

Supplemental Table 2. Average Elemental Concentration by Production Zone

	Buckley	Liverpool	Staffordshire	London Area	Surrey-Hampshire Border	Philadelphia	Tidewater Chesapeake	Alexandria	N. Virginia Piedmont	Shenandoah Valley	South Ridge & Valley	Piedmont North Carolina
	<i>n</i> =24	<i>n</i> =27	<i>n</i> =18	<i>n</i> =56	<i>n</i> =18	<i>n</i> =16	<i>n</i> =53	<i>n</i> =34	<i>n</i> =14	<i>n</i> =70	<i>n</i> =13	<i>n</i> =23
	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD	Avg. SD
<i>wr% oxide</i>												
Na ₂ O	.27 ± .06	.36 ± .11	.21 ± .06	.56 ± .12	.23 ± .03	1.23 ± .12	.61 ± .14	.46 ± .09	.95 ± .25	.29 ± .10	.34 ± .12	.81 ± .48
Al ₂ O ₃	31.98 ± 2.85	27.15 ± 2.71	30.84 ± 2.63	23.40 ± 1.10	27.19 ± 2.00	23.45 ± .71	25.52 ± 2.06	22.08 ± 1.17	21.33 ± 1.29	21.11 ± 2.88	22.43 ± .99	28.97 ± 3.59
SiO ₂	57.12 ± 2.89	61.44 ± 3.61	59.17 ± 2.88	59.94 ± 1.98	64.86 ± 1.94	64.05 ± 1.54	64.71 ± 1.94	67.99 ± 1.93	66.99 ± 1.52	69.15 ± 4.49	63.18 ± 1.96	61.19 ± 4.14
K ₂ O	2.24 ± .33	2.83 ± .47	1.92 ± .22	3.17 ± .33	2.47 ± .24	2.74 ± .14	2.29 ± .31	2.65 ± .32	2.04 ± .22	2.17 ± .54	5.01 ± .82	0.72 ± .40
CaO	.17 ± .06	.11 ± .05	.24 ± .05	.86 ± .40	.42 ± .11	.62 ± .14	.30 ± .19	.14 ± .07	.32 ± .14	.42 ± .38	.41 ± .07	.85 ± .57
TiO ₂	1.21 ± .18	1.09 ± .21	1.28 ± .10	1.21 ± .29	.99 ± .21	1.20 ± .20	1.42 ± .28	1.35 ± .45	1.46 ± .28	1.09 ± .23	1.56 ± .43	1.26 ± .45
Fe ₂ O ₃	6.58 ± 1.55	6.63 ± 2.22	6.07 ± 1.95	10.48 ± 1.51	3.50 ± 2.03	6.07 ± .51	4.84 ± 1.19	5.04 ± 1.19	6.27 ± .42	5.49 ± 1.64	6.71 ± 1.33	5.90 ± 1.92
<i>ppm</i>												
Li	196.31 ± 62.73	154.08 ± 92.42	90.46 ± 22.93	79.74 ± 17.52	58.58 ± 9.82	52.90 ± 8.31	60.20 ± 13.71	61.98 ± 6.81	49.42 ± 7.67	56.98 ± 12.97	155.08 ± 54.43	22.16 ± 9.57
Sc	26.84 ± 2.28	24.77 ± 3.45	30.94 ± 3.33	26.14 ± 2.84	19.84 ± 3.01	22.08 ± 1.82	23.31 ± 2.04	21.54 ± 2.08	21.33 ± 9.20	18.44 ± 3.23	18.10 ± 2.07	29.87 ± 11.73
V	169.80 ± 27.01	166.59 ± 23.23	216.42 ± 41.23	226.15 ± 23.80	115.22 ± 13.44	158.20 ± 9.91	168.22 ± 21.17	153.81 ± 14.71	156.45 ± 11.33	131.73 ± 25.69	118.06 ± 11.49	171.35 ± 62.78
