U.S. DEPARTMENT OF THE INTERIOR

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GEOCHEMICAL DATA FOR JURASSIC DIABASE ASSOCIATED WITH EARLY MESOZOIC BASINS IN THE EASTERN UNITED STATES: CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

By

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CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

Three-hundred seventeen (317) samples of diabase from twelve (12) sheets and fourteen (14) dikes were collected by three (3) workers in Virginia and Maryland and analyzed by the U.S. Geological Survey. Ms. Kathy Mihm, then of the University of Maryland, contributed eleven (11) samples from the Belmont diabase sheet for which partial chemistry is here provided; the balance of the chemistry (major- and selected trace-element data) is documented in Mihm (1986). James M. McNeal, assisted by Kristin O. Dennen, both of the U.S.G.S., provided seven (7) new whole rock analyses from the East Gainesville sheet. Froelich and Gottfried, U.S.G.S., collected two hundred ninety-nine (299) whole rock samples from twelve (12) sheets and fourteen (14) dikes, for most of which complete chemistry is documented here, although for some closely spaced cores of the Belmont sheet, only partial chemistry of minor and trace elements is provided. Additional U.S.G.S. diabase analyses from the northern Culpeper basin based on earlier studies are documented in Lee and others (1984).

The palladium (Pd) and platinum (Pt) abundances and ratios of the chilled margins of many of the sheets and dikes are typical of those in the high Ti, quartz-normative (HTQ) magmas throughout the province, while others are characteristic of the low Ti, quartz-normative (LTQ) magmas. The Pd and Pt abundances and ratios of the olivine normative (ON) magma is similar to the HTQ magma, although Pd abundance generally exceeds Pt in the interior as well as the chilled margins of some of the plugs. Abundances of Pt are consistently greater than Pd in the orthopyroxene zone of the HTQ sheets, and Pd is greater than Pt in the late-stage ferrogabbro differentiates. A significant zone of Pd enrichment was discovered in a ferrogabbro-ferrodiorite-granophyre section of the Belmont sheet (See Tables 2c, 2e, 2f, 2g, 2i, 2k, 2l, 2o, 2p, 2q, and 2s), which is discussed in the publication by Froelich and others (1991). Many other zones of ferrogabbro-granophyre differentiates are present in the Culpeper basin, most notably in the Germanna Bridge sheet (Tables 9a, 9b). Ratios of Pd/Pt commonly exceed 3.0, but no significant zones of Pd enrichment were sampled; however, many thick zones and large areas of ferrogabbro, ferrodiorite and granophyric differentiates are present that were not sampled during the course of this geochemical reconnaissance.

References

Froelich, A.J., Woodruff, L.G., Belkin, H.E., and Gottfried, David, 1991, Concentration and zonation of copper and palladium in the Mesozoic Belmont diabase sheet, Culpeper basin, northern Virginia --an exploration guide to enrichment of precious metals in mafic magmatic rocks, in U.S.G.S. Research on Mineral Resources - 1991, Programs and Abstracts, U.S. Geological Survey Circular 1062, p. 26-29.

Lee, K.Y., Leavy, B.D., and Gottfried, D., 1984, Geochemical data for Jurassic diabase and basalt of the northern Culpeper basin, Virginia: U.S. Geological Survey Open-File Report 84-771, 19 p.

Mihm, K.A., 1986, Geochemistry, petrography, and petrogenesis of the Belmont diabase sheet, northern Culpeper basin, Virginia: unpublished M.S. thesis, University of Maryland, College Park, 202 p.

EXPLANATION FOR PLATE 1

Geochemical sample locality

M- ● K.A. Mihm, 1986

JM- ● J.M. McNeal, USGS, 1986

● ✦ Froelich and Gottfried, USGS, 1984; 1985; 1986; 1987; 1989; 1990

✦ Corehole

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Boyds sheet, Maryland-Coreholes
		Table 1a, 1b, 1c
		(distance above lower contact, in feet)
B11-99′	High Ti, quartz normative	125′ Diabase, cumulate
B11-139′	"	85′ " "
B11-164′	"	60′ Diabase, aphyric
B11-186′	"	38′ "
B11-212′	"	12′ "
B11-220′	"	4′ "
B11-222′	"	2′ "
B11-224′	"	0′ Diabase, chilled base
B2A-9′	"	449′ Diabase, cumulate
B2A-18′	"	440′ "
B2A-32′	"	426′ "
B2A-57′	"	401′ "
B2A-74′	"	384′ "
B2A-85′	"	373′ "
B2A-101′	"	357′ "
B2A-113′	"	345′ Pegmatite
B2A-114′	"	344′ Diabase, cumulate
B2A-148′	"	310′ "
B2A-170.5′	"	288′ "
B2A-207′	"	251′ "
B2A-209′	"	249′ Pegmatite
B2A-230.5′	"	227′ Diabase, cumulate
B2A-241′	"	216′ "
B2A-265′	"	192′ "
B2A-286′	"	171′ "
B-9-7-123′	"	0 Diabase, chilled base

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	SAMPLE DESCRIPTION
		Belmont sheet - Table 2a
FG-86-51	High Ti, quartz normative	Chilled margin
FG-86-52	"	Orthopyroxene cumulate
		Belmont sheet (K. Mihm samples) - Table 2a
ST-08	"	Orthopyroxene cumulate
ST-09	"	"
ST-12	"	"
L-82	"	Chilled margin
L-93	"	"
L-83	"	Granophyre ferrodiorite - Table 2b
L-96	"	"
L-129	"	"
GC QK	"	Ferrogabbro - Table 2b
L-27	"	Granophyre
L-28	"	Ferrogabbro

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Belmont sheet core hole W-886 (depth below surface, in feet) Table 2c, 2d, 2e
886-1 (70.5′)	High Ti, quartz normative	Ferrogabbro
886-2 (182′)	"	"
886-3 (217′)	"	"
886-4 (232′)	"	"
886-39.5′	"	"
886-45.5′	"	"
886-61	"	Gabbro, sheared
886-64.5′	"	Ferrogabbro
886-75′	"	"
886-81′	"	"
886-85.5′	"	"
886-90.5′	"	"
886-95′	"	"
886-100.5′	"	"
886-162.5′	"	"
886-176′	"	"
886-186′	"	"
886-189′	"	"
886-196.5′	"	"
886-200′	"	"
886-205′	"	"
886-209.5′	"	Diorite-granophyre
886-240′	"	Gabbro

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Belmont sheet, core hole W-887 (depth below surface, in feet) Table 2f, 2g, 2h
887-1 (48.5′)	High Ti, quartz normative	Ferrogabbro
887-2 (70.5′)	"	"
887-3 (115.3′)	"	"
887-4 (155.5′)	"	"
887-5 (164.5′)	"	Ferrodiorite-granophyre
887-6 (212′)	"	"
885-7 (223′)	"	"
887-8 (250′)	"	"
887-9 (261′)	"	"
887-10 (264′)	"	"
887-40′	"	Ferrogabbro
887-45′	"	"
887-50′	"	"
887-55′	"	Ferrodiorite
887-59.5′	"	"
887-65′	"	"
887-75′	"	"
887-86′	"	"
887-101′	"	"
887-145.8′	"	"
887-180′	"	Ferrogabbro
887-185′	"	"
887-269′	"	Diorite
887-275′	"	"
887-286.5′	"	Ferrodiorite
887-296.5′	"	"
887-300′	"	"

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Belmont sheet, core hole W-888 (depth below surface, in feet) Table 2i, 2j, 2k, 2l, 2m, 2n, 2o
888-1 (75′)	High Ti, quartz normative	Ferrogabbro
888-2 (105′)	"	Diorite granophyre
888-3 (134′)	"	Ferrogabbro
888-4 (155′)	"	Ferrodiorite
888-5 (168′)	"	Granophyre
888-6 (172′)	"	"
888-7 (185′)	"	Ferrodiorite granophyre
888-8 (190′)	"	"
888-9 (221′)	"	"
888-10 (228′)	"	"
888-11 (231′)	"	"
888-12 (305′)	"	"
888-13 (315′)	"	"
888-14 (353′)	"	"
888-15 (366′)	"	"
888-16 (373′)	"	Granophyre
888-17 (384′)	"	"
888-18A (398′)	"	"
888-18B (398′)	"	"
888-19 (401′)	"	Diabase
888-20 (423.5′)	"	"
888-21 (466′)	"	"
888-22 (482′)	"	"
888-44.5′	"	Ferrogabbro
888-50′	"	"
888-70′	"	"
888-79.5′	"	"
888-101.5′	"	Diorite granophyre
888-106′	"	"
888-109′	"	"
888-110′	"	Ferrodiorite
888-112.5′	"	"
888-115.5′	"	"
888-118′	"	Ferrogabbro
888-119′	"	Ferrodiorite
888-125′	"	Ferrogabbro
888-128′	"	"
888-129′	"	"
888-136.5′	"	"
888-138.5′	"	"
888-141′	"	"
888-147′	"	Ferrodiorite
888-159′	"	Granophyre
888-171′	"	"

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Belmont sheet, core hole W-888 (continued)
888-2A (112.5′)	High Ti, quartz normative	Ferrodiorite
888-2B (131.5′)	"	Ferrogabbro
888-3A (154.9′)	"	Ferrodiorite
888-10A (242′)	"	Ferrodiorite granophyre
888-11A (293′)	"	"
888-81	"	Ferrogabbro
888-84	"	Granophyre with veins
888-86.5	"	"
888-92	"	"
888-95	"	"
888-99.5	"	"
888-103.5	"	"

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Belmont sheet, core hole W-889 (depth below surface, in feet) Table 2p, 2q
889-52′	High Ti, quartz normative	Ferrogabbro
889-56′	"	"
889-72′	"	"
889-77.5′	"	"
889-97.5′	"	"
889-101′	"	"
889-108′	"	"
889-114.5′	"	"
889-118.5′	"	"
889-123.5′	"	"
889-124.5′	"	Ferrodiorite granophyre
889-129′	"	"
889-130.5′	"	Ferrogabbro
889-137′	"	"
889-140.5′	"	"
889-147.5′	"	"
889-155′	"	"
889-158′	"	"
889-164′	"	"
889-168′	"	"

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLE
		Belmont sheet, core hole W-890 (depth below surface, in feet) Table 2r, 2s
890-1 (185′)	High Ti, quartz normative	Granophyre
890-48.5′	"	Ferrodiorite
890-55′	"	"
890-79′	"	"
890-95.5′	"	"
890-127′	"	Ferrodiorite granophyre
890-133′	"	Ferrodiorite
890-140′	"	Ferrogabbro
890-141.5′	"	"
890-144.5′	"	"
890-152′	"	"
890-157.5′	"	Ferrodiorite granophyre
890-174.5′	"	"

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	SAMPLE DESCRIPTION
		Herndon sheet, Sterling area Table 3
FG-90-St-1	High Ti, quartz normative	Ferrogabbro
FG-90-St-2	"	"
FG-90-St-3	"	Diorite granophyre
FG-90-St-4	"	Ferrogabbro
FG-90-St-5	"	Diorite
FG-90-St-6	"	"
FG-90-St-7A	"	Granophyre
FG-90-St-7B	"	Diabase
		Centerville sheet, Table 4
FG 85-23	"	Cumulate
FG 85-24	"	"
		Union Mill plug (altered samples)
FG 85-25	"	Cumulate
FG 85-26	"	"
FG 85-27	"	"
FG 85-28	"	"
		East Gainesville sheet core hole - Table 5a
RD 16-139.2′	"	Fine-grained chilled margin
RD 16-140′	"	"
RD 15-142.5′	"	"
FG 85-39	"	Diabase
FG 85-40	"	"
FG 85-41	"	"
		East Gainesville sheet, core hole (depth below surface in feet) Table 5b
V 16-19′	"	Granophyric diabase
V 16-25′	"	"
V 16-45′	"	"
V 16-51′	"	"
V 16-69′	"	"
V 16-103′	"	"
V 16-122′	"	"
V 16-156′	"	"

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	SAMPLE DESCRIPTION
		East Gainesville sheet (J. McNeal samples) - Table 5c
JM 86-16	High Ti, quartz normative	Ferrogabbro
JM 86-17	"	"
JM 86-13	"	"
JM 86-15	"	"
JM 86-18	"	"
JM 86-19	"	"
JM 86-14	"	"
		Nokesville sheet, corehole - Table 6a (depth below surface, in feet)
57-10′	"	Diabase
57-40′	"	"
57-90′	"	"
57-120′	"	"
57-230′	"	"
57-280′	"	"
57-320′	"	"
57-330′	"	"
57-340′	"	"
57-346′	"	"
		Nokesville sheet, core hole - Table 6b (depth below surface, in feet)
39 V-22′	"	Diabase
39 V-50′	"	"
39 V-90′	"	"
39 V-140′	"	"
39 V-200′	"	"
39 V-240′	"	"
39 V-249.5′	"	"
39 V-270′	"	"
39 V-280′	"	"
39 V-283′	"	"
		Tinpot sheet - Table 7
FG-87-54A	Low Ti, quartz normative	Diabase
FG-87-54B	"	"
FG-87-55A	"	"
FG-87-55B	"	"
		Catlett sheet - Table 7
FG-85-32	"	"

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	SAMPLE DESCRIPTION
		Remington diabase sheet - Table 8
FG-85-R2	Low Ti, quartz normative	Diabase
FG-85-R3	"	"
FG-85-R4	"	"
FG-85-R5	"	"
FG-85-R6	"	"
FG-85-R7	"	"
FG-85-R8	"	"
FG-85-R9	"	"
		Germanna Bridge sheet
		Berry Hill area - Table 9a
FG-84-20B	High Ti, quartz normative	Ferrogabbro
FG-84-20A1	"	Granophyre
FG-84-20A2	"	"
FG-84-20A3	"	Diabase
FG-89-62	"	Ferrogabbro
FG-89-63A	"	"
FG-89-64	"	Granophyre
FG-89-64A	"	Ferrogabbro
		Germanna Bridge sheet - Table 9b
FG-84-2A	"	Ferrogabbro
FG-84-2B	"	Granophyre
FG-84-3	"	Cumulate
FG-84-5	"	"
FG-84-21	"	"
FG-85-33	"	Diabase
FG-85-34	"	"
FG-85-38	"	"
		Rapidan sheet, state route 655
		Table 10a
K-2	"	Cumulate
K-3	"	"
K-4	"	"
K-4A	"	"
K-5	"	"
K-6	"	"
K-7	"	Chilled margin (lower)
		Rapidan sheet - Table 10b
FG-85CE-2A	"	Cumulate
FG-85CE-3	"	"
FG-85CE-5	"	"
522A	"	Chilled margin (upper)
522B	"	Granophyre
FG-84-8A	"	Basal chilled margin
FG-84-8B	"	Cumulate

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	SAMPLE DESCRIPTION
		Rapidan sheet, Mt. Pony Table 10c
FG-84-4	High Ti, quartz normative	Cumulate
FG-84-6	"	" (same as RA-A1)
FG-84-14	"	Near chill, altered Rapidan sheet
F-84-11	"	Cumulate
F-84-12	"	"
		Dickerson dike - Table 11a
MD-84-1	Low Ti-quartz normative	Diabase dike, eastern chilled margin
MD-84-3	"	Diabase 18′ west of eastern chilled margin
MD-84-5	"	" 36′ "
MD-84-6	"	" 45′ "
MD-84-7	"	" 54′ "
MD-84-8	"	" 70′ "
MD-84-10	"	" 90′ "
MD-84-11	"	" 100′ "
MD-84-12	"	" 109′ "
MD-84-13	"	" 118′ "
MD-84-14	"	" 127′ "
MD-84-15	"	" 151′ "
MD-84-16	"	" 163′ "
MD-84-17	"	" 171′ west of eastern chilled margin (3′east of western chilled margin)
		Lucketts dike - Table 11b
FG-86-50	High Ti, quartz normative	Diabase
		Seneca dike - Table 11b
FG-85-31	"	Diabase
		Shorthill dike - Table 11b
VA-89-317A	Olivine normative	Diabase
VA-89-317B	"	"
		Bristersburg plug - Table 11c
FG-86-48	High Fe, quartz normative	Diabase
FG-86-49	"	"
		Carriage Ford, composite (?) dike Table 11c
CF-87-2	Olivine normative	Picrite
FG-85-35	High Ti, quartz normative (?)	Altered?

CULPEPER BASIN AND VICINITY, VIRGINIA AND MARYLAND

SAMPLE NO.	MAGMA TYPE	SAMPLE DESCRIPTION
		St. Stephens dike - Table 11c
SS-87-1	Olivine normative	Diabase
		Buckland dike - Table 11c
BU-87-2	Low Ti, quartz normative	Diabase
FG-86-43	"	"
		Aldie, composite (?) dike - Table 11d
FG-87-56	Olivine normative	Diabase
FG-87-57	"	"
FG-87-58	High Ti, quartz normative(?)	Altered?
FG-87-59	Olivine normative	Diabase
FG-89-61A	Low Ti, quartz normative(?)	Altered?
FG-89-61B	Olivine normative	Diabase
		Haymarket dike - Table 11d
FG-86-44	"	Diabase
HM-87-1	"	"
		Subsurface dike or sheet, USGS Opal No. 1 core hole (depth below surface, in feet) - Table 11e
OP-89-15 (229′)	Olivine normative	Diabase, fine-grained, 9 ft below top
OP-89-14 (237′)	"	" medium
OP-89-1 (246′)	"	" coarse
OP-89-2 (252′)	"	" aphanitic, 1.5 ft. above base

Table 1a. Culpeper basin and vicinity, Virginia and Maryland. Boyds sheet, Maryland.

	W-223030 B11 99	W-223031 B11 139	W-223032 B11 164	W-223033 B11 186	W-223034 B11 212	W-223035 B11 220	W-223036 B11 222	W-223037 B11 224
Lat.	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N
Long.	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W
SiO_2 (%)	52.40	52.00	52.30	52.50	51.90	51.50	51.90	51.90
TiO_2	0.82	0.94	1.00	1.10	1.10	1.10	1.10	1.10
Al_2O_3	11.60	13.10	13.80	14.00	13.70	13.80	14.00	13.90
Fe_2O_3	1.80	1.60	1.60	2.10	2.20	2.60	2.50	2.90
FeO	9.10	8.60	8.60	8.40	8.20	7.00	7.90	7.50
MnO	0.19	0.18	0.19	0.18	0.21	0.23	0.34	0.32
MgO	13.00	10.10	8.50	8.10	8.00	7.50	7.40	7.50
CaO	9.60	10.70	10.80	10.90	10.50	10.70	10.60	10.20
Na_2O	1.13	1.27	1.29	1.48	1.32	1.75	1.48	1.28
K_2O	0.50	0.62	0.70	0.62	0.54	0.86	0.72	0.76
P_2O_5	0.12	0.13	0.14	0.15	0.15	0.17	0.16	0.15
H_2O^+	0.21	0.43	0.59	0.75	0.88	1.00	1.20	1.40
H_2O^-	0.31	0.32	0.31	0.35	0.42	0.36	0.41	0.40
CO_2	0.03	0.03	0.03	0.04	0.03	0.13	0.03	0.04
Σ	100.81	100.02	99.85	100.67	99.15	98.70	99.74	99.35
Sc (ppm)	36	36	36	36	36	36	37	36
Cr	650	530	400	360	390	271	294	299
Co	63	52	49	47	47	42	46	45
Ni	190	170	130	110	95	95	99	97
Cu	91	94	112	117	115	144	123	157
Zn	85	229	88	83	81	144	114	259
Rb	13.0	18.0	19.0	20.0	23.0	32	22.0	33
Sr	141	164	170	168	180	237	183	234
Sb	<0.80	<0.80	<0.80	<0.70	<0.80	<0.80	0.52	<0.80
Cs	0.80	0.77	1.00	1.10	1.10	0.94	1.40	1.30
Ba	111	145	157	152	169	227	207	246
Y	20.0	20.0	21.0	25.0	24.0	25.0	24.0	28.0
La	7.1	8.5	9.9	10.1	10.0	11.8	10.7	10.6
Ce	15.5	18.8	20.7	21.2	21.5	26.8	22.6	23.1
Nd	13.0	<20.0	12.0	<20.0	17.0	16.0	15.0	13.0
Sm	2.40	2.77	3.2	3.2	3.3	3.7	3.4	3.4
Eu	0.73	0.87	0.97	10.00	10.00	1.12	1.02	1.00
Tb	0.39	0.51	0.52	0.60	0.57	0.61	0.61	0.61
Yb	1.60	1.80	1.94	2.07	2.07	2.31	1.97	2.13
Lu	0.240	0.267	0.296	0.31	0.31	0.33	0.32	0.31
Zr	75	87	96	97	102	111	111	115
Hf	1.72	2.02	2.31	2.41	2.34	2.58	2.52	2.53
Nb	4.1	5.1	7.0	7.2	5.7	6.6	6.1	5.7
Ta	0.38	0.46	0.44	0.48	0.47	0.54	0.53	0.47
Th	1.53	1.74	1.97	1.97	2.00	2.20	2.10	2.04
U	<1.00	<0.60	<1.00	0.62	<1.00	0.59	0.57	<1.00
Pd (ppb)	8.3	9.6	11.0	11.0	11.0	10.0	11.0	11.0
Pt	22.0	17.0	13.0	13.0	13.0	13.0	13.0	15.0
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 1b. Boyds sheet, Maryland.

