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Intex Resources ASA	11656-001	Molynor AS		

Tittel

An Investigation into the Recovery of Molybdenum Ore Composite from the Hurdal Orebody

Forfatter	Dato	År	Bedrift (Oppdragsgiver og/eller oppdragstaker)
Mokrzycki Paul, Imeson Dan	22.07	2008	Molynor AS v/ Intex Resources ASA

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Oppredning miljø		Hurdalfeltet Nordli Nordliforekomsten

Råstoffgruppe	Råstofftype
Malm/metall	Mo

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Rapporten er på engelsk og er utført av SGS Lakefield Research Limited på oppdrag for Intex Resources ASA).
Rapporten omhandler formålstesting av reagenser og flytskjema-muligheter for flotasjonsutvinningen av molybden på malm fra Hurdalen.
En får beskrevet hvordan 155 kg med borkjernemateriale blir prossesert ned til aktuelle provestørrelser for de forskjellige testene.som maletest og flere forskjellige oppredningstekniske forsøk.
Rapporten beskriver videre bruken av forskjellige reagenser i flot.forsøkene. her oppnår en et konsentrat på 57% Mo med en utvinning på 78%. Det anslås at en kontinuerlig flotasjon vil øke utvinningen til 85-90%.
Det foreslås flere alternativer til flotasjonsagenser, flotasjon fra flere soner i forekomsten, malbarheten i forhold til malmhardhet og avgangens påvirkning på det ytre miljøet.

An Investigation into

THE RECOVERY OF MOLYBDENUM ORE COMPOSITE FROM THE HURDAL ORE BODY

prepared for

Intex Resources ASA

Project 11656-001 – Final Report
July 22, 2008

NOTE:
This report refers to the samples as received.

The practice of this Company in issuing reports of this nature is to require the recipient not to publish the report or any part thereof without the written consent of SGS Minerals Services.

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Executive Summary

This report summarizes scoping testwork completed for Intex Resources ASA (formerly Crew Minerals AS). The testwork investigated reagent and flowsheet options for the flotation recovery of molybdenum, on ore from the Hurdal property in Sweden. The scope of the program involved; sample preparation of a single composite, grindability testing, high-definition QEMSCAN™ mineralogical characterization, rougher kinetics testing, and batch cleaner testing. The Hurdal composite graded 0.12% Mo and 0.79% S.

Grindability testing on the Hurdal composite resulted in a Bond Ball Work Index (BWI) of 14.7 kWh/t. Relative to other BWI indices in the SGS database, this result is indicative of a medium hardness ore.

Four rougher kinetics tests were performed. Commercial diesel (Diesel #2) was used as the 'fuel oil' collector, and pine oil was used as the frother. The rougher kinetics tests indicated that a flotation time of at least 20 minutes would be required for maximum recovery of molybdenum, at a primary grind of P_{80} = 114 µm. Rougher molybdenum recoveries using this primary grind were typically in the range of 90-92%.

Subsequent cleaner testing further explored changes and optimization to reagent addition in the roughers. Fuel oil dosage was reduced from 80 g/t to 55 g/t, and pine oil was eliminated in favour of MIBC. The combined effect of these two changes allowed for better molybdenum upgrading in the cleaners. MIBC dosage in the roughers was 50 g/t.

Six cleaner tests were performed to study the effects of different reagents, dosages, and regrind, on the upgrading characteristics of the ore. It was determined that only 4-5 cleaner stages were required to sufficiently upgrade the final concentrate to a saleable grade (at least 50% Mo).

Two dispersants were tested to mitigate the presence of talc-like mineralization (phyllosilicates) in the cleaner concentrates: carboxy-methyl cellulose (CMC) and sodium silicate (Na_2SiO_3). Sodium silicate was more effective at this function since CMC adversely affected molybdenum recovery. With higher sodium silicate dosages, concentrate grades improved but at the expense of molybdenum recovery to the final concentrate.

The cleaner test with the best metallurgical performance utilized a conventional lime/NaCN pyrite depressant scheme, five stages of cleaning, and a second regrind before the fifth stage of cleaning. The final concentrate graded 57% Mo with a 78% molybdenum recovery to the final concentrate. In a continuous environment with re-circulation of middling streams, SGS anticipates molybdenum recoveries would improve to 85-90%.

Mineralogical characterization (by XRD and QEMSCAN™ analysis) of a rougher concentrate indicated that it largely consisted of molybdenite, with minor amounts of pyrite. The largest constituent of non-sulphide gangue was quartz. Molybdenite was highly liberated in the rougher concentrate sample. Based on the test results and the mineralogical investigation, the Hurdal ore is not considered to be highly refractory in nature. Molybdenite liberation of 96% can be achieved with a regrind size of 20 µm.

Introduction

This report summarizes scoping testwork completed for Intex Resources ASA (formerly Crew Minerals AS). The testwork investigated reagent and flowsheet options for the flotation recovery of molybdenum, on ore from the Hurdal property in Sweden. The scope of the program involved: sample preparation of a single composite, grindability testing, QEMSCAN™ mineralogical characterization, rougher kinetics testing, and batch cleaner testing. All work referenced in this report was completed under the internal SGS project number of CALR-11656-001.

The primary goal of this testwork was to assess the flotation response of the ore and conceptualize a flowsheet. Various reagents and flowsheets were examined to achieve this goal.

The testing program was completed over the months of September 2007 to January 2008. Mr. Jon Steen Petersen, and Ms. Jette Blomsterberg, both of Intex Resources ASA, were regularly updated with new results as the testing progressed.

Paul Mokrzycki, M.A.Sc.
Project Metallurgist

Dan Imeson, MSc.
Manager – Flotation Group

Testwork Summary

1. Sample Receipt and Preparation

Approximately 155 kg of drill core shipped from Crew Minerals' Hurdal Molybdenum ore body was received at the SGS Lakefield site on August 28, 2007. This shipment was assigned the receipt number of 0373-AUG07. Upon receipt, sample inventory and weights were taken, and compared with a shipping list from the client. The inventory list is given in Appendix A. Once inventoried, the drill core was crushed to -6 mesh and combined, and 10 kg of material riffled out for Bond ball mill work index testing. The remainder of the material was stage crushed to -10 mesh and riffled into 10 kg charges. Approximately 150 grams of material was extracted for head sample chemical analysis.

2. Material Characterization

2.1. Chemical Analysis

The head analysis sample obtained from initial sample preparation was assayed for Mo, W, and S and included an ICP metal scan. A list of the assays is given in Table 1.

Table 1. Head Assay of Hurdal Drill Core Composite

Element	Assay	Element	Assay
XRF		*ICP*	
Mo %	0.12	Li g/t	< 5
W %	< 0.01	Mg g/t	1800
S %	0.79	Mn g/t	200
ICP		Na g/t	28000
Ag g/t	0.3	Ni g/t	25
Al g/t	60000	P g/t	390
As g/t	< 10	Pb g/t	6
Ba g/t	460	Sb g/t	< 0.8
Be g/t	3.3	Se g/t	< 10
Bi g/t	< 0.6	Sn g/t	< 2
Ca g/t	2300	Sr g/t	160
Cd g/t	< 2	Ti g/t	1700
Co g/t	< 0.6	Tl g/t	0.5
Cr g/t	14	U g/t	5.3
Cu g/t	7.9	V g/t	3
Fe g/t	8600	Y g/t	7.5
K g/t	37000	Zn g/t	29

The analyses indicate that sulphides were mainly comprised of molybdenite and iron sulphides, in a ratio of approximately 1:6.

3. Bond Ball Mill Work Index Testing

The Bond ball mill grindability test is performed according to the original Bond procedure. The closing size of the BWI for this test was 150 mesh (106μm) with a product P_{80} of 127 μm. The BWI was determined to be 14.7 kWh/t for the Hurdal ore. This is considered to be a 'medium hardness' ore in the context of the SGS BWI database. A histogram of the relative hardness of the Hurdal ore is shown in Figure 1. Details on testing data and calculations can be found in Appendix B.

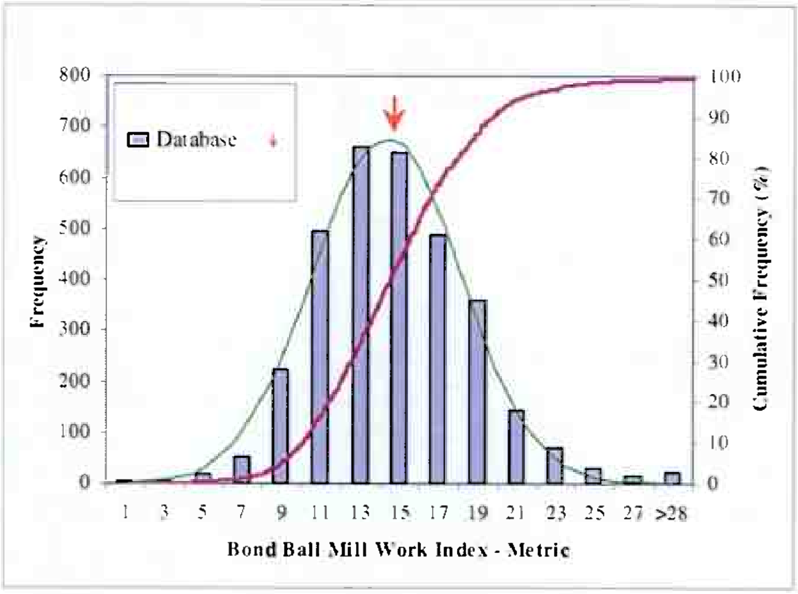


Figure 1. Hardness of the Hurdal Ore (Red Arrow) Relative to the SGSBWI Database

4. Metallurgical Testwork

The suite of tests discussed here serve as a 'scoping' test program to investigate the metallurgical response of Hurdal ore with flotation. An initial set of rougher tests were conducted to establish a basic rougher flowsheet and grind times for further testwork. Cleaner testwork was completed to assess upgrading potential of the ore to a saleable concentrate. In total, four rougher, and eight batch cleaner tests were completed.

4.1. Rougher Metallurgy

Four rougher tests, F1-F4, were conducted, with the results presented in Table 2. The test sheets are provided in Appendix C. Commercial Diesel Fuel was used as the collector (the Diesel has been called "fuel oil" in this report). Pine oil was used as the frother. These tests were performed to establish an appropriate rougher flowsheet, as well as to establish an appropriate grind for optimal Mo recovery. Up to four incremental rougher concentrates were collected for each test, followed by a scavenger concentrate. The fuel oil was added to the primary grind because high attrition forces are required to adequately disperse the fuel oil over the mineral surfaces. Test F1 had a rougher time of 10 minutes, with an additional 4 minute scavenger stage.

The rougher Mo recovery was 86%, and with the scavenger concentrate, overall Mo recovery of the flowsheet was 88%. Results for F1 (Appendix C) indicated that the Mo grade of the third rougher concentrate was 0.36% Mo. The rougher scavenger concentrate assayed at 0.56% Mo. Collector was added in the scavenger stage, and ideally, the scavenger concentrate should assay at head grade (since in a plant process the scavenger concentrate will be recycled back into the roughers).

The significance of the Mo grade in the scavenger concentrate being both higher than the third rougher concentrate, and the head grade, is that either more collector or more residence time is required in the roughers. An increase in rougher time was implemented in tests F2-F4, with the inclusion of a 4 minute rougher stage. Tests F1 and F4 had the same primary grind and the inclusion of the additional 4 minute rougher stage increased Mo recovery by 1%. The scavenger time in F2-F4 was extended to 6 minutes. The total float time in tests F2-F4 increased to 20 minutes. Test F3 had the highest Mo recovery in the overall rougher concentrate at 91%, and improved to 92% with the scavenger.

Test F3 had the finest grind at 114 µm, with a total fuel oil dosage of 80g/t. Test F2 had the same fuel oil dosage as F3, but had a coarser grind at 150 µm. Mo recovery in F3 was 2% greater than F2. Mass pull to the rougher concentrate was highest in F3 at ~ 4%. The kinetic and grade-recovery data of the rougher kinetics tests are illustrated in Figures 1-4.

Table 2. Test Summary of Initial Rougher Tests

Test# / Flowsheet / Conditions	Product	Wt. (%)	Grade (%)		Distribution (%)	
			Mo	S	Mo	S
F1	Mo Ro Conc 1	1.06	9.26	0.81	75.1	32.4
P80 = 205 µm	Mo Ro Conc 1-2	1.81	6.14	1.45	85.0	38.4
Diesel in Grind: 40 g/t	Mo Ro Conc 1-3	2.16	5.19	1.77	85.9	39.7
Total Diesel = 55 g/t	Mo Ro Scav Conc + Ro Conc 1-3	2.65	4.33	2.20	88.1	41.1
Pine Oil = 50 g/t	Ro Tls	97.3	0.016	0.14	11.9	58.9
Float time = 14 min	Head (Calc)		0.13	0.23		
F2	Mo Ro Conc 1	1.12	8.67	1.19	77.0	18.7
P80 = 194 µm	Mo Ro Conc 1-2	2.09	5.25	2.38	86.9	22.7
Diesel in Grind: 60 g/t	Mo Ro Conc 1-3	2.76	4.06	3.22	88.9	23.8
Total Diesel = 80 g/t	Mo Ro Conc 1-4	3.15	3.58	3.70	89.5	24.1
Pine Oil = 50 g/t	Mo Ro Scav Conc + Ro Conc 1-4	3.65	3.11	4.34	90.1	24.6
Float Time = 20 min	Ro Tls	96.4	0.013	0.43	9.9	75.4
	Head (Calc)		0.13	0.55		
F3	Mo Ro Conc 1	1.81	4.99	2.47	70.0	21.6
P80 = 114 µm	Mo Ro Conc 1-2	2.74	4.09	3.69	86.8	26.5
Diesel in Grind: 60 g/t	Mo Ro Conc 1-3	3.24	3.60	4.38	90.3	27.6
Total Diesel = 80 g/t	Mo Ro Conc 1-4	3.87	3.05	5.45	91.4	29.1
Pine Oil = 50 g/t	Mo Ro Scav Conc + Ro Conc 1-4	4.33	2.74	6.19	91.9	29.7
Float Time = 20 min	Ro Tls	95.7	0.011	0.42	8.1	70.3
	Head (Calc)		0.13	0.57		
F4	Mo Ro Conc 1	1.16	7.50	1.05	68.0	15.1
P80 =202 µm	Mo Ro Conc 1-2	1.83	5.58	1.78	80.0	19.0
Diesel in Grind: 40 g/t	Mo Ro Conc 1-3	2.41	4.48	2.38	84.5	20.5
Total Diesel = 60 g/t	Mo Ro Conc 1-4	2.77	4.02	2.78	87.0	21.4
Pine Oil = 50 g/t	Mo Ro Scav Conc + Ro Conc 1-4	3.22	3.49	3.30	87.9	22.0
Float Time = 20 min	Ro Tls	96.8	0.016	0.42	12.1	78.0
	Head (Calc)		0.13	0.52		

Figure 2 presents the grade-recovery curves of the rougher kinetics tests. It is evident that test F3 produced the highest recovery, but at the expense of grade. The grinds of tests F2 and F4 were coarser and thus likely had less Mo liberation than test F3. Figure 3 shows that for F3, Mo recovery to the first rougher concentrate is not as high as F1 or F2, even though Mo liberation should be better. It is possible that there was either more floatable gangue or slower flotation kinetics (due to finer grind) in F3. This may be compensated by the addition of more collector. Over the course of the test, F3 eventually recovers more Mo. The higher recovery appears to be also connected with a higher mass pull, as shown in Figure 3.

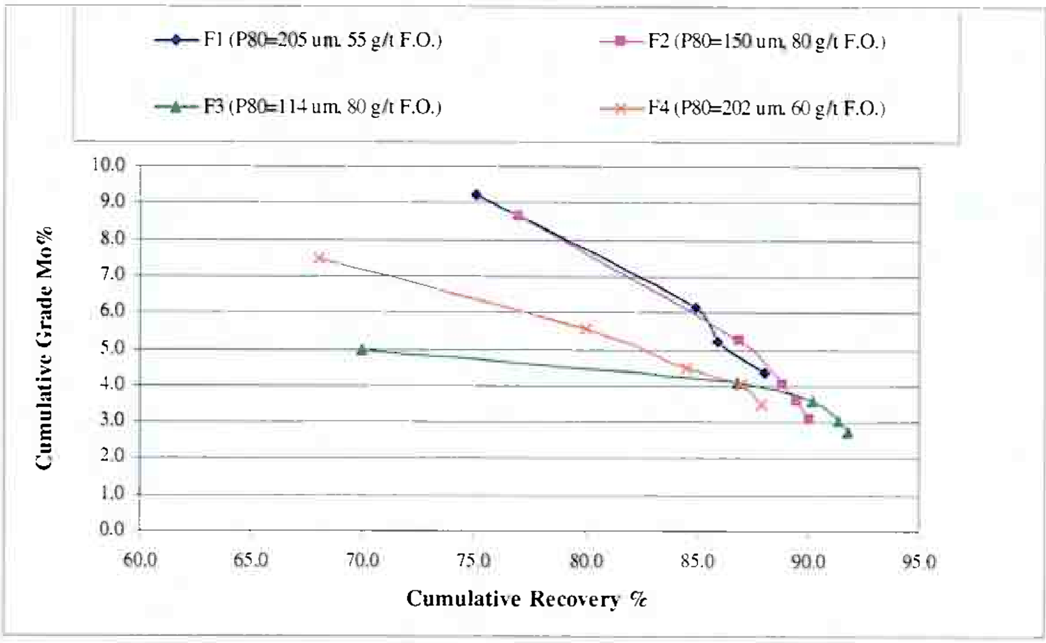


Figure 2. Mo Rougher Grade-Recovery Curves

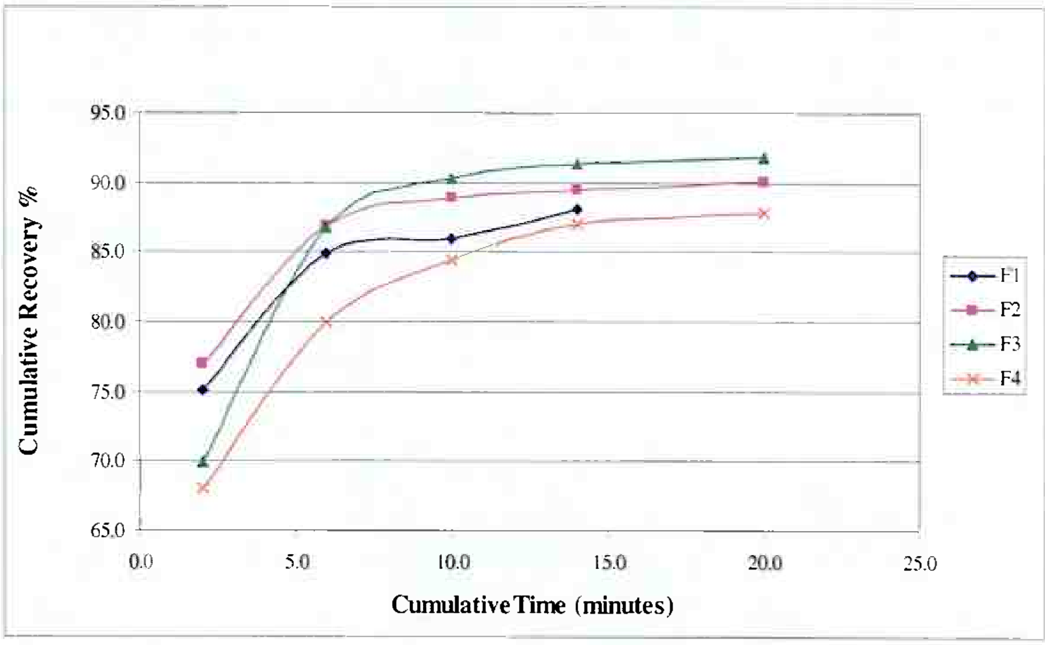


Figure 3. Mo Rougher Kinetics

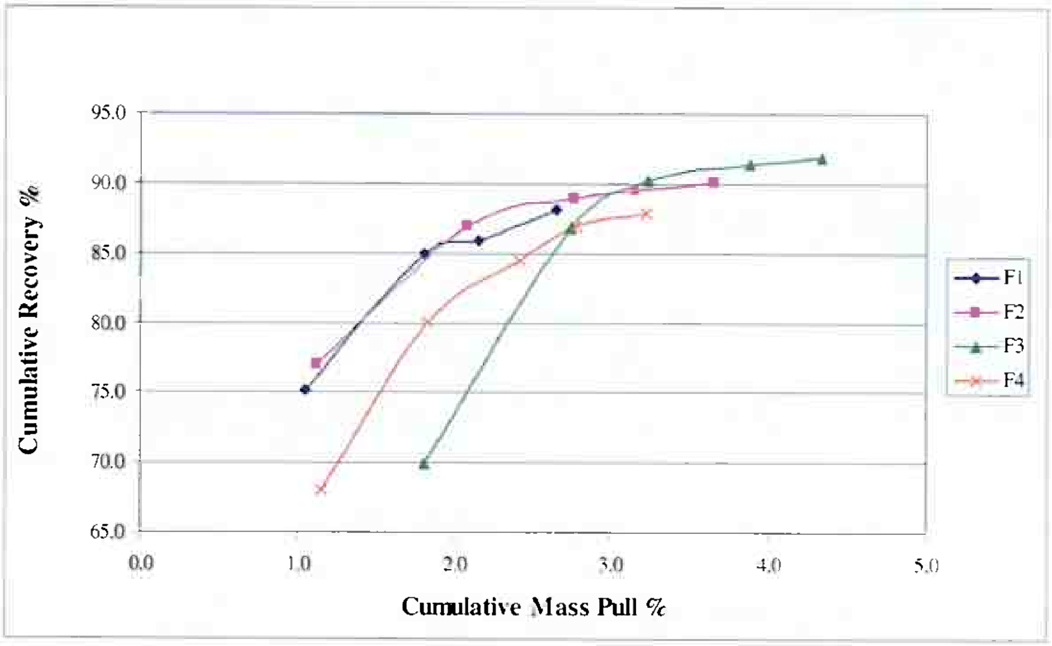


Figure 4. Rougher Recovery as Function of Mass Pull

The results of the rougher kinetics tests can be summarized as follows:

- Molybdenum occurrence is likely bimodal. Fast floating, well liberated molybdenum floats in the first several minutes of the roughers followed by more poorly liberated molybdenum in the later rougher/scavenger stages.
- Rougher Mo recovery appears to be partially related to mass pull. The finer grind in test F3 also appears to have a positive impact on recovery. A grind time of 45 minutes for P_{80}= 114µm, 20 minutes flotation time, and total of 80 g/t fuel oil produced the best overall molybdenum rougher recovery of 92%.

4.2. Cleaner Metallurgy

Eight cleaner tests, F5, F6, and F8-F13, were conducted to investigate various reagent and flowsheet alternatives for the production of a saleable molybdenum concentrate. A summary of these results is presented in Table 3. The test sheets are provided in Appendix D.

Tests F5 and F6 compared the effect of primary grind time on cleaner performance. Pine oil was used as the frother in these two tests. The rougher circuit targeted higher mass pull than the rougher tests. No regrind was applied to the rougher concentrate. Four cleaner stages were used. No depressants were added in the cleaner circuit. Both tests resulted in a concentrate with 85% molybdenum recovery, at a grade of 23% Mo. Molybdenum recovery to the final concentrate in F6 was also 85%, and graded 23%

Mo. The different primary grind times had no perceivable effect. Under a microscope, the gangue in the final concentrates appeared to consist of large liberated silicate particles and a small proportion of fine pyrite grains. With the large silicate particles reporting to the final concentrate, it was suspected that either the fuel oil dosage was too high or the pine oil frother was too aggressive.