Cr	174.70 ± 15.51	152.72 ± 23.77	138.38 ± 40.18	188.23 ± 76.68	164.95 ± 113.78	131.175 ± 12.81	134.454 ± 13.44	103.97 ± 10.26	106.47 ± 18.80	99.31 ± 20.66	98.80 ± 6.60	83.99 ± 25.05
Mn	183.99 ± 107.19	153.93 ± 98.53	252.89 ± 101.75	278.14 ± 252.57	81.64 ± 24.13	204.45 ± 76.23	112.93 ± 47.88	106.66 ± 42.77	141.32 ± 24.41	105.97 ± 48.53	163.10 ± 32.25	243.36 ± 104.36
Co	12.02 ± 2.55	15.04 ± 6.68	15.33 ± 8.70	24.66 ± 7.96	14.79 ± 6.79	12.95 ± 1.55	12.57 ± 5.22	16.53 ± 6.94	10.98 ± 4.23	11.80 ± 3.68	20.89 ± 10.45	20.35 ± 14.78
Cu	45.69 ± 11.86	30.97 ± 15.00	72.14 ± 45.54	42.10 ± 20.44	19.59 ± 4.00	28.46 ± 13.28	26.65 ± 15.38	27.33 ± 6.58	31.49 ± 3.63	29.49 ± 14.21	17.41 ± 4.79	49.94 ± 27.61
Zn	77.85 ± 83.23	79.91 ± 30.84	93.76 ± 18.07	171.14 ± 60.16	59.08 ± 21.73	142.06 ± 10.93	94.80 ± 21.57	119.57 ± 24.63	84.54 ± 5.68	128.08 ± 86.31	100.97 ± 33.10	76.25 ± 29.50
Rb	134.23 ± 21.17	171.02 ± 21.08	126.63 ± 11.89	171.99 ± 12.53	137.29 ± 12.26	162.80 ± 3.96	157.36 ± 19.46	171.04 ± 17.47	127.39 ± 9.78	141.33 ± 34.15	186.75 ± 7.98	37.43 ± 21.37
Sr	107.36 ± 18.36	98.39 ± 31.44	80.52 ± 28.57	113.12 ± 31.88	374.76 ± 137.82	97.87 ± 11.72	79.52 ± 12.10	76.52 ± 9.45	68.78 ± 13.34	58.23 ± 13.97	79.55 ± 17.22	86.11 ± 73.19
Y	41.94 ± 15.64	32.42 ± 9.68	35.15 ± 14.64	31.48 ± 11.82	22.71 ± 15.72	29.55 ± 6.47	36.51 ± 16.21	37.76 ± 39.32	60.55 ± 89.81	32.45 ± 13.02	36.87 ± 15.88	26.61 ± 8.07
Zr	189.20 ± 50.57	171.47 ± 65.52	176.59 ± 31.59	146.95 ± 32.76	289.23 ± 313.41	126.77 ± 45.45	202.86 ± 142.97	194.96 ± 80.86	2921.09 ± 8405.41	236.43 ± 198.64	260.36 ± 250.32	775.24 ± 1813.50
Nb	21.88 ± 2.12	20.71 ± 2.63	18.03 ± 1.47	20.74 ± 5.96	19.92 ± 5.47	24.45 ± 8.52	26.92 ± 8.40	26.82 ± 9.82	29.49 ± 6.47	21.27 ± 4.92	25.03 ± 6.17	13.43 ± 4.71
Mo	.68 ± .30	1.49 ± 2.77	.83 ± .29	1.04 ± .37	.40 ± .20	.95 ± .54	1.27 ± .70	.89 ± .42	1.22 ± .37	1.07 ± .55	.85 ± .51	.59 ± .48
Sn	6.06 ± .58	4.85 ± .43	4.09 ± .58	4.29 ± .94	4.13 ± .72	8.94 ± 4.47	5.34 ± 1.21	4.92 ± .73	12.23 ± 9.58	4.21 ± 1.05	3.80 ± .45	2.89 ± .63
Cs	13.78 ± 2.65	17.55 ± 4.41	9.67 ± .92	11.74 ± 1.31	7.75 ± .78	8.28 ± .34	9.13 ± 1.05	9.13 ± .96	6.33 ± .52	8.49 ± 1.55	5.82 ± .83	3.11 ± 1.11
