

ADDRESS REPLY TO
THE DISTRICT ENGINEER
U. S. ENGINEER OFFICE
700 CENTRAL BUILDING
SEATTLE, WASH.

REFER TO FILE NO. SE 7559 (Trans-
Canadian Alaska Ry.) 79

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE
SEATTLE, WASHINGTON

4Y

May 15, 1942.

May 15, 1942.

Subject: Aerial Reconnaissance of Trans-Canadian Alaska Rail Route.

To: The District Engineer, U.S. Engineer Office, Seattle, Washington.

1. In compliance with oral instructions from the District Engineer and travel order No. 7034, Office, Division Engineer, dated April 23, 1942, I report completion of an aerial reconnaissance of the proposed Trans-Canadian Alaska Railway route during a period from May 3rd to May 12th, inclusive.

2. In company with Mr. F. A. Hansen, engineer assigned in charge of the location surveys in the Yukon Division, I left Paine Field May 3rd at 12:45 p.m. by chartered plane and followed the route of the Pacific Great Eastern Railway from the vicinity of Harrison Lake to Prince George, arriving at Prince George at 5:40 p.m.

a. The roadbed of the Pacific Great Eastern appears to be in good condition as viewed from the air. It was noted that a considerable amount of tie replacement is underway, and a small amount of riprapping is being done in the vicinity of Quesnel, the present northern terminus of the line. North of Quesnel, the line has been abandoned and is taken over in part for highway. Location follows the left limit of the Fraser River and connects with the Canadian National at the east end of the Fraser River bridge, approximately 1-1/2 miles east of the town of Prince George.

b. Prince George is located at the confluence of the Nechako and Fraser Rivers, and on the right limit of both streams. Upon arrival at Prince George, I looked over the yard lay-out and found that there are now 7 house tracks approximately 1 mile in length and room for expansion of at least 100 percent without excessive grading. The main line of the Canadian National is 60-pound steel on spruce and hemlock ties, and is gravel ballast. Yard tracks are laid with 60 and 70-pound steel. Yard facilities include a 90-foot turntable, 12-stall roundhouse and machine shop. The Canadian National also maintains a casting yard for concrete culvert pipe, utilizing pit run gravel from the

banks of the Nechako River immediately west of the yards. The crossing of the Nechako River does not appear to present any unusual difficulties although some protection of the abutments may be required.

3. I left Prince George at 9:06 a.m., May 4th, and flew the route to Watson Lake, Yukon Territory, arriving at Watson Lake at 2:08 p.m.

a. It appears that little difficulty will be experienced in developing the line north of Prince George to Summit Lake, a distance of approximately 35 miles, following closely the location of the present road to this point. From Summit Lake, the line follows the Crooked River drainage to its confluence with the Parsnip River, and turns down the left limit of the Parsnip River to Finlay Forks and up the Finlay River to Sifton Pass, the highest point reached on the location, i.e., 3,273 feet. The valley floor appears to have an average width of about 4 miles and is remarkably straight, heavily timbered, and all cut banks reveal gravel practically to the surface. Cross drainages are not glacial fed and crossings are not expected to be difficult. Sifton Pass appears from the air to be a gentle summit as the headwaters of both drainages are meandering in their courses in the vicinity of the pass.

b. In general, western and southern facing slopes are preferable from a standpoint of maintenance, but it is believed that in this case a cheaper line can be developed on the opposite slope, particularly on the northern side of Sifton Pass where several deep canyons enter the valley of the Kechika River from the east. Approximately 50 miles of fairly heavy work will be encountered north of Sifton Pass* From this point on to the confluence of the Kechika with the Turnagain, timber thins out considerably and there is evidence of some rock work.

c. Two routes are possible from the mouth of the Kechika to the Lower Post on the Liard. One route would follow the Turnagain River to the Liard, thence up the right limit of the Liard to a crossing in the vicinity of Lower Post. However, I believe that it is entirely practicable to develop a much shorter route directly across country to the Lower Post without resorting to maximum grade.

