

MERCURY

(Hg) CAS # 7439-97-6 (Metal)

Synonyms include liquid silver, quick silver, hydragypsum, and metallic mercury

SOURCE/USE

Mercury is a naturally occurring element that is found as mercuric sulfide, an insoluble, stable compound. The largest commercial use of mercury in the U.S. was for electrolytic production of chlorine and caustic soda in mercury cells, manufacturing of wiring devices and switches, and dental equipment supplies. It is also used in aqueous systems such as inks, adhesives, and caulking compounds. Due to high toxicity of mercury in most of its forms, many applications have been canceled as a result of attempts to limit the amount of exposure to mercury waste. Mercury is expected to be one of the more toxicologically important air contaminants found during remediation projects.

ROUTES OF EXPOSURE

Most exposures to mercury occur by inhalation. Although the risk of off-post acute exposure to mercury as a result of remediation at the Rocky Mountain Arsenal is very small, any such exposure would very likely be via inhalation. Also, the concentrations resulting in acute clinical effects discussed in this document reflect occupational exposures and are much higher than those likely to be encountered at the fence line during remediation at the RMA. Mercury vapor is heavier than air and may cause asphyxiation in enclosed, poorly ventilated, or low-lying areas. Other routes of exposure include dermal/ocular contact and ingestion.

APPLICABLE STANDARDS AND LIMITS	
ATSDR MRL	Chronic 0.2 mg/m ³
ACGIH TLV (inorganic or vapor)	0.02 mg/m ³
OSHA PEL (vapor)	0.05 mg/m ³
NIOSH REL (vapor)	0.05 mg/m ³
Odor threshold	Odorless
RMA acute fence line criteria	ARC -0.3 µg/m ³ MARC - 1.7 µg/m ³
RMA chronic fence line criteria	Cancer - NA Noncancer - 0.3 µg/m ³

NA - Not applicable. Cancer criteria were not derived for this chemical because it is not considered a carcinogen or because a cancer slope factor is not available.

The goal of the remediation is exposure prevention through remedial design, environmental monitoring, and modeling. Failure of prevention could result in acute and/or chronic exposures. Following is an overview of the types of health effects associated with mercury exposure.

ACUTE HEALTH EFFECTS

A wide variety of cognitive, personality, sensory and motor disturbances are reported. Most prominent symptoms include tremors, emotional lability, insomnia, memory loss, neuromuscular changes, headaches, and polyneuropathy.

Exposure to metallic mercury may cause cough, dyspnea, tightness or burning pains in chest, and impairment of pulmonary function. Respiratory distress, pulmonary edema, lobar pneumonia, fibrosis, and desquamation of bronchiolar epithelium can also occur. Exposure to organic mercury can cause dyspnea, respiratory depression, respirations frequently obstructed by mucus.

Metallic mercury may increase heart rate and blood pressure.

Erythematous and pruritic skin rashes, heavy perspiration, reddened or peeling skin on palms of hands and soles of feet can occur from metallic mercury exposure.

Red burning eyes and conjunctivitis can occur from exposure to metallic mercury.

Anorexia, abdominal cramps, mild diarrhea, painful mouth, stomatitis (inflammation of oral mucosa), excessive salivation and difficulty swallowing may occur from exposure to metallic mercury. Organic mercury may cause swollen mouth, reddened and tender gums, carious teeth, and infected and swollen posterior pharyngeal wall.

Proteinuria, hematuria, oliguria, and a decreased ability to concentrate urine may result from exposure to metallic mercury.

CHRONIC HEALTH EFFECTS

Children and some adults develop acrodynia, which is associated with severe leg cramps, irritability, and peeling erythematous skin on fingers, hands, and feet. Neurological symptoms intensify and may become irreversible as exposure duration increases. Disturbed sense of taste and smell may develop from exposure to elemental mercury.

Methyl mercury, an organic compound, is classified as a possible human carcinogen. This type of mercury is not found at RMA.