

TR11-143-145

R. 506

**25. KING ISLAND SCHEELITE (1947) LTD: TILTING DECK
TESTS ON VANNER TAILINGS****Sample**

A pulp sample of vanner tailings was submitted by the above company for tilting deck concentration tests.

This product, containing about 10-12 per cent WO_3 is currently returned, without further treatment, to the head of the rougher scheelite flotation cells.

The object of the tests was to determine whether a further quantity of good grade gravity concentrate could be stripped from the vanner tailing before its return to flotation.

Test Procedure

A series of tilting deck tests were performed on the above sample. Variables examined were deck slope, concentrating period and feed pulp density. Pulp flow rate was kept constant at one gallon per minute per foot of deck width except in one case where the pulp flow rate was halved.

Sizing analyses with WO_3 distributions were made of the feed sample and tailings from selected tests.

Rougher tests only were performed.

Assays of the various products were made by staff of King Island Scheelite (1947) Ltd.

Summary

The rougher tilting deck tests show a range of recoveries of WO_3 from 30.2 to 67.3 per cent with related grades of concentrate from 31.3 to 16.0 per cent WO_3 . Recoveries are generally high in sizes down to C.S. 3 (equiv. 13μ scheelite particle) but depreciate rapidly in sizes finer than this.

The feed sizing analysis shows that some 30 per cent of the scheelite is coarser than C.S. 4 and it should therefore be feasible to recover these fractions in a good grade concentrate if the scheelite is in a free state.

Test No. 6 for example shows a recovery of 41.7 per cent of the scheelite in a concentrate assaying 26.4 per cent WO_3 . It is probable that cleaner deck treatment would upgrade this concentrate to sale grade without diminishing the overall recovery to less than 30 per cent.

Test Results

| Test No. | Deck | | Feed % Solid | Concentrate Per Cent | | | Tailing Per Cent | | |
|----------|----------------|-----------|--------------|----------------------|-----------------|-----------------------|------------------|-----------------|-----------------------|
| | Slope in./foot | Time min. | | Weight | WO ₃ | WO ₃ Dist. | Weight | WO ₃ | WO ₃ Dist. |
| 1 | 2 | 5 | 15 | 11.6 | 31.3 | 30.2 | 88.4 | 9.5 | 69.8 |
| 2 | 2 | 4 | 15 | 15.9 | 30.0 | 39.7 | 84.1 | 8.6 | 60.3 |
| 3 | 2 | 3 | 15 | 22.2 | 23.2 | 43.5 | 77.8 | 8.6 | 56.5 |
| 9* | 2 | 6 | 15 | 41.6 | 18.8 | 67.3 | 58.4 | 6.5 | 32.7 |
| 10 | 2 | 6 | 10 | 12.8 | 28.8 | 31.0 | 87.2 | 9.4 | 69.0 |
| 8 | 1½ | 6 | 15 | 21.6 | 24.0 | 44.3 | 78.4 | 8.3 | 55.7 |
| 6 | 1½ | 5 | 15 | 18.9 | 26.4 | 41.7 | 81.1 | 8.6 | 58.3 |
| 7 | 1½ | 4 | 15 | 26.5 | 23.6 | 47.2 | 73.5 | 9.5 | 52.8 |
| 4 | 1 | 5 | 15 | 34.6 | 18.8 | 55.4 | 65.4 | 8.0 | 44.6 |
| 5 | 1 | 3 | 15 | 39.2 | 16.8 | 54.6 | 60.8 | 9.0 | 45.4 |
| 11 | 1 | 6 | 10 | 44.3 | 16.0 | 60.5 | 55.7 | 8.3 | 39.5 |

* Feed pulp flow rate 0.5 gal/min/foot deck width

Sizing Analyses

HEAD SAMPLE—K.I.S. VANNER TAILING

| Fraction | Per Cent | | WO ₃ Distribution | |
|------------|----------|-----------------|------------------------------|---------------|
| | Weight | WO ₃ | Per Cent | Per Cent Cum. |
| +200 mesh | 0.9 | 6.8 | 0.68 | 0.68 |
| C.S. 1 | 5.2 | 17.2 | 8.54 | 9.22 |
| C.S. 2 | 7.1 | 9.4 | 6.37 | 15.59 |
| C.S. 3 | 17.8 | 8.8 | 14.96 | 30.55 |
| C.S. 4 | 27.5 | 10.6 | 27.84 | 58.39 |
| C.S. 5 | 16.1 | 14.2 | 21.83 | 80.22 |
| C.S. 6 | (25.4) | (8.3) | (19.78) | 100.00 |
| Comp. Head | 100.0 | 10.5 | 100.0 | |

