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Department of the Interior, Canada.
WATER POWER BRANCH

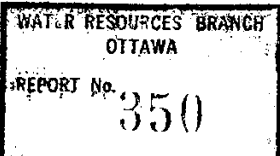
PROGRESS REPORT
ON THE
PROPOSED
HYDRO-ELECTRIC
DEVELOPMENT OF THE
FREDERICKS RIVER
IN
BRITISH COLUMBIA

Department of the Interior,

Canada.

DOMINION WATER POWER BRANCH.

BRITISH COLUMBIA HYDROMETRIC SURVEY

PLEASE ADDRESS YOUR REPLY TO
THE CHIEF ENGINEERBRITISH COLUMBIA HYDROMETRIC SURVEY,
249 HASTINGS STREET, EAST,
VANCOUVER, B.C.

REFER TO FILE NO.

VANCOUVER, B.C., December 2nd 1918.

Sir,-

Progress Report**Re investigation of Water Rights appurtenant to Indian Reserves in British Columbia**

Since reporting progress on October 8th, the work in connection with the above investigation has been confined almost entirely to securing information in the field which will be necessary for the consideration of the Water Board in the adjudication of Indian Rights.

At a conference held in Mr. Young's office in Victoria between the Water Commissioners, Mr. Young, Mr. Balls and the undersigned, Mr. Armstrong, Chairman of the Board, stated that the confirmation or revision of existing records would depend upon the information regarding the Indian Water requirements, and, it was decided to secure this jointly by the Water Power Branch and Water Rights Branch.

To acquire this information surveys have been made, in co-operation with the Provincial Water Rights Branch of irrigated and irrigable areas, storage reservoirs, ditch lines, etc., on reserves in the Lytton Agency, as listed below. Photographs illustrating Indian lands and works have been taken where weather conditions were favourable.

An investigation was made and Mr. Ballis covering report submitted on storage conditions at Fountain or Quetlenemo Lake.

A joint investigation has also been made recently of proposed storage for irrigation purposes on Alkali Lake Creek in the Cariboo District. On this subject a report will be submitted and plans prepared as soon as computations have been made from field data.

Field work for the season has been discontinued and during the winter months a complete list of Indian Records will be compiled and a full report dealing with reserves on which surveys have been made will be submitted together with plans and photographs.

List of Indian Reserves in Lytton Agency on which irrigated and irrigable areas have been surveyed.

* * * * *

<u>No.</u>	<u>Reserve</u>
Lytton 24	Tuckozap
" 2	Huatin
" 22	Kleetlekut
" 21	Inkluckcheen
" 21A	do
" 14	Malhalaeden
" 19	Hooten
" 20	Kitzowit
" 23	Hohomeen
" 27	Pogyum
" 27A	do
" 27B	do
" 25	Hickeyeah
" 26	Shayaynope
" 26A	do
Skuppah 2	Inklyuhkinatko
" 1	Upper Skuppah
" 4	Skuppah

Re Survey of Kamloops Indian Reserve No. 1
to investigate methods of providing a water
supply for irrigation.

While the work is not as yet sufficiently far
advanced to submit a detailed report with plans and
estimates of the cost of construction, the following will
give some idea of the general features of the situation.

Following the completion of the pumping station
at the Kamloops Industrial school and the laying out of
ditch lines, a start was made in the early summer on a
topographic survey of part of the Reserve for the purpose
of investigating methods of providing a larger water
supply. We have endeavored to carry on this work without
employing any extra assistance, and at the same time
carry on our own work efficiently. Fortunately the
country is of an open nature and very little cutting was
necessary, so that Mr. Phillips, with the assistance of
the Kamloops Office Clerk, acting as rodman, has carried
on the work for the most part.

