

S E C R E T

.....
: SECRET SECRET:
:Auth: CG Ft.Randall Als
:/s/_____ 25 Oct 1942:
.....

WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY

Engineering Report
on
COAL SEAMS IN HERENDEEN BAY AREA
and
PROPOSED ROAD FROM HERENDEEN BAY TO BALBOA BAY
at
Herenden Bay, Alaska

This report was prepared under the direction of Mr. N. Lester Troast, Project Engineer at Cold Bay, Alaska by 2nd Lt. Richard H. Yost, H & S Co., 151st Engineer Regt.

151st Engineer Headquarters
Cold Bay, Alaska
September 5, 1942

S E C R E T
-1-

S E C R E T

INDEX

SECTION	SUBJECT	PAGE
	Orders for Report	2.
	Syllabus	3.
I	Subject	4.
II	Authority	4.
III	Previous Investigation	4.
IV	Scope of Report	4.
V	Chronicle of Investigation	5.
VI	The Investigation	6.
	1. Location	6.
	2. Information on old mine	7.
	3. Meteorology	8.
	4. Hydrography	9.
	5. Traverse	9.
	6. Harbor Facilities	9.
	7. Building Area	10.
	8. Vegetation	10.
	9. Utilities	10.
	10. Geology	11.
	11. Coal Outcroppings	11.
	12. Property Ownership	12.
	13. Recommendations and Findings	13.

S E C R E T

HEADQUARTERS
UNITED STATES ARMY TROOPS

9 August 1942

SUBJECT: Orders.

TO : Commanding Officer, 151st Engineers (C), Fort Randall, Alaska.

1. The following named officer and EM will proceed by boat from this station to Port Moller, Alaska, on a reconnaissance mission to secure full information on the coal seam thereat, and further information as to plans for roads and loading docks to both Herendeen Bay and Balboa Bay:

2nd Lt Richard H. Yost 0465079 H & S Co., 151st Engr.
Pvt. Willard E. Gates 39825862 H & S Co., 151st Engr.

2. It is estimated that this reconnaissance will take from 8 to 14 days.

3. Travel will be accomplished on the boat "Martha".

By command of Brigadier General JONES:

CARL G. NOTTROT
Captain, Infantry
Adjutant

S E C R E T

S E C R E T

SYLLABUS

1. Subject Considered: This report covers the investigation and survey of an abandoned coal mine and a strategic road from the Bering Sea to the Pacific Ocean for use by bases along the Alaska Peninsula, bases in the Aleutian Islands, bases on Kodiak Island, and bases in the Nome area.

2. Finding and Recommendations. It is found that:

a. In the Herendeen Bay section several coal outcroppings are located. An attempt had been made in 1903 - 06 to mine the coal. The mine is now abandoned and is caved in and drifted shut. Mine has the appearance of a "Wildcat" mining proposition.

b. The physical conditions are suitable for operation of the mine and for construction of operations buildings.

c. There is available a sufficient supply of water, suitable rock and gravel for roads.

d. Though the weather has a tendency to change quickly, temperatures are moderate and work may be prosecuted the year around.

e. A portage exists between Herendeen Bay and Balboa Bay favorable for road construction.

f. A suitable moorage exists in Mine Harbor of Herendeen Bay and one is reported in Balboa Bay.

g. There are 12 inhabitants, some local improvements, no utilities or facilities available and that all machinery, etc., must be transported to the site by water borne carriers.

h. The estimated cost is \$_____.

3. It is Recommended that:

a. The site investigated at Herendeen Bay be favorably considered for installation of mining equipment, harbor facilities, and a road across the portage from Herendeen Bay to Balboa Bay.

b. The site be inspected by a geological survey party to determine the true extent of the coal deposit.

c. The project be expedited with the greatest possible dispatch and that the work be prosecuted continuously until completed.

d. The order of procedure should be:

S E C R E T

S E C R E T

(1) The geological survey party complete their investigation of the coal deposits.

(2) If their investigation is favorable the procedure would be to coordinate the assembly of personnel, material, and equipment so that construction of harbor facilities, mining facilities, roads, buildings and utilities may proceed concurrently.

(3) To procure materials, equipment and labor so that their arrival will be coordinated with construction.

