Table 1.12
Volume Calculations for Surface, Near-surface, Upper Vadose and Lower Vadose Zone Soils
Pemaco Superfund Site, Maywood, CA

Soil Zones	COCs Above PRGs	Area of Contaminated Soil (ft^2)	Thickness of Contaminated Soils (ft)	Volume of Soil in Contaminated Area (cubic yard)	Average Concentration (mg/kg)
Surface Soil	**Metals**	1,875	1.0	69	48,334.86
Surface Soil	**SVOCs**	21,250	1.0	787	21.71
Surface Soil*	**Metals and SVOCs**	22,500	1.0	833	NA
Near Surface Soil	**Metals**	1,250	2.0	93	48,930.48
Near Surface Soil	**SVOCs**	18,125	2.0	1,343	15.61
Near Surface Soil*	**Metals and SVOCs**	18,750	2.0	1,389	NA
Combined Surface and Near Surface*	**Metals and SVOCs**	19,998	3.0	2,222	NA
Upper Vadose Zone	**Total VOCs**	122,299	32.0	144,947	7.07
Upper Vadose Zone**	**Total VOCs (onsite only)**	69,611	32.0	82,502	7.07
Lower Vadose Zone	**Total VOCs**	13,840	30.0	15,378	32.79
Lower Vadose Zone**	**Total VOCs (onsite only)**	12,716	30.0	14,129	32.79

Notes:

1.) ft - foot

2.) ft^2 - square foot (unit of area)

3.) mg/kg - milligram/kilogram (unit of concentration)

4.) Areas for surface and near surface soils derived from adding the area of total grids (25 ft x 25 ft) which exceeded USEPA Region IX Preliminary Remediation Goals (PRGs) for Residential Soil.

5.) Areas for upper and lower vadose zone soils derived from soil "plumes" based on the sum of all detected VOCs detected between 25 and 35 feet below ground surface and 54 and 56 feet below ground surface.

6.) Surface and near surface soil thicknesses determined as 1.0 ft (zero to 1 ft bgs) and 2.0 feet (1 to 3 ft bgs), respectively. For alternative design (i.e. excavation), thickness was assumed to be 3 ft for near surface soil contaminated grids even if surface soil within that grid was below PRGs.

7.) Upper and lower vadose zone soil thicknesses derived by assuming contamination existed throughout the entire zone thickness, 32 feet and 25 feet, respectively. (Upper vadose zone soils extend from 3-35 feet bgs; lower vadose zone soils extend from 35-65 feet bgs.)

8.) Average concentrations determined using data collected in August 2003 with a cone penetration testing (CPT) rig equipped with a membrane interface probe (MIP). Real-time and discrete sampling data collected with the MIP indicates much higher soil/soil vapor concentrations than those reported from discrete soil samples collected during RI well installation activities. In addition, groundwater concentrations are indicative of non-aqueous phase liquid (NAPL) and/or free product; therefore, mass concentrations in soil are assumed to be much higher. This is supported by the MIP results as well as the results of a high-vacuum dual-phase extraction pilot study, which removed approximately 81 pounds of VOCs in one day.

*** When calculating total area for surface soils and near-surface soils, grids contaminated with both metals and SVOCs were only counted once. Likewise, when calculating the combined surface and near-surface soil area, if grids were contaminated in both 'zones', the grid was only counted once; if the near-surface soil was contaminated and the surface soil within the same grid was clean, the area was still included in the total area.**

**** These vadose zone totals include only contaminated soils within the Pemaco boundary.**