TILTING DECK TAILINGS

Test No. 1

| Fraction | Per Cent | | WO ₃ Dist. | | % Recovered in Conc. from Individual Sizes |
|-----------|----------|-----------------|-----------------------|--------|--|
| | Weight | WO ₃ | % | % Cum. | |
| +200 mesh | 0.5 | 2.3 | 0.1 | 0.1 | 85.3 |
| C.S. 1 | 5.3 | 6.4 | 3.6 | 3.7 | 70.7 |
| C.S. 2 | 6.6 | 5.3 | 3.7 | 7.4 | 59.2 |
| C.S. 3 | 17.9 | 6.8 | 12.8 | 20.2 | 40.5 |
| C.S. 4 | 27.6 | 10.1 | 29.3 | 49.5 | 26.3 |
| C.S. 5 | 13.6 | 14.0 | 20.0 | 69.5 | 35.8 |
| C.S. 6 | (28.5) | (10.1) | (30.5) | 100.0 | Neg. |
| Composite | 100.0 | 9.5 | 100.0 | | 30.2 Mean Rec. |

Test No. 4

| | | | | | |
|-----------|--------|-------|-------|-------|----------------|
| +200 mesh | 0.4 | 2.3 | 0.1 | 0.1 | 94.1 |
| C.S. 1 | 1.1 | 3.2 | 0.4 | 0.5 | 97.9 |
| C.S. 2 | 1.1 | 1.5 | 0.2 | 0.7 | 98.8 |
| C.S. 3 | 8.7 | 4.1 | 4.5 | 5.2 | 86.6 |
| C.S. 4 | 26.1 | 8.3 | 27.1 | 32.3 | 56.5 |
| C.S. 5 | 18.4 | 14.2 | 32.7 | 65.0 | 33.1 |
| C.S. 6 | (44.2) | (6.3) | 35.0 | 100.0 | 21.1 |
| Composite | 100.0 | 8.0 | 100.0 | | 55.4 Mean Rec. |

Test No. 6

| | | | | | |
|-----------|--------|-------|--------|-------|----------------|
| +200 mesh | 0.3 | 2.2 | 0.1 | 0.1 | 91.2 |
| C.S. 1 | 3.6 | 3.2 | 1.3 | 1.4 | 99.1 |
| C.S. 2 | 5.4 | 3.0 | 1.9 | 3.3 | 82.7 |
| C.S. 3 | 16.3 | 5.2 | 9.9 | 13.2 | 61.2 |
| C.S. 4 | 28.3 | 9.9 | 32.6 | 45.8 | 31.8 |
| C.S. 5 | 17.6 | 13.4 | 27.4 | 73.2 | 26.7 |
| C.S. 6 | (28.5) | (8.1) | (26.8) | 100.0 | 21.1 |
| Composite | 100.0 | 8.6 | 100.0 | | 41.7 Mean Rec. |

Test No. 10

| | | | | | |
|-----------|--------|--------|--------|-------|----------------|
| +200 mesh | 0.4 | 1.9 | 0.1 | 0.1 | 89.7 |
| C.S. 1 | 4.0 | 3.2 | 1.4 | 1.5 | 88.6 |
| C.S. 2 | 6.0 | 2.9 | 1.8 | 3.3 | 80.5 |
| C.S. 3 | 17.4 | 2.7 | 5.0 | 8.3 | 76.9 |
| C.S. 4 | 28.3 | 10.0 | 30.1 | 38.4 | 25.4 |
| C.S. 5 | 17.7 | 11.2 | 21.1 | 59.5 | 33.3 |
| C.S. 6 | (26.2) | (14.5) | (40.5) | 100.0 | Neg. |
| Composite | 100.0 | 9.4 | 100.0 | | 31.0 Mean Rec. |

C.S.=Cyclosizer Fraction

Note: Figures marked thus () are derived values.

Scheelite particle diameter equivalents of C.S. Fractions

| | | |
|------------|---------|-----------------|
| - 200 mesh | +C.S. 1 | - 76+24 microns |
| | C.S. 2 | - 24+19 microns |
| | C.S. 3 | - 19+13 microns |
| | C.S. 4 | - 13+ 9 microns |
| | C.S. 5 | - 9+ 7 microns |
| | C.S. 6 | - 7 |