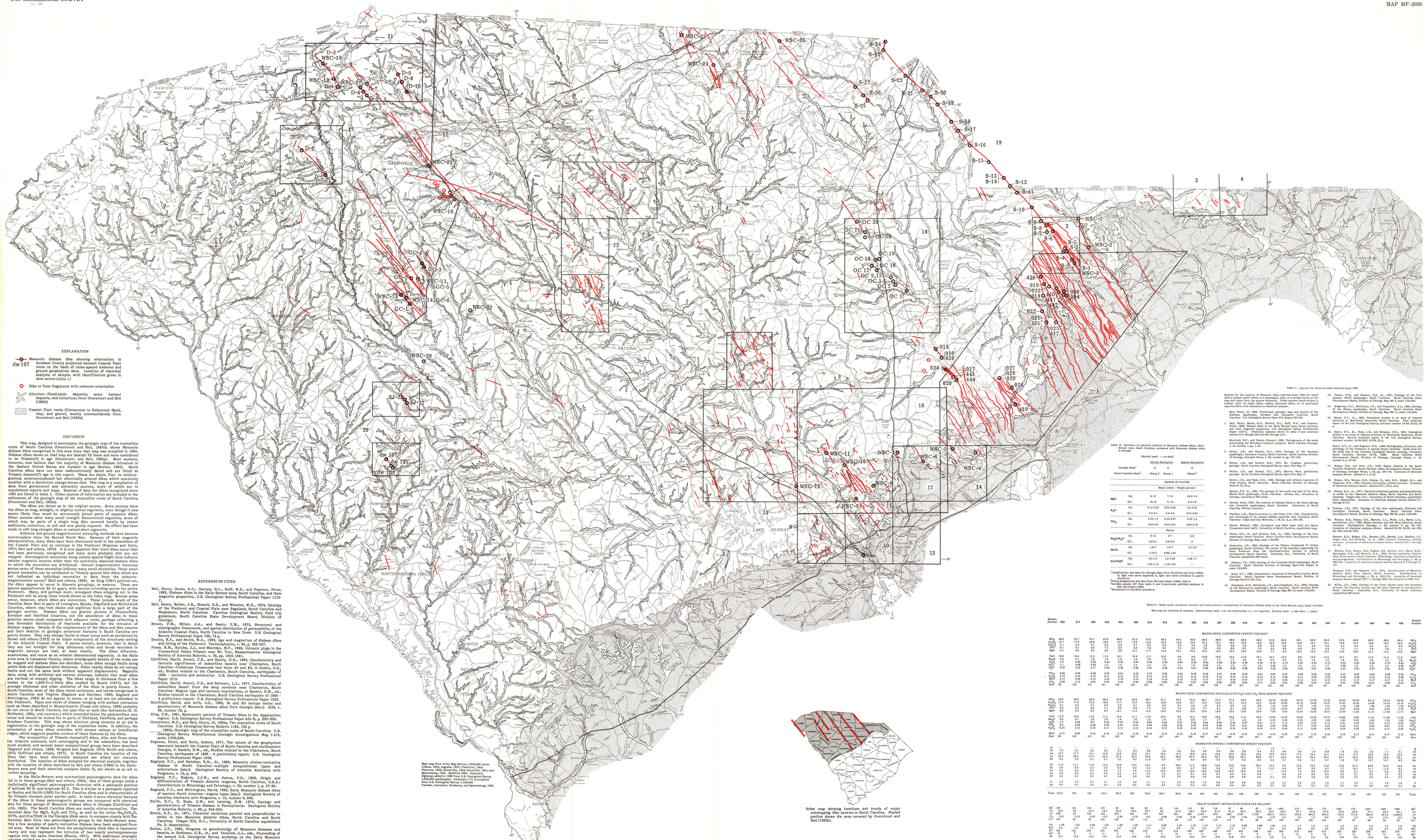

Index map showing locations and trends of major outcropping dike swarms in South Carolina. Shaded section shows the area covered by Overstreet and Bell (1965b).

Table 1.—*Sources for Mesozoic dikes reported since 1960*

Sources for the location of Mesozoic dikes reported since 1960 are listed in the order in which the information was published. Some sources are map and text references. Other sources (listed without a number refer to single dikes, widely scattered dikes, or to previously reported dikes with extensions or chemical analysis.

Bell, Henry, III, 1986, Preliminary geologic map and section of the Kershaw quadrangle, Kershaw and Lancaster Counties, South Carolina: U.S. Geological Survey Open-File Report 86-234.

1. Bell, Henry, Books, K.G., Daniels, D.L., Huff, W.E., and Popenoe, Peter, 1980, Diabase dikes in the Halle-Brewer area, South Carolina, and their magnetic properties: U.S. Geological Survey Professional Paper 1123-C. (Chemical analyses shown in table 2 and locations labeled 015 through 020 and 435 through 441).

