

not be made to avoid bridges and large flumes, inasmuch as there is not sufficient fall in the vicinity of them to allow a tunnel to head the gullies, or nearly so; but a large deviation could be made from Wilson's Creek to avoid all expensive bridges and flumes between that point and the end of the race.

C.—The probable cost of maintenance, including ordinary repairs to bridges and flumes for the next six years, will be as follows:—First year, £1,750; second year, £1,800; third year, £1,800; fourth year, £2,000; fifth year, £2,200; and sixth year, £2,500.

D.—The probable gross revenue from sales of water during the next six years, and the number of men employed, would be as follows:—First year, £2,400; 68 men employed. Second year, £2,400; 68 men employed. Third year, £2,400; 68 men employed. Fourth year, £2,300; 66 men employed. Fifth year, £2,200; 62 men employed. Sixth year, £1,900; 54 men employed. From the above computation, the sixth year does not pay for maintenance.

E.—From what is known of the auriferous ground commanded by the present line of race, it will take probably from ten to twelve years to work out; but from four to six years will work out the principal portion of it.

F.—With regard to the future prospects of the race, a reconnaissance survey has been made from the end of the flume at Wilson's Creek peg, 6 miles 46 chains to the end of the race, *via* Callaghan's Creek, which shows that a deviation could be made to avoid all expensive bridges and flumes, by tunnelling from gully to gully, and crossing each creek or gully with a low flume from 6 feet to 8 feet in height. The total distance from Wilson's Creek to present end of race by this route is about 4 miles 60 chains, and the cost of constructing the same would be about £10,600. In addition to this there are four water rights which would require to be purchased, which would probably amount to £1,000, making the total estimate for this route £11,600.

The water rights referred to, are small water races brought along flat terraces, and lock up a considerable extent of auriferous ground that would be worked if water were available at a higher level.

With regard to the extent of auriferous ground that is said to be payable in the vicinity of Callaghan's Creek and its tributaries, there exists a great difference of opinion among the miners who reside in this locality, and it is only from observations of the auriferous indication of the country, the depth of alluvial deposits, the fall there is for working the ground, and from the information obtained concerning the gold workings that has been done that any estimate can be formed of the amount of ground that is likely to be worked if water were brought on to it.

The general nature of the country greatly resembles that through which the Nelson Creek Water Race is constructed, the creeks and gullies are very precipitous on the sides, but much narrower than those on the Nelson Creek side. There is no wash on the side of the range at the level that the race would be on. The auriferous ground is on terraces along the bank of Callaghan's Creek, and its tributaries, and on a large flat, between what is termed Callaghan's Creek Township and O'Rourke's Creek. A good portion of the latter ground has very little fall, and it is on this account very questionable if it could be ground sluiced; or, if not, whether it is sufficiently rich to be worked by any other method.

The total extent of new auriferous ground that the race would command, by adopting the route *via* Callaghan's Creek, would be about 400 acres, but probably one-half of this could not be worked. Assuming that 150 acres could be worked, and the average depth of the ground to be 16 feet, it would give employment to seventy men for eleven years.

A reconnaissance survey has likewise been made from peg, 6 miles 46 chains, on the Nelson Creek Water-Race, to command the country, on the Ahaura water shed, between Irishman's and Sullivan's Creeks.

The extent of auriferous country that could be commanded by the race in this locality is fully 1,000 acres. With regard to the payable nature of this country, the miners in the locality are unanimous in their opinion on the subject. They say the whole of the terraces would pay for working if water was available, and that it would give good returns. The appearance of the country, and the depth of alluvial deposits, with a large amount of fall for working, bears out what the miners say about it. The country is very broken, with deep, wide gorges, the depth of wash can be easily seen, in some places it is 80 feet deep, and I think the average depth may safely be taken from 15 to 20 feet over the whole area of the 1,000 acres. It is, however, impossible to arrive at a correct estimate of the amount of payable ground* without having the country thoroughly prospected, and it is only the information of the miners residing in the locality, together with the appearance of the alluvial deposit, and the richness of all the gullies running back from the river, that the estimate of the quantity of auriferous ground is based on.

The proposed line from Nelson's Creek at peg, 6 miles 46 chains, to the Ahaura River, is by tunnelling from gully to gully, crossing first to Callaghan's Creek, thence crossing it with a flume, where it is only about 30 feet wide, thence by tunnel to head of Black Sand Creek, thence tunnelling from gully to gully to Sullivan's Creek in one direction, and from Black Sand Creek to Irishman's Creek in the opposite direction, allowing the water from the race to flow down Sullivan's and Irishman's Creeks to the Ahaura River. The broken nature of the country will not admit of the race being carried round on a contour line, unless at a very great expense. Tunnelling will be far cheaper than ditching, in the first instance, on account of the length that it will cut off, and will also cost less for maintenance afterwards. The miners would have to make branch races from the openings in the several gullies, which they would not consider any hardship in this locality.

The length of race required to command this ground will be about 5 miles 30 chains, and the cost of constructing same £12,200.

In estimating the cost of both these routes—*viz.*, *via* Callaghan's and to Ahaura River, a liberal allowance has been made for surveys, supervision, &c., so that the total estimate given will cover all contingencies.

* Eighty feet of wash in some places. Average, over 1,000 acres, 15 to 20 feet.—C.Y.O.C.