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Appendix VII

Metallurgical Report

An Investigation into

SCOPING METALLURGICAL TESTWORK ON OSMANI GOLD DEPOSIT SAMPLES, COLDSTREAM PROPERTY, NORTHWESTERN ONTARIO

prepared for

FOUNDATION RESOURCES INC.

620-650 WEST GEORGIA STREET
VANCOUVER, BC V6B 4N9

Project 50174-001 – Final Report
December 13, 2011

SGS Canada Inc. | 50-655 West Kent Avenue North, Vancouver, BC, V6P 6T7
Tel: (604) 324-1166 Fax: (604) 324-1177 www.met.sgs.com www.ca.sgs.com
Member of the SGS Group (SGS SA)

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Executive Summary

A scoping level metallurgical test program was completed on samples originating from the Osmani Gold Deposit (formerly known as the East Coldstream Deposit) of the Coldstream property in Northwest Ontario, Canada. One composite was created for the test program using four individual samples. Each sample was also subjected to variability metallurgical testing. The head analyses of the primary elements of interest for the main composite are shown in Table 1.

Table 1: Chemical Head Analysis

Master Composite Head Assay		
Element	**Assay**	**Units**
Au	3.28	g/t
Ag	< 2.00	g/t
Fe	8.38	%
S-Total	1.80	%

A total of 2 gravity separation tests, 3 whole ore rougher kinetics flotation tests, 1 whole ore open circuit cleaner flotation test, 1 gravity tails rougher flotation test, 1 gravity tails leaching tests, 4 variability rougher kinetics flotation tests and 4 variability leaching tests were conducted.

Individual tests that were found to generate the highest recovery for each unit operation on the master composite conducted in the program were G2 for the gravity tests, F1 for the rougher flotation tests (highest Au recovery but not the most cost efficient) and L1 for the leach tests. The conditions and the results for these tests, as well as testwork done on gravity tailings, are shown in Table 2.

Table 2: Metallurgical Test Summary

Test	Grade (g/t, mg/L)	Recovery (%)	Product
G2	655	24.8	Mozley Concentrate
F1	46.7	94.4	Rougher Flotation Concentrate
F4	124	81.3	2nd Cleaner Flotation Concentrate
L1	2.28	95.6	48hr Pregnant Leach Solution
G2+F5	655, 33.7	94.8	Mozley Concentrate + Rougher Flotation Concentrate
G2+L3	655, 1.38	96.1	Mozley Concentrate + 48hr Pregnant Leach Solution

The best recovery test was achieved using a combination of gravity and leaching, yielding Au recovery of 96.1%

To improve the metallurgical process of the project, the following recommendations are made for the next phase of testing:

- Conduct additional rougher flotation testing in order to optimize rougher configuration involving feed size, reagents, and residence time to improve Au recoveries further.
- Conduct additional open circuit cleaner testing to optimize the reagent scheme and regrind step, as well as to minimize the Au losses in the midstream.
- Conduct locked cycle testing in order to determine the effect of circulating streams on the final product grade and recovery. This will allow proper metallurgical projections.
- Conduct additional leaching testwork to investigate the effects of using a coarser grind and lower cyanide dosages.
- Conduct downstream processing (post leach) to investigate gold recovery from cyanide solution (CIP model) and develop cyanide waste stream for cyanide destruction (CND).
- Conduct additional variability testing which includes comminution study to define production forecast model and point sample testing to measure ore variability to develop recovery model.
- Apply new configurations to gravity tailings and look into improving Au recoverability

Introduction

Foundation Resources Inc. is a Canadian company focused on exploration and development of the Coldstream Gold property in Northwest Ontario, Canada and the San Rafael Gold-Silver property in Durango Mexico. Foundation recently has also acquired a massive sulphide Mitchell Property located in the Red Lake Mining District in North-western Ontario.

The Coldstream Gold property is host to 16 km of the 25km long mineralized corridor that includes properties held by Moss Lake Gold Mines and Xtrata/Royal Mountain Royalty Corp. The 16 kilometre structural trend on the Coldstream property is host to five significant gold targets of which the Osmani Gold Deposit ("Deposit") is the most advanced target (Figure 1). The Deposit has a NI 43-101 resource estimate of 763,276 ounces gold in the 'Inferred' and 96,400 ounces gold in the Indicated Categories.

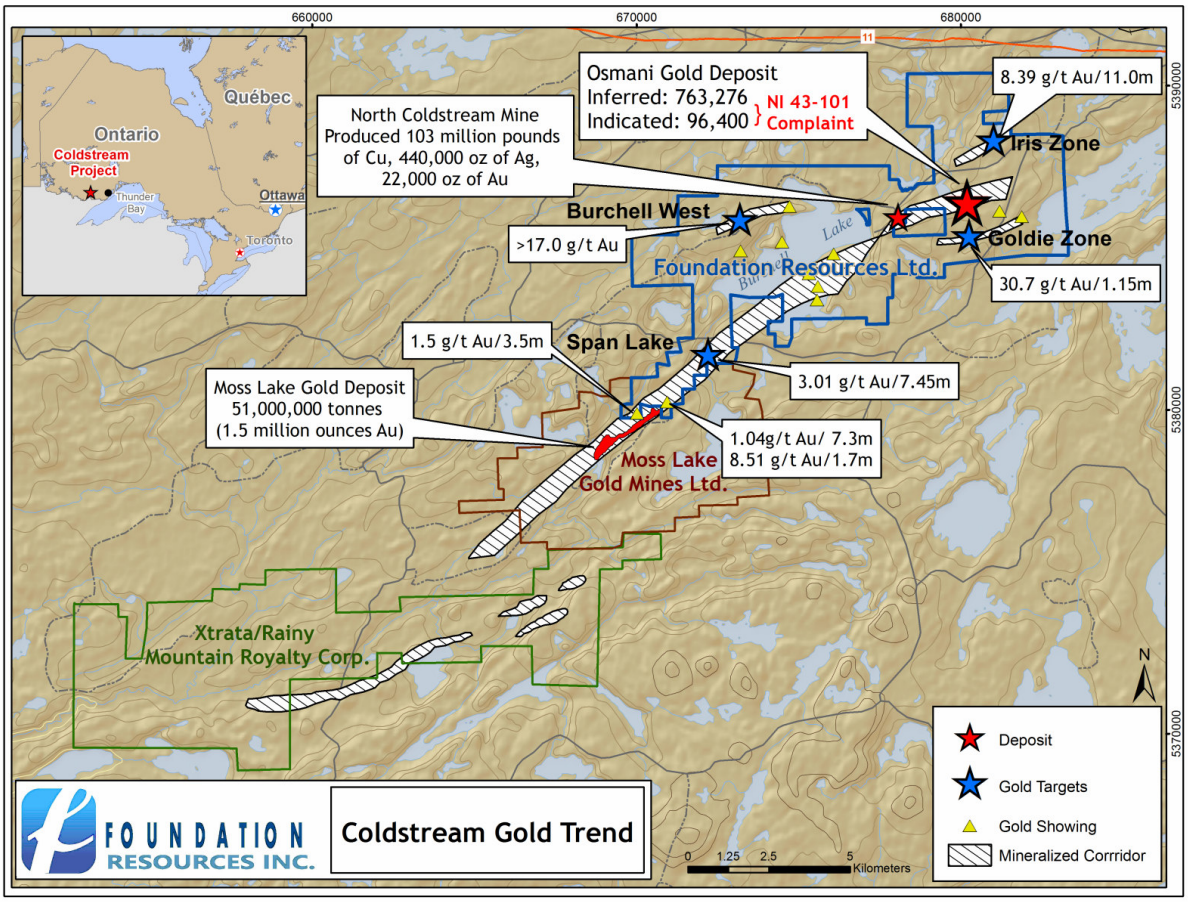


Figure 1: Coldstream Property

Mr. Ike Osmani of Foundation Resources Inc. approached SGS with a request for a scoping level study to investigate the characterization of gold recoverability at the Osmani Gold Deposit. The scope of the program included:

- Gravity Testing – to explore the option of recovering gravity recoverable gold as a preliminary step before flotation or leaching.
- Flotation Bench Scale Testing – which includes rougher kinetics and batch cleaner development to examine the response of the whole ore composite, gravity tailings and variability samples with different testing configurations (ie. feed size, regrind addition, and reagent types).
- Leach Testing – which includes leaching kinetics to look into the recovery of gold by cyanidation on the whole ore composite, gravity tailings, and variable samples.

Kristelle Sarinas, B.A.Sc.,
Junior Metallurgist, Minerals Services, Vancouver

Jake Lang, B.E.Sc.,
Lead Metallurgist, Minerals Services, Vancouver

Experimental work by: Kristelle Sarinas, Keith Blunden
Report preparation by: Kristelle Sarinas
Reviewed by: Jake Lang

Testwork Summary

1. Sample Preparation and Characterization

1.1. Sample Receipt and Preparation

One shipment of 4 rice bags containing individually packed samples were received at SGS's Byrne preparation site from Foundation's project geologist Nick Zulinski on September 16, 2011. Each individual samples were inspected, weighed and inventoried. Each sample was prepared separately by first stage crushing to nominal 6 mesh using a combination of jaw and roll crusher. About 75% of each sample was taken out to be blended all together to create the master composite. The remainder of each sample were roll crushed to minus 10 mesh to create test charges for variability testing. 10 kg was then taken out from the created master composite for BWI testing, and the remainder was roll crushed to -10 mesh, then rotary split into necessary test charges for metallurgical testing. The flowsheet for sample preparation is shown in Figure 2.

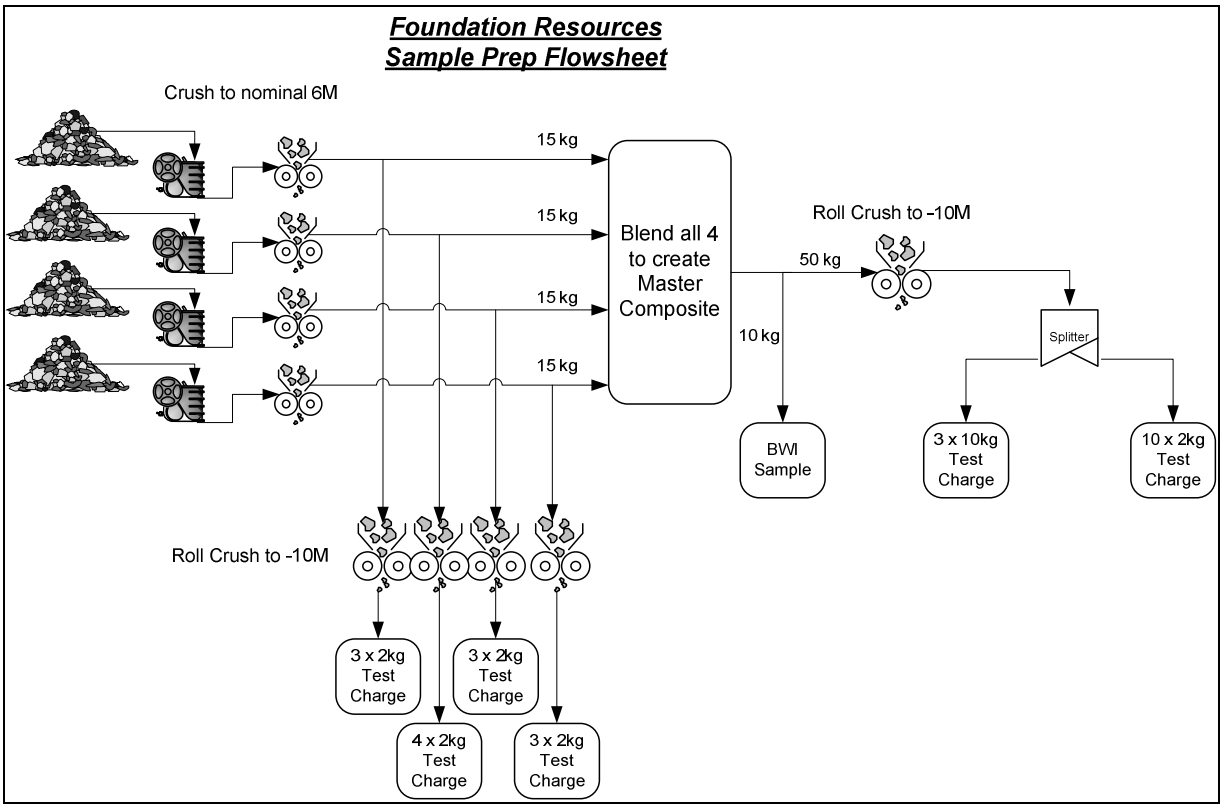


Figure 2: Sample Preparation Flowsheet

More detailed information about the inventory and sample preparation procedures can be found in Appendix A.

1.2. Chemical Head Analysis

For the master composite and all four variability samples, one of the 2kg test charges was taken and split into two 1kg charges. One was used to conduct screen metallics for Au and the other was riffled down to about 150 grams to be used for Fe, S-Total and a multi-elemental scan (ICP-Scan) analysis. The procedure used for screen metallics is as follows:

1. Sample was initially passed through a 150µm screen.
2. Oversize material was pulverized and re-screened.
3. Pulverizing and screening was repeated until oversize is roughly 30 grams.
4. Coarse fraction was weighed and fire assayed to extinction.
5. The undersize fractions were combined, blended and weighed. Three samples were riffled and split to be sent for assays.

The results of all the screen metallics test is presented in Table 3.

Table 3: Screen Metallics Results

Master Composite	Sample		Assay - g/t	Distribution - %
	Weight - g	Wt %	Au	Au
Screen Oversize	30.1	3.01	2.19	2.0
Screen Undersize	971	97.0	3.32	98.0
Calc. Feed	1001	100	3.28	100

(a)

Sample 100	Sample		Assay - g/t	Distribution - %
	Weight - g	Wt %	Au	Au
Screen Oversize	28.2	2.82	1.90	2.0
Screen Undersize	972	97.2	2.74	98.0
Calc. Feed	1000	100	2.72	100

(b)

Sample 200	Sample		Assay - g/t	Distribution - %
	Weight - g	Wt %	Au	Au
Screen Oversize	32.2	3.22	2.30	1.9
Screen Undersize	968	96.8	3.93	98.1
Calc. Feed	1000	100	3.88	100

(c)

Sample 300	Sample		Assay - g/t	Distribution - %
	Weight - g	Wt %	Au	Au
Screen Oversize	31.4	3.14	3.38	2.9
Screen Undersize	969	96.9	3.68	97.1
Calc. Feed	1000	100	3.67	100

(d)

Sample 400	Sample		Assay - g/t	Distribution - %
	Weight - g	Wt %	Au	Au
Screen Oversize	33.2	3.32	1.47	1.5
Screen Undersize	967	96.7	3.21	98.5
Calc. Feed	1000	100	3.15	100

(e)

From the pulp metallics, it is shown that for all the samples, about 97% of the Au is found in the -150 µm fractions. This also produces the head assay for the master composite to be 3.28 g/t Au.

The results of all the analyses are presented in Table 4.

Table 4: Chemical Head Analyses

Master Composite Head Assay		
Element	**Assay**	**Units**
Au	3.28	g/t
Ag	< 2	g/t
Fe	8.38	%
S-Total	1.80	%

(a)

ICP Multi-Elemental Scan (Master Composite)					
Element	**Assay**	**Unit**	**Element**	**Assay**	**Unit**
Al	52300	g/t	Na	31500	g/t
As	< 30	g/t	Ni	88	g/t
Ba	149	g/t	P	1190	g/t
Be	0.52	g/t	Pb	< 20	g/t
Bi	< 20	g/t	Sb	< 10	g/t
Ca	48500	g/t	Se	< 30	g/t
Cd	< 2	g/t	Sn	< 20	g/t
Co	42	g/t	Sr	112	g/t
Cr	144	g/t	Ti	7700	g/t
Cu	74.8	g/t	Tl	< 30	g/t
K	6280	g/t	U	< 20	g/t
Li	< 5	g/t	V	253	g/t
Mg	17800	g/t	Y	35.7	g/t
Mn	1600	g/t	Zn	102	g/t
Mo	< 5	g/t			

(b)

Sample 100 Head Assay		
Element	**Assay**	**Units**
Au	2.72	g/t
Ag	< 2	g/t
Fe	10.3	%
S-Total	1.66	%

(c)

Sample 200 Head Assay		
Element	**Assay**	**Units**
Au	3.88	g/t
Ag	< 2	g/t
Fe	8.67	%
S-Total	1.47	%

(d)

Sample 300 Head Assay		
Element	**Assay**	**Units**
Au	3.67	g/t
Ag	< 2	g/t
Fe	8.64	%
S-Total	1.89	%

(e)

Sample 400 Head Assay		
Element	**Assay**	**Units**
Au	3.15	g/t
Ag	< 2	g/t
Fe	8.41	%
S-Total	2.28	%

(f)

ICP Multi-Elemental Scan (Sample 100)					
Element	**Assay**	**Unit**	**Element**	**Assay**	**Unit**
Al	52900	g/t	Na	31500	g/t
As	< 30	g/t	Ni	25	g/t
Ba	170	g/t	P	1890	g/t
Be	0.86	g/t	Pb	< 30	g/t
Bi	< 20	g/t	Sb	< 10	g/t
Ca	38500	g/t	Se	< 30	g/t
Cd	< 2	g/t	Sn	< 20	g/t
Co	34	g/t	Sr	92.3	g/t
Cr	47	g/t	Ti	9430	g/t
Cu	99.4	g/t	Tl	< 30	g/t
K	6990	g/t	U	< 20	g/t
Li	< 5	g/t	V	187	g/t
Mg	11800	g/t	Y	55.3	g/t
Mn	2000	g/t	Zn	94	g/t
Mo	5	g/t			

(g)

ICP Multi-Elemental Scan (Sample 200)					
Element	**Assay**	**Unit**	**Element**	**Assay**	**Unit**
Al	48900	g/t	Na	23300	g/t
As	< 30	g/t	Ni	262	g/t
Ba	165	g/t	P	525	g/t
Be	0.6	g/t	Pb	< 20	g/t
Bi	< 20	g/t	Sb	< 10	g/t
Ca	73100	g/t	Se	< 30	g/t
Cd	< 2	g/t	Sn	< 20	g/t
Co	60	g/t	Sr	157	g/t
Cr	182	g/t	Ti	7810	g/t
Cu	92600	g/t	Tl	< 30	g/t
K	7690	g/t	U	< 20	g/t
Li	6	g/t	V	262	g/t
Mg	34500	g/t	Y	21.3	g/t
Mn	1600	g/t	Zn	103	g/t
Mo	10	g/t			

(h)

ICP Multi-Elemental Scan (Sample 300)					
Element	**Assay**	**Unit**	**Element**	**Assay**	**Unit**
Al	51700	g/t	Na	34300	g/t
As	< 30	g/t	Ni	41	g/t
Ba	104	g/t	P	712	g/t
Be	0.62	g/t	Pb	< 30	g/t
Bi	< 20	g/t	Sb	< 10	g/t
Ca	48900	g/t	Se	< 30	g/t
Cd	< 2	g/t	Sn	< 20	g/t
Co	42	g/t	Sr	125	g/t
Cr	38	g/t	Ti	7170	g/t
Cu	190	g/t	Tl	< 30	g/t
K	3620	g/t	U	< 20	g/t
Li	< 5	g/t	V	375	g/t
Mg	18500	g/t	Y	24.3	g/t
Mn	1180	g/t	Zn	78	g/t
Mo	5	g/t			

(i)

ICP Multi-Elemental Scan (Sample 400)					
Element	**Assay**	**Unit**	**Element**	**Assay**	**Unit**
Al	56200	g/t	Na	37500	g/t
As	< 30	g/t	Ni	< 20	g/t
Ba	139	g/t	P	1700	g/t
Be	0.6	g/t	Pb	< 20	g/t
Bi	< 20	g/t	Sb	< 10	g/t
Ca	35500	g/t	Se	< 30	g/t
Cd	< 2	g/t	Sn	< 20	g/t
Co	21	g/t	Sr	97.1	g/t
Cr	74	g/t	Ti	6510	g/t
Cu	21.8	g/t	Tl	< 30	g/t
K	7010	g/t	U	< 20	g/t
Li	< 5	g/t	V	73	g/t
Mg	9780	g/t	Y	59.9	g/t
Mn	1730	g/t	Zn	59	g/t
Mo	7	g/t			

(j)

1.3. Grindability

A Bond ball mill work index (BWI) test was conducted on the master composite. With a Bond ball mill work index of 16.2 kWh/tonne, the composite is considered to be hard. The details of the tests and the results are placed in Appendix B. The results of the Bond ball mill work index tests were bench marked against the SGS database and are displayed in Figure 3.

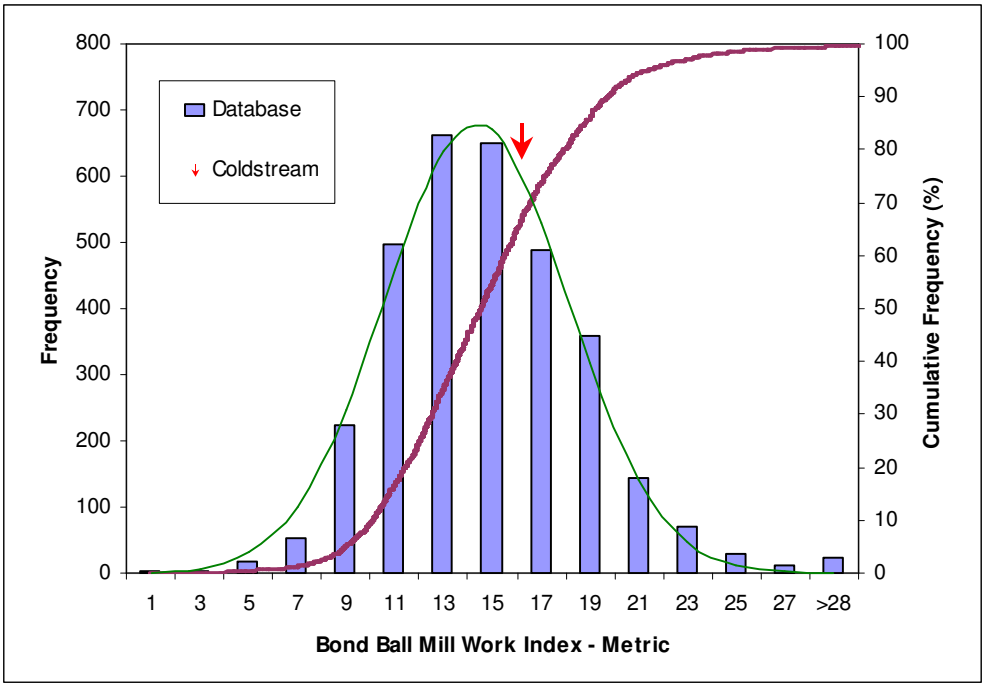


Figure 3: Histogram of Bond Ball Mill Work Indices

1.4. Grind Curve Calibration

To determine the required grind time that would achieve a specific particle size, the relationship with P_{80} and grind time was developed. A grind curve specific for the mill, feed charge and grinding conditions was produced. This grind curve was used to determine the grind time required for the following metallurgical testing stage. Test charges of the master composite (both at 10kg and 2kg charges) and the variability samples were used to conduct a grind calibration using rod charges. The results are shown in Table 5.

Table 5: Grind Calibration Results

Grind Calibration (40 mins)		
Charge	**Weight (kg)**	**P80**
Master Comp	2	124
Master Comp	10	144
Sample 100	1	37
Sample 200	1	34
Sample 300	1	39
Sample 400	1	42

2. Metallurgical Testwork

For the master composite, the metallurgical test program consisted of:

- Gravity separation of whole ore
- Flotation Testing of whole ore and gravity tailings
- Cyanide leaching of whole ore and gravity tailings

2.1. Gravity Separation Testing

Two gravity tests were completed on the master composite, which evaluated the potential for gravity recoverable gold at a primary grind size of P_{80} of ~120 µm and ~60 µm using a Knelson MD-3 concentrator. The Knelson concentrate was then further upgraded on a Mozley shaking table. The Mozley concentrate was assayed for Au to extinction while the combined tailings was sampled and assayed for Au. The remainder of the combined tailings was then split to be filtered and freezer stored to create test charges for later testwork. A summary of the results are shown in Table 6.

Table 6: Summary of Gravity Testwork on the Master Composite

Test #	Product	Mass		Assay - g/t	Distribution - %
P_{80} -µm		g	%	Au	Au
G1	Mozley conc	11.6	0.12	358	13.0
117 µm	Final tails	9988	99.9	2.78	87.0
	Calculated Head	10000	100	3.19	100
G2	Mozley conc	12.5	0.13	655	24.8
62 µm	Final tails	9988	99.9	2.49	75.2
Comp 2	Calculated Head	10000	100	3.31	100

The master composite performed the best at a finer grind of 62µm, producing 24.8% recovery at 655 g/t Au.

2.2. Whole Ore Flotation Bench Scale Testwork

Three rougher kinetic tests and one batch cleaner test on the whole ore master composite feed was conducted.

2.2.1. Rougher Kinetics Flotation

Initial testwork on the master composite looked at the effects of the primary grind of feed and the collector type. A summary of the tests are provided in Table 7, and detailed mass balances including sizing data is included in Appendix D.

