D - R - A - F - T
(Subject to correction and revision)

INITIAL WAR MINERALS REPORT

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

W.M.R._____ Coal November 1944

Coal Deposits
Nelson Island
Western Alaska

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INITIAL WAR MINERALS REPORT*

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

W.M.R.____ Coal November 1944

COAL DEPOSITS
Nelson Island
Western Alaska

SUMMARY

Two coal deposits on the western end of Nelson Island are of sufficient size to supply the fuel requirements of the inhabitants of that island. The Natives, acting through their cooperative store and the Government school at Tununak, propose to exploit both deposits. After an annual production of about 150 tons has been assured, the cooperative store will finance small frame houses at Tununak. Coal procurement and subsequent adequate housing is directed toward improved health of the Natives through better living conditions.

The 2 coal deposits outcrop at Kinarak Bay and at Coal Point. The continuity of these beds has not been tested, but it is very

*This initial war minerals report has been prepared for the engineers and consultants of the Bureau of Mines for their technical review and criticism, and to keep them informed of the progress of the Bureau of Mines war minerals program. It is not to be made available to others, as the data are subject to correction and revision. The final report, when issued, will be distributed on a limited basis to officials of the Federal war agencies, the owners or operators of the properties described therein, and to certain others with specific concern in the production of minerals vital to the prosecution of the war.

reasonable to believe that each will extend back from the coast line a minimum distance of several hundred feet. At Kinarak Bay, following a small production by surface mining, it is estimated that about 11 tons of coal can be recovered by underground mining from each foot of strike interval. The Coal Point coal beds will be strip-mined. It is estimated that each foot of strike interval at Coal Point contains 3.3 tons of recoverable coal.

Exploration by the Bureau of Mines is not contemplated. It is proposed that local Eskimos will mine the coal under the supervision of the school teacher.

INTRODUCTION

An examination of the coal beds within a reasonable distance of the village of Tununak, Nelson Island, Alaska, was undertaken in October, 1944, by an engineer 1/ of the Bureau of Mines, at the request of the Territorial Guard 2/ and the Bureau of Indian Affairs school 3/ at Tununak. The purpose of the examination was (1) to evaluate the potentialities of the several known coal occurrences on the western end of Nelson Island, and (2) to assist in planning their utilization by the Native population. The establishment of an assured source of local fuel at a reasonable price is prerequisite to the inauguration of a program of health improvement based upon better housing.

LOCATION AND ACCESSIBILITY

Nelson Island is situated along the Bering Sea coast between the Yukon and Kuskokwim rivers, and faces upon Etolin Strait and

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1/ Burr S. Webber, Mining Engineer
2/ Major Marston, Commandant
3/ Chas. Guim, Government teacher.

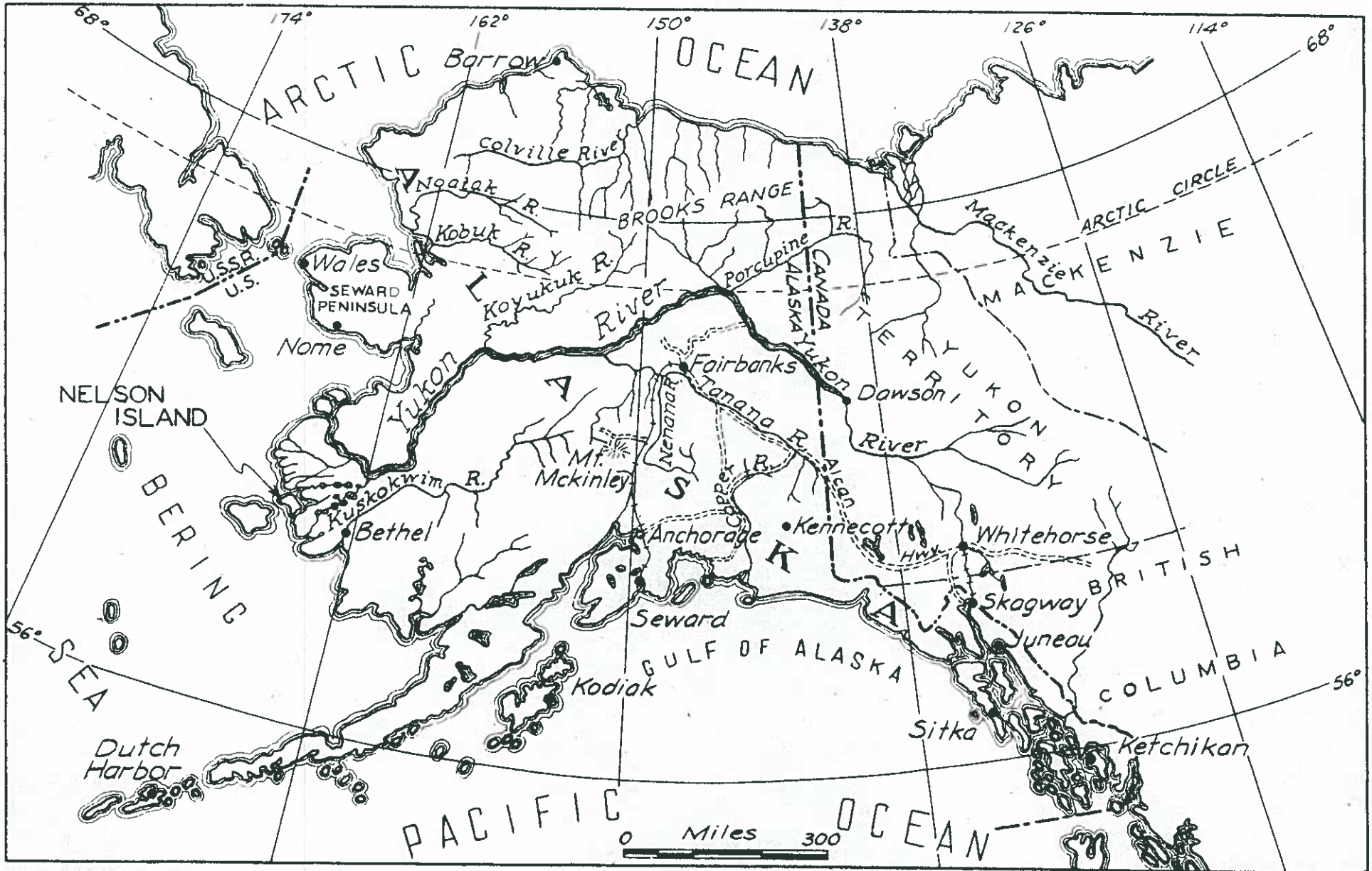
Hazen Bay. (See Index Map) The village of Tununak is near the western extremity of the island, about 17 miles north and east of Cape Vancouver, and at longitude 165° 15' W. and latitude 60° 40' N. (See Sketch Map of Nelson Island).

