Table 1 A
Series and Location of Benchmark Soils'

Soil Series and Texture Phase	Soil No.	County	Longitude	North Latitude	Soil Taxonomy
Aiken scl	4	El Dorado	120°50'	38°39'	Clayey, oxidic, mesic, Xeric Haplohumufts
Aiken cl	5	El Dorado	120°57'	38°15'	
Aiken cl	6	Tehama	121°43'	40°26'	
Altamont cl	1	San Diego	117°13'	32°54'	Fine, montmorillonitic, thermic Typic Chromoxererts
Altamont cl	2	Glenn	122°22'	39°34'	
Altamont cl	3	Tehama	122°41'	40°14'	
Cajon fs	28	San Bernardino	117°40'	34°46'	Mixed, thermic, Typic Torripsamments
Coachella fs	7	Riverside	116°12'	33°42'	Sandy, mixed, hyperthermic Typic Torrifluvents
Fresno l	8	Kern	119°23'	35°23'	Fine-loamy, mixed, thermic Natric Durixeraffs
Fresno l	10	Merced	120°29'	37°10'	
Hanford sl	12	San Diego	116°47'	32°49'	Coarse-loamy, mixed, nonacid, thermic Typic Xerorthents
Hanford sl	11	San Joaquin	121°14'	38°11'	
Holland ls	14	El Dorado	120°41'	38°36'	Fine-loamy, mixed, mesic
Holland l	13	Fresno	119°22'	37°04'	
Holland ls	15	El Dorado	120°54'	38°49'	
Holtville sl	50	Imperial	115°23'	32°46'	Clayey over loamy, montmorillonitic (calcareous) hyperthermic Typic Torrifluvents
Hugo cl	17	Solano	122°00'	38°22'	Fine-loamy, mixed mesic dysrtic xerochrepts
Hugo cl	16	Humboldt	123°54'	40°45'	
Imperial cl	18	Imperial	115°34'	32°42'	Fine, montmorillonitic (calcareous), hyperthermic
Imperial cl	19	Riverside	114°36'	33°38'	
Imperial cl	20	Imperial	115°31'	32°56'	Vertic Torrifluvents
Kettlemen sl	21	Fresno	120°40'	36°35'	Fine-loamy, mixed (calcareous), Thermic Typic Torriorthents
Kettlemen sl	23	Fresno	120°20'	36°19'	
Kettlemen cl	22	Kern	119°22'	34°58'	

Soil Series and Texture Phase	Soil No.	County	Longitude	North Latitude	Soil Taxonomy
Lassen c	25	Tulare	119°00'	36°06'	Fine, montmorillonitic, mesic Typic Chromoxererts
Lassen c	24	Modoc	120°27'	41°32'	
Los Osos c	27	Santa Barbara	120°28'	34°35'	Fine, montmorillonitic, thermic, Typic Argixerolls
Los Osos cl	26	Lake	122°30'	38°53'	
Maymen sl	30	Lake	122°54'	39°16'	Loamy, mixed, mesic dystric Lithic Xerochrepts
Maymen sl	31	Tehama	122°41'	40°09'	
Maymen sl	29	Glenn	122°36'	39°34'	
Merced sl	9	San Joaquin	121°22'	38°05'	Fine, montmorillonitic, thermic Patchic Haploxerolls
Merced c	33	Fresno	120°12'	36°35'	
Merced cl	34	Merced	120°19'	37°28'	
Merced c	32	Kern	119°13'	35°12'	
Mojave l	36	San Bernardino	117°12'	34°32'	Not available
Mojave sl	35	San Bernardino	116°41'	34°58'	
Panoche cl	48	Fresno	Not available		Fine-loamy, mixed (calcareous), thermic Typic Torriorthents
Ramona sl	37	San Diego	116°54'	32°43'	Fine-loamy, mixed, thermic, Typic Haploxeraffs
Ramona sl	38	San Joaquin	121°13'	38°14'	
Redding cl	40	Tehama	122°12'	40°04'	Fine, mixed, thermic Abruptic Durixeralfs
Redding cl	39	Glenn	122°15'	39°41'	
San Joaquin sl	41	Merced	120°11'	37°10'	Not available
San Joaquin l	42	Tulare	119°05'	36°02'	
Venice	49	San Joaquin	121°31'	37°40'	Eric, thermic Typic Medihemists
Watsonville l	45	Santa Cruz	122°03'	36°57'	Fine, montmorillonitic, thermic Xeric Argialbolls
Watsonville l	43	Santa Barbara	120°27'	34°29'	
Watsonville l	44	Santa Cruz	121°42'	36°56'	
Yolo cl	46	Solano	121°47'	38°26'	Fine-silty, mixed, nonacid, thermic Typic Xerorthent
Yolo cl	47	Tehama	122°15'	40°03'	

[1]Table 1 A is alphabetical by soil series. Table 1 B is in numerical order by soil number.