d. Upon arrival at Watson Lake, I found that the General Construction Company of British Columbia had made great progress in the development of the airfield at that point, having one runway approximately 5,000 feet in length, fine graded, and clearing and grading operations are underway on the second runway. The elevation of the field at Watson Lake is 2,245 feet above sea level. This company has erected a small sawmill, machine shop, substantial office building, bunkhouses, and necessary utilities adjacent to the field. All heavy equipment for this work is freighted in by way of the Stikine River to Telegraph Creek, thence by road to Dease Lake, and down the Dease River to Lower Post. The contractor has constructed a pioneer road from the Lower Post to Watson Lake, a distance of

approximately 24 miles. I spent the evening with Mr. A, Holland, resident engineer for the provincial Government, and Mr. A. F. Airey, contractor's superintendent, from whom I secured valuable information relative to the nature of the materials, transportation problems and character of the streams in that locality. Examination of the map and profile of the pioneer road shown me by Mr. Holland leads me to believe that this route will be quite satisfactory for a rail location.

e. Mr. Holland agreed to furnish transportation for our locating parties to establish camps as required along this road, and I believe it will be possible to make all further camp movements by boat on the Frances River. Mr. Airey agreed to furnish lumber from their local sawmill for the construction of suitable poling boats and gave me the names of certain natives at the Lower Post who are supposedly capable of building the boats and operating them, **f.** The morning of May 5th. Mr. Ganfield and Mr. Krause of the Aero Service Corporation, engaged by Colonel Loper in the Chief's Office, arrived at Watson Lake enroute to Whitehorse. In view of the fact that it was an excellent day for mapping. I prepared a flight plan for Mr. Canfield to cover the route from Lower Post to Finlayson Summit, a scaled distance of approximately 165 miles. He estimated his flying time for this mission at 5 hours. I radioed Major Pettit at Whitehorse advising him that this mission had been assigned, and that upon completion Mr. Canfield would proceed to Whitehorse.

4. We left Watson Lake at 9:10 a.m. and flew the route via the Little Salmon drainage into Selkirk on the Yukon, arriving at 1:4.5 p.m.

a. Frances Valley appears to be rather heavily timbered, and I believe the valley floor is largely gravel. I expect some heavy work in this reach, but do not believe that maximum grade will be required. A ground reconnaissance will have to be made to determine which shore of Frances Lake is preferable. It appears that either side may be used in view of the fact that the apex of this V-shaped lake is little more than a sand bar, and can be readily crossed by trestle.

b. From the northern end of Frances Lake to Finlayson Lake, the route follows a shallow valley and does not appear to offer any location problem, nor does the shore of Finlayson Lake. However, the divide immediately west of Finlayson Lake may require a few miles of fairly heavy rock work into the head of Campbell Creek. I believe that in the upper reaches of Campbell Creek, this stream -drops faster than our gradient will permit, and it may be necessary to generate some line southward to the Big Campbell Creek, thence down the Big Campbell Creek to the Pelly River at the trading post of Pelly Banks.

d. Between the Pelly Banks and the trading post at Ross River, the valley is terraced, and it will be possible to retain some elevation above the valley floor, and from Ross River to the divide between the Magundy and the Pelly, it will probably be

necessary to adopt some adverse grade to make the summit. Owing to bad cross winds in this pass, I was unable to determine its elevation with any degree of accuracy, and decided to proceed on to Selkirk and remain there until weather conditions would permit a return flight over this route and an examination of the lower Pelly Valley for comparison.

