Table 28. - Semiquantitative spectrographic, chemical, and radiometric analyses of ashed surface samples of lignite and carbonaceous shale from Sentinel Butte Member of Fort Union Formation, Little Missouri River escarpment and adjoining areas, southwestern North Dakota

[Analyses shown graphically on plate 18E in U.S. Geol. Survey Prof. Paper 463, 1965. Asterisk (*) indicates locality shown on plate 8 or figure 19 in Prof. Paper 463. See Prof. Paper 463, table 8, for other analyses. For explanation of code used in semiquantitative spectrographic analyses see Prof. Paper 463, p. 51. 0, looked for but not detected; n.d., not determined. Analysts: Spectrographic, Mona Frank, J. C. Hamilton, K. V. Hazel, C. L. Waring, and H. W. Worthing; Radiometric, C. G. Angelo, and P. R. Moore; Chemical, R. P. Cox, H. H. Lipp and R. Moore]

Sample No.	Location (section, township, and range)	Bed thickness (feet)	Source of sample	Ash (percent)	Chemical: Uranium in ash (percent)	Chemical: Uranium in sample (percent)	Radiometric: Equivalent uranium	Si	Al	Fe	Ca	Na	Mg	K	As	Mo	Ba	Ti	P	Sr	B	Zr	Mn	Ni	V	Y	Cu	La	Co	Pb	Li	Ge	Cr	Ga	Sc	Yb	Sn	Be	Nb	Ag	Other elements
Billings County																																									
248434	*SWSW 2 137N 100W	1.0	.....	46	0.25	0.12	0.072	1	1	2+	3+	3+	3	2−	0	3−	3−	3	0	4−	5+	4	4−	5	4−	5+	4+	5−	4−	5	0	0	4−	5+	5	6+	0	6−	0	7−	
438	*NWSW 11 137N 100W	1.2	.....	50	.43	.21	.14	1	2+	2+	3+	2−	3−	2−	4−	3+	3−	3	0	4−	5+	4+	4−	5	4−	5	4−	0	4−	5−	0	5−	5	5+	5−	6+	5	6−	0	7−	
462	*NESW 34 137N 100W	1.6	Upper 0.8 ft	18	1.03	.187	.08	2+	1	2	2−	3	3	3+	0	3−	3−	3−	0	4−	5+	4+	4−	4−	4−	4−	4−	5	5−	5−	0	5−	5+	5+	5	5−	0	6−	0	7−	
463	do	1.6	Basal 0.8 ft	25	.10	.025	.006	2+	2+	1	3+	3	3	3+	3+	3−	4+	4+	0	5+	5+	3−	4−	5+	4	5	5+	5	5−	5−	0	5+	5	5+	5−	6+	0	7+	0	7−	
230194	NWSW 34 137N 100W	2.7	Upper 1.0 ft	17	.059	.010	.007	2+	2+	1	1	1	2−	3+	4+	3−	3	3−	0	3−	3−	3−	3	4+	4+	4−	4	0	4	4	0	4−	5+	5	5+	n.d.	0	5−	0	0	Cd, 5+.
195	do	2.7	Next 0.7 ft	69	.024	.006	.009	1	2−	3+	2−	3+	3−	0	0	4−	4+	3	0	5+	4−	4+	4−	6+	5+	5	5+	0	6+	5−	0	0	5+	0	0	6+	0	0	0	0	
197	do	2.7	Basal 1.0 ft	23	.26	.089	.082	1	2+	1	2	1	2−	2+	4+	3	3−	3−	0	3−	4+	4+	3−	5	4−	5+	5+	0	5	4−	0	0	5+	5	5−	5−	0	6	0	0	
145282	SESW 34 137N 100W	1.0	.....	13	8.20	1.10	.68	2+	2	2−	2−	3	3−	3	3	2	3	4	2−	3−	4+	4+	4	5−	5+	5+	5−	4−	5+	5−	4	0	5	6+	6+	6+	5	6+	0	6−	
283	do	1.0	.....	9	.21	.019	.016	1	1	2	2+	2	2−	3+	4+	3	3	3	0	3−	3−	4+	3	5−	5+	4	4+	4	5	6+	0	0	4−	5−	5	5	5−	5−	0	6−	
284	do	1.3	.....	11	.41	.044	.032	1	1	2+	2+	2	3+	3+	4+	3	3	3−	0	3−	4+	4+	3−	5+	4−	4−	5	5+	5+	5	0	5−	4−	5−	5	5−	5−	5−	5+	6−	
285	do	.9	.....	45	.027	.012	.015	1	1	2+	2−	3	3+	3	3+	4	3−	3−	0	4+	4	4+	4+	4	4+	5+	4−	5	5+	6+	0	5+	5+	5−	5	6+	0	6+	0	6−	Nd, 5−.
286	do	1.2	.....	35	.037	.013	.014	1	2+	1	2−	3+	3	3	3+	3−	3−	4+	0	4+	5+	4+	3−	5	4	5	5	0	5	6+	0	5	5	5−	6+	6	5−	6+	0	6−	
202331	*SESE 18 137N 102W	2.5	Upper 0.8 ft	31	.11	.034	.020	1	1	1	2	2−	2	3	0	3	3−	3	0	4+	4−	3−	3	4+	4−	4	4−	4−	4	5−	0	5	5	5	5	0	0	5−	0	6−	Nd, 4−; Ce 4.
