City of Oakland
Survey of Studies on Naturally-occurring Metals Concentrations

Some naturally-occurring concentrations of metals in Oakland soils are higher than the thresholds calculated by risk-based models. In such cases, there is unlikely to be any real reduction in risk realized from remediation to the risk-based threshold since the observed concentrations are likely to represent ambient conditions. In Oakland, this is especially true of arsenic. The following table contains the results from studies on naturally-occurring metals conducted in locations that are relevant to Oakland's geology.

Background Metal Concentrations
(ppm in soil)

Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Lawrence Berkeley National Laboratories[1]	6	24*	1.0	5.6	120	63	43	0.42	272	4.9	2.9	10	140
San Leandro, Ca[2]	<3-<15	1.8-5.9	<0.25-<1.30	<0.25-<1.30	24.8-43.0	11.8-68.0	3.3-10.4	<0.10	2.93-43.60	<0.25-<2.50	<0.50-<2.50	<0.50-<5.00	9.3-61.3
Union City, Ca[3]	5.0	6.92-9.34	0.5-0.81	0.5-1.30	46.5-112	28.2-60.1	19.8-148	0.1-0.36	32.4-60.6	0.5	0.5	5.0	97.1-474
Western U.S.[4]	--	1-50	--	0.1-0.7	1-1,000	2-100	20-100	0.01-0.3	5-500	--	--	--	10-300

Sources:
[1] Lawrence Berkeley National Laboratory Environmental Restoration Program, April 2009. Concentrations listed are Upper 99% Confidence Limits of data from 1,600 samples.
[2] Chemical Testing on Background Soil Samples: Roberts Landing Development Site, San Leandro, CA, 1994.
[3] Sitewide Remedial Investigation: Pacific States Steel Corp. Union City, CA, 1992.
[4] USEPA (found in Remedial Investigation Report, Hercules Properties, Inc., 1991).
*- Background arsenic concentration for all soils sampled, except the Great Valley group. For Great Valley group, the concentration is reported as 42 ppm.