Nelson Island is not a port of call for vessels plying between Seattle and Nome. Freight is delivered to Nome or St. Michael, and transshipped to Tununak. The base freight rate in 1943 was $65 a ton from Seattle, exclusive of lighterage at Tununak. On a Department of Interior ship delivering directly to Tununak, the prewar base rate from Seattle was $25 a ton. There has been no freight service to Nelson Island during the 1944 season.

Contact with Bethel, at the head of ocean navigation on the lower Kuskokwim River, is possible by means of small gasoline powered coastwise boats based at Tununak. As this necessitates a 500 mile round trip through inadequately chartered shoal waters, it is seldom attempted. Bethel may also be reached in the winter by dog team or tractor over a compass course about 120 miles in length. Tununak is most readily accessible by air. An unimproved airstrip accomodates small planes, and airplanes on pontoons or skis use the lagoon just south of the village. Mail service is once monthly by airplane from Bethel.

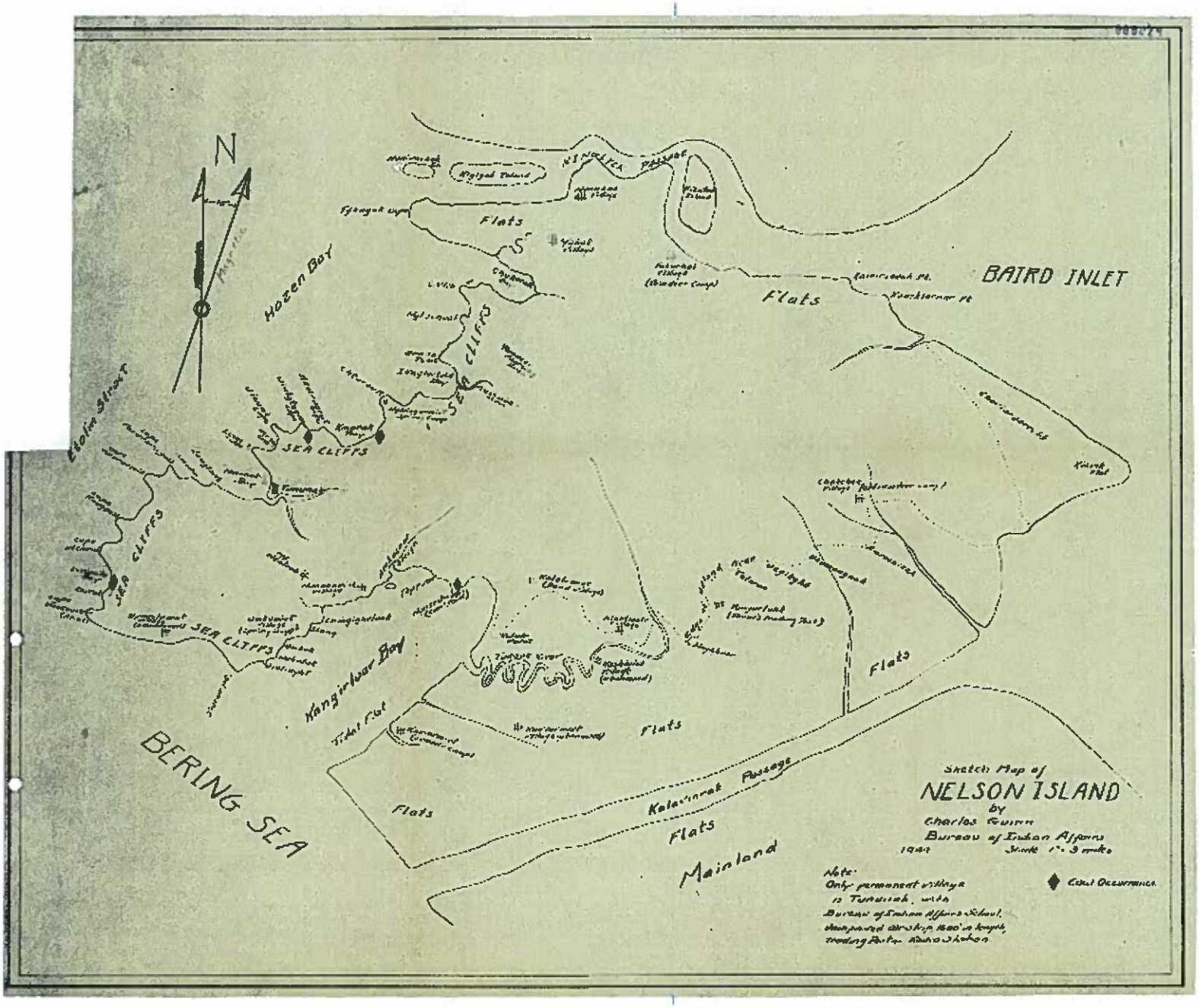
PHYSICAL FEATURES AND CLIMATE

Nelson Island is geographically a part of the Bering Sea coastal plain though it is separated from the mainland by Baird Inlet to the east, Ninglick Passage toward the northwest and Kalavinrak Passage toward the southwest.