	W-223038 B2A 9	W-223039 B2A 18	W-223040 B2A 32	W-223041 B2A 57	W-223042 B2A 74	W-223043 B2A 85	W-223044 B2A 101	W-223045 B2A 113	W-223046 B2A 114	W-223047 B2A 148
Lat.	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N
Long.	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W
SiO_2 (%)	51.70	51.60	52.20	52.30	52.30	52.10	51.90	55.50	52.70	52.50
TiO_2	0.66	0.78	0.75	0.76	0.68	0.69	0.74	2.60	0.85	0.66
Al_2O_3	14.70	12.70	13.00	13.70	12.20	13.20	13.40	13.20	11.30	12.40
Fe_2O_3	1.40	1.40	1.60	1.40	1.40	1.50	1.50	4.60	1.80	1.60
FeO	7.40	8.20	7.80	7.60	8.30	7.80	7.80	6.80	9.50	7.80
MnO	0.17	0.18	0.17	0.16	0.18	0.17	0.17	0.22	0.20	0.18
MgO	10.20	10.80	10.90	10.30	12.10	11.40	10.80	3.90	12.30	12.40
CaO	11.60	10.60	11.00	10.50	10.60	10.70	11.00	7.20	10.00	10.80
Na_2O	1.35	1.35	1.21	1.29	1.01	1.48	1.28	2.02	0.73	0.94
K_2O	0.22	0.36	0.30	0.32	0.50	0.30	0.44	1.20	0.32	0.24
P_2O_5	0.09	0.10	0.10	0.12	0.08	0.08	0.09	0.64	0.10	0.08
H_2O^+	0.49	0.54	0.42	0.56	0.61	0.66	0.61	1.10	0.46	0.33
H_2O^-	0.22	0.21	0.21	0.20	0.21	0.20	0.24	0.47	0.26	0.24
CO_2	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02
Σ	100.23	98.84	99.68	99.24	100.19	100.30	99.99	99.48	100.54	100.19
Sc (ppm)	35	37	37	34	38	36	36	24.0	39	36
Cr	490	590	620	560	670	660	630	56	650	720
Co	48	52	50	49	55	52	50	35	58	53
Ni	150	160	160	150	170	160	140	45	190	180
Cu	65	84	78	87	78	71	85	200	98	60
Zn	78	74	71	63	76	69	68	76	73	63
Rb	14.0	12.0	17.0	16.0	8.0	10.0	14.0	31	14.0	10.0
Sr	177	155	153	172	142	159	166	181	139	144
Sb	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.60	<0.80	<0.80
Cs	0.40	0.57	0.51	0.71	0.45	0.46	0.51	0.63	0.41	0.44
Ba	109	117	126	138	109	111	115	250	113	96
Y	17.0	20.0	19.0	18.0	14.0	17.0	18.0	48	20.0	17.0
La	5.4	6.8	6.9	7.9	5.3	5.7	7.0	38	6.4	5.4
Ce	12.1	15.4	14.9	16.4	12.6	13.0	15.0	75	14.7	11.7
Nd	<20.0	<20.0	14.0	<20.0	13.0	<20.0	<20.0	38	<20.0	10.0
Sm	1.90	2.39	2.21	2.40	2.00	1.97	2.23	9.2	2.30	1.80
Eu	0.63	0.72	0.74	0.78	0.63	0.66	0.73	1.81	0.75	0.58
Tb	0.33	0.45	0.39	0.37	0.39	0.36	0.40	1.39	0.41	0.36
Yb	1.19	1.50	1.40	1.40	1.30	1.40	1.38	4.3	1.58	1.30
Lu	0.191	0.237	0.226	0.230	0.199	0.211	0.210	0.63	0.280	0.210
Zr	63	71	73	75	60	66	70	330	71	59
Hf	1.32	1.70	1.59	1.79	1.45	1.37	1.62	8.2	1.55	1.28
Nb	3.0	4.2	3.4	4.7	2.90	3.0	3.4	25.0	3.9	3.1
Ta	0.290	0.36	0.38	0.39	0.33	0.30	0.35	1.85	0.34	0.260
Th	1.00	1.40	1.30	1.52	1.00	1.10	1.29	8.3	1.21	0.95
U	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.50	<2.00	<2.00
Pd (ppb)	5.8	7.7	6.5	7.6	5.7	7.0	6.4	1.10	8.4	5.0
Pt	14.0	14.0	18.0	16.0	16.0	15.0	16.0	1.20	19.0	9.3
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 1c. Boyds sheet, Maryland.

	W-223048 B2A 170.5	W-223049 B2A 207	W-223050 B2A 209	W-223051 B2A 230.5	W-223052 B2A1 241	W-223053 B2A 265	W-223054 B2A 286	W-223055 B9 123
Lat.	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N	39°10'N
Long.	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W	77°19'W
SiO_2 (%)	52.70	52.70	52.30	52.70	52.10	52.40	52.60	52.30
TiO_2	0.65	0.60	1.30	0.60	0.52	0.66	0.68	1.10
Al_2O_3	12.10	12.20	14.30	11.80	13.60	11.80	11.70	14.00
Fe_2O_3	1.80	1.30	3.20	1.40	1.30	1.30	1.60	2.10
FeO	8.00	7.90	7.00	8.10	7.30	8.20	8.00	8.40
MnO	0.15	0.17	0.16	0.19	0.16	0.18	0.18	0.18
MgO	13.10	12.60	7.20	12.70	11.90	12.20	12.30	7.60
CaO	10.70	10.50	10.30	11.50	11.20	11.30	11.30	10.70
Na_2O	1.35	1.30	1.28	1.30	1.12	1.00	1.48	1.62
K_2O	0.24	0.14	0.50	0.24	0.20	0.20	0.30	0.54
P_2O_5	0.08	0.09	0.24	0.08	0.07	0.09	0.09	0.15
H_2O^+	0.50	0.41	0.70	0.35	0.33	0.51	0.40	0.30
H_2O^-	0.24	0.22	0.50	0.29	0.23	0.25	0.25	0.28
CO_2	0.03	0.01	0.03	0.02	0.02	0.02	0.01	0.04
Σ	101.64	100.14	99.01	101.27	100.05	100.11	100.89	99.31
Sc (ppm)	38	37	31	40	36	40	41	37
Cr	760	760	187	720	740	770	730	289
Co	55	53	43	54	51	54	54	45
Ni	180	160	91	170	170	170	160	87
Cu	63	59	102	57	53	70	64	117
Zn	66	66	62	66	61	80	82	85
Rb	11.0	9.0	27.0	14.0	10.0	18.0	12.0	20.0
Sr	142	139	188	139	156	141	138	179
Sb	<0.80	<0.80	0.37	<0.80	<0.80	<0.80	<0.80	<0.80
Cs	0.48	0.45	0.86	0.52	0.42	0.48	0.53	0.92
Ba	90	97	170	83	85	89	111	181
Y	16.0	14.0	31	16.0	14.0	20.0	17.0	26.0
La	5.2	5.1	14.8	4.9	4.2	5.4	5.9	11.3
Ce	11.8	11.8	31	10.7	9.6	12.1	12.4	23.8
Nd	<20.0	<20.0	20.0	<20.0	<20.0	<20.0	11.0	16.0
Sm	1.76	1.80	4.2	1.70	1.50	1.90	2.00	3.4
Eu	0.59	0.59	1.10	0.57	0.55	0.62	0.62	1.04
Tb	0.46	0.31	0.58	0.31	0.260	0.270	0.35	0.63
Yb	1.30	1.10	2.33	1.20	1.00	1.10	1.30	2.06
Lu	0.192	0.186	0.34	0.200	0.161	0.214	0.221	0.32
Zr	59	59	141	58	52	167	67	108
Hf	1.24	1.30	3.4	1.20	0.97	1.30	1.43	2.49
Nb	3.1	3.3	9.9	2.80	2.00	3.7	3.6	7.4
Ta	0.260	0.260	0.64	0.32	0.190	0.220	0.31	0.55
Th	0.94	10.00	3.1	0.88	0.81	1.10	1.12	2.19
U	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<1.00	<2.00
Pd (ppb)	5.5	4.8	6.3	5.2	2.70	5.7	3.3	9.8
Pt	19.0	21.0	5.5	16.0	9.9	21.0	13.0	10.0
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 2a. Belmont sheet, Virginia. Chilled margins and cumulates.

	W-243837 FG-86-51	W-243838 FG-86-52	W-236254 ST-08	W-236255 ST-09	W-236256 ST-12	W-236257 L-82	W-236258 L-93
Lat.	39° 4'N	39° 4'N	39° 4'N	39° 4'N	39° 4'N	39° 1'N	39° 1'N
Long.	77°27'W	77°27'W	77°30'W	77°30'W	77°29'W	77°34'W	77°34'W
SiO_2 (%)	52.20	49.10	—	—	—	—	—
TiO_2	1.15	0.42	—	—	—	—	—
Al_2O_3	13.80	16.60	—	—	—	—	—
$Fe_2O_3^*$	—	—	12.27	12.20	11.78	12.01	12.16
Fe_2O_3	2.90	2.43	—	—	—	—	—
FeO	8.20	6.20	—	—	—	—	—
MnO	0.18	0.15	—	—	—	—	—
MgO	7.64	10.30	—	—	—	—	—
CaO	10.90	12.20	13.15	13.71	13.15	11.33	11.89
Na_2O	1.94	1.90	1.81	1.77	2.14	2.08	2.12
K_2O	0.40	0.26	—	—	—	—	—
P_2O_5	0.15	0.08	—	—	—	0.18	0.16
H_2O^+	1.00	0.62	—	—	—	—	—
H_2O^-	0.20	0.20	—	—	—	—	—
CO_2	0.01	0.03	—	—	—	—	—
S	0.04	0.03	—	—	—	0.02	<0.01
F	0.02	0.01	—	—	—	0.03	0.02
Cl	0.01	<0.00	—	—	—	0.01	0.02
Σ	100.74	100.53	—	—	—	—	—
B (ppm)	5.2	17.4	—	—	—	—	—
Sc	38	38	45	45	41	39	39
Cr	310	640	238	252	128	310	264
Co	49	49	56	56	51	49	46
Ni	77	165	110	110	81	91	65
Cu	102	54	80	61	67	97	85
Zn	70	58	69	69	56	79	71
Ga	19.0	15.0	—	—	—	—	—
As	1.30	<1.10	<5.0	1.90	<3.0	2.10	3.6
Rb	7.0	7.0	19.0	21.0	15.0	14.0	27.0
Sr	220	156	180	173	199	172	215
Ag	—	—	0.034	0.042	0.041	0.065	0.048
Sb	0.130	<0.40	<0.70	<0.70	<0.60	<0.60	<0.60
Cs	<0.230	<0.220	0.61	0.56	0.62	0.95	0.74
Ba	176	69	120	106	129	110	182
Y	22.0	16.0	21.0	24.0	19.0	29.0	30
La	11.5	4.1	7.6	7.0	8.1	11.2	11.8
Ce	25.0	8.2	16.0	15.0	18.0	24.0	25.0
Nd	12.0	6.8	8.2	10.0	9.5	11.0	12.0
Sm	3.6	1.53	2.65	2.50	2.70	3.6	3.8
Eu	1.10	0.49	0.86	0.82	0.97	1.10	1.16
Tb	0.73	0.38	0.49	0.48	0.50	0.66	0.73
Yb	2.20	2.00	1.80	1.70	1.90	2.30	2.40
Lu	0.34	0.30	0.270	0.260	0.280	0.32	0.36
Zr	96	52	76	72	76	104	107
Hf	2.70	0.96	1.90	1.60	1.90	2.60	2.80
Nb	7.5	1.80	4.6	4.1	5.0	6.2	7.4
Ta	0.57	<0.110	0.42	0.33	0.43	0.55	0.50
Th	2.30	0.60	1.60	1.50	1.70	2.20	2.20
U	0.52	<0.30	0.42	<0.80	0.32	0.41	0.49
Pd (ppb)	5.2	4.4	—	—	—	—	—
Pt	7.5	5.5	—	—	—	—	—
Au	<5.0	5.7	<16.0	<16.0	<11.0	9.3	<13.0

Table 2b. Belmont sheet, Virginia. Granophyres and ferrogabbros.

	W-236248 GCQK	W-236249 L-27	W-236250 L-28	W-236251 L-83	W-236252 L-96	W-236253 L-129
Lat.	39° 0'N	39° 4'N	39° 4'N	39° 1'N	39° 1'N	39° 1'N
Long.	77° 0'W	77°31'W	77°31'W	77°33'W	77°34'W	77°33'W
$Fe_2O_3^*$ (%)	17.73	8.67	17.16	13.00	13.17	12.96
CaO	8.67	4.34	10.07	8.25	9.93	9.79
Na_2O	2.37	4.27	2.55	3.33	2.55	2.97
P_2O_5	0.34	0.30	0.22	0.27	0.19	0.20
S	0.02	0.09	0.01	<0.01	0.02	<0.01
F	0.04	0.04	0.03	0.04	0.03	0.03
Cl	0.12	0.03	0.02	0.15	0.11	0.14
Sc (ppm)	41	15.4	40	29.9	39	33
Cr	15.0	<7.0	14.0	4.6	84	5.1
Co	52	17.3	55	38	47	41
Ni	42	12.0	49	24.0	62	30
Cu	186	600	190	147	49	170
Zn	70	47	87	128	48	79
As	2.80	4.3	<2.70	3.4	<2.70	3.2
Rb	50	70	36	97	35	51
Sr	220	184	214	480	254	286
Ag	0.030	0.30	0.076	0.074	0.0250	0.074
Sb	0.48	0.220	<0.60	<0.50	<0.60	<0.60
Cs	1.40	0.52	2.50	1.00	1.80	1.80
Ba	297	420	228	490	181	310
Y	41	77	32	41	29.0	32
La	23.1	54	16.0	21.4	13.0	17.6
Ce	49	106	34	45	27.0	38
Nd	25.0	47	18.0	20.0	14.0	20.0
Sm	7.2	12.6	5.1	6.1	4.1	5.1
Eu	1.86	2.45	1.51	1.74	1.33	1.70
Tb	1.29	2.16	0.91	1.10	0.81	0.91
Yb	4.0	7.9	3.3	3.5	2.60	3.2
Lu	0.59	1.10	0.45	0.52	0.39	0.43
Zr	185	470	136	184	113	140
Hf	5.6	12.7	4.0	4.9	3.4	4.0
Nb	14.0	26.0	11.0	14.0	8.3	11.0
Ta	1.30	2.43	0.90	1.10	0.71	0.91
Th	4.9	13.4	3.3	4.4	2.60	3.8
U	1.10	2.70	0.86	0.91	0.87	0.80
Pd (ppb)	—	—	—	10.0	10.0	8.3
Pt	—	—	—	5.6	6.6	5.0
Au	<14.0	<9.0	26.0	14.0	7.8	7.4

Table 2c. Belmont sheet, Virginia. Corehole W-886.

	W-241910 886-1	W-241911 886-2	W-241912 886-3	W-241913 886-4	W-246914 886-39.5	W-246915 886-45.5	W-246916 886-61	W-246917 886-64.5	W-246918 886-75
Lat.	39° 0'N	39° 0'N	39° 0'N	39° 0'N	39° 0'N	39° 0'N	39° 0'N	39° 0'N	39° 0'N
Long.	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W
SiO_2 (%)	50.50	51.10	53.80	53.40	—	—	—	—	—
TiO_2	3.47	3.69	2.40	2.50	—	—	—	—	—
Al_2O_3	11.30	11.70	13.90	12.90	—	—	—	—	—
Fe_2O_3	4.49	4.89	3.50	3.34	—	—	—	—	—
FeO	14.10	13.10	11.00	11.40	—	—	—	—	—
MnO	0.26	0.23	0.21	0.21	—	—	—	—	—
MgO	2.99	3.37	2.43	2.71	—	—	—	—	—
CaO	8.40	8.51	8.04	6.59	—	—	—	—	—
Na_2O	2.57	2.67	2.95	3.68	—	—	—	—	—
K_2O	1.04	1.04	1.48	1.60	—	—	—	—	—
P_2O_5	0.57	0.23	0.29	0.27	—	—	—	—	—
H_2O^+	0.88	0.29	0.95	1.80	—	—	—	—	—
H_2O^-	0.32	0.17	0.15	0.18	—	—	—	—	—
CO_2	0.04	0.03	0.04	0.02	—	—	—	—	—
S	0.06	0.02	0.06	0.02	—	—	—	—	—
F	0.06	0.03	0.04	0.04	—	—	—	—	—
Cl	0.03	0.06	0.18	0.15	—	—	—	—	—
Σ	101.08	101.13	101.42	100.82	—	—	—	—	—
B (ppm)	13.0	11.0	17.0	14.0	—	—	—	—	—
Sc	41	47	34	33	—	—	—	—	—
V	—	—	—	—	110	100	—	—	94
Cr	3.9	2.70	1.90	<2.60	—	—	—	—	—
Co	55	55	42	44	53	53	55	55	51
Ni	7.0	24.0	5.0	19.0	18.0	12.0	25.0	58	12.0
Cu	470	197	181	138	610	700	770	620	650
Zn	113	109	93	93	—	—	—	—	—
As	2.50	<1.50	2.50	<1.50	—	—	—	—	—
Rb	44	42	61	60	—	—	—	—	—
Sr	195	201	245	280	—	—	—	—	—
Sb	<0.050	0.270	0.31	0.270	—	—	—	—	—
Cs	4.5	1.90	3.2	0.92	—	—	—	—	—
Ba	245	250	350	360	—	—	—	—	—
Y	51	49	46	43	—	—	—	—	—
La	22.0	19.7	23.9	23.4	—	—	—	—	—
Ce	47	41	50	49	—	—	—	—	—
Nd	26.0	20.0	26.0	25.0	—	—	—	—	—
Sm	6.8	5.8	6.8	6.6	—	—	—	—	—
Eu	2.14	1.85	2.03	1.68	—	—	—	—	—
Tb	1.30	1.20	1.20	1.23	—	—	—	—	—
Yb	4.0	3.9	4.2	3.9	—	—	—	—	—
Lu	0.57	0.54	0.58	0.53	—	—	—	—	—
Zr	165	163	183	213	—	—	—	—	—
Hf	4.6	4.7	5.3	5.4	—	—	—	—	—
Nb	18.0	17.0	16.0	16.0	—	—	—	—	—
Ta	1.30	1.30	1.10	1.20	—	—	—	—	—
Th	4.1	4.2	5.2	5.3	—	—	—	—	—
U	0.82	0.98	1.10	0.94	—	—	—	—	—
Pd (ppb)	8.3	290	20.0	13.0	14.0	3.6	11.0	11.0	13.0
Pt	2.60	23.0	5.0	4.2	2.70	1.30	1.50	1.40	1.50
Rh	—	—	—	—	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	—	—	—	—	<0.50	<0.50	<0.50	<0.50	<0.50
Ir	—	—	—	—	<0.50	<0.50	<0.50	<0.50	<0.50
Au	9.5	140	<6.0	14.0	—	—	—	—	—

Table 2d. Belmont sheet, Virginia. Corehole W-886.