I. SUBJECT:

1. Subject Considered:

This report covers the investigation and survey of an abandoned coal mine and a strategic road from the Bering Sea to the Pacific Ocean for use by bases along the Alaska Peninsula, bases in the Aleutian Islands, Bases on Kodiak Island, the bases in the Nome area.

II. AUTHORITY.

1. The Authority for This Investigation is as Follows:

a. General

(1) By command of Brigadier General Lloyd E. Jones.

b. Specific

(1) It was requested by Col. Edwin W. Jones, Commanding Officer, 151st Engr. Regt. that a survey and investigation of coal seams, and abandoned coal mine on a peninsula between Herendeen Bay and Port Moller and investigation of a road between Herendeen Bay and Balboa Bay.

III. PREVIOUS INVESTIGATION.

No previous investigations are known to have been made at the time of the writing by military personnel. However, there were undoubtedly mining claims made and filed at either Unga, Dutch Harbor, or Kodiak. Engineers were reported in this area and large scale maps were produced. The exploitation of the coal seam would seem to indicate the above assumptions.

IV. SCOPE OF THIS REPORT.

1. This Report Covers:

a. Information on the location and vicinity of Herendeen Bay, Alaska.

S E C R E T

S E C R E T

- b. Information on old mine.
- c. Present condition of mine.
- d. Meteorological observations collected from local inhabitants.
- e. Hydrography of the vicinity.
- f. Survey data including four sketches of the region, Sheets 1, 2, 3, & 4.
- g. Harborage and moorage facilities with suggestions for installation of the same.
- h. Building areas, their topography and accessibility.
- i. Utilities.
- j. Status of Land ownership.
- k. Recommendations and findings.

2. Findings. The findings of this report are:

- a. That several coal outcroppings occur on the peninsula between Herendeen Bay and Port Moller.
- b. An attempt was made in 1903 - 1906 to mine coal from three of these outcroppings. The attempt failed, apparently from poor transportation facilities to and from the mine to the coast.
- c. A portage exists from Herendeen Bay to Balboa Bay and it is favorable for road construction.
- d. The weather is such that operations can be carried out the year around.
- e. There is a plentiful supply of water, some of which can be used for water power. Also, rock and gravel fit for road construction can be obtained in the vicinity.
- f. Most of the land in question is public domain.
- g. That a transway will have to be constructed from the mine to the dumping area. (Sheet 2)

V. CHRONICLE OF THE INVESTIGATION.

- 1. Under the authority cited in Section II a survey party of two men left Fort Randall, Cold Bay, Alaska, August 10, 1942 and embarked on the chartered U.S.E.D. boat, Martha, and traveled to Herendeen Bay, Alaska.

S E C R E T

S E C R E T

2. The party disembarked at Herendeen Bay with all equipment at 7:00 A.M., August 13.

3. Field trips were made to find the tunnels of the mine and to locate any outcroppings of coal seams. One tunnel was definitely located. Five separated outcroppings were found.

4. Soundings were made for a dock in Herendeen Bay from which the proposed dock site was determined.

5. Trips were made over the proposed roads to determine the type of work necessary for their construction.

6. Samples of the coal seams and samples of gravel were taken at various locations.

7. Two control points were established by use of a hand level. All control was determined and established by use of hand level, steel tape, and by pacing.

8. Observations were made of the soils, drainage, water supply, harbor, and vegetation in the area.

9. During the progress of the survey, Project Engineer N. Lester Troast and a party of four men arrived at the site to inspect work being done and several aerial photographs were taken.

10. On August 21, the investigation was completed and the party boarded the U.S.E.D. boat, Martha, and returned to Fort Randall, Cold Bay, Alaska on August 27.

VI. THE INVESTIGATION

1. Location: Mine Harbor in Herendeen Bay is located on the Alaska Peninsula about 75 miles northeast of the Army Post, Fort Randall at Cold Bay, Alaska at latitude $55^{\circ} 45'$ north and longitude $160^{\circ} 45'$ west. It is approximately 16 miles southeast of Port Moller, a small cannery village.

