

The length of the line from Drury to Tuakau (indicated in red) may be taken for the purposes of this report at fifteen and a half miles. It passes in this length over a number of swamps, and a considerable length of wet bush, very difficult to drain, and also through some considerable extent of prime land.

The gradients will generally be easy, with the exception of one, where there will be 1 in 50 for about one mile in length; and the cost of construction, mile for mile, will be less than any other line from Auckland to the Waikato River.

*Line from Drury to Mercer.*

The route from Drury to Mercer *via* the Pokeno Range is indicated in its general direction by a green line.

This is the line to which your instructions chiefly refer, and upon which I have to observe that the gentlemen who accompanied me over the difficult portions of this route did point out to me what they conceived would be a pass, through what is known as "Fitness's Road," at B on the tracing. There are some difficulties presenting themselves before this supposed pass is reached, but they are, I think, surmountable without the necessity of tunnelling. But, assuming I am correct in my judgment that the summit may be passed without tunnelling, there is no possibility of reaching the Pokeno Valley by the basin of Austin's farm, except with gradients so severe and curves so sharp as not to be useable for railway purposes except by the aid of locomotives specially constructed for the purpose.

So far then as the line pointed out to me by the gentlemen who were good enough to accompany me over the ground is concerned, it cannot be constructed, if the commercial results are to be considered.

I did, not however, let my investigation of this line rest here; for, considering how much the value of a line of communication is enhanced when it accommodates the largest area of country abounding with soil of the finest quality, I entered into the question whether it would be possible at all to carry a line of railway from Drury to Mercer, through any part of the spurs on the western side of Pokeno Hill; and I found that, by following generally the continuous green line shown on the tracing, I could pass, as far as the aneroid would enable me to judge, from the foot of the range at A, with gradients that would in all probability rule as follows:—

Rising gradients—

Martin's Hotel to Kempthorne's Road, 1 in 80.

Kempthorn's Road to Fitness's Hill, 1 in 45.

Falling Gradients—

Fitness's Hill to Tuakau Road at C, 1 in 40.

Tuakau Road to Pokeno (Queen's Redoubt), 1 in 50.

The length of this line from Drury to Mercer would be about seventeen and a half miles.

The country from Drury to Martin's Hotel at A is of an average quality of soil, and presents no difficulties; but from this point the works through the range to the Tuakau Road at C would be heavy, though no tunnel would, I think, be necessary. Long lengths of bush, on very rough sidelong ground, have to be dealt with; but so far as this portion is concerned, the land generally is of first-class quality, very sound and entirely free from swamps, forming a great contrast in the latter respect with the character of the line to Tuakau; but the gradients would be much more costly to work than those on the Tuakau line, because they are not only more severe, but are much longer.

From the Tuakau Road at C to Mangatawhiri Creek at D, the works would be light; and from thence to Mercer, side-cutting in indurated sand or imperfect sandstone as far as the present tunnel, and a swamp from thence to Mercer. This length would be somewhat expensive; but as the present tunnel can be made available without much if any further expense, and the swamp being shallow and resting on a firm clay bottom, no trouble or unusual expense will have to be incurred.

From what I have stated, it is perfectly clear that Mercer cannot be reached from Drury by a line of railway of the same length as the one from Drury to Tuakau, the excess of distance being about two miles; but there is no doubt that the line on the western side of Pokeno Hill (shown in green on tracing) would insure the largest amount of good if the conditions were equal to the Tuakau line, because it is more central with the settled districts, having the Bombay settlement on the east, and Pukekohe and Tuakau on the west, from the latter of which it would be a distance of about three and a quarter miles.

But the conditions are not equal, because this line (green) over the range, would be worked only at an increased cost over that of the Tuakau line; this is an important consideration, and, we must recollect, would be a permanent annual charge in excess of what would be required on the Tuakau line.

*Best Terminus.*

Seeing that the portion of the green line extending over the spurs of Pokeno Hill, from A to C on tracing, would be costly in construction and expensive to work, as compared with the line to Tuakau, the next question is, whether it is desirable to leave the terminus at Tuakau undisturbed?

To arrive at this, I first examined generally the River Waikato from Mercer to Tuakau. I was told the river might then be considered in an average condition as to depth of water; and in this state I found, at what is known as the "Bullock Bend," eight feet of water, so that it is probable that, in dry seasons, there are times when the water, at some points of this length of the river, does not exceed five feet in depth. I could not learn that any of the present class of steamers now plying on the Waikato get aground in this length, but the "Sturt" has been frequently so, as I am informed.

The time occupied by the "Bluenose" steamer (which I chartered for the purpose of the investigation) in taking me and my assistant from Mercer to Tuakau, having first discharged her cargo, was 55 minutes, and the return journey up stream occupied 1 hour and 45 minutes: hence, whatever time a train takes from Drury to Tuakau, these respective times must be added to the up-and-down journey between Drury and Mercer, if Tuakau was the terminus.