	W-246919 886-81	W-246920 886-85.5	W-246921 886-90.5	W-246922 886-95	W-246923 886-100.5
Lat. Long.	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W
V (ppm)	110	—	120	—	—
Co	55	53	55	57	62
Ni	10.0	12.0	17.0	9.0	10.0
Cu	650	730	600	710	720
Pd (ppb)	13.0	14.0	13.0	10.0	13.0
Pt	2.00	1.90	2.00	1.40	3.0
Rh	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	<0.50	<0.50	<0.50	<0.50	<0.50
Ir	<0.50	<0.50	<0.50	<0.50	<0.50

Table 2e. Belmont sheet, Virginia. Corehole W-886.

	W-246924 886 162.5	W-246925 886 176	W-246926 886 186	W-249431 886 189	W-246927 886 196.5	W-246928 886 200	W-249432 886 205	W-249433 886 209.5	W-246929 886 240
Lat. Long.	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W	39° 0'N 77°34'W
B (ppm)	—	—	—	15.0	—	—	10.0	15.0	—
Sc	—	—	—	30	—	—	30	20.0	—
Co	47	53	51	53	45	55	56	42	42
Ni	14.0	13.0	18.0	12.0	14.0	17.0	18.0	11.0	17.0
Cu	670	750	210	170	190	200	190	220	250
Ga	—	—	—	50	—	—	50	70	—
Sr	—	—	—	300	—	—	200	200	—
Ba	—	—	—	300	—	—	200	300	—
Y	—	—	—	30	—	—	30	50	—
Zr	—	—	—	100	—	—	100	150	—
Pd (ppb)	28.0	39	480	130	180	310	130	15	43
Pt	5.9	8.6	26.0	12	8.8	16.0	9.9	3.2	6.6
Rh	<0.50	<0.50	<0.50	6.7	<0.50	<0.50	3.2	0.6	<0.50
Ru	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<1.0	<1.0	<0.50
Ir	<0.50	<0.50	<0.50	<0.5	<0.50	<0.50	<0.5	<0.5	<0.50

Table 2f. Belmont sheet, Virginia. Corehole W-887.

	W-241914 887-1	W-241915 887-2	W-241916 887-3	W-241917 887-4	W-241918 887-5	W-241919 887-6	W-241920 887-7	W-241921 887-8	W-241922 887-9	W-241923 887-10
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W
SiO_2 (%)	49.00	52.80	53.00	53.00	52.40	52.20	52.00	52.60	52.00	52.60
TiO_2	4.79	2.85	2.48	2.33	2.36	2.23	2.00	2.24	2.35	2.01
Al_2O_3	9.88	12.10	13.80	15.00	15.30	15.40	16.10	15.70	15.30	16.40
Fe_2O_3	4.89	4.31	3.90	3.31	3.69	3.10	3.12	3.08	3.46	2.59
FeO	15.80	12.20	10.90	10.40	8.40	8.40	7.20	9.90	10.40	7.90
MnO	0.29	0.24	0.22	0.19	0.16	0.17	0.18	0.19	0.18	0.17
MgO	3.74	2.92	2.59	2.61	2.51	2.60	2.28	2.43	2.57	2.40
CaO	8.75	8.06	8.21	8.32	8.98	9.67	10.10	8.97	8.71	9.24
Na_2O	2.17	2.71	2.87	3.15	3.75	3.79	4.45	3.10	3.09	4.74
K_2O	1.05	1.39	1.37	1.38	1.69	1.55	1.29	1.07	1.19	1.39
P_2O_5	0.23	0.25	0.26	0.20	0.20	0.19	0.19	0.22	0.20	0.19
H_2O^+	0.75	0.96	0.95	1.10	1.00	1.10	1.50	0.88	1.00	1.30
H_2O^-	0.19	0.24	0.15	0.09	0.07	0.14	0.05	0.12	0.10	0.07
CO_2	0.02	0.06	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.04
S	0.04	0.05	0.04	0.04	0.03	0.04	0.04	0.02	0.03	0.03
F	0.04	0.03	0.04	0.03	0.05	0.03	0.04	0.03	0.04	0.04
Cl	0.20	0.22	0.29	0.23	0.15	0.17	0.10	0.23	0.19	0.15
Σ	101.83	101.39	101.10	101.41	100.75	100.81	100.66	100.80	100.82	101.26
B (ppm)	17.0	24.0	22.0	9.6	—	—	—	15.0	16.0	26.0
Sc	54	38	34	32	32	32	29.5	30	32	29.2
Cr	2.40	2.80	1.80	2.00	3.6	3.0	2.60	<3.0	3.6	3.0
Co	63	48	42	41	36	39	31	39	42	31
Ni	19.0	15.0	9.0	11.0	15.0	19.0	16.0	15.0	19.0	13.0
Cu	235	179	180	98	107	132	147	173	139	85
Zn	113	149	141	90	153	99	118	91	74	100
As	4.0	<1.70	2.90	<2.20	3.3	3.3	5.2	3.4	<1.80	4.3
Rb	53	53	50	69	64	68	33	36	54	49
Sr	174	202	246	310	320	340	290	253	265	300
Sb	0.270	0.250	0.33	0.220	0.210	0.210	0.210	0.31	0.200	0.150
Cs	2.60	3.5	2.30	1.10	0.39	0.47	0.220	1.50	1.00	0.31
Ba	261	330	310	330	310	273	248	265	267	237
Y	41	52	39	46	33	43	33	34	40	33
La	18.8	23.2	21.3	20.0	17.9	17.7	17.4	18.1	18.0	17.3
Ce	41	48	44	41	37	37	36	39	37	36
Nd	21.0	25.0	23.0	21.0	19.0	19.0	19.0	20.0	18.0	19.0
Sm	6.2	6.6	6.0	5.6	5.5	5.2	5.1	5.3	5.2	5.3
Eu	1.76	1.87	1.92	1.77	1.75	1.73	1.80	1.71	1.60	1.69
Tb	1.30	1.30	1.15	1.07	1.07	1.01	0.93	1.02	1.04	0.94
Yb	4.5	4.3	3.7	3.6	3.5	3.3	3.1	3.4	3.4	3.2
Lu	0.64	0.58	0.54	0.49	0.49	0.46	0.45	0.46	0.48	0.47
Zr	169	198	157	167	166	150	137	151	151	139
Hf	5.1	5.3	4.9	4.5	4.5	4.0	4.0	4.1	4.2	4.2
Nb	24.0	18.0	16.0	15.0	14.0	15.0	13.0	13.0	14.0	12.0
Ta	1.70	1.30	1.20	1.00	1.10	0.89	0.90	0.92	0.97	0.95
Th	4.0	5.1	4.3	4.0	4.0	3.7	3.7	3.9	3.9	3.8
U	0.73	1.20	0.93	<1.30	1.20	0.64	0.86	0.92	0.80	0.78
Pd (ppb)	130	9.4	21.0	18.0	17.0	18.0	18.0	7.6	15.0	16.0
Pt	15.0	3.5	5.0	4.6	4.4	3.5	3.7	4.9	4.3	4.3
Au	21.0	11.0	<8.0	7.3	8.1	<6.0	<8.0	8.8	11.0	<8.0

Table 2g. Belmont sheet, Virginia. Corehole W-887.

	W-246930	W-246931	W-246932	W-246933	W-246934	W-249434	W-249435	W-246935	W-246936	W-246937
	887	887	887	887	887	887	887	887	887	887
	40	45	50	55	59.5	65	75	86	101	145.8
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W
B (ppm)	—	—	—	—	—	10.0	20.0	—	—	—
Sc	—	—	—	—	—	30	20.0	—	—	—
V	—	—	—	—	—	—	—	—	—	340
Cr	—	—	—	—	—	<10.0	—	—	—	—
Co	55	57	51	45	47	50	47	45	42	40
Ni	17.0	18.0	17.0	23.0	17.0	12.0	11.0	19.0	18.0	25.0
Cu	650	230	240	240	230	210	220	250	230	210
Zn	—	—	—	—	—	<200	—	—	—	—
Ga	—	—	—	—	—	30	50	—	—	—
Sr	—	—	—	—	—	200	200	—	—	—
Ba	—	—	—	—	—	200	300	—	—	—
Y	—	—	—	—	—	30	30	—	—	—
Zr	—	—	—	—	—	100	100	—	—	—
Pd (ppb)	16.0	510	78	49	42	33	21	40	39	36
Pt	5.1	41	5.2	4.5	4.8	4.2	2.7	4.1	4.0	6.4
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	1.0	<0.5	<0.50	<0.50	<0.50
Ru	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.50	0.60
Ir	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	<0.5	<0.50	<0.50	<0.50

Table 2h. Belmont sheet, Virginia. Corehole W-887.

	W-246938	W-246939	W-246940	W-246941	W-246942	W-246943	W-246944
	887	887	887	887	887	887	887
	180	185	269	275	286.5	296.5	300
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W
V (ppm)	350	—	410	—	420	—	—
Co	40	44	42	36	42	40	42
Ni	20.0	19.0	20.0	19.0	23.0	24.0	24.0
Cu	230	230	130	140	190	210	180
Pd (ppb)	32	37	29.0	24.0	25.0	28.0	25.0
Pt	6.3	6.5	6.7	7.2	7.1	7.0	6.6
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Ru	<0.50	0.70	0.80	0.60	<0.50	<0.50	<0.50
Ir	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 2i. Belmont sheet, Virginia. Corehole W-888.

	W-241934 888-1	W-241935 888-2	W-241936 888-3	W-241937 888-4	W-241938 888-5	W-241939 888-6	W-241940 888-7	W-241947 888-8	W-241941 888-9	W-241942 888-10
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W
SiO_2 (%)	51.50	53.70	52.40	53.60	52.80	54.80	53.30	52.60	53.10	54.90
TiO_2	3.71	3.31	2.99	2.28	2.11	2.18	2.05	2.18	2.29	2.06
Al_2O_3	12.80	12.90	13.70	14.60	15.30	14.40	15.40	15.40	15.00	14.30
Fe_2O_3	4.66	2.01	4.81	2.99	2.51	1.77	2.30	3.25	2.37	2.07
FeO	12.40	7.20	10.60	10.00	9.10	6.40	6.90	9.70	7.70	6.60
MnO	0.22	0.19	0.19	0.17	0.17	0.18	0.18	0.17	0.20	0.20
MgO	2.88	3.09	2.69	2.39	2.24	2.52	2.06	2.27	2.34	2.63
CaO	8.52	9.75	8.60	8.09	7.84	10.50	9.81	6.34	9.01	8.71
Na_2O	2.60	3.63	2.95	3.15	4.27	4.41	5.03	4.92	4.74	4.15
K_2O	0.98	2.50	1.09	1.94	2.11	2.46	1.47	1.85	1.79	3.44
P_2O_5	0.23	0.21	0.23	0.28	0.27	0.24	0.26	0.26	0.27	0.21
H_2O^+	0.71	0.81	0.59	1.10	1.10	0.90	1.00	1.20	0.90	0.80
H_2O^-	0.29	0.09	0.31	0.15	0.11	0.10	0.09	0.12	0.10	0.10
CO_2	0.02	0.12	0.04	0.03	0.02	0.05	0.10	0.01	0.08	0.13
S	0.03	0.03	0.02	0.03	0.04	0.04	0.08	0.03	0.05	0.02
F	0.03	0.03	0.03	0.04	0.05	0.03	0.04	0.04	0.04	0.03
Cl	0.03	0.08	—	—	—	—	—	—	—	—
Σ	101.62	99.64	101.24	100.84	100.04	100.98	100.06	100.33	99.98	100.36
B (ppm)	9.3	—	13.0	32	—	20.0	—	—	—	—
Sc	46	41	38	32	30	31	28.1	31	30	30
Cr	2.10	<3.1	<4.0	3.0	<2.20	1.40	<2.40	<2.10	2.10	<2.50
Co	51	27.6	46	39	35	26.0	41	37	39	23.5
Ni	7.0	8.0	6.0	14.0	17.0	23.0	6.0	16.0	7.0	22.0
Cu	460	145	169	115	84	143	218	127	267	24.0
Zn	108	58	74	91	150	156	78	84	80	216
As	1.70	4.4	2.40	2.30	4.7	2.60	19.0	3.0	15.0	<1.40
Rb	33	74	37	57	76	82	56	70	60	98
Sr	204	340	223	390	410	292	350	400	360	320
Sb	<0.230	0.34	0.230	0.290	0.34	0.220	0.200	0.33	0.240	0.260
Cs	5.6	0.78	3.1	1.10	0.56	0.250	0.290	0.42	0.38	0.41
Ba	242	440	286	380	330	1070	241	292	292	1550
Y	45	35	40	34	35	44	40	39	40	42
La	18.2	17.0	20.8	21.6	20.6	29.0	20.0	20.1	20.3	26.7
Ce	39	38	45	45	43	58	43	42	44	52
Nd	20.0	19.0	22.0	23.0	22.0	26.0	22.0	21.0	22.0	26.0
Sm	5.8	5.6	6.2	6.3	6.1	7.0	6.1	6.1	6.1	6.4
Eu	1.88	1.95	2.01	1.90	1.88	1.73	2.08	1.77	1.80	1.79
Tb	1.10	1.02	1.16	1.15	1.08	1.16	1.11	1.15	1.12	1.05
Yb	3.8	3.2	3.7	3.7	3.5	3.7	3.6	3.7	3.6	3.3
Lu	0.54	0.46	0.54	0.52	0.48	0.51	0.48	0.51	0.50	0.43
Zr	149	166	172	180	169	177	174	168	170	176
Hf	4.5	4.7	5.0	5.0	4.7	5.0	4.7	4.9	4.8	4.8
Nb	20.0	22.0	20.0	17.0	16.0	16.0	16.0	20.0	16.0	17.0
Ta	1.20	1.30	1.20	1.00	1.00	1.20	1.00	1.10	1.10	1.10
Th	4.0	4.2	4.6	4.8	4.5	4.5	4.5	4.3	4.3	4.3
U	0.85	1.60	0.92	0.92	1.10	2.10	1.20	1.10	1.30	2.10
Pd (ppb)	10.0	40	44	20.0	15.0	14.0	15.0	19.0	17.0	11.0
Pt	4.9	6.4	5.7	4.7	3.4	3.3	3.7	3.8	3.7	3.5
Au	24.0	17.0	<7.0	8.2	<1.50	<1.50	<6.0	<6.0	6.4	<1.50

Table 2j. Belmont sheet, Virginia. Corehole W-888.

	W-241924 888-11	W-241925 888-12	W-241926 888-13	W-241943 888-14	W-241927 888-15	W-241928 888-16	W-241929 888-17	W-241930 888-18A	W-241944 888-18B
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W
SiO_2 (%)	53.10	52.40	53.40	54.10	51.10	52.60	52.70	55.60	51.40
TiO_2	2.14	1.92	1.82	1.58	1.67	1.85	1.74	1.25	2.00
Al_2O_3	15.50	15.00	15.60	15.30	15.90	15.50	15.50	14.00	13.80
Fe_2O_3	3.46	3.00	3.92	3.36	3.40	3.54	2.96	3.43	3.88
FeO	9.70	9.50	8.30	7.60	8.30	8.90	9.10	8.40	10.40
MnO	0.20	0.20	0.16	0.14	0.17	0.16	0.19	0.18	0.22
MgO	2.28	2.78	2.66	2.51	2.97	3.10	3.40	3.91	5.06
CaO	7.00	6.57	8.53	7.59	8.13	5.72	8.84	8.98	10.50
Na_2O	3.23	5.03	3.15	6.20	4.23	5.59	3.01	2.53	2.40
K_2O	1.94	1.81	1.55	0.45	1.91	1.57	1.40	1.21	0.72
P_2O_5	0.25	0.26	0.23	0.21	0.21	0.23	0.20	0.24	0.15
H_2O^+	1.20	1.50	1.30	1.70	1.60	2.00	0.95	0.92	0.72
H_2O^-	0.17	0.17	0.24	0.20	0.28	0.22	0.15	0.28	0.12
CO_2	0.03	0.18	0.05	0.14	0.13	0.02	0.05	0.06	0.02
S	0.03	0.04	0.04	0.03	0.02	0.04	0.03	0.02	0.02
F	0.04	0.04	0.05	0.03	0.06	0.04	0.03	0.03	0.03
Cl	0.20	0.13	0.04	—	0.03	—	—	—	—
Σ	100.48	100.53	101.04	101.14	100.11	101.08	100.24	101.04	101.45
B (ppm)	19.0	18.0	18.0	9.7	—	16.0	18.0	13.0	8.7
Sc	29.0	31	28.2	27.9	31	32	31	33	42
Cr	2.70	5.1	5.7	6.5	8.6	9.1	11.0	10.0	22.0
Co	38	37	37	34	37	39	39	41	51
Ni	13.0	21.0	23.0	15.0	26.0	28.0	23.0	35	41
Cu	198	134	183	115	163	132	171	70	113
Zn	148	111	88	113	117	144	80	78	82
As	1.80	2.40	3.3	7.1	4.3	2.90	1.70	1.10	<1.60
Rb	69	64	60	16.0	83	60	51	42	24.0
Sr	380	390	286	148	410	390	296	214	199
Sb	0.41	0.290	0.220	<0.120	0.51	0.150	0.280	0.200	<0.31
Cs	1.80	0.50	1.70	0.210	1.60	0.59	1.40	0.92	1.50
Ba	380	350	320	57	510	450	294	281	188
Y	34	36	43	36	44	43	36	43	24.0
La	22.5	20.7	21.5	17.5	18.8	18.8	18.8	21.2	13.1
Ce	47	43	46	37	39	40	39	43	27.7
Nd	24.0	23.0	23.0	21.0	20.0	21.0	20.0	21.0	15.0
Sm	6.5	6.0	6.2	5.4	5.4	5.6	5.4	5.8	4.1
Eu	1.82	1.92	1.77	1.39	1.75	1.24	1.65	1.21	1.24
Tb	1.18	1.14	1.13	1.01	1.01	1.06	0.98	1.10	0.83
Yb	3.7	3.5	3.7	2.90	3.3	3.4	3.1	3.5	2.50
Lu	0.52	0.50	0.51	0.39	0.47	0.49	0.45	0.48	0.39
Zr	180	146	182	138	168	155	153	173	97
Hf	5.0	4.7	5.1	3.8	4.2	4.6	4.2	5.1	3.2
Nb	15.0	15.0	16.0	15.0	13.0	15.0	13.0	14.0	14.0
Ta	1.10	1.00	1.10	0.88	0.88	1.00	0.91	1.00	0.77
Th	4.7	4.4	4.8	3.8	3.9	4.2	4.0	4.8	2.80
U	0.85	0.91	0.86	0.60	0.83	0.87	0.80	1.10	0.57
Pd (ppb)	14.0	14.0	13.0	9.4	12.0	12.0	10.0	9.4	—
Pt	4.9	4.1	4.7	4.0	5.0	3.6	5.6	1.30	—
Au	10.0	<9.0	6.4	<7.0	<6.0	<7.0	5.1	—	<7.0

Table 2k. Belmont sheet, Virginia. Corehole W-888.