Table 3. Summary of Cleaner Test Results

Test# / Flowsheet / Conditions	Objective	Product	Wt. (%)	Grade (%) Mo	Grade (%) S	Distribution (%) Mo	Distribution (%) S
F5	Test cleaners with 35 min.	Mo Cir 4 Conc	0.5	22.6	18.3	84.8	15.1
P_{80} = 153 µm	primary grind.	Mo Cir 3 Conc	0.6	17.6	14.4	86.7	15.5
Diesel in Grind: 40 g/t		Mo Cir 2 Conc	0.8	12.5	10.8	87.9	16.1
Total Diesel = 40 g/t		Mo Cir 1 Conc	1.6	6.98	6.11	89.2	17.2
Pine Oil = 50 g/t		Mo Ro Conc	6.9	1.76	8.03	90.9	21.4
Float time = 14 min		Ro Tls	93.1	0.012	0.47	9.15	78.6
		Head (Calc)		0.12	0.56		
		Head (Direct)		0.12	0.79		
F6	Test cleaners with 45 min.	Mo Cir 4 Conc	0.5	22.6	20.4	84.9	17.7
P_{80} = 124 µm	primary grind.	Mo Cir 3 Conc	0.6	18.3	17.0	86.5	18.5
Diesel in Grind: 60 g/t		Mo Cir 2 Conc	0.8	13.3	12.7	87.7	19.2
Total Diesel = 40 g/t		Mo Cir 1 Conc	1.6	6.70	6.75	89.1	20.7
Pine Oil = 50 g/t		Mo Ro Conc	6.8	1.78	3.73	91.8	23.6
Float Time = 20 min		Ro Tls	93.2	0.012	0.43	8.2	76.4
		Head (Calc)		0.12	0.52		
F8	Lower diesel dosage	Mo Cir 4 Conc	0.1	55.1	35.3	49.6	6.9
Primary P80 = 110 µm	add CMC in cleaners	Mo Cir 3 Conc	0.1	54.0	35.2	50.0	7.0
Second Re-grind P80 = N/A		Mo Cir 2 Conc	0.1	42.5	27.6	50.5	8.0
Diesel in Grind: 40 g/t		Mo Cir 1 Conc	0.6	14.2	11.5	70.1	14.0
Total Diesel = 56 g/t		Mo Cir 1 Conc + Cir 1 Scav Conc	0.9	10.0	8.43	88.2	10.2
NaCN = 80 g/t		Mo Ro Conc	4.0	2.38	2.27	90.6	18.9
MIBC = 40 g/t		Mo Ro Conc + Ro Scav Conc	5.0	1.93	1.90	91.0	19.5
CMC = 10 g/t		Ro Tls	95.0	0.010	0.41	9.0	80.5
		Head (Calc)		0.11	0.48		
F9	Lower diesel dosage	Mo Cir 4 Conc	0.1	55.5	34.4	64.1	6.84
Primary P80 = 110 µm	Add Sodium Silicate	Mo Cir 3 Conc	0.1	53.4	33.1	70.1	7.46
Second Re-grind P80 = 18 µm	(Na2O*nSiO2) in cleaners	Mo Cir 2 Conc	0.2	41.5	25.8	76.4	8.22
Diesel in Grind: 45 g/t		Mo Cir 1 Conc	0.6	13.6	9.87	83.5	10.4
Total Diesel = 56 g/t		Mo Cir 1 Conc + Cir 1 Scav Conc	0.8	11.1	7.77	88.6	10.7
NaCN = 40 g/t		Mo Ro Conc	2.6	3.25	4.09	92.1	19.9
MIBC = 42.5 g/t		Mo Ro Conc + Ro Scav Conc	3.4	2.75	3.51	92.4	20.3
$Na_2O*nSiO_2$ = 1000 g/t		Ro Tls	96.6	0.008	0.40	7.57	79.7
		Head (Calc)		0.10	0.59		
F10	Staged primary grind	Mo Cir 4 Conc	0.2	45.1	32.1	76.0	8.6
Primary P80 = 140 µm	Lower Sodium Silicate	Mo Cir 3 Conc	0.2	45.5	31.6	82.1	9.4
Second Re-grind P80 = 24 µm		Mo Cir 2 Conc	0.2	37.9	28.5	84.5	10.1
Diesel in Grind: 40 g/t		Mo Cir 1 Conc	0.5	16.9	13.9	88.9	11.6
NaCN = 40 g/t		Mo Cir 1 Conc + Cir 1 Scav Conc	0.7	12.6	10.4	90.7	12.0
Lime = 76 g/t		Mo Ro Conc	4.2	2.17	4.17	92.2	28.0
Total Diesel = 55.5 g/t		Mo Ro Conc + Ro Scav Conc	5.0	1.84	3.50	92.7	28.6
MIBC = 51.5 g/t		Mo Ro Tls	95.0	0.008	0.47	7.3	71.4
$Na_2O*nSiO_2$ = 200 g/t		Head (Calc)		0.099	0.63		
F11	Staged primary grind	Mo Cir 4 Conc	0.1	48.2	30.5	72.6	7.3
Primary P80 = 142 µm	Lower Sodium Silicate	Mo Cir 3 Conc	0.2	47.4	30.1	76.2	7.7
Second Re-grind P80 = 23 µm	No NaCN added	Mo Cir 2 Conc	0.2	43.3	27.6	78.9	8.0
Diesel in Grind: 40 g/t		Mo Cir 1 Conc	0.4	21.1	15.3	82.8	8.7
Lime = 30 g/t		Mo Cir 1 Conc + Cir 1 Scav Conc	0.6	15.3	9.84	88.3	9.0
Total Diesel = 55.5 g/t		Mo Ro Conc	3.9	2.24	3.92	90.7	25.1
MIBC = 51.5 g/t		Mo Ro Conc + Ro Scav Conc	4.4	2.01	3.55	91.0	25.5
$Na_2O*nSiO_2$ = 200 g/t		Mo Ro Tls	95.6	0.009	0.48	9.0	74.5
		Head (Calc)		0.096	0.62		
F12	Staged primary grind	Mo Cir 4 Conc	0.1	55.6	36.2	51.3	5.9
Primary P80 = 134 µm	Substitute NaHS for NaCN	Mo Cir 3 Conc	0.1	50.8	31.9	67.0	2.0
Second Re-grind P80 = 23 µm	to depress pyrite	Mo Cir 2 Conc	0.2	43.2	29.5	76.7	1.3
Diesel in Grind: 40 g/t	1000 g/t Sodium Silicate	Mo Cir 1 Conc	0.3	25.80	17.8	83.2	1.1
Lime = 20 g/t		Mo Cir 1 Conc + Cir 1 Scav Conc	0.6	15.71	10.7	88.3	0.9
NaHS = 200 g/t		Mo Ro Conc	2.8	3.44	4.32	92.1	9.8
Total Diesel = 55.5 g/t		Mo Ro Conc + Ro Scav Conc	3.7	2.61	3.36	92.5	[illegible]
MIBC = 50 g/t		Mo Ro Tls	96.4	0.008	0.48	7.1	79.1
$Na_2O*nSiO_2$ = 1000 g/t		Head (Calc)		0.10	0.58		
F13	Staged primary grind	Mo Cir 5 Conc	0.1	56.6	37.0	77.6	10.0
Primary P_{80} = 148 µm	Addition of second re-grind	Mo Cir 4 Conc	0.2	45.5	29.8	81.6	10.7
Second Re-grind P_{80} = 18 µm	in cleaners	Mo Cir 3 Conc	0.2	44.4	30.5	82.9	11.2
Diesel in Grind: 40 g/t		Mo Cir 2 Conc	0.2	38.8	28.0	83.7	11.6
NaCN = 80 g/t		Mo Cir 1 Conc	0.3	30.4	22.8	84.3	12.5
OPS = 25.5 g/t		Mo Cir 1 Conc + Cir 1 Scav Conc	0.6	14.4	12.5	88.4	15.2
Total Diesel = 56 g/t		Mo Ro Conc	3.6	2.56	5.97	91.0	41.5
MIBC = 55 g/t		Mo Ro Conc + Ro Scav Conc	4.2	2.19	5.14	90.5	41.9
$Na_2O*nSiO_2$ = 800 g/t		Mo Ro Tls	95.8	0.010	0.31	9.5	58.1
Lime = 25 g/t		Head (Calc)		0.10	0.51		

Another test, F7, was performed to generate a rougher concentrate which would then be used for QEMSCAN™ mineralogical characterization. Fuel oil dosage in the roughers was kept the same as F5 and F6, and MIBC was used as the frother to determine if it would minimize the recovery of liberated silicates in the froth. A mock cleaner test was performed on the rougher concentrate. Throughout the cleaner stages, each stage concentrate was examined under microscope to determine the visual degree of concentrate upgrading.

Large silicate particles were still present in the final concentrate. It was decided that the fuel oil dosage in the roughers should be lowered. Another issue identified in the cleaner tests was the presence of talc-like mineralization (phyllosilicates) in the first cleaner concentrate. This would have to be addressed in future tests by the addition of silicate dispersants. A regrind in the cleaners would be included in further tests with the aim of improving cleaner concentrate grades.

Tests F8 and F9 incorporated the new flowsheet and reagent changes. Both tests had a lower fuel oil dosage of 45 g/t in the roughers, and an 8 minute regrind on the first cleaner concentrate with lime and NaCN to depress pyrite. Silicate dispersants were added to the second cleaner stage in both tests, with 10 g/t CMC added in F8 and 1000g/t Na_2SiO_3 added in F9. Concentrate upgrading was assessed visually under microscope throughout the tests. The final molybdenum concentrates appeared to be dominated by platey molybdenum clusters with no liberated silicates, and a very small fraction of finely dispersed pyrite grains. Test F8 final concentrate graded 55% Mo with a 50% molybdenum recovery. Test F9 final concentrate graded 56% Mo with a 64% molybdenum recovery. The lower molybdenum recovery in F8 is likely attributable to CMC, which has a tendency to depress molybdenum. This is evident in the second cleaner stage (where the CMC was added) which has 22% of the molybdenum reporting to the second cleaner tailings. The second cleaner tailings in F9 (with no CMC) only had 7% of the molybdenum reporting to it. The other change made to F8 and F9 was that the cleaner stage times were shortened, which also would have contributed in improving concentrate grades.

At this point in the testwork program, it was demonstrated that a saleable molybdenum concentrate could be produced from the ore. It was also noted that the combined concentrate P_{80} of test F9 was 18μm. With such a fine particle size in the first cleaner concentrate regrind product, it is possible that this resulted in lower stage recoveries of molybdenum in the cleaners. To address this issue, stage grinding of the rougher feed was implemented. Stage grinding in this case was comprised of a sequence of 5 minute grinds in the 10kg rod mill, in which the mill product was wet screened over 65 mesh. The grind cycles continued until the plus 65 mesh weight distribution equated to that of the distributions in tests F8 and F9. After that, a rougher float was performed. A regrind was then applied to the rougher concentrates, rather than on the first cleaner concentrate. In F5 and F6, molybdenum loss to the 1st cleaner tailings was likely due to unliberated molybdenum in the form of middlings.

The objective of test F10 was to investigate the effectiveness of stage grinding on molybdenum recovery and to improve upon F8 and F9 (although at a saleable grade). Lime and NaCN were used to depress pyrite, and were adjusted as needed on a visual basis. Sodium silicate was added in the first cleaner at a lower dosage of 200 g/t which was just enough to disperse the talc-like minerals in the pulp (no silicates visible in froth). The final concentrate graded 45% Mo, with a 76% molybdenum recovery.

Test F11 investigated the use of lime only to depress pyrite, with slightly higher lime adjusted pH levels in the cleaners. The final concentrate graded at 48% Mo, with a 73% molybdenum recovery. The performance of tests F10 and F11 demonstrated improved molybdenum recovery, but did not attain a saleable concentrate grade.

Test F12 was conducted to investigate the use of NaHS as a substitute for NaCN in depressing pyrite. The NaHS was adjusted over the test based on examinations of froth sample under microscope. In addition to this, the Na_2SiO_3 dosage was brought back up to 1000 g/t as in test F9. It was suspected that the lower Na_2SiO_3 dosage in tests F10 and F11 had an impact on the final concentrate grades. The final concentrate of F12 graded 56% Mo with a 51% molybdenum recovery, which is closer the metallurgical performance of tests F8 and F9. This appeared to confirm the suspicion of Na_2SiO_3 influence on metallurgical performance.

Test F13 was conducted by using only 200 g/t sodium silicate in the regrind on the rougher concentrate, and utilizing the conventional lime/NaCN scheme to depress pyrite. A fuel oil surfactant, OP6, was added in the primary grind at 25 g/t to investigate its effect on rougher Mo recovery. Rougher Mo recovery was 91%, showing no improvement over rougher recoveries in the other cleaner tests. A second regrind on the fourth cleaner concentrate was implemented with an additional 100 g/t sodium silicate. A final concentrate grade of 57% Mo with 78% recovery was achieved in F13. This was a 13% improvement in recovery over the next best test, F9. The first dosage of Na_2SiO_3 was sufficient to disperse talc-like mineralization in the pulp without depressing the molybdenite/silicate middlings. The molybdenum concentrate was successively cleaned through to the fourth cleaner stage, after which the second regrind liberated more molybdenum from the silicates. An additional 100g/t of Na_2SiO_3 was added in the second regrind for further dispersion of liberated insolubles. The results of the cleaner tests are presented graphically in Figure 5. The open-circuit configuration for test F13 is presented in Figure 6.

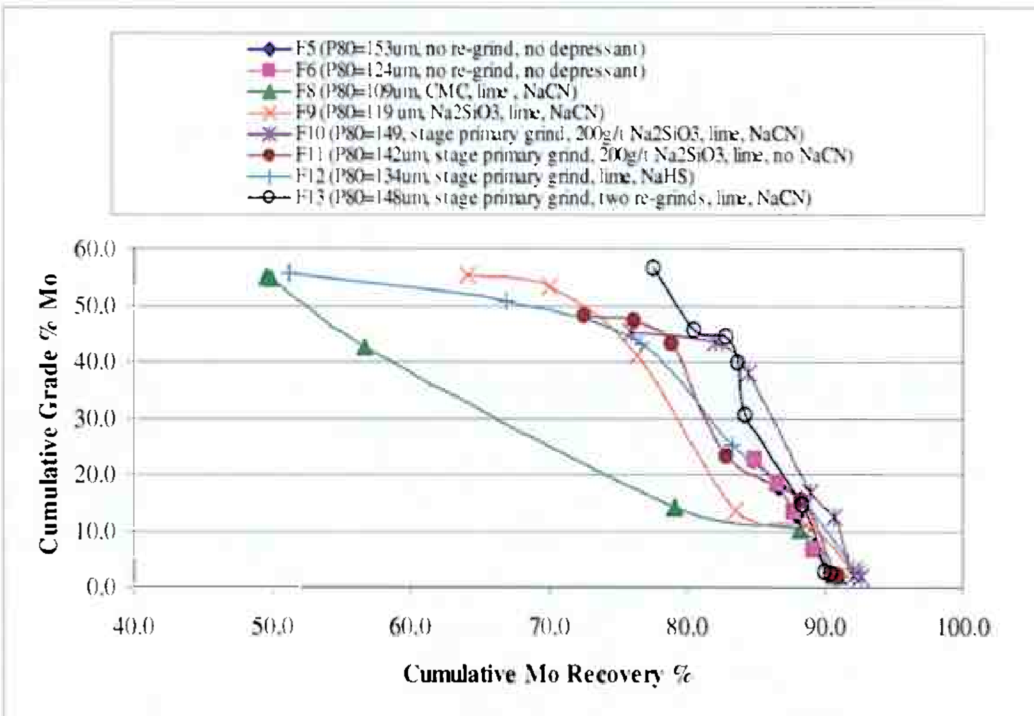


Figure 5. Mo Grade-Recovery Curves for Cleaner Tests

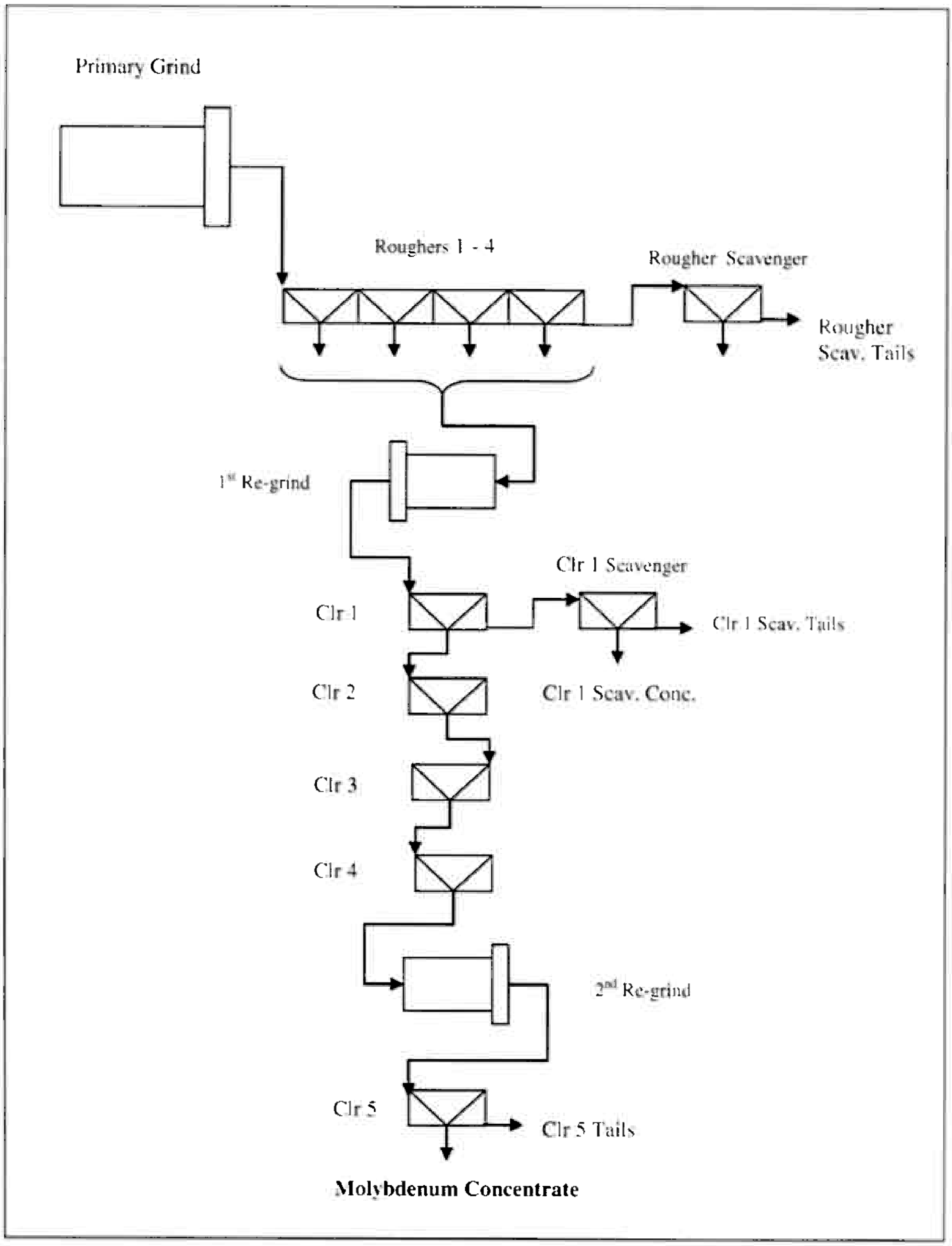


Figure 6. Open-Circuit Flowsheet of Cleaner Test F13

4.3. Summary of Cleaner Results

Poor final concentrate grades in tests F4 and F5 were attributable to a combination of too high a fuel oil dosage, and the use of pine oil as a frother. Subsequent testing used a lower fuel oil dosage of 45g/t of fuel oil in the roughers, and MIBC as a frother. Less free silicates were observed in the cleaner concentrate stages as a result.

Phyllosilicate dispersants are required to minimize phyllosilicates reporting to the froth. Sodium silicate is highly recommended for this purpose. It does not have as adverse an impact on molybdenum recovery as CMC.

It was observed that Na_2SiO_3 dosage has an impact on molybdenum concentrate grade and recovery. As the Na_2SiO_3 dosage increased, the concentrate grades increased, but at the expense of molybdenum recovery. This is likely due to the higher Na_2SiO_3 dosages depressing molybdenum-silicate middlings which would otherwise report to the concentrate at much lower dosage.

At the low dosage of 200g/t Na_2SiO_3 in the rougher concentrate regrind, in tests F10 and F11, final concentrate grades fell just short of 50% Mo.

When the Na_2SiO_3 dosage was increased to 1000g/t in F12, final concentrate grade exceeded 50% Mo.

Due to the impact that Na_2SiO_3 dosage has on Mo metallurgy, the effects of stage grinding and NaHS on Mo metallurgy, remain inconclusive.

The use of a fuel oil surfactant, OP6, did not improve molybdenum rougher recovery over that of earlier tests.

The addition of a second regrind in the cleaner circuit was demonstrated to improve concentrate grade, and significantly improve Mo recovery, with a Na_2SiO_3 dosage of 300g/t.

Based on the results of test F13, it would be anticipated that in a locked cycle test, Mo recovery in a final concentrate would be in the range of 85-90%.

5. QEMSCAN Characterization

Mineralogical investigations were conducted on four size fractions (-300/+106μm, -106/+53μm, -53/+20μm, -20/+3μm) of a rougher concentrate (test F7), using QEMSCAN™ (Quantitative Evaluation of Materials by Scanning Electron Microscopy) technology. A more detailed description of this process and its operating modes is provided in Appendix E.

Four graphite-impregnated 30mm polished sections were prepared, and the coarsest fraction was submitted for XRD analysis. Each size fraction was also submitted for chemical analysis. The polished sections were carbon coated and analysed using the QEMSCAN Particle Mapping Analysis (PMA) mode. PMA is a two-dimensional mapping analysis aimed at resolving liberation and locking characteristics of a generic set of particles. A pre-defined number of particles are mapped at a point spacing selected in order to spatially resolve and describe mineral textures and associations. The operating statistics for the PMA mode are given in Table 4.

Table 4. Operating Statisics for PMA

QEM Size Fraction	Weight (g)	Weight %	Sections No.	Pixel Size (µm)	Particle No.	Points No.
-300µm +106µm	50	16.5	1	5	2749	2852837
-106 µm +53 µm	22.2	7.3	1	4	5011	1582329
-53 µm +20 µm	19	6.3	1	2	5000	922188
-20µm -3µm	212	69.9	1	2	30059	267988
Total	***303.2***	100				

Key QEMSCAN™ mineralogical assays have been regressed with chemical assays and this is presented in Figure 7. The overall correlation, as measured by R-squared criteria, was 0.989. This is considered to be acceptable. Full QEMSCAN™ and direct chemical assays are presented in Appendix E.

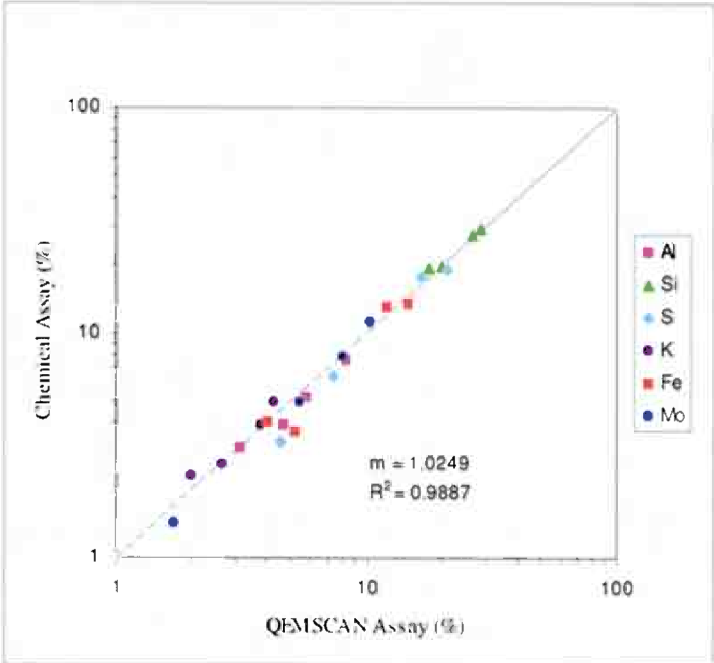


Figure 7. QEMSCAN and Direct Assay Reconciliation

5.1. *Modal Analysis and Grain Size Distribution*

Bulk modal analysis results, presented in Appendix E, indicate mineral distributions in the rougher concentrate for each of the size fractions. The main value mineral in the rougher concentrate is molybdenite, which comprises 5.7% of the concentrate. Pyrite is the predominant sulphide gangue accounting for 10% of the concentrate. Other sulphide minerals account for 1.4% of the concentrate. Quartz, feldspars, and micas/phyllosilicates make up the bulk of the non-sulphide gangue (NSG). These three NSG minerals account for 78% of the rougher concentrate mass. The -106/+53 µm fraction of the rougher concentrate contained the highest proportion of molybdenite, at 17% of the size fraction weight. This is shown in the graphs in Appendix E. An XRD scan was performed on the fraction, with the relative proportions of minerals classified into abundance categories of: major, moderate, minor, and trace. Table 5 lists the crystalline phase identification from the XRD analysis.

Table 5. XRD Identification of Crystalline Phases in the -106+53 µm fraction

Sample	Crystalline Mineral Assemblage (relative proportions based on peak height)			
	Major	Moderate	Minor	Trace
F7 Mo Conc -106+53µm	quartz	molybdenite plagioclase	potassium-feldspar pyrite	*dolomite, *mica *magnesite *pyroxene *pyrrhotite *tetrahedrite

*Tentative identification due to low concentrations, diffraction line overlap, or poor crystallinity

The cumulative grain size distributions of molybdenite, pyrite, copper sulphides, and silicates are depicted in Figure 8. Molybdenite appears to be the coarsest mineral in the series with a P_{80} of approximately 60µm. The next coarsest mineral appears to be pyrite with a P_{80} between 55 and 60 µm. Above 60 µm, the size distributions of pyrite and molybdenite appear to overlap one another, implying that the two are closely associated with one another in this size range. This implication will be discussed in further detail in the liberation and association section of this text.

The finest mineral group in the series is the phyllosilicate group. This group consists of micas, chlorite, talc, serpentine, and clay minerals. Because of the fine size distribution of this mineral group, it may consist of a soft mineral such as talc. This assumption is strengthened by the appearance of talc-like mineralization of the froth in the cleaner tests.