INDEX MAP

NELSON ISLAND


N
Hooper Bay
Flats
BAIRD INLET
SEA CLIFFS
Etolin Strait
SEA CLIFFS
SEA CLIFFS
Kangirlvar Bay
BERING SEA
Flats
Flats
Flats
Kalavinrak Passage
Mainland
Sketch Map of
NELSON ISLAND
by
Charles Guinn
Bureau of Indian Affairs
1941
Note:
Only permanent villages
in Tununak with
Bureau of Indian Affairs School,
incorporated since 1940 in bold,
trading posts also Indian
Coal Occurrence

A peninsula about 20 miles in length by 9 miles in average width forms the central portion of the westerly side of the island and culminates as Cape Vancouver. The peninsula is bounded by cliffs facing upon Etolin Strait, Hazen and Kangirluar bays. From the line of 5 capes which form the westerly end of the peninsula, the sea cliffs progressively decline in height from about 1000 feet to the mud flats encountered at the head of Kangirluar Bay and of Chukarak Bay.

The greater portion of the surface of Nelson Island conforms to that of the coastal region, in that it is blanketed by tundra, is of low relief and is bordered by wide tidal flats.

Vegetation consists of the usual tundra plants. Thickets of stunted willows occupying spots favored by partial protection from the high winds are the only trees on the island. A species of grass growing on the low benches close to tidewater are used in basketry and a hematite-rich rock, and vivianite, are used as dyes.

There is no official data on the climate of Nelson Island. Mean summer temperatures along the shores of Bering Sea are reported to range between 45 and -54 degrees F. and the mean annual temperature from 22 to 37 degrees F. The precipitation at St. Michael has averaged about 12 inches.4/ Along the Bering Sea coast, during an unstated period prior to 1941, the maximum and minimum temperatures were 89 and -56 degrees F. respectively, and precipitation ranged between 36.65 and 3.89 inches.5/ Except during the summer months, high northerly winds prevail on Nelson Island.

4/ "General Information Regarding Alaska", 1941, by the Alaska Planning Council.

5/ "Climatological Data, Alaska Section", Vol. XXVI, No. 13, U.S. Dept. of Commerce, Weather Bureau.

Approximately 400 Eskimos inhabit Nelson Island, about 1/3 of which reside at Tununak, the only permanent village on the island. Trapping has been their principal source of revenue, though native handiwork is now of equal importance. The Arts and Crafts program of the Bureau of Indian Affairs school at Tununak has been very effective, and the Tununak Native Store, also under the direction of the Bureau of Indian Affairs, is well managed and successful. A reindeer herd of about 3,000 is owned by the community and some 500 or 600 are slaughtered annually for local use.

Sufficient unskilled Native labor is available during the summer months to man the coal mining operation proposed by the Tununak Native Store. The established rate of pay is 50 cents an hour.

LIVING CONDITIONS

The Natives' time-honored means of surviving the winters in the tundra regions of Alaska is to crowd into unventilated, partly subterranean sod igloos. These are not heated except by seal oil lamps but their nearly air-tight construction largely prevents the dissipation of body heat. Housing on Nelson Island is of this type. The prevalence of tuberculosis among the Natives and the very high rate of infant mortality is believed to be a direct result of these crowded and unsanitary living conditions. Frame houses have not been built by the Natives because they are harder to heat and local fuel has not been available.

The Natives, acting through their cooperative store and the Government school, propose to solve their fuel problem by mining coal from deposits within a reasonable distance of Tununak. When assured

of a regular supply of coal, the cooperative store will finance simple frame houses. As the project will be centered at Tununak, this village will increase its population as living conditions are eased there. Coal requirements at the village are estimated to be 50 tons during the winter of 1945-46, and will increase to a minimum of 150 tons a year as their housing program materializes.

PROPERTY AND OWNERSHIP

All of the coal occurrences on Nelson Island are a part of the public domain, and none are now held under Coal Prospecting Permits. It is understood that the Tununak Native Store will apply for "Free Coal Mining Permits" under the provisions of section 10 of the Act of October 20, 1914 (38 Stat. 741,48 U.S.C. Sec. 445) covering the two deposits they expect to mine.

GENERAL GEOLOGY

The western part of Nelson Island consists of Eocene sediments overlain by basic flows which are predominantly amygdaloidal. The extrusives, together with associated indurated tuffs, have protected the underlying shaly sediments and have been responsible for the formation of the sea cliffs.

Generally, the shales and sandstones have very low dips, but folds exposing beds lower in the succession are seen along the sea cliffs. Coal seams, usually very thin, are numerous. At Kinarak Bay, a 177-foot section nearly normal to the strike of the sediments, contains 6 coal seams less than 6 inches in thickness and one 30-inch bed.

COAL OCCURRENCES

None of the 4 occurrences of coal examined on the western end of Nelson Island would ordinarily be of economic status. However, in view of the almost complete absence of driftwood and other local fuels, the prohibitive price of imported coal or oil, and the modest wage scale in force, 2 of these coal deposits have been recommended for exploitation. These are the 30-inch bed outcropping at Kinarak Bay, and 2 beds totaling 22 inches in thickness outcropping at Coal Point.

Samples from these 3 coal beds have been submited for proximate analyses and heat unit determinations. The results, when received, will be appended to this report.

Kinarak Bay Coal Deposit

At the base of the sea cliff along Kinarak Bay, a 30-inch coal bed outcrops in cross section and dips 38 degrees toward the northeast. (See Figure 1) It has been trenched at the base of the cliff which corresponds with extreme high tide level, and 15 feet seaward at mean high tide level. The strike interval of the coal bed projected across the space between the mean high tide line and the low tide line is not less than 300 feet. The trace of the coal bed up the steep talus slope above the base of the cliff is intermittantly marked by coal bloom. The coal bloom terminates at an elevation of 69 feet above the base of the cliff, coincident with the base of a series of flat lying sediments. The coal bed appears to have been truncated at this horizan.