[2]Texture phase abbreviations: l = loam, sl = sandy loam, ls = loamy sand, fs = fine sand, cl = clay loam, scl = sandy clay loam, c = clay (USDA-SCS classification scheme)

Table 1 B
Series and Location of Benchmark Soils[1]

Soil Series and Texture Phase	Soil No.	County	Longitude	North Latitude	Soil Taxonomy
Altamont cl	1	San Diego	117°13'	32°54'	Fine, montmorillonitic, thermic Typic Chromoxererts
Attamont cl	2	Glenn	122°22'	39°34'	
Alfamont cl	3	Tehama	122°41'	40°14'	
Aiken scl	4	El Dorado	120°50'	38°39'	Clayey, oxidic, mesic, Xeric HaplohumuRs
Aiken ci	5	El Dorado	120°57	38°15'	
Aiken ci	6	Tehama	121°43'	40°26'	
Coachella fs	7	Riverside	116°12'	33°42'	Sandy, mixed, hyperthermic Typic Torrifluvents
Fresno l	8	Kern	119°23'	35°23'	Fine-loamy, mixed, thermic Natric Durixeralfs
Merced sl	9	San Joaquin	121°22'	38°05'	Fine, montmorillonitic, thermic Pachic Haploxerolls
Fresno l	10	Merced	120°29'	37°10'	Fine-loamy, mixed, thermic Natric Durixeralfs
Hanford sl	11	San Joaquin	121°14'	38°11'	Coarse-loamy, mixed, nonacid, themnic Typic Xerorthents
Hardord sl	12	San Diego	116°47	32°49'	
Holland l	13	Fresno	119°22'	37°04'	Fine-loamy, mixed, mesic Ultic Haploxeralfs
Holland ls	14	El Dorado	120°41'	38°36'	
Holland ls	15	El Dorado	120°54'	38°49'	
Hugo cl	16	Humboldt	123°54'	40°45'	Fine-loamy, mixed mesic Dystric Xerochrepts
Hugo cl	17	Solano	122°00'	38°22'	
Imperial cl	18	Imperial	115°34'	32°42'	Fine, montmorillonitic (calcareous), hyperthermic
Imperial cl	19	Riverside	114°36'	33°38'	
imperial cl	20	Imperial	115°31'	32°56'	Vertic Torrifluvents
Kettlemen sl	21	Fresno	120°40'	36°35'	Fine-loamy, mixed (calcareous), thermic Typic Torriorthents
Kettlemen cl	22	Kern	119°22'	34°58'	
Kettlemen sl	23	Fresno	120°20'	36°19'	
Lassen c	24	Modoc	120°27	41°32'	Fine, montmorillonitic, mesic Typic Chromoxererts
Lassen c	25	Tulare	119°00'	36°06'	
Los Osos cl	26	Lake	122°30'	38°53'	Fine, montmorillonitic, thermic, Typic Argixerolls
Los Osos c	27	Santa Barbara	120°28'	34°35'	
Cajon fs	28	San Bernardino	117°40'	34°46'	Mixed, thermic, Typic Torripsamments
Maymen sl	29	Glenn	122°36'	39°34'	Loamy, mixed, mesic Dystric Lithic Xerochrepts
Maymen sl	30	Lake	122°54'	39°16'	

Soil series	No.	County	Longitude	Latitude	Classification
Maymen sl	31	Tehama	122°41'	40°09'	
Merced c	32	Kern	119°13'	35°12'	Fine, montmoriilonitic, thermic Pachic Haploxerolls
Merced c	33	Fresno	120°12'	36°35'	
Merced cl	34	Merced	120°19'	37°28'	
Mojave sl	35	San Bernardino	116°41'	34°58'	Fine-loamy, mixed, thermic Typic Haplargids
Mojave l	36	San Bernardino	117°12'	34°32	
Ramona sl	37	San Diego	116°54'	32°43'	Fine-loamy, mixed, thermic, Typic Haploxeraffs
Ramona sl	38	San Joaquin	121°13'	38°14'	
Redding cl	39	Glenn	122°15'	39°41'	Fine, mixed, thermic Abruptic Durixeralfs
Redding cl	40	Tehama	122°12'	40°04'	
San Joaquin sl	41	Merced	120°11'	37°10'	Fine, mixed, thermic Abruptic Durixeraffs
San Joaquin l	42	Tulare	119°05'	36°02'	
Watsonville l	43	Santa Barbara	120°27'	34°29'	Fine, montmorillonitic, thermic Xeric Argialbolls
Watsonville l	44	Santa Cruz	121°42'	36°56'	
Watsonville l	45	Santa Cruz	122°03'	36°57'	
Yolo cl	46	Solano	121°47'	38°26'	Fine-silty, mixed, nonacid, thermic Typic Xerorthent
Yolo cl	47	Tehama	122°15'	40°03'	
Panoche cl	48	Fresno	Not available		Fine-loamy, mixed (calcareous), thermic Typic Torriorthents
Venice	49	San Joaquin	121°31'	37°40'	Eric, thermic Typic Medihemists
Holtville sl	50	Imperial	115°23'	32°46'	Clayey over loamy, montmorillonitic (calcareous) hyperthermic Typic Torrifluvents

[1]Table 1 B is in numerical order by soil number. Table 1 A is alphabetical by soil series. [2]Texture phase abbreviations: I = loam, sl = sandy loam, Is = loamy sand, fs = fine sand, cl = clay loam, scl = sandy clay loam, c = clay (USDA-SCS classification scheme)

