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SUMMARY OF CORE DRILLING RESULTS,
BRIDGA RIVER COAL FIELD, 1959
by
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A reconnaissance of the Beluga River coal field in August 1957 (described in Report of Investigations 5430) indicated favorable possibilities for the development of large reserves of sub-bituminous coal that might be utilized for the on-site production of thermoelectric power for use in the Anchorage defense area. To further investigate this possibility, preparations for the movement of equipment and supplies to the Beluga River field were started in early June of 1959. The movement involved truck haulage of a diamond-core drill, tractors, pumps, and other heavy equipment from the Bureau's storage warehouse at Palmer to the dock at Anchorage, tug and barge charter from Anchorage, to a landing site located 4.5 miles up the Beluga River and transportation by tractor-train from the landing to the project site (fig. 1 - Index map of Beluga River project area). The overland trek from the barge landing to the project site (through an unexplored and poorly mapped region) required 5 weeks and 40-trail miles to cover an airline distance of approximately 20 miles. The generally low relief of much of the area traversed and the exceptionally wet season were responsible for the slow progress. Road or railroad construction from tidewater to the project site, however, would not be overly difficult or expensive (by Alaska standards).

The site selected for further investigation is adjacent to a coal crop discovered by a Bureau of Mines engineer during the 1957 reconnaissance. The outcrop, exposed in the cut bank of an un-named tributary of the Beluga River, gave evidence of a coal seam of considerable thickness with

flat or gentle pitch and moderate cover. Of the several outcrops examined in the Beluga River field, this appeared to offer the most favorable possibilities for the development of large stripping coal reserves.

Between the time of arrival at the project site (July 31) and suspension of drilling operations on September 26, six diamond-drill holes ranging in depth from 93 feet to 252 feet and having a total drilled footage of 1,085 feet were completed. Drill holes 1, 2, 3, and 6 intersected the outcrop seam at overburden depths ranging from 7 to 171 feet; hole 5 encountered a 28-foot seam believed to underlie the outcrop seam, and hole 4 was a blank (see fig. 2, Plan of Beluga River project area). The outcrop seam as intersected in holes 1, 2, 3, and 6 has an estimated average true thickness of 52.0 feet; of this total thickness, average true thickness of clean coal is estimated to be 44 feet. Most of the partings or high-ash coal are concentrated in the lower 12 to 15 feet of seam thickness. From the outcrop to an overburden depth of 171 feet and along a strike length of 1,600 feet (between drill holes 3 and 6) the drilling completed to date is estimated to have indicated reserves of 1,600,000 tons of clean coal. Additional drilling is planned.

All coal cores were submitted to the Anchorage laboratory for analyses. Although the thick bed appeared to be fairly uniform in composition, core from coal intersections in several of the holes was sampled in consecutive sections to indicate possible variations in moisture and ash content, between the top and bottom of the seam. Analyses are tabulated as follows:

