

posals, would be unable to put down the borehole to the depth required, which would not be less than, and might considerably exceed, 1,000 ft. of boring. But, without taking this fact into consideration, the improbability of finding a workable seam in any case compelled me to advise the discontinuance of the borehole.

There are ample facts contained in the various reports on the geology of the Kawakawa Coal-field showing the improbability of being able to reach coal at depths less than 1,000 ft. at any point to the west of the Waiharakeke Swamp, on the east side of which the deepest borehole put down by the Bay of Islands Coal Company reached to 680 ft. before touching the slate-rock. To the immediate westward of the swamp, owing to the direction and amount of dip of the strata, and the presence of beds yet higher in the series, nothing short of 1,000 ft. of boring would be required to pass through the coal-measures; and as the present borehole, No. 1, is situated fully half a mile further to the west, without having regard of the presence of a younger unconformable formation from the datum line of sea-level, much more than 1,000 ft. of sinking would be required to reach the coal, which in all cases forms the bottom bed of the series, with only a few feet of clay underlying. This is inevitable unless a reversal of the dip takes place, and on the western side of the syncline thus formed, the shorn coal-measures would expose lower and yet lower beds as the section was followed towards the west.

All the evidence collected leads to the conclusion that, as affecting the coal-measures, no such reversal of dip does take place, and that the strata presently being bored in, dipping to the north and north-east, form no part of the coal-bearing series. Yet, allowing that the site of the bore may be on the crown of a denuded anticline, the greenish marly clays passed through must represent the calcareous greensands that are seen on the range further south, and a very great thickness of strata, more than 1,000 ft., would have to be passed through, if the different beds are of normal thickness, before reaching the coal.

Former examinations of a more extended character have shown that west of the Waiharakeke Swamp, on Turntable Hill near Pakaraka, in Morgan's Bush, and wherever the base of the coal-bearing formation can be reached, the evidences of coal occurring as workable seams has always been of a negative character. And, as in the furthest west of the borings made by the Bay of Islands Coal Company the seam was unworkably thin, there is little hope that it thickens to a workable seam at the present No. 1 borehole and again wholly thins out before reaching Turntable Hill.

It is somewhat remarkable that all efforts to find coal at Waiomio and outside the Bay of Islands Coal Company's property have failed, while at the same time there was no mistake as to the identity of the strata tested with the coal-measures of Kawakawa. And, seeking for an explanation of this, as early as 1884 I came to the conclusion that the principal productive part of the field lay to the eastward of Kawakawa, and has since its deposit been almost wholly removed by denudation. Further west and north-west the land-surface preceding the coal-period was too rapidly submerged by the encroachment of the sea, and, therefore, all the beds of the series above the very lowest are marine. This is proved at Kawakawa, where the seam of coal worked was, at many places, directly overlain by a bed of shells of marine species, and, where this was not, a covering of greensand, equally marine, succeeded the coal.

Aware of these discouraging facts, I still thought it was possible to find coal on the western margin of the company's property at Kawakawa, and for some distance up Scoria Flat, and at Waiomio favoured the putting down of a borehole to test the measures there: thinking in the latter case that where a thick seam was absent from the eastern out-crop of the beds that here conditions might be reversed, and that the feeble indications of coal showing on the east margin of the basin might improve as these were followed to the dip westward. The results of the bore put down by the Bay of Islands Coal Company were undecisive, and it yet remains to be seen whether workable coal exists in the upper basin of Waiomio Creek. Coal is reported present in the hills to the westward, but I have not been to the locality nor seen samples of the same.

I have examined the Kawakawa River above Scoria Flat, nearly to its source, and in the several places where coal might be expected none appears. On Turntable Hill, in Morgan's Bush, and at Pakaraka, the evidence is everywhere unfavourable.

To sum up and conclude from the facts above stated, it would appear that there is but little prospect of finding a workable seam of coal within a moderate distance of the Kawakawa workings, either to the west, south-west, or the south, and by a continuance of Borehole No. 1, being put down by the Russell Syndicate (Limited), the finding of coal is a problem of doubtful issue.

As regards Borehole No. 2, the prospects are equally unfavourable, and the evidence to show this, being similar and in great part the same as stated above, need not be repeated here.

REPORT ON THE TE PUKE GOLDFIELD, TAURANGA COUNTY.

By ALEXANDER MCKAY, F.G.S., Government Geologist.

Wellington, 9th June, 1898.

THE country forming the lower grounds between Tauranga Harbour and the main range to the westward from near Captain Stewart's and Hikurangi at first is rhyolite *débris*, from the area of rhyolite of which Hikurangi is the culminating peak.

Further south pumiceous sands and clays form the country along the seaboard back to the mountain-range, composed of andesic materials; but until reaching about half-way from Katikati to Tauranga the pumiceous matter is not coarser than sand, and gives clear evidence of having been stratified under water—probably an extension of the Bay of Plenty. Three miles south of Katikati