	W-241945 888-19	W-241931 888-20	W-241932 888-21	W-241933 888-22	W-246945 888-44.5	W-246946 888-50	W-246947 888-70	W-246948 888-79.5	W-246949 888-101.5
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W	77°33'W
SiO_2 (%)	53.20	51.70	52.90	53.00	—	—	—	—	—
TiO_2	1.46	0.95	1.34	1.38	—	—	—	—	—
Al_2O_3	15.60	14.80	13.50	13.90	—	—	—	—	—
Fe_2O_3	3.05	3.82	2.66	2.31	—	—	—	—	—
FeO	8.80	8.50	9.60	9.50	—	—	—	—	—
MnO	0.18	0.18	0.19	0.19	—	—	—	—	—
MgO	3.92	5.74	6.29	6.27	—	—	—	—	—
CaO	9.27	10.60	10.20	10.20	—	—	—	—	—
Na_2O	2.76	2.64	2.32	2.37	—	—	—	—	—
K_2O	1.30	0.60	0.75	0.77	—	—	—	—	—
P_2O_5	0.20	0.09	0.16	0.16	—	—	—	—	—
H_2O^+	0.74	1.20	0.69	0.70	—	—	—	—	—
H_2O^-	0.16	0.61	0.17	0.17	—	—	—	—	—
CO_2	0.02	0.04	0.05	0.04	—	—	—	—	—
S	0.03	0.02	0.01	0.04	—	—	—	—	—
F	0.03	0.02	0.02	0.02	—	—	—	—	—
Σ	100.71	101.52	100.85	101.02	—	—	—	—	—
B (ppm)	17.0	10.0	7.9	13.0	—	—	—	—	—
Sc	33	40	39	38	—	—	—	—	—
V	140	180	—	300	120	—	—	—	—
Cr	21.0	79	81	88	—	—	—	—	—
Co	41	48	48	48	49	51	53	53	40
Ni	37	52	65	59	10.0	32	14.0	15.0	25.0
Cu	104	106	140	110	630	650	650	630	190
Zn	90	115	81	73	—	—	—	—	—
As	<1.50	1.80	1.70	1.00	—	—	—	—	—
Rb	48	18.0	19.0	25.0	—	—	—	—	—
Sr	310	200	182	202	—	—	—	—	—
Sb	0.250	<0.100	0.150	0.250	—	—	—	—	—
Cs	0.77	0.77	1.20	1.20	—	—	—	—	—
Ba	280	164	187	179	—	—	—	—	—
Y	33	31	22.0	28.0	—	—	—	—	—
La	16.2	10.0	13.4	13.0	—	—	—	—	—
Ce	34	21.7	28.6	27.7	—	—	—	—	—
Nd	18.0	13.0	15.0	14.0	—	—	—	—	—
Sm	4.7	3.5	4.1	4.0	—	—	—	—	—
Eu	1.53	1.22	1.26	1.20	—	—	—	—	—
Tb	0.88	0.70	0.81	0.73	—	—	—	—	—
Yb	2.90	2.60	2.50	2.50	—	—	—	—	—
Lu	0.41	0.37	0.38	0.36	—	—	—	—	—
Zr	129	86	104	111	—	—	—	—	—
Hf	3.6	2.10	3.1	3.1	—	—	—	—	—
Nb	12.0	5.7	10.0	10.0	—	—	—	—	—
Ta	0.80	0.38	0.65	0.65	—	—	—	—	—
Th	3.4	1.90	2.90	2.70	—	—	—	—	—
U	1.20	0.45	0.52	0.37	—	—	—	—	—
Pd (ppb)	11.0	5.9	7.0	5.6	7.7	11.0	13.0	20.0	89
Pt	4.1	7.4	5.8	6.5	1.40	3.0	8.2	9.5	6.9
Rh	—	—	—	—	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	—	—	—	—	<0.50	<0.50	<0.50	<0.50	0.70
Ir	—	—	—	—	<0.50	<0.50	<0.50	<0.50	<0.50
Au	8.1	<11.0	—	—	—	—	—	—	—

Table 2l. Belmont sheet, Virginia. Corehole W-888.

	W-246950 888-106	W-246951 888-109	W-246952 888-110	W-246953 888-112.5	W-246954 888-115.5	W-246955 888-118	W-246956 888-119	W-246957 888-125	W-246958 888-128	W-246959 888-129
Lat. Long.	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W
V (ppm)	240	—	250	—	270	270	—	280	—	—
Co	49	45	45	44	45	48	43	50	48	45
Ni	18.0	17.0	20.0	19.0	11.0	17.0	13.0	12.0	15.0	13.0
Cu	240	230	230	230	240	210	220	230	210	210
Pd (ppb)	65	76	61	51	47	50	44	51	52	49
Pt	8.0	11.0	7.4	8.0	6.9	6.7	6.0	7.9	8.0	6.5
Rh	<0.50	<1.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	0.50	<1.00	0.60	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ir	<0.50	<1.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 2m. Belmont sheet, Virginia. Corehole W-888.

	W-246960 888-136.5	W-246961 888-138.5	W-246962 888-141	W-246963 888-147	W-246964 888-159.5	W-246965 888-171
Lat. Long.	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W
V (ppm)	270	—	320	—	270	320
Co	40	43	48	43	38	35
Ni	11.0	12.0	13.0	16.0	14.0	23.0
Cu	180	230	220	220	240	140
Pd (ppb)	27.0	38	43	32	21.0	23.0
Pt	5.1	6.9	8.8	6.3	4.7	5.1
Rh	<0.50	<0.50	<0.50	<0.50	<0.60	<0.50
Ru	<0.50	<0.50	<0.50	<0.50	<0.60	<0.50
Ir	<0.50	<0.50	<0.50	<0.50	<0.60	<0.50

Table 2n. Belmont sheet, Virginia. Corehole W-888 infill.

	W-245709 888-2A	W-245710 888-2B	W-245711 888-3A	W-245712 888-10A	W-245713 888-11A
Lat. Long.	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W
Pd (ppb)	38	38	13.0	15.0	13.0
Pt	5.0	4.5	3.4	4.0	4.5

Table 2o. Belmont sheet, Virginia. Corehole W-888 infill.

	W-249436 888-81	W-249437 888-84	W-249438 888-86.5	W-249439 888-92	W-249440 888-95	W-249441 888-99.5	W-249442 888-103.5
Lat. Long.	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W
B (ppm)	10.0	10.0	20.0	20.0	10.0	10.0	500
Sc	30	20.0	30	30	30	30	30
Co	53	50	47	53	53	39	31
Ni	12	10	10	10	9.6	8.8	16
Cu	620	590	540	640	560	190	170
Ga	50	70	50	70	50	50	70
Sr	150	200	300	300	150	150	500
Ba	200	200	200	300	200	300	300
Y	30	30	30	30	30	30	30
Zr	150	100	100	100	150	100	100
Pd (ppb)	24	12	16	23	18	59	46
Pt	9.5	4.2	5.3	8.7	7.5	6.4	5.7
Rh	1.4	0.6	1.3	1.3	0.8	1.3	<0.5
Ru	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ir	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Table 2p. Belmont sheet, Virginia. Corehole W-889.

	W-246966 889 52	W-246967 889 56	W-246968 889 72	W-246969 889 77.5	W-246970 889 97.5	W-246971 889 101	W-246972 889 108	W-249443 8895 114.5	W-249444 889 118.5	W-249445 889 123.5
Lat. Long.	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W
B (ppm)	—	—	—	—	—	—	—	10.0	10.0	<10.0
Sc	—	—	—	—	—	—	—	30	30	20.0
Co	55	55	55	48	50	53	55	47	49	50
Ni	13.0	11.0	9.2	14.0	9.2	14.0	12.0	12.0	10.0	10.0
Cu	650	580	580	540	570	620	540	220	230	210
Ga	—	—	—	—	—	—	—	70	70	30
Sr	—	—	—	—	—	—	—	200	150	150
Ba	—	—	—	—	—	—	—	200	300	200
Y	—	—	—	—	—	—	—	30	30	20.0
Zr	—	—	—	—	—	—	—	100	150	70
Pd (ppb)	8.4	7.5	8.1	6.1	11.0	12.0	19.0	150	150	320
Pt	1.80	1.50	2.40	2.50	4.5	6.3	11.0	11	9.5	26
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.6	5.1	10
Ru	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0
Ir	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	<0.5	<0.5

Table 2q. Belmont sheet, Virginia. Corehole W-889.

	W-249446 889 124.5	W-249447 889 129	W-246973 889 130.5	W-246974 889 137	W-246975 889 140.5	W-246976 889 147.5	W-246977 889 155	W-246978 889 158	W-246979 889 164	W-246980 889 168
Lat. Long.	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W	39° 1'N 77°33'W
B (ppm)	50	150	—	—	—	—	—	—	—	—
Sc	30	30	—	—	—	—	—	—	—	—
Co	45	42	53	55	50	53	48	50	48	45
Ni	15.0	10.0	15.0	15.0	16.0	19.0	16.0	14.0	14.0	14.0
Cu	170	290	220	220	210	220	210	220	230	240
Ga	50	50	—	—	—	—	—	—	—	—
Sr	200	300	—	—	—	—	—	—	—	—
Ba	200	200	—	—	—	—	—	—	—	—
Y	30	30	—	—	—	—	—	—	—	—
Zr	100	100	—	—	—	—	—	—	—	—
Pd (ppb)	260	270	200	210	200	170	160	120	58	35
Pt	21	31	24.0	27.0	26.0	17.0	13.0	12.0	9.2	6.3
Rh	11	9.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ir	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 2r. Belmont sheet, Virginia. Corehole W-890.

	W-241946 890-1	W-246981 890-48.5	W-246982 890-55	W-246983 890-79	W-246984 890-95.5	W-246985 890-127	W-246986 890-133	W-246987 890-140
Lat.	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N	39° 1'N
Long.	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W	77°34'W
SiO_2 (%)	52.20	—	—	—	—	—	—	—
TiO_2	1.70	—	—	—	—	—	—	—
Al_2O_3	12.90	—	—	—	—	—	—	—
Fe_2O_3	0.18	—	—	—	—	—	—	—
FeO	3.40	—	—	—	—	—	—	—
MnO	0.06	—	—	—	—	—	—	—
MgO	1.57	—	—	—	—	—	—	—
CaO	15.00	—	—	—	—	—	—	—
Na_2O	4.29	—	—	—	—	—	—	—
K_2O	0.28	—	—	—	—	—	—	—
P_2O_5	0.23	—	—	—	—	—	—	—
H_2O^+	2.00	—	—	—	—	—	—	—
H_2O^-	0.08	—	—	—	—	—	—	—
CO_2	0.63	—	—	—	—	—	—	—
S	0.01	—	—	—	—	—	—	—
F	0.03	—	—	—	—	—	—	—
Σ	94.56	—	—	—	—	—	—	—
Sc (ppm)	17.0	—	—	—	—	—	—	—
Cr	<1.40	—	—	—	—	—	—	—
Co	14.9	33	30	35	40	38	40	43
Ni	12.0	4.8	6.8	14.0	6.8	11.0	23.0	9.9
Cu	36	390	400	420	460	430	580	580
Zn	94	—	—	—	—	—	—	—
As	11.0	—	—	—	—	—	—	—
Rb	16.0	—	—	—	—	—	—	—
Sr	89	—	—	—	—	—	—	—
Sb	0.270	—	—	—	—	—	—	—
Cs	0.180	—	—	—	—	—	—	—
Ba	64	—	—	—	—	—	—	—
Y	38	—	—	—	—	—	—	—
La	15.0	—	—	—	—	—	—	—
Ce	33	—	—	—	—	—	—	—
Nd	18.0	—	—	—	—	—	—	—
Sm	4.9	—	—	—	—	—	—	—
Eu	2.15	—	—	—	—	—	—	—
Tb	0.85	—	—	—	—	—	—	—
Yb	2.50	—	—	—	—	—	—	—
Lu	0.38	—	—	—	—	—	—	—
Zr	179	—	—	—	—	—	—	—
Hf	4.0	—	—	—	—	—	—	—
Nb	14.0	—	—	—	—	—	—	—
Ta	0.93	—	—	—	—	—	—	—
Th	3.9	—	—	—	—	—	—	—
U	1.00	—	—	—	—	—	—	—
Pd (ppb)	12.0	0.80	1.00	1.40	1.80	3.2	5.5	10.0
Pt	1.90	<0.50	<0.50	<0.50	<0.50	1.90	3.0	8.8
Rh	—	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	—	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ir	—	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Au	<1.30	—	—	—	—	—	—	—

Table 2s. Belmont sheet, Virginia. Corehole W-890.

	W-249448 890-141.5	W-249449 890-144.5	W-246988 890-152	W-246989 890-157.5	W-246990 890-174.5
Lat. Long.	39° 1'N 77°34'W	39° 1'N 77°34'W	39° 1'N 77°34'W	39° 1'N 77°34'W	39° 1'N 77°34'W
B (ppm)	15.0	15.0	—	—	—
Sc	30	30	—	—	—
Co	42	43	40	40	45
Ni	8.4	9.6	17.0	26.0	17.0
Cu	540	490	240	260	320
Ga	70	70	—	—	—
Sr	200	200	—	—	—
Ba	200	200	—	—	—
Y	50	50	—	—	—
Zr	200	150	—	—	—
Pd (ppb)	17	41	110	23.0	35
Pt	8.9	17	9.9	5.1	5.0
Rh	<0.5	1.6	<0.50	<0.50	<0.50
Ru	<1.0	<1.0	<0.50	<0.50	<0.50
Ir	<0.5	<0.5	<0.50	<0.50	<0.50

Table 3. Herndon NNW sheet, Sterling area.

	W-251472 FG-90 ST-1	W-251473 FG-90 ST-2	W-251474 FG-90 ST-3	W-251475 FG-90 ST-4	W-251476 FG-90 ST-5	W-251477 FG-90 ST-6	W-251478 FG-90 ST-7A	W-251479 FG-90 ST-7B
Lat.	39°03'N	39°03'N	39°03'N	39°04'N	39°04'N	39°01'N	39°03'N	39°03'N
Long.	77°27'W	77°27'W	77°27'W	77°27'W	77°27'W	77°25'W	77°26'W	77°26'W
SiO_2 (%)	52.90	52.90	54.30	52.50	52.20	52.40	70.40	52.10
TiO_2	1.90	1.94	2.78	1.39	1.61	1.05	0.88	1.27
Al_2O_3	14.60	14.60	12.10	15.70	15.10	13.80	12.10	13.50
Fe_2O_3	3.35	4.00	5.10	1.86	2.56	2.15	0.72	2.65
FeO	9.40	9.00	10.80	9.30	9.30	8.50	1.40	9.40
MnO	0.21	0.20	0.23	0.19	0.17	0.18	0.02	0.20
MgO	3.24	3.27	2.21	3.51	4.57	7.27	0.93	6.49
CaO	8.24	8.35	5.18	8.85	9.77	11.20	4.37	10.20
Na_2O	2.74	2.78	3.54	3.14	2.61	2.10	5.90	2.21
K_2O	1.38	1.35	2.09	1.28	0.83	0.58	<0.02	0.73
P_2O_5	0.23	0.25	0.32	0.23	0.18	0.14	0.11	0.16
H_2O^+	1.20	0.95	1.20	1.50	0.85	0.52	0.93	0.87
H_2O^-	0.47	0.45	0.51	0.34	0.25	0.22	0.17	0.53
CO_2	<0.01	0.01	0.01	0.07	0.12	0.01	1.60	0.01
Σ	99.86	100.05	100.37	99.87	100.13	100.13	99.55	100.32
Sc (ppm)	33	33	36	29.5	35	39	12.8	39
V	340	320	134	244	350	274	33	279
Cr	9.7	8.0	4.5	8.4	16.0	165	5.9	128
Co	42	42	40	38	44	48	7.4	48
Ni	26.0	24.0	7.5	24.0	42	71	7.6	65
Cu	190	160	380	100	150	100	6.5	140
Zn	141	159	164	100	86	87	16.0	93
Ga	23.0	22.0	23.0	22.0	21.0	19.0	14.0	20.0
As	2.50	3.3	2.60	2.10	1.30	1.20	3.9	2.30
Rb	53	51	72	48	32	23.0	<3.0	30
Sr	238	231	292	225	230	195	59	218
Ag	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Sb	0.260	0.280	0.30	0.160	0.200	0.160	0.180	0.240
Cs	1.30	1.10	0.54	0.80	1.30	1.00	<0.180	1.10
Ba	370	360	440	266	220	177	9.0	204
Y	35	35	47	30	26.0	23.0	49	26.0
La	19.2	19.7	25.8	18.1	13.7	11.9	24.7	13.0
Ce	39	39	53	36	28.2	25.0	54	27.0
Nd	20.0	18.0	27.0	19.0	15.0	13.0	29.0	15.0
Sm	5.7	5.8	7.9	5.1	4.3	3.8	8.1	4.1
Eu	1.68	1.70	2.26	1.54	1.35	1.17	2.71	1.44
Tb	1.05	1.00	1.50	0.94	0.80	0.74	1.40	0.79
Yb	3.5	3.4	4.9	3.0	2.60	2.30	5.3	2.60
Lu	0.48	0.48	0.69	0.40	0.34	0.33	0.73	0.37
Zr	160	190	320	210	200	240	470	<300
Hf	4.4	4.3	6.4	3.5	3.3	2.70	12.8	2.90
Nb	17.0	21.0	26.0	9.7	13.0	6.8	17.0	8.2
Ta	0.94	0.97	1.50	0.73	0.66	0.52	2.13	0.60
Th	4.1	3.9	5.7	3.3	2.90	2.30	12.7	2.60
U	0.65	0.88	0.97	0.82	0.63	0.60	3.1	1.00
Pd (ppb)	11	12	<1.0	11	17	<1.0	9.9	6.7
Pt	4.8	4.5	1.0	4.9	5.4	<1.0	9.0	8.2
Rh	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	1.0	<1.0
Ru	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ir	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Au	8.1	<1.90	<7.0	<12.0	6.4	<9.0	<7.0	12.0

Table 4. Centreville sheet and Union Mill plug.

