DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Table 23. - Semiquantitative spectrographic analyses of representative samples of Oligocene, Miocene, and Pliocene rocks from eastern Montana and the Dakotas

[Analyses shown graphically on plate 18A in U.S. Geol. Survey Prof. Paper 463, 1965. For explanation of code used in semiquantitative spectrographic analyses see Prof. Paper 463, p. 51. Tr, near threshold (below limit of sensitivity); 0, looked for but not detected; asterisk (*) indicates chemical analyses. Analysts: Charles Annell, P. J. Dunton, J. C. Hamilton, and H. W. Worthing. See table 22 for other analyses]

Sample No.	Location (section, township, range, and area)	Area	Sample description	Core hole	Stratigraphic position	Si	Al	Ca	Na	K	Mg	Fe	Ti	Ba	Mn	Sr	Zr	V	B	Cr	Y	La	Cu	Nb	Ni	Ga	Pb	Sc	Co	Yb	Be	Other elements
Flaxville Formation (upper Miocene or Pliocene)																																
248477	SWSW 8, 36N 40E Valley County, Mont.	Opheim	Tuffaceous claystone		50 ft above base	1	2+	1	2−	2	2	2−	3−	4+	4−	4−	4−	5+	5	5	5	5	5−	5−	5−	6+	5−	6+	6+	6	6−	Li, 4−.
481	NWNW 24, 15N 47E Prairie County, Mont.	Sheep Mountain	do		35 ft above base	1	1	3+	2−	2	2	2	3	4+	4+	4−	4	4−	5	5+	5	5	5+	5−	5	5−	5−	5−	5−	6	6−	Ce, 4−.
480	SWSW 13, 15N 47E Prairie County, Mont.	do	Volcanic ash		30 ft above base	1	2+	1	2	2	3+	2−	3−	4+	4	4	4−	4−	0	5−	5+	5+	5	5	6+	5−	5−	6	0	6+	6−	Ce, 4−; Mo, 5−; Sn, 6+.
479	do	do	do		15 ft above base	1	1	2−	2	2	2	2	3	4+	4	4−	4	5+	0	5+	5+	5+	5	5	5	5−	5−	6+	5−	6+	6−	Ce, 4−; Mo, 6+; Sn, 6+.
Arikaree Formation (Miocene)																																
251542	SWSW 35, 5S 60E Carter County, Mont.	Finger Buttes	Volcanic ash		215 ft above base; 5-ft bed.	1	1	2−	2	2	3	3+	3−	4	4	4−	4−	5−	5+	6+	5	5	4−	0	5−	5+	5	6+	0	6+	6	Ag, 7−; Mo, 6+; Hg, 3−.
248487	NWNW 32, 5S 60E Carter County, Mont.	do	Tuffaceous siltstone		5 ft above base	1	1	2	2	2	2	2	3	3−	4+	4	4	4−	5+	5	5	5	5	5−	5−	5−	5−	5−	5−	6	6−	Li, 4−.
241868	SESW 6, 2S 61E Carter County, Mont.	Long Pine Hills	Volcanic ash		25 ft above base; 12-ft bed.	1	2	3+	3+	2	3	2−	3−	4−	4	5+	4−	4−	4	5−	5	0	4−	6+	5−	6	6+	6+	6+	6	0	Li, 4−; Mo, 5.
251543	NENE 35, 17N 3E Harding County, S. Dak.	East Short Pine Hills	do		20 ft above base; 5-ft bed.	1	1	2−	2−	2+	3+	2−	3	4+	4	4	4	5+	4+	5−	5	5+	5+	0	5−	5+	5−	5−	5−	6	6−	As, 4−; Mo, 6+.
223431	SWSW 6, 17N 8E Harding County, S. Dak.	Slim Buttes	Quartzitic siltstone	17	Near top of formation (at depth of 53 ft).	1	1	2+	2−	2−	3+	2−	3−	4+	4+	4+	5+	5+	5	5	5	0	5	0	0	5	5−	Tr	0	6+	0	P, 0.03*.
430	SENE 12, 17N 7E Harding County, S. Dak.	do	Tuffaceous siltstone	16A	Near base of formation (at depth of 120 ft)	1	1	2−	2	2−	3+	2−	3−	3−	3	4+	5+	5+	5	5	5	0	5	0	0	5	5−	Tr	0	6+	0	P, 0.03*.
Brule Formation (middle and upper Oligocene)																																
248476	SWNE 17, 18N 8E Harding County, S. Dak.	Slim Buttes	Tuffaceous claystone		145 ft above base	1	2+	1	2	2	2−	2−	3−	4+	4+	4	4−	4−	5	5−	5	5	5	0	6+	6+	5−	5−	6+	6	0	Li, 4−.
475	do	do	do		65 ft above base	1	2+	1	2	2	2−	2	3−	4+	3−	4	4−	5+	5	5	5	5	5	0	5−	6+	5−	5−	6+	6	6−	
Upper part of Chadron Formation (lower Oligocene)																																
223437	NENE 8, 16N 8E Harding County, S. Dak.	Slim Buttes (Cedar Canyon).	Tuffaceous sandstone		Near top of formation	1	2−	3+	3+	3+	3−	3+	3−	4+	4−	5+	4−	5	5	5	5	0	5+	0	6+	Tr	5−	0	0	6+	0	
429	SENE 12, 17N 7E Harding County, S. Dak.	Slim Buttes	Tuffaceous claystone	16A	Near top of formation (at depth of 137 ft).	1	2+	2+	2−	2−	2	2−	3−	4	4+	4+	5	4−	5+	5+	0	0	5	0	6+	5	5−	Tr	0	6	0	
428	SENW 31, 18N 8E Harding County, S. Dak.	do	do	16	Near top of formation (at depth of 232 ft).	1	1	3+	2−	2	2−	2−	3−	4+	4+	4−	5+	5+	4−	5+	5	0	5	0	5−	5	5−	5−	6+	6+	0	
Lower part of Chadron Formation (lower Oligocene)																																
223433	NENE 26, 17N, 7E Harding County, S. Dak.	Slim Buttes (J. B. Pass).	Arkose		40 ft above base	1	1	3+	2−	2−	3+	3	4+	4+	4−	4−	5+	5+	5+	5−	0	0	5−	0	6+	5	5−	0	0	6−	0	
432	NESE 16, 17N 8E Harding County, S. Dak.	Slim Buttes (J. B. Hill).	do		25 ft above base	1	2+	3+	2−	2−	2−	3	3−	4+	4−	4	5+	5	Tr	5−	0	0	6	0	0	5	5−	0	0	6−	0	
434	NESE 1, 17N 7E Harding County, S. Dak.	Slim Buttes (Mendenhall area).	do		15 ft above base	1	1	3+	2−	2−	3+	3	3−	3−	4−	4	5	5+	5	5	0	0	5−	0	6+	5	5−	Tr	0	6−	0	

BASIC ANALYTICAL AND WELL DATA
SUMMARIZED IN U.S. GEOLOGICAL SURVEY
PROFESSIONAL PAPER 463, BY
N. M. DENSON AND J. R. GILL, 1965