal effects by ingestion; teratogen
Barium	Y	0.5 mg/m <sup>3</sup>	2 mg/L	Human poison by ingestion; skin and gastrointestinal effects by ingestion
Beryllium	Y	0.002 mg/m <sup>3</sup>	0.004 mg/L	Suspected human carcinogen; human systemic effects by inhalation: lung fibrosis, dyspnea, and weight loss
Cadmium	Y	0.05 mg Cd/m <sup>3</sup>	0.005 mg/L	Confirmed human carcinogen; human poison by inhalation, ingestion; teratogen; kidney damage
Chromium	Y	0.5 mg Cr/m <sup>3</sup>	0.1 mg/L	Suspected human carcinogens producing tumors of the lungs, nasal cavity; chromic acid is corrosive on skin; allergic dermatitis
Cobalt	Y	0.05 mg/m <sup>3</sup>	0.5 mg/L	Suspected human carcinogen; human systemic effects by ingestion and inhalation: pulmonary damage, dermatitis, nausea, and vomiting
Fluorine	Y	1 ppm	2 mg/L	A poison gas. Caustic irritant to tissue
Lead	Y	0.15 mg Pb/m <sup>3</sup>	0.015 mg/L	Suspected carcinogen; human systemic effects by ingestion and inhalation: loss of appetite, anemia, muscle and joint pains; diminishing IQ scores of children; severe toxicity can cause sterility, neonatal mortality; poison by ingestion; kidney problems; high blood pressure
Magnesium	Y			Human poison by ingestion; powdered metal ignites readily on skin causing burns; inhalation of dust and fumes can cause metal fume fever

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Manganese	Y	Fume: 1 mg/m <sup>3</sup> Dust: 5 mg/m <sup>3</sup>	0.5 mg/L	Human systemic effects by inhalation: degenerative brain changes, changes in motor activity, muscle weakness. A skin and eye irritant; Questionable carcinogen.
Mercury	N	0.05 mg Hg/m <sup>3</sup>	0.002 mg/L	Poison by inhalation; corrosive to skin, eyes and mucus membranes; systemic effects by inhalation: ingestion may cause muscle weakness, dermatitis, anorexia; teratogenic effects; kidney damage and severe muscle pain
Molybdenum	Y	Soluble: 5 mg/m <sup>3</sup> Insoluble: 10 mg/m <sup>3</sup>		Poison by intraperitoneal and intratracheal routes; experimental teratogen
Nickel	Y	1 mg (Ni)/m <sup>3</sup>	0.04 mg/L	Confirmed carcinogen; poison by ingestion: nausea, vomiting, diarrhea; allergic contact dermatitis, pulmonary asthma, conjunctivitis and inflammatory reactions
Nitrate	N		10 mg/L	Large amounts ingested may have serious or fatal effects: dizziness, abdominal cramps, vomiting, bloody diarrhea, weakness, convulsions, and collapse; small repeated doses may lead to weakness, general depression, headache, and mental impairment
Sulfate	N		250 mg/L	Variable toxicity
Sulfide	N			Variable toxicity, softening and irritation of skin
Thallium	Y	0.1 mg (Tl)/m <sup>3</sup>	0.002 mg/L	Human poison by unspecified route; human systemic effects by ingestion: nerve or sheath structural changes, extra-ocular muscular changes, sweating, and other effects
Vanadium	Y			Poison by subcutaneous route; questionable carcinogen

