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Property File

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Big Slide

June 6, 1938.

Grange Consolidated Mines Ltd.
Standard Bank Building,
Vancouver, B. C.

Gentlemen:-

This letter, embodying my notes taken from May 31st to June 3rd, covers development at your Grange Mine since August 14, 1937, the date of my last visit.

During this period a little work was done in the south end of No. 3 level, the south end of No. 6 level, and in the raise 40 feet south of the winze on No. 7 level; the winze was also continued from No. 7 level to No. 8, and a drift driven south on No. 8 level. The details of this work follows; - see also the maps.

No. 3 Level, South: Both the main drift and the crosscut near the face were extended, the former 7 feet and the latter 6 feet. In the drift the vein-fracture can be traced some fifty feet southerly from the end of the quartz to the present face, but for the last 20 feet it is little more than a gouge filled crack. There is no definite cut-off visible, but a turn of the vein to the eastward and a generally crushed condition of the ground indicates the influence of the No. 1 fault which is to be expected at about this point.

At and near the face of the crosscut there is a three to five inch barren appearing quartz vein which is faulted and thrown three or four feet, twice, by slips which do not correspond to No. 1 fault in dip or strike, but which are likely subsidiary fractures caused by the main fault. The quartz vein is probably a stringer and of no special importance.

No. 6 Level, South: The crosscut near the south face of the level, which was being driven in August 1937, was continued a further 30 feet. This work was designed to pick up the vein to the southeast of what was hoped to be the last slip of No. 3 fault, but was not extended far enough to do so. The new work is entirely in gabbro which is comparatively fresh in appearance. At and near the face of the crosscut there is some well defined shearing having approximately the dip and strike of the main vein, but showing no mineralization. This is not the vein, but it suggests the possibility that the vein may be near, since parallel fracturing often occurs in the vein walls.

No. 7 Level, South Raise: This raise was extended on the

vein about 23 feet to a total height above the track of approximately 53 feet. Good ore is said by McPherson to be in the south end of the raise from 20 to 35 feet above the track. Only the top of this shoot is now exposed on account of timbering; here there is a good looking vein with 1.3 feet of quartz well mineralized with sulphides. Sample #347 was taken at this point and assays 2.14 Oz. gold and 2.12 Oz. silver.

Winze from No. 7 to No. 8 Level: The winze was sunk 104.5 feet following the vein on a 70° dip to the No. 8 level, and in addition there is a 14 foot sump. No. 8 level is 98 feet vertically below No. 7.

The winze generally required close lagging but is open for inspection at a few points. So far as can be seen the vein is largely composed of altered rock and gouge with generally only a small proportion of quartz which rarely shows much sulphides and is barren appearing. The following is a rough log of the winze made by Mr. McPherson during sinking, and checked by me wherever the vein is now visible. The samples were taken by McPherson.

Ft. below
Level 7.

- 0 - 10 Old sump, fair small vein.
- 10 - 20 Lagged, said to be barren.
- 21 8" of quartz in south end. Sample #53 0.12 Oz. gold.
- 30 2 Ft. quartz in south end. " 54 0.14 Oz. gold
- 35 Vein nearly 4 feet wide; mixed quartz and gougy rock; lean.
- 36 20" quartz on south end. Sample #55 0.09 Oz. gold.
- 45 3 ft. quartz on south end with sulphides a few inches wide. Sample #56 0.10 Oz. gold. North end is 18" wide and looks leaner.
- 49 About as at 45 feet.
- 60 Vein on the north end 18" mostly gouge; on south end 3 ft wide with only 4" of white quartz.
- 70 2 ft. vein on the north with a little white quartz; on the south end is three or four inches gouge & some quartz
- 70-105 Gouge 1 to 4 feet wide with stringers of white quartz.

The average of the samples is 1.8 feet assaying 0.11 Oz. gold and 0.59 Oz. silver (\$4.09) These samples and the appearance of the vein seem sufficient to prove the absence of commercial ore in the winze between levels 7 and 8.

No 8 Level: The total work on the level is 196 feet, as follows:

Drift north on vein	6 feet.
Drift south on vein, north of No.1 fault	12 "
Crosscut in fault zone	41 "
Drift south on vein, south of No. 1 fault	137 "
	196 "

The vein north of the fault is from two to three feet wide and is mostly gouge and crushed rock with a few small stringers of quartz with rare streaks of pyrite. It is not considered to be worth sampling.

The No. 1 fault has flattened slightly to 65° dip but throws the vein about the same amount as on the upper levels.

The vein where first cut south of the fault is a gouge seam about six inches wide. Going south, quartz soon begins to come in and widens to a foot at 16 feet; from there to the south face quartz is continuous and varies from a few inches to four feet wide. At 60 feet there is a small stringer, mostly gouge, leading off into the hanging-wall; and at 76 feet the vein splits but the two parts join again at 90 feet. At the face the vein is 1.7 feet wide and of fairly good appearance.

The dip of the vein has steepened below the 7th level about 4 degrees, by dip observations, but about 12 degrees according to the surveyed positions of the drifts. (The survey was checked, but there may be some local magnetic variation of the compass.)

The vein has much the same appearance as in the upper levels, except there is a considerable decrease in the total amount of sulphides. Arsenopyrite, pyrrhotite, and sphalerite which occurred sparingly in the upper levels, are not present on the 8th level; pyrite with occasional specks of chalcopyrite appear to be the only sulphides on the eighth.

There is apparently a slight improvement in the condition of the wall-rock (gabbro) on this level, but the vein walls are still weak and both vein and walls continue to sluff off in large slabs.