The coal is overlain by shale and has a resistant sandy-shale footwall. Probably as a result of folding, the coal is shattered and

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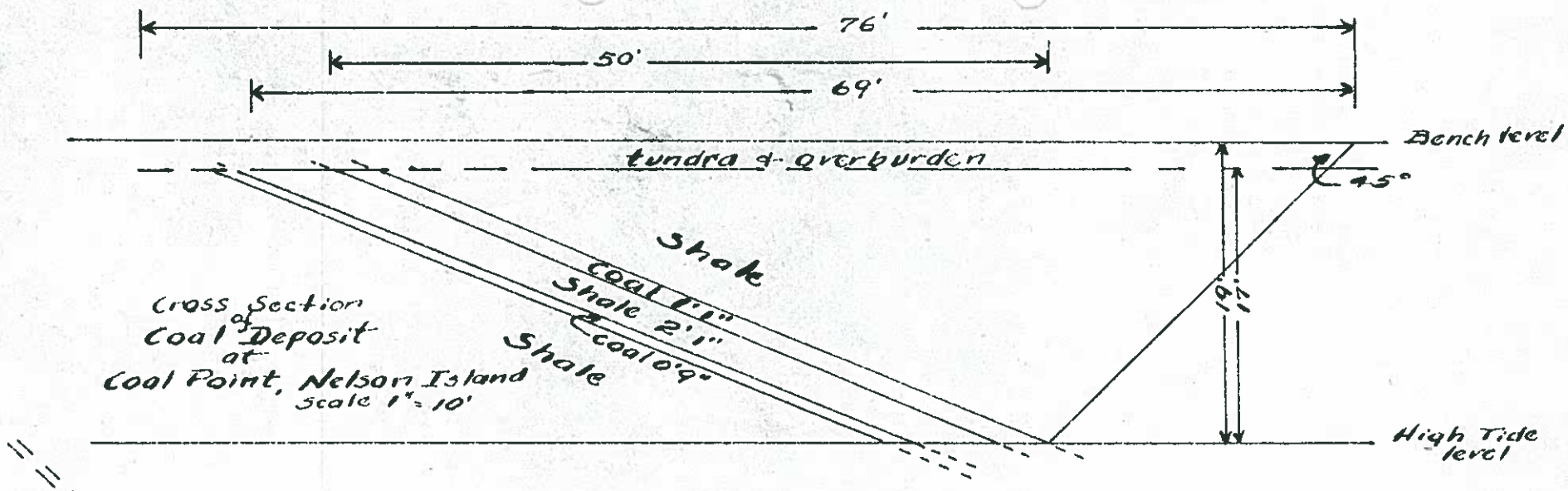
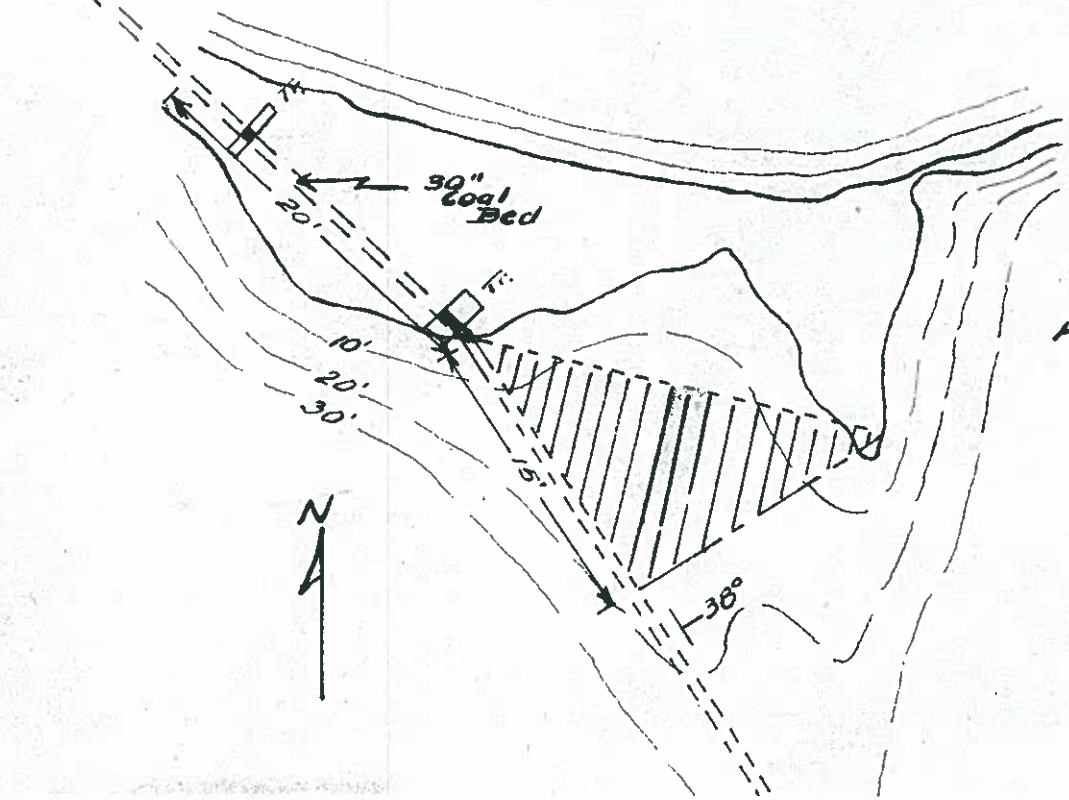
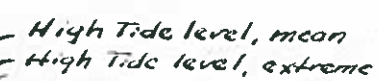


Cross Section of Coal Deposit at Coal Point, Nelson Island
Scale 1" = 10'





Plan view Coal Deposit at Kinarak Bay, Nelson Island
Scale 1" = 10'

Nelson Island, Alaska
Coal Deposits

Figure 1

is expected to yield a considerable percentage of fines.