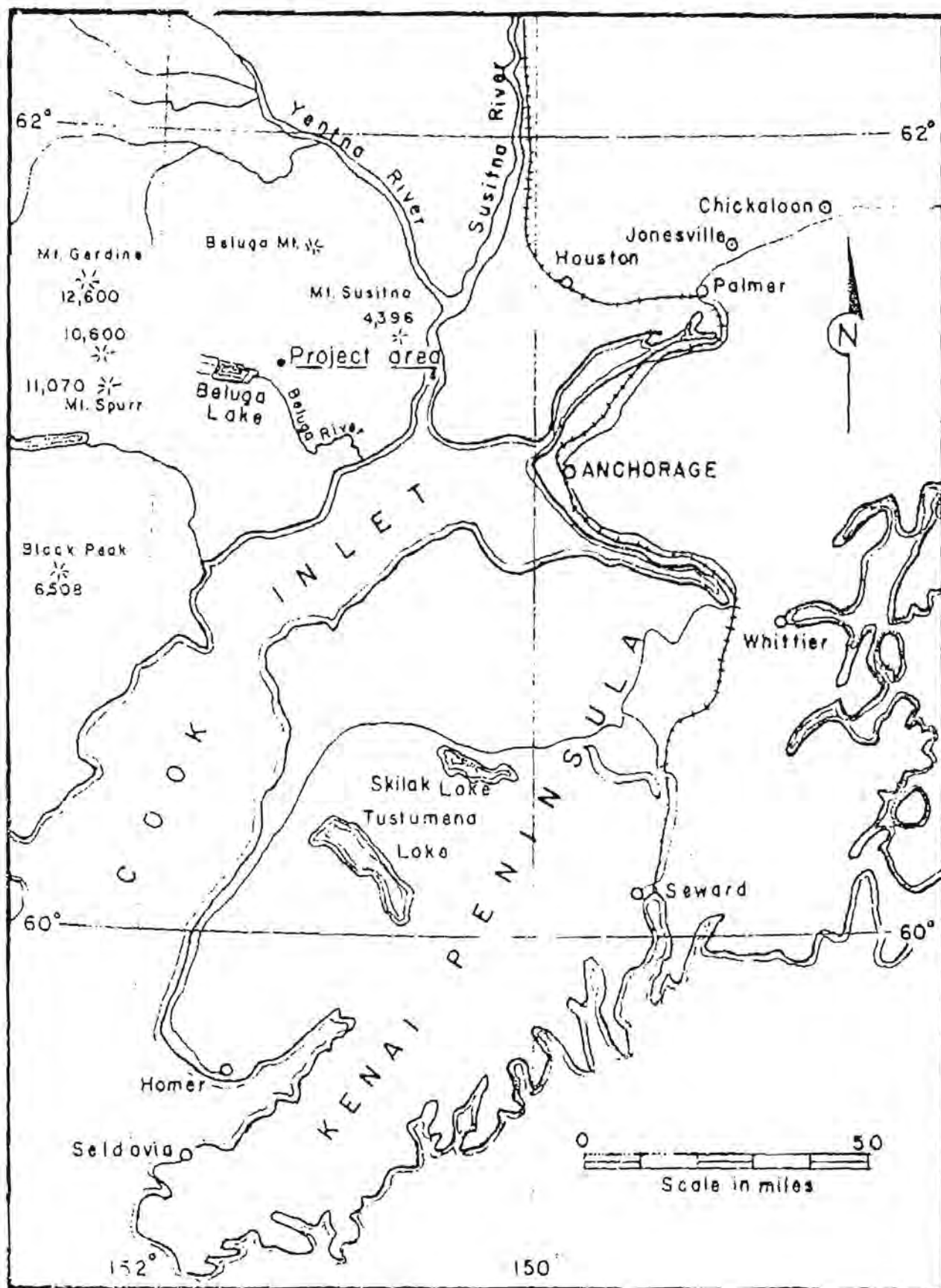


FIGURE 1.—Index Map, Beluga River, Alaska.