	W-232425 FG-85-23	W-232426 FG-85-24	W-232427 FG-85-25	W-232428 FG-85-26	W-232429 FG-85-27	W-232430 FG-85-28
Lat.	38°50'N	38°50'N	38°47'N	38°47'N	38°47'N	38°47'N
Long.	77°24'W	77°24'W	77°25'W	77°25'W	77°25'W	77°25'W
SiO_2 (%)	52.20	52.60	47.70	48.80	49.40	49.30
TiO_2	1.10	0.93	0.24	0.56	0.29	0.54
Al_2O_3	11.90	13.50	17.40	16.90	14.70	13.40
Fe_2O_3	1.60	1.60	1.10	1.60	1.70	2.40
FeO	10.10	8.00	6.30	8.10	8.40	9.10
MnO	0.20	0.17	0.17	0.20	0.21	0.26
MgO	8.80	9.00	11.20	9.20	11.50	10.80
CaO	10.80	10.50	10.30	11.80	10.80	11.70
Na_2O	1.75	2.02	0.92	1.31	0.94	1.08
K_2O	0.56	0.53	0.26	0.02	0.02	0.03
P_2O_5	0.13	0.12	0.02	0.16	0.11	0.09
H_2O^+	0.43	0.65	3.00	0.88	0.89	0.57
H_2O^-	0.17	0.28	0.16	0.10	0.16	0.13
CO_2	0.01	0.01	0.02	0.01	0.08	0.01
S	0.09	0.09	0.14	0.21	0.08	0.15
Σ	99.84	100.00	98.93	99.85	99.28	99.56
B (ppm)	6.0	4.0	10.0	2.00	2.00	3.0
Sc	46	37	31	44	43	59
Cr	121	560	360	150	620	560
Co	56	49	48	48	51	49
Ni	88	110	110	74	130	90
Cu	97	94	66	65	45	56
Zn	94	84	60	100	110	120
Rb	20.0	15.0	8.0	3.0	3.0	10.0
Sr	150	173	152	176	142	145
Sb	<0.70	<0.60	0.30	<0.60	<0.60	<0.70
Cs	0.61	0.55	1.10	1.10	<0.70	<0.80
Ba	128	156	45	48	53	40
Y	28.0	21.0	9.0	25.0	22.0	30
La	9.4	9.7	2.50	5.6	5.2	4.2
Ce	19.0	22.0	4.5	11.0	12.0	10.0
Nd	12.0	9.5	<8.0	9.0	9.0	8.4
Sm	3.2	2.94	0.72	2.80	2.29	2.80
Eu	0.85	0.88	0.36	1.02	0.77	0.86
Tb	0.63	0.51	0.150	0.52	0.45	0.50
Yb	2.10	2.00	0.70	2.20	2.00	2.40
Lu	0.31	0.280	0.120	0.33	0.32	0.36
Zr	92	88	14.0	28.0	30	31
Hf	2.10	2.00	<0.60	<1.60	0.51	0.78
Nb	5.9	5.6	<2.00	<2.00	<2.00	<2.00
Ta	0.45	0.42	<0.040	0.100	0.0220	0.061
Th	1.80	1.90	<0.70	1.20	<0.80	<1.70
U	0.47	0.47	<0.50	<0.40	<0.60	<0.50
Pd (ppb)	5.8	5.9	<0.50	<0.50	<0.50	<0.50
Pt	5.9	20.0	<1.00	<1.00	<1.00	<1.00
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 5a. East Gainesville sheet.

	W-225235 RD16-139.2	W-225234 RD16-140	W-225240 RD15-142.5	W-232438 FG-85-39	W-232439 FG-85-40	W-232440 FG-85-41
Lat.	38°46'N	38°46'N	38°46'N	38°43'N	38°43'N	38°43'N
Long.	77°31'W	77°31'W	77°31'W	77°33'W	77°33'W	77°33'W
SiO_2 (%)	49.40	50.30	51.60	52.60	52.50	52.80
TiO_2	1.20	1.10	1.20	1.10	1.00	1.60
Al_2O_3	14.70	14.30	14.70	14.00	15.50	13.50
Fe_2O_3	3.00	2.10	2.70	1.40	1.60	4.80
FeO	7.50	8.30	8.00	8.70	8.20	8.00
MnO	0.19	0.19	0.19	0.17	0.16	0.19
MgO	7.10	7.00	6.40	7.40	6.40	4.80
CaO	10.90	10.20	10.30	10.80	10.80	7.10
Na_2O	0.25	0.23	0.22	2.02	2.29	2.16
K_2O	0.37	0.76	0.97	0.42	0.64	2.00
P_2O_5	0.17	0.17	0.16	0.13	0.14	0.24
H_2O^+	3.10	1.50	1.60	0.56	0.34	1.30
H_2O^-	1.20	0.70	0.24	0.20	0.28	0.30
CO_2	0.03	0.03	0.05	0.02	0.01	0.01
S	—	—	—	0.04	0.05	0.08
Σ	99.11	96.88	98.33	99.57	99.91	98.88
B (ppm)	—	—	—	9.0	7.0	34
Sc	38	36	38	40	36	37
Cr	320	275	226	227	112	22.0
Co	48	46	45	48	44	46
Ni	87	83	65	71	63	31
Cu	140	110	120	100	83	130
Zn	108	127	143	93	85	87
Rb	11.0	30	36	18.0	22.0	78
Sr	169	191	199	174	196	380
Sb	<0.100	0.34	<0.60	<0.60	<0.50	0.36
Cs	1.30	1.59	2.40	0.94	0.82	1.10
Ba	98	142	214	141	162	380
Y	23.0	22.0	24.0	24.0	26.0	35
La	12.0	11.2	12.0	11.0	10.0	17.0
Ce	22.7	21.8	21.5	22.0	22.0	33
Nd	10.0	13.0	15.0	12.0	13.0	19.0
Sm	3.9	3.7	4.0	3.4	3.4	5.2
Eu	0.93	0.96	1.07	1.00	1.05	1.40
Tb	0.63	0.59	0.66	0.58	0.59	0.89
Yb	2.34	2.20	2.54	1.90	2.10	3.0
Lu	0.36	0.37	0.35	0.34	0.32	0.47
Zr	95	91	107	98	100	162
Hf	2.56	2.38	2.76	2.70	2.50	3.8
Nb	7.3	7.4	7.9	7.1	6.6	12.0
Ta	0.52	0.52	0.55	0.52	0.50	0.84
Th	2.28	2.23	2.41	2.40	2.10	3.6
U	0.47	0.54	0.64	0.48	0.63	0.76
Pd (ppb)	3.7	7.0	6.0	7.4	6.9	8.4
Pt	3.0	4.0	5.6	7.1	11.0	3.8
Rh	0.50	<0.50	1.00	<0.50	<0.50	<0.50

Table 5b. East Gainesville sheet.

	W-217712 V16-19'	W-217713 V16-25'	W-217714 V16-45'	W-217715 V16-51'	W-217716 V16-69'	W-217717 V16-103'	W-217718 V16-122'	W-217719 V16-156'
Lat.	38°46'N	38°46'N	38°46'N	38°46'N	38°46'N	38°46'N	38°46'N	38°46'N
Long.	77°31'W	77°31'W	77°31'W	77°31'W	77°31'W	77°31'W	77°31'W	77°31'W
SiO_2 (%)	50.60	53.00	51.50	52.20	50.40	52.70	50.60	51.20
TiO_2	3.10	1.50	2.40	1.70	2.30	1.50	1.40	1.20
Al_2O_3	11.50	15.40	13.70	14.90	14.10	15.90	15.60	16.80
Fe_2O_3	5.10	2.50	3.50	2.90	2.80	2.90	3.10	2.20
FeO	11.90	9.60	11.00	9.50	7.90	8.20	6.10	7.60
MnO	0.24	0.19	0.24	0.17	0.26	0.16	0.14	0.17
MgO	3.90	3.80	4.20	4.10	4.30	3.80	3.30	3.80
CaO	8.40	8.90	8.90	9.00	10.30	8.60	12.80	6.90
Na_2O	2.29	2.83	2.56	2.83	4.18	2.97	4.18	4.85
K_2O	1.10	1.10	0.97	1.10	0.70	1.30	0.19	1.50
P_2O_5	0.30	0.22	0.23	0.21	0.16	0.21	0.18	0.20
H_2O^+	1.00	0.73	0.78	0.95	2.10	1.40	2.70	2.70
H_2O^-	0.38	0.23	0.33	0.28	0.17	0.35	0.29	0.35
CO_2	0.10	0.07	0.07	0.06	0.69	0.07	0.04	0.54
Σ	99.91	100.07	100.38	99.90	100.36	100.06	100.62	100.01
Sc (ppm)	41	33	38	35	37	33	35	27.9
Cr	3.3	7.8	6.7	10.0	10.0	9.8	11.0	8.3
Co	54	43	51	44	35	41	34	36
Ni	56	49	55	52	45	48	48	46
Cu	170	170	170	170	87	120	250	160
Zn	131	122	204	107	93	100	87	108
Rb	32	39	32	40	31	54	5.0	75
Sr	171	248	205	270	201	330	93	440
Sb	<0.80	0.40	<0.90	<0.70	<0.70	<0.70	<0.70	<0.50
Cs	1.40	1.40	1.80	1.70	0.48	2.31	<0.50	0.86
Ba	262	235	263	244	104	269	58	330
Y	38	27.0	32	31	28.0	26.0	27.0	28.0
La	20.2	15.9	16.1	14.9	19.2	16.1	14.4	14.1
Ce	43	34	34	32	48	33	30	27.7
Nd	23.0	18.0	20.0	11.0	26.0	19.0	19.0	15.0
Sm	6.5	4.8	5.1	4.6	5.6	4.6	4.2	4.2
Eu	1.57	1.49	1.39	1.38	1.86	1.41	1.66	1.41
Tb	1.03	0.83	0.86	0.78	0.80	0.78	0.73	0.70
Yb	3.2	2.63	2.51	2.56	2.60	2.25	2.20	2.15
Lu	0.62	0.44	0.45	0.40	0.43	0.38	0.39	0.34
Zr	173	129	156	133	129	123	113	111
Hf	4.6	3.6	3.6	3.5	3.1	3.4	2.93	2.84
Nb	19.0	13.0	15.0	12.0	13.0	12.0	10.0	11.0
Ta	1.11	0.74	0.85	0.76	0.72	0.74	0.62	0.66
Th	3.9	3.5	3.2	3.0	2.80	3.0	2.60	2.60
U	0.91	0.79	0.67	0.41	1.90	0.66	0.79	0.70
Pd (ppb)	9.2	9.2	6.5	9.2	9.1	10.0	9.2	8.1
Pt	1.00	2.80	1.10	3.2	2.90	3.6	5.8	4.5
Rh	<0.50	0.70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Au	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0

Table 5c. East Gainesville sheet.

	W-238443 JM-86-13	W-238460 JM-86-14	W-238449 JM-86-15	W-238432 JM-86-16	W-238436 JM-86-17	W-238453 JM-86-18	W-238454 JM-86-19
Lat.	38°30'N	38°30'N	38°30'N	38°30'N	38°30'N	38°30'N	38°30'N
Long.	77°32'W	77°32'W	77°32'W	77°32'W	77°32'W	77°32'W	77°32'W
SiO_2 (%)	52.60	52.60	52.50	51.40	55.70	53.70	52.10
TiO_2	1.47	1.54	1.72	2.21	0.95	1.32	1.84
Al_2O_3	15.20	15.70	14.90	13.60	18.60	19.30	15.10
Fe_2O_3	2.93	2.61	3.34	3.73	2.74	3.39	4.26
FeO	8.90	8.20	9.60	10.80	4.70	4.80	8.90
MnO	0.17	0.22	0.22	0.24	0.10	0.15	0.17
MgO	4.57	4.17	3.98	4.05	1.31	1.65	3.48
CaO	9.83	8.52	9.54	9.82	6.98	6.03	9.41
Na_2O	2.68	3.18	2.64	2.49	4.27	4.34	2.74
K_2O	0.86	1.44	0.92	0.89	2.38	2.66	0.87
P_2O_5	0.19	0.19	0.20	0.20	0.25	0.22	0.20
H_2O^+	1.00	1.50	1.00	0.85	1.50	1.60	1.10
H_2O^-	0.12	0.26	0.34	0.26	0.17	0.32	0.53
CO_2	<0.01	0.04	<0.01	0.01	0.03	0.01	<0.01
S	<0.01	0.01	0.01	<0.01	<0.01	<0.01	0.02
F	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cl	0.03	0.09	0.18	0.16	0.04	0.04	0.12
Σ	100.58	100.31	101.13	100.74	99.75	99.55	100.87
Sc (ppm)	34	33	34	41	13.7	17.2	34
Cr	22.0	13.0	9.7	8.3	<5.0	2.60	9.4
Co	44	39	45	52	17.9	22.2	45
Ni	38	25.0	41	29.0	6.0	8.0	17.0
Cu	107	90	116	115	103	115	166
Zn	68	85	99	80	63	71	106
As	1.50	6.0	4.1	<2.90	4.1	3.2	3.7
Rb	37	61	32	21.0	83	109	27.0
Sr	255	300	245	224	510	600	240
Sb	<0.30	0.280	0.140	<0.50	0.260	0.250	0.290
Cs	1.50	1.10	1.70	1.40	0.70	0.63	1.70
Ba	233	330	262	244	440	510	257
Y	30	30	33	28.0	35	31	33
La	15.0	15.9	16.8	16.0	22.8	18.5	16.9
Ce	30	33	35	30	46	36	35
Nd	19.0	19.0	20.0	17.0	24.0	21.0	20.0
Sm	4.6	4.8	5.0	4.9	6.3	5.2	5.1
Eu	1.33	1.30	1.50	1.42	2.10	1.85	1.50
Tb	0.76	0.82	0.84	0.84	1.10	0.98	0.89
Yb	2.50	2.80	3.1	3.0	3.2	3.1	3.1
Lu	0.46	0.43	0.45	0.45	0.46	0.43	0.47
Zr	137	138	134	137	188	148	146
Hf	3.3	3.5	3.8	3.3	4.9	3.8	3.7
Nb	8.6	11.0	10.0	11.0	13.0	9.6	11.0
Ta	0.71	0.77	0.83	0.80	1.00	0.82	0.80
Th	3.1	3.4	3.8	3.1	5.0	3.7	3.4
U	0.69	0.77	0.79	0.76	1.10	0.76	0.79
Pd (ppb)	13.0	14.0	15.0	17.0	8.5	13.0	17.0
Pt	6.1	7.0	5.4	6.1	8.9	10.0	4.8
Rh	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	0.60
Ru	<0.50	0.50	0.50	<0.50	<1.00	<1.00	0.50
Ir	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<0.50
Au	<24.0	<19.0	10.0	<24.0	<24.0	<19.0	<18.0

Table 6a. Nokesville sheet.

	W-217690 57-10'	W-217691 57-40'	W-217692 57-90'	W-217693 57-120'	W-217694 57-160'	W-217695 57-190'	W-217696 57-230'	W-217697 57-280'	W-217698 57-320'	W-217699 57-330'
Lat.	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N
Long.	77°35'W	77°35'W	77°35'W	77°35'W	77°35'W	77°35'W	77°35'W	77°35'W	77°35'W	77°35'W
SiO_2 (%)	51.00	53.10	50.60	50.50	50.70	50.90	50.80	51.20	51.40	51.20
TiO_2	0.61	0.96	0.71	0.70	0.74	0.73	0.77	0.81	0.82	0.75
Al_2O_3	16.20	14.70	14.80	15.50	15.30	14.80	14.80	15.30	15.10	15.30
Fe_2O_3	1.60	2.20	1.80	2.10	1.70	1.60	2.00	2.20	2.30	1.70
FeO	7.90	7.40	8.50	8.30	8.80	9.10	9.30	8.70	8.70	9.00
MnO	0.19	0.20	0.19	0.18	0.21	0.20	0.20	0.23	0.21	0.22
MgO	7.70	6.60	8.50	7.50	8.30	8.40	8.20	7.60	7.30	7.80
CaO	11.60	10.40	11.20	11.80	11.10	11.00	11.10	11.00	10.90	11.40
Na_2O	2.08	2.37	2.14	1.94	2.12	2.08	2.05	2.12	2.16	2.02
K_2O	0.43	0.64	0.45	0.36	0.46	0.43	0.39	0.43	0.52	0.35
P_2O_5	0.09	0.16	0.10	0.10	0.10	0.11	0.10	0.12	0.12	0.10
H_2O^+	0.37	0.73	0.74	0.68	0.45	0.43	0.40	0.40	0.46	0.32
H_2O^-	0.18	0.34	0.22	0.39	0.14	0.13	0.19	0.16	0.20	0.14
CO_2	0.09	0.06	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Σ	100.04	99.86	100.01	100.09	100.16	99.95	100.34	100.31	100.23	100.34
Sc (ppm)	39	42	42	45	41	40	42	41	42	42
Cr	253	69	282	283	265	254	234	200	182	244
Co	44	38	50	45	48	49	49	46	47	47
Ni	78	60	110	68	81	100	120	78	52	76
Cu	54	83	57	70	58	64	68	64	68	70
Zn	81	91	85	85	79	76	93	93	97	90
Rb	8.0	20.0	19.0	11.0	11.0	11.0	17.0	13.0	16.0	10.0
Sr	140	138	144	131	134	133	138	143	145	127
Sb	<0.70	<0.70	<0.80	<0.80	<0.70	<0.70	<0.80	<0.70	<0.80	<0.80
Cs	0.64	1.30	1.10	0.76	0.95	0.66	0.59	0.75	0.94	0.68
Ba	104	190	72	106	118	114	98	160	100	96
Y	18.0	27.0	25.0	21.0	22.0	22.0	26.0	25.0	25.0	21.0
La	5.1	7.7	6.7	5.4	6.7	6.2	5.7	6.8	7.2	5.5
Ce	10.6	17.0	13.0	12.0	13.0	13.0	12.0	13.0	15.0	11.0
Nd	5.1	7.8	9.3	8.6	8.5	11.0	7.1	8.6	9.4	7.3
Sm	1.72	2.61	2.18	2.07	2.23	2.24	2.12	2.30	2.42	2.16
Eu	0.63	0.80	0.70	0.66	0.69	0.68	0.72	0.77	0.77	0.71
Tb	0.39	0.46	0.50	0.45	0.48	0.47	0.49	0.49	0.56	0.52
Yb	1.70	2.30	2.10	2.20	2.10	2.10	1.90	2.10	2.50	2.00
Lu	0.277	0.38	0.30	0.32	0.31	0.37	0.33	0.36	0.37	0.36
Zr	54	86	64	59	64	63	64	73	73	63
Hf	1.20	2.19	1.40	1.40	1.50	1.40	1.40	1.70	1.70	1.30
Nb	3.4	5.7	3.8	3.9	5.1	4.0	4.4	4.7	6.2	4.5
Ta	0.270	0.38	0.33	0.190	0.270	0.280	0.30	0.270	0.280	0.160
Th	0.96	1.70	1.30	1.20	1.40	1.20	1.30	1.50	1.50	1.10
U	0.32	0.51	<0.30	0.280	0.34	<0.40	0.37	0.42	0.43	0.290
Pd (ppb)	0.50	<0.50	0.60	0.70	0.60	0.90	0.90	0.50	1.00	<0.50
Pt	4.3	1.00	2.20	1.90	2.60	1.10	3.9	2.00	2.20	1.90
Rh	<0.50	<0.50	0.50	0.70	<0.50	0.60	<0.50	<0.50	<0.50	<0.50
Au	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0

Table 6b. Nokesville sheet.

