

Treatment of Soluble Metal Streams

(Reference: Groundwater Resources Association of California; Hydro Visions – Volume 10, No. 2; Summer 2001)

Metal	Arsenic	Lead	Copper	Zinc
Treatment Notes:	Acid medium only forms various arsenic sulfides; pH>7; arsenic-sulfur compounds are soluble; pH<7 the compounds are insoluble.	Wide Range (pH: 4-9); forms lead sulfide	Close to neutral (Optimal pH: 5-7); forms copper sulfide	Wide range (pH: 4-9); forms zinc sulfide
Metal	Cadmium	Molybdenum	Uranium	Cyanide
Treatment Notes:	Wide range (pH: 4-9); forms cadmium sulfide	Wide range (pH: 4-9); forms molybdenum sulfide	Wide range (pH: 4-9); forms uranium sulfide	Chemical conversion produces thiocyanate*
<ul style="list-style-type: none"> - <i>*Thiocyanate can be bio-treated, or it can be treated with lime, producing calcium carbonate, gypsum and ammonia.</i> - <i>Chromium (Cr VI) can be treated with calcium polysulfide, and the Cr(VI) is reduced to Cr(III), which is then precipitated as chromium hydroxide.</i> 				

While the table above indicates effective treatment may be obtained with system pH near 4.0, best results are achieved within pH 7-10. Calcium Polysulfide is most stable in systems with pH greater than 5.0, to avoid potential formation of hydrogen sulfide gas.