Table 7: Whole Ore Rougher Flotation Summary

Test	Product	Time	Wt.	Assay, g/t, %		Distribution, %	
			%	Au	S	Au	S
F1	Ro Conc 1	2	4.17	70.8	33.2	88.8	79.8
P80=48	Ro Conc 1-2	6	5.59	55.7	30.3	93.6	97.7
pH: 8.54	Ro Conc 1-3	14	6.40	49.0	26.7	94.2	98.2
	Ro Conc	24	6.73	46.7	25.4	94.4	98.4
	Ro Tail		93.3	0.20	0.03	5.6	1.6
	Head (calc.)		100	3.33	1.74	100	100
F2	Ro Conc 1	2	4.38	68.9	35.8	87.2	91.7
P80=82	Ro Conc 1-2	6	5.59	57.1	30.0	92.4	98.1
pH: 8.76	Ro Conc 1-3	14	5.98	53.8	28.2	93.1	98.6
	Ro Conc	24	6.37	50.8	26.5	93.5	98.9
	Ro Tail		93.6	0.24	0.02	6.5	1.1
	Head (calc.)		100	3.46	1.71	100	100
F3	Ro Conc 1	2	4.10	71.7	36.9	86.5	88.4
P80=82	Ro Conc 1-2	6	5.33	58.7	31.1	91.9	96.8
pH: 9.06	Ro Conc 1-3	14	5.76	54.9	29.0	92.9	97.5
	Ro Conc	24	6.17	51.5	27.2	93.4	97.8
	Ro Tail		93.8	0.24	0.04	6.6	2.2
	Head (calc.)		100	3.40	1.71	100	100

2.2.1.1. Effect of Primary Grind

Two flotation tests were conducted to evaluate the impact of the primary grind size on the metallurgical response. Flotation feed size targets of 50 µm (F1) and 80 µm (F2) were tested. All flotation tests involved using PAX as the primary collector and MIBC as the frother. Two types of secondary collector, 3418A and Aero 407, was tested in this part of the program. The Au recovery versus mass pull, float time, sulphide grade and sulphide recovery are presented in Figure 4.

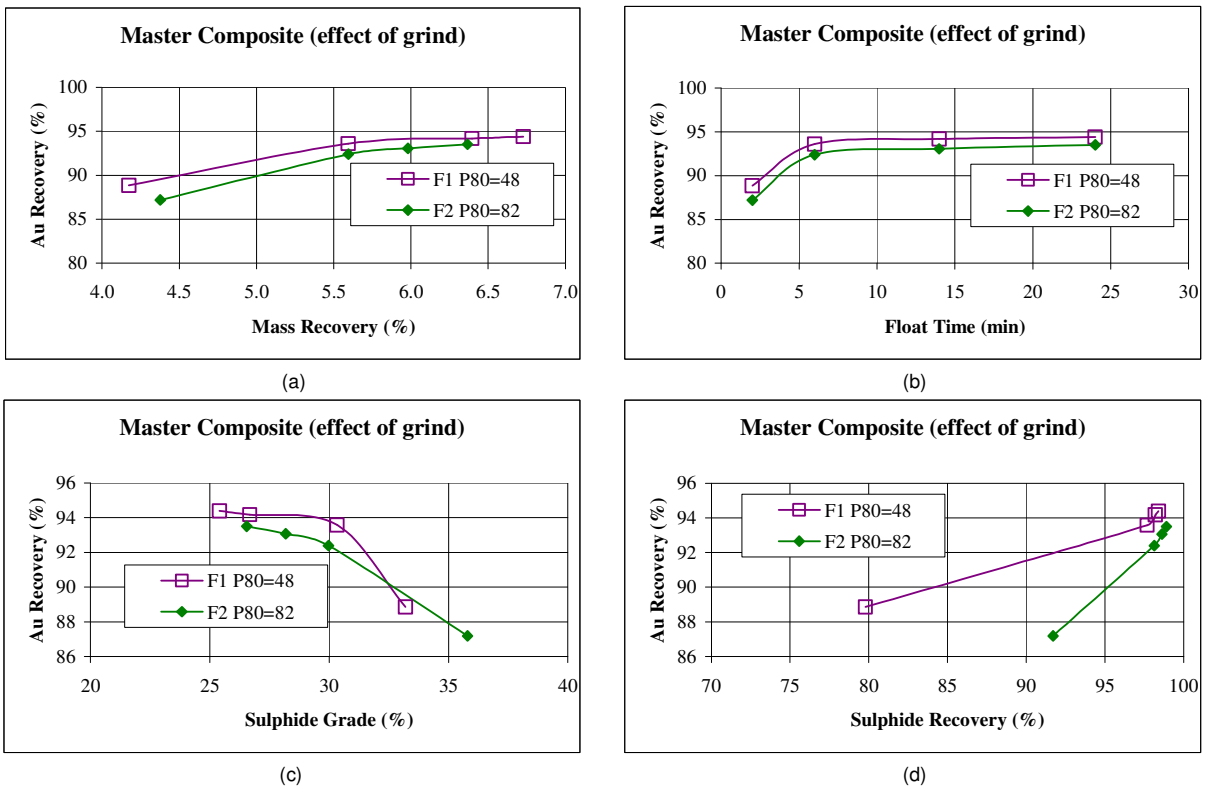


Figure 4: Master Composite Au Recovery Relationship with Varying Grind Size

Figure 4 shows that the Au recoveries with respect to mass pull, flotation time, sulphide grade and sulphide recovery were the highest at a finer grind of 50 µm (F1). The combined rougher concentrate was able to recover 94.4% Au with grades of 46.7 g/t. F2 also produced excellent results even with a coarser grind, producing 93.5% Au recovery at 50.8% grade. A difference of 0.9% in Au recovery from 80 to 50 µm is considered marginal and therefore, it would be more cost effective to use the coarser grind. The recovery of Au with respect to Sulphur also correlates well.

2.2.1.2. Effect of Reagent

One flotation test was conducted and analyzed to assess the effects of using 407 instead of 3418A as a collector. This test was then compared with F2 for evaluation. The Au recovery versus mass pull and flotation time relationships are shown in Figure 5.

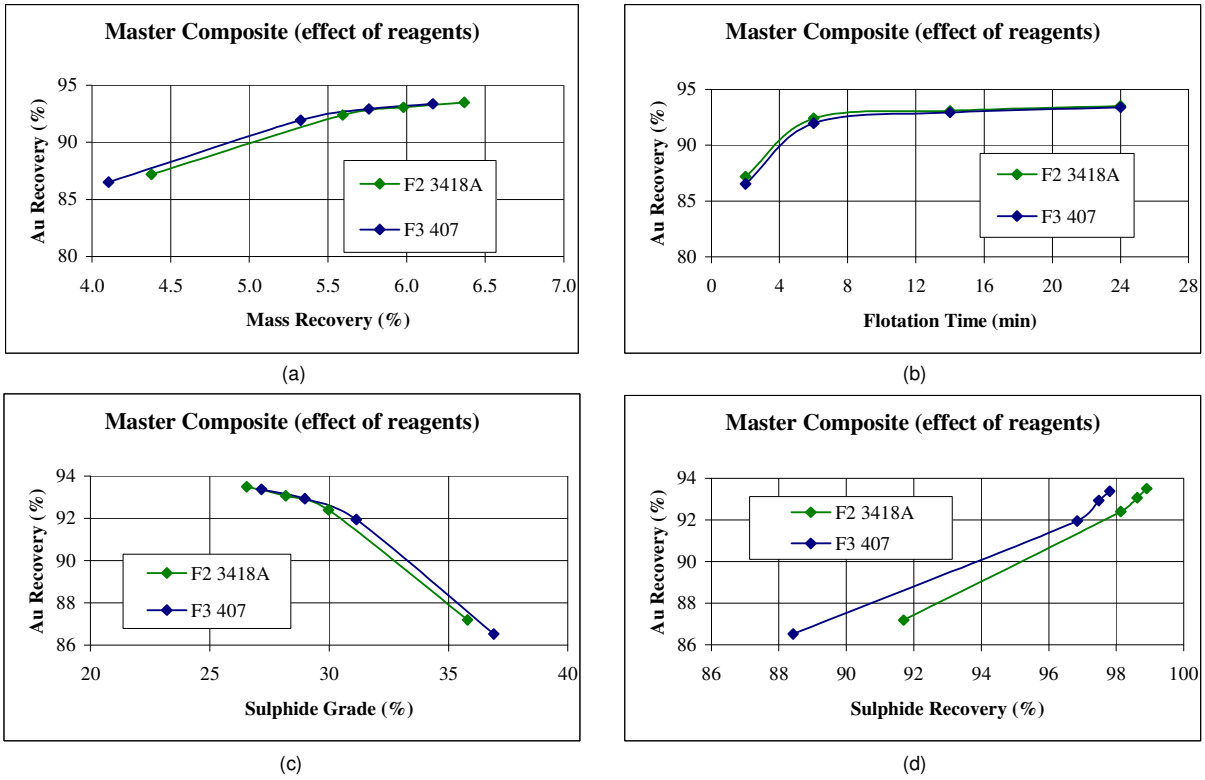


Figure 5: Master Composite Au Recovery Relationship with Varying Reagents

From Figure 5, the addition of Aero 407 (F3) produced the same rougher concentrate recovery as using 3418A (F2), which is about 93.4% Au at 51.5 g/t. Since both collectors roughly produce the same results, replacing 3418A with 407 would be a better route with the lower collector cost.

From this series of rougher tests, it is suggested to incorporate the following general flotation scheme for the rougher stage:

- Primary grind target size of approximately 80 µm
- A combination of PAX and 407 as collectors

Additional testing is required to optimize reagent schemes (dosages and types) as well as primary grinding.

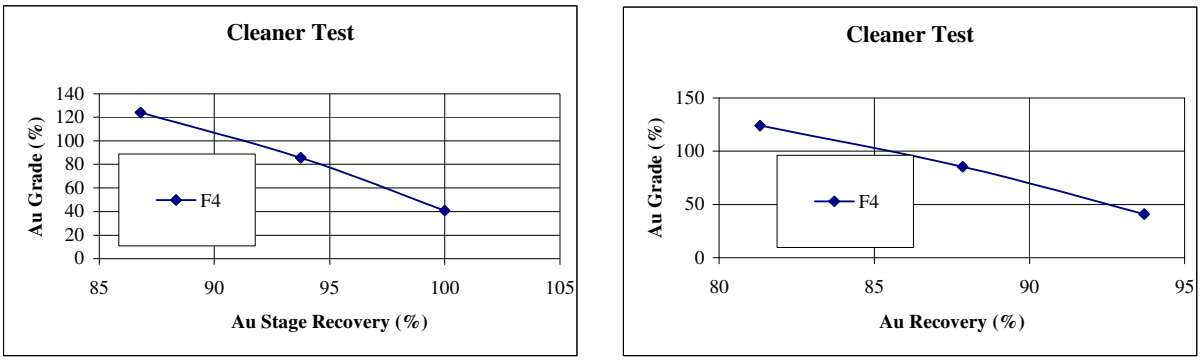
2.2.2. Batch Cleaner Flotation Testing

One batch cleaner test was conducted on the master composite. A regrind to 21 µm using a ceramic ball mill before cleaning to see if further liberation would benefit the upgrading stage. A summary of the test is

provided in Table 8 and the Au grade versus recovery and stage recovery relationships are shown in Figure 6. Detailed mass balances including sizing data and reagent dosages are included in Appendix D.

Table 8: Master Composite Cleaner Flotation Summary

Test	Product	Wt.	Assay, g/t, %		Distribution, %		Stage Rec., %	
		%	Au	S	Au	S	Au	S
F4	Cln 2 Conc	1.76	124	51.3	81.3	52.6	86.8	53.5
P80=48	Cln 1 Conc	2.75	85.6	42.7	87.8	68.5	93.8	69.6
8.77	Ro Conc	6.14	40.9	27.5	93.7	98.4	100	100
PAX/407	Ro Tail	93.9	0.18	0.03	6.31	1.64		
Cleaner K80=21	**Head (calc.)**	100	1.84	2.04	100	100		



(a) (b)

Figure 6: Au Grade versus Recovery and Stage Recovery

As shown, the cleaner test produced a final concentrate with Au recovery of 86.8% at a grade of 124 g/t (upgraded from 40.9 g/t). The sample upgrade is good at 3 times, but there are some losses in the midstream products. Further testing of the cleaner stage is required to improve cleaner stage recovery, minimize losses to the cleaner tails, and optimize the reagent scheme.

2.3. Whole Ore Cyanide Leach Testwork

Two bottle roll leach tests by cyanidation were conducted on whole ore. The tests assessed the effects of the primary grind. Testwork was conducted at 40% pulp density, 48 hour leach time and maintained at a minimum pH of 10.5. A summary of the tests variables and results are provided in Table 9, and detailed mass balances including sizing data is included in Appendix D. The Au leach kinetics is presented in Figure 7.

Table 9: Summary of Whole Ore Leach Test Results

Test	Grind P80 - µm	NaCN Strength g/L	Consumption - kg/t		Calc. Head	Residue	Au Extraction - %		
			Cyanide	Lime	Au (g/t)	Au (g/t)	4 hr	24 hr	48 hr
L1	39	1.5	2.11	0.51	3.64	0.16	10.6	94.8	95.6
L2	95	1.5	1.28	0.49	3.87	0.26	45.6	92.8	93.3

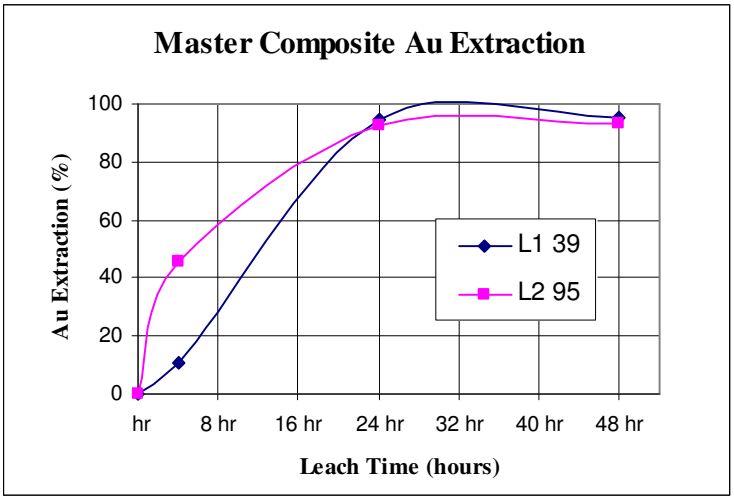


Figure 7: Au Leach Kinetics on Master Composite

Both tests produced very good Au leach results, producing recoveries greater than 90 at the 24 hour mark. The highest Au recovery on the 48 hour pregnant leach solution was produced from L1(P_{80} = 39 µm) with 95.6% at a grade of 2.28 mg/L. Leaching kinetics was comparatively slow during the first 4 hours. The range of the grind size did not greatly influence the 24 hour or 48 hour Au recoveries. Conducting the leach tests at the coarser grind even had a greater intermediate extraction compared to the finer grind, but the end result was around the same recovery.

From this series of leach testing, it is found that the configuration that will produce the best result is

- Target grind size of 40 µm
- Cyanide dosage of 1.5 g/t
- Residence time of 24 hours (excluding safety factor)

It may be possible to further optimize the conditions for leaching by trying a coarser grind, lower dosages of cyanide, pre-aeration, increased dissolved oxygen (D.O.) and different percent solids.

2.4. Gravity Downstream Tests

This section evaluated the effects of applying methods used for whole ore flotation and cyanidation to the tailings produced in the gravity circuit.

2.4.1. Flotation Tests on Gravity Tailings

One rougher flotation test was conducted to evaluate the amenability of recovering gold from the gravity tailings. The best configuration based on the results from the whole ore rougher flotation testing was used on the best gravity tests (G2). Flotation balance summary is shown in Table 10 and the combined balance with the gravity test result is shown in Table 11. The details of the tests and the results are included in Appendix D.

Table 10: Rougher Flotation Summary on Gravity Tailings

Test	Product	Time	Wt.	Assay, g/t, %		Distribution, %	
			%	Au	S	Au	S
F5	Ro Conc 1	2	4.73	47.5	34.1	87.8	90.7
P80=50	Ro Conc 1-2	6	5.83	40.2	29.9	91.6	97.9
pH: 8.67	Ro Conc 1-3	14	6.55	36.2	26.8	92.6	98.6
	Ro Conc	24	7.07	33.7	24.9	93.1	99.0
	Ro Tail		92.9	0.19	0.02	6.9	1.0
	Head (calc.)		100	2.56	1.78	100	100

Table 11: Metallurgical Balance on Gravity Test and Rougher Flotation on Gravity Tailings

Test	Product	Wt.	Assay, g/t	Distribution, %
		%	Au	Au
G2+F5	**Combined Conc**	**7.18**	**-**	**94.8**
	Mozley Conc	0.13	655	24.3
	Rougher Conc	7.06	33.7	70.5
	Rougher Tails	92.8	0.19	5.2
	Calculated Head	100	3.38	

As seen from the results above, rougher flotation on gravity tailings performed very similar to the whole ore rougher flotation. It was able to produce a rougher concentrate with stage recovery on the gravity tailings of 93.1% Au at a grade of 33.7 g/t. Combining the flotation concentrate with the Mozley concentrate, the overall process was able to recover 94.8% of the gold in the master composite.

2.4.2. Leaching Test on Gravity Tailings

The best leaching conditions produced from the whole ore leaching section were applied to the best gravity tailings product to evaluate the recovery of the remaining gold in the sample. A summary of the test is provided in Table 12 and the Au leach kinetics is presented in Figure 8. The details of the tests and the results are included in Appendix D.

Table 12: Summary of Gravity Tailings Leach Test Results

Test	Grind	NaCN Strength	Consumption - kg/t		Calc. Head	Residue	Au Extraction - %		
	P80 - µm	g/L	Cyanide	Lime	Au (g/t)	Au (g/t)	4 hr	24 hr	48 hr
L3	40	1.5	0.37	0.86	2.72	0.14	81.4	93.2	94.9

(a)

Test	Product	Wt.		Assay, g/t, mg/L	Distribution, %
		mg	%	Au	Au
G2+L3	**Combined Conc**	**34.0**	**96.1**	**-**	**96.1**
	Mozley Conc	8.19	23.1	655	23.1
	48 hr PLS	25.8	72.9	1.38	72.9
	48 hr Leach Residue	1.40	3.95	0.14	3.9
	Calculated Head	35.4	100	3.54	100

(b)

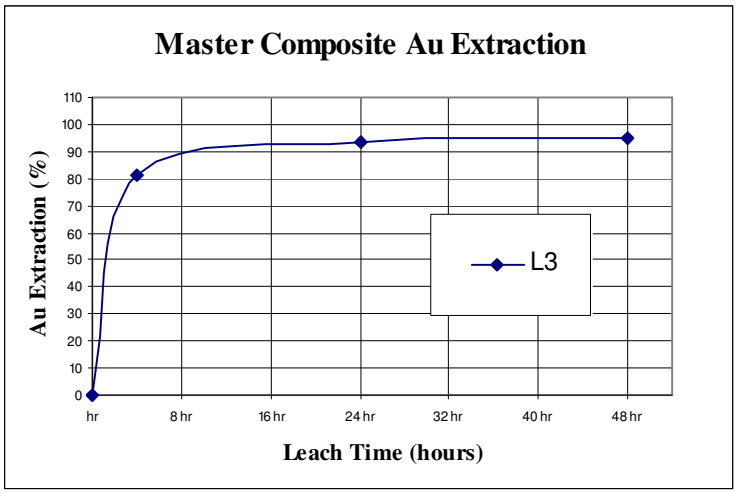


Figure 8: Au Leach Kinetics on Gravity Tailings

From the results above, leaching on gravity tailings performed very similar to the whole ore leaching. It was able to produce a 48 hr pregnant leach solution with recovery of 94.9% Au at a grade of 1.38 mg/L. But compared to the whole ore leaching, gravity tailings leaching had a faster leaching kinetics. Even the 24 hr pregnant leach solution had Au recovery of 93.2%. Combining this with the Mozley concentrate, the overall process was able to recover 96.1% of the gold in the master composite.

2.5. Variability Testing

Using the metallurgical results from the master composite testwork, the best method for rougher flotation and cyanide leaching was applied to the four variability samples.

2.5.1. Variability Flotation

A 1kg test charge was used to conduct the following testwork due to shortage of samples. For all the variability samples, testwork was completed at a target feed of 50 µm but the actual test size turned out to be approximately 40 µm. Collector 407 was used in the testwork instead of 3418A. PAX and MIBC was also used in the testwork. A summary of the tests are provided in Table 13, and The Au recovery versus

mass pull, float time, sulphide grade and sulphide recovery are presented in Figure 9. Detailed mass balances including sizing data is included in Appendix D.

Table 13: Variability Rougher Flotation Summary

Test	Product	Time	Wt.	Assay, g/t, %		Distribution, %	
			%	Au	S	Au	S
F6	Ro Conc 1	2	4.57	62.6	28.6	91.7	82.4
P80=40	Ro Conc 1-2	6	6.11	48.2	25.1	94.5	96.9
pH: 9.17	Ro Conc 1-3	14	7.27	40.9	21.4	95.2	97.8
PAX/407	Ro Conc	24	8.30	35.9	18.8	95.6	98.3
MIBC	Ro Tail		91.7	0.15	0.03	4.4	1.7
	Head (calc.)		100	3.12	1.59	100	100
F7	Ro Conc 1	2	3.74	76.5	28.5	82.7	74.0
P80=39	Ro Conc 1-2	6	5.22	60.0	26.7	90.6	96.8
pH: 8.96	Ro Conc 1-3	14	6.40	49.7	22.1	91.9	98.2
PAX/407	Ro Conc	24	7.42	43.2	19.2	92.5	98.7
MIBC	Ro Tail		92.6	0.28	0.02	7.5	1.3
	Head (calc.)		100	3.46	1.44	100	100
F8	Ro Conc 1	2	4.03	84.7	32.3	91.4	68.6
P80=38	Ro Conc 1-2	6	6.14	59.4	30.1	97.7	97.5
pH: 9	Ro Conc 1-3	14	7.69	47.6	24.3	98.1	98.6
PAX/407	Ro Conc	24	9.01	40.7	20.8	98.3	99.0
MIBC	Ro Tail		91.0	0.07	0.02	1.7	1.0
	Head (calc.)		100	3.73	1.90	100	100
F9	Ro Conc 1	2	4.69	56.4	30.9	91.9	69.1
P80=40	Ro Conc 1-2	6	7.23	39.0	28.3	97.9	97.4
pH: 9.14	Ro Conc 1-3	14	8.51	33.2	24.2	98.2	98.2
PAX/407	Ro Conc	24	9.78	29.0	21.2	98.4	98.7
MIBC	Ro Tail		90.2	0.05	0.03	1.6	1.3
	Head (calc.)		100	2.88	2.10	100	100

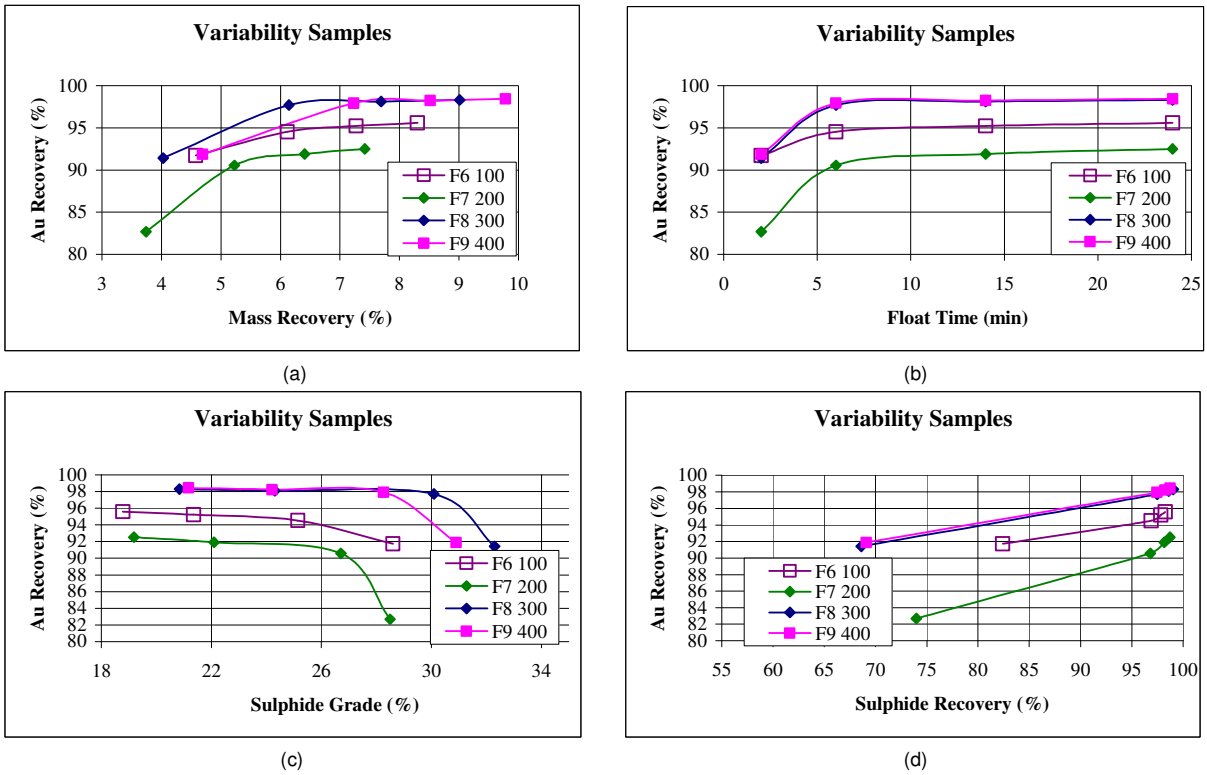


Figure 9: Variability Au Recovery Relationship

As shown, all four variability samples had good gold recoveries, ranging from 92.5% to 98.4%. Since the testwork was conducted at a much finer grind, it is recommended that more testing should be performed to optimize the feed size.