	W-217700 57-340'	W-217701 57-346'	W-232435 FG-85-36	W-232436 FG-85-37	W-232431 FG-85-32
Lat.	38°40'N	38°40'N	38°39'N	38°39'N	38°37'N
Long.	77°35'W	77°35'W	77°37'W	77°37'W	77°37'W
SiO_2 (%)	50.20	50.20	49.60	49.50	51.60
TiO_2	0.73	0.71	0.69	0.72	0.73
Al_2O_3	15.00	15.20	15.00	15.00	15.60
Fe_2O_3	2.10	2.20	2.10	4.40	1.40
FeO	8.60	8.30	8.10	5.90	8.60
MnO	0.22	0.21	0.20	0.23	0.18
MgO	8.20	8.00	7.90	8.00	7.80
CaO	11.20	11.40	10.60	8.00	11.00
Na_2O	2.14	2.02	1.89	3.10	2.02
K_2O	0.32	0.28	0.44	0.77	0.40
P_2O_5	0.11	0.11	0.10	0.09	0.11
H_2O^+	0.99	1.00	1.30	2.80	0.56
H_2O^-	0.18	0.21	0.36	0.52	0.30
CO_2	0.08	0.09	0.20	0.01	0.02
S	—	—	0.19	0.14	0.06
Σ	100.07	99.93	98.67	99.18	100.38
B (ppm)	—	—	14.0	58	4.0
Sc	41	42	42	42	41
Cr	246	262	266	254	232
Co	51	48	48	42	47
Ni	100	92	58	56	56
Cu	94	70	65	140	59
Zn	88	91	99	59	79
Rb	14.0	17.0	23.0	46	14.0
Sr	134	135	166	226	145
Sb	<0.80	<0.80	<0.70	<0.270	<0.60
Cs	2.31	2.10	1.10	0.39	1.20
Ba	80	95	129	188	100
Y	24.0	25.0	24.0	27.0	25.0
La	5.0	5.4	4.6	7.4	6.7
Ce	11.0	11.0	9.8	14.0	13.0
Nd	<10.0	5.4	<40	7.6	7.6
Sm	1.96	1.96	1.96	2.31	2.26
Eu	0.66	0.71	0.73	0.88	0.75
Tb	0.50	0.43	0.48	0.55	0.48
Yb	1.80	2.00	2.10	2.50	2.40
Lu	0.33	0.31	0.30	0.45	0.35
Zr	65	64	65	67	72
Hf	1.40	1.30	1.50	1.50	1.60
Nb	5.1	4.2	2.10	2.30	3.1
Ta	0.190	0.190	0.170	0.190	0.240
Th	1.20	1.10	0.99	0.86	1.50
U	0.30	<0.40	<0.40	0.63	0.46
Pd (ppb)	2.30	0.80	0.70	<0.50	0.50
Pt	4.8	0.80	1.30	1.00	3.7
Rh	<0.50	0.50	<0.50	<0.50	<0.50
Au	<10.0	<10.0	—	—	—

Table 6c. Nokesville sheet.

	W-217702 39V-22'	W-217703 39V-50'	W-217704 39V-90'	W-217705 39V-140'	W-217706 39V-200'	W-217707 39V-240'	W-217708 39V-249.5'	W-217709 39V-270'	W-217710 39V-280'	W-217711 39V-283.0'
Lat.	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N	38°40'N
Long.	77°36'W	77°36'W	77°36'W	77°36'W	77°36'W	77°36'W	77°36'W	77°36'W	77°36'W	77°36'W
SiO_2 (%)	50.50	51.30	51.30	50.90	51.00	51.10	50.70	50.80	50.60	50.00
TiO_2	0.65	0.71	0.71	0.75	0.77	0.77	0.74	0.75	0.71	0.72
Al_2O_3	15.30	15.70	15.90	15.30	14.90	15.30	15.40	15.40	15.30	15.50
Fe_2O_3	1.70	1.70	1.50	1.90	2.10	1.70	1.60	2.00	3.10	3.00
FeO	8.80	8.40	8.30	8.60	8.80	8.90	8.50	8.60	7.30	7.50
MnO	0.22	0.19	0.18	0.19	0.19	0.22	0.19	0.20	0.18	0.20
MgO	8.30	7.80	7.90	8.00	8.10	7.70	7.80	7.90	7.90	8.00
CaO	11.30	11.40	11.30	11.00	11.10	11.30	11.50	11.30	11.50	11.10
Na_2O	2.13	2.16	2.37	2.09	2.02	2.16	2.02	2.16	2.16	2.02
K_2O	0.36	0.37	0.45	0.39	0.33	0.35	0.33	0.30	0.36	0.41
P_2O_5	0.10	0.11	0.11	0.13	0.12	0.11	0.11	0.12	0.11	0.11
H_2O^+	0.65	0.48	0.57	0.49	0.44	0.40	0.46	0.54	0.96	1.30
H_2O^-	0.16	0.18	0.12	0.22	0.22	0.21	0.18	0.28	0.17	0.44
CO_2	0.07	0.05	0.05	0.06	0.04	0.05	0.09	0.07	0.08	0.07
Σ	100.24	100.55	100.76	100.02	100.13	100.27	99.62	100.42	100.43	100.37
Sc (ppm)	41	40	44	40	41	42	41	42	42	42
Cr	267	232	295	236	223	228	234	238	266	260
Co	49	46	49	47	48	47	45	46	46	47
Ni	96	92	92	96	100	92	93	90	93	99
Cu	57	52	58	58	64	75	68	69	64	69
Zn	92	78	93	84	85	96	79	98	85	88
Rb	11.0	14.0	11.0	13.0	11.0	19.0	17.0	14.0	19.0	10.0
Sr	124	148	137	134	132	137	138	158	158	131
Sb	<0.80	<0.70	<0.80	<0.70	<0.70	<0.80	<0.70	<0.70	<0.80	<0.80
Cs	0.89	0.62	0.92	0.92	0.84	0.78	0.84	0.90	2.00	1.10
Ba	94	99	123	86	120	87	84	117	84	72
Y	22.0	21.0	19.0	23.0	21.0	26.0	26.0	23.0	25.0	23.0
La	5.6	6.2	8.0	6.5	6.2	5.3	5.3	5.4	5.5	5.2
Ce	12.0	12.0	15.2	14.1	13.0	12.0	12.0	12.0	12.0	11.0
Nd	<10.0	7.8	7.3	8.7	9.2	7.5	<10.0	6.7	9.6	6.5
Sm	1.98	2.25	2.13	2.27	2.31	2.24	2.22	2.07	2.04	2.05
Eu	0.66	0.70	0.80	0.71	0.77	0.76	0.74	0.73	0.74	0.73
Tb	0.44	0.49	0.54	0.47	0.48	0.49	0.41	0.47	0.50	0.47
Yb	1.60	1.90	2.10	2.01	1.90	2.10	1.70	1.80	1.80	1.90
Lu	0.30	0.32	0.43	0.35	0.35	0.35	0.36	0.37	0.35	0.32
Zr	60	60	63	65	66	66	66	67	66	60
Hf	1.40	1.50	1.50	1.57	1.50	1.30	1.50	1.50	1.30	1.20
Nb	4.1	3.8	4.1	4.7	5.3	4.4	4.0	4.7	4.5	4.3
Ta	0.190	0.220	0.210	0.250	0.36	0.31	0.230	<0.200	0.280	0.190
Th	1.20	1.30	1.60	1.50	1.40	1.20	1.10	1.00	1.00	1.00
U	0.31	0.38	<0.50	0.41	<0.30	0.50	0.63	0.270	0.41	0.32
Pd (ppb)	1.30	0.80	0.50	<0.50	0.60	1.80	<0.50	0.70	<0.50	<0.50
Pt	1.40	2.30	1.50	1.70	1.50	1.30	2.20	3.0	1.20	<1.00
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Au	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0

Table 7. Tinpot, Cedar Run, Goose Creek, and Catlett sheets.

	W-243822 FG-87-54A	W-243823 FG-87-54B1	W-243824 FG-87-55A	W-243825 FG-87-55B	W-243831 FG-85-CT4B	W-249263 FG-89-60	W-241411 FG-85-30
Lat.	38°33'N	38°33'N	38°33'N	38°33'N	38°39'N	39° 1'N	38°45'N
Long.	77°49'W	77°49'W	77°50'W	77°50'W	77°40'W	77°37'W	77°30'W
SiO_2 (%)	50.10	50.00	49.80	51.30	50.80	50.80	51.10
TiO_2	0.83	0.81	0.70	0.79	0.73	0.76	0.70
Al_2O_3	14.70	14.30	14.90	15.00	15.00	15.00	13.50
Fe_2O_3	3.27	3.15	2.59	3.02	2.90	2.15	1.62
FeO	8.10	7.90	8.00	8.00	8.10	8.50	9.74
MnO	0.20	0.19	0.14	0.19	0.20	0.22	0.21
MgO	7.09	7.33	8.05	7.00	7.98	7.74	9.60
CaO	8.36	8.41	10.30	10.40	11.30	11.30	11.10
Na_2O	3.67	4.00	2.06	2.49	2.04	1.98	1.87
K_2O	1.10	0.65	1.42	1.04	0.43	0.38	0.33
P_2O_5	0.12	0.11	0.09	0.09	0.10	0.10	0.08
H_2O^+	2.30	2.70	1.40	0.79	0.70	0.60	0.52
H_2O^-	0.40	0.33	0.35	0.32	0.40	0.50	0.18
CO_2	0.06	0.04	0.03	0.03	0.39	0.04	0.04
S	0.11	0.12	0.05	0.07	0.07	0.06	0.05
F	0.02	0.01	0.02	0.02	0.01	0.02	<0.01
Cl	0.05	0.08	0.16	0.01	0.02	0.07	<0.01
Σ	100.47	100.13	100.06	100.56	101.17	100.22	100.64
B (ppm)	18.1	—	—	10.4	16.4	—	2.00
Sc	43	42	41	44	44	42	45
V	—	—	—	—	—	272	—
Cr	180	180	252	190	254	215	310
Co	48	48	47	46	49	46	54
Ni	65	67	70	44	65	69	83
Cu	51	45	61	76	63	—	63
Zn	70	48	34	64	62	111	72
Ga	18.0	19.0	18.0	19.0	19.0	19.0	—
As	1.10	2.40	4.7	<0.80	2.80	1.28	1.10
Rb	64	23.0	71	55	18.0	21.4	11.0
Sr	380	149	207	267	133	148	119
Ag	—	—	—	—	—	—	0.0260
Sb	<0.080	0.170	0.35	<0.080	<0.060	0.176	<0.40
Cs	1.10	0.32	1.40	0.53	1.60	1.10	0.87
Ba	111	44	188	137	65	110	88
Y	22.0	21.0	19.0	19.0	20.0	21.0	21.0
La	7.0	7.0	5.0	6.0	5.7	5.9	5.5
Ce	14.0	14.0	11.0	12.0	12.0	12.3	11.0
Nd	8.7	6.4	7.8	6.7	6.7	7.3	<4.0
Sm	2.45	2.27	1.94	2.10	2.22	2.20	2.05
Eu	0.81	0.82	0.71	0.77	0.76	0.74	0.65
Tb	0.59	0.49	0.48	0.51	0.58	0.52	0.43
Yb	2.40	2.40	2.10	2.20	2.40	2.41	2.20
Lu	0.37	0.35	0.33	0.34	0.35	0.34	0.33
Zr	69	63	58	68	65	<250	59
Hf	1.80	1.80	1.20	1.40	1.60	1.57	1.50
Nb	4.7	4.1	3.0	3.7	3.8	3.8	2.90
Ta	0.30	0.280	0.190	0.260	0.230	0.247	0.220
Th	1.60	1.40	0.98	1.20	1.20	1.35	1.20
U	0.50	<0.50	0.31	0.39	0.43	0.80	0.230
Pd (ppb)	<0.50	2.00	0.70	<0.50	<0.50	<0.80	<0.80
Pt	3.8	6.1	2.90	3.9	1.60	2.40	3.0
Rh	—	—	—	—	—	<0.50	<0.50
Ru	—	—	—	—	—	<0.50	<0.50
Ir	—	—	—	—	—	<0.50	<0.50
Au	<2.90	<1.80	<4.0	<2.30	<2.30	<4.0	<12.0

Table 8. Remington sheet.

	W-243409 FG-85-R2	W-243410 FG-85-R3	W-243411 FG-85-R4	W-243412 FG-85-R5	W-243413 FG-85-R6	W-243414 FG-85-R7	W-243415 FG-85-R8	W-243416 FG-85-R9	W-228180 FG-84-1
Lat.	38°31'N	38°31'N	38°31'N	38°30'N	38°31'N	38°30'N	38°33'N	38°33'N	38°33'N
Long.	77°48'W	77°48'W	77°48'W	77°49'W	77°50'W	77°50'W	77°47'W	77°47'W	77°45'W
SiO_2 (%)	51.42	54.94	50.50	51.46	52.11	51.91	51.09	50.87	51.80
TiO_2	0.72	1.76	0.69	0.74	0.79	0.80	0.73	0.65	1.10
Al_2O_3	15.40	12.21	15.59	15.37	15.56	14.81	15.44	17.79	14.90
$Fe_2O_3^*$	11.20	14.74	10.99	11.51	11.35	12.07	11.47	10.05	—
Fe_2O_3	—	—	—	—	—	—	—	—	2.80
FeO	—	—	—	—	—	—	—	—	9.40
MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
MgO	7.93	4.15	8.60	7.91	7.29	7.75	7.81	6.53	4.90
CaO	11.30	8.28	11.51	11.18	10.95	10.50	10.97	11.59	9.80
Na_2O	2.11	3.68	2.01	2.10	2.34	2.27	2.33	2.07	2.29
K_2O	0.35	0.34	0.31	0.38	0.43	0.57	0.69	0.46	0.48
P_2O_5	0.03	0.30	0.07	0.08	0.10	0.10	0.08	0.08	0.16
H_2O^+	—	—	—	—	—	—	—	—	0.72
H_2O^-	—	—	—	—	—	—	—	—	0.45
CO_2	—	—	—	—	—	—	—	—	0.02
S	0.05	0.07	0.03	0.05	0.04	0.07	0.06	0.04	0.03
F	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.02
Cl	0.01	0.07	0.01	0.01	0.02	0.15	0.07	0.05	0.09
Σ	100.53	100.56	100.31	100.80	100.99	101.01	100.75	100.19	99.16
B (ppm)	36	40	—	15.1	—	37	—	25.3	13.0
Sc	41	47	38	44	41	43	42	35	43
Cr	257	13.0	297	250	198	197	238	163	26.0
Co	46	35	47	48	44	49	46	41	43
Ni	68	27.0	82	68	57	68	69	58	18.0
Cu	68	74	58	63	61	65	82	54	115
Zn	74	128	60	79	74	87	80	71	109
As	<1.70	3.1	<2.00	<2.20	<2.30	<2.40	<2.50	<2.40	—
Rb	12.0	12.0	19.0	15.0	13.0	15.0	25.0	17.0	19.0
Sr	130	96	143	137	144	149	179	143	170
Sb	<0.210	<0.30	<0.270	<0.230	<0.240	<0.240	<0.240	<0.230	<0.70
Cs	0.51	<0.280	0.63	0.60	0.75	1.30	0.66	0.72	0.89
Ba	87	45	74	88	107	125	103	86	135
Y	27.0	69	28.0	24.0	25.0	24.0	20.0	24.0	30
La	5.5	15.7	4.8	5.6	6.8	7.1	5.5	6.1	8.8
Ce	11.0	35	11.0	12.0	14.0	15.0	11.0	13.0	18.0
Nd	6.8	16.0	6.0	8.5	7.8	8.1	6.6	6.9	<40
Sm	2.00	6.1	1.79	2.10	2.42	2.36	2.06	1.99	3.2
Eu	0.70	1.41	0.68	0.77	0.77	0.79	0.73	0.68	0.98
Tb	0.47	1.45	0.44	0.51	0.57	0.57	0.56	0.51	0.64
Yb	2.10	6.3	1.80	2.30	2.50	2.50	2.20	2.10	3.0
Lu	0.290	0.89	0.260	0.33	0.35	0.36	0.32	0.34	0.46
Zr	64	183	61	62	69	68	63	62	92
Hf	1.40	4.9	1.30	1.50	1.70	1.80	1.30	1.40	2.30
Nb	2.80	10.0	2.70	2.70	3.6	3.6	2.80	3.0	4.6
Ta	0.240	0.78	0.190	0.240	<0.60	0.30	0.230	0.250	0.32
Th	1.10	4.4	1.10	1.30	1.50	1.50	1.20	1.30	1.80
U	<0.60	1.30	<0.70	<0.70	<0.70	<0.50	<0.70	0.32	<2.70
Pd (ppb)	<0.50	0.50	0.60	<0.50	1.30	0.80	1.40	0.80	1.20
Pt	<1.00	<1.00	1.50	1.70	2.30	2.90	<1.00	4.0	3.2
Rh	—	—	—	—	—	—	—	—	1.70
Au	<9.0	<10.0	<5.0	<11.0	<10.0	<10.0	<10.0	<9.0	—

Table 9a. Germanna Bridge sheet. Berry Hill area.

	W-235793 FG-84 20B	W-235794 FG-84 20A1	W-235795 FG-84 20A3	W-235796 FG-84 20A2	W-251491 FG-89 62	W-251492 FG-89 63A	W-251493 FG-89 64	W-251494 FG-89 64A
Lat.	38°27'N	38°27'N	38°27'N	38°27'N	38°33'N	38°32'N	38°31'N	38°31'N
Long.	77°50'W	77°50'W	77°50'W	77°50'W	77°45'E	77°45'E	77°46'E	77°46'E
SiO_2 (%)	52.20	57.80	52.50	59.00	52.10	52.30	52.50	60.50
TiO_2	1.70	1.80	1.20	1.80	1.60	1.21	1.62	1.61
Al_2O_3	16.00	12.50	15.40	13.70	14.80	15.10	15.80	11.90
Fe_2O_3	3.70	4.40	3.00	5.30	2.91	2.17	3.70	4.13
FeO	8.50	6.80	7.50	3.60	8.90	8.40	8.10	7.80
MnO	0.16	0.18	0.22	0.14	0.16	0.17	0.17	0.22
MgO	3.30	1.10	5.50	0.77	4.28	5.75	3.40	1.02
CaO	5.90	5.70	9.90	4.00	9.45	9.94	8.94	3.57
Na_2O	4.21	4.60	2.40	4.78	2.80	2.59	2.74	3.98
K_2O	2.70	2.20	0.83	2.50	1.02	0.94	1.22	2.18
P_2O_5	0.24	0.76	0.20	0.77	0.18	0.15	0.20	0.41
H_2O^+	2.00	0.98	1.10	1.80	1.10	0.89	0.84	1.50
H_2O^-	0.54	0.72	0.34	0.98	0.38	0.41	0.56	0.64
CO_2	0.03	0.02	0.01	0.01	0.02	0.01	0.01	0.01
S	0.06	0.06	0.11	0.11	—	—	—	—
F	0.04	0.10	0.03	0.05	—	—	—	—
Cl	0.22	0.20	0.19	0.03	—	—	—	—
Σ	101.50	99.92	100.43	99.34	99.70	100.02	99.79	99.47
B (ppm)	31	16.0	8.0	13.0	—	—	—	—
Sc	33	27.3	36	23.9	35	34	32	21.4
V	—	—	—	—	330	278	290	35
Cr	<13.0	<8.0	61	<5.0	11.0	51	10.0	4.6
Co	43	29.4	46	12.2	45	44	41	26.9
Ni	25.0	<5.0	60	7.0	49	69	41	11.0
Cu	176	123	148	27.0	130	140	170	210
Zn	122	52	82	48	67	90	114	105
Ga	—	—	—	—	20.0	20.0	22.0	23.0
As	4.1	4.4	2.40	<3.2	3.2	1.40	1.90	3.0
Rb	112	66	43	75	44	39	52	83
Sr	410	146	213	120	257	249	248	245
Sb	0.43	<0.60	0.43	<0.60	0.230	0.190	0.240	0.160
Cs	0.75	<0.90	1.30	0.79	0.72	1.10	2.00	1.90
Ba	370	390	265	410	244	204	320	480
Y	42	131	30	121	27.0	26.0	31	69
La	21.2	82	12.6	76	16.0	13.0	17.0	37
Ce	34	150	25.0	123	32	25.4	36	75
Nd	20.0	100	13.0	100	16.0	15.0	18.0	41
Sm	5.7	28.3	3.9	26.9	4.7	3.9	5.1	10.9
Eu	1.50	5.6	1.16	5.0	1.35	1.20	1.55	2.37
Tb	1.00	4.5	0.68	3.7	0.81	0.78	0.95	1.97
Yb	3.4	15.6	2.60	9.5	2.90	2.50	3.2	6.3
Lu	0.48	2.10	0.35	1.30	0.41	0.36	0.45	0.88
Zr	158	320	110	390	290	180	220	340
Hf	3.7	8.4	2.73	10.0	3.5	2.92	4.4	7.9
Nb	10.0	24.0	8.4	29.0	12.0	8.3	14.0	27.0
Ta	0.77	1.90	0.58	2.12	0.72	0.61	0.86	1.95
Th	3.6	8.7	2.60	10.0	3.3	2.66	3.7	8.2
U	<1.00	1.50	0.54	2.50	0.70	0.59	0.88	1.00
Pd (ppb)	12.0	<0.50	5.7	<0.50	15	13	4.1	15
Pt	5.4	<1.00	6.3	<1.00	4.4	5.8	0.6	5.6
Rh	<0.50	<0.50	<0.50	<0.50	0.7	0.7	<0.5	9.8
Au	<14.0	<9.0	<16.0	<14.0	<7.0	<9.0	<3.0	<1.00

Table 9b. Germanna Bridge sheet.