Table 2
Total Concentrations of Elements in Benchmark Soils

Soil No.	Ag Mg/Kg	Al %	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
1	0.21	8.3	11.0	23	738	2.19	0.80	7360	0.11	305	8.8	36
2	0.37	8.1	8.3	17	654	1.20	0.38	5680	0.18	138	15.0	47
3	0.27	9.9	8.0	45	764	1.90	0.42	6948	0.44	121	24.1	110
4	0.37	9.7	3.9	16	659	1.90	0.25	6758	0.25	177	34.8	115
5	0.22	7.1	3.9	7	438	1.90	0.27	3782	0.95	217	38.8	242
6	0.22	9.6	1.2	1	260	1.10	0.24	6795	0.19	94	13.1	45
7	0.12	6.3	1.2	2	533	0.80	0.21	25090	0.16	292	6.9	35
8	0.28	7.6	4.2	74	526	1.25	0.39	22035	0.52	213	9.3	42
9	0.41	6.6	0.8	5	379	0.64	0.37	9587	0.05	161	4.3	26
10	0.80	6.3	1.1	13	517	1.38	0.29	17967	0.40	141	7.1	89
11	0.52	9.0	1.2	4	472	1.51	0.33	11081	0.31	184	7.6	27
12	4.30	8.3	0.6	10	250	0.60	0.24	24524	0.13	122	15.8	29
13	0.40	9.5	2.1	2	625	1.53	0.20	8592	0.36	208	10.8	26
14	3.30	8.7	6.9	34	358	1.43	0.34	16494	0.36	167	22.7	108
15	0.48	7.6	1.2	19	258	1.45	0.19	16658	0.56	85	18.3	107
16	0.42	6.8	5.7	27	375	1.70	0.39	2903	0.15	133	29.9	214
17	2.60	8.0	9.6	26	796	0.93	0.37	6488	0.20	173	15.9	73
18	0.16	6.4	5.2	36	371	1.48	0.45	36400	0.58	189	11.3	40
19	0.37	6.7	4.7	44	392	2.26	0.52	45577	0.43	216	10.0	52
20	0.43	5.9	5.4	33	385	1.76	0.41	41649	0.62	188	8.3	45
21	0.55	6.1	1.8	28	1400	1.14	0.34	15295	0.30	140	10.1	86
22	0.34	6.8	4.0	19	556	0.77	0.25	8243	1.70	115	8.1	50
23	8.30	6.9	4.4	19	677	0.83	0.31	20015	1.00	147	11.9	129
24	0.49	9.9	1.4	4	403	1.78	0.29	17812	1.10	154	26.6	92
25	0.18	8.5	1.7	5	248	0.66	0.28	24070	0.29	119	46.9	1579
26	0.22	10.6	1.4	3	525	1.17	0.33	9408	0.05	127	14.5	51
27	0.44	8.8	4.5	25	720	2.70	0.65	4559	0.44	240	14.2	102
28	0.28	5.8	1.0	5	576	0.68	0.60	15054	0.32	214	11.6	67
29	0.42	8.0	6.3	46	434	1.84	0.39	2777	0.31	153	26.4	181

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Mg/Kg	%	---Mg/Kg---									
30	0.16	7.1	3.2	16	461	1.49	0.39	2451	0.13	107	12.9	70
31	3.80	7.7	6.8	30	440	1.47	0.30	2495	0.16	141	26.0	190
32	0.39	7.8	6.7	44	493	1.75	0.52	24853	0.14	234	8.7	38
33	0.27	8.3	3.9	26	552	1.45	0.58	11610	0.14	173	11.6	88
34	0.40	8.4	2.1	20	684	1.51	0.37	16160	0.05	158	16.0	68
35	0.12	6.9	3.8	11	571	1.10	0.39	16311	0.05	243	8.7	23
36	0.16	4.0	2.4	9	710	1.91	0.38	11229	0.14	239	8.0	47
37	2.50	10.4	1.7	17	221	0.86	0.64	29095	0.45	114	18.8	36
38	0.22	6.9	1.0	5	730	1.13	0.14	7653	0.05	155	7.9	49
39	0.63	5.0	2.1	8	158	0.92	0.25	2762	0.30	88	12.0	221
40	0.80	3.0	2.4	5	133	0.25	0.23	3422	0.11	83	8.8	102
41	0.13	7.0	1.4	8	531	0.50	0.29	14362	0.26	122	9.6	47
42	0.35	8.0	1.8	9	540	1.25	0.28	14131	0.24	167	10.8	50
43	0.16	5.2	1.4	7	571	1.42	0.35	3763	0.39	182	8.4	121
44	0.63	5.3	1.9	15	767	1.28	0.25	2570	0.18	148	9.2	129
45	0.22	4.9	1.1	9	565	0.68	0.11	6600	0.71	113	2.7	87
46	0.53	7.5	4.5	23	511	1.30	0.33	6076	0.21	114	22.1	397
47	0.58	7.5	3.0	22	361	1.03	0.20	10770	0.18	117	26.1	271
48	0.10	7.5	6.0	49	522	1.23	0.44	12531	0.18	139	17.8	147
49	0.20	3.5	4.7	25	324	0.25	0.34	24175	0.73	78	8.8	49
50	0.35	4.4	2.2	18	328	1.18	0.25	26824	0.58	121	4.3	29
AVG	0.80	7.3	3.5	19	509	1.28	0.35	14466	0.36	159	14.9	122
GEOM MEAN	0.41	7.1	2.8	14	468	1.14	0.33	10849	0.26	151	12.6	76
MAX	8.30	10.6	11.0	74	1400	2.70	0.80	45577	1.70	305	46.9	1579
MIN	0.10	3.0	0.6	1	133	0.25	0.11	2451	0.05	78	2.7	23
RANGE	8.20	7.6	10.4	73	1267	2.45	0.69	43126	1.65	227	44.2	1556
ESt.D.LiM.[1]	0.015	0.001	0.2	2	1	0.5	0.1	25	0.10	0.15	2.5	1

[1]Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim.
Descriptive statistics are calculated accordingly.