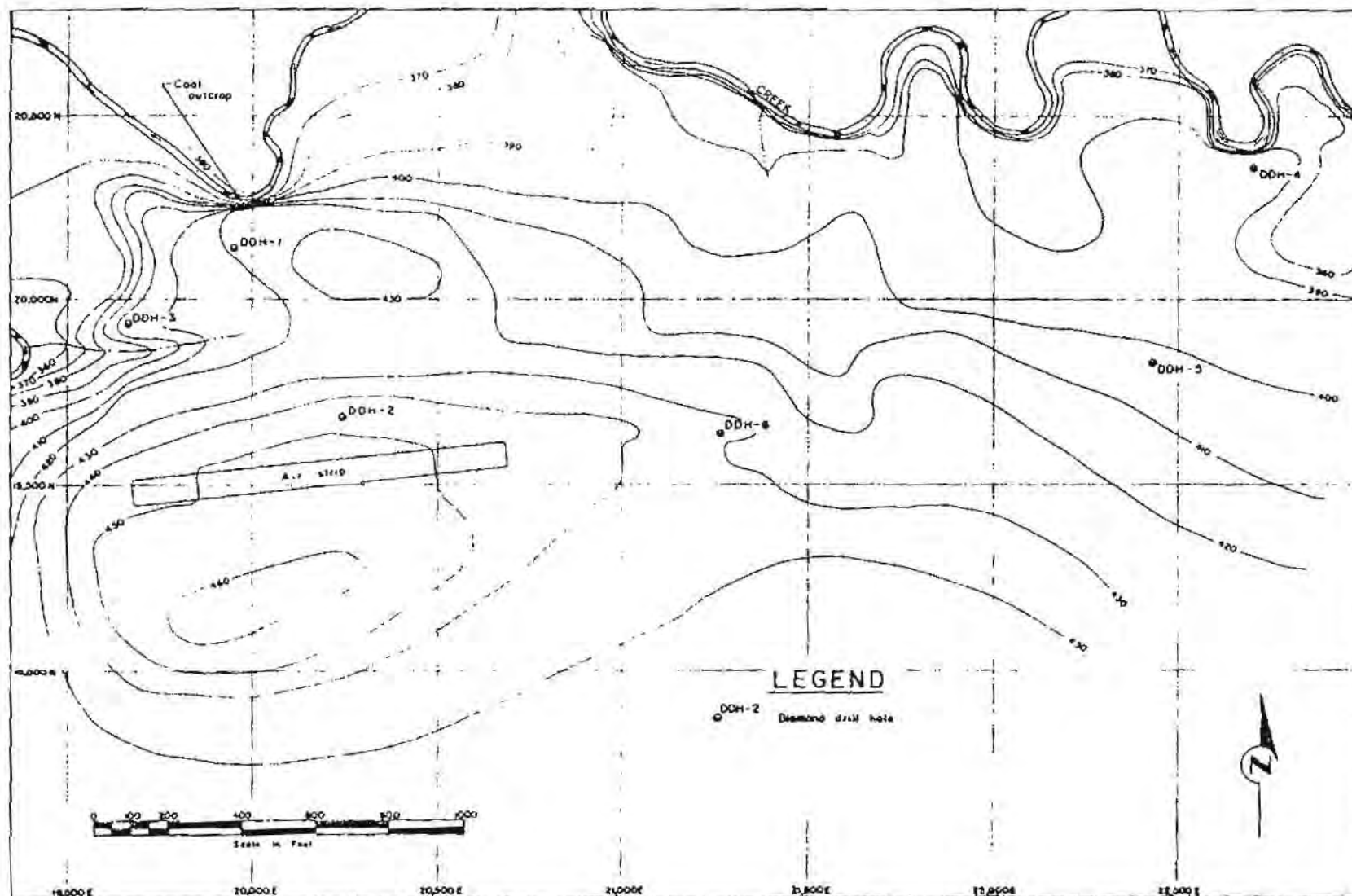


FIGURE 2.-Plan of Beluga River project area

Analyses of Beluga Coal Cores

Hole No.	Sample No.	Hole Interval		Coal feet	Reject feet	Proximate, percent				Calorific value B.t.u.
		From feet	To feet			Moisture	Ash	Volatile matter	Fixed carbon	
1	1	66.0	105.2	37.55	1.65	14.4	15.2	36.2	34.2	8620
						-	17.8	42.3	39.9	10070
						-	-	51.5	48.5	12250
1	2	105.2	118.5	8.0	5.3	13.5	24.6	31.3	30.6	7400
						-	28.5	36.2	35.3	8560
						-	-	50.6	49.4	11970
2	3	171.1	213.4	40.6	1.7	14.3	15.9	35.6	34.2	8600
						-	18.6	41.6	39.8	10030
						-	-	51.1	48.4	12330
2	4	213.4	225.6	6.3	5.9	11.3	26.2	31.7	30.8	7480
						-	29.5	35.8	34.7	8430
						-	-	50.8	49.2	11970
3	5	88.4	98.4	10.0	.0	17.3	14.0	35.5	33.2	8390
						-	16.9	42.9	40.2	10140
						-	-	51.6	48.4	12200
3	6	98.4	101.9	3.5	.0	17.4	13.3	35.3	34.0	8500
						-	16.1	42.8	41.1	10290
						-	-	51.0	49.0	12270
3	7	101.9	102.3	.0	.4	9.4	46.5	25.7	18.4	5080
						-	51.4	28.4	20.2	5600
						-	-	58.4	41.6	11530
3	8	102.3	112.3	9.5	.5	16.6	15.3	34.5	33.6	8310
						-	18.3	41.4	40.3	9960
						-	-	50.7	49.3	12190
3	9	112.3	122.3	9.6	.4	15.6	16.2	35.6	32.6	8430
						-	19.2	42.2	38.6	9990
						-	-	52.2	47.8	12360
3	10	122.3	132.3	7.1	2.9	16.0	24.1	29.8	30.1	7220
						-	28.7	35.4	35.9	8590
						-	-	49.7	50.3	12050
3	11	132.3	141.5	4.4	4.8	15.6	24.2	30.8	29.4	7200
						-	28.7	36.5	34.8	8530
						-	-	51.2	48.8	11960

Analysis of Baluze Coal Cores

Hole No.	Sample No.	<u>Hole Interval</u>		Coal feet	Reject feet	<u>Proximate, percent</u>				Calorific value B.t.U.
		From feet	To feet			Mixture	Ash	Volatiles matter	Fixed carbon	
5	12	95.0	106.0	7.6	3.4	11.9	20.8	33.9	33.4	8230
						-	23.6	38.5	37.9	9340
						-	-	50.4	49.6	12130
5	13	106.0	122.8	6.0	10.8	13.5	23.1	30.3	33.1	7590
						-	26.7	35.0	38.3	8770
						-	-	47.8	52.2	11970
6	14	7.0	22.5	15.5	.0	13.1	14.4	37.9	34.6	8890
						-	16.5	43.6	39.9	10230
						-	-	52.2	47.8	12250
6	15	22.5	49.8	26.75	.55	13.3	15.9	36.7	34.1	8660
						-	18.4	42.4	39.2	9990
						-	-	51.9	48.1	12240
6	16	49.8	66.8	12.7	4.3	13.0	22.2	32.3	32.5	7760
						-	25.5	37.2	37.3	8920
						-	-	49.9	50.1	11970

Note: Sample No. 14 is probably not representative because of proximity to the outcrop. Sample No. 14 consisted of poorly consolidated coal and/or coal float; core recovery was poor.

Beluga River - Log, hole No. 1

Location: 20,141.5 N; 19,951.0 E,

Elevation: Collar of hole - 421.2 feet, mean sea level datum (aneroid base)

Dip of hole: Vertical

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
0.0	21.4	Unconsolidated soil and clayey overburden, occasional pebbles (mostly igneous)	21.4	0.0	
21.4	21.8	Medium-grained sandstone, hard and dense	.4	.4	
21.8	62.0	Sandy claystone, soft, poorly compacted	40.2	35.1	Bedding angles range from 20° to 30°
62.0	66.0	Sandy claystone, soft, poorly compacted - numerous coal streaks, bands and inclusions	4.0	4.0	
66.0	67.9	Top of seam. COAL - dull w/occasional streaks of clay, included in Sample No. 1	1.9	1.9	
67.9	68.0	Boney Coal - rejected.	.1	.1	
68.0	68.2	Brown clay seam, hard-boney - rejected	.2	.2	
68.2	73.8	COAL, dull, with very occasional very thin clay seams; included in Sample No. 1	5.6	5.6	
73.8	79.3	COAL, dull, included in Sample No. 1	5.5	5.5	
79.3	79.4	Boney Coal - rejected	.1	.1	
79.4	79.7	COAL, dull, included in Sample No. 1	.3	.3	
79.7	80.0	Coaly claystone - rejected	.3	.3	
80.0	80.6	COAL, dull, included in Sample No. 1	.6	.6	
80.6	80.7	Boney Coal - rejected.	.1	.1	
80.7	83.2	COAL, dull, included in Sample No. 1	2.5	2.5	
83.2	83.3	Boney Coal - rejected.	.1	.1	
83.3	83.9	COAL, dull, included in Sample No. 1	.6	.6	
83.9	84.0	Boney Coal - rejected.	.1	.1	
84.0	90.0	COAL, dull, included in Sample No. 1	6.0	6.0	
90.0	90.3	Boney Coal - rejected - occasional minute clay seams	.3	.3	
90.3	95.4	COAL - dull, occasional very tiny minute clay seams, included in Sample No. 1	5.1	5.1	
95.4	95.6	Claystone with streaks, bands and inclusions of Coal - rejected	.2	.2	