Extending along the two branches of the
Thompson River, East and North of the City of Kamloops
there is an area of more than 2000 acres of good
agricultural land on the reserve. Until recently it has
been necessary to depend entirely on Paul Creek for the
water supply, but now that the city of Kamloops is
giving a reasonable rate for hydro-electric power,
irrigation of the reserve by pumping from the Thompson
River would seem to be the logical solution. Several
irrigation pumping plants have been installed near the
city and are proving a success.

Appended hereto is blue print plan showing the location of the various tracts of land referred to herein:-

- (1) Land irrigated from Paul Creek
- (2) Industrial school land irrigated from pumping plant installed last spring; and adjoining land on the Indian Reserve which could be served by same installation.
- (3) Flooded land to be dyked and adjoining land to be irrigated by the drainage pumps.
- (4) Low flat land suitable for independent pumping plant.

The accompanying photograph shows a general view of the South Western portion of the Reserve, where most of the land under consideration in this report is situated. By comparing it with the plan some idea may be obtained of the general conditions. The lake near the Industrial school on the right of the picture was frozen when the photograph was taken and shows white so that it can be easily distinguished from the South Thompson River in the centre of the picture. The road from Kamloops crosses the high water channel on a trestle. The Canadian Northern Railway junction and yards are just north of the steel bridge over the North Thompson River which is shown on the extreme left.

- (1) Of late years, about 700 acres have been irrigated by a gravity supply from Paul creek. During the 1918 season, some 2200 acre-feet of water was obtained from this source. This would give 3 acre-feet per acre, and under ordinary circumstances is considered sufficient, last summer however part of the crop on this area was a failure owing to the shortage of water.

The total discharge from Paul lake during the 1918 irrigation season was 3850 acre-feet. If this amount, the Western Canadian Ranching Company are entitled to one third and the Indian reserve to two thirds. The Indians' share, therefore, should have been about 2500 acre-feet. The amount actually received at the reserve, as stated above, was 2200 acre-feet, so that there was a discrepancy of some 300 acre-feet, or about 15%. After allowance is made for a certain amount of seepage loss in some 8 or 9 miles of creek bed, it would seem that the division was made in close accordance with the agreement.

Apparently the supply of water from Paul Creek is no more than sufficient to serve the acreage it does at present, and it will be necessary to resort to some other method of obtaining water for the rest of the reserve.

(2) Last spring, an irrigation pumping plant was installed at the Kamloops Industrial school, and its operation during the season was quite a success. It was designed to give an ample supply of water for 120 acres of land under the most adverse conditions when running 12 hours a day. When the river is high, as is the case during most of the hottest part of the irrigation season the capacity of the pump increases considerably. Under these circumstances, the plant could serve 200 acres, by operating 15 hours a day or more.

In addition to digging 2 miles of irrigation ditches, and in spite of the late start, the pupils and employees at the Industrial school brought 40 acres under cultivation. This fall, a considerably larger acreage has been ploughed, and probably something like 80 acres will be cultivated next year. However, the total area

of agricultural land on the school property below the ditches is only 120 acres, so that the pump should be able to serve a considerable additional area.

The total cost of electric power for the 60 acres irrigated the first season was \$60.00, or only \$1.50 per acre. The value of the produce obtained was more than twenty times that amount, and it would seem that irrigation by pumping should be a paying proposition under proper conditions. As soon as the area of irrigated land served from the pump exceeds 60 acres, the city of Kamloops is to make a 15% reduction in the power rate.

Just west of the Industrial School property there is an area of about 90 acres of Reserve land which could easily be supplied from the school pumping plant. Owing to the position of the road, about 1000 feet of fluming would be required, but the rest of the distribution system would consist of simple earth ditches. In previous years, this land has been irrigated from Paul Creek, but last summer there was a scarcity of water and the crops were a failure. By arranging to supply it from the Industrial school pump, this uncertainty would be eliminated, and the Paul creek water would be released for land closer to the creek.