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Cs	Cu	Fe	Ga	Ge	Hg	I	K	La	Li	Mg	Mn
	-----mg/Kg-----		%	-------------------mg/Kg-------------------				%	--------------------mg/Kg--------------------			
1	7.3	36.6	3.2	22.0	1.6	0.90	1.24	3.00	38.5	33	7407	501
2	3.0	44.2	3.7	19.6	3.0	0.10	0.91	2.36	16.4	27	4913	549
3	4.5	66.9	5.7	27.6	3.5	0.70	0.94	1.48	13.0	90	11067	527
4	3.1	96.4	6.8	27.9	5.6	0.27	0.93	2.13	18.3	20	8745	1186
5	2.8	85.7	7.6	26.8	5.8	0.61	0.91	1.21	21.6	23	9586	1687
6	1.8	21.9	3.6	16.5	1.6	0.10	0.60	0.75	14.0	13	5888	618
7	1.8	14.8	2.9	18.0	2.0	0.10	0.72	2.48	39.3	21	11613	587
8	5.1	18.3	3.2	20.3	2.3	0.40	0.60	2.40	28.3	42	12928	682
9	1.5	13.7	2.0	11.5	1.9	0.27	0.49	1.78	20.4	11	5631	449
10	2.1	17.5	3.0	16.5	2.0	0.49	0.54	1.53	17.8	15	11000	598
11	1.9	24.4	3.0	14.3	2.8	0.10	0.49	2.91	24.6	13	6442	599
12	1.7	14.2	6.6	14:6	2.9	0.26	0.50	1.09	11.4	11	14345	1051
13	4.4	13.7	3.7	23.1	2.4	0.10	0.44	1.87	27.6	35	7920	911
14	3.2	21.6	5.3	18.7	2.5	0.22	0.43	1.51	18.6	50	12027	726
15	1.0	22.5	3.7	14.9	2.7	0.21	0.36	1.37	9.8	9	11364	584
16	2.8	34.5	4.0	15.0	1.9	0.10	0.33	1.03	18.2	40	15538	810
17	4.5	34.2	3.7	21.0	2.2	0.10	0.43	2.50	23.0	32	7147	574
18	5.5	16.5	2.6	15.4	2.2	0.10	0.34	2.38	25.6	23	12014	426
19	6.2	17.8	2.7	17.0	1.9	0.10	0.27	2.45	29.5	24	14305	480
20	5.1	17.7	2.3	15.3	3.0	0.10	0.33	2.16	25.4	18	12163	421
21	3.4	18.7	2.6	24.7	2.5	0.25	0.22	2.06	19.6	16	9628	456
22	2.6	11.8	1.8	13.7	2.6	0.29	0.25	2.25	16.3	7	4710	259
23	2.4	17.7	3.3	16.3	1.0	0.22	0.24	2.12	20.4	11	12036	542
24	2.1	45.2	5.8	19.3	3.7	0.10	0.27	0.57	16.5	8	11822	1217
25	2.2	52.7	4.5	13.3	2.1	0.57	0.26	1.05	15.5	8	32378	809
26	4.1	58.4	4.5	21.0	2.4	0.10	0.27	1.90	13.8	7	12014	768
27	8.7	28.7	4.3	24.5	3.9	0.39	0.25	2.93	32.3	14	9873	454
28	1.2	13.3	3.1	15.7	3.1	0.10	0.16	2.25	28.0	4	9678	470
29	3.5	50.3	5.0	20.0	4.8	0.75	0.28	1.72	17.3	13	12581	858

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Cs	Cu	Fe	Ga	Ge	Hg	I	K	La	LI	Mg	Mn
	-----mg/Kg-----		%	------------------mg/Kg------------------				%	------------------mg/Kg------------------			
30	3.2	29.0	2.6	18.2	1.5	0.22	0.26	0.84	16.7	8	7497	961
31	2.5	55.6	5.1	19.2	5.1	0.10	0.23	1.33	16.0	32	12381	824
32	4.3	22.3	3.4	19.1	2.5	0.10	0.23	2.15	33.4	51	8370	285
33	3.9	23.6	3.5	18.9	2.6	0.45	0.23	1.74	23.4	33	8238	260
34	3.4	24.8	4.4	20.4	2.5	0.66	0.28	2.08	21.7	61	15918	768
35	2.4	11.3	2.5	16.5	2.2	0.32	0.20	2.47	31.8	32	7861	433
36	2.0	15.1	3.1	17.9	2.8	0.10	0.22	1.69	33.8	25	7410	439
37	1.6	35.6	8.7	20.9	5.2	0.10	0.27	0.51	10.9	11	13725	1205
38	1.6	16.1	3.3	15.3	2.1	0.10	0.20	2.49	20.1	9	3664	890
39	1.0	20.7	2.5	8.3	3.5	0.10	0.17	0.36	10.1	15	3003	480
40	1.0	20.0	2.1	8.5	4.1	0.10	0.15	0.21	9.7	9	2402	382
41	1.3	10.6	2.3	14.0	0.3	0.10	0.19	1.63	14.2	8	5436	638
42	3.9	18.6	3.5	18.5	3.8	0.10	0.27	2.06	21.5	20	8396	736
43	2.3	11.4	1.3	12.7	2.2	0.63	0.62	1.56	23.8	7	1970	445
44	2.1	16.6	2.0	17.7	1.5	0.10	0.42	1.99	20.4	10	2384	593
45	2.4	9.5	1.0	12.8	1.5	0.10	0.43	1.67	15.0	5	1456	268
46	3.3	41.5	4.5	18.3	4.4	0.34	0.32	1.66	13.3	27	15324	674
47	2.6	51.3	5.2	18.5	3.8	0.57	0.24	1.03	13.4	28	20568	720
48	4.1	37.6	4.2	20.8	3.3	0.10	0.35	2.01	18.8	52	18414	535
49	1.5	24.4	2.4	10.4	2.4	0.25	0.67	0.42	9.9	27	7393	436
50	2.8	9.1	1.4	10.7	1.2	0.10	0.27	1.57	16.0	20	7616	253
AVG	3.1	28.7	3.7	17.6	2.8	0.26	0.40	1.73	20.3	23	9923	646
GEOM MEAN	2.7	24.0	3.4	17.1	2.5	0.20	0.35	1.54	19.0	18	8492	592
MAX	8.7	96.4	8.7	27.9	5.8	0.90	1.24	3.00	39.3	90	32378	1687
MIN	1.0	9.1	1.0	8.3	0.3	0.10	0.15	0.21	9.7	4	1456	253
RANGE	7.7	87.3	7.7	19.6	5.6	0.80	1.09	2.79	29.6	86	30922	1434
Est.D.Lim.[1]	0.25	0.25	.00025	0.15	0.5	0.2	0.15	0.05	0.15	2	10	2.5