248436	*SWSE 32 138N 100W	.6	.....	16	.79	.13	.063	1	2+	2+	2−	2+	2−	2−	0	3+	3−	3	0	4+	4+	3	4+	4	4−	4−	4−	5−	4	5−	0	4−	4−	5+	5+	5	5−	6+	0	7−	
445	*NWNW 10 140N 100W	3.0	Upper 0.7 ft	78	.11	.085	.084	1	1	2	2	3−	2−	2−	4	3+	4	3+	0	4−	4	4+	5+	5−	4−	5−	5+	0	4−	5−	0	5	5+	5+	5	6	0	6−	0	0	
446	do	3.0	Next 0.7 ft	26	.73	.19	.10	2+	2+	1	2+	3+	2−	3+	3+	2−	3−	3−	0	4−	5+	3	4−	5+	4−	5+	5+	0	4−	5−	0	0	5	5+	5	6+	0	6−	0	7−	
447	do	3.0	Next 0.7 ft	27	.46	.12	.066	2−	2+	1	1	3	3+	3+	4−	3	3−	4	0	4−	5+	4	4−	5+	5	5+	5+	0	4−	5−	0	0	5−	5+	5−	6+	0	6−	0	7−	
443	*NENE 12 140N 100W	3.0	.....	25	.002	< .001	.002	2+	2+	1	2+	2	3+	2−	0	4−	3	3−	0	3−	5+	4	4−	4−	5+	4+	5+	5−	4−	5−	0	5−	5−	5+	5−	6+	0	6−	0	0	
452	*NWNW 7 141N 99W	1.2	Upper 0.6 ft	92	.77	.70	.40	1	1	2	2	2−	2−	2−	4−	4+	2−	3+	0	4−	4−	4−	4	5	4−	5	5+	5−	4	5	0	0	5+	5+	5	6+	0	6−	0	0	
453	do	1.2	Basal 0.6 ft	45	1.85	.084	.36	1	1	2	2+	3	2	3+	4−	3	3	3+	0	4+	4−	3−	4+	4+	4−	4−	4+	0	4+	5+	0	4−	5+	5+	5+	5−	5−	5−	0	7−	
Bowman County																																									
223480	SWSW 25 132N 104W	0.5	.....	88	0.013	0.011	0.015	1	1	2+	3+	3	2	2	0	5+	3	3	0	4	4	4	5+	4	5+	5+	4	5	5	5	0	5	5+	5+	5	6+	0	6	0	0	
481	do	.5	.....	86	.002	.002	.014	1	1	2+	2+	3	2	2	0	5+	3	3	0	4	4	4	5+	5+	5	5	5+	5	5	5	0	5	5+	5+	5	6	0	6	0	0	
482	do	.5	.....	86	.014	.012	.041	1	2+	2+	2	3	2	2	0	5+	3	3	0	4	4	4	5+	5+	5	5	5+	5	5	5	0	5	5	5	5	6	5	6	0	0	
Dunn County																																									
248454	NENE 10 146N 96W	1.0	.....	32	0.018	0.006	0.004	2+	2+	2+	1	3	3+	3+	0	4−	4+	4+	0	4+	5+	4−	4−	4	5+	4−	4	5	5	5−	0	0	5	5+	5−	5−	0	6+	0	7−	
Golden Valley County																																									
202257	NWNE 8 139N 104W	2.0	Upper 1.0 ft	22	0.087	0.028	0.022	1	1	2	2	2	2	3−	0	3−	3−	3	0	3−	4	3−	4−	5+	4	4−	4−	5−	5−	5−	0	5−	5+	5−	5	0	0	5−	0	7	Nd, 5+.
McKenzie County																																									
223485	NWNW 36 145N 98W	0.8	.....	78	0.034	0.026	0.052	1	1	2+	2	3	3+	3+	0	4	3	3+	0	4	4	4+	5	4	4	3	4	3	5	5	0	5	5+	5+	5	4	0	6+	0	6	Er, 5+; Dy, 4; Ce, 3; Pr, 4; Nd, 3; Ho, 5.
486	do	.8	.....	64	6.60	4.20	1.4	1	1	2+	2	3+	3+	3+	4+	4+	3	3	0	4	4	4	5	4	5+	3	5+	4+	5	5+	0	5	5+	5+	5	5+	0	6+	0	6	Pr, 4; Nd, 4+; Ho, 5; Er, 5+; Dy, 5+; Ce, 4.
Slope County																																									
100901	*SWNW 26 134N 101W	1.4	.....	38	0.23	0.087	0.041	1	1	2+	2+	3	2	0	4	3−	3−	3	0	4+	5+	4+	5+	4−	5+	4−	5	4−	5−	5−	0	5−	5	5−	5	0	0	6	0	0	Tm, 5; Pr, 4+; Er, 4; Nd, 3; Ho, 5+; Eu, 4; Dy, 4+; Ce, 3.
248471	SWSW 26 135N 98W	.2		67	.004	.002	.004	1	1	2−	2+	4+	3+	3+	0	5	4+	3+	4+	4+	5+	4−	4−	5+	4−	3−	4+	3	5−	4−	0	0	4	5+	4−	4−	0	5	0	7+	
456	*NWSW 5 136N 100W	1.4	Upper 0.7 ft	27	.13	.035	.021	1	1	2	2	3	3+	3	3	4+	4+	3+	0	4−	5+	4+	4	4	4	4−	4−	0	5	5−	0	5	5−	5+	5−	5−	0	5−	0	7	
Stark County																																									
223483	SWSE 22 139N 91W	1.5	.....	83	0.015	0.012	0.008	1	1	2+	2	3	2	2	0	6+	3	3	0	4+	4	5+	5	4	4	5+	4	5	5	5+	0	5	5+	5+	5	6+	0	6	0	6	
98149	NWNW 31 139N 97W	.6	.....	5	1.86	.11	.047	2	1	2	1	2+	2	2−	0	3+	3	4	0	3	3	5+	4+	4+	4	4	4−	4−	4−	5−	0	3	5+	5	5	0	0	5−	0	7	Zn, 4; Nd, 4.