2.5.2. Variability Leaching

A 1kg test charge was used to grind the sample, and was split into 500g to conduct the testwork. For all the variability samples, testwork was completed at a target feed size of 40 µm. Cyanide dosage of 1.5 g/L was used in the testwork, and was also run for 48 hours. A summary of the tests is provided in Table 14, and the Au leach kinetics is presented in Figure 10. The details of the tests and the results are included in Appendix D.

Table 14: Variability Leach Test Results

Test	Grind	NaCN Strength	Consumption - kg/t		Calc. Head	Residue	Au Extraction - %		
	P80 - µm	g/L	Cyanide	Lime	Au (g/t)	Au (g/t)	4 hr	24 hr	48 hr
L4	34	1.5	0.63	1.82	4.19	0.08	68.0	96.5	98.1
L5	40	1.5	0.92	1.21	4.22	0.16	78.4	96.8	96.2
L6	46	1.5	1.36	1.25	3.26	0.16	79.9	95.4	95.1
L7	39	1.5	0.49	0.67	3.38	0.12	87.5	95.3	96.4

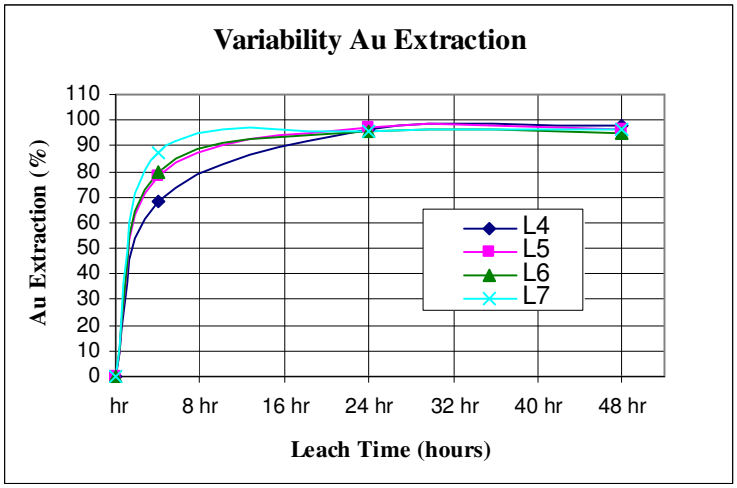


Figure 10: Au Leach Kinetics on Variability Samples

As shown, all four variability samples showed excellent gold recoveries, ranging from 96.4% to 98.1%, which are even higher compared to the master composite. Similar to the gravity tailings leaching, these samples also showed fast leaching kinetics and had good 24 hour pregnant leach solutions.

Discussion or Conclusions and Recommendations

Conclusion

The Osmani Gold deposit of the Coldstream property has shown excellent results in the conducted testwork. From the testwork completed, the flowsheet that produced the highest recovery was the combination of gravity followed by leaching of the gravity tailings (96.1%). This was also able to produce a gravity concentrate of 655 g/t.

Sample Characterisation

- The gold head assay as determined by screen metallics and determined to be 3.28 g/t.
- The Bond ball mill work index is 16.2 kWh/tonne, and is considered to be hard.

Metallurgical Testing

- Gravity testing using a Knelson Concentrator and a Mozley Shaking Table at a feed size of 80 µm was able to produce recoveries of 24.8% Au at a grade of 655 g/t for the master composite.
- The whole ore rougher flotation test using a feed size of 50 µm was able to produce Au recoveries of 94.4%. But the recovery difference of using 80 µm and 50 µm is very marginal, and therefore, using the finer grind may not be cost effective. Using 407 in place of 3418A proved to show similar recoveries, and is therefore, the preferred collector due to its lower cost.
- The whole ore cleaner flotation test with a regrind step was able to produce a final concentrate recovery of 81.3% Au at a grade of 124 g/t (upgraded from 40.9 g/t). Further testing is required to minimize the losses in the midstream products.
- The whole ore leach test using a feed size of 40 µm and cyanide dosage of 1.5 g/L was able to a 48hr pregnant leach solution with gold recoveries of 95.6%. A leach time of 24 hours is also appropriate to reach acceptable Au recovery.
- Rougher flotation test conducted on gravity tailings using similar configuration as the whole ore rougher flotation test was able to produce a rougher concentrate with 93.1% recovery and 33.7 g/t Au. Combining this with the gravity test, it was able to produce an overall recovery of 94.8% Au.
- The leaching test conducted on gravity tailings using similar configuration as the whole ore leaching test was able to produce a 48hr pregnant leach solution with gold recoveries of 94.9%. Combining this with the gravity test, it was able to produce an overall recovery of 96.1%.
- Variability flotation testwork using similar configuration as the whole ore rougher flotation was able to produce similar recoveries, ranging from 92.5% to 98.4%.
- Variability leaching testwork using similar configuration as the whole ore leaching was able to produce even better results, ranging from 96.4% to 98.1%.

Recommendation

It is recommended that additional testwork is conducted in order to optimize flowsheet configuration and generate an overall flowsheet. Rougher flotation testing should be conducted to optimize its configuration by investigating other reagent types, feed sizes and residence time to improve Au recoveries further. More open circuit cleaner testwork is required to optimize the cleaning configuration, reagent scheme and regrind step in an effort to minimize the Au losses in the midstream. Once a proper flowsheet is determined, and if flotation is to be added in the process, locked cycle testing is recommended in order to determine the effect of circulating streams on the final product grade and recovery, allowing proper metallurgical projections.

Additional cyanide leaching testwork is recommended to investigate the effect of coarser feed size and lower cyanide dosages on Au recovery. Au recovery from cyanide solution should also be considered (CIP modelling), as well as developing a cyanide waste stream for cyanide destruction (CND)

Additional variability testing should be conducted which includes comminution study to define production forecast model and point sample testing to measure ore variability to develop recovery model.

Environmental testing should also be considered on the final tailings product which will include Acid Base Accounting (ABA) and Net Acid Generation (NAG).

Once a new configuration is defined, testing on gravity tailings similar to the one produced in this metallurgical test program should be conducted to see improvements in Au grade and recovery.

Appendix A – Sample Preparation

SGS

SAMPLE PREPARATION AND COMPOSITING INSTRUCTIONS

Receipt Number: VAN302 Date: September 16, 2011
Project Number: 50174-001 Metallurgist: Kristelle S. Dept.: MET
Name of Company: Foundation Resources
Name of Samples: Sample 100, 200, 300, 400

Crushing Information: (Indicate Size Required)

Jaw Crush to: -2" ☐ -1" ☐ -3/4" ☐ -1/2" ☐ -3/8" ☐
-3 Mesh (1/4") ☐ -6 Mesh (3.3 mm) ☒ **Riffle and Store** ☐
Roll Crush to: -10 Mesh (2 mm) ☒ -20 Mesh (0.84 mm) ☐ **Riffle and Store** ☐

Analyses Required:

Head Sample: Number: ×
Chemical Analyses: Screen Metallics (Au -FA), Fe, S-Total, ICP-Scan (Will use 2kg test charge)
Bucking Room:
Mineralogy:
Other:

Storage Information:

Freezer Storage: ☒ Sample Plant Storage: ☐ Other: _____

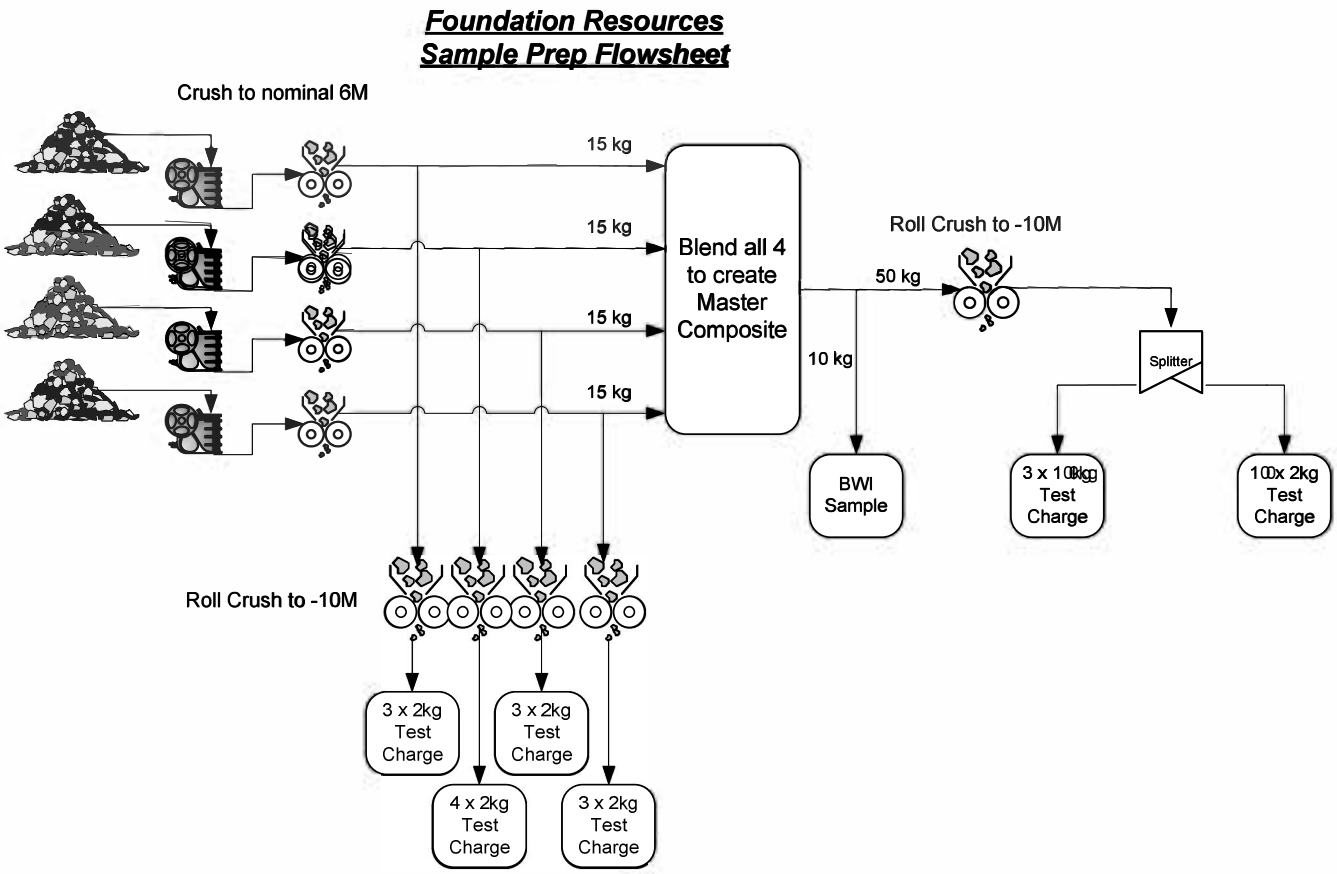
Compositing Instructions:

Log, weigh and inventory samples
Crush each sample to nominal 6M
Take out 15kg from each sample and blend all 4 together to create a Master Composite
Take out 10kg from the Master Composite for BWI testing – split this into 10x1kg test charge
Take remainder of the Master Composite and roll crush to -10M.
Create 3 x 10kg and 10 x 2kg test charges
Take the remainder of the 4 samples and split each one to create as much 2kg test charges

Charges Required: (Please list all charges by number, weight and mesh size, eg. 10 × 2 kg, -10M)

Test Charge Location	Charge #	Unit Wt. (kg)
Sample 100	3	2
Sample 200	4	2
Sample 300	3	2
Sample 400	3	2
Master Composite	3	10
Master Composite	10	2

COMPLETED BY: YL/JR **DATE COMPLETED:** September 27, 2011



Inventory (From Client)

Sample 100 (approx 21.35 kg)
Sample 200 (approx 23.70 kg)
Sample 300 (approx 22.30 kg)
Sample 400 (approx 22.30 kg)

Inventory (From SGS)

Sample 100 (approx 20.16 kg)
Sample 200 (approx 22.50 kg)
Sample 300 (approx 21.08 kg)
Sample 400 (approx 20.92 kg)

Appendix B – Grindability Study

SGS Minerals Services

Standard Bond Ball Mill Grindability Test

Project No.: 50174-001 Date: 12-Oct-11
Sample: Mast Comp.

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:
- Feed 100% Passing 6 mesh
- Mesh of grind: 150 mesh
- Test feed weight (700 mL): 1,383 grams
- Equivalent to : 1,976 kg/m³ at Minus 6 mesh
- Weight % of the undersize material in the ball mill feed: 6.3%
- Weight of undersize product for 250% circulating load: 395 grams

Results: Gram per Rev Average for the Last Three Stages = **1.17 g**
Circulation load = **250%**

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	106	microns
Grp = Grams per revolution	1.17	grams
P_{80} = 80% passing size of product	81	microns
F_{80} = 80% passing size of the feed	2,561	microns

BWI = **14.7** kWh/t (imperial)

BWI = **16.2** kWh/t (metric)

Comments:

Stage No.	# of Revs	New Feed (grams)	Product in Feed (grams)	Material to Be Ground (grams)	Material Passing 150 mesh in Product (grams)	Net Ground Material (grams)	Material Ground Per Mill Rev (grams)
1	150	1,383	87	309	251	164	1.09
2	347	251	16	380	367	351	1.01
3	368	367	23	372	417	394	1.07
4	345	417	26	369	415	389	1.13
5	328	415	26	369	408	382	1.16
6	317	408	26	370	395	370	1.17
7	318	395	25	370	396	371	1.17
8	317	396	25	370	394	369	1.16
		Average for Last Three Stages =		395 g			1.17 g

SGS Minerals Services

Standard Bond Ball Mill Grindability Test

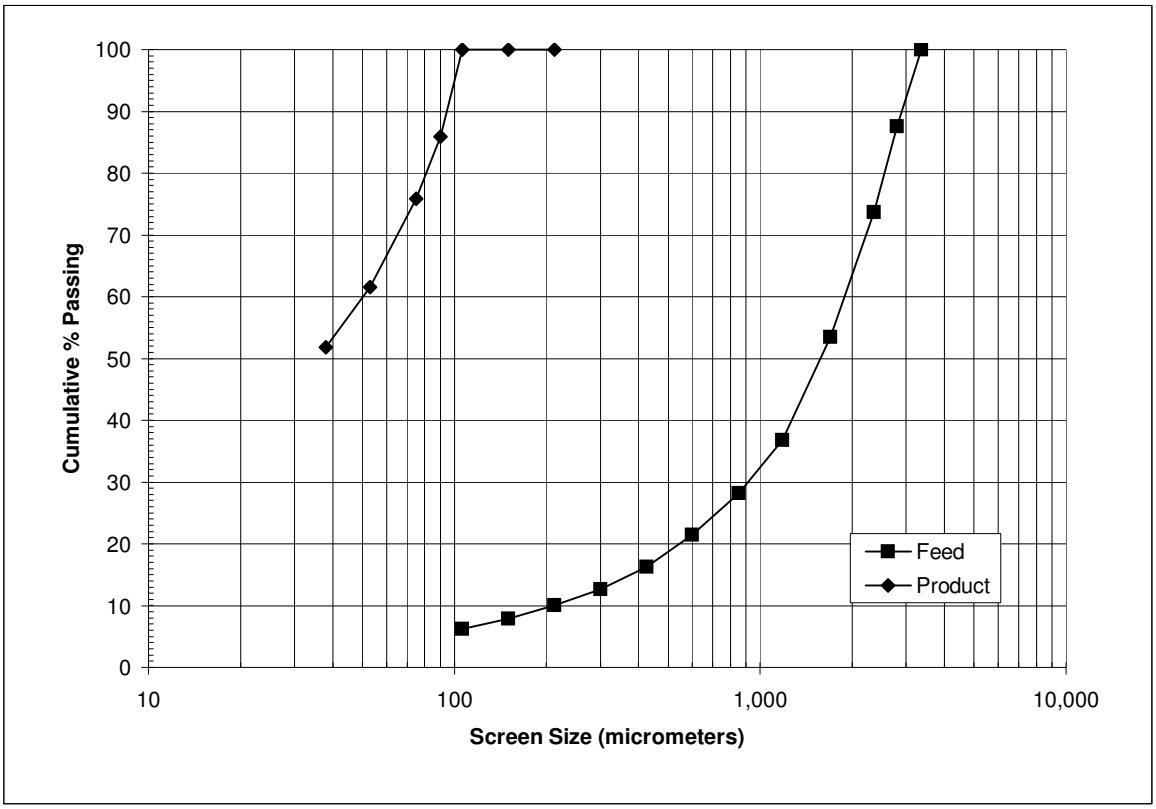
Project No.: 50174-001 Date: 12-Oct-11
Sample: Mast Comp.

Feed Particle Size Analysis

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
6	3,360	0.00	0.00	0.00	100.0
7	2,800	27.0	12.4	12.4	87.6
8	2,360	30.3	13.9	26.4	73.6
10	1,700	43.7	20.1	46.5	53.5
14	1,180	36.3	16.7	63.2	36.8
20	850	18.8	8.65	71.8	28.2
28	600	14.5	6.67	78.5	21.5
35	425	11.3	5.20	83.7	16.3
48	300	7.90	3.64	87.3	12.7
65	212	5.60	2.58	89.9	10.1
100	150	4.80	2.21	92.1	7.87
150	106	3.50	1.61	93.7	6.26
170	90				
200	75				
270	53				
400	38				
Pan	-	13.6	6.3	100.0	-
Total	**-**	**217.3**	**100.0**	**F_{80}:**	**2,561**

Product Particle Size Analysis

Weight	% Retained		% Passing
grams	Individual	Cumulative	Cumulative
0.00	0.00	0.00	100.0
0.00	0.00	0.00	100.0
0.00	0.00	0.00	100.0
22.2	14.1	14.1	85.9
15.7	9.99	24.1	75.9
22.6	14.4	38.5	61.5
15.2	9.67	48.2	51.8
81.5	51.8	100.0	-
157.2	**100.0**	**P_{80}:**	**81**



Appendix C – Sample Characterisation

Project #: 50174-001
Sample: Master Composite
Analysis: Head Elemental Scan

ICP Multi-element Scan (Master Composite)						
Element	**Assay**	**Units**		**Element**	**Assay**	**Units**
Ag	< 2	g/t		Na	31500	g/t
Al	52300	g/t		Ni	88	g/t
As	< 30	g/t		P	1190	g/t
Ba	149	g/t		Pb	< 20	g/t
Be	0.52	g/t		Sb	< 10	g/t
Bi	< 20	g/t		Se	< 30	g/t
Ca	48500	g/t		Sn	< 20	g/t
Cd	< 2	g/t		Sr	112	g/t
Co	42	g/t		Ti	7700	g/t
Cr	144	g/t		Tl	< 30	g/t
Cu	74.8	g/t		U	< 20	g/t
K	6280	g/t		V	253	g/t
Li	< 5	g/t		Y	35.7	g/t
Mg	17800	g/t		Zn	102	g/t
Mn	1600	g/t		Fe	8.38	%
Mo	< 5	g/t		S	1.8	%

Project #: 50174-001
Sample: Sample 100
Analysis: Head Elemental Scan

ICP Multi-element Scan (Sample 100)						
Element	**Assay**	**Units**		**Element**	**Assay**	**Units**
Ag	< 2	g/t		Na	31500	g/t
Al	52900	g/t		Ni	25	g/t
As	< 30	g/t		P	1890	g/t
Ba	170	g/t		Pb	< 30	g/t
Be	0.86	g/t		Sb	< 10	g/t
Bi	< 20	g/t		Se	< 30	g/t
Ca	38500	g/t		Sn	< 20	g/t
Cd	< 2	g/t		Sr	92.3	g/t
Co	34	g/t		Ti	9430	g/t
Cr	47	g/t		Tl	< 30	g/t
Cu	99.4	g/t		U	< 20	g/t
K	6990	g/t		V	187	g/t
Li	< 5	g/t		Y	55.3	g/t
Mg	11800	g/t		Zn	94	g/t
Mn	2000	g/t		Fe	10.3	%
Mo	5	g/t		S	1.66	%

Project #: 50174-001
Sample: Sample 200
Analysis: Head Elemental Scan

ICP Multi-element Scan (Sample 200)						
Element	**Assay**	**Units**		**Element**	**Assay**	**Units**
Ag	< 2	g/t		Na	23300	g/t
Al	48900	g/t		Ni	262	g/t
As	< 30	g/t		P	525	g/t
Ba	165	g/t		Pb	< 20	g/t
Be	0.6	g/t		Sb	< 10	g/t
Bi	< 20	g/t		Se	< 30	g/t
Ca	73100	g/t		Sn	< 20	g/t
Cd	< 2	g/t		Sr	157	g/t
Co	60	g/t		Ti	7810	g/t
Cr	182	g/t		Tl	< 30	g/t
Cu	92600	g/t		U	< 20	g/t
K	7690	g/t		V	262	g/t
Li	6	g/t		Y	21.3	g/t
Mg	34500	g/t		Zn	103	g/t
Mn	1600	g/t		Fe	8.67	%
Mo	10	g/t		S	1.47	%

Project #: 50174-001
Sample: Sample 300
Analysis: Head Elemental Scan

ICP Multi-element Scan (Sample 300)						
Element	**Assay**	**Units**		**Element**	**Assay**	**Units**
Ag	< 2	g/t		Na	34300	g/t
Al	51700	g/t		Ni	41	g/t
As	< 30	g/t		P	712	g/t
Ba	104	g/t		Pb	< 30	g/t
Be	0.62	g/t		Sb	< 10	g/t
Bi	< 20	g/t		Se	< 30	g/t
Ca	48900	g/t		Sn	< 20	g/t
Cd	< 2	g/t		Sr	125	g/t
Co	42	g/t		Ti	7170	g/t
Cr	38	g/t		Tl	< 30	g/t
Cu	190	g/t		U	< 20	g/t
K	3620	g/t		V	375	g/t
Li	< 5	g/t		Y	24.3	g/t
Mg	18500	g/t		Zn	78	g/t
Mn	1180	g/t		Fe	8.64	%
Mo	5	g/t		S	1.89	%

Project #: 50174-001
Sample: Sample 400
Analysis: Head Elemental Scan

ICP Multi-element Scan (Sample 400)						
Element	**Assay**	**Units**		**Element**	**Assay**	**Units**
Ag	< 2	g/t		Na	37500	g/t
Al	56200	g/t		Ni	< 20	g/t
As	< 30	g/t		P	1700	g/t
Ba	139	g/t		Pb	< 20	g/t
Be	0.6	g/t		Sb	< 10	g/t
Bi	< 20	g/t		Se	< 30	g/t
Ca	35500	g/t		Sn	< 20	g/t
Cd	< 2	g/t		Sr	97.1	g/t
Co	21	g/t		Ti	6510	g/t
Cr	74	g/t		Tl	< 30	g/t
Cu	21.8	g/t		U	< 20	g/t
K	7010	g/t		V	73	g/t
Li	< 5	g/t		Y	59.9	g/t
Mg	9780	g/t		Zn	59	g/t
Mn	1730	g/t		Fe	8.41	%
Mo	7	g/t		S	2.28	%

Screened Metallics - Au and Ag Determination

Project: 50174-001 **Operator:** Kristelle S.

Sample ID: Master Composite Date: 10/03/2011

Test ID:

Separation Screen Size: 150 µm

Procedure:

Select approximately 1000 grams of -10 mesh sub-sample of the sample to be tested. Screen the sample at the selected separation size. Pulverize the coarse fraction and repeat screening at the same screen. Continue the pulverizing and screening process until the screen oversize is approximately 30 gr. Weigh the coarse fraction. Forward coarse fraction for assay to extinction.
Combine all screen undersize and weigh. Blend the screen undersize by riffling and split out triplicate samples for assaying.

	Sample		Assay - g/t		Distribution - %	
	Weight - g	Wt %	Au		Au	
Screen Oversize	30.1	3.01	2.19		2.0	
Screen Undersize	971	97.0	3.32		98.0	
Calc. Feed	1001	100	3.28		100	

	Assay - g/t	
	Au	
Head Assay of the sample	**3.28**	

Screened Metallics - Au and Ag Determination

Project: 50174-001 **Operator:** Kristelle S.

Sample ID: 100 Date: 10/17/2011

Test ID:

Separation Screen Size: 150 µm

Procedure:

Select approximately 1000 grams of -10 mesh sub-sample of the sample to be tested. Screen the sample at the selected separation size. Pulverize the coarse fraction and repeat screening at the same screen. Continue the pulverizing and screening process until the screen oversize is approximately 30 gr. Weigh the coarse fraction. Forward coarse fraction for assay to extinction.
Combine all screen undersize and weigh. Blend the screen undersize by riffling and split out triplicate samples for assaying.

	Sample		Assay - g/t		Distribution - %	
	Weight - g	Wt %	Au		Au	
Screen Oversize	28.2	2.82	1.90		2.0	
Screen Undersize	972	97.2	2.74		98.0	
Calc. Feed	1000	100	2.72		100	

	Assay - g/t	
	Au	
Head Assay of the sample	**2.72**	

Screened Metallics - Au and Ag Determination

Project: 50174-001 **Operator:** Kristelle S.

Sample ID: 200 Date: 10/17/2011

Test ID:

Separation Screen Size: 150 µm

Procedure:

Select approximately 1000 grams of -10 mesh sub-sample of the sample to be tested. Screen the sample at the selected separation size. Pulverize the coarse fraction and repeat screening at the same screen. Continue the pulverizing and screening process until the screen oversize is approximately 30 gr. Weigh the coarse fraction. Forward coarse fraction for assay to extinction.
Combine all screen undersize and weigh. Blend the screen undersize by riffling and split out triplicate samples for assaying.

	Sample		Assay - g/t		Distribution - %	
	Weight - g	Wt %	Au		Au	
Screen Oversize	32.2	3.22	2.30		1.9	
Screen Undersize	968	96.8	3.93		98.1	
Calc. Feed	1000	100	3.88		100	

	Assay - g/t	
	Au	
Head Assay of the sample	**3.88**	

Screened Metallics - Au and Ag Determination

Project: 50174-001 **Operator:** Kristelle S.