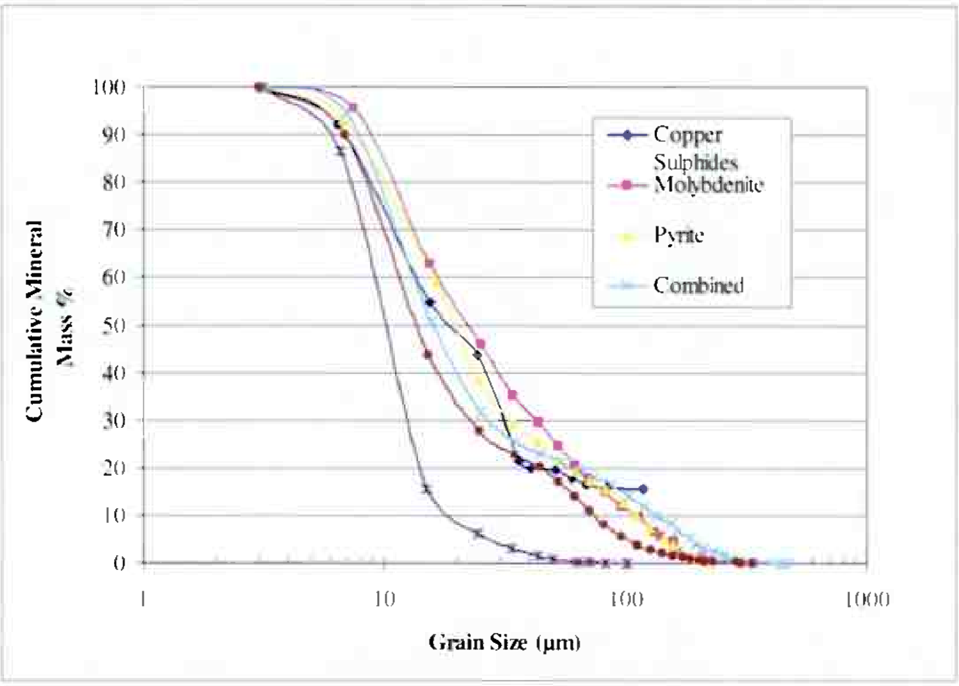


Figure 8. Average Grain Size Distribution of Minerals in Rougher Concentrate

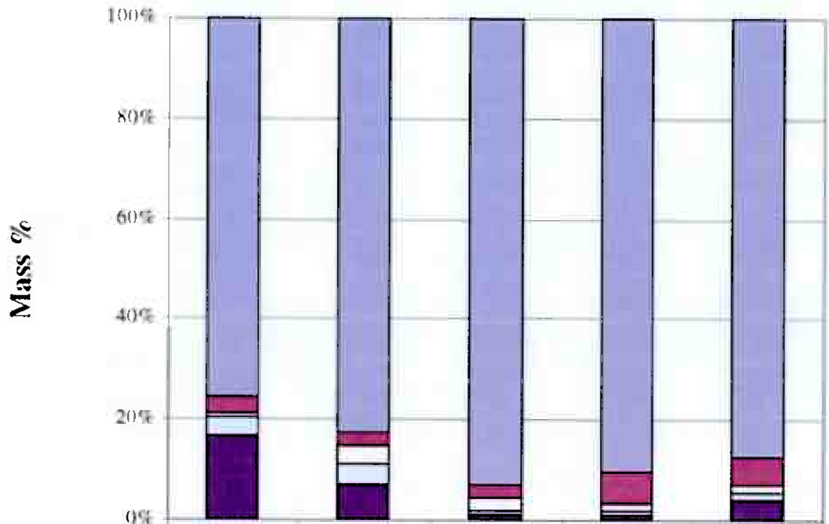
5.2. *Mineral Liberation*

For the purpose of this analysis, particle liberation is defined based on 2D particle area percent. Particles are classified into the following groups based on the mineral area percent (in the order of decreased % area liberation): free, liberated, sub-middling, middling, and locked. The criteria for these categories is listed in Table 6.

Table 6. Criteria for Liberation Classification

Free	Area % >= 95
Liberated	Area % <95% & >= 80%
Middlings	Area % <80% & >= 50%
Sub-Middlings	Area % <50% & >=20%
Locked	Area % < 20

Combined and size-by-size distributions of molybdenite are presented in Figure 9. Molybdenum occurs as molybdenite throughout the entire sample.



	-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm	Combined
Free Mo	75.51	82.38	93.05	90.30	87.45
Lib Mo	3.32	2.72	2.65	6.39	5.38
Midds	0.67	3.90	2.30	1.50	1.59
Sub-Midds	3.73	4.01	0.71	0.75	1.48
Locked	16.77	6.99	1.29	1.05	4.09
Barren	0.00	0.00	0.00	0.00	0.00

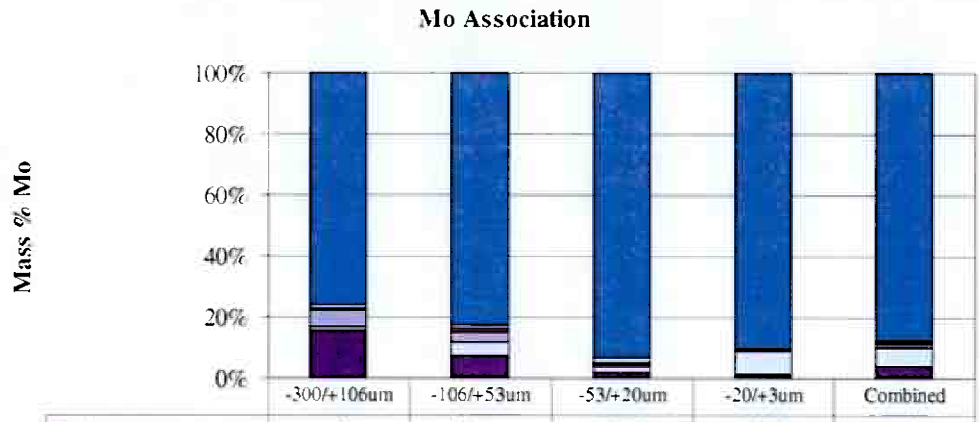
Figure 9. Rougher Concentrate Molybdenum Liberation Statistics

Free molybdenite for the global sample was 87%, with the highest proportion of free molybdenite occurring in the -53/+20µm fraction, at 93%. The highest proportion of locked molybdenite occurred in the -300/+106µm fraction at 17%, and correspondingly it had the lowest proportion of free molybdenite at 76%. A molybdenite liberation map is included in Appendix E.

5.3. *Mineral Association*

The chart for mineral associations with molybdenite is presented in Figure 10. In order to provide some clarification on some of the mineral groups, the Complex Sulphides category consists of complex combinations: pyrite, chalcopyrite, sphalerite, pyrrhotite and other copper sulphides. The Complex NSG category consists of complex combinations of: rutile, carbonates, micas/phyllosilicates, and quartz. Digital output of the mineral association textures is presented in Appendix E for more of a visual representation of the mineral associations found in the sample.

The mineral association analysis indicated that in the global sample, the largest association of locked molybdenite was with the complex sulphides group of minerals, at 6% of the sample weight. In the -300/+106μm fraction, the largest association with molybdenite was with complex NSG, at 15% of the sample weight. In the -20/+3μm fraction, the largest association of molybdenite was with the complex sulphides group, at almost 8% of the sample weight.



	-300/+106um	-106/+53um	-53/+20um	-20/+3um	Combined
Lib Mo	75.95	82.71	93.13	90.38	87.61
Mo:Phyllosilicates	1.44	1.46	2.01	0.08	0.52
Mo:Carbonates	0.43	0.73	0.52	0.68	0.63
Mo:Qtz-FSP-Amph	5.34	3.66	0.60	0.23	1.34
Mo:Complex Sulphides	1.42	4.40	2.32	7.74	6.12
Mo:Complex NSG	15.16	6.49	1.18	0.60	3.47
Other	0.26	0.55	0.24	0.30	0.31

Fraction

Figure 10. Molybdenum Association Statistics

5.4. Determinative Mineralogy

Figure 11 illustrates the mineralogically limiting copper grade-recovery curves for the rougher concentrate sample. This analysis provides an indication of the maximum achievable molybdenum grade by recovery based on individual particle liberation and grade. These results, of course, do not reflect gangue activation and entrainment, or other factors that could occur in the actual metallurgical process. The plots in Figure 11 indicate that metallurgical performance improves (grade-recovery curves shift upward and to the right) in the finer fractions. The coarser the fractions become, the metallurgical response becomes more limited. This is due to the poor liberation of molybdenite. The combined size fraction plot in Figure 15 predicts that a final concentrate grade of 54% Mo with 93% recovery is achievable with the Hurdal ore. Figure 11 also shows the metallurgical performance of test F13 relative to the theoretical curves.

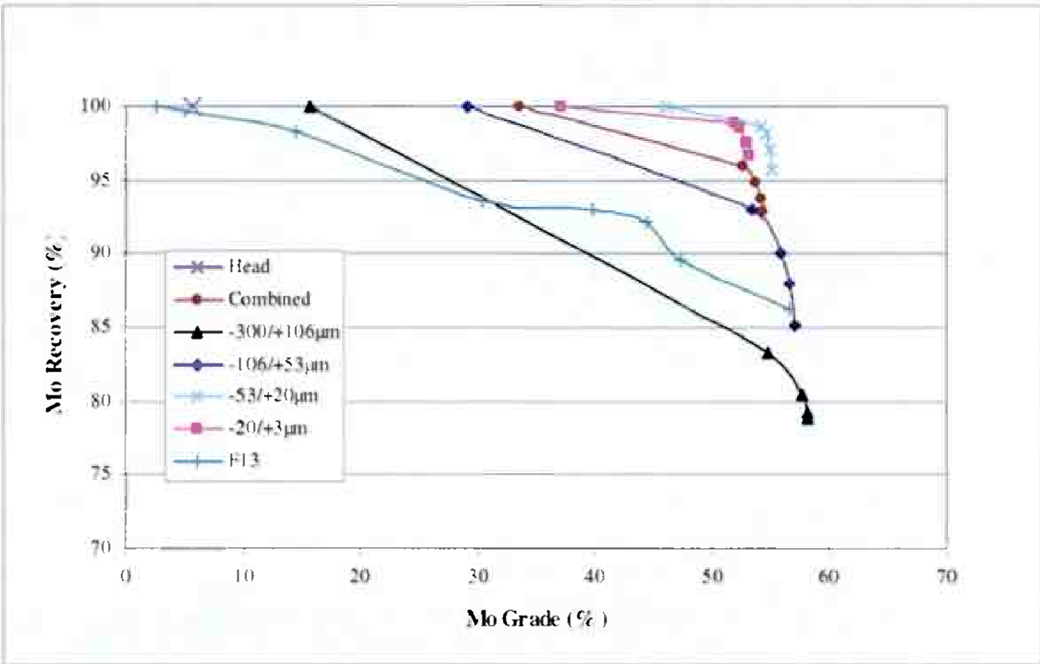


Figure 11. Theoretical Size-Limiting Grade-Recovery Curves

The plot for F13 in Figure 11 has recoveries normalized to the Mo content of the rougher concentrate going into the cleaner circuit (i.e. F13 is expressed as a stage-recovery plot).

The theoretical mineral release curve for molybdenite in Figure 12 is essentially a re-iteration of the liberation data discussed earlier, presented in a different graphical format. The graph shows that molybdenite is already well liberated in the -300/+150 µm (P_{80}= 122µm) at 79% Mo liberation. The minimum particle size for a regrind would appear to be at 20µm with 96% Mo liberation at this grind. In the cleaner tests, the reground rougher concentrates sized between P_{80}=18-24µm.

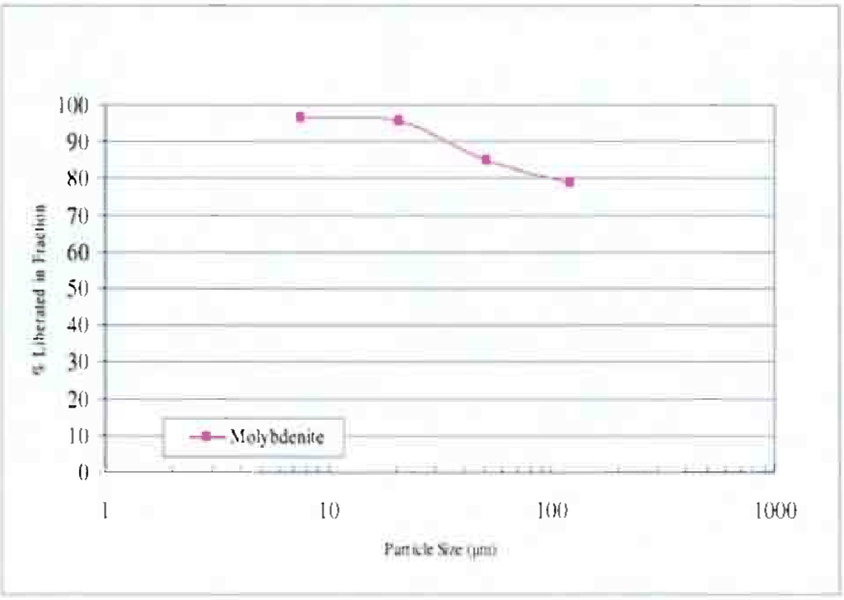


Figure 12. Theoretical Molybdenite Liberation Curve

6. Conclusions and Recommendations

The conclusions that can be drawn from the testwork can be summarized as follows:

- Based on the mineralogical characterization of the ore and results of the metallurgical testwork, the Hurdal ore does not appear to be highly refractory in nature. Gangue minerals of significance were phyllosilicate minerals and pyrite. The phyllosilicate minerals were controlled with the addition of Na_2SiO_3 dispersant. Pyrite was depressed by a combination of lime, higher pH, and NaCN depressant. Depending on reagent additions, saleable molybdenum concentrates can be produced with as few as 4 or 5 cleaning stages because of the nature of the ore.
- Sodium silicate dosage appeared to have the greatest influence on molybdenum cleaner circuit metallurgy. As dosage increased, concentrate grade improved, but with a much lower molybdenum recovery associated with it.
- The effect of stage grinding of the rougher flotation feed appeared to have no effect on molybdenum metallurgy.
- The addition of OP6 fuel oil surfactant appeared to have no effect on rougher molybdenum recovery.
- The effect of NaHS on depressing pyrite in one of the tests could not be determined, due to the masking effect of the high Na_2SiO_3 dosage.
- The introduction of a second regrind in the cleaner circuit was beneficial in upgrading the molybdenum concentrate, without excessive use of sodium silicate. Molybdenum stage recovery was also significantly improved with this flowsheet option.

Recommendations for future work include:

1. Further tests should be conducted for flowsheet optimization. Using lime only in the cleaners, or use of NaHS as a substitute for NaCN, has the potential to produce a saleable molybdenum concentrate with further optimization.
2. A variability flotation study is an option to be considered to assess the metallurgical response of different zones of the Hurdal ore body.
3. A grindability study is recommended to determine grinding equipment requirements and variability in ore hardness.
4. A study on the environmental impact of flotation tailings material is also recommended.

Appendix A – Drill Core Inventory List

Hurdal - Intervals for test work

Crew cores

Drill hole	From	To	Sample no	MoS_2 %	Client Measured Weight (kg)	SGS Measured Weight (kg)
Dh 02	370	375	43313	0.157	6.7	6.7
Dh 02	385	390	43317	0.165	6.9	6.9
Dh 02	395	400	43320	0.180	7.6	7.6
Dh 02	410	415	43323	0.222	3.1	3.1
Dh 02	415	420	43325	0.248	6.8	6.8
Dh 02	430	435	43328	0.171	7.2	7.2
Dh 02	470	475	43336	0.317	7.6	7.7
Dh 02	635	640	43376	0.180	6.6	6.7
Dh 02	640	645	43377	0.181	7.1	7.2
Dh 02	655	660	43379	0.186	6.9	7.0
Dh 02	660	665	43380	0.225	7.2	7.3
Dh 02	755	760	43405	0.241	7.1	7.3
Dh 03	560	565	43433	0.293	6.9	7.0
Dh 03	580	585	43439	0.215	7.9	7.9
Dh 03	590	595	43441	0.159	7.5	7.5
				Total	103.1	103.9

SGS weight includes bag weight

Hydro cores

Drill hole	From	To	Sample no	MoS_2 %	Client Measured Weight (kg)	SGS Measured Weight (kg)
BH 7	330	335		0.180	4.5	4.5
BH 7	335	340		0.234	4.4	4.4
BH 7	340	345		0.351	4.4	4.4
BH 7	355	360		**0.218**	4.6	4.7
BH 7	360	365		**0.231**	4	4.1
BH 7	365	370		**0.151**	4.3	4.4
BH 7	370	375		**0.168**	4.5	4.6
BH 7	375	380		**0.185**	4.4	4.5
BH 7	390	395		**0.223**	4.1	4.3
BH 7	395	400		**0.184**	4.2	4.3
				Total	43.4	44.2

SGS weight includes bag weight

Appendix B – Bond Work Index Data and Calculations

SGS Minerals Services

Standard Bond Ball Mill Grindability Test

Project No.:	11656-001 Product: Minus 6 Mesh Date: Jan 29 2008	
Sample.:	Ore Drill Core	
Purpose:	To determine the ball mill grindability of the sample in terms of a Bond work index number.	
Procedure:	The equipment and procedure duplicate the Bond method for determining ball mill work indices.	
Test Conditions:	Mesh of grind:	100 mesh
	Test feed weight (700 mL):	1230 grams
	Equivalent to : 1757 kg/m³ at Minus 6 mesh	
	Weight % of the undersize material in the ball mill feed:	13.0 %
	Weight of undersize product for 250% circulating load:	351 grams
Results:	Average for Last Three Stages = **1.75g.**	**247%** Circulation load

CALCULATION OF A BOND WORK INDEX

$$BWI = \frac{44.5}{P1^{0.23} \times Grp^{0.82} \times \left\{ \frac{10}{\sqrt{P}} - \frac{10}{\sqrt{F}} \right\}}$$

P1 = 100% passing size of the product	150 microns
Grp = Grams per revolution	1.75 grams
P80 = 80% passing size of product	127 microns
F80 = 80% passing size of the feed	2039 microns

BWI = **13.4** (imperial)

BWI = **14.7** (metric)

Grindability Test Data | Project No.: 11656-001 | Test No.: Ore Drill Core

Stage No.	Revs	New Feed (grams)	Undersize In Feed (grams)	Undersize To Be Ground (grams)	U'Size In Product (grams)	Undersize Product Total (grams)	Undersize Product Per Mill Rev (grams)
1	100	1,230	159	192	299	140	1.40
2	224	299	39	313	363	324	1.45
3	210	363	47	304	377	330	1.57
4	193	377	49	303	381	332	1.72
5	176	381	49	302	351	302	1.71
6	179	351	45	306	361	316	1.76
7	173	361	47	305	351	304	1.76

Average for Last Three Stages = 354g. 1.75g.

Feed K80

Size Mesh	Size µm	Weight grams	% Retained Individual	% Retained Cumulative	% Passing Cumulative
6	3,360	0.0	0.0	0.0	100.0
7	2,800	41.5	5.0	5.0	95.0
8	2,360	61.6	7.5	12.5	87.5
10	1,700	133.3	16.2	28.7	71.3
14	1,180	131.3	15.9	44.6	55.4
20	850	106.7	13.0	57.6	42.4
28	600	80.3	9.7	67.3	32.7
35	425	54.2	6.6	73.9	26.1
48	300	48.2	5.9	79.8	20.2
65	212	36.0	4.4	84.1	15.9
100	150	24.0	2.9	87.0	13.0
Pan	-150	106.7	13.0	100.0	0.0
Total	-	**823.8**	**100.0**	-	-

K80 **2,039**

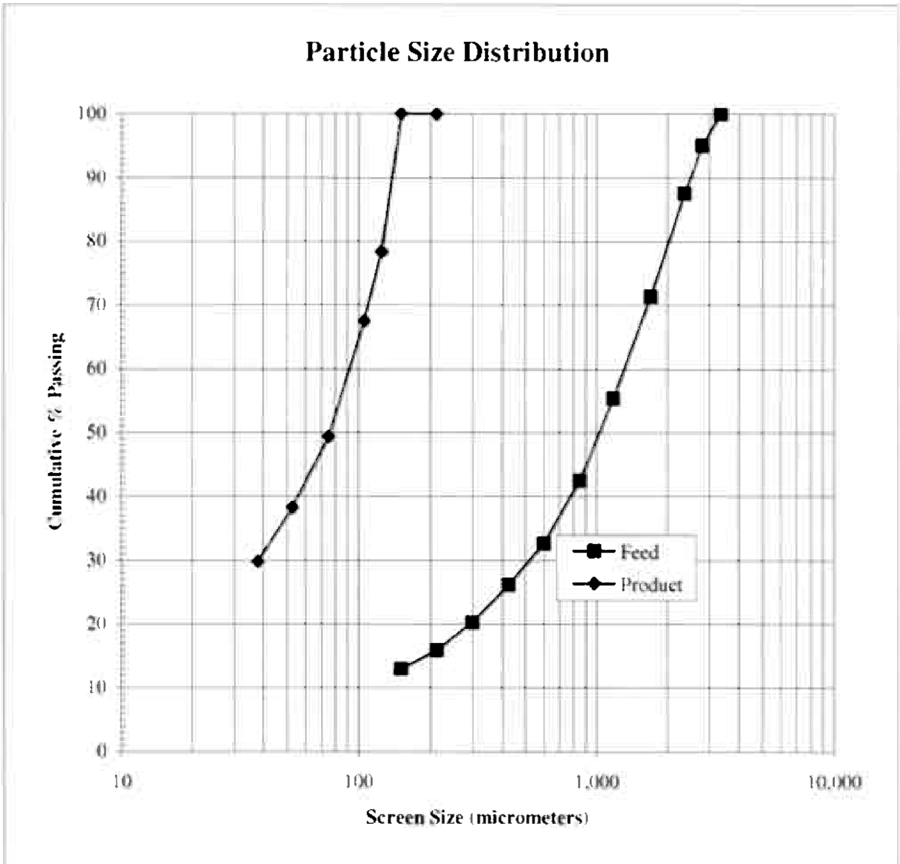
Product K80

Size Mesh	Size µm	Weight grams	% Retained Individual	% Retained Cumulative	% Passing Cumulative
65	212	0.0	0.0	0.0	100.0
100	150	0.0	0.0	0.0	100.0
115	125	33.4	21.7	21.7	78.3
150	106	16.7	10.8	32.5	67.5
200	75	27.9	18.1	50.6	49.4
270	53	17.1	11.1	61.7	38.3
400	38	13.1	8.5	70.2	29.8
Pan	-38	45.9	29.8	100.0	0.0
Total	-	154.1	**100.0**	-	-

K80 **127**

Project No.: 11656-001

Test No.: Ore Drill Core



Appendix C – Rougher Kinetics Test Sheets

Test No.: **F1** | Project No.: **11656-001** | Operator: **PSM**

Date: **Sept. 27/2007**

Purpose: Initial Rougher Kinetics Scoping Test

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 25 minutes, Laboratory 10kg SS Rod Mill, 65 % solids,

Notes: - pull rate every 10 seconds over entire test
- stopped test after 3 rougher stages as froth was barren

Conditions: K80 (grind): 205 um

Stage	Reagents added, grams per tonne					Time, minutes			
	Diesel Fuel	**Pine Oil**				**Grind**	**Cond.**	**Froth**	**pH**
Grind	40					25			
Condition		50					1		Nat
Mo rougher 1								2	8.3
Mo rougher 2								4	
Mo rougher 3								4	
Mo Ro Scav	15						5	4	
Total	55	50					6	14	

Stage	Rougher 1-Scav
Flotation Cell	10 kg
Speed, rpm	50% setting

Metallurgical Balance

Product	**Weight**		**Assays, %**		**% Distribution**	
	g	**%**	**Mo**	**S**	**Mo**	**S**
Mo Ro Conc 1	105.8	1.1	9.26	7.09	75.1	32.4
Mo Ro Conc 2	74.7	0.7	1.72	1.87	9.9	6.0
Mo Ro Conc 3	35.6	0.4	0.36	0.82	1.0	1.3
Mo Ro Scav Conc	49.1	0.5	0.56	0.69	2.1	1.5
Ro Tls	9734.8	97.3	0.016	0.14	11.9	58.9
Head (calc.)	10000	100	0.13	0.23	100.0	100.0
(direct)			0.12	0.79		