[1]Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim.
Descriptive statistics are calculated accordingly.

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Mo	Na	Nb	Ni	P	Pb	Rb	Sb	Sc	Se	Si %	Sn Mg/Kg
					-----mg/Kg-----							
1	1.4	14710	1.3	20	94	57.1	84.5	1.95	11.9	0.015	26.7	1.20
2	1.2	15620	0.9	25	231	29.7	48.0	1.46	11.6	0.015	31.0	1.25
3	0.4	8960	0.3	77	82	26.9	52.2	0.78	21.0	0.030	27.2	0.89
4	1.2	11790	0.8	51	359	22.4	53.1	1.15	18.0	0.015	23.7	0.75
5	0.7	10010	1.8	140	972	34.3	51.9	0.45	22.0	0.070	26.6	1.26
6	0.8	14400	1.3	25	13	15.6	19.5	0.29	12.0	0.015	22.4	1.13
7	2.4	16610	2.3	19	772	14.2	70.0	0.33	9.0	0.150	26.5	0.77
8	9.6	29000	3.4	21	807	18.4	81.5	0.73	7.5	0.015	27.0	1.38
9	0.6	15050	1.5	12	213	21.3	39.8	0.36	4.9	0.015	32.4	0.82
10	1.2	15270	1.3	26	107	14.8	43.2	0.32	7.6	0.015	28.9	0.86
11	0.5	22240	1.0	13	515	22.7	42.8	0.38	6.1	0.015	34.0	0.98
12	0.7	19560	1.1	10	74	15.6	31.9	0.26	20.0	0.015	24.3	1.38
13	1.4	73400	4.0	16	1150	97.1	86.0	0.47	5.7	0.015	24.4	2.16
14	0.6	18800	0.5	64	378	22.1	53.7	0.25	11.4	0.015	28.3	0.58
15	0.2	17400	0.5	49	142	12.4	25.9	0.35	9.5	0.015	30.1	1.14
16	0.7	13970	1.9	142	697	34.0	46.5	0.46	8.5	0 015	28.3	1.46
17	0.6	16230	0.8	40	539	30.9	54.7	1.03	10.5	0.050	31.2	1.01
18	0.8	9870	1.9	21	740	44.3	59.8	0.73	4.7	0.190	28.8	1.46
19	1.3	9490	2.1	25	873	37.0	66.8	0.77	5.9	0.220	26.3	1.12
20	0.8	10690	2.0	22	736	33.8	55.9	0.68	5.2	0.180	29.9	1.47
21	1.4	14620	1.0	53	342	19.7	53.5	0.66	5.6	0.170	32.6	0.57
22	3.7	10980	2.1	27	509	14.6	48.4	0.45	2.8	0.180	30.3	1.07
23	0.9	18380	1.0	62	560	22.5	41.7	1.50	5.1	0.160	32.1	1.00
24	0.4	14370	3.4	57	252	16.7	18.9	0.44	15.5	0.015	23.9	0.68
25	1.3	11340	1.8	509	41	17.9	33.4	0.73	11.7	0.015	25.2	1.91
26	0.8	11970	0.5	27	385	24.1	47.7	0.73	17.0	0.015	26.0	0.53
27	1.3	20970	3.5	52	293	39.1	107.9	1.52	7.8	0.430	30.0	1.85
28	0.1	15650	1.3	30	657	13.2	43.0	0.16	6.7	0.015	30.0	0.94
29	1.1	15580	0.5	116	664	23.9	57.2	0.75	12.8	0.230	30.2	0.85

