TDH:1 19th August, 1949.

MEMORANDUM:

The Nugget Race.

During a recent visit to the head of the Nugget Race and the area drained by this, I gleaned the following information. It should be noted that all figures below are very approximate and no detailed survey was attempted.

Watershed. The intake of the race is from a branch of the Cascade River some 60 chains south of and 450 feet vertically above the Morning Star Dam. The area immediately drained by the Cascade and its tributaries above the intake covers some 900 acres or a little less than half that of the catchment area of the Morning Star Dam. The average annual rainfall at this dam is about 5 feet but the precipitation is higher at the loftier elevation of the watershed so that 6 feet may be taken as an average figure. The country comprising this catchment area consists of fairly steep valley sides and is almost wholly denuded of vegetation, in many places granite outcropping to the surface. Hence I do not think that 50% of the total rainfall is an excessive figure for the run-off. This means that the total amount of water which could be collected per annum is 2,700 acre feet.

Existing Dams. Two small existing dams, with breached walls, could, if repaired, be utilised for the storage of water for this race. Neither actually tap the Cascade itself, although the upper Cascade water could be brought to the Ah Foo Dam by an existing race.

Dam on Section 3113/W - 30 acres. This was used to impound water from McIntyre Creek, a small tributary of the Cascade near the Star of Peace workings. The dam wall has been constructed from overburden of these workings and is 400 feet in length with a maximum height of 13 feet. Near the centre where the creek flows through is a breach, 40 feet in length. If the dam wall were repaired it should be capable of holding about four million gallons of water. This would only allow for 10 sluiceheads to be taken for 45 hours. Unfortunately the catchment area is not large and this dam could only be filled about five times a year. This dam is at an elevation of 2,550 feet or about 300 feet above the intake of the race.

Dam at head of Ah Foo Creek - Section 3152/W- 26 acres. The wall of this dam, too, has been breached. It is an earth dam with a wall 200 feet long and 9 feet high in the centre. A breach of 42 feet has been made here through which Ah Foo Creek flows. The capacity of this dam would be about two million gallons which would supply 10 sluiceheads for only 22 hours. The catchment area of Ah Foo Creek above the dam is very small but a small race about 1 mile in length links the dam with the Cascade River. This race is not in good order but there appear to be no major breaks in it. The elevation of this dam is 2,520 feet or about 270 feet above the Nugget Race. The water could be taken down

Ah Foo Creek into this latter race.

Proposed Dam Sites. From the above figures it can be seen that even if the existing dams were repaired, they would only hold sufficient water to allow for ten sluiceheads for very limited periods. This is partly on account of their small size and partly because water from the whole catchment area could not be utilised. However, if a dam or dams were constructed on the Cascade itself, the position would be rather different. The average monthly rainfall is such that no one month has a lower rainfall than 50% of the average. This means that if a dam could be constructed to hold at least one month's catchment it would be able to supply ten sluiceheads for 12 hours daily the whole year round. Unfortunately, it does not appear that there is any site suitable for the construction of a dam of this size, i.e., of 30 million gallons capacity. As shown on the accompanying plan, at two sites on the Cascade itself smaller dams could be constructed. That at the junction of the Cascade and Try Again Creek, with a wall 120 feet long and 11 feet high at the centre, would have a capacity of about 2½ million gallons; while the lower one with a wall 50 feet long and maximum height 18 feet could hold little over one million gallons. Though these dams would be small, they would, except in the driest periods, quickly fill. It should also be noted that the whole area acts to a certain degree as a dam and most of the water absorbed into the soil eventually soaks its way down to the Cascade.

From the above notes, it would appear impossible to collect ten sluiceheads of water for the Nugget Race all the year round. However, with the repairing of existing dams or the construction of new ones, much more water would be available throughout the year than at present. No account has been taken in the above estimates of any creeks flowing across the Nugget Race itself. Additional water could be obtained from some of these, particularly Black Creek which flows throughout the year. It should also be noted that any water taken or stored for the Nugget Race would deprive the Morning Star Dam of that amount.

T. D. Hughes.
GEOLOGIST.

The Director of Mines.