d. From the summit down to the east end of Little Salmon Lake, a distance of approximately 30 miles, the line traverses a shallow valley, and from the nature of the vegetation, it is believed that the valley floor is composed of gravel. I believe the Magundy River can be navigated with shallow draft poling boats. The north shore of Little Salmon Lake, approximately 20 miles long, appears to be less precipitous and cross drainages are in well-defined channels. From the west end of Little Salmon Lake, the line follows the right limit of the Little Salmon River for a distance of about 30 miles to its confluence with the Lewes River at the trading post of Little Salmon. Poling boats can be used on the Little Salmon River, but the stream meanders so badly that the river distance is probably three times the actual distance along the axis of the valley.

e. From Little Salmon to Five-Finger Rapids, the line follows the right limit of the Lewes River, and will require about 6 miles of comparatively heavy sidehill benching but the remainder is across timbered bars estimated at 15 to 25 feet above river level. Five-Finger Rapids offers the most desirable crossing obtainable on the Yukon drainage in that at this point the river cuts through a conglomerate rock dike, providing suitable bridge rests, to an elevation that will permit the use of fixed spans. The longest span is estimated to be 160 feet.

f. From Five-Finger Rapids westward the line follows the left limit of the Yukon River, and consists of approximately 20 percent sidehill work, the remainder being across timbered bars where construction will be quite economical.

g. Upon arrival at Selkirk, I met Corporal G.I. Cameron, Royal Canadian Mounted Police, and discussed with him the choice of routes between Selkirk and Ross River. Corporal Cameron was well acquainted with both routes, having traversed them by dog team and he volunteered to accompany me on a return flight, which was made leaving Selkirk at 4:20 p.m., flying, by way of Little Salmon and Magundy, Pelly Summit, and thence back the Pelly River into Selkirk arriving at Selkirk at 7:40 p.m. Atmospheric conditions had improved to such an extent that we were able to fly almost at the tree tops through the pass, registering an elevation of 2,900 feet. The summit is broken and I believe it will be possible to get through this gap at an elevation of approximately 2,650 feet.

h. I do not believe that the Pelly River route is desirable for several reasons, the first and most important being that it deprives us of the favorable crossing of the Yukon at Five-Finger Rapids, and, secondly, that a southern facing slope, which is preferable, will entail 7 major stream crossings and there is

evidence of a considerable amount of soft ground and muskeg swamp in the valley floor.

i. On my second return to Selkirk I got in touch with a Mr. A. C. Coward who is an experienced riverboat man and owns several small riverboats and barges. I made tentative arrangements with him to transport and supply survey parties operating in this vicinity. I also secured from him the names of other riverboat men along the river who are equipped to perform similar services elsewhere along the river route.

j. As the Dominion telegraph line follows the left limit of the Yukon from Five-Finger Rapids to the mouth of the White River I made inquiries as to the possibility of tapping this line with field sets and was advised that there was no objection to so doing but I was asked in return for this favor that we remove any dangerous trees or repair any breaks in the line that we might find.

5. I left Selkirk at 8:35 a.m.. May 6th, flying the route to the mouth of the White River up the White River to the mouth of the Ladue, up the Ladue River Valley to the summit of the divide between the Ladue and the Tanana and thence down the Tanana River to Fairbanks, arriving in Fairbanks at 1:40 p.m., after stopping at Tanacross and Big Delta.

a. From Selkirk to the mouth of the White River there are probably 15 miles of fairly heavy sidehill work and about 80 miles of relatively simple construction on timbered gravel bars. From the mouth of the White River to a point opposite the mouth of the Ladue, a distance of approximately 25 miles. I believe we will encounter our wettest work although a more stable and better roadbed can be established by benching into the northern-slope at considerable added expense.

b. An alternate route to avoid this section along the White River may be possible by leaving the Yukon River at a point approximately 15 miles upstream from the mouth of the White River, following up the drainage of Los Angeles Creek to what appears to be a comparatively low summit, and thence down a westward flowing, unnamed tributary to the White River, entering the White River opposite the mouth of the Ladue River. I was unable to determine the height of this summit and I am not inclined to favor it for the present development in view of the difficulties that would be encountered in securing ready access to such a line with construction equipment.