Beluga River - Log, hole No. 1 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
95.6	103.3	COAL - dull, with occasional minute clay seams, included in Sample No. 1	7.7	7.7	
103.3	103.35	Boney Coal - rejected	.05	.05	
103.35	103.7	COAL, dull, included in Sample No. 1	.35	.35	
103.7	103.8	Boney Coal, occasional thin clay seams, rejected.	.1	.1	
103.8	105.2	COAL - dull, occasional thin clay seams, included in Sample No. 1	1.4	1.4	
105.2	105.3	Coaly claystone - rejected	.1	.1	
105.3	108.4	COAL - dull with thin clay seams, included in Sample No. 2 (107.2 a 1/4" claystone seam-rejected)	3.1	3.0	
108.4	109.8	Claystone with numerous bands, streaks, and inclusions of Coal - rejected	1.4	1.4	
109.8	110.0	COAL - dull, with small clay seams, included in Sample No. 2	.2	.2	
110.0	111.3	Claystone with numerous bands, streaks, and inclusions of coal - rejected	1.3	1.2	
111.3	111.4	Claystone - rejected	.1	.1	
111.4	112.1	Claystone with numerous streaks, bands, and inclusions of Coal - rejected	.8	.8	
112.1	113.7	COAL - dull, with numerous small thin clay seams, included in Sample No. 2	1.6	1.6	
113.7	114.1	Claystone with numerous streaks, bands, and inclusions of Coal - rejected	.4	.4	
114.1	114.4	COAL - dull with occasional thin clay seams, included in Sample No. 2	.3	.3	
114.4	114.7	Claystone with numerous streaks, bands, and inclusions of Coal - rejected	.3	.3	
114.7	115.3	COAL - dull, numerous clay streaks, and seams, included in Sample No. 2	.8	.8	
115.3	116.1	Claystone with numerous bands, streaks, and inclusions of Coal - rejected	.6	.6	
116.1	116.5	COAL - dull, with numerous thin clay seams, included in Sample No. 2	.4	.4	

Beluga River - Log, hole No. 1 (con.)

Depth					
From	To				
feet	feet				
116.5	116.9	Claystone with numerous bands, streaks, and inclusions of Coal - rejected	.4	.4	
116.9	118.5	COAL - dull with numerous thin clay seams, bottom of seam. Included in Sample No. 2	1.6	1.6	
118.5	136.1	Claystone - numerous bands and streaks of Coal	14.2	10.7	Bedding angles range from 15° to 18°
136.1	146.1	Sandy claystone which grades to a medium- to fine-grained poorly cemented sandstone	10.0	7.6	
146.1	156.1	Medium- to fine-grained soft incompetent sandstone - some clayey binder	10.0	.6	
156.1	236.7	Medium- to fine-grained soft, poorly cemented sandstone containing occasional to numerous siliceous pebbles	80.6	1.5	Core recovered consists entirely of the siliceous pebbles and cobbles

Bottom

Beluga River - Log, hole No. 2

Location: 19,684.6 N.; 20,246.2 E.

Elevation: Collar of hole - 448.7 feet, mean sea level datum (aneroid base)

Dip of hole: Vertical

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
0.0	36.1	Unconsolidated soil and clayey overburden - occasional pebbles	36.1	0.0	
36.1	41.5	Sandy claystone, soft, gray color	5.4	4.7	
41.5	51.5	Sandy claystone, numerous hard igneous pebbles upper portion (possibly cave)	10.0	3.0	
51.5	71.2	Sandy claystone, soft, gray color	19.7	8.7	Average bedding angle 15°
71.2	72.0	Fine- to medium-grained sandstone, fairly hard and dense	.8	.8	
72.0	93.0	Sandy claystone	21.0	14.0	Average bedding angle 10° to 15°
93.0	93.3	Fine- to medium-grained sand- stone, light gray to white, fairly hard and dense	.3	.3	
93.3	101.5	Sandy claystone	8.2	1.4	
101.5	111.7	Sandy claystone, banded, soft	10.2	8.7	Average bedding angle 7° to 15°
111.7	116.7	Sandy claystone, banded, soft, same cross bedding	5.0	5.0	Average bedding angle 5° to 10°
116.7	117.7	Fine- to medium-grained sandstone, banded, light gray to white	1.0	1.0	Bedding angle 10°
117.7	147.4	Sandy claystone, banded, soft	29.7	26.5	Average bedding angle 0° to 12°
147.4	147.9	Medium- to fine-grained sandstone, light gray to white	.5	.5	
147.9	163.0	Sandy claystone, banded, soft 1/8 in. band Coal at 161.0	15.1	12.8	Average bedding angle 5° to 13°
163.0	167.2	Sandy claystone, banded, soft, occasional thin coal bands	4.2	4.2	
167.2	171.1	Claystone with numerous streaks and bands Coal	3.9	3.9	
171.1	171.15	COAL - bright - band, top of seam, included in Sample No. 3	.05	.05	
171.15	171.4	COAL - dull with numerous thin streaks and seams of clay, in- cluded in Sample No. 3	.25	.25	
171.4	183.7	COAL - dull, included in Sample No. 3	12.3	12.3	
183.7	184.1	Boney Coal - rejected	.4	.4	

