

Fall to be reckoned from the total difference of level in 60 lineal feet of tail-race running free.

The regulation has now been in force for some years, and has given satisfaction to all the parties interested. It will be seen that the table is calculated from the rule, "The number of cubic yards per hour required to be sluiced away, divided by the fall per box (in inches), gives the quantity of water required for that purpose." Other main tail-races have adopted the same rule.

The table in the regulations for No. 4 channel is based on each party sluicing into the main tail-race 112 cubic yards of tailings per hour.

Fall per Box of 12 ft.	No. of Sluice-heads.
1 in 21.33, 6 $\frac{3}{4}$ in. per box	16.59 sluice-heads.
1 in 20.57, 7 in. "	16.00 "
1 in 18.00, 8 in. "	14.00 "

The rule given is in accordance with American authorities on the subject, and produces practically the same results as the rule given in Gordon's "Miner's Guide," but it is more simple, and will be more readily understood and applied by ordinary miners and others.

LIST of CLAIMS at present sluicing on the Kumara Goldfield, showing Width of Boxes, Fall per Box, Quantities of Water used, and Remarks on Working.

Number of Claims.	Width of Boxes.	Fall per Box.	Quantity of Water.	Remarks.
	In.	In.		
1	32	4	20 sluice-heads ...	Works well.
1	30	4 $\frac{1}{2}$	20 " ...	Not straight; bad.
1	26	5	12 " ...	Fair.
1	22	5	12 " ...	"
2	26	6	10 " ...	"
2	22	6	10 " ...	"
1	22	6 $\frac{1}{2}$	10 " ...	"
1	26	6 $\frac{3}{4}$	24 " ...	Too narrow.
1	24	7	14 " ...	"
1	22	7	8 " ...	Good.
2	24	8	14 " ...	Too narrow.
3	24	8	10 " ...	Very good.
2	22	8	8 " ...	Fair.
1	22	8	10 " ...	Good.
1	20	8	10 " ...	"
1	20	8	8 " ...	Fair.
1	26	9	12 " ...	Good.
1	24	10	10 " ...	"
1	30	12	10 " ...	"

The total length of private tail-races in use at Kumara is more than seven miles, and quite double that length are now abandoned, as the ground commanded by them has been worked out. The main tail-races in use have an aggregate length of about three miles.

Wear of Wood (on end) Blocks.

Red-pine (rimu), being the most plentiful timber in the neighbourhood of Kumara, is the timber generally used as paving-blocks for sluices. Other timber is, however, often used, and white-pine will stand longer in sluices than red-pine, as it does not wear away so rapidly.

The following rule will give the life of wood-paving blocks in sluices nearly correct, as it has been deduced from carefully-compiled information obtained from all the sluicing claims on the Kumara Goldfield. The width of the sluice (in inches) multiplied by the thickness of the blocks (in inches) multiplied by 320 gives the number of cubic yards of wash that will pass through the sluice before a set of blocks are worn out:—

Examples.

Width of Sluice.	Thickness of Blocks.	Con- stant.	Quantity.
32 inches	× 6 inches	× 320 =	61,440 cubic yards.
30 "	× 8 "	× 320 =	76,800 "
26 "	× 8 "	× 320 =	66,560 "
24 "	× 7 "	× 320 =	53,760 "
22 "	× 6 "	× 320 =	42,240 "
20 "	× 8 "	× 320 =	51,200 "

Almost any kind of timber would be suitable for paving sluices. Other material has been tried for paving sluices, but in Kumara timber is almost universally used.

A Sluice-head of Water. (Under "The Mines Act, 1891.")

A large number of people not connected with mining, and even a great many miners, have a very hazy idea of what a sluice-head of water really is. If you ask some miners they will say "A sluice-head of water is 40 inches." This is correct under certain circumstances, for a sluice-head of