Combined Products

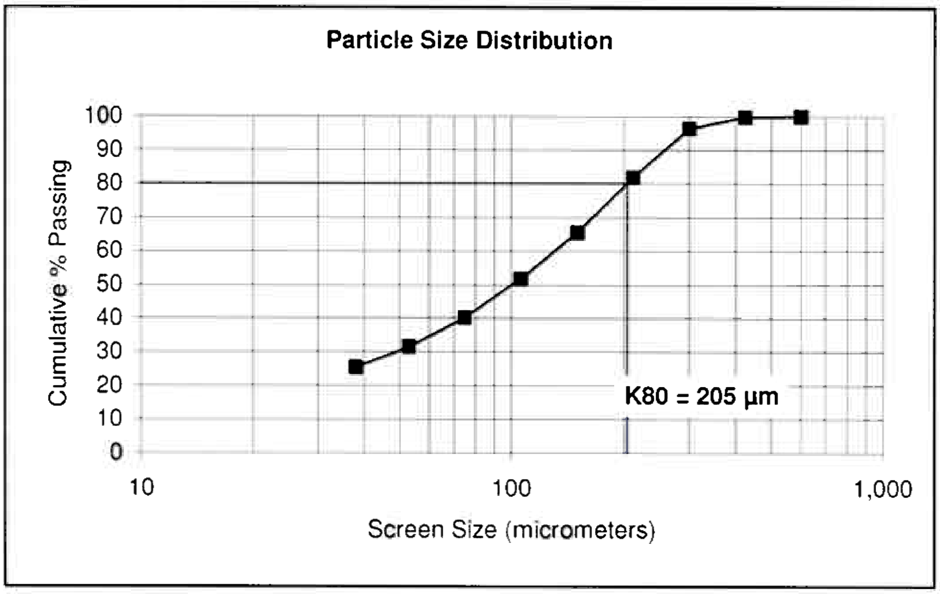
Product	**Weight**		**Assays, %**		**% Distribution**	
	g	**%**	**Mo**	**S**	**Mo**	**S**
Mo Ro Conc 1	105.80	1.1	9.3	0.8	75.1	32.4
Mo Ro Conc 1-2	180.50	1.8	6.1	1.4	85.0	38.4
Mo Ro Conc 1-3	216.10	2.2	5.2	1.8	85.9	39.7
Mo Ro Scav Conc + Ro Conc 1-3	265.20	2.7	4.3	2.2	88.1	41.1

SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro Tls Sub** Test No.: **F1**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
28	600	0.0	0.0	0.0	100.0
35	425	0.3	0.2	0.2	99.8
48	300	6.8	3.5	3.6	96.4
65	212	28.7	14.6	18.2	81.8
100	150	32.1	16.3	34.5	65.5
150	106	27.1	13.8	48.3	51.7
200	75	22.9	11.6	59.9	40.1
270	53	17.0	8.6	68.5	31.5
400	38	12.2	6.2	74.7	25.3
Pan	-38	49.7	25.3	100.0	0.0
Total	-	**196.8**	100.0	-	-
K80	**205**				



Test No.:	Project No.:	11656-001	Operator:	PSM
F2			Date:	**Oct.11/2007**

Purpose: 2nd Rougher Kinetics Scoping Test

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 35 minutes, Laboratory 10kg SS Rod Mill, 65 % solids,

Notes: - pull rate every 10 seconds over entire test

Conditions: K80 (grind): 150 (estimated)

	Reagents added, grams per tonne					Time, minutes			
Stage	**Diesel Fuel**	**Pine Oil**				**Grind**	**Cond.**	**Froth**	**pH**
Grind	60					35			
Condition		50					1		Nat
Mo rougher 1								2	8.3
Mo rougher 2								4	
Mo rougher 3								4	
Condition	10						5		
Mo rougher 4								4	
Mo Ro Scav	10						5	6	
Total	80	50					11	20	

Stage	Rougher 1-Scav
Flotation Cell	10 kg
Speed, rpm	50% setting

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Ro Conc 1	112	1.1	8.67	9.18	77.0	18.7
Mo Ro Conc 2	96.8	1.0	1.29	2.29	9.9	4.0
Mo Ro Conc 3	67.4	0.7	0.37	0.82	2.0	1.0
Mo Ro Conc 4	38.5	0.4	0.19	0.53	0.6	0.4
Mo Ro Scav Conc	50.3	0.5	0.15	0.51	0.6	0.5
Ro Tls	9635	96.4	0.013	0.43	9.9	75.4
Head (calc.)	10000	100	0.13	0.55	100.0	100.0
(direct)			0.12	0.79		

Combined Products

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Ro Conc 1	112.0	1.1	8.7	1.2	77.0	18.7
Mo Ro Conc 1-2	208.8	2.1	5.2	2.4	86.9	22.7
Mo Ro Conc 1-3	276.2	2.8	4.1	3.2	88.9	23.8
Mo Ro Conc 1-4	314.7	3.1	3.6	3.7	89.5	24.1
Mo Ro Scav Conc + Ro Conc 1-4	365.0	3.7	3.1	4.3	90.1	24.6

Test No.: **F3** Project No.: **11656-001** Operator: **PSM** Date: **Oct.11/2007**

Purpose: 3rd Rougher Kinetics Scoping Test

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 45 minutes, Laboratory 10kg SS Rod Mill, 65 % solids.

Notes: - pull rate every 10 seconds over entire test

Conditions: K80 (grind): 114

Stage	Reagents added, grams per tonne					Time, minutes			
	Diesel Fuel	Pine Oil				Grind	Cond.	Froth	pH
Grind	60					45			
Condition		50					1		Nat
Mo rougher 1								2	8.3
Mo rougher 2								4	
Mo rougher 3								4	
Condition	10						5		
Mo rougher 4								4	
Mo Ro Scav	10						5	6	
Total	80	50					11	20	

Stage	Rougher 1-Scav
Flotation Cell	10 kg
Speed, rpm	50% setting

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Ro Conc 1	181.1	1.8	4.99	6.81	70.0	21.6
Mo Ro Conc 2	93	0.9	2.34	2.99	16.8	4.9
Mo Ro Conc 3	49.5	0.5	0.90	1.35	3.4	1.2
Mo Ro Conc 4	63.8	0.6	0.23	1.30	1.1	1.5
Mo Ro Scav Conc	45.9	0.5	0.13	0.75	0.5	0.6
Ro Tls	9566.7	95.7	0.011	0.42	8.1	70.3
Head (calc.)	10000	100	0.13	0.57	100.0	100.0
(direct)			0.12	0.79		

Combined Products

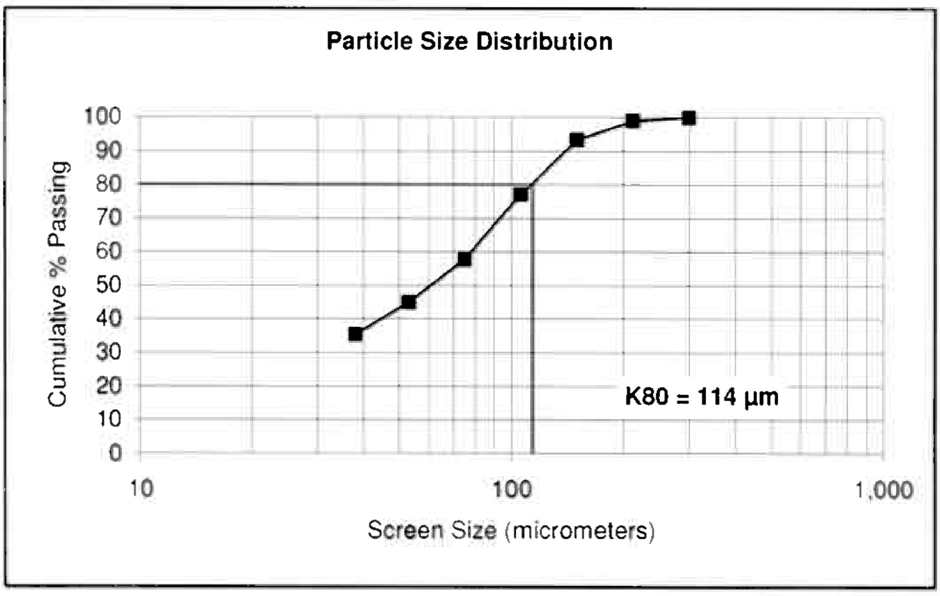
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Ro Conc 1	181.1	1.8	5.0	2.5	70.0	21.6
Mo Ro Conc 1-2	274.1	2.7	4.1	3.7	86.8	26.5
Mo Ro Conc 1-3	323.6	3.2	3.6	4.4	90.3	27.6
Mo Ro Conc 1-4	387.4	3.9	3.0	5.5	91.4	29.1
Mo Ro Scav Conc + Ro Conc 1-4	433.3	4.3	2.7	6.2	91.9	29.7

SGS Minerals Services
Size Distribution Analysis

Project No. **11656-001**

Sample: **Ro Sc Tails** Test No.: **F3**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.2	0.1	0.1	99.9
65	212	1.5	1.0	1.1	98.9
100	150	8.4	5.6	6.7	93.3
150	106	24.5	16.3	23.0	77.0
200	75	29.1	19.3	42.3	57.7
270	53	19.3	12.8	55.1	44.9
400	38	14.4	9.6	64.7	35.3
Pan	-38	53.2	35.3	100.0	0.0
Total	-	**150.6**	100.0	-	-
K80	**114**				



Test No.: F4

Project No.: **11656-001**

Operator: **PSM**
Date: **Oct.11/2007**

Purpose: 4th Rougher Kinetics Scoping Test

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 25 minutes, Laboratory 10kg SS Rod Mill, 65 % solids.

Notes: - pull rate every 10 seconds over entire test

Conditions:

K80 (grind): 202 um

Stage	Reagents added, grams per tonne					Time, minutes			
	Diesel Fuel	Pine Oil				Grind	Cond.	Froth	pH
Grind	40					25			
Condition		50					1		Nat
Mo rougher 1								2	8.3
Mo rougher 2								4	
Mo rougher 3								4	
Condition	10						5		
Mo rougher 4								4	
Mo Ro Scav	10						5	6	
Total	60	50					11	20	

Stage	Rougher 1-Scav
Flotation Cell	10 kg
Speed, rpm	50% setting

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Ro Conc 1	115.9	1.2	7.5	6.81	68.0	15.1
Mo Ro Conc 2	67.5	0.7	2.28	2.99	12.0	3.9
Mo Ro Conc 3	57.5	0.6	0.99	1.35	4.5	1.5
Mo Ro Conc 4	36.0	0.4	0.89	1.30	2.5	0.9
Mo Ro Scav Conc	45.2	0.5	0.25	0.75	0.9	0.7
Ro Tls	9677.9	96.8	0.016	0.42	12.1	78.0
Head (calc.)	10000	100	0.13	0.52	100.0	100.0
(direct)			0.12	0.79		

Combined Products

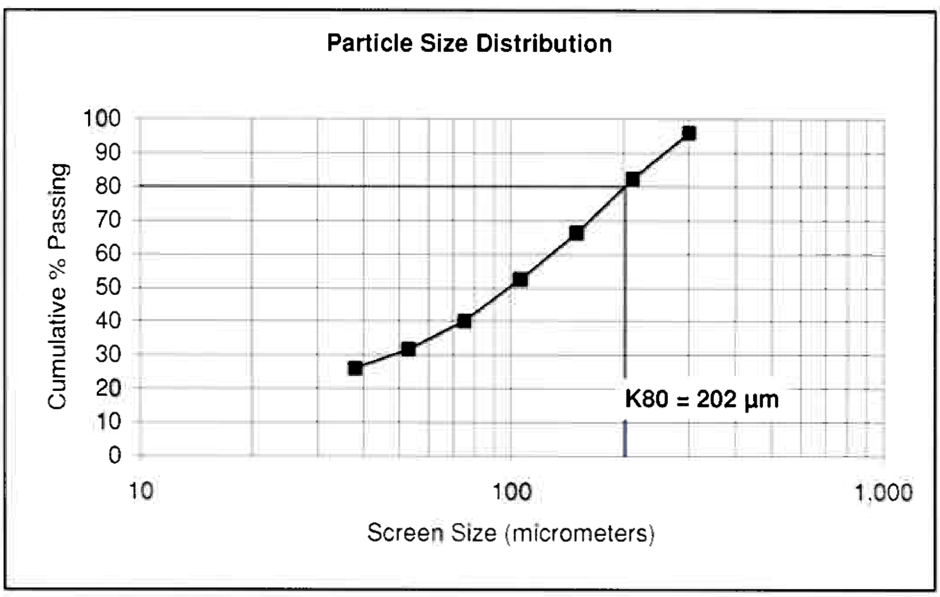
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Ro Conc 1	115.9	1.2	7.5	1.1	68.0	15.1
Mo Ro Conc 1-2	183.4	1.8	5.6	1.8	80.0	19.0
Mo Ro Conc 1-3	240.9	2.4	4.5	2.4	84.5	20.5
Mo Ro Conc 1-4	276.9	2.8	4.0	2.8	87.0	21.4
Mo Ro Scav Conc + Ro Conc 1-4	322.1	3.2	3.5	3.3	87.9	22.0

SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro Sc Tails** Test No.: **F4**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	6.1	4.1	4.1	95.9
65	212	20.4	13.6	17.6	82.4
100	150	24.1	16.0	33.7	66.3
150	106	20.7	13.8	47.5	52.5
200	75	18.8	12.5	60.0	40.0
270	53	12.6	8.4	68.4	31.6
400	38	8.4	5.6	74.0	26.0
Pan	-38	39.1	26.0	100.0	0.0
Total	**-**	**150.2**	100.0	-	-
K80	**202**				



Appendix D – Batch Cleaner Test Sheets

Test No.: F5 | Project No.: 11656-001 | Operator: PSM | Date: Nov. 19/2007

Purpose: 1st cleaner test using F2 rougher conditions

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 35 minutes, Laboratory 10kg SS Rod Mill, 65 % solids.

Notes: - pull rate every 10 seconds over entire test
-10 kg float machine has new impeller
-Used machine #6 for cleaners

Conditions: K80 (grind): 153

Stage	Reagents added, grams per tonne				Time, minutes				
	Diesel Fuel	Pine Oil			Grind	Cond.	Froth	pH	Redox
Grind	60				35				
Condition		50				1		Nat	
Mo rougher 1							2	9.5	
Mo rougher 2							4	9.3	
Mo rougher 3							4	9.6	
Condition	10					5			
Mo rougher 4							4	9.0	
Mo Ro Scav	10					5	6	8.3	
Cleaners									
		as needed							
Cleaner1		--					13	8.1	180
Cleaner2		--					10	8.0	180
Cleaner3		--					8	7.8	150
Cleaner4		--					6	7.7	120
Total	80	50					57		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	45.8	0.5	22.6	18.3	84.8	15.1
Mo Clr 4 Tls.	14.2	0.1	1.64	1.85	1.9	0.5
Mo Clr 3 Tls.	23.3	0.2	0.65	1.45	1.2	0.6
Mo Clr 2 Tls.	73.1	0.7	0.21	0.79	1.3	1.0
Mo Clr 1 Tls.	536.4	5.4	0.038	0.44	1.7	4.2
Mo Ro Tls	9307.2	93.1	0.012	0.47	9.1	78.6
Head (calc.)	10000	100	0.12	0.56	100.0	100.0
(direct)			0.12	0.79		

Combined Products

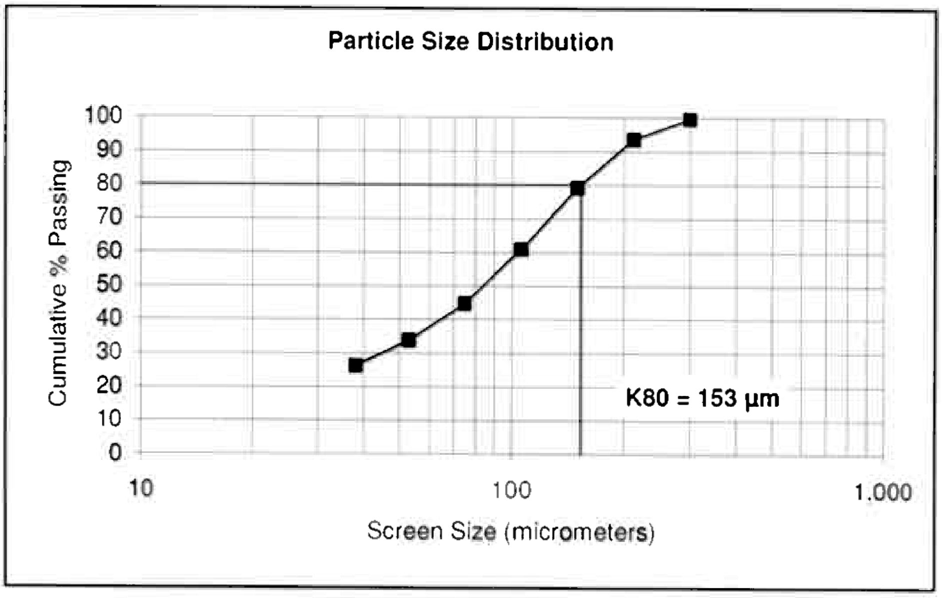
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	45.8	0.5	22.6	18.3	84.8	15.1
Mo Clr 3 Conc.	60.0	0.6	17.6	14.4	86.7	15.5
Mo Clr 2 Conc.	83.3	0.8	12.9	10.8	87.9	16.1
Mo Clr 1 Conc.	156.4	1.6	7.0	6.1	89.2	17.2
Mo Ro Conc	692.8	6.9	1.8	8.0	90.9	21.4

SGS Minerals Services
Size Distribution Analysis

Project No. **11656-001**

Sample: **Ro Tl Sub** Test No.: **F5**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.7	0.4	0.4	99.6
65	212	8.9	6.0	6.5	93.5
100	150	21.1	14.3	20.8	79.2
150	106	26.8	18.3	39.1	60.9
200	75	23.9	16.3	55.4	44.6
270	53	15.9	10.9	66.3	33.7
400	38	11.1	7.6	73.8	26.2
Pan	-38	38.4	26.2	100.0	0.0
Total	-	**146.7**	100.0	-	-
K80	**153**				



Test No.: F6	Project No.:	11656-001	Operator:	PSM
			Date:	Nov.19/2007

Purpose: 2nd cleaner test using F3 rougher conditions

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 45 minutes, Laboratory 10kg SS Rod Mill, 65 % solids.

Notes:
- Rougher pull rate every 10 seconds
- Weight of rod mill charge may have changed based on grind K80
- Used machine #6 for cleaners
- 10 kg float machine has new impeller

Conditions: K80 (grind): 124

Stage	Reagents added, grams per tonne					Time, minutes			pH	Redox
	Diesel Fuel	Pine Oil				Grind	Cond.	Froth		
Grind	60					45				
Roughers										
Condition		50					1		Nat	
Mo rougher 1								2	8.3	
Mo rougher 2								4		
Mo rougher 3								4		
Condition	10						5			
Mo rougher 4								4		
Mo Ro Scav	10						5	6		
Cleaners										
Condition										
		as needed								
Cleaner1		–						13	8.2	180
Cleaner2		–						13	8.0	180
Cleaner3		–						8	8.0	150
Cleaner4		–						6	7.9	100
Total	20							60		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	45.5	0.5	22.6	20.4	84.9	17.7
Mo Clr 4 Tls.	11.6	0.1	1.64	3.85	1.6	0.9
Mo Clr 3 Tls.	22.5	0.2	0.65	1.76	1.2	0.8
Mo Clr 2 Tls.	81.4	0.8	0.21	0.91	1.4	1.4
Mo Clr 1 Tls.	517.8	5.2	0.038	0.29	1.6	2.9
Mo Ro Tls	9321.2	93.2	0.012	0.43	9.2	76.4
Head (calc.)	10000	100.0	0.12	0.52	100.0	100.0
(direct)			0.12	0.79		

Combined Products

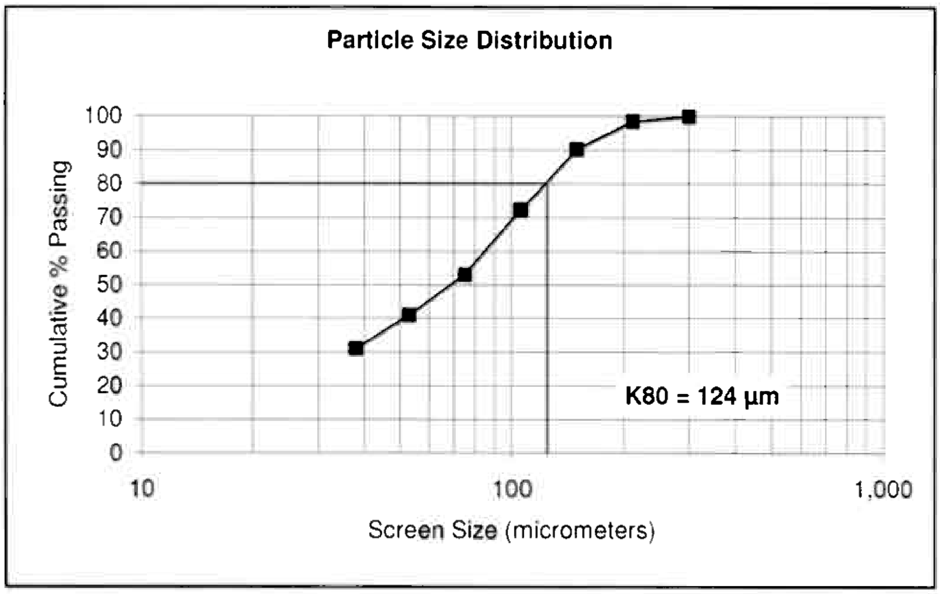
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	45.5	0.5	22.6	20.4	84.9	17.7
Mo Clr 3 Conc.	57.1	0.6	18.3	17.0	86.5	18.5
Mo Clr 2 Conc.	79.6	0.8	13.3	12.7	87.7	19.3
Mo Clr 1 Conc.	161.0	1.6	6.70	6.75	89.1	20.7
Mo Ro Conc	678.8	6.8	1.78	7.73	90.8	23.6

SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro TI Sub** Test No.: **F6**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.1	0.1	0.1	99.9
65	212	2.2	1.5	1.6	98.4
100	150	12.3	8.3	9.8	90.2
150	106	26.8	18.0	27.8	72.2
200	75	28.6	19.3	47.1	52.9
270	53	17.8	12.0	59.1	40.9
400	38	15.0	10.1	69.2	30.8
Pan	-38	45.8	30.8	100.0	0.0
Total	-	**148.6**	100.0	-	-
K80	**124**				

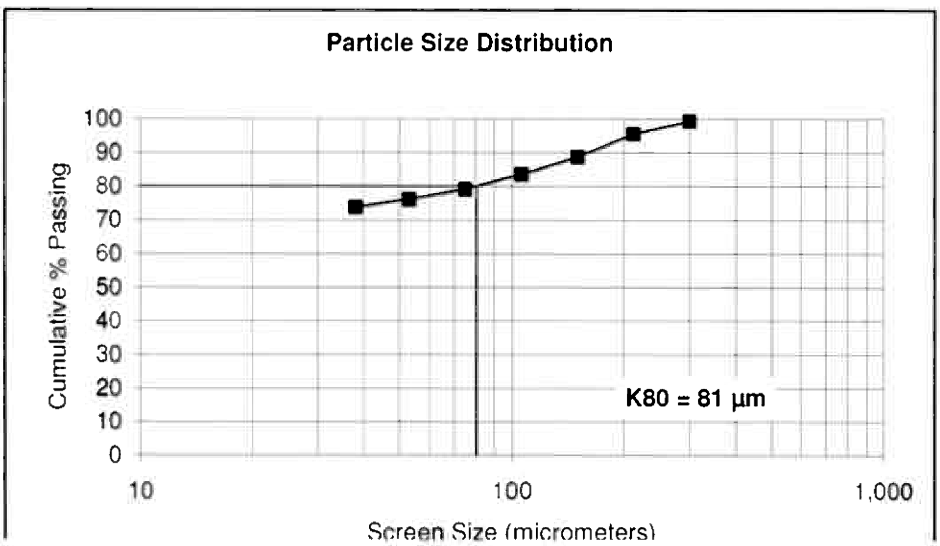


SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro Con** Test No.: **F7**

Size		Weight	% Retained		% Passing
Mesh	μm	grams	Individual	Cumulative	Cumulative
48	300	2.1	0.7	0.7	99.3
65	212	11.6	3.8	4.5	95.5
100	150	20.5	6.8	11.3	88.7
150	106	15.8	5.2	16.5	83.5
200	75	13.3	4.4	20.9	79.1
270	53	8.9	2.9	23.8	76.2
400	38	7.3	2.4	26.2	73.8
Pan	-38	223.7	73.8	100.0	0.0
Total	-	**303.3**	100.0	-	-
K80	**81**				



Test No.: **F8**

Project No.: **11656-001**

Operator: **PSM**

Date: **Dec. 5/2007**

Purpose: Cleaner test to observe effect of less fuel oil in roughers, re-grind on 1st Cleaner concentrate, and addition of cyanide and lime to depress pyrite
Achieve grade of 50% Mo in 4th cleaner concentrate
CMC added in Clr 2 to depress talc

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: [illegible] minutes, Laboratory 10kg SS Rod Mill, 65 % solids.
[illegible] minutes re-grind in pebble mill

Notes:
- Rougher pull rate every 10 seconds in Ro 1-3
- Pull rate in Ro 4,5 every 15 seconds

K80 (grind): 109
K80 (re-grind): N/A

Conditions:

Stage	Reagents added, grams per tonne					Time, minutes			pH	Redox
	Diesel Fuel	MIBC	NaCN	Lime	CMC	Grind	Cond.	Froth		
Grind	40					45				
Roughers										
Condition		50					1		Nat	
Mo Rougher 1								2	8.3	
Mo Rougher 2								4		
Mo Rougher 3								4		
Condition	2.5						5			
Mo Rougher 4								5		
Condition	2.5						5			
Mo rougher 5								5		
Condition										
Mo Ro Scav. (Sep. Conc.)	10						5	6		
Cleaners										
Ro Conc 1-5										
Condition										
		as needed								
Cleaner1		–						4	8.21	
Cleaner1 Scav								6	8.09	
Re-grind Clr1 Conc			20	100		8			11.55	-100
Cleaner2	2	2.5	10		10			4	10.14	-90
Cleaner3		–	10					3	9.71	-85
Cleaner4	0.5	–	10					2	9.70	-80
Total	17.5	52.5	50	100	10			45		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	9.5	0.1	55.1	35.3	49.6	6.9
Mo Clr 4 Tls	0.1	0.001	38.1	23.2	0.4	0.05
Mo Clr 3 Tls	4.5	0.045	16.0	11.4	6.8	1.1
Mo Clr 2 Tls	44.9	0.4	5.3	6.41	22.4	5.9
Mo Clr 1 Scav Conc.	33.8	0.3	2.83	3.13	9.1	2.2
Mo Clr 1 Scav Tls	309.0	3.1	0.083	0.42	2.4	2.7
Mo Ro Scav Conc	95.0	1.0	0.040	0.33	0.4	0.6
Mo Ro Tls	9503.2	95.0	0.010	0.410	9.0	80.5
Head (calc.)	10000	100.0	0.11	0.48	100.0	100.0
(direct)			0.12	0.79		