	W-228181 FG-84-2A	W-228182 FG-84-2B	W-228183 FG-84-3	W-228185 FG-86-5	W-232432 FG-85-33	W-232433 FG-85-34	W-232437 FG-85-38	W-241421 FG-84-21
Lat.	38°33'N	38°33'N	38°31'N	38°28'N	38°38'N	38°38'N	38°38'N	38°30'N
Long.	77°44'W	77°44'W	77°43'W	77°53'W	77°37'W	77°36'W	77°35'W	77°45'W
SiO_2 (%)	56.80	63.40	52.30	52.10	52.30	52.60	52.40	52.00
TiO_2	2.20	1.10	0.83	1.00	1.50	1.40	1.20	0.82
Al_2O_3	12.00	12.40	14.00	13.80	15.60	14.20	15.70	17.30
Fe_2O_3	5.90	4.60	2.40	2.00	2.60	2.20	1.80	1.99
FeO	7.80	5.90	6.80	8.20	8.90	9.40	8.50	7.06
MnO	0.19	0.16	0.16	0.17	0.17	0.20	0.17	0.14
MgO	1.80	0.98	9.40	8.30	3.80	5.80	5.50	6.07
CaO	4.60	3.20	11.00	10.50	8.00	9.90	9.90	12.00
Na_2O	3.10	5.12	1.48	1.75	2.70	2.16	2.16	2.30
K_2O	2.90	0.11	0.62	0.56	1.80	0.83	1.10	0.49
P_2O_5	0.44	0.17	0.14	0.14	0.20	0.19	0.17	0.12
H_2O^+	0.90	1.40	0.39	0.44	1.40	0.67	0.72	0.51
H_2O^-	0.40	0.95	0.60	0.52	0.25	0.17	0.30	0.18
CO_2	0.04	0.01	0.02	0.01	0.02	0.01	0.01	<0.01
S	0.02	0.01	0.02	<0.00	0.08	0.10	0.10	0.02
F	0.06	0.02	0.02	0.02	—	—	—	0.01
Cl	0.10	0.18	0.01	0.05	—	—	—	<0.01
Σ	99.25	99.71	100.19	99.56	99.32	99.83	99.73	101.02
B (ppm)	33	10.0	12.0	11.0	80	11.0	12.0	3.0
Sc	31	16.8	36	37	34	38	35	34
Cr	5.5	4.1	620	370	11.0	52	55	91
Co	28.3	18.2	47	50	44	47	44	41
Ni	13.0	12.0	110	110	18.0	35	45	73
Cu	221	53	81	126	120	160	140	101
Zn	169	63	69	90	83	120	98	67
As	—	—	—	—	—	—	—	0.85
Rb	95	8.1	25.0	35	77	28.0	40	15.0
Sr	257	41	200	191	420	197	244	204
Ag	—	—	—	—	—	—	—	0.038
Sb	0.44	<0.250	<0.70	<0.60	0.40	0.38	0.44	<0.40
Cs	0.44	<0.40	0.84	0.96	0.85	1.90	1.20	0.81
Ba	800	44	178	162	330	197	228	155
Y	58	62	20.0	27.0	33	31	30	17.0
La	34	32	8.3	11.0	16.0	14.0	13.0	8.8
Ce	67	81	18.0	22.5	33	30	27.0	18.0
Nd	36	39	11.0	10.0	17.0	15.0	15.0	9.9
Sm	11.0	10.5	2.80	3.4	4.8	4.4	3.8	3.1
Eu	2.36	2.33	0.82	1.04	1.49	1.20	1.20	0.98
Tb	1.76	1.90	0.56	0.57	0.81	0.76	0.67	0.53
Yb	5.5	7.1	1.80	2.30	2.90	2.50	2.30	1.90
Lu	0.83	1.00	0.270	0.35	0.44	0.37	0.36	0.270
Zr	310	470	84	106	139	132	114	80
Hf	7.6	11.8	1.90	2.40	3.3	3.1	2.70	2.00
Nb	24.0	36	5.2	6.6	9.5	9.7	9.1	5.7
Ta	1.70	2.64	0.41	0.51	0.73	0.64	0.60	0.42
Th	7.4	12.0	1.70	2.20	2.90	3.0	2.80	1.60
U	1.70	1.60	0.56	0.78	0.53	0.64	<0.50	0.40
Pd (ppb)	18.0	0.60	7.6	12.0	9.8	9.0	7.8	7.4
Pt	1.40	0.40	18.0	13.0	6.8	5.6	8.0	8.4
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ru	—	—	—	—	—	—	—	0.70
Ir	—	—	—	—	—	—	—	<0.50
Au	—	—	—	—	—	—	—	<4.0

Table 10a. Rapidan sheet, state route 655.

	W-232041 K-2	W-232042 K-3	W-232043 K-4	W-232044 K-4A	W-232045 K-5	W-232046 K-6	W-232047 K-7
Lat.	38°22'N	38°22'N	38°21'N	38°21'N	38°21'N	38°21'N	38°21'N
Long.	78° 0'W	78° 0'W	77°59'W	77°59'W	77°59'W	77°59'W	77°59'W
SiO_2 (%)	52.00	51.90	52.20	50.80	50.90	51.10	52.00
TiO_2	0.76	0.41	0.63	0.76	0.83	0.88	1.10
Al_2O_3	13.60	15.60	13.10	11.60	13.00	13.00	13.60
Fe_2O_3	2.00	1.60	1.90	2.00	1.90	2.00	2.20
FeO	8.20	6.30	7.20	8.00	7.90	7.80	8.20
MnO	0.19	0.16	0.18	0.18	0.17	0.17	0.18
MgO	8.90	9.30	10.40	12.40	10.60	9.90	8.30
CaO	11.70	12.70	12.00	10.40	10.90	11.00	10.60
Na_2O	1.89	1.89	1.62	1.62	1.75	1.89	2.02
K_2O	0.38	0.26	0.29	0.40	0.45	0.56	0.64
P_2O_5	0.07	0.04	0.07	0.09	0.10	0.12	0.14
H_2O^+	0.66	0.46	0.61	0.68	0.49	0.62	0.89
H_2O^-	0.15	0.16	0.16	0.23	0.24	0.29	0.31
CO_2	0.02	0.01	0.01	0.02	0.02	0.02	0.01
Σ	100.52	100.79	100.37	99.18	99.25	99.35	100.19
B (ppm)	3.0	3.0	3.0	4.0	4.0	5.0	8.0
Sc	42	36	40	36	35	37	37
Cr	370	430	480	930	760	760	410
Co	51	45	51	62	56	54	50
Ni	86	100	110	190	150	130	91
Cu	79	30	51	73	82	87	101
Zn	70	63	68	72	78	70	81
Rb	9.0	6.0	8.0	16.0	13.0	21.0	29.0
Sr	172	189	149	140	154	159	179
Sb	<0.90	<0.60	<0.70	<0.70	<0.80	<0.70	<0.80
Cs	0.88	0.41	0.47	0.74	0.63	0.80	1.70
Ba	119	90	112	111	112	126	171
Y	21.0	12.0	17.0	21.0	20.0	19.0	30
La	6.7	3.5	7.1	7.2	7.9	8.9	10.9
Ce	14.0	6.9	12.0	15.0	17.0	19.0	22.0
Nd	9.8	<40	8.1	10.0	8.4	<50	14.0
Sm	2.47	1.27	2.14	2.38	2.68	2.91	3.5
Eu	0.87	0.59	0.72	0.74	0.80	0.86	1.00
Tb	0.47	0.240	0.38	0.46	0.50	0.52	0.62
Yb	1.80	0.87	1.40	1.30	1.80	1.80	2.20
Lu	0.270	0.180	0.260	0.250	0.250	0.260	0.32
Zr	66	35	55	81	81	86	104
Hf	1.60	0.62	1.30	1.70	2.00	2.20	2.46
Nb	4.5	<2.00	3.8	5.1	5.3	6.5	6.8
Ta	0.280	0.130	0.250	0.35	0.39	0.39	0.50
Th	1.30	0.56	1.00	1.40	1.40	1.90	2.20
U	0.280	<0.30	0.230	0.31	<0.40	0.32	0.48
Pd (ppb)	2.80	3.0	3.4	7.8	6.8	7.9	9.3
Pt	15.0	11.0	20.0	39	22.0	22.0	14.0
Rh	<0.50	<0.50	<0.50	0.60	0.50	<0.50	<0.50

Table 10b. Rapidan sheet.

	W-241410 FG-85 CE-5	W-241416 FG-85 CE-2A	W-241417 FG-85 CE-3	W-241418 522A	W-241419 522B	W-227666 FG-84 14	W-228187 FG-84 8B
Lat.	38°25'N	38°22'N	38°22'N	38°23'N	38°22'N	38°22'N	38°20'N
Long.	77°52'W	78° 0'W	77°52'W	78° 0'W	78° 0'W	78° 5'W	78° 1'W
SiO_2 (%)	51.00	52.30	51.00	52.10	56.70	48.30	52.10
TiO_2	0.96	0.73	0.85	1.17	0.89	2.30	0.65
Al_2O_3	13.00	14.40	12.40	14.00	17.60	13.80	10.30
Fe_2O_3	2.67	1.80	1.88	2.07	4.08	4.50	1.80
FeO	8.62	7.28	8.60	8.64	3.01	8.90	8.60
MnO	0.18	0.16	0.18	0.18	0.12	0.19	0.19
MgO	10.30	9.36	11.60	7.14	2.80	6.20	14.60
CaO	10.90	11.80	11.10	10.90	3.63	8.90	9.40
Na_2O	1.85	1.91	1.70	2.22	5.57	2.50	1.06
K_2O	0.50	0.48	0.43	0.68	4.03	1.30	0.30
P_2O_5	0.12	0.08	0.09	0.14	0.17	0.29	0.10
H_2O^+	0.57	0.41	0.40	1.02	1.30	1.70	0.37
H_2O^-	0.25	0.11	0.32	0.12	0.18	0.30	0.51
CO_2	0.01	0.04	0.04	0.07	<0.01	0.02	0.02
S	0.02	0.02	0.02	0.03	0.02	<0.01	<0.01
F	0.01	<0.01	<0.01	0.01	0.04	0.03	0.01
Cl	<0.01	<0.01	<0.01	0.08	0.04	0.06	0.01
Σ	100.96	100.89	100.61	100.57	100.17	99.29	100.03
B (ppm)	2.00	3.0	2.00	5.0	71	34	3.0
Sc	38	37	37	37	17.0	40	37
Cr	660	580	790	251	84	75	1020
Co	58	46	59	45	16.5	48	66
Ni	177	110	209	81	52	53	220
Cu	105	64	87	115	14.0	14	77
Zn	75	52	64	89	95	94	80
As	1.50	<2.10	<2.30	1.60	2.30	—	—
Rb	16.0	17.0	11.0	27.0	108	80	16.0
Sr	158	172	138	183	380	420	123
Ag	0.036	0.034	0.034	0.053	0.0240	—	—
Sb	0.250	<0.40	0.210	<0.40	0.250	0.37	<0.60
Cs	1.20	0.67	1.50	2.00	3.5	0.51	0.58
Ba	141	121	120	160	700	310	106
Y	19.0	23.0	18.0	26.0	36	33	17.0
La	9.6	7.6	8.0	11.4	49	14.5	6.3
Ce	20.4	16.0	17.0	22.0	96	32	14.0
Nd	10.0	7.9	<11.0	12.0	39	24.0	9.5
Sm	3.1	2.30	2.62	3.6	9.0	5.6	2.10
Eu	0.90	0.78	0.76	1.00	1.67	1.71	0.62
Tb	0.53	0.46	0.47	0.65	1.20	0.95	0.36
Yb	1.90	1.60	1.80	2.30	4.2	2.81	1.40
Lu	0.290	0.250	0.30	0.34	0.56	0.44	0.240
Zr	85	72	76	109	176	156	64
Hf	2.20	1.70	1.90	2.60	4.8	3.9	1.50
Nb	5.4	5.2	5.4	8.1	16.0	14.1	3.7
Ta	0.45	0.36	0.39	0.53	1.38	1.05	0.31
Th	1.90	1.40	1.60	2.30	12.8	1.10	1.20
U	0.39	<0.40	0.32	0.48	1.80	<4.0	<1.00
Pd (ppb)	9.7	6.3	8.2	9.9	0.90	12.0	5.6
Pt	21.0	20.0	22.0	11.0	<0.50	24.0	11.0
Rh	1.10	0.80	0.90	<0.50	<0.50	<2.00	<0.50
Ru	1.00	1.00	1.10	0.80	0.60	—	—
Ir	1.20	0.60	1.20	<0.50	<0.50	—	—
Au	3.1	<9.0	<10.0	<6.0	<7.0	—	—

Table 10c. Rapidan sheet.

	W-228184 FG-84-4	W-228186 FG-84-6	W-232422 F-84-11	W-232423 F-84-12	W-241420 FG-84-17	W-227667 FG-84-8A
Lat.	38°26'N	38°20'N	38°19'N	38°19'N	38°22'N	38°20'N
Long.	77°58'W	78° 2'W	78° 5'W	78° 5'W	78° 7'W	78° 1'W
SiO_2 (%)	52.20	51.60	52.40	52.60	52.50	51.50
TiO_2	0.70	0.48	0.83	0.82	0.94	1.00
Al_2O_3	14.50	11.40	13.10	12.70	13.50	13.70
Fe_2O_3	1.40	1.00	1.70	1.70	2.32	1.60
FeO	6.80	7.30	7.60	7.80	7.97	8.70
MnO	0.15	0.17	0.17	0.17	0.19	0.17
MgO	9.00	13.00	10.30	10.80	9.02	8.20
CaO	11.80	12.00	10.80	10.50	10.90	10.60
Na_2O	1.89	1.12	1.62	1.62	1.91	1.90
K_2O	0.48	0.16	0.40	0.50	0.50	0.59
P_2O_5	0.10	0.07	0.11	0.11	0.11	0.15
H_2O^+	0.36	0.08	0.47	0.30	0.71	0.83
H_2O^-	0.40	0.41	0.25	0.25	0.19	0.27
CO_2	0.01	0.02	0.01	0.01	0.02	0.05
S	<0.00	<0.00	0.07	0.04	0.02	0.02
F	0.01	0.01	—	—	0.01	0.02
Cl	0.00	0.00	—	—	<0.01	0.02
Σ	99.80	98.82	99.83	99.92	100.82	99.31
B (ppm)	7.0	3.0	4.0	4.0	3.0	4.0
Sc	37	43	37	39	38	37
Cr	510	980	720	790	520	420
Co	45	55	50	53	49	49
Ni	110	170	120	120	111	100
Cu	76	47	79	77	94	110
Zn	63	59	69	79	72	89
As	—	—	—	—	1.20	—
Rb	21.0	10.0	16.0	26.0	25.0	19
Sr	193	128	150	157	169	183
Ag	—	—	—	—	0.034	—
Sb	<0.60	<0.60	<0.60	0.290	<0.40	<0.60
Cs	0.68	0.36	0.78	0.83	0.98	1.40
Ba	131	86	114	132	153	159
Y	19.0	16.0	20.0	19.0	22.0	27
La	7.4	4.0	8.2	8.1	9.3	10.0
Ce	15.0	8.8	16.0	16.0	19.0	23.5
Nd	9.3	6.8	8.8	9.5	11.0	23.0
Sm	2.39	1.60	2.50	2.47	2.94	3.3
Eu	0.79	0.51	0.82	0.78	0.92	1.06
Tb	0.45	0.290	0.55	0.51	0.61	0.56
Yb	1.30	0.90	1.70	1.50	1.90	2.02
Lu	0.240	0.190	0.280	0.260	0.270	0.36
Zr	75	51	78	80	83	106
Hf	1.70	1.10	1.60	1.80	2.20	2.48
Nb	4.0	2.20	4.8	5.0	6.1	6.3
Ta	0.34	0.180	0.36	0.37	0.49	0.53
Th	1.40	0.72	1.40	1.50	1.80	1.95
U	<1.00	<0.90	0.35	0.290	0.36	<4.0
Pd (ppb)	3.0	3.8	3.2	3.6	6.7	13.0
Pt	14.0	23.0	11.0	9.8	16.0	21.0
Rh	<0.50	<0.50	<0.50	<0.50	0.70	<2.00
Ru	—	—	—	—	0.70	—
Ir	—	—	—	—	0.50	—
Au	—	—	—	—	<5.0	—

Table 11a. Diabase dikes, Dickerson dike, Maryland.

