

Out.  
4. nov. 1987.

BIGGEJAVRI DAVIDITE ORE

Sample Material Balance :

A - Unprocessed material

A1 - Uncrushed, original size	60 kg
A2 - Crushed material (-4 mm)	25 kg

B - Processed material

B1 - Carpco treated	200 kg
B2 - Grind for bench testing	20 kg
B3 - Last mill load	20 kg

Total sample material received	325 kg
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Ready samples :

Rougher separation products from Carpco WHIMS ;

5 kg Concentrate 1 (c.a. 900 ppm Sc)  
40 kg Concentrate 2 (c.a. 300 ppm Sc)

Grinding in pilot scale : In Moment Mill , 67% solids, 18 kg/h ,  
in closed circuit with Sweco Screen - 65 Mesh .

Screen analyse of the grind product : (Tyler Screens and  
Warman Cyclosizer on -200 Mesh material)

Mesh (Micron)	Weight %	Cumulative Passing %
- 65 + 100 Mesh	2.81	2.81
- 100 + 150 "	5.05	7.86
- 150 + 200 "	8.53	<u>16.39</u>
- 200 + 270 "	14.26	30.65
- 270 + 325 "	7.45	38.10
- 325 + 400 "	5.50	43.60
- 400 Mesh	56.40	
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- 74 + 46 Micron	11.04	27.43
- 46 + 34 Micron	12.27	39.70
- 34 + 25 Micron	14.40	54.10
- 25 + 17 Micron	13.15	67.25
- 17 + 14 Micron	4.80	72.05
- 14 Micron	27.95	

A more complete range will be covered by Sedigraph analyse  
later on. Cyclosizer was run mainly for providing submicron  
size fractions for XRF analyses.

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Applied Beneficiation Tests ;

A - Magnetic (Carpco WHIMS)

A1 - 200 kg - Primary separation (Rougher)

A2 - 4 kg - Full separation (Rougher, Scavenger, Cleaner)

B - Magnetic + Flotation

Flotation on intermediate product (Concentrate 2) from Carpco

C - Flotation

C1 - On intermediate Carpco product (Flotation Tests: 1,4,5)

C2 - On original "deslimed" material (Flotation Tests: 3,6,10)

C3 - On original "Un-deslimed" material (Flotation Tests: 2,7,8,11)

C4 - On original "Un-deslimed" material with regrind (Fl.Test: 11)

A1 - CarpcO Testing : 200 kg - Rougher separation  
 15 kg/h capacity on average

Product	Weight %	Sc ppm	Sc Recovery %
Concentrate 1	3.6	821	20.67
Concentrate 2	22.4	291	45.58
Tailing 1	24.5	42	7.20
Tailing 2	22.7	37	5.87
Slime + Losses	26.8	110 Calculated	20.68
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Total Feed	100.0	143 Analysed	100.00
Concentrate 1+2	26.0	364 ppm	66.25 %

§ - Tailings will be scavenged and the magnetic product of this step will be combined with the main magnetic concentrates prior to final cleaning step.

A2 - CarpcO Testing : 4 kg - Full separation  
8 kg/h capacity

Product	Weight %	Sc ppm	Sc Recovery %
<u>Rougher</u>			
Concentrate	24.0	391	67.2
Tailing	69.5	50	24.9
Slime	6.5	170 Calculated	7.9
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Total Feed	100.0	140	100.0
<u>Scavenger</u>			
Concentrate	6.2	210	9.4
Tailing	60.6	30	13.1
Slime	2.7	130 Calculated	2.4
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Rougher Tailing	69.5	50	24.9
<u>Cleaner</u>			
Concentrate 1	4.0	870	24.5
Concentrate 2	8.8	605	37.4
Tailing 1	12.1	110	9.3
Tailing 2	5.3	145	5.4
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Concentrates from Rougher+Scavenger	30.2	361	76.6
Cl. Conc. 1+2	12.2	688 ppm	61.9 %
Cl. Conc. 1+2 + Tailing 2	18.1	529 ppm	67.3 %

B - Flotation Tests on Carpco intermediate product (Concentrate 2)  
 Feed: 22.4 Wt.% of total feed, 291 ppm Sc, 45.6% Sc Recovery.

Stepwise collector addition in 3 steps, no cleaning :

Results from Flotation Test 4.