Beluga River - Log, hole No. 2 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
184.1	198.6	COAL - dull, included in Sample No. 3, 194.8 - 1/4" stringer boney coal - rejected, 198.3 small resin marker?	14.5	13.6	
198.6	198.9	Claystone w/numerous streaks and bands of Coal - rejected	.3	.3	
198.9	201.5	COAL - dull, included in Sample No. 3	2.6	2.6	
201.5	201.9	Claystone with bands, streaks, and inclusions of Coal, rejected	.4	.4	
201.9	202.1	Boney Coal - rejected	.2	.2	
202.1	205.3	COAL - dull, included in Sample No. 3	3.2	3.2	
205.3	205.5	Boney Coal - rejected	.2	.2	
205.5	208.3	COAL - dull, included in Sample No. 3	2.8	2.8	
208.3	208.4	Boney Coal - rejected	.1	.1	
208.4	211.5	COAL - dull, included in Sample No. 3	3.1	3.0	
211.5	211.6	Boney Coal - rejected	.1	.1	
211.6	213.4	COAL - dull, included in Sample No. 3	1.8	1.8	
213.4	213.8	Boney Coal with occasional thin clay seams, rejected	.4	.4	
213.8	214.3	COAL - dull with occasional thin clay seams - included in Sample No. 4	.5	.5	
214.3	214.9	Coaly claystone - occasional thin bands of bright Coal - rejected	.6	.6	
214.9	215.2	COAL - dull with occasional thin clay seams, included in Sample No. 4	.3	.3	
215.2	215.3	Coaly claystone - occasional bands of bright coal and minute inclusions of dull coal - rejected	.1	.1	
215.3	215.5	COAL - dull w/occasional clay seams, included in Sample No. 4	.2	.2	
215.5	216.8	Claystone with numerous bands, streaks, and inclusions of Coal - rejected	1.3	1.3	
216.8	217.6	COAL - dull, included in Sample No. 4	.8	.8	
217.6	217.8	Claystone containing only occasional small inclusions of Coal - rejected	.2	.2	
217.8	217.9	Boney Coal - rejected	.1	.1	

Beluga River - Log, hole No. 2 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
217.9	218.5	COAL - dull, occasional very thin clay seams, included in Sample No. 4	0.6	0.6	
218.5	218.8	Claystone with bands, streaks, and inclusions of Coal - rejected	.3	.3	
218.8	219.4	COAL - dull, with numerous thin clay seams, included in Sample No. 4	.6	.6	
219.4	219.6	Claystone with streaks, bands, and inclusions of Coal - rejected	.2	.2	
219.6	220.3	COAL, w/numerous small clay seams, included in Sample No. 4	.7	.7	
220.3	220.6	Claystone w/occasional small Coal bands, streaks and inclusions - rejected	.3	.3	
220.6	220.8	Claystone with numerous streaks, bands, and inclusions of Coal - rejected	.2	.2	
220.8	221.4	COAL - dull, w/numerous small minute clay seams, included in Sample No. 4	.6	.6	
221.4	221.7	Claystone w/numerous streaks, bands and inclusions of Coal - rejected	.3	.3	
221.7	223.0	COAL - dull, numerous small clay seams, included in Sample No. 4	1.3	1.3	
223.0	224.1	Claystone with numerous bands, streaks, and inclusions of Coal - rejected	1.1	1.1	
224.1	224.8	COAL - dull, numerous small minute clay seams, included in Sample No. 4	.7	.7	
224.8	225.0	Claystone with streaks and inclusions of Coal - rejected	.2	.2	
225.0	225.6	COAL - dull, numerous minute clay seams - rejected, bottom of seam	.6	.6	
225.6	232.8	Claystone, numerous streaks and bands of Coal	7.2	7.2	Average bedding angle 5° to 15°
232.8	239.7	Sandy claystone, soft, gray color, no banding	6.9	6.9	
239.7	251.5	Medium-grained sandstone, soft, incompetent, poorly cemented, some clayey binder upper 2 ft.	11.8	3.6	A few Coal streaks in small amount of core recovered between 241.0 and 251.5

Bottom

Beluga River - Log, hole No. 3

Location: 19,937.1 N., 19,663.9 E.