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Mo	Na	Nb	Ni		P	Pb	Rb	Sb	Sc	Se	Si	Sn
												%	Mg/Kg
					----------mg/Kg--								
30	0.6	15620	1.8	47	610	20.6	57.6		0.28	7.3	0.015	34.0	0.77
31	0.6	14270	0.7	104	487	18.1	41.7		0.59	17.1	0.040	32.8	0.85
32	4.5	15110	4.3	21	407	22.4	68.5		1.40	8.5	0.015	26.3	1.91
33	2.4	15650	2.7	56	63	24.5	61.4		0.68	7.9	0.015	28.8	1.35
34	1.7	16830	3.1	29	463	17.5	67.4		0.46	10.0	0.015	25.9	1.19
35	0.9	17260	1.3	12	301	21.3	55.1		0.33	5.3	0.015	30.4	1.22
36	1.0	7580	1.8	23	314	26.7	61.8		0.32	6.0	0.015	35.6	1.01
37	0.5	19540	1.4	15	33	17.0	28.5		0.42	24.0	0.015	27.9	1.38
38	0.5	13800	1.1	23	257	21.3	42.1		0.37	5.0	0.015	35.9	0.25
39	0.4	15550	0.8	50	194	12.7	16.3		0.24	5.0	0.015	39.4	0.64
40	0.7	6630	0.6	30	124	14.0	14.3		0.16	5.0	0.015	37.1	1.04
41	0.3	17410	0.9	17	65	14.2	30.2		0.15	6.8	0.015	33.5	0.99
42	1.0	13800	0.8	22	107	17.8	61.3		0.60	8.8	0.015	32.7	0.92
43	1.7	13570	4.9	20	387	13.4	41.7		0.50	2.5	0.110	36.7	2.44
44	3.1	10230	1.4	27	309	19.7	43.5		0.57	4.2	0.015	27.3	1.32
45	2.6	12290	2.9	9	360	16.0	28.9		0.48	2.6	0.015	34.7	1.77
46	0.7	17040	1.5	212	467	18.9	40.5		0.50	11.0	0.015	27.2	1.05
47	0.7	17890	0.6	196	351	14.9	34.4		0.40	15.3	0.015	28.1	0.65
48	1.5	19290	1.3	113	357	23.1	55.8		0.60	13.5	0.015	28.8	0.81
49	2.2	5580	1.7	41	1210	27.4	21.1		0.42	4.2	0.140	13.2	1.04
50	0.3	10010	0.9	12	524	16.8	31.9		0.31	0.8	0.015	35.6	1.35
AVG	1.3	15838	1.7	57	412	23.9	48.5		0.60	9.5	0.058	29.4	1.11
GEO. MEAN	0.9	14500	1.4	36	290	21.7	44.6		0.50	8.2	0.028	29.0	1.03
MAX	9.6	73400	4.9	509	1210	97.1	107.9		1.95	24.0	0.430	39.4	2.44
MIN	0.1	5580	0.3	9	13	12.4	14.3		0.15	0.8	0.015	13.2	0.25
RANGE	9.5	67820	4.6	500	1197	84.7	93.6		1.80	23.2	0.415	26.2	2.19
Est.D.Lim.[1]	0.025	100	0.25	5	25	1	0.15		0.15	0.2	0.03	0.0005	0.5

[1] Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim
Descriptive statistics are calculated accordingly.

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Sr	Th	Ti	TL	U	V	W	Y	Zn	Zr
						-mg/Kg-				
1	84	36.2	4640	1.10	8.2	74	1.10	30.6	172	610
2	166	13.9	6463	0.62	5.7	134	0.22	22.6	165	232
3	38	10.1	6218	0.74	2.7	187	0.10	15.0	204	134
4	194	10.8	7337	0.85	3.8	236	0.16	31.2	149	151
5	47	8.8	12890	0.70	3.1	191	0.28	29.2	162.	230
6	155	9.8	5918	0.46	3.2	123	0.40	19.1	139	88
7	236	27.5	4351	0.62	8.5	60	0.36	43.2	170	32
8	210	25.4	4780	0.68	21.3	83	1.60	39.1	180	57
9	152	20.2	2885	0.34	4.6	55	0.33	29.4	182	51
10	151	12.8	4466	0.48	3.1	93	0.45	29.4	153	67
11	198	23.9	3864	0.41	5.1	80	0.28	26.6	97	56
12	92	11.0	5373	0.52	2.4	220	0.31	31.9	123	52
13	118	32.4	4650	0.87	10.7	89	0.74	23.4	236	53
14	84	18.0	5662	0.49	5.7	170	0.15	30.7	104	90
15	156	5.3	3590	0.29	1.9	123	0.19	26.8	141	29
16	68	8.1	4566	0.59	1.8	125	0.97	11.8	177	108
17	102	13.3	5225	0.57	3.2	133	0.42	22.8	193	99
18	169	15.8	3657	0.73	4.2	69	0.76	27.5	172	130
19	193	18.6	4778	0.75	4.4	84	0.73	31.8	179	180
20	197	15.9	3949	0.57	3.9	74	0.71	28.6	168	178
21	106	16.0	3740	0.42	3.4	92	0.60	25.3	165	81
22	176	13.7	2453	0.47	5.6	58	0.54	21.6	152	50
23	187	14.2	3963	0.47	2.9	113	0.47	25.0	107	92
24	182	8.2	6957	0.45	1.5	139	0.65	33:3	149	107
25	86	13.3	2757	0.36	4.3	77	0.95	16.8	133	45
26	231	9.8	3997	0.67	2.8	117	0.05	19.5	183	38
27	134	25.5	5683	0.90	5.8	133	1.20	24.8	144	105
28	116	19.5	3705	0.38	2.4	85	0.10	32.6	92	20
29	33	9.4	7096	0.69	1.6	185	0.22	15.6	157	164