Product	Weight %	Sc ppm	Sc Recovery% (of the total feed)
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Concentrate 1	5.97	935	38.65
Concentrate 2	4.35	160	4.82
Concentrate 3	1.02	85	0.60
Tailing	11.06	20	1.53
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Feed - Carpco Intermediate C.	22.40	291	45.60

Combined Magnetic + Flotation Results :

Carpco Conc.1 + Flot.Conc.1	9.6	892 ppm	59.4 %
Carpco Conc.1 + Flot.Conc.1 + Flot.Conc.2	13.9	666 ppm	64.0 %

C2 - Flotation Tests on original "deslimed" material :

§ Without cleaning (3 steps rougher flotation) - Test 3.

Product	Weight %	Sc ppm	Sc Recovery %
Concentrate 1	4.20	1150	34.77
Concentrate 2	7.90	420	23.89
Concentrate 3	3.70	135	3.60
Tailing	40.20	10	2.89
Slime	44.00	110	34.85
<b>Total Feed</b>	<b>100.00</b>	<b>139</b>	<b>100.00</b>
Concentrate 1+2	12.10	673	58.66
Concentrate 1+2+3	15.80	547	62.26

§ With cleaning (3 steps rougher + 2 steps cleaner) - Test 10.

Product	Weight %	Sc ppm	Sc Recovery %
Cleaner Conc.1	8.6	910	55.90
Cleaner Conc.2	7.4	295	15.59
Cleaner Tailing	7.6	60	3.25
Rougher Tailing	48.4	10	3.46
Slime + Losses	28.0	110	21.80
<b>Total Feed</b>	<b>100.0</b>	<b>140</b>	<b>100.00</b>
Concentrate 1+2	16.0	625	71.49 %

C3 - Flotation Tests on original "Un-deslimed" material :

§ Without cleaning (4 steps rougher flotation) - Test 2.

Product	Weight %	Sc ppm	Sc Recovery %
Concentrate 1	3.83	215	5.44
Concentrate 2	13.44	475	42.17
Concentrate 3	7.51	355	17.61
Concentrate 4	17.10	240	27.11
Tailing	58.12	20	7.67
Total Feed	100.00	151 Calculated	100.00
Conc.1+2+3+4	41.88	334	92.33
Concentrates 2+3	20.95	432	59.78

§ With cleaning (3 steps rougher + 2 steps cleaner) - Test 7.

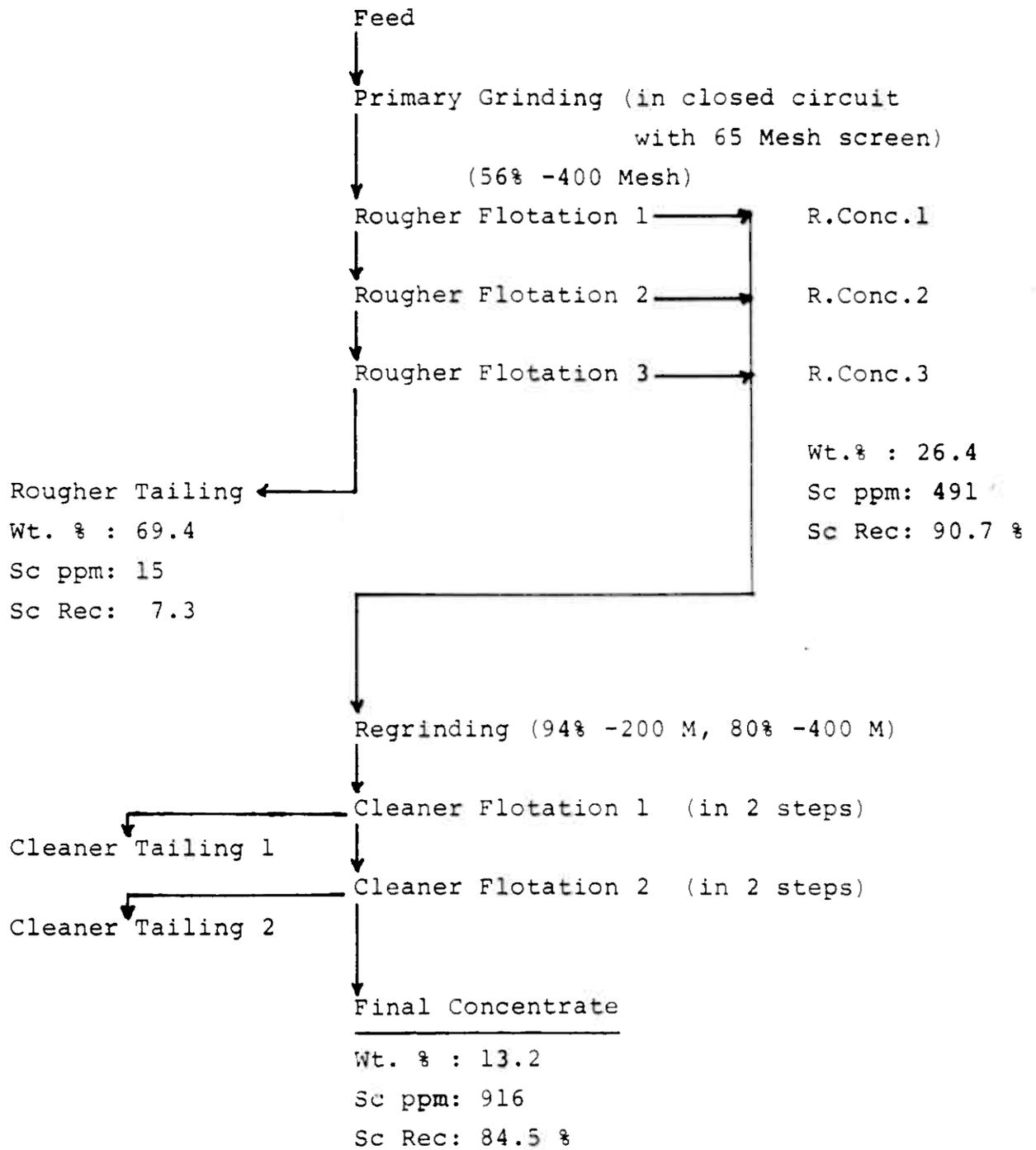
Product	Weight %	Sc ppm	Sc Recovery %
Cleaner Conc.1	8.0	925	52.86
Cleaner Conc.2	3.6	455	11.70
Cleaner Tailing	8.2	135	7.91
Rougher Tailing	71.0	45	22.82
Slime + Losses	9.2	72 Calculated	4.71
Total Feed	100.0	140	100.00
Cleaner Conc.1+2	11.6	779	64.56 %

C4 - Flotation tests on original "Un-deslimed" material,  
 with regrinding and re-floating : (Flotation Test 11)

§ Flowsheet included

Product	Weight %	Sc ppm	Sc Recovery %
Cleaner Conc.1	10.1	1060	74.8
Cleaner Conc.2	3.1	446	9.7
Cleaner Tail.1	6.0	34	1.4
Cleaner Tail.2	7.2	95	4.8
Rougher Tailing	69.4	15	7.3
Slime + Losses	4.2	70 Estimated	2.0
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Total Feed	100.0	143 Calculated	100.0
Cleaner Conc.1+2	13.2	916 ppm	84.5 %

Flowsheet For Test 11 (Flotation-Regrinding-Flotation)



Flotation Test 11

Stepwise Product Distribution :

§ Rougher Flotation (3 consecutive steps)

Product	Weight %	Sc ppm	Sc Recovery %
Total 3 concentrates	26.4	491	90.7
Tailing	69.4	15	7.3
Total slime + losses	4.2	70	2.0
Total Feed	100.0	143	100.0

§ Cleaner 1 flotation (after regrinding)

Total 2 concentrates	20.4	626	89.3
Cleaner 1 Tailing	6.0	34	1.4
Total Rougher Conc.	26.4	491	90.7

§ Cleaner 2 flotation

Cleaner 2 - Conc.1	10.1	1060	74.8
Cleaner 2 - Conc.2	3.1	446	9.7
Cleaner 2 Tailing	7.2	95	4.8
Cleaner 1 Conc.	20.4	626	89.3
Cleaner 2 - Conc.1+2	13.2	916 ppm	84.5 %

Particle size analyses on Primary Grind, Regrind and Final Product

Tyler Mesh	Primary Grind	Regrind	Final Product
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+100	2.81	0.27	0.23
- 100 +200	13.58	5.68	3.79
- 200 +400	27.21	14.55	18.56
- 400	56.40	79.50	77.42
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Total	100.00	100.00	100.00