## Organics

Name	EPA TSCA Inventory	ACGIH TLV	MCL or TT Water	Health Effects
Acetone	Y	750 ppm		Moderately toxic by various routes; a skin and severe eye irritant; human systemic effects by inhalation: changes in EEG, changes in carbohydrate metabolism, nasal effects, conjunctiva irritation, respiratory system effects, nausea and vomiting, and muscle weakness; human systemic effects by ingestion: coma, kidney damage, and metabolic changes
Benzene	Y	0.1 ppm	0.005 mg/L	Anemia; decrease in blood platelets; confirmed human carcinogen producing myeloid leukemia, Hodgkin's disease and lymphomas by inhalation; human poison by inhalation; severe eye irritant; teratogen
Benzylbutylphthalate	Y			Questionable carcinogen; moderately toxic by ingestion; experimental reproductive effects
Bromodichloromethane	Y		0.1 mg/L	Suspected carcinogen; moderately toxic by ingestion
Carbon disulfide	Y	10 ppm		Human poison by unspecified route; mildly toxic to humans by inhalation: human reproductive effects on spermatogenesis, experimental teratogenic and reproductive effects
Carbon Tetrachloride	Y	5 ppm	0.005 mg/L	Suspected human carcinogen; human poison by ingestion; human systemic effects by inhalation and ingestion: nausea or vomiting, papillary constriction, coma, antipsychotic effects, tremors, somnolence, anorexia, unspecified respiratory system and gastrointestinal system effects; an eye and skin irritant; damages liver, kidneys, and lungs

## Organics

Name	EPA TSCA Inventory	ACGIH TLV	MCL or TT Water	Health Effects
Chlorobenzene	Y	10 ppm	0.1 mg/L	Moderately toxic by ingestion and intraperitoneal routes; experimental teratogenic and reproductive effects; may cause liver and kidney damage
Chloroethane (ethyl chloride)	Y	1000 ppm		Mildly toxic by inhalation; an irritant to skin, eyes, and mucous membranes
Chloroform Trihalomethane chloroform	Y	10 ppm	0.1 mg/L	Suspected carcinogen; human poison by ingestion and inhalation; human systemic effects by inhalation: hallucinations and distorted perceptions, nausea, vomiting, and other unspecified gastrointestinal effects; experimental teratogenic and reproductive effects
Dibromochloromethane	Y			Moderately toxic by ingestion
Dichlorobenzene	Y		0.6 for o-Di...0.75 for p-Di..	A poison affecting the liver and kidney.
Dichloroethane 1,2-dichloroethane	Y	200 ppm	0.005 mg/L	Moderately toxic by ingestion; experimental teratogenic effects
Dichloroethylene Cis-1,2-dichloroethene Trans-1,2-dichloroethene	N		0.07 for cis 0.1 for trans	Moderately toxic by ingestion; mildly toxic by inhalation
Dimethylformamide	Y	10 ppm (skin)		Suspected carcinogen; moderately toxic by ingestion, intravenous subcutaneous, intramuscular, and intraperitoneal routes; mildly toxic by skin contact and inhalation; experimental teratogenic and reproductive effects; a skin and eye irritant
Di-n-butyl phthalate	Y	5 mg/m <sup>3</sup>	34 mg/L	Moderately toxic by intravenous routes and ingestion; human systemic effects: hallucinations, kidney and bladder changes; experimental teratogenic effects

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Name	EPA TSCA Inventory	ACGIH TLV	MCL or TT Water	Health Effects
Ethyl acetate	Y	400 ppm		Poison by inhalation; moderately toxic by intraperitoneal and subcutaneous routes; mildly toxic by ingestion; human systemic effects by inhalation: olfactory changes, conjunctiva irritation, and pulmonary changes; human eye irritant
Ethylbenzene	Y	100 ppm	0.7	Moderately toxic by ingestion; mildly toxic by inhalation; teratogen; systemic effects: eye, sleep and pulmonary changes
Ethylene bromide	Y		0.00005 mg/L	Suspected carcinogen; human poison by ingestion
Methylene Chloride	Y	50 ppm	10 mg/L	Suspected human carcinogen; moderately toxic by ingestion, subcutaneous and intraperitoneal routes; mildly toxic by inhalation; human systemic effects by ingestion and inhalation: parasthesia, somnolence, altered sleep time, convulsions, euphoria, and change in cardiac rate; experimental teratogen; an eye and skin irritant
Methyl ethyl ketone	Y	200 ppm		Moderately toxic by ingestion, skin contact, and intraperitoneal routes; human systemic effects by inhalation: conjunctiva, irritation and unspecified effects on the nose and respiratory system; an experimental teratogen; affects peripheral nervous system and central nervous system
Methyl isobutyl ketone (hexone)	Y	50 ppm		A poison by intraperitoneal route; moderately toxic by ingestion; mildly toxic by inhalation; experimental teratogen; very irritating to skin, eyes, and mucous membranes; a human system by inhalation