The reconnaissance in this region has established this region as suitable for coal mining operations. Previous operations have shown the coal fit for use. The numerous outcroppings seem to make the region appear as to have a sufficient amount of coal suitable for supply to Peninsula and Aleutian bases. By supplying coal to these bases by barges and employing some of the tugs available in this region for towing them, much needed shipping space could be saved and used for supplying more food, ammunition, and equipment.

By building the proposed road from Herendeen Bay (Bering Sea) to Balboa Bay (Pacific Ocean) the coal could be shipped up and down to Pacific Coast bases the year around. Ships would also save some 750 miles per trip through submarine infested waters in the Unimak Pass area when enroute to Port Heiden or Naknek. Materials could be unloaded at the proposed dock in Balboa Bay, loaded onto trucks and hauled across the portage and loaded on barges. These barges could be towed to the designated base.

SECRET

The site of the mine is a very broken country. It is approximately 4.5 miles from the dock to Mine Harbor. Mine creek valley is flat for about 1.75 miles where it narrows up to a small canyon. The mine is on a branch of Mine Creek. The mine is about 1800 feet above sea level (estimate).

Herendeen Bay is a large bay extending from the Bering Sea to within nine miles of the Pacific Ocean. The Johnston Channel in the Bay is narrow and is not marked or buoyed. The minimum depth in the channel is 7 fathoms. Entrance into the Bay is accomplished by following thru the Hague Channel from the Bering Sea. The minimum depth in the Channel is 3-1/2 fathoms with deeper water available in that region up to 5 fathoms. Once within the bay it has the appearance of a wide fjord. Mine Harbor has two small reefs that are covered at high tide and could easily be marked. The harbor is deep and about 1.5 miles across from Tow Point to Crew Point.

Portage Valley lies between mountains. It rises gradually to the divide and then drops gradually into a valley traveling from either direction.

Balboa Bay appears to be a large mountain lake. Entrance to Balboa Bay may be gained by coming in from the Pacific via Unga Strait. The arm of the bay in which the proposed dock is located is shallow according to U.S.C. & G. S. Chart 8700. Deeper water can be obtained a mile further south of the site selected.

Both the building area in Herendeen Bay and the area in Balboa Bay are well drained. They are covered by gravel or a light top-soil. All sites are easily accessible from the dock sites.

2. Information on Old Mine: All information on previous operations were obtained from Mr. & Mrs. Chas. Frans of Nelson Lagoon, Mr. & Mrs. Charles H. Myers of Herendeen Bay, and Mr. Albert Olson of False Pass.

a. Location: The old mine is located about 2.5 - 4.5 miles inclusive up Mine Creek from the beach. It is at the bottom of a sandy, rocky ravine just above a creek bed. It is in rough and broken country. The surrounding terrain is of volcanic origin. The earth is faulted in this area. The faults are a result of frequent earthquakes.

b. Time of Operations: The mine was opened by a Mr. Foster in 1903. He continued operations until 1905 or '06. He became involved in a lawsuit at that time and ceased operations. A Mr. Cunningham became owner and operator of the mine succeeding Mr. Foster. Cunningham took out some coal but not as extensively as Foster. Coal was taken out for use in the nearby canneries up to about 1916. Cunningham also found a small vein about 400 yards from the Michelson home and took coal out of it for use in his home and store which is now the Michelson home. A Mr. McMillan had a hand in the operation but his connections are not quite clear.

c. Type of Mine: Three tunnels are said to have been opened for operations. They were the upper tunnel, lower tunnel, and China Ridge tunnel. Of the three, the upper tunnel was the only one that was definitely located.

SECRET

S E C R E T

The upper tunnel appeared to be about 4.5 feet wide and 6-6.5 feet high and is located in the hillside. (See Fig. No. 7). It follows up the main coal vein in the area which is about 5 feet across. (See Fig. No. 8). The tunnel enters the cliff at a bearing of 107° from true north. The length of the tunnel could not be learned. However its walls were of hard solid coal and the mine was dry. According to Mrs. Frans it could have been 500 feet or longer.