(3) In the south west portion of the reserve, just across the South Thompson river from the city of Kamloops, there is an area of about 170 acres of fine land which lies a few feet below the ordinary high water level of the river and as a consequence it is flooded for a month or two each summer. On the accompanying plan this land is outlined and marked "High water channel" however there is very little actual flow through this channel. It is very

fertile, and no doubt would yield splendid crops with very little irrigation if the river water could be kept off it. Under present conditions, however, the land cannot be used for serious agricultural purposes, although a few tons of wild hay are cut each fall.

Adjoining the high water channel is a considerable area of higher land which is too dry to grow anything without irrigation. The highest parts of it, from 15 to 20 feet above high water, are rather sandy, but there is a considerable area which would grow good crops if it was irrigated.

It would not be an expensive matter to dyke the flooded land, since there are only two places where the water can enter, and one of these is almost entirely closed by the C.N.R. embankment. It would be necessary to provide two pumps to take care of the drainage water during the freshet, but they could also be used for irrigation. One pump, located at the lake near the Industrial school, would drain and irrigate 140 acres of the low land and could also irrigate 100 acres of the higher land. The pump at the west end would drain some 30 acres of low land and could irrigate a considerable area of higher land.

This project presents quite a favorable condition for immediate development. On account of the low elevation to which the water would be pumped, the cost for power would be less than at the Industrial school plant. The first cost of the plants would be quite reasonable also, and the transmission lines would not be long.

(4) North west of the C.N.R. junction station, there is a strip of land, some 140 acres in extent, between the C.N.R. right-of-way and the North Thompson river, which would lend itself very well to irrigation by pumping. The general elevation above low water is less than 50 feet, and 15 feet above high water. The low head to which the water would have to be pumped would make the annual cost for power very low.

The soil apparently consists of alluvial deposits from the North Thompson river, and although rather light, should be quite productive. Most of the best of it is ready for the plough just as it stands, but at the north end there is a small area which is lightly timbered with jack pine.

At present there is no transmission line from Kamloops to the C.N.R. junction and the cost of building the line, some 25 miles in length, would be about \$4000.00 at existing prices. If this had to be done simply to serve the 140 acres of land, the cost of the pumping system would be rather high. However, it is quite possible that the line may be built sometime soon, either by the city or the Canadian Northern Railway Company, and when that is being done it would not be an expensive matter to make the line of sufficient capacity to handle the extra power required for the irrigation plant.

With the transmission line difficulty settled, this pumping project would be quite a reasonable one. On account of the low level of the land, it would probably be better to provide it with a separate plant rather than attempt to include it in any larger scheme that might be proposed for the higher land adjoining.

(5) In addition to the land included in the foregoing proposals, there is still a large area to be considered, and apparently the only method of irrigating it would be by pumping. Indeed it might ultimately be advisable to irrigate the whole of the bottom land by pumping, and thus release the Paul creek water for use on the upper benches.


Certain difficulties are presented in planning a pumping system for the main block of land along the North Thompson river, on account of the long pipe lines necessary to cross the wide flat. However, when the surveys are complete it will be possible to select the best sites for these plants, and it is expected that the cost per acre will not be excessive. It is ~~not~~ probable however that it will be found advisable to recommend one large pumping plant in place of the several smaller ones described above.

One important factor in connection with the value of the land on the reserve when properly developed, is its proximity to the city of Kamloops and rail transportation.

Whether the acreage under consideration is greater than can properly be cultivated by the Indians I am unable to say, as this is a matter with which we have not concerned ourselves. However, if it should be, it seems undesirable that conveniently situated as it is any portion of this land should remain idle. This is

particularly the case at the present time when settlement of returned soldiers on the land is one of the most vital problems confronting the Government. If it could be arranged that the Indian Department would turn over to the Land Settlement Board the area the Indians are unable to cultivate, it would be a step in the direction of solving this problem.

Your obedient servant


Chief Engineer.

J. B. Challies, Esq., C.E.
Superintendent
Water Power Branch
Department of the Interior
Ottawa, Ont.