Table 2 (continued)
Total Concentrations of Elements in Benchmark Soils

Soil No.	Sr	Th	Ti	TL	U	V	W	Y	Zn	Zr
					-mg/Kg-					
30	20	10.8	4814	0.63	3.0	102	0.44	8.5	144	68
31	24	7.3	7875	0.42	1.5	181	0.17	12.9	189	136
32	229	30.1	3499	0.79	17.3	77	6.50	36.9	164	43
33	172	23.1	3739	0.75	14.5	126	6.90	21.5	157	60
34	264	17.3	5178	0.68	6.4	115	1.20	33.9	176	48
35	179	25.1	3790	0.61	4.9	74	0.64	35.7	154	35
36	90	25.8	2950	0.77	3.9	75	0.72	30.6	94	19
37	158	5.9	7771	0.45	1.7	288	0.47	32.9	154	34
38	83	16.1	3644	0.42	3.4	96	0.28	20.9	91	58
39	23	6.0	4990	0.20	1.2	92	0.25	9.5	88	92
40	27	5.6	2388	0.17	1.2	76	0.24	10.8	136	24
41	65	10.4	3857	0.33	2.6	68	0.28	17.9	138	56
42	84	32.9	4565	0.81	6.7	94	0.28	24.4	155	60
43	87	17.3	4233	0.44	3.8	54	1.10	15.7	133	63
44	49	13.3	3454	0.58	4.3	88	0.50	15.6	100	56
45	69	11.3	2629	0.50	5.6	48	0.50	18.0	135	41
46	83	9.1	5539	0.50	2.1	139	0.48	16.4	119	100
47	74	7.2	6099	0.33	1.6	175	0.27	18.1	165	98
48	180	14.0	4913	0.59	4.0	138	0.37	25.7	132	111
49	271	9.8	2239	0.28	6.3	58	1.30	25.6	122	34
50	123	9.5	2012	0.49	2.5	39	0.36	18.1	150	95
AVG	128	15.7	4716	0.56	4.7	112	0.77	24.3	149	93
GEOM. MEAN	107	13.8	4419	0.52	3.8	101	0.45	22.9	145	72
MAX	271	36.2	12890	1.10	21.3	288	6.90	43.2	236	610
MIN	20	5.3	2012	0.17	1.2	39	0.05	8.5	88	19
RANGE	251	30.9	10878	0.93	20.1	249	6.85	34.7	148	591
Est.D.Lim.[1]	4	0.1	5	0.15	0.05	5	0.1	0.15	2.5	0.25

[1]Est.D.Lim. denotes the estimated detection limit for each element. In this table, concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim.
Descriptive statistics are calculated accordingly.

Table 3

Ranges In Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	Ag	Al	As	B	Ba	Be	BI	Ca	Cd	Ce
Mean	0.80	7.3	3.5	19	509	1.28	0.35	14466	0.36	159
Standard Deviation	1.43	1.7	2.5	15	210	0.52	0.14	10703	0.31	52
Coefficient of Variation (CV) (%)	178	24	71	79	41	41	39	74	88	33
Geometric Mean	0.41	7.1	2.8	14	468	1.14	0.33	10849	0.26	151
Geometric Deviation	2.64	1.3	2.1	2.6	1.54	1.79	1.46	2.25	2.27	1.38
Geometric CV (%)	636	19	76	19	0.30	157	448	0.02	876	0.9
Minimum	0.10	3.0	0.6	1	133	0.25	0.11	2451	0.05	78
Lower Quartile	0.22	6.3	1.4	7	375	0.92	0.25	6600	0.15	121
Median	0.37	7.5	2.7	17	519.5	1.265	0.335	11420	0.275	150.5
Upper Quartile	0.53	8.3	4.7	26	625	1.53	0.39	20015	0.44	188
Maximum	8.30	10.6	11.0	74	1400	2.70	0.80	45577	1.70	305
W:Normal[b]	0.4864	0.9761	0.8865	0.8935	0.9161	0.9883	0.9248	0.8848	0.7977	0.9426
Prob<W[c]	0.0001	0.5824	0.0001	0.0001	0.0015	0.9591	0.0039	0.0001	0.0001	0.0268
W:Ln Normal[d]	0.8708	0.9218	0.9556	0.9566	0.9562	0.8305	0.9816	0.9505	0.9764	0.9781
Prob<W	0.0001	0.0028	0.1021	0.1129	0.1082	0.0001	0.7863	0.061	0.5961	0.6564
Methods Reported[e]	1	2	3	2	2	1	1	2	1	1

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.
[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 - ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hg	I
Mean	14.9	122	3.1	28.7	3.7	17.6	2.8	0.26	0.40
Standard Deviation	9.2	223	1.6	19.3	1.6	4.5	1.2	0.21	0.24
Coefficient of Variation (CV) (%)	62	183	53	67	43	25	43	80	60
Geometric Mean	12.6	76	2.7	24.0	3.4	17.1	2.5	0.20	0.35
Geometric Deviation	1.79	2.27	1.7	1.8	1.6	1.3	1.6	2.12	1.67
Geometric CV (%)	14	3	62	7	46	7	64	1059	476
Minimum	2.7	23	1.0	9.1	1.0	8.3	0.4	0.05	0.15
Lower Quartile	8.7	45	1.9	16.1	2.6	14.9	2.0	0.10	0.24
Median	11.6	69	2.6	21.6	3.3	17.9	2.5	0.19	0.30
Upper Quartile	18.3	115	3.9	36.6	4.5	20.3	3.5	0.34	0.49
Maximum	46.9	1579	8.7	96.4	8.7	27.9	5.8	0.90	1.24
W:Normal[b]	0.8510	0.3834	0.9001	0.8169	0.9396	0.9758	0.9410	0.8133	0.8138
Prob<W[c]	0.0001	0.0001	0.0003	0.0001	0.0194	0.5721	0.0226	0.0001	0.0001
W:Ln Normal[d]	0.9727	0.9265	0.9815	0.9544	0.9846	0.96	0.9379	0.9212	0.9372
Prob<W	0.4631	0.0047	0.783	0.0903	0.8799	0.1563	0.0162	0.0026	0.015
Methods Reported[e]	2	2	1	1	2	1	1	1	1