The lower tunnel is said to have been in a smaller vein but of a better grade of coal. Coal from this tunnel was used for samples. It was the first one opened. Nothing much is known of the China Ridge tunnel but it is thought to be the one located about 400 yards from the house.

d. Operations: The pick and shovel method seemed to be that used. Operations were on a small scale. Coal was taken out of the mine in small mine cars. The cars were drawn up and down the hills by horses along the side of the mountain on a rather treacherous path. Rails were laid along the path. Coal was carried by pack horse across the portage to Balboa Bay. The only known load of coal was taken by a schooner Lettie to Dutch Harbor. However, numerous samples were sent out and also other small loads of coal. Poor transportation facilities, both on land and on sea helped to make the venture fail.

e. Equipment: A steam drill was brought in to make test holes in the flats about lower Mine Creek. It is said that numerous test holes were drilled in an effort to find coal in a place where mining operations could be carried out with less effort and also to get away from the transportation difficulties met with in bringing coal down from the upper tunnel. No success was attained in this project. The drill now stands in the creek in a dilapidated and rusted condition.

Two pairs of wheels for the mine cars were found near the upper tunnel. They were 30" gage rail wheels. The remains of a blacksmith shop, namely a forge and rotted foundation, was found near the upper tunnel. (See Fig. No. 9). A cook shack was also in this area. The remains of a stove and a few utensils were found.

f. Present Conditions: Figures No. 7 and 9 show the general condition. All tunnels are drifted shut and have caved in. A small trickle of water is coming out at the bottom of the upper tunnel. All buildings have rotted away. All roads are grown over with alders, some of which are 3-4 inches in diameter. To open the mine, a new beginning will have to be made.

The original tunnel was cribbed with 4"x4" at about 5 foot intervals. The ground is loose and requires cribbing. During operations no known cave-in occurred.

3. Meteorology: The usual Alaska Peninsula weather conditions prevail here. Namely that it is usually cloudy and light rains are frequent. The average temperature from November 1 to March 31 is normally about 20 degrees F., and from April 1 to October 31 the average temperature is about 50 degrees F. The usual low is about 5 degrees F. The lowest

S E C R E T

temperature in the last fifteen years was -20 degrees F.

Ice conditions in Herendeen Bay vary from year to year in direct relation to the temperature. The Bay has not frozen over in the last two years. In a normal season the Bay freezes up about December 1 and is open again about March 1. In the most severe winters it is closed from about November 15 to about April 1. During a mild winter boats can enter the Bay during warm periods. Conditions in and about Mine Harbor could be obtained by contacting Mrs. Charles A. Myers, who operates an emergency transmitter at her home in the Bay. The official designation of her transmitter is as follows:

Emergency Transmitter
Mrs. Charles A. Myers
Frequency - 3612 k.c.
Approximate Range - 75 miles
6 volt battery operation

4. Hydrography: The region about the mine and the portage has six main streams. They are Mine, Swamp, Grass, Lawrence, Portage and Johnson Creek. All streams have springs as sources and flow varies with accordance to the amount of rainfall. All streams have rock bottom at the higher elevations and gravel bottom in the lower flat valleys. They flow the year around.

5. Traverse: Beginning at the southeast corner of the Michelson home a traverse was run around Mine Harbor to the extreme end of the cliff on Crow Point. This traverse was run by Lt. Yost and PFC Gates on August 16, 1942 to determine the length of the base line from the Crow Point Cliff to the Michelson home for triangulations.

6. Harbor Facilities: a. Herendeen Bay: This dock is located in Mine Harbor. (Sketches 1 and 4). It is on approximately the identical spot where the Phoenix Packing Company had their dock when they operated a cannery in Mine Harbor. This site was chosen after soundings had been made in all logical locations for the dock. This is the best site obtainable in respect to selecting a site where the shortest dock could be built and still have 30 feet of water at end of dock at low tide.

The bank on which a net shed is located is 10 - 15 feet above high tide level. It is proposed that the dock be located directly in front of this shed. On a line along the west side of the shed measuring from the southwest corner of the shed, it is 265 feet to 20 feet of water at low tide and 285 feet to 30 feet of water. The sea bottom slopes down gradually to the 20 foot depth but drops rapidly from here to 20 and 40 feet of water.

There is approximately a 14 - 16 foot tide in this area of the Bay. The Bay has a gravel bottom in the dock area. A level area about 50 - 100 foot exists behind the net shed. This would serve well as an approach to the dock. Buildings can also be constructed in this area. This level area slopes down toward the large level area adjacent to Mine Creek where housing and operations facilities could be maintained. A road from the dock to the dumping area (X on Sketches) can be easily

S E C R E T

S E C R E T

Constructed. Gravel for the roads can be obtained along the beaches. (Gravel Sample No. 1).

b. Balboa Bay: No soundings were made here because no boat was available. According to Mr. Charles Franz deep water can be had within 500 feet of end of trail. The proposed dock is located at a point recommended by Mr. Franz, who has been in both Herendeen and Balboa Bays at times previous to the time of the survey. There is a large level valley in the area adjacent to the dock and proposed road that is suitable for warehouse and hopper or dump construction. Good gravel for road construction is available on the beach or from creek bed. (Gravel Sample No.2).

7. Building Area: The most feasible building site in Herendeen Bay is east of the proposed dock. It is in a flat valley and covers an area of about 2 square miles. The best building area in Balboa Bay is to the west of the proposed dock. There is a flat valley in this area of about 6 square mile. The dumping site on Mine Creek is in a valley which is about 50 yards wide. Some areas in this valley are swampy and will require a cover of gravel and some type of drainage into the creek.

8. Vegetation: There is no timber of commercial importance in the area. Alders up to about 4 inches in diameter are clustered over the area. The ground in the valleys and on small hills is covered by clusters of alders, ferns, reindeer moss and grass. The grass and ferns are head high in the valleys and on some of the lower slopes. On the beaches, above wave action, the beaches are generally sand and gravel. The creek beds in the flats are of sand and gravel while those beds at higher elevations are of various sized rocks.

9. Utilities: a. Roads: The topsoil in this area varies. That in the flat valleys away from creek beds and on small hills is very light and becomes very sticky and soft when wet. In this type of soil it will be necessary to strip off about a foot for a suitable subgrade. Along creek beds gravel is on the surface and only grading will be necessary to level it off. In other areas swampy land is encountered and fills will have to be made over these areas and they will need to be filled over after some use because the fills will sink in. In this climate the roads will be wet a large percentage of the time and will not even hold light traffic without suitable surfacing. Plenty of gravel for surfacing can be found throughout the entire area along the beaches, along creek beds or under the surface. In some areas rock will be met. The longest of these is 4000 feet and the rock is of a crumbling nature and can be moved by D-8 caterpillar bulldozers.

b. Water Supply: Sources of water supply are discussed under Hydrography, paragraph 4. At the time of the survey weather conditions were normal and streams were at their normal summer levels. Water can be taken directly from the streams and is plentiful.

c. Water Power: There appears to be a possibility that power for use at the site may be developed from the creeks. The Bering Sea Packing Company Cannery at the base of Pinnacle Peak has two 20 inch Felton type waterwheels used to generate power for the cannery. One is directly con-

S E C R E T

S E C R E T

ected to the drive shaft for the cannery machinery and the other is connected to a 12 kw D. C. generator. This generator is said to be in working condition and was last operated about one year ago. By building a small wooden or earth dam in the mountains, running water could be obtained in the housing and operations area.

d. Sewerage: Sewerage may be discharged, untreated, into the sea or pit latrines may easily be dug.

e. Drainage: The porous nature of the soil is believed to make the drainage problem relatively simple and economical. The topography is such that drainage lines and ditches are well established. Only seven small lakes of less than 75 feet square were observed in the region and would not interfere with operations.

10. Geology: The flat lands are of glacial origin, apparently residual gravel. This gravel is covered by a layer of silt and ash of various depths. Some of the mountains appear to have been pushed up out of the sea by some great upheaval because of the tops are of the same gravel as found on the sea shore. Other mountains are of volcanic origin. Mt. Pavlof is 45 miles west and is a slightly active volcano while Veniaminof Crater is 50 miles to the east.

11. Coal Outcroppings: Six separate outcroppings were found in the area. Samples were taken from each of the outcroppings. Outcroppings are reported at several other places on the peninsula between Herendeen Bay and Port Moller.

KEY TO SAMPLES (See Sketch 2 for relative locations)

Sample No. 1.

From small outcropping almost at creek level. Vein is about 3-1/2 feet across. It dips into the earth at a horizontal position and strikes in a southerly direction. It has shale above and below it.

Sample No. 2.

