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VICTORIA, B.C.
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PRELIMINARY
REPORT ON
PEMBERTON VALLEY DYKING DISTRICT
DRAINAGE PROPOSALS

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SYNOPSIS

This report deals with the drainage problem which exists in the area south and east of the Village of Pemberton.

Two alternatives to solve this problem have been investigated:

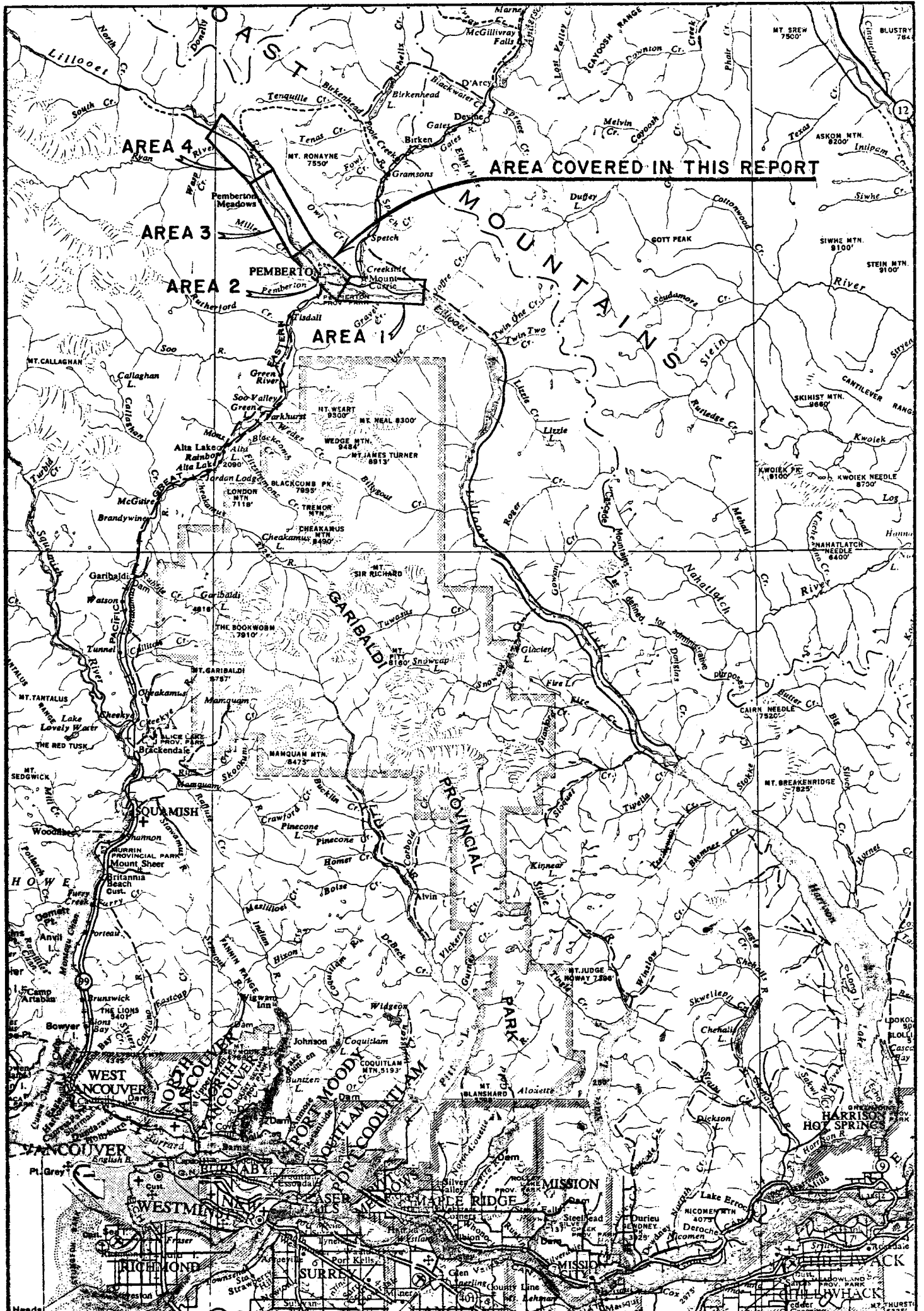
- A. Drainage by gravity.
- B. Drainage by pumping.

Alternative A involves the diversion of One Mile Creek into the Green River, while Alternative B considers a pumping station at the confluence of the drainage canal and One Mile Creek.

The capital costs of the alternatives are estimated at \$119,000 and \$103,000 respectively.

Although the estimated annual cost to the District of the pumping scheme is slightly more than the annual cost of the gravity scheme, \$ 5,604 against \$5,483, the pumping scheme is recommended because it will afford better protection against flooding.

The cost estimates and designs for the various works are subject to adjustments when final designs are prepared. Before final designs are undertaken, additional surveys will be required and drainage requirements should be reviewed by agriculture and soil experts.



AREA COVERED IN THIS REPORT

BRITISH COLUMBIA
DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES
WATER RESOURCES SERVICE
WATER INVESTIGATIONS BRANCH

TO ACCOMPANY REPORT ON
PEMBERTON VALLEY DYKING DISTRICT
DRAINAGE PROPOSALS
KEY MAP

SCALE: 10 miles to 1 inch

DATE
JULY 1967

J. Wester ENGINEER

0242512-27

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A C K N O W L E D G E M E N T S

Field surveys were carried out by personnel of the Water Investigations Branch under the supervision of Mr. R.G. Fernyhough, Technician.

