O T T A W A August 12th, 1942.

# R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1281.

## Examination of Mill Tailing and Mill Solution from the De Santis Porcupine Mines Limited Timmins, Ontario.



(Copy No. 8.)

BUREAU OF MINES
DIVISION OF METALLIC MINERALS

ORE DRESSING AND
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CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Shipments:

One can of mill tailing, weighing approximately 50 pounds, was received on April 14th, 1942. Two bottles of mill solution were received on April 30th, 1942.

The samples were submitted by C.M. Beck, Manager, De Santis Porcupine Mines Limited, Timmins, Ontario.

Location of the Property:

This property is located in Ogden township, in the Porcupine mining area of northern Ontario. It is a few miles south of the town of Timmins.

Sampling and Assaying:

The sample of mill tailing was assayed and reported as follows:

| | | |
|---|---|---|
| Gold | - | 0.014 oz./ton |
| Silver | - | 0.015 " |
| Iron | - | 6.00 per cent |
| Sulphur | - | 2.77 " |

The samples of mill solution were assayed and reported as follows:

| | | Pregnant Solution | Barren Solution |
|---|---|---|---|
| Sodium cyanide, lb./ton | - | 0.56 | 0.56 |
| Lime | - | 0.49 | 0.48 |
| Reducing power, ml. N/10 $KMnO_4$/litre | - | 290 | 283 |
| KCNS, grams/litre | - | 0.46 | 0.41 |
| Copper, | - | 0.06 | 0.06 |
| Nickel, | - | 0.03 | 0.03 |
| Gold, oz./ton | - | 0.046 | 0.0015 |

Experimental Tests:

The mill tailing sample submitted was thought to assay somewhere in the neighbourhood of 70 cents per ton, representing an increase of 20 cents from the normal tailing assay of 50 cents per ton. The problem was to trace down the reason for the increase in the tailing assay and to offer a solution. Our assays, however, showed the tailing samples to assay approximately 50 cents per ton both on samples as received and after washing with water. Bulk sample assays and screen analyses checked closely on all samples.

(Experimental Tests, cont'd) -

The following screen analysis on a sample of tailing as received is typical of a number carried out:

| Mesh | | Weight, per cent | Assay, Au oz./ton |
|---|---|---|---|
| +100 | - | 11.20 | 0.01 |
| -100 +150 | - | 11.18 | 0.015 |
| -150 +200 | - | 9.74 | 0.015 |
| -200 | - | 67.88 | 0.014 |
| Tailing Sample | - | 100.00 | 0.01376 |

This assay amounts to 49 cents per ton of tailing and is apparently what would normally be expected.

A sample of the tailing was agitated in cyanide solution, 1.0 pound NaCN per ton, for 24 hours. The re-cyanided tailing assayed as follows:

| Mesh | | Weight, per cent | Assay, Au oz./ton |
|---|---|---|---|
| +100 | - | 10.9 | 0.015 |
| -100 +150 | - | 12.8 | 0.015 |
| -150 +200 | - | 7.3 | 0.01 |
| -200 | - | 69.0 | 0.01 |
| Tailing | - | 100.00 | 0.0112 |

This test would seem to indicate that more gold could be extracted by a longer period of agitation or by improving the condition of the mill solutions. The assay of the solution samples submitted showed a rather high content of potassium thiocyanate. This is likely to set up a reducing condition in the solution which would tend to reduce extraction. Owing to the fact that the sulphides in the sample submitted had been finely reground selectively, it was impossible to concentrate them on a table as had been suggested.

Conclusions:

Owing to the discrepancy in assays it is recommended that another sample of tailing be submitted or preferably that a sample of ore be submitted for experimental testing. Previous work done here on ore from this property appeared to check closely the results obtained by an outside firm and from this it seems probable that still finer regrinding of the sulphides would improve extraction. The addition of lead salts to the mill solutions might also be tried as a means of keeping the solutions in better working condition.

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