*TR12 - 174 - 176*

# R. 558

## GOLD ORE—WESTERN AUSTRALIA

### Sample

A sample of gold ore containing a considerable quantity of clay was submitted by Mr W. Manson. The sample was stated to have been obtained from Kanowna, Western Australia and was in the form of semi-dry clay-like nodules. The sample weighed approximately 8 kg and contained 9.5% moisture.

Tests were required to—

    (1) Determine the gold content of the sample.

    (2) Estimate the recovery of gold obtainable by panning.

    (3) Determine the size analysis of the sample and size distribution of the gold content.

No responsibility is accepted for results except as applied to the sample tested.

### Experimental

Two samples, each about 1 kg were riffled out and used for the tests.

#### TEST N1—CONCENTRATION OF GOLD BY PANNING

### Disintegration and Dispersion

This was attempted by pulping the sample with about 10 lb/ton sodium silicate in water at a pulp density of about 25% solids. Thirty minutes violent agitation in the laboratory Fagergren flotation machine failed to achieve adequate disintegration of the pug.

A further thirty minutes agitation in the laboratory ball mill gave a considerable improvement, although disintegration was not yet complete. Final disintegration of the remaining pug was achieved by violent agitation in a small high speed mixer.

## Panning

The dispersed pulp was allowed to settle and the suspended slime material removed by decantation. The panning was carried out on the residue with the tailing being repanned once.

### Results—Dry Basis

| Product | Per Cent Weight | Total Au Content (mg) | Per Cent Au Distribution |
|---|---|---|---|
| Pan concentrate .. .... .... | 0.18 | 46.16 | 94.2 |
| Pan tailing .... .... .... | 47.77 | 1.89 | 3.9 |
| Slime decant .. .... .... .... | 52.05 | 0.92 | 1.9 |

### Calculated Head Value

The total weight (dry) treated of 1,099 grams, contained 48.97 mg of gold. This is equivalent to an assay of 1.45 oz Au/ton.

## TEST N2—SIZING ANALYSIS

### Disintegration and Dispersion

Procedure was varied from N1 by soaking the sample in water for sixteen hours prior to agitation and dispersion. This was effective in achieving partial disintegration and comparatively gentle agitation with about 4 lb/ton sodium phosphate resulted in near total dispersion. The time factor is probably most important in slaking of the material.

### Sizing

This was done by wet screening on the indicated screens and sedimentation of the minus 200 mesh material for the plus and minus 20 micron fraction (quartz equivalent).

### Results—Dry Basis

| Fraction | Per Cent Weight | Au Assay (oz/ton) | Per Cent Au Distribution |
|---|---|---|---|
| + 52 mesh .... .... .... .... .... | 7.3 | 12.44 | 66.7 |
| 100 mesh .... .... .... .... .... | 10.9 | 1.50 | 12.0 |
| 200 mesh .... .... .... .... .... | 7.8 | 1.29 | 7.4 |
| −200 mesh+20 microns .. | 12.9 | 1.28 | 12.1 |
| − 20 microns .... .... .... .... | 61.1 | 0.04 | 1.8 |
| Composite Head .... .... .... | 100.0 | 1.36 | 100.0 |

## Head Value

The calculated head values of N1 and N2, i.e., 1.45 and 1.36 oz per ton respectively are in reasonably close agreement and since these are based on weights of approximately 1 kg each it was considered that the mean of these figures would represent a more accurate head value than one obtained from the assay of a small quantity.

This value is 1.4 oz per ton.

## Remarks

Tests N1 and N2 are confirmatory of one another and it appears that once the difficulty of disintegration of the material is overcome, the gold, which is relatively coarse, would be easily recoverable by comparatively simple processes, such as amalgamation or straking, although no testing work has been done to confirm this. It is suggested that hydrocycloning of the pulp would be effective in discarding the minus 20 micron material, some 60% by weight, which would cause difficulties in subsequent treatment.