Sample ID: 300 Date: 10/17/2011

Test ID:

Separation Screen Size: 150 µm

Procedure:

Select approximately 1000 grams of -10 mesh sub-sample of the sample to be tested. Screen the sample at the selected separation size. Pulverize the coarse fraction and repeat screening at the same screen. Continue the pulverizing and screening process until the screen oversize is approximately 30 gr. Weigh the coarse fraction. Forward coarse fraction for assay to extinction.
Combine all screen undersize and weigh. Blend the screen undersize by riffling and split out triplicate samples for assaying.

	Sample		Assay - g/t		Distribution - %	
	Weight - g	Wt %	Au		Au	
Screen Oversize	31.4	3.14	3.38		2.9	
Screen Undersize	969	96.9	3.68		97.1	
Calc. Feed	1000	100	3.67		100	

	Assay - g/t	
	Au	
Head Assay of the sample	**3.67**	

Screened Metallics - Au and Ag Determination

Project: 50174-001 **Operator:** Kristelle S.

Sample ID: 400 Date: 10/19/2011

Test ID:

Separation Screen Size: 150 µm

Procedure:

Select approximately 1000 grams of -10 mesh sub-sample of the sample to be tested. Screen the sample at the selected separation size. Pulverize the coarse fraction and repeat screening at the same screen. Continue the pulverizing and screening process until the screen oversize is approximately 30 gr. Weigh the coarse fraction. Forward coarse fraction for assay to extinction.
Combine all screen undersize and weigh. Blend the screen undersize by riffling and split out triplicate samples for assaying.

	Sample		Assay - g/t		Distribution - %	
	Weight - g	Wt %	Au		Au	
Screen Oversize	33.2	3.32	1.47		1.5	
Screen Undersize	967	96.7	3.21		98.5	
Calc. Feed	1000	100	3.15		100	

	Assay - g/t	
	Au	
Head Assay of the sample	**3.15**	

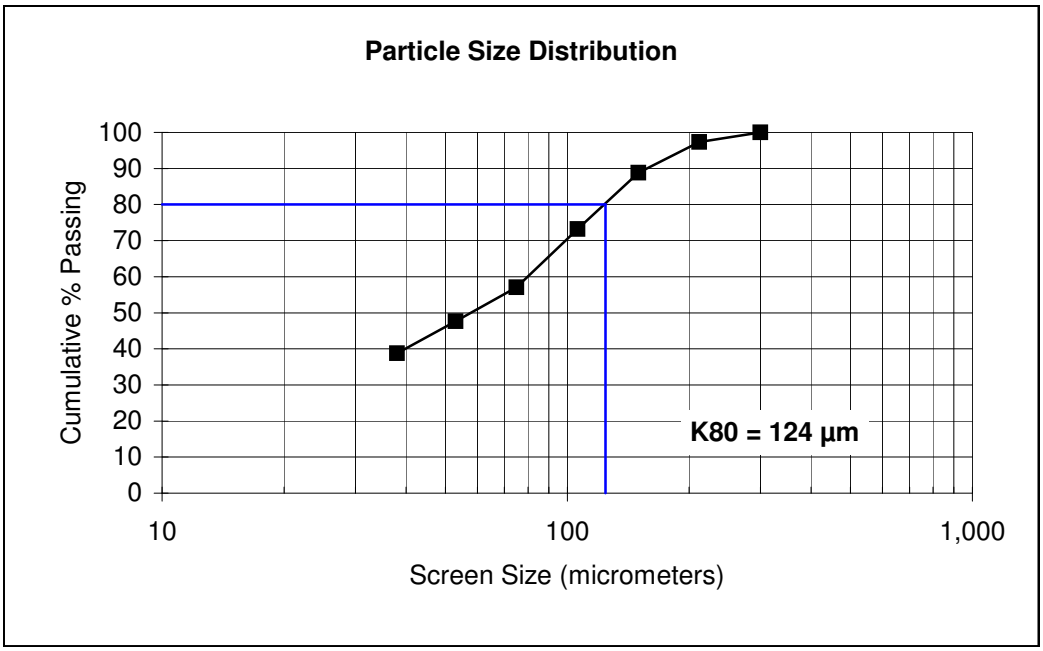
Appendix D – Metallurgical Study

SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Master Comp. (2kg)** Test No.: **40min Rod Mill Grind Cal (C**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	5.5	2.6	2.6	97.4
100	150	17.9	8.6	11.2	88.8
150	106	32.6	15.6	26.8	73.2
200	75	33.8	16.1	42.9	57.1
270	53	19.8	9.5	52.4	47.6
400	38	18.6	8.9	61.3	38.7
Pan	-38	81.1	38.7	100.0	0.0
Total	**-**	**209.3**	100.0	**-**	**-**
K80	**124**				

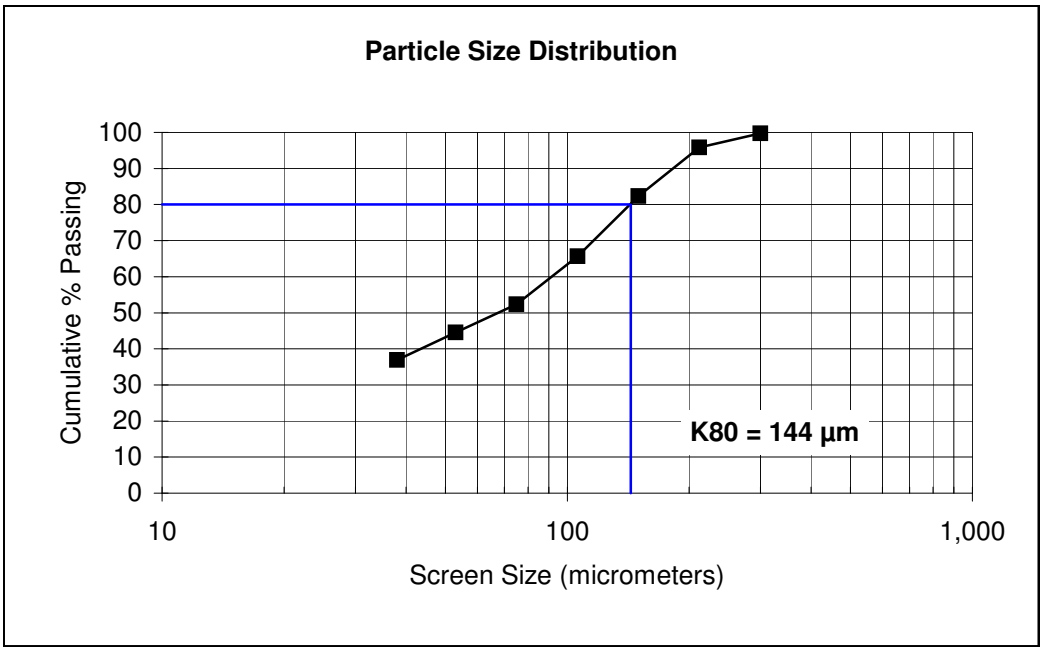


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Master Comp. (10kg)** Test No.: **40min Rod Mill Grind Cal (C**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.6	0.3	0.3	99.7
65	212	8.5	3.9	4.2	95.8
100	150	29.3	13.5	17.7	82.3
150	106	36.3	16.7	34.4	65.6
200	75	28.9	13.3	47.7	52.3
270	53	16.9	7.8	55.5	44.5
400	38	16.5	7.6	63.0	37.0
Pan	-38	80.3	37.0	100.0	0.0
Total	**-**	**217.3**	100.0	**-**	**-**
K80	**144**				



MASTERSIZER 2000

Result Analysis Report

Sample Name:
50174-001 GC2 - Average

SOP Name:
50174-001

Measured:
12000

Sample Source & type:

Measured by:
Yonika_Wiputri

Analysed:
Enhanced

Sample bulk lot ref:

Result Source:
Edited

Particle Name:
Cu (II) O

Accessory Name:
Hydro 2000G (A)

Analysis model:
General purpose

Sensitivity:
Enhanced

Particle RI:
2.630

Absorption:
1

Size range:
0.020 to 2000.000 um

Obscuration:
15.31 %

Dispersant Name:
Water

Dispersant RI:
1.330

Weighted Residual:
0.247 %

Result Emulation:
Off

Concentration:
0.0116 %Vol

Span :
3.324

Uniformity:
1.43

Result units:
Volume

Specific Surface Area:
1.02 m²/g

Surface Weighted Mean D[3,2]:
5.880 um

Vol. Weighted Mean D[4,3]:
28.219 um

---

d(0.1): 2.614 um **d(0.5):** 15.043 um **d (0.8) :** 36.475 um **d(0.9):** 52.615 um

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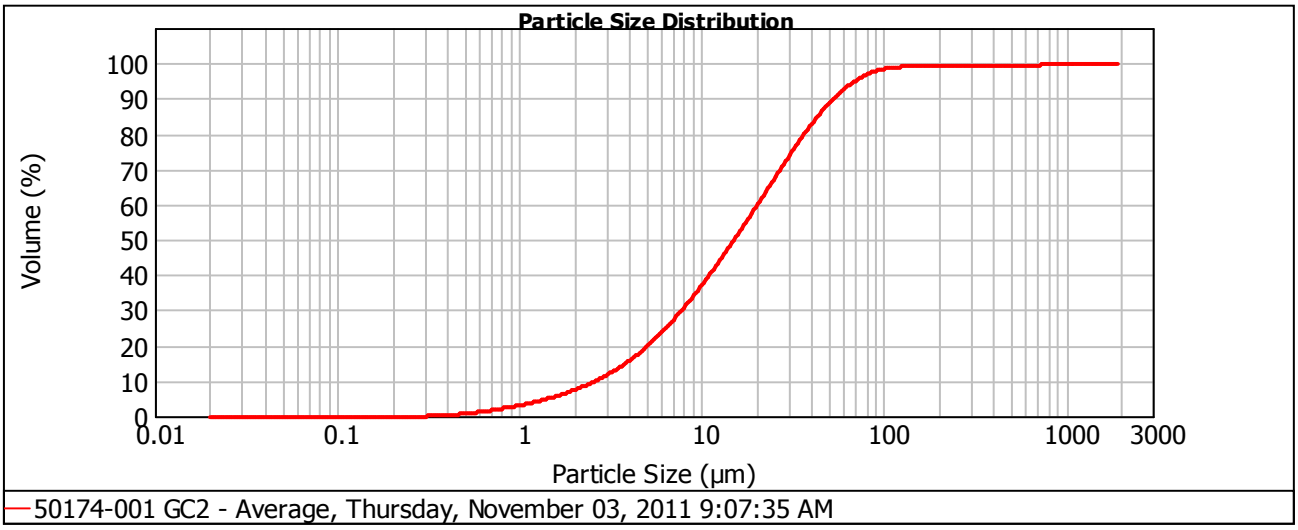


Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	3.22	7.530	29.23	54.372	90.72	392.608	99.13
0.022	0.00	0.162	0.00	1.171	3.79	8.458	32.38	61.077	93.02	441.026	99.18
0.025	0.00	0.182	0.00	1.316	4.43	9.502	35.69	68.609	94.90	495.415	99.25
0.028	0.00	0.205	0.00	1.478	5.15	10.673	39.14	77.071	96.37	556.512	99.33
0.032	0.00	0.230	0.00	1.660	5.95	11.990	42.72	86.575	97.47	625.143	99.42
0.036	0.00	0.258	0.00	1.865	6.83	13.468	46.40	97.252	98.23	702.238	99.53
0.040	0.00	0.290	0.00	2.095	7.82	15.129	50.19	109.246	98.72	788.841	99.65
0.045	0.00	0.326	0.04	2.354	8.91	16.995	54.06	122.718	99.00	886.124	99.76
0.051	0.00	0.366	0.16	2.644	10.12	19.091	58.01	137.852	99.10	995.405	99.86
0.057	0.00	0.411	0.33	2.970	11.48	21.445	62.02	154.853	99.10	1118.162	99.94
0.064	0.00	0.462	0.55	3.336	12.99	24.090	66.06	173.950	99.10	1256.058	99.97
0.072	0.00	0.519	0.80	3.748	14.67	27.061	70.09	195.402	99.10	1410.960	99.99
0.081	0.00	0.583	1.10	4.210	16.56	30.398	74.06	219.500	99.10	1584.966	100.00
0.091	0.00	0.655	1.44	4.729	18.65	34.147	77.90	246.569	99.10	1780.430	100.00
0.102	0.00	0.736	1.81	5.312	20.97	38.358	81.55	276.977	99.10	2000.000	100.00
0.114	0.00	0.826	2.23	5.967	23.51	43.089	84.95	311.135	99.10		
0.129	0.00	0.928	2.70	6.703	26.27	48.403	88.02	349.506	99.11		

Operator notes:

MASTERSIZER 2000

Result Analysis Report

Sample Name:
50174-001 GC3 - Average

SOP Name:
50174-001

Measured:
12000

Sample Source & type:

Measured by:
Yonika_Wiputri

Analysed:
Enhanced

Sample bulk lot ref:

Result Source:
Edited

Particle Name:
Cu (II) O

Accessory Name:
Hydro 2000G (A)

Analysis model:
General purpose

Sensitivity:
Enhanced

Particle RI:
2.630

Absorption:
1

Size range:
0.020 to 2000.000 um

Obscuration:
15.30 %

Dispersant Name:
Water

Dispersant RI:
1.330

Weighted Residual:
0.344 %

Result Emulation:
Off

Concentration:
0.0115 %Vol

Span :
2.894

Uniformity:
0.967

Result units:
Volume

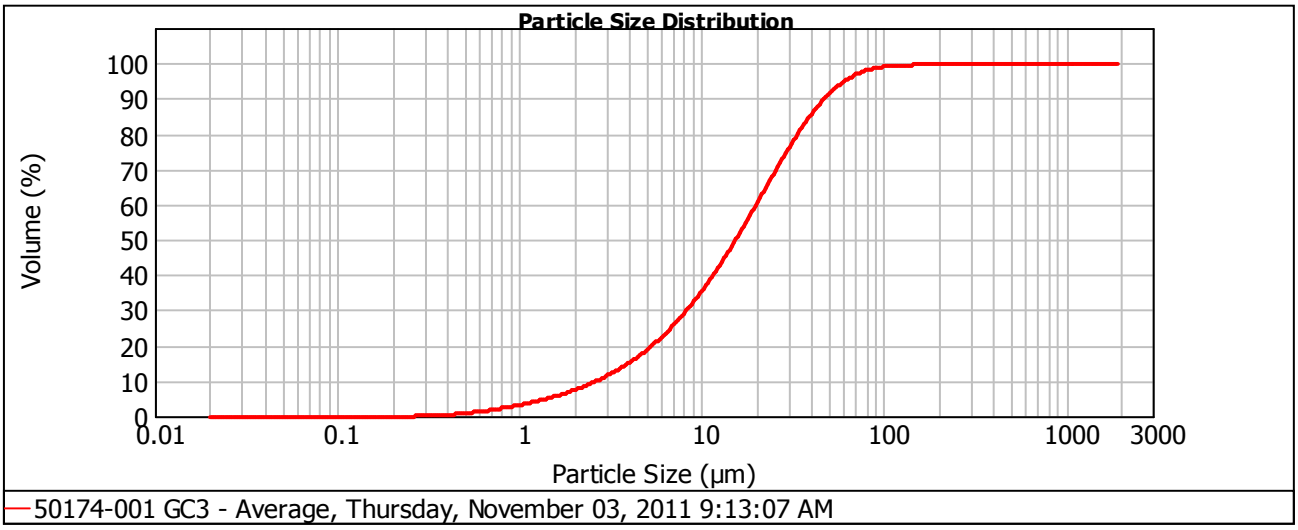
Specific Surface Area:
1.03 m²/g

Surface Weighted Mean D[3,2]:
5.845 um

Vol. Weighted Mean D[4,3]:
21.899 um

d(0.1): 2.651 um **d(0.5):** 15.331 um **d (0.8) :** 33.555 um **d(0.9):** 47.020 um

---



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	3.33	7.530	27.61	54.372	93.13	392.608	99.94
0.022	0.00	0.162	0.00	1.171	3.89	8.458	30.67	61.077	95.10	441.026	99.97
0.025	0.00	0.182	0.00	1.316	4.52	9.502	33.98	68.609	96.62	495.415	100.00
0.028	0.00	0.205	0.00	1.478	5.21	10.673	37.52	77.071	97.73	556.512	100.00
0.032	0.00	0.230	0.00	1.660	5.99	11.990	41.30	86.575	98.50	625.143	100.00
0.036	0.00	0.258	0.00	1.865	6.84	13.468	45.31	97.252	99.01	702.238	100.00
0.040	0.00	0.290	0.04	2.095	7.79	15.129	49.51	109.246	99.31	788.841	100.00
0.045	0.00	0.326	0.12	2.354	8.83	16.995	53.89	122.718	99.47	886.124	100.00
0.051	0.00	0.366	0.25	2.644	9.97	19.091	58.40	137.852	99.54	995.405	100.00
0.057	0.00	0.411	0.43	2.970	11.23	21.445	62.99	154.853	99.57	1118.162	100.00
0.064	0.00	0.462	0.66	3.336	12.63	24.090	67.59	173.950	99.61	1256.058	100.00
0.072	0.00	0.519	0.92	3.748	14.17	27.061	72.11	195.402	99.65	1410.960	100.00
0.081	0.00	0.583	1.23	4.210	15.88	30.398	76.48	219.500	99.70	1584.966	100.00
0.091	0.00	0.655	1.57	4.729	17.78	34.147	80.60	246.569	99.75	1780.430	100.00
0.102	0.00	0.736	1.94	5.312	19.89	38.358	84.38	276.977	99.80	2000.000	100.00
0.114	0.00	0.826	2.36	5.967	22.23	43.089	87.76	311.135	99.85		
0.129	0.00	0.928	2.82	6.703	24.80	48.403	90.68	349.506	99.90		

Operator notes:

MASTERSIZER 2000

Result Analysis Report

Sample Name:
50174-001 GC4 - Average

SOP Name:
50174-001

Measured:
12000

Sample Source & type:

Measured by:
Yonika_Wiputri

Analysed:
Enhanced

Sample bulk lot ref:

Result Source:
Edited

Particle Name:
Cu (II) O

Accessory Name:
Hydro 2000G (A)

Analysis model:
General purpose

Sensitivity:
Enhanced

Particle RI:
2.630

Absorption:
1

Size range:
0.020 to 2000.000 um

Obscuration:
12.34 %

Dispersant Name:
Water

Dispersant RI:
1.330

Weighted Residual:
0.305 %

Result Emulation:
Off

Concentration:
0.0101 %Vol

Span :
2.646

Uniformity:
0.851

Result units:
Volume

Specific Surface Area:
0.927 m²/g

Surface Weighted Mean D[3,2]:
6.473 um

Vol. Weighted Mean D[4,3]:
24.271 um

---

d(0.1): 2.866 um **d(0.5):** 18.642 um **d (0.8) :** 38.790 um **d(0.9):** 52.187 um

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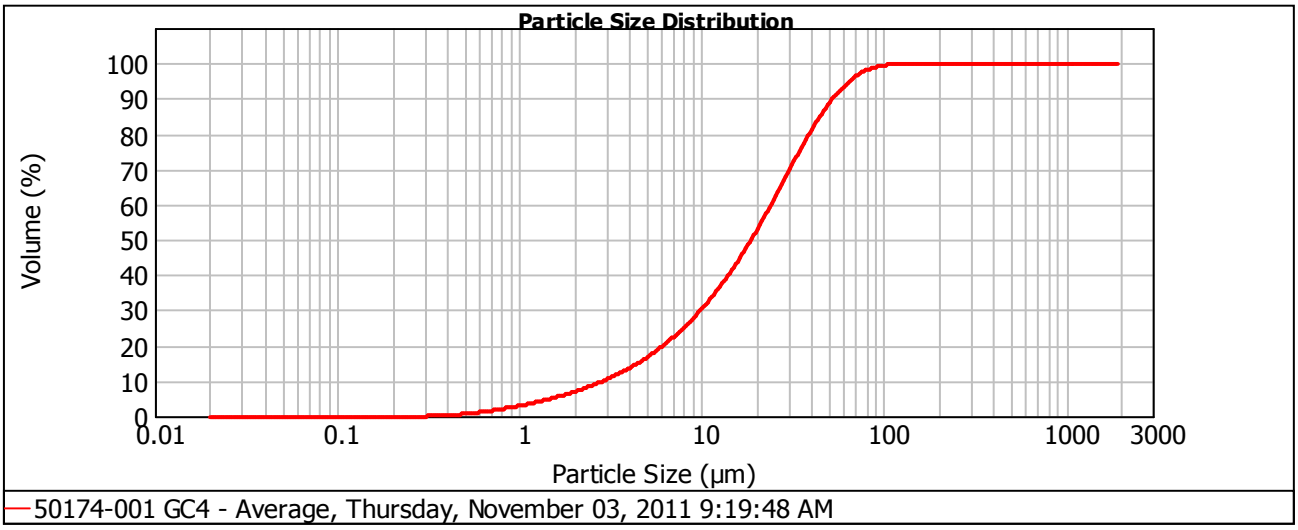

Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	3.08	7.530	23.91	54.372	91.12	392.608	99.98
0.022	0.00	0.162	0.00	1.171	3.63	8.458	26.42	61.077	93.88	441.026	100.00
0.025	0.00	0.182	0.00	1.316	4.24	9.502	29.16	68.609	96.05	495.415	100.00
0.028	0.00	0.205	0.00	1.478	4.91	10.673	32.13	77.071	97.64	556.512	100.00
0.032	0.00	0.230	0.00	1.660	5.64	11.990	35.34	86.575	98.72	625.143	100.00
0.036	0.00	0.258	0.00	1.865	6.44	13.468	38.82	97.252	99.37	702.238	100.00
0.040	0.00	0.290	0.00	2.095	7.30	15.129	42.57	109.246	99.69	788.841	100.00
0.045	0.00	0.326	0.04	2.354	8.24	16.995	46.60	122.718	99.78	886.124	100.00
0.051	0.00	0.366	0.15	2.644	9.25	19.091	50.90	137.852	99.78	995.405	100.00
0.057	0.00	0.411	0.30	2.970	10.34	21.445	55.46	154.853	99.78	1118.162	100.00
0.064	0.00	0.462	0.50	3.336	11.54	24.090	60.23	173.950	99.78	1256.058	100.00
0.072	0.00	0.519	0.75	3.748	12.84	27.061	65.12	195.402	99.78	1410.960	100.00
0.081	0.00	0.583	1.03	4.210	14.27	30.398	70.06	219.500	99.80	1584.966	100.00
0.091	0.00	0.655	1.35	4.729	15.85	34.147	74.92	246.569	99.83	1780.430	100.00
0.102	0.00	0.736	1.72	5.312	17.59	38.358	79.57	276.977	99.87	2000.000	100.00
0.114	0.00	0.826	2.13	5.967	19.50	43.089	83.89	311.135	99.91		
0.129	0.00	0.928	2.58	6.703	21.60	48.403	87.77	349.506	99.95		

Operator notes:

MASTERSIZER 2000

Result Analysis Report

Sample Name:
50174-001 GC5 - Average

SOP Name:
50174-001

Measured:
12000

Sample Source & type:

Measured by:
Yonika_Wiputri

Analysed:
Enhanced

Sample bulk lot ref:

Result Source:
Edited

Particle Name:
Cu (II) O

Accessory Name:
Hydro 2000G (A)

Analysis model:
General purpose

Sensitivity:
Enhanced

Particle RI:
2.630

Absorption:
1

Size range:
0.020 to 2000.000 um

Obscuration:
12.64 %

Dispersant Name:
Water

Dispersant RI:
1.330

Weighted Residual:
0.304 %

Result Emulation:
Off

Concentration:
0.0098 %Vol

Span :
3.283

Uniformity:
1.25

Result units:
Volume

Specific Surface Area:
0.98 m²/g

Surface Weighted Mean D[3,2]:
6.121 um

Vol. Weighted Mean D[4,3]:
29.054 um

---

d(0.1): 2.663 um **d(0.5):** 17.212 um **d (0.8) :** 41.873 um **d(0.9):** 59.172 um

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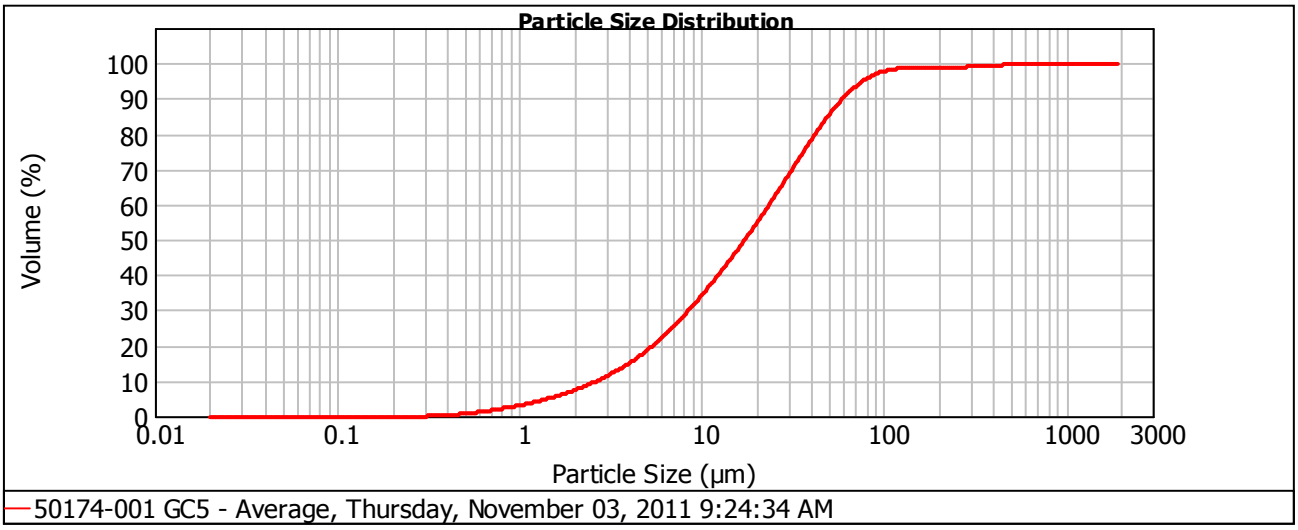


Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	3.22	7.530	27.16	54.372	87.85	392.608	99.41
0.022	0.00	0.162	0.00	1.171	3.80	8.458	29.98	61.077	90.75	441.026	99.55
0.025	0.00	0.182	0.00	1.316	4.44	9.502	32.95	68.609	93.18	495.415	99.68
0.028	0.00	0.205	0.00	1.478	5.15	10.673	36.06	77.071	95.13	556.512	99.80
0.032	0.00	0.230	0.00	1.660	5.94	11.990	39.28	86.575	96.59	625.143	99.89
0.036	0.00	0.258	0.00	1.865	6.80	13.468	42.62	97.252	97.60	702.238	99.95
0.040	0.00	0.290	0.00	2.095	7.75	15.129	46.06	109.246	98.22	788.841	100.00
0.045	0.00	0.326	0.04	2.354	8.79	16.995	49.61	122.718	98.53	886.124	100.00
0.051	0.00	0.366	0.15	2.644	9.93	19.091	53.27	137.852	98.64	995.405	100.00
0.057	0.00	0.411	0.32	2.970	11.18	21.445	57.06	154.853	98.67	1118.162	100.00
0.064	0.00	0.462	0.53	3.336	12.57	24.090	60.95	173.950	98.70	1256.058	100.00
0.072	0.00	0.519	0.78	3.748	14.10	27.061	64.95	195.402	98.74	1410.960	100.00
0.081	0.00	0.583	1.08	4.210	15.80	30.398	69.01	219.500	98.79	1584.966	100.00
0.091	0.00	0.655	1.42	4.729	17.69	34.147	73.07	246.569	98.87	1780.430	100.00
0.102	0.00	0.736	1.80	5.312	19.76	38.358	77.07	276.977	98.98	2000.000	100.00
0.114	0.00	0.826	2.23	5.967	22.04	43.089	80.93	311.135	99.12		
0.129	0.00	0.928	2.70	6.703	24.50	48.403	84.55	349.506	99.27		

Operator notes:

Test No.:	G1	**Operator**:	Keith
Project No:	50174-001	**Date**:	05-Oct-11
Purpose:	Concentrate Au by gravity, as well as to produce Leaching and Flotation Feed		

Feed:	10 kg of MC		
Grind:	40 min	target K_{80}	120
Regrind:		tested K80	117
Procedure:	Grind Sample to target size. Run sample through Knelson. Obtain Knelson concentrate and run through Mozley table once. Take the first Mozley table concentrate and run through the table again to obtain 5-10g of concentrate. Take the Mozley Table concentrate and send for Au (to extinction) analysis. Combine the Knelson tailings and Mozley tailings, mix well, take out a sub-sample and send for Au analysis (triplicate), as well as a particle size analysis. Take the remaining tailings and split into 2kg test charges.		