Milled samples were taken at five foot intervals beginning at 17 feet from where the vein was first cut, south of No. 1 fault, and extending to the face of the drift. Where the vein appeared especially lean or narrow two adjoining cuts were combined into one sample - (see assay map).

The averages of the samples are as follows:-

Length	Width	Oz. Gold	Oz. Silver	Total Value	Sample Nos.
50	2.3	0.05	0.45	\$1.93	327-336 N. end
40	0.9	0.24	0.90	8.80	337-341 Middle
30	1.3	0.32	0.62	11.45	342-346 S. end

There is, therefore, a consistent improvement in values going south along the vein, but even the most southerly section is below the grade of commercial ore when the narrow width is taken into account.

Sample #348 is a chip-sample of ten or twelve tons of coarse ore from Level 8 which is piled on the dump; it assays 0.23 Oz. Gold and 0.78 Oz. Silver per ton. (\$8.36)

Resume: The last years work has not developed any commercial ore, and has considerably reduced the prospects of finding any. The first creshoot south of No. 1 fault on Levels 6 and 7 evidently does not extend down to Level 8, and the second shoot on Level 6 does not extend to level 7, and even if it should open up again below 7 it would probably be partially cut off by No. 3 fault which should be encountered on Level 8 about 60 feet south of the present face. It therefore hardly seems worth while to continue Level 8 further south.

North of the winze on Level 7 the vein, as far as developed, has been low grade and there is no reason to expect that better values would be obtained in Level 8 by extending it to the northward.

Now that the two lower levels are lean and the

mineralization is showing a decrease in gold and in all sulphides except pyrite, there is little justification for sinking to greater depths.

At the south end of Level 6 the shearing at the face northeast of Sta. "Q" vaguely suggests that the vein may be close ahead. However, the values for some distance in south Level 6 have not been particularly good, and the chance of picking up commercial ore here by a short extension of the crosscut is not very encouraging, although entirely possible.

Perhaps the best chance of developing more ore is at the south end of No. 3 Level, south of No. 1 fault. This fault should now show near the last crosscut on the level, but has not been definitely identified, although the ground is somewhat crushed.

The probable position of the vein south of the fault varies about 25 feet, according to whether its probable position is determined by projecting the vein upward from Level 6, or by assuming that the fault has the same throw on Level 3 as on Level 6.

A crosscut driven N 80° E from the present face should cut the vein within a distance of between 35 and 65 feet. This proposed work is sketched on the map in pencil, and is probably a justified gamble for the chance of developing sufficient ore to warrant equipping the mill for a salvage operation.

Ore Reserve: As calculated in my report of April 10th, 1937, the first south creshoot between Levels 6 and 7 contains 2500 tons of "Probable Ore" with a gold content of 0.30 Oz. per ton.

The second creshoot south on Level 6 is 45 feet long and averages 0.35 Oz. gold over a width of 2.3 feet. Allowing for a reasonable dilution with wall rock and gouge in mining, the stopping width is increased to 3.5 feet and the value reduced to 0.21 Oz. gold per ton. Assuming the block to extend 25 feet upward it will contain 300 tons. It is very doubtful if these creshoots can be profitably mined below the 7th and 6th levels, respectively.

There is some ore along the winze between Levels 6 & 7, the tonnage of which cannot be estimated, but probably no great amount. It cannot be taken out until the mine is ready to be abandoned below Level 6, and it is a question whether it would then be worth while.

It is not safe therefore to count on more than 2800 tons of ore at 0.29 Oz. gold, or a gross value of \$28,420.

It is impossible, on account of the lenticular and erratic orebodies in this mine, to make a really dependable estimate of ore in sight, and a large variation, either up or down, from the figures given would not be surprising.

Assuming that former costs would still apply to a salvage operation, costs and metallurgical losses on 2800 tons would amount to \$27,370 which, plus the estimated cost of getting the plant into operation, \$1000, would amount to practically the same as the gross value of the ore.

It is very doubtful if the former costs of operation could be obtained either in the mine or mill until work was

well systematized, which might not be until the ore was nearly exhausted.

Assuming that a small concentrate-cyaniding plant, along the lines suggested in the Ottawa ore-test report, be installed, total costs of mining, treatment, and marketing might be reduced \$2.00 per ton leaving an apparent "operating profit" of \$5600 out of which the cost of the cyanide plant must be taken. I do not know off hand what the cost of a satisfactory cyanide plant would be, but doubt if it would be less than \$10,000, installed.

It seems, therefore, that at least double the amount of ore now visible must be developed before any salvage operation will be surely profitable.

It is probable that if the mill were operating a few tons of ore could be picked out from numerous places in the mine which might in the aggregate add considerably to the 2800 tons figured above. On the other hand, there is no certainty that the block of 2500 tons of ore presumed to exist south of No. 1 fault between Levels 6 and 7 may not prove to be discontinuous between the levels.

The best chance to develop more ore appears to be to crosscut to the vein south of No. 1 fault on No. 3 level and to explore it above the south oreshoot on Level 6.

I recommend that this be done.

Considering the weakness of the showing in the two lower levels of the mine, I do not believe that further development on those levels, or at greater depth, is justified and unless a substantial amount of ore is developed by the proposed work on No. 3 level. I would recommend a permanent shut down.

As an alternative, it is possible that a man, or small group of men, could be found who would operate the mine and mill under a lease, thereby protecting the Grange company from any risk of loss, and possibly paying a small amount in royalties.

Yours very truly,

Wm. C. Starr