Coal Point Coal Deposit

The Coal Point coal deposit is about 12 miles airline southeast of Tununak, and about 30 miles by water. An upper bed of coal, 13 inches in thickness, and a lower 9-inch coal bed are separated by 25 inches of shale and dip northeasterly at 22 degrees. (See Figure 1). The beds outcrop in cross section in the face of a bench which rises 19 feet above high tide level. The bench extends back from the beach about 1/4 mile and is succeeded by a second low bench. It is estimated that the coal measures are overlain by an average of 2 feet of detrital material. The ground is permanently frozen, but seasonal thawing usually extends between 2 and 3 feet below the surface. Both coal beds are enclosed by shale.

RESERVES

The continuity of the coal beds outcropping at Coal Point and at Kinarak Bay has not been tested. Coal beds of similar age in Alaska have been found to vary in this respect between wide limits. It is logical to assume that they will extend inland some hundreds of feet.

Each foot of strike interval of the Coal Point beds is estimated to have a reserve of 3.3 tons of coal above high tide line, as follows: (Figure 1).

Available height of bench above high tide, 19'-2' = 17 feet

Dip length of coal beds, recoverable, 45 feet
(2 coal beds, 13 inches and 9 inches thick)

Reserve for each foot of strike length $\frac{45 \times \frac{13 + 9}{12}}{25} = 3.3$ tons

The inferred reserve of each 100-foot strike interval of the Coal Point beds will meet the local requirements over a 2-year period.

The 30-inch Kinarak Bay coal bed is estimated to contain 550 tons of coal within the initial 100-foot strike interval from the high tide line. This reserve would supply the village of Tununak for a period of 3 years. Beyond this initial 100-foot strike interval, this bed is estimated to contain 11.1 tons of coal for each additional foot of strike. (Figure 1)

MINING METHODS PROPOSED

It is proposed to prepare the Coal Point coal beds for surface mining by mechanical stripping and hand cleaning. It is probable that the frozen overlying shale can be thawed by diverting a nearby small stream periodically over the stripping site following removal of the unfrozen overburden. If this proves unsuccessful, a rooter may be necessary.

As the coal beds are thin and as the cleats will probably have been opened by ice within the section to be mined, the use of explosives will not be necessary or desirable.

Following the recovery of the upper coal bed, it may prove possible and practical to strip the 25-inch shale bed overlying the lower coal, by drilling and blasting. This would not be practical unless the shale can be drilled by hand augers and broken progressively upward from the bottom of the cut. Though frozen shale does not respond satisfactorily to blasting, the seam of ice to be expected between the shale and coal may make it feasible in this instance.

The extracted coal, as at Kinarak Bay, will be screened at 3/4 inch, both products sacked and transported by boat or barge to Tununak. Coal passing through the screen will be utilized in mechanically fed furnaces at the store and ship buildings.

In preparing the 2 coal beds for extraction, it is estimated that each foot of strike interval will require the removal of 28 cubic yards of material, as follows: (Figure 1)

Width to be stripped at surface	69 ft.
Maximum depth	19 ft.
Stripping for upper bed $\frac{69 \times 19}{2}$ =	656 cu. ft.
Stripping for lower bed $\frac{45 \times 2.08}{}$ =	94 cu. ft.
Total stripping	750 cu. ft. = 28 cu. yds.
Estimated hand cleaning, both beds	3.0 cu. yds.
Estimated mechanical stripping	25.0 cu. yds.
Total stripping	28.0 cu. yds.

Because of the favorable topography at the outcrop of the kinarak Bay coal bed, it will be possible to strip the overlying shale from the coal bed, for a distance of 15 feet from the base of the sea cliff by hand mining. This portion of the bed will reach a maximum elevation of 12 feet above extreme high tide level and will yield about 38 tons of coal. It will necessitate the removal of about 175 tons of overlying shale, which probably will not be frozen.

Following the extraction of this small block, it is suggested that the same interval, plus at least 20 feet toward the mean high-tide line, be underhand stoped from the surface. By removing the overlying shale for a horizontal distance of 6.4 feet back from the hanging wall

of the coal bed, 0.8 tons of coal can be uncovered for each foot of strike interval. The maximum depth of shale removed would be 5 feet, and it is probable that the back wall would not require sloping. This 35 feet of strike interval, easily minable to this depth, would produce an estimated 28 tons of coal.

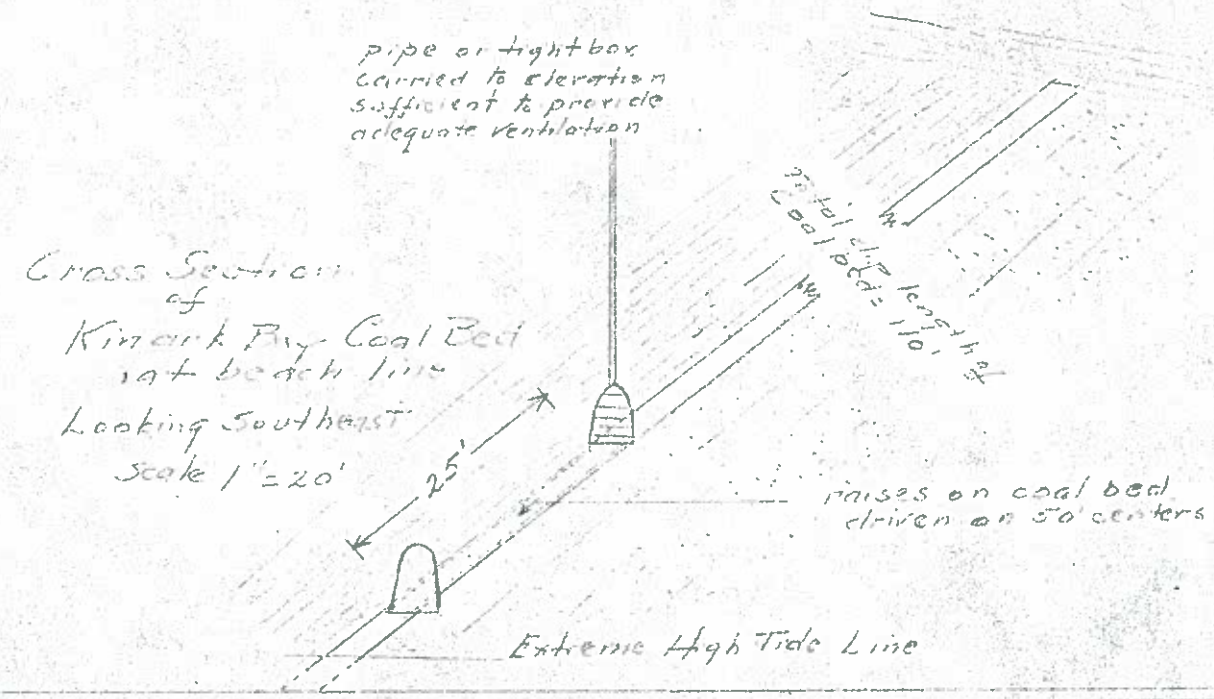
In order to continue the extraction of this coal bed after recovering the two blocks described above, it will be necessary to start a small underground operation. The Tununak Native Store expects to then secure the services of a practical miner to supervise the operation and to train a few Natives in this work. Except for planking, driftwood will meet the mine-timber requirements of this operation. As the hanging wall shales appear to be well compacted, it is probable that the adits will requite a minimum of support. Materials should be on hand however, for drift sets and lagging. In order to insure the extraction of the maximum amount of coal from this bed consistant with the type of operation contemplated, the adit should be advanced 250 feet, or to the laterial limit of its economic width or grade, before stoping is started.