The Mozley concentrate will be assayed for Au (to extinction)
The Mozley and Knelson tails will be assayed for Au, as well as a PSA

Results: 50174-001 G1

Grind	Product	Mass		Assay - g/t		Distribution - %	
P_{80} -µm		g	%	Au		Au	
117	Mozley conc	11.6	0.12	358.0		13.0	
	Final tails	9988	99.9	2.78		87.0	
	Calculated Head	10000	100.00	**3.19**		100	
	Direct Head			3.28			

Test No.:	G2	**Operator**:	Keith
Project No:	50174-001	**Date**:	05-Oct-11
Purpose:	Concentrate Au by gravity, as well as to produce Leaching and Flotation Feed		

Feed:	10 kg of MC		
Grind:	70 min	target K_{80}	60
Regrind:		tested K80	62

Procedure:

Grind Sample to target size. Run sample through Knelson. Obtain Knelson concentrate and run through Mozley table once. Take the first Mozley table concentrate and run through the table again to obtain 5-10g of concentrate. Take the Mozley Table concentrate and send for Au (to extinction) analysis. Combine the Knelson tailings and Mozley tailings, mix well, take out a sub-sample and send for Au analysis (triplicate), as well as a particle size analysis. Take the remaining tailings and split into 2kg test charges.

The Mozley concentrate will be assayed for Au (to extinction)
The Mozley and Knelson tails will be assayed for Au, as well as a PSA

Results: 50174-001 G2

Grind P_{80} -µm	Product	Mass		Assay - g/t		Distribution - %	
		g	%	Au		Au	
62	Mozley conc	12.5	0.13	655.0		24.8	
	Final tails	9988	99.9	2.49		75.2	
	Calculated Head	10000	100.00	**3.31**		100.0	
	Direct Head			3.28			

F1 **Project No:** 50174-001 **Operator**: KS **Date**: 13-Oct

Purpose: Baseline test @ 50um

Procedure: As outlined below.

Feed: **2-kg of minus 10 mesh Master Composite**

Grind: 62.0 minutes / 2-kg at 65% solids in laboratory rod mill (Titan) Primary K_{80} = 48 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**3418A**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				62.0				
Rougher 1	-	-	-	10				1	2	8.54	123.80
Rougher 2	-	20	5	5				1	4	8.85	15.10
Rougher 3	-	25	-					1	8	8.45	-17.60
Rougher 4	-	40	7.5	3				1	10	9.12	-60.90
Total:	0	95	15	18	0	0	62	4	24		

Stage	Rougher			
Flotation Cell #8	D1			
Speed rpm	1800			

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	83.7	4.2	70.8		33.2		88.8		79.8	
Ro Conc 2	28.5	1.4	11.1		21.9		4.7		17.9	
Ro Conc 3	16.1	0.8	2.47		1.14		0.6		0.5	
Ro Conc 4	6.7	0.3	2.14		0.96		0.2		0.2	
Ro Tail	1870	93.3	0.20		0.03		5.6		1.6	
Head (calc.)	2005	100	3.33		1.74		100		100	
(direct)			3.28		1.80					

Combined Products

Ro Conc 1	4.2	70.8		33.2		88.8		79.8	
Ro Conc 1-2	5.6	55.7		30.3		93.6		97.7	
Ro Conc 1-3	6.4	49.0		26.7		94.2		98.2	
Ro Conc	6.7	46.7		25.4		94.4		98.4	
Ro Tail	93.3	0.20		0.03		5.6		1.6	

F2 **Project No:** 50174-001 **Operator**: KS **Date**: 13-Oct

Purpose: Baseline test @ 80um

Procedure: As outlined below.

Feed: **2-kg of minus 10 mesh Master Composite**

Grind: 41.0 minutes / 2-kg at 65% solids in laboratory rod mill (Titan) Primary K_{80} = 82 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**3418A**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				41.0				
Rougher 1	-	-	-	10				1	2	8.76	92.30
Rougher 2	-	20	5	5				1	4	8.83	12.40
Rougher 3	-	25						1	8	9.16	-51.40
Rougher 4	-	40	7.5	2				1	10	9.09	-70.00
Total:	0	95	15	17	0	0	41	4	24		

Stage	Rougher			
Flotation Cell #8	D1			
Speed rpm	1800			

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	87.7	4.4	68.9		35.8		87.2		91.7	
Ro Conc 2	24.4	1.2	14.8		9.03		5.2		6.4	
Ro Conc 3	7.7	0.4	5.97		2.17		0.7		0.5	
Ro Conc 4	7.7	0.4	3.95		1.26		0.4		0.3	
Ro Tail	1875	93.6	0.24		0.02		6.5		1.1	
Head (calc.)	2003	100	3.46		1.71		100		100	
(direct)			3.28		1.80					

Combined Products

Ro Conc 1	4.4	68.9		35.8		87.2		91.7	
Ro Conc 1-2	5.6	57.1		30.0		92.4		98.1	
Ro Conc 1-3	6.0	53.8		28.2		93.1		98.6	
Ro Conc	6.4	50.8		26.5		93.5		98.9	
Ro Tail	93.6	0.24		0.02		6.5		1.1	

F3 **Project No:** 50174-001 **Operator**: KS **Date**: 24-Oct

Purpose: Effect of Reagent test @ 80um

Procedure: As outlined below.

Feed: **2-kg of minus 10 mesh Master Composite**

Grind: 41.0 minutes / 2-kg at 65% solids in laboratory rod mill (Titan) Primary K_{80} = 82 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				41.0				
Rougher 1	-	-	-	10				1	2	9.06	96.90
Rougher 2	-	20	5	5				1	4	9.04	27.60
Rougher 3	-	25						1	8	8.90	29.80
Rougher 4	-	40	7.5	2				1	10	8.77	-3.40
Total:	0	95	15	17	0	0	41	4	24		

Stage	Rougher			
Flotation Cell #8	D1			
Speed rpm	1800			

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	81.2	4.1	71.7		36.9		86.5		88.4	
Ro Conc 2	24.2	1.2	15.1		11.8		5.4		8.4	
Ro Conc 3	8.6	0.4	7.70		2.51		1.0		0.6	
Ro Conc 4	8.1	0.4	3.73		1.38		0.4		0.3	
Ro Tail	1857	93.8	0.24		0.04		6.6		2.2	
Head (calc.)	1979	100	3.40		1.71		100		100	
(direct)			3.28		1.80					

Combined Products

Ro Conc 1	4.1	71.7		36.9		86.5		88.4	
Ro Conc 1-2	5.3	58.7		31.1		91.9		96.8	
Ro Conc 1-3	5.8	54.9		29.0		92.9		97.5	
Ro Conc	6.2	51.5		27.2		93.4		97.8	
Ro Tail	93.8	0.24		0.04		6.6		2.2	

F4 **Project No:** 50174-001 **Operator**: KS **Date**: 01-Nov

Purpose: Cleaner Flotation, effect of regrind, based on F1 and F3

Procedure: As outlined below.

Feed: **2-kg of minus 10 mesh Master Composite**

Grind: 62.0 minutes / 2-kg at 65% solids in laboratory rod mill (Titan) Primary K_{80} = 48 µm Ro Tail

Regrind: 10 minutes / 50% solids in laboratory Pebble Mill Regrind K_{80} = 21 µm Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind		10	2.5				62.0				
Rougher 1		-	-	10				1	2	8.77	111.9
Rougher 2		20	5	5				1	4	8.73	39.9
Rougher 3		25						1	8	8.75	-7.8
Rougher 4		40	7.5	2				1	10	8.71	-36.9
Regrind							10.0				
1st Cleaner				2					12	7.97	42.3
1st Cleaner Scv.		10	5					1	2	8.33	3.7
2nd Cleaner				2					6	7.89	84.9
Total:	0	105	20	21	0	0	62	5	44		

Stage	Rougher	1st, 2nd		
Flotation Cell #8	D1	250-g		
Speed rpm	1800	1200		

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Cln 2 Conc	35.2	1.8	124.0		51.3		81.3		52.6	
Cln 2 Tail	19.9	1.0	17.6		27.4		6.5		15.9	
Cln 1 Scav Conc	9.4	0.5	12.8		41.9		2.2		11.5	
Cln 1 Scav Tail	58.5	2.9	3.31		10.8		3.6		18.4	
Ro. Tail	1881	93.9	0.18		0.03		6.3		1.6	
Head (calc.)	2004	100	2.68		1.71		100		100	
(direct)			3.28		1.80					

Combined Products

Cln 2 Conc	1.8	124.0		51.3		81.3		52.6	
Cln 1 Conc	2.7	85.6		42.7		87.8		68.5	
Ro Conc	6.1	40.9		27.5		93.7		98.4	
Ro Tail	93.9	0.18		0.03		6.3		1.6	

F5 **Project No:** 50174-001 **Operator**: KS **Date**: 03-Nov

Purpose: Rougher flotation test on gravity tailings (G2), based on F1 and F3

Procedure: As outlined below.

Feed: **2-kg of G2 Tails**

Grind: 10.0 minutes / 2-kg at 65% solids in laboratory rod mill (Titan) Primary K_{80} = 50 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				10.0				
Rougher 1	-	-	-	10				1	2	8.67	81.3
Rougher 2	-	20	5	5				1	4	8.59	17.6
Rougher 3	-	25						1	8	8.54	2.7
Rougher 4	-	40	7.5	2				1	10	8.56	-24.8
Total:	0	95	15	17	0	0	10	4	24		

Stage	Rougher			
Flotation Cell #8	D1			
Speed rpm	1800			

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	94.4	4.7	47.5		34.1		87.8		90.7	
Ro Conc 2	21.9	1.1	8.95		11.7		3.8		7.2	
Ro Conc 3	14.3	0.7	3.44		1.70		1.0		0.7	
Ro Conc 4	10.4	0.5	2.53		1.23		0.5		0.4	
Ro Tail	1854	92.9	0.19		0.02		6.9		1.0	
Head (calc.)	1995	100	2.56		1.78		100		100	
(direct)			2.49							

Combined Products

Ro Conc 1	4.7	47.5		34.1		87.8		90.7	
Ro Conc 1-2	5.8	40.2		29.9		91.6		97.9	
Ro Conc 1-3	6.5	36.2		26.8		92.6		98.6	
Ro Conc	7.1	33.7		24.9		93.1		99.0	
Ro Tail	92.9	0.19		0.02		6.9		1.0	

G2/F5 **Project No:** 50174-001 **Operator**: KS

Metallurgical Balance (Gravity - G2)

Grind	Product	Mass		Assay - g/t		Distribution - %	
P_{80} -µm		g	%	Au		Au	
62	Mozley conc	12.5	0.13	655.0		24.8	
	Final tails	9988	99.9	2.49		75.2	
	Calculated Head	10000	100.00	**3.31**		100	
	Direct Head			3.28			

Metallurgical Balance (Flotation - F5)

Product	**Weight**		**Assays, g/t, %**			**% Distribution**		
	Dry	**%**	**Au**		**S**	**Au**	**0**	**S**
Ro Conc 1	94.4	4.7	47.5		34.1	87.8		90.7
Ro Conc 2	21.9	1.1	8.95		11.7	3.8		7.2
Ro Conc 3	14.3	0.7	3.44		1.70	1.0		0.7
Ro Conc 4	10.4	0.5	2.53		1.23	0.5		0.4
Ro Tail	1854	92.9	0.19		0.02	6.9		1.0
Head (calc.)	1995	100	2.56		1.78	100		100
(direct)			2.49					

Combined Products

Ro Conc 1	4.7	47.5		34.1	87.8		90.7
Ro Conc 1-2	5.8	40.2		29.9	91.6		97.9
Ro Conc 1-3	6.5	36.2		26.8	92.6		98.6
Ro Conc	7.1	33.7		24.9	93.1		99.0
Ro Tail	92.9	0.19		0.02	6.9		1.0

Metallurgical Balance (G2 and F5)

Product		**Weight**	**Assays, g/t, %**		**% Distribution**	
		%	**Au**		**Au**	
Combined Conc		**7.18**	**-**		**94.8**	
Mozley Conc		0.13	655.0		24.3	
Rougher Conc		7.1	33.7		70.5	
Rougher Tails		92.8	0.19		5.2	
Calculated Head		100	3.38			
Direct Head			3.28			

F6 **Project No:** 50174-001 **Operator**: KS **Date**: 03-Nov

Purpose: Rougher flotation test on sample 100, based on F1 and F3

Procedure: As outlined below.

Feed: **1-kg of minus 10 mesh Sample 100**

Grind: 33.0 minutes / 1-kg at 50% solids in laboratory rod mill (Titan) Primary K_{80} = 40 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				33.0				
Rougher 1	-	-	-	10				1	2	9.17	81.0
Rougher 2	-	20	5	5				1	4	8.97	11.0
Rougher 3	-	25		2				1	8	8.84	0.5
Rougher 4	-	40	7.5	2				1	10	8.79	-46.1
Total:	0	95	15	19	0	0	33	4	24		

Stage	Rougher				
Flotation Cell #8	500-g				
Speed rpm	1500				

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	46.0	4.6	62.6		28.6		91.7		82.4	
Ro Conc 2	15.5	1.5	5.65		14.9		2.8		14.5	
Ro Conc 3	11.6	1.2	1.88		1.29		0.7		0.9	
Ro Conc 4	10.4	1.0	1.15		0.68		0.4		0.4	
Ro Tail	922	91.7	0.15		0.03		4.4		1.7	
Head (calc.)	1006	100	3.12		1.59		100		100	
(direct)			2.72		1.66					

Combined Products

Ro Conc 1	4.6	62.6		28.6		91.7		82.4	
Ro Conc 1-2	6.1	48.2		25.1		94.5		96.9	
Ro Conc 1-3	7.3	40.9		21.4		95.2		97.8	
Ro Conc	8.3	35.9		18.8		95.6		98.3	
Ro Tail	91.7	0.15		0.03		4.4		1.7	

F7 **Project No:** 50174-001 **Operator**: KS **Date**: 03-Nov

Purpose: Rougher flotation test on sample 200, based on F1 and F3

Procedure: As outlined below.

Feed: **1-kg of minus 10 mesh Sample 200**

Grind: 32.0 minutes / 1-kg at 50% solids in laboratory rod mill (Titan) Primary K_{80} = 39 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				32.0				
Rougher 1	-	-	-	10				1	2	8.96	80.3
Rougher 2	-	20	5	5				1	4	8.88	-8.4
Rougher 3	-	25		2				1	8	8.83	-33.0
Rougher 4	-	40	7.5	2				1	10	8.68	-67.4
Total:	0	95	15	19	0	0	32	4	24		

Stage	Rougher			
Flotation Cell #8	500-g			
Speed rpm	1500			

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	37.6	3.7	76.5		28.5		82.7		74.0	
Ro Conc 2	14.9	1.5	18.4		22.2		7.9		22.8	
Ro Conc 3	11.9	1.2	3.90		1.67		1.3		1.4	
Ro Conc 4	10.2	1.0	2.11		0.76		0.6		0.5	
Ro Tail	930	92.6	0.28		0.02		7.5		1.3	
Head (calc.)	1005	100	3.46		1.44		100		100	
(direct)			3.88		1.47					

Combined Products

Ro Conc 1	3.7	76.5		28.5		82.7		74.0	
Ro Conc 1-2	5.2	60.0		26.7		90.6		96.8	
Ro Conc 1-3	6.4	49.7		22.1		91.9		98.2	
Ro Conc	7.4	43.2		19.2		92.5		98.7	
Ro Tail	92.6	0.28		0.02		7.5		1.3	

F8 **Project No:** 50174-001 **Operator**: KS **Date**: 03-Nov

Purpose: Rougher flotation test on sample 300, based on F1 and F3

Procedure: As outlined below.

Feed: **1-kg of minus 10 mesh Sample 300**

Grind: 34.0 minutes / 1-kg at 50% solids in laboratory rod mill (Titan) Primary K_{80} = 38 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				34.0				
Rougher 1	-	-	-	10				1	2	9.00	82.2
Rougher 2	-	20	5	5				1	4	8.89	14.7
Rougher 3	-	25		2				1	8	8.89	-19.5
Rougher 4	-	40	7.5	2				1	10	8.75	-32.8
Total:	0	95	15	19	0	0	34	4	24		

Stage	Rougher				
Flotation Cell #8	500-g				
Speed rpm	1500				

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	40.4	4.0	84.7		32.3		91.4		68.6	
Ro Conc 2	21.2	2.1	11.1		25.9		6.3		28.9	
Ro Conc 3	15.5	1.5	0.97		1.33		0.4		1.1	
Ro Conc 4	13.3	1.3	0.55		0.66		0.2		0.5	
Ro Tail	912	91.0	0.07		0.02		1.7		1.0	
Head (calc.)	1003	100	3.73		1.90		100		100	
(direct)			3.67		1.89					

Combined Products

Ro Conc 1	4.0	84.7		32.3		91.4		68.6	
Ro Conc 1-2	6.1	59.4		30.1		97.7		97.5	
Ro Conc 1-3	7.7	47.6		24.3		98.1		98.6	
Ro Conc	9.0	40.7		20.8		98.3		99.0	
Ro Tail	91.0	0.07		0.02		1.7		1.0	

F9 **Project No:** 50174-001 **Operator**: KS **Date**: 03-Nov

Purpose: Rougher flotation test on sample 400, based on F1 and F3

Procedure: As outlined below.

Feed: **1-kg of minus 10 mesh Sample 400**

Grind: 36.0 minutes / 1-kg at 50% solids in laboratory rod mill (Titan) Primary K_{80} = 40 µm Ro Tail

Regrind: / 50% solids in laboratory Pebble Mill Regrind K_{80} = - Comb

Conditions:

	Reagents added, g/t						Time, minutes			Pulp	
Stage		**PAX**	**407**	**MIBC**			**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	10	2.5				36.0				
Rougher 1	-	-	-	10				1	2	9.14	78.5
Rougher 2	-	20	5	5				1	4	9.03	8.5
Rougher 3	-	25		2				1	8	8.84	-16.9
Rougher 4	-	40	7.5	2				1	10	8.78	-46.0
Total:	0	95	15	19	0	0	36	4	24		

Stage	Rougher				
Flotation Cell #8	500-g				
Speed rpm	1500				

Metallurgical Balance

Product	**Weight**		**Assays, g/t, %**				**% Distribution**			
	Dry	**%**	**Au**		**S**		**Au**		**S**	
Ro Conc 1	46.7	4.7	56.4		30.9		91.9		69.1	
Ro Conc 2	25.3	2.5	6.87		23.4		6.1		28.3	
Ro Conc 3	12.8	1.3	0.67		1.31		0.3		0.8	
Ro Conc 4	12.6	1.3	0.47		0.77		0.2		0.5	
Ro Tail	898	90.2	0.05		0.03		1.6		1.3	
Head (calc.)	995	100	2.88		2.10		100		100	
(direct)			3.15		2.28					

Combined Products

Ro Conc 1	4.7	56.4		30.9		91.9		69.1	
Ro Conc 1-2	7.2	39.0		28.3		97.9		97.4	
Ro Conc 1-3	8.5	33.2		24.2		98.2		98.2	
Ro Conc	9.8	29.0		21.2		98.4		98.7	
Ro Tail	90.2	0.05		0.03		1.6		1.3	

Test ID: L1 **Project: 50174-001**
Sample ID: **Master Composite**
Purpose: To evaluate the leach kinetics of Au using cyanide, effect of grind.

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 1,007 g of Master Composite

Solution Volume: 1,500 mL

Pulp Density: 40 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 2 kg of Master Comp in rod mill B for 80 minutes and split — Target K_{80} = 40 µm; Actual K_{80} = 39 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 4.36 CaO: 1.06
Reagent Consumption (kg/t of cyanide feed) **NaCN: 2.11** **CaO: 0.51**

Time	Added, Grams				Residual		Consumed		pH	D.O$_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	Ca(OH)$_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	2.37								8.4	
0 - 4	2.37	1.44	2.25	1.07	0.35		1.90		10.7	0.36
4 - 24	2.00	0.00	1.90	0.00	2.06		0.20		12.0	1.85
24 - 48	0.25	0.00	0.24	0.00	2.27	0.55	0.03	0.51	11.7	7.81
Total	4.62	1.44	4.39	1.07	2.27	0.55	2.12	0.51		

Cyanidation Results:

Product	Amount g, mL	Assays, mg/L Au		% Distribution Au	
4 h Pregnant Solution	1,493	0.26		10.6	
24 h Pregnant Solution	1,493	2.32		94.8	
48 h Pregnant Solution	1,491	2.28		95.6	
Final Residue	1,006.7	0.16		4.4	
Head (calc.)	1,006.7	3.64		100.0	

Test ID: L2 **Project: 50174-001**
Sample ID: **Master Composite**
Purpose: To evaluate the leach kinetics of Au using cyanide, effect of grind.

