

Metal Concentrations in Natural Soils

Questions about "heavy metals" and their effect are increasing. Following is a list of metals and their common range and average concentration in soils. If the metal concentration of a soil is near the average range there would usually not be a problem. However, if the concentration of a metal is significantly higher than the average value you should investigate further.

Element	Symbol	Common Range (ppm or mg/kg)	Average Concentration (ppm or mg/kg)
Aluminum	Al	10,000 - 300,000	71,000
Antimony	Sb	2 - 10	-
Arsenic	As	1 - 50	5
Barium	Ba	100 - 3,000	430
Beryllium	Be	0.1 - 40	6
Boron	B	2 - 100	10
Bromine	Br	1 - 10	5
Cadmium	Cd	0.01 - 0.7	0.06
Cesium	Cs	0.3 - 25	6
Chlorine	Cl	20 - 900	100
Chromium	Cr	1 - 1,000	100
Cobalt	Co	1 - 40	8
Copper	Cu	2 - 100	30
Fluorine	F	10 - 4,000	200
Gallium	Ga	0.4 - 300	30
Gold	Au	-	1
Iodine	I	0.1 - 40	5
Lanthanum	La	1 - 5,000	30
Lead	Pb	2 - 200	10
Lithium	Li	5 - 200	20
Magnesium	Mg	600 - 6,000	5,000
Manganese	Mn	20 - 3,000	600
Mercury	Hg	0.01 - 0.3	0.03
Molybdenum	Mo	0.2 - 5	2
Nickel	Ni	5 - 500	40
Radium	Ra	8×10^{-5}	-
Rubidium	Rb	5 - 500	10
Selenium	Se	0.1 - 2	0.3
Silver	Ag	0.01 - 5	0.05
Strontium	Sr	50 - 1,000	200
Thallium	Tl	-	5
Tin	Sn	2 - 200	10
Tungsten	W	-	1
Uranium	U	0.9 - 9	1
Vanadium	V	20 - 500	100
Yttrium	Y	25 - 250	50
Zinc	Zn	100 - 300	50
Zirconium	Zr	60 - 2,000	300

Source: USEPA Office of Solid Waste and Emergency Response, Hazardous Waste Land Treatment, SW-874 (April 1983), page 273.