	W-232380 MD-84-1	W-232381 MD-84-3	W-232382 MD-84-5	W-232383 MD-84-6	W-232384 MD-84-7	W-232385 MD-84-8	W-232386 MD-84-10	W-232387 MD-84-11	W-232388 MD-84-12	W-232389 MD-84-13
Lat.	39°12'N	39°12'N	39°12'N	39°12'N	39°12'N	39°12'N	39°12'N	39°12'N	39°12'N	39°12'N
Long.	77°26'W	77°26'W	77°26'W	77°26'W	77°26'W	77°26'W	77°26'W	77°26'W	77°26'W	77°26'W
SiO_2 (%)	50.20	51.40	51.00	50.90	50.60	52.30	52.00	50.60	50.80	50.90
TiO_2	0.74	0.81	0.81	0.79	0.75	0.80	0.75	0.74	0.79	0.77
Al_2O_3	15.20	15.40	14.90	14.80	15.30	15.20	14.80	15.20	14.80	15.00
Fe_2O_3	2.30	2.10	1.90	2.00	1.90	1.50	1.50	1.80	2.50	2.20
FeO	8.50	8.30	8.50	9.00	8.40	8.80	8.60	8.60	8.20	8.60
MnO	0.19	0.19	0.19	0.20	0.19	0.19	0.19	0.20	0.22	0.19
MgO	8.00	6.80	7.10	7.40	7.50	7.10	7.10	7.80	7.00	7.50
CaO	11.10	10.90	10.40	10.40	10.60	10.10	10.10	10.80	10.10	10.60
Na_2O	2.16	2.29	2.24	2.29	2.16	2.20	2.29	2.16	2.40	2.16
K_2O	0.51	0.56	0.53	0.54	0.50	0.67	0.59	0.38	0.48	0.48
P_2O_5	0.09	0.11	0.10	0.11	0.10	0.11	0.11	0.09	0.11	0.09
H_2O^+	0.42	0.93	0.99	0.73	0.67	0.45	0.51	0.24	1.20	0.48
H_2O^-	0.22	0.27	0.21	0.15	0.15	0.16	0.25	0.19	0.25	0.15
CO_2	0.04	0.02	0.03	0.02	0.01	0.02	0.02	0.01	0.02	0.03
S	0.08	0.04	0.07	0.07	0.06	0.04	0.04	0.07	0.06	0.06
Σ	99.75	100.12	98.97	99.41	98.89	99.64	98.85	98.88	98.93	99.21
B (ppm)	3.0	10.0	8.0	5.0	5.0	5.0	7.0	4.0	7.0	4.0
Sc	43	44	43	44	44	42	43	44	42	44
Cr	250	187	182	189	200	186	189	236	183	210
Co	48	46	46	48	47	46	45	49	44	47
Ni	54	42	58	32	38	38	38	47	38	65
Cu	64	68	98	65	57	60	56	63	350	60
Zn	88	120	100	94	89	89	91	96	90	93
Rb	13.0	15.0	19.0	18.0	9.0	20.0	16.0	10.0	18.0	20.0
Sr	131	134	137	141	137	127	131	130	147	136
Sb	<0.60	<0.60	<0.60	<0.70	<0.60	<0.60	<0.70	<0.60	<0.70	<0.60
Cs	0.56	0.64	1.10	0.90	0.50	0.80	0.66	0.52	0.67	0.64
Ba	99	133	129	130	110	125	145	111	129	110
Y	27.0	28.0	27.0	28.0	25.0	25.0	26.0	24.0	27.0	31
La	5.8	8.1	7.6	7.8	7.0	9.5	10.0	6.6	7.8	7.3
Ce	12.0	17.0	15.0	16.0	14.0	19.6	20.0	13.0	16.0	15.0
Nd	<14.0	<16.0	<18.0	<16.0	<13.0	<18.0	<19.0	<7.0	<19.0	<9.0
Sm	2.20	2.80	2.62	2.61	2.50	2.90	3.0	2.30	2.68	2.50
Eu	0.71	0.87	0.83	0.87	0.83	0.87	0.88	0.79	0.84	0.82
Tb	0.49	0.58	0.56	0.57	0.55	0.58	0.62	0.50	0.56	0.52
Yb	2.20	2.50	2.50	2.30	2.50	2.50	2.70	2.40	2.60	2.30
Lu	0.33	0.45	0.39	0.40	0.42	0.39	0.41	0.38	0.39	0.39
Zr	66	82	78	79	73	85	89	66	81	83
Hf	1.30	1.70	1.80	1.70	1.60	1.90	2.20	1.60	1.80	1.80
Nb	2.70	3.9	3.7	3.8	3.5	4.1	4.1	2.60	3.4	3.5
Ta	0.210	0.290	0.290	0.280	0.31	0.32	0.34	0.200	0.280	0.270
Th	1.20	2.00	1.70	<2.30	1.60	2.00	2.20	1.50	1.90	1.60
U	<1.30	<1.70	<1.90	<1.40	<1.40	<1.90	0.96	<1.50	<2.00	<1.60
Pd (ppb)	0.50	1.80	0.80	1.10	0.60	0.50	0.70	0.50	1.00	0.80
Pt	1.60	2.80	3.3	3.3	3.4	2.40	2.50	1.60	2.60	2.80
Rh	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 11b. Diabase dikes. Dickerson dike, Lucketts dike, Seneca dike, and Short Hill Mountain dike.

	W-232390 MD-84 14	W-232391 MD-84 15	W-232392 MD-84 16	W-232393 MD-84 17	W-243836 FG-86 50	W-232424 AJF-85 31	W-249276 VA-89 317A	W-249277 VA-89 317B
Lat.	39°12'N	39°12'N	39°12'N	39°12'N	39°13'N	39° 2'N	39°18'N	39°18'N
Long.	77°26'W	77°26'W	77°26'W	77°26'W	77°28'W	77°20'W	77°40'W	77°40'W
SiO_2 (%)	50.90	50.60	49.90	50.20	52.20	51.70	48.10	47.60
TiO_2	0.81	0.74	0.73	0.73	1.14	1.10	0.29	0.27
Al_2O_3	15.20	15.40	15.50	15.20	14.00	13.80	15.60	14.60
Fe_2O_3	2.20	2.40	2.80	2.90	2.64	2.10	1.98	2.40
FeO	8.90	8.30	7.60	7.10	8.20	8.40	8.30	8.10
MnO	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.18
MgO	7.50	7.80	7.80	7.80	7.64	7.50	10.90	13.30
CaO	10.70	10.80	11.00	11.00	10.90	10.20	12.00	11.30
Na_2O	2.29	2.16	2.16	2.16	1.94	1.89	1.60	1.46
K_2O	0.45	0.56	0.37	0.35	0.40	0.73	0.32	0.31
P_2O_5	0.11	0.09	0.10	0.10	0.15	0.16	0.07	0.06
H_2O^+	0.49	0.62	0.61	0.75	1.10	1.00	0.49	0.52
H_2O^-	0.17	0.09	0.36	0.21	0.20	0.27	0.25	0.12
CO_2	0.03	0.01	0.02	0.06	0.02	0.03	0.03	0.11
S	0.06	0.05	0.05	0.07	0.06	0.10	0.02	0.02
F	—	—	—	—	0.02	—	0.02	0.03
Cl	—	—	—	—	0.01	—	0.01	<0.00
Σ	100.01	99.81	99.19	98.81	100.81	99.15	100.14	100.37
B (ppm)	3.0	4.0	4.0	4.0	7.0	7.0	—	—
Sc	42	44	43	44	37	37	39	38
Cr	180	240	250	250	296	299	700	930
Co	46	49	46	48	48	52	56	65
Ni	53	57	52	51	88	92	350	500
Cu	62	65	69	66	109	120	—	—
Zn	86	93	93	92	83	87	88	80
Ga	—	—	—	—	19.0	—	14.0	14.0
As	—	—	—	—	<1.00	—	<0.90	<0.90
Rb	15.0	11.0	12.0	8.0	7.0	23.0	16.9	12.5
Sr	137	134	146	131	219	184	61	59
Sb	<0.60	<0.60	<0.60	<0.60	0.180	<0.70	<0.090	<0.090
Cs	0.78	0.82	0.70	0.76	<0.230	1.10	0.37	<0.70
Ba	114	133	171	100	183	172	101	105
Y	27.0	25.0	27.0	24.0	22.0	30	13.0	12.0
La	7.1	5.7	5.7	5.4	11.2	12.0	4.5	4.2
Ce	14.0	12.0	10.0	12.0	25.0	25.0	10.2	9.9
Nd	<20.0	<12.0	<12.0	<8.0	15.0	13.0	4.2	5.3
Sm	2.60	2.20	2.30	2.20	3.5	3.7	1.20	1.15
Eu	0.83	0.76	0.75	0.74	1.10	1.10	0.30	0.288
Tb	0.55	0.56	0.53	0.52	0.64	0.73	0.266	0.258
Yb	2.40	2.10	2.40	2.20	2.30	2.60	1.85	1.79
Lu	0.38	0.35	0.36	0.35	0.34	0.36	0.294	0.277
Zr	82	64	68	64	97	113	<160	<120
Hf	1.70	1.40	1.30	1.50	2.50	2.60	0.93	0.80
Nb	3.3	2.50	2.70	2.80	8.4	8.1	2.30	2.00
Ta	0.260	0.220	0.210	0.250	0.52	0.55	0.162	0.127
Th	1.50	1.40	1.20	<1.40	2.30	2.60	0.94	0.86
U	<1.50	<2.00	<1.60	<1.60	0.70	0.46	<0.30	<0.30
Pd (ppb)	0.70	<0.50	0.60	0.60	5.0	8.4	20.0	19.0
Pt	2.70	1.30	1.20	1.90	6.8	12.0	14.0	13.0
Rh	<0.50	<0.50	<0.50	<0.50	—	<0.50	1.50	1.30
Ru	—	—	—	—	—	—	1.20	1.50
Ir	—	—	—	—	—	—	<0.50	<0.50
Au	—	—	—	—	<6.0	—	6.0	26.1

Table 11c. Bristersburg plug, and Carriage Ford, St. Stephens, and Buckland diabase dikes.

	W-243834 FG-86-48	W-243835 FG-86-49	W-243419 CF-87-2	W-232434 FG-85-35	W-243418 SS-87-1	W-241422 FG-85-29	W-243420 BU-87-2	W-243832 FG-86-43
Lat.	38°34'N	38°34'N	38°38'N	38°38'N	38°40'N	38°39'N	38°48'N	38°48'N
Long.	77°37'W	77°37'W	77°35'W	77°35'W	77°40'W	77°41'W	77°39'W	77°39'W
SiO_2 (%)	53.10	52.60	—	52.90	—	49.20	—	46.40
TiO_2	1.35	0.95	—	1.20	—	0.29	—	0.39
Al_2O_3	12.80	14.10	—	16.10	—	18.20	—	16.60
$Fe_2O_3^*$	—	—	14.23	—	9.70	—	10.80	—
Fe_2O_3	3.87	3.26	—	1.90	—	1.79	—	2.83
FeO	9.90	9.00	—	8.00	—	6.28	—	6.40
MnO	0.22	0.21	—	0.16	—	0.14	—	0.18
MgO	4.96	6.49	—	4.90	—	7.98	—	9.50
CaO	8.65	10.40	5.18	9.80	11.19	13.20	10.77	9.37
Na_2O	2.56	2.32	1.17	2.16	1.68	1.74	1.98	2.44
K_2O	0.74	0.49	—	0.86	—	0.62	—	1.04
P_2O_5	0.16	0.14	—	0.18	—	0.05	—	0.08
H_2O^+	1.40	0.52	—	0.55	—	1.06	—	3.50
H_2O^-	0.44	0.68	—	0.37	—	0.20	—	0.58
CO_2	0.05	0.01	—	0.01	—	0.07	—	0.24
S	0.05	0.03	0.03	0.08	0.01	0.02	0.03	0.08
F	0.02	0.02	0.01	—	0.03	<0.01	0.01	0.01
Cl	0.01	<0.00	0.04	—	0.01	0.01	0.01	0.02
Σ	100.28	101.21	—	99.17	—	100.84	—	99.65
B (ppm)	12.1	14.8	20.9	10.0	27.3	3.0	37	24.2
Sc	51	47	20.6	32	37	39	40	33
Cr	18.0	88	1740	44	540	600	237	2160
Co	46	58	111	41	45	41	44	53
Ni	29.0	58	1100	48	200	167	69	275
Cu	49	80	53	120	68	66	55	64
Zn	90	79	72	93	61	60	59	74
Ga	21.0	20.0	—	—	—	—	—	14.0
As	<1.10	<1.10	<2.20	—	<2.60	0.280	<3.0	<0.90
Rb	30	15.0	6.0	32	14.0	15.0	16.0	37
Sr	209	141	65	238	88	102	154	430
Ag	—	—	—	—	—	0.0170	—	—
Sb	0.160	<0.100	<0.250	<0.60	<0.230	<0.40	<0.230	<0.090
Cs	0.59	0.43	0.51	2.00	0.95	0.89	0.83	0.67
Ba	137	156	47	206	110	134	75	320
Y	28.0	25.0	10.0	30	16.0	14.0	25.0	12.0
La	11.7	8.6	2.30	14.0	6.5	6.2	5.0	4.2
Ce	23.0	18.0	8.0	29.0	15.0	13.0	10.0	15.0
Nd	14.0	9.2	4.2	14.0	7.9	<13.0	6.6	4.9
Sm	3.6	2.97	0.93	4.1	1.56	1.55	1.82	1.31
Eu	1.10	0.97	0.280	1.25	0.40	0.38	0.68	0.42
Tb	0.71	0.64	0.190	0.69	0.240	0.250	0.43	0.30
Yb	3.3	3.0	1.10	2.40	1.80	1.80	2.00	1.50
Lu	0.49	0.42	0.160	0.41	0.31	0.270	0.290	0.230
Zr	109	88	42	130	56	57	58	50
Hf	2.40	2.00	0.68	3.2	1.20	1.20	1.20	0.75
Nb	6.2	5.6	1.40	8.6	2.50	2.70	2.60	2.20
Ta	0.40	0.34	0.200	0.74	0.31	0.220	<0.40	0.180
Th	2.90	2.00	<0.140	3.0	1.50	1.40	1.00	0.61
U	0.80	0.55	<0.80	0.68	<0.70	0.34	0.53	<0.30
Pd (ppb)	0.80	0.90	8.0	8.8	12.0	9.6	<0.50	—
Pt	1.30	3.0	7.3	8.8	14.0	12.0	1.40	—
Rh	—	—	—	<0.50	—	0.60	—	—
Ru	—	—	—	—	—	1.10	—	—
Ir	—	—	—	—	—	<0.50	—	—
Au	<1.60	<2.10	<8.0	—	<5.0	4.9	<10.0	6.9

Table 11d. Aldie and Haymarket diabase dikes.

	W-243826 FG-87-56	W-243827 FG-87-57	W-243828 FG-87-58	W-247414 FG88-59	W-249264 FG-89-61A	W-243833 FG-86-44	W-243421 HM-87-1
Lat.	38°58'N	38°58'N	38°58'N	39° 0'N	38°51'N	38°48'N	38°48'N
Long.	77°39'W	77°39'W	77°39'W	77°39'W	77°41'W	77°39'W	77°39'W
SiO_2 (%)	47.10	47.00	53.40	47.50	50.90	50.60	—
TiO_2	0.26	0.26	1.01	0.27	0.74	0.68	—
Al_2O_3	14.40	13.70	14.10	14.70	15.30	15.10	—
$Fe_2O_3^*$	—	—	—	—	—	—	11.08
Fe_2O_3	2.36	2.14	3.57	2.54	2.04	2.67	—
FeO	8.20	8.60	8.90	8.20	8.60	8.20	—
MnO	0.17	0.17	0.21	0.20	0.19	0.18	—
MgO	14.10	15.50	5.61	12.90	8.07	8.45	—
CaO	11.20	10.70	9.48	11.50	11.60	11.20	10.49
Na_2O	1.48	1.43	2.76	1.46	2.00	2.06	1.85
K_2O	0.28	0.27	0.67	0.30	0.33	0.31	—
P_2O_5	0.06	0.06	0.18	0.06	0.10	0.10	—
H_2O^+	0.96	0.51	0.37	0.93	0.74	0.79	—
H_2O^-	0.14	0.12	0.73	0.17	0.18	0.41	—
CO_2	0.29	0.52	0.01	0.20	0.06	0.02	—
S	0.07	0.04	0.06	0.04	0.09	0.04	0.02
F	0.01	0.01	0.03	0.01	0.01	0.01	0.01
Cl	0.02	0.01	0.00	0.01	0.01	0.02	0.01
Σ	101.10	101.04	101.09	100.99	100.96	100.85	—
B (ppm)	3.0	7.4	11.4	—	—	5.6	17.6
Sc	38	37	44	39	42	41	35
V	—	—	—	—	212	—	—
Cr	1090	1200	20.0	1000	248	235	840
Co	68	73	45	67	46	50	55
Ni	510	580	21.0	420	69	82	300
Cu	67	66	36	55	—	69	64
Zn	69	70	73	59	83	70	70
Ga	13.0	12.0	21.0	14.0	19.0	19.0	—
As	<0.80	<0.80	<0.90	<1.10	<0.70	1.80	<2.60
Rb	3.0	2.00	20.0	13.0	15.7	20.0	9.0
Sr	55	44	248	66	128	139	130
Sb	<0.080	<0.080	<0.090	<0.130	<0.080	<0.070	<0.240
Cs	<0.240	<0.230	<0.260	<0.230	0.75	1.40	0.79
Ba	76	62	179	107	117	76	97
Y	11.0	11.0	26.0	12.0	20.0	18.0	23.0
La	3.9	3.7	10.7	4.1	5.2	5.3	5.2
Ce	11.0	11.0	23.0	9.5	11.2	12.0	11.0
Nd	6.4	4.1	12.0	<5.0	6.6	7.8	7.8
Sm	1.04	0.99	3.5	1.14	2.06	1.99	1.51
Eu	0.270	0.260	1.10	0.30	0.75	0.72	0.42
Tb	0.230	0.250	0.71	0.250	0.55	0.51	0.34
Yb	1.80	1.60	3.1	1.70	2.34	2.10	1.80
Lu	0.270	0.280	0.45	0.280	0.32	0.31	0.280
Zr	39	37	98	42	<100	60	50
Hf	0.76	0.68	2.30	0.82	1.51	1.30	0.99
Nb	1.90	1.60	5.2	1.60	3.3	3.0	2.10
Ta	0.120	<0.120	0.36	0.240	0.208	0.240	0.160
Th	0.83	0.72	2.00	0.95	1.16	1.10	0.83
U	<0.32	<0.31	0.55	0.81	<0.31	<0.70	<0.80
Pd (ppb)	14.0	12.0	1.10	17.0	<0.80	<0.50	4.7
Pt	19.0	15.0	2.30	18.0	1.10	2.40	7.6
Rh	—	—	—	1.20	<0.50	—	—
Ru	—	—	—	2.00	<0.50	—	—
Ir	—	—	—	<0.50	<0.50	—	—
Au	<4.0	6.8	<8.0	<6.0	<1.70	<2.10	<10.0

Table 11e. Diabase dikes. USGS Opal No. 1 corehole.

	W-250539 OP-89-15	W-250538 OP-89-14	W-250524 OP-89-1	W-250525 OP-89-2
Lat.	38°38'N	38°38'N	38°38'N	38°38'N
Long.	77°48'W	77°48'W	77°48'W	77°48'W
SiO_2 (%)	44.70	43.70	45.00	44.70
TiO_2	0.27	0.25	0.35	0.38
Al_2O_3	13.70	12.20	12.70	12.80
Fe_2O_3	4.31	4.49	3.30	2.98
FeO	5.30	5.50	5.90	6.50
MnO	0.16	0.16	0.18	0.21
MgO	12.40	15.30	13.90	14.40
CaO	11.00	8.99	8.83	8.91
Na_2O	1.31	1.21	2.13	1.39
K_2O	0.10	0.10	0.11	0.23
P_2O_5	0.05	0.05	0.05	0.05
H_2O^+	3.20	5.00	4.90	4.50
H_2O^-	3.00	3.40	2.60	2.70
CO_2	0.82	0.63	0.21	0.12
Σ	100.31	100.97	100.16	99.87
Sc (ppm)	41	36	38	39
V	192	165	188	193
Cr	2220	1840	1670	1640
Co	59	64	65	66
Ni	350	470	500	490
Cu	45	30	32	25.0
Zn	51	48	49	49
Ga	14.0	13.0	11.0	13.0
As	<1.40	<1.20	<1.10	<0.80
Rb	<2.00	4.0	<2.00	5.0
Sr	128	141	248	175
Ag	<2.00	<2.00	<2.00	<2.00
Sb	<0.110	<0.070	<0.120	<0.050
Cs	<0.160	1.90	5.8	2.90
Ba	58	710	175	3600
Y	17.0	15.0	16.0	16.0
La	2.70	2.30	1.90	2.50
Ce	8.5	6.7	5.8	6.3
Nd	<3.0	<4.0	<2.60	<7.0
Sm	1.08	0.96	0.97	1.00
Eu	0.39	0.38	0.36	0.36
Tb	0.35	0.30	0.30	0.33
Yb	2.10	1.80	2.00	2.10
Lu	0.32	0.280	0.270	0.30
Zr	34	35	32	31
Hf	0.81	0.68	0.71	0.65
Nb	<1.00	1.20	1.10	<1.00
Ta	0.084	0.110	0.150	0.130
Th	0.51	0.53	0.55	0.50
U	<0.40	<0.40	<0.290	<0.30
Pd (ppb)	11	3.9	9.7	11
Pt	12	11	8.8	8.7
Rh	1.4	<0.5	0.9	1.4
Ru	2.0	<0.5	2.2	2.2
Ir	<0.5	<0.5	<0.5	<0.5
Au	<5.0	<5.0	6.6	<5.0