Note: Insufficient sample for Cleaner 4 tailings, used assays from F9 as approximations

Combined Products

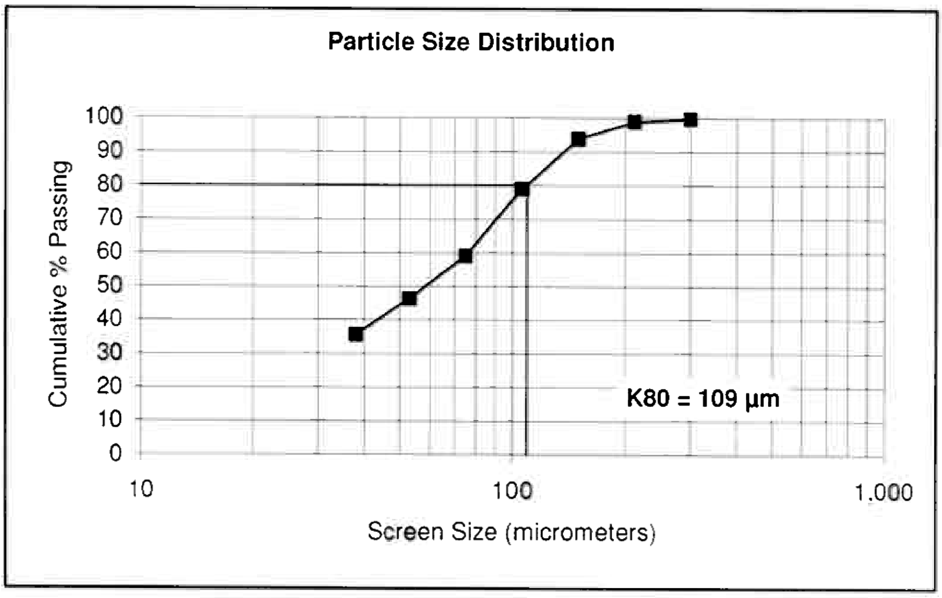
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	9.5	0.1	55.1	35.3	49.6	6.9
Mo Clr 3 Conc	9.6	0.1	54.9	35.2	50.0	7.0
Mo Clr 2 Conc	14.1	0.1	42.5	27.6	56.8	8.0
Mo Clr 1 Conc	59.0	0.6	14.16	11.47	79.1	14.0
Mo Clr 1 Conc. + Clr. 1 Scav. Conc.	92.8	0.9	10.03	8.43	88.2	16.2
Mo Ro Conc	401.8	4.0	2.38	2.27	90.6	15.9
Mo Ro Conc + Ro Scav. Conc.	496.8	5.0	1.93	1.90	91.0	19.5

SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro Sc Tl Sub** Test No.: **F8**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.4	0.3	0.3	99.7
65	212	1.3	0.9	1.2	98.8
100	150	7.1	4.9	6.1	93.9
150	106	21.5	15.0	21.1	78.9
200	75	28.5	19.9	41.0	59.0
270	53	18.3	12.7	53.7	46.3
400	38	15.3	10.7	64.4	35.6
Pan	-38	51.1	35.6	100.0	0.0
Total	-	**143.4**	100.0	-	-
K80	**109**				



Test No.: **F9** Project No.: **11656-001** Operator: **PSM** Date: **Dec. 6/2007**

Purpose: Cleaner test to observe effect of less fuel oil in roughers, re-grind on 1st Cleaner concentrate, and addition of cyanide and lime to depress pyrite
Achieve grade of 50% Mo in 4th cleaner concentrate
Sodium silicate added to depress talc in Clr 2

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: 45 minutes, Laboratory 10kg SS Rod Mill, 65 % solids.
5 minutes re-grind in pebble mill

Notes: - Rougher pull rate every 10 seconds for first 10 minutes
- Rougher pull rate every 15 seconds after 10 minutes

K80 (primary grind): 119
K80 (re-grind): 18

Conditions:

Stage	Reagents added, grams per tonne					Time, minutes			pH	Redox
	Diesel Fuel	MIBC	NaCN	Lime	Sod Sil	Grind	Cond.	Froth		
Grind	40					45				
Roughers										
Condition		40					1		Nat	
Mo Rougher 1								2	8.3	
Mo Rougher 2								4		
Mo Rougher 3								4		
Condition	2.5						5			
Mo Rougher 4								5		
Condition	2.5						5			
Mo rougher 5								5		
Condition										
Mo Ro Scav (Sep. Conc.)	10						5	8		
Cleaners										
Ro Conc 1-5										
Condition										
		as needed								
Cleaner1		–						4	8.3	+180
Cleaner1 Scav								6	8.1	+120
Re-grind Clr1 Conc			20	100		5			12.4	-220
Cleaner2	1	2.5	10		1000			4	12.3	-210
Cleaner3		–	10					3	12.0	-200
Cleaner4		–						2	11.2	-100
Total	56	42.5	40	100	1000			45		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	11.8	0.1	55.5	34.4	64.1	6.8
Mo Clr 4 Tls	1.6	0.02	38.1	23.2	6.0	0.6
Mo Clr 3 Tls	5.5	0.1	11.7	8.21	6.3	0.8
Mo Clr 2 Tls	43.6	0.4	1.67	2.95	7.1	2.2
Mo Clr 1 Scav Conc	19.1	0.2	2.73	2.64	5.1	0.3
Mo Clr 1 Scav Tls	207.5	2.1	0.17	0.890	3.5	9.2
Mo Ro Scav Conc	54	0.5	0.064	0.410	0.3	0.4
Mo Ro Tls	9656.9	96.6	0.008	0.490	7.6	79.7
Head (calc.)	10000	100.0	0.102	0.594	100.0	100.0
(direct)			0.120	0.790		

Combined Products

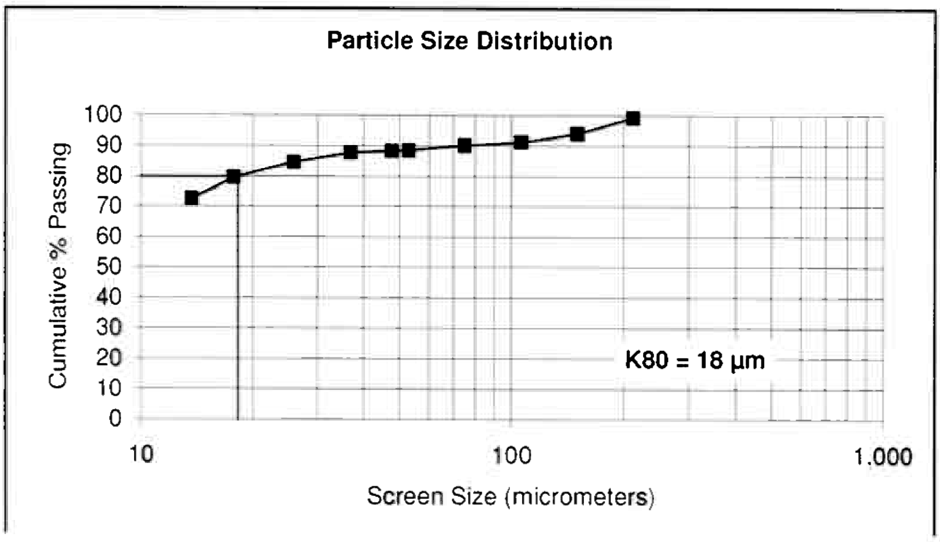
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	11.8	0.1	55.5	34.4	64.1	6.8
Mo Clr 3 Conc	13.4	0.1	53.4	33.1	70.1	7.5
Mo Clr 2 Conc	18.9	0.2	41.3	25.8	76.4	8.2
Mo Clr 1 Conc	62.5	0.6	13.65	9.87	83.5	10.4
Mo Clr 1 Conc + Clr. 1 Scav. Conc	81.6	0.8	11.09	7.77	88.6	10.7
Mo Ro Conc	289.1	2.9	3.25	4.09	92.1	19.9
Mo Ro Conc + Ro Scav. Conc	343.1	3.4	2.75	3.51	92.4	20.3

SGS Minerals Services
Size Distribution Analysis

Project No. **11656-001**

Sample: **Comb Prod** Test No.: **F-9**

Dry Solids S.G.=		2.63	Water Temperature =		4.00 Cº
Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
65	212	0.4	0.8	0.8	99.2
100	150	2.6	5.2	6.0	94.0
150	106	1.5	2.9	8.9	91.1
200	75	0.5	1.1	10.0	90.0
270	53	0.8	1.5	11.5	88.5
	48	0.1	0.2	11.7	88.3
	37	0.3	0.5	12.2	87.8
	26	1.6	3.1	15.4	84.6
	18	2.5	5.0	20.4	79.6
	14	3.5	7.0	27.5	72.5
	-14	36.3	72.5	100.0	0.0
Total	-	**50.0**	100.0	-	-
K80	18				



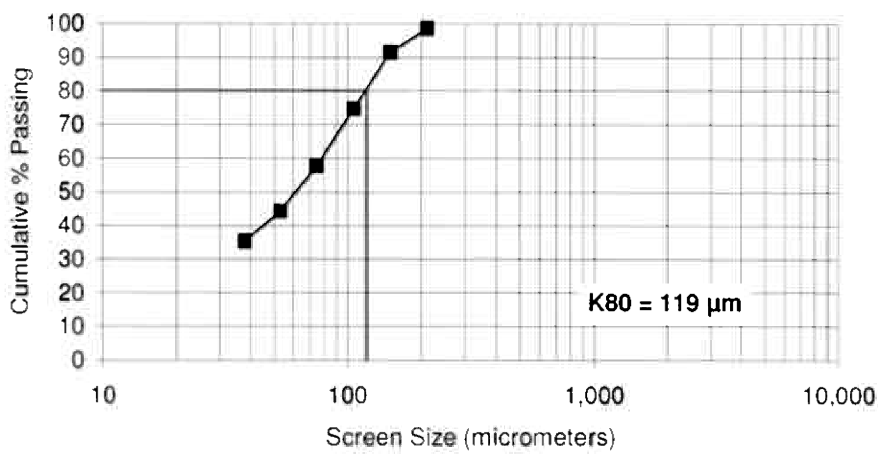
SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro Scav Tail** Test No.: **F9**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
65	212	2.0	1.4	1.4	98.6
100	150	10.3	7.1	8.5	91.5
150	106	24.2	16.8	25.3	74.7
200	75	24.6	17.0	42.3	57.7
270	53	19.5	13.5	55.8	44.2
400	38	12.7	8.8	64.6	35.4
Pan	-38	51.1	35.4	100.0	0.0
Total	-	**144.4**	100.0	-	-
K80	**119**				

Particle Size Distribution



Test No.: **F10** | Project No.: **11656-001** | Operator: **PSM** | Date:

Purpose: Cleaner test to observe effect of stage grinding of Rougher feed to avoid over grinding of liberated Mo
Re-grind on rougher concentrate, addition of cyanide and lime to depress pyrite
Sodium silicate added to depress talc in Clr 1
Achieve grade of 50% Mo in 4th cleaner concentrate
Improve Mo recovery to final concentrate, above F8 and F9

Procedure: As outlined below

Feed: 10kg of Hurdal ore composite

Grind: Primary grind: Stage at 5 minute intervals laboratory 10kg SS Rod Mill, 65 % solids
10 minutes Rougher concentrate re-grind in pebble mill

Notes:
- Rougher pull rate every 10 seconds for first 10 minutes — K80 (primary grind): 149 µm
- Rougher pull rate every 15 seconds after 10 minutes — K80 (re-grind): 24 µm
- measured pH levels in cleaners that differ from target pH levels are bracketed in red

Conditions:

Stage	Reagents added, grams per tonne					Time, minutes			pH	Redox
	Diesel Fuel	MIBC	NaCN	Lime	Sod Sil	Grind	Cond.	Froth		
Grind	40					Stage Gr.				
Roughers										
Condition		40					1		Nat	
Mo Rougher 1								2	8.3	
Mo Rougher 2								4		
Mo Rougher 3								4		
Condition	2.5						5			
Mo Rougher 4								5		
Condition	2.5						5			
Mo rougher 5		5						5		
Condition										
Mo Ro Scav (Sep. Conc.)	10						5	6		
Re-grind										
Ro Conc 1-5	0.5		20	as needed for pH 9.5 = 16 g/t	200	10			9.5	
Condition										
		as needed		as needed						
Cleaner1	1	2.5		13				4	10.0	-160
Cleaner1 Scav	1	1		0				6	10.0	-170
Cleaner2		2	10	0				4	10.5	-200
Cleaner3		1	10	25				3	11.0	-180
Cleaner4		—		22				2	11.5	180
Total	55.5	51.5	40	76	200			45		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc.	16.7	0.2	45.1	32.1	76.0	8.6
Mo Clr 4 Tls.	2	0.02	30.4	27.3	6.1	0.9
Mo Clr 3 Tls.	3.4	0.0	7.11	11.7	2.4	0.6
Mo Clr 2 Tls.	30.1	0.3	1.450	3.110	4.4	1.5
Mo Clr 1 Scav Conc.	19.4	0.2	0.92	2.880	1.8	0.4
Mo Clr 1 Scav Tls.	349.2	3.5	0.041	1.240	1.4	16.1
Mo Ro Scav Conc.	79.2	0.8	0.068	0.490	0.5	0.6
Mo Ro Tls.	9500	95.0	0.0076	0.470	7.3	71.4
Head (calc.)	10000	100.0	0.099	0.626	100.0	100.0
(direct)			0.120	0.790		

Combined Products

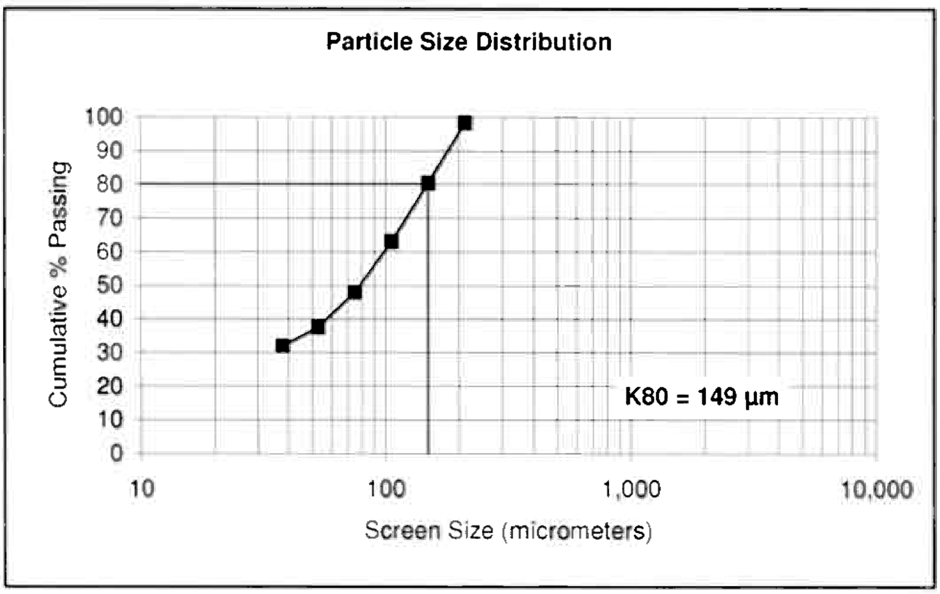
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc.	16.7	0.2	45.1	32.1	76.0	8.6
Mo Clr 3 Conc.	18.7	0.2	43.5	31.6	82.1	9.4
Mo Clr 2 Conc.	22.1	0.2	37.9	28.5	84.5	10.1
Mo Clr 1 Conc.	52.2	0.5	16.89	13.87	88.9	11.6
Mo Clr 1 Conc. + Clr 1 Scav Conc.	71.6	0.7	12.56	10.45	90.7	12.0
Mo Ro Conc.	420.8	4.2	2.17	4.17	92.2	25.0
Mo Ro Conc. + Ro Scav. Conc.	500	5.0	1.84	3.59	92.7	28.6

SGS Minerals Services
Size Distribution Analysis

Project No.
11656-001

Sample: **Ro Scav Tail sub** Test No.: **F10**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
65	212	1.9	1.7	1.7	98.3
100	150	19.7	17.8	19.5	80.5
150	106	19.4	17.5	37.0	63.0
200	75	16.8	15.1	52.1	47.9
270	53	11.5	10.4	62.5	37.5
400	38	6.2	5.6	68.1	31.9
Pan	-38	35.4	31.9	100.0	0.0
Total	-	**110.9**	100.0	-	-
K80	**149**				



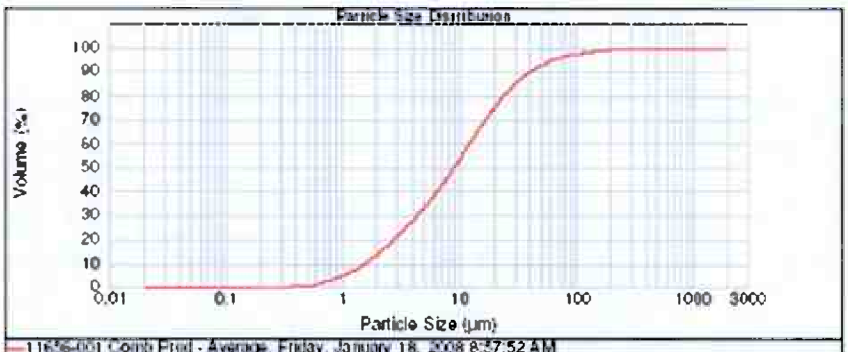
MALVERN INSTRUMENTS

MASTERSIZER 2000

Result Analysis Report

Sample Name: 11656-001 Comb Prod - Average	**SOP Name:** default	**Measured:** Friday, January 18, 2008 8:57:52 AM	
Sample Source & type: Factory - F10	**Measured by:** Lr_hydro1	**Analysed:** Friday, January 18, 2008 8:57:53 AM	
Sample bulk lot ref: 123-ABC	**Result Source:** Averaged		
Particle Name: Default	**Accessory Name:** Hydro 2000G (A)	**Analysis model:** General purpose	**Sensitivity:** Enhanced
Particle RI: 1.520	**Absorption:** 0.1	**Size range:** 0.020 to 2000.000 um	**Obscuration:** 14.87 %
Dispersant Name: Water	**Dispersant RI:** 1.330	**Weighted Residual:** 1.413 %	**Result Emulation:** Off
Concentration: 0.0098 %Vol	**Span:** 4.275	**Uniformity:** 1.72	**Result units:** Volume
Specific Surface Area: 1.47 m²/g	**Surface Weighted Mean D[3,2]:** 4.079 um	**Vol. Weighted Mean D[4,3]:** 19.375 um	

d(0.1): 1.574 um d(0.5): 8.853 um **D(0.80) : 24.12 µm**



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.010	0.00	0.105	0.00	1.096	5.83	11.482	[illegible]	120.226	[illegible]	1258.925	100.00
0.011	0.00	0.120	0.00	1.259	7.3[illegible]	13.183	[illegible]	138.038	[illegible]	1445.440	100.00
0.013	0.00	0.138	0.00	1.445	[illegible]	15.136	[illegible]	158.489	[illegible]	1659.587	100.00
0.015	0.00	0.158	0.00	[illegible]	11.72	17.378	70.22	181.970	[illegible]	1905.461	100.00
0.017	0.00	0.182	0.00	[illegible]	[illegible]	[illegible]	74.28	208.930	[illegible]	2187.762	100.00
0.020	0.00	0.209	0.00	2.188	[illegible]	22.909	[illegible]	239.883	[illegible]	2511.886	100.00
0.023	0.00	0.240	0.00	2.512	17.9[illegible]	26.303	[illegible]	275.423	[illegible]	2884.032	100.00
0.026	0.00	0.275	0.00	[illegible]	[illegible]	30.200	[illegible]	316.228	[illegible]	3311.311	100.00
0.030	0.00	0.316	0.00	3.311	[illegible]	[illegible]	[illegible]	363.078	[illegible]	3801.894	100.00
0.035	0.00	0.363	0.00	[illegible]	26.90	39.811	[illegible]	416.869	[illegible]	4365.158	100.00
0.040	0.00	0.417	0.05	4.365	[illegible]	[illegible]	[illegible]	478.630	[illegible]	5011.872	100.00
0.046	0.00	[illegible]	0.30	5.012	[illegible]	52.481	[illegible]	[illegible]	[illegible]	[illegible]	100.00
0.052	0.00	0.550	0.76	[illegible]	[illegible]	60.256	[illegible]	630.957	[illegible]	[illegible]	100.00
0.060	0.00	0.631	1.44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.00	7585.776	100.00
0.069	0.00	[illegible]	2.31	[illegible]	[illegible]	[illegible]	[illegible]	831.764	100.00	[illegible]	100.00
0.079	0.00	[illegible]	[illegible]	8.710	[illegible]	91.201	[illegible]	[illegible]	100.00	10000.000	100.00
0.091	0.00	[illegible]	4.82	10.000	[illegible]	[illegible]	[illegible]	[illegible]	100.00		

Operator notes:

Test No.:		Project No.:	11656-001	Operator:	PSM
F11				Date:	

Purpose: Cleaner test to depress pyrite with lime only
Achieve grade of 50% Mo in 4th cleaner concentrate
Sodium silicate added to depress talc in Clr 1
Stage grinding of Rougher feed

Procedure: As outlined below

Feed: 10kg of Hurdal ore composite

Grind: Stage grinding of flotation feed, laboratory 10kg SS Rod Mill, 65 % solids
10 minutes re-grind in pebble mill

Notes:
- Rougher pull rate every 10 seconds for first 10 minutes
- Rougher pull rate every 15 seconds after 10 minutes
- In Re-grind, lime added to pH 9.5 before sod. Sil. Added

K80 (primary grind):	142	µm
K80 (re-grind):	23	µm

Conditions:

Stage	Reagents added, grams per tonne				Time, minutes			pH	Redox
	Diesel Fuel	MIBC	Lime	Sod Sil	Grind	Cond.	Froth		
Grind	40				Stage Gr.				
Roughers									
Condition		40				1		Nat	
Mo Rougher 1							2	8.3	
Mo Rougher 2							4		
Mo Rougher 3							4		
Condition	2.5					5			
Mo Rougher 4		5					5		
Condition	2.5					5			
Mo rougher 5							5		
Condition									
Mo Ro Scav *(Sep. Conc.)*	10					5	6		
Re-grind									
Ro Conc 1-5	0.5		as needed for pH 9.5 =16 g/t	200	10			9.5	-120
Condition									
		as needed	as needed						
Cleaner1		2.5	0				4	10 (11)	-180
Cleaner1 Scav		1	0				6	10.0	-150
Cleaner2		2	23				4	10.5	-200
Cleaner3		1	20				3	11.0	-180
Cleaner4		–	31				2	11.5	-120
Total	55.5	51.5	90	200			45		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1500	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	14.7	0.1	48.2	30.5	72.6	7.3
Mo Clr 4 Tls	1	0.01	35.3	23.5	3.6	0.4
Mo Clr 3 Tls	2.1	0.0	12.5	9.13	2.7	0.3
Mo Clr 2 Tls	17.2	0.2	2.20	2.67	3.9	0.7
Mo Clr 1 Scav Conc	21.4	0.2	2.53	2.93	5.5	0.3
Mo Clr 1 Scav Tls	337.9	3.4	0.067	0.840	2.3	16.1
Mo Ro Scav Conc	47.3	0.5	0.067	0.520	0.3	0.4
Mo Ro Tls	9555.4	95.6	0.0092	0.480	9.0	74.5
Head (calc.)	10000	100.0	0.085	0.616	100.0	100.0
(direct)			0.120	0.790		

