

Enclosure.

Messrs. SIMPSON and WINK to Mr. J. O'NEILL, C.E.

SIR,—

Grahamstown, 5th February, 1872.

According to your instructions, we have carefully gauged the flow of water in the "Kauwae-ranga" and its tributaries, at the two proposed levels, and have the honor to report that the aggregate quantity at the high level is $7\frac{1}{2}$ cubic feet per second; on the low level we find $29\frac{1}{2}$ cubic feet per second.

These quantities were taken on Saturday, 3rd instant, after an unusual spell of dry weather, and do not fairly represent the usual summer flow, which must be greatly in excess of this. It is some years since the streams were so low.

I have, &c.,

DAN. SIMPSON, C.E.

GEO. M. WINK, C.E.

J. O'Neill, Esq., Princes Street, Auckland.

No. 3.

REPORT ON THE THAMES WATER SUPPLY BY THE ENGINEER-IN-CHIEF.

Mr. J. CARRUTHERS to the Hon. J. D. ORMOND.

Wellington, 25th April, 1872.

Two schemes have been proposed for supplying the Thames Gold Fields with water for mining purposes—the low level and the high level races. Surveys have been made and estimates prepared by Mr. J. J. O'Neill, by which it appears that the low-level race would be nearly twelve miles long, and would cost £29,604, exclusive of distribution to the batteries; it would deliver 40 heads water at a height of 132 feet above sea level. The high-level race would be over forty-five miles long, and would cost, exclusive of distribution, £97,772; it would deliver 20 heads of water at a height of 500 feet above sea level. Allowing for distribution, the cost of the two races respectively may be taken at £33,000 and £102,000.

On the 20th January last, much valuable information as to their requirements was obtained from the managers of most of the important mines, and a circular was addressed by the Hon. the Minister of Public Works, on 24th January, to forty-four owners and managers of mines, but only seven replies were received.

From these data I have been enabled to form an estimate of the probable revenue.

The great drawback to both schemes is the uncertainty of the water supply. In February last, there were only two heads of water available for the high-level race, instead of twenty, which are required. It is likely that this insufficiency of water will last for three months in the year, when the high-level race would not be able to supply water enough for the batteries, and the low level, though it would have enough for batteries, would not have enough for motive power.

The construction of either of the races would not therefore enable new companies to dispense altogether with steam engines, nor the old companies to sell those they have.

LOW-LEVEL RACE.

There are at present 317 stampers at work which could be served by the low-level race, each requiring 1 horse-power, or in all 317 h.p.

The supply proposed is 40 heads of water, equal to 40 cubic feet per second, or 2,400 cubic feet per minute. The total head is 132 feet, of which 32 would be lost in passing through the batteries, leaving 100 feet of total or 60 feet of effective head, equal to 275 h.p., when working under the most favourable circumstances.

It is not likely, however, that more than half the batteries would adopt water power, or say 160 h.p. in all, so that when the race is full there will be an excess of power.

Revenue.

The main items of saving which would accrue to the mining companies by having an abundant supply of good water are as follows:—Fuel saved by using water power; gold saved by pure water at the tables; boiler repairs lessened by using good water.

In order to estimate the revenue, it will be best to calculate the total saving effected under these heads, and then to assume proportion which could be collected as the share of the Government in the shape of water rates.

Fuel.

The consumption of fuel at the mines seems to be very great per horse power, due probably to the boilers being forced beyond their fair capacity; but I do not think it safe to assume more than 15 lbs. per h.p., per hour.

This would give for 108 hours per week, and for 160 h.p. (the probable power required), a total weekly consumption of 116 tons at 25s. = £145.

Gold.

The increase in the yield of gold from a ton of ore, due to pure water instead of foul being used on the tables is estimated by different managers at from 1 to 5 dwts.

It is noteworthy, however, that those who estimate 1 dwt. have already a good water supply, while those who estimate 4 or 5 have at present a supply described either as bad or very bad. As the greater part of the batteries commanded by the low-level race either use sea water or could easily do so, it will be only prudent to take the lowest estimate of 1 dwt. per ton of ore.