c. The White River crossing will be difficult but I believe that the site selected by Mr. Hansen and myself is the most satisfactory in the lower reaches of the White River. The stream is controlled on its right limit at this point by rock shoulder and appears to be held against this limit by the inflow of the Ladue River some 2 miles upstream. The main channel seems to be fairly well confined and the low bars on the left limit of the White are heavily timbered with evergreens, indicating a greater degree of stability than is evidenced elsewhere in the White River. The Ladue River is not a glacial fed stream and its valley

will provide an excellent location, I favor the northern facing slope to a point 20 miles west of the International Boundary and from this point on to the summit there appears to be no difference in the slopes and the stream is small enough that it may be crossed with bulkhead openings or short trestle-bent structures.

d. From the head of the Ladue the summit breaks off sharply into the Tanana Valley floor. The elevation of this divide is approximately 600 feet above the valley floor and it will be necessary to take sidehill work for a distance of 10 miles down to the site selected for the crossing of the Tanana River. This work may be rather heavy but it is through gravel material and the slopes generally are 30 degrees with the horizontal. From the crossing of the Tanana to the village of Tanacross the line traverses a timbered, gravel plain for a distance of about 25 miles and the crossing of the one tributary of the Tanana, the Tok River, does not present any serious problem.

e. At Tanacross I met the contractor, then engaged in the enlargement of the flying field at that point, who agreed to place at my disposal a tractor and trailer wagon for moving camp and equipment from the river to the initial camp site on the line. I also met Mr. Herman Kessler, trading post operator at Tanacross, and ascertained that he had available 8 head of pack stock as well as a riverboat suitable for transporting one locating party down river from Tanacross.

f. The line west of Tanacross, as far as the crossing of the Robertson River, closely follows the old winter trail and traverses some wet ground. There does not seem to be much choice in the selection of a crossing on the Robertson River as it is a threaded channel throughout its length. The channel ice in this stream appears to melt away before the flood stage caused by melting glaciers and as it heads above the timber line there is very little evidence of drift in the stream. Hence, I see no reason why a trestle structure will not provide a satisfactory crossing.

g. After crossing the Robertson River the line follows quite closely along the left limit of the Tanana River, crossing the Johnson River immediately above its mouth. This stream is very similar to the Robertson River. The Tanana River swings sharply to the north at this point and there appears to be no object in following the river further as a direct line from the crossing of the Johnson to a point on the Delta River immediately below the confluence of Jarvis Creek traverses good ground and the crossings of the Big Gerstle and Little Gerstle Rivers will not be difficult. From Big Delta I proceeded directly to Fairbanks.

6. On the following day, May 7th, I left Fairbanks at 8:05 a.m., accompanied by Mr. Berryhill, engineer in charge of the location in Alaska, flew directly to Station Kobe on the Alaska Railroad and thence east along the projected route to Big Delta.

a. I found upon arrival at Big Delta that the two locating parties initially sent into Alaska with partial equipment had succeeded in laying down 12 miles of line and had reached the limit of their operations without camp equipment. The line established by these parties is a scratch work line with an average fill of about 3 feet and a maximum cut of 4 feet.

b. From Big Delta we flew the route to Tanacross and there arranged with Mr. Kessler for the immediate use of his pack stock for the parties at Big Delta, selected the control point at Tanacross with reference to the beam station location, and arranged with the contractor on the field grading to move one party by tractor and wagon to their initial camp site about 4-miles east of Tanacross.

c. After leaving Tanacross we agreed on the crossings of the Tok and Tanana, and established the summit between the Ladue and the Tanana. I instructed Mr. Berryhill to have party No. 6 work east out of Tanacross down the Ladue to meet party No. 7. This was a change in the original plan which 'contemplated that party No. 6 would work eastward to the summit only, but in view of the fact that the line east out of Tanacross to the Tanana River can be developed quite rapidly, it seemed advisable to extend the scope of their work and secure the use of another pack train. I therefore flew south to Nabeena and got in touch with Mr. Harry Boyden and arranged for the remainder of his pack stock to make up two pack trains, one to leave immediately for Tanacross and the other to proceed to the mouth of the Ladue. From Nabesna I returned directly to Fairbanks, arriving at 6:40 p.m.