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est. D. Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 = ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni
Mean	1.73	20.3	23	9923	646	1.3	15838	1.7	57
Standard Deviation	0.69	7.5	17	5356	285	1.5	9309	1.1	80
Coefficient of Variation (CV) (%)	40	37	75	54	44	113	59	65	141
Geometric Mean	1.54	19.0	18	8492	592	0.9	14500	1.4	36
Geometric Deviation	1.77	1.4	2.0	1.80	1.5	2.23	1.5	1.9	2.4
Geometric CV (%)	115	7.5	11	0.02	0.3	239	0.01	141	7
Minimum	0.21	9.7	4	1456	253	0.1	5580	0.3	9
Lower quartile	1.33	15.0	10	6442	449	0.6	11790	0.9	21
Median	1.76	18.7	19	9166	590	0.85	15080	1.3	27
Upper Quartile	2.25	24.6	32	12036	809	1.4	17260	2	56
Maximum	3.00	39.3	90	32378	1687	9.6	73400	4.9	509
W:Normal[b]	0.9610	0.9350	0.8442	0.8978	0.9104	0.6126	0.5514	0.8747	0.5508
Prob<W[c]	0.1722	0.0118	0.0001	0.0002	0.0008	0.0001	0.0001	0.0001	0.0001
W:Ln Normal[d]	0.8352	0.9696	0.9776	0.92	0.9732	0.9849	0.904	0.9806	0.9388
Prob<W	0.0001	0.3634	0.6377	0.0023	0.4807	0.8873	0.0004	0.749	0.0178
Methods Reported[e]	2	1	2	2	2	1	2	1	2

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
2 = ICP-OES (ICP-Optical Emission Spectroscopy)
3 = ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements in 50 Benchmark California Soils[a]

Parameter	P	Pb	Rb	Sb	Sc	Se	Si	Sn	Sr
Mean	412	23.9	48.5	0.60	9.5	0.058	29.4	1.11	128
Standard Deviation	290	13.8	19.0	0.39	5.3	0.084	4.6	0.42	67.62
Coefficient of Variation (CV) (%)	70	58	39	66	55	147	16	38.	53
Geometric Mean	290	21.7	44.6	0.50	8.2	0.028	29.0	1.03	107
Geometric Dev	3	1.5	1.5	1.80	1.7	2.89	1.2	1.48	1.97
Geometric CV (%)	0.9	7	3	360	21	10149	4	143	2
Minimum	13	12.4	14.3	0.15	0.8	0.015	13.2	0.25	20
Lower Quartile	194	16	34.4	0.33	5.3	0.015	26.6	0.85	83
Median	360	20.6	47.9	0.47	8.0	0.015	28.8	1.04	121
Upper Quartile	560	26.7	57.6	0.73	11.9	0.050	32.6	1.35	180
Maximum	1210	97.1	107.9	1.95	24.0	0.430	39.4	2.44	271
W:Normal[b]	0.9330	0.6712	0.9680	0.8210	0.8966	0.5860	0.9662	0.9444	0.9501
Prob<W[c]	0.0950	0.0001	0.3202	0.0001	0.0002	0.0001	0.2500	0.0322	0.0587
W:Ln Normal[d]	0.9101	0.9118	0.9538	0.9704	0.9712	0.626	0.7089	0.9708	0.9045
Prob<W[e]	0.0008	0.0009	0.0849	0.39	0.415	0.0001	0.0001	0.4015	0.0004
Methods Reported	2	1	1	1	2	3	2	1	2

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic
[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution
[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported
 1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)
 2 = ICP-OES (ICP-Optical Emission Spectroscopy)
 3 = ICP-OES Hydride

Table 3 (continued)
Ranges in Concentration and Summary Statistics of 46 Elements In 50 Benchmark California Soils[a]

Parameter	Th	Ti	Tl	U	V	W	Y	Zn	Zr
Mean	15.7	4716	0.56	4.7	112	0.77	24.3	149	93
Standard Deviation	7.6	185	0.19	3.9	53	1.27	8.1	32	90
Coefficient of Variation (CV) (%)	49	39	34	83	47	166	33	21	97
Geometric Mean	13.8	4419	0.52	3.8	101	0.45	22.9	145	72
Geometric Deviation	1.6	1	1.46	1.9	2	2.51	1.45	1	2
Geometric CV (%)	12	0.03	280	51	2	553	6	0.9	3
Minimum	5.3	2012	0.17	1.2	39	0.05	8.5	88	19
Lower Quartile	9.8	3657	0.42	2.5	75	0.28	18.0	133	48
Median	13.5	4516	0.54	3.8	94	0.45	24.9	153	63
Upper Quartile	19.5	5539	0.69	5.6	134	0.73	30.6	170	107
Maximum	36.2	12890	1.10	21.3	288	6.90	43.2	236	610
W:Normal[b]	0.9028	0.8778	0.9846	0.7174	0.8974	0.4405	0.9793	0.9696	0.6261
Prob<W[e]	0.0004	0.0001	0.8775	0.0001	0.0002	0.0001	0.7026	0.3657	0.0001
W:Ln Normal[d]	0.9611	0.9843	0.9633	0.9657	0.9809	0.9589	0.9467	0.9401	0.9497
Prob<W	0.1731	0.8699	0.212	0.2633	0.7619	0.1415	0.041	0.0205	0.0561
Methods Reported[e]	1	2	1	1	2	1	1	2	2

[a]Please refer to Table 2 for concentration units for each element. Concentrations less than the Est.D.Lim. are reported as one-half of the Est.D.Lim. Descriptive statistics are calculated accordingly.

[b]w:Normal: Normal test statistic

[c]Prob<W: Associated probability for testing the hypothesis that the data come from a normal distribution

[d]W:Ln Normal: Normal test statistic for Ln transformed data

[e]Methods Reported

1 = ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy)

2 = ICP-OES (ICP-Optical Emission Spectroscopy)

3 = ICP-OES Hydride