

Feeder at summit when required..	\$ 987,485
Route B.—Same as route A excepting that Rivières des Prairies (Back river) one of the branches of the Ottawa river, north of Mon- treal Island, is followed instead of Lake St. Louis and the St. Lawrence river from Ste. Anne to Montreal as in route A.	
Locks, dams, channels, piers, light- ing, damages.. . . . .	\$83,354,508
Contingencies, engineering, admin- istration, &c.. . . . .	8,335,492
Storage of flood waters, regulation basins, telephones, &c.. . . . .	2,200,000
<b>Total.. . . . .</b>	<b>\$93,890,000</b>

With an extra amount of \$987,485 for feeder at summit, as in the previous case. They have figured out the cost of maintenance, and it amounts to, as I have already stated, some \$900,000.

Distance from Montreal harbour to French river village on Georgian bay equals 440 miles. The rise from Montreal harbour to the summit of 659 feet can be overcome by 23 locks, ranging from 5 feet to 50 feet in lift and that the descent of 98 feet from the summit to Georgian bay can be made by four locks ranging from 21 feet to 29 feet in height of lift,—27 locks in all, connecting twenty-three navigable pool levels of various lengths.

That sufficient water may be stored within its own and adjacent watersheds to operate a summit level above Lake Nipissing. That to use the Lake Nipissing level as a summit would increase the cost by at least \$10,000,000, and introduce twelve additional miles of canal cutting.

The reports point out that there were two alternate methods of getting over the summit level:

1st. By carrying the Lake Nipissing level through to the Paresseux locks, making a raised summit of Lake Nipissing the summit level.

2nd. By raising all the lakes between Lake Nipissing and the Paresseux locks to a common level, thus making a summit level above that of Lake Nipissing.

3rd. By augmenting the supply of the watershed of the second or adopted condition from outside sources.

The first establishes the summit level at elevation 648.0 feet over a distance of 56½ miles from the Chaudière Falls at the outlet of Lake Nipissing to the Paresseux locks at the foot of Talon lake, and whose supply is derived from the watersheds of Lakes Nipissing, Trout, Turtle, Talon and Nosbonsing, the combined area being 4,420 square miles. These watersheds would together yield a minimum outflow in excess of 4,500 cubic feet per second, with control at the present outflow of Lake Nipissing at the Chaudière Falls. This outflow is obviously much beyond the limit of any canal requirement, so that further discussion of this level with regard to supply is unnecessary.

So that as regards getting a sufficient water supply, there is no doubt so far as the first method is concerned but on account of the extra cost, the engineers saw fit to adopt the second method:

The second is that which applies to the project as laid down and calls for a summit level at elevation 677.0 or 29 feet over the raised Lake Nipissing level, and extending from the small upper lakes or sources of the Ojibway-sippi creek at the west end, to the lower end of Talon lake at the east end, and embracing Trout and Turtle lakes, the Little Mattawan river and Talon lake, a distance of about 24 miles.

This will be accomplished by ten small puddle core earth dams at the west end, and a concrete overflow crest dam just above the present overflow of the Talon chute at the east end. The effect of this will be to raise Talon lake 41.7 feet, and Trout and Turtle lakes 14.3 feet above their present levels, thereby creating a summit basin of 22.4 square miles in area.

This elevation of 677 feet is the most economic height to raise the water now contained in these lakes, in order to use them as a summit level from the comparative standpoint of increased height and consequent cost of the lock structures at either end and the minimizing excavation to obtain grade between them.

By fixing the summit grade at elevation 651.0 a storage of six feet is obtained in the summit basin over the minimum projected draft of 20 feet on the upper sills of the summit locks.

So it will be seen that by saving some ten miles of excavation they got sufficient water for canal purposes by adopting the second condition. The report goes on to say:

That the natural low water flow from the Ottawa and French rivers is most ample to meet all the requirements.

With regard to the flow regulation, the report says:

The Ottawa valley or watershed is bounded toward the north by the height of land, or west of the ridge which marks the commencement of the slope to Hudson bay along the west and south the ridge marks the slope towards the Great Lakes and St. Lawrence. The encircled valley is 55,700 square miles in area, all of which drains through creeks and rivers eventually into the main stream. The rain and snowfall within this area alone has to be considered. Of the total area 45,000 square miles lie to the north of the river and 10,000—practically all in Ontario—to the south. The northern area from Montreal to Mattawa forms a rectangle 300 miles east and west by 150 miles north and south. Roughly speaking, this rectangle is divided in half by the Gatineau valley.

The western half or upper Ottawa basin contains the large lakes—Victoria, Expanse and Quinze, with an expansion of the Ottawa on its way westwards into its north and south-lying expansion—Lake Temiscamingue. Here the Blanche and Montreal rivers enter, and the whole continues south to Mattawa.

That the spring flood in the Ottawa river can be restrained by storage throughout its watershed so that, under extreme conditions, the reaches will not overflow; currents therein will not be over three miles per hour, and locks will be workable, that is to say, prac-