

ridge on which the line runs is low and of nearly uniform surface. The strait, connecting the arm with the main body of the lake, is less than 100 yards wide and less than ten feet deep. Only an ordinary culvert would be required here, which could be easily built on the dry land and not in the strait. The grades in all this section would be very easy.

Between the forty-third and fiftieth miles the line runs down a small river called Mackie's Creek, and up the Madawaska. There will be a great many short level portions on this section, with some side-hill end headland. The character of the line is that of Contract No. 17. But at the beginning of the section there will be heavy work for about half a mile, which although I do not think it would raise the average cost of the section above that of Contract No. 17, modified. I think it safest to add \$10,000 for, as there will be about 9,000 cubic yards of rock cutting on the face of solid rock, with a slope backward of about $\frac{3}{4}$ to 1. There will also be a bridge of 50 feet span over Mackie's Creek, on a rock foundation, and without any difficulty in construction. This bridge I estimate at \$6,500. I accordingly estimate the average cost of the whole work of the section at about \$19,800 per mile.

Between the fiftieth and seventy-fifth miles the line follows the valley of the Madawaska River. A very large proportion of the work will be very easy. There will not be any works of difficulty, though in a few places there will be short rock cuttings with a depth of only a few feet. I estimate the average cost at the modified rate for Contract No. 1, but as the line crosses a few streams (about five) which will require bridges with spans of twenty or thirty feet, which I estimate at \$2,000 each, the total average will amount to \$9,500 per mile.

The section between the seventy-fifth and eighty-fourth miles is expensive and unsatisfactory, on account of the curves which appear to be necessary. The line at the eightieth mile crosses the Mississippi or Beaver Creek, a branch of the York River, which itself is a branch of the Madawaska. The York River is called in the reports of the Geological Survey, the Shawashkong—the river of marshes. The marshes extend up the Mississippi farther than the point which I have selected for crossing, they are in many places very wide, and particularly so at the junctions of the Shawashkong with the Mississippi and the Madawaska, but at the place which I have selected, which is the second place available, hard ground is got on both sides of the River Mississippi where the banks are about 200 feet apart. As the land lying between the Mississippi and the Shawashkong rises quickly to a kind of plateau 150 or 200 feet higher than the rivers it is necessary after crossing the Mississippi to curve down the stream again to get into the valley of the Shawashkong and Papineau Creek.

From the eighty-fourth mile to the ninety-fifth the work will be very much lighter. The grades on the first five miles will be one in a hundred up and down over a ridge, but on the remaining fifteen miles they will be easy. There will be an expensive bridge across the Mississippi, another with a span of 100 feet across the Shawashkong, and two others with spans of fifty feet over the greater and less Papineau Creeks. These last three will not be expensive as the foundations will be good. I estimate the average cost of the whole section exclusive of the bridges, at the modified average estimate for contract No. 18, \$25,000 per mile—and I further estimate the Mississippi bridge at \$45,000, Shawashkong at \$15,000, and the two Papineau bridges at \$21,000—making in all an average for the section of about \$29,000 per mile.

I am much inclined to favor a route following the Madawaska River up from the seventy-third mile to the Village of Combermere, about nine miles up, and there turning west and southwest, and joining the line I have laid down near the ninety-fifth mile. The cuttings would be rather lighter on this route, but there would be of necessity a very steep grade for several miles of probably one in eighty up and down. I was informed, and upon reliable authority, I believe, that the line by Combermere would be of considerable benefit to the lumbering interests—and that Combermere is a kind of centre from which lumbering parties disperse. On this route the line would have to cross the Madawaska twice to avoid great marshes at the