Topographic information was obtained from mapping of the area being prepared by personnel of the Surveys and Mapping Branch, Department of Lands, Forests and Water Resources.

Drawings and air photo mosaics were prepared by Mr. F.W. Danks, Draughtsman, under the supervision of Mr. B. Varcoe, Chief Draughtsman.

The manuscript was typed by Mrs. L. Stalker.

Preparation of this report was carried out under the general supervision of Mr. R.G. Harris, Chief, Water Supply and Investigations Division of the Water Investigations Branch.

The study was authorized by Mr. V. Raudsepp, Chief Engineer.

WATER INVESTIGATIONS BRANCH
B. C. WATER RESOURCES SERVICE
DEPT. OF LANDS, FORESTS & WATER RESOURCES
PARLIAMENT BUILDINGS
VICTORIA, B.C.

PRELIMINARY REPORT ON

PEMBERTON VALLEY DYKING DISTRICT DRAINAGE PROPOSALS

1. PREFACE

Following representations made by the Pemberton Valley Dyking District and the Pemberton Board of Trade, the drainage problem near the Village of Pemberton was investigated on the instructions of the Chief Engineer of the Water Investigations Branch. Field surveys were carried out in 1965 and 1966 by the Water Investigations Branch.

2. HISTORY

Under the tripartite agreement between the Pemberton Dyking District, the Federal Government and the Provincial Government, the Prairie Farm Rehabilitation Administration (P.F.R.A.), Canada Department of Agriculture, carried out certain dyking and drainage works in the Pemberton Valley from 1946 to 1953. As a result of these works, some 12,000 acres of fertile land were reclaimed or protected from flooding.

The engineering proposals carried out at that time called for:

- a. the lowering of Lillooet Lake by deepening the channel between Lillooet and Tennesse Lakes;
- b. the straightening of meanders in the Lillooet River;
- c. diversion of the Green River;
- d. channel improvement of Ryan River and Miller Creek;
- e. the construction of drainage canals;
- f. the construction of a system of dykes.

The lowering of Lillooet Lake by some eight feet proved successful and the bed of the Lillooet River has degraded considerably. Various meanders of the Lillooet River were straightened by excavating a pilot channel after which the river scoured out the present channels. The largest of these cutoffs, the so-called McKenzie cutoff, has a length of 2.7 miles.

The Green River, which used to enter the Lillooet at a right angle (where at present One Mile Creek enters the Lillooet River) was diverted along the foot of the mountain and now joins the Lillooet River some two miles below the old point of confluence. This channel was initiated by excavating a pilot channel approximately 20 feet wide and six feet deep and has continued to develop by natural flows, particularly in high water, and now carries all the Green River flow.

The channels of Ryan River and Miller Creek were improved by clearing and excavating and the banks were protected with rip-rap, where needed.

Throughout the valley, drainage canals were constructed to which private owners could drain their lands by lateral ditches. Existing dykes were reinforced and new dykes constructed where necessary along the Lillooet River, Ryan River and One Mile Creek together with bank protection at places where erosion was occurring.

For reference, the Pemberton Valley was divided into four areas as follows:

- Area No. 1: From Lillooet Lake to Green River
- Area No. 2: From Green River to Miller Creek
- Area No. 3: From Miller Creek to Ryan River
- Area No. 4: Above Ryan River.

The lowering of Lillooet Lake and the consequent lowering of the lower reaches of the Lillooet River was of immediate benefit to Area No. 1, mainly consisting of Indian Reserve land.

The reclamation of Areas 3 and 4 was also successful and apart from regular maintenance, the works in these areas are completed. Area No. 2, however, in which the Village of Pemberton is located, still has problems with high water during certain times of the year and our investigation is centered on the problem in Area No. 2 to find ways of improving this situation.

3. DESCRIPTION OF EXISTING PROBLEM

The principal works so far constructed in Area 2 are a dyke along the south bank of the Lillooet River, the north side of the old Green River and the east side of the One Mile (Pemberton) Creek. A drainage canal starting in Area No. 3 runs through Area No. 2 and carries water to One Mile Creek. These works are shown on the attached mosaic of aerial photographs, Drawing No. 4690-1.

Although the constructed works were of great benefit to the area, which formerly was mostly swamp land, there is still room for improvement because the area does not drain satisfactorily during spring runoff and during high flows in the Lillooet River. The Trustees of the Dyking District are anxious to bring Area No. 2 on a par with Areas No. 3 and 4, especially since it appears that Area No. 2 will develop into the industrial and commercial center of the valley.

The area involved is located around the Village of Pemberton and is bounded on the south and west by the One Mile Creek, on the east by the Lillooet River and on the north by the Pemberton Meadows Road and amounts to a total of approximately 1,300 acres. About 500 acres are presently cultivated while another 50 acres might be classified as industrial and residential area (i.e. sawmill, railroad, bulk plant, school, etc.) It is estimated that 500 acres more could be brought into production within the area.

From our investigations and studies, it appears that there are two basic reasons for the existing drainage problem, namely:

- a. The cross-section of the drainage canal is inadequate to handle the flow during spring runoff and during periods of heavy rainfall.
- b. During high stages of the Lillooet River which normally occur in June and July because of snowmelt, or in October and November due to heavy rains, water backs up in One Mile Creek as far as the confluence with the drainage canal, thus preventing the drainage by the canal.