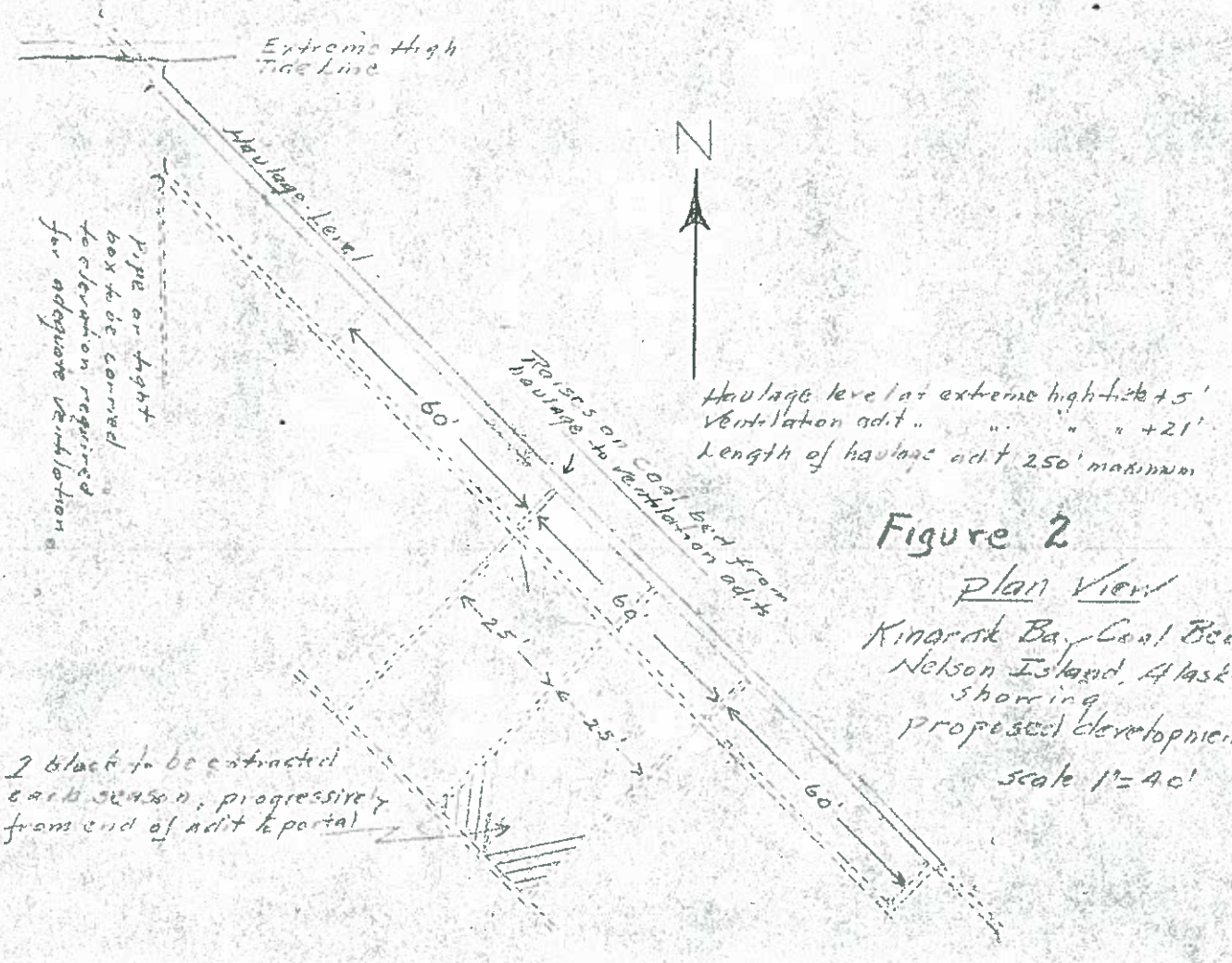
Ventilation can be provided with the least capital expenditure by carying a paralled adit, also driven on the coal bed, located above the haulage adit and separated from it by a 25 foot pillar. The ventilation adit may be carried about 60- feet behind the haulage adit. The two adits should be connected at 60-foot centers by small raises fitted with chutes, also driven on the coal bed. The portal of the ventilation adit should be closed and tapped by a pipe or tight box which is then to be carried up the hillside a vertical distance sufficient to provide adequate ventilation.

The ventilation adit need not be equipped with trackage as the development coal and waste can be delivered to the haulage adit through the connecting raises. The forward raise must be kept open to provide ventilation; other raises must be closed. Each adit will yield about 0.6 tons of coal a foot of advance.

After advancing the adits to the 250-foot limit or to a shorter economic limit, a raise on the coal bed is to be driven from the haulage level to the upper limit of the coal bed. The dip distance from the back of the haulage adit to the flat beds truncating the coal formation is estimated to be 100 feet, or 70 feet above the ventilation adit. (See Figure 2).

Similar raises are successively to be carried up to the top of the coal from the ventilation adit as extensions of the previously driven ventilation raises outline blocks 25 feet wide. Each of the raises should be 5 feet in width and divided by a line of stulls and planking into a manway and chute. An air-connection then is driven between the raises at the top of the coal bed. The first raise is bratticed at the haulage level so as to direct the air up the last raise, through the connection, down the preceding raise and out the ventilation adit. The enclosed block of coal is mined by underhand open stoping to the haulage level. Coal is delivered through the 2 raises, and ventilation is maintained during the mining operation by keeping the first chute filled with coal between the haulage and ventilation adits, and the manway of this raise bratticed at the haulage level. The extraction of each block is





Haulage level at extreme high tide +5'
Ventilation adit " " " +21'
Length of haulage adit 250' maximum

Figure 2

Plan View

Kinarut Bay Coal Bed
Nelson Island, Alaska
showing
proposed development

Scale 1"=40'

completed by robbing the pillar between the adits, from the haulage level. One block should be completely extracted during a mining season.

ESTIMATED COSTS

The following estimated cost of mining, sizing and transporting the coal from the 2 beds at Coal Point are based upon the supposition that a bulldozer will be obtained at a token price by the Bureau of Indian Affairs from the Army's surplus stocks in Alaska, and upon Native labor at the current rate of 50 cents an hour:

For each foot of strike length, equalling 3.3 tons of coal:

Mechanical stripping,	$1.00cu/yd. x 25	=	$25.00
Hand cleaning	3.00 cu/yd.x 3	=	9.00
			$34.00

Stripping, $\frac{\$34.00}{3.3}$ = $10.30 a ton

Coal extraction	2.50	" "
Screening	1.50	" "
Sacking,plus sacks	4.00	" "
Transportation	2.00	" "
Total	$20.30 a ton	

The time required to extract that portion of the Kinarak Bay coal bed easily amenable to surface mining will undoubtedly prove to be excessive, because inexperienced Native labor will be used. The cost may reach $15 a ton for screened and sacked coal delivered at Tununak.

It is reasonable to assume that the underground operation will more closely approach normal mining costs. A strike interval of 85 feet will intervene between the portal of the haulage adit and that point along the strike at which the coal bed reaches its maximum dip length of 111 feet. In estimating production costs, the full dip

length has been used.

Costs are estimated as follows:

Total cost of driving haulage and ventilation adits with connecting raises at $50 a foot, prorated against 11 tons of coal	$ 4.55 a ton
Mining	4.00 " "
Screening	1.50 " "
Sacking plus sacks	4.00 " "
Transportation, 4 miles to Tununak . .	1.50 " "
Total	$15.55 a ton

Required Equipment

In order to strip the Coal Point coal beds, a bulldozer will be required. This preferably should be equipped with an angle blade, and any machine corresponding in size to the D-4 or larger could be used. In addition the usual assortment of small tools will be needed.

Development and mining at Kinarak Bay will require a hand mining outfit, about 300 feet of 8 to 12 pound trackage, one small mine car of either end or side-dump construction, and explosives.

If a bulldozer is secured, it must be, in effect, a transfer from the army to the Bureau of Indian Affairs station at Tununak.

A list of required hand mining supplies, small tools and explosives has been supplied the Government teacher at Tununak.

CONCLUSION

An examination of the known coal occurrences in the vicinity of Tununak, Nelson Island, has indicated that 2 of these deposits may be utilized in relieving the acute fuel shortage existing there. Either of these deposits might yield enough coal annually to supply the needs of the community. Because of the proven tendency of thin Eocene coal

beds to occur in rather small, discontinuous lenses, both deposits should be tested through development and mining. If one is exhausted, a third occurrence should be sought and developed.

The Kinarak Bay coal bed is believed to offer the better potentiality as a continued source of coal and at lower cost. The physical condition of this coal is not expected to equal that of Coal Point, in that it will contain a greater percentage of fines.

It is not recommended that the Bureau of Mines explore the coal deposits on Nelson Island at this time. It can, however, be of assistance to the 400 Natives on the island, by advising them concerning mining and development procedures.

SUPPLEMENT TO

INITIAL WAR MINERALS REPORT

UNITED STATES DEPARTMENT OF THE INTERIOR – BUREAU OF MINES

W.M.R.____ Coal January 1945

COAL DEPOSITS
Nelson Island
Western Alaska

January 12, 1945

The Proximate and Ultimate Analysis of the four samples cut during the examination have just been received. They should be attached to the original report.

6-139
(September 1943)

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JAN 11 1945

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

G—COAL-ANALYSIS REPORT

Sample No. N.I. #1 Lab. No. C-29496

Sample of Medium Volatile Bituminous Coal (74.-151)-CF. Can No. 270

Operator _____ Mine _____

State Alaska County _____ Bed _____

Town Nelson Island . 30-inch coal bed outcropping at Kinarak Bay.

Submitted to B. of M. Anchorage, Alaska, by B. S. Webber, Mining Engineer, Nelson Island, Alaska, October 13, 1944.

Method of sampling _____ Gross weight, lbs. _____ Net weight, grams 1196.0

Date of sampling _____ Date of Lab. sampling 11/13/44 Date of analysis _____

of M. or U. S. G. S. section B. of M. Collector B. S. Webber

	Air-dry Loss .4	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	2.0	2.3		
	Volatile matter	19.2	19.1	19.5	28.9
	Fixed carbon	47.1	47.1	48.2	71.1
	Ash	31.7	31.5	32.3	
		100.0	100.0	100.0	100.0
Ultimate Analy	Hydrogen	3.6	3.6	3.4	5.1
	Carbon	57.2	57.0	58.4	86.2
	Nitrogen	.9	.9	.9	1.4
	Oxygen	6.0	6.5	4.4	6.5
	Sulphur	.6	.5	.6	.8
	Ash	31.7	31.5	32.3	
		100.0	100.0	100.0	100.0
British thermal units		9950	9910	10150	15000

Fusibility of Ash, °F.	
Initial deformation temperature	2330
Softening temperature	2520
Fluid temperature	2710

Date December 1, 1944 (Signed) H. M. Cooper
Chemist.