Bourland, W.C., and Farrar, Stewart, 1985, Tectonicals of the rocks surrounding the Winnsboro intrusive complex: South Carolina Geology, v. 24, number 1, pp. 1-10.

2. Butler, J.R., and Howell, D.E., 1976, Geology of the Taxahaw quadrangle, Lancaster County, South Carolina: South Carolina Division of Geology, Geologic Notes, v. 20, number 4, pp. 133-149.

3. Butler, J.R., and Howell, D.E., 1977, Mt. Croghan, preliminary geology: South Carolina Geological Survey Open-File Map 17.

4. Butler, J.R., and Howell, D.E., 1977, Morven West, preliminary geology: South Carolina Geological Survey Open-File Map 17.

Butler, J.R., and Ships, G.E., 1984, Geology and mineral resources of York County, South Carolina: South Carolina Division of Geology Bulletin 15, 91 p.

Byerly, G.R., Jr., 1983, The geology of the south one-half of the Warr Shoals West quadrangle, South Carolina: Athens, Ga., University of Georgia, unpublished MS thesis.

5. Dennis, Allen, 1981, The location of diabase dikes in the Glenn Springs and Jonesville quadrangles, South Carolina: University of South Carolina, Sutter Conclusion.

6. Gardner, L.R., Kheuvoromonn, L., and Chen, H.H., 1981, Geochemistry and mineralogy of an unusual diabase saprolite near Columbia, South Carolina: Clays and Clay Minerals, v. 29, no. 2, p. 184-190.

7. Hauck, Michael, 1983, Geological map Blair (east half) and Salem Crossroads (west half): University of South Carolina, unpublished map.

8. Heron, R.D., Jr., and Johnson, H.S., Jr., 1966, Geology of the Iva quadrangle, South Carolina: South Carolina State Development Board, Division of Geology Map, scale 1:24,000.

9. Horkowitz, J.P., 1984, Geology of the Pillson Crossroads 7½ minute quadrangle, Anderson County, South Carolina: Unpublished senior thesis Furman University, 30 p. (Chemical analyses shown in table 2 and locations labeled 019 through 022 and 435 through 441).

10. Johnson, T.F., 1973, Geology of the Columbia North quadrangle, South Carolina: South Carolina Division of Geology Open-File Report 9, scale 1:24,000.

11. Koch, R.C., 1985, Groundwater resources of Greenville County, South Carolina: South Carolina State Development Board, Division of Geology Bulletin 54, 72 p.

12. Paradeses, W.D., McCauley, J.F., and Colquhoun, D.J., 1984, Geology of the Blacksburg quadrangle, Cherokee County, South Carolina: South Carolina Development Board, Division of Geology Map MS-19, scale 1:24,000.

13. Pooser, W.K., and Johnson, H.S., Jr., 1961, Geology of the Fort Lawn quadrangle, South Carolina: South Carolina State Development Board, Division of Geology Map MS-3, scale 1:24,000.

14. Sidgwick, D.C., McCauley, J.F., and Colquhoun, D.J., 1984, Geology of the Blacksburg quadrangle, South Carolina: South Carolina State Development Board, Division of Geology Map MS-11, scale 1:24,000.

15. Secor, D.T., Jr., 1985, Geological studies in an area of induced seismicity at Monticello Reservoir, South Carolina: Second Technical report to the U.S. Geological Survey, contract number 14-08-0001-19124, 24 p.

16. Secor, D.T., Jr., Peck, L.B., and Simpson, D.H., 1981, Geological studies in an area of induced seismicity at Monticello Reservoir, South Carolina: Second Technical report to the U.S. Geological Survey, contract number 14-08-0001-19124, 82 p.

Secor, D.T., Jr., and Wagener, H.D., 1984, Stratigraphy, structure, and petrology of the Piedmont in central South Carolina: Guide book for 1984 Geol. Soc. Am. Southeastern Section meeting, Columbia, South Carolina, October 18-19, 1984: South Carolina State Development Board, Division of Geology, Geologic Notes, v. 12, number 4, p. 87-94.

17. Snipes, D.S., and Farr, J.E., 1973, Easley dolerite in the South Carolina Piedmont: South Carolina State Development Board, Division of Geology, Geologic Notes, v. 18, pp. 129-145. (Location of chemical analyses shown labeled D-1, D-2).

18. Snipes, D.S., Weaver, R.D., Gaskin, R., Ast, R.D., Knight, R.L., and Stevens, J.C., 1985, Shoals Junction and Dan River dolerites, South Carolina: Geological Society of America, Abstracts with Programs, v. 17, p. 742. (Location of chemical analyses shown labeled OC1, OC2, etc).