Elevation: Collar of hole - 403.8 feet, mean sea level datum (aneroid base)

Dip of hole: Vertical

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
0.0	30.0	Unconsolidated soil and clayey overburden, occasional pebbles	30.0	0.0	
30.0	42.3	Sandy claystone, soft, gray color, banded	12.3	9.8	Average bedding angle 15°
42.3	42.8	Medium- to fine-grained sandstone, fairly hard and dense, light gray to white color	.5	.5	
42.8	56.5	Sandy claystone, soft, gray color, banded	13.7	2.8	
56.5	66.5	Sandy claystone, soft, gray color	10.0	9.8	Average bedding Angle 10°
66.5	82.3	Sandy claystone, soft, gray color, banded	15.8	15.7	Average bedding angle 0° to 10°
82.3	84.3	Claystone, numerous streaks and bands of Coal	2.0	2.0	
84.3	84.9	Fine-grained sandstone, hard and dense, light gray to white color	.6	.6	
84.9	88.4	Claystone, numerous bands and streaks of Coal	3.5	3.4	Average bedding angle 0° to 5°
88.4	98.4	COAL - dull, included in Sample No. 5, Top of seam	10.0	10.0	
98.4	101.9	COAL - dull, included in Sample No. 6	3.5	3.5	
101.9	102.3	Boney Coal, included in Sample No. 7 (ordinarily reject)	.4	.4	
102.3	110.6	COAL - dull, included in Sample No. 8	8.3	8.3	
110.6	110.8	Boney Coal with thin claystone streaks - rejected	.2	.2	
110.8	110.9	COAL - dull, included in Sample No. 8	.1	.1	
110.9	111.2	Coaly claystone - rejected	.3	.3	
111.2	112.3	COAL - dull, included in Sample No. 8	1.1	1.1	
112.3	112.6	COAL - dull, included in Sample No. 9	.3	.3	
112.6	112.7	Boney Coal - rejected	.1	.1	
112.7	115.8	COAL - dull, included in Sample No. 9	3.1	3.1	
115.8	116.1	Boney Coal - rejected	.3	.3	

Beluga River - Log, hole No. 3 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
116.1	122.3	COAL - dull, occasional thin clay seams, included in Sample No. 9	6.2	6.2	
122.3	124.2	COAL - dull, included in Sample No. 10	1.9	1.9	
124.2	124.4	Boney Coal - rejected	.2	.2	
124.4	124.7	COAL - dull, included in Sample No. 10	.3	.3	
124.7	124.8	Boney Coal - rejected	.1	.1	
124.8	127.4	COAL - dull, included in Sample No. 10, occasional thin clay seams	2.6	2.6	
127.4	127.5	Claystone with Coal streaks and inclusions - rejected	.1	.1	
127.5	127.8	COAL - dull, included in Sample No. 10	.3	.3	
127.8	128.2	Banded Coal and Claystone - rejected	.4	.4	
128.2	128.4	COAL - dull, included in Sample No. 10	.2	.2	
128.4	129.0	Banded Coal and claystone-rejected	.6	.6	
129.0	129.3	COAL - dull, included in Sample No. 10	.3	.3	
129.3	130.8	Claystone with bands, streaks, and inclusions of Coal - rejected	1.5	1.5	
130.8	132.3	COAL - dull, included in Sample No. 10, occasional thin claystone bands	1.5	1.5	
132.3	132.7	Boney Coal - rejected	.4	.4	
132.7	133.6	COAL - dull, included in Sample No. 11	.9	.9	
133.6	133.7	Claystone with Coal streaks and inclusions - rejected	.1	.1	
133.7	133.9	COAL - dull, included in Sample No. 11	.2	.2	
133.9	134.4	Banded Coal and claystone - rejected	.5	.5	
134.4	134.7	COAL - dull, included in Sample No. 11	.3	.3	
134.7	136.1	Dark claystone with numerous streaks, bands, and inclusions of Coal - rejected	1.4	1.4	
136.1	137.3	COAL - dull, included in Sample No. 11	1.2	1.2	
137.3	139.7	Banded Coal and claystone - rejected	2.4	2.4	

Beluga River - Log, hole No. 3 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
139.7	141.5	COAL - dull, included in Sample No. 11, bottom of seam	1.8	1.8	
141.5	142.4	Banded Coal and claystone	.9	.9	
142.4	149.1	Claystone, numerous streaks and bands of Coal	6.7	6.7	Average bedding angle 0° to 5°
149.1	155.0	Claystone to sandy claystone, soft, no banding	5.9	5.9	
		Bottom			

Beluga River - Log, hole No. 4

Location: 20,358.1 N.; 22,705.2 E.

Elevation: Collar of hole - 395.7 feet, mean sea level datum (aneroid base)

Dip of hole: Vertical

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
0.0	76.0	Unconsolidated soil and clayey overburden, occasional to numerous pebbles (mostly igneous)	76.0	0.0	
76.0	91.3	Sandy claystone, numerous Coal streaks and inclusions upper 1 ft., 0.1 ft. medium-grained sandstone band at 81.8 ft.	15.3	13.2	
91.3	93.5	Very fine-grained sandstone (hard and dense)	2.2	2.2	
93.5	96.0	Sandy claystone	2.5	0.0	
96.0	106.0	Clayey sandstone, soft, poorly compacted	10.0	3.7	Bedding angles 20° to 26°
106.0	107.0	Medium-grained arkosic poorly cemented sandstone	1.0	1.0	
107.0	108.2	Medium-grained arkosic sandstone, hard and dense	1.2	1.2	
108.2	116.1	Medium-grained arkosic sandstone, soft, poorly cemented	7.9	0.0	
116.1	131.0	Medium-grained arkosic sandstone, contains occasional well-rounded pebbles. 3.2 ft. of hard dense arkosic sandstone, well compacted	14.9	3.9	
131.0	145.1	Medium-grained arkosic sandstone	14.1	.5	
145.1	151.5	Dark gray sandy claystone with only occasional Coal streaks	6.4	5.6	Bedding angles 10° to 15°
151.5	161.5	Sandy claystone to claystone, occasional Coal streaks	10.0	7.7	Bedding angles 20° to 25°

Bottom

Beluga River - Log, hole No. 5

Location: 19,829.5 N.; 22,430.6 E.