Combined Products

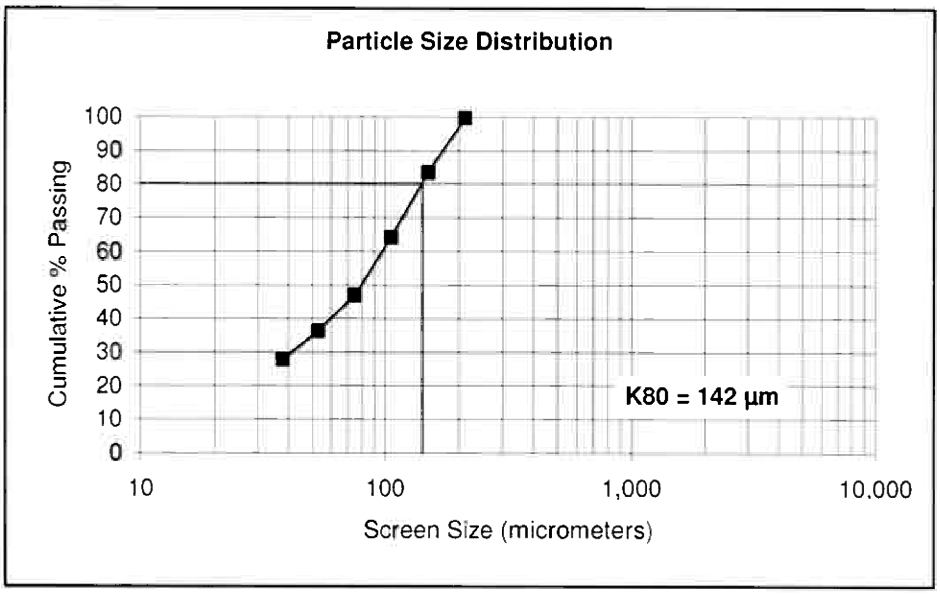
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	14.7	0.1	48.2	30.5	72.6	7.3
Mo Clr 3 Conc	15.7	0.2	47.4	30.1	76.2	7.7
Mo Clr 2 Conc	17.8	0.2	43.3	27.6	78.9	8.0
Mo Clr 1 Conc	35.0	0.4	23.1	15.3	82.8	8.7
Mo Clr 1 Conc + Clr 1 Scav Conc	56.4	0.6	15.28	9.54	88.3	9.0
Mo Ro Conc	394.3	3.9	2.24	3.92	90.7	25.1
Mo Ro Conc + Ro Scav Conc	441.6	4.4	2.01	3.55	91.0	25.5

SGS Minerals Services
Size Distribution Analysis

Project No. **11656-001**

Sample: **Ro Scav Tail sub** Test No.: **F11**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
65	212	0.6	0.5	0.5	99.5
100	150	19.7	16.0	16.5	83.5
150	106	23.8	19.3	35.9	64.1
200	75	21.3	17.3	53.2	46.8
270	53	13.0	10.6	63.7	36.3
400	38	10.4	8.5	72.2	27.8
Pan	-38	34.2	27.8	100.0	0.0
Total	-	**123.0**	100.0	-	-
K80	**142**				



MALVERN INSTRUMENTS

MASTERSIZER 2000

Result Analysis Report

Sample Name: 11656-001 Comb Prod - Average	**SOP Name:** default	**Measured:** Friday, January 18, 2008 8:48:11 AM	
Sample Source & type: Factory - F11	**Measured by:** U_hydro	**Analysed:** Friday, January 18, 2008 8:48:12 AM	
Sample bulk lot ref: 123-ABC	**Result Source:** Averaged		
Particle Name: Default	**Accessory Name:** Hydro 2000G (A)	**Analysis model:** General purpose	**Sensitivity:** Enhanced
Particle RI: 1.520	**Absorption:** 0.1	**Size range:** 0.020 to 2000.000 um	**Obscuration:** 19.33 %
Dispersant Name: Water	**Dispersant RI:** 1.330	**Weighted Residual:** 1.360 %	**Result Emulation:** Off
Concentration: 0.0132 %Vol	**Span:** 4.146	**Uniformity:** 1.53	**Result units:** Volume
Specific Surface Area: 1.43 m²/g	**Surface Weighted Mean D[3,2]:** 4.197 um	**Vol. Weighted Mean D[4,3]:** 17.635 um	

d(0.1): 1.657 um d(0.5): 8.841 um D(0.80) : 22.73 µm

Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.010	0.00	0.105	0.00	1.096	5.46	11.482	58.[illegible]7	120.226	[illegible]	1258.925	100.00
0.011	0.00	0.120	0.00	1.259	[illegible]	13.183	63.00	138.038	99.02	1445.440	100.00
0.013	0.00	0.138	0.00	1.445	8.[illegible]	15.136	68.36	158.[illegible]	99.26	1659.587	100.00
0.015	0.00	0.158	0.00	1.660	10.02	17.378	72.86	181.970	99.41	1905.461	100.00
0.017	0.00	0.1[illegible]	0.00	1.905	11.91	19.953	76.82	208.930	99.52	2187.762	100.00
0.020	0.00	0.209	0.00	2.1[illegible]	14.[illegible]	22.909	80.19	239.883	99.60	2511.[illegible]	100.00
0.023	0.00	0.2[illegible]	0.00	2.512	16.41	26.303	83.36	275.423	99.66	2884.032	100.00
0.026	0.00	0.275	0.00	2.884	19.[illegible]	30.200	[illegible].12	316.228	[illegible].71	3311.311	100.00
0.030	0.00	0.31[illegible]	0.00	3.311	21.[illegible]	34.67[illegible]	88.50	363.078	99.78	3801.[illegible]	100.00
0.035	0.00	0.363	0.00	3.802	25.[illegible]	[illegible].811	[illegible].93	416.869	[illegible].86	4365.158	100.00
0.040	0.00	0.417	0.[illegible]	4.365	28.44	45.709	92.25	478.630	99.93	5011.872	100.00
0.046	0.00	0.[illegible]	0.27	5.012	32.[illegible]	52.481	[illegible].73	549.541	99.[illegible]	57[illegible]	100.00
0.052	0.00	0.550	0.75	5.7[illegible]	36.13	60.256	94.97	630.957	100.00	6606.[illegible]	100.00
0.060	0.00	0.631	1.36	6.607	[illegible]	[illegible].183	96.03	72[illegible]	100.00	7585.77[illegible]	100.00
0.069	0.00	0.7[illegible]	2.18	7.586	[illegible].83	[illegible].433	96.91	831.7[illegible]	100.00	8709.636	100.00
0.079	0.00	0.832	3.16	8.710	[illegible]	91.201	97.64	[illegible]	100.00	10000.[illegible]	100.00
0.091	0.00	0.955	4.26	10.000	54.[illegible]	104.713	98.23	1096.478	100.00		

Operator notes:

Malvern Instruments Ltd
Malvern, UK

Mastersizer 2000 Ver. 5.22
Serial Number : MAL101660

File name: Arne 2008
Record Number: 88

Test No.:		Project No.:	11656-001	Operator:	PSM
F12				Date:	

Purpose: Cleaner test to depress pyrite with NaHS and lime
Achieve grade of 50% Mo in 4th cleaner concentrate
Sodium silicate added to depress talc in Clr 1
Stage grinding of Rougher feed

Procedure: As outlined below.

Feed: 10kg of Hurdal ore composite

Grind: Stage grinding of flotation feed, laboratory 10kg SS Rod Mill, 65 % solids
10 minutes re-grind in pebble mill

Notes: - Rougher pull rate every 10 seconds for first 10 minutes
- Rougher pull rate every 15 seconds after 10 minutes
- Measured pH levels in cleaners that differ from target pH levels are bracketed in red

K80 (primary grind):	134	µm
K80 (re-grind):	23	µm

Conditions:

Stage	Reagents added, grams per tonne					Time, minutes			pH	Redox
	Diesel Fuel	MIBC	NaHS	Lime	Sod Sil	Grind	Cond.	Froth		
Grind	40					Stage Gr.				
Roughers										
Condition		45					1		Nat	
Mo Rougher 1								2	8.7	
Mo Rougher 2								4	9.0	
Mo Rougher 3		5						4	8.6	
Condition	2.5						5			
Mo Rougher 4								5	8.5	
Condition	2.5						5			
Mo rougher 5								5	8.3	
Condition										
Mo Ro Scav (Sep. Conc.)	10						5	6		
Re-grind										
Ro Conc 1-5	0.5		200	none	1000	10			9.5 (12.5 after adding Sod. Sil.)	
Condition									12.0	-300
		as needed	as needed	as needed						
Cleaner1		2.5		0				4	10 (12)	-300
Cleaner1 Scav				0				6	10 (12)	-300
Cleaner2		1.5	50	0				4	10.5 (11.5)	-250
Cleaner3		1	50	0				3	11.0	-270
									10.0	
Cleaner4		--	10	20				2	11.5	-280
Total	55.5	50	300	20	1000			45		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-4
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1500	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	9.5	0.1	55.6	36.2	51.3	5.9
Mo Clr 4 Tls	4.1	0.04	39.6	28.6	15.5	2.0
Mo Clr 3 Tls	4.7	0.0	21.2	16.8	9.7	1.3
Mo Clr 2 Tls	15.6	0.2	4.32	4.10	6.5	1.1
Mo Clr 1 Scav Conc	24	0.2	2.16	2.620	5.0	0.3
Mo Clr 1 Scav Tls	217.8	2.2	0.18	0.720	3.8	9.8
Mo Ro Scav Conc	89.3	0.9	0.05	0.370	0.4	0.6
Mo Ro Tls	9635	96.4	0.008	0.480	7.5	79.1
Head (calc.)	10000	100.0	0.103	0.585	100.0	100.0
(direct)			0.120	0.790		

Combined Products

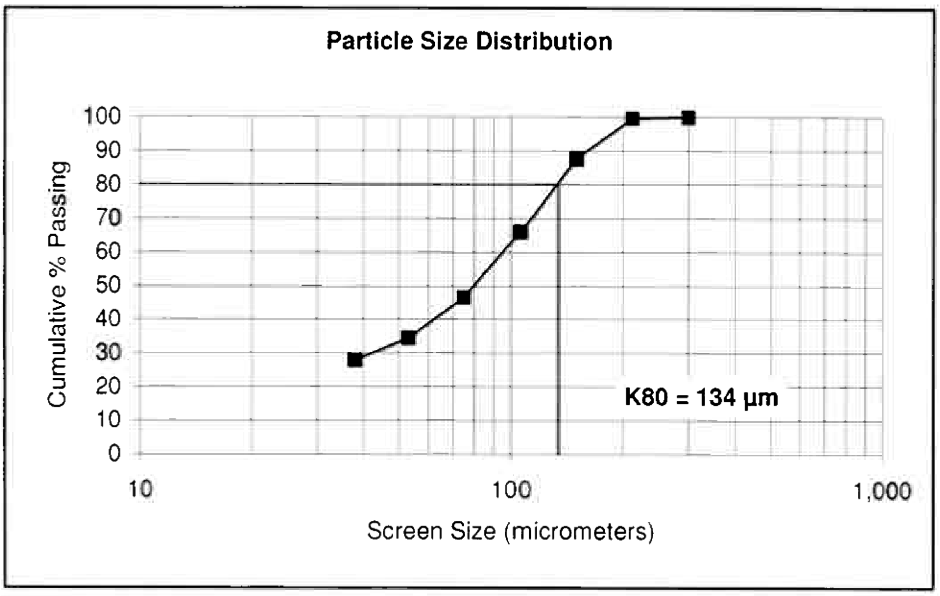
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 4 Conc	9.5	0.1	55.6	36.2	51.3	5.9
Mo Clr 3 Conc	13.6	0.1	50.8	33.9	67.0	7.9
Mo Clr 2 Conc	18.3	0.2	43.2	29.5	76.7	9.2
Mo Clr 1 Conc	33.9	0.3	25.30	17.82	83.2	10.3
Mo Clr 1 Conc + Clr. 1 Scav. Conc.	57.9	0.6	15.71	10.73	88.3	10.6
Mo Ro Conc	275.7	2.5	3.44	4.32	92.1	20.4
Mo Ro Conc + Ro Scav Conc	365	3.7	2.61	3.36	92.5	20.9

SGS Minerals Services
Size Distribution Analysis

Project No. **11656-002**

Sample: **Ro Scav Tails Sub** Test No.: **F12**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.5	0.3	0.3	99.7
100	150	17.1	12.0	12.3	87.7
150	106	31.1	21.7	34.1	65.9
200	75	28.0	19.6	53.6	46.4
270	53	17.2	12.0	65.7	34.3
400	38	9.3	6.5	72.2	27.8
Pan	-38	39.8	27.8	100.0	0.0
Total	-	**143.0**	100.0	-	-
K80	**134**				



MALVERN

MASTERSIZER 2000

Result Analysis Report

Sample Name: 11656-002 Comb Prod - Average	**SOP Name:** default	**Measured:** Tuesday, February 05, 2008 9:16:42 AM	
Sample Source & type: Factory - F12	**Measured by:** Lr_hydro1	**Analysed:** Tuesday, February 05, 2008 9:16:43 AM	
Sample bulk lot ref: 123-ABC	**Result Source:** Averaged		
Particle Name: Default	**Accessory Name:** Hydro 2000G (A)	**Analysis model:** General purpose	**Sensitivity:** Enhanced
Particle RI: 1.520	**Absorption:** 0.1	**Size range:** 0.020 to 2000.000 um	**Obscuration:** 16.76 %
Dispersant Name: Water	**Dispersant RI:** 1.330	**Weighted Residual:** 1.379 %	**Result Emulation:** Off
Concentration: 0.0112 %Vol	**Span:** 4.203	**Uniformity:** 1.43	**Result units:** Volume
Specific Surface Area: 1.43 m²/g	**Surface Weighted Mean D[3,2]:** 4.193 um	**Vol. Weighted Mean D[4,3]:** 16.726 um	

d(0.1): 1.460 um d(0.5): 8.865 um **D(0.80) : 23.32 µm**

Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.010	0.00	0.105	0.00	1.096	5.50	11.482	58.74	120.226	99.18	1258.925	100.00
0.011	0.00	0.120	0.00	[illegible]	[illegible]	13.183	63.36	138.038	[illegible]	1445.440	100.00
0.013	0.00	0.138	0.00	1.445	8.32	15.136	67.81	158.489	[illegible]	1659.587	100.00
0.015	0.00	0.158	0.00	[illegible]	10.[illegible]	17.378	72.30	181.970	[illegible]	1905.461	100.00
0.017	0.00	0.182	0.00	1.905	11.[illegible]	19.953	76.[illegible]	208.930	[illegible]	2187.762	100.00
0.020	0.00	0.209	0.00	2.188	14.[illegible]	22.909	79.86	239.883	[illegible]	2511.886	100.00
0.023	0.00	0.240	0.00	2.512	16.43	26.303	[illegible]	275.423	99.86	2884.032	100.00
0.026	0.00	0.275	0.00	[illegible]	[illegible]	30.200	86.66	316.228	[illegible]	3311.311	100.00
0.030	0.00	0.316	0.00	3.311	22.01	[illegible]	[illegible]	363.078	99.90	3801.894	100.00
0.035	0.00	0.363	0.00	[illegible]	[illegible]	[illegible]	[illegible]	416.869	[illegible]	4365.158	100.00
0.040	0.00	0.417	0.35	[illegible]	[illegible]	[illegible]	92.22	478.630	[illegible]	5011.872	100.00
0.046	0.00	[illegible]	[illegible]	5.012	[illegible]	52.481	[illegible]	[illegible]	[illegible]	5754.399	100.00
0.052	0.00	0.550	[illegible]	5.754	[illegible]	60.256	95.23	630.957	100.00	6606.934	100.00
0.060	0.00	0.631	1.30	[illegible]	[illegible]	[illegible]	[illegible]	724.436	100.00	7585.776	100.00
0.069	0.00	0.724	2.21	7.586	[illegible]	79.433	[illegible]	831.764	100.00	8709.636	100.00
0.079	0.00	0.832	3.19	8.710	48.41	91.201	[illegible]	[illegible]	100.00	10000.000	100.00
0.091	0.00	[illegible]	[illegible]	10.000	[illegible]	104.713	[illegible]	1096.478	100.00		

Operator notes:

Malvern Instruments Ltd.
Malvern, UK

Mastersizer 2000 Ver. 5.22
Serial Number: MAL101472

File name: [illegible]
Record Number: [illegible]

Test No.:		Project No.:	11656-001	Operator:	PSM
F13				Date:	

Purpose: Investigate effect of second re-grind in the cleaners on final conc.
Investigate the use of fuel oil dispersant, OP6, in rougher

Procedure: As outlined below

Feed: 10kg of Hurdal ore composite

Grind: Stage Grinding of Flotation Feed, Laboratory 10kg SS Rod Mill, 65 % solids
10 minutes first re-grind in pebble mill
8 minutes second re-grind in pebble mill

Notes:
- Rougher pull rate every 10 seconds for first 10 minutes
- Rougher pull rate every 15 seconds after 10 minutes
- Some flotation feed spilled while emptying rod mill
- Measured pH levels in cleaners that differ from target pH levels are bracketed in red

K80 (primary grind):	148	µm
K80 (5th Clr Conc.):	18	µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes			pH	Redox
	Diesel Fuel	MIBC	NaCN	Lime	OP6	Sod Sil	Grind	Cond.	Froth		
Grind	40				25		Stage Gr.				
Roughers											
Condition		40						1		Nat	
Mo Rougher 1									2	8.3	
Mo Rougher 2									4		
Mo Rougher 3		2.5							4		
Condition	2.5							5			
Mo Rougher 4		2.5							5		
Condition	2.5							5			
Mo rougher 5									5		
Condition											
Mo Ro Scav (Sep. Conc.)	10	2.5						5	6		
Re-grind											
Ro Conc 1-5	1		20	none	0.5	200	10			9.5 (11.8)	-200
Condition											
		as needed									
Cleaner1		2.5		as needed					4	10 (11)	-80
Cleaner1 Scav	1	2.5							6	10 (10.5)	-20
Cleaner2		–	10	0					4	10.5	-100
										9.6	-10
Cleaner3		–	10	0					3	11.0	-80
										9.8	-20
Cleaner4		–		23					2	11.5	-100
Re-grind Clr 4 Conc.	1		20			100	8				
Cleaner5		2.5							2	11.5 (11.8)	-50
Total	58	55	60	23	25.5	300			47		

Stage	Rougher 1-Scav	Cleaner1	Cleaner2	Cleaner 3-5
Flotation Cell	10 kg	D1 - 1000g	D1 - 500 g	D1 - 250g
Speed, rpm	50% setting	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 5 Conc.	13.6	0.14	56.6	37.0	77.6	10.0
Mo Clr 5 Tls.	3.3	0.03	8.99	11.0	3.0	0.7
Mo Clr 4 Tls.	1.6	0.02	14.3	15.1	2.3	0.2
Mo Clr 3 Tls.	2.4	0.02	3.57	8.72	0.9	0.4
Mo Clr 2 Tls.	6.6	0.07	0.810	6.47	0.5	0.9
Mo Clr 1 Scav Conc.	33.3	0.34	1.23	4.58	4.1	2.7
Mo Clr 1 Scav Tls.	288.4	2.9	0.055	4.66	1.6	26.3
Mo Ro Scav Conc.	60.5	0.62	0.083	0.340	0.5	0.4
Mo Ro Tls.	9405	95.8	0.010	0.310	9.5	55.1
Head (calc.)	9815	100.0	0.101	0.511	100.0	100.0
(direct)			0.120	0.790		

Combined Products

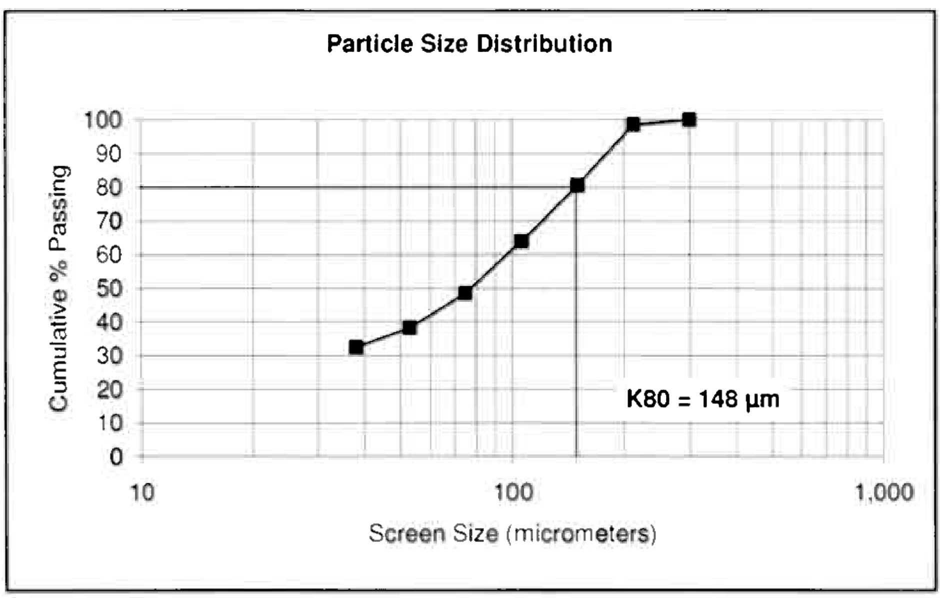
Product	Weight		Assays, %		% Distribution	
	g	%	Mo	S	Mo	S
Mo Clr 5 Conc.	13.6	0.14	56.6	37.0	77.6	10.0
Mo Clr 4 Conc.	16.9	0.17	47.3	31.9	80.6	10.7
Mo Clr 3 Conc.	18.5	0.19	44.4	30.5	82.9	11.2
Mo Clr 2 Conc.	20.9	0.21	39.8	28.0	83.7	11.6
Mo Clr 1 Conc.	27.5	0.28	30.41	22.81	84.3	12.5
Mo Clr 1 Conc. + Clr. 1 Scav. Conc.	60.8	0.62	14.43	12.54	88.4	15.2
Mo Ro Conc.	349.2	3.6	2.56	5.97	90.0	41.5
Mo Ro Conc + Ro Scav. Conc.	409.7	4.2	2.19	5.14	90.5	41.9

SGS Minerals Services
Size Distribution Analysis

Project No. **11656-001**

Sample: **Ro Scav Tls** Test No.: **F13**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	2.3	1.5	1.5	98.5
100	150	26.5	17.8	19.4	80.6
150	106	24.8	16.7	36.1	63.9
200	75	22.9	15.4	51.5	48.5
270	53	15.3	10.3	61.8	38.2
400	38	8.5	5.7	67.5	32.5
Pan	-38	48.2	32.5	100.0	0.0
Total	-	**148.5**	100.0	-	-
K80	**148**				



MASTERSIZER 2000

Result Analysis Report

Sample Name: 11656-001 F13 Clrl Sc. Tls. - Average
SOP Name: default
Measured: Wednesday, July 16, 2008 10:57:40 AM

Sample Source & type: Factory - Paris
Measured by: Lr_hydro1
Analysed: Wednesday, July 16, 2008 10:57:41 AM

Sample bulk lot ref: PSM
Result Source: Averaged

Particle Name: Default
Accessory Name: Hydro 2000G (A)
Analysis model: General purpose
Sensitivity: Enhanced

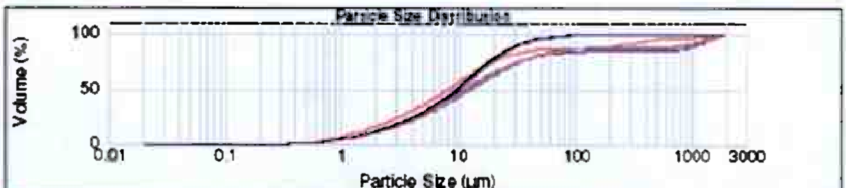
Particle RI: 1.520
Absorption: 0.1
Size range: 0.020 to 2000.000 um
Obscuration: 13.21 %

Dispersant Name: Water
Dispersant RI: 1.330
Weighted Residual: 1.329 %
Result Emulation: Off

Concentration: 0.0090 %Vol
Span: 3.054
Uniformity: 1.02
Result units: Volume

Specific Surface Area: 1.41 m²/g
Surface Weighted Mean D[3,2]: 4.260 um
Vol. Weighted Mean D[4,3]: 14.242 um

d(0.1): 1.672 um   d(0.5): 9.593 um   **D(0.80) : 21.28 µm**



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.010	0.00	0.105	0.00	1.096	5.77	11.482	56.94	120.226	99.68	1258.925	100.00
0.011	0.00	0.120	0.00	1.259	7.04	13.183	62.38	138.038	99.75	1445.440	100.00
0.013	0.00	0.138	0.00	1.445	8.41	15.136	67.77	158.489	99.86	1659.587	100.00
0.015	0.00	0.158	0.00	1.660	9.91	17.378	72.89	181.970	99.92	1905.461	100.00
0.017	0.00	0.182	0.00	1.905	11.58	19.953	77.57	208.930	99.96	2187.762	100.00
0.020	0.00	0.209	0.01	2.188	13.43	22.909	82.30	239.883	99.99	2511.886	100.00
0.023	0.00	0.240	0.01	2.512	15.46	26.303	86.19	275.423	100.00	2884.032	100.00
0.026	0.00	0.275	0.01	2.884	17.76	30.200	89.45	316.228	100.00	3311.311	100.00
0.030	0.00	0.316	0.01	3.311	20.37	34.674	92.15	363.078	100.00	3801.894	100.00
0.035	0.00	0.363	0.01	3.802	23.03	39.811	94.27	416.869	100.00	4365.158	100.00
0.040	0.00	0.417	0.07	4.365	25.98	45.709	95.90	478.630	100.00	5011.872	100.00
0.046	0.00	0.479	0.35	5.012	29.44	52.481	97.10	549.541	100.00	5754.399	100.00
0.052	0.00	0.550	0.85	5.754	33.13	60.256	97.98	630.957	100.00	6606.934	100.00
0.060	0.00	0.631	1.58	6.607	37.20	69.183	98.60	724.436	100.00	7585.776	100.00
0.069	0.00	0.724	2.46	7.586	41.95	79.433	99.03	831.764	100.00	8709.636	100.00
0.079	0.00	0.832	3.47	8.710	46.45	91.201	99.34	954.993	100.00	10000.000	100.00
0.091	0.00	0.955	4.58	10.000	51.57	104.713	99.54	1096.478	100.00		

Operator notes:

Malvern Instruments Ltd.
Malvern, UK

Mastersizer 2000 Ver. 5.22
Serial Number : MAL101400

File name: Amis 2008 june.mea
Record Number: 742

Appendix E – Mineralogy Data

DESCRIPTION of QEMSCAN

Mineralogical testing can be an extremely powerful tool that compliments any flotation program. Such studies are useful in establishing performance limits and identifying possible areas for improvement. This can be accomplished by either an optical petrography study or QEMSCAN® mineralogical characterization to evaluate various flotation products. QEMSCAN® is an automated SEM that is capable of producing quantitative data to assess bulk modal analysis, liberation characteristics, and mineral associations. QEMSCAN is an acronym for Quantitative Evaluation of Materials by SCANning electron microscopy, a system which differs from image analysis systems in that it is configured to measure mineralogical variability based on chemistry at the micrometer-scale. QEMSCAN® utilizes both the back-scattered electron (BSE) signal intensity as well as an Energy Dispersive X-ray Signal (EDS) at each measurement point. It thus makes no simplifications or assumptions of homogeneity based on the BSE intensity, as many mineral phases show BSE overlap. EDS signals are used to assign mineral identities to each measurement point by comparing the EDS spectrum against a mineral species identification program (SIP) or database. QEMSCAN® can map many thousands of particles in a polished section to obtain a detailed and statistically robust characterization of the ore liberation. QEMSCAN map the particles based on differences in chemical analyses and can differentiate amongst the various non-opaque gangues present in the ore body.

There are two general types of measurement: those using the linear intercept and those based on particle mapping. Bulk mineral analysis (BMA) is performed using the linear intercept method, while liberation is performed by particle mapping in particle analysis (PMA), specific mineral (SMS) and trace mineral search (TMS) modes. Specific details of the measurement modes are presented below.

Bulk Mineral Analysis, or BMA, is performed by the linear intercept method, in which the electron beam is rastered at a pre-defined point spacing (nominally 3 micrometers, but variable with particle size) along several lines per field, and covering the entire polished section at any given magnification. This provides a robust data set for determination of the bulk mineralogy, with mineral identities and proportions, along with grain size measurements. This would be performed on every section to accurately establish modal abundance. XRD analyses will be performed to identify the significant crystalline phases present in the ore to support the QEMSCAN work.

The Specific Mineral Search (SMS) routine is a particle mapping method which uses BSE measurements to map only those particles which contain the constituents of interest. This provides a more statistically abundant analysis of the minerals of interest, and provides spatial information, allowing for full characterization of these minerals, including liberation, association and determinative mineralogical characteristics.

Each polished section prepared from an ore sample can be analyzed using the Particle Mineral Analysis (PMA) method. This ensures that the mineralogy of all minerals is captured. This method is a particle mapping mode of measurement which allows for complete analysis of the mineralogy of the sample. Like the BMA, it allows for a robust determination of the bulk mineralogy, with mineral identities and proportions, along with average grain size measurements. The PMA mode also provides an analysis of the spatial characteristics of minerals, including liberation, association and grain size distribution, and it allows for determinative mineralogical analyses such as grade vs. recovery curves and mineral release curves

Introduction

One F7 molybdenite concentrate containing four fractions was submitted for mineralogical analysis from Crew Minerals in December 2007. Four graphite-impregnated 30mm polished sections were prepared, and the coarsest fraction was submitted for XRD analysis. The polished sections were carbon coated and analysed using the QEMSCAN Particle Mapping Analysis (PMA) mode. The resulting data was processed to separate touching particles, resulting in the following particle counts:

Fraction (µm)	Sections No.	Particle No.
-300/+106	1	2749
-106/+53	1	5011
-53/+20	1	5000
-20/+3	1	30059

Reports included are as follows:

XRD summary
Operational statistics
Assay reconciliation
Modal data and distribution graphs
Mo liberation and corresponding image grid
Mo association and example textures
Mo grade-recovery curves
Mo release curves
Cumulative grain size distribution curves

CALR-11656-001
MI5004-DEC07
Crew Minerals-Hurdal

XRD Summary

Sample	Crystalline Mineral Assemblage (relative proportions based on peak height)			
	Major	Moderate	Minor	Trace
F7 Mo Conc -106+53μm	quartz	molybdenite plagioclase	potassium-feldspar pyrite	*dolomite, *mica *magnesite *pyroxene *pyrrhotite *tetrahedrite

*Tentative identification due to low concentrations, diffraction line overlap, or poor crystallinity

CALR-11656-001
MI5004-DEC07
Crew Minerals-Hurdal

Operational Statistics

Batch ID	MI5004-DEC07			
SIP ID	TONO			
Analysis Type	PMA			
Fraction (μm)	Sections No.	Pixel Size (μm)	Particle No.	Points No.
-300/+106μm	1	5	2749	2852837
-106/+53μm	1	4	5011	1582329
-53/+20μm	1	2	5000	922188
-20/+3μm	1	2	30059	267988

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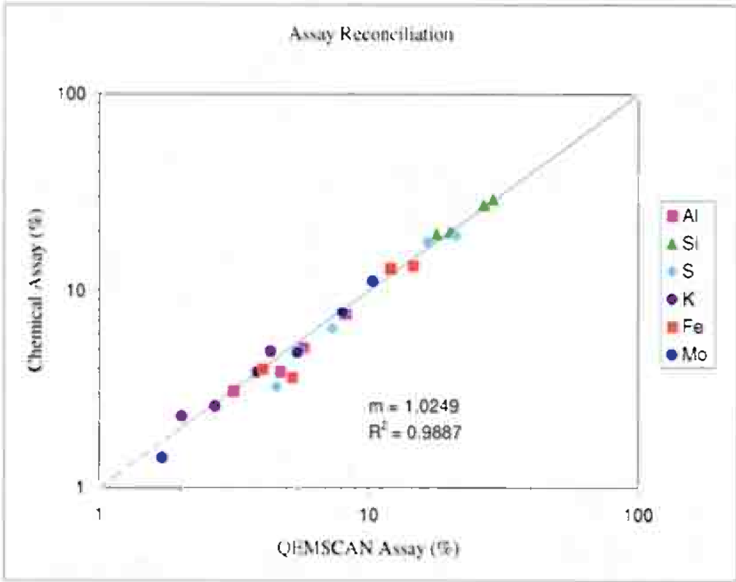
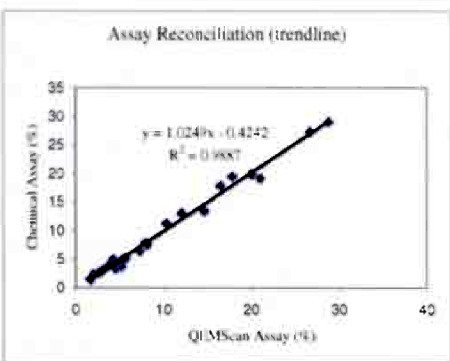
Assay Reconciliation



	Assays (%)												1:1 Line	
	Al		Si		S		K		Fe		Mo			
Fraction	QEM	Chem.	QEM	Chem.	QEM	Chem.	QEM	Chem.	QEM	Chem.	QEM	Chem.		
-300/+106µm	5.78	5.16	28.78	29.03	7.39	6.44	3.84	3.87	4.06	4.01	5.45	4.88	1	1
-106/+53µm	3.16	3.08	17.86	19.45	21.00	19.10	2.03	2.30	14.61	13.43	10.36	11.20	100	100
-53/+20µm	4.73	3.87	20.05	19.82	16.50	17.80	2.69	2.59	12.06	13.01	8.02	7.78		
-20/+3µm	8.27	7.62	26.63	27.25	4.56	3.26	4.34	4.94	5.24	3.62	1.72	1.42		

QEM	Chem.
5.78	5.16
3.16	3.08
4.73	3.87
8.27	7.62
28.78	29.03
17.86	19.45
20.05	19.82
26.63	27.25
7.39	6.44
21.00	19.10
16.50	17.80
4.56	3.26
3.84	3.87
2.03	2.30
2.69	2.59
4.34	4.94
4.06	4.01
14.61	13.43
12.06	13.01
5.24	3.62
5.45	4.88
10.36	11.20
8.02	7.78
1.72	1.42



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M15004-DEC07
Crew Minerals-Hurdal

Bulk Modal Analyses

Survey	Name	Crew Minerals-Hurdal								
	Id	M15004-DEC07								
Sample	Name	F7 Moly Con								
Fraction	Name	Combined	-300/+106µm		-106/+53µm		-53/+20µm		-20/+3µm	
	Mass Size Distribution (%)	100.00	16.49		7.32		6.27		69.92	
	Particle Size (µm)	10	122		51		21		8	
		Combined	-300/+106µm		-106/+53µm		-53/+20µm		-20/+3µm	
		Sample	Sample	Fraction	Sample	Fraction	Sample	Fraction	Sample	Fraction
Mineral Mass (%)	Molybdenite	5.66	1.51	9.14	1.28	17.48	0.85	13.57	2.02	2.89
	Pyrite	10.04	1.29	7.80	2.14	29.19	1.48	23.65	5.14	7.35
	Chalcopyrite	0.37	0.01	0.06	0.04	0.57	0.06	0.97	0.26	0.37
	Pyrrhotite	0.41	0.02	0.15	0.07	1.01	0.03	0.44	0.29	0.41
	Sphalerite	0.13	0.00	0.00	0.01	0.17	0.01	0.13	0.11	0.16
	Other Cu-Sulphides	0.34	0.00	0.00	0.01	0.14	0.01	0.20	0.32	0.45
	Other_Sulphides	0.09	0.00	0.01	0.00	0.03	0.01	0.11	0.08	0.11
	Quartz	26.51	4.98	30.22	1.60	21.87	1.25	19.91	18.68	26.71
	Feldspars	20.26	6.63	40.18	1.42	19.33	1.57	25.10	10.65	15.23
	Amphibole	0.91	0.06	0.34	0.04	0.59	0.04	0.63	0.77	1.11
	Clays/Talc	0.49	0.11	0.65	0.04	0.53	0.03	0.46	0.32	0.45
	Micas/Phyllosilicates	31.53	1.53	9.28	0.50	6.90	0.83	13.26	28.66	40.99
	Rutile	1.12	0.06	0.38	0.03	0.42	0.02	0.30	1.01	1.44
	Fe-Oxides	0.22	0.01	0.07	0.01	0.17	0.01	0.12	0.19	0.27
	Carbonates	1.43	0.21	1.28	0.10	1.35	0.06	0.94	1.06	1.52
	Apatite/Phosphates	0.35	0.05	0.31	0.02	0.21	0.01	0.15	0.27	0.39
	Fluorite	0.02	0.01	0.09	0.00	0.01	0.00	0.03	0.00	0.01
	Other_Oxides	0.05	0.00	0.02	0.00	0.02	0.00	0.02	0.05	0.07
	Other	0.04	0.00	0.02	0.00	0.01	0.00	0.01	0.03	0.05
Grain Size (µm)	Molybdenite	-	44		28		14		8	
	Pyrite	-	72		49		24		8	
	Chalcopyrite	-	72		38		18		5	
	Pyrrhotite	-	26		20		8		6	
	Sphalerite	-	19		80		19		8	
	Other Cu-Sulphides	-	8		15		7		8	
	Other_Sulphides	-	7		6		12		3	
	Quartz	-	66		40		14		5	
	Feldspars	-	43		28		14		6	
	Amphibole	-	11		10		8		5	
	Clays/Talc	-	8		8		4		3	
	Micas/Phyllosilicates	-	11		9		5		6	
	Rutile	-	23		18		11		7	
	Fe-Oxides	-	21		16		7		4	
	Carbonates	-	32		25		16		5	
	Apatite/Phosphates	-	34		21		9		4	
	Fluorite	-	26		11		14		4	
	Other_Oxides	-	13		9		5		5	
	Other	-	9		9		8		4	

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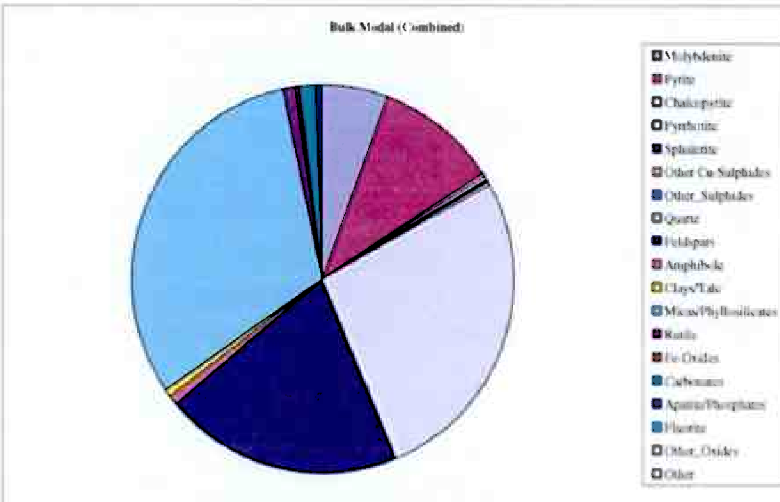
Bulk Modal Analyses



		Combined	-300/+106um		-106/+53um		-53/+20um		-20/+3um	
		Sample	Sample	Fraction	Sample	Fraction	Sample	Fraction	Sample	Fraction
Mineral Mass (%)	Molybdenite	5.66	1.51	9.14	1.28	17.48	0.85	13.57	2.02	2.89
	Pyrite	10.04	1.29	7.80	2.14	29.19	1.48	23.65	5.14	7.35
	Chalcopyrite	0.37	0.01	0.06	0.04	0.57	0.06	0.97	0.26	0.37
	Pyrrhotite	0.41	0.02	0.15	0.07	1.01	0.03	0.44	0.29	0.41
	Sphalerite	0.13	0.00	0.00	0.01	0.17	0.01	0.13	0.11	0.16
	Other Cu Sulphides	0.34	0.00	0.00	0.01	0.14	0.01	0.20	0.32	0.45
	Other_Sulphides	0.05	0.00	0.01	0.00	0.03	0.01	0.11	0.04	0.05
	Quartz	26.51	4.98	30.22	1.60	21.87	1.25	19.91	18.68	26.71
	Feldspars	20.25	6.63	40.18	1.42	19.33	1.57	25.10	10.65	15.23
	Amphibole	0.91	0.06	0.34	0.04	0.59	0.04	0.63	0.77	1.11
	Clays/Talc	0.49	0.11	0.65	0.04	0.53	0.03	0.46	0.32	0.45
	Micas/Phyllosilicates	31.53	1.53	9.29	0.50	6.90	0.83	13.26	28.66	40.99
	Rutile	1.12	0.06	0.38	0.03	0.42	0.02	0.30	1.01	1.44
	Fe-Oxides	0.22	0.01	0.07	0.01	0.17	0.01	0.12	0.19	0.27
	Carbonates	1.43	0.21	1.29	0.10	1.35	0.06	0.94	1.06	1.52
	Apatite/Phosphates	0.35	0.05	0.31	0.02	0.21	0.01	0.15	0.27	0.39
	Fluorite	0.02	0.01	0.09	0.00	0.01	0.00	0.03	0.00	0.01
	Other_Oxides	0.05	0.00	0.02	0.00	0.02	0.00	0.02	0.05	0.07
	Other	0.04	0.00	0.02	0.00	0.01	0.00	0.01	0.03	0.05

		-300/+106um	-106/+53um	-53/+20um	-20/+3um
Mineral Mass (%)	Molybdenite	9.14	17.48	13.57	2.89
	Pyrite	7.80	29.19	23.65	7.35
	Chalcopyrite	0.06	0.57	0.97	0.37
	Pyrrhotite	0.15	1.01	0.44	0.41
	Sphalerite	0.00	0.17	0.13	0.16
	Other Cu Sulphides	0.00	0.14	0.20	0.45
	Other_Sulphides	0.01	0.03	0.11	0.05
	Quartz	30.22	21.87	19.91	26.71
	Feldspars	40.18	19.33	25.10	15.23
	Amphibole	0.34	0.59	0.63	1.11
	Clays/Talc	0.65	0.53	0.46	0.45
	Micas/Phyllosilicates	9.28	6.90	13.26	40.99
	Rutile	0.38	0.42	0.30	1.44
	Fe-Oxides	0.07	0.17	0.12	0.27
	Carbonates	1.28	1.35	0.94	1.52
	Apatite/Phosphates	0.31	0.21	0.15	0.39
	Fluorite	0.09	0.01	0.03	0.01
	Other_Oxides	0.02	0.02	0.02	0.07
	Other	0.02	0.01	0.01	0.05

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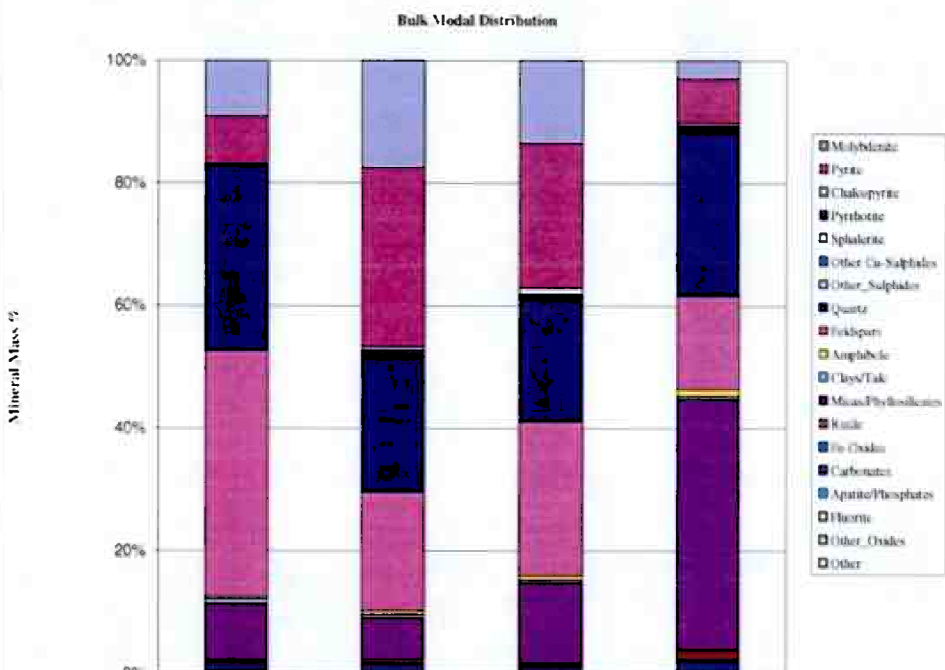
Bulk Modal Analyses



	-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm
Molybdenite	9.14	17.48	13.57	2.86
Pyrite	7.80	29.19	23.85	7.35
Chalcopyrite	0.00	0.57	0.07	0.37
Pyrrhotite	0.15	1.01	0.44	0.41
Sphalerite	0.00	0.17	0.11	0.16
Other Cu-Sulphides	0.00	0.14	0.20	0.45
Other_Sulphides	0.01	0.05	0.11	0.05
Quartz	31.22	23.87	19.91	26.71
Feldspars	40.18	19.33	25.10	15.23
Amphibole	0.24	0.50	0.63	1.11
Clays/Talc	1.65	0.59	0.46	0.45
Micas/Phyllosilicates	9.28	6.80	13.26	41.98
Rutile	0.38	0.42	0.30	1.44
Fe-Oxides	0.07	0.17	0.12	0.27
Carbonates	1.28	1.35	0.94	1.52
Apatite/Phosphates	0.21	0.21	0.15	0.20
Fluorite	0.00	0.01	0.03	0.01
Other_Oxides	0.12	0.02	0.02	0.07
Other	0.12	0.01	0.01	0.05

Fraction

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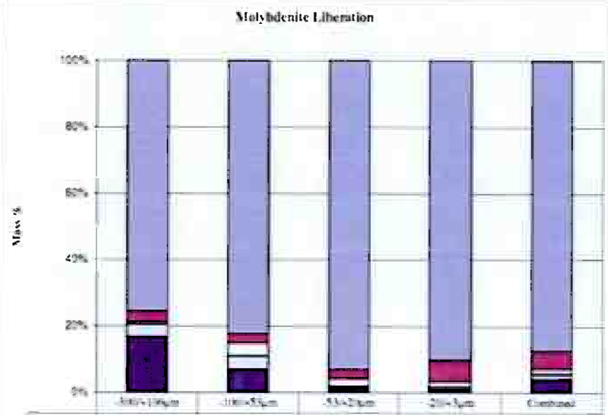
Note: All Molybdenum occurs as molybdenite

Molybdenite Liberation



	-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm	Combined
Free Mo	75.51	82.38	93.05	90.30	87.45
Lib Mo	3.32	2.72	2.65	6.39	5.38
Midds	0.67	3.90	2.30	1.50	1.59
Sub-Midds	3.73	4.01	0.71	0.75	1.48
Locked	16.77	6.99	1.29	1.05	4.09
Barren	0.00	0.00	0.00	0.00	0.00

Categories are based on particle area percent:
Free >= 95%; Lib <95% & >= 80%; Midds <80% & >= 50%; Sub-Midds <50% & >=20%; Locked <20%

Calculations

Absolute Mineral Mass

	-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm	Combined
Free Mo	1.14	1.05	0.79	1.83	4.81
Lib Mo	0.05	0.03	0.02	0.13	0.24
Midds	0.01	0.05	0.02	0.03	0.11
Sub-Midds	0.06	0.05	0.01	0.02	0.13
Locked	0.25	0.09	0.01	0.02	0.37
Barren	0.00	0.00	0.00	0.00	0.00
Total	1.51	1.28	0.85	2.02	5.66

Normalized Mineral Mass

	-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm	Combined
Free Mo	75.51	82.38	93.05	90.30	87.45
Lib Mo	3.32	2.72	2.65	6.39	5.38
Midds	0.67	3.90	2.30	1.50	1.59
Sub-Midds	3.73	4.01	0.71	0.75	1.48
Locked	16.77	6.99	1.29	1.05	4.09
Barren	0.00	0.00	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100

Free + Liberated Molybdenite

-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm
[illegible]	[illegible]	[illegible]	[illegible]

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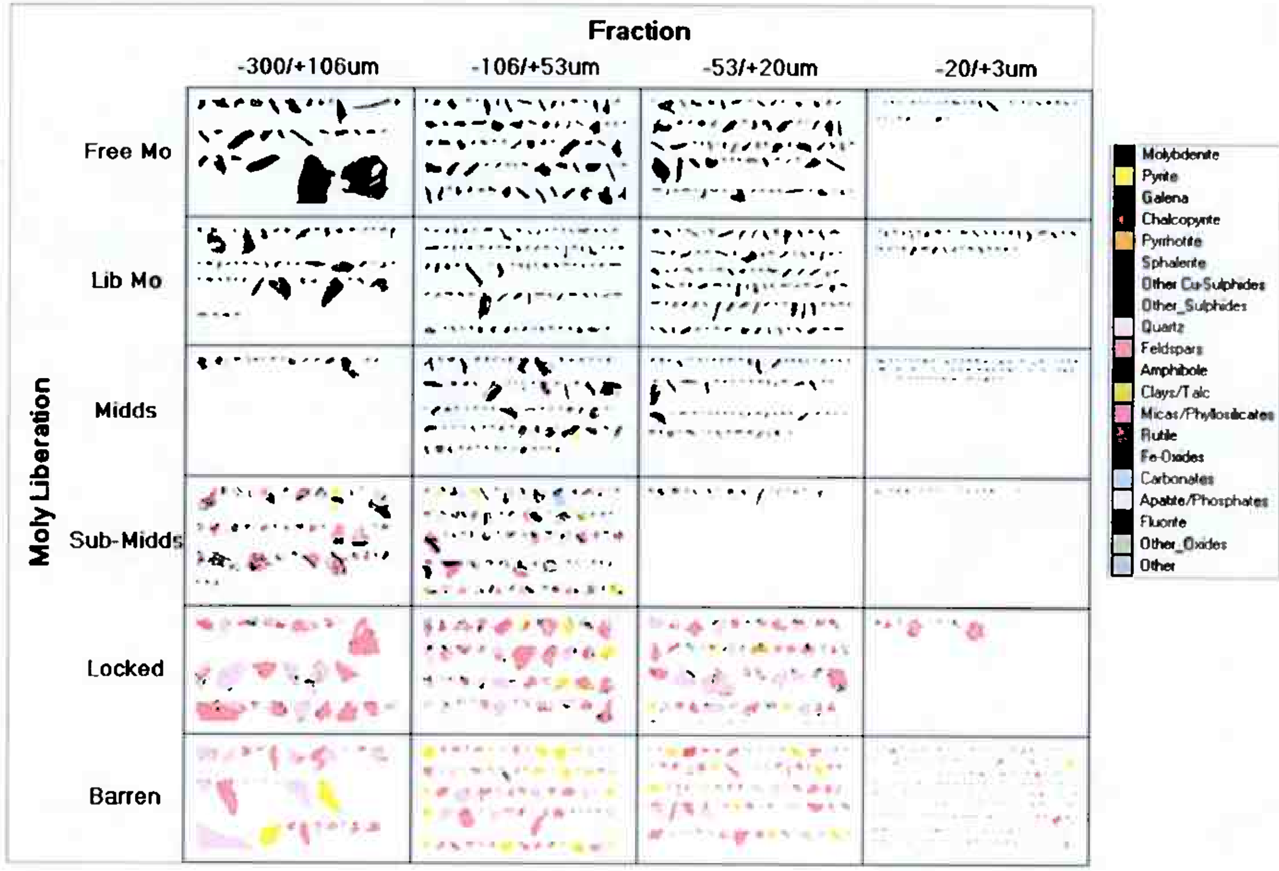
<u>Image Grid - Cu Sulphide Liberation</u>



Categories are based on particle area percent:
Free >= 95%; Lib <95% & >= 80%; Midds <80% & >= 50%; Sub-Midds <50% & >=20%; Locked <20%.