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Name	EPA TSCA Inventory	ACGIH TLV	MCL or TT Water	Health Effects
Pentachlorophenol	Y	0.5 mg/m <sup>3</sup>	0.001 mg/L	Suspected carcinogen; human poison by ingestion; experimental teratogen; a skin irritant; acute poisoning is marked by weakness with changes in respiration, blood pressure, and urinary output; also causes dermatitis, convulsions, and collapse; chronic exposure can cause liver and kidney injury
Perchloroethylene	Y	50 ppm		Confirmed carcinogen; moderately toxic to humans by inhalation: local anesthetic, conjunctiva, irritation, general anesthesia, hallucinations, distorted perceptions, coma, and pulmonary changes; experimental teratogen; eye and severe skin irritant
Polychlorinated Biphenyls	Y		0.0005 mg/L	Confirmed carcinogen; moderately toxic by ingestion; skin effects and toxic to live; human systemic effects: nausea, vomiting, loss of weight, jaundice, edema, and abdominal pain
Tetrachloroethane (PCE), 1,1,2,2-tetrachloroethane	Y			Suspected carcinogen; poison by inhalation and ingestion; moderately toxic by intraperitoneal route; mildly toxic by skin contact
Tetrachloroethylene	Y		0.005 mg/L	Poison by ingestion and inhalation; mildly toxic by skin contact
Tetrahydrofuran	Y	200 ppm		Moderately toxic by ingestion and intraperitoneal routes; mildly toxic by inhalation; human systemic effects by inhalation: general anesthesia; irritant to eyes and mucous membranes
Toluene	Y	100 ppm	1 mg/L	Moderately toxic by intravenous route; mildly toxic by inhalation; teratogen; systemic effects: hallucinations, motor activity changes, bone marrow changes; human eye irritant

## Organics

Name	EPA TSCA Inventory	ACGIH TLV	MCL or TT Water	Health Effects
Trichloroethane	Y	10 ppm (skin)	0.2 for 1,1,1 0.005 for 1,1,2	Suspected carcinogen; poison by ingestion, intravenous, and subcutaneous routes; moderately toxic by inhalation, skin contact, and intraperitoneal routes; and eye and skin irritant
Trichloroethylene (TCE)	Y	50 ppm	0.005 mg/L	Suspected carcinogen; human systemic effects by ingestion and inhalation: eye effects, somnolence, hallucinations or distorted perceptions, gastrointestinal changes, and jaundice; a severe skin and eye irritant
Vinyl Chloride	Y	5 ppm	0.002 mg/L	Confirmed human carcinogen productin liver and blood tumors; moderately toxic by ingestion; human reproductive effects by inhalation: changes in spermatogenesis; a severe irritant to skin, eyes, and mucous membranes; chronic exposure has produced liver injury
Xylene	Y	100 ppm	10	Moderately toxic by intravenous route; mildly toxic by ingestion, inhalation; teratogen; systemic effects: olfactory changes, pulmonary changes, conjunctiva irritation

### \*References

- Lewis, Sr, Richard J. "Hazardous Chemicals Desk Reference." Van Nostrand Reinhold. 1993.
- US EPA. "Chemicals in the Environment: OPPT Chemical Fact Sheets", April 25, 2001, <[www.epa.gov/opptintr/facts.htm](http://www.epa.gov/opptintr/facts.htm)>.
- ATSDR. "ToxFAQs", June 21, 2001, <<http://www.atsdr.cdc.gov/toxfaq.html>>.
- US EPA. "Current Drinking Water Standards", January 23, 2002, <<http://www.epa.gov/safewater/mcl.html>>.