Ba	343.60 ± 61.78	413.10 ± 75.93	461.93 ± 69.33	413.92 ± 138.22	352.39 ± 65.52	535.61 ± 56.10	471.86 ± 74.95	532.39 ± 53.15	492.01 ± 65.33	476.04 ± 119.11	583.34 ± 49.65	380.83 ± 139.70
La	59.33 ± 9.43	52.86 ± 8.89	46.90 ± 5.28	45.89 ± 9.87	89.10 ± 28.77	50.09 ± 14.20	56.74 ± 15.98	53.58 ± 16.58	45.02 ± 29.45	49.52 ± 14.20	60.58 ± 14.42	20.77 ± 4.92
Ce	118.90 ± 23.39	99.69 ± 20.47	85.82 ± 11.76	80.97 ± 16.49	148.04 ± 64.98	99.73 ± 29.13	114.15 ± 29.93	102.25 ± 27.40	90.46 ± 65.92	92.42 ± 28.81	111.03 ± 27.33	37.50 ± 11.58
Nd	70.77 ± 17.02	57.63 ± 12.89	51.27 ± 8.01	52.15 ± 12.33	73.57 ± 38.02	60.78 ± 13.61	67.94 ± 16.39	61.26 ± 17.01	55.22 ± 47.11	54.82 ± 15.91	69.663 ± 15.79	25.04 ± 6.78
Sm	9.805 ± 3.38	7.55 ± 2.51	7.20 ± 1.38	8.12 ± 2.27	6.21 ± 6.12	8.37 ± 1.08	10.01 ± 2.53	8.43 ± 1.53	6.87 ± 5.68	7.28 ± 2.43	9.77 ± 2.03	4.31 ± 1.43
Eu	2.05 ± .76	1.49 ± .49	1.65 ± .31	1.80 ± .52	1.24 ± 1.52	1.76 ± .29	1.99 ± .56	1.57 ± .23	1.28 ± .76	1.39 ± .47	1.91 ± .42	1.04 ± .31
Tb	1.20 ± .49	.88 ± .23	.90 ± .14	.99 ± .35	.77 ± 1.02	1.02 ± .19	1.30 ± .92	.93 ± .26	.81 ± .65	.86 ± .25	1.12 ± .32	.66 ± .18
Dy	7.22 ± 2.94	5.30 ± 1.18	5.78 ± .80	5.87 ± 1.97	4.67 ± 5.17	6.29 ± 1.44	7.78 ± 6.37	5.64 ± 1.48	5.20 ± 4.78	5.27 ± 1.87	6.32 ± 1.54	4.32 ± 1.16
Yb	4.14 ± 1.14	3.27 ± .51	3.63 ± .45	3.13 ± .87	3.02 ± 2.92	3.67 ± 1.26	4.08 ± 2.16	3.51 ± 1.03	3.93 ± 5.35	3.41 ± 1.55	3.52 ± .68	3.56 ± 1.65
Lu	.62 ± .15	.54 ± .08	.53 ± .08	.46 ± .13	.45 ± .45	.50 ± .16	.56 ± .26	.531 ± .22	.60 ± .83	.52 ± .26	.54 ± .11	.62 ± .38
Ta	1.60 ± .32	1.96 ± .46	1.41 ± .25	1.55 ± .42	2.12 ± 1.82	1.68 ± .64	2.17 ± .91	2.04 ± .55	3.13 ± 1.47	1.57 ± .38	2.03 ± .65	1.48 ± .87
Bi	.66 ± .30	.48 ± .13	.44 ± .32	.37 ± .13	.35 ± .12	.36 ± .25	.29 ± .19	.25 ± .28	.27 ± .31	.26 ± .25	.26 ± .24	.24 ± .15
Th	19.03 ± 1.94	16.34 ± 1.87	14.85 ± 1.15	13.96 ± 8.28	12.67 ± 3.53	14.39 ± 2.99	16.13 ± 4.97	15.64 ± 3.37	14.65 ± 4.62	15.27 ± 6.72	14.65 ± 2.18	8.17 ± 2.15
U	5.06 ± .92	5.14 ± 1.25	4.14 ± .40	3.00 ± .72	3.01 ± 1.84	4.00 ± .77	4.96 ± 1.52	4.18 ± .52	6.17 ± 4.68	4.58 ± .93	4.09 ± .61	3.00 ± 1.51