From the outcropping above the mine. This outcropping is about 35 feet across (See Fig. No. 4). There are several veins in this seam. None of the veins are thicker than 3 feet. They are separated by layers of rock ranging from a few inches to 2 feet. Dips into earth at 70° and strikes in northeasterly direction.

Sample No. 3.

Outcropping in vicinity of lower tunnel. It is an 18 foot seam. No vein is thicker than 2 feet. The coal veins are separated by layers of rock from 1/4 inch to 2 feet. Dips into earth at about 60° and strikes in a northeasterly direction.

Sample No. 4.

Taken in mine area from the vein being mined. Vein is about 4-1/2 -

S E C R E T

5 feet thick. It dips into earth at 45° and strikes in northeasterly direction. It extends for about 500 yards up the valley before it goes underground. (See Fig. No. 8).

Sample No. 6.

Taken all the way across the mine seam. Seam extends for 80 feet across face of the cliff. The seam dips into the earth at about 45° and strikes in a northeasterly direction. The main vein is separated from other veins by about 4 feet of soapstone. Other veins range from 6 inches to 3 feet and are separated by layers of sandstone of similar size.

Sample No. 7.

Taken from outcropping on cliff of stream below the one the mine is on. Coal seam here is 35 feet across. The main veins are about 2.5 feet thick. The best seam is near the center where about 6 foot of coal is broken by two layers of rock, one about 2 inches thick and the other about 10 inches thick. The seam dips into the earth at about 20° and strikes in an easterly direction.

Sample No. 8.

Taken further down stream in the lower tunnel area. It is evidently the same seam as Sample No. 3 having same structure and dip.

Sample No. 9.

Taken between Samples 8 - 3. Part of same seam as Samples Nos. 3 & 8.

12. Property Ownership: There are no property lines in evidence in the mine area. However along the beach various canneries are reported to have rights to the property. The dock site in Herendeen Bay is on the site now occupied by a cannery operated by the Phoenix Packing Company.

There is a certain trapper Scott that has a cabin in Lawrence Valley about 200 yards from the Lawrence Creek and about 100 yards from the beach.

Harry Michelson lives in a house owned by Otto Skog (spelling questionable) on the property.

The Bering Sea Packing Company has a cannery on the beach below Pinnacle Rock. Mr. Charles A. Myers has a home on this property and is the watchman for the cannery.

The Fidelogo Packing Company has a cannery near Portage Valley. Scott has a cabin on this property. He is the watchman for this cannery. Scott also has a trapping shack in Portage Valley.

Burns' cabin is on the shores of Balboa Bay but is more than a mile from proposed dock site.

S E C R E T
-12-

SECRET

13. Findings and Recommendations: It is found that: a. In the Herendeen Bay section several coal outcroppings are located. An attempt had been made in 1903 - '06 to mine the coal. The mine is now abandoned and is caved in and drifted shut.

b. The physical conditions are suitable for operation of the mine and for construction of operations buildings.

c. There is available a sufficient supply of water, suitable rock and gravel for roads.

d. Though the weather has a tendency to change quickly, temperatures are moderate and work may be prosecuted the year around.

e. A portage exists between Herendeen Bay and Balboa Bay and favorable for road construction.

f. A suitable moorage exists in Mine Harbor of Herendeen Bay and one is reported in Balboa Bay.

g. There are 12 inhabitants, some local improvements, no utilities or facilities available and that all machinery, etc., must be transported to the site by water borne carriers.

h. The estimated cost is \$_____.

It is recommended that: a. The site investigated at Herendeen Bay be favorably considered for installation of mining equipment, harbor facilities, and a road across the portage from Herendeen Bay to Balaboa Bay.

b. The site be inspected by a geological survey party to determine the true extent of the coal deposit.

c. The project be expedited with the greatest possible dispatch and that the work be prosecuted continuously until completed.

d. The order of procedure should be:

(1) The geological survey party complete their investigation of the coal deposits.

(2) If their investigation is favorable the procedure would be to coordinate the assembly of personnel, material, and equipment so that construction of harbor facilities, mining facilities, roads, buildings and utilities may proceed concurrently.

(3) To procure materials, equipment and labor so that their arrival will be coordinated with the construction.

SECRET