Elevation: Collar of hole - 405.4 feet, mean sea level datum (aneroid base)

Dip of hole: Vertical

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
0.0	27.0	Unconsolidated soil and clayey overburden, occasional to numerous pebbles and cobbles, pebbles and cobbles consisted of both igneous and sedimentary rocks including Coal	27.0	0.0	
27.0	57.0	Medium-grained sandstone, arkosic, pebbles to 1/2" (both coarse and rounded). Recovered sandstone is hard and dense. Un-recovered portion is soft and poorly cemented (from drilling characteristic). Clay seam noted on one fracture at 28.0 ft. A few highly siliceous pebbles recovered between 37 and 57 ft.	30.0	4.9	
57.0	67.0	Sandy claystone, occasional Coal streaks and inclusions	10.0	6.0	Bedding angles 20° to 25°
67.0	76.3	Sandy claystone, numerous streaks, bands and inclusions of Coal (bands to 1/4" near base of run)	9.3	9.3	Bedding angles 25° to 30°
76.3	86.5	Sandy claystone grading to dark gray claystone, numerous streaks, bands and inclusions of Coal (bands to 1/2"), chert inclusion at 77.7 ft., very fine-grained hard dense sandstone band at 79.4 ft.	10.2	10.1	Bedding angles 20° to 35°
86.5	94.7	Claystone; numerous streaks, bands and inclusions Coal (bands to 1/2") fine-grained sandstone band at 94 ft.	8.2	8.2	
94.7	95.0	Claystone, numerous Coal streaks	.3	.3	
95.0	95.2	COAL - dull, with occasional thin clay seam, top of seam, included in Sample No. 12	.2	.2	
95.2	95.5	Claystone w/numerous coal streaks and inclusions - rejected	.3	.3	

Baluga River - Log, hole No. 5 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
95.5	99.2	COAL - dull, included in Sample No. 12	3.7	3.7	
99.2	101.1	Boney Coal - rejected	1.9	1.9	
101.1	102.6	COAL - dull, included in Sample No. 12	1.5	1.5	
102.6	102.7	Boney Coal - rejected	.1	.1	
102.7	103.5	COAL - dull, included in Sample No. 12	.8	.8	
103.5	104.0	Claystone with bands and streaks of Coal - rejected	.5	.5	
104.0	104.2	Boney Coal - rejected	.2	.2	
104.2	104.5	COAL - dull, included in Sample No. 12	.3	.3	
104.5	104.8	Boney Coal - rejected	.3	.3	
104.8	105.5	COAL - dull, included in Sample No. 12, thin bands of clay	.7	.7	
105.5	105.6	Boney Coal - rejected	.1	.1	
105.6	106.0	COAL - dull, included in Sample No. 12, thin bands of clay	.4	.4	
106.0	106.7	Boney Coal - rejected	.7	.7	
106.7	107.1	Claystone with thin streaks and in- clusions of Coal - rejected	.4	.4	
107.1	107.7	COAL - dull with thin clay seams, included in Sample No. 13	.6	.6	
107.7	111.0	Claystone with thick bands, seams, and inclusions of Coal, core banded in appearance - rejected	3.3	3.3	
111.0	111.1	COAL - dull, included in Sample No. 13	.1	.1	
111.1	114.2	Claystone with thick bands, seams, and inclusions of Coal - rejected	3.1	3.1	
114.2	115.5	COAL - dull, with occasional min- ute clay seams - included in Sample No. 13	1.3	1.3	
115.5	116.9	Claystone with 1/4" bands, seams, and inclusions of Coal - rejected	1.4	1.4	
116.9	117.0	COAL - bright, band included in Sample No. 13	.1	.1	
117.0	118.4	Claystone with numerous thick bands and inclusions of Coal - rejected	1.4	1.4	
118.4	119.7	COAL - bright conchoidal, in Sample No. 13	1.3	1.3	

Beluga River - Log, hole No. 5 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
119.7	121.2	COAL - dull, occasional bands and streaks of clay, included in Sample No. 13	1.5	1.5	
121.2	121.7	Claystone with bands and streaks of Coal - rejected	.5	.5	
121.7	122.8	COAL - dull, with bands of clay, included in Sample No. 13. Bottom of seam	1.1	1.1	
122.8	123.7	Claystone with numerous bands, streaks, and inclusions of Coal - rejected	.9	.9	
123.7	128.0	Very slightly sandy claystone to claystone with numerous streaks, bands and inclusions of Coal	4.3	4.3	Average bedding angle 25°
128.0	130.0	Claystone with bands, streaks, and inclusions of Coal	2.0	1.2	
130.0	130.8	Sandy claystone to sandstone	.8	.8	No banding
130.8	131.6	Fine- to medium-grained sandstone, faint banding, hard, dense, competent	.8	.8	
131.6	139.5	Medium- to fine-grained sandstone (locally in narrow stringers somewhat clayey). Incompetent, poorly cemented, 0.3 ft. of Coal bands at 137.5 ft.	7.9	7.6	Faint banding. Coaly stringers Bedding angles 28° to 30°
139.5	152.0	Medium-grained well compacted, dense sandstone grading to incompetent sandstone	2.5	1.6	No banding
152.0	186.5	Medium- to fine-grained sandstone, soft, incompetent, with occasional coaly bands or streaks	34.5	.0	
Bottom					

Beluga River - Log, hole No. 6

Location: 19,639.7 N.; 21,263.3 E.