d. On our return to Fairbanks we found that the additional parties for Alaska had arrived with their equipment and we immediately made arrangements with the Star Airways and the Pollock Flying Service to transport two parties to Tanacross and one party to the head of Wood River. The remaining party was sent to Kobe via the Alaska Railroad to start work from that point; east. I believe that the entire line in Alaska will be laid down by July 15th.

7. On the following day. May 8th, I left Fairbanks at 2:00 p.m. and stopped at Burwash Landing at the west end of Kluane Lake.

a. We interviewed the owner of some pack stock in this locality. I was unable to reach a satisfactory agreement on this pack stock.

b. In the landing at Burwash the plane was damaged and the contract terminated. From Burwash Landing I radioed Major Pettit at Whitehorse who arranged to have the small Cessna plane used by the Aero Service Corporation on their photographic mission, and then idle, pick me up May 9th at 10:50 a.m.

8. I arrived in Whitehorse at 11:55 a.m.

a. I found that parties No. 7 and No. 8, with their equipment, were ready to go in the field. Although the river was

open, the ice on Lake LaBarge was still solid and the riverboat officials advised me that there was every indication that the first river steamer would not be able to get out of Whitehorse before May 25th. I got in touch with the Yukon Southern Airways and arranged a contract to fly these two parties, with minimum equipment sufficient to carry them until June 1st, to Selkirk and arranged by telegraph with Mr. Coward at Selkirk to handle one party down river to the mouth of Los Angeles Creek. This movement was completed on the 9th and 10th.

b. I called on Major Pettit at his headquarters, met Colonel O'Connor and discussed with them the portions of the route common to both locations.

c. I inspected the quarters secured by Mr. Hardison above the Royal Canadian Telegraph station and found them to be entirely too small for the establishment of the division office and wired the District Engineer requesting that a K.D. building, 20' x 60' at least, be made available to augment this office space.

d. I found that the Aero Service Corporation had photographed the Little Salmon drainage from Ross River to Little Salmon and were then preparing to leave for Tanacross to base for the Ladue mapping. I cancelled this portion of the photography as the Ladue Valley location is quite simple and the photography unnecessary, and substituted the intervening stretch between Boss River and Finlayson Summit which would give us continuous photography from the Lower Post on the Liard to the trading post of Little Salmon on the Yukon. Major Pettit was quite anxious to get the services of this contractor to photograph the route between Norman on the McKenzie across to Whitehorse.

e. General Hoge arrived at Whitehorse the morning of May 11th. I called on the General and explained the nature of our mission.

f. I reported to the infirmary and completed my typhoid inoculation and second tetanus vaccination, left Whitehorse at 3:05 p.m. via Yukon Southern, arrived at Prince George at 7:05 p.m.

g. I met Constable Thomas of the Provincial Police who is familiar with the Parsnip River drainage north of Prince George, and secured from him the names of several riverboat men capable of freighting our equipment in this locality.

h. I left Prince George at 10:55 a.m.. May 12th, arrived in Seattle at 2:30 p.m. the same day.

9. Conclusions: My previous knowledge of this route was limited to the section westward from Little Salmon, Yukon Territory, to the Alaska Railroad. The aerial reconnaissance, just completed, convinces me that the remainder of the proposed location will lend itself to rapid and economical construction within the standards established for a military railroad. I believe it will be very difficult to defend any alternate location when a direct line with such low summits is possible through the Rocky Mountain Trench.

Jas. Truitt,
Lt. Colonel, Corps of Engineers,
Executive Assistant.