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 1,002 g of Master Composite

Solution Volume: 1,500 mL

Pulp Density: 40 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 2 kg of Master Comp in rod mill B for 45 minutes and split — Target K_{80} = 110 µm; Actual K_{80} = 95 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 3.48 CaO: 0.95
Reagent Consumption (kg/t of cyanide feed) **NaCN: 1.28** **CaO: 0.49**

Time	Added, Grams				Residual		Consumed		pH	$D.O_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	2.37								8.3	
0 - 4	2.37	1.29	2.25	0.95	1.07		1.18		10.7	0.9
4 - 24	1.27	0.00	1.21	0.00	2.28		0.00		11.9	6.0
24 - 48	0.03	0.00	0.03	0.00	2.21	0.46	0.10	0.49	11.6	8.0
Total	3.67	1.29	3.48	0.95	2.21	0.46	1.28	0.49		

Cyanidation Results:

Product	**Amount g, mL**	**Assays, mg/L**		**% Distribution**	
		Au		**Au**	
4 h Pregnant Solution	1,498	1.18		45.6	
24 h Pregnant Solution	1,498	2.37		92.8	
48 h Pregnant Solution	1,498	2.32		93.3	
Final Residue	1,002.1	0.26		6.7	
Head (calc.)	1,002.1	3.87		100.0	

Test ID: L3 **Project: 50174-001**
Sample ID: **G2 Tails**
Purpose: To evaluate the effect of leaching Au using cyanide

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 897 g of Master Composite

Solution Volume: 1,500 mL

Pulp Density: 37 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 2 kg of G2 Tails in rod mill B for 15 minutes and split — Target K_{80} = 40 µm; Actual K_{80} = 40 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 2.92 CaO: 0.96
Reagent Consumption (kg/t of cyanide feed) **NaCN: 0.37** **CaO: 0.86**

Time	Added, Grams				Residual		Consumed		pH	$D.O_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	2.37								10.0	
0 - 4	2.37	1.17	2.25	0.86	2.13		0.12		10.5	5.6
4 - 24	0.27	0.00	0.25	0.00	2.28		0.10		11.0	5.5
24 - 48	0.12	0.00	0.11	0.00	2.28	0.10	0.11	0.77	10.8	4.8
Total	2.75	1.17	2.62	0.86	2.28	0.10	0.33	0.77		

Cyanidation Results:

Product	Amount g, mL	Assays, mg/L Au		% Distribution Au	
4 h Pregnant Solution	1,603	1.24		81.4	
24 h Pregnant Solution	1,603	1.39		93.2	
48 h Pregnant Solution	1,603	1.38		94.9	
Final Residue	896.7	0.14		5.1	
Head (calc.)	896.7	2.72		100.0	

G2/L3 **Project No:** 50174-001 **Operator**: kb/ks

Metallurgical Balance (Gravity - G2)

Grind	Product	Mass		Assay - g/t		Distribution - %	
P_{80} -µm		g	%	Au		Au	
117	Mozley conc	12.5	0.13	655.0		24.8	
	Final tails	9988	99.9	2.49		75.2	
	Calculated Head	10000	100.00	**3.31**		100	
	Direct Head			3.28			

Metallurgical Balance (Leach - L3)

Product	**Amount g, mL**	**Assay - g/t**		**% Distribution**	
		Au		**Au**	
4 h Pregnant Solution	1,603	1.24		81.4	
24 h Pregnant Solution	1,603	1.39		93.2	
48 h Pregnant Solution	1,603	1.38		94.9	
Final Residue	897	0.14		5.1	
Head (calc.)	897	2.72		100	

Metallurgical Balance (G2 and L3)

Product		**Weight (mg)**		**Assays, g/t, mg/L**		**% Distribution**	
		Au		**Au**		**Au**	
Combined Conc		**34.0**		**-**		**96.1**	
Mozley Conc		8.19		655.0		23.1	
48 hr PLS		25.82		1.38		72.9	
48 hr Leach Residue		1.398		0.14		3.9	
Calculated Head		35.40		3.54		100.0	
Direct Head				3.28			

Test ID: L4 **Project: 50174-001**
Sample ID: **Sample 100**
Purpose: To evaluate the effect of leaching Au using cyanide

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 493 g of Master Composite

Solution Volume: 750 mL

Pulp Density: 40 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 1 kg of Sample 100 in rod mill B for 40 minutes and split — Target K_{80} = 40 µm; Actual K_{80} = 40 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 2.82 CaO: 2.14
Reagent Consumption (kg/t of cyanide feed) **NaCN: 0.63** **CaO: 1.82**

Time	Added, Grams				Residual		Consumed		pH	$D.O_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	1.18								9.5	
0 - 4	1.18	1.43	1.13	1.06	1.01		0.12		11.7	2.8
4 - 24	0.14	0.00	0.13	0.00	1.01		0.13		11.4	4.7
24 - 48	0.14	0.00	0.13	0.00	1.08	0.16	0.06	0.90	11.4	5.4
Total	1.46	1.43	1.39	1.06	1.08	0.16	0.31	0.90		

Cyanidation Results:

Product	Amount g, mL	Assays, mg/L Au		% Distribution Au	
4 h Pregnant Solution	757	1.86		68.0	
24 h Pregnant Solution	757	2.54		96.5	
48 h Pregnant Solution	757	2.45		98.1	
Final Residue	493.3	0.08		1.9	
Head (calc.)	493.3	4.19		100.0	

Test ID: L5 **Project: 50174-001**
Sample ID: **Sample 200**
Purpose: To evaluate the effect of leaching Au using cyanide

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 494 g of Master Composite

Solution Volume: 750 mL

Pulp Density: 40 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 1 kg of Sample 200 in rod mill B for 36 minutes and split — Target K_{80} = 40 µm; Actual K_{80} = 34 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 2.81 CaO: 1.33
Reagent Consumption (kg/t of cyanide feed) **NaCN: 0.92** **CaO: 1.21**

Time	Added, Grams				Residual		Consumed		pH	$D.O_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	1.18								9.3	
0 - 4	1.18	0.40	1.13	0.30	1.11		0.01		10.6	2.8
4 - 24	0.03	0.00	0.03	0.00	0.90		0.24		10.6	5.4
24 - 48	0.25	0.49	0.24	0.36	0.93	0.06	0.20	0.60	10.5	5.2
Total	1.46	0.89	1.39	0.66	0.93	0.06	0.46	0.60		

Cyanidation Results:

Product	Amount g, mL	Assays, mg/L Au		% Distribution Au	
4 h Pregnant Solution	756	2.16		78.4	
24 h Pregnant Solution	756	2.55		96.8	
48 h Pregnant Solution	756	2.40		96.2	
Final Residue	493.8	0.16		3.8	
Head (calc.)	493.8	4.22		100.0	

Test ID: L6 **Project: 50174-001**
Sample ID: **Sample 300**
Purpose: To evaluate the effect of leaching Au using cyanide

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 495 g of Master Composite

Solution Volume: 750 mL

Pulp Density: 40 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 1 kg of Sample 300 in rod mill B for 39 minutes and split — Target K_{80} = 40 µm; Actual K_{80} = 46 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 3.10 CaO: 1.44
Reagent Consumption (kg/t of cyanide feed) **NaCN: 1.36** **CaO: 1.25**

Time	Added, Grams				Residual		Consumed		pH	$D.O_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	1.18								8.1	
0 - 4	1.18	0.30	1.13	0.22	1.11		0.01		10.9	1.1
4 - 24	0.03	0.00	0.03	0.00	0.75		0.38		10.5	5.6
24 - 48	0.40	0.66	0.38	0.49	0.86	0.09	0.27	0.62	11.3	6.9
Total	1.61	0.96	1.53	0.71	0.86	0.09	0.67	0.62		

Cyanidation Results:

Product	**Amount g, mL**	**Assays, mg/L**		**% Distribution**	
		Au		**Au**	
4 h Pregnant Solution	755	1.71		79.9	
24 h Pregnant Solution	755	1.95		95.4	
48 h Pregnant Solution	755	1.84		95.1	
Final Residue	495.1	0.16		4.9	
Head (calc.)	495.1	3.26		100.0	

Test ID: L7 **Project: 50174-001**
Sample ID: **Sample 400**
Purpose: To evaluate the effect of leaching Au using cyanide

Procedure: The ground feed sample was pulped to 40% solids. The pulp was brought to minimum pH of 10.5 with lime. Then, 1.5 g/L of cyanide was added and the pulp was re-agitated. NaCN, pH and DO were monitored over the duration of the test. Intermitent solution samples were removed for CN strength and Au assay. At 48h, the termination of the test, the pulp was filtered and the residue washed with fresh water. The final leach solution and the residue was submitted for Au analysis.

Feed: 494 g of Master Composite

Solution Volume: 750 mL

Pulp Density: 40 % solids
$Pb(NO_3)_2$ addition: 0 g/t
Sol'n Composition: 1.50 g/L of NaCN maintained

pH Range: >10.5 maintained with lime as required.

Grind: 1 kg of Sample 400 in rod mill B for 41 minutes and split — Target K_{80} = 40 µm; Actual K_{80} = 39 µm

Reagent Addition (kg/t of cyanide feed) NaCN: 2.38 CaO: 0.76
Reagent Consumption (kg/t of cyanide feed) **NaCN: 0.49** **CaO: 0.67**

Time	Added, Grams				Residual		Consumed		pH	$D.O_2$
	Actual		Equivalent		Grams		Grams			
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO		
To add 1 g/L	1.18								8.4	
0 - 4	1.18	0.30	1.13	0.22	1.11		0.01		10.7	5.2
4 - 24	0.03	0.00	0.03	0.00	1.11		0.03		10.6	5.6
24 - 48	0.03	0.21	0.03	0.15	0.93	0.05	0.21	0.33	10.9	7.0
Total	1.24	0.51	1.18	0.38	0.93	0.05	0.24	0.33		

Cyanidation Results:

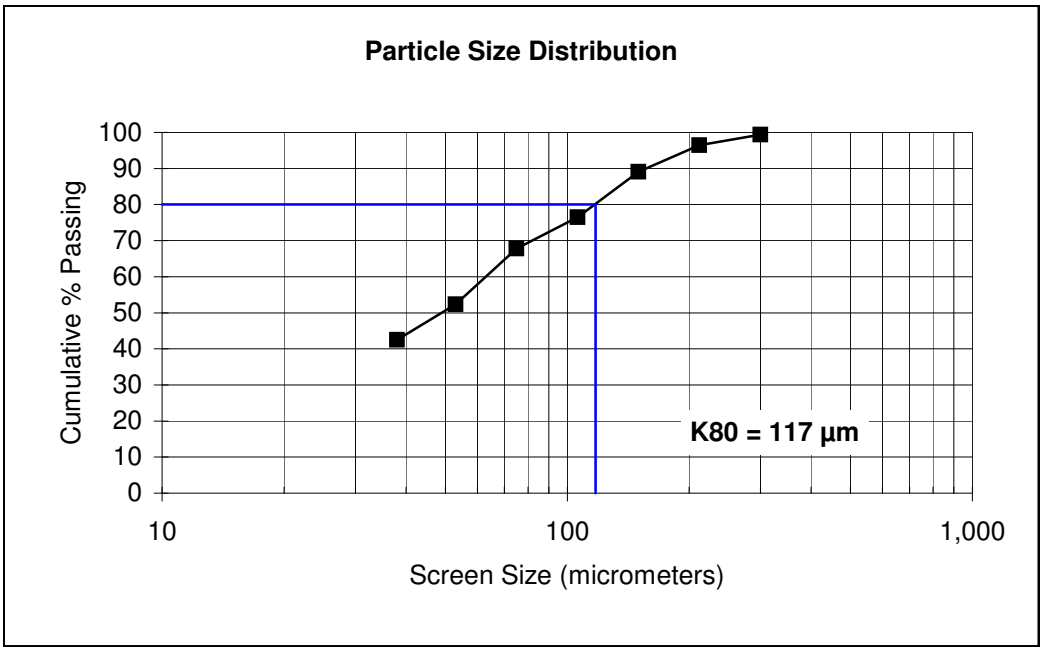
Product	Amount g, mL	Assays, mg/L Au		% Distribution Au	
4 h Pregnant Solution	756	1.93		87.5	
24 h Pregnant Solution	756	2.00		95.3	
48 h Pregnant Solution	756	1.92		96.4	
Final Residue	493.9	0.12		3.6	
Head (calc.)	493.9	3.38		100.0	

SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Knelson+Mozley Tails** Test No.: **G1**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	1.0	0.6	0.6	99.4
65	212	4.5	2.9	3.5	96.5
100	150	11.4	7.3	10.9	89.1
150	106	19.7	12.7	23.6	76.4
200	75	13.5	8.7	32.2	67.8
270	53	23.9	15.4	47.6	52.4
400	38	15.3	9.8	57.5	42.5
Pan	-38	66.1	42.5	100.0	0.0
Total	**-**	**155.4**	100.0	**-**	**-**
K80	**117**				

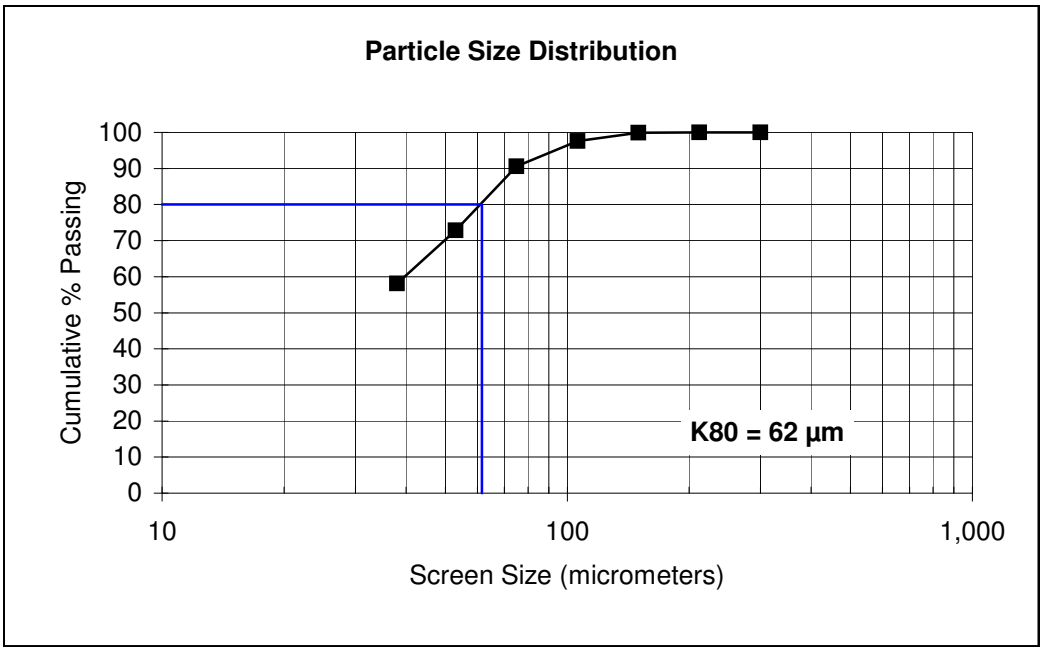


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Knelson+Mozley Tails** Test No.: **G2**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.0	0.0	0.0	100.0
100	150	0.1	0.1	0.1	99.9
150	106	3.8	2.4	2.4	97.6
200	75	11.2	6.9	9.4	90.6
270	53	28.7	17.8	27.2	72.8
400	38	23.7	14.7	41.9	58.1
Pan	-38	93.7	58.1	100.0	0.0
Total	**-**	**161.2**	100.0	**-**	**-**
K80	**62**				

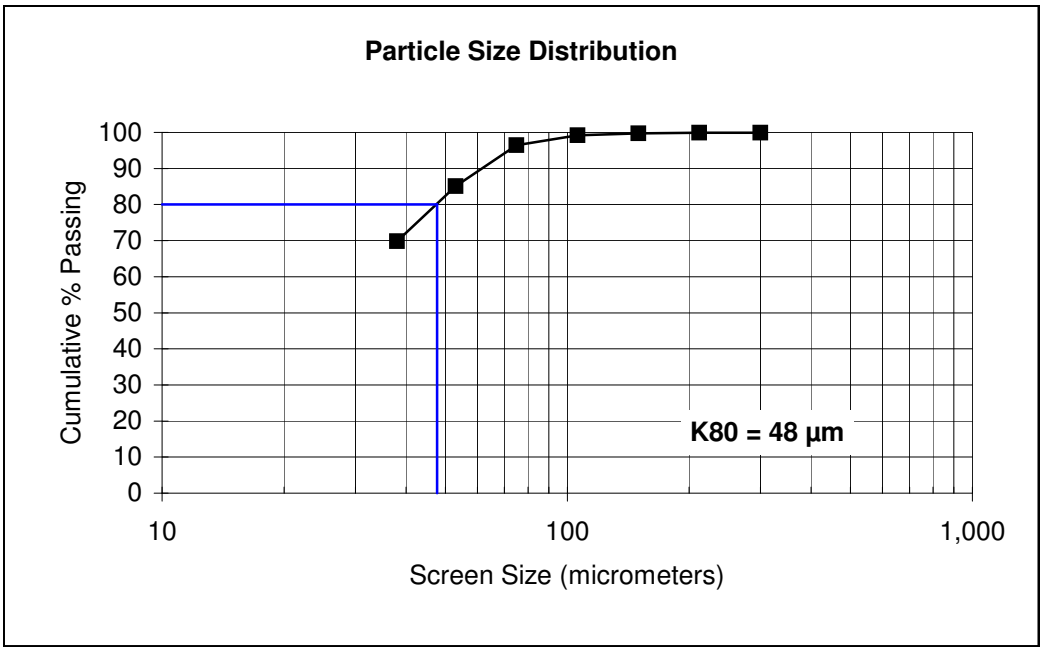


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Ro Tails** Test No.: **F1**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.1	0.1	0.1	99.9
65	212	0.1	0.1	0.1	99.9
100	150	0.2	0.1	0.2	99.8
150	106	0.9	0.5	0.8	99.2
200	75	4.6	2.8	3.5	96.5
270	53	19.0	11.4	14.9	85.1
400	38	25.5	15.3	30.2	69.8
Pan	-38	116.7	69.8	100.0	0.0
Total	**-**	**167.1**	100.0	**-**	**-**
K80	**48**				

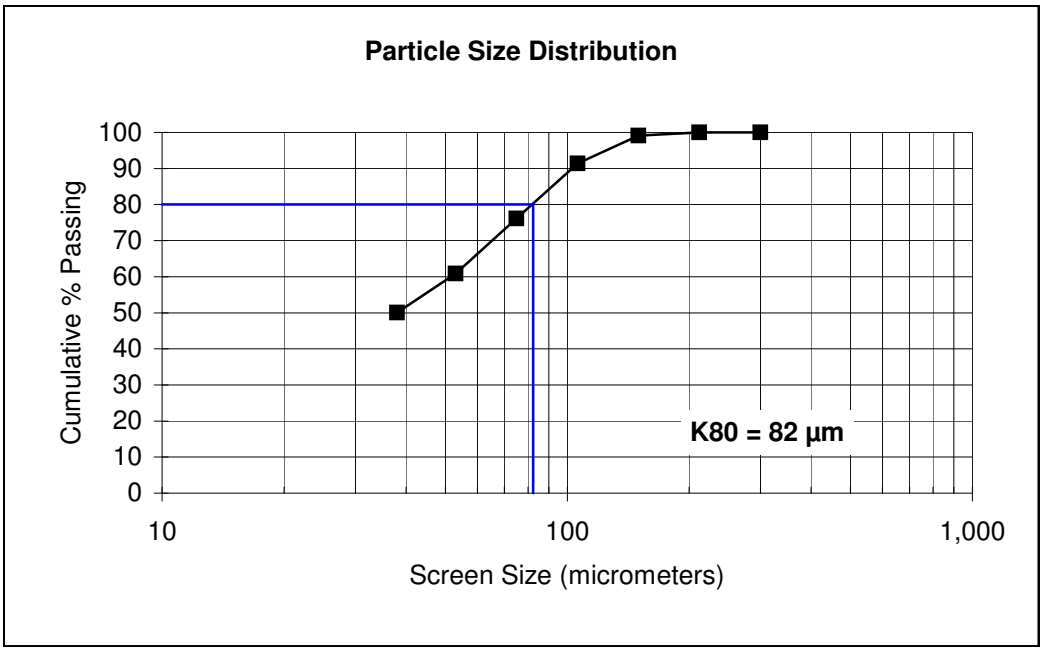


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Ro Tails** Test No.: **F2**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.0	0.0	0.0	100.0
100	150	1.5	0.9	0.9	99.1
150	106	12.6	7.7	8.6	91.4
200	75	24.8	15.2	23.8	76.2
270	53	24.9	15.3	39.1	60.9
400	38	17.7	10.8	49.9	50.1
Pan	-38	81.7	50.1	100.0	0.0
Total	**-**	**163.2**	100.0	**-**	**-**
K80	**82**				

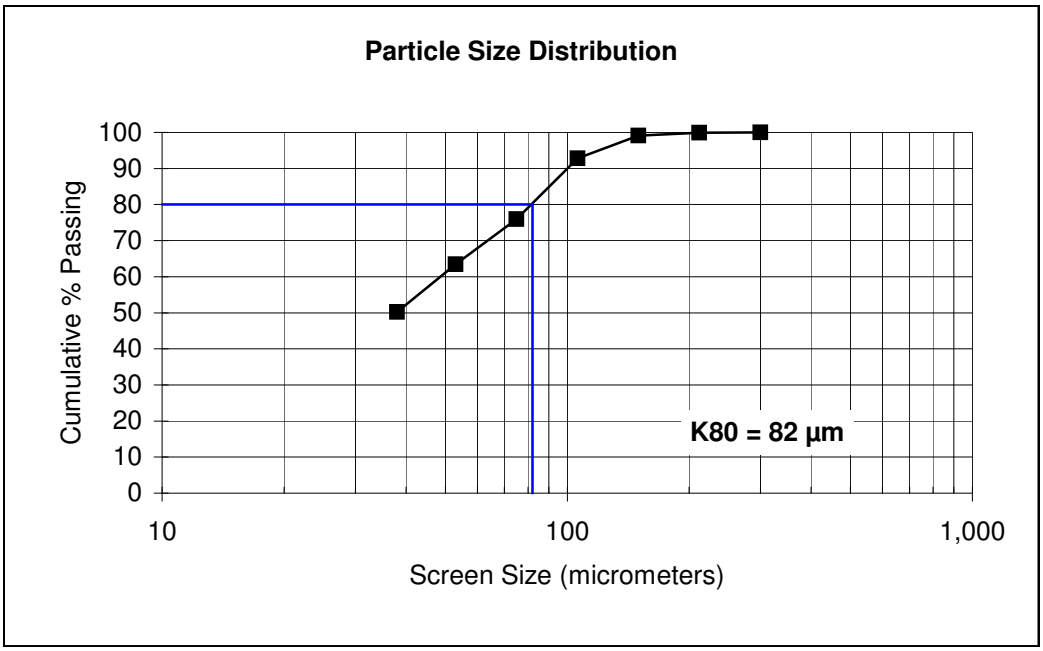


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

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

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.2	0.1	0.1	99.9
100	150	1.4	0.7	0.9	99.1
150	106	11.8	6.3	7.2	92.8
200	75	31.6	16.9	24.1	75.9
270	53	23.4	12.5	36.6	63.4
400	38	24.6	13.2	49.8	50.2
Pan	-38	93.9	50.2	100.0	0.0
Total	**-**	**186.9**	100.0	**-**	**-**
K80	**82**				

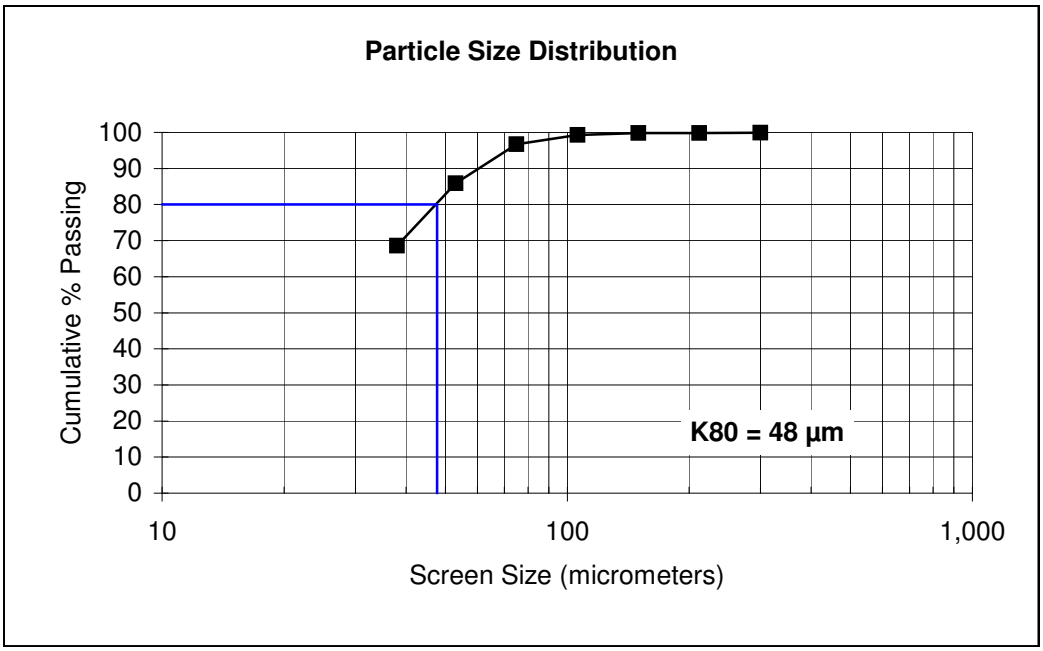


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

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

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.1	0.1	0.1	99.9
65	212	0.1	0.1	0.1	99.9
100	150	0.1	0.1	0.2	99.8
150	106	0.7	0.5	0.7	99.3
200	75	3.8	2.6	3.2	96.8
270	53	16.0	10.8	14.1	85.9
400	38	25.6	17.3	31.4	68.6
Pan	-38	101.4	68.6	100.0	0.0
Total	**-**	**147.8**	100.0	**-**	**-**
K80	**48**				



MASTERSIZER 2000

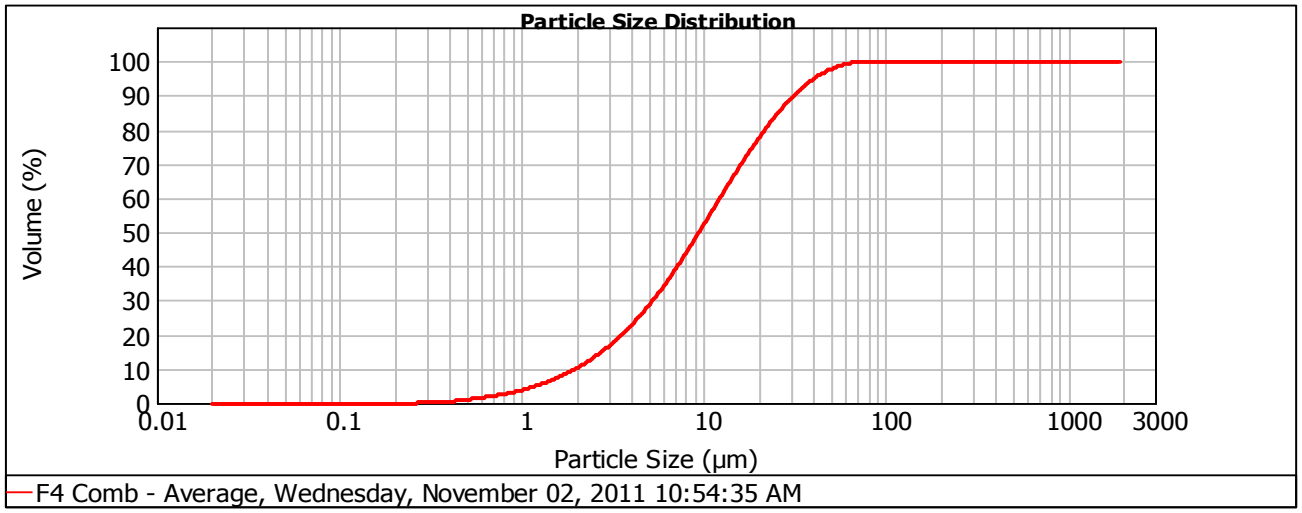
Result Analysis Report

Sample Name: F4 Comb - Average	**SOP Name:** 50174-001	**Measured:** 12000
Sample Source & type:	**Measured by:** Shengmei_Yang2	**Analysed:** Enhanced
Sample bulk lot ref:	**Result Source:** Averaged	