Elevation: Collar of hole - 431.8 feet, mean sea level datum (aneroid base)

Dip of hole: Vertical

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
0.0	7.0	Soil and clayey overburden, occasional large cobbles	7.0	0.0	
7.0	10.0	Drill cuttings indicate Coal	3.0	.0	
10.0	12.0	COAL - dull, badly fractured - included in Sample No. 14	2.0	1.5	Sample No. 14 consisted of poorly con- solidated and/or coal float
12.0	14.1	COAL - dull - 2 quartz pebbles (rejected), included in Sample No. 14	2.1	1.8	
14.1	18.0		3.9	none	
18.0	22.5	COAL - dull, occasional bright stringers, included in Sample No. 14	4.5	2.7	
22.5	23.1	COAL - dull - included in Sample No. 15	.6	.6	
23.1	24.6	COAL, clayey in appearance, soft, floats in CCL 4 - assume fractured zone, included in Sample 15	1.5	1.3	
24.6	35.1	COAL - dull, 26.9 - 1/16" clay seam, 27.8 - 0.1' high ash seam, includ- ed in Sample No. 15	10.5	10.4	
35.1	35.2	Coaly claystone - rejected	.1	.1	
35.2	36.9	COAL - dull, included in Sample No. 15	1.7	1.7	
36.9	36.95	Boney Coal - rejected	.05	.05	
36.95	42.1	COAL - dull, included in Sample No. 15, 38.7 - 1/4" Boney Coal, ~ rejected	5.15	3.9	
42.1	42.5	Coaly claystone - rejected	.4	.4	
42.5	49.2	COAL - dull, included in Sample No. 15, occasional to numerous 1/8+" stringers bright Coal - badly fractured	6.7	5.3	
49.2	49.8	COAL - alternating dull and bright, included in Sample No. 15	.6	.6	
49.8	50.1	Boney Coal - rejected	.3	.3	
50.1	51.8	COAL - dull, badly fractured, in- cluded in Sample No. 16	1.7	1.7	
51.8	52.3	COAL - dull, occasional thin clay seams, included in Sample No. 16	.5	.5	
52.3	52.8	COAL - dull, included in Sample No. 16	.5	.5	

Beluga River - Log, hole No. 6 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
52.8	53.5	COAL - dull, occasional thin clay seams, included in Sample No. 16	.7	.7	
53.5	53.6	Claystone with Coal streaks and inclusions - rejected	.1	.1	
53.6	56.0	COAL - dull, soft, high ash. Included in Sample No. 16	2.4	2.4	
56.0	56.1	Claystone with Coal streaks and inclusions - rejected	.1	.1	
56.1	56.5	COAL - dull, included in Sample No. 16	.4	.4	
56.5	57.6	Claystone with Coal bands, streaks, and inclusions - rejected	1.1	.9	
57.6	58.6	COAL - dull, included in Sample No. 16	1.0	1.0	
58.6	59.3	Claystone with Coal bands, streaks, and inclusions-rejected	.7	.7	
59.3	60.4	COAL - dull, included in Sample No. 16	1.1	1.1	
60.4	60.5	Claystone with bands and streaks of Coal - rejected	.1	.1	
60.5	61.5	COAL - dull, included in Sample No. 16. 60.9 = a thin 1/32" resin stringer	1.0	1.0	
61.5	61.6	Claystone with bands and streaks of Coal - rejected	.1	.1	
61.6	62.2	COAL - dull, included in Sample No. 16	.6	.6	
62.2	62.7	Claystone with bands and streaks of Coal - rejected	.5	.5	
62.7	63.7	COAL - dull with thin bands and streaks of clay, included in Sample No. 16	1.0	1.0	
63.7	65.0	Claystone with bands, streaks, and inclusions of Coal-rejected	1.3	1.0	
65.0	66.8	COAL - dull, included in Sample No. 16. Bottom of coal	1.8	1.8	
66.8	67.0	Boney Coal - rejected	.2	.2	
67.0	71.3	Banded Coal and claystone-rejected	4.3	4.3	
71.3	73.3	Claystone with numerous bands and streaks of Coal	2.0	1.8	Bedding angles 28° to 32°
73.3	79.9	Claystone to slightly sandy claystone with numerous bands, streaks, and inclusions of Coal	6.6	6.6	Coal bands to 0.2 ft. thickness; Bedding angles 28° to 30°

Beluga River - Log, hole No. 6 (con.)

Depth		Material	Inter- val feet	Core re- covery	Remarks
From feet	To feet				
79.9	83.3	Slightly sandy claystone to sandy claystone to clayey sand- stone	3.4	3.4	
83.3	91.9	Clayey sandstone to medium-grained poorly cemented incompetent sand- stone	8.6	8.6	
91.9	93.3	Medium-grained poorly cemented incompetent sandstone	1.4	.0	
		Bottom			