19. Steele, K.F., Jr., 1971, Chemical variations parallel and perpendicular to strike in two Mesozoic dolerite dikes, North Carolina and South Carolina: Chapel Hill, N.C., University of North Carolina, unpublished Ph.D. dissertation. (Location of chemical analyses shown labeled S-1 through S-27).

20. Tewhey, J.D., 1977, Geology of the Irmo quadrangle, Richland and Lexington Counties, South Carolina: South Carolina State Development Board, Division of Geology Map MS-23, scale 1:24,000.

21. Warner, R.D., Bolgen, D.E., Hughes, S.S., Steiner, J.C., Davis, M.W., Manooglian, P.R., and Schmitz, R.A., 1981, Olivine-normative diabase dikes in the Shoals Junction and Dan River quadrangles, Georgia and petrogenetic Contributions to Mineralogy and Petrology, v. 76, p. 380-400. (Location of chemical analyses shown labeled D-3 through D-10).

Weigand, P.W., and Ragland, P.C., 1970, Geochemistry of Mesozoic dolerite dikes from eastern North America: Contributions to Mineralogy and Petrology, v. 29, p. 195-214. (Location of chemical analyses shown labeled WSC-1 through WSC-27 exclusive of WSC-21).

22. Willis, J.D., 1984, Geology of the Cross Anchor area--the boundary between the Piedmont and the Coastal Plain, Spartanburg and Union Counties, South Carolina: Columbia, S.C., University of South Carolina, unpublished MS thesis.

Table 2.—*Major-oxide, normative mineral, and trace-element compositions of Mesozoic diabase dikes in the Halle-Brewer area, South Carolina*

[See map for locations of samples. Abbreviations used: n.d., not determined; n.r., not reported. Symbols used: —, less than; ~, none.]