DK

U. S. GOVERNMENT PRINTING OFFICE 16—35204-1

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6-139
(September 1943)

JAN 11 1945

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

G—COAL-ANALYSIS REPORT

Sample ~~Test~~ No. N.I. #2 Lab. No. C-29497

Sample of Medium Volatile Bituminous Coal (70.-148)-CG. Can No. 941

Operator _____ Mine _____

State Alaska County _____ Bed _____

~~Town~~ Nelson Island. 8-inch coal seam outcropping between Cape Vancouver and Coal Point. This bed was not considered in the Nelson Island report

~~Location~~ Submitted to B. of M. Anchorage, Alaska, by B. S. Webber, Mining Engineer, Nelson Island, Alaska, October 13, 1944.

Method of sampling _____ Gross weight, lbs. _____ Net weight, grams 893.0

Date of sampling _____ Date of Lab. sampling 11/13/44 Date of analysis _____

of M. or U. S. G. S. section B. of M. Collector B. S. Webber

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss	.3				
Proximate Analysis	Moisture	1.3	1.6		
	Volatile matter	24.4	24.3	24.7	31.5
	Fixed carbon	52.8	52.6	53.5	68.5
	Ash	21.5	21.5	21.8	
		100.0	100.0	100.0	100.0
Ultimate Anal	Hydrogen	4.0	4.0	3.9	5.0
	Carbon	65.7	65.5	66.6	85.2
	Nitrogen	1.2	1.2	1.2	1.6
	Oxygen	7.1	7.3	6.0	7.6
	Sulphur	.5	.5	.5	.6
	Ash	21.5	21.5	21.8	
		100.0	100.0	100.0	100.0
British thermal units		11360	11330	11510	14720

Fusibility of Ash, °F.		
	Initial deformation temperature	2150
	Softening temperature	2210
	Fluid temperature	2330

Date December 1, 1944 (Signed) H. M. Cooper
DK Chemist.

U. S. GOVERNMENT PRINTING OFFICE 10—35204-1

6-139
(September 1943)

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JAN 11 1945

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

G—COAL-ANALYSIS REPORT

Sample ~~Test~~ No. N.I. #3 Lab. No. C-29498

Sample of Medium Volatile Bituminous Coal (71.-143)-AF. Can No. 3649

Operator _____ Mine _____

State Alaska County _____ Bed _____

~~Town~~ Nelson Island. 13-inch sample, upper coal bed. Coal Point

~~Location of mine~~ Submitted to B. of M. Anchorage, Alaska, by B. S. Webber, Mining Engineer, Nelson Island, Alaska, October 13, 1944.

Method of sampling _____ Gross weight, lbs. _____ Net weight, grams 1220.5

Date of sampling _____ Date of Lab. sampling 11/13/44 Date of analysis _____

of M. or U. S. G. S. section B. of M. Collector B. S. Webber

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
	Air-dry Loss 1.5				
Proximate Analysis	Moisture	2.4	3.9		
	Volatile matter	24.2	23.8	24.7	30.5
	Fixed carbon	54.9	54.1	56.3	69.5
	Ash	18.5	18.2	19.0	
		100.0	100.0	100.0	100.0
Ultimate Anal.	Hydrogen	4.2	4.3	4.0	5.0
	Carbon	67.1	66.1	68.8	84.9
	Nitrogen	1.2	1.2	1.2	1.5
	Oxygen	8.5	9.8	6.5	8.0
	Sulphur	.5	.4	.5	.6
	Ash	18.5	18.2	19.0	
		100.0	100.0	100.0	100.0
British thermal units		11610	11440	11900	14680

Fusibility of Ash, °F.	
Initial deformation temperature	2620
Softening temperature	2710
Fluid temperature	2910

Date December 1, 1944 (Signed) H. M. Cooper
Chemist.

DK

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(September 1943)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Sample
~~Test~~ No. N.I. #4

G—COAL-ANALYSIS REPORT

Lab. No. C-29499

Sample of Medium Volatile Bituminous Coal (71.-142)-AF. Can No. 9228

Operator _____ Mine _____

State Alaska County _____ Bed _____

~~Town~~ Nelson Island, 9-inch sample, lower coal bed at Coal Point

~~Location in mine~~ Submitted to B. of M. Anchorage, Alaska, by B. S. Webber, Mining Engineer, Nelson Island, Alaska, October 13, 1944.

Method of sampling _____ Gross weight, lbs. _____ Net weight, grams 1147.5

Date of sampling _____ Date of Lab. sampling 11/13/44 Date of analysis _____

of M. or U. S. G. S. section B. of M. Collector B. S. Webber

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
	Air-dry Loss 1.4				
Proximate Analysis	Moisture	2.5	3.9		
	Volatile matter	24.0	23.7	24.7	30.4
	Fixed carbon	55.1	54.2	56.4	69.6
	Ash	18.4	18.2	18.9	
		100.0	100.0	100.0	100.0
Ultimate Anal	Hydrogen	4.2	4.3	4.0	4.9
	Carbon	67.1	66.2	68.8	84.8
	Nitrogen	1.2	1.2	1.2	1.5
	Oxygen	8.7	9.7	6.7	8.3
	Sulphur	.4	.4	.4	.5
	Ash	18.4	18.2	18.9	
		100.0	100.0	100.0	100.0
British thermal units		11570	11410	11870	14640

Fusibility of Ash, °F.		
	Initial deformation temperature	2490
	Softening temperature	2570
	Fluid temperature	2770

Date December 1, 1944 (Signed) H. M. Cooper
Chemist.

DK

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