Particle Name: Cu (II) O	**Accessory Name:** Hydro 2000G (A)	**Analysis model:** General purpose	**Sensitivity:** Enhanced
Particle RI: 2.630	**Absorption:** 1	**Size range:** 0.020 to 2000.000 um	**Obscuration:** 12.72 %
Dispersant Name: Water	**Dispersant RI:** 1.330	**Weighted Residual:** 1.867 %	**Result Emulation:** Off

Concentration: 0.0072 %Vol	**Span :** 3.094	**Uniformity:** 0.951	**Result units:** Volume
Specific Surface Area: 1.34 m^2/g	**Surface Weighted Mean D[3,2]:** 4.471 um	**Vol. Weighted Mean D[4,3]:** 13.475 um	

d(0.1): 1.973 um **d(0.5):** 9.392 um **d (0.8) :** 21.516 um **d(0.9):** 31.035 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.020	0.00	0.144	0.00	1.043	0.79	7.530	4.23	54.372	0.75	392.608	0.00
0.022	0.00	0.162	0.00	1.171	0.91	8.458	4.35	61.077	0.47	441.026	0.00
0.025	0.00	0.182	0.00	1.316	1.04	9.502	4.42	68.609	0.16	495.415	0.00
0.028	0.00	0.205	0.00	1.478	1.18	10.673	4.43	77.071	0.05	556.512	0.00
0.032	0.00	0.230	0.00	1.660	1.34	11.990	4.39	86.575	0.00	625.143	0.00
0.036	0.00	0.258	0.04	1.865	1.50	13.468	4.30	97.252	0.00	702.238	0.00
0.040	0.00	0.290	0.09	2.095	1.68	15.129	4.17	109.246	0.00	788.841	0.00
0.045	0.00	0.326	0.15	2.354	1.87	16.995	3.98	122.718	0.00	886.124	0.00
0.051	0.00	0.366	0.20	2.644	2.07	19.091	3.77	137.852	0.00	995.405	0.00
0.057	0.00	0.411	0.25	2.970	2.29	21.445	3.51	154.853	0.00	1118.162	0.00
0.064	0.00	0.462	0.30	3.336	2.53	24.090	3.22	173.950	0.00	1256.058	0.00
0.072	0.00	0.519	0.35	3.748	2.78	27.061	2.90	195.402	0.00	1410.960	0.00
0.081	0.00	0.583	0.40	4.210	3.05	30.398	2.55	219.500	0.00	1584.966	0.00
0.091	0.00	0.655	0.46	4.729	3.32	34.147	2.18	246.569	0.00	1780.430	0.00
0.102	0.00	0.736	0.52	5.312	3.59	38.358	1.81	276.977	0.00	2000.000	
0.114	0.00	0.826	0.60	5.967	3.83	43.089	1.44	311.135	0.00		
0.129	0.00	0.928	0.69	6.703	4.05	48.403	1.08	349.506	0.00		
0.144		1.043		7.530		54.372		392.608			

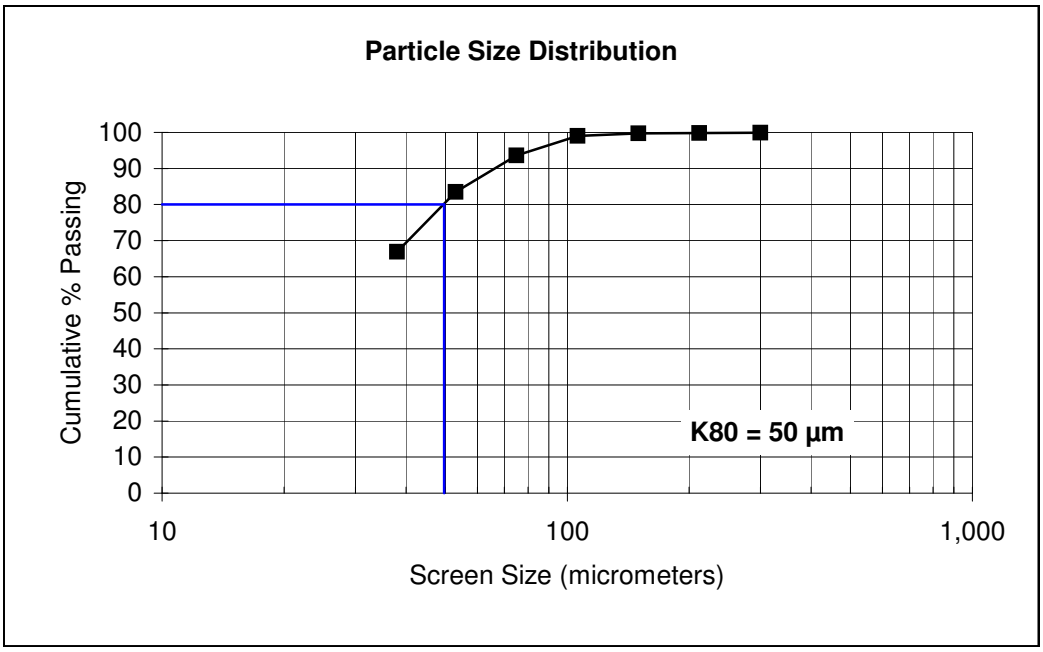
Operator notes:

SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Ro Tails** Test No.: **F5**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.1	0.1	0.1	99.9
65	212	0.1	0.1	0.1	99.9
100	150	0.2	0.1	0.3	99.7
150	106	1.1	0.7	1.0	99.0
200	75	7.9	5.3	6.3	93.7
270	53	15.0	10.1	16.5	83.5
400	38	24.6	16.6	33.1	66.9
Pan	-38	99.1	66.9	100.0	0.0
Total	**-**	**148.1**	100.0	**-**	**-**
K80	**50**				

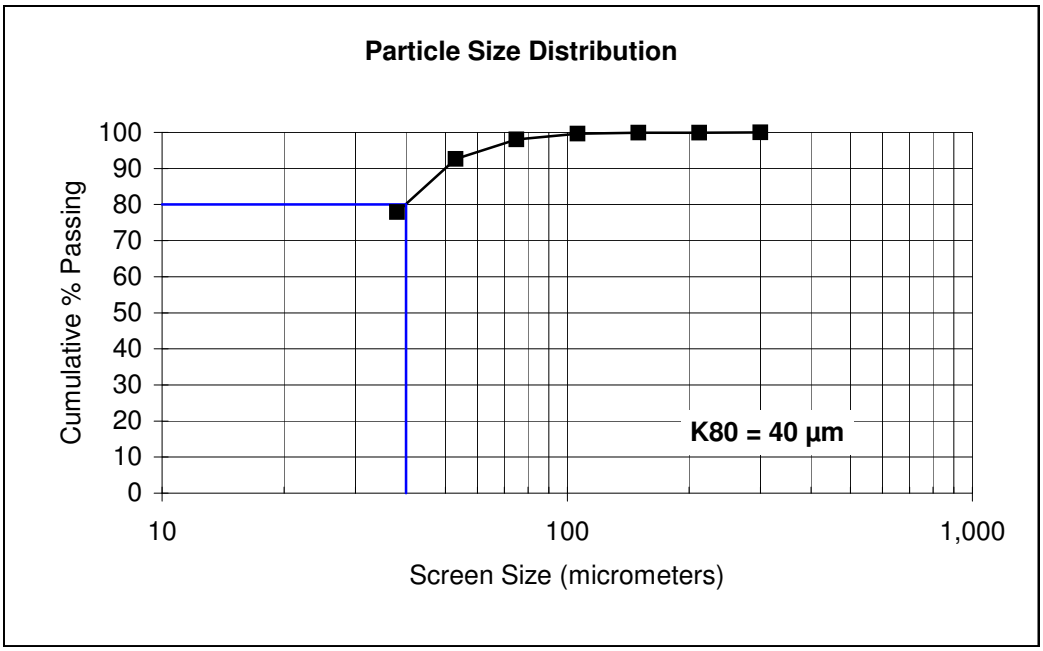


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Ro Tails** Test No.: **F6**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.1	0.1	0.1	99.9
100	150	0.1	0.1	0.1	99.9
150	106	0.3	0.2	0.3	99.7
200	75	2.6	1.7	2.0	98.0
270	53	8.5	5.4	7.4	92.6
400	38	23.2	14.7	22.1	77.9
Pan	-38	122.5	77.9	100.0	0.0
Total	**-**	**157.3**	100.0	**-**	**-**
K80	**40**				



MASTERSIZER 2000

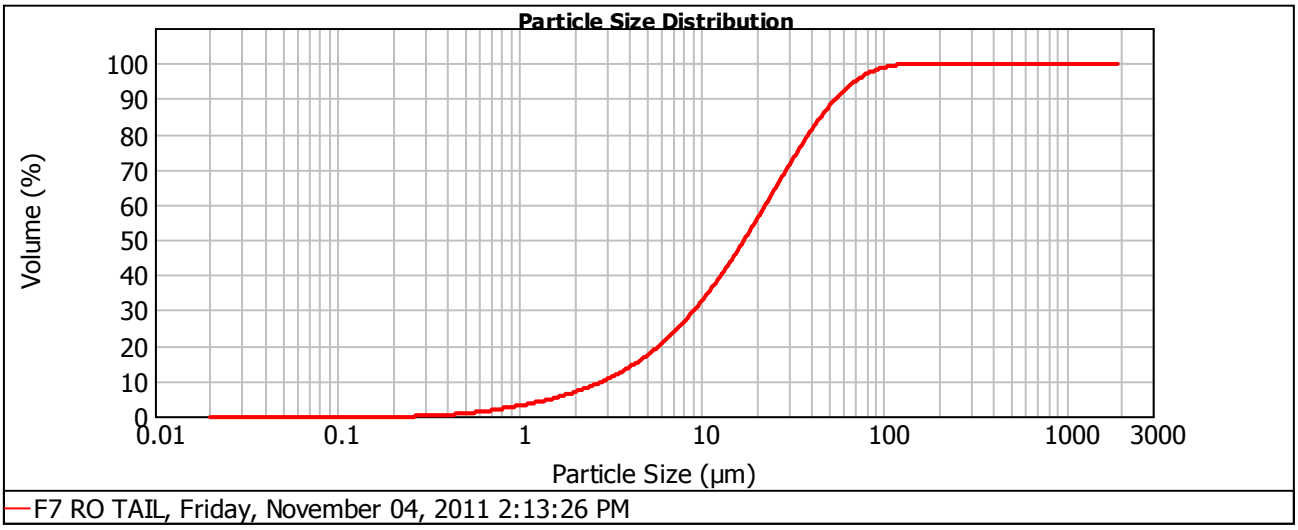
Result Analysis Report

Sample Name: F7 RO TAIL
SOP Name: 50174-001
Measured: 12000
Sample Source & type:
Measured by: max_ahn
Analysed: Enhanced
Sample bulk lot ref:
Result Source: Averaged

Particle Name: Cu (II) O
Accessory Name: Hydro 2000G (A)
Analysis model: General purpose
Sensitivity: Enhanced
Particle RI: 2.630
Absorption: 1
Size range: 0.020 to 2000.000 um
Obscuration: 12.79 %
Dispersant Name: Water
Dispersant RI: 1.330
Weighted Residual: 0.811 %
Result Emulation: Off

Concentration: 0.0102 %Vol
Span : 3.002
Uniformity: 0.939
Result units: Volume
Specific Surface Area: 0.959 m²/g
Surface Weighted Mean D[3,2]: 6.260 um
Vol. Weighted Mean D[4,3]: 23.888 um

d(0.1): 2.882 um **d(0.5):** 17.112 um **d (0.8) :** 38.577 um **d(0.9):** 54.251 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.020	0.00	0.144	0.00	1.043	0.52	7.530	2.84	54.372	2.60	392.608	0.00
0.022	0.00	0.162	0.00	1.171	0.57	8.458	3.06	61.077	2.15	441.026	0.00
0.025	0.00	0.182	0.00	1.316	0.63	9.502	3.29	68.609	1.70	495.415	0.00
0.028	0.00	0.205	0.00	1.478	0.70	10.673	3.50	77.071	1.28	556.512	0.00
0.032	0.00	0.230	0.00	1.660	0.78	11.990	3.71	86.575	0.92	625.143	0.00
0.036	0.00	0.258	0.03	1.865	0.86	13.468	3.90	97.252	0.61	702.238	0.00
0.040	0.00	0.290	0.07	2.095	0.95	15.129	4.07	109.246	0.38	788.841	0.00
0.045	0.00	0.326	0.13	2.354	1.04	16.995	4.22	122.718	0.19	886.124	0.00
0.051	0.00	0.366	0.17	2.644	1.15	19.091	4.33	137.852	0.10	995.405	0.00
0.057	0.00	0.411	0.21	2.970	1.27	21.445	4.41	154.853	0.02	1118.162	0.00
0.064	0.00	0.462	0.25	3.336	1.41	24.090	4.42	173.950	0.00	1256.058	0.00
0.072	0.00	0.519	0.29	3.748	1.57	27.061	4.37	195.402	0.00	1410.960	0.00
0.081	0.00	0.583	0.32	4.210	1.75	30.398	4.25	219.500	0.00	1584.966	0.00
0.091	0.00	0.655	0.35	4.729	1.94	34.147	4.05	246.569	0.00	1780.430	0.00
0.102	0.00	0.736	0.39	5.312	2.16	38.358	3.78	276.977	0.00	2000.000	
0.114	0.00	0.826	0.43	5.967	2.38	43.089	3.43	311.135	0.00		
0.129	0.00	0.928	0.47	6.703	2.61	48.403	3.04	349.506	0.00		
0.144		1.043		7.530		54.372		392.608			

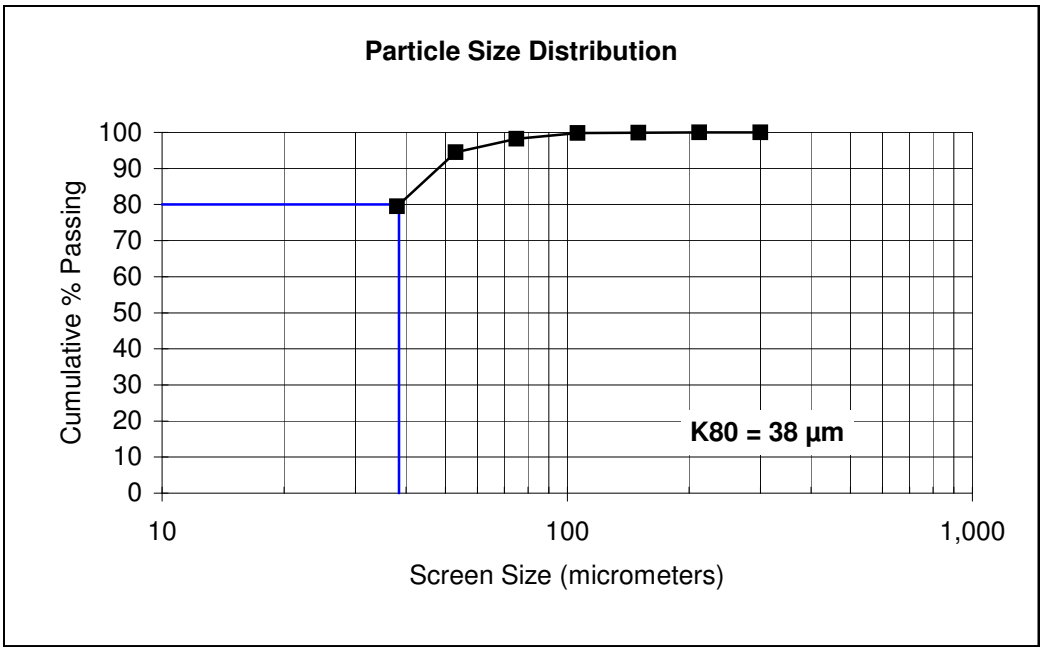
Operator notes: *Average of 3 measurements from 50174-001*

SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Ro Tails** Test No.: **F8**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.0	0.0	0.0	100.0
100	150	0.1	0.1	0.1	99.9
150	106	0.2	0.1	0.2	99.8
200	75	2.5	1.6	1.8	98.2
270	53	5.7	3.7	5.5	94.5
400	38	23.1	15.0	20.5	79.5
Pan	-38	122.8	79.5	100.0	0.0
Total	**-**	**154.4**	100.0	**-**	**-**
K80	**38**				

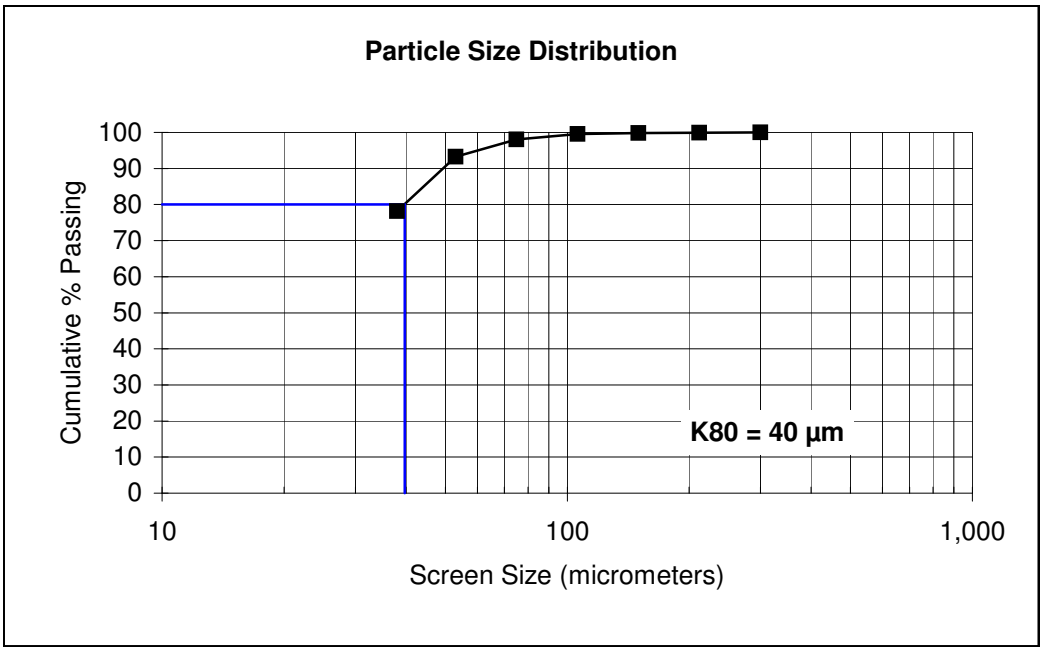


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **Knelson+Mozley Tails** Test No.: **F9**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.1	0.1	0.1	99.9
100	150	0.2	0.1	0.2	99.8
150	106	0.3	0.2	0.4	99.6
200	75	2.3	1.6	2.0	98.0
270	53	7.1	4.8	6.8	93.2
400	38	22.3	15.1	21.9	78.1
Pan	-38	115.4	78.1	100.0	0.0
Total	**-**	**147.7**	100.0	**-**	**-**
K80	**40**				

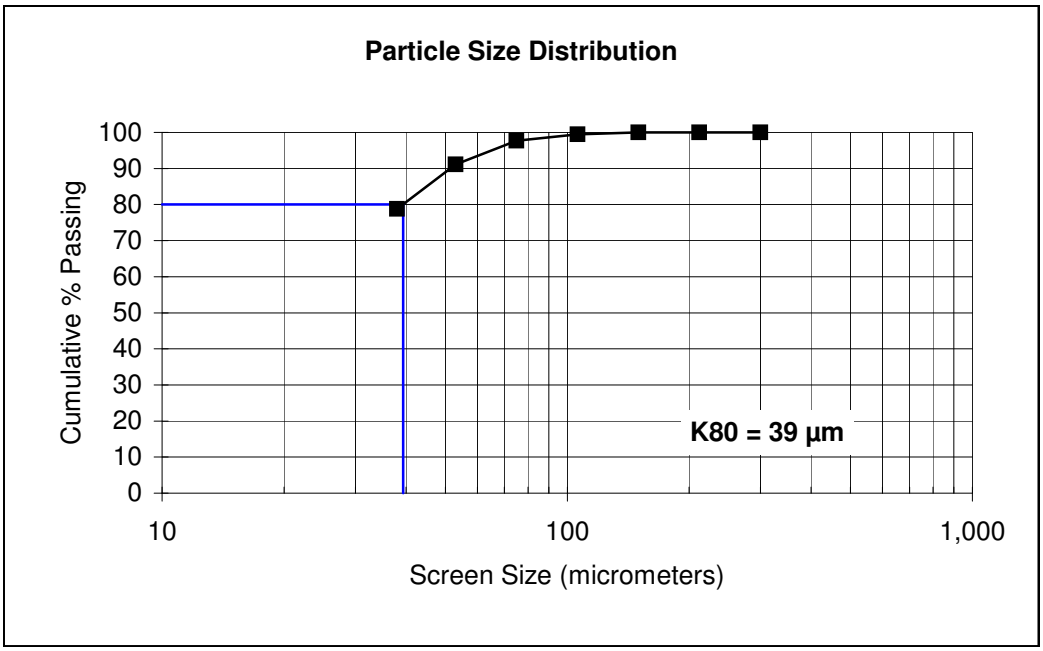


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **48 hr Residue** Test No.: **L1**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	0.0	0.0	0.0	100.0
100	150	0.0	0.0	0.0	100.0
150	106	0.9	0.5	0.5	99.5
200	75	3.0	1.8	2.3	97.7
270	53	11.0	6.5	8.8	91.2
400	38	20.9	12.4	21.2	78.8
Pan	-38	132.9	78.8	100.0	0.0
Total	**-**	**168.7**	100.0	**-**	**-**
K80	**39**				

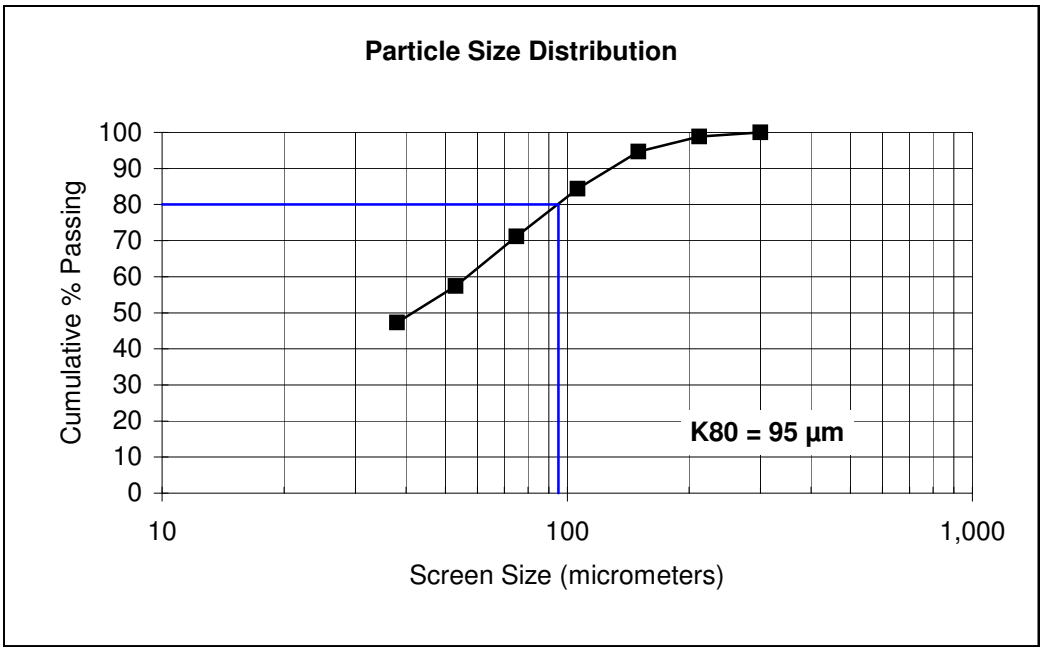


SGS Minerals Services
Size Distribution Analysis

Project No.
50174-001

Sample: **48 hr Residue** Test No.: **L2**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	1.8	1.1	1.1	98.9
100	150	6.8	4.2	5.3	94.7
150	106	16.7	10.3	15.6	84.4
200	75	21.5	13.3	28.9	71.1
270	53	22.2	13.7	42.6	57.4
400	38	16.5	10.2	52.7	47.3
Pan	-38	76.6	47.3	100.0	0.0
Total	**-**	**162.1**	100.0	**-**	**-**
K80	**95**				