Sample Number	895	817	896	893	894	899	815	816	891	829	819	827	828	818	822	427	440	439	442	428	441	435	443	444	436	Sample Number
MAJOR OXIDE COMPOSITION (WEIGHT PERCENT)																										
SiO_2	48.3	47.7	47.7	47.6	46.6	45.2	47.0	46.3	45.1	48.8	48.3	46.8	46.3	51.6	48.3	48.1	46.0	48.1	46.0	45.5	47.4	46.3	45.3	48.5	48.3	SiO_2
Al_2O_3	15.7	17.2	16.8	16.4	16.2	15.7	16.3	16.1	15.8	16.1	16.1	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	Al_2O_3
Fe_2O_3	2.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	Fe_2O_3
FeO	8.1	9.1	5.6	7.0	8.8	8.8	7.5	8.0	7.1	8.2	8.0	8.7	7.3	6.2	8.8	8.0	9.0	8.2	7.1	7.8	7.8	7.1	7.8	7.8	7.1	FeO
MgO	6.7	5.6	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	MgO
CaO	10.8	10.4	11.0	10.1	10.1	10.1	10.7	10.2	9.9	10.8	10.2	10.3	10.2	10.3	11.2	10.1	10.7	10.3	9.9	10.5	10.7	9.7	10.3	11.4	11.0	CaO
Na_2O	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Na_2O
K_2O	1.0	0.66	0.93	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	K_2O
TiO_2	0.60	0.63	0.55	0.55	0.61	0.55	0.57	0.55	0.56	0.59	0.57	0.61	0.57	0.55	0.59	0.57	0.59	0.57	0.55	0.60	0.59	0.55	0.60	0.59	0.55	TiO_2
P_2O_5	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	P_2O_5
MnO	0.17	0.20	0.13	0.18	0.18	0.18	0.18	0.19	0.18	0.18	0.17	0.17	0.18	0.15	0.17	0.16	0.20	0.15	0.15	0.18	0.18	0.16	0.18	0.17	0.15	MnO
Sum	99	100	101	101	101	100	101	100	100	101	100	100	100	100	101	100	100	100	100	100	101	100	100	101	100	Sum
MAJOR OXIDE COMPOSITION RECALCULATED H_2O AND CO_2 FREE (WEIGHT PERCENT)																										
SiO_2	48.0	48.0	48.3	48.3	47.8	46.3	48.7	47.1	46.0	47.6	46.7	47.1	47.3	49.0	48.1	48.7	47.5	48.7	46.9	46.7	47.94	48.42	45.94	50.14	50.04	SiO_2
Al_2O_3	17.4	17.3	21.0	16.4	16.1	15.5	16.4	16.8	16.7	15.5	15.3	15.1	15.4	16.1	16.43	16.34	16.18	16.48	16.37	15.64	14.00	14.02	15.14	15.23	Al_2O_3
Fe_2O_3	2.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	Fe_2O_3
FeO	8.1	9.1	5.6	7.0	8.8	8.8	7.5	8.0	7.1	8.2	8.0	8.7	7.3	6.2	8.8	8.0	9.0	8.2	7.1	7.8	8.37	8.37	8.37	8.37	8.37	FeO
MgO	6.8	5.6	6.8	6.7	10.1	11.3	11.9	12.6	13.5	13.5	13.4	13.3	13.3	13.3	13.9	7.80	6.43	10.45	10.52	10.91	10.99	11.00	11.21	11.66	11.71	MgO
CaO	10.9	10.4	11.0	10.1	10.1	10.1	10.7	10.2	9.9	10.8	10.2	10.3	10.2	10.3	11.2	10.1	10.7	10.3	9.9	10.5	10.7	9.7	10.3	11.4	11.0	CaO
Na_2O	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Na_2O
K_2O	1.0	0.66	0.93	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	K_2O
TiO_2	0.60	0.63	0.55	0.55	0.61	0.55	0.57	0.55	0.56	0.59	0.57	0.61	0.57	0.55	0.59	0.57	0.59	0.57	0.55	0.60	0.59	0.55	0.60	0.59	0.55	TiO_2
P_2O_5	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	P_2O_5
MnO	0.17	0.20	0.13	0.18	0.18	0.18	0.18	0.19	0.18	0.18	0.17	0.17	0.18	0.15	0.17	0.16	0.20	0.15	0.15	0.18	0.18	0.16	0.17	0.17	0.15	MnO
Sum	99	100	101	101	101	100	101	100	100	101	100	100	100	100	101	100	100	100	100	100	101	100	100	101	100	Sum
NORMATIVE MINERAL COMPOSITION (WEIGHT PERCENT)																										
Q	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Q
Or	7.2	5.7	5.3	5.3	5.3	5.3	5.3	5.3	5.4	5.6	5.3	5.4	5.4	5.3	5.4	5.3	5.4	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	Or
Ab	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	Ab
An	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	An
Wo	8.0	8.3	17.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	Wo
Fs	14.8	16.5	8.8	13.0	16.8	17.3	15.9	16.7	15.7	16.8	16.7	17.3	16.7	15.9	16.8	16.7	17.3	16.8	15.7	16.5	16.5	15.7	16.5	16.5	15.7	Fs
Fo	8.8	5.8	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	Fo
Fa	5.6	5.4	1.7	4.3	5.4	5.4	4.7	5.3	5.1	5.4	5.3	5.4	5.3	5.1	5.4	5.3	5.4	5.4	5.1	5.3	5.3	5.1	5.3	5.3	5.1	Fa
Mt	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	Mt
Il	1.1	1.2	0.7	1.1	1.2	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.2	1.1	1.1	1.2	1.1	1.1	Il
Ap	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	Ap
Total	101.3	100	100	100.1	99.9	100	99.9	100.1	99.9	100	100	100.1	100	100	100	100	100	100	100	100	100	100	100	100	100	Total
TRACE ELEMENT ABUNDANCES (PARTS PER MILLION)[2]																										
Ba[4]	180	142	109	107	83	66	92	61	144	112	99	118	97	85	85	<400	215	<400	<400	<400	<400	179	<400	<400	<400	Ba[4]
Cr	453.0	354.0	442.0	443.0	272.0	454.0	747	346	87	55.1	52.0	51.0	51.0	51.0	38.4	60.0	66.4	47.8	54.0	47.8	54.0	54.0	54.0	54.0	54.0	Cr
Cu	383.0	94	419	78	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	Cu
Ni	130.0	90	110	120	120	120	110	170	90	130	100	110	110	90	130	110	90	110	110	110	110	90	110	110	110	Ni
Sc	1.79	1.22	0.98	1.23	1.23	1.13	0.89	0.96	1.40	1.12	1.10	1.24	1.13	1.07	1.12	1.07	1.12	1.07	1.12	1.07	1.12	1.07	1.12	1.07	1.12	Sc
Sr	180	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	Sr
V	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	V
Y	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	Y
Zn	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	Zn
Zr	80	80	80	70	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	Zr
Ce[3]	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	Ce[3]
RARE-EARTH ELEMENTS[3]																										
La	7.0	6.1	4.8	4.6	6.6	3.3	6.2	5.4	8.4	5.1	5.0	5.3	5.3	5.3	5.8	7.0	7.0	6.8	6.8	6.8	6.8	7	7	7	7	La
Ce	15.0	13.0	10.0	10.0	14.0	7.0	13.0	11.0	17.0	11.0	11.0	11.0	11.0	11.0	14.0	15.0	15.0	15.0	15.0	15.0	15.0	15	15	15	15	Ce
Nd	9.0	8.0	6.0	6.0	8.0	4.0	8.0