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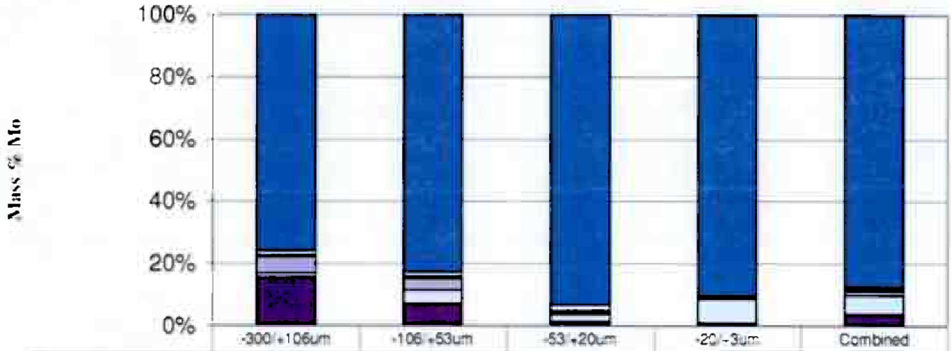
Molybdenite Association

Mo Association



	-300/+106um	-106/+53um	-53/+20um	-20/-3um	Combined
Lib Mo	75.95	82.71	93.13	90.38	87.61
Mo:Phyllosilicates	1.44	1.46	2.01	0.08	0.52
Mo:Carbonates	0.43	0.73	0.52	0.68	0.63
Mo:Qtz-FSP-Amph	5.34	3.66	0.60	0.23	1.34
Mo:Complex Sulphides	1.42	4.40	2.32	7.74	6.12
Mo:Complex NSG	15.16	6.49	1.18	0.60	3.47
Other	0.26	0.55	0.24	0.30	0.31

Fraction

Note: Categories are based on having particles more than 95% of the combined mineral masses.

Mass of Molybdenite (g)

	-300/+106um	-106/+53um	-53/+20um	-20/+3um	Combined
Lib Mo	1.14	1.06	0.79	1.83	4.82
Mo:Qtz-FSP-Amph	0.08	0.05	0.01	0.00	0.14
Mo:Carbonates	0.01	0.01	0.00	0.01	0.03
Mo:Phyllosilicates	0.02	0.02	0.02	0.00	0.06
Mo:Complex Sulph	0.02	0.06	0.02	0.16	0.25
Mo:Complex NSG	0.23	0.08	0.01	0.01	0.33
Other	0.00	0.01	0.00	0.01	0.02
Total:	1.51	1.28	0.85	2.02	5.66

Normalized by fraction

	-300/+106um	-106/+53um	-53/+20um	-20/+3um	Combined
Lib Mo	75.95	82.71	93.13	90.38	87.61
Mo:Qtz-FSP-Amph	5.34	3.66	0.60	0.23	1.34
Mo:Carbonates	0.43	0.73	0.52	0.68	0.63
Mo:Phyllosilicates	1.44	1.46	2.01	0.08	0.52
Mo:Complex Sulphides	1.42	4.40	2.32	7.74	6.12
Mo:Complex NSG	15.16	6.49	1.18	0.60	3.47
Other	0.26	0.55	0.24	0.30	0.31
Total:	24.05	17.29	6.87	9.62	100.00

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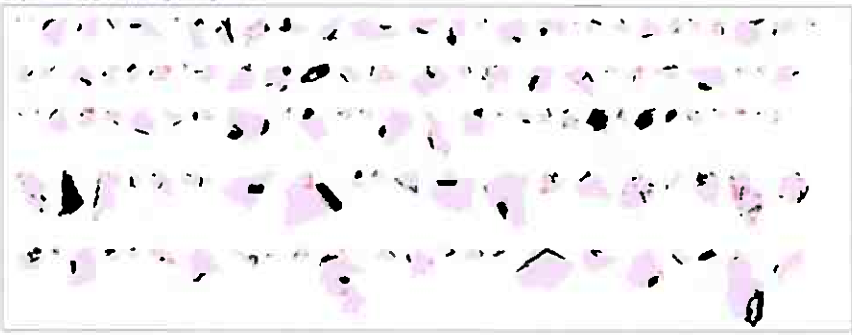
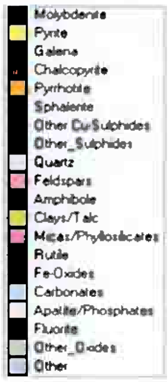
Examples of Binary and Tertiary Mineral Textures in the Crew Minerals samples

Examples are from all fractions combined.

Molybdenite + Quartz/Feldspar/Amphibole





Molybdenite-Carbonates

Molybdenite-Phyllosilicates

Molybdenite-Complex Sulphides

Molybdenite-Complex NSG

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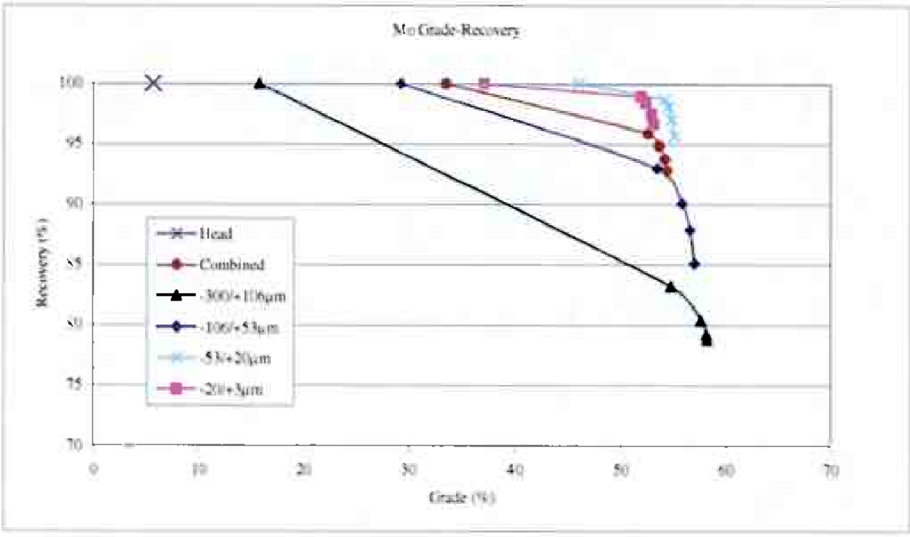
MI5004-DEC07
Crew Minerals-Hurdal

Mo Grade vs. Recovery



Calculations

A. Grade

A.1. Absolute Elemental Mass of Mo by Category

GrRec Mo

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	0.71	0.60	0.40	1.17	[illegible]
60<=A<80	0.00	0.02	0.01	0.01	0.04
40<=A<60	0.01	0.02	0.01	0.01	0.04
20<=A<40	0.00	0.02	0.00	0.01	0.06
0<A<20	0.15	0.05	0.01	0.01	0.22
A=0	0.00	0.00	0.00	0.00	0.00
Global	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A.2. Elemental Mass of Mo Normalized to Sample

(from A.1)

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	23.98	18.25	24.17	14.56	80.27
60<=A<80	0.73	0.63	0.21	0.30	1.74
40<=A<60	0.71	0.48	0.30	0.21	1.31
20<=A<40	0.77	0.66	0.09	0.15	1.56
0<A<20	4.47	1.59	0.18	0.28	6.51
A=0	0.00	0.00	0.00	0.00	0.00
Global	[illegible]	[illegible]	[illegible]	[illegible]	100.00

A.3. Cumulative Elemental Mass of Mo Normalized to Sample

(from A.2)

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	23.99	14.25	14.21	34.56	89.17
60<=A<80	23.96	13.88	14.38	34.61	90.41
40<=A<60	21.40	10.27	14.74	35.23	60.72
20<=A<40	22.29	11.04	14.83	35.36	93.38
0<A<20	28.67	22.63	15.02	35.74	100.00
A=0	28.67	22.63	15.02	35.74	100.00

A.4. Mo Grade by Category

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	58.17	57.04	55.11	53.50	58.52
60<=A<80	49.03	45.58	41.61	38.30	40.69
40<=A<60	35.40	36.35	36.16	26.29	29.20
20<=A<40	22.84	25.23	23.22	16.58	18.60
0<A<20	3.46	4.15	3.73	1.33	3.05
A=0	0.00	0.00	0.00	0.00	0.00

A.5. Mo Dist. by Category Grade

(A.2/A.4)

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	16.58	32.77	26.56	67.21	46.71
60<=A<80	0.23	1.78	0.50	0.77	10.86
40<=A<60	0.87	1.78	0.44	1.00	1.62
20<=A<40	3.29	2.65	0.37	0.97	4.86
0<A<20	139.16	26.99	5.31	28.02	40.29
A=0	0.00	0.00	0.00	0.00	0.00

A.6. A.5 Cumulative

(from A.5)

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	16.58	32.77	26.56	67.21	46.71
60<=A<80	16.80	35.11	26.56	65.91	56.07
40<=A<60	17.28	36.51	27.02	67.24	60.70
20<=A<40	40.47	39.36	27.39	68.23	64.69
0<A<20	109.70	77.45	32.60	96.33	100.94
A=0	109.77	77.45	32.60	96.33	100.94

A.7. Cu Grade

(A.3/A.6)

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60<=A<80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
40<=A<60	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20<=A<40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0<A<20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A=0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

B. Recovery

B.1. Absolute Elemental Mass of Mo by Category

GrRec Mo

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	0.71	0.60	0.40	1.17	[illegible]
60<=A<80	0.00	0.02	0.01	0.01	0.04
40<=A<60	0.01	0.02	0.01	0.01	0.04
20<=A<40	0.00	0.02	0.00	0.01	0.06
0<A<20	0.15	0.05	0.01	0.01	0.22
A=0	0.00	0.00	0.00	0.00	0.00
Global	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

B.2. Elemental Mass of Mo Normalized to Fraction

(for Cu)

	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	78.63	85.11	95.75	[illegible]	79.32
60<=A<80	0.41	3.79	1.37	0.83	13.40
40<=A<60	1.56	2.15	1.06	0.98	2.44
20<=A<40	2.62	2.83	0.58	0.45	2.24
0<A<20	16.77	6.09	1.29	1.06	4.23
A=0	0.00	0.00	0.00	0.00	0.00
Global	100.00	100.00	100.00	100.00	100.00

B.3. Cumulative Elemental Mass of Mo Normalized to Fraction

(for Cu)

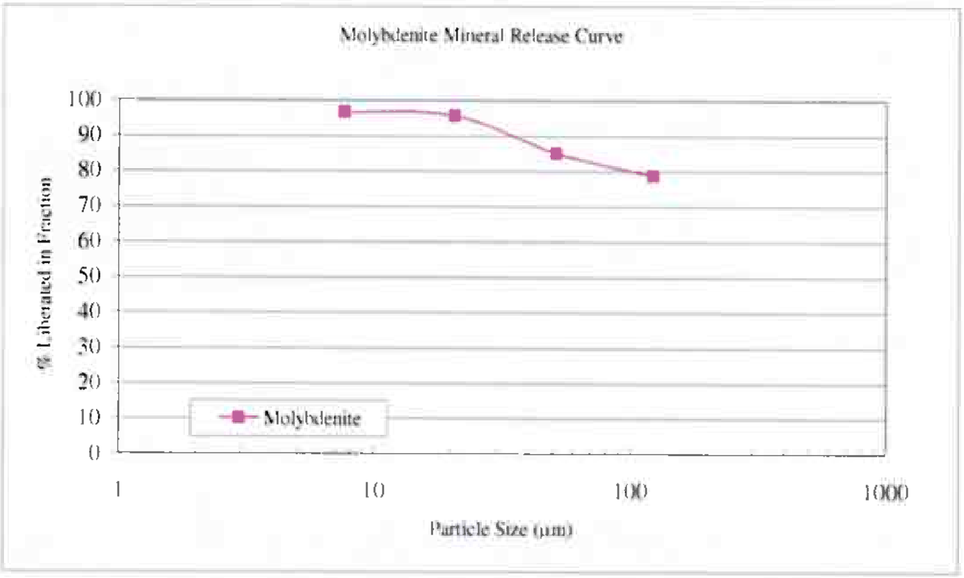
	300×106μm	106×53μm	53×20μm	20×3μm	Combined
A>=80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60<=A<80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
40<=A<60	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20<=A<40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0<A<20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A=0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

C.1 [illegible]

	Grade	Recovery
A>0	[illegible]	[illegible]

CALR-11656-001
MI5004-DEC07
Crew Minerals-Hurdal

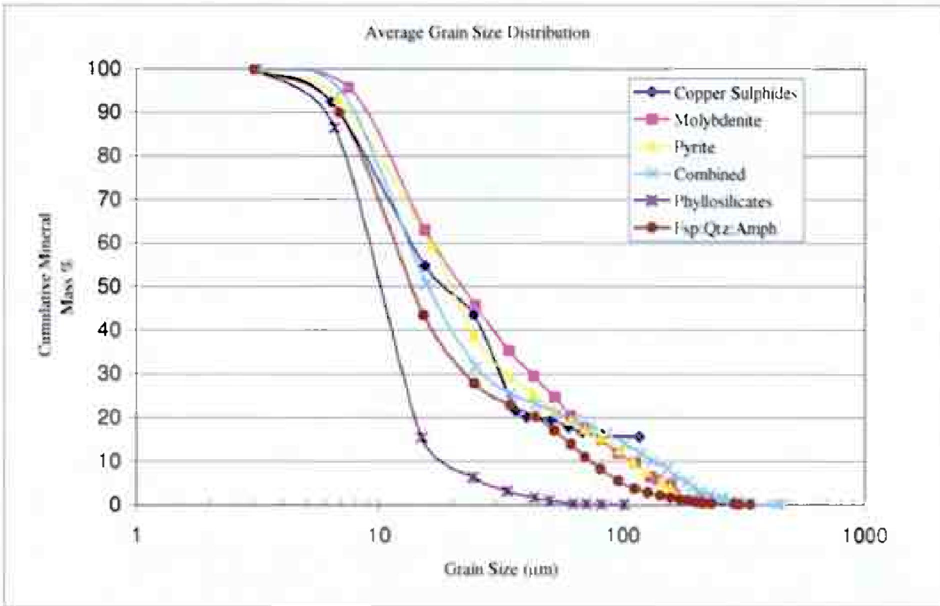
Mineral Release Curves



Name		-300/+106µm	-106/+53µm	-53/+20µm	-20/+3µm
Particle Size		121.92	51.08	20.61	7.59
Mineral Mass %					
Molybdenite	80% Lib	78.83	85.10	95.70	96.69

CALR-11656-001
MI5004-DEC07
Crew Minerals-Hurdal

<u>Average Grain Size Distribution</u>



All Particles

	Size	Mass		Size	Mass
+600	0.00	0.00	+600		0.00
+540	0.00	0.00	+540		0.00
+480	0.00	0.00	+480		0.00
+420	460.40	0.09	+420	460.40	0.09
+390	436.68	0.06	+390	436.68	0.15
+360	0.00	0.00	+360		0.15
+330	338.74	0.04	+330	338.74	0.19
+300	330.97	0.27	+300	330.97	0.45
+270	296.79	0.30	+270	296.79	0.75
+255	277.98	0.15	+255	277.98	0.90
+240	259.03	0.44	+240	259.03	1.35
+225	256.13	0.42	+225	256.13	1.76
+210	229.73	0.66	+210	229.73	2.42
+195	209.19	0.64	+195	209.19	3.06
+180	195.09	1.00	+180	195.09	4.06
+165	185.78	1.26	+165	185.78	5.32
+150	163.66	1.42	+150	163.66	6.74
+135	154.03	1.58	+135	154.03	8.32
+120	133.53	1.74	+120	133.53	10.06
+105	119.26	1.93	+105	119.26	11.99
+90	102.61	2.11	+90	102.61	14.10
+75	87.05	2.34	+75	87.05	16.44
+66	74.07	1.58	+66	74.07	18.01
+57	64.27	1.50	+57	64.27	19.51
+48	53.96	1.62	+48	53.96	21.13
+39	44.20	1.99	+39	44.20	23.13
+30	34.60	2.30	+30	34.60	25.43
+21	25.10	6.28	+21	25.10	31.70
+12	15.67	18.92	+12	15.67	50.62
+4	6.95	44.21	+4	6.95	94.84
-4	3.15	5.16	-4	3.15	100.00
	Total:	100.00			

Molybdenite

	Size	Mass	Norm		Size	Mass
+600	0.00	0.00	0.00	+600		0.00
+540	0.00	0.00	0.00	+540		0.00
+480	0.00	0.00	0.00	+480		0.00
+420	0.00	0.00	0.00	+420		0.00
+390	0.00	0.00	0.00	+390		0.00
+360	0.00	0.00	0.00	+360		0.00
+330	0.00	0.00	0.00	+330		0.00
+300	0.00	0.00	0.00	+300		0.00
+270	0.00	0.00	0.00	+270		0.00
+255	0.00	0.00	0.00	+255		0.00
+240	0.00	0.00	0.00	+240		0.00
+225	226.20	0.04	0.62	+225	226.20	0.62
+210	0.00	0.00	0.00	+210		0.62
+195	206.74	0.04	0.68	+195	206.74	1.30
+180	0.00	0.00	0.00	+180		1.30
+165	165.69	0.06	1.00	+165	165.69	2.31
+150	158.01	0.13	2.37	+150	158.01	4.67
+135	140.06	0.06	0.98	+135	140.06	5.65
+120	131.49	0.04	0.79	+120	131.49	6.44
+105	112.73	0.18	3.28	+105	112.73	9.72
+90	96.05	0.12	2.10	+90	96.05	11.83
+75	81.71	0.18	3.24	+75	81.71	15.07
+66	69.95	0.15	2.66	+66	69.95	17.73
+57	61.41	0.15	2.76	+57	61.41	20.49
+48	52.64	0.23	4.12	+48	52.64	24.61
+39	43.11	0.27	4.88	+39	43.11	29.50
+30	34.15	0.32	5.75	+30	34.15	35.25
+21	24.96	0.59	10.44	+21	24.96	45.69
+12	15.42	0.97	17.32	+12	15.42	63.00
+4	7.50	1.83	32.69	+4	7.50	95.69
-4	3.10	0.24	4.31	-4	3.10	100.00
	Total:	5.61	100.00			

Pyrite

	Size	Mass
+600	0.00	0.00
+540	0.00	0.00
+480	0.00	0.00
+420	0.00	0.00
+390	0.00	0.00
+360	0.00	0.00
+330	0.00	0.00
+300	0.00	0.00
+270	0.00	0.00
+255	0.00	0.00
+240	0.00	0.00
+225	0.00	0.00
+210	216.52	0.25
+195	201.12	0.56
+180	192.20	0.66
+165	170.43	0.39
+150	157.23	1.98
+135	144.23	1.38
+120	124.89	2.40
+105	110.95	2.26
+90	96.79	2.73
+75	81.86	2.93
+66	70.09	1.89
+57	61.53	1.88
+48	52.44	2.20
+39	42.89	4.04
+30	34.36	3.83
+21	24.47	9.24
+12	16.37	20.66
+4	6.76	33.86
-4	3.11	6.84
	Total:	100.00

	Size	Mass
+600		0.00
+540		0.00
+480		0.00
+420		0.00
+390		0.00
+360		0.00
+330		0.00
+300		0.00
+270		0.00
+255		0.00
+240		0.00
+225		0.00
+210	216.52	0.25
+195	201.12	0.81
+180	192.20	1.47
+165	170.43	1.86
+150	157.23	3.85
+135	144.23	5.23
+120	124.89	7.63
+105	110.95	9.89
+90	96.79	12.62
+75	81.86	15.56
+66	70.09	17.44
+57	61.53	19.33
+48	52.44	21.52
+39	42.89	25.56
+30	34.36	29.40
+21	24.47	38.64
+12	16.37	59.30
+4	6.76	93.16
-4	3.11	100.00

Phyllosilicates

	Size	Mass		Size	Mass
+600	0.00	0.00	+600		0.00
+540	0.00	0.00	+540		0.00
+480	0.00	0.00	+480		0.00
+420	0.00	0.00	+420		0.00
+390	0.00	0.00	+390		0.00
+360	0.00	0.00	+360		0.00
+330	0.00	0.00	+330		0.00
+300	0.00	0.00	+300		0.00
+270	0.00	0.00	+270		0.00
+255	0.00	0.00	+255		0.00
+240	0.00	0.00	+240		0.00
+225	0.00	0.00	+225		0.00
+210	0.00	0.00	+210		0.00
+195	0.00	0.00	+195		0.00
+180	0.00	0.00	+180		0.00
+165	0.00	0.00	+165		0.00
+150	0.00	0.00	+150		0.00
+135	0.00	0.00	+135		0.00
+120	0.00	0.00	+120		0.00
+105	0.00	0.00	+105		0.00
+90	101.81	0.06	+90	101.81	0.06
+75	82.08	0.00	+75	82.08	0.07
+66	70.99	0.11	+66	70.99	0.17
+57	62.85	0.05	+57	62.85	0.22
+48	50.12	0.78	+48	50.12	1.01
+39	43.40	0.60	+39	43.40	1.60
+30	33.54	1.52	+30	33.54	3.12
+21	24.39	3.19	+21	24.39	6.32
+12	14.97	9.15	+12	14.97	15.47
+4	6.55	71.00	+4	6.55	86.47
-4	3.08	13.53	-4	3.08	100.00
	Total:	100.00			

Fsp:Qtz:Amph

	Size	Mass		Size	Mass
+600	0.00	0.00	+600		0.00
+540	0.00	0.00	+540		0.00
+480	0.00	0.00	+480		0.00
+420	0.00	0.00	+420		0.00
+390	0.00	0.00	+390		0.00
+360	0.00	0.00	+360		0.00
+330	335.76	0.07	+330	335.76	0.07
+300	302.11	0.02	+300	302.11	0.09
+270	288.30	0.17	+270	288.30	0.26
+255	0.00	0.00	+255		0.26
+240	0.00	0.00	+240		0.26
+225	232.31	0.07	+225	232.31	0.33
+210	213.28	0.08	+210	213.28	0.40
+195	200.51	0.18	+195	200.51	0.58
+180	186.00	0.45	+180	186.00	1.03
+165	171.98	0.22	+165	171.98	1.25
+150	157.30	0.39	+150	157.30	1.64
+135	142.62	0.47	+135	142.62	2.11
+120	126.97	0.66	+120	126.97	2.77
+105	111.96	0.99	+105	111.96	3.76
+90	96.35	1.71	+90	96.35	5.47
+75	81.24	2.72	+75	81.24	8.19
+66	70.10	2.76	+66	70.10	10.95
+57	61.49	2.93	+57	61.49	13.87
+48	52.36	3.17	+48	52.36	17.04
+39	43.65	3.21	+39	43.65	20.25
+30	34.49	2.61	+30	34.49	22.87
+21	24.71	4.94	+21	24.71	27.81
+12	15.26	15.67	+12	15.26	43.48
+4	6.85	46.48	+4	6.85	89.96
-4	3.03	10.04	-4	3.03	100.00
	Total:	100.00			

Copper Sulphides

	Size	Mass		Size	Mass
+600	0.00	0.00	+600		0.00
+540	0.00	0.00	+540		0.00
+480	0.00	0.00	+480		0.00
+420	0.00	0.00	+420		0.00
+390	0.00	0.00	+390		0.00
+360	0.00	0.00	+360		0.00
+330	0.00	0.00	+330		0.00
+300	0.00	0.00	+300		0.00
+270	0.00	0.00	+270		0.00
+255	0.00	0.00	+255		0.00
+240	0.00	0.00	+240		0.00
+225	0.00	0.00	+225		0.00
+210	0.00	0.00	+210		0.00
+195	0.00	0.00	+195		0.00
+180	0.00	0.00	+180		0.00
+165	0.00	0.00	+165		0.00
+150	0.00	0.00	+150		0.00
+135	0.00	0.00	+135		0.00
+120	0.00	0.00	+120		0.00
+105	117.51	15.54	+105	117.51	15.54
+90	0.00	0.00	+90		15.54
+75	83.28	0.46	+75	83.28	16.00
+66	68.58	0.65	+66	68.58	16.65
+57	59.95	1.09	+57	59.95	17.74
+48	50.93	1.77	+48	50.93	19.51
+39	40.16	0.56	+39	40.16	20.06
+30	36.22	1.47	+30	36.22	21.53
+21	24.53	21.97	+21	24.53	43.50
+12	15.44	11.26	+12	15.44	54.76
+4	6.37	37.56	+4	6.37	92.32
-4	3.09	7.68	-4	3.09	100.00
	Total:	100.00			