MASTERSIZER 2000

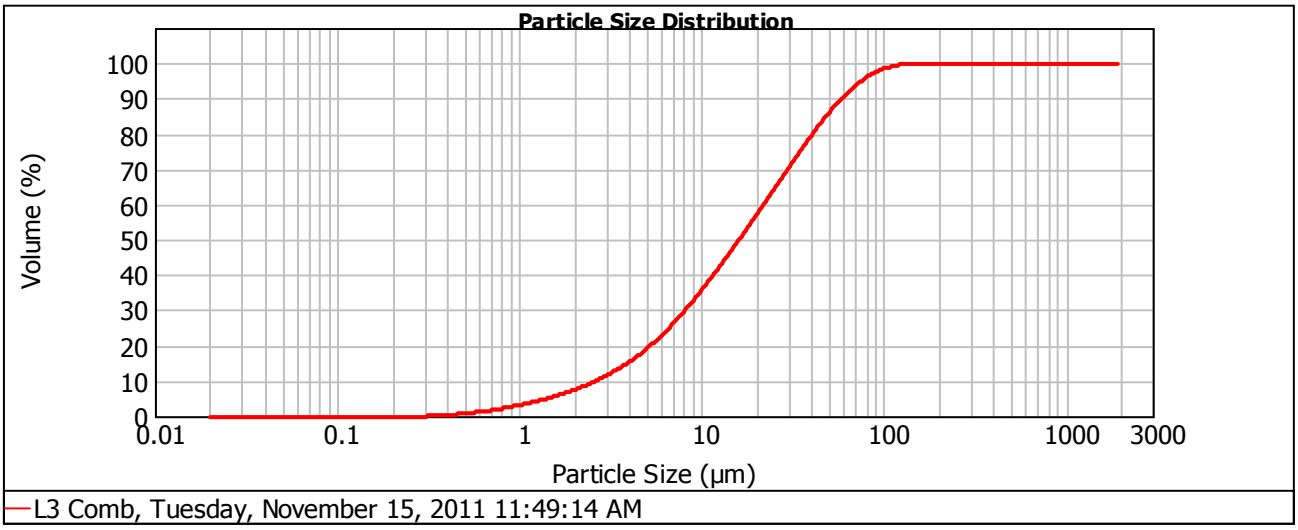
Result Analysis Report

Sample Name: L3 Comb
SOP Name: 50174-001
Measured: 12000
Sample Source & type:
Measured by: shengmei_yang2
Analysed: Enhanced
Sample bulk lot ref:
Result Source: Averaged

Particle Name: Cu (II) O
Accessory Name: Hydro 2000G (A)
Analysis model: General purpose
Sensitivity: Enhanced
Particle RI: 2.630
Absorption: 1
Size range: 0.020 to 2000.000 um
Obscuration: 11.64 %
Dispersant Name: Water
Dispersant RI: 1.330
Weighted Residual: 0.357 %
Result Emulation: Off

Concentration: 0.0088 %Vol
Span : 3.474
Uniformity: 1.08
Result units: Volume
Specific Surface Area: 1.01 m²/g
Surface Weighted Mean D[3,2]: 5.959 um
Vol. Weighted Mean D[4,3]: 24.270 um

d(0.1): 2.613 um **d(0.5):** 15.980 um **d (0.8) :** 40.429 um **d(0.9):** 58.127 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.020	0.00	0.144	0.00	1.043	0.58	7.530	3.02	54.372	2.76	392.608	0.00
0.022	0.00	0.162	0.00	1.171	0.65	8.458	3.18	61.077	2.39	441.026	0.00
0.025	0.00	0.182	0.00	1.316	0.72	9.502	3.33	68.609	1.99	495.415	0.00
0.028	0.00	0.205	0.00	1.478	0.80	10.673	3.44	77.071	1.58	556.512	0.00
0.032	0.00	0.230	0.00	1.660	0.88	11.990	3.53	86.575	1.19	625.143	0.00
0.036	0.00	0.258	0.00	1.865	0.97	13.468	3.61	97.252	0.82	702.238	0.00
0.040	0.00	0.290	0.04	2.095	1.07	15.129	3.67	109.246	0.53	788.841	0.00
0.045	0.00	0.326	0.12	2.354	1.17	16.995	3.72	122.718	0.25	886.124	0.00
0.051	0.00	0.366	0.17	2.644	1.29	19.091	3.77	137.852	0.11	995.405	0.00
0.057	0.00	0.411	0.22	2.970	1.43	21.445	3.80	154.853	0.00	1118.162	0.00
0.064	0.00	0.462	0.26	3.336	1.59	24.090	3.83	173.950	0.00	1256.058	0.00
0.072	0.00	0.519	0.31	3.748	1.77	27.061	3.82	195.402	0.00	1410.960	0.00
0.081	0.00	0.583	0.35	4.210	1.96	30.398	3.78	219.500	0.00	1584.966	0.00
0.091	0.00	0.655	0.39	4.729	2.17	34.147	3.70	246.569	0.00	1780.430	0.00
0.102	0.00	0.736	0.43	5.312	2.40	38.358	3.56	276.977	0.00	2000.000	
0.114	0.00	0.826	0.47	5.967	2.61	43.089	3.35	311.135	0.00		
0.129	0.00	0.928	0.53	6.703	2.83	48.403	3.09	349.506	0.00		
0.144		1.043		7.530		54.372		392.608			

Operator notes:

MASTERSIZER 2000

Result Analysis Report

Sample Name:
L4 - Average

SOP Name:
50174-001

Measured:
12000

Sample Source & type:

Measured by:
Yonika_Wiputri

Analysed:
Enhanced

Sample bulk lot ref:

Result Source:
Averaged

Particle Name:
Cu (II) O

Accessory Name:
Hydro 2000G (A)

Analysis model:
General purpose

Sensitivity:
Enhanced

Particle RI:
2.630

Absorption:
1

Size range:
0.020 to 2000.000 um

Obscuration:
11.10 %

Dispersant Name:
Water

Dispersant RI:
1.330

Weighted Residual:
0.242 %

Result Emulation:
Off

Concentration:
0.0079 %Vol

Span :
3.318

Uniformity:
1.06

Result units:
Volume

Specific Surface Area:
1.07 m²/g

Surface Weighted Mean D[3,2]:
5.607 um

Vol. Weighted Mean D[4,3]:
21.129 um

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d(0.1): 2.494 um **d(0.5):** 13.926 um **d (0.8) :** 34.011 um **d(0.9):** 48.703 um

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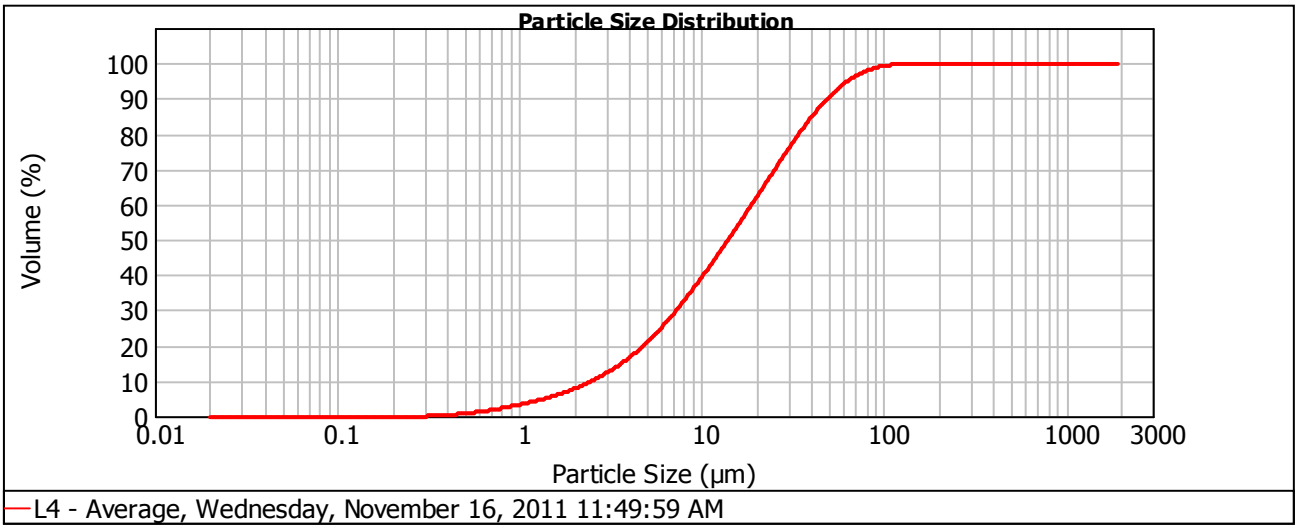


Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	3.43	7.530	31.05	54.372	92.40	392.608	99.96
0.022	0.00	0.162	0.00	1.171	4.04	8.458	34.37	61.077	94.52	441.026	99.97
0.025	0.00	0.182	0.00	1.316	4.72	9.502	37.85	68.609	96.24	495.415	99.98
0.028	0.00	0.205	0.00	1.478	5.47	10.673	41.44	77.071	97.55	556.512	99.99
0.032	0.00	0.230	0.00	1.660	6.30	11.990	45.13	86.575	98.51	625.143	100.00
0.036	0.00	0.258	0.00	1.865	7.22	13.468	48.90	97.252	99.16	702.238	100.00
0.040	0.00	0.290	0.00	2.095	8.24	15.129	52.74	109.246	99.55	788.841	100.00
0.045	0.00	0.326	0.04	2.354	9.38	16.995	56.63	122.718	99.77	886.124	100.00
0.051	0.00	0.366	0.16	2.644	10.66	19.091	60.57	137.852	99.84	995.405	100.00
0.057	0.00	0.411	0.34	2.970	12.09	21.445	64.55	154.853	99.85	1118.162	100.00
0.064	0.00	0.462	0.56	3.336	13.69	24.090	68.53	173.950	99.86	1256.058	100.00
0.072	0.00	0.519	0.84	3.748	15.49	27.061	72.49	195.402	99.87	1410.960	100.00
0.081	0.00	0.583	1.16	4.210	17.51	30.398	76.38	219.500	99.88	1584.966	100.00
0.091	0.00	0.655	1.52	4.729	19.76	34.147	80.13	246.569	99.89	1780.430	100.00
0.102	0.00	0.736	1.93	5.312	22.24	38.358	83.67	276.977	99.91	2000.000	100.00
0.114	0.00	0.826	2.38	5.967	24.96	43.089	86.93	311.135	99.93		
0.129	0.00	0.928	2.88	6.703	27.90	48.403	89.85	349.506	99.94		

Operator notes:

MASTERSIZER 2000

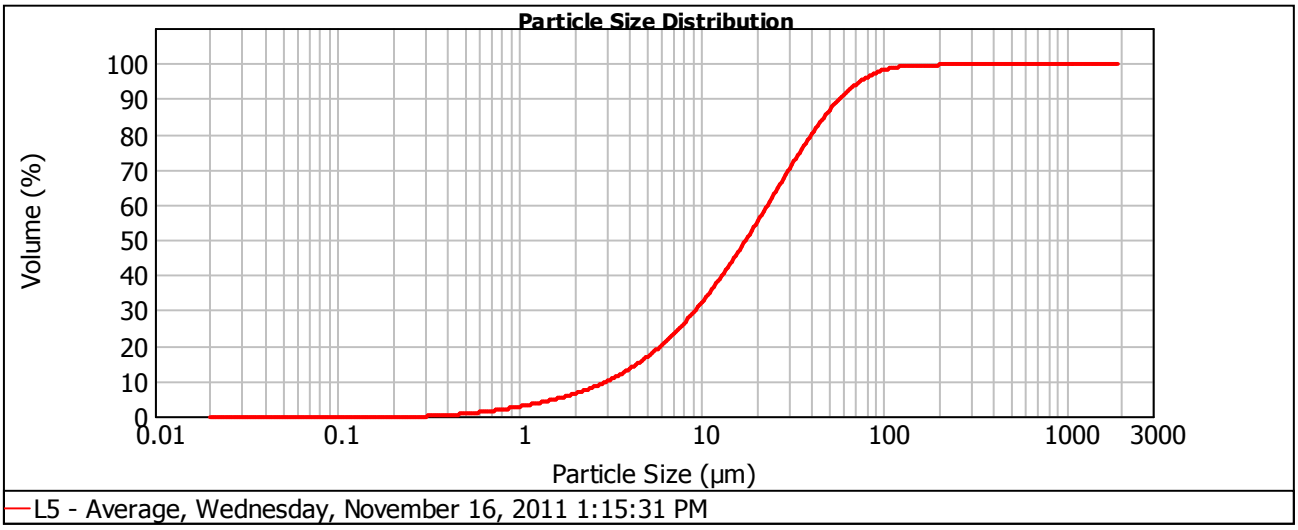
Result Analysis Report

Sample Name: L5 - Average
SOP Name: 50174-001
Measured: 12000
Sample Source & type:
Measured by: Yonika_Wiputri
Analysed: Enhanced
Sample bulk lot ref:
Result Source: Averaged

Particle Name: Cu (II) O
Accessory Name: Hydro 2000G (A)
Analysis model: General purpose
Sensitivity: Enhanced
Particle RI: 2.630
Absorption: 1
Size range: 0.020 to 2000.000 um
Obscuration: 13.27 %
Dispersant Name: Water
Dispersant RI: 1.330
Weighted Residual: 0.323 %
Result Emulation: Off

Concentration: 0.0112 %Vol
Span : 3.092
Uniformity: 1.03
Result units: Volume
Specific Surface Area: 0.914 m²/g
Surface Weighted Mean D[3,2]: 6.562 um
Vol. Weighted Mean D[4,3]: 25.907 um

d(0.1): 3.040 um **d(0.5):** 17.483 um **d (0.8) :** 40.120 um **d(0.9):** 57.094 um



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	2.85	7.530	24.98	54.372	88.82	392.608	99.92
0.022	0.00	0.162	0.00	1.171	3.33	8.458	27.81	61.077	91.50	441.026	99.96
0.025	0.00	0.182	0.00	1.316	3.86	9.502	30.85	68.609	93.74	495.415	100.00
0.028	0.00	0.205	0.00	1.478	4.46	10.673	34.11	77.071	95.55	556.512	100.00
0.032	0.00	0.230	0.00	1.660	5.12	11.990	37.56	86.575	96.94	625.143	100.00
0.036	0.00	0.258	0.00	1.865	5.86	13.468	41.20	97.252	97.96	702.238	100.00
0.040	0.00	0.290	0.00	2.095	6.68	15.129	45.03	109.246	98.66	788.841	100.00
0.045	0.00	0.326	0.04	2.354	7.60	16.995	49.01	122.718	99.10	886.124	100.00
0.051	0.00	0.366	0.16	2.644	8.62	19.091	53.13	137.852	99.34	995.405	100.00
0.057	0.00	0.411	0.32	2.970	9.76	21.445	57.36	154.853	99.45	1118.162	100.00
0.064	0.00	0.462	0.52	3.336	11.03	24.090	61.67	173.950	99.50	1256.058	100.00
0.072	0.00	0.519	0.75	3.748	12.45	27.061	66.00	195.402	99.54	1410.960	100.00
0.081	0.00	0.583	1.02	4.210	14.04	30.398	70.30	219.500	99.60	1584.966	100.00
0.091	0.00	0.655	1.32	4.729	15.81	34.147	74.49	246.569	99.66	1780.430	100.00
0.102	0.00	0.736	1.65	5.312	17.78	38.358	78.51	276.977	99.73	2000.000	100.00
0.114	0.00	0.826	2.01	5.967	19.97	43.089	82.28	311.135	99.79		
0.129	0.00	0.928	2.41	6.703	22.36	48.403	85.74	349.506	99.86		

Operator notes:

MASTERSIZER 2000

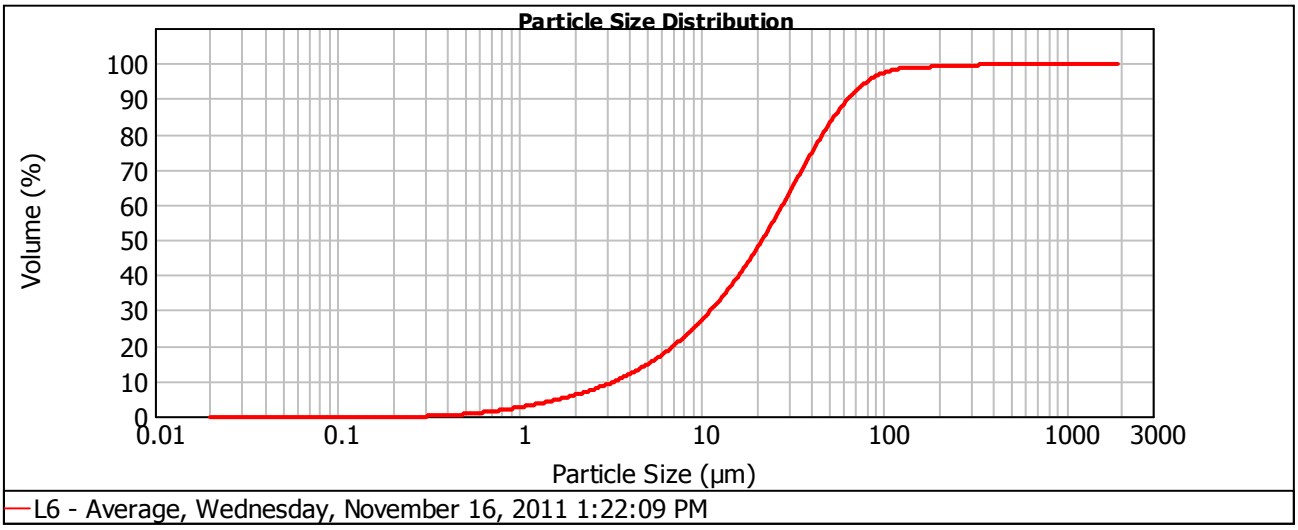
Result Analysis Report

Sample Name: L6 - Average
SOP Name: 50174-001
Measured: 12000
Sample Source & type:
Measured by: Yonika_Wiputri
Analysed: Enhanced
Sample bulk lot ref:
Result Source: Averaged

Particle Name: Cu (II) O
Accessory Name: Hydro 2000G (A)
Analysis model: General purpose
Sensitivity: Enhanced
Particle RI: 2.630
Absorption: 1
Size range: 0.020 to 2000.000 um
Obscuration: 10.45 %
Dispersant Name: Water
Dispersant RI: 1.330
Weighted Residual: 0.265 %
Result Emulation: Off

Concentration: 0.0096 %Vol
Span : 2.800
Uniformity: 0.988
Result units: Volume
Specific Surface Area: 0.827 m²/g
Surface Weighted Mean D[3,2]: 7.257 um
Vol. Weighted Mean D[4,3]: 30.821 um

d(0.1): 3.359 um **d(0.5):** 21.468 um **d (0.8) :** 46.000 um **d(0.9):** 63.469 um



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	2.67	7.530	21.33	54.372	85.64	392.608	99.73
0.022	0.00	0.162	0.00	1.171	3.14	8.458	23.64	61.077	89.00	441.026	99.83
0.025	0.00	0.182	0.00	1.316	3.65	9.502	26.15	68.609	91.84	495.415	99.90
0.028	0.00	0.205	0.00	1.478	4.22	10.673	28.86	77.071	94.13	556.512	99.96
0.032	0.00	0.230	0.00	1.660	4.83	11.990	31.77	86.575	95.89	625.143	99.99
0.036	0.00	0.258	0.00	1.865	5.51	13.468	34.91	97.252	97.16	702.238	100.00
0.040	0.00	0.290	0.00	2.095	6.24	15.129	38.29	109.246	98.01	788.841	100.00
0.045	0.00	0.326	0.03	2.354	7.04	16.995	41.92	122.718	98.53	886.124	100.00
0.051	0.00	0.366	0.12	2.644	7.91	19.091	45.81	137.852	98.79	995.405	100.00
0.057	0.00	0.411	0.26	2.970	8.88	21.445	49.96	154.853	98.91	1118.162	100.00
0.064	0.00	0.462	0.44	3.336	9.94	24.090	54.34	173.950	98.97	1256.058	100.00
0.072	0.00	0.519	0.65	3.748	11.11	27.061	58.92	195.402	99.05	1410.960	100.00
0.081	0.00	0.583	0.90	4.210	12.41	30.398	63.63	219.500	99.14	1584.966	100.00
0.091	0.00	0.655	1.18	4.729	13.86	34.147	68.38	246.569	99.24	1780.430	100.00
0.102	0.00	0.736	1.50	5.312	15.47	38.358	73.07	276.977	99.36	2000.000	100.00
0.114	0.00	0.826	1.85	5.967	17.24	43.089	77.58	311.135	99.49		
0.129	0.00	0.928	2.24	6.703	19.19	48.403	81.81	349.506	99.61		

Operator notes:

MASTERSIZER 2000

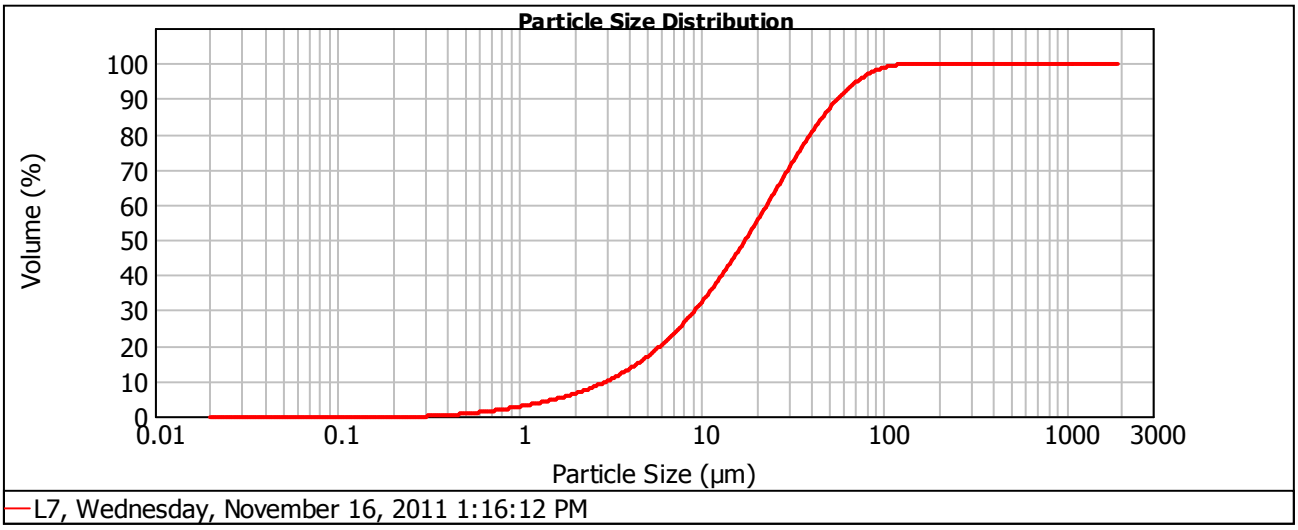
Result Analysis Report

Sample Name: L7
SOP Name: 50174-001
Measured: 12000
Sample Source & type:
Measured by: Yonika_Wiputri
Analysed: Enhanced
Sample bulk lot ref:
Result Source: Edited

Particle Name: Cu (II) O
Accessory Name: Hydro 2000G (A)
Analysis model: General purpose
Sensitivity: Enhanced
Particle RI: 2.630
Absorption: 1
Size range: 0.020 to 2000.000 um
Obscuration: 13.25 %
Dispersant Name: Water
Dispersant RI: 1.330
Weighted Residual: 0.314 %
Result Emulation: Off

Concentration: 0.0111 %Vol
Span : 3.033
Uniformity: 0.947
Result units: Volume
Specific Surface Area: 0.919 m²/g
Surface Weighted Mean D[3,2]: 6.532 um
Vol. Weighted Mean D[4,3]: 24.374 um

d(0.1): 3.028 um **d(0.5):** 17.356 um **d (0.8) :** 39.492 um **d(0.9):** 55.671 um



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.144	0.00	1.043	2.86	7.530	25.07	54.372	89.42	392.608	100.00
0.022	0.00	0.162	0.00	1.171	3.34	8.458	27.92	61.077	92.11	441.026	100.00
0.025	0.00	0.182	0.00	1.316	3.88	9.502	30.98	68.609	94.36	495.415	100.00
0.028	0.00	0.205	0.00	1.478	4.48	10.673	34.25	77.071	96.17	556.512	100.00
0.032	0.00	0.230	0.00	1.660	5.14	11.990	37.73	86.575	97.56	625.143	100.00
0.036	0.00	0.258	0.00	1.865	5.88	13.468	41.40	97.252	98.58	702.238	100.00
0.040	0.00	0.290	0.00	2.095	6.71	15.129	45.25	109.246	99.27	788.841	100.00
0.045	0.00	0.326	0.04	2.354	7.63	16.995	49.26	122.718	99.70	886.124	100.00
0.051	0.00	0.366	0.16	2.644	8.65	19.091	53.42	137.852	99.91	995.405	100.00
0.057	0.00	0.411	0.32	2.970	9.80	21.445	57.69	154.853	100.00	1118.162	100.00
0.064	0.00	0.462	0.52	3.336	11.07	24.090	62.03	173.950	100.00	1256.058	100.00
0.072	0.00	0.519	0.76	3.748	12.50	27.061	66.40	195.402	100.00	1410.960	100.00
0.081	0.00	0.583	1.03	4.210	14.10	30.398	70.73	219.500	100.00	1584.966	100.00
0.091	0.00	0.655	1.33	4.729	15.88	34.147	74.97	246.569	100.00	1780.430	100.00
0.102	0.00	0.736	1.66	5.312	17.86	38.358	79.02	276.977	100.00	2000.000	100.00
0.114	0.00	0.826	2.02	5.967	20.05	43.089	82.83	311.135	100.00		
0.129	0.00	0.928	2.42	6.703	22.45	48.403	86.31	349.506	100.00		

Operator notes: