WorleyParsons
resources & energy

EcoNomics™

STELLAR RESOURCES LIMITED

Heemskirk Tin Project

Severn Further Flowsheet Development and Optimisation

201010-00575–PM-REP-002

12 June 2015

Minerals, Metals & Chemicals
Level 12, 333 Collins Street
Melbourne VIC 3000
Australia
Telephone: +61 3 8676 3500
Facsimile: +61 3 8676 3505
www.worleyparsons.com
ABN 61 001 279 812

WorleyParsons

resources & energy

EcoNomics

STELLAR RESOURCES LIMITED
HEEMSKIRK TIN PROJECT
SEVERN FURTHER FLOWSHEET DEVELOPMENT AND OPTIMISATION

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Stellar Resources Limited, and is subject to and issued in accordance with the agreement between Stellar Resources Limited and WorleyParsons. WorleyParsons accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this report by any third party.

Copying this report without the permission of Stellar Resources Limited and WorleyParsons is not permitted.

PROJECT 201010-00575 - HEEMSKIRK TIN PROJECT

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Issued for internal review	J Resta	S McKenna	N/A	6-Jun-2015	N/A	
B	Issued for use	J Resta	S McKenna		12-Jun-2015		

CONTENTS

1 SUMMARY

The Severn metallurgical testing program has focused on the optimisation of the process flowsheet utilising a large “global” composite sample representing the typical Severn mineralogy, composition and tin grades. This has provided a number of important improvements to metallurgical performance, and flowsheet simplifications, in addition to generating more robust information with respect to optimum process design criteria and processing conditions.

Key outcomes of the program include:

- Elimination of the heavy media separation circuit.

  This has provided a simplification to the overall process flowsheet and a reduction in associated tin losses, and is expected to provide an improved project outcome.

- Coarser primary grind; grind size optimisation test work has demonstrated a significantly coarser primary grind size (P80 = 250 µm) is more optimum than that considered in the PFS (P80 = 130 µm). This provides the following benefits;
  - reduced tin losses due to reduced fines production,
  - reduction in primary grind operating and capital costs, and overall comminution energy requirements.

  Significantly, the percentage of tin passing 30 µm (below which size gravity recovery is relatively poor) is estimated to decrease from ~43% passing 30 µm at a primary grind size of 130 µm (as assumed in the PFS), to only ~30% passing 30 µm at a primary grind size of 240 µm. This is equivalent to ~30% reduction in fine tin generation, and is a key contributor to the improved gravity recovery achieved.

- Optimisation of the sulfide flotation circuit has led to a significant reduction in tin losses to the final sulphide concentrate tailings stream. This, together with the elimination of the heavy media circuit has increased the amount of tin available for recovery within the gravity and tin flotation circuits.
- Optimisation of the gravity circuit configuration, combine with upstream flowsheet improvements, has led to ~10% improvement in tin recovery via gravity.
- Improvements with the concentrate dressing circuit have led to improved gravity concentrate quality and clearly demonstrated a high quality concentrate, low in penalty elements, can be readily produced.
- Elimination of the silica flotation circuit has provided a simplification to the overall process flowsheet.
- Optimisation of the De-slime cut point has allowed minimisation of combine slimes and tin flotation tailings losses.
- Tin flotation test work has robustly demonstrated commercially meaningful tin flotation concentrate grades can be achieved at acceptable recoveries.

- Based on the outcomes of the optimisation program overall tin recovery is estimated at 79.5% at a final concentrate grade of 45% Sn.

Importantly, the overall performance has been demonstrated across a consistent, robust test work program, covering all major sections (including sulfide flotation, gravity separation, de-sliming, tin flotation, concentrate dressing and concentrate leaching) of the proposed process flowsheet.

2 INTRODUCTION

The Severn metallurgical testing program has focused on the optimisation of the Heemskirk Tin Project process flowsheet utilising a large “global” composite sample representing the typical Severn mineralogy, composition and tin grades. The current program has focused on the Severn deposit which forms approximately 60% of the overall tin resource for the Heemskirk Tin Project

A significant amount of testwork has previously been completed on the Heemskirk project over a number of separate programs, carried out on various samples from the Upper Queen Hill, Lower Queen Hill, Severn and Saint Dizier deposits. Review of the previous work highlighted that separately these programs were very much ‘development’ type programs, and were often limited by availability of sample to allow more detailed optimisation work to be completed. The review highlighted the need for significant additional flowsheet development and optimisation testwork which the current program has aimed to address.

Keys aims of the Severn metallurgical testing program were:

- Achieve improved overall performance with respect to tin recovery to saleable concentrate grades.
- Better define the optimum process flowsheet, process design criteria and expected performance.
- Demonstrate achievable overall tin recovery to saleable concentrate grades.

3 OUTLINE OF PROGRAM

The Severn metallurgical testing program focused on optimisation of the PFS process flow-sheet using a large, ~120 kg, “global composite” sample representing typical Severn mineralogy, composition and tin grade. The program was completed under the supervision of WorleyParsons via ALS Metallurgy Burnie laboratory (ALS job no. T0879).

The testwork scope of work contained in Appendix 1 details the original program planned to be completed.

Keys aims of the program were to:

- Achieve improved overall performance with respect to tin recovery to saleable concentrate grades.
- Better define the optimum flowsheet, process design criteria and expected performance.
- Demonstrate achievable overall tin recovery to saleable concentrate grades.

In addition to detailed sample characterisation the testwork undertaken covered all major unit processes including:

- Comminution
- HMS
- Sulfide flotation
- Gravity Separation
- Gravity Concentrate Dressing
- De-sliming
- Tin flotation
- Concentrate leach

The general approach to the overall program was to progressively optimise each of the upstream flowsheet areas, then generate sample under the ‘optimised’ conditions to form the feed for downstream testwork. This approach was taken to ensure testwork on the downstream areas of the flowsheet was conducted on a reasonably representative feed.

For example, the sulfide flotation testwork initially focused on optimisation of primary grind size, followed by regrind size, then optimisation of the overall float. Following optimisation of the sulfide float a series of larger (12 kg) batch flotation tests were completed to produce sulfide flotation tailings as feed to the downstream (gravity separation, de-sliming and tin flotation) testwork. Likewise, initial gravity separation work focused on optimising the circuit configuration prior to generating sample for subsequent de-sliming and tin flotation work and gravity concentrate dressing.

4 SAMPLES USED IN TESTWORK PROGRAM

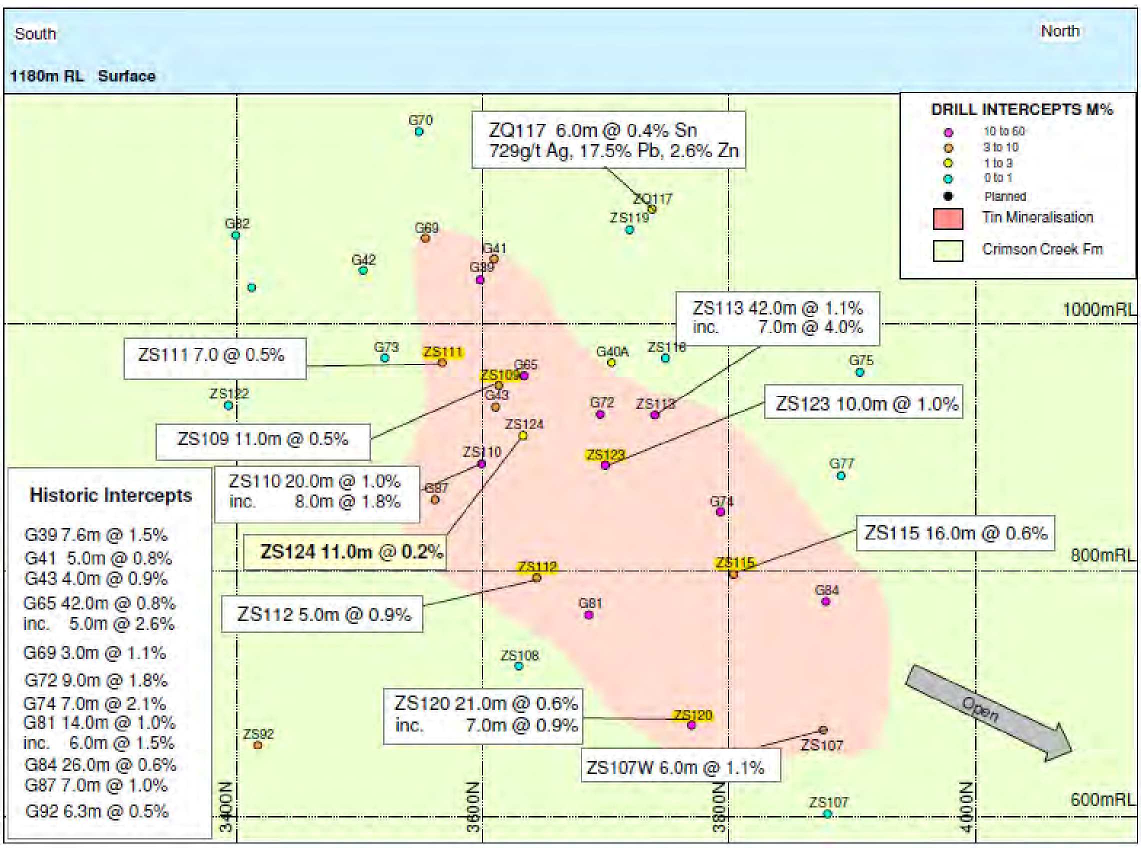
The Severn metallurgical testing program has focused on optimisation of the PFS process flow-sheet using a large, ~120 kg, "global composite" sample representing typical Severn mineralogy, composition and tin grade.

Throughout this report this composite is referred to as; Severn Bulk Composite (SBC).

The Severn Bulk Composite (SBC) sample was produced from ½ core from intersections of the following drill holes; ZS-109, ZS-111, ZS-111W, ZS-112a, ZS-112b, ZS-112c, ZS-112d, ZS-112W, ZS-115, ZS-120 and ZS-123, with remaining material from Severn composites from previous test programs also added to argument the total quantity of sample. Full details of the intervals and previous composites forming the Severn Bulk Composite are contained in Appendix 1.

Figure 4-1 shows a long projection of the Severn deposit with the intervals forming the Severn Bulk Composite highlighted in yellow. The intervals forming Severn Bulk Composite represent a reasonable spread across the tin mineralisation both spatially and in terms of composition.

Figure 4-1 Severn Long Projection



Overall the Severn Bulk Composite is thought to be "typical" of the majority of the Severn deposit.

5 SAMPLE CHARACTERISATION

Samples characterisation consisted of the following:

- Full Head assay
- Size by size assay
- Optical mineralogy – Fully and Sn scan
- Heavy liquid testing (refer Section 7)

Table 1 shows the head analysis for the Severn Bulk Composite, along with the estimated overall Severn Mineral Resource analysis for comparison.

Table 1 – Severn Bulk Composite Head Analysis

	Sn %	Sn Acid Sol ppm	Fe %	As %	S %	SiO_2 %	CaO %	MgO %	Al_2O_3 %	Mn %	Cu %	Pb %	Zn %
Severn Bulk Composite	1.00	170	26.1	0.28	14.6	30.1	0.71	2.74	6.29	0.40	0.09	0.63	0.77
Severn Mineral Resource	0.98	177	-	-	9.06	-	-	-	-	-	-	0.03	-

Table 2 shows basic statistics from 1 m composites of Severn drill core assays for comparison with the Severn Bulk Composite sample head analysis.

Table 2 – Basic Statistics from 1 m composites of Severn Drill Core Assays

Variable	Sn %	AS_Sn ppm	S %	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Fe %	Bi ppm	W ppm	Ni ppm
Number of samples	370	135	292	331	251	323	227	199	234	182	141	191
Minimum value	0.01	10	0.14	8	7	10	1	0.05	6.39	0.01	0.01	5
Maximum value	11.1	1000	32.5	4400	19000	18500	88	20400	44.0	560	120	476
Mean	**0.89**	**171**	**8.99**	**585**	**235**	**227**	**4**	**1077**	**21.7**	**60**	**2**	**62**
Median	0.50	100	7.50	407	20	59	2	80	21.0	30	0	50
Geometric Mean	0.48	121	6.61	390	32	55	2	95	20.7	22	0	43
Variance	1.46	27100	42.1	313628	1838117	2011248	68	8976723	39.3	6152	196	4014
Standard Deviation	1.21	165	6.49	560	1356	1418	8	2996	6.27	78	14	63
Coefficient of variation	1.36	0.96	0.72	0.96	5.77	6.24	2.11	2.78	0.29	1.30	5.61	1.02

Sn grade of the Severn Bulk Composite compares very closely with that of the overall Severn Mineral Resource Sn grade, and is marginally lower than the overall Heemskirk mineral resource, which averages 1.14% Sn.

Although S content of the SBC sample is higher than average, it is not untypical of Severn, being well within the range of sulfur contents typically seen.

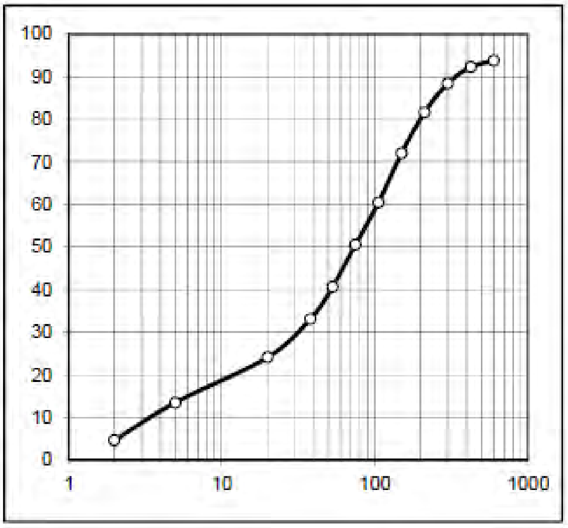
Fe content of the Severn Bulk Composite is also reasonably typical of Severn.

Soluble Sn content of the Severn Bulk Composite (and overall Severn resource) is negligible.

Table 3 shows size distribution and size by size metal distribution for the Severn Bulk Composite sample ground to a P80 of 203 µm. Generally Sn distribution follows the mass distribution, with minor upgrading of Sn in sizes ranges -106µm +8µm, while -8µm fractions are relatively low Sn grade, representing only 4.5% of the total Sn distribution compared with 13.6% of the total mass.

Table 3 - Size Distribution and Size by Size Analysis of Severn Bulk Composite

SBC GROUND HEAD		SIZE	WEIGHTS		
		um	gm	(%)	%PASS
	P80	600	15.00	6.23	93.8
		425	3.63	1.51	92.3
		300	9.22	3.83	88.4
		212	16.45	6.84	81.6
	202	150	22.96	9.54	72.0
		106	27.89	11.59	60.4
		75	23.86	9.92	50.5
		53	23.73	9.86	40.7
		38	18.09	7.52	33.1
		20	21.65	9.00	24.1
MINS 20	CS5	5	25.49	10.60	13.6
CENTRIFUGE	CS6	2	21.35	8.87	4.7
		SUB	11.26	4.68	0.0
		TOTAL	240.6	100.0	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mount
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	Number
600	6.23	0.97	6.2	21.30	5.1	0.17	3.7	9.85	4.1	40.40	8.7	
212	12.18	0.64	8.0	20.40	9.6	0.15	6.3	9.41	7.7	40.80	17.1	879064
150	9.54	0.84	8.2	25.60	9.4	0.25	8.2	15.35	9.8	32.30	10.6	879065
106	11.59	0.98	11.6	27.50	12.3	0.31	12.4	17.80	13.8	28.90	11.5	879066
75	9.92	1.10	11.1	28.30	10.8	0.34	11.6	18.60	12.3	26.80	9.1	879067
53	9.86	1.26	12.7	28.90	11.0	0.35	11.9	19.65	13.0	25.30	8.6	879068
38	7.52	1.31	10.1	29.50	8.5	0.38	9.9	19.50	9.8	24.20	6.3	879069
20	9.00	1.37	12.6	29.50	10.2	0.35	10.9	18.40	11.1	23.40	7.2	879070
8	10.60	1.40	15.1	29.80	12.1	0.35	12.8	18.15	12.9	21.30	7.8	879071
2	8.87	0.43	3.9	23.10	7.9	0.16	4.9	7.67	4.6	31.30	9.5	
CAL <2	4.68	0.13	0.6	17.49	3.1	0.46	7.5	3.26	1.0	22.77	3.7	
ASSAY	100.0	0.98	100.0	26.00	100.0	0.29	100.0	14.95	100.0	29.10	100.0	

SIZE	WT	MnO		CaO		MgO		Al203	
um	%	%	dist	%	dist	%	dist	%	dist
600	6.23	0.21	4.0	0.56	5.2	2.63	6.3	7.93	8.2
212	12.18	0.27	10.0	0.59	10.7	3.03	14.1	7.36	14.8
150	9.54	0.32	9.3	0.64	9.1	2.56	9.3	5.62	8.9
106	11.59	0.33	11.6	0.63	10.9	2.35	10.4	5.03	9.7
75	9.92	0.33	9.9	0.67	9.9	2.21	8.4	4.73	7.8
53	9.86	0.34	10.2	0.65	9.6	2.12	8.0	4.36	7.1
38	7.52	0.34	7.7	0.69	7.7	2.13	6.1	4.30	5.4
20	9.00	0.35	9.5	0.74	9.9	2.32	8.0	4.76	7.1
8	10.60	0.37	11.9	0.80	12.7	2.35	9.5	4.62	8.1
2	8.87	0.32	8.6	0.78	10.3	3.87	13.1	9.68	14.2
CAL <2	4.68	0.52	7.4	0.56	3.9	3.86	6.9	11.33	8.8
ASSAY	100.0	0.33	100.0	0.67	100.0	2.62	100.0	6.04	100.0

5.1 Mineralogy

The full report for optical mineralogy carried out on the Severn Bulk Composite is contained in Appendix 2.

Optical mineralogy was completed on the Severn Bulk Composite by MODA. Four scans using standard MODA techniques were carried out as detailed below;

In a first scan, for each fraction, 100 grains were selected at random and the area % of each mineral present was visually estimated. The minerals logged were: *pyrite+marcasite* (Py), *pyrrhotite* (Po), *cassiterite* (Cs), *stannite* (St), *arsenopyrite* (As), *chalcopyrite* (Cp), *sphalerite+galena* (SpGn) and *gangue* (*quartz, silicates, carbonates, etc,* Ga). This allowed calculation of an overall mineralogical composition.

In a second scan, for each fraction, 100 grains containing *pyrite* or *pyrrhotite* were selected at random and logged as per the first scan. This improved the count statistics for the Fe sulphides.

In a third scan, for each fraction, 100 grains containing *cassiterite* or *stannite* were selected at random and logged as per the first scan. This improved the count statistics for the Sn mineralisation.

In a fourth scan, for each fraction, 100 grains containing *sphalerite, galena, chalcopyrite, stannite* or *tetrahedrite* were selected at random and logged as per the first scan. This improved the count statistics for miscellaneous base metal mineralisation.

The mineralogy is summarised in the extracts and tables below (reproduced from MODA's report);

The following minerals were identified, in approximate descending order:

- Gangue (*quartz*, silicates, carbonate, *rutile*, *carbonaceous matter*, *fluorite*, *talc* etc.)
- *Pyrite* (95.4% crystalline and 4.6% *melnikovite*)
- *Pyrrhotite*
- *Magnetite*
- *Sphalerite*
- *Cassiterite*
- *Marcasite*
- *Galena*
- *Arsenopyrite*
- *Chalcopyrite*
- *Goethite*
- *Hematite*
- *Stannite* (rare)
- *Tetrahedrite* (very rare)
- *Bismuthinite* (very rare)
- *Native bismuth* (very rare)

Severn Bulk Comp Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	Cs#	St#	As#	Cp#	SpGn	Ga
+212µm	12.2	11.7	0.2	0.4	0.0	0.0	0.1	0.8	86.9
+150µm	9.5	22.9	1.7	0.2	0.0	0.1	0.0	1.4	73.8
+106µm	11.6	23.0	4.6	0.2	0.0	1.0	0.0	1.1	70.1
+75µm	9.9	31.4	1.2	1.0	0.0	0.1	Tr	0.0	66.3
+53µm	9.9	26.3	3.5	1.2	1.0	0.0	0.1	2.1	66.0
+38µm	7.5	26.6	9.5	0.5	0.0	0.0	0.2	2.1	61.1
+20µm	9.0	29.9	6.2	1.3	0.0	0.0	0.2	4.0	58.4
+8µm	10.6	28.3	6.7	2.0	0.0	0.0	0.0	3.0	60.1
TOTAL	**80.2**	**24.5**	**3.9**	**0.8**	**0.1**	**0.2**	**0.1**	**1.7**	**68.6**

Py=pyrite, Po=pyrrhotite, Cs=cassiterite, St=stannite, As=arsenopyrite, Cp=chalcopyrite, SpGn=sphalerite+galena, Ga=gangue
 # count statistics are very poor for the scarce minerals

Severn Bulk Comp Composition Vol% (from Sn scan)

Fraction	Sn Wt%	Py	Po	Cs	St	As	Cp	SpGn	Ga
+212µm	6.2	15.6	4.2	12.9	0.4	0	0.1	0.1	66.8
+150µm	8.0	19.6	2.2	23.8	0.1	0.9	0.1	0	53.4
+106µm	8.2	11.0	4.9	32.2	2.6	0	0.7	2.0	46.7
+75µm	11.6	6.1	1.6	43.2	1.8	0	1.1	0.7	45.6
+53µm	11.1	10.0	1.6	44.1	4.2	0	0.8	2.2	37.2
+38µm	12.7	3.8	3.1	64.8	4.2	Tr	0.8	1.6	21.8
+20µm	10.1	4.1	0.1	82.0	1.3	0	0.1	0.1	12.5
+8µm	12.6	1.8	0.4	87.8	2.1	0	0.4	0	7.6
TOTAL	**80.5**	**7.9**	**2.1**	**53.2**	**2.3**	**0.1**	**0.6**	**0.9**	**33.1**

Notably the residence of Sn in cassiterite sums to 99% with 1% in stannite.

Also of note the estimated Zn and Pb head grades of the Severn Bulk Composite are 0.9%Zn and 0.6% Pb, present as sphalerite and galena and are in reasonable agreement with the head assays shown in Table 1.

Severn Bulk Comp Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary+
			Py	Po	St	Cp	As	Ga	
+212µm	6.2	0	1	1	0	0	0	71	26
+150µm	8.0	17	9	0	0	0	0	41	32
+106µm	8.2	28	8	0	0	0	0	45	17
+75µm	11.6	46	2	0	0	0	0	41	11
+53µm	11.1	59	3	0	0	0	0	36	2
+38µm	12.7	66	2	1	0	1	0	25	4
+20µm	10.1	72	0	1	0	1	0	21	3
+8µm	12.6	83	1	1	0	1	0	14	0
TOTAL	**80.5**	**52**	**3**	**1**	**0**	**0**	**0**	**34**	**10**

Severn Bulk Comp Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	St	Cp	As	Ga
+212µm	6.2	21	9	2	5	0	94
+150µm	8.0	36	6	0	2	0	73
+106µm	8.2	21	4	0	0	0	62
+75µm	11.6	7	3	5	5	0	50
+53µm	11.1	5	0	0	1	0	38
+38µm	12.7	4	2	0	1	0	28
+20µm	10.1	2	1	0	2	0	24
+8µm	12.6	1	1	0	1	0	14
TOTAL	**80.5**	**10**	**3**	**1**	**2**	**0**	**43**

Severn Bulk Comp Stannite liberation distribution%

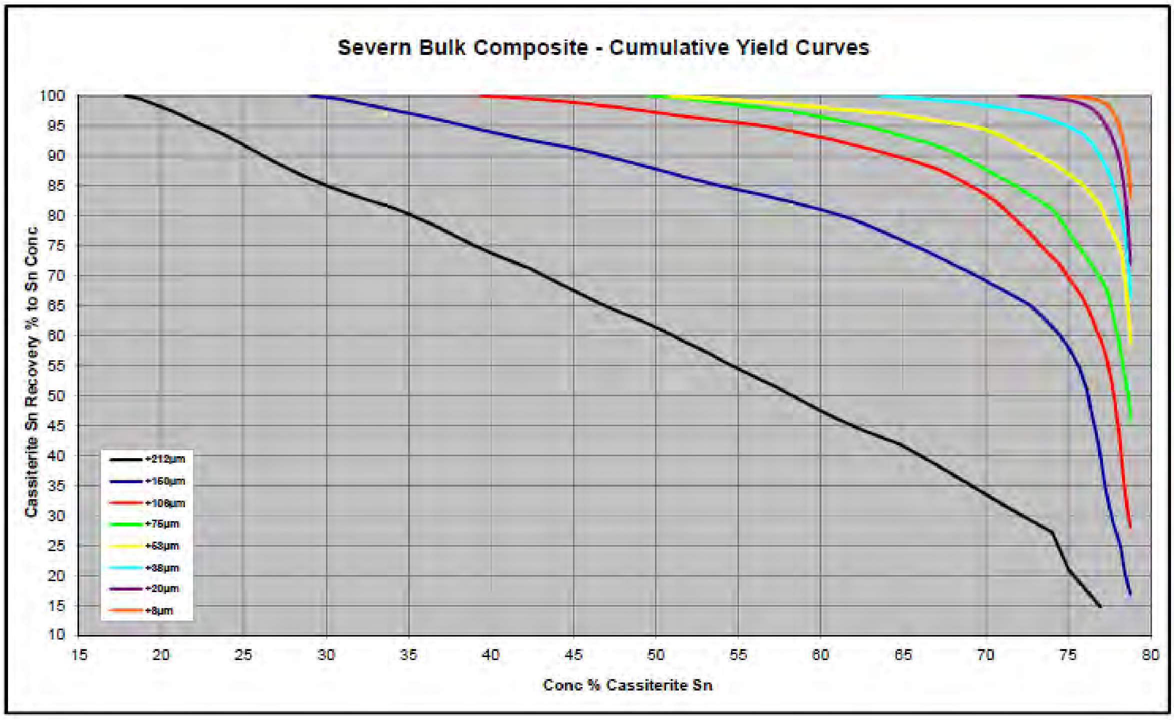
Fraction	Sn Wt%	Free	Binary with						Ternary
			Py	Po	Cs	Cp	As	Ga	
+212µm	6.2	0	0	0	0	0	0	0	100
+150µm	8.0	0	0	0	0	0	0	0	100
+106µm	8.2	39	0	0	0	29	0	14	18
+75µm	11.6	57	0	0	0	6	0	0	37
+53µm	11.1	24	0	0	0	22	0	1	42
+38µm	12.7	24	0	0	0	68	0	0	3
+20µm	10.1	0	4	0	0	0	0	86	10
+8µm	12.6	98	2	0	0	0	0	0	0
TOTAL	80.5	**35**	**1**	**0**	**0**	**18**	**0**	**12**	**32**

Severn Bulk Comp Stannite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	Cs	Cp	As	Ga
+212µm	6.2	0	100	97	97	0	3
+150µm	8.0	0	0	100	62	0	100
+106µm	8.2	0	0	0	46	0	32
+75µm	11.6	11	0	12	41	0	26
+53µm	11.1	2	2	12	61	0	28
+38µm	12.7	0	0	0	70	0	3
+20µm	10.1	4	0	10	0	0	96
+8µm	12.6	2	0	0	0	0	0
TOTAL	80.5	**3**	**8**	**22**	**44**	**0**	**34**

Stannite is a rare fine-grained component, mainly hosted by *chalcopyrite*, but also *sphalerite, galena, pyrite, cassiterite* and gangue.

The observations of stannite are in-line with the soluble Sn content of the Severn Bulk Composite (and overall Severn resource). Stannite is likely responsible for the major portion of Sn loss from the sulfide flotation circuit under the optimised conditions (refer Section 8).



Notably pyrite and pyrrhotite are reasonably well liberated at much coarser sizes compared to cassiterite (refer Table 4), indicating a relatively coarse primary grind should provide adequate sulfide roughing performance, while a significantly heavier regrind is required in the gravity circuit. However, given the associations of cassiterite with both pyrite and pyrrhotite a heavy regrind in the sulfide circuit is expected to be required to minimise Sn losses to the final sulfide concentrate.

Table 4 – Comparison of Liberation of Pyrite, Pyrrhotite and Cassiterite

Fraction (µm)	+212	+150	+106	+75	+53	+38	+20	+8
Pyrite	46	49	67	74	70	85	87	97
Pyrrhotite	53	62	73	70	67	91	76	88
Cassiterite	0	17	28	46	59	59	72	83

6 COMMINUTION

Comminution testing of the Severn Bulk Composite sample consisted of determination of Bond Ball Mill Work Index, Bond Rod Mill Work Index and bulk SG.

Full results are contained in Appendix 3 and summarised in Table 5, along with those for the Saint Dizier Bulk Composite for comparison.

Table 5 – Severn Bulk Composite Comminution Parameters

Parameter	Severn Bulk Composite	Saint Dizier Bulk Composite	Units
Bond Ball Mill Work Index	20.1	17.7	kWh/t
Bond Rod Mill Work Index	20.5	19.0	kWh/t
Bulk SG	1.8	1.8	

Results indicate the Severn ore is moderately hard.

Comminution testing in previous Heemskirk testwork was limited to a single Bond Ball Mill Work Index determination for Severn Comp 3. The Bond Ball Mill Work Index for Severn Comp 3 was; BWI = 17.5 kWh/t, indicating this sample was softer than the Severn Bulk Composite.

Laboratory grind sizes and times of the Severn Bulk Composite, previous Lower Queen Hill metallurgical composites, along with the Saint Dizier metallurgical composites were compared in order to determine relative grindability to give an indication of the variability in comminution properties of these deposits.

Relative grindability was calculated as;

Relative grindability = $Wi_t/Wi_r = (10/\sqrt{P_r} - 10/\sqrt{F_r})/ (10/\sqrt{P_t} - 10/\sqrt{F_t})$

for samples ground for the same length of time under the same conditions, where

Wi_t = estimated Bond index of test sample

Wi_r = measured Bond index of reference sample

P_r = P80 of reference sample

F_r = F80 of reference sample

P_t = P80 of test sample

F_t = F80 of test sample

Results are summarised in Table 6.

Table 6 – Relative Grindability of Various Heemskirk Composites

PROJECT	T0879	T0887	T0887	T0887	T0887	T0887	T0819	T0819	T0714
Ore	**Severn**	**Saint Dizier**	**Saint Dizier**	**Saint Dizier**	**Saint Dizier**	**Saint Dizier**	**Lower Queen Hill**	**Lower Queen Hill**	**Severn**
Sample	Severn Bulk Composite	St Dizier Bulk Composite	Comp 2	Comp 3	Comp 4	Comp 2+3	Comp 6 Sinks/Fines	Comp 6 Sinks/Fines/Floats (whole ore)	Comp 3
DATE	20/05/2014	15/05/2014	24/07/2014	25/07/2014	25/07/2014	5/09/2014	6/05/2013	11/06/2013	26/10/2012
Measured:									
BBWi (kWh/t)	**20.1**	**17.7**	-	-	-	-	-	-	17.5
BRWi (kWh/t)	**20.5**	**19.0**	-	-	-	-	-	-	-
Relative Grindability	**1.00**	**0.90**	**1.69**	**1.30**	**1.23**	**1.43**	**0.76**	**0.78**	**-**
Estimated:									
BBWi (kWh/t)	20.1	17.7	34.0	26.2	24.8	28.7	14.9	15.4	-
BRWi (kWh/t)	20.5	19.0	34.6	26.7	25.3	29.3	16.0	16.5	-

Across the composites from the 3 deposits compared in Table 7 there is considerable variability in ore competency.

The Saint Dizier composites shown are significantly more competent (harder) than the Severn Bulk Composite, with those produced from drill hole ST06 (Comp 2, 3, 4 and 2+3) being exceptionally hard ores.

The Lower Queen Hill composites shown are somewhat softer than the Severn Bulk Composite, being more in line with 'typical' base metals ores. Comparing the two Lower Queen Hill samples it can be seen heavy media separation had minimal impact on grindability.

7 HEAVY MEDIA SEPARATION

Heavy Media Separation (HMS) testwork on the Severn Bulk Composite sample included both heavy liquid testing and small pilot scale heavy media testing. Results for these are summarised in Table 7, Figure 7-1 and Table 8 with full results contained in Appendix 4.

Table 7 – Summary of Heavy Liquid Separation Results; SBC, HL SG = 2.95

FRACTIONS	Picno	WT	Overall		Overall		Overall		Overall		Overall		Overall		Overall		Overall	
mm	SG	%	%Sn	dist	%Fe	dist	%As	dist	%S	dist	%SiO2	dist	%CaO	dist	%MgO	dist	%Al2O3	dist
Sinks+4.75		18.70	2.32	30.86	29.30	23.18	0.28	23.01	14.60	27.66	28.40	15.02	0.79	22.27	2.88	18.13	7.45	16.15
Sinks+3.35		16.45	1.85	21.64	28.50	19.83	0.37	26.74	14.00	23.33	24.70	11.49	0.82	20.33	2.79	15.45	7.16	13.65
Sinks+2.36		13.89	2.34	23.13	28.10	16.52	0.37	22.59	14.75	20.76	24.90	9.78	0.67	14.03	2.58	12.07	6.72	10.83
Sinks+1.70		7.32	1.68	8.75	28.70	8.89	0.29	9.33	13.75	10.20	24.80	5.13	0.84	9.27	2.95	7.27	7.49	6.36
Sinks+1.18		3.84	1.86	5.09	28.40	4.62	0.19	3.21	13.30	5.18	24.20	2.63	0.75	4.35	3.01	3.90	8.05	3.59
Floats+4.75		7.98	0.06	0.34	13.30	4.49	0.05	1.75	0.91	0.74	56.40	12.72	0.42	5.05	3.34	8.97	11.35	10.50
Floats+3.35		8.01	0.09	0.51	12.15	4.12	0.05	1.76	0.88	0.71	55.60	12.59	0.44	5.31	3.19	8.60	11.65	10.82
Floats+2.36		7.23	0.09	0.46	12.45	3.81	0.05	1.59	1.15	0.84	55.90	11.44	0.47	5.13	3.27	7.97	11.05	9.27
Floats+1.70		3.53	0.08	0.20	12.40	1.85	0.05	0.78	0.81	0.29	56.50	5.64	0.43	2.29	3.31	3.94	11.65	4.77
Floats+1.18		1.87	0.09	0.12	12.15	0.96	0.05	0.41	0.67	0.13	57.30	3.04	0.48	1.36	3.30	2.08	11.50	2.50
Total Sinks		60.20	2.09	89.46	28.67	73.04	0.32	84.87	14.28	87.12	25.88	44.05	0.77	70.25	2.80	56.82	7.25	50.58
Total Floats		28.63	0.08	1.64	12.58	15.23	0.05	6.29	0.93	2.71	56.12	45.43	0.44	19.14	3.27	31.56	11.40	37.86
Fines -1.18		11.17	1.12	8.90	24.80	11.72	0.18	8.84	8.99	10.17	33.30	10.52	0.63	10.61	3.09	11.62	8.93	11.57
CALC FEED		**100.00**	**1.41**	**100.00**	**23.63**	**100.00**	**0.23**	**100.00**	**9.87**	**100.00**	**35.36**	**100.00**	**0.66**	**100.00**	**2.97**	**100.00**	**8.62**	**100.00**

Figure 7-1 Heavy Liquid Separation: Recovery by Size Fraction

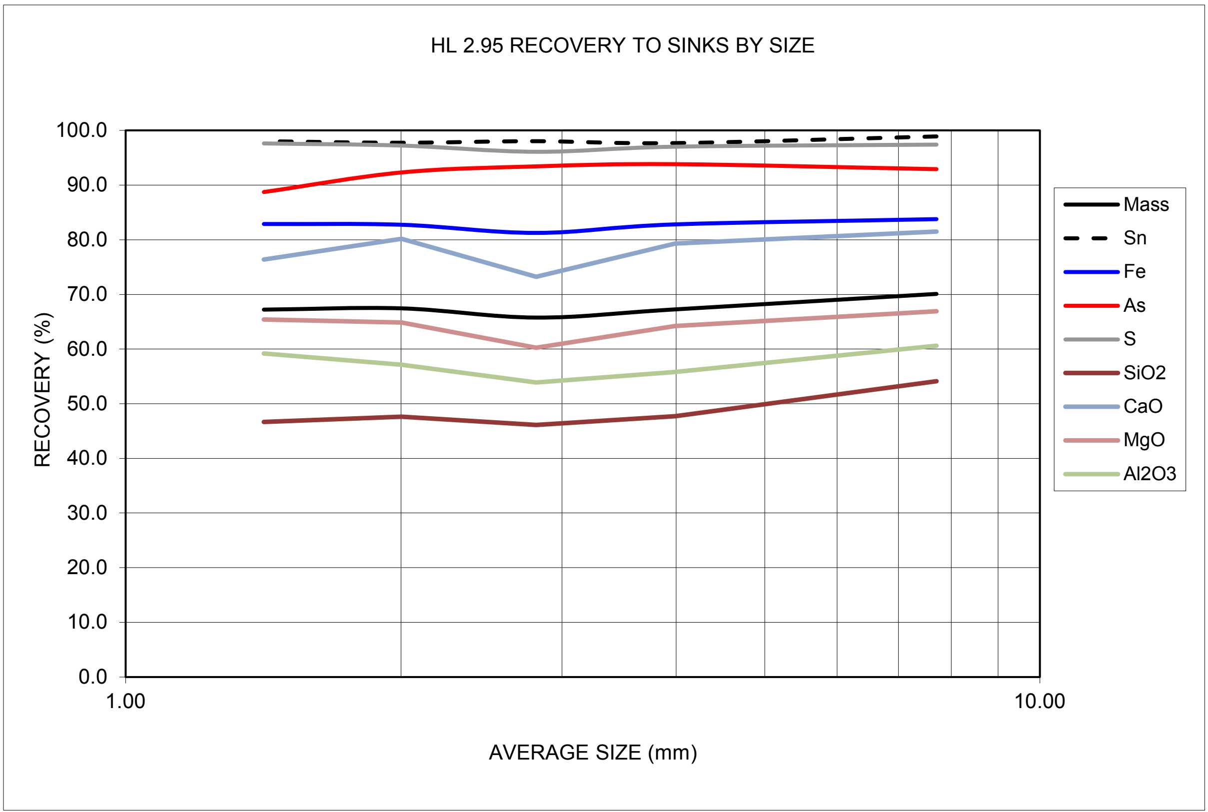


Table 8 - Heavy Media Separation Results: SBC, Fractions 9.50 to 2.35mm, Media SG = 2.95

PRODUCT	Wt (kg)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	Al2O3 (%)	Dist (%)
DMS Sinks (> 2.95)	8365	42.98	2.31	77.0	30.00	55.5	22.40	27.6	16.95	72.0	6.20	30.2
DMS Floats (< 2.95)	6917	35.54	0.14	3.9	14.70	22.5	51.50	52.5	1.61	5.7	12.05	48.6
Fines (<2.35mm)	4180	21.48	1.15	19.2	23.80	22.0	32.40	19.9	10.55	22.4	8.69	21.2
CALC Head	19462	100.00	1.29	100.0	23.23	100.0	34.89	100.0	10.12	100.0	8.81	100.0

Both the heavy liquid and heavy media testing were completed at an equivalent media SG of 2.95.

Both heavy liquid and heavy media testing gave moderate mass rejection to the floats fraction with fairly low Sn losses.

As expected both mass rejection and Sn loss for the heavy media testing were somewhat higher (1.24 times and 2.4 times respectively) than for the heavy liquid testing.

The heavy media testing results are considered more indicative of likely industrial scale performance.

These results are better than the majority of the previous heavy liquid / heavy media testing completed on the Heemskirk ores.

Previous work showed:

- Heavy liquid separation on Severn Comp 2 (from T0714) gave 23.3% mass rejection, with 1.5% Sn loss at 0.1% Sn grade to the floats product.
- Dense media separation on Severn Comp 2 (from T0714) gave 38.3% mass rejection, with 7.0% Sn loss @ 0.2% Sn to the floats product.
- Heavy Liquid work on Queen Hill comp 1 and 2 (T0587) shows low Sn loss and moderate mass rejection; 17.9% mass rejection, 1.2% Sn loss for comp 1 and 8.8% mass rejection, 0.55% Sn loss for comp 2. For composite 2 mass rejection is quite poor.
- Heavy media work on Lower Queen Hill (T0819) showed unacceptably high Sn losses; 13.7% Sn for comp 4, 14.8% for comp 6, and 2.8% Sn for comp 5 but with minimal mass loss at only 6.6%.
- Heavy media work on Severn comp 4 (T0797) gave 6.3% Sn loss with 42.2% mass rejection.

7.1 Application of HMS in the Heemskirk Flowsheet

The Heemskirk Tin Project Prefeasibility Study process flowsheet included heavy media separation (HMS) prior to the primary milling circuit. However, due to the variability seen in results of earlier heavy media and heavy liquid testwork (completed prior to the current program) and results of the current work (refer Section 7), a review of the merits of inclusion of HMS in the flowsheet was completed.

The review completed is contained in Appendix 5, with the key conclusions and recommendations reproduced below;

Conclusions:

- *Over the range of mass rejection considered removal of HMS from the flowsheet is expected to have negligible impact on total CAPEX (within the accuracy of the estimate). However, operating costs are expected to rise with removal of HMS.*
- *The expected improvement in overall Sn recovery by the removal of HMS is expected to more than offset the increase in OPEX, leading to an improvement in net revenue of the order of $2.6 M/y.*
- *Exclusion of HMS from the flowsheet simplifies the overall process flowsheet, and eliminates a loss opportunity (via HMS floats product) for Sn from the flowsheet.*
- *Previous testwork has shown HMS is not applicable to all ore types to be treated by the Heemskirk project.*
- *When considered from a processing only perspective HMS has no merits.*

Recommendations:

Based on the analysis completed heavy media separation detracts value from the Heemskirk project when the treatment of the same ROM (grade and tonnages of ore) is considered. That is, HMS detracts value when considered from a processing only perspective. On this basis inclusion of HMS in the Heemskirk flowsheet is not recommended.

8 SULFIDE FLOTATION

Previous testwork on Severn had considered flotation of both whole of ore and HMS sinks plus fines material. This earlier work had generally given reasonable results (of the order of 7% Sn loss) with a reagent regime consisting of sulfuric acid, copper sulfate, PAX, MIBC and guar, in a circuit consisting of roughing plus regrind and 2 stage cleaning. This work had highlighted both;

- use of gangue depressant has significant benefit; This is critical to achieving low tin losses
  - Guar was identified as is very effective and outperformed other reagents tested
- regrind is also critical to achieving low tin losses

Review of this early work identified the need for further testwork to optimise both primary and regrind sizes and confirm appropriate target sulfur grades for both sulfide tails and final sulfide concentrate.

All sulfide flotation testwork completed in the current program, was carried out on the Severn Bulk Composite sample (whole of ore). This initially focused on optimisation of primary grind size, followed by regrind size, then optimisation of the overall float. Following optimisation of the sulfide float a series of larger (12 kg) batch flotation tests were completed to produce sulfide flotation tailings as feed to the downstream (gravity separation, de-sliming and tin flotation) testwork.

Complete results for the sulfide flotation testwork are contained in Appendix 6.

8.1 Primary Grind Size

A series of roughing tests (T02 to T06) were completed at primary grind sizes in the range P80 = 100 to 240 µm to aid in identifying the optimum grind size. Results are summarised in Figure 8-1 to Figure 8-4.

Over the range tested tin and sulfur flotation rates were quite comparable, with no significant shift in tin/sulfur selectivity observed.

Notably, tin and sulfur deportment to rougher concentrate did not vary significantly over this range of grind sizes; refer Table 9.

Table 9 – Tin and Sulfur Recovery to Rougher Concentrate with Varying Primary Grind Size

Test no.	Primary Grind Size (µm)	% Sn Recovery to Rougher Concentrate	% S Recovery to Rougher Concentrate
T02	100	11.9	93.8
T03	130	12.5	87.5
T04	160	12.6	91.7
T05	240	11.1	90.2
T06	240	11.6	92.5

Figure 8-1

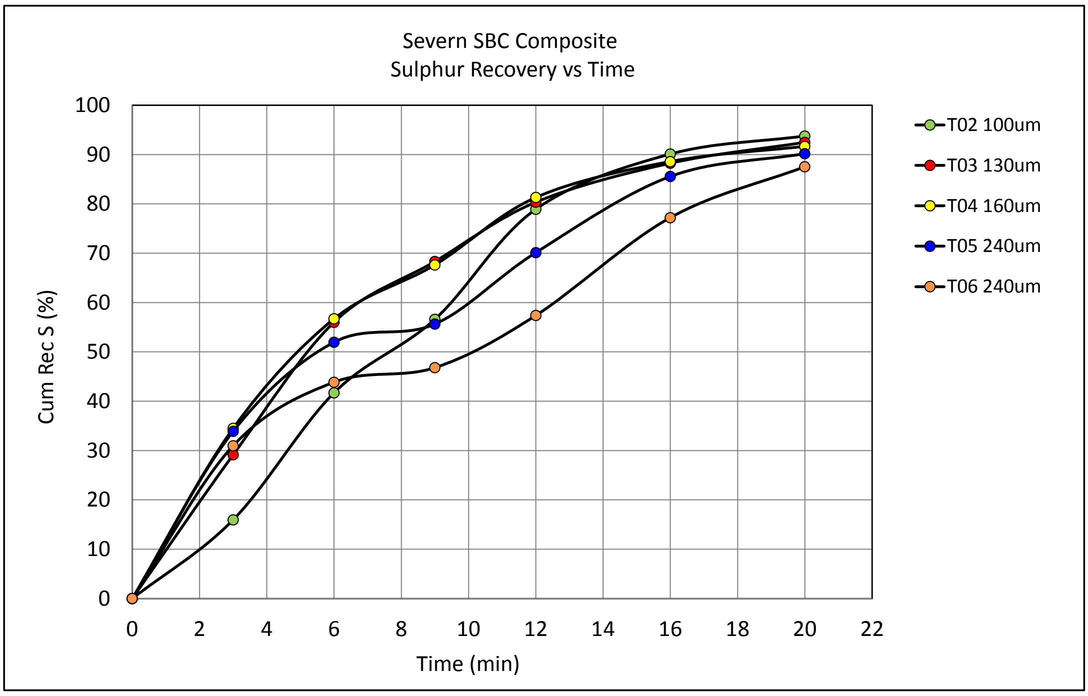


Figure 8-2

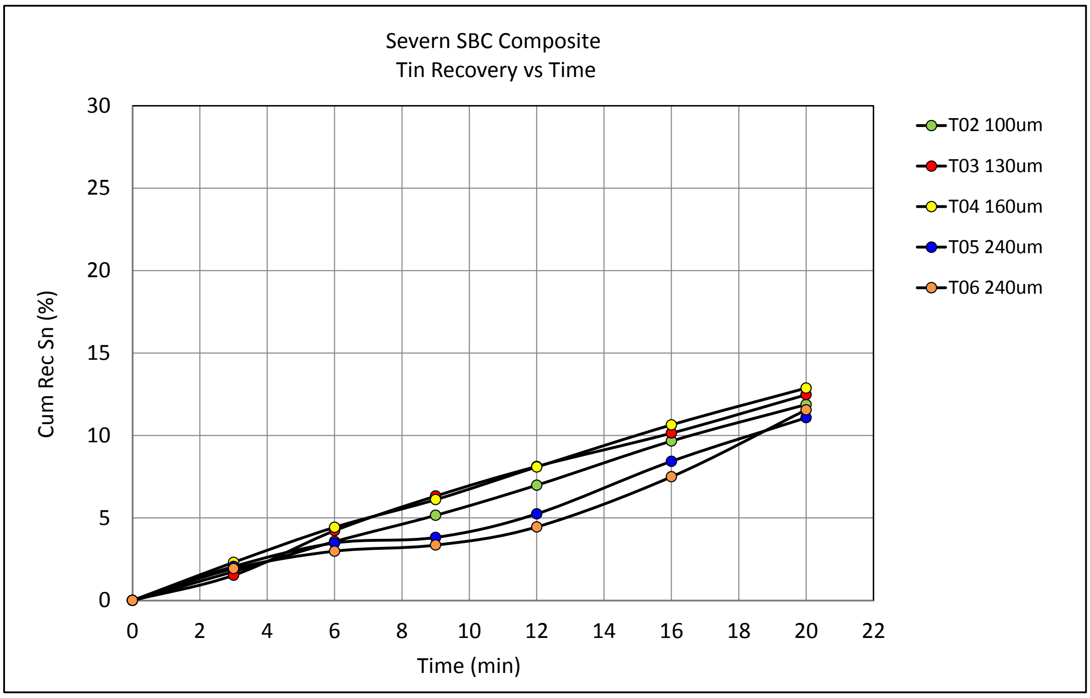


Figure 8-3

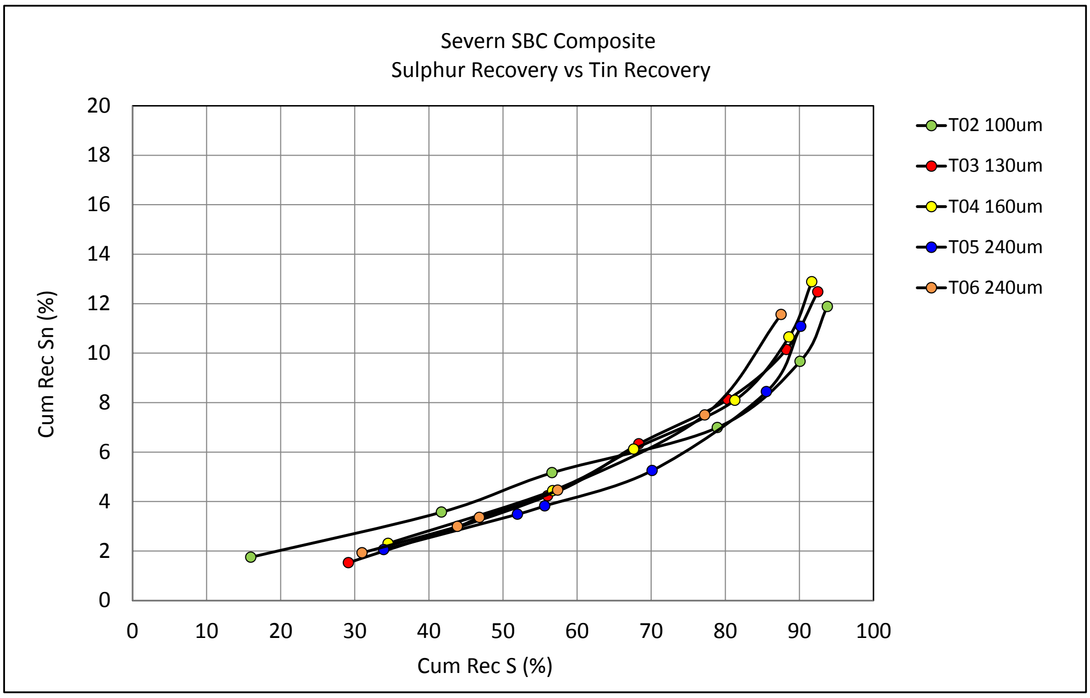


Figure 8-4

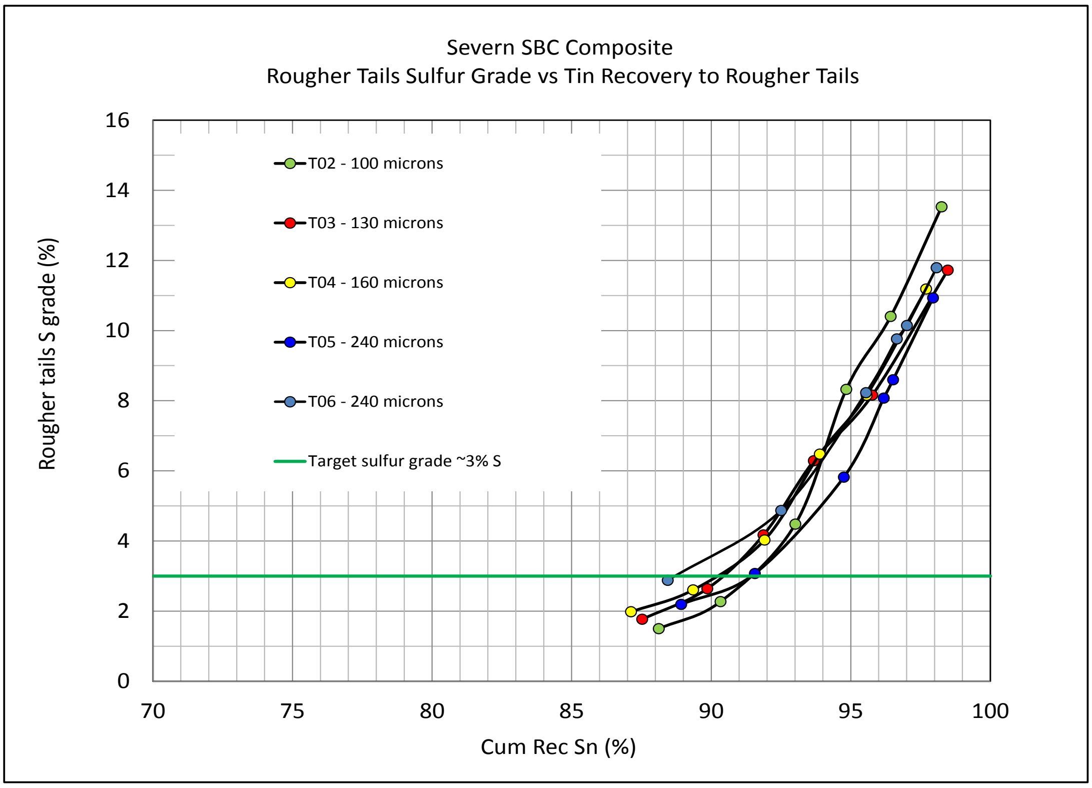


Table 10 and Figure 8-5 show the variation in size by size tin distribution in sulfide rougher tails for varying primary grind sizes over the range P80 = 100 to 240 µm.

Table 10 – Variation in Size by Size Tin Distribution in Sulfide Rougher Tails with Primary Grind Size

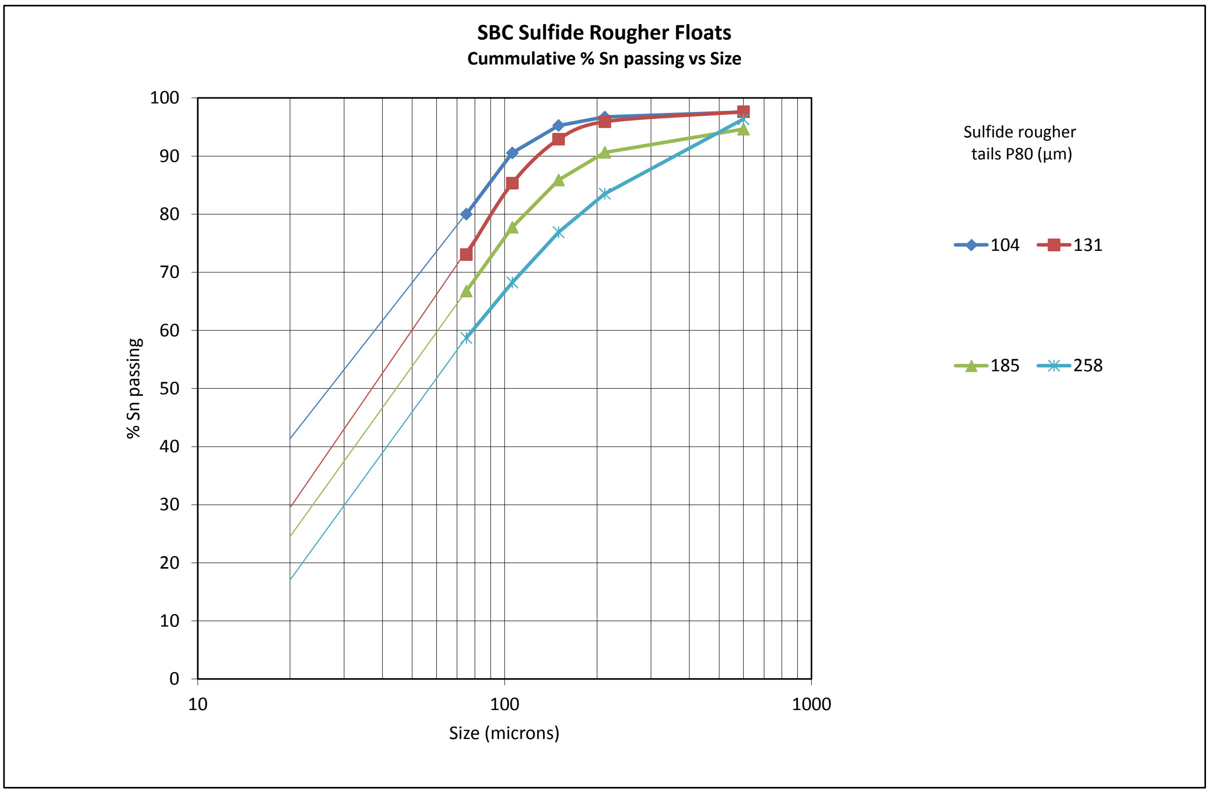
Test	T02		T03		T04		T05		T06	
Primary Grind size (P80 µm)	**100**		**130**		**160**		**240[1]**		**240**	
Rougher Tails Mass P80 (µm)	104		131		185		278		258	
Rougher Tails Sn P80 (µm)	**75**		**93**		**118**		**160**		**179**	
SIZE	Sn		Sn		Sn		Sn		Sn	
um	%	dist	%	dist	%	dist	%	dist	%	dist
600	1.25	2.4	0.91	2.4	1.02	5.4	0.98	7.9	0.93	3.6
212	0.44	0.9	0.43	1.7	0.57	4.0	0.71	7.6	0.87	12.8
150	0.44	1.5	0.62	3.0	0.84	4.7	1.00	5.4	1.07	6.6
106	0.70	4.7	0.97	7.6	1.15	8.1	1.31	7.6	1.31	8.7
75	1.22	10.6	1.47	12.3	1.59	11.0	1.75	9.4	1.57	9.6
<75	**1.61**	**80.0**	**1.57**	**73.1**	**1.60**	**66.8**	**1.58**	**62.1**	**1.49**	**58.7**
CALC	1.38	100.0	1.35	100.0	1.36	100.0	1.34	100.0	1.30	100.0
ASSAY	1.38		1.35		1.31		1.32		1.30	

Note 1: Significant coarse material present. Primary grind method modified for subsequent tests to eliminate excessive coarse material.

Over this size range tin P80 in the sulfide rougher tails increases from 75 µm following a primary grind of 106 µm, to 179 µm following a primary grind of 240 µm.

Significantly, the percentage of tin passing 30 µm (below which size gravity recovery is poor) is estimated to decrease from ~43% passing 30 µm at a primary grind size of 130 µm (grind size assumed in the PFS), to only ~30% passing 30 µm at a primary grind size of 240 µm. This is equivalent to ~30% reduction in fine tin generation, and is a key contributor to the improved gravity recovery achieved (refer Section 9).

Figure 8-5

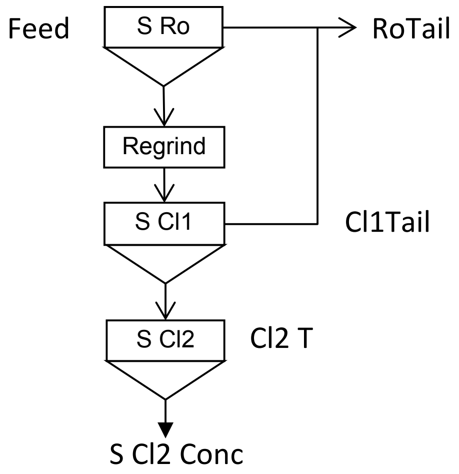


There is likely some scope to further coarsen primary grind size beyond 240 µm. However, this must be balanced against issues such as the handling of coarse solids and their 'flotability' through the sulfide flotation circuit, increasing sulfide regrind circuit power requirements and to a lesser extent gravity regrind power requirements. Given these considerations a primary grind P80 of 250 µm is recommended.

8.2 Regrind Size

Regrind optimisation tests, T07 to T13, were carried out following a primary grind of P80 = 250 µm and roughing at pH ~5.4, with ~900 g/t H_2SO_4, 225 g/t guar, 100 g/t $CuSO_4$, 140 g/t PAX and 70 g/t MIBC. Figure 8-6 shows the flowsheet tested, which consisted of roughing followed by regrind of the rougher concentrate and two stage open circuit cleaning of the reground rougher concentrate. Cleaner 1 tails and rougher tails were combined to form the total sulfide flotation tails.

Figure 8-6 Roughing plus regrind and 2 stage cleaning flowsheet



For the regrind duty both ball milling and stirred milling with ceramic media were investigated.

Results are summarised in Figure 8-7, Figure 8-8 and Figure 8-9.

Figure 8-7

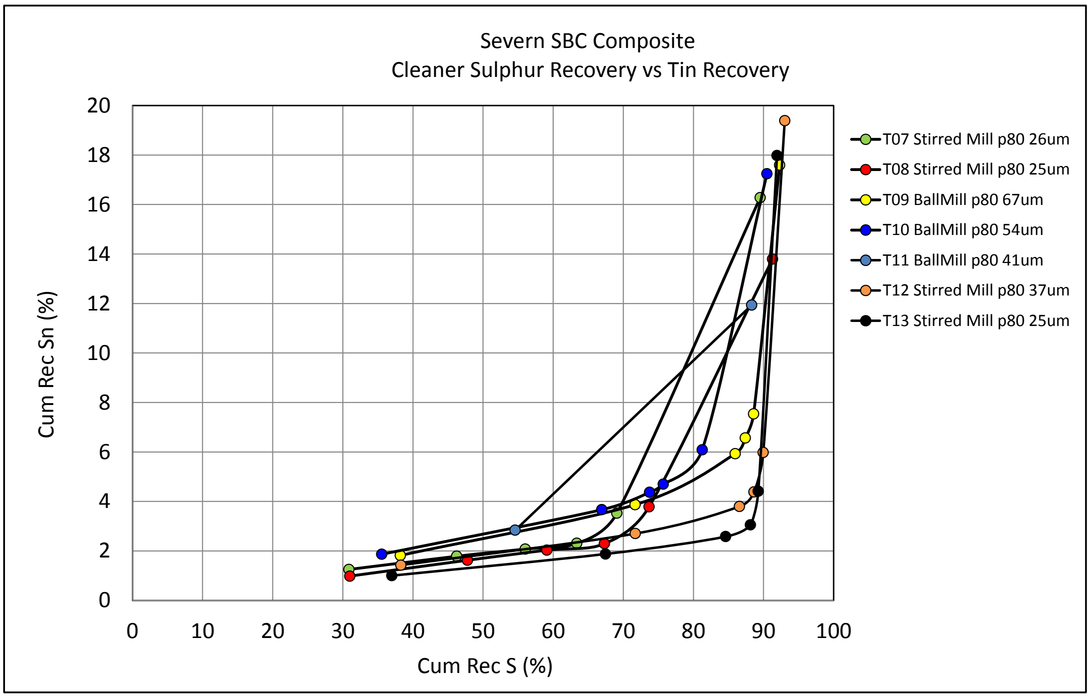


Figure 8-8

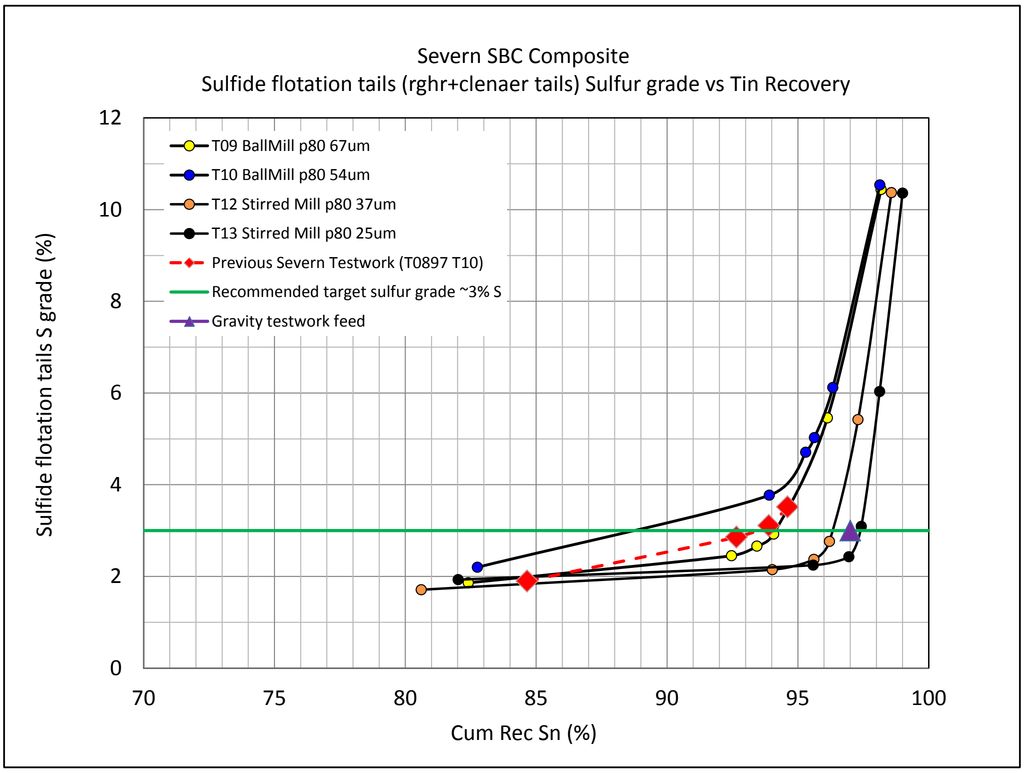
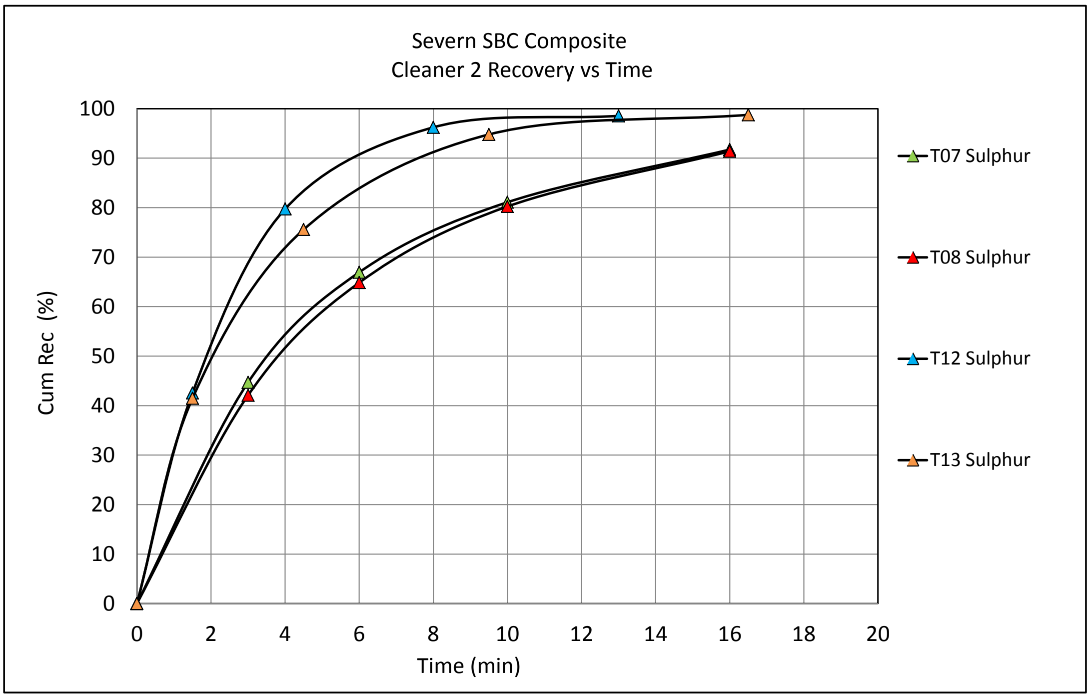


Figure 8-9



Initial stirred milling tests, T07 and T08, which gave a P80 to 26 and 25 µm, performed relatively poorly due to sluggish sulfide kinetics. However, following optimisation of reagent scheme post regrind extremely good results were achieved with a regrind P80 of 25 µm, with 97.4 % Sn recovery achieved to sulfide flotations tails a grade of 3% sulfur.

Referring to Figure 8-8 it can be seen a target sulfide flotation tails grade of 3% sulfur is appropriate. A 3% sulfur grade is considered readily manageable through the gravity circuit (Renison Bell successfully has operated for many years at this target sulfur grade), while very low tin losses are achievable at this grade following appropriate regrind and cleaning. Targeting a lower sulfur grade would significantly increase tin losses, while higher grades would place additional load on the gravity circuit, sulfide dressing circuit and sulfide scavenger circuit.

Comparing results of T12 and T13 which reground to P80 of 37 and 25 µm respectively a Sn recovery improvement of over 1% can be achieved at sulfide flotations tails a grade of 3% sulfur at the finer regrind size.

Comparing results for tests with ball milling and stirred milling shows significantly improved performance is achievable utilising stirred milling for regrind.

- A target regrind size of P80 = 25 µm is recommended. Required regrind energy input to achieve this regrind size = 20 kWh/t
- Recommended target sulfide flotation tails grade = 3% sulfur
- Recommended target final sulfide flotation concentrate grade = 45% sulfur (~85% sulfide mineral).

  Examination of the overall sulfide flotation results shows tin losses to final sulfide concentrate are strongly affected by final sulfide concentrate sulfur grade, with low losses favoured by high sulfur grades (hence reduced entrainment).

- Stirred milling for the sulfide regrind gives a clearly better outcome compared to ball milling. At the target regrind size stirred milling is expect to provide improved energy efficiency (of the order of 20%-30%), reduced media consumption costs and is also expected to provide advantages in installation costs compared to conventional ball milling.

8.3 Production of Sulfide Flotation Tailings for Downstream Testwork

Tests T14 to T21 were completed under the optimised conditions to produce sulfide flotation tailings for downstream testwork.

These larger scale sulfide flotation tests (12 kg batch floats) completed to generate sample for gravity and other downstream testwork produced ~80 kg sulfide flotation tailings at 3% sulfur with >97% Sn recovery as gravity circuit feed.

This demonstrated the optimised conditions at larger scale across a significant quantity of sample.

Notably both guar and frother consumption was reduced for these larger scale tests to 93 g/t and 64 g/t respectively compared with 325 g/t and 125 g/t for the smaller scale tests without adverse impact on performance.

8.4 Impact of Sulfur Head Grade

Although not considered untypical, S content of the Severn Bulk Composite sample is higher than the average for the overall Severn Mineral Resource at 14.6% S compared with 9.06% S. This results in a higher than average mass deportment to final sulfide concentrate for the SBC, and likely higher Sn loses than average. Figure 8-10 summarises mass, Sn and S deportment across the sulfide flotation circuit as per the optimised testwork results achieved on the Severn Bulk Composite .

Estimated mass, Sn and S deportment across the sulfide flotation circuit at 9.06% S head grade (average for the overall Severn Mineral Resource) is shown in Figure 8-11. This assume similar tin grades in final sulfide concentrate can be achieved at the resources average S grade.

At a sulfur head grade equal to the overall Severn Mineral Resource of 9.06% S, tin loss to the final sulfide concentrate is estimated at 1.4%, with 98.6% Sn recovery to the gravity circuit feed.

Figure 8-10 Tin Deportment Across Sulfide Flotation Circuit at 14.6% S head grade

(as per optimised testwork on Severn Bulk Composite)

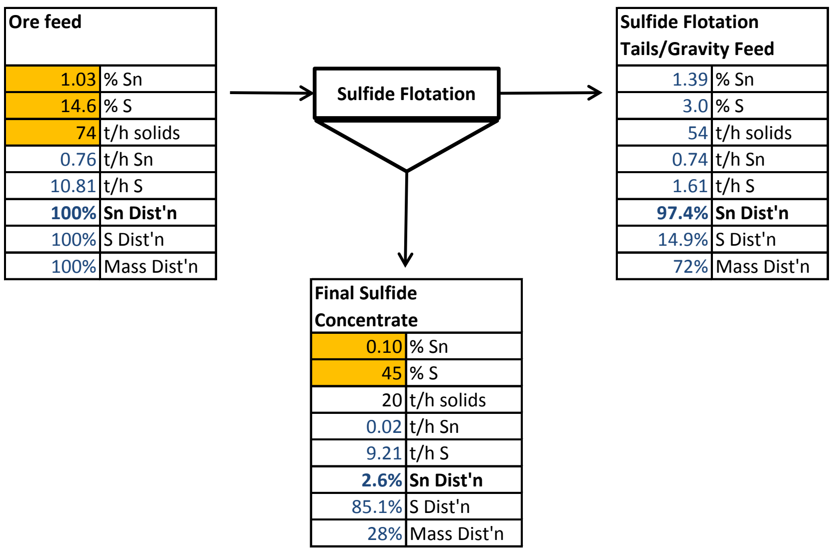
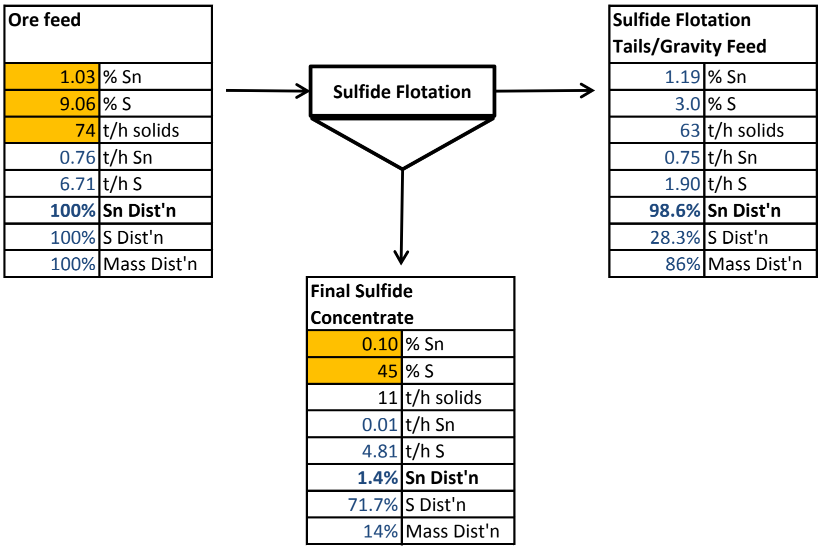


Figure 8-11 Estimated Tin Deportment Across Sulfide Flotation Circuit at 9.06% S head grade

(equivalent to overall Severn Mineral Resource S grad; assumes same performance as SBC)



Assuming similar tin grades in final sulfide concentrate can be achieved at the resources average sulfur grade, tin loss to the final sulfide concentrate is estimated at 1.4%, with 98.6% Sn recovery to the gravity circuit feed. This compares with a loss of 2.6% the final sulfide concentrate for the Severn Bulk Composite.

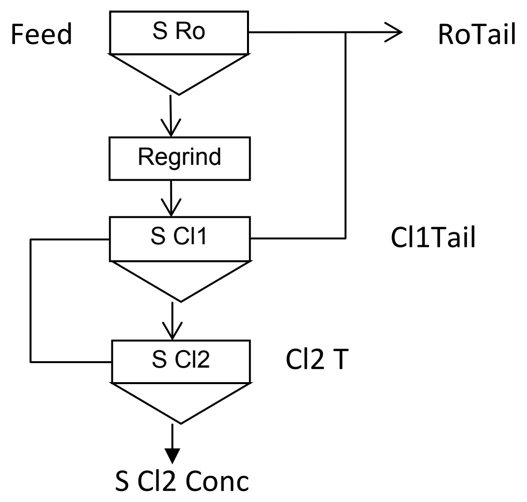
This represents some additional upside in overall tin recovery compared to that presented in Section 14.1.

8.5 Key Outcomes

- Primary grind size can be significantly coarser than what was considered in the PFS; a P80 of 250 μm is recommended. This compares with a P80 of 130 μm which was assumed for the PFS.
- A target regrind size of P80 = 25 μm is recommended. Required regrind energy input to achieve this regrind size = 20 kWh/t.
- Recommended target sulfide flotation tails grade = 3% sulfur
- Recommended target final sulfide flotation concentrate grade = 45% sulfur (~85% sulfide mineral).
- At the above target sulfur grades and grind sizes tin loss to final sulfide concentrate was 2.6% for the Severn Bulk Composite . Tin grade of the final sulfide concentrate was 0.10%.
- At a sulfur head grade equal to the overall Severn Mineral Resource of 9.06% S, tin loss to the final sulfide concentrate is estimated at 1.4%.
- Stirred milling for the sulfide regrind gives a clearly better outcome compared to ball milling. At the target regrind size stirred milling is expect to provide improved energy efficiency (of the

order of 20-30%), reduced media consumption costs and is also expected to provide advantages in installation costs compared to conventional ball milling.

Figure 8-12 – Recommended Circuit Configuration



The expected reagent consumptions for the sulfide flotation circuit based on dose rates observed in the testwork are summarised in Table 11.

Table 11 – Expected Sulfide Float Reagent Consumptions

pH	5.4
Sulfuric Acid	732 g/t
Copper Sulphate	200 g/t
PAX	225 g/t
Frother (MIBC)	64 g/t
Guar	93 g/t

8.6 Mineralogy of Sulfide Flotation Tails/Gravity Circuit Feed

Full reports for optical mineralogy carried out on the sulfide flotation tailings produced as feed to downstream gravity testwork are contained in Appendix 2. Initially standard MODA scans were completed (refer report dated July 2014). The slides were subsequently re-logged to assess siderite/cassiterite associations (refer report dated July 2014).

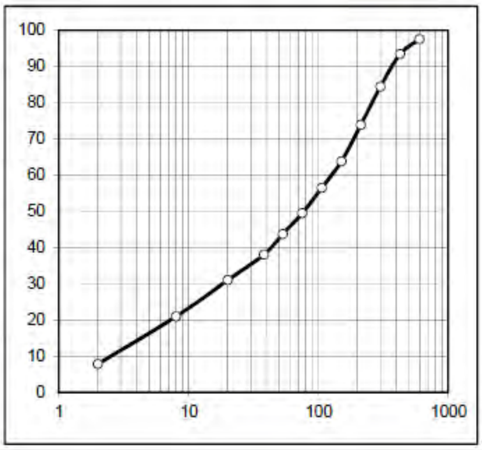
Figure 8-13 shows size distribution and size by size assays and metal deportment of the sulfide flotation tailings.

Figure 8-13 SBC Sulfide Flotation Tailings Size Distribution and Size by Size assays

ALS Metallurgy
BURNIE LABORATORY
SIZE ANALYSIS REPORT SHEET WITH CS6

PROJECT	T0879
SAMPLE	SBC Sulphide Tails
DATE	70614
TECHNICIAN	MS

SBC Sulphide Tails		SIZE um	WEIGHTS gm	(%)	%PASS
	P80	600	4.32	2.44	97.6
		425	7.34	4.15	93.4
		300	15.89	8.99	84.4
	263	212	18.62	10.54	73.9
		150	17.83	10.09	63.8
		106	12.92	7.31	56.5
		75	12.33	6.98	49.5
		53	10.21	5.78	43.7
		38	10.02	5.67	38.1
		20	12.48	7.06	31.0
MINS 20	CS5	8	17.75	10.04	21.0
CENTRIFUGE	CS6	2	23.24	13.15	7.8
		SUB	13.79	7.80	0.0
		TOTAL	176.7	100.0	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mount Number
212	26.12	0.68	13.3	16.85	22.5	0.09	13.8	3.05	25.9	48.70	31.1	879194
106	17.40	1.37	17.8	18.40	16.4	0.08	8.2	2.45	13.8	45.60	19.4	879195
53	12.75	1.75	16.7	18.00	11.7	0.05	3.8	2.75	11.4	39.50	12.3	879196
20	12.73	2.23	21.2	21.20	13.8	0.16	12.0	2.71	11.2	39.90	12.4	879197
8	10.04	2.39	17.9	24.60	12.6	0.38	22.4	3.00	9.8	31.60	7.8	897198
2	13.15	0.51	5.0	21.70	14.6	0.25	19.3	4.16	17.8	34.70	11.2	
CAL <2	7.80	1.41	8.2	20.87	8.3	0.45	20.5	4.01	10.2	30.64	5.8	
ASSAY	100.0	1.34	100.0	19.55	100.0	0.17	100.0	3.08	100.0	40.90	100.0	

SIZE um	WT %	MnO %	MnO dist	CaO %	CaO dist	MgO %	MgO dist	Al203 %	Al203 dist
212	26.12	0.44	20.2	0.84	23.1	3.76	26.5	9.05	27.7
106	17.40	0.63	19.2	1.00	18.3	3.62	17.0	7.87	16.0
53	12.75	0.61	13.6	1.01	13.6	3.01	10.4	6.34	9.5
20	12.73	0.71	15.9	1.29	17.3	3.28	11.3	6.64	9.9
8	10.04	0.78	13.7	1.20	12.7	3.27	8.9	6.28	7.4
2	13.15	0.44	10.2	0.85	11.8	4.13	14.7	10.65	16.4
CAL <2	7.80	0.53	7.2	0.40	3.3	5.32	11.2	14.50	13.2
ASSAY	100.0	0.57	100.0	0.95	100.0	3.70	100.0	8.55	100.0

The mineralogy is summarised in the extract and tables below (reproduced from MODA's report);

The following minerals were identified, in approximate descending order:

- Gangue (*quartz*, silicates, carbonate, *rutile*, *carbonaceous matter*, *fluorite*, *talc* etc.)
- *Magnetite* (preferentially represented in the +106µm fraction)
- *Pyrite* (78% crystalline and 22% *melnikovite*)
- *Cassiterite*
- *Pyrrhotite*
- *Sphalerite*
- *Marcasite*
- *Galena*
- *Arsenopyrite*
- *Chalcopyrite*
- *Goethite*
- *Hematite*
- *Stannite* (rare)
- *Native bismuth* (very rare)

Severn Bulk Comp Sulphide Tail Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	Cs#	St#	As#	Cp#	SpGn#	Ga
+212µm	26.1	2.3	0.5	0.3	Tr	0	Tr	0.5	96.5
+106µm	17.4	5.1	0.4	1.9	Tr	0	0	0.1	92.5
+53µm	12.8	2.5	1.1	2.0	Tr	1.0	0	0	93.4
+20µm	12.7	2.8	1.0	0.1	Tr	0	0	0	96.2
+8µm	10.0	4.4	0	2.3	0	0	0	1.0	92.3
TOTAL	**79.0**	**3.3**	**0.6**	**1.1**	**Tr**	**0.2**	**Tr**	**0.3**	**94.5**

Py=pyrite, Po=pyrrhotite, Cs=cassiterite, St=stannite, As=arsenopyrite, Cp=chalcopyrite, SpGn=sphalerite+galena, Ga=gangue
 # count statistics are very poor for the scarce minerals

Severn Bulk Comp Sulphide Tail Composition Vol% (from Sn scan)

Fraction	Sn Wt%	Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	Siderite fraction% of non-sulphide Ga
+212µm	13.3	16.1	36.6	12.9	1.2	1.0	1.4	0.2	30.8	19
+106µm	17.8	18.7	17.1	41.6	4.4	0.3	0.5	0.2	17.3	35
+53µm	16.7	16.4	9.9	54.6	2.5	0	1.0	0	15.5	38
+20µm	21.2	14.1	10.2	67.7	0.8	0	1.4	Tr	5.7	45
+8µm	17.9	7.7	1.0	88.1	0	0	1.0	0	2.3	64
TOTAL	86.9	14.5	13.7	55.7	1.8	0.2	1.1	0.1	13.1	34

Sd=siderite, Qz=quartz, Cs=cassiterite, PyMa=pyrite/marcasite, Po=pyrrhotite, Fl=fluorite, OS=other sulphides, OG=other gangue

Severn Bulk Comp Sulphide Tail Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary+
			Py	Po	St	Cp	As	Ga	
+212µm	13.3	0	0	0	0	0	0	73	27
+106µm	17.8	14	3	3	0	0	0	70	10
+53µm	16.7	50	0	0	0	0	0	47	2
+20µm	21.2	71	0	0	0	1	0	27	1
+8µm	17.9	87	0	1	0	0	0	10	1
TOTAL	86.9	48	1	1	0	0	0	43	7

Severn Bulk Comp Sulphide Tail Cassiterite liberation distribution%

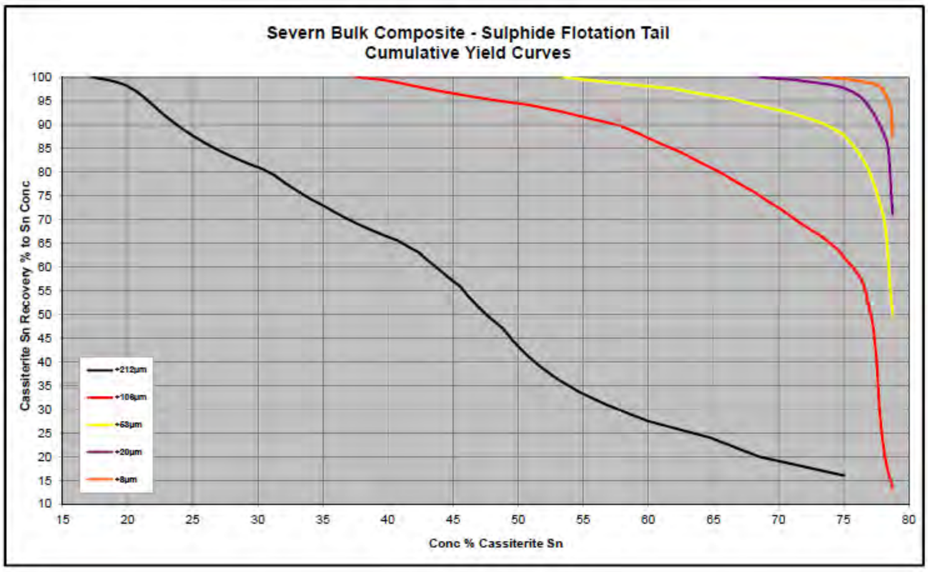
Fraction	Sn Wt%	Free	Binary with						Ternary+
			Sd	Qz	PyMa	Po	Fl	OG	
+212µm	13.3	0	0	11	0	0	0	18	71
+106µm	17.8	26	16	9	2	0	0	22	22
+53µm	16.7	55	6	4	2	0	0	23	10
+20µm	21.2	64	11	4	0	0	0	14	7
+8µm	17.9	92	3	2	0	0	0	3	0
TOTAL	86.9	50	8	6	1	0	0	16	19

Severn Bulk Comp Sulphide Tail Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	St	Cp	As	Ga
+212µm	13.3	18	16	0	1	0	100
+106µm	17.8	12	5	0	1	0	80
+53µm	16.7	0	1	0	2	2	50
+20µm	21.2	0	0	0	1	0	28
+8µm	17.9	0	2	0	0	0	11
TOTAL	86.9	5	4	0	1	0	50

Severn Bulk Comp Sulphide Tail Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Sd	Qz	PyMa	Po	Fl	OG
+212µm	13.3	40	72	4	9	8	59
+106µm	17.8	31	17	6	2	1	37
+53µm	16.7	11	12	4	2	0	28
+20µm	21.2	14	9	0	0	0	19
+8µm	17.9	3	2	0	0	0	3
TOTAL	86.9	19	19	3	2	1	27



Notably the residence of Sn in cassiterite sums to >99.9% with <0.1% in stannite.

Sn liberation is limited in the coarser fractions. However, this increases to >50% in the +53 µm, clearly indicating the need for significant regrind within the gravity circuit.

Overall 19% of the cassiterite observed is associated with siderite. Generally association with siderite increases in the coarser fractions with 40% of cassiterite +212 µm being associated with siderite. Given the relatively high SG of siderite and association with cassiterite it is expected this will tend to concentrate within the gravity circuit.

9 GRAVITY SEPARATION

Following optimisation of the sulfide flotation a series of larger (12 kg) batch flotation tests (tests T14 to T21) were completed on the Severn Bulk Composite under the optimised conditions to produce sulfide flotation tailings for downstream testwork. This produced ~80 kg of sulfide flotation tailings at 3% sulfur with >97% Sn recovery which was composited to form the gravity circuit feed.

Gravity separation testing consisted of initial batch testing, followed by lock cycle testing. In both cases testing was completed using a laboratory Mozley table, with size based separations completed via cycloning and screening. Two tests were also completed to assess the ability of the UF Falcon centrifugal separator to scavenge additional tin from the "-106 µm tails" stream produced from the lock testing.

The basic concept of the gravity circuit flowsheet was to produce a crude heavy mineral concentrate suitable for upgrading to saleable tin concentrate grades via dressing and (if required) concentrate leaching.

Full gravity testing results are contained in Appendix 7.

9.1 Gravity Separation Batch Testing

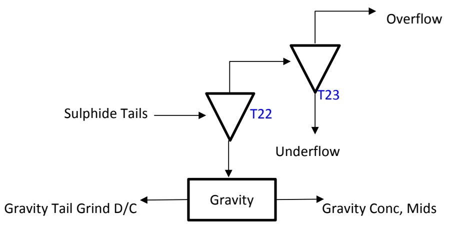
Initial batch testing results are summarized in Table 12 with Figure 9-1 summarising the overall mass balance based on sulfide flotation feed for the batch testing.

Table 12 – Gravity Batch Testing Results

ALS Metallurgy
BURNIE LABORATORY: SEPARATION REPORT SHEET

PROJECT	T0879
TEST NO	T22, T23, T24
DATE	21/07/14
TECH	MS

TEST TYPE	Cyclone & Gravity Separation
Stage 1	Cyclone T22
Stage 2	Cyclone T23
Stage 3	Mozley Separation T24



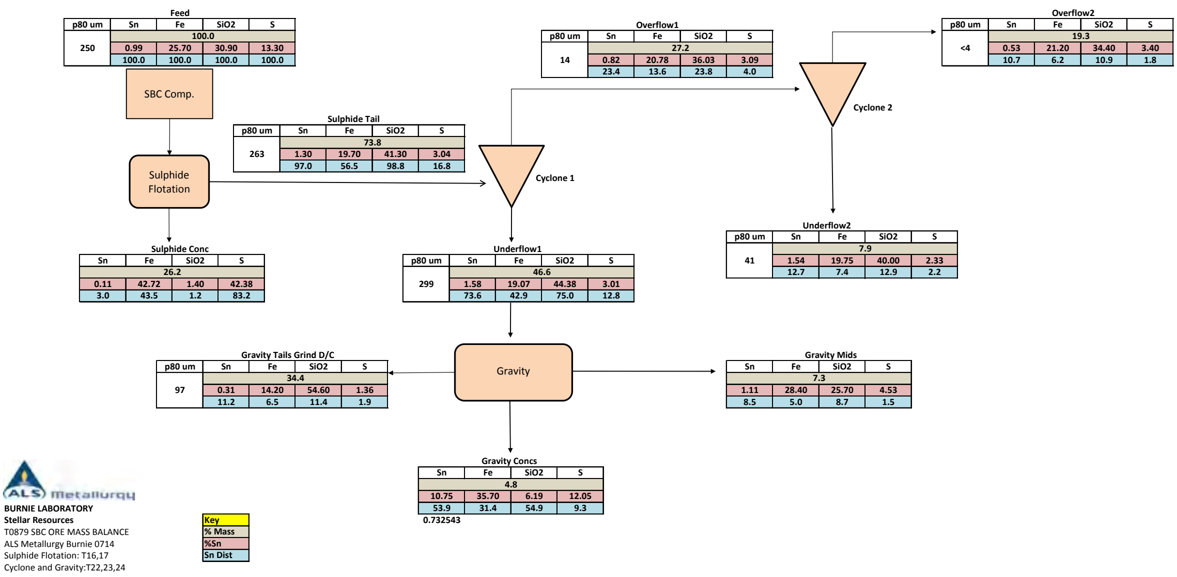
START MATERIAL	SBC - SRT (T22 cyclone) Feed
FROM TEST NO	
START WEIGHT (gm)	1852.45

SEPARATION RESULTS

Product	Weight (gm)	P80 (Sizing)	Weight (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	As (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)	MnO (%)	Dist (%)
T23 Overflow	484.30	<8	26.14	0.53	11.0	21.20	28.5	0.21	38.8	3.40	29.6	34.40	21.6	0.44	20.8
Underflow	198.80	41	10.73	1.54	13.1	19.75	10.9	0.20	15.2	2.33	8.3	40.00	10.3	0.65	12.6
T24 Gravity Conc	120.39		6.50	10.75	55.6	35.70	11.9	0.52	23.9	12.05	26.0	6.19	1.0	1.07	12.6
Gravity Mids	184.36		9.95	1.11	8.8	28.40	14.5	0.08	5.6	4.53	15.0	25.70	6.1	1.12	20.2
Gravity Tail Grind D/C	864.60	97	46.67	0.31	11.5	14.20	34.1	0.05	16.5	1.36	21.1	54.60	61.1	0.40	33.8
Total	1852.45		100.00	1.26	100.0	19.44	100.0	0.14	100.0	3.01	100.0	41.73	100.0	0.55	100.0

Product	Weight (gm)	P80 (Sizing)	Weight (%)	CaO (%)	Dist (%)	MgO (%)	Dist (%)	Al2O3 (%)	Dist (%)	Sample No
T23 Overflow	484.30	>8	26.14	0.52	15.8	4.35	31.4	11.90	36.4	879201
Underflow	198.80	41	10.73	1.13	14.0	3.33	9.9	6.64	8.3	879202
T24 Gravity Conc	120.39		6.50	0.69	5.2	2.02	3.6	2.17	1.6	879203
Gravity Mids	184.36		9.95	1.37	15.8	3.60	9.9	6.33	7.4	879204
Gravity Tail Grind D/C	864.60	97	46.67	0.91	49.2	3.52	45.3	8.49	46.3	879205
Total	1852.45		100.00	0.86	100.0	3.63	100.0	8.56	100.0	

Figure 9-1 – Gravity Batch Testing Results



These initial results showed good promise achieving 53.9% Sn recovery to the gravity concentrate with an additional 19.7% of tin contained within middling streams.

Significantly ~74% of feed Sn units were recovered to the primary gravity cyclone underflow.

9.2 Gravity Separation Lock Cycle Testing

Lock cycle testing was completed with three basic aims:

1. Optimise the gravity circuit configuration
2. Quantify achievable gravity circuit performance
3. Produce representative feed sample for downstream testwork; de-slime, sulfide scavenging and tin flotation

To meet number 3 of these aims the lock cycling testing was carried on over a much larger number of cycles (a total of 31 cycles) than would typically be completed. Aside from producing the required quantity of sample for downstream testwork this also provided considerable confidence in the achievable results.

Over the initial 6 cycles the configuration of the lock cycle flowsheet was modified to optimise overall performance. For cycles 1 to 4 the circuit consisted of primary gravity classification via cyclone, with cyclone underflow screened at 106 µm to produce “coarse gravity” (labelled as +106 µm) and “fine gravity” (labelled as -106µm) feed streams, with a single roughing stage in the “coarse” and “fine” streams. Coarse tailings and fine mids were recycled following regrinding, while fine tails formed a final tailings stream (refer Figure 9-2).

An additional fine scavenger stage was added in cycle 5 (refer Figure 9-3), with cleaner stages for both the fine rougher and fine scavenger added for cycles 6 to 31 (refer Figure 9-4).

Figure 9-2 - Gravity Lock Cycle Test Flowsheet: Cycles 1 to 4

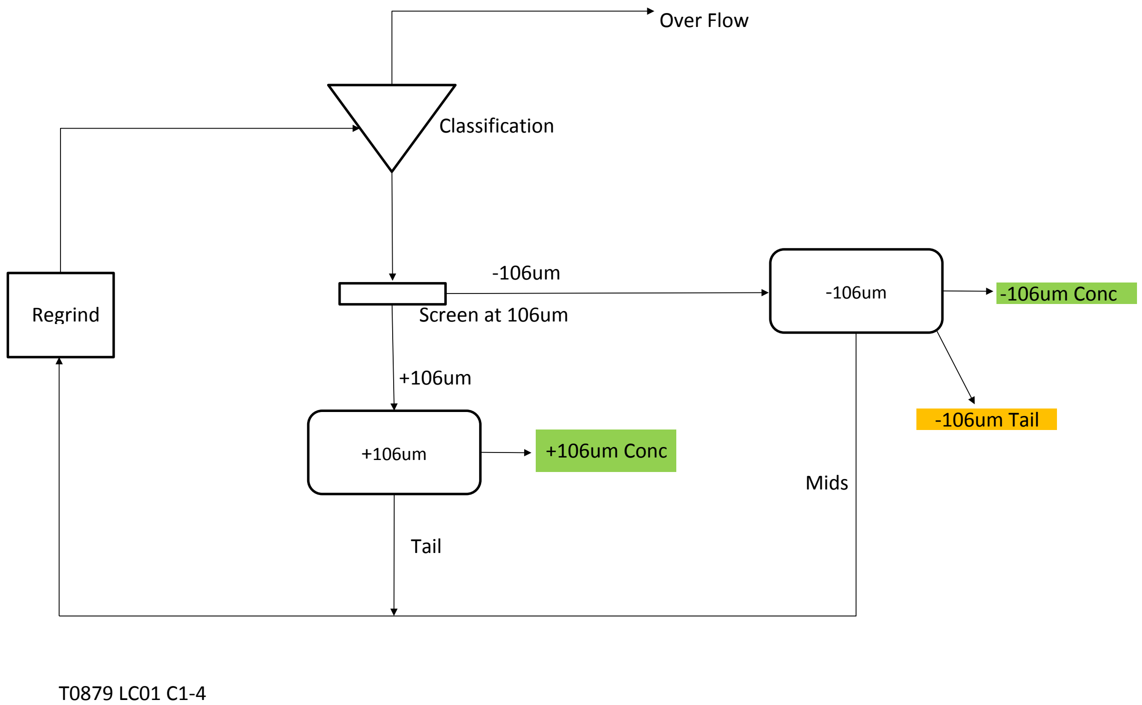


Figure 9-3 - Gravity Lock Cycle Test Flowsheet: Cycle 5

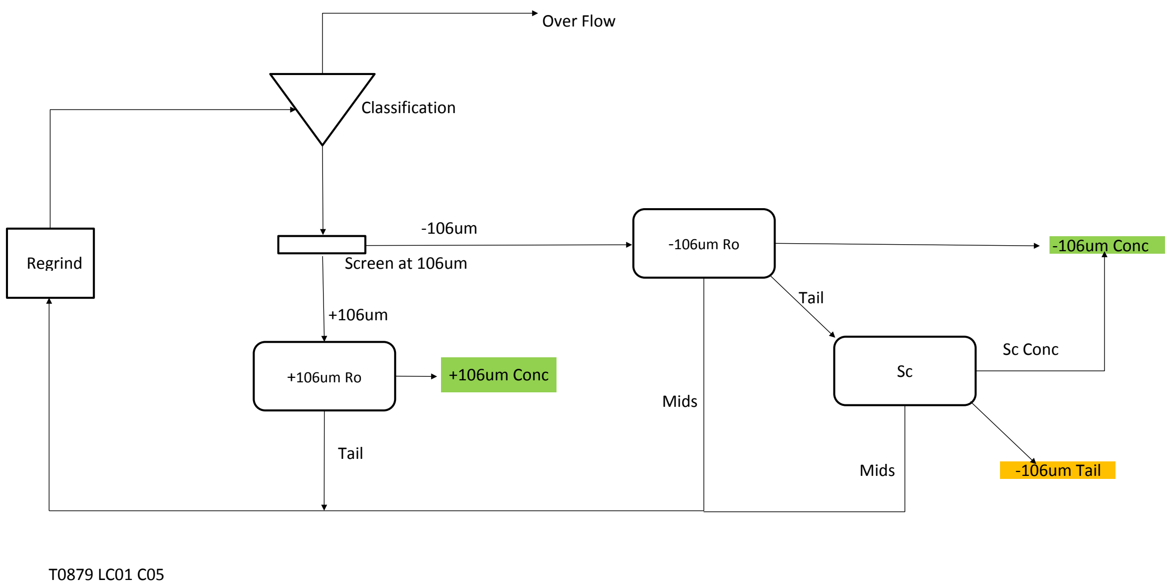


Figure 9-4 - Gravity Lock Cycle Test Flowsheet: Cycles 6 to 31

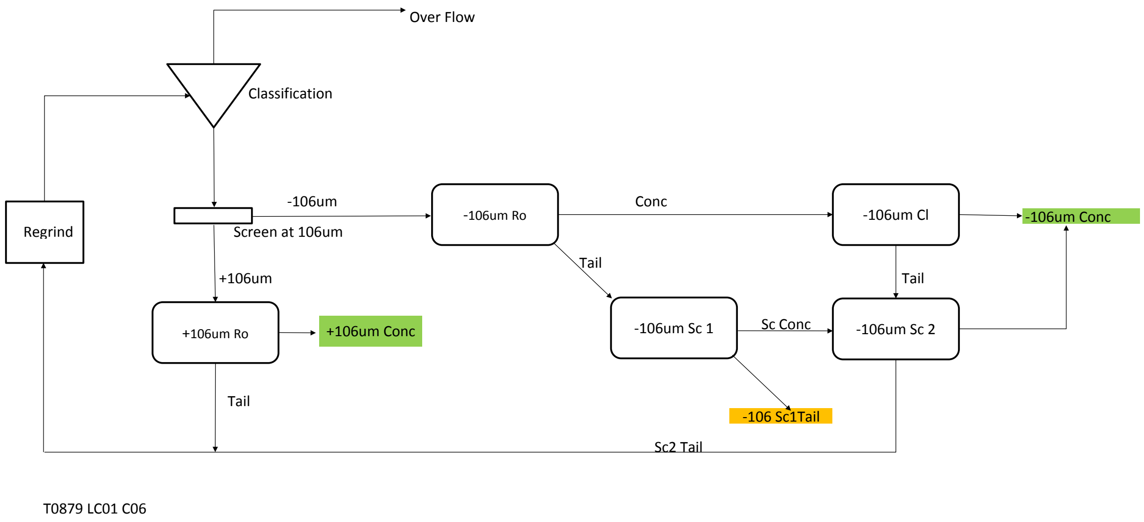


Table 13 shows the overall results for the lock cycle test across all cycles completed (cycles 1 to 31), with Table 14 shows a summary of grades, mass and metal distributions for cycles 16 to 31. Over the course of the lock cycle testing a number of sizing surveys were completed with size distributions and size by size assays results contained in Appendix 7.

WorleyParsons

resources & energy

EcoNomics

STELLAR RESOURCES LIMITED

HEEMSKIRK TIN PROJECT

SEVERN FURTHER FLOWSHEET DEVELOPMENT AND OPTIMISATION

Table 13 – Overall Gravity Lock Cycle Test results

ALS Metallurgy

BURNIE LABORATORY: LOCKED CYCLE GRAVITY TEST

PROJECT	T0879
TEST NO	LC01
FEED	SULPHIDE TAILS
FROM TEST	
DATE	50814
TECH	ID

EXIT STREAMS

CYCLE NO		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Gravity final conc 1	gm	35.54	40.57	43.98	45.58	44.50	46.95	49.10	53.20	48.70	58.10	52.10	54.90	54.40	54.70	52.70
(+106 Conc)	%Sn	9.49	9.19	8.14	9.01	8.92	9.90	9.16	8.80	8.31	8.00	9.04	9.68	9.68	9.68	9.68
dry wt and assays	%Fe	37.50	38.10	38.60	37.60	37.80	39.50	34.30	38.10	37.90	38.40	38.00	36.60	36.60	36.60	36.60
	%S	11.10	11.75	11.40	11.55	13.15	9.61	11.75	10.80	9.33	9.97	9.61	11.40	11.40	11.40	11.40
	%SiO2	6.23	6.10	6.10	6.21	6.23	5.27	6.86	5.26	6.57	6.31	5.83	6.21	6.21	6.21	6.21
Gravity final conc 2	gm	24.79	26.80	35.20	44.30	41.26	43.37	58.80	46.40	70.80	65.80	46.50	52.90	62.10	66.70	64.90
(-106 Conc)	%Sn	26.50	30.30	30.40	26.50	30.00	28.6	18.65	24.10	19.20	19.20	22.20	25.60	25.60	25.60	25.60
dry wt and assays	%Fe	31.70	29.20	29.00	31.70	29.10	29.0	37.7	34.40	35.20	36.50	27.60	29.20	29.20	29.20	29.20
	%S	14.70	15.95	17.30	20.20	19.35	18.5	19.2	10.80	16.30	12.55	11.75	17.60	17.60	17.60	17.60
	%SiO2	2.50	2.12	1.85	1.83	1.86	1.86	1.87	1.97	2.30	2.26	3.18	2.15	2.15	2.15	2.15
Gravity Final Tail	gm	364.80	522.30	953.69	1018.90	1021.80	1231.30	877.60	956.50	1120.10	967.70	863.50	1086.80	1022.70	1013.50	1029.30
(-106 Tails)	%Sn	0.30	0.42	0.44	0.47	0.38	0.41	0.42	0.44	0.32	0.34	0.38	0.36	0.33	0.38	0.38
dry wt and assays	%Fe	13.60	16.75	18.15	18.25	16.95	16.3	18.75	16.90	15.30	16.25	16.60	16.75	17.20	17.00	16.80
	%S	1.08	1.41	1.78	1.28	1.79	1.76	1.64	1.72	1.14	1.50	1.10	1.63	1.56	1.65	1.58
	%SiO2	55.40	50.20	46.00	47.30	48.50	48.3	45.7	49.00	52.80	48.30	50.50	48.70	48.30	47.50	48.60
Over Flow	gm	739.1	1109.8	885.4	802.0	874.0	707.7	1283.6	846.2	912.0	904.8	989.9	871.8	920.9	943.6	929.1
	%Sn	0.65	0.65	0.65	0.65	0.65	0.65	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
dry wt and assays	%Fe	19.35	19.35	19.35	19.35	19.35	19.35	20.34	20.34	20.34	20.34	20.34	20.34	20.34	20.34	20.34
	%S	2.96	2.96	2.96	2.96	2.96	2.96	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
	%SiO2	39.70	39.70	39.70	39.70	39.70	39.7	37.44	37.44	37.44	37.44	37.44	37.44	37.44	37.44	37.44
Combined Concentrate	gm	60.33	67.37	79.18	89.88	85.76	90.32	107.90	99.60	119.50	123.90	98.60	107.80	116.50	121.40	117.60
	%Sn	16.48	17.59	18.04	17.63	19.06	18.88	14.33	15.93	14.76	13.95	15.25	17.49	18.17	18.43	18.47
	%Fe	35.12	34.56	34.33	34.69	33.61	34.46	36.15	36.38	36.30	37.39	33.10	32.97	32.66	32.53	32.52
	%S	12.58	13.42	14.02	15.81	16.13	13.88	15.81	10.80	13.46	11.34	10.62	14.44	14.70	14.81	14.82
	%SiO2	4.70	4.52	4.21	4.05	4.13	3.63	4.14	3.73	4.04	4.16	4.58	4.22	4.05	3.98	3.97

CYCLE NO		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVERAGE
Gravity final conc 1	gm	53.60	58.40	53.10	56.70	55.90	54.30	55.20	51.50	53.90	54.40	54.10	56.70	51.40	51.70	52.40	56.70	870.00
(+106 Conc)	%Sn	9.10	9.10	9.10	9.06	9.21	9.21	9.21	19.80	19.80	19.80	9.15	9.15	9.15	10.45	10.45	10.45	11.34
dry wt and assays	%Fe	37.40	37.40	37.40	36.60	37.10	37.10	37.10	35.20	35.20	35.20	36.60	36.60	36.60	43.70	43.70	43.70	37.91
	%S	11.10	11.10	11.10	9.62	10.80	10.80	10.80	18.25	18.25	18.25	11.45	11.45	11.45	12.90	12.90	12.90	12.70
	%SiO2	6.38	6.38	6.38	7.78	6.61	6.61	6.61	2.24	2.24	2.24	7.05	7.05	7.05	7.47	7.47	7.47	6.06
Gravity final conc 2	gm	61.90	61.50	63.80	63.00	64.30	59.10	58.40	55.50	54.90	60.40	60.10	59.40	59.80	57.10	65.70	63.30	968.20
(-106 Conc)	%Sn	20.70	20.70	20.70	22.90	22.90	22.90	21.20	19.80	19.80	19.80	20.90	20.90	20.90	23.50	23.50	23.50	21.57
dry wt and assays	%Fe	33.00	33.00	33.00	31.70	31.70	31.70	34.50	35.20	35.20	35.20	35.70	35.70	35.70	44.90	44.90	44.90	36.02
	%S	17.60	17.60	17.60	16.30	16.30	16.30	19.85	18.25	18.25	18.25	18.60	18.60	18.60	17.60	17.60	17.60	17.79
	%SiO2	2.99	2.99	2.99	2.59	2.59	2.59	2.04	2.24	2.24	2.24	2.54	2.54	2.54	2.32	2.32	2.32	2.51
Gravity Final Tail	gm	1039.20	883.30	1068.10	1081.30	1058.10	1067.20	1028.40	1070.30	984.70	1023.40	955.00	1039.10	1064.40	1053.40	1096.00	998.30	16510.20
(-106 Tails)	%Sn	0.41	0.41	0.41	0.39	0.39	0.39	0.39	0.40	0.40	0.40	0.37	0.37	0.37	0.39	0.39	0.39	0.39
dry wt and assays	%Fe	17.45	17.45	17.45	17.20	17.20	17.20	17.70	17.15	17.15	17.15	17.10	17.10	17.10	16.55	16.55	16.55	17.12
	%S	1.69	1.69	1.69	1.52	1.52	1.52	1.69	1.62	1.62	1.62	1.64	1.64	1.64	1.56	1.56	1.56	1.61
	%SiO2	48.20	48.20	48.20	48.30	48.30	48.30	47.10	47.90	47.90	47.90	47.70	47.70	47.70	48.90	48.90	48.90	48.14
Over Flow	gm	791.7	1045.9	711.1	793.2	827.0	818.0	848.6	843.4	929.7	925.0	954.4	894.5	935.6	871.3	812.0	753.8	13755.24
	%Sn	0.53	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
dry wt and assays	%Fe	20.34	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.68
	%S	3.16	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
	%SiO2	37.44	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40
Combined Concentrate	gm	115.50	119.90	116.90	119.70	120.20	113.40	113.60	107.00	108.80	114.80	114.20	116.10	111.20	108.80	118.10	120.00	1838.20
	%Sn	15.32	15.05	15.43	16.34	16.53	16.34	15.37	19.80	19.80	19.80	15.33	15.16	15.47	17.30	17.71	17.33	16.73
	%Fe	35.04	35.14	35.00	34.02	34.21	34.29	35.76	35.20	35.20	35.20	36.13	36.14	36.12	44.33	44.37	44.33	36.91
	%S	14.58	14.43	14.65	13.14	13.74	13.67	15.45	18.25	18.25	18.25	15.21	15.11	15.30	15.37	15.51	15.38	15.36
	%SiO2	4.56	4.64	4.53	5.05	4.46	4.51	4.26	2.24	2.24	2.24	4.68	4.74	4.62	4.77	4.61	4.75	4.20

REGRIND DATA

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
New Feed (gm) (dry)	2003	2005	2005	2007	2010	2010	2010	2010	2010	2010	2001	2001	2007	2003	2006
Regrind feed Damp Wt (gm)	0.0	736.2	927	1099	1249	1314	1475	1178	1344	1237	1346	1371	1298	1268	1246
Regrind Time (min per 100gm)	3.0	3.0	2.8	3.0	3.0	3.0	3.0	3.3	3.5	3.5	3.5	4.0	4.0	4.0	4.0
Regrind Time (min.sec)	0.0	22.1	26.0	33.0	37.5	39.4	44.3	38.9	46.4	42.7	47.3	51.9	50.7	49.8	51.6
Regrind D/C underflow (%Wt)															

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
New Feed (gm) (dry)	2001	2003	2006	2008	2008	2003	2015	2006	2008	2008	2001	2008	2007	2008	2003	2007	
Regrind feed Damp Wt (gm)	1290	1310	1172	1334	1294	1281	1251	1280	1277	1302	1225	1258	1301	1278	1284	1296	
Regrind Time (min per 100gm)	4.0	4.0	4.0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
Regrind Time (min.sec)	52.4	46.9	53.4	53.7	53.2	51.9	53.1	53.0	54.0	50.8	52.2	54.0	53.0	53.3	53.8	53.7	
Regrind D/C underflow (%Wt)																	

DISTRIBUTIONS		AV	FROM NEW FEED (%)														
		16-31	Cyc 1	Cyc 2	Cyc 3	Cyc 4	Cyc 5	Cyc 6	Cyc 7	Cyc 8	Cyc 9	Cyc 10	Cyc 11	Cyc 12	Cyc 13	Cyc 14	Cyc 15
MASS	+106 Conc	2.70	1.76	2.01	2.18	2.26	2.21	2.33	2.44	2.64	2.42	2.88	2.59	2.72	2.70	2.71	2.61
	-106 Conc	3.00	1.23	1.33	1.75	2.20	2.05	2.15	2.92	2.30	3.51	3.26	2.31	2.62	3.08	3.31	3.22
	-106 Tail	51.20	18.10	25.92	47.32	50.56	50.70	61.10	43.55	47.46	55.58	48.02	42.85	53.93	50.75	50.29	51.07
	Over Flow	42.66	36.67	55.07	43.93	39.79	43.37	35.12	63.69	41.99	45.25	44.90	49.12	43.26	45.69	46.82	46.10
	Calc Recycle	0.44	42.23	15.68	4.82	5.19	1.68	-0.69	-12.59	5.61	-6.76	0.94	3.14	-2.53	-2.22	-3.13	-3.01
TIN	+106 Conc	23.08	12.62	13.95	13.40	15.37	14.86	17.40	16.83	17.52	15.15	17.40	17.63	19.89	19.71	19.82	19.09
	-106 Conc	48.85	24.59	30.39	40.05	43.94	46.33	46.43	41.05	41.85	50.88	47.29	38.64	50.69	59.50	63.91	62.19
	-106 Tail	15.13	4.10	8.21	15.71	17.92	14.53	18.90	13.80	15.75	13.42	12.31	12.28	14.64	12.63	14.42	14.64
	Over Flow	15.23	17.98	27.00	21.54	19.51	21.26	17.22	25.46	16.79	18.09	17.95	19.64	17.29	18.27	18.72	18.43
	Calc Recycle	-2.31	40.71	20.44	9.30	3.25	3.02	0.06	2.86	8.08	2.47	5.05	11.81	-2.52	-10.11	-16.86	-14.35
TIN REC OA (%)		**71.94**	**37.21**	**44.35**	**53.45**	**59.31**	**61.19**	**63.82**	**57.88**	**59.38**	**66.03**	**64.68**	**56.27**	**70.58**	**79.21**	**83.73**	**81.28**
TIN REC GRAVITY (%)		**82.55**	**90.08**	**84.38**	**77.29**	**76.79**	**80.81**	**77.16**	**80.75**	**79.03**	**83.11**	**84.01**	**82.08**	**82.82**	**86.25**	**85.31**	**84.74**
IRON	+106 Conc	5.23	3.38	3.93	4.31	4.35	4.27	4.71	4.28	5.15	4.69	5.67	5.03	5.10	5.06	5.08	4.90
	-106 Conc	5.53	2.00	1.99	2.59	3.57	3.05	3.19	5.63	4.05	6.33	6.10	3.26	3.92	4.60	4.95	4.81
	-106 Tail	44.87	12.60	22.22	43.96	47.22	43.98	50.97	41.79	41.05	43.52	39.93	36.40	46.23	44.67	43.75	43.91
	Over Flow	45.15	36.32	54.53	43.51	39.41	42.95	34.77	66.30	43.71	47.11	46.73	51.13	45.03	47.57	48.74	47.99
	Calc Recycle	-0.79	45.70	17.34	5.64	5.45	5.75	6.36	-17.99	6.04	-1.64	1.57	4.18	-0.28	-1.89	-2.52	-1.61
SULPHUR	+106 Conc	11.48	6.58	7.95	8.36	8.78	9.76	7.53	9.62	9.58	7.58	9.66	8.35	10.44	10.34	10.40	10.02
	-106 Conc	17.95	6.08	7.13	10.16	14.93	13.32	13.38	18.83	8.36	19.25	13.77	9.11	15.53	18.23	19.58	19.05
	-106 Tail	27.71	6.57	12.28	28.32	21.76	30.51	36.15	24.01	27.44	21.30	24.21	15.84	29.55	26.61	27.90	27.13
	Over Flow	45.05	36.49	54.80	43.72	39.60	43.15	34.94	67.66	44.60	48.07	47.69	52.18	45.95	48.54	49.74	48.97
	Calc Recycle	-2.19	44.27	17.84	9.44	14.94	3.26	8.00	-20.12	10.01	3.80	4.66	14.51	-1.47	-3.73	-7.62	-5.18
SILICA	+106 Conc	0.398	0.27	0.30	0.32	0.34	0.33	0.30	0.40	0.34	0.38	0.44	0.37	0.41	0.41	0.41	0.39
	-106 Conc	0.183	0.07	0.07	0.08	0.10	0.09	0.10	0.13	0.11	0.20	0.18	0.18	0.14	0.16	0.17	0.17
	-106 Tail	59.72	24.30	31.52	52.75	57.95	59.58	71.51	48.22	56.35	71.11	56.20	52.43	63.64	59.39	57.88	60.15
	Over Flow	38.66	35.28	52.97	42.26	38.28	41.72	33.78	57.78	38.09	41.05	40.73	44.56	39.24	41.45	42.48	41.82
	Calc Recycle	1.04	40.08	15.14	4.59	3.34	-1.73	-5.68	-6.54	5.11	-12.74	2.45	2.47	-3.43	-1.41	-0.94	-2.53

DISTRIBUTIONS		Cyc 16	Cyc 17	Cyc 18	Cyc 19	Cyc 20	Cyc 21	Cyc 22	Cyc 23	Cyc 24	Cyc 25	Cyc 26	Cyc 27	Cyc 28	Cyc 29	Cyc 30	Cyc 31
MASS	+106 Conc	2.66	2.90	2.63	2.81	2.77	2.69	2.74	2.56	2.67	2.70	2.68	2.81	2.55	2.57	2.60	2.81
	-106 Conc	3.07	3.05	3.17	3.13	3.19	2.93	2.90	2.75	2.72	3.00	2.98	2.95	2.97	2.83	3.26	3.14
	-106 Tail	51.56	43.83	53.00	53.65	52.50	52.95	51.03	53.11	48.86	50.78	47.39	51.56	52.81	52.27	54.38	49.53
	Over Flow	39.28	51.90	35.28	39.36	41.03	40.59	42.11	41.85	46.13	45.90	47.36	44.38	46.42	43.23	40.29	37.40
	Calc Recycle	3.42	-1.67	5.92	1.05	0.50	0.83	1.23	-0.26	-0.39	-2.37	-0.41	-1.70	-4.76	-0.90	-0.53	7.11
TIN	+106 Conc	18.26	19.89	18.09	19.23	19.27	18.72	19.03	38.17	39.95	40.32	18.53	19.42	17.60	20.22	20.50	22.18
	-106 Conc	47.96	47.65	49.43	54.00	55.11	50.66	46.34	41.13	40.69	44.76	47.01	46.47	46.78	50.22	57.79	55.68
	-106 Tail	15.95	13.56	16.39	15.78	15.45	15.58	15.01	16.02	14.74	15.32	13.23	14.39	14.74	15.38	16.00	14.57
	Over Flow	15.71	18.40	12.51	13.95	14.55	14.39	14.93	14.84	16.35	16.27	16.79	15.74	16.46	15.33	14.28	13.26
	Calc Recycle	2.13	0.51	3.58	-2.96	-4.38	0.66	4.69	-10.16	-11.73	-16.67	4.44	3.99	4.42	-1.15	-8.57	-5.69
TIN REC OA (%)		**66.22**	**67.54**	**67.52**	**73.23**	**74.38**	**69.37**	**65.37**	**79.30**	**80.63**	**85.08**	**65.54**	**65.89**	**64.38**	**70.45**	**78.28**	**77.85**
TIN REC GRAVITY (%)		**80.59**	**83.29**	**80.47**	**82.27**	**82.81**	**81.66**	**81.32**	**83.19**	**84.54**	**84.74**	**83.21**	**82.07**	**81.37**	**82.08**	**83.03**	**84.23**
IRON	+106 Conc	5.09	5.55	5.04	5.27	5.27	5.12	5.20	4.60	4.82	4.86	5.03	5.27	4.78	5.74	5.81	6.29
	-106 Conc	5.19	5.15	5.35	5.07	5.18	4.76	5.12	4.96	4.91	5.40	5.45	5.38	5.42	6.51	7.49	7.22
	-106 Tail	46.05	39.14	47.33	47.23	46.21	46.61	46.22	46.61	42.88	44.57	41.47	45.12	46.22	44.27	46.06	41.96
	Over Flow	40.89	54.98	37.38	41.69	43.47	43.00	44.61	44.33	48.87	48.62	50.17	47.02	49.18	45.80	42.68	39.63
	Calc Recycle	2.78	-4.82	4.90	0.74	-0.13	0.52	-1.15	-0.51	-1.48	-3.45	-2.11	-2.80	-5.60	-2.32	-2.05	4.91
SULPHUR	+106 Conc	9.92	10.81	9.83	9.10	10.07	9.78	9.94	15.68	16.41	16.56	10.33	10.83	9.82	11.12	11.28	12.20
	-106 Conc	18.17	18.06	18.73	17.13	17.48	16.07	19.34	16.90	16.71	18.39	18.65	18.43	18.55	16.76	19.29	18.58
	-106 Tail	29.30	24.90	30.11	27.42	26.83	27.06	28.99	28.92	26.61	27.66	26.13	28.43	29.12	27.41	28.52	25.98
	Over Flow	41.73	54.78	37.25	41.55	43.32	42.85	44.45	44.18	48.70	48.45	49.99	46.85	49.00	45.64	42.53	39.48
	Calc Recycle	0.88	-8.55	4.08	4.81	2.30	4.24	-2.72	-5.67	-8.43	-11.05	-5.10	-4.54	-6.49	-0.94	-1.62	3.75
SILICA	+106 Conc	0.41	0.45	0.41	0.53	0.44	0.43	0.44	0.14	0.15	0.15	0.46	0.48	0.44	0.46	0.47	0.51
	-106 Conc	0.22	0.22	0.23	0.20	0.20	0.18	0.14	0.15	0.15	0.16	0.18	0.18	0.18	0.16	0.18	0.18
	-106 Tail	60.22	51.19	61.90	62.79	61.45	61.98	58.24	61.64	56.71	58.94	54.77	59.59	61.04	61.93	64.44	58.69
	Over Flow	35.64	47.03	31.98	35.67	37.19	36.78	38.16	37.93	41.81	41.59	42.92	40.22	42.07	39.18	36.51	33.90
	Calc Recycle	3.50	1.11	5.49	0.81	0.72	0.63	3.02	0.15	1.19	-0.84	1.67	-0.48	-3.73	-1.74	-1.61	6.72

INTERNAL STREAMS

Final Regrind Feed	
gm	1116.6
%Sn	0.63
%Fe	21.00
%S	3.09
%SiO2	40.80
p80	342

Final Reg Discharge	
gm	1080.0
%Sn	0.63
%Fe	21.00
%S	3.09
%SiO2	40.80
p80	84

NEW FEED	CALC	31
gm	62476	2015.4
%Sn	1.33	1.34
%Fe	19.54	19.55
%S	2.97	3.08
%SiO2	41.27	40.90

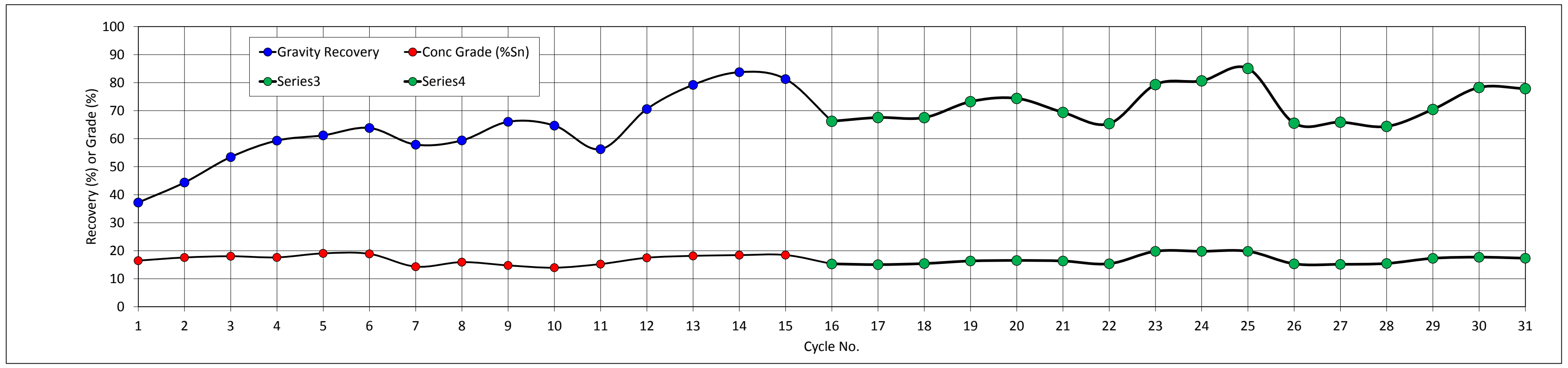


Table 14 – Gravity Lock Cycle Test results: Average of Cycles 16 to 31

		Grade	Distribution
Gravity final conc 1	gm	**870**	2.7
(+106 Conc)	**%Sn**	**11.3**	**23.1**
"Coarse concentrate"	%Fe	37.9	5.2
	%S	12.7	11.5
	$\%SiO_2$	6.1	0.4
Gravity final conc 2	gm	**968**	3.0
(-106 Conc)	**%Sn**	**21.6**	**48.9**
"Fine Concentrate"	%Fe	36.0	5.5
	%S	17.8	18.0
	$\%SiO_2$	2.5	0.2
Gravity Final Tail	gm	**16510**	51.2
(-106 Tails)	%Sn	0.39	15.1
	%Fe	17.1	44.9
	%S	1.61	27.7
	$\%SiO_2$	48.1	59.7
Over Flow	gm	**13755**	42.7
	%Sn	0.47	15.2
	%Fe	20.7	45.1
	%S	3.14	45.0
	$\%SiO_2$	37.4	38.7
Combined Concentrate	gm	**1838**	5.7
	%Sn	**16.7**	**71.9**
	%Fe	36.9	10.8
	%S	15.4	29.4
	$\%SiO_2$	4.20	0.6

Referring to Table 14 it can be seen that the circuit configuration shown in Figure 9-4 provided excellent performance, achieving an overall tin recovery of 71.9% (based on gravity circuit feed) to the combine fine and coarse concentrates at a grade of 16.7% Sn. Of this total, the coarse concentrate contributed 23.1% Sn recovery at a grade of 11.3% Sn, while the fine concentrate contributed 48.9% recovery at a grade of 21.6% Sn.

A total 42.7% of the mass deported to the primary cyclone overflow along with 15.2% of the tin units giving a grade of 0.47% Sn.

51.2% of the mass deported to the “-106 µm tails” stream, along with 15.2% of the tin units at a grade of 0.39% Sn. Recovery of additional tin units from this stream is discussed in Section 9.2.1.

Analysis of the combine (fine plus coarse) concentrate produced from cycles 1 to 31 is shown in Table 15. Clearly pyrite/pyrrhotite, magnetite and siderite are the major diluents in the concentrate.

Table 15 – Analysis of combine concentrate produced from cycles 1 to 31

Sn %	Fe %	As %	S %	SiO_2 %	Mn %	CaO %	MgO %	Al_2O_3 %	C %	C organic %	C inorg %
19.2	34.4	0.91	12.3	3.84	0.53	0.43	1.4	1.33	2.34	0.48	1.86

9.2.1 Tin Recovery from "-106 μm Tails" Stream

With >50% of the gravity circuit feed mass deporting to the "-106 μm Tails" stream, this stream offers a significant opportunity to reject mass ahead of tin flotation if directed to final tails. However, at a grade of ~0.4% Sn this would represent a significant loss (of ~15.1%).

Table 16 shows size distribution and size by size assays and metal distribution of this stream. Sn is clearly concentrated in the minus 38 μm fractions, while relatively barren silicates are concentrated in the plus 38 μm fractions, reflecting the sharp drop off in gravity performance below 38 μm. The plus 38 μm fractions contained 56% of the mass with only 27.8% of the Sn at a grade of 0.22%.

Screening of this stream at ~38-40 μm would allow the rejection of ~29% of the gravity circuit feed mass to the screen oversize at a Sn grade of 0.22% (less than the tin flotation tailings grade), representing a loss of only 4.2% of gravity circuit feed units. Additionally Sn in this size range (-106+40 μm) is expected largely locked within Sn lean composites.

At a cut point of ~38-40 μm screen undersize is expected to contain ~72.2% of the screen feed Sn units at an Sn grade of ~0.72%, and ~44% of the screen feed mass.

Application of the UF Falcon centrifugal concentrator for scavenging tin from this stream was also tested, both on the whole stream and the <38 μm. Results are shown in Table 17 and Table 18 respectively.

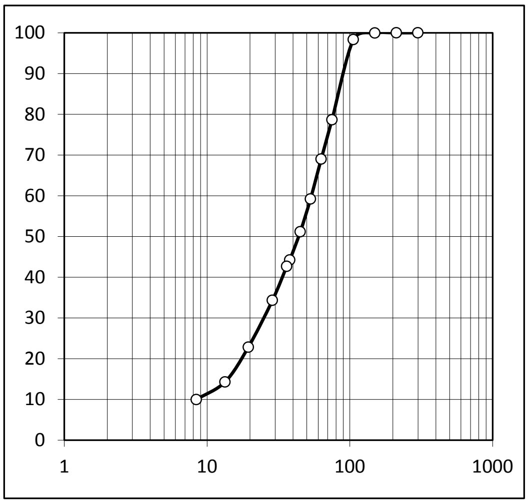
In both cases only relatively poor performance was achieved; Sn recovery and upgrade, and mass rejection were poor when compared with that expected for a size based separation.

Table 16 – Size Distribution and Size by Size Metal Distribution of "-106 µm Tails" Stream

ALS Metallurgy
BURNIE LABORATORY
[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc6 -106
	Mozley Tail
DATE	110814
TECHNICIAN	MS

LC01 Cyc6 -106 Mozley Tail		SIZE	WEIGHTS		
		um	gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.02	0.02	100.0
		106	1.91	1.62	98.4
	77	75	23.19	19.68	78.7
		63	11.41	9.68	69.0
		53	11.55	9.80	59.2
		45	9.45	8.02	51.2
		38	8.16	6.92	44.3
CYCLOSIZER	CS1	36	1.88	1.60	42.7
FLOW 185	CS2	29	9.79	8.31	34.4
TEMP 21	CS3	19	13.56	11.51	22.9
SG **2.60**	CS4	13	10.06	8.54	14.3
MINS 20	CS5	8	5.09	4.32	10.0
		SUB	11.78	10.00	0.0
		TOTAL	117.85	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mn	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
75	21.32	0.23	11.1	12.05	15.7	0.06	13.5	0.77	9.8	57.40	24.8	0.26	13.6
63	9.68	0.22	4.8	12.55	7.4	0.05	5.1	0.90	5.2	57.20	11.2	0.29	6.9
53	9.80	0.22	4.9	12.70	7.6	0.06	6.2	0.91	5.3	57.50	11.4	0.31	7.5
45	8.02	0.22	4.0	13.75	6.7	0.06	5.1	1.06	5.1	55.90	9.1	0.35	6.9
38	6.92	0.20	3.1	14.45	6.1	0.05	3.6	1.04	4.3	53.80	7.5	0.40	6.8
26	9.90	0.49	10.9	23.90	14.5	0.08	8.3	2.48	14.7	35.90	7.2	0.71	17.3
12	20.04	0.77	34.8	19.50	23.9	0.14	29.5	2.42	29.1	42.60	17.3	0.50	24.6
8	14.31	0.82	26.5	20.70	18.1	0.19	28.6	3.08	26.4	39.70	11.5	0.47	16.5
CALC	100.00	0.44	100.0	16.37	100.0	0.09	100.0	1.67	100.0	49.39	100.0	0.41	100.0
ASSAY		0.41		16.45		0.10		1.68		49.70		0.40	

ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
75	21.32	0.92	19.3	3.62	22.0	8.82	23.8				
63	9.68	0.93	8.9	3.47	9.6	8.46	10.4				
53	9.80	0.92	8.9	3.38	9.5	8.29	10.3				
45	8.02	1.01	8.0	3.47	7.9	8.13	8.3				
38	6.92	1.07	7.3	3.48	6.9	7.98	7.0				
26	9.90	1.25	12.2	3.28	9.3	6.85	8.6				
12	20.04	1.06	20.9	3.42	19.6	7.05	17.9				
8	14.31	1.04	14.6	3.75	15.3	7.59	13.8				
CALC	100.00	1.02	100.0	3.51	100.0	7.89	100.0				
ASSAY		0.99		3.65		8.21					

Table 17 – UF Falcon Separation of "-106 µm Tails" Stream

ALS Metallurgy
BURNIE LABORATORY: BATCH UF FALCON SEPARATION

PROJECT	T0879
TEST NO	T25
DATE	120814
TECHNICIAN	ID

CONDITIONS

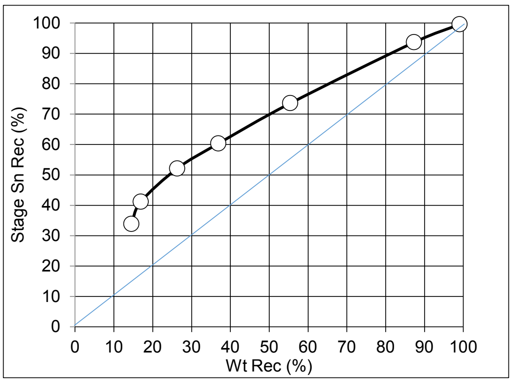
Separation of	Sn
Feed Pulp Density (%)	12
Feed In Time (min)	16
UF-100 Speed (g's)	218
Total Feed Weight (gm)	3987.7
Calc Feed Rate (gm/min)	249.2
	34.3 Ltr H2O

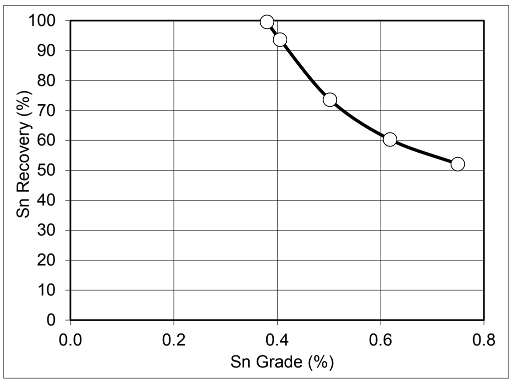
FEED MATERIAL
LC01 cyc 1-6
Mozley tail -106

Product	Feed on Time (min)	Product Mass (gm)	Product Mass (%)	Calc Feed Mass (gm)	Calc Mass to Conc (gm)	Calc Mass to Conc (%)	Sn Tail (%)	Sn Dist (%)	Sn Stage Rec (%)	Sn Calc Conc (%)
Tail	1.00	2.3	0.1	249.2	246.9	99.1	0.19	0.0	99.5	0.38
Tail	2.00	60.8	1.5	498.5	435.4	87.3	0.19	0.8	93.6	0.41
Tail	4.00	381.1	9.6	996.9	552.7	55.4	0.23	5.8	73.6	0.50
Tail	6.00	499.3	12.5	1495.4	551.9	36.9	0.25	8.3	60.3	0.62
Tail	8.00	525.8	13.2	1993.9	524.6	26.3	0.26	9.1	52.1	0.75
Tail	12.00	1015.1	25.5	2990.8	508.7	16.9	0.30	20.2	41.2	0.92
Tail	16.00	923.6	23.2	3987.7	579.7	14.5	0.36	22.0	33.8	0.88
Conc		579.7	14.5				0.88	33.8		
Total		3987.7	100.0				0.38	100.0		
Head							0.52			

	Fe %	Dist %	S %	Dist %	SiO2 %	Dist %	Al2O3 %	Dist %	As %	Dist %
Tail	12.25	0.0	1.11	0.0	57.20	0.1	10.30	0.1	0.08	0.1
Tail	11.00	1.0	0.64	0.7	60.50	1.9	8.66	1.7	0.05	1.0
Tail	13.95	7.9	0.97	6.4	53.40	10.4	8.36	10.0	0.05	6.1
Tail	16.00	11.9	1.20	10.4	51.20	13.1	8.23	13.0	0.07	11.1
Tail	16.45	12.9	1.40	12.8	48.90	13.2	8.08	13.4	0.06	10.0
Tail	17.25	26.1	1.10	19.3	49.00	25.5	7.98	25.5	0.07	22.6
Tail	17.15	23.6	1.72	27.5	48.00	22.7	7.75	22.6	0.08	23.5
SRT Con	19.20	16.6	2.28	22.9	43.80	13.0	7.52	13.7	0.14	25.8
Calc Head	16.83	100.0	1.45	100.0	48.88	100.0	7.95	100.0	0.08	100.0
Assay Head	17.45		1.79		46.60		7.66		0.1	

*Number in red means less





STELLAR RESOURCES LIMITED
HEEMSKIRK TIN PROJECT
SEVERN FURTHER FLOWSHEET DEVELOPMENT AND OPTIMISATION

Table 18– UF Falcon Separation of "-106 µm Tails" Stream; -38 µm fraction

ALS Metallurgy
BURNIE LABORATORY: BATCH UF FALCON SEPARATION

PROJECT	T0879
TEST NO	T26
DATE	180814
TECHNICIAN	ID

CONDITIONS

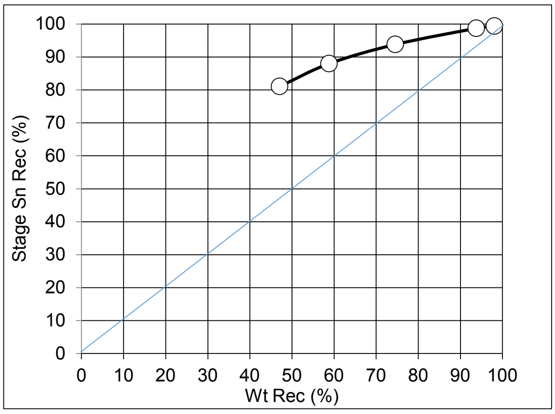
Separation of	Sn
Feed Pulp Density (%)	12
Feed In Time (min)	8
UF-100 Speed (g's)	218
Total Feed Weight (gm)	1206.6
Calc Feed Rate (gm/min)	150.8
	32.2 Ltr H2O

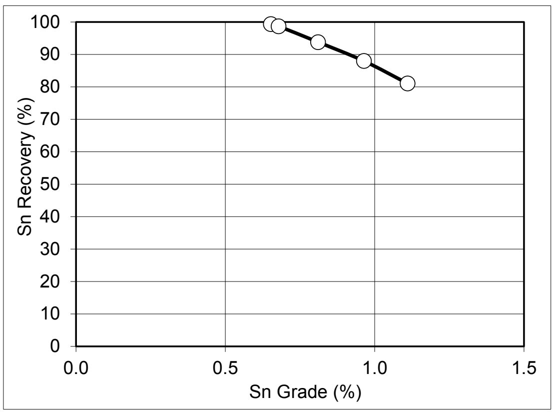
FEED MATERIAL
LC01 cyc 1-6
-106 Mozley tail
-38um

Product	Feed on Time (min)	Product Mass (gm)	Product Mass (%)	Calc Feed Mass (gm)	Calc Mass to Conc (gm)	Calc Mass to Conc (%)	Sn Tail (%)	Sn Dist (%)	Sn Stage Rec (%)	Sn Calc Conc (%)
Tail	1.00	2.8	0.2	150.8	148.0	98.1	0.23	0.1	99.3	0.65
Tail	2.00	15.8	1.3	301.7	283.1	93.8	0.12	0.2	98.7	0.68
Tail	4.00	134.7	11.2	603.3	450.0	74.6	0.16	2.8	93.8	0.81
Tail	6.00	219.2	18.2	905.0	532.5	58.8	0.21	5.9	88.0	0.96
Tail	8.00	266.1	22.1	1206.6	568.0	47.1	0.29	9.9	81.1	1.11
Conc		568.0	47.1				1.11	81.1		
Total		1206.6	100.0				0.64	100.0		
Head							0.58			

	Fe %	Dist %	S %	Dist %	SiO2 %	Dist %	Al2O3 %	Dist %	As %	Dist %
Tail	17.45	0.2	1.93	0.2	40.20	0.2	14.00	0.4	0.11	0.2
Tail	10.35	0.6	0.61	0.3	61.90	2.1	9.49	1.7	0.05	0.5
Tail	14.95	7.6	0.85	3.7	52.80	15.5	8.75	13.3	0.07	5.7
Tail	18.80	15.5	1.34	9.5	44.20	21.1	8.10	20.0	0.06	8.0
Tail	21.00	21.0	1.89	16.3	40.80	23.7	7.73	23.2	0.08	13.0
SRT Con	25.90	55.2	3.79	69.9	30.10	37.3	6.44	41.3	0.21	72.6
Calc Head	22.08	100.0	2.55	100.0	38.00	100.0	7.34	100.0	0.14	100.0
Assay Head	21.70		2.45		38.30		7.36		0.12	

*Number in red means less





9.3 Key Outcomes

- The gravity lock cycle testing demonstrated excellent gravity separation performance is achievable, with an overall tin recovery of 71.9% (based on gravity circuit feed) to the combine fine and coarse concentrates at a grade of 16.7% Sn achieved across 16 cycles.
- Pyrite/pyrrhotite, magnetite and siderite are the major diluents in the combine gravity concentrate. These can be readily rejected from the concentrate by a combination of flotation, magnetic separation and leaching.
- Based on the outcomes of the gravity testing the recommended overall gravity configuration is shown in Figure 9-5. However, further larger scale testing utilising spirals for the coarse roughing and fine roughing and scavenging duties is recommended.
- Screening of the fine scavenger tails stream at ~38-40 µm is recommended as this would allow the rejection of ~29% of the gravity circuit feed mass to the screen oversize at a Sn grade of ~0.22% (less than the expected tin flotation tailings grade), representing a loss of only ~4.2% of gravity circuit feed units. This allows a significant reduction in the total de-slime/tin flotation feed tonnage.

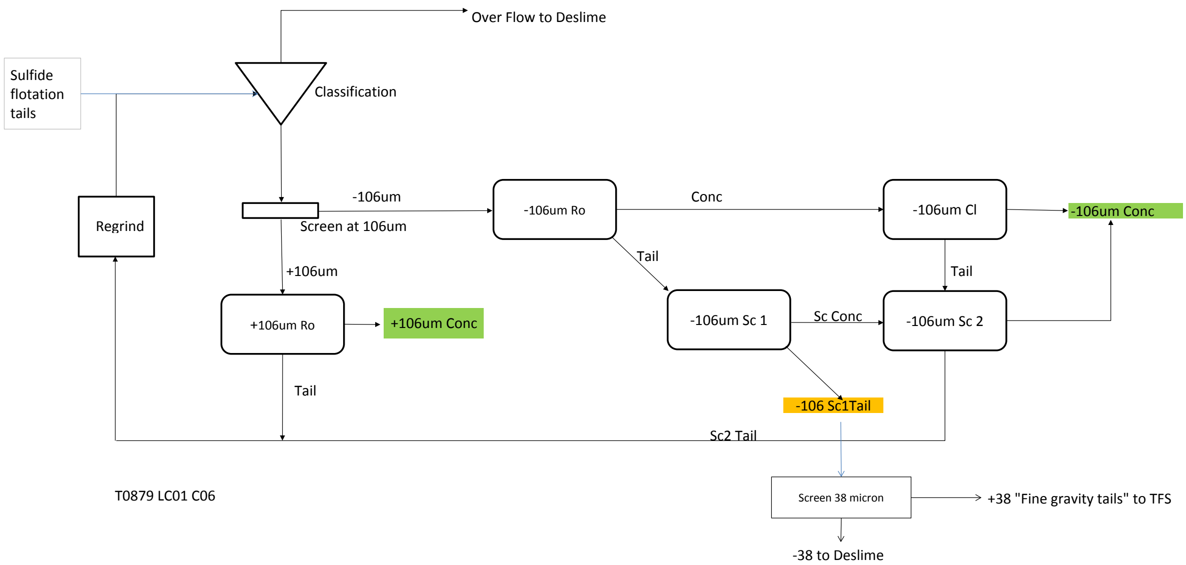
  This “fine gravity tailings” stream (screen undersize) would form a final tailing stream from the circuit, and could potentially be useful for paste fill underground.

  The screen undersize would be directed to the de-slime circuit feed along with the primary gravity cyclone overflow.

  Fine screening rather than cycloning is strongly recommended for this duty to avoid the miss reporting of Sn fines to the “fine gravity tailings”.

- To achieve adequate liberation significant regrind is required within the gravity circuit. Recommended target regrind size is nominally P80 = 52 µm (based on the weighted average size distributions of the various exit streams).

Figure 9-5 – Recommended Overall Gravity Configuration



10 GRAVITY CONCENTRATE DRESSING

Gravity concentrate dressing testwork consisted of sulfide dressing flotation, dressing magnetic separation (low intensity) and concentrate leaching to remove the major diluents pyrite/pyrrhotite, magnetite and siderite present in the combine gravity concentrate.

Feed to gravity concentrate dressing testwork was gravity concentrate produced from cycles 1-31 of the gravity lock cycle test (LC01).

10.1 Sulfide Dressing Flotation

Sulfide dressing flotation results are contained in Appendix 8.

Sulfide dressing flotation consisted of a simple single roughing stage with a single cleaner stage. A number of tests were performed largely to treat the various batches of gravity concentrate produced and optimise sulfur grade in the tailings. Expected reagent consumptions based on the various tests performed are shown in Table 19, with Figure 10-1 showing sulfide dressing flotation tailings grade versus Sn recovery to tails.

Roughing and cleaning flotation times (laboratory) of 15 and 12 minutes respectively are expected to be sufficient based on the various tests completed.

Table 19 – Expected Sulfide Dressing Flotation Reagent Consumptions

pH	~4.2
Sulfuric Acid	16 g/t
Copper Sulphate	65 g/t
PAX	200 g/t
Frother (MIBC)	200 g/t
Acidified sodium silicate (ASS)	350 g/t

Figure 10-1 – Test T030

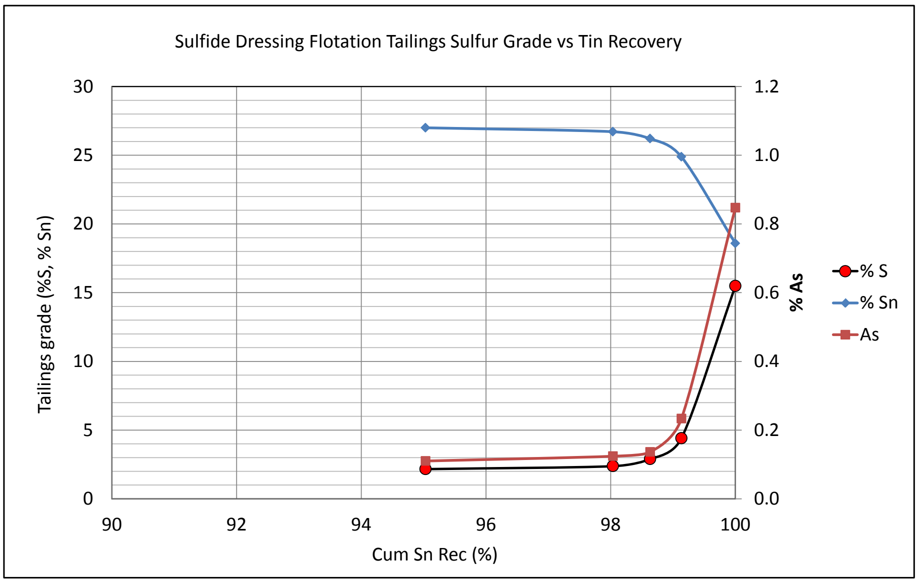


Figure 10-1 shows a plot of sulfide dressing flotation tailings grade versus Sn recovery. The gravity concentrate upgrades significantly across dressing flotation from ~18.6% Sn to ~27% Sn with S levels readily reduced to <2%, and As levels to ~0.1%. Further scavenging in T57 showed before S and As levels can readily be reduced to <1% and <0.1% respectively (refer Table 20).

Table 20 – Test T57

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
Ro Tail+Cl1 Tail+Cl1 C3	455.3	96.4	26.8	99.6	21.9	93.8	0.10	83.4	1.54	58.6	7.02	96.6	1.35	99.0
Ro Tail+Cl1 Tail	**437.2**	**92.5**	**27.7**	**98.9**	**21.3**	**87.5**	**0.09**	**74.0**	**0.81**	**29.8**	**7.00**	**92.5**	**1.39**	**97.6**
Ro Tail	417.1	88.3	28.4	96.8	20.9	82.0	0.09	69.9	0.68	23.8	6.87	86.6	1.39	93.2

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	C inorg %	CUM
Ro Tail+Cl1 Tail+Cl1 C3	455.3	96.4	1.11	98.7	2.52	97.1	2.80	97.6	4.54	98.1	0.08	90.7	4.45	98.2
Ro Tail+Cl1 Tail	**437.2**	**92.5**	**1.13**	**96.6**	**2.55**	**94.3**	**2.81**	**94.0**	**4.59**	**95.2**	**0.08**	**81.7**	**4.51**	**95.5**
Ro Tail	417.1	88.3	1.15	93.6	2.48	87.6	2.79	89.1	4.57	90.5	0.07	72.3	4.50	90.9

As the sulfide dressing flotation cleaner concentrate is expected to contain Sn in contained in sulfide cassiterite composites (as well as entrained Sn) this stream should be recycled to the sulfide regrind circuit, where it can be adequately liberated.

10.2 Dressing Magnetic Separation

Following sulfide dressing flotation dressing magnetic separation is aimed at further upgrading the concentrate by rejecting magnetite.

Dressing magnetic separation testing consisted of roughing, followed by regrind to a P80 of 34 µm and cleaning of the magnetic product (refer tests T34, T50 and T55 in Appendix 8).

Overall this provided a mass rejection of 20% (based on dressing magnetic separation feed) with an Sn loss of only 0.4% to the magnetic product.

As the magnetic product would only build-up if recycled within the circuit the dressing magnetic separation cleaner magnetic product will form a final tailings stream from the circuit.

10.2.1 Alternative approaches to magnetite rejection

As an alternative to dealing with magnetite rejection within the gravity concentrate dressing circuit, magnetic separation of the whole of the sulfide flotation tails, prior to gravity separation was considered in test T35 (refer Appendix 8 for results).

T35 consisted of a single roughing magnetic separation (LIWMS). This resulted in an overall loss to the magnetic product of 2.8% Sn based on sulfide flotation tails. Potentially with regrind and cleaning this loss could be reduced.

As dealing with magnetite rejection within the gravity concentrate dressing circuit will require smaller equipment sizings, and is expected to give lower Sn losses this approach is recommended. However, if magnetite levels in ROM are expected to increase significantly beyond those seen in the Severn Bulk Composite (for example with co-treatment of Severn with Saint Dizier) further consideration should be given to rejection of magnetite ahead of the gravity circuit, as increasing magnetite loads will impact equipment sizings, and potentially performance within the gravity circuit.

High intensity magnetic separation of the whole of the sulfide flotation tails, prior to gravity separation was considered in tests T39, T40 and T41 (refer Appendix 8 for results) at 3,000, 6,000 and 10,000 gauss respectively. In addition to rejecting magnetite, high intensity magnetic separation rejects siderite, which potentially reduces issues in tin flotation, along with giving significantly increased mass rejection (compared to LIMS). Results are summarised in Table 21.

Table 21 - High intensity magnetic separation of sulfide flotation tails

Gauss	% mass rejection	% Sn loss	Non-mags Fe grade(1)
3,000	18.5	9.9	14.1 %
6,000	52.8	32.6	6.8 %
10,000	67.1	49.6	5.4 %

Notes; 1. Fe feed grade = 19.6%

Generally this approach resulted in very high losses of tin to the magnetic fraction (even in the finer size fractions). As such it was not pursued further.

10.3 Concentrate Leach

Refer Section 12.

10.4 Final Gravity Concentrate Quality

The dressing testwork completed showed the major diluents present can be readily rejected from the concentrate by a combination of flotation, low intensity magnetic separation and leaching to upgrade the concentrate to saleable Sn grades with minimal Sn losses.

Final gravity concentrate analysis is detailed in Table 22 and Table 23.

Table 22 – Severn Bulk Composite: Final Gravity Concentrate Analysis

Element	Sn	Fe	As	S	SiO_2	Mn	CaO	MgO	Al_2O_3	C_{total}	$C_{organic}$	$C_{inorganic}$	Ag	Au	B	Ba	Be	Bi	Cd	Ce	Co	Cr	Cs	Cu	Ga	Ge	Hf	Hg	In
Units	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Value	55.3	3.82	0.13	1.145	13.1	0.11	0.705	0.56	2.79	0.59	0.15	0.435	3.2	0.2	20	185	2.8	18.38	<0.01	59.4	4.85	257	1.57	150	1.82	0.11	0.15	0.33	1.11
Element	K	La	Li	Mg	Mo	Na	Nb	Ni	P	Pb	Rb	Re	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr	
Units	%	ppm	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Value	0.1	27.7	6.8	0.16	133	0.01	<0.05	28.9	90	658	15.2	0.002	5.66	1.15	0.25	495	34.8	<0.01	0.01	2.05	0.01	0.27	0.55	6	145	5.68	55.5	5.05	

Table 23 - Severn Bulk Composite: Final Gravity Concentrate QXRD Analysis

Phase	Weight%
Arsenopyrite	**0.2**
Cassiterite	**70.1**
Chlorite	**0**
Diopside	**0**
Dolomite	**0**
Dravite	**4.2**
Gypsum	**0.9**
Marcasite	**0**
Microcline	**0**
Phlogopite	**0**
Pyrite	**0.7**
Pyrrhotite-4C	**1**
Quartz	**7.4**
Rhodocrosite?	**0.4**
Rutile	**1.6**
Scheelite	**0.7**
Siderite	**12**
Topaz	**0.6**
Zircon	**0.1**

The outcomes of the Severn optimisation program have led to improved gravity concentrate quality and clearly demonstrated a high quality final gravity concentrate, low in penalty elements, can be readily produced.

Comments:

- No significant impurities impacting the saleability of the concentrate are present.
- Generally, the levels of impurities elements which are present, are not expected to incur significant penalties charges.

11 DE-SLIME AND TIN FLOTATION

Feed to de-sliming and tin flotation was the combine primary gravity overflow stream and <40µm fraction of the fine scavenger tailings stream produced from cycles 1-31 of the gravity lock cycle test (LC01).

Initially a series of "scouting" tests were carried out on a composite of the primary gravity overflow stream; this includes tin flotation tests T29 to T44, and separate composite of <40µm fraction of the fine scavenger tailings stream; this includes T45 to T48 produced from cycles 1 to 10.

Primary gravity overflow stream and <40µm fraction of the fine scavenger tailings stream produced from cycles 11-31 of the gravity lock cycle test (LC01) were composited together and formed the feed to de-sliming tests T56 onwards and tin flotation tests T58 onwards.

11.1 De-Slime

De-sliming results are contained in Appendix 10.

De-slime testing was completed using a cyclone test rig fitted with a 44 mm Mozley cyclone, with vortex finder and spigot sizes adjusted to manipulate cut point.

The variation in mass and metal deportment with de-slime cut point across the range 4 to 12 µm is shown in Table 24 along with the Sn upgrade ratio, and ratios of Fe, SiO_2, S and CaO to Sn in the underflow. Notably at coarser cut-points moderate upgrade of tin is achieved across de-sliming, with a significant decrease in the Fe:Sn ratio compared to the de-slime feed material. That is, siderite is rejected reasonably strongly at coarser cut-points. However, Sn recovery is only modest.

As the cut-point is reduced, Sn recovery improves considerably at the expense of Sn upgrade ratio and in particular Fe rejection.

Table 24 – Variation in Mass and Metal Deportment with De-slime Cut Point

Test no.	D50 (µm)	% Mass Recovery to U/F	U/F % <CS5 (<8 µm)	% Sn	% Recovery to U/F	% Fe	% Recovery to U/F	% SiO_2	% Recovery to U/F	% S	% Recovery to U/F	% CaO	% Recovery to U/F	Sn upgrade ratio	Fe/Sn ratio	SiO_2/Sn ratio	S/Sn ratio	CaO/Sn ratio
T56	12.1	39.3	9.7	0.93	60.1	18.7	37.1	44.1	43.9	2.45	35.8	0.98	45.8	1.54	20.1	47.4	2.6	1.05
T63	6.1	61.8	27.1	0.76	77.8	21.5	62.4	39.3	62.5	2.55	63.3	1.05	70.2	1.26	28.3	51.7	3.4	1.38
T70	4	79.9	40.6	0.64	84.7	21.2	79.5	39.0	80.1	2.86	91.8	0.95	82.1	1.06	33.1	60.9	4.5	1.48
Feed	0	100.0	53.0	0.60	100.0	21.3	100.0	38.9	100.0	2.49	100.0	0.92	100.0	1.00	35.3	64.4	4.1	1.53

Figure 11-1 shows the variation in mass recovery to de-slime underflow/tin flotation feed with de-slime cut point, while Figure 11-2 shows the variation in Sn losses to slime tails and Figure 11-3 shows impact on tin flotation feed slimes content.

Figure 11-1

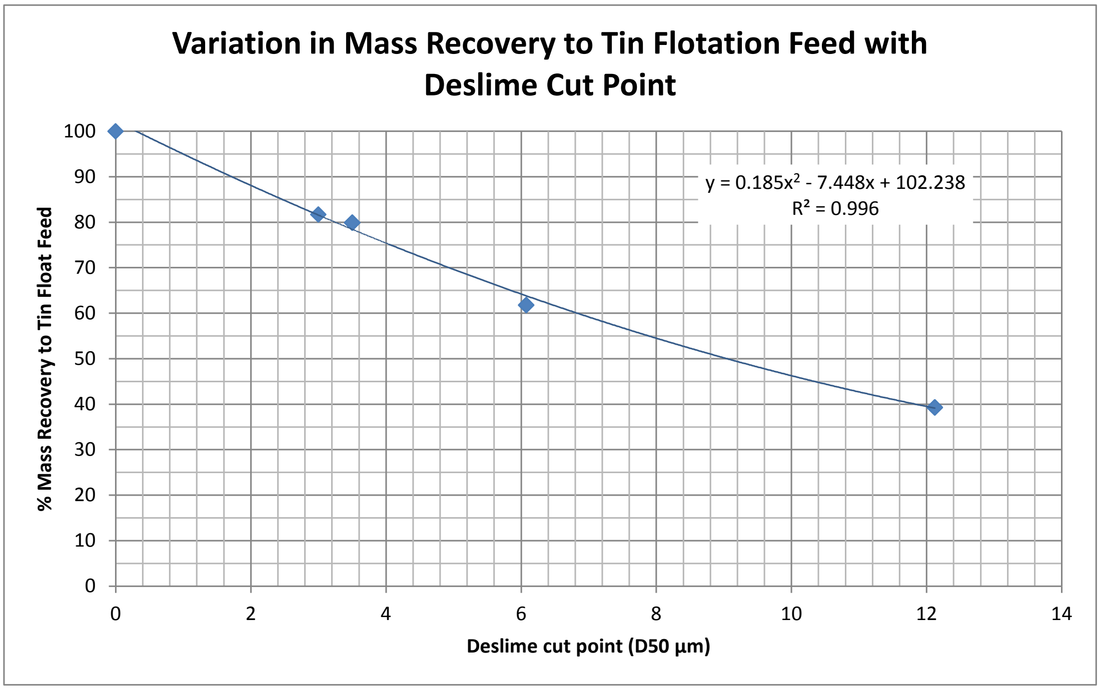


Figure 11-2

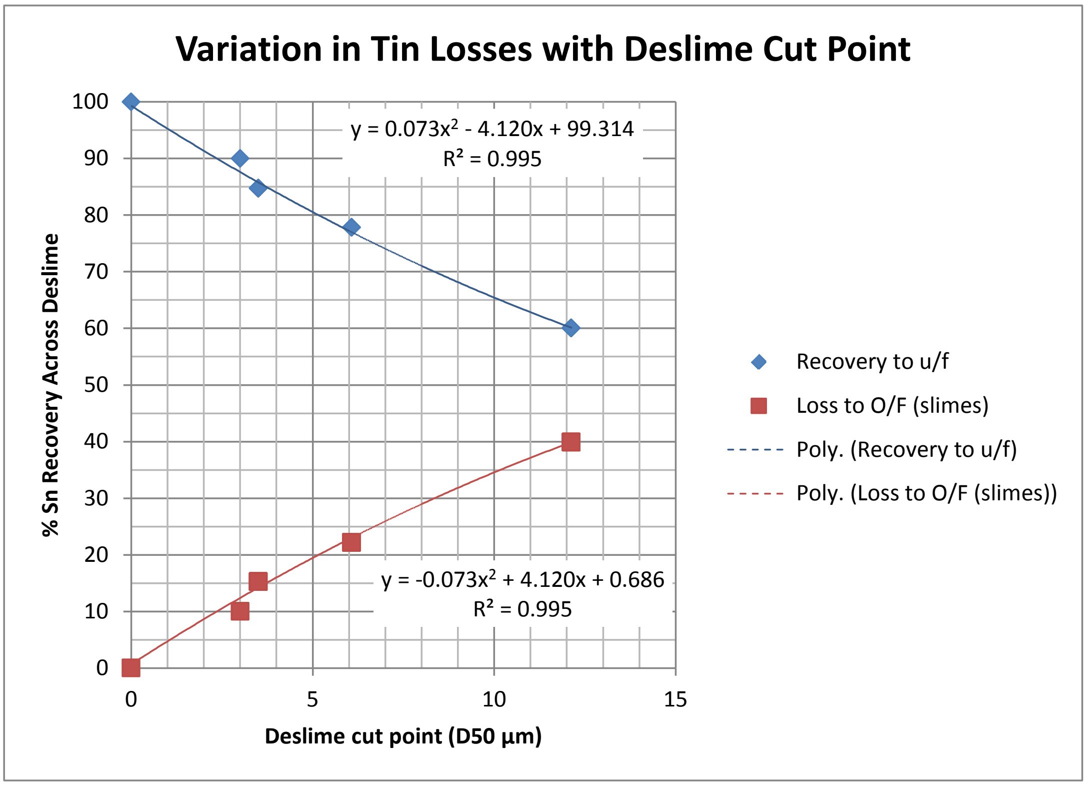
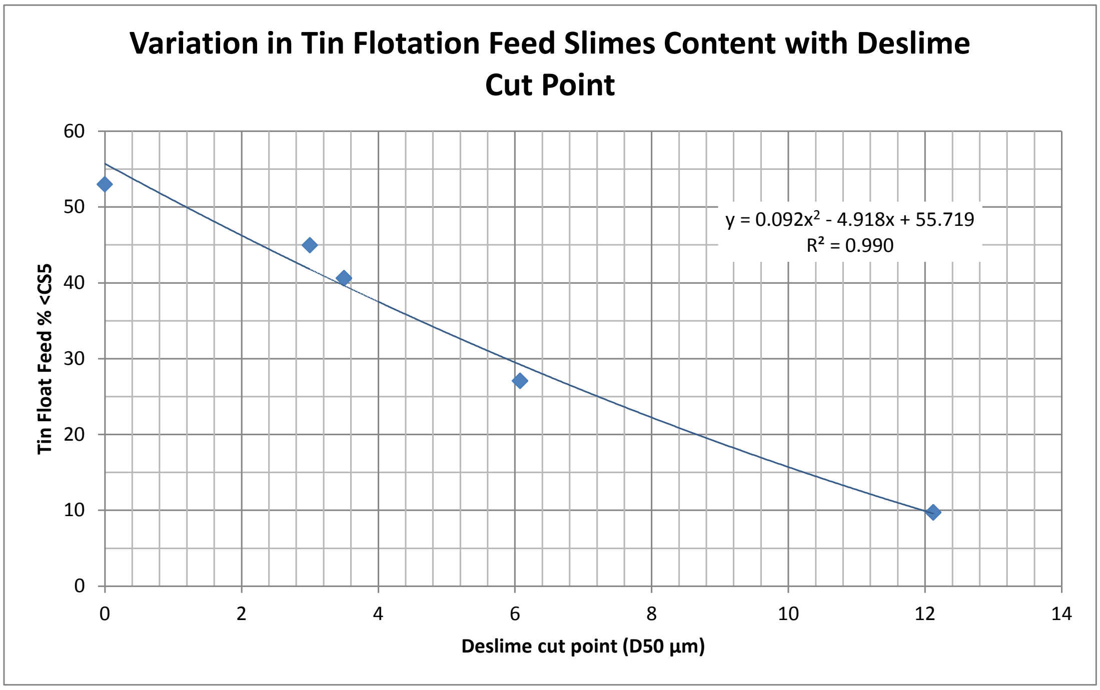


Figure 11-3



Once tin flotation conditions were optimised tin flotation testing was carried out on the underflow produced at various de-slime cut points to assess the trade-off between Sn losses to slimes tails and tailing flotation performance. This is discussed further in Section 11.2.

11.2 Tin Flotation

Complete tin flotation results are contained in Appendix 11.

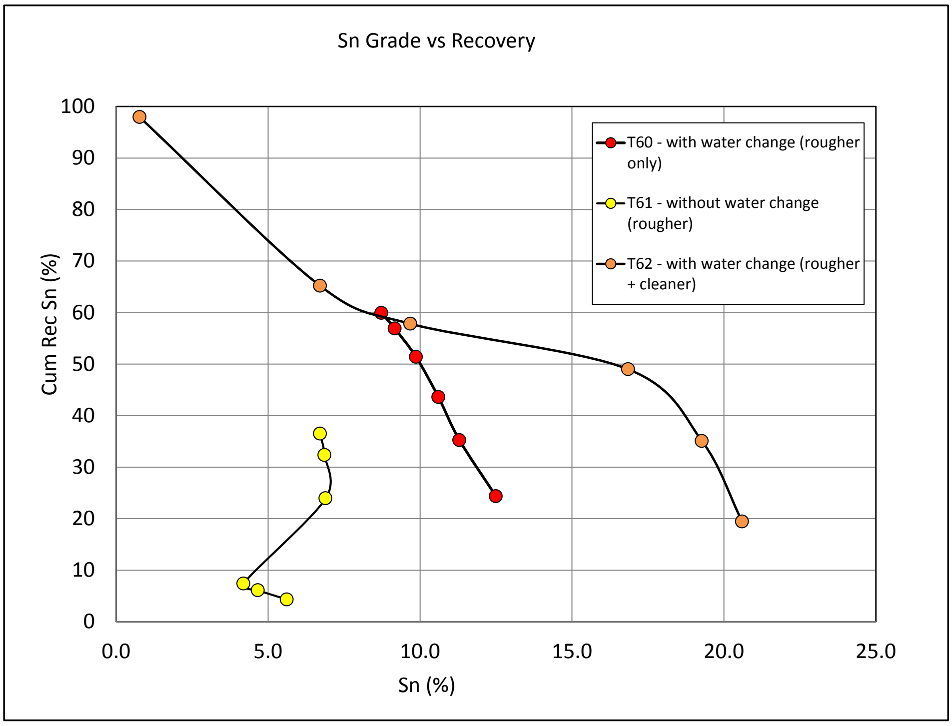
Initial sighter tests were focused on investigating response of sulfide scavenging and tin roughing. These initial sighter tests highlighted challenges with achieving adequate sulfide rejection in sulfide scavenging and selectivity against Fe/siderite.

Use of a low pH high intensity conditioning (HIC) stage with addition of SSF, followed by a “water change” (following the HIC the pulp was filtered and repulped in fresh water for flotation) ahead of sulfide scavenging provided a step change in sulfide rejection, allowing sulfur levels to be consistently reduced to well <1%S, and improved subsequent Sn grade recovery response.

These initial sighter tests also showed Sn losses to the sulfide scavenger concentrate could be significantly reduced by cleaning of the sulfide scavenger concentrate. With a single stage of cleaning Sn losses to the sulfide scavenger concentrate of the order of 1% of tin flotation feed units are expected to be readily achievable. Although the sulfide scavenger concentrate will ultimately be recycled to the sulfide regrind circuit, minimising Sn deportment here will reduce Sn recirculating loads across the circuit and reduce loss opportunities.

Figure 11-4 shows a comparison of tests with and without “water change” post the high intensity conditioning stage, immediately prior sulfide scavenger flotation. Clearly removal of the “water change” step in T61 was extremely detrimental to grade/recovery response. The “water change” post the high intensity conditioning stage, immediately prior sulfide scavenger flotation was used in all subsequent tests.

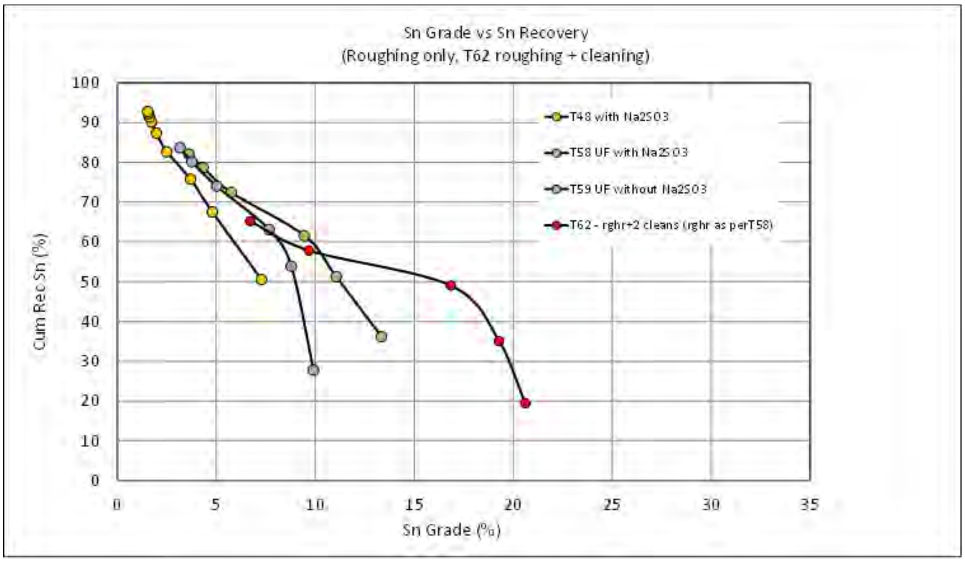
Figure 11-4 – Effect of “Water Change” post HIC



It is strongly suspected the detrimental effect seen in T61 is a result of excessive levels of soluble ions, particularly Fe present, and it is speculated that this could potentially be mitigated by chemical means such as increased dose of SSF or addition of a Fe complexing agent. From a practical plant design perspective a chemical means of addressing the impacts of soluble ions would be far preferable to installation of the necessary additional equipment to facilitate an effective “water change”. As such it is strongly recommended to carry out further work to determine if this can be successfully eliminated/solution chemistry issues can mitigated by other means.

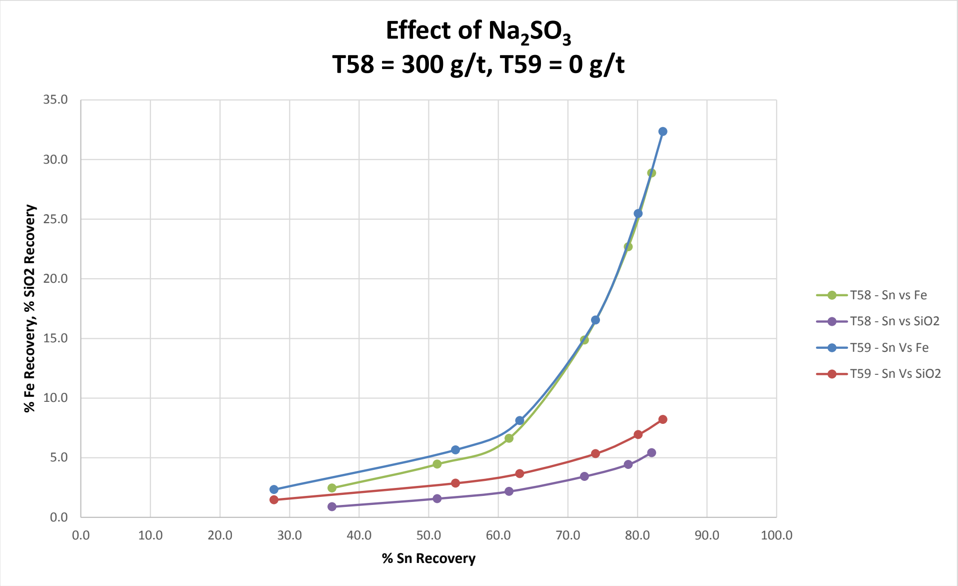
Tin flotation tests investigating roughing response with low SPA dosages with and without sodium sulfite (Na_2SO_3), at a relatively coarse de-slime size (12 µm) size were completed (refer Figure 11-5).

Figure 11-5



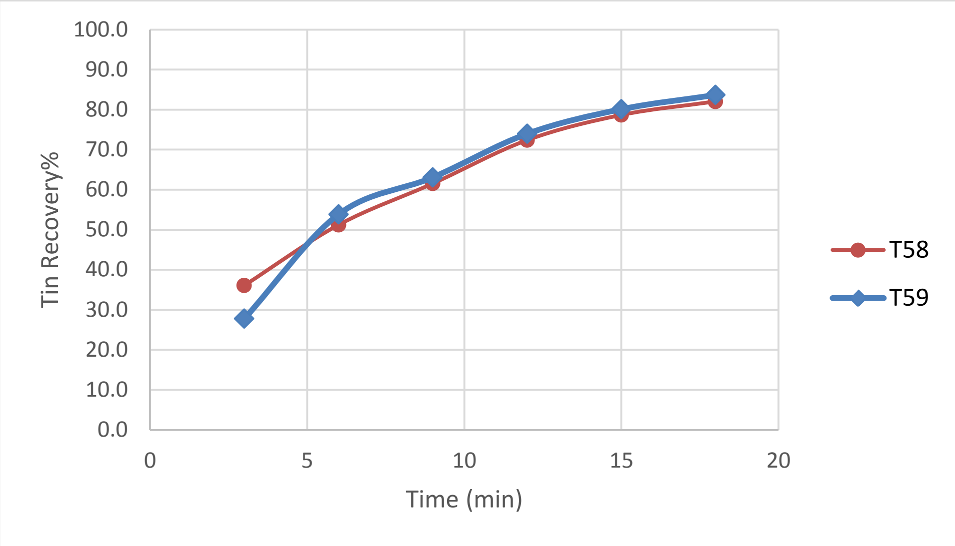
Good response was achieved with approximately 60% Sn recovery achieved to a concentrate grade of 10% Sn from roughing flotation only with addition of sodium sulfite (refer T58 in Figure 11-5. T48 represents the previous best result). T62 included roughing plus 2 stage cleaning under conditions as per T58 and achieved a very good result; achieving a recovery of 52% to a concentrate grade of 15% tin, and 49% recovery at 16.8% tin grade.

Figure 11-6



Sodium sulfite was expected to act as a siderite depressant. However, it's action appears to be more via improved initial cassiterite kinetics (refer Figure 11-6 and Figure 11-7).

Figure 11-7 – Rougher Flotation Rate with (T58) and without Na_2SO_3 (T59)



Earlier tests highlighted issues with poor selectivity against siderite. This selectivity issue is exacerbated at high SPA dosages. This can be seen in Figure 11-8 and Figure 11-9 which show rough flotation rate and selectivity for T48. In T48 290 g/t SPA was stage doses at 0, 9 and 18 minutes to give a total dose of 870 g/t. Referring to Figure 11-8 it can be seen that Fe and mass recovery rates steepen considerably with each additional SPA dose beyond the initial 290 g/t, resulting in significantly poorer selectivity.

Results for T58 with a total SPA dose of 400 g/t are shown in Figure 11-9 for comparison; clearly limiting SPA dosage results in significantly improved selectivity.

Figure 11-8 - T48 Rougher Flotation Rate

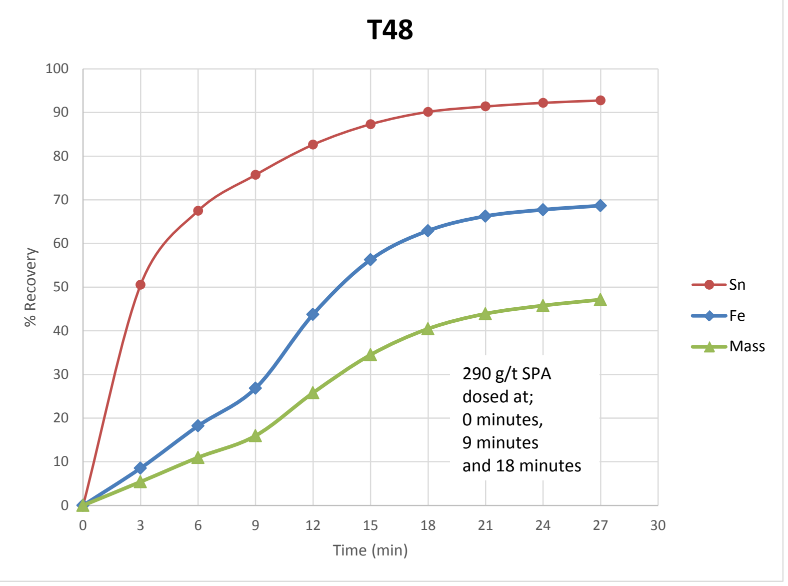


Figure 11-9 - Rougher Selectivity

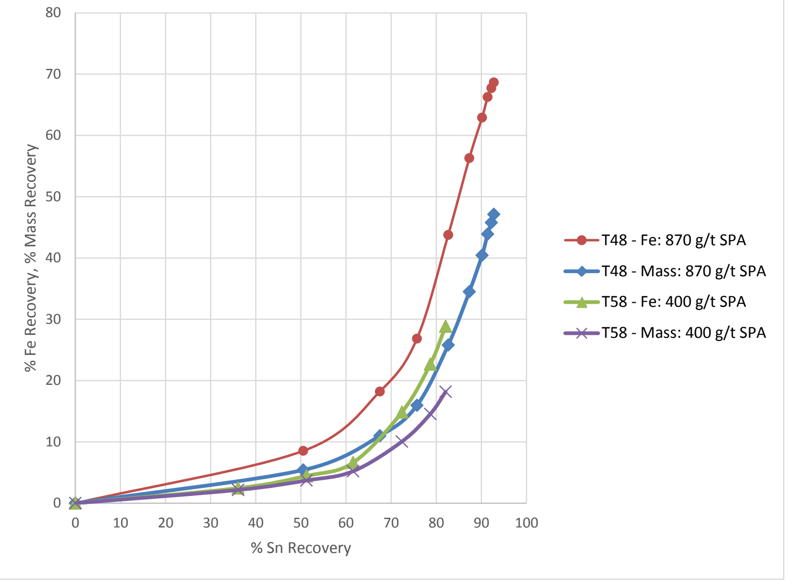


Table 25 shows a summary of conditions and results for test T58 to T79. This series of tests were fed with a composite of the primary gravity overflow stream and <40µm fraction of the fine scavenger tailings stream produced from cycles 11-31 of the gravity lock cycle test**,** LC01 de-slimed at sizes ranging from 12.1 µm to 0 µm (i.e. no de-slime).

Table 25 - Summary of Tin Flotation Tests T58 to T79

(De-slime feed sample; Primary gravity overflow stream and <40µm fraction of the fine scavenger tailings stream produced from cycles 11-31 of the gravity lock cycle test, LC01)

Tin Flotation Test No.	Feed material			Deslime mass recovery	Sulfide scav.				Tin float					Tin Flotation Response						Deslime Performance		Overall Tin deportment to Deslime feed	Overall Tin to Tin Float Feed	Overall Tin recovery to flotation con		
	Deslime cut point (D50)	Produced from test no.	% <CS5 (<8 µm)	to u/f	H_2SO_4	SSF	Water change	SIPX	H_2SO_4	SSF	Na_2SO_3	SPA7080	MIBC	Roughing		Cleaning				Tin recovery to U/F	Tin loss to O/F	% of ore feed Sn units	% of ore feed Sn units	Roughing (at ~4% Sn) % of ore feed Sn units	Cleaning (at 12% Sn) % of ore feed Sn units	Cleaning (at 15% Sn) % of ore feed Sn units
	µm			% wt	g/t	g/t		g/t	g/t	g/t	g/t	g/t	g/t	Grade (% Sn)	Roughing recovery	Grade (% Sn)	Cleaning recovery	Grade (% Sn)	Cleaning recovery							
T58	12.1	UF from T56	9.7	39.3	401	200	yes	50	180	200	301	401	99	4.0	80.2			9.0	62.9	60.1	39.9	24.4	14.7	11.8		
T59	12.1	UF from T56	9.7	39.3	440	200	yes	50	200	200	0	400	119	4.0	79.0			9.0	48.9	60.1	39.9	24.4	14.7	11.6		
T60	12.1	UF from T56	9.7	39.3	399	200	yes	50	100	200	299	299	99	4.0	82.7					60.1	39.9	24.4	14.7	12.1		
T61	12.1	UF from T56	9.7	39.3	298	199	no	50	0	199	298	398	98	4.0	64.7					60.1	39.9	24.4	14.7	9.5		
T62	**12.1**	**UF from T56**	**9.7**	**39.3**	**400**	**200**	**yes**	**50**	**180**	**200**	**300**	**400**	**79**	**4.0**	**80.1**	**12.0**	**55.0**	**15.0**	**51.3**	**60.1**	**39.9**	**24.4**	**14.7**	**11.7**	**8.1**	**7.5**
T65	12.1	UF from T56	9.7	39.3	199	199	yes	50	100	199	299	398	79	4.0	78.2			15.0	42.8	60.1	39.9	24.4	14.7	11.5		6.3
T64	6.1	UF from T63	27.1	61.8	397	199	yes	50	179	199	298	397	88	4.0	76.4					77.8	22.2	24.4	19.0	14.5		
T67	6.1	UF from T63	27.1	61.8	499	200	yes	50	120	200	300	399	99	4.0	62.3			15.0	32.1	77.8	22.2	24.4	19.0	11.8		6.1
T79	6.1	UF from T63	27.1	61.8	1010	202	yes	50	242	303	404	656	130	4.0	66.4	12.0	41.6	14.7	20.4	77.8	22.2	24.4	19.0	12.6	7.9	3.9
T71	**4**	**UF from T70**	**40.6**	**79.9**	**592**	**197**	**yes**	**49**	**197**	**197**	**296**	**395**	**88**	**4.0**	**57.5**	**12.0**	**37.0**	**15.0**	**32.1**	**84.7**	**15.3**	**24.4**	**20.7**	**11.9**	**7.7**	**6.6**
T72	4	UF from T70	40.6	79.9	394	197	yes	49	177	197	296	394	88	4.0	59.8					84.7	15.3	24.4	20.7	12.4		
T74	4	UF from T70	40.6	79.9	596	199	yes	50	199	199	298	397	79	4.0	37.1			15.0	21.9	84.7	15.3	24.4	20.7	7.7		4.5
T75	4	UF from T70	40.6	79.9	595	198	yes	50	198	298	397	496	79	4.0	37.5			15.0	23.1	84.7	15.3	24.4	20.7	7.8		4.8
T76	**4**	**UF from T70**	**40.6**	**79.9**	**1203**	**200**	**yes**	**50**	**241**	**301**	**401**	**601**	**129**	**4.0**	**67.3**	**12.0**	**49.7**	**15.0**	**28.2**	**84.7**	**15.3**	**24.4**	**20.7**	**13.9**	**10.3**	**5.8**
T69	3	LC Cyc 11-31: -40 Fine Tails + O/F, +CS6	45.0	81.7	783	196	yes	49	176	196	294	392	97	3.9	12.3					90	10.0	24.4	22.0	2.7		
T68	0	LC Cyc 11-31: -40 Fine Tails + O/F	53.0	100.0	298	198	yes	50	298	198	298	397	88	3.4	8.7					100	0.0	24.4	24.4	2.1		

Figure 11-10 and Figure 11-11 show the impact of varying de-slime size (D50 cut point) on tin flotation roughing and cleaning grade/recovery response, while Figure 11-12 and Figure 11-13 show Sn recovery and mass recovery vs flotation time.

Figure 11-10

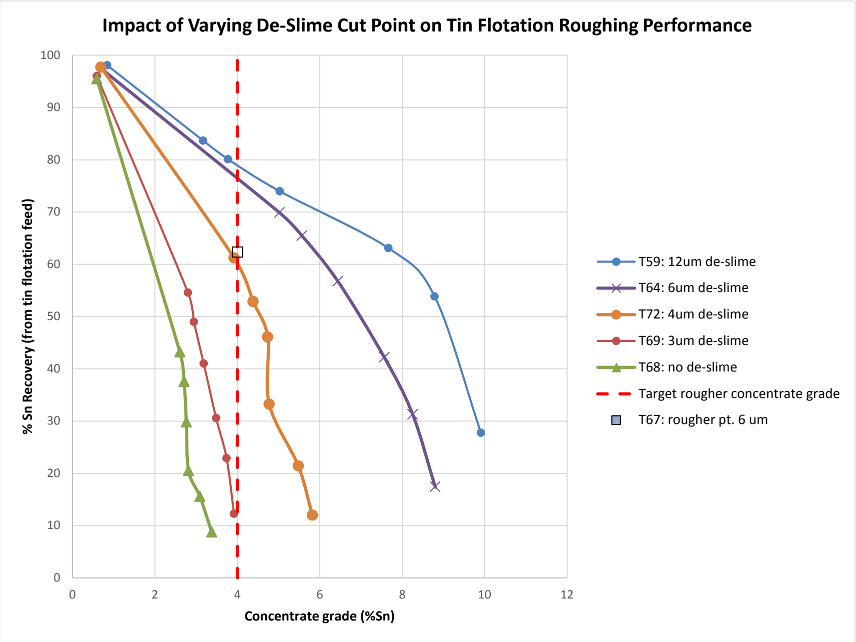


Figure 11-11

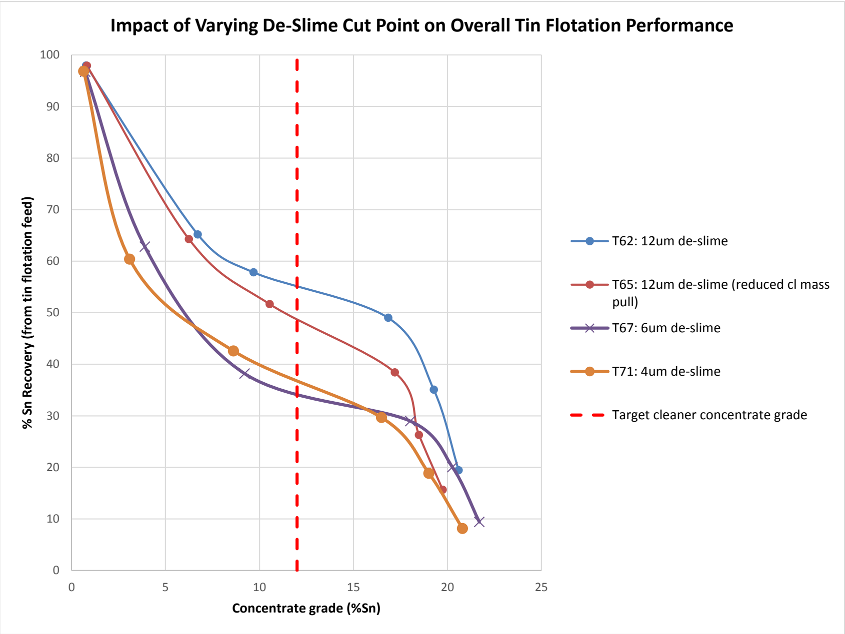


Figure 11-12 Sn Recovery vs Flotation Time

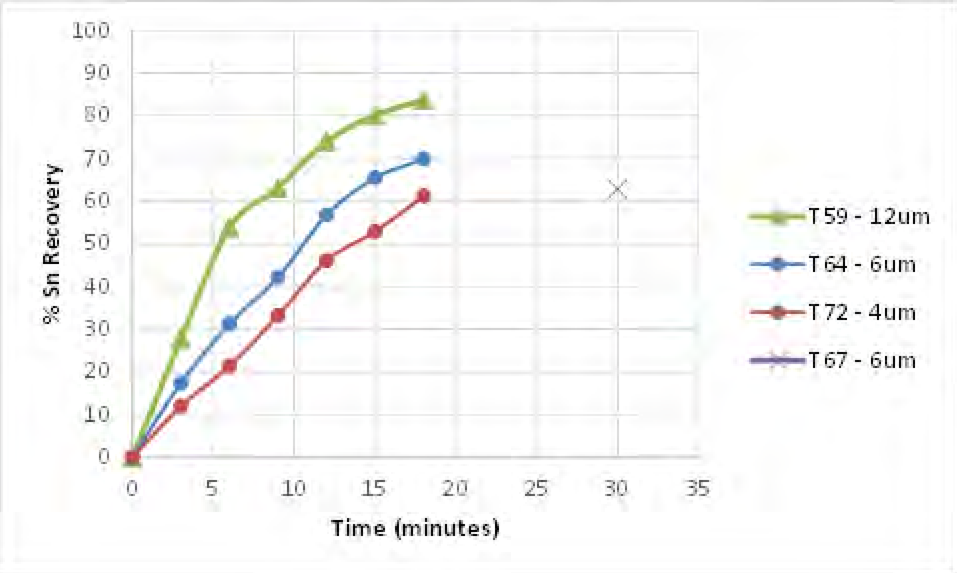
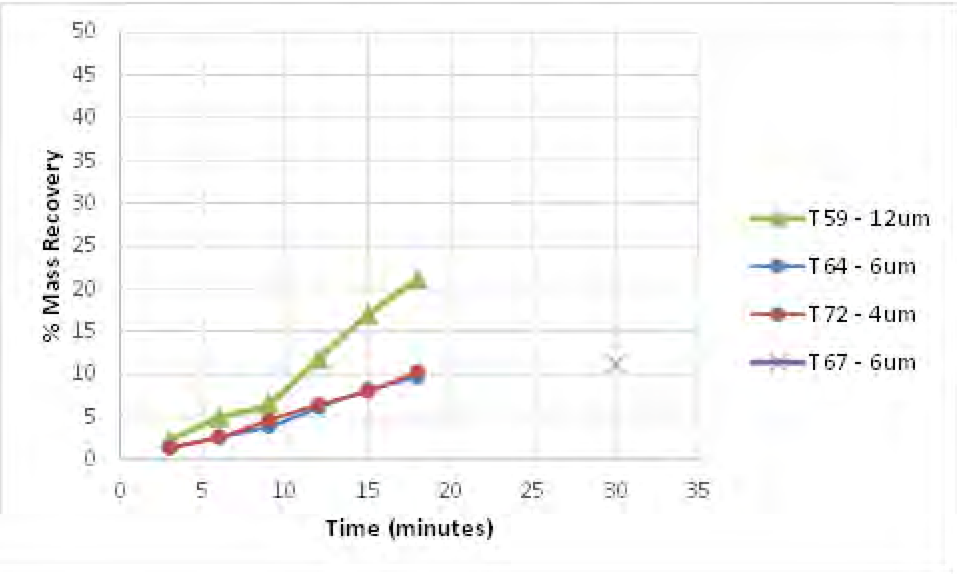


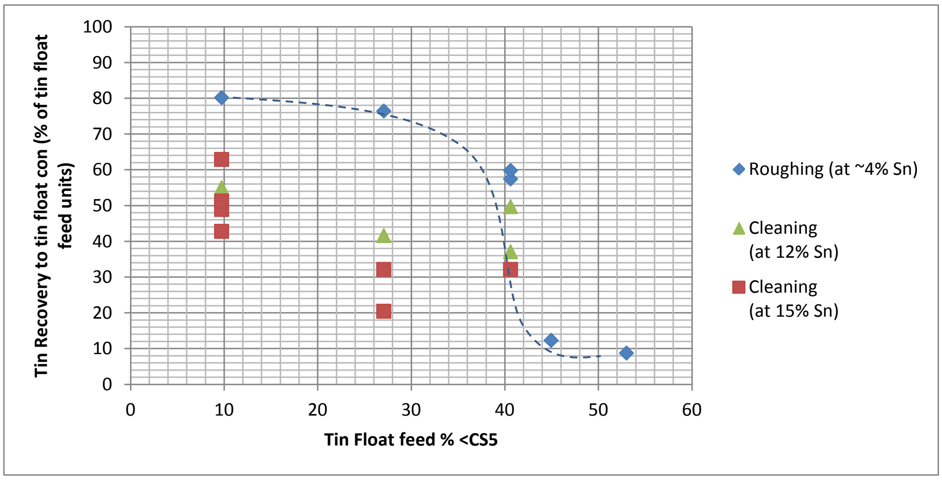
Figure 11-13 Mass Recovery vs Flotation Time



At de-slimes sizes <4 µm tin flotation response is extremely poor.

Generally there is a very clear trend of deteriorating flotation performance with decreasing de-slime size/increasing slimes content. It should be noted T67 results do not fit with the general trends observed, with T67 result impacted by sample aging effects (refer Section 11.2.1).

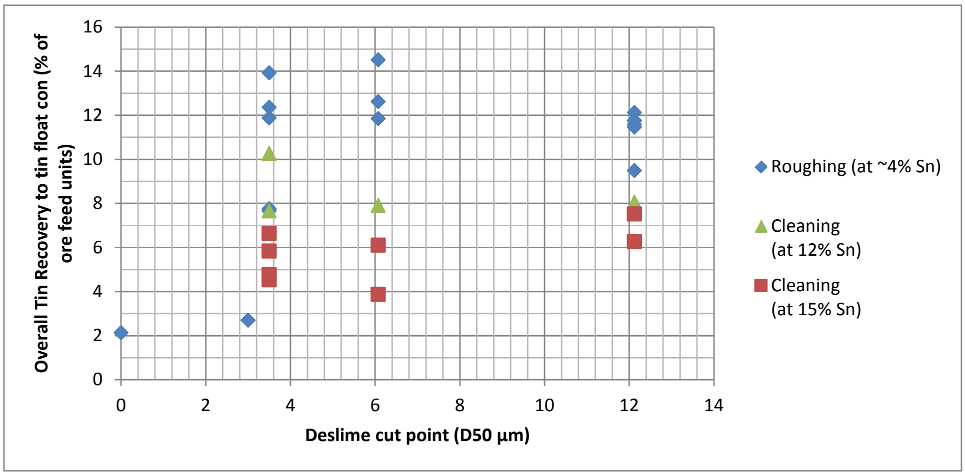
Figure 11-14 – Effect of Tin Flotation Feed slimes Content on Tin Flotation Performance



The deteriorating flotation response with decreasing de-slime size is offset to a considerable extent by increased Sn recovery to tin flotation feed at finer de-slime sizes.

This is illustrated in Figure 11-15 which shows overall tin flotation recovery from ore feed with varying de-slime size.

Figure 11-15 – Effect of De-slime size on Overall Sn Recovery to Tin Flotation Concentrate



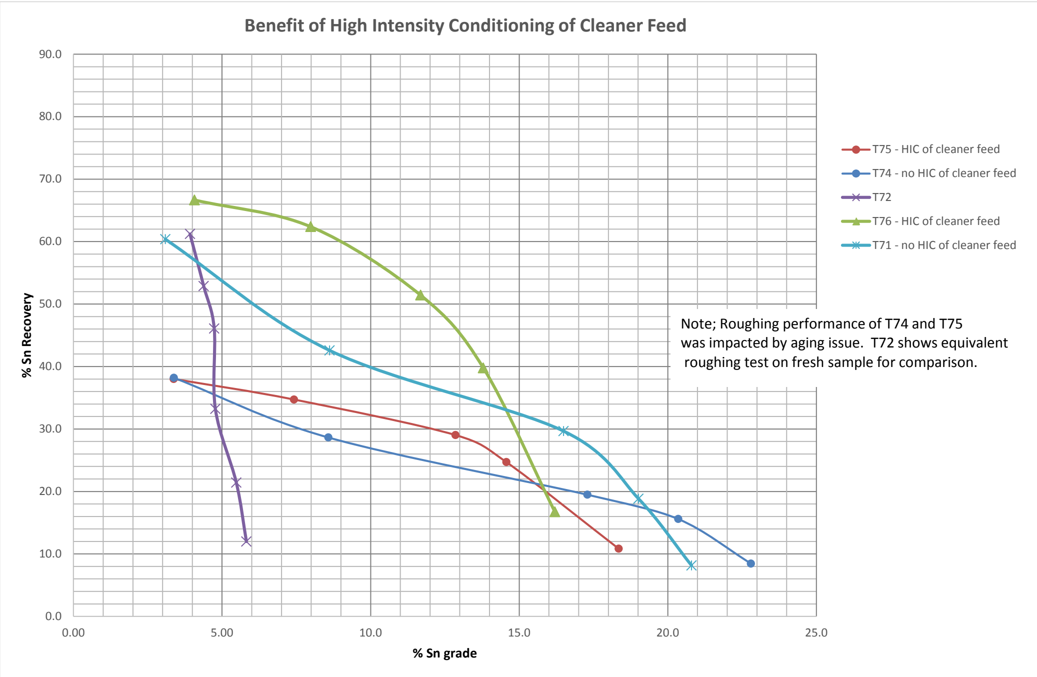
Quite clearly the increased recovery across de-slime more than offsets poorer tin flotation performance at de-slime sizes of 4 and 6 µm. However, at de-slimes sizes ≤ ~3µm (tin flotation feed –CS5 content of >42%) overall recovery from Tin flotation is extremely poor.

Optimum de-slime cut point (D50) appears to be within the range 4 - 7µm. Given mass deportment to tin flotation feed is expected to increase considerably over this range, resulting in increased reagent consumptions (particularly SPA) and hence increased operating costs, further optimisation work is recommended.

In tests T74, T75, T71 and T76 use of high intensity conditioning (HIC) of rougher concentrate/cleaner feed was investigated as a means to improve response in cleaning and reduce Sn losses to cleaner 1 tails.

Clearly HIC gave a significantly improved cleaner response, with significantly reduced Sn losses to cleaner 1 tails.

Figure 11-16



Due to the small scale of the tin flotation tests meaningful measurement of specific power input to both the HIC stages (sulfide scavenger feed and cleaner feed) was not possible. Therefore, it is recommended further work be completed to better quantify HIC power requirements.

11.2.1 Sample Aging Issue

The later tin flotation results highlighted some issues with unexpected variability in flotation response. This was identified as an issue due to tin flotation feed sample "aging" through handling and storage during the laboratory routine (this is an artefact of the laboratory testing routine and not expected to be an issue at full scale).

Figure 11-17 Test T76 Sulfide Scavenger Tails Filter Cake showing visible flakes of brown aging product

Figure 11-17 shows the filter cake from T76 following the high intensity conditioning of the sulfide scavenger feed (stage immediately prior to the tin float). In the photo is shown pieces of cake which have been turned over, which have brown flaky material on them. On closer inspection these are clearly an iron compound (iron hydroxide/ iron hydroxysulfate) which has re-precipitated to produce agglomerates of particles held together by the iron compound. This is clear evidence of the sample aging/going off; it is assumed the sulfides present have oxidised releasing some iron and acid. The iron is then expected to re-precipitate as iron hydroxides and/or hydroxysulfates (such as jarosites). It is expected the iron which has precipitated on any mineral surfaces is likely of more concern than the actual agglomerates seen in T76.

Table 26 compares the dates of when the various de-sliming tests were done and when the float tests were completed to show the time elapsed between these and comparable tin floats. It appears the more obvious ‘fliers’; T67 (compares with T64), T65 (compares with T62), T74 and T75 (compares with T71) have considerable time elapsed between the de-slime run and the tin float test, and the ‘comparable test’. The ‘aging’ effect seems consistent in affect; with slowed cassiterite rate and reduced selectivity, with the tests having the largest elapsed times showing the most impact on performance.

Table 26 – Time Elapsed Between De-slime Test and Tin Flotation Test

Date of deslime test	Date of float test	Time elapsed (days) from deslime to float test	Time elapsed (days) from 'comparable test'	Tin Flotation Test No.	Feed material			Deslime mass recovery to u/f	Sulfide scav.				Tin float					Tin Flotation Response					
					Deslime cut point (D50)	Produced from test no.	% <CS5 (<8 µm)		H_2SO_4	SSF	Water change	SIPX	H_2SO_4	SSF	Na_2SO_3	SPA7080	MIBC	Roughing		Cleaning			
					µm			% wt	g/t	g/t		g/t	g/t	g/t	g/t	g/t	g/t	Grade (% Sn)	Roughing recovery	Grade (% Sn)	Cleaning recovery	Grade (% Sn)	Cleaning recovery
24/11/2014	24/11/2014	0		T58	12.1	UF from T56	9.7	39.3	401	200	yes	50	180	200	301	401	99	4.0	80.2			9.0	62.9
24/11/2014	24/11/2014	0	**0**	T59	12.1	UF from T56	9.7	39.3	440	200	yes	50	200	200	0	400	119	4.0	79.0			9.0	48.9
24/11/2014	02/12/14	8		T60	12.1	UF from T56	9.7	39.3	399	200	yes	50	100	200	299	299	99	4.0	82.7				
24/11/2014	01/12/14	7	**1**	T61	12.1	UF from T56	9.7	39.3	298	199	no	50	0	199	298	398	98	4.0	64.7				
24/11/2014	02/12/14	8		**T62**	**12.1**	**UF from T56**	**9.7**	**39.3**	**400**	**200**	**yes**	**50**	**180**	**200**	**300**	**400**	**79**	**4.0**	**80.1**	**12.0**	**55.0**	**15.0**	**51.3**
24/11/2014	05/12/14	11	**3**	T65	12.1	UF from T56	9.7	39.3	199	199	yes	50	100	199	299	398	79	4.0	78.2			15.0	42.8
3/12/2014	04/12/14	1		T64	6.1	UF from T63	27.1	61.8	397	199	yes	50	179	199	298	397	88	4.0	76.4				
3/12/2014	15/12/14	12	**11**	T67	6.1	UF from T63	27.1	61.8	499	200	yes	50	120	200	300	399	99	4.0	62.3			15.0	32.1
3/12/2014	2/03/2015	89	88	T79	6.1	UF from T63	27.1	61.8	1010	202	yes	50	242	303	404	656	130	4.0	66.4	12.0	41.6	14.7	20.4
22/01/2015	23/01/2015	1		**T71**	**4**	**UF from T70**	**40.6**	**79.9**	**592**	**197**	**yes**	**49**	**197**	**197**	**296**	**395**	**88**	**4.0**	**57.5**	**12.0**	**37.0**	**15.0**	**32.1**
22/01/2015	28/01/2015	6	**5**	T72	4	UF from T70	40.6	79.9	394	197	yes	49	177	197	296	394	88	4.0	59.8				
22/01/2015	11/02/15	20	**19**	T74	4	UF from T70	40.6	79.9	596	199	yes	50	199	199	298	397	79	4.0	37.1			15.0	21.9
22/01/2015	11/02/15	20	**19**	T75	4	UF from T70	40.6	79.9	595	198	yes	50	198	298	397	496	79	4.0	37.5			15.0	23.1
22/01/2015	**19/2/15**	**28**	**27**	**T76**	**4**	**UF from T70**	**40.6**	**79.9**	**1203**	**200**	**yes**	**50**	**241**	**301**	**401**	**601**	**129**	**4.0**	**67.3**	**12.0**	**49.7**	**15.0**	**28.2**
13/01/2015	13/01/15	0		T69	3	LC Cyc 11-31: -40 Fine Tails + O/F, +CS6	45.0	81.7	783	196	yes	49	176	196	294	392	97	3.9	12.3				
13/01/2015	13/01/15	0	**0**	T68	0	LC Cyc 11-31: -40 Fine Tails + O/F	53.0	100.0	298	198	yes	50	298	198	298	397	88	3.4	8.7				

This aging issue is thought to have particularly impacted the results achieved in tests T67, T74, T75 and T79 with roughing response being significantly poorer than that seen in earlier comparable tests.

The impact of this was mitigated to some extent in T76 (which was essentially a repeat of T75) and T79 with a modified roughing procedure. In these tests the rougher concentrate was filtered to give a better estimate of mass recovery and the rougher stage continued until a target damp weight of cake (rather than froth) was reached.

It should be noted the majority of tests completed have followed expected trends and are not thought to be particularly impacted by this issue.

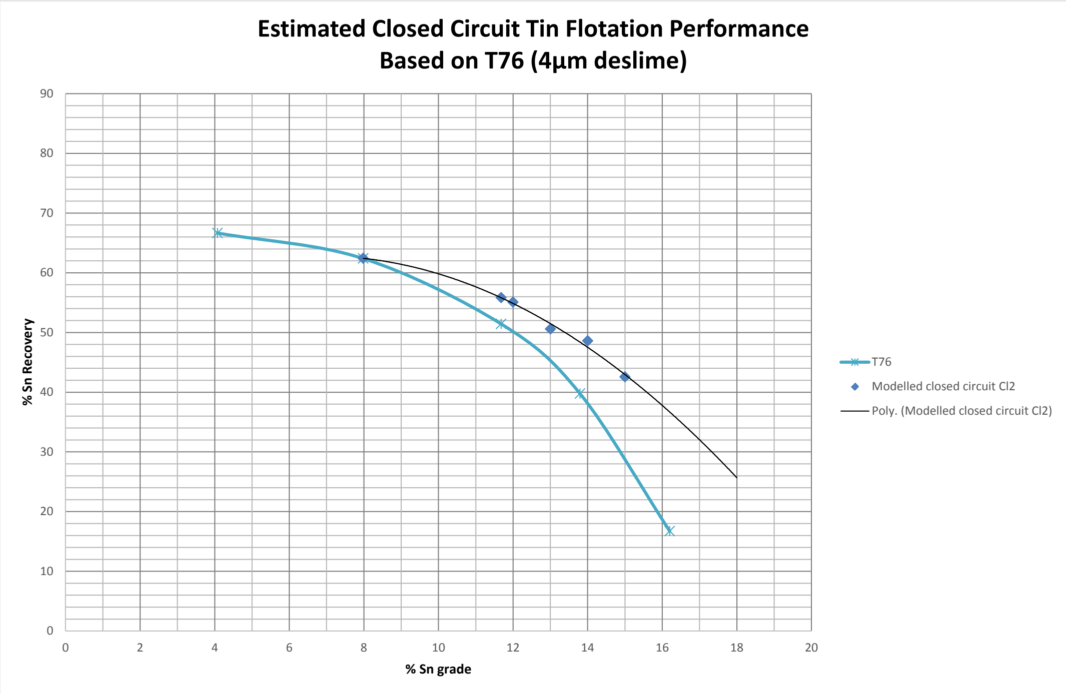
In future work it is strongly recommended to review sample handling procedures to minimise opportunity for oxidation, and that all tin flotation feed materials be kept in cold storage until immediately prior to use.

11.2.2 Estimated Closed Circuit Tin Flotation Performance

Due to restrictions in the quantity of tin flotation feed sample available conducting locked cycle tin flotation tests to estimate closed circuit cleaning performance was not practical. Therefore, in order to estimate closed circuit cleaning performance the tin flotation circuit was modelled utilising Metsim based on the batch test results seen in test T76.

Results are summarised in Figure 11-18, with the solid blue line showing the batch test result achieved in T76, while the black line and blue diamonds show the modelling outcome. Given the considerable amount of tin units contained in the cleaner 2 tailings from the batch tests (11% in T76), considerable uplift in tin flotation recovery is expected with the recycle of cleaner 2 tailings to cleaner 1 feed.

Figure 11-18



11.2.3 Tin Flotation Concentrate Composition

Tin flotation concentrate produced under the optimised flotation conditions is summarised in Table 27 for a range of Sn grades.

Table 27 – Tin Flotation Concentrate Composition (from T76)

Assay	Units	Tin Flotation Concentrate			
Sn	**%**	**15.0**	**14.0**	**13.0**	**12.0**
Fe	%	23.8	24.3	24.8	25.3
As	%	0.12	0.12	0.12	0.12
Mn	%	0.31	0.32	0.33	0.34
CaO	%	0.30	0.31	0.32	0.32
MgO	%	1.71	1.75	1.80	1.87
Al_2O_3	%	3.98	4.04	4.16	4.28
SiO_2	%	14.8	15.3	15.8	16.3
S	%	2.11	2.09	2.12	2.16
CO_3	%	10.6	11.1	11.5	12.0

"Low" and "Medium" Grade composites of cleaner concentrates were put together from cleaner concentrate products from tests T62 to T79 for more detailed analysis and leaching. Table 28 shows ICP scan results for these composites, with QXRD results shown in Table 29.

Table 28 – ICP Analysis of “Low” and “Medium” Grade Cleaner Concentrate

Sample	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cs ppm	Cu ppm	Fe %	Ga ppm	Ge ppm	Hf ppm	In ppm	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm
Cl2 Conc Low Grade Comp	3.65	1.95	932	60	10.2	53.1	0.24	0.42	31.3	9.1	206	10.7	350	26	17.8	0.76	2.5	5.7	0.23	13.6	24.8	1.09	3080	9.8
Cl2 Conc Medium Grade Comp	3.81	1.6	973	70	13.35	77.4	0.79	<0.02	41.9	7.7	181	9.16	276	23.9	15.6	0.91	2.3	5.35	0.19	18.1	20.4	0.95	2840	8.51

Sample	Na %	Nb ppm	Ni ppm	P ppm	Pb ppm	Rb ppm	Re ppm	S %	Sb ppm	Sc ppm	Se ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm
Cl2 Conc Low Grade Comp	0.06	60.3	56.7	830	1220	48	0.007	1.91	23.7	14	3	41.5	3.08	0.08	5.9	2.2	0.76	4	131	197.5	13.8	572	107
Cl2 Conc Medium Grade Comp	0.05	63.9	55.5	3310	1270	40.6	0.005	1.74	22.4	13	3	101	3.23	0.08	7	2.08	0.64	4	127	226	23	485	97.6

Table 29 – QXRD Analysis of “Low” and “Medium” Grade Cleaner Concentrate

CL2 CONC LOW GRADE COMP	10.4% Sn	CL2 CONC MEDIUM GRADE COMP	14.9% Sn
Phase	Weight%	Phase	Weight%
Siderite	37.1	Siderite	34.2
Cassiterite	13.1	Cassiterite	18.9
Quartz	11.7	Rutile	12
Rutile	11.5	Quartz	10.2
Magnetite	7.5	Magnetite	9.1
Chlorite	4.6	Pyrite	2.9
Pyrite	3.9	Anatase	2.6
Dravite/tourmaline	3.1	Apatite	2.4
Anatase	2.8	Chlorite	2.1
Microcline	1.4	Dravite/tourmaline	1.9
Diaspore?	1.4	Diaspore?	1.6
Muscovite	1.2	Microcline	1.3
Apatite	0.6	Muscovite	0.7
Calcite	0	Calcite	0
Dolomite	0	Dolomite	0
Actinolite/tremolite	0	Actinolite	0

Siderite is by far the most significant diluent present in the tin flotation concentrates, with significant levels of quartz, rutile and magnetite also present. Given the quantity of siderite present the tin flotation concentrate is expected to upgrade significantly in concentrate leaching.

11.3 Key Outcomes

- The various tin flotation testing completed has highlighted that silica is not particularly problematic from a selectivity perspective, with silica levels in concentrate being in-line with those expected due to entrainment.
- Tin flotation testwork has highlighted the criticality of appropriate de-slime and rejection of sulfur via the sulfide scavenger flotation circuit to achieving acceptable tin flotation performance;
    - A target sulfur grade in tin flotation feed post sulfide scavenging of less than ~0.7% S is recommended
    - Optimum de-slime cut point is within the range 4 - 7µm
    - At de-slimes sizes <4 µm tin flotation response is extremely poor
- Optimisation of the De-slime cut point has allowed minimisation of combine slimes and tin flotation tailings losses.
- Fundamentally poor selectivity against siderite remains the major challenge within the tin flotation circuit. From this perspective the testwork has demonstrated;
    - selectivity against siderite is significantly improved at low SPA dose rates (i.e. high dosages are detrimental to selectivity)
    - the usefulness of high intensity conditioning both of tin flotation feed and cleaner feed in improving selectivity
    - limiting mass pull within roughing reduces siderite deportment to the cleaner circuit to manageable levels
- Tin flotation test work has robustly demonstrated commercially meaningful tin flotation concentrate grades can be achieved at acceptable recoveries.

Expected Tin Float reagent consumptions (including sulfide scavenging) based on dose rates observed in the testwork are summarised in Table 30.

Table 30 - Expected Tin Float Reagent Consumptions (including sulfide scavenging)

pH	~5
Sulfuric Acid	600 g/t
PAX/SIPX	50 g/t
SSF	500 g/t
SPA	500 g/t
Na_2SO_3	400 g/t
Frother (MIBC)	90 g/t

It should be noted that in the testwork SIPX was used in the sulfide scavenger. However, to maintain commonality with the sulfide flotation and sulfide dressing flotation circuits it is suggested PAX be used in place of SIPX. This is not expected to have any detrimental performance impacts.

12 CONCENTRATE LEACHING

Full concentrate leach test results are contained in Appendix 10.

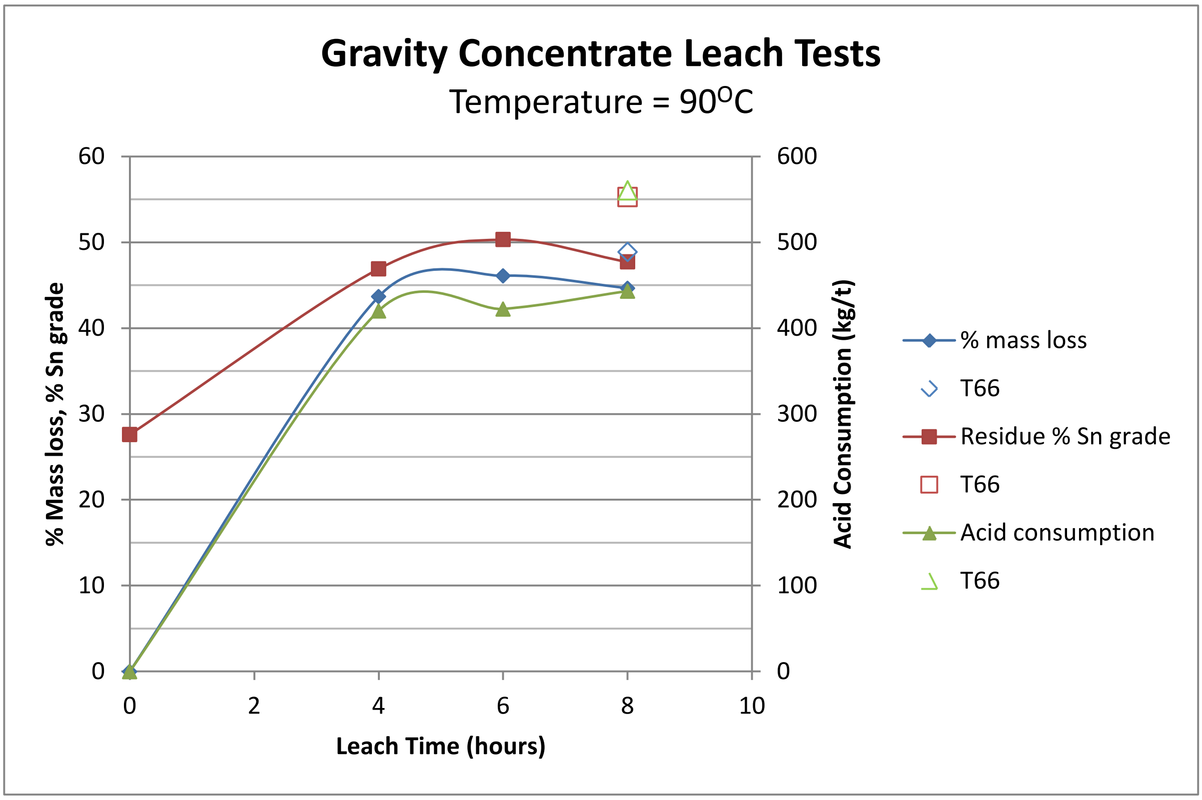
Concentrate leach tests were carried out on both the gravity concentrate produced from gravity concentrate dressing testwork and on two composites of tin flotation cleaner concentrate produced from tin flotation testing.

Aims of the concentrate leach testwork were to:

- Better quantify required concentrate leach residence time.
- Confirm achievable Sn upgrade, extents of leaching of other species, and expected acid consumption of both the gravity and tin flotation concentrates across the concentrate leach circuit.
- Produce final concentrate samples for detailed analysis including multi-element ICP scans and QXRD (refer Section 10.4 for final gravity concentrate and Section 11.2.3 for final tin flotation concentrate analysis).

Figure 12-1 shows plots of mass loss, final leach residue Sn grade and acid consumption versus leach time at 90^{O}C for concentrate leach tests carried out on the dressed gravity concentrate.

Figure 12-1



The concentrate leach is expected to operate at a temperature of ~90 to 97^{O}C due to the large heat of dilution associated with the required acid input.

At a temperature of 90^{O}C the concentrate leach is nearing completion by 4 hours. However, at 4 hours residues still contained some carbonate. Hence a total residence time of 8 hours is recommended to ensure complete leaching.

For the gravity concentrate acid consumption was in the range 440 to 560 kg/t after 8 hours of leaching. Actual acid consumption is expected to be highly dependent on feed concentrate composition. A residual free acid of ~20-25 g/l at the end of the leach is recommended to ensure leaching reaches completion.

Table 31 shows results for concentrate leach test T66 conducted on the dressed gravity concentrate produced under the final optimised concentrate dressing conditions, while Table 32 shows results of duplicate assays of the final gravity concentrate produced, along with the unleached concentrate for comparison.

Table 31 – Final Gravity Concentrate: Concentrate Leach Results (T66)

Acid consumption = 560 kg/t, leach time = 8 hours, Leach temperature = 90^{O}C

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al	
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)
Start Liquor	0.8	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
Final Liquor	0.8	0.008	0.0	74.30	91.3	0.01	4.0	3.91	95.1	0.72	35.8	4.95	82.7	2.77	35.0

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Start Solids	300.0	28.80		21.00		0.10		1.10		1.20		2.60		2.70	
Final Residue	153.4	55.25	100.0	3.82	8.7	0.13	96.0	0.11	4.9	0.70	64.2	0.56	17.3	2.79	65.0

Calc Feed	300.0	28.25		22.50		0.07		1.14		0.56		1.66		2.19	
Assay Feed		28.80		21.00		0.10		1.10		1.20		2.60		2.70	

Table 32 – "Final Gravity Concentrate" Analysis (post leaching)

Results of Duplicate Assays for T66 Residue Solids

	Sn	Fe	As	S	SiO_2	Mn	CaO	MgO	Al_2O_3
	%	%	%	%	%	%	%	%	%
T66 End Leach Res A	54.4	3.8	0.13	1.13	13.45	0.11	0.7	0.56	2.84
T66 End Leach Res B	56.1	3.83	0.13	1.16	12.8	0.11	0.71	0.56	2.73
T66 Leach Feed	28.8	21.0	0.1	0.7	7.0	1.1	1.2	2.6	2.7

Aside from the carbonates present a substantial portion of the Al_2O_3 present has also leached.

Table 33 and Table 34 show results for concentrate leach tests carried out on "Medium" and "Low" grade tin flotation cleaner concentrate samples.

Table 33 –"Medium" Grade Cleaner Concentrate: Concentrate Leach Results

Acid consumption = 480 kg/t, leach time = 8 hours, Leach temperature = 90^{O}C

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Final Residue	2.8384	28.10	100.0	4.12	7.5	0.05	71.6	0.03	4.3	0.07	5.2	0.49	19.6	4.29	70.4
Calc Feed	6.0086	13.27		25.80		0.03		0.33		0.64		1.18		2.88	

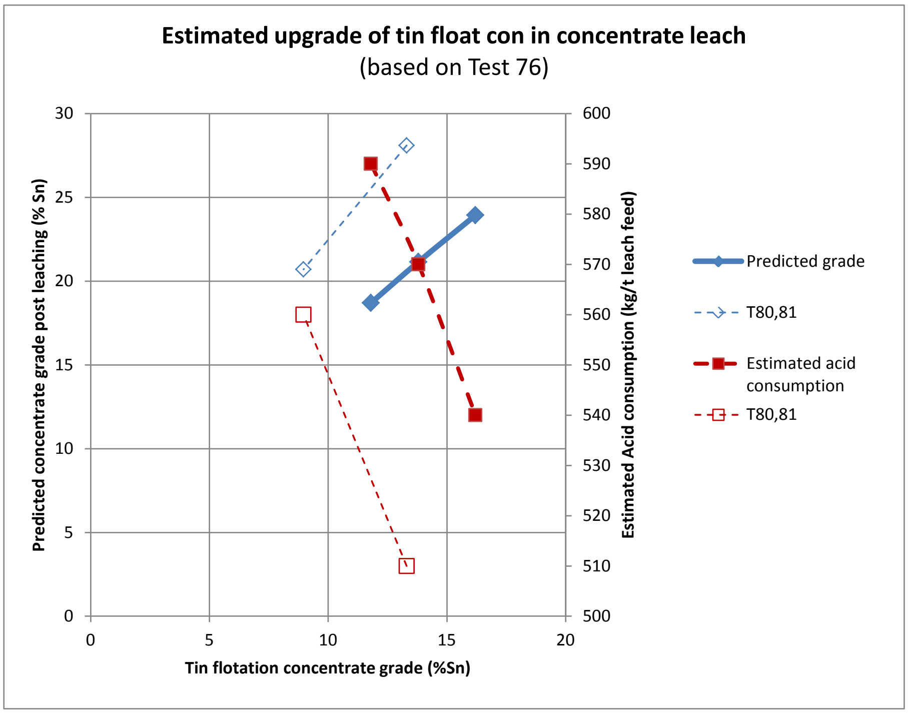
Table 34 –"Low" Grade Cleaner Concentrate: Concentrate Leach Results

Acid consumption = 528 kg/t, leach time = 8 hours, Leach temperature = 90^{O}C

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Final Residue	2.5996	20.70	100.0	4.30	6.6	0.05	18.1	0.01	1.3	0.08	11.7	0.57	18.8	5.26	69.8
Calc Feed	6.0086	8.96		28.28		0.12		0.34		0.30		1.31		3.26	

Both the medium and low grade concentrates upgraded extremely well, more than doubling in Sn grade. The upgrade seen was much higher than expected based on previous modelling of expected concentrate leach performance of tin flotation concentrates. A comparison of model expectations and the actual test outcomes is shown in Figure 12-2.

Figure 12-2 Comparison of Concentrate Leach Model and Leach Test Outcomes



Given the significant under estimation of the upgrade of tin flotation concentrate and over estimation of acid consumption it is it recommended to revise the previous concentrate leach model to better reflect expected performance on tin flotation concentrates.

13 TAILINGS CHARACTERISTICS

The tailings streams produced from the circuit and their relative tonnages assuming a ROM treatment rate of 600,000 t/y are shown in Table 35.

Table 35 – Tailings Streams

Tailings Stream	Tonnage (t/y)(1)
Final Sulfide Concentrate	164,400
Fine Gravity Tailings	118,400
Slime Tailings	62,200
Tin Flotation Tailings	242,000

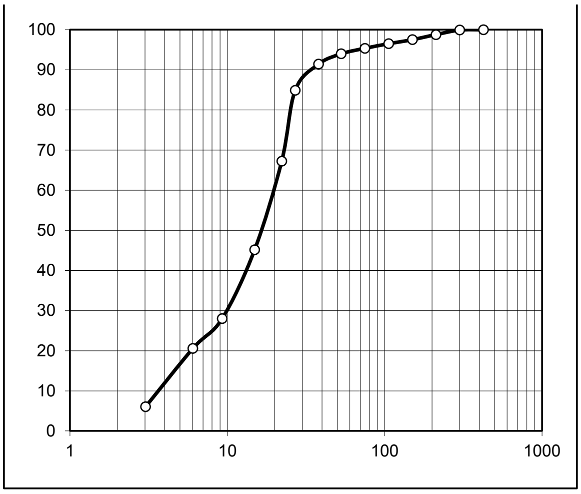
Notes; 1. Assumes 600,000 t/y ROM treated

Head assays, size distributions and size by size assays and metal distributions of these are shown in Table 36, Table 37, Table 38 and Table 39 respectively.

In addition to the above stream a minor amount, ~4,000 t/y, of magnetite concentrate will also be produced as an additional final tailings stream from the gravity concentrate dressing circuit.

Table 36 – Final Sulfide Concentrate

Product Sized Comb Clnr C1-C3		SIZE um	WEIGHTS g	(%)	%PASS
	P80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.21	0.09	99.9
		212	2.54	1.12	98.8
		150	2.88	1.27	97.5
		106	2.29	1.01	96.5
		75	2.57	1.14	95.4
		53	3.12	1.38	94.0
	26	38	5.84	2.58	91.4
CYCLOSIZER	CS1	27	14.71	6.50	84.9
FLOW 185	CS2	22	40.08	17.70	67.2
TEMP 21	CS3	15	49.97	22.07	45.1
SG **3.50**	CS4	9	38.84	17.15	28.0
MINS 20	CS5	6	16.79	7.42	20.6
CENTRIFUGE	CS6	3	32.90	14.53	6.0
		SUB	13.68	6.04	0.0
		TOTAL	226.42	100.0	



ANALYSES

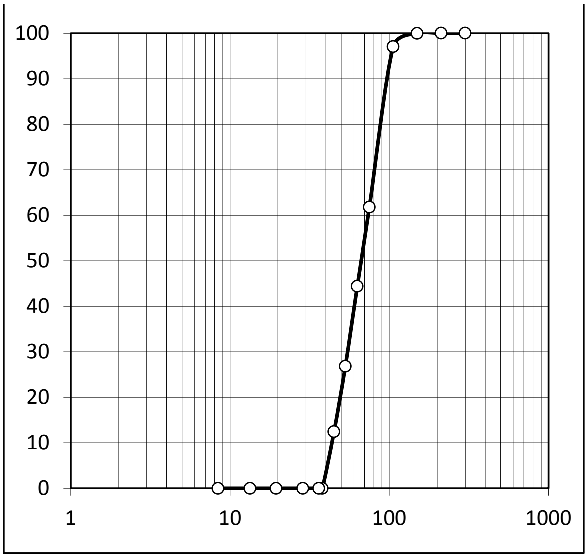
SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	Si02 %	Si02 dist	MnO %	MnO dist
75	4.63	0.09	4.69	42.90	4.87	0.34	4.30	40.90	4.74	1.85	4.74	0.02	5.19
CS1	10.45	0.07	8.23	44.10	11.29	0.55	15.71	44.30	11.58	0.92	5.32	0.01	5.86
CS2	17.70	0.07	13.94	43.60	18.90	0.45	21.77	46.00	20.37	0.72	7.05	0.01	9.92
CS3	22.07	0.08	19.86	42.50	22.97	0.38	22.91	39.80	21.97	1.12	13.67	0.01	12.37
CS4	17.15	0.08	15.44	41.30	17.35	0.35	16.40	41.50	17.81	1.06	10.05	0.01	9.61
CS5	7.42	0.08	6.67	41.00	7.45	0.28	5.67	33.70	6.25	1.11	4.55	0.01	4.16
CS6	14.53	0.12	19.61	38.70	13.77	0.25	9.93	38.60	14.03	2.62	21.05	0.04	32.57
<CS6	6.04	0.17	11.55	23.00	3.40	0.20	3.30	21.50	3.25	10.05	33.57	0.06	20.32
CALC	100.0	0.09	100.00	40.83	100.00	0.37	100.00	39.98	100.00	1.81	100.00	0.02	100.00
ASSAY		0.07		41.20		0.38		42.10		1.58		0.02	

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist	CO3 %	CO3 dist	C -organic %	C -organic dist	C -inorganic %	C -inorganic dist
75	4.63	0.16	7.91	0.34	4.33	0.48	1.81	0.34	4.71	0.18	4.00	0.16	5.98
CS1	10.45	0.04	4.46	0.29	8.34	0.29	2.47	0.17	5.32	0.08	4.01	0.09	7.59
CS2	17.70	0.02	3.78	0.32	15.58	0.20	2.89	0.20	10.60	0.07	5.95	0.12	17.14
CS3	22.07	0.03	7.07	0.32	19.42	0.29	5.22	0.24	15.85	0.10	10.59	0.14	24.93
CS4	17.15	0.03	5.49	0.31	14.63	0.24	3.36	0.24	12.32	0.12	9.88	0.12	16.61
CS5	7.42	0.05	3.96	0.30	6.12	0.26	1.57	0.25	5.55	0.15	5.34	0.10	5.98
CS6	14.53	0.06	9.30	0.47	18.78	0.80	9.48	0.53	23.05	0.39	27.19	0.14	16.41
<CS6	6.04	0.90	58.03	0.77	12.80	14.85	73.19	1.25	22.60	1.14	33.05	0.11	5.36
CALC	100.0	0.09	100.00	0.36	100.00	1.23	100.00	0.33	100.00	0.21	100.00	0.12	100.00
ASSAY		0.02		0.37		0.48		0.28		0.15		0.13	

Table 37 – Fine Gravity Tailings

LC01 Cyc6 -106 FGT		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.02	0.03	100.0
		106	1.91	2.91	97.1
	91	75	23.19	35.30	61.8
		63	11.41	17.37	44.4
		53	11.55	17.58	26.8
		45	9.45	14.39	12.4
		38	8.16	12.42	0.0
CYCLOSIZER	CS1	36		0.00	0.0
FLOW 185	CS2	29		0.00	0.0
TEMP 21	CS3	19		0.00	0.0
SG **2.60**	CS4	13		0.00	0.0
MINS 20	CS5	8		0.00	0.0
		SUB	0.00	0.00	0.0
		TOTAL	65.69	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mn %	Mn dist
75	38.24	0.23	39.7	12.05	36.0	0.06	40.2	0.77	33.0	57.40	38.7	0.26	32.7
63	17.37	0.22	17.3	12.55	17.0	0.05	15.2	0.90	17.5	57.20	17.5	0.29	16.6
53	17.58	0.22	17.5	12.70	17.5	0.06	18.5	0.91	17.9	57.50	17.8	0.31	17.9
45	14.39	0.22	14.3	13.75	15.5	0.06	15.1	1.06	17.1	55.90	14.2	0.35	16.5
38	12.42	0.20	11.2	14.45	14.0	0.05	10.9	1.04	14.5	53.80	11.8	0.40	16.3
26													
12													
8													
CALC	100.00	0.22	100.0	12.79	100.0	0.06	100.0	0.89	100.0	56.72	100.0	0.30	100.0
ASSAY													

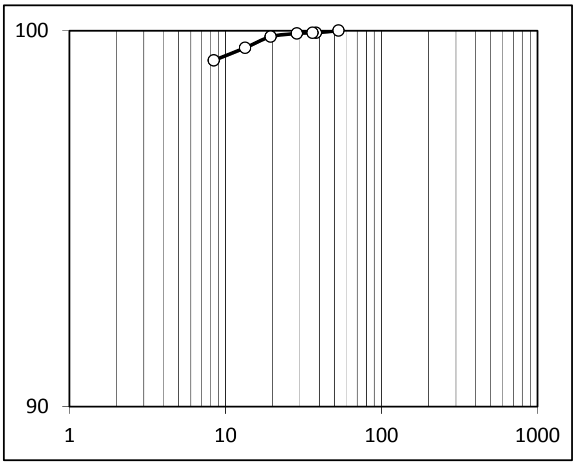
ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
75	38.24	0.92	36.9	3.62	39.4	8.82	39.9				
63	17.37	0.93	16.9	3.47	17.2	8.46	17.4				
53	17.58	0.92	17.0	3.38	16.9	8.29	17.2				
45	14.39	1.01	15.2	3.47	14.2	8.13	13.8				
38	12.42	1.07	13.9	3.48	12.3	7.98	11.7				
26	0.00										
12	0.00										
8	0.00										
CALC	100.00	0.95	100.0	3.51	100.0	8.46	100.0				
ASSAY											

Table 38 – Slime Tails

	% Sn	% Fe	% SiO_2	% S	% CaO
Slime Tails	0.46	21.7	38.4	1.01	0.82

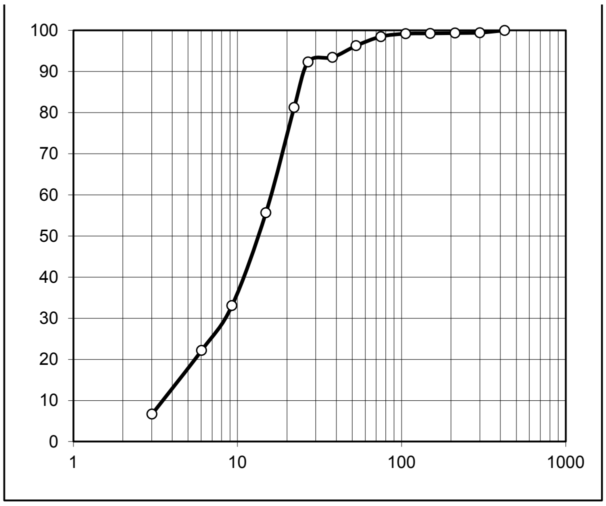
Cyclone Overflow T70		SIZE um	WEIGHTS gm	(%)	%PASS
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.00	0.00	100.0
		106	0.00	0.00	100.0
		75	0.00	0.00	100.0
		53	0.00	0.00	100.0
		38	0.06	0.06	99.9
CYCLOSIZER		36	0.00	0.00	99.9
FLOW	185	29	0.02	0.02	99.9
TEMP	21	19	0.09	0.09	99.8
SG	**2.60**	13	0.31	0.30	99.5
MINS	20	8	0.35	0.33	99.2
		SUB	104.20	99.21	0.0
		TOTAL	105.03	100.00	



STELLAR RESOURCES LIMITED
HEEMSKIRK TIN PROJECT
SEVERN FURTHER FLOWSHEET DEVELOPMENT AND OPTIMISATION

Table 39 – Tin Flotation Tails

Product Sized Ro Tail		SIZE um	WEIGHTS g	(%)	%PASS
	P80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.70	0.54	99.5
		212	0.14	0.11	99.3
		150	0.10	0.08	99.3
		106	0.10	0.08	99.2
		75	0.89	0.69	98.5
		53	2.84	2.21	96.3
	22	38	3.65	2.84	93.5
CYCLOSIZER	CS1	27	1.45	1.13	92.3
FLOW 185	CS2	22	14.23	11.06	81.3
TEMP 21	CS3	15	32.95	25.61	55.7
SG **3.50**	CS4	9	29.01	22.55	33.1
MINS 20	CS5	6	14.08	10.94	22.2
CENTRIFUGE	CS6	3	19.88	15.45	6.7
		SUB	8.63	6.71	0.0
		TOTAL	128.65	100.0	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	Si02 %	Si02 dist	MnO %	MnO dist
CS1	7.67	0.41	12.84	17.65	7.03	0.05	7.38	0.77	14.55	49.20	8.78	0.53	6.03
CS2	11.06	0.44	19.87	25.30	14.53	0.05	10.63	0.48	13.08	30.00	7.72	1.11	18.21
CS3	25.61	0.26	27.18	18.80	25.00	0.05	24.62	0.28	17.66	45.40	27.05	0.72	27.35
CS4	22.55	0.20	18.41	18.45	21.60	0.05	21.68	0.20	11.11	45.60	23.92	0.67	22.41
CS5	10.94	0.18	8.04	18.60	10.57	0.05	10.52	0.21	5.66	44.20	11.26	0.64	10.39
CS6	15.45	0.16	10.09	18.85	15.12	0.05	14.85	0.45	17.13	41.60	14.96	0.52	11.92
<CS6	6.71	0.13	3.56	17.65	6.15	0.08	10.32	1.26	20.82	40.40	6.31	0.37	3.68
CALC	100.0	0.24	100.00	19.26	100.00	0.05	100.00	0.41	100.00	42.98	100.00	0.67	100.00
ASSAY		0.24		19.30		0.05		0.33		42.90		0.69	

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist	CO3 %	CO3 dist	C -organic %	C -organic dist	C -inorganic %	C -inorganic dist
CS1	7.67	0.89	5.61	3.43	6.91	7.05	6.63	2.02	5.56	0.14	6.55	1.88	5.50
CS2	11.06	1.34	12.18	3.47	10.08	6.41	8.70	4.36	17.30	0.11	7.41	4.25	17.92
CS3	25.61	1.13	23.78	3.37	22.67	7.01	22.02	2.94	27.02	0.11	17.17	2.83	27.63
CS4	22.55	1.15	21.31	3.69	21.85	7.43	20.55	2.83	22.90	0.11	15.12	2.72	23.38
CS5	10.94	1.15	10.34	3.96	11.38	8.21	11.02	2.87	11.27	0.11	7.34	2.76	11.52
CS6	15.45	1.01	12.83	4.70	19.07	10.80	20.47	2.23	12.36	0.15	14.13	2.08	12.25
<CS6	6.71	2.53	13.95	4.56	8.03	12.90	10.61	1.49	3.59	0.79	32.29	0.70	1.79
CALC	100.0	1.22	100.00	3.81	100.00	8.15	100.00	2.79	100.00	0.16	100.00	2.62	100.00
ASSAY		1.12		3.87		8.23		2.80		0.11		2.69	

14 CONCLUSIONS

The Severn metallurgical testing program has focused on the optimisation of the process flowsheet utilising a large "global" composite sample representing the typical Severn mineralogy, composition and tin grades. This has provided a number of important improvements to metallurgical performance, and flowsheet simplifications, in addition to generating more robust information with respect to optimum process design criteria and processing conditions.

Key outcomes of the program include:

- Elimination of the heavy media separation circuit

  Based on the analysis completed heavy media separation detracts value from the Heemskirk project when the treatment of the same ROM (grade and tonnages of ore) is considered. That is, HMS detracts value when considered from a processing only perspective. On this basis inclusion of HMS in the Heemskirk flowsheet is not recommended.

- Coarser primary grind; grind size optimisation test work has demonstrated a significantly coarser primary grind size (P80 = 250 µm) is more optimum than that considered in the PFS (P80 = 130 µm). This provides the following benefits;
  - reduced tin losses due to reduced fines production
  - reduction in primary grind operating and capital costs, and overall comminution energy requirements

  Significantly, the percentage of tin passing 30 µm (below which size gravity recovery is relatively poor) is estimated to decrease from ~43% passing 30 µm at a primary grind size of 130 µm (as assumed in the PFS), to only ~30% passing 30 µm at a primary grind size of 240 µm. This is equivalent to ~30% reduction in fine tin generation, and is a key contributor to the improved gravity recovery achieved.

- Optimisation of the sulfide flotation circuit has led to a significant reduction in tin losses to the final sulphide concentrate tailings stream. This, together with the elimination of the heavy media circuit has increased the amount of tin available for recovery within the gravity and tin flotation circuits.
- Heavy regrind within the sulfide flotation circuit along with use of guar are key to achieving very low Sn losses in this circuit.
- Optimisation of the gravity circuit configuration, combine with upstream flowsheet improvements, has led to ~10% improvement in tin recovery via gravity.
- Improvements with the concentrate dressing circuit have led to improved gravity concentrate quality and clearly demonstrated a high quality concentrate, low in penalty elements, can be readily produced.
- The various tin flotation testing completed has highlighted that silica is not particularly problematic from a selectivity perspective, with silica levels in concentrate being in-line with

those expected due to entrainment. This allows the elimination of the silica flotation circuit (considered in the PFS) and provides a simplification to the overall process flowsheet.

- Tin flotation testwork has highlighted the criticality of appropriate de-slime and rejection of sulfur via the sulfide scavenger flotation circuit to achieving acceptable tin flotation performance.
    - A target sulfur grade in tin flotation feed post sulfide scavenging of less than ~0.7% S is recommended.
    - Optimum de-slime cut point is within the range 4 - 7µm.
    - At de-slimes sizes <4 µm, or <CS5 “slimes” content of >43%, tin flotation response is extremely poor.
- Optimisation of the De-slime cut point has allowed minimisation of combine slimes and tin flotation tailings losses.
- Fundamentally poor selectivity against siderite remains the major challenge within the tin flotation circuit. From this perspective the testwork has demonstrated;
    - selectivity against siderite is significantly improved at low SPA dose rates (i.e. high dosages are detrimental to selectivity)
    - the usefulness of high intensity conditioning both of tin flotation feed and cleaner feed in improving selectivity
    - limiting mass pull within roughing reduces siderite deportment to the cleaner circuit to manageable levels
- Tin flotation test work has robustly demonstrated commercially meaningful tin flotation concentrate grades can be achieved at acceptable recoveries.
- Concentrate leaching performance on tin flotation concentrates was significantly better than expected, providing greater Sn upgrade with reduced acid consumption than previously estimated.
- Concentrate leaching provides a robust, tin loss free means of significantly upgrading Sn grade of both the gravity concentrate and tin flotation concentrate, as siderite forms the major diluent present in both of these concentrates.

  In particular leaching of the gravity concentrate upgrades this sufficiently to allow significant dilution with relatively low grade tin flotation concentrate, allowing overall Sn recoveries to be maximised.

Based on the outcomes of the optimisation program overall tin recovery is estimated at 79.5% at a final concentrate grade of 45% Sn.

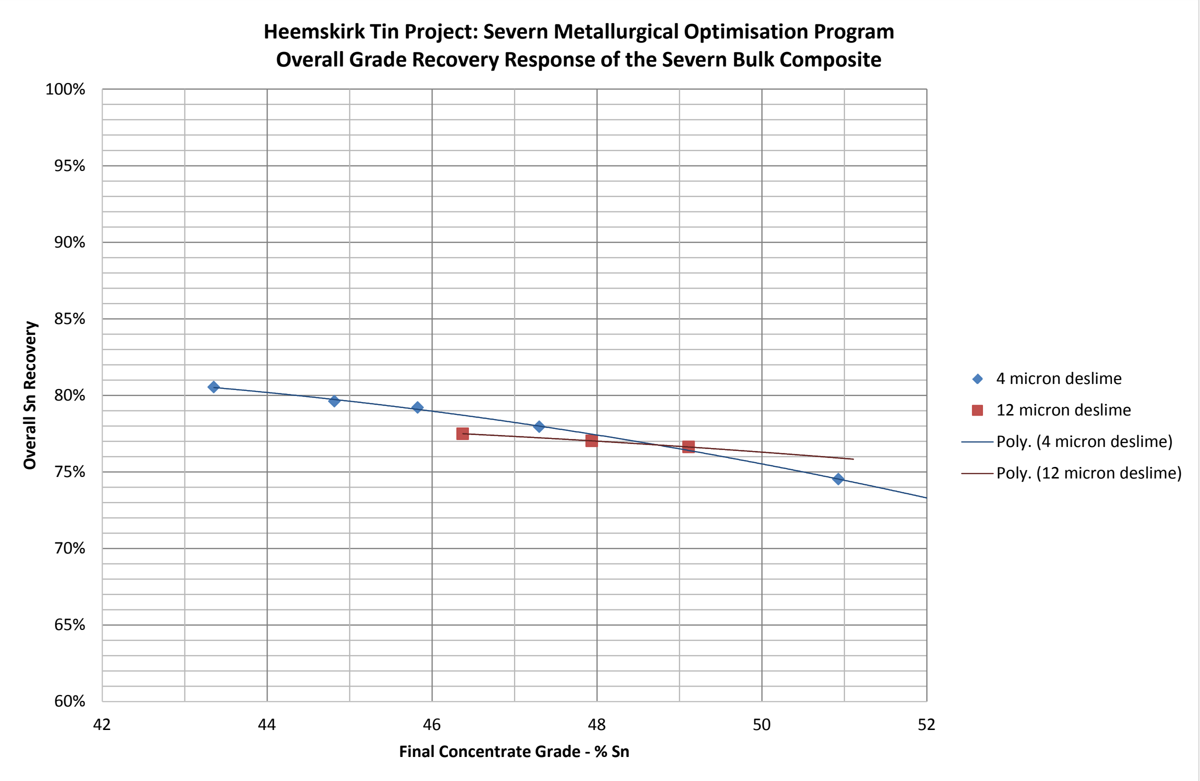
14.1 Overall Metallurgical Performance

A series of overall circuit tin balances based on the outcomes of optimisation program are contained in Appendix 14. In these two cases have been considered;

1. 4 µm cut point (D50) in de-slime ahead of tin flotation
2. 12 µm cut point (D50) in de-slime ahead of tin flotation

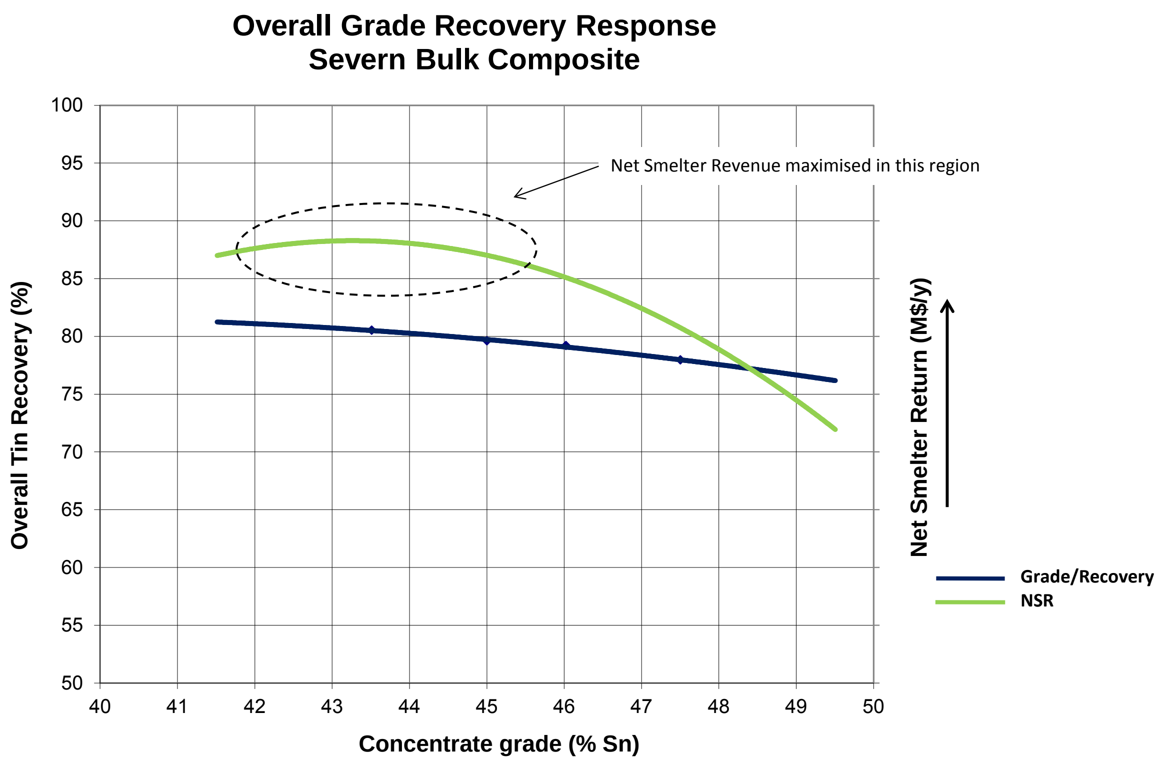
In both cases a variety of tin flotation concentrate grades have been considered to allow the generation of an overall grade recovery response curve across the entire circuit, as shown in Figure 14-1.

Figure 14-1



Due to the significantly flatter tin flotation grade recovery response achieved at the coarser de-slime cut point the overall grade recovery response is also relatively flat when compared to the finer cut point. However, at lower concentrate grades, less than ~48% Sn, it is expected de-sliming at the finer size will provide improved overall Sn recovery.

Figure 14-2

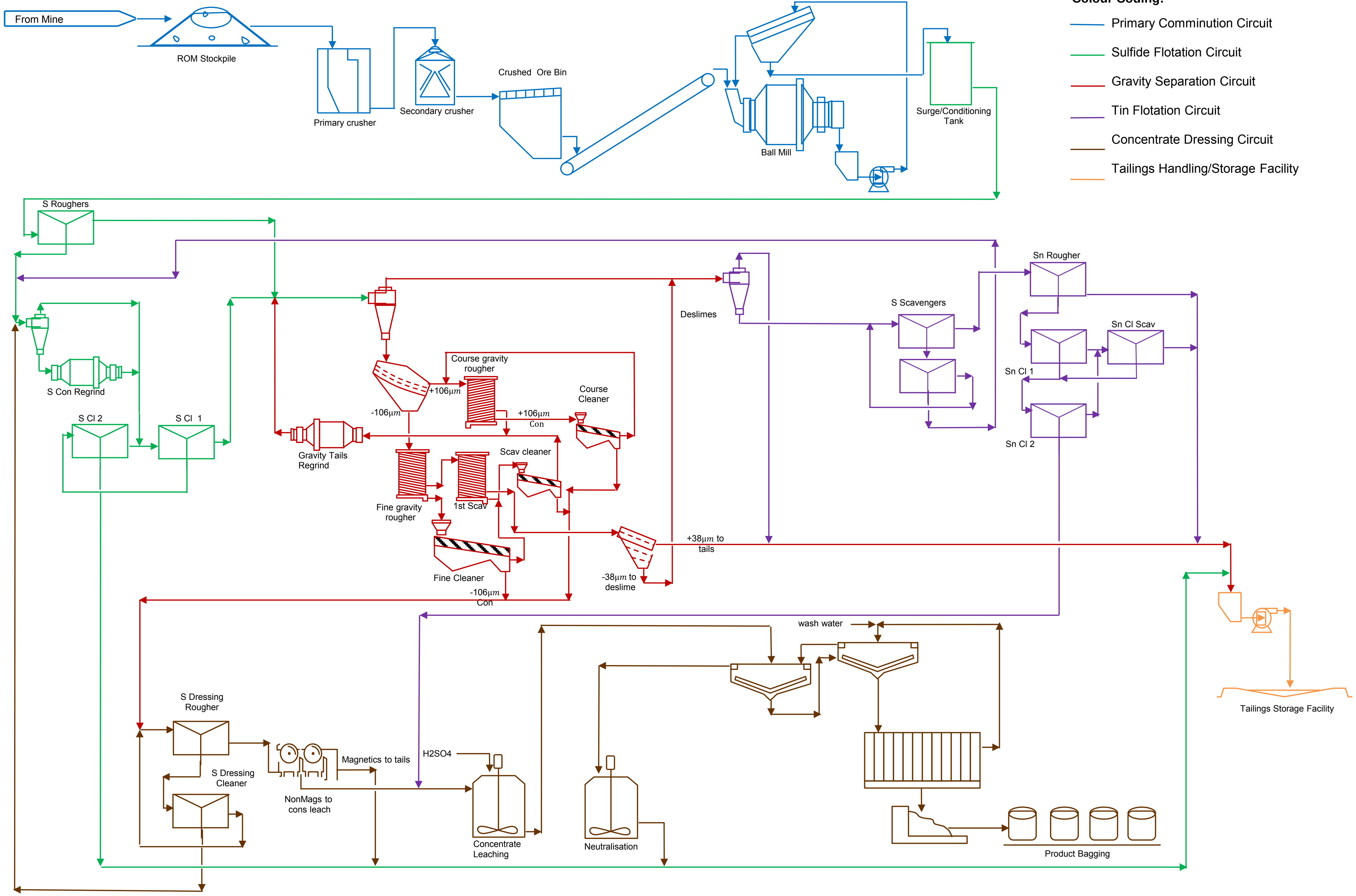


Net Smelter Return (NSR) analysis based on typical tin concentrate treatment and refining charges and penalty rates, at a range of grade recovery points has shown NSR is maximised at final concentrate tin grades in the low to mid-forties (refer Figure 14-2). As such targeting the finer de-slime size is recommended.

15 PROPOSED PROCESS FLOWSHEET

A simplified version of the optimised process flowsheet which incorporates the various improvements and simplifications arising out of the testwork program is shown in Figure 15-1.

Figure 15-1 OPTIMISED PROCESS FLOWSHEET (simplified)



15.1 Major design criteria

The major recommended process design criteria arising from the overall testwork program are summarised in Table 40.

Table 40 – Major Design Criteria

Item	Description	Units	Nominal
1.0	**Primary Grinding**		
	Target Grind Size (P80)	µm	250
2.0	**Sulfide Flotation**		
	Circuit configuration		Rougher plus R/G plus 2 stage cleaning with open circuit cleaner 1 tails
	Conditioning		
	Number of conditioning stages		1
	Laboratory Conditioning Time (per stage)	minutes	5
	Pulp density	t/m^3	1.33
	% solids	%	36
	Rougher flotation		
	Laboratory Flotation Time	minutes	20
	Feed density	t/m^3	1.33
	% solids	%	36
	Solids SG		3.2
	Regrind		
	Mill type		sand mill
	specific energy input	kWh/t	20
	Target regrind size (P80)	µm	25
	1st Cleaner flotation		
	Cleaner tail destination		final sulfide tails
	Laboratory Flotation Time	minutes	12
	Pulp density	t/m^3	1.20
	% solids	%	22
	Solids SG		4.0
	2nd Cleaner flotation		
	Cleaner tail destination		Regrind feed
	Laboratory Flotation Time	minutes	12
	Pulp density	t/m^3	1.20
	% solids	%	22
	Solids SG		4.2
3.0	**Gravity**		
	Primary gravity cyclone cut point (D50)		20
	Primary Gravity Screen cut point (D50)		106
	Target regrind size (P80)	µm	52
	Fine Gravity Tails Screen Cut Point (D50)		38-40
	Mass recovery to O/S ("Fine gravity tails")	%	55%
4.0	**Gravity Concentrate Dressing**		
4.1	**Sulfide dressing flotation**		
	Circuit configuration		Rougher plus 1 stage closed circuit cleaner
	Conditioning		
	Type		std
	Number of conditioning stages		2
	Laboratory Conditioning Time (per stage)	minutes	2
	% solids	%	30
	Sulfide dressing - Rougher flotation		
	Laboratory Flotation Time	minutes	15
	Feed density	t/m^3	1.30
	% solids	%	30
	Solids SG		4.3
	Sulfide dressing - 1st Cleaner flotation		
	Laboratory Flotation Time	minutes	12.0
	Pulp density	t/m^3	1.18
	% solids	%	20
	Solids SG		4.5
4.2	**Dressing Magnetic Separation**		
	Circuit configuration		Rougher plus regrind and cleaner
	Mass recovery to mags	%	25%
	Mags regrind mill type		ball
	Target regrind size (P80)	µm	34

Item	Description	Units	Nominal
5.0	**Tin Flotation**		
	De-slime		
	De-slime cut point (D50)	µm	4
	Conditioning		
	Type		HIC
	Number of conditioning stages		2
	Laboratory Conditioning Time (per stage)	minutes	5
	HIC energy	kWh/t	TBC
	Sulfide Scavenger - Rougher flotation		
	Laboratory Flotation Time	minutes	7.5
	Feed density	t/m^3	1.35
	% solids	%	38
	Solids SG		3.2
	Sulfide Scavenger - 1st Cleaner flotation		
	Cleaner tail destination		sulfide scavenger rougher feed
	Laboratory Flotation Time	minutes	3.0
	Pulp density	t/m^3	1.18
	% solids	%	20
	Solids SG		4.0
	Concentrate destination		sulfide regrind circuit
	Sn Rougher flotation		
	Circuit configuration		Rougher plus plus 2 stage cleaning with open circuit cleaner 1 tails
	Laboratory Flotation Time	minutes	18
	Feed density	t/m^3	1.30
	% solids	%	34
	Solids SG		3.2
	Cleaner Feed Conditioning		
	Type		HIC
	Number of conditioning stages		2
	Laboratory Conditioning Time (per stage)	minutes	5
	Pulp density	t/m^3	1.1
	% solids	%	13
	Solids SG		3.5
	HIC energy	kWh/t	TBC
	Sn 1st Cleaner flotation		
	Laboratory Flotation Time	minutes	8
	Pulp density	t/m^3	1.10
	% solids	%	13
	Solids SG		3.5
	Sn 2nd Cleaner flotation		
	Laboratory Flotation Time	minutes	8
	Pulp density	t/m^3	1.10
	% solids	%	13
	Solids SG		3.5
6.0	**Concentrate leach**		
	Leach temperature	^oC	90
	Pulp density	t/m^3	1.93
	% solids	%	60
	Solids SG		5.0
	retention time	h	8.0

15.2 Key changes from PFS Process Flowsheet

Key changes to the process flowsheet arising out of the optimisation program compared to the PFS flowsheet are summarised below:

- Elimination of the heavy media separation circuit
- Coarser primary grind; grind size optimization testwork has demonstrated a significantly coarser primary grind size is more optimum than that considered in the PFS.
- Finer Sulfide regrind, utilising sand milling rather than ball milling has led to a significant reduction in tin losses to the final sulfide concentrate tailings stream.

- Optimisation of the gravity circuit configuration, combine with upstream flowsheet improvements, has led to ~10% improvement in tin recovery via gravity.
- Introduction of a magnetic separation in the gravity concentrate dressing circuit
- Elimination of the silica flotation circuit
- High intensity conditioning (HIC) in tin flotation; both of sulfide scavenger feed and rougher concentrate
- Leaching of combine gravity and flotation concentrates

Table 41 shows a comparison of the tin deportment across the circuit assumed in the PFS and the Severn Optimisation Program Outcomes.

Table 41 – Comparison of Tin Deportment Assumed in PFS and Severn Optimisation Program Outcomes

Process Product and Tail		Assumed PFS Performance	Severn Optimisation program Outcome	Change from PFS Performance
Ore Grade	**% Sn**	1.06	1.00	0.06
1.Ore Feed (product)	**% Sn**	100	100	0.0
2. HMS Floats (tail)	**% Sn**	-1.5	0	1.5
3.Final Sulfide Conc (tail)	**% Sn**	-10.1	-2.6	7.5
Sn Recovery to Gravity Circuit Feed (product)	**% Sn**	88.4	97.4	**9.0**
4. Gravity Conc (product)	**% Sn**	**63.9**	**69.1**	**5.2**
5. Gravity Tail	**% Sn**	-2.6	-3.8	-1.2
6. Slime Tail	**% Sn**	-1.3	-3.7	-2.4
7. Tin Flotation Conc (product)	**% Sn**	**8.5**	**10.4**	**1.9**
8. Tin Flotation Tail	**% Sn**	-12.1	-10.2	1.9
9. Overall Recovery (product)	**% Sn**	**72.4**	**79.5**	**7.1**
10. Overall Loss (tail)	**% Sn**	**-27.6**	**-20.4**	**7.2**
Final Tin Concentrate Grade	**% Sn**	**50.8**	**45.0**	**5.8**

Notably significant reduction in tin losses to the HMS Floats, Final Sulfide Concentrate and Tin Flotation Tailings streams have been achieved. In particular the reduction in losses ahead of the primary tin recovery circuits (gravity and tin flotation), via HMS Floats and Final Sulfide Concentrate have improved tin recovery into the feed of these, with tin deportment to gravity circuit feed now at 97.4%, up 9% from the PFS.

Tin recovery into both gravity and tin flotation concentrates has also improved to give an overall recovery of 79.5%, an improvement of 7.1% compared to the PFS performance.

Final concentrate grade is slightly reduced compared to the PFS. However, this is more than offset by the increase in overall recovery, resulting in a significant increase in net smelter return compared to the PFS.

16 RECOMMENDED FURTHER WORK

The current metallurgical testing program has focused on the Severn deposit which forms approximately 60% of the overall tin resource for the Heemskirk Tin Project. As yet, the same rigorous approach to metallurgical testing and optimisation has not been applied to the Upper Queen Hill, Lower Queen Hill and Montana deposits due to limited availability of suitable samples. However, it is expected that many of the learnings and process improvements from the Severn program will be translatable to these deposits, particularly improvements achieved with respect primary grinding, sulfide flotation, gravity and dressing circuit configuration, and tin flotation.

In outline the recommended further work with respect to the metallurgical development of the project include:

1. Testing of the other major ore sources

   Detailed testing building on the learnings from Severn of the other major ore sources including the Upper Queen Hill, Lower Queen Hill and Montana deposits is planned to be under taken once sample availability permits.

2. Pilot testing, larger scale batch testing and other testwork necessary to support the DFS

   In addition to further definition of process design criteria and variability testing this will need to include some larger scale testing such as piloting and/or large scale batch testing, vendor testing for equipment sizing purposes, and potentially generation of larger sample quantities for work such as tailings characterisation, production of concentrate samples, etc.

3. Further variability testing (to be completed as part of DFS)

   Ore variability testing will be required on all major ore types, and on the various blends reflecting mining schedule and treatment ratios.

16.1 Specific issues requiring further definition

Gravity Separation:

- Larger scale testing utilising spirals and industrial type tables is strongly recommended to better define the optimum circuit configuration and confirm achievable performance.

Tin Flotation:

- Further optimisation of de-slime cut point

  It is expected de-slime cut point can be increased somewhat (to around 6 µm) from nominally 4 µm without detrimental impact on the overall recovery. This would have advantages in terms of reducing tin flotation feed tonnage and hence reagent consumption (particularly SPA).

- The requirement for “water change” (impact of solution chemistry) following high intensity conditioning ahead of sulfide scavenger flotation needs further investigation to determine if this can be successfully eliminated/solution chemistry issues mitigated by other means (eg. increased SSF dose).
- Energy input requirements for high intensity conditioning stages in tin flotation

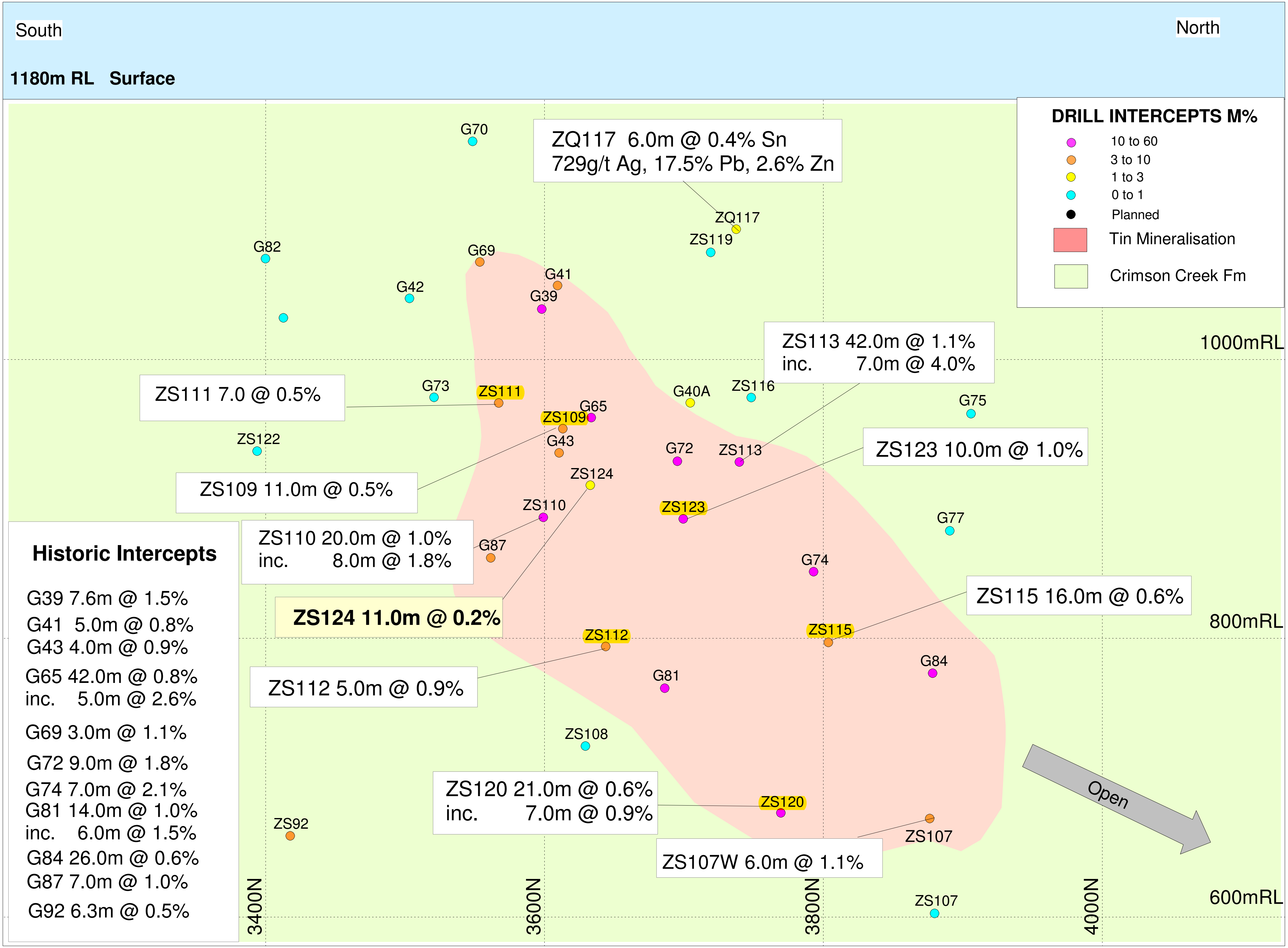
  The small scale of the tin flotation tests completed made meaningful measurement of specific energy input impractical.

- Lock cycle testing to better estimate achievable closed circuit performance.

Appendix 1 – Sample Details

HEEMSKIRK TIN PROJECT
Drill Hole Assays

Intercepts and previous composites forming Severn Bulk Composite (SBC)																
PROJECT	**Sample_ID**	**Hole_ID**	**From_m**	**To_m**	**Interval_m**	Measured wt	**Sn_%**	**AS Sn ppm**	**Cu_%**	**Pb_%**	**Zn_%**	**Ag_ppm**	**Fe_%**	**S_%**	**As ppm**	**1/4 core wts**
ZEEHAN	5568	ZS-109	188.00	189.00	1.00	1.48	0.61	90.00	0.05	0.03	0.10	6	23.2	11.35	9180	0.74
ZEEHAN	5570	ZS-109	190.00	191.00	1.00	1.57	1.48	90.00	0.09	0.18	0.52	11	24.3	7.81	330	0.785
ZEEHAN	5615	ZS-109	235.00	236.00	1.00	1.46	2.84	150.00	0.12	0.01	0.01	5	24.9	13.6	20	0.73
ZEEHAN	5631	ZS-109	251.00	252.00	1.00	1.7	0.61	<50	0.03	0.00	0.01	2	18.55	6.37	10	0.85
ZEEHAN	5633	ZS-109	253.00	254.00	1.00	1.08	0.70	170	0.15	0.01	0.01	11	21.30	13.25	1560	0.54
ZEEHAN	5655	ZS-109	275.00	276.00	1.00	1.2	0.80	<50	0.03	0.00	0.01	1	19.10	5.27	20	0.6
ZEEHAN	5657	ZS-109	277.00	278.00	1.00	1.28	0.55	<50	0.02	0.00	0.01	1	17.75	2.94	10	0.64
ZEEHAN	5659	ZS-109	279.00	280.00	1.00	1.17	0.66	<50	0.08	0.00	0.01	2	20.90	7.05	-10	0.585
ZEEHAN	5660	ZS-109	280.00	281.00	1.00	1.88	0.77	<50	0.04	0.00	0.01	-1	22.40	6.35	30	1
ZEEHAN	5665	ZS-109	285.00	286.00	1.00	1.22	1.59	50	0.04	0.01	0.00	4	18.75	12.70	70	0.61
ZEEHAN	5916	ZS-111	211.00	212.00	1.00	1.51	0.86	<50	0.01	0.00	0.01	2	21.3	1.4	1220	0.755
ZEEHAN	5922	ZS-111	217.00	218.00	1.00	1.31	2.24	<50	0.04	0.01	0.01	1	19.7	6.49	160	0.655
ZEEHAN	5938	ZS-111	233.00	234.00	1.00	1.52	0.81	70	0.07	0.00	0.01	3	20.2	5.07	40	0.76
ZEEHAN	5939	ZS-111	234.00	235.00	1.00	1.29	0.62	120	0.14	0.01	0.01	5	27.3	16.45	360	0.645
ZEEHAN	5983	ZS-111W	214.00	215.00	1.00	1.02	0.76	<50	0.02	0.00	0.01	1	18.75	2.88	150	0.51
ZEEHAN	6204	ZS-112	329.00	330.00	1.00	2.07	3.22	<50	0.17	0.00	0.01	4	29.90	13.25	0	1.035
ZEEHAN	6206	ZS-112	331.00	332.00	1.00	1.61	1.07	<50	0.02	0.00	0.01	5	21.10	2.44	<0.05	0.805
ZEEHAN	6219	ZS-112	344.00	345.00	1.00	1.75	1.95	<50	0.08	0.00	0.01	4	27.40	9.08	0	0.875
ZEEHAN	6230	ZS-112	355.00	356.00	1.00	1.32	1.15	<50	0.05	0.00	0.00	3	25.10	6.64	0	0.66
ZEEHAN	6237	ZS-112	362.00	363.00	1.00	1.6	2.45	<50	0.02	0.00	0.01	1	20.30	2.37	1	0.8
ZEEHAN	6261	ZS-112	386.00	387.00	1.00	1.63	1.01	<50	0.16	0.00	0.00	1	48.50	31.70	0	0.815
ZEEHAN	6262	ZS-112	387.00	388.00	1.00	1.69	1.53	60	0.05	0.00	0.00	1	24.90	10.25	<0.05	0.845
ZEEHAN	6391	ZS-112W	328.00	329.00	1.00	1.01	0.55	<50	0.09	0.00	0.02	2	30.10	10.55	240	0.505
ZEEHAN	6392	ZS-112W	329.00	330.00	1.00	1.08	1.89	70	0.08	0.19	0.09	7	30.30	12.05	890	0.54
ZEEHAN	6410	ZS-112W	355.00	356.00	1.00	0.97	1.59	60	0.12	0.00	0.00	2	33.60	14.35	4790	0.485
ZEEHAN	6411	ZS-112W	356.00	357.00	1.00	1.08	1.23	<50	0.07	0.00	0.01	1	28.30	8.03	70	0.54
ZEEHAN	6415	ZS-112W	369.00	370.00	1.00	0.86	1.21	<50	0.03	0.00	0.01	1	21.50	4.56	810	0.43
ZEEHAN	573264	ZS-120	514.00	515.00	1.00	1.16	0.80	60	0.05	0.00	0.00	1	14.95	6.75	60	0.58
ZEEHAN	573265	ZS-120	515.00	516.00	1.00	1.41	0.90	<50	0.06	0.00	0.00	1	16.65	8.77	30	0.705
ZEEHAN	573266	ZS-120	516.00	517.00	1.00	1.62	1.41	<50	0.06	0.00	0.00	1	15.05	6.59	340	0.81
ZEEHAN	573284	ZS-120	534.00	535.00	1.00	1.43	0.53	<50	0.08	0.00	0.01	1	16.7	7.51	100	0.715
ZEEHAN	573445	ZS-123	288.00	289.00	1.00	1.12	4.67	400	0.33	0.02	0.06	46	23.50	20.20	20400	0.56
ZEEHAN	573446	ZS-123	290.70	291.80	1.10	2.28	1.60	340	0.17	0.11	0.17	28	35.10	27.20	16650	1.14
ZEEHAN	573453	ZS-123	299.00	300.00	1.00	1.24	4.81	<50	0.12	0.00	0.01	2	26.20	12.10	540	0.62
ZEEHAN	573458	ZS-123	304.00	305.00	1.00	1.42	1.32	<50	0.06	0.00	0.01	1	21.80	6.71	530	0.71
ZEEHAN	573459	ZS-123	305.00	306.00	1.00	1.66	0.91	<50	0.05	0.00	0.01	1	22.70	4.13	30	0.83
ZEEHAN	573461	ZS-123	307.00	308.00	1.00	1.44	0.66	<50	0.09	0.00	0.01	2	29.20	11.75	20	0.72
ZEEHAN	573462	ZS-123	308.00	309.00	1.00	1.5	1.86	<50	0.07	0.00	0.00	1	26.60	10.55	1400	0.75
ZEEHAN	573476	ZS-123	322.00	323.00	1.00	1.33	1.18	<50	0.09	0.00	0.01	1	23.70	10.25	100	0.665
ZEEHAN	573477	ZS-123	323.00	324.00	1.00	1.27	3.08	60	0.11	0.00	0.00	1	29.80	16.80	560	0.635
COMP 2						25.0	0.77						23.00	10.95	2300	12.5
COMP 3						2.0	1.53						28.50	11.25	4000	1
COMP 4						26.0	0.31									
T0797 S+F						8.0	1.49									
Total SBC						**117.2**	**1.07**									


South
North
1180m RL Surface
DRILL INTERCEPTS M%
10 to 60
3 to 10
1 to 3
0 to 1
Planned
Tin Mineralisation
Crimson Creek Fm
ZQ117 6.0m @ 0.4% Sn
729g/t Ag, 17.5% Pb, 2.6% Zn
ZS113 42.0m @ 1.1%
inc. 7.0m @ 4.0%
ZS111 7.0 @ 0.5%
ZS123 10.0m @ 1.0%
ZS109 11.0m @ 0.5%
ZS110 20.0m @ 1.0%
inc. 8.0m @ 1.8%
ZS124 11.0m @ 0.2%
ZS115 16.0m @ 0.6%
ZS112 5.0m @ 0.9%
ZS120 21.0m @ 0.6%
inc. 7.0m @ 0.9%
ZS107W 6.0m @ 1.1%
Historic Intercepts
G39 7.6m @ 1.5%
G41 5.0m @ 0.8%
G43 4.0m @ 0.9%
G65 42.0m @ 0.8%
inc. 5.0m @ 2.6%
G69 3.0m @ 1.1%
G72 9.0m @ 1.8%
G74 7.0m @ 2.1%
G81 14.0m @ 1.0%
inc. 6.0m @ 1.5%
G84 26.0m @ 0.6%
G87 7.0m @ 1.0%
G92 6.3m @ 0.5%
G70
G82
G69
G41
G42
G39
ZQ117
ZS119
G73
ZS111
G65
ZS109
G40A
ZS116
G75
ZS122
G43
G72
ZS113
ZS124
ZS110
ZS123
G87
G77
G74
ZS112
ZS115
G81
G84
ZS108
ZS120
ZS107
ZS92
ZS107
Open
1000mRL
800mRL
600mRL
3400N
3600N
3800N
4000N

Appendix 2 – Mineralogy

ALS Metallurgy

STELLAR RESOURCES LTD
Heemskirk Tin Project

Severn Bulk Composite
Testwork Mineralogy

JUNE 2014

MODA microscopy

McArthur Ore Deposit Assessments Pty Ltd

Gary J McArthur PhD FAusIMM MMICA MSEG

Suite 6, 1st Floor, Brownell Place, 11 Wilson St (P.O. Box 1303) Burnie TAS 7320 AUSTRALIA
Tel (03) 6431 1701 Fax (03) 6431 1278 Mobile 0419 367240 email gary@modapl.com.au

ALS METALLURGY

Stellar Resources – Severn
Bulk Composite Mineralogy
June 2014

Method

A drillcore Bulk Composite sample from Stellar Resources' Severn Prospect was submitted for mineralogical assessment. The sample was sized into 8 fractions: +212µm, +150µm, +106µm, +75µm, +53µm, +38µm, +20µm, and +8µm) and these were mounted on three polished mounts by Australian Petrographics (Queanbeyan, NSW).

The standard MODA technique was adopted to quantify the mineralogy, using four scans.

In a first scan, for each fraction, 100 grains were selected at random and the area % of each mineral present was visually estimated. The minerals logged were: *pyrite+marcasite* (Py), *pyrrhotite* (Po), *cassiterite* (Cs), *stannite* (St), *arsenopyrite* (As), *chalcopyrite* (Cp), *sphalerite+galena* (SpGn) and *gangue* (*quartz, silicates, carbonates, etc,* Ga). This allowed calculation of an overall mineralogical composition.

In a second scan, for each fraction, 100 grains containing *pyrite* or *pyrrhotite* were selected at random and logged as per the first scan. This improved the count statistics for the Fe sulphides.

In a third scan, for each fraction, 100 grains containing *cassiterite* or *stannite* were selected at random and logged as per the first scan. This improved the count statistics for the Sn mineralisation.

In a fourth scan, for each fraction, 100 grains containing *sphalerite, galena, chalcopyrite, stannite* or *tetrahedrite* were selected at random and logged as per the first scan. This improved the count statistics for miscellaneous base metal mineralisation.

The normal liberation and association parameters were calculated.

Photomicrographs were taken of each size fraction and these were annotated using PowerPoint.

Results

Composition

The following minerals were identified, in approximate descending order:

- Gangue (*quartz*, silicates, carbonate, *rutile*, *carbonaceous matter*, *fluorite*, *talc* etc.)
- *Pyrite* (95.4% crystalline and 4.6% *melnikovite*)
- *Pyrrhotite*
- *Magnetite*
- *Sphalerite*
- *Cassiterite*
- *Marcasite*
- *Galena*
- *Arsenopyrite*
- *Chalcopyrite*
- *Goethite*
- *Hematite*
- *Stannite* (rare)
- *Tetrahedrite* (very rare)
- *Bismuthinite* (very rare)
- *Native bismuth* (very rare)

The overall composition of the Bulk Composite is summarised below:

Severn Bulk Comp Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	Cs#	St#	As#	Cp#	SpGn	Ga
+212µm	12.2	11.7	0.2	0.4	0.0	0.0	0.1	0.8	86.9
+150µm	9.5	22.9	1.7	0.2	0.0	0.1	0.0	1.4	73.8
+106µm	11.6	23.0	4.6	0.2	0.0	1.0	0.0	1.1	70.1
+75µm	9.9	31.4	1.2	1.0	0.0	0.1	Tr	0.0	66.3
+53µm	9.9	26.3	3.5	1.2	1.0	0.0	0.1	2.1	66.0
+38µm	7.5	26.6	9.5	0.5	0.0	0.0	0.2	2.1	61.1
+20µm	9.0	29.9	6.2	1.3	0.0	0.0	0.2	4.0	58.4
+8µm	10.6	28.3	6.7	2.0	0.0	0.0	0.0	3.0	60.1
TOTAL	**80.2**	**24.5**	**3.9**	**0.8**	**0.1**	**0.2**	**0.1**	**1.7**	**68.6**

Py=pyrite, Po=pyrrhotite, Cs=cassiterite, St=stannite, As=arsenopyrite, Cp=chalcopyrite, SpGn=sphalerite+galena, Ga=gangue
 # count statistics are very poor for the scarce minerals

The composition of the grains containing *pyrite* and *pyrrhotite* is summarised below:

Severn Bulk Comp Composition Vol% (from PyPo scan)

Fraction	Fe Wt%	Py	Po	Cs	St	As	Cp	SpGn	Ga
+212µm	5.1	41.4	3.8	0.3	0	0.6	Tr	0.4	53.6
+150µm	9.6	53.0	4.9	1.2	Tr	0.1	Tr	1.3	39.6
+106µm	9.4	59.4	8.2	0.5	0	0	Tr	1.0	30.9
+75µm	12.3	63.7	7.2	0	Tr	0.1	Tr	1.3	27.7
+53µm	10.8	75.7	10.5	0.4	0	0	0.2	0.1	13.2
+38µm	11.0	74.4	16.6	0.5	0	0	0.2	0	8.4
+20µm	8.5	73.9	15.7	0.1	0	0	0.7	0.1	9.6
+8µm	10.2	73.1	20.6	0	0	0	0	0	6.4
TOTAL	**76.9**	**65.9**	**11.3**	**0.4**	**Tr**	**0.1**	**0.1**	**0.5**	**21.7**

The composition of the grains containing *cassiterite* and *stannite* is summarised below. Note the residence of Sn sums to 99% in *cassiterite* and 1% in *stannite*.

Severn Bulk Comp Composition Vol% (from Sn scan)

Fraction	Sn Wt%	Py	Po	Cs	St	As	Cp	SpGn	Ga
+212µm	6.2	15.6	4.2	12.9	0.4	0	0.1	0.1	66.8
+150µm	8.0	19.6	2.2	23.8	0.1	0.9	0.1	0	53.4
+106µm	8.2	11.0	4.9	32.2	2.6	0	0.7	2.0	46.7
+75µm	11.6	6.1	1.6	43.2	1.8	0	1.1	0.7	45.6
+53µm	11.1	10.0	1.6	44.1	4.2	0	0.8	2.2	37.2
+38µm	12.7	3.8	3.1	64.8	4.2	Tr	0.8	1.6	21.8
+20µm	10.1	4.1	0.1	82.0	1.3	0	0.1	0.1	12.5
+8µm	12.6	1.8	0.4	87.8	2.1	0	0.4	0	7.6
TOTAL	**80.5**	**7.9**	**2.1**	**53.2**	**2.3**	**0.1**	**0.6**	**0.9**	**33.1**

The composition of the grains containing *sphalerite, galena, chalcopyrite, stannite* and *tetrahedrite* is summarised below:

Severn Bulk Comp Composition Vol% (from SpGnCpStTe scan)

Fraction	Wt%	Py	Po	As	Sp	Gn	Cp	St	Te	Cs	Mt	He	Go	Ga
+212µm	12.2	15.9	2.0	0.2	11.8	1.4	2.1	0.2	0	0.5	0.1	0	0	65.9
+150µm	9.5	18.5	Tr	0.1	23.1	5.6	2.5	0.1	0	1.7	Tr	0	0	48.4
+106µm	11.6	14.8	Tr	0.3	35.4	4.7	1.7	0.4	0	0	0	0	0	42.9
+75µm	9.9	15.7	Tr	1.9	33.6	8.9	2.5	0.2	0	1.8	0	0	0	35.4
+53µm	9.9	10.1	0.9	0	40.9	6.6	5.8	0.2	0	0.2	0	0	0	35.3
+38µm	7.5	6.0	0.2	1.5	58.0	15.6	2.6	0.1	0.1	0.8	0	0	0	15.2
+20µm	9.0	3.5	0	0.9	46.7	29.5	9.0	0.4	0	0.4	0	0	0	9.7
+8µm	10.6	1.4	0	0	56.5	33.2	3.0	0	0	0	0	0	0	6.0
TOTAL	**80.2**	**11.1**	**0.4**	**0.6**	**37.0**	**12.6**	**3.5**	**0.2**	**Tr**	**0.6**	**Tr**	**0**	**0**	**34.0**

From the scan above, the estimated base metal head grades for the Severn Bulk Composite are 0.9%Zn and 0.6%Pb.

Liberation and Association

Essential summaries of the liberation parameters for the main economic phases are:

Severn Bulk Comp Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary+
			Py	Po	St	Cp	As	Ga	
+212µm	6.2	0	1	1	0	0	0	71	26
+150µm	8.0	17	9	0	0	0	0	41	32
+106µm	8.2	28	8	0	0	0	0	45	17
+75µm	11.6	46	2	0	0	0	0	41	11
+53µm	11.1	59	3	0	0	0	0	36	2
+38µm	12.7	66	2	1	0	1	0	25	4
+20µm	10.1	72	0	1	0	1	0	21	3
+8µm	12.6	83	1	1	0	1	0	14	0
TOTAL	**80.5**	**52**	**3**	**1**	**0**	**0**	**0**	**34**	**10**

Severn Bulk Comp Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	St	Cp	As	Ga
+212µm	6.2	21	9	2	5	0	94
+150µm	8.0	36	6	0	2	0	73
+106µm	8.2	21	4	0	0	0	62
+75µm	11.6	7	3	5	5	0	50
+53µm	11.1	5	0	0	1	0	38
+38µm	12.7	4	2	0	1	0	28
+20µm	10.1	2	1	0	2	0	24
+8µm	12.6	1	1	0	1	0	14
TOTAL	**80.5**	**10**	**3**	**1**	**2**	**0**	**43**

Severn Bulk Comp Stannite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary
			Py	Po	Cs	Cp	As	Ga	
+212µm	6.2	0	0	0	0	0	0	0	100
+150µm	8.0	0	0	0	0	0	0	0	100
+106µm	8.2	39	0	0	0	29	0	14	18
+75µm	11.6	57	0	0	0	6	0	0	37
+53µm	11.1	24	0	0	0	22	0	1	42
+38µm	12.7	24	0	0	0	68	0	0	3
+20µm	10.1	0	4	0	0	0	0	86	10
+8µm	12.6	98	2	0	0	0	0	0	0
TOTAL	**80.5**	**35**	**1**	**0**	**0**	**18**	**0**	**12**	**32**

Severn Bulk Comp Stannite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	Cs	Cp	As	Ga
+212µm	6.2	0	100	97	97	0	3
+150µm	8.0	0	0	100	62	0	100
+106µm	8.2	0	0	0	46	0	32
+75µm	11.6	11	0	12	41	0	26
+53µm	11.1	2	2	12	61	0	28
+38µm	12.7	0	0	0	70	0	3
+20µm	10.1	4	0	10	0	0	96
+8µm	12.6	2	0	0	0	0	0
TOTAL	**80.5**	**3**	**8**	**22**	**44**	**0**	**34**

Stannite is a rare fine-grained component, mainly hosted by *chalcopyrite*, but also *sphalerite*, *galena*, *pyrite, cassiterite* and gangue.

The miscellaneous base metal sulphides (*sphalerite*, *galena* and *chalcopyrite*) are common throughout, but more so in the finer fractions. *Galena* has the highest measured liberation. *Tetrahedrite* was seen only rarely, always with *galena*. *Bismuthinite* and *native bismuth* were very rare, mostly hosted by *chalcopyrite*.

Severn Bulk Comp Sphalerite liberation distribution%

Fraction	Wt%#	Free	Binary	Ternary	Quat.y+	%associated with							
						Py	Po	As	Gn	Cp	St	Cs	Ga
+212µm	12.2	0	25	46	29	42	8	3	46	22	0	0	83
+150µm	9.5	26	34	31	9	20	0	5	35	13	0	4	47
+106µm	11.6	25	42	25	8	30	0	0	32	18	1	0	36
+75µm	9.9	54	16	26	4	10	0	2	22	21	0	0	26
+53µm	9.9	42	35	18	5	17	10	0	18	20	1	1	21
+38µm	7.5	52	43	5	0	7	0	0	15	25	0	0	6
+20µm	9.0	60	39	1	0	0	0	0	20	17	0	0	3
+8µm	10.6	76	22	2	0	0	0	0	8	12	0	0	6
TOTAL	**80.2**	**40**	**32**	**21**	**8**	**17**	**2**	**1**	**25**	**18**	**0**	**1**	**31**

 # Zn assays were not provided, so total weight% is used

Sphalerite often exhibits "*chalcopyrite* disease", as evidenced by the high *sphalerite-chalcopyrite* association. The *sphalerite* is quite dark, suggesting a moderate-Fe variety.

Severn Bulk Comp Galena liberation distribution%

Fraction	Wt%#	Free	Binary	Ternary	Quat.y+	%associated with							
						Py	Po	As	Sp	Cp	St	Cs	Ga
+212µm	12.2	0	25	33	42	50	4	1	56	8	5	0	94
+150µm	9.5	36	25	23	17	23	0	0	43	1	0	2	52
+106µm	11.6	21	40	24	15	28	0	4	42	4	0	0	53
+75µm	9.9	56	26	17	0	17	0	0	22	4	0	1	16
+53µm	9.9	60	33	6	1	7	0	0	11	0	0	0	28
+38µm	7.5	90	10	1	0	2	0	0	6	0	0	1	2
+20µm	9.0	88	8	4	0	2	0	0	4	0	0	5	4
+8µm	10.6	96	3	0	0	2	0	0	2	0	0	0	0
TOTAL	**80.2**	**53**	**22**	**15**	**11**	**18**	**1**	**1**	**25**	**2**	**1**	**1**	**34**

 # Pb assays were not provided, so total weight% is used

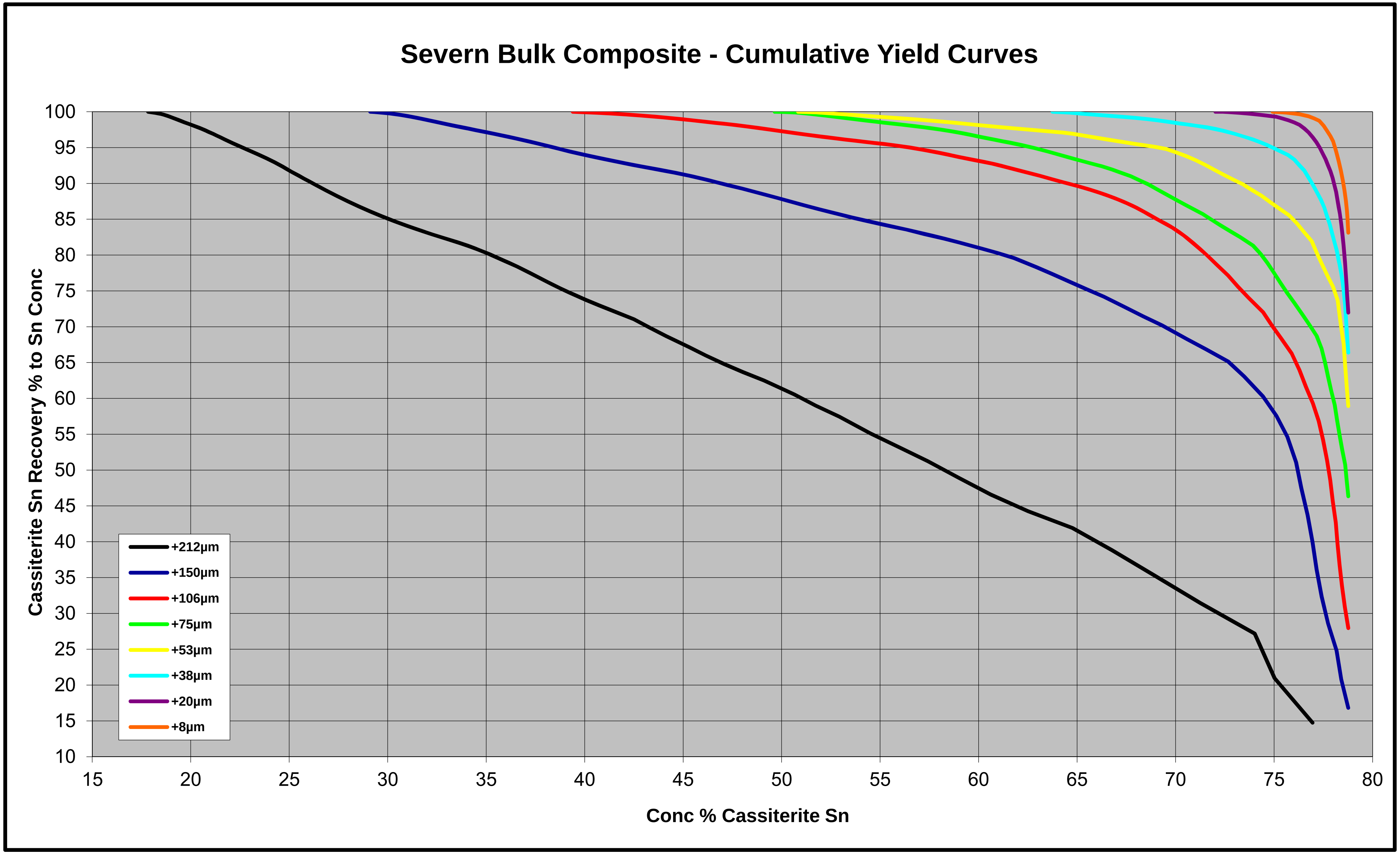
Galena is more liberated than *sphalerite*, but also occurs interstitial to *pyrite*, or as fine-grained blebs in *sphalerite* and carbonate gangue.

Severn Bulk Comp Chalcopyrite liberation distribution%

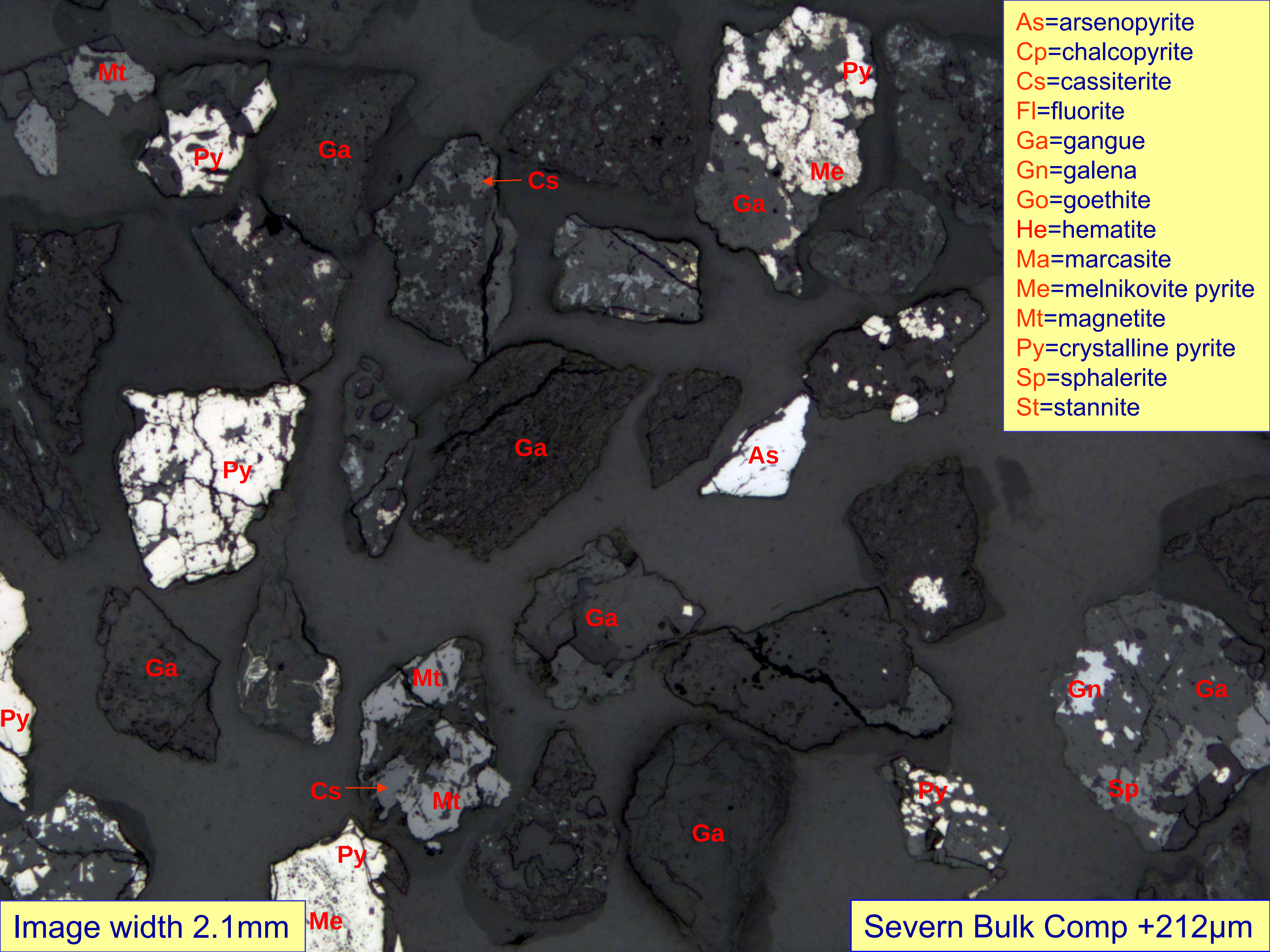
Fraction	Wt%#	Free	Binary	Ternary	Quat.y+	%associated with							
						Py	Po	As	Sp	Gn	St	Cs	Ga
+212µm	12.2	0	46	36	18	30	11	1	7	3	8	9	99
+150µm	9.5	0	39	56	4	44	2	0	2	10	6	2	98
+106µm	11.6	0	65	29	6	44	2	0	10	8	5	0	74
+75µm	9.9	40	36	8	16	12	0	6	4	2	13	15	47
+53µm	9.9	34	44	19	3	18	1	0	6	2	9	3	53
+38µm	7.5	38	49	11	2	2	4	39	11	0	2	0	18
+20µm	9.0	78	22	0	0	4	0	0	1	0	0	0	17
+8µm	10.6	66	33	0	0	0	0	0	6	0	0	0	28
TOTAL	**80.2**	**30**	**42**	**21**	**7**	**20**	**3**	**5**	**6**	**3**	**6**	**4**	**57**

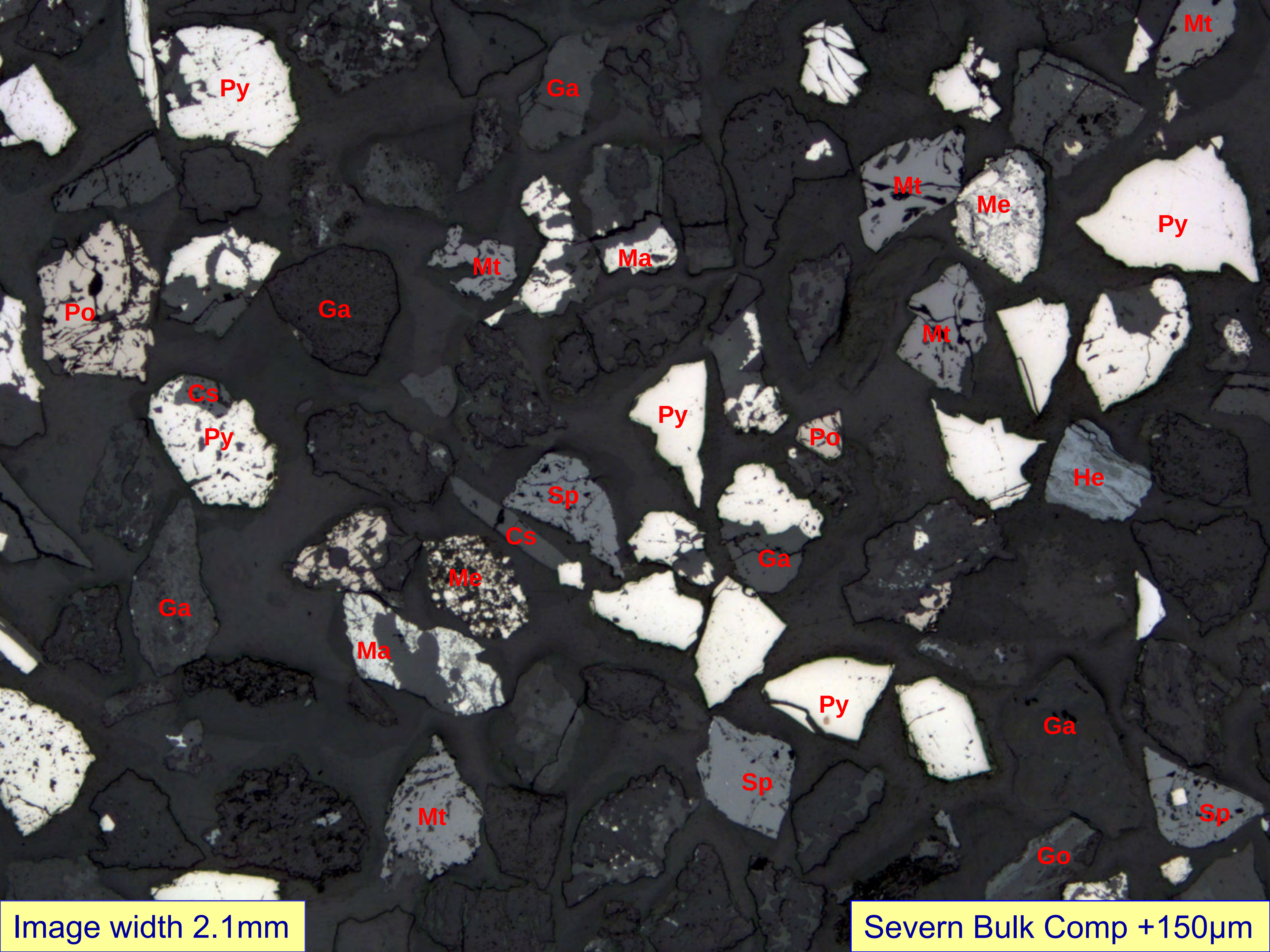
 # Cu assays were not provided, so total weight% is used

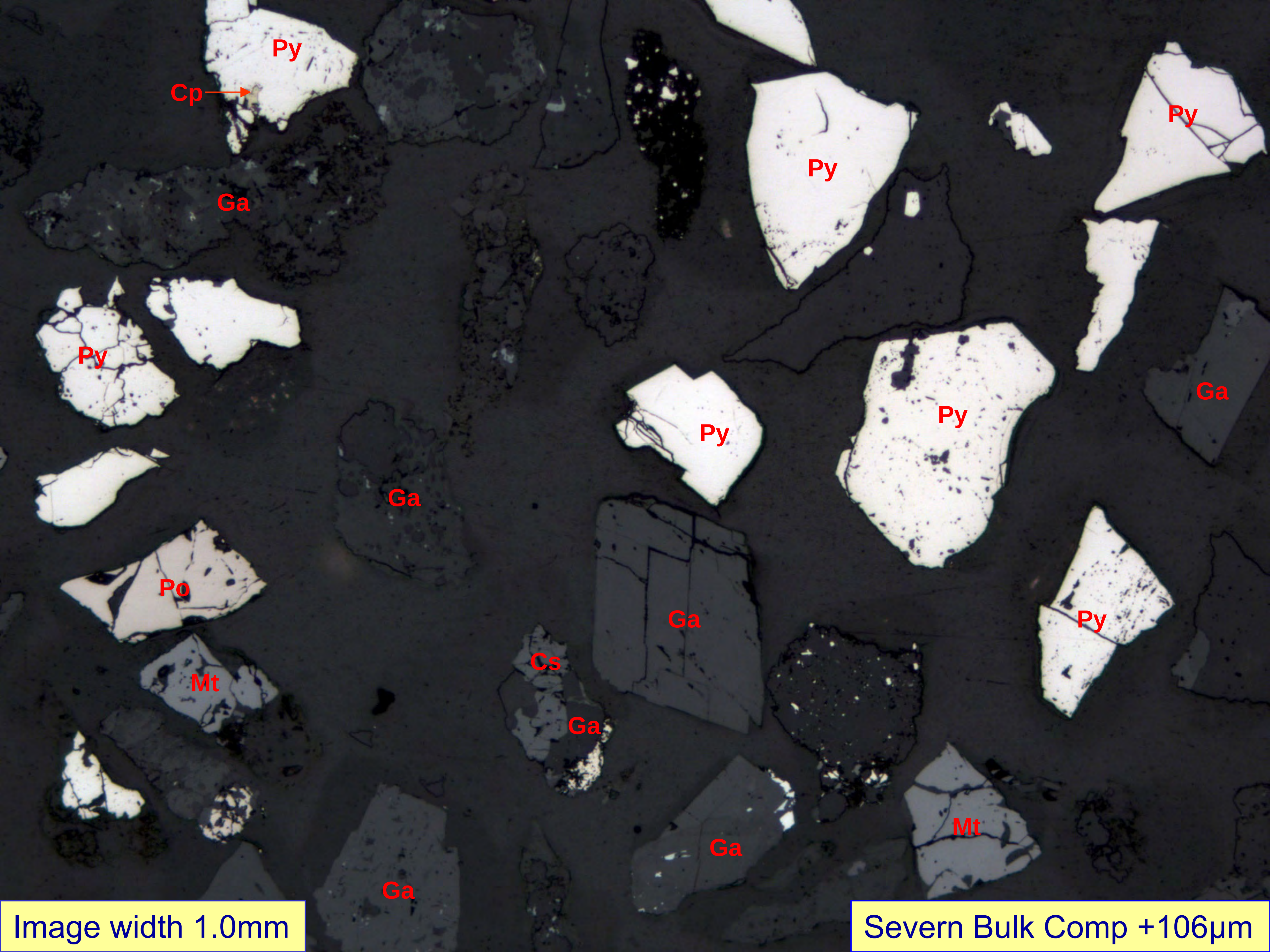
G.J.McArthur PhD FAusIMM MMICA MSEG Principal Mineralogist 17.6.14

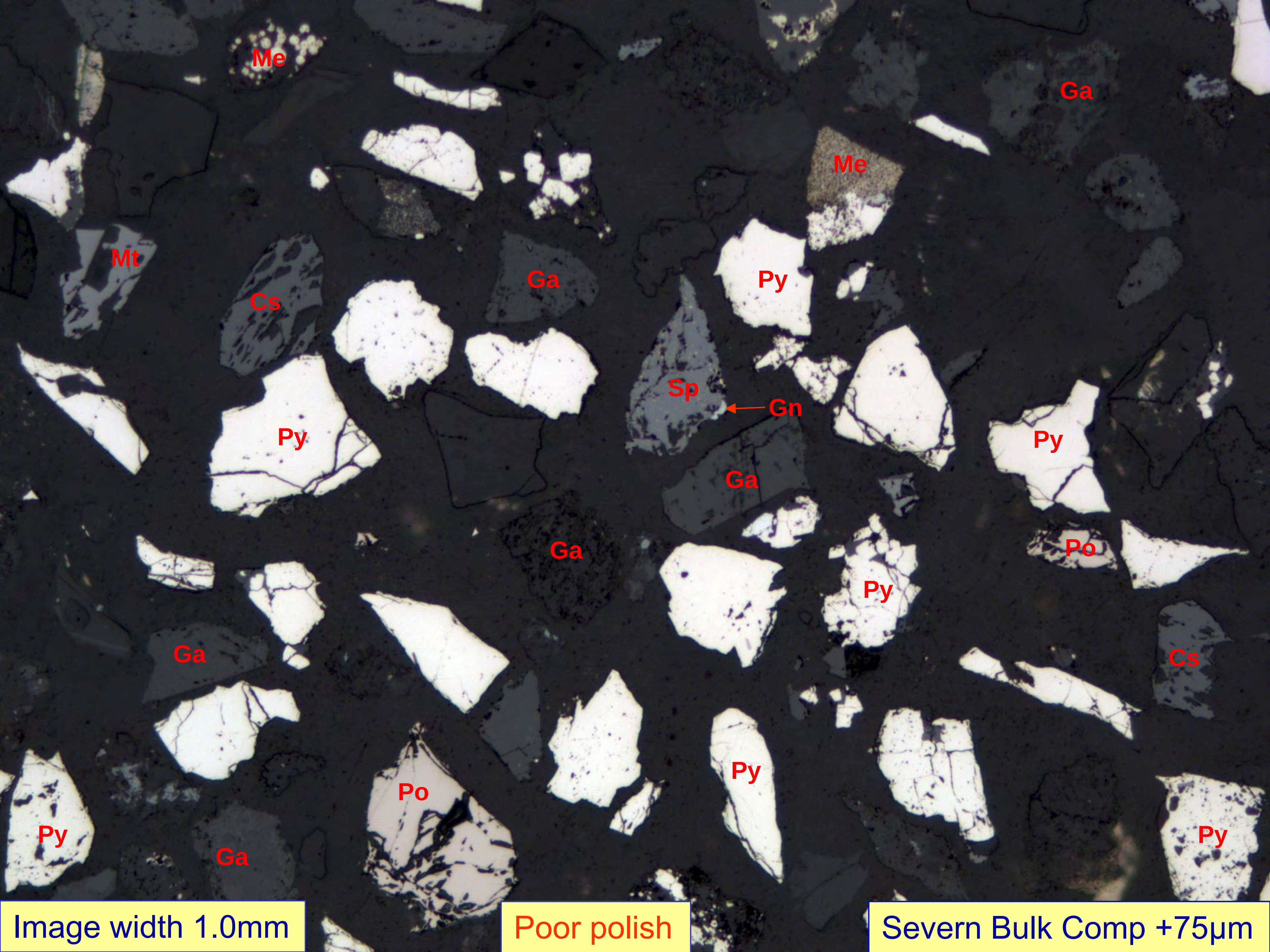


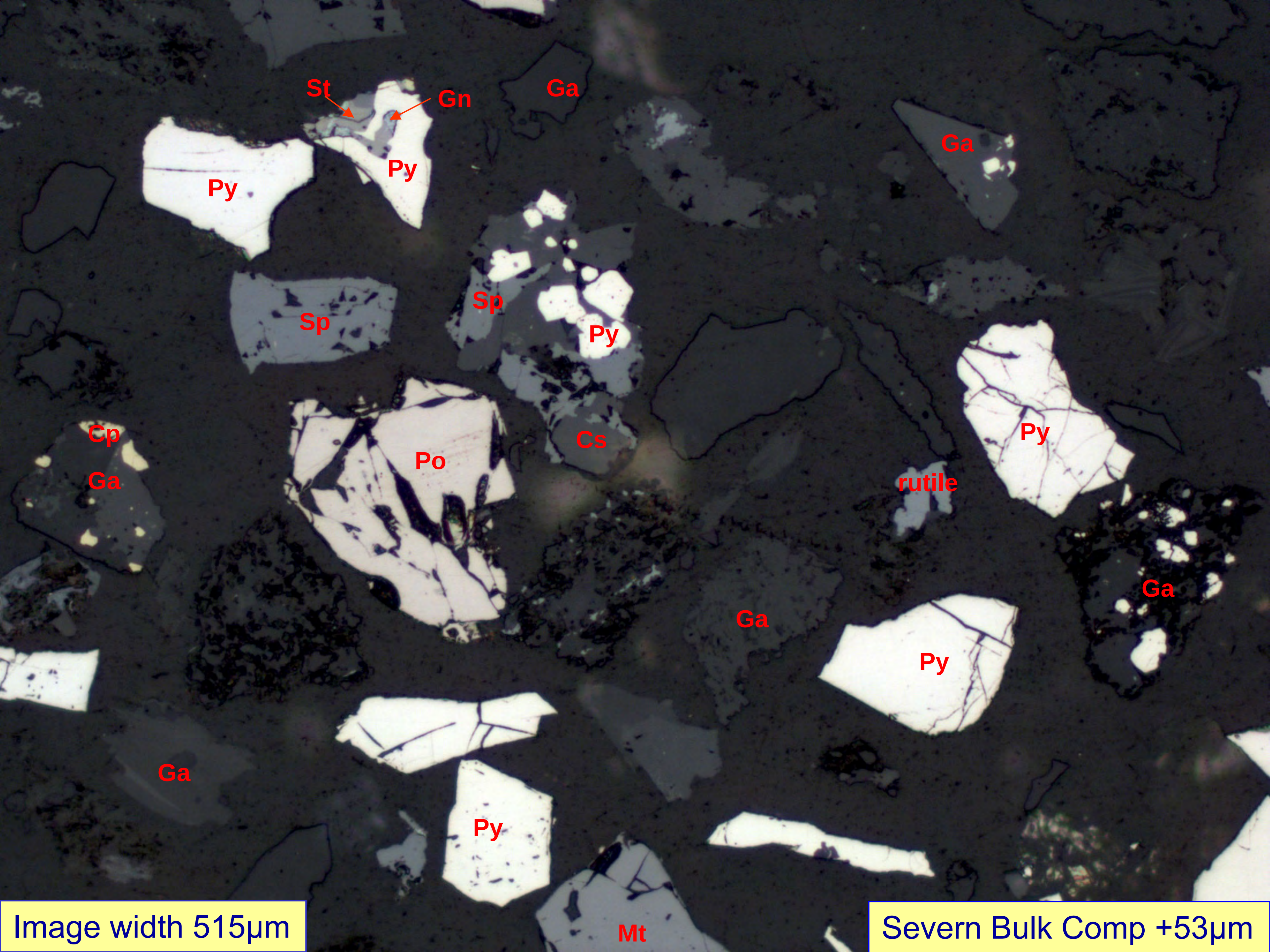
Severn Bulk Composite - Cumulative Yield Curves
Cassiterite Sn Recovery % to Sn Conc
Conc % Cassiterite Sn
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
+212µm
+150µm
+106µm
+75µm
+53µm
+38µm
+20µm
+8µm

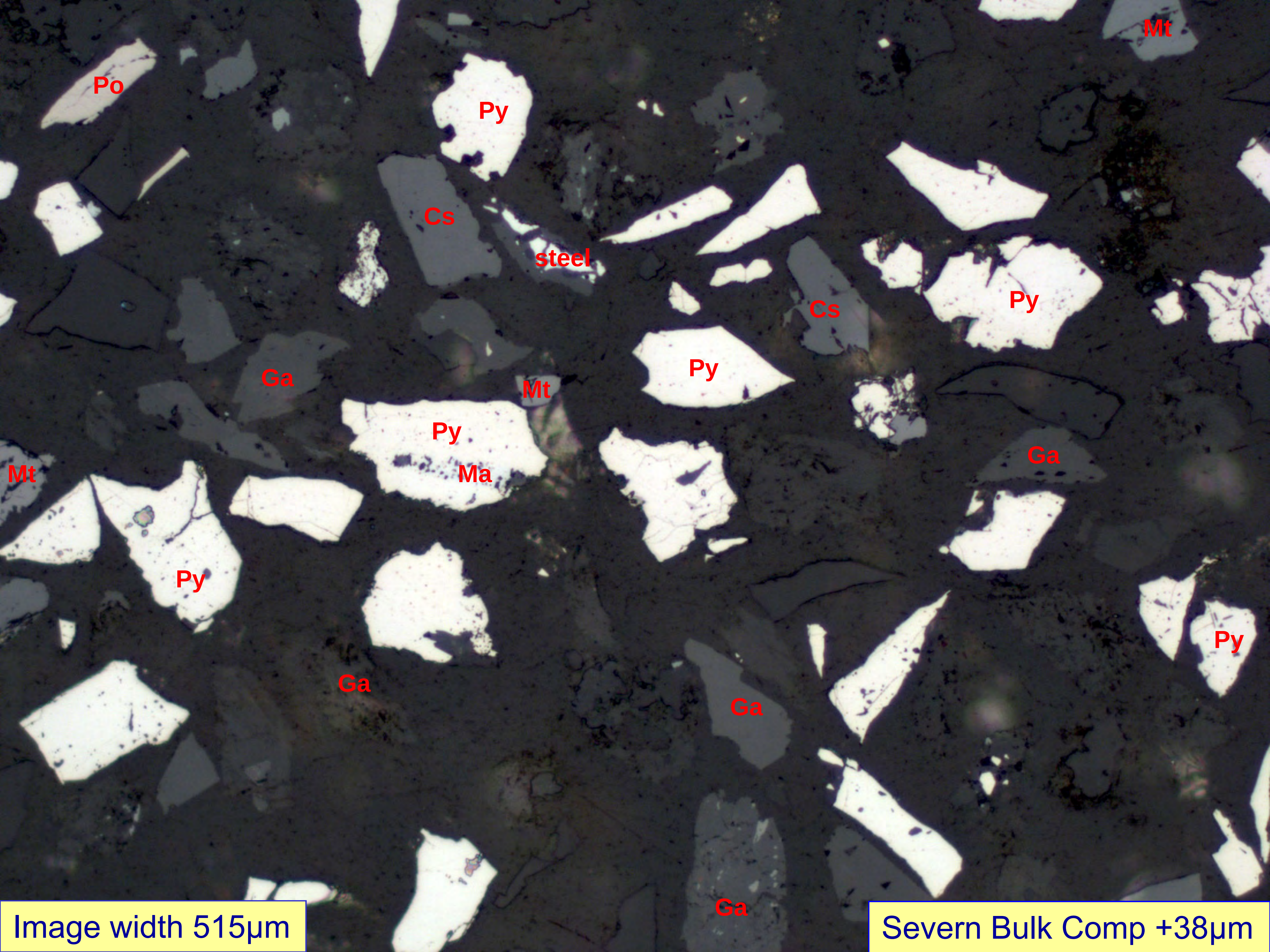

As=arsenopyrite
Cp=chalcopyrite
Cs=cassiterite
Fl=fluorite
Ga=gangue
Gn=galena
Go=goethite
He=hematite
Ma=marcasite
Me=melnikovite pyrite
Mt=magnetite
Py=crystalline pyrite
Sp=sphalerite
St=stannite
Mt
Py
Ga
Cs
Py
Me
Ga
Py
Ga
As
Ga
Ga
Py
Mt
Cs
Mt
Py
Me
Ga
Gn
Ga
Py
Sp
Image width 2.1mm
Severn Bulk Comp +212µm

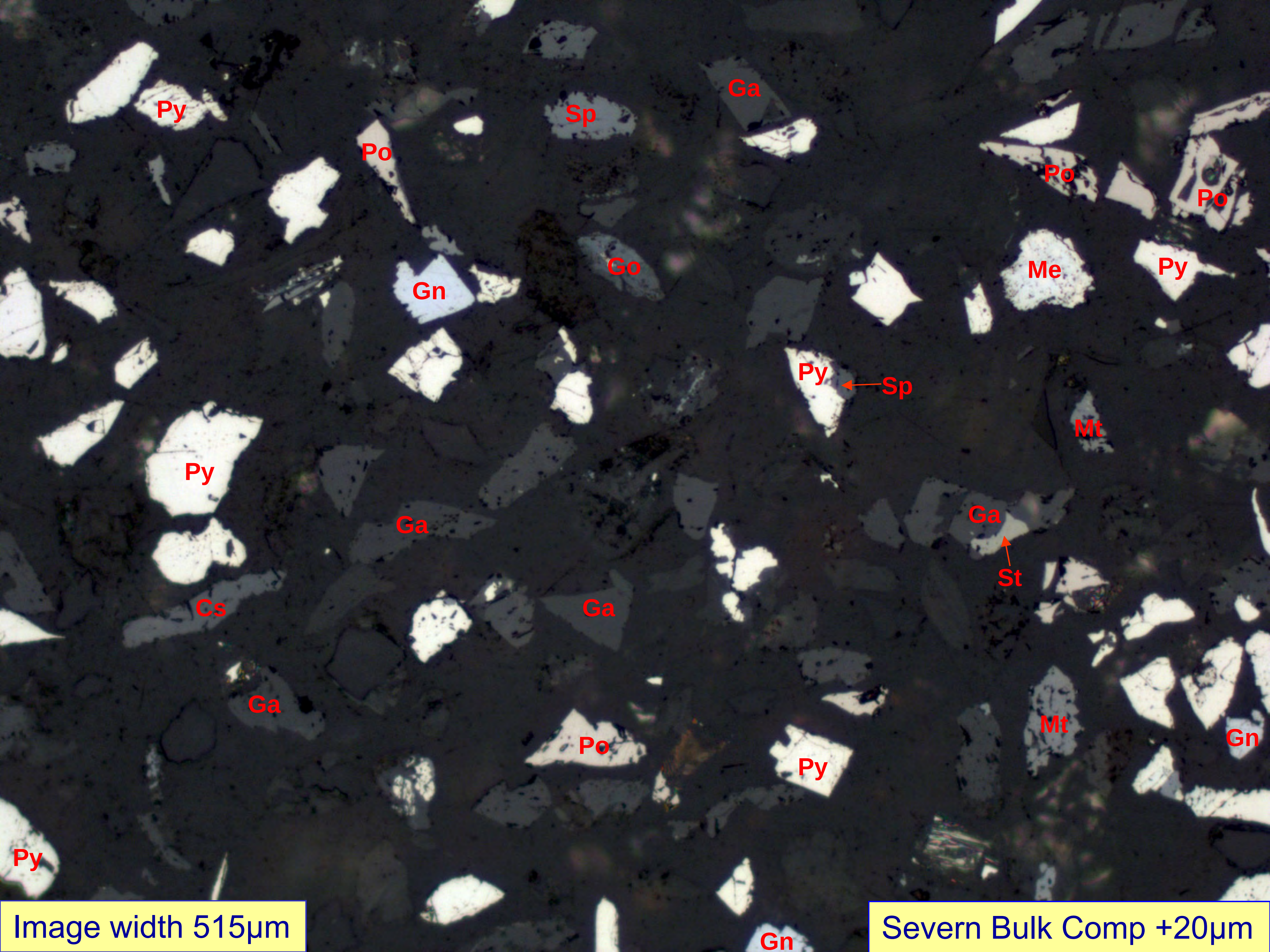

Mt
Py
Ga
Mt
Me
Py
Ma
Mt
Ga
Po
Mt
Cs
Py
Po
Py
He
Sp
Cs
Ga
Me
Ga
Ma
Py
Ga
Sp
Mt
Sp
Go
Image width 2.1mm
Severn Bulk Comp +150µm

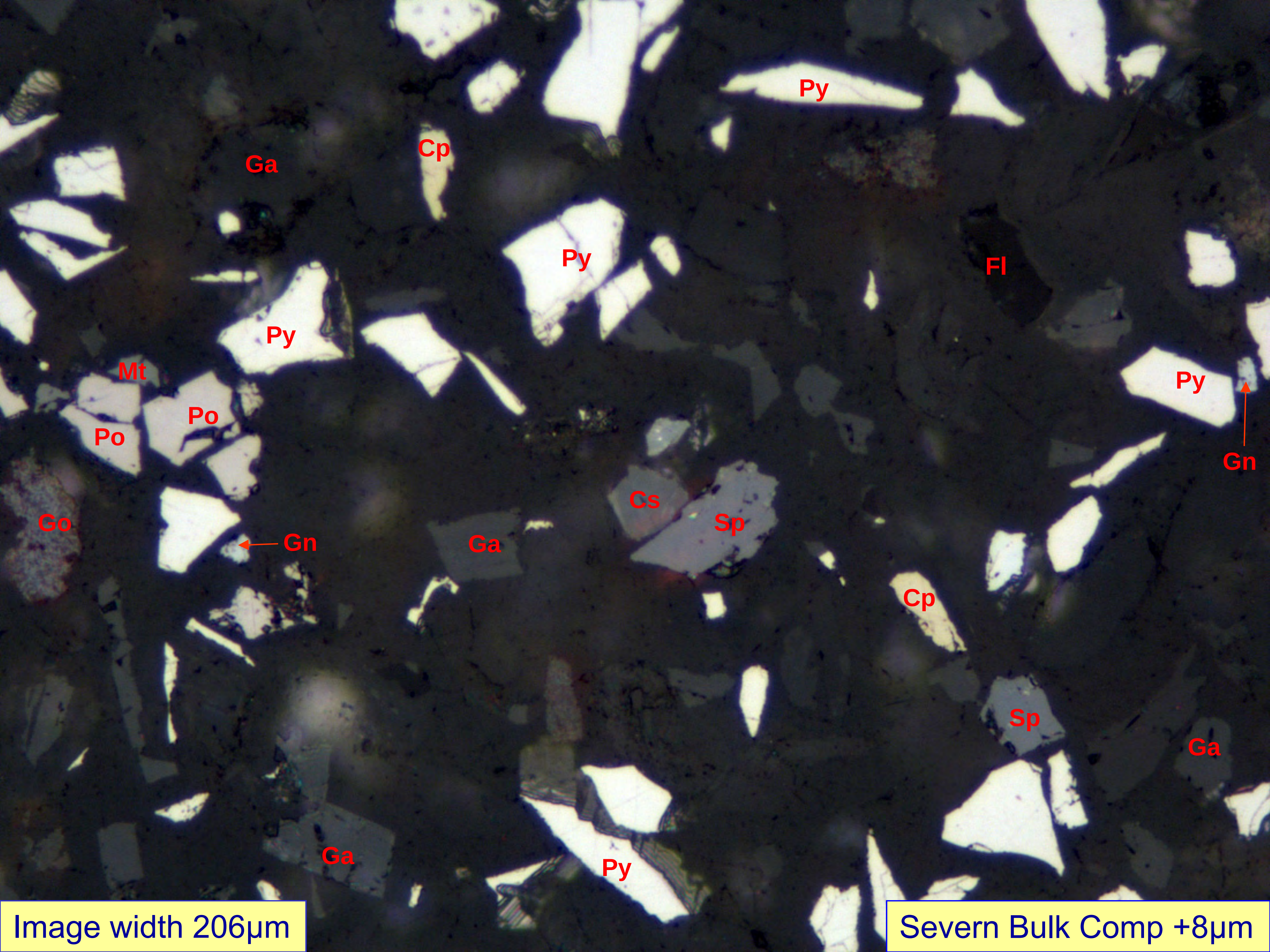

Py
Cp
Py
Py
Ga
Py
Ga
Ga
Py
Py
Po
Ga
Py
Cs
Mt
Ga
Ga
Mt
Ga
Image width 1.0mm
Severn Bulk Comp +106μm


Me
Ga
Me
Mt
Cs
Ga
Py
Sp
Gn
Py
Py
Ga
Ga
Po
Py
Ga
Cs
Py
Po
Py
Ga
Py
Image width 1.0mm
Poor polish
Severn Bulk Comp +75µm


St
Gn
Ga
Ga
Py
Py
Sp
Sp
Py
Cp
Ga
Po
Cs
rutile
Py
Ga
Ga
Py
Ga
Py
Mt
Image width 515µm
Severn Bulk Comp +53µm


Po
Py
Mt
Cs
steel
Py
Cs
Py
Ga
Mt
Py
Py
Ma
Mt
Ga
Py
Py
Ga
Ga
Ga
Image width 515µm
Severn Bulk Comp +38µm


Py
Sp
Ga
Po
Po
Po
Go
Gn
Me
Py
Py
Sp
Mt
Py
Ga
Ga
St
Cs
Ga
Ga
Po
Py
Mt
Gn
Py
Gn
Image width 515µm
Severn Bulk Comp +20µm

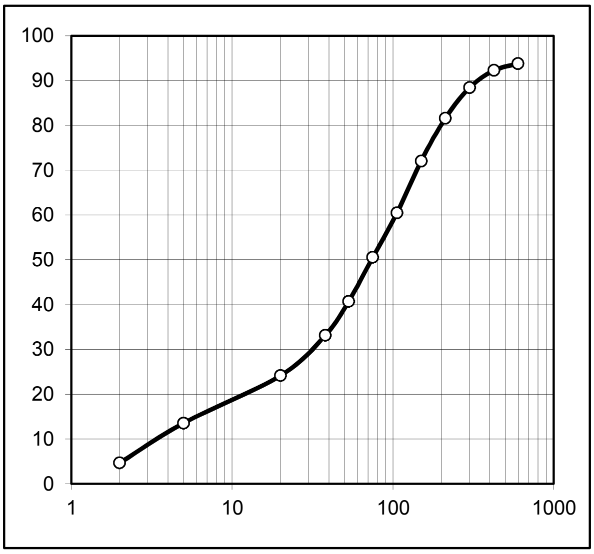

Py
Cp
Ga
Py
Fl
Py
Mt
Po
Py
Po
Gn
Go
Gn
Ga
Cs
Sp
Cp
Sp
Ga
Ga
Py
Image width 206μm
Severn Bulk Comp +8μm

BURNIE LABORATORY

SIZE ANALYSIS REPORT SHEET WITH CS6

PROJECT	T0879
SAMPLE	SBC GROUND HEAD
DATE	260514
TECHNICIAN	MS

SBC GROUND HEAD		SIZE um	WEIGHTS gm	(%)	%PASS
	P80	600	15.00	6.23	93.8
		425	3.63	1.51	92.3
		300	9.22	3.83	88.4
		212	16.45	6.84	81.6
	202	150	22.96	9.54	72.0
		106	27.89	11.59	60.4
		75	23.86	9.92	50.5
		53	23.73	9.86	40.7
		38	18.09	7.52	33.1
		20	21.65	9.00	24.1
MINS 20	CS5	5	25.49	10.60	13.6
CENTRIFUGE	CS6	2	21.35	8.87	4.7
		SUB	11.26	4.68	0.0
		TOTAL	240.6	100.0	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mount Number
600	6.23	0.97	6.2	21.30	5.1	0.17	3.7	9.85	4.1	40.40	8.7	
212	12.18	0.64	8.0	20.40	9.6	0.15	6.3	9.41	7.7	40.80	17.1	879064
150	9.54	0.84	8.2	25.60	9.4	0.25	8.2	15.35	9.8	32.30	10.6	879065
106	11.59	0.98	11.6	27.50	12.3	0.31	12.4	17.80	13.8	28.90	11.5	879066
75	9.92	1.10	11.1	28.30	10.8	0.34	11.6	18.60	12.3	26.80	9.1	879067
53	9.86	1.26	12.7	28.90	11.0	0.35	11.9	19.65	13.0	25.30	8.6	879068
38	7.52	1.31	10.1	29.50	8.5	0.38	9.9	19.50	9.8	24.20	6.3	879069
20	9.00	1.37	12.6	29.50	10.2	0.35	10.9	18.40	11.1	23.40	7.2	879070
8	10.60	1.40	15.1	29.80	12.1	0.35	12.8	18.15	12.9	21.30	7.8	879071
2	8.87	0.43	3.9	23.10	7.9	0.16	4.9	7.67	4.6	31.30	9.5	
CAL <2	4.68	0.13	0.6	17.49	3.1	0.46	7.5	3.26	1.0	22.77	3.7	
ASSAY	100.0	0.98	100.0	26.00	100.0	0.29	100.0	14.95	100.0	29.10	100.0	

SIZE um	WT %	MnO %	MnO dist	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist
600	6.23	0.21	4.0	0.56	5.2	2.63	6.3	7.93	8.2
212	12.18	0.27	10.0	0.59	10.7	3.03	14.1	7.36	14.8
150	9.54	0.32	9.3	0.64	9.1	2.56	9.3	5.62	8.9
106	11.59	0.33	11.6	0.63	10.9	2.35	10.4	5.03	9.7
75	9.92	0.33	9.9	0.67	9.9	2.21	8.4	4.73	7.8
53	9.86	0.34	10.2	0.65	9.6	2.12	8.0	4.36	7.1
38	7.52	0.34	7.7	0.69	7.7	2.13	6.1	4.30	5.4
20	9.00	0.35	9.5	0.74	9.9	2.32	8.0	4.76	7.1
8	10.60	0.37	11.9	0.80	12.7	2.35	9.5	4.62	8.1
2	8.87	0.32	8.6	0.78	10.3	3.87	13.1	9.68	14.2
CAL <2	4.68	0.52	7.4	0.56	3.9	3.86	6.9	11.33	8.8
ASSAY	100.0	0.33	100.0	0.67	100.0	2.62	100.0	6.04	100.0

MODA microscopy

PARTICLE MINERALOGY

Severn Report Format

Mineral species logged:
Py-pyrite Po-pyrrhotite Cs-cassiterite
St-stannite As-arsenopyrite
Cp-chalcopyrite SpGn-sphalerite/galena Ga-gangue

Sum of the weight fractions for the sizes examined

Total number of grains logged

All sizings combined 73% of sample

Average composition - all grains

Mineral content as area %

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
19.3	0.6	18.5	0.8	0.0	2.0	0.8	58.0	**300**
84	0	90	0	29	0	97	48	

Average area % per grain when present

ASSAYS

Assays calculated from mineral area % using theoretical compositions

	SG	Sn	S	As	Fe	Cu	
Calc'd	5.29	57.1	4.8	0.5	5.8	0.02	
Actual		**55.2**	**8.9**	**0.39**	**8.3**		

Sizing assay if provided

COMPOSITE PROPORTIONS

% of mineral fully liberated

% of mineral in grains with 3 minerals present

% of grains with this mineral

	Py	Po	Cs	St	Cp	As	Ga	
Mono	49	0	63	0	0	42	72	
Binary	50	0	34	0	0	33	26	
Ternary	0	0	2	0	0	21	2	
Quat.y+	0	0	0	0	0	4	0	
% Grains	12	0	69	0	0	3	52	1.36

% of mineral in grains with 2 minerals present

% of mineral in grains with >3 minerals present

Average number of minerals per grain

BINARY ASSOCIATION MATRIX

e.g. 95% of all binary Cs occurs with Ga

	Py	Po	Cs	St	Cp	As	Ga
Py		0	19	0	0	0	81
Po	0	0	0	0	0	0	0
Cs	0	0		0	0	4	95
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	4	0	7	0	0		89
Ga	13	0	86	0	0	0	

TOTAL ASSOCIATION MATRIX

These rows do not sum to 100% because of fully liberated and multi-mineral grains

of all

	Py	Po	Cs	St	Cp	As	Ga
Py		0	10	0	0	0	41
Po	0		0	0	0	0	0
Cs	2	0		0	0	2	35
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	12	0	15	8	6		50
Ga	3	0	25	0	0	2	

e.g. 2% of all Cs occurs with As but 15% of all As occurs with Cs

DISTRIBUTION MATRIX

e.g. while 63% of Cs is fully liberated, 2% occurs as binaries with As and 33% with Ga. 2% occurs with 2 other minerals

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	49		0	9	0	0	0	41	0	0
Po	0	0		0	0	0	0	0	0	0
Cs	63	0	0		0	0	2	33	2	0
St	0	0	0	0		0	0	0	0	0
Cp	0	0	0	0	0		0	0	0	0
As	42	1	0	2	0	0		30	21	4
Ga	72	3	0	23	0	0	0		2	0

These rows will sum to 100% (unless binary SpGn occurs or unless minor rounding errors occur)

PARTICLE MINERALOGY REPORT

GJMcA 13.6.14

Severn Bulk Comp

June 2014

A +212µm — 12 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
11.7	0.2	0.4	0.0	0.0	0.1	0.8	86.9	100
48	22	13	18	0	3	16	92	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.35	0.60	9.8	0.00	21.8	0.04	
Actual		0.64	9.4		20.4		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	46	53	0	0	0	0	76	
Binary	47	40	74	0	56	0	19	
Ternary	6	6	21	3	0	0	3	
Quat.y+	1	1	5	97	44	0	1	
#Grains	25	4	4	0	3	0	94	1.30

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	9	0	0	0	91
Po	0		0	0	0	0	100
Cs	2	2		0	0	0	96
St	0	0	0		0	0	0
Cp	0	0	0	0		0	100
As	0	0	0	0	0		0
Ga	62	11	16	0	6	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		4	4	0	0	2	50
	Po	5		0	0	0	1	47
of	Cs	21	9		2	5	0	94
all	St	0	100	97		97	0	3
	Cp	44	0	0	0		0	100
	As	0	0	0	0	0		0
	Ga	14	4	4	0	2	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	46		0	4	0	0	0	43	6	1
Po	53	0		0	0	0	0	40	6	1
Cs	0	1	1		0	0	0	71	21	5
St	0	0	0	0		0	0	0	3	97
Cp	0	0	0	0	0		0	56	0	44
As	0	0	0	0	0	0		0	0	0
Ga	76	12	2	3	0	1	0		3	1

B +150µm — 10 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
22.9	1.7	0.2	0.0	0.1	0.0	1.4	73.8	100
61	35	24	4	10	0	34	84	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.59	0.26	18.4	0.08	26.9	0.00	
Actual		0.84	15.4		25.6		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	49	62	17	0	0	0	77	
Binary	47	36	51	0	0	100	19	
Ternary	2	2	30	37	0	0	4	
Quat.y+	2	0	2	62	0	0	0	
#Grains	35	5	3	0	0	1	88	1.32

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	8	0	0	4	88
Po	0		0	0	0	0	100
Cs	18	0		0	0	1	81
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		100
Ga	64	17	7	0	0	6	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		2	5	0	0	2	45
	Po	0		0	2	0	0	38
of	Cs	36	6		0	2	0	73
all	St	0	0	100		62	0	100
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		100
	Ga	16	3	3	0	0	1	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	49		0	4	0	0	2	42	2	2
Po	62	0		0	0	0	0	36	2	0
Cs	17	9	0		0	0	0	41	30	2
St	0	0	0	0		0	0	0	37	62
Cp	0	0	0	0	0		0	0	0	0
As	0	0	0	0	0	0		100	0	0
Ga	77	12	3	1	0	0	1		4	0

C +106µm — 12 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
23.0	4.6	0.2	0.0	1.0	0.0	1.1	70.1	100
70	48	35	37	100	0	52	88	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.67	0.34	19.8	0.77	28.7	0.00	
Actual		0.98	17.5		27.5		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	67	73	28	39	0	100	78	
Binary	32	16	55	43	0	0	16	
Ternary	1	11	16	18	0	0	5	
Quat.y+	0	0	1	0	0	0	0	
#Grains	35	8	5	0	0	1	80	1.29

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	9	0	0	0	91
Po	0		0	0	0	0	100
Cs	14	1		0	0	0	81
St	0	0	0		68	0	32
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	64	20	8	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		0	4	0	0	0	30
	Po	11		0	0	0	0	27
of	Cs	21	4		0	0	0	62
all	St	0	0	0		46	0	32
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		0
	Ga	16	5	5	0	0	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	67		0	3	0	0	0	29	1	0
Po	73	0		0	0	0	0	16	11	0
Cs	28	8	0		0	0	0	45	16	1
St	39	0	0	0		29	0	14	18	0
Cp	0	0	0	0	0		0	0	0	0
As	100	0	0	0	0	0		0	0	0
Ga	78	10	3	1	0	0	0		5	0

D +75µm — 10 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
31.4	1.2	1.0	0.0	0.1	0.0	0.0	66.3	100
72	45	45	17	8	1	0	88	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.76	1.45	23.0	0.06	29.5	0.01	
Actual		1.10	18.6		28.3		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	74	70	46	57	0	0	81	
Binary	22	24	43	6	0	0	16	
Ternary	3	5	6	26	67	100	2	
Quat.y+	1	1	5	11	33	0	1	
#Grains	41	5	1	0	2	1	75	1.25

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	100
Cs	4	0		0	0	0	95
St	0	0	0		100	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	74	26	0	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		3	0	0	2	1	26
	Po	5		0	0	1	0	30
of	Cs	7	3		5	5	0	50
all	St	11	0	12		41	0	26
	Cp	100	33	0	0		0	100
	As	100	0	0	0	0		100
	Ga	14	5	0	0	2	1	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	74		0	0	0	0	0	22	3	1
Po	70	0		0	0	0	0	24	5	1
Cs	46	2	0		0	0	0	41	6	5
St	57	0	0	0		6	0	0	26	11
Cp	0	0	0	0	0		0	0	67	33
As	0	0	0	0	0	0		0	100	0
Ga	81	12	4	0	0	0	0		2	1

MODA microscopy

PARTICLE MINERALOGY REPORT

GJMcA 17.6.14

Severn Bulk Comp

June 2014

E +53µm — 10 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
26.3	3.5	1.2	1.0	0.0	0.1	2.1	66.0	100
86	81	48	38	0	4	68	90	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.75	1.98	21.6	0.00	28.3	0.36	
Actual		1.26	19.7		28.9		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	70	67	59	24	0	0	88	
Binary	30	28	39	34	62	0	10	
Ternary	0	0	1	26	37	0	1	
Quat.y+	0	5	1	16	0	0	1	
#Grains	34	4	4	1	2	0	73	1.18

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	12	0	0	0	84
Po	0		33	0	30	0	37
Cs	7	0		0	0	0	93
St	0	0	0		66	0	3
Cp	0	0	0	100		0	0
As	0	0	0	0	0		0
Ga	85	1	14	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		0	4	0	0	0	25
	Po	5		14	0	9	0	15
of	Cs	5	0		0	1	0	38
all	St	2	2	12		61	0	28
	Cp	37	0	0	62		0	37
	As	0	0	0	0	0		0
	Ga	11	1	2	0	1	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	70		0	4	0	0	0	25	0	0
Po	67	0		9	0	9	0	10	0	5
Cs	59	3	0		0	0	0	36	1	1
St	24	0	0	0		22	0	1	26	16
Cp	0	0	0	0	62		0	0	37	0
As	0	0	0	0	0	0		0	0	0
Ga	88	9	0	1	0	0	0		1	1

F +38µm — 8 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
26.6	9.5	0.5	0.0	0.0	0.2	2.1	61.1	100
91	92	69	70	0	11	52	93	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.81	0.71	24.1	0.00	31.7	0.08	
Actual		1.31	19.5		29.5		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	85	91	66	24	0	0	90	
Binary	15	6	29	73	9	0	9	
Ternary	1	3	4	0	91	0	1	
Quat.y+	0	0	0	3	0	0	0	
#Grains	30	10	3	0	2	0	66	1.11

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	100
Cs	7	4		0	4	0	84
St	0	0	0		92	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	49	1	17	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		0	1	0	0	0	15
	Po	0		3	0	3	0	6
of	Cs	4	2		0	1	0	28
all	St	0	0	0		70	0	3
	Cp	0	91	91	0		0	0
	As	0	0	0	0	0		0
	Ga	5	0	2	0	0	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	85		0	0	0	0	0	15	1	0
Po	91	0		0	0	0	0	6	3	0
Cs	66	2	1		0	1	0	25	4	0
St	24	0	0	0		68	0	0	0	3
Cp	0	0	0	0	0		0	0	91	0
As	0	0	0	0	0	0		0	0	0
Ga	90	5	0	2	0	0	0		1	0

G +20µm — 9 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
29.9	6.2	1.3	0.0	0.0	0.2	4.0	58.4	100
91	78	85	33	0	6	80	94	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.88	1.82	25.0	0.00	30.4	0.07	
Actual		1.37	18.4		29.5		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	87	76	72	0	0	0	89	
Binary	13	20	25	90	100	0	10	
Ternary	1	4	3	10	0	0	1	
Quat.y+	0	0	0	0	0	0	0	
#Grains	33	8	3	0	3	0	62	1.09

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	4	0	86
Po	0		0	0	0	0	100
Cs	1	5		0	5	0	85
St	4	0	0		0	0	96
Cp	0	0	0	0		0	79
As	0	0	0	0	0		0
Ga	29	24	14	0	15	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		0	0	0	0	0	12
	Po	4		0	0	0	0	24
of	Cs	2	1		0	2	0	24
all	St	4	0	10		0	0	96
	Cp	0	0	0	0		0	79
	As	0	0	0	0	0		0
	Ga	4	3	2	0	1	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	87		0	0	0	0	0	11	1	0
Po	76	0		0	0	0	0	20	4	0
Cs	72	0	1		0	1	0	21	3	0
St	0	4	0	0		0	0	86	10	0
Cp	0	0	0	0	0		0	79	0	0
As	0	0	0	0	0	0		0	0	0
Ga	89	3	2	1	0	1	0		1	0

H +8µm — 11 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
28.3	6.7	2.0	0.0	0.0	0.0	3.0	60.1	100
94	93	91	68	0	0	100	98	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.87	2.81	23.8	0.00	30.0	0.00	
Actual		1.40	18.2		29.8		

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	97	88	83	98	0	0	97	
Binary	3	12	17	2	0	0	3	
Ternary	0	0	0	0	0	0	0	
Quat.y+	0	0	0	0	0	0	0	
#Grains	30	7	2	0	0	0	61	1.00

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	100
Cs	8	4		0	4	0	84
St	100	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	85	15	0	0	0	0	

TOTAL ASSOCIATION MATRIX

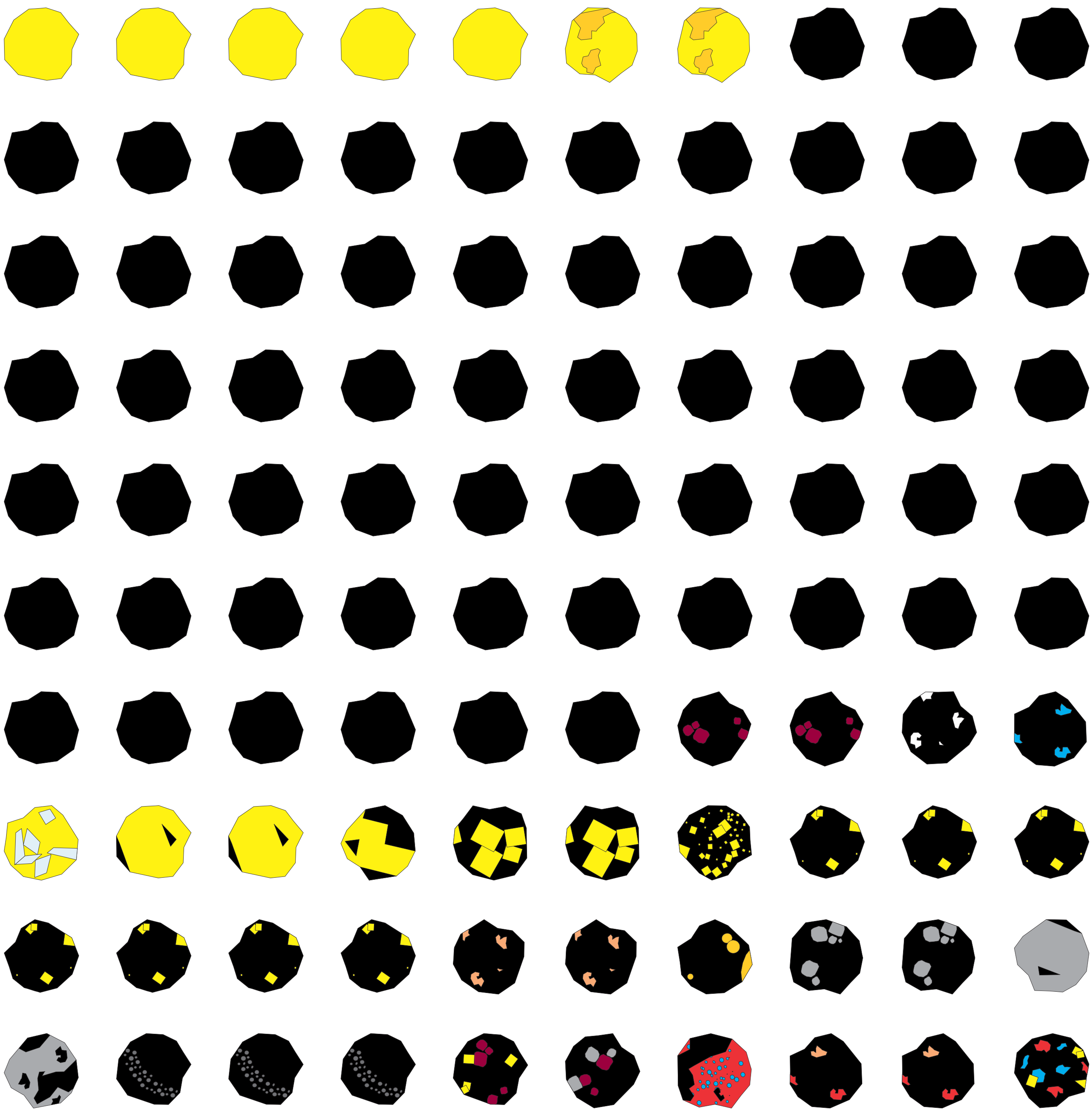
		Py	Po	Cs	St	Cp	As	Ga
	Py		0	0	0	0	0	3
	Po	0		0	0	0	0	12
of	Cs	1	1		0	1	0	14
all	St	2	0	0		0	0	0
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		0
	Ga	3	0	0	0	0	0	

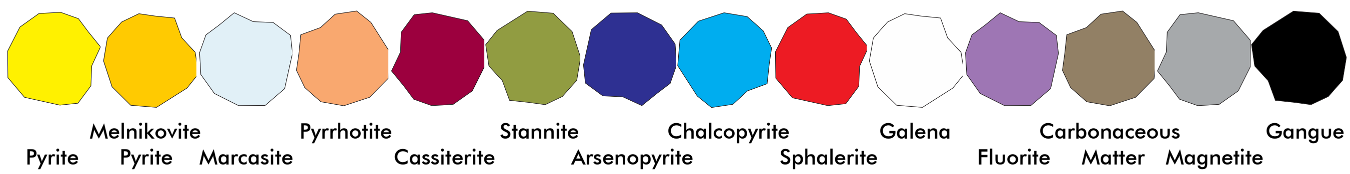
DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	97		0	0	0	0	0	3	0	0
Po	88	0		0	0	0	0	12	0	0
Cs	83	1	1		0	1	0	14	0	0
St	98	2	0	0		0	0	0	0	0
Cp	0	0	0	0	0		0	0	0	0
As	0	0	0	0	0	0		0	0	0
Ga	97	3	0	0	0	0	0		0	0

ALS Metallurgy - Heemskirk Sn Project Testwork

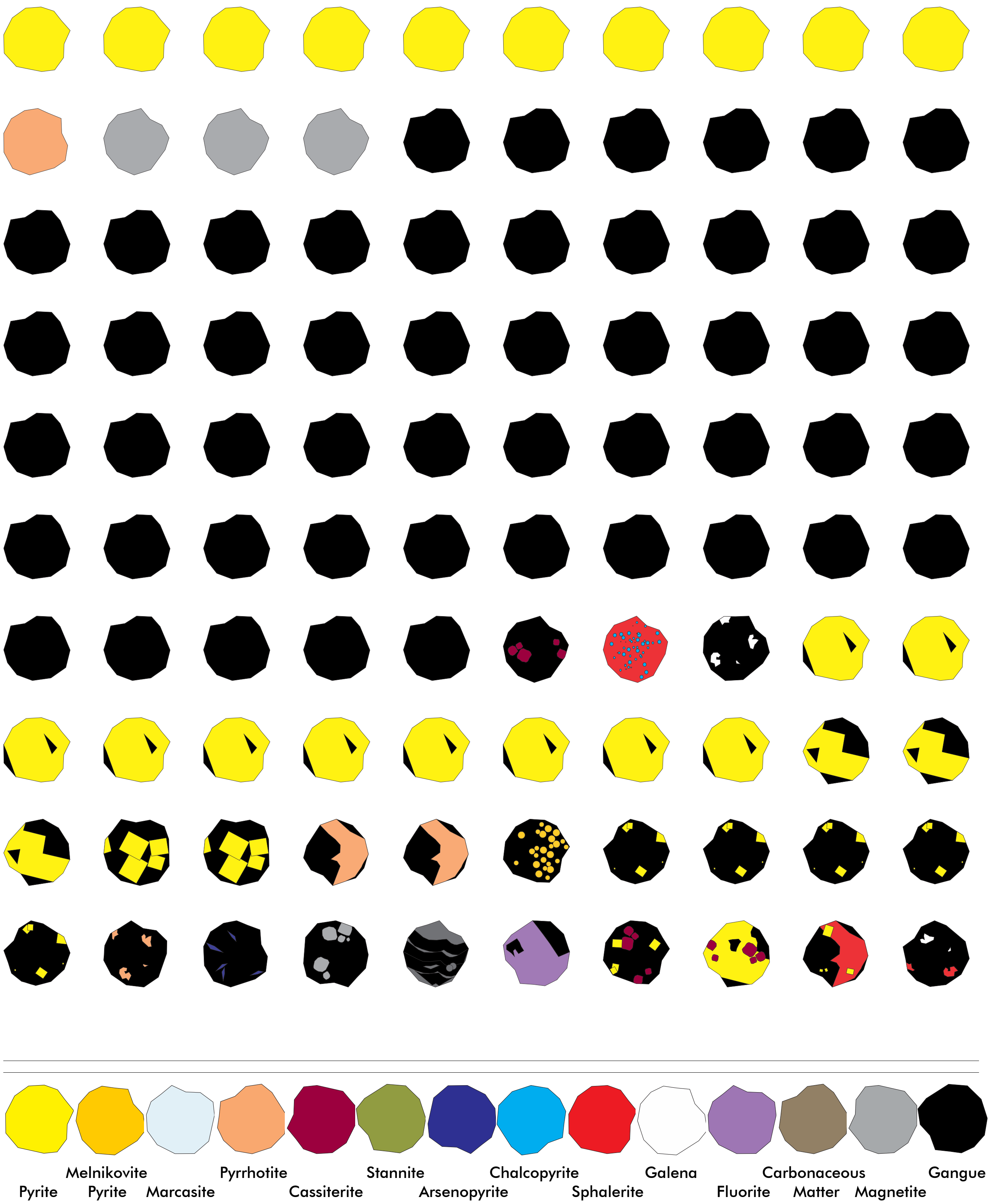
Severn Bulk Comp **A +212μm** **June** **2014**





ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **B +150μm** **June** **2014**

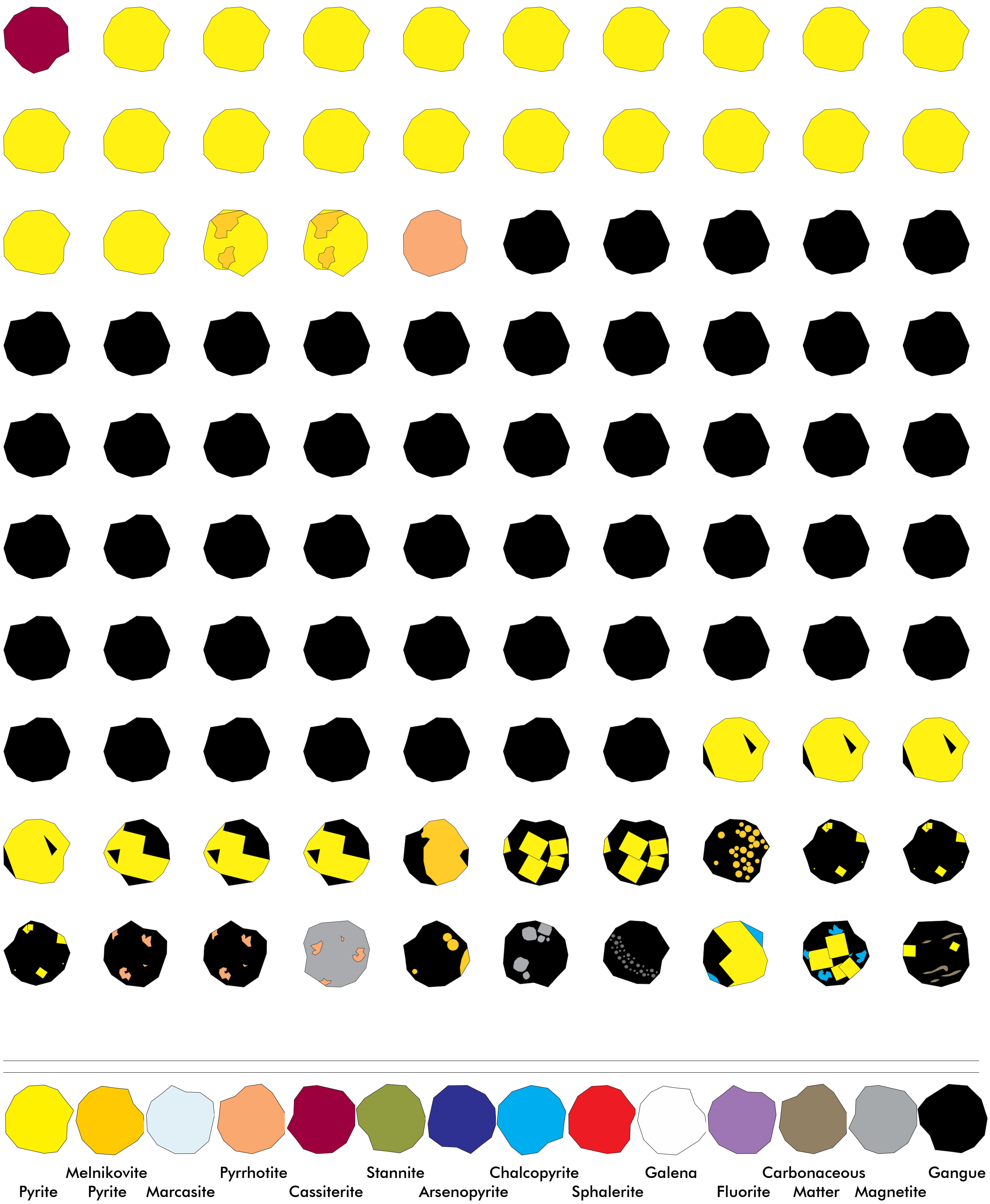


ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **C +106μm** **June** **2014**

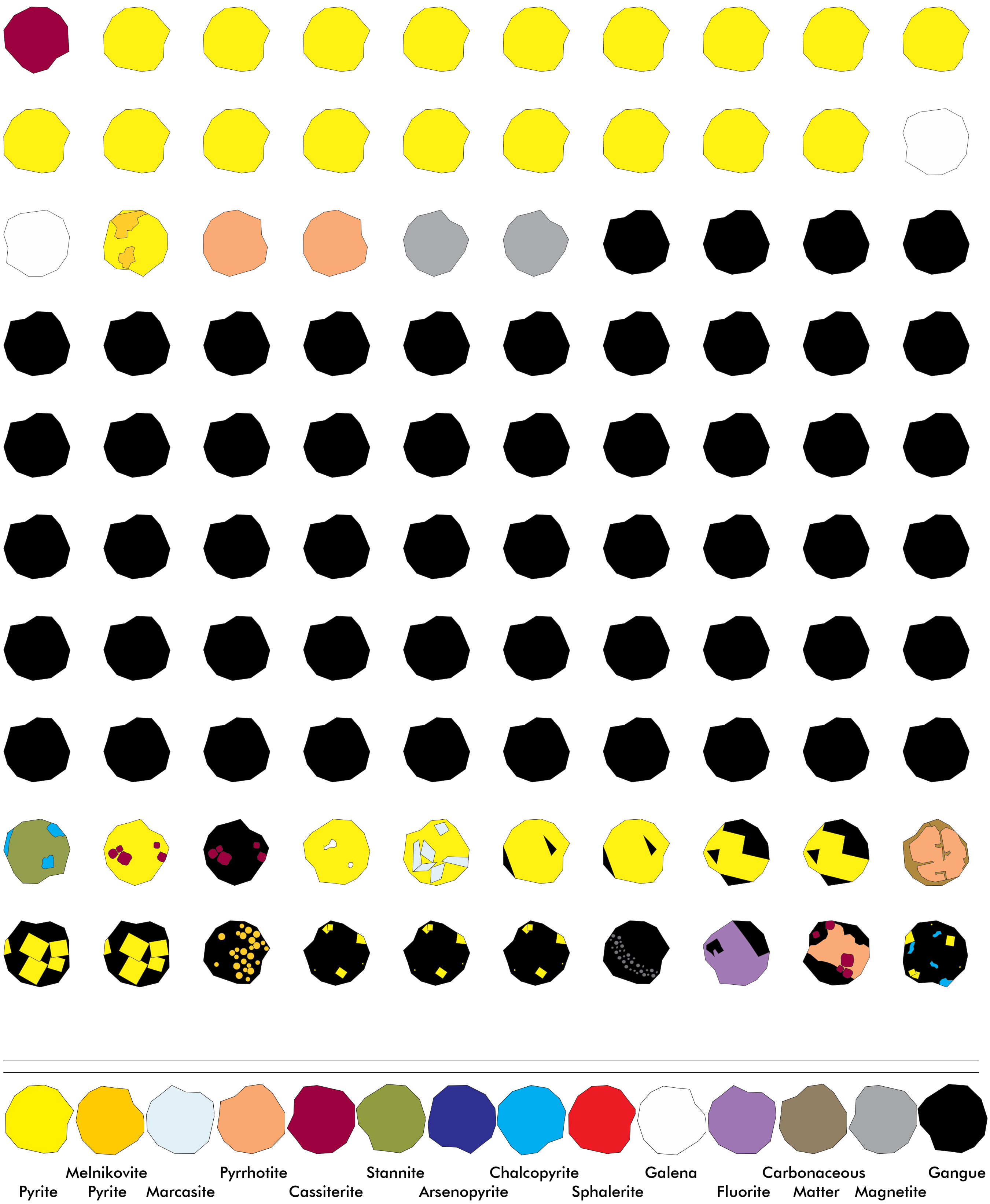
ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **D +75µm** **June** **2014**



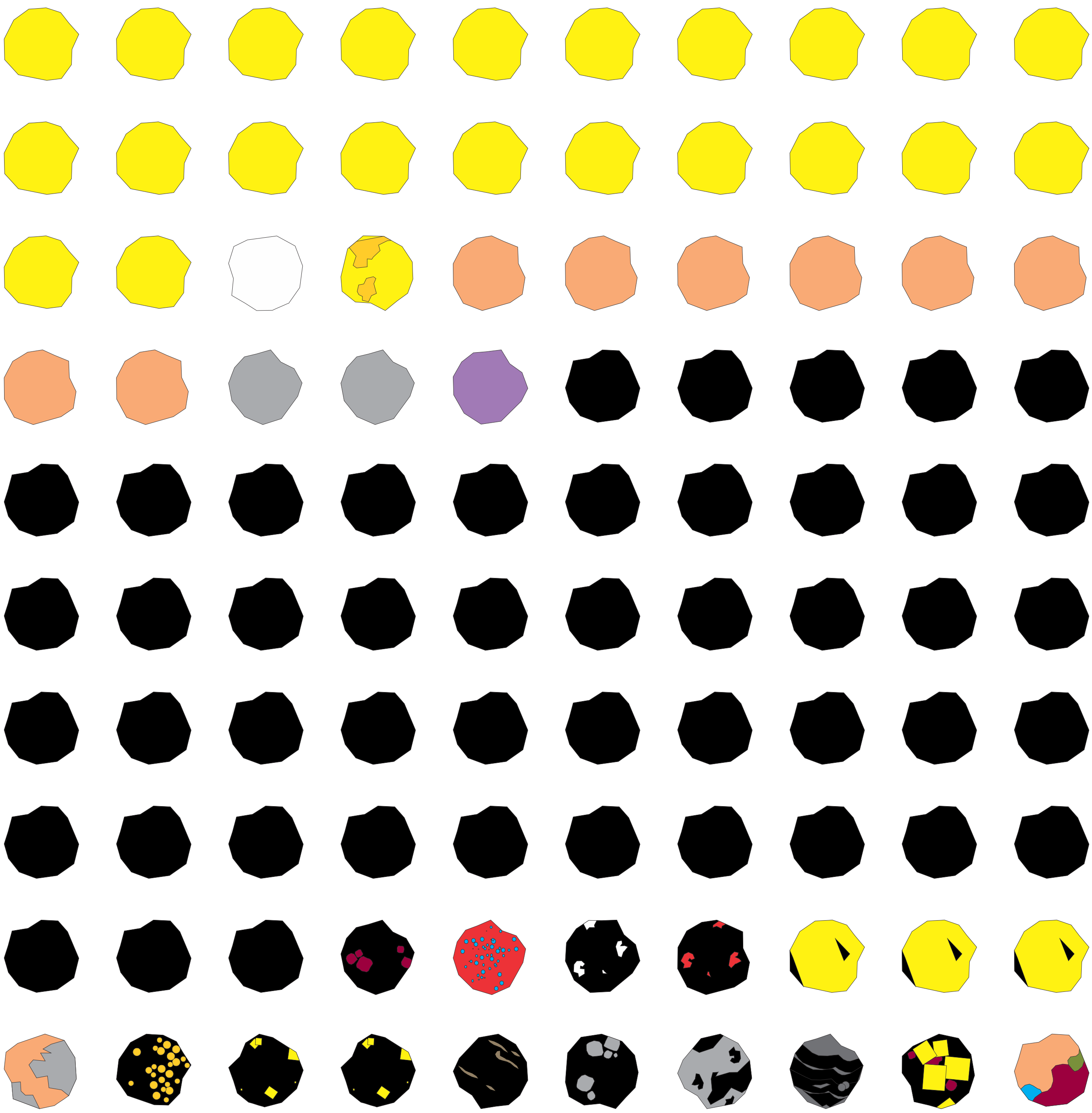
ALS Metallurgy - Heemskirk Sn Project Testwork

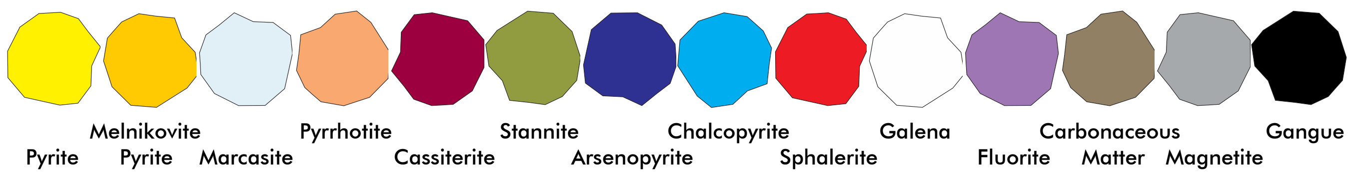
Severn Bulk Comp **E +53μm** **June** **2014**



ALS Metallurgy - Heemskirk Sn Project Testwork

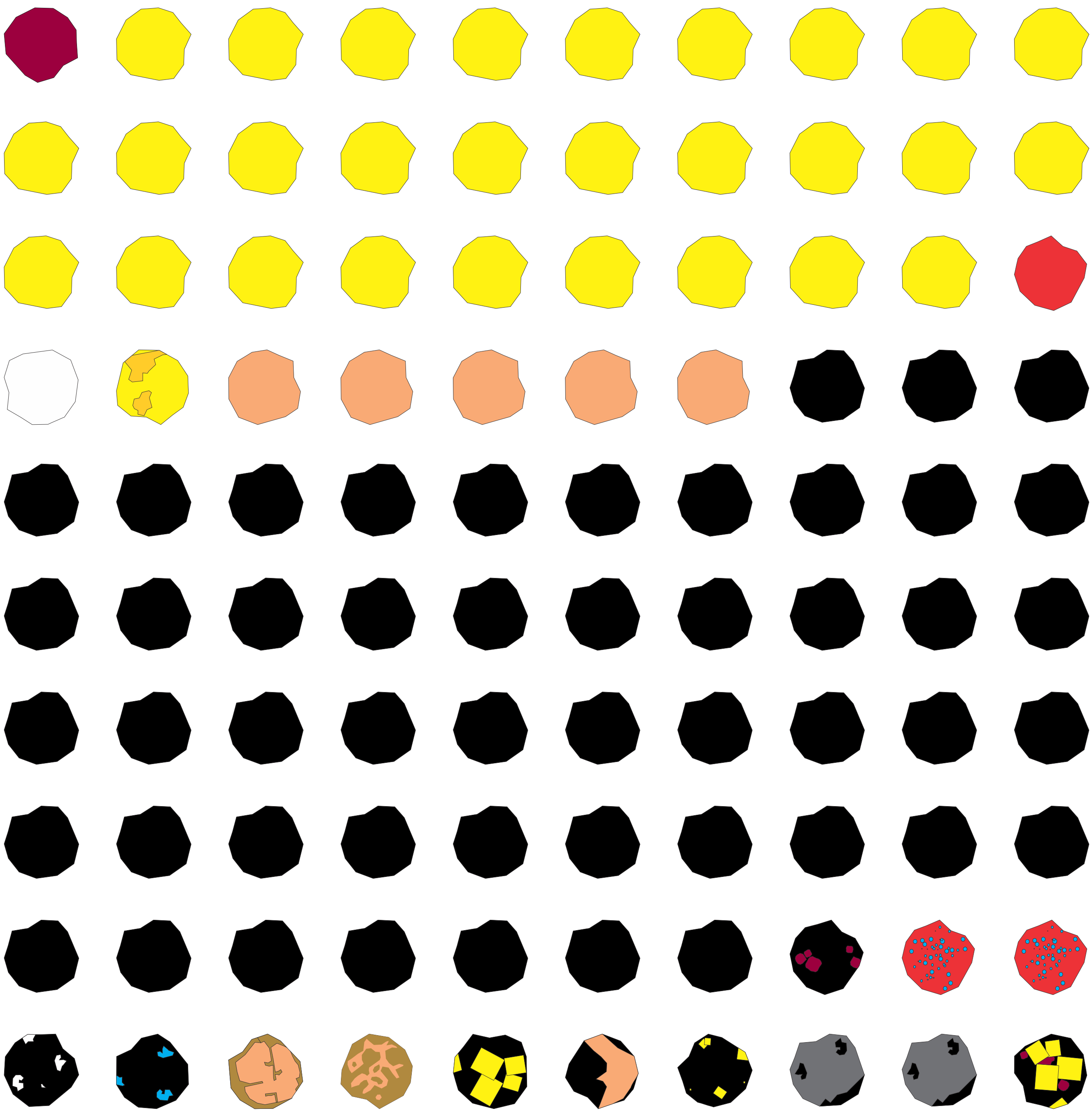
Severn Bulk Comp **F +38µm** **June 2014**

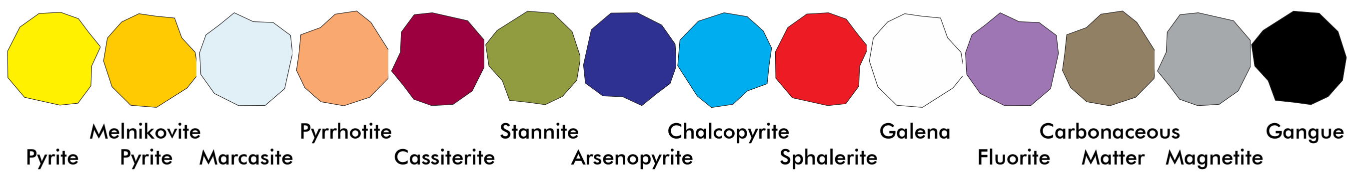




ALS Metallurgy - Heemskirk Sn Project Testwork

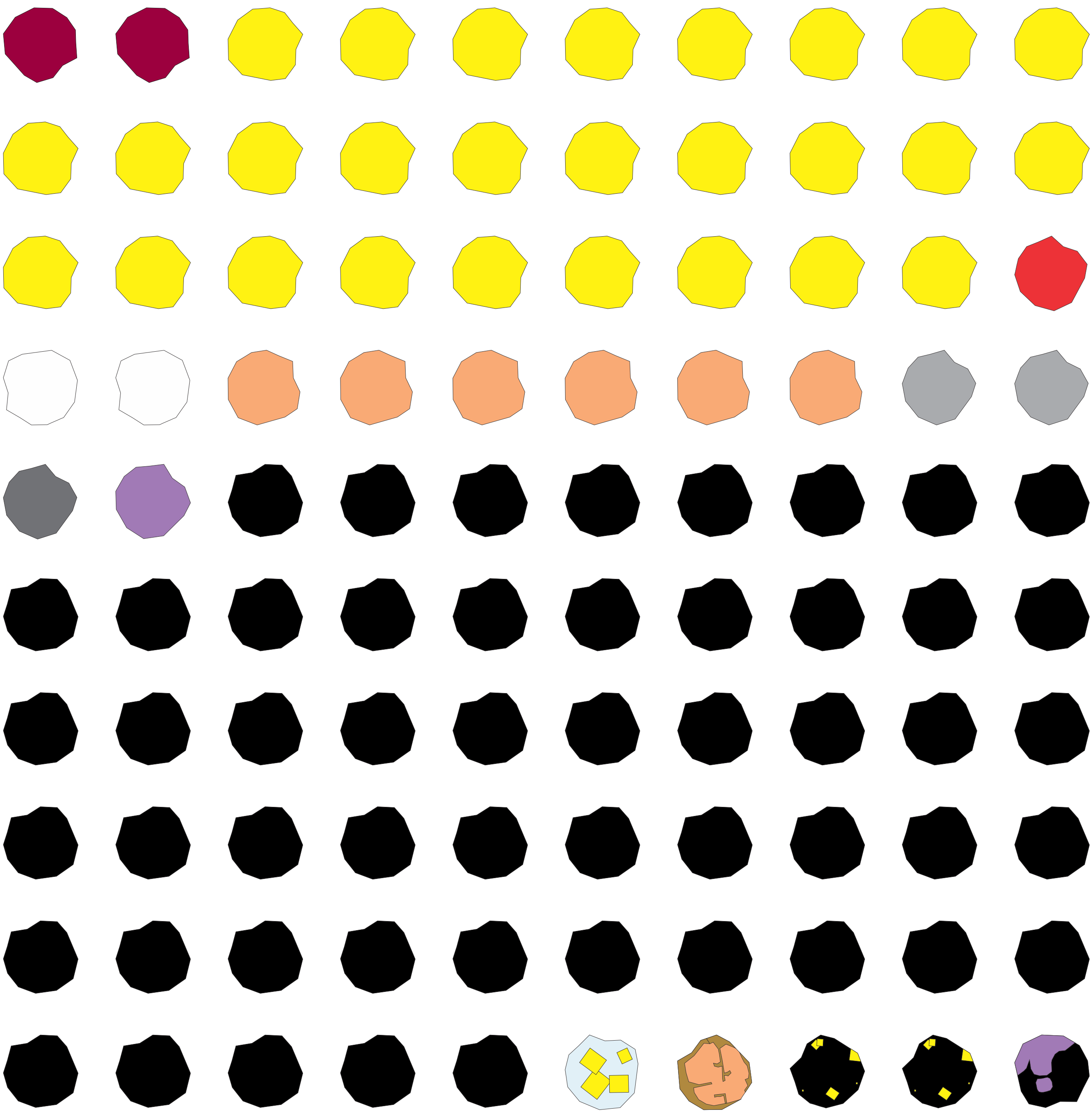
Severn Bulk Comp **G +20µm** **June** **2014**

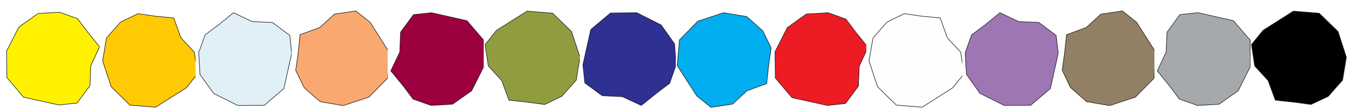




ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **H +8μm** **June** **2014**

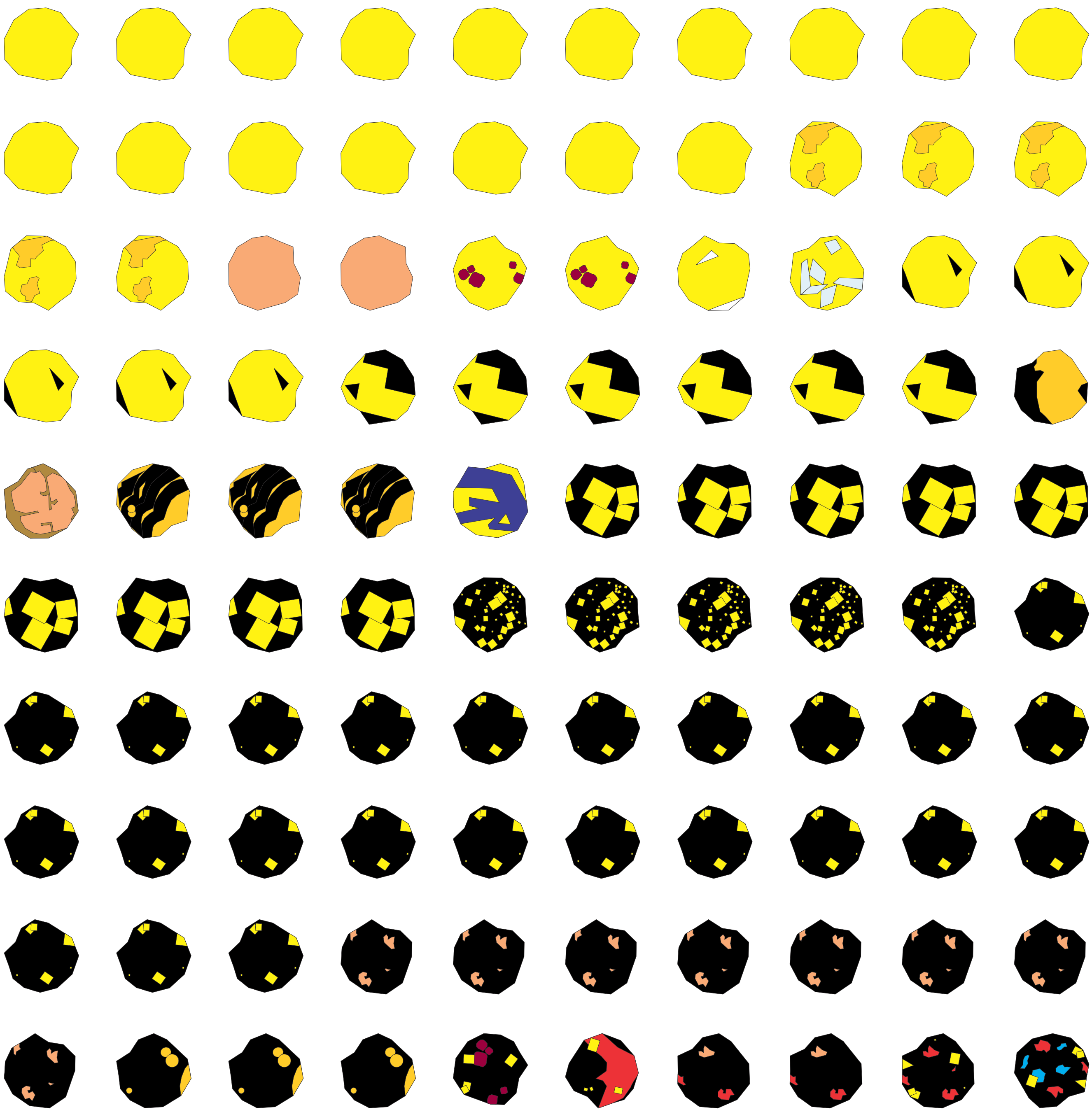


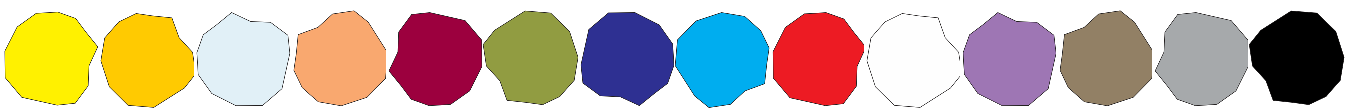


ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **A +212μm** **June 2014**

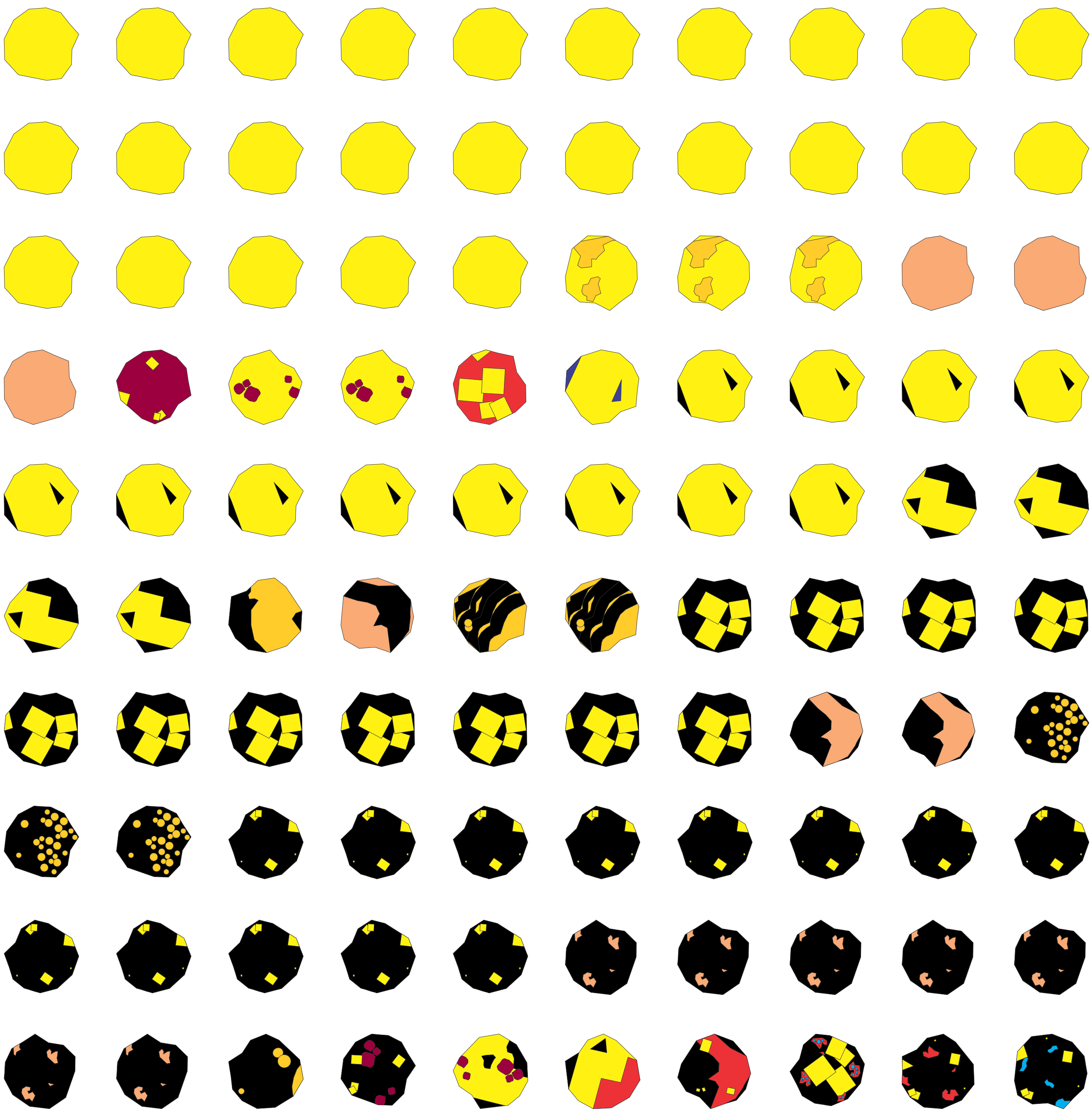
Py/Po SCAN

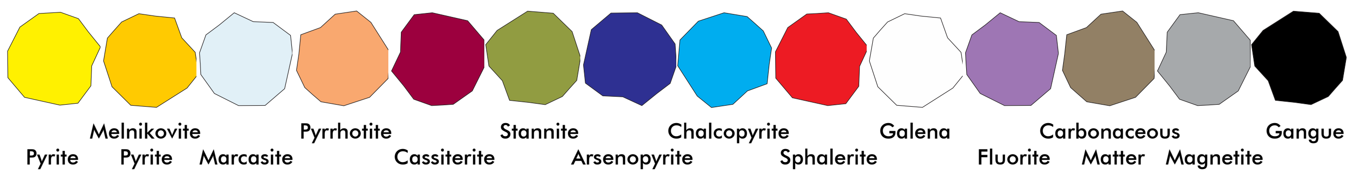




ALS Metallurgy - Heemskirk Sn Project Testwork

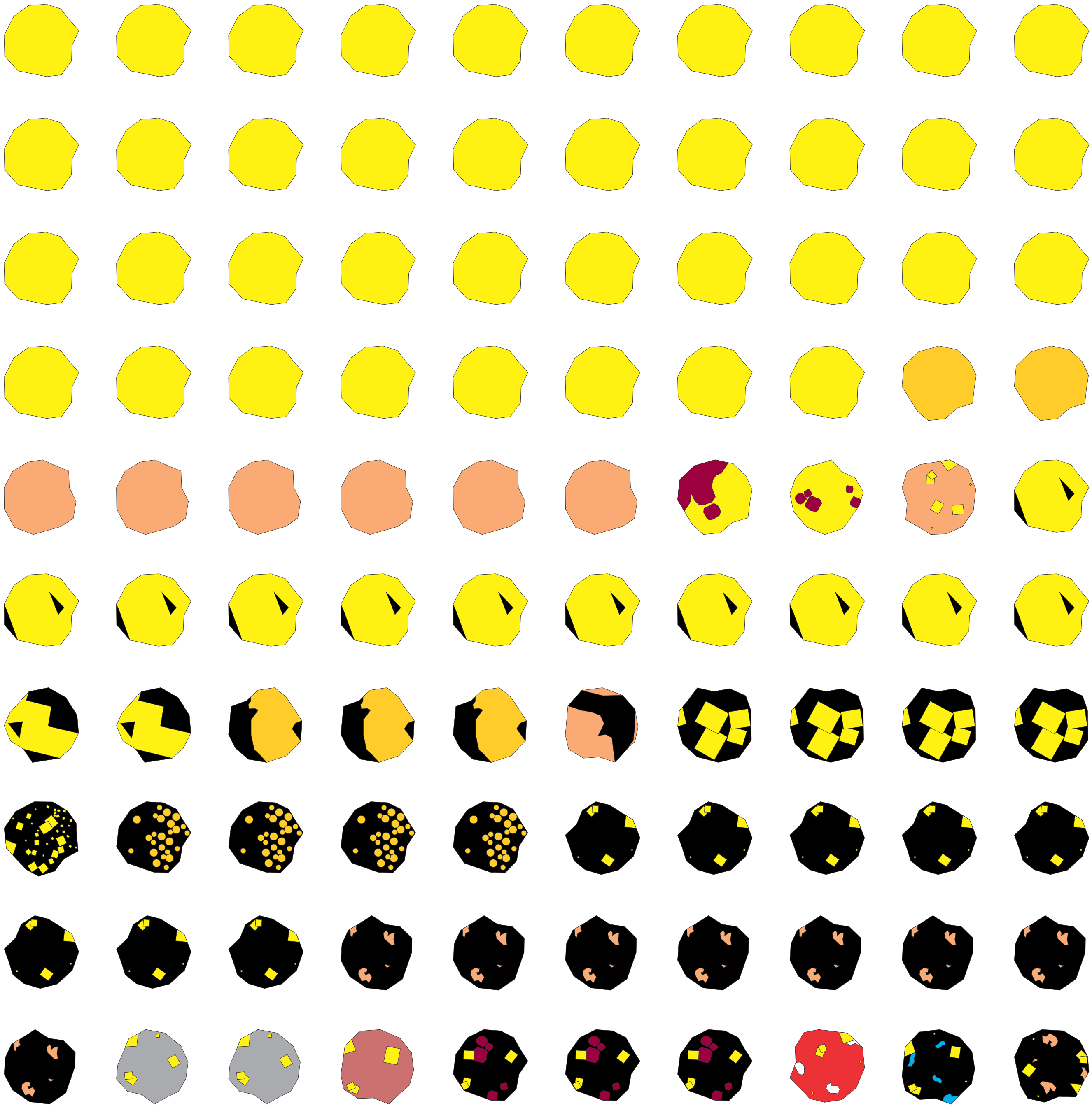
Severn Bulk Comp **B +150μm** **June** **2014**
Py/Po SCAN

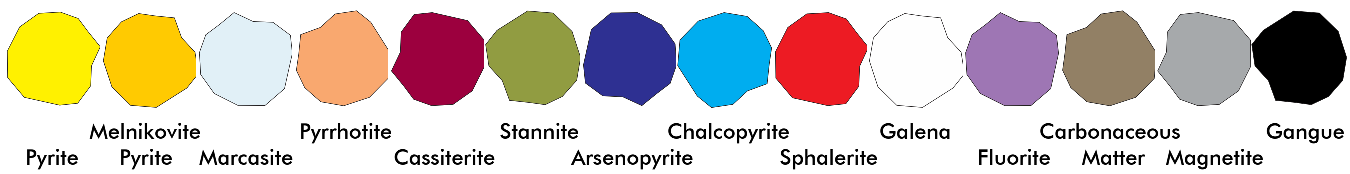




ALS Metallurgy - Heemskirk Sn Project Testwork

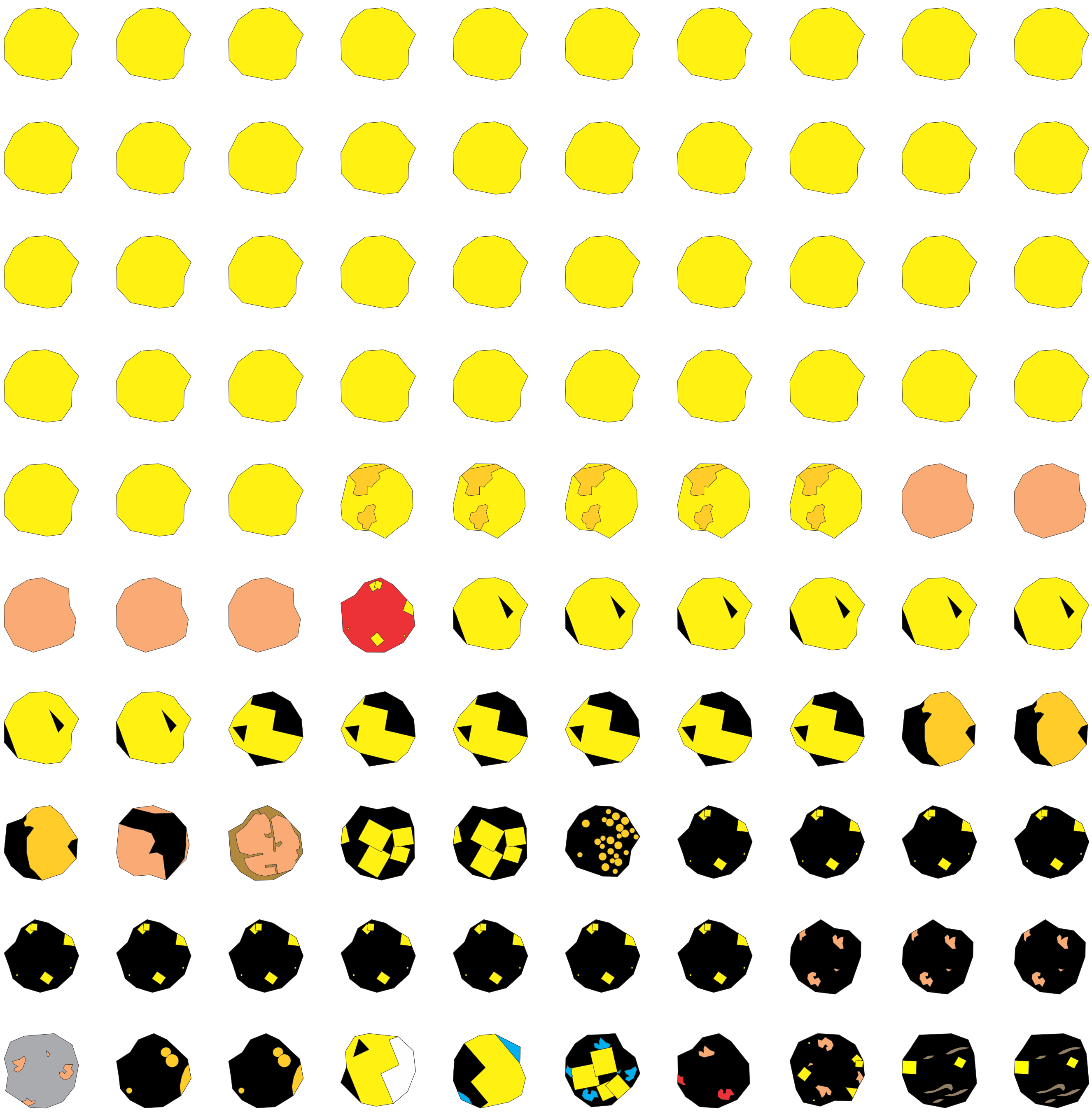
Severn Bulk Comp **C +106μm** **June** **2014**
Py/Po SCAN

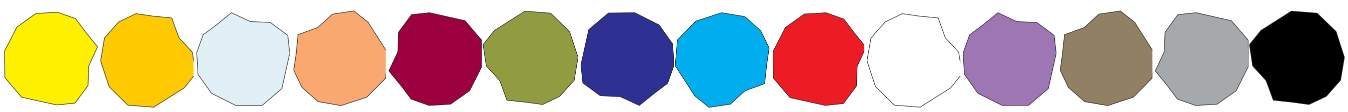




ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **D +75µm** **June 2014**
Py/Po SCAN

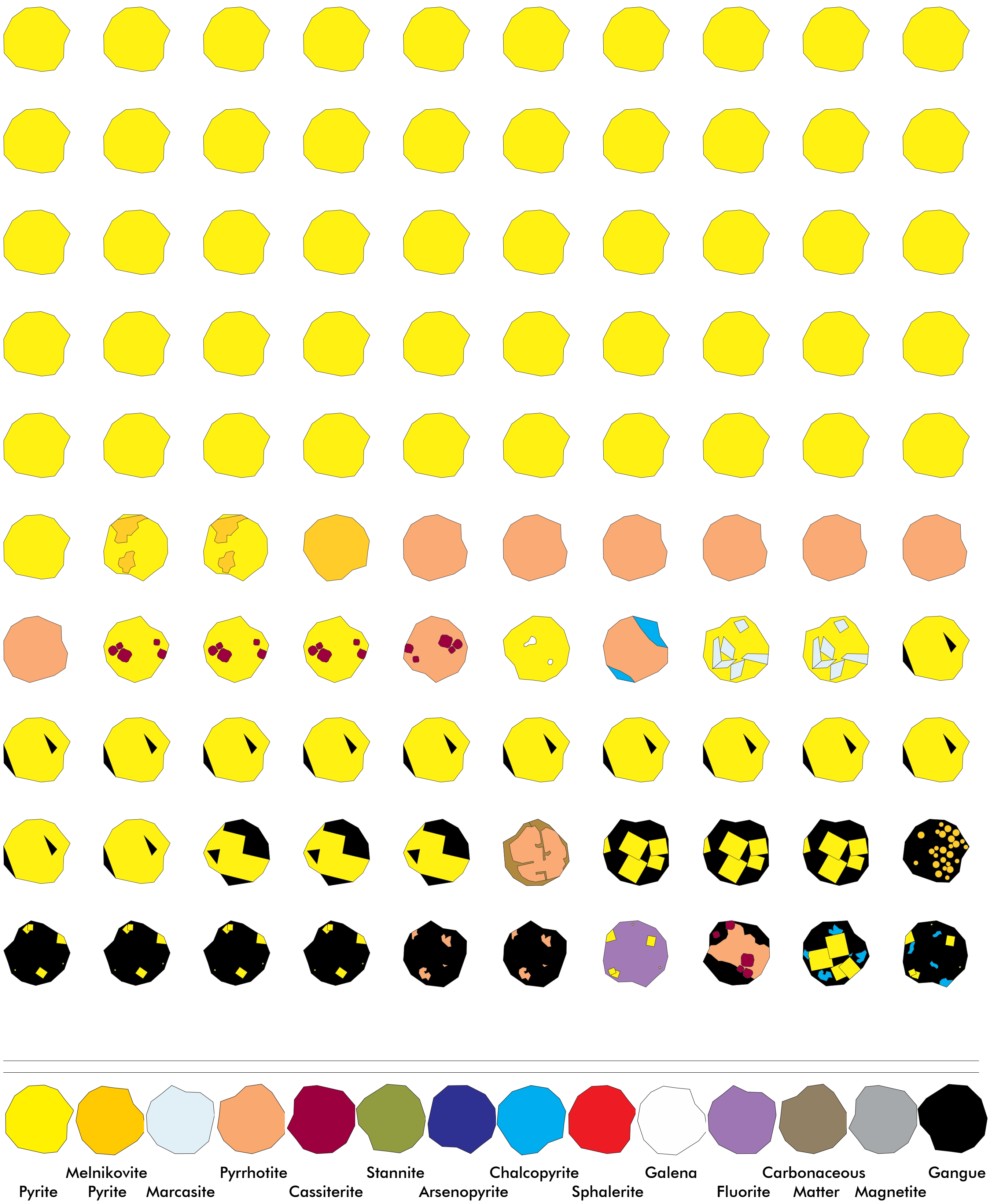




Pyrite, Melnikovite Pyrite, Marcasite, Pyrrhotite, Cassiterite, Stannite, Arsenopyrite, Chalcopyrite, Sphalerite, Galena, Fluorite, Carbonaceous Matter, Magnetite, Gangue

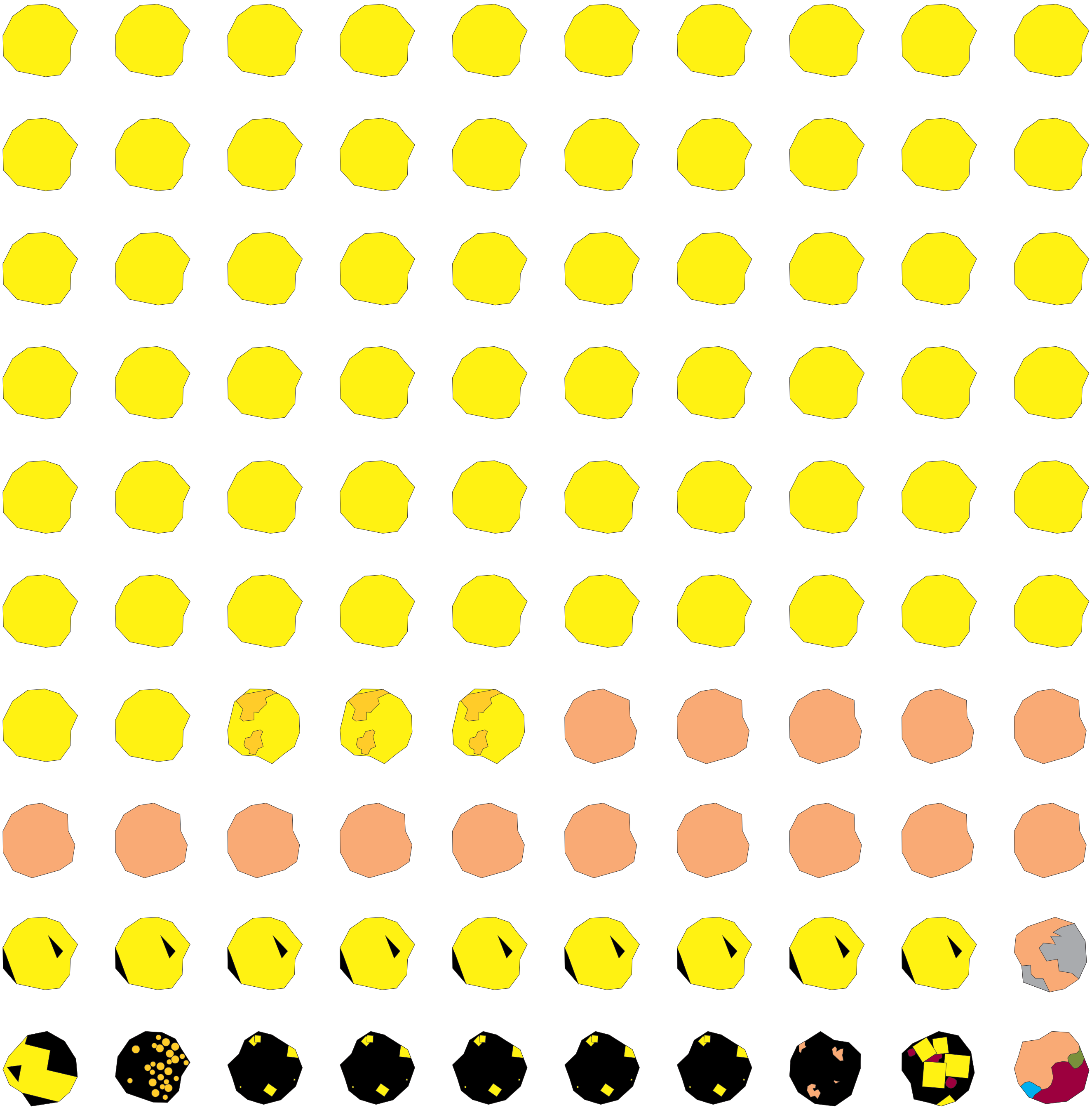
ALS Metallurgy - Heemskirk Sn Project Testwork

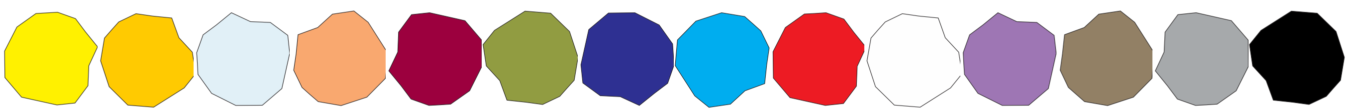
Severn Bulk Comp **E +53μm** **June 2014**
Py/Po SCAN



ALS Metallurgy - Heemskirk Sn Project Testwork

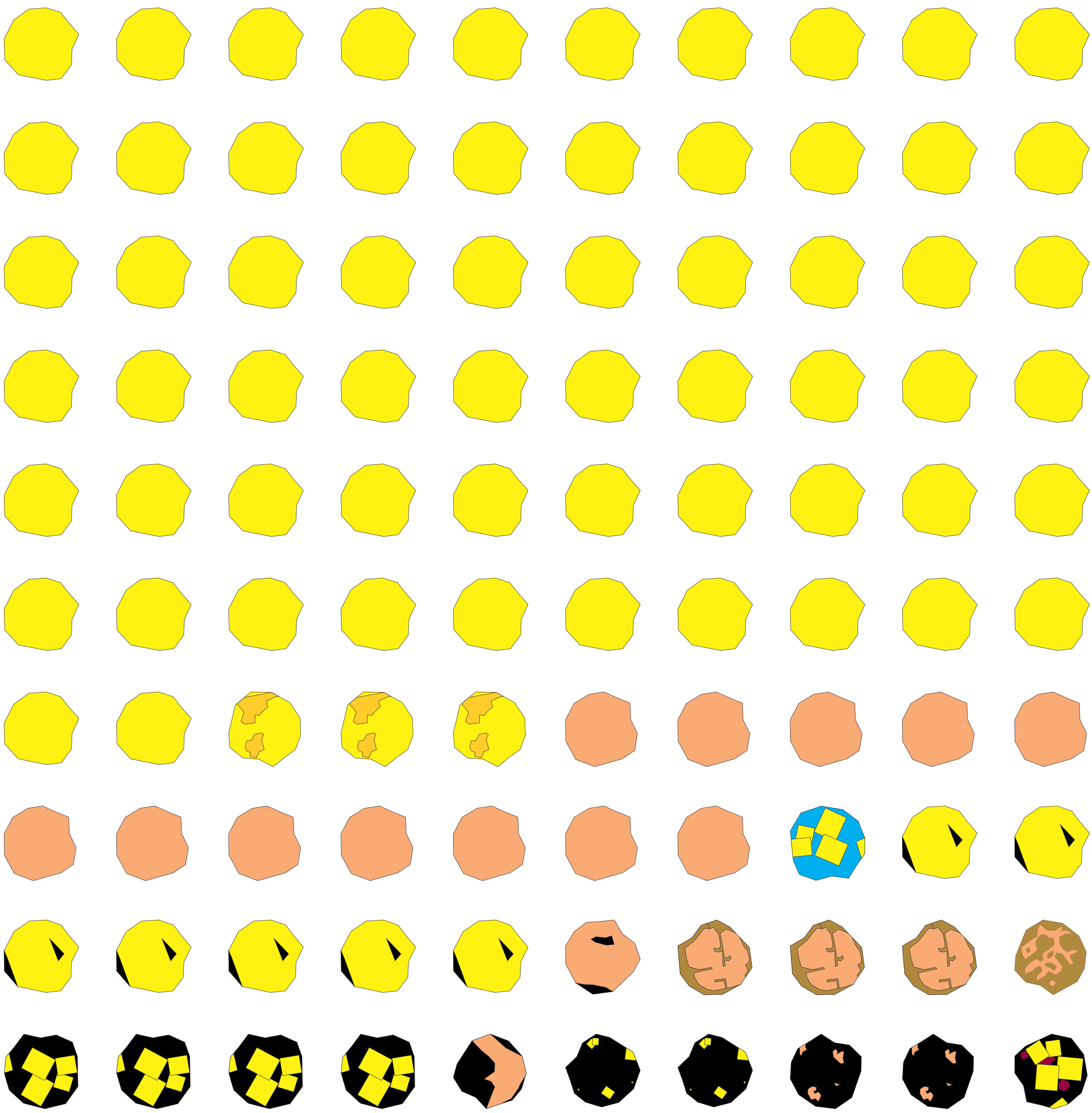
Severn Bulk Comp **F +38μm** **June 2014**
Py/Po SCAN

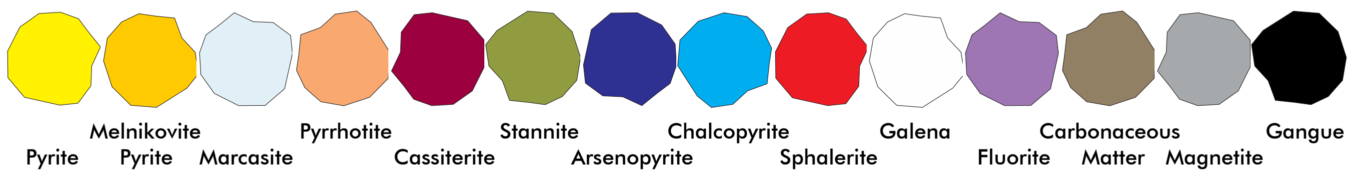




ALS Metallurgy - Heemskirk Sn Project Testwork

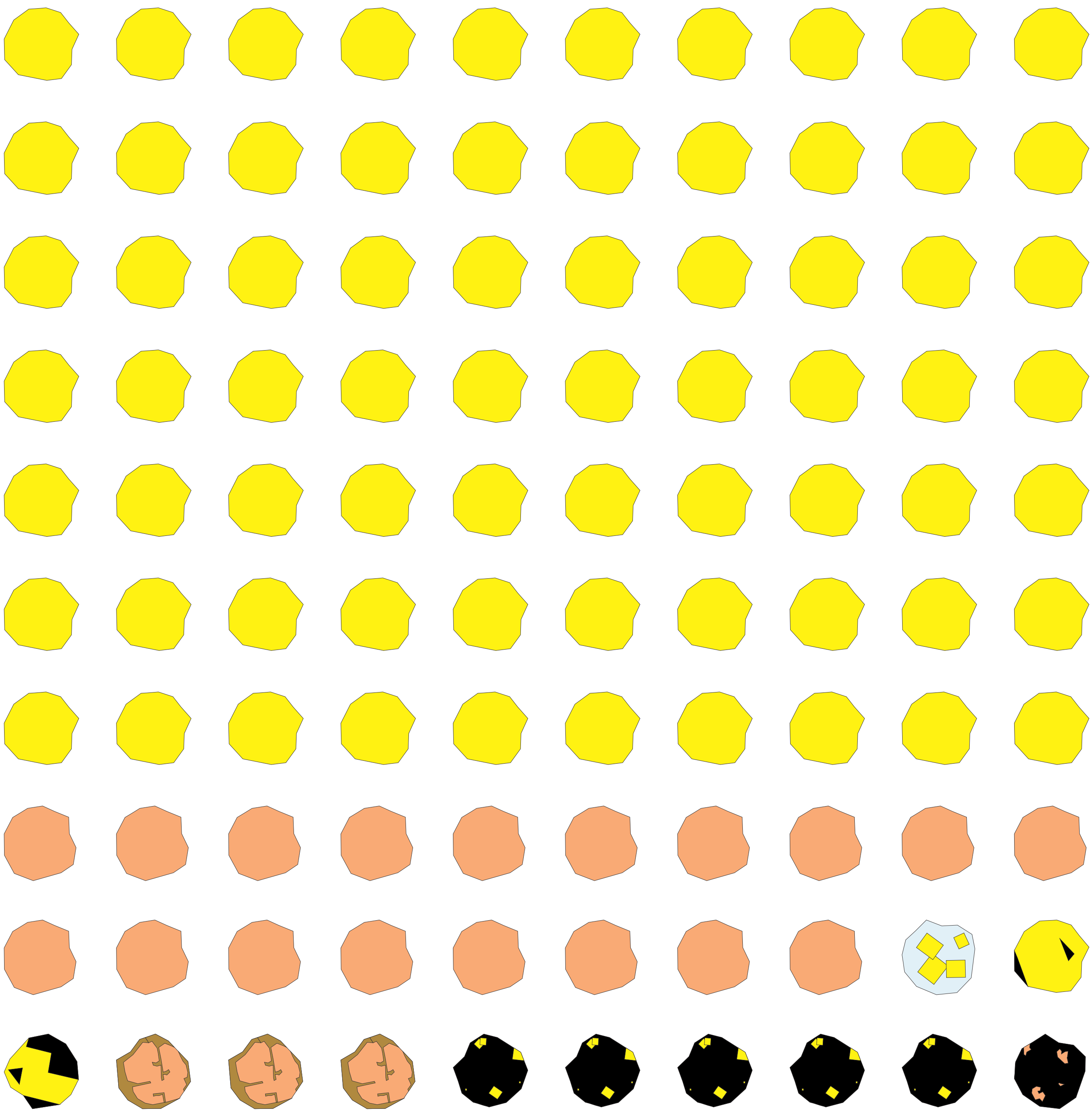
Severn Bulk Comp **G +20μm** **June** **2014**
Py/Po SCAN

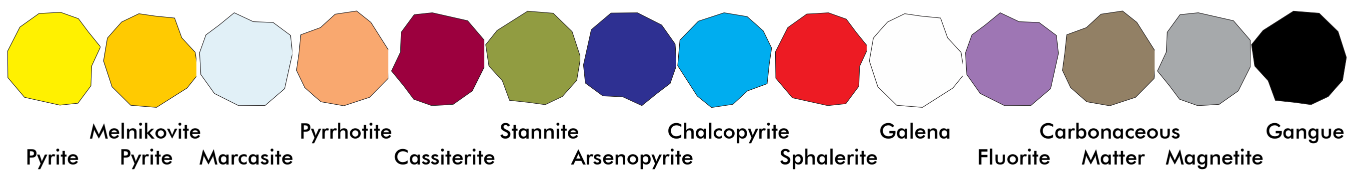




ALS Metallurgy - Heemskirk Sn Project Testwork

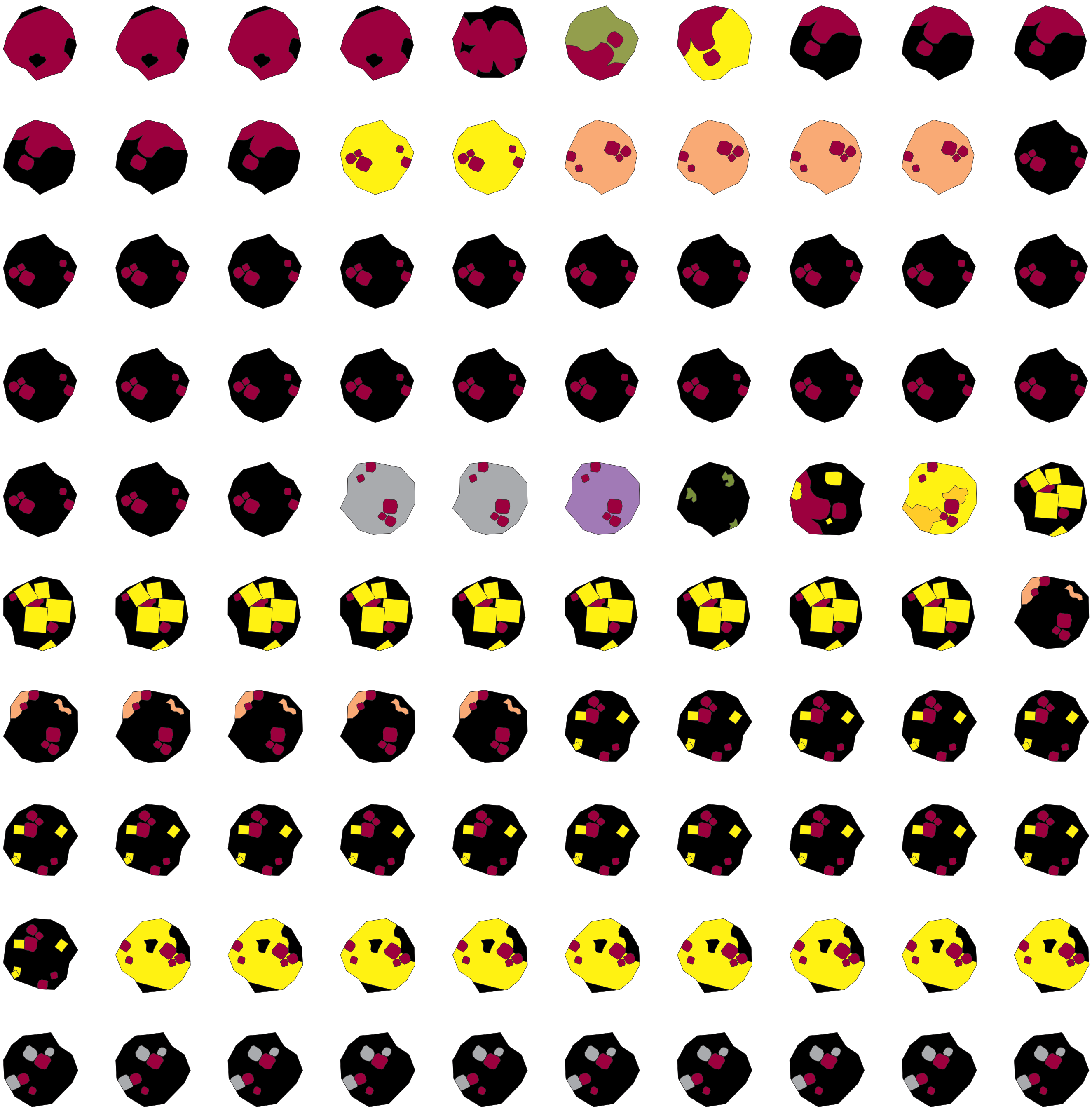
Severn Bulk Comp **H +8µm** **June 2014**
Py/Po SCAN

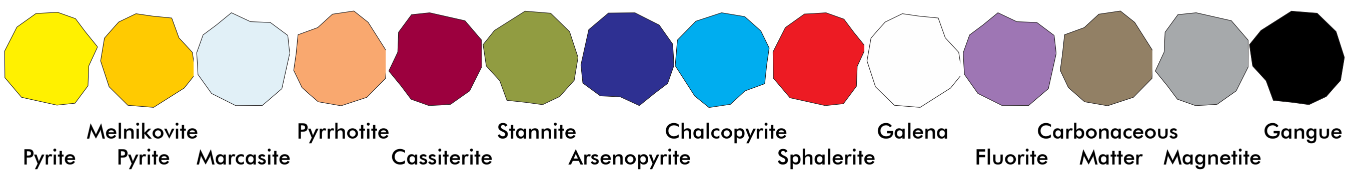




ALS Metallurgy - Heemskirk Sn Project Testwork

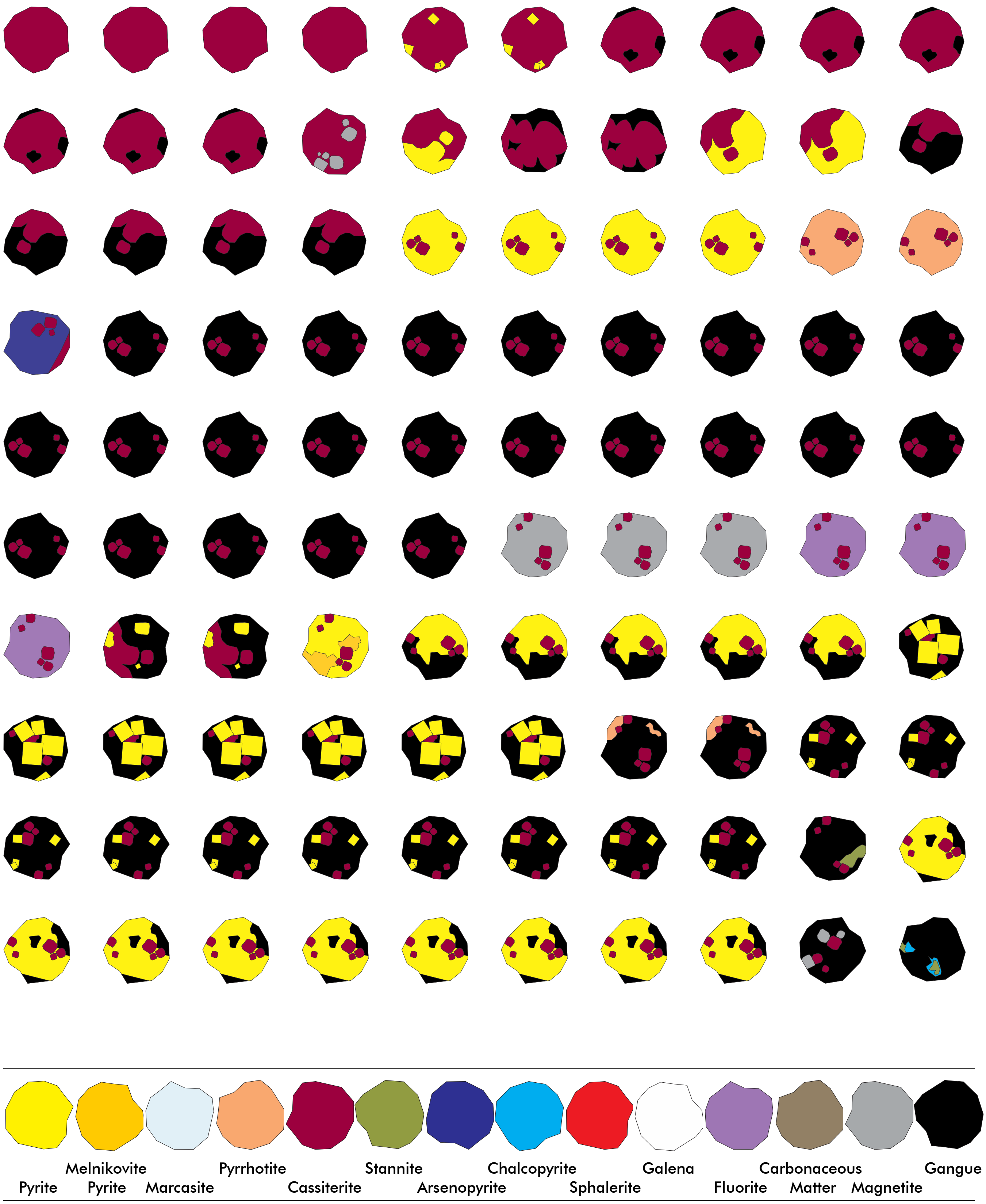
Severn Bulk Comp Sn SCAN **A +212μm** **June 2014**





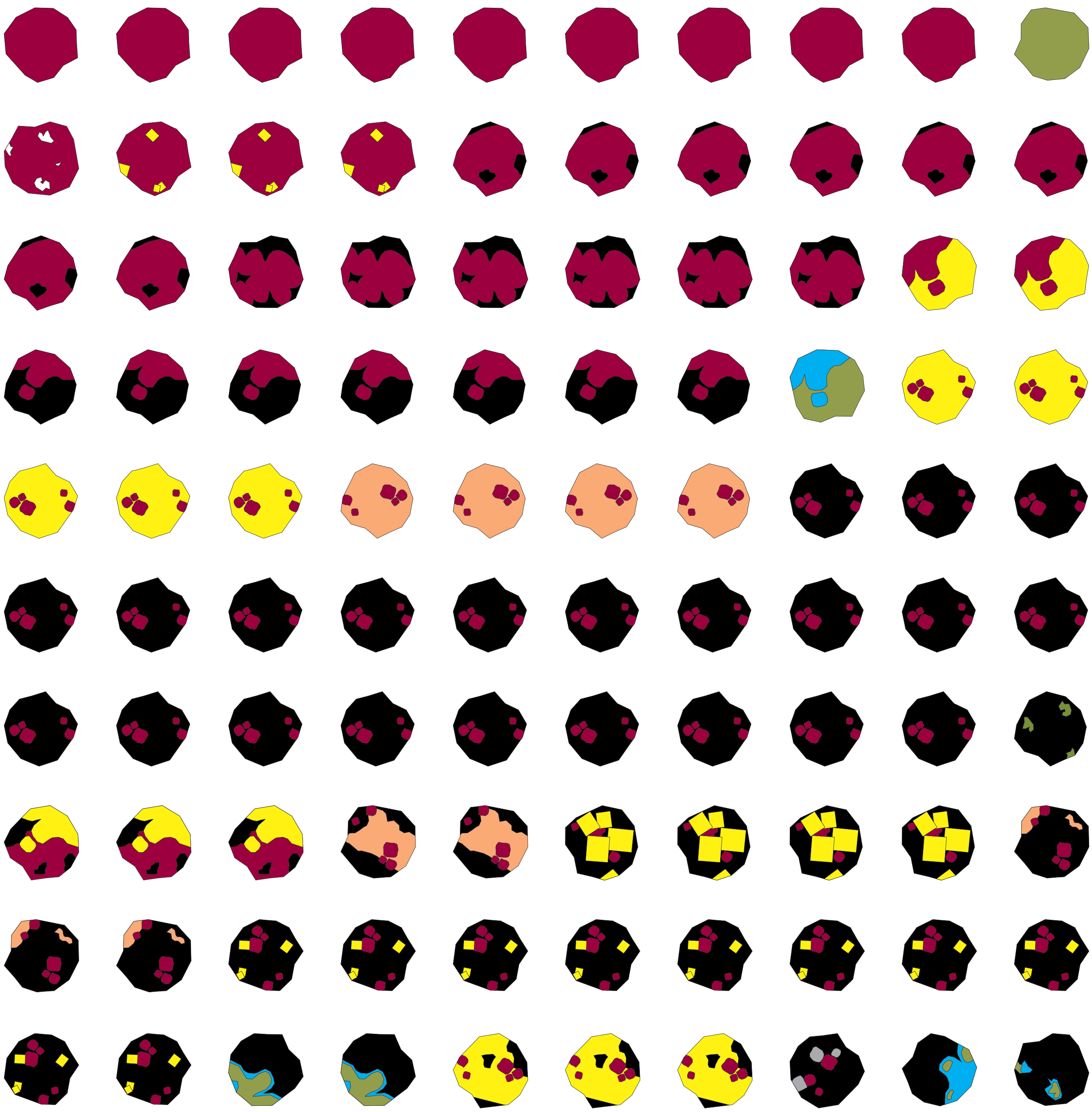
ALS Metallurgy - Heemskirk Sn Project Testwork

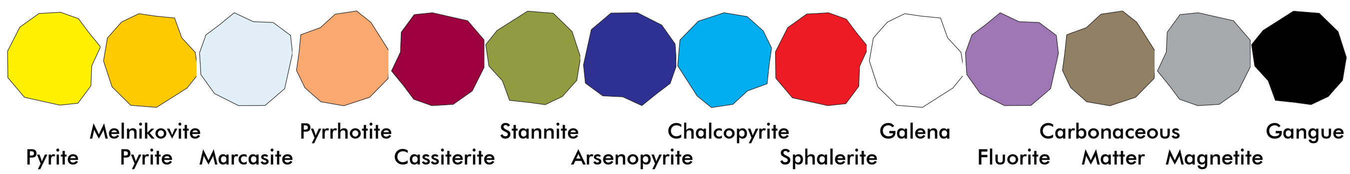
Severn Bulk Comp Sn SCAN **B +150μm** **June 2014**



ALS Metallurgy - Heemskirk Sn Project Testwork

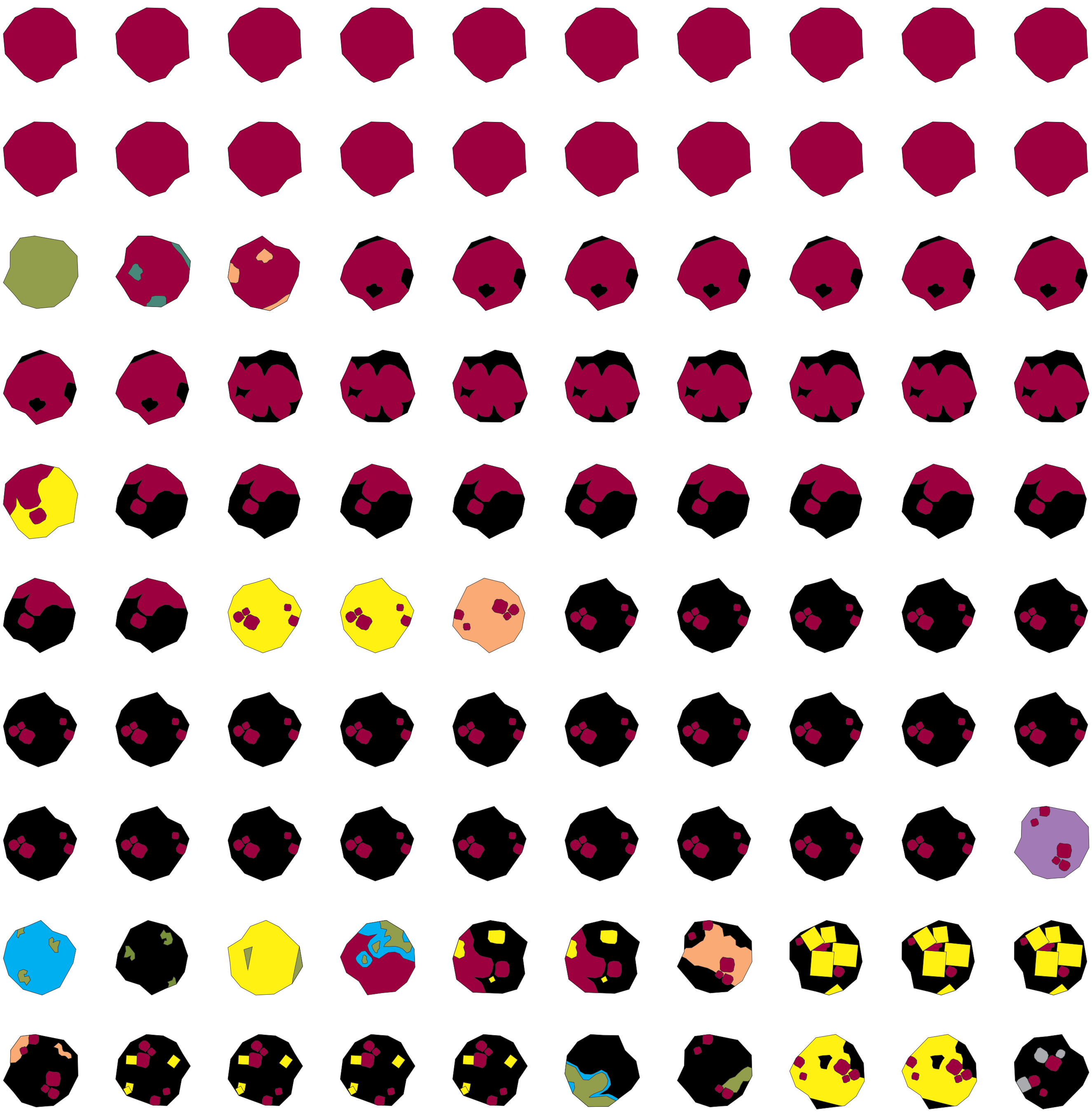
Severn Bulk Comp Sn SCAN C +106μm June 2014

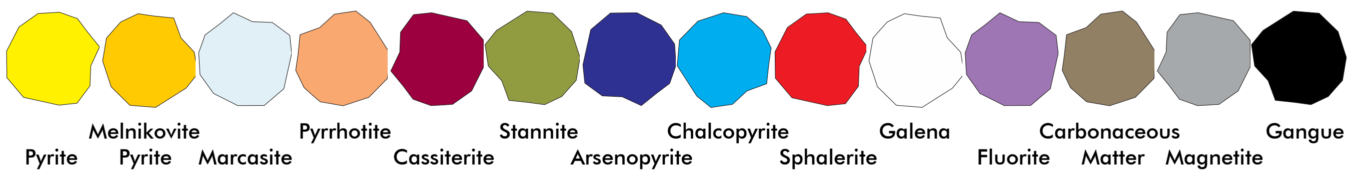




ALS Metallurgy - Heemskirk Sn Project Testwork

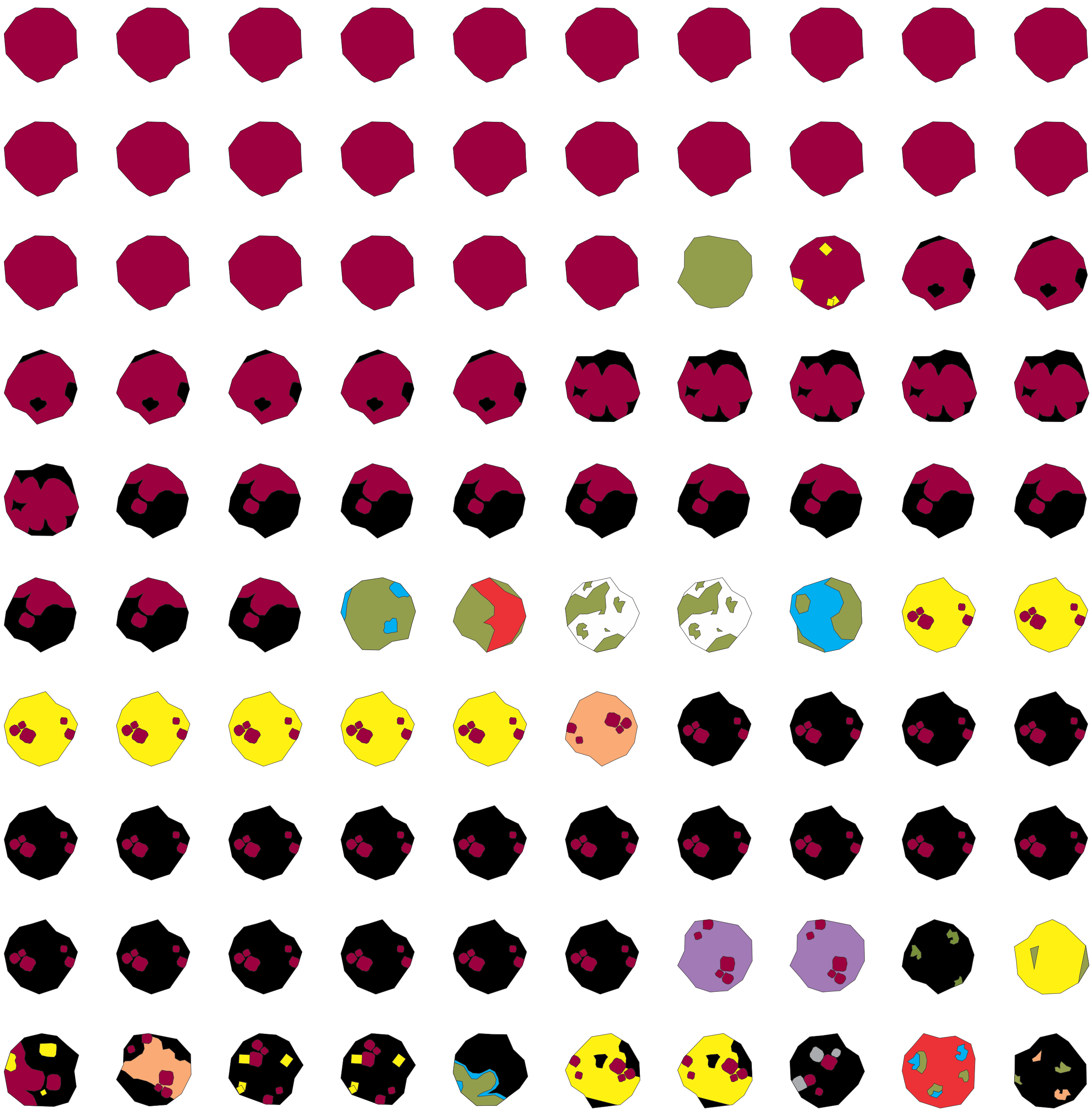
Severn Bulk Comp Sn **D +75µm** **June 2014**
SCAN

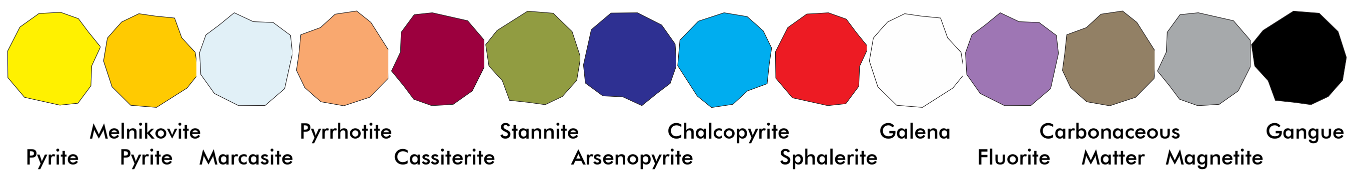




ALS Metallurgy - Heemskirk Sn Project Testwork

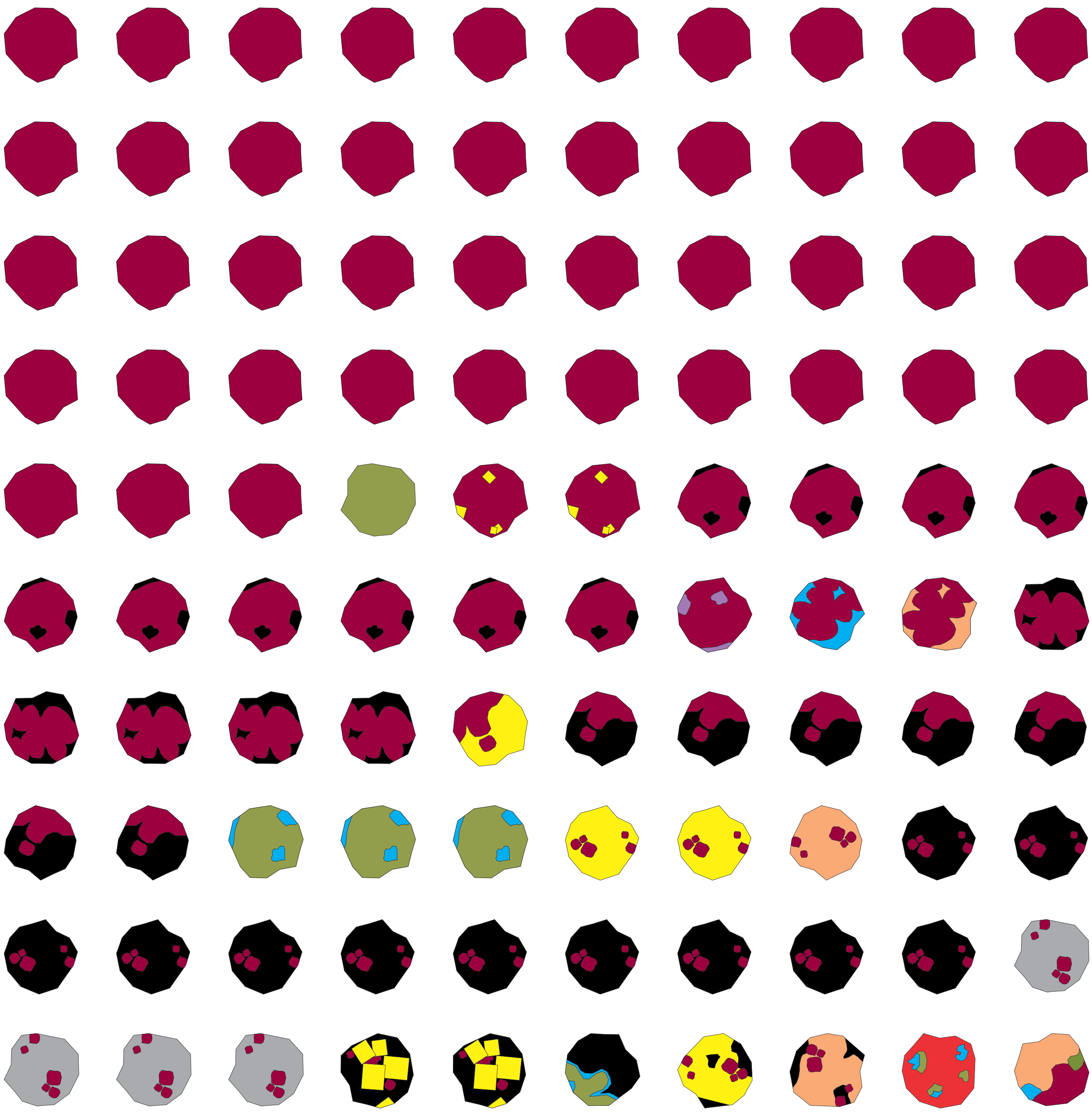
Severn Bulk Comp Sn SCAN **E +53μm** **June** **2014**

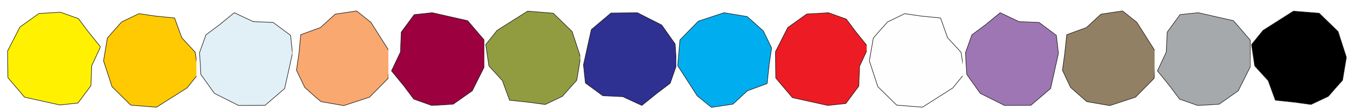




ALS Metallurgy - Heemskirk Sn Project Testwork

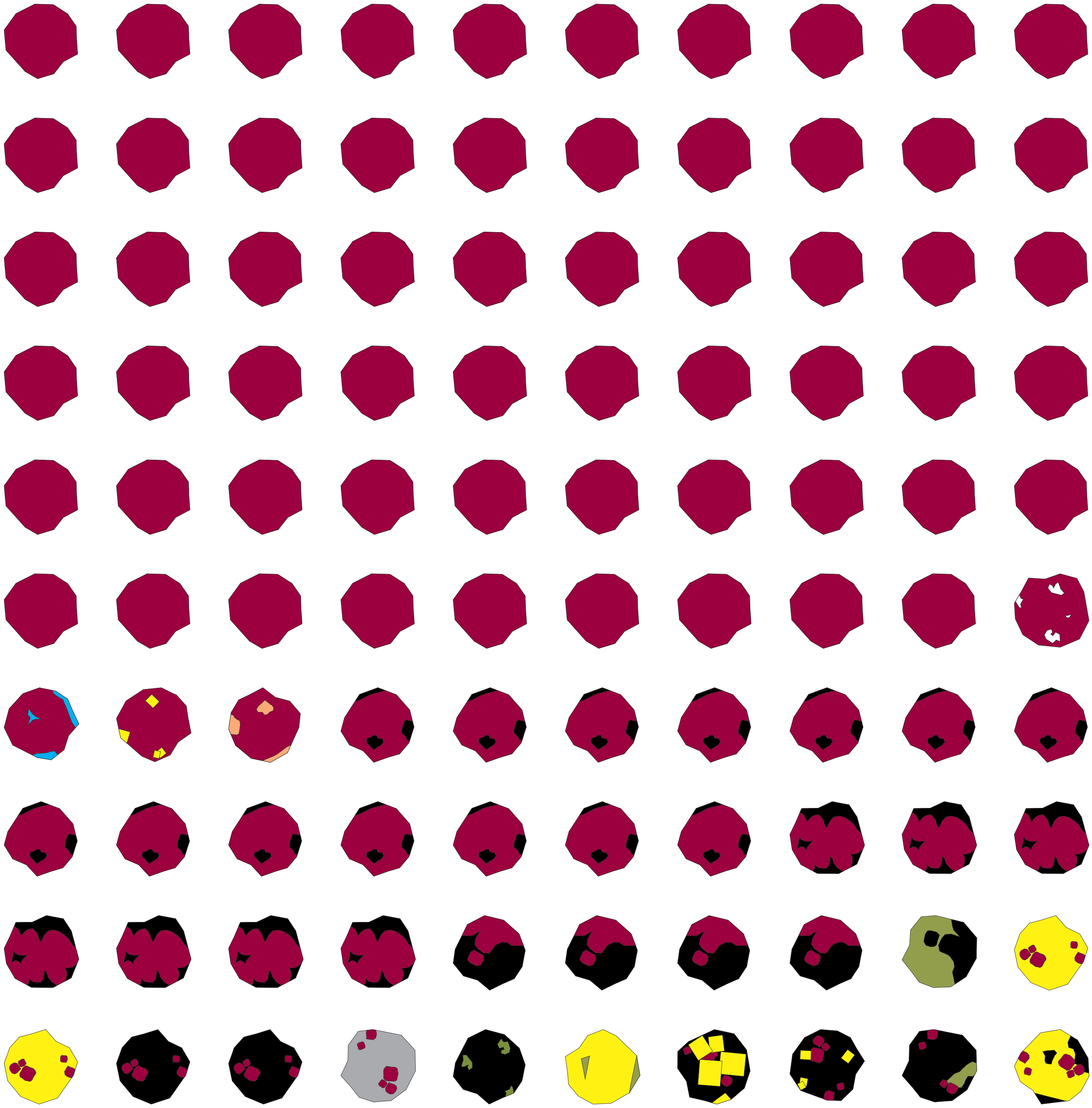
Severn Bulk Comp Sn SCAN **F +38μm** **June** **2014**

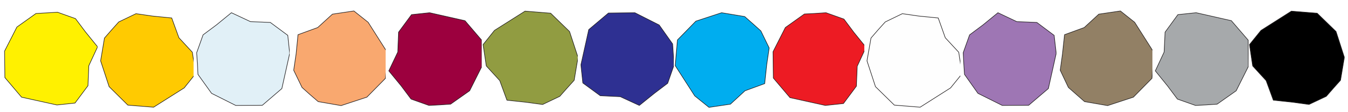




ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp Sn SCAN **G +20μm** **June** **2014**

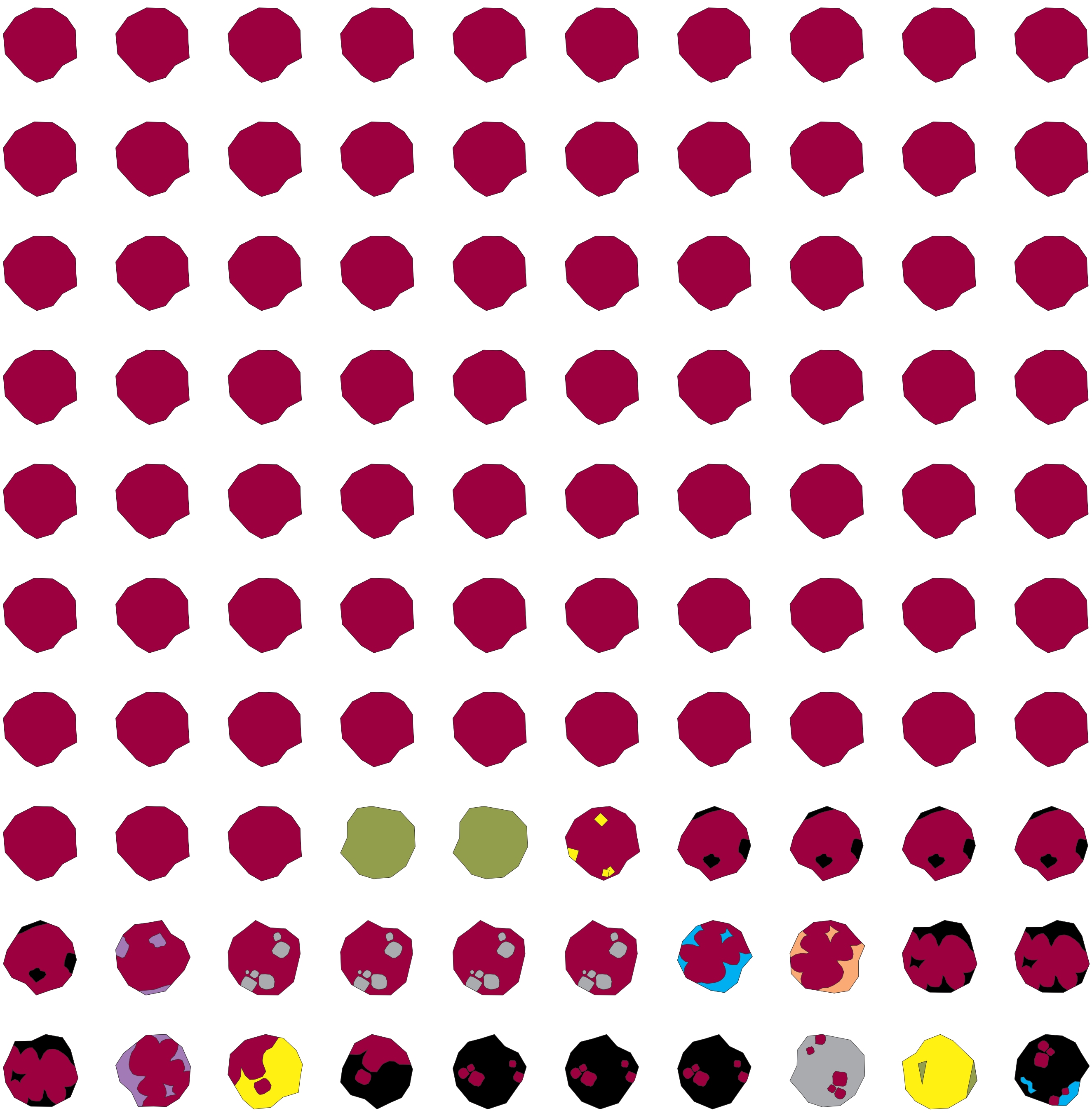


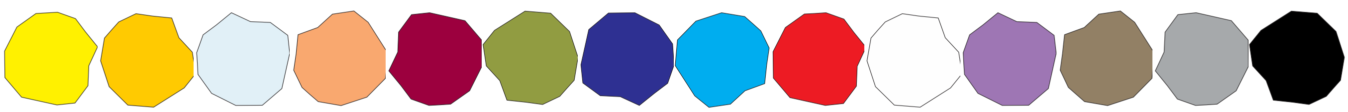


Pyrite, Melnikovite Pyrite, Marcasite, Pyrrhotite, Cassiterite, Stannite, Arsenopyrite, Chalcopyrite, Sphalerite, Galena, Fluorite, Carbonaceous Matter, Magnetite, Gangue

ALS Metallurgy - Heemskirk Sn Project Testwork

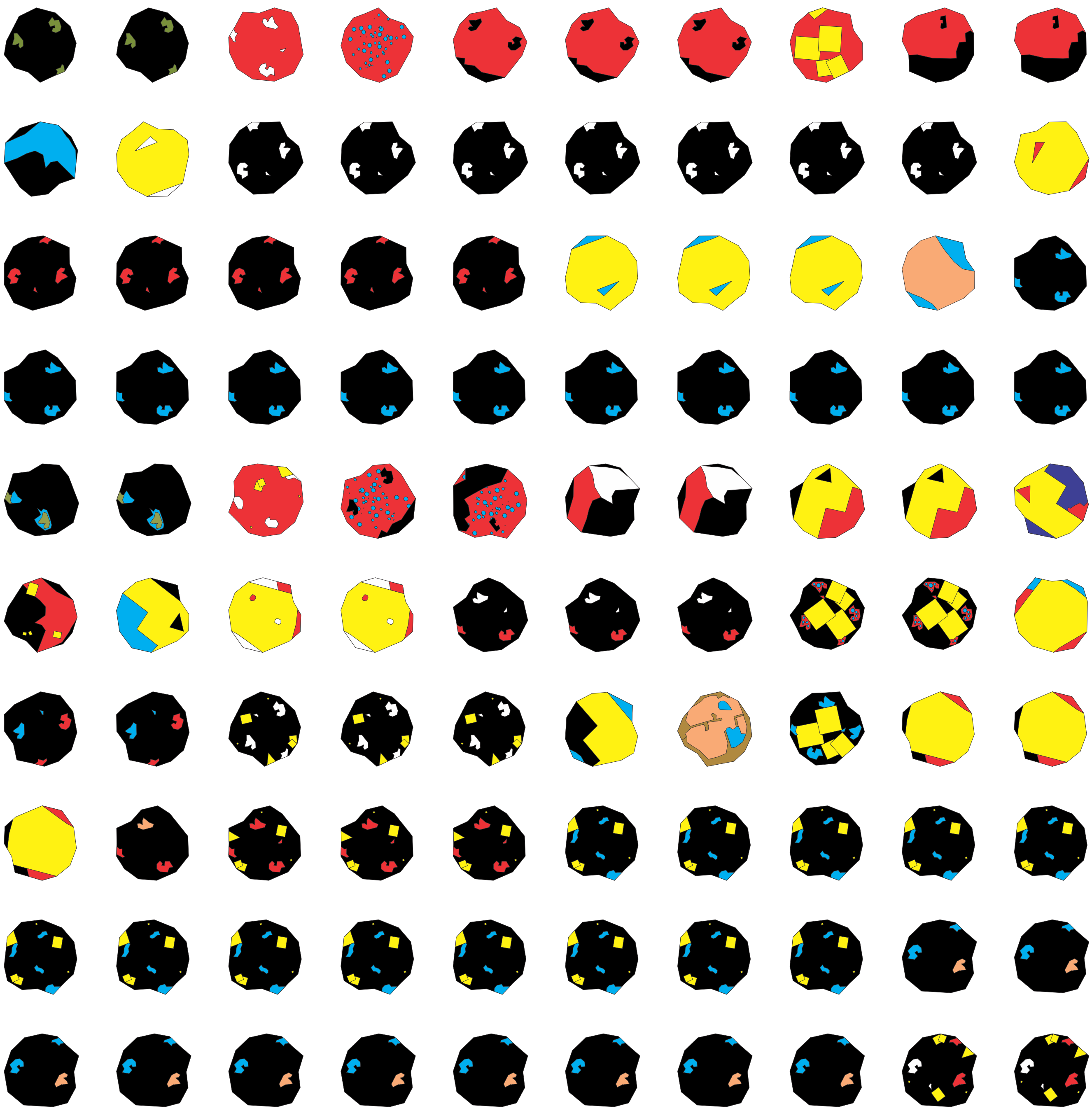
Severn Bulk Comp Sn SCAN **H +8μm** **June 2014**

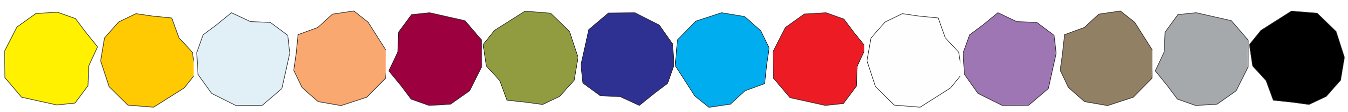




ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp Non-PyPoAs Sulphide SCAN **A +212µm** **June** **2014**

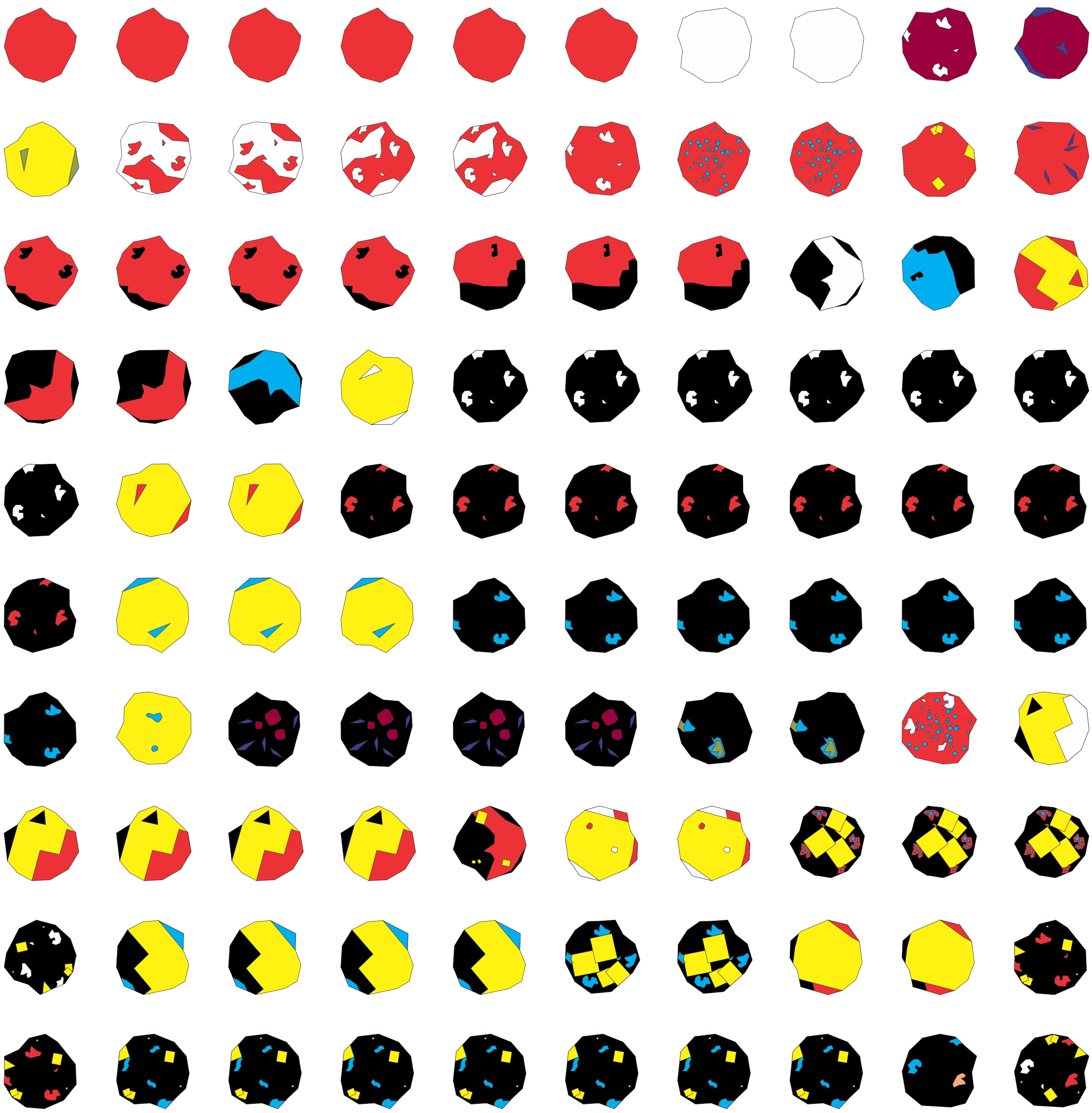


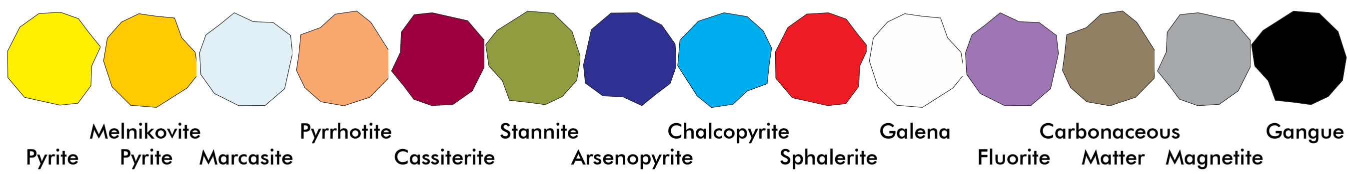


Pyrite Melnikovite Pyrite Marcasite Pyrrhotite Cassiterite Stannite Arsenopyrite Chalcopyrite Sphalerite Galena Fluorite Carbonaceous Matter Magnetite Gangue

ALS Metallurgy - Heemskirk Sn Project Testwork

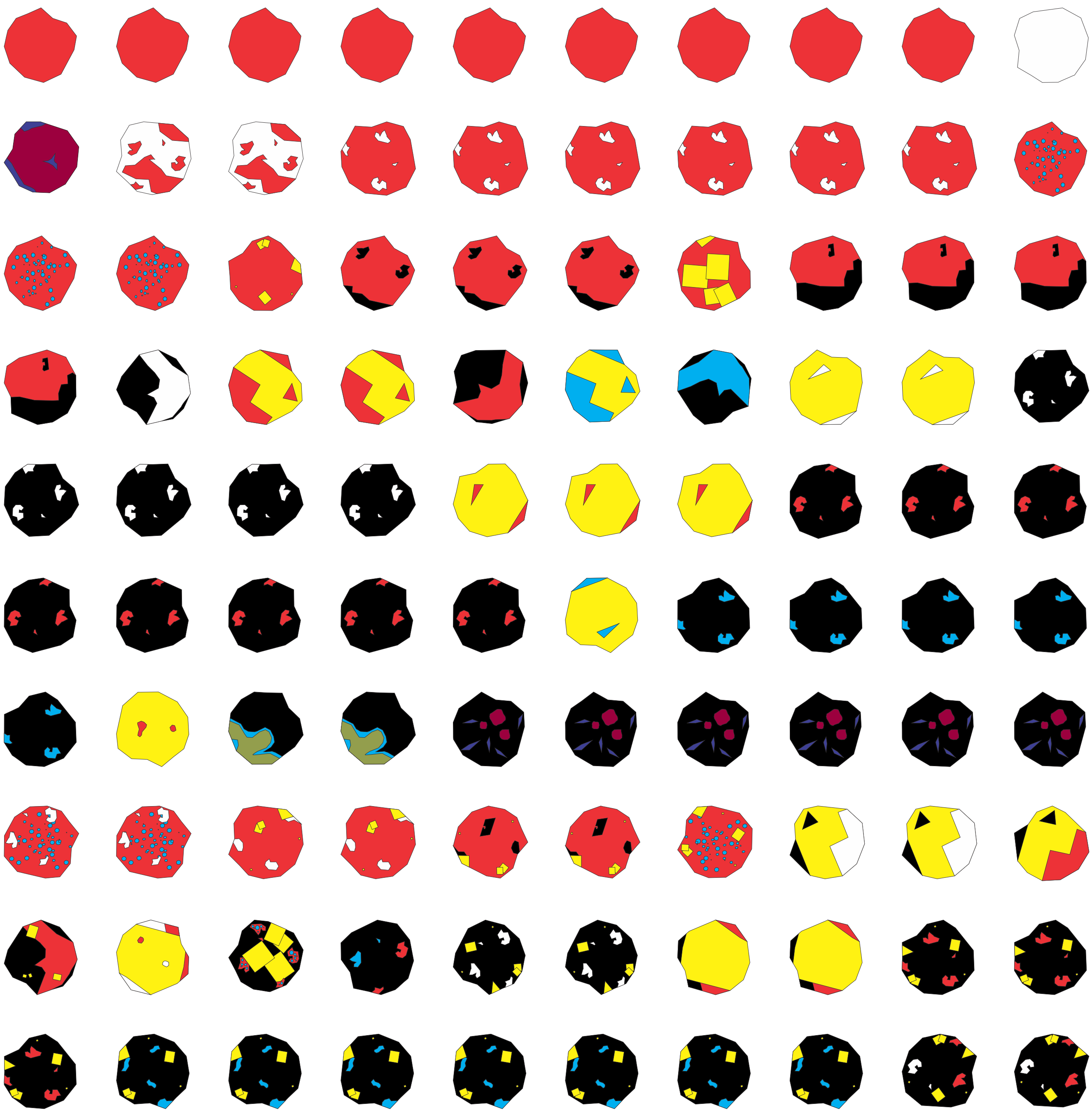
Severn Bulk Comp Non-PyPoAs Sulphide SCAN | **B +150μm** | **June** | **2014**

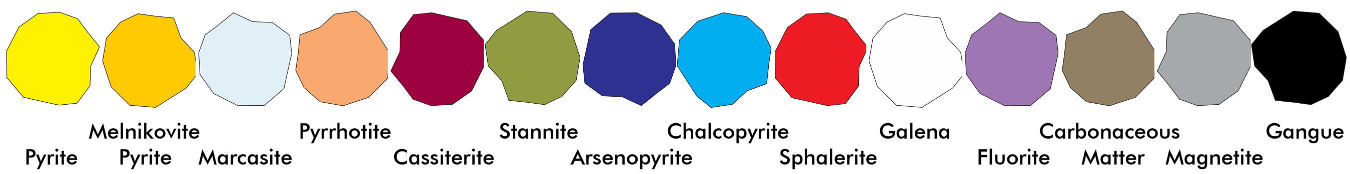




ALS Metallurgy - Heemskirk Sn Project Testwork

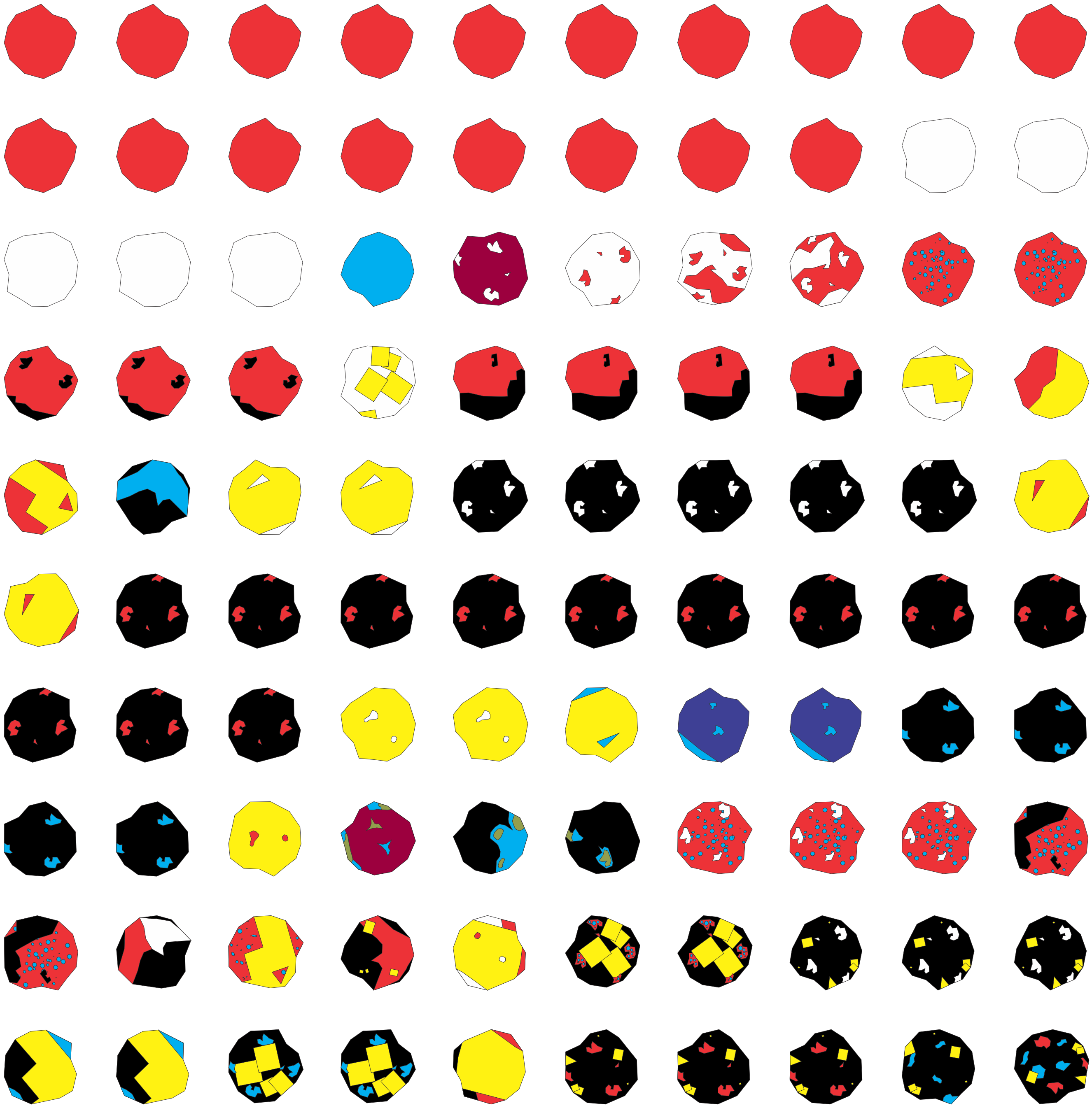
Severn Bulk Comp Non-PyPoAs Sulphide SCAN | **C +106µm** | **June** | **2014**

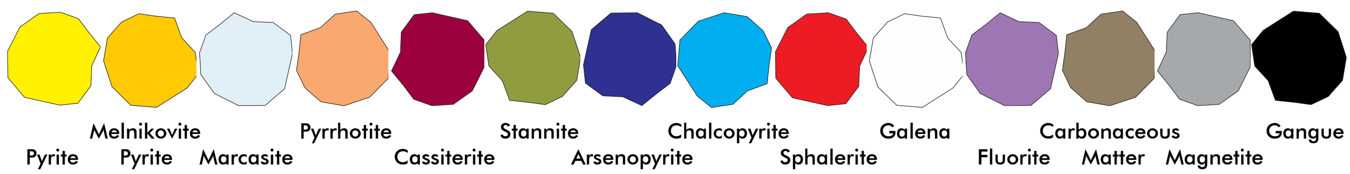




ALS Metallurgy - Heemskirk Sn Project Testwork

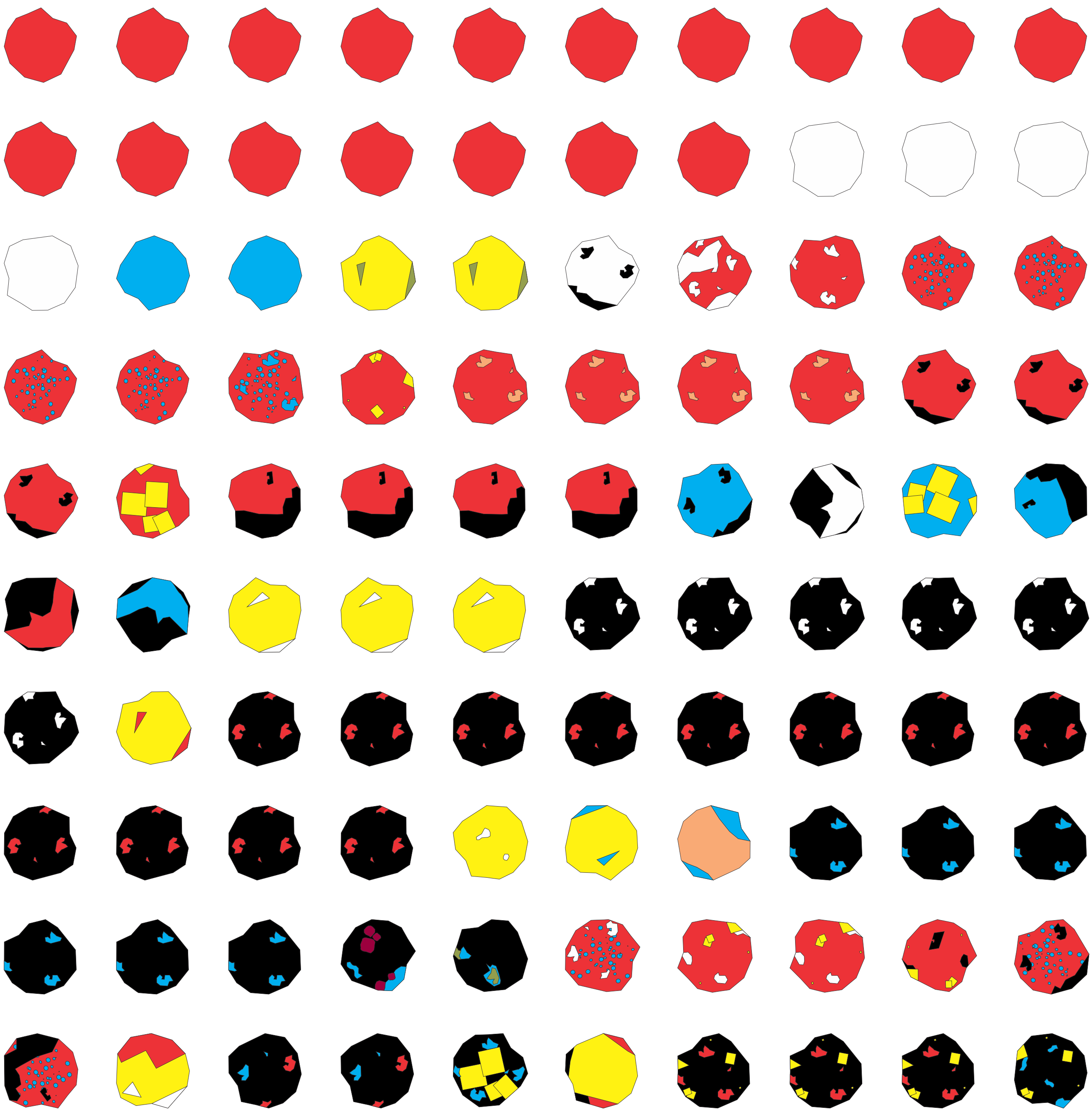
Severn Bulk Comp Non-PyPoAs Sulphide SCAN **D +75µm** **June** **2014**

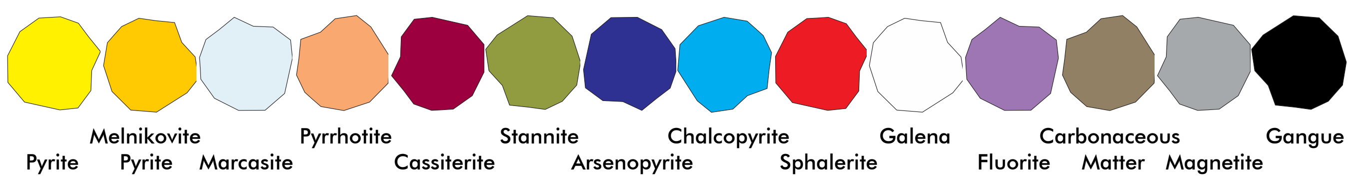




ALS Metallurgy - Heemskirk Sn Project Testwork

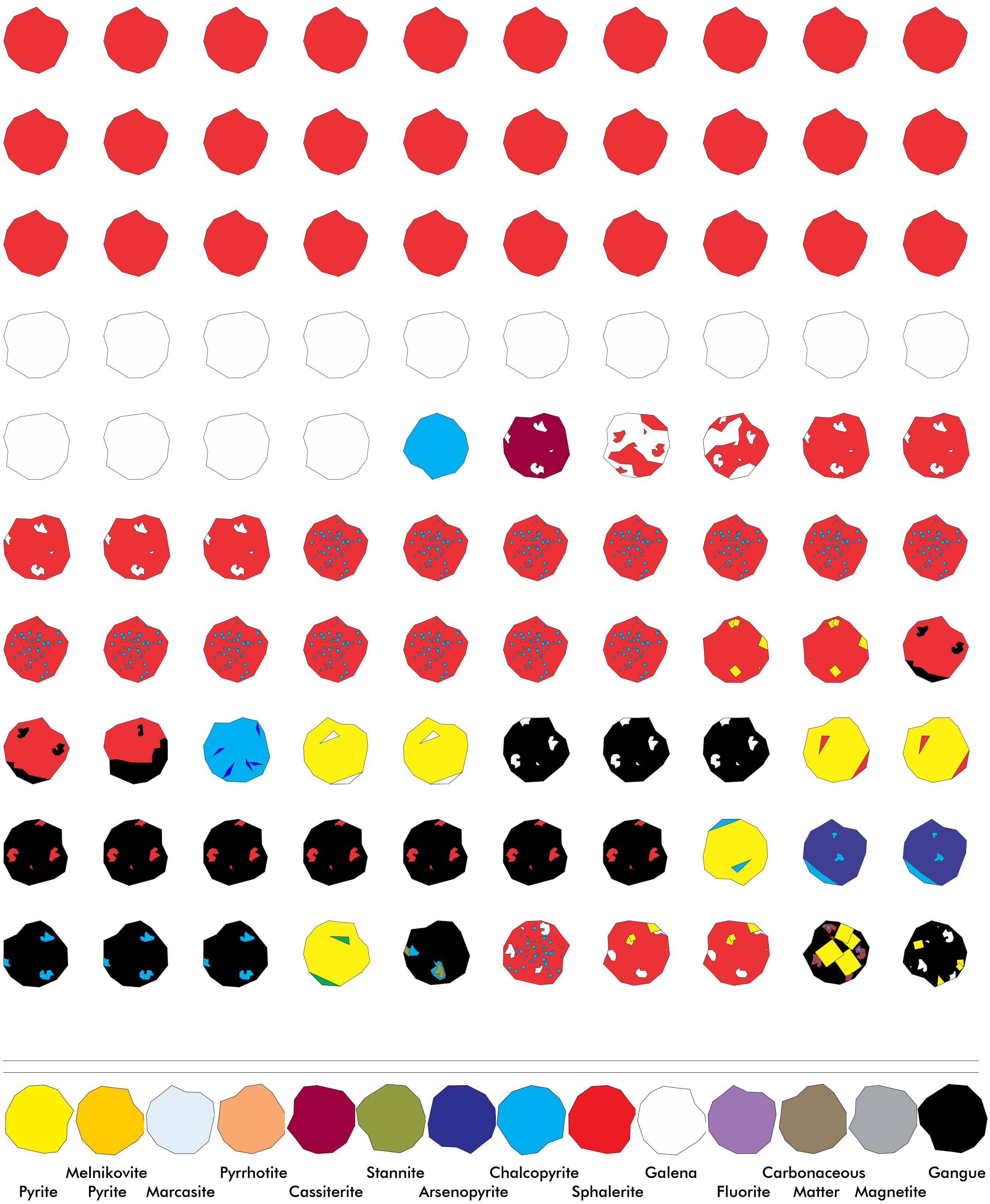
Severn Bulk Comp Non-PyPoAs Sulphide SCAN | **E +53μm** | **June** | **2014**





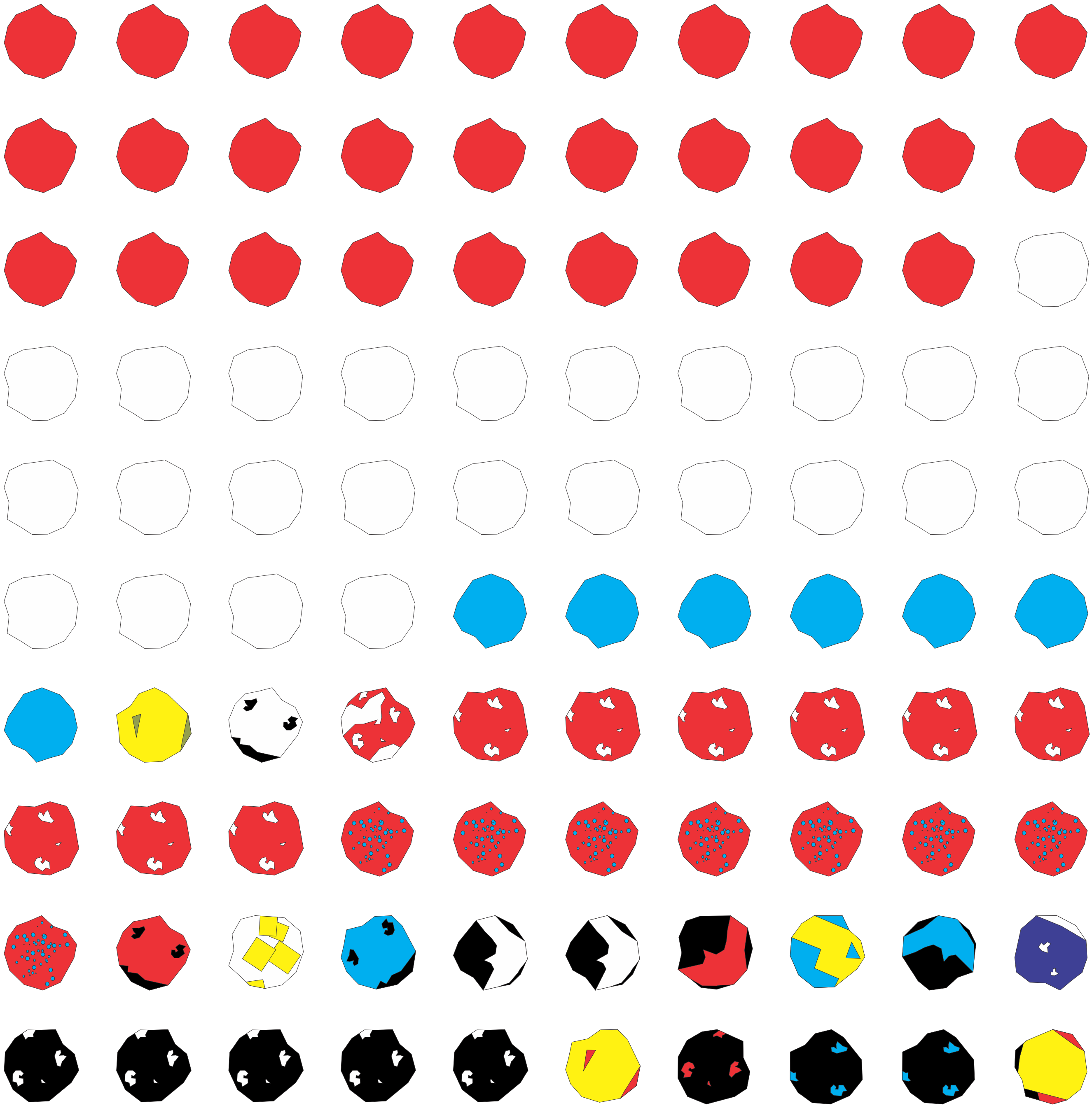
ALS Metallurgy - Heemskirk Sn Project Testwork

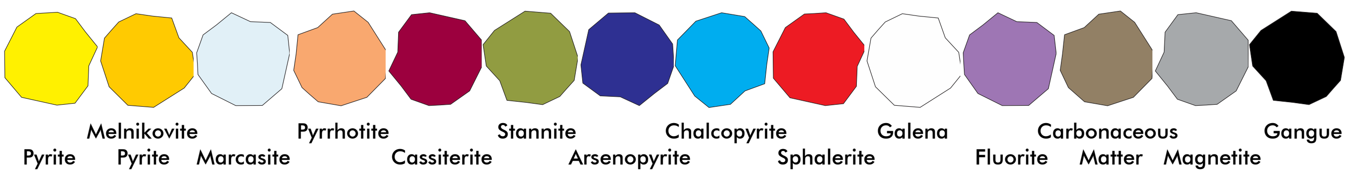
Severn Bulk Comp Non-PyPoAs Sulphide SCAN **F +38µm** **June** **2014**



ALS Metallurgy - Heemskirk Sn Project Testwork

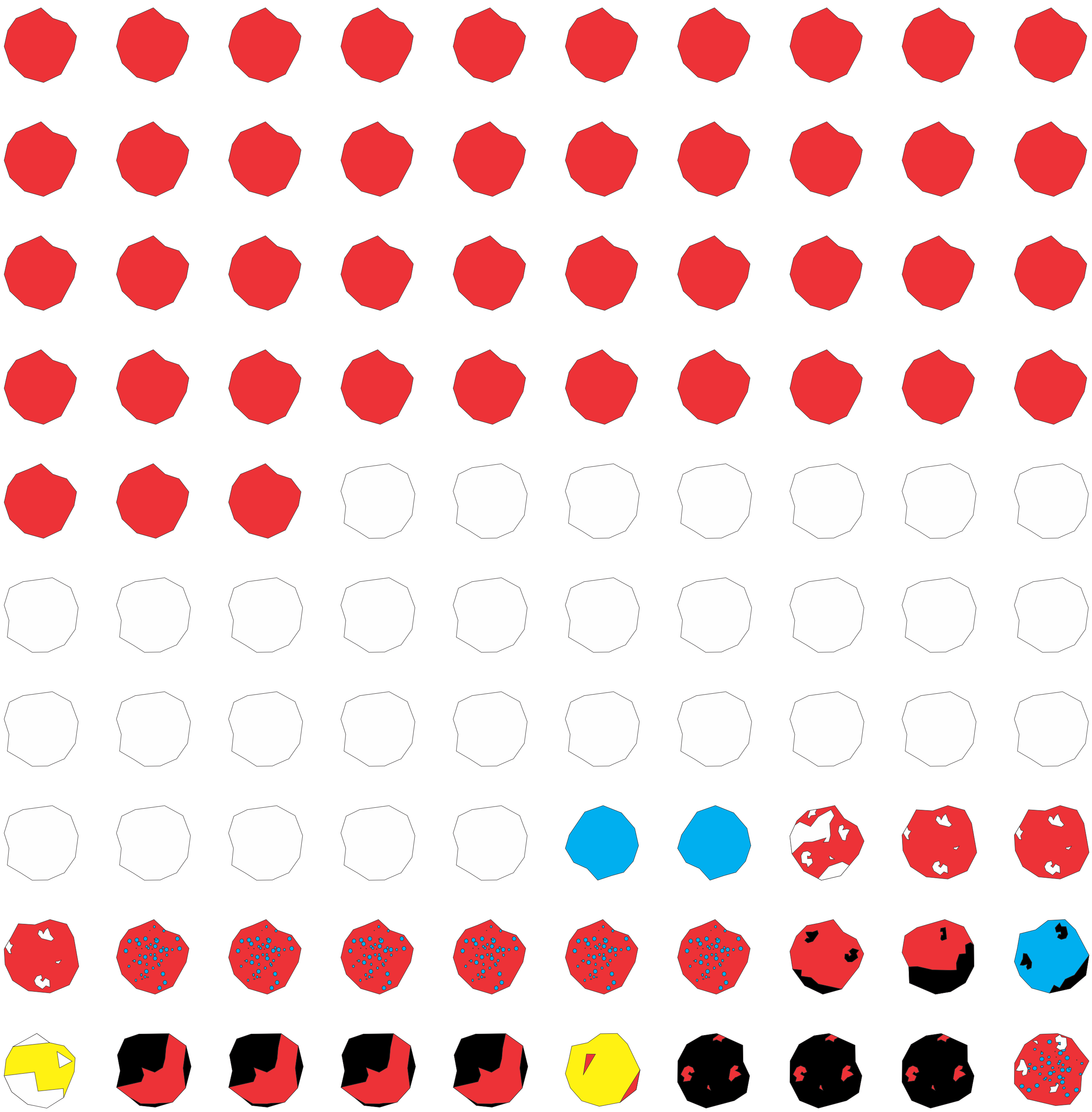
Severn Bulk Comp Non-PyPoAs Sulphide SCAN **G +20µm** **June** **2014**

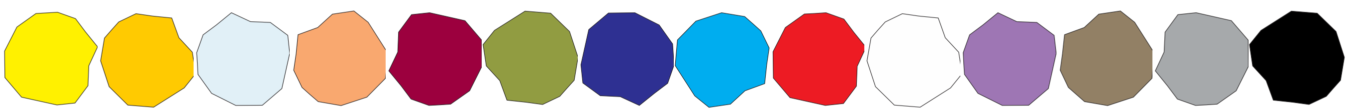




ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp Non-PyPoAs Sulphide SCAN | **H +8μm** | **June** | **2014**





ALS Metallurgy

STELLAR RESOURCES LTD
Heemskirk Tin Project

Severn Bulk Composite
Sulphide Tail Mineralogy

JULY 2014

MODA microscopy

McArthur Ore Deposit Assessments Pty Ltd

Gary J McArthur PhD FAusIMM MMICA MSEG

Suite 6, 1st Floor, Brownell Place, 11 Wilson St (P.O. Box 1303) Burnie TAS 7320 AUSTRALIA
Tel (03) 6431 1701 Fax (03) 6431 1278 Mobile 0419 367240 email gary@modapl.com.au

ALS METALLURGY

Stellar Resources – Severn
Bulk Composite Sulphide Tail Mineralogy
July 2014

Method

A sulphide tail produced from a Bulk Composite sample from Stellar Resources' Severn Prospect was submitted for mineralogical assessment. The sample was sized into 5 fractions: +212µm, +106µm, +53µm, +20µm and +8µm and these were mounted on two polished mounts by Australian Petrographics (Queanbeyan, NSW).

The standard MODA technique was adopted to quantify the mineralogy, using two scans.

In a first scan, for each fraction, 100 grains were selected at random and the area % of each mineral present was visually estimated. The minerals logged were: *pyrite+marcasite* (Py), *pyrrhotite* (Po), *cassiterite* (Cs), *stannite* (St), *arsenopyrite* (As), *chalcopyrite* (Cp), *sphalerite+galena* (SpGn) and *gangue* (*quartz, silicates, carbonates, etc,* Ga). This allowed calculation of an overall mineralogical composition.

In a second scan, for each fraction, 100 grains containing *cassiterite* or *stannite* were selected at random and logged as per the first scan. This improved the count statistics for the Sn mineralisation.

The normal liberation and association parameters were calculated. Cumulative yield curves for *cassiterite* were calculated for each fraction.

Results

Composition

The following minerals were identified, in approximate descending order:

- Gangue (*quartz*, silicates, carbonate, *rutile*, *carbonaceous matter*, *fluorite*, *talc* etc.)
- *Magnetite* (preferentially represented in the +106µm fraction)
- *Pyrite* (78% crystalline and 22% *melnikovite*)
- *Cassiterite*
- *Pyrrhotite*
- *Sphalerite*
- *Marcasite*
- *Galena*
- *Arsenopyrite*
- *Chalcopyrite*
- *Goethite*
- *Hematite*
- *Stannite* (rare)
- *Native bismuth* (very rare)

The overall composition of the Sulphide Tail is summarised below:

Severn Bulk Comp Sulphide Tail Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	Cs#	St#	As#	Cp#	SpGn#	Ga
+212µm	26.1	2.3	0.5	0.3	Tr	0	Tr	0.5	96.5
+106µm	17.4	5.1	0.4	1.9	Tr	0	0	0.1	92.5
+53µm	12.8	2.5	1.1	2.0	Tr	1.0	0	0	93.4
+20µm	12.7	2.8	1.0	0.1	Tr	0	0	0	96.2
+8µm	10.0	4.4	0	2.3	0	0	0	1.0	92.3
TOTAL	**79.0**	**3.3**	**0.6**	**1.1**	**Tr**	**0.2**	**Tr**	**0.3**	**94.5**

Py=pyrite, Po=pyrrhotite, Cs=cassiterite, St=stannite, As=arsenopyrite, Cp=chalcopyrite, SpGn=sphalerite+galena, Ga=gangue
 # count statistics are very poor for the scarce minerals

The composition of the grains containing *cassiterite* and *stannite* is summarised below. Note the residence of Sn sums to >99.9% in *cassiterite* and <0.1% in *stannite*.

Severn Bulk Comp Sulphide Tail Composition Vol% (from Sn scan)

Fraction	Sn Wt%	Py	Po	Cs	St	As	Cp	SpGn	Ga
+212µm	13.3	6.1	1.8	11.3	0.1	0	Tr	0.1	80.6
+106µm	17.8	4.8	0.5	29.5	0.3	Tr	0.2	Tr	64.7
+53µm	16.7	0.2	1.0	48.0	0.1	Tr	0.3	Tr	50.4
+20µm	21.2	Tr	0.3	74.6	Tr	0	0.1	0	25.0
+8µm	17.9	0.9	1.0	86.9	0	0	0	0	11.2
TOTAL	**86.9**	**2.1**	**0.8**	**53.1**	**0.1**	**Tr**	**0.1**	**Tr**	**43.7**

Liberation and Association

Essential summaries of the liberation parameters *cassiterite* are:

Severn Bulk Comp Sulphide Tail Cassiterite liberation distribution%

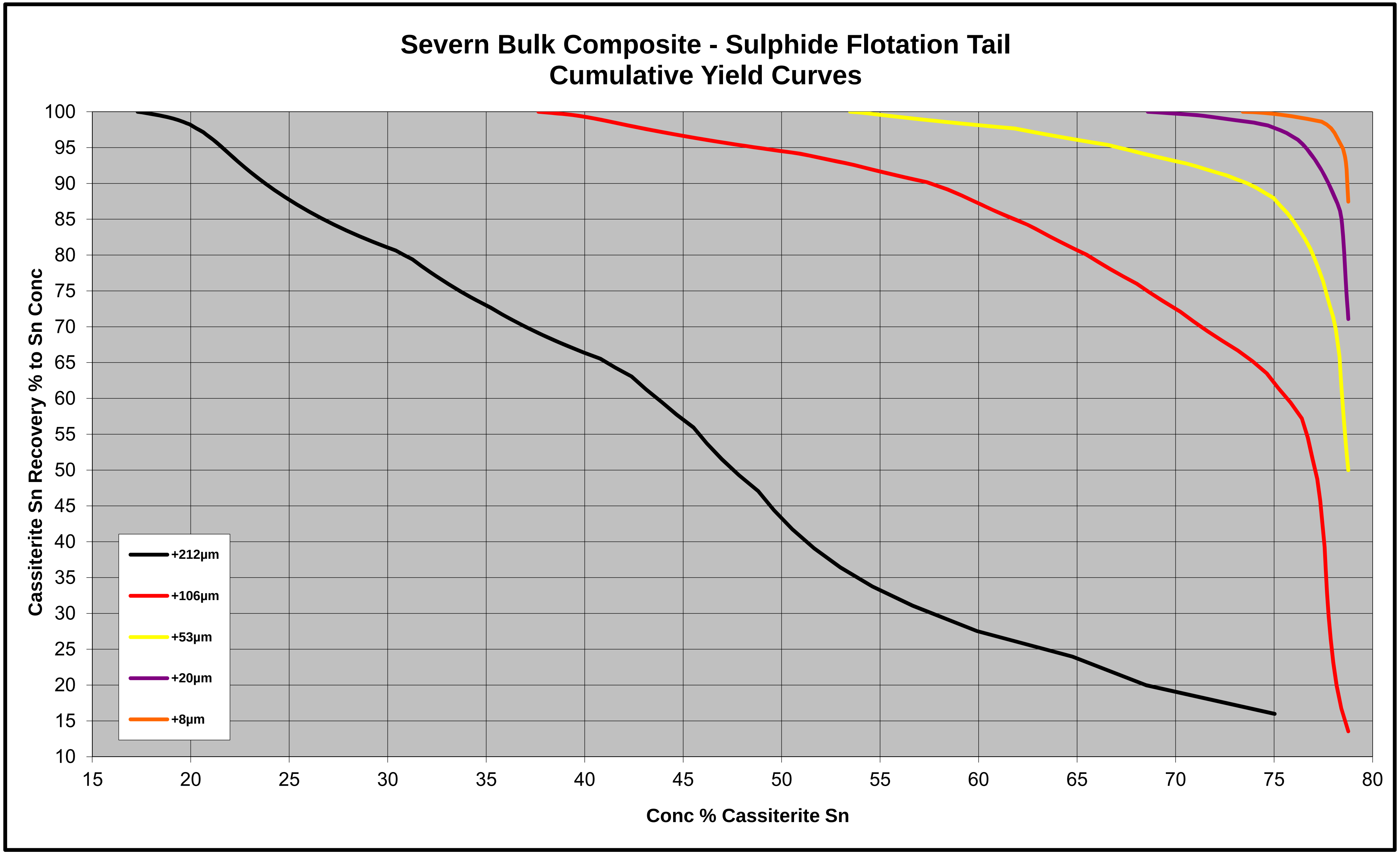
Fraction	Sn Wt%	Free	Binary with						Ternary+
			Py	Po	St	Cp	As	Ga	
+212µm	13.3	0	0	0	0	0	0	73	27
+106µm	17.8	14	3	3	0	0	0	70	10
+53µm	16.7	50	0	0	0	0	0	47	2
+20µm	21.2	71	0	0	0	1	0	27	1
+8µm	17.9	87	0	1	0	0	0	10	1
TOTAL	**86.9**	**48**	**1**	**1**	**0**	**0**	**0**	**43**	**7**

Severn Bulk Comp Sulphide Tail Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	St	Cp	As	Ga
+212µm	13.3	18	16	0	1	0	100
+106µm	17.8	12	5	0	1	0	80
+53µm	16.7	0	1	0	2	2	50
+20µm	21.2	0	0	0	1	0	28
+8µm	17.9	0	2	0	0	0	11
TOTAL	**86.9**	**5**	**4**	**0**	**1**	**0**	**50**

Stannite is a rare fine-grained component, mainly hosted by *chalcopyrite*, but also *sphalerite*, *pyrite, cassiterite* and gangue.

G.J.McArthur PhD FAusIMM MMICA MSEG Principal Mineralogist 24.7.14

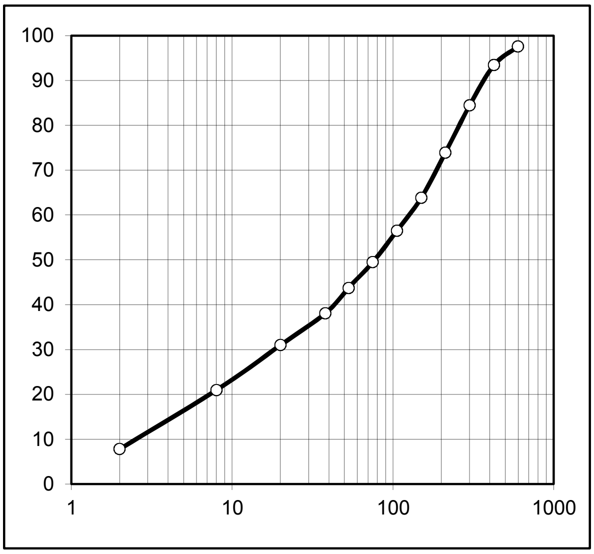


Severn Bulk Composite - Sulphide Flotation Tail
Cumulative Yield Curves
Cassiterite Sn Recovery % to Sn Conc
Conc % Cassiterite Sn
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
+212µm
+106µm
+53µm
+20µm
+8µm

BURNIE LABORATORY
SIZE ANALYSIS REPORT SHEET WITH CS6

PROJECT	T0879
SAMPLE	SBC Sulphide Tails
DATE	70614
TECHNICIAN	MS

SBC Sulphide Tails		SIZE	WEIGHTS		
		um	gm	(%)	%PASS
	P80	600	4.32	2.44	97.6
		425	7.34	4.15	93.4
		300	15.89	8.99	84.4
	263	212	18.62	10.54	73.9
		150	17.83	10.09	63.8
		106	12.92	7.31	56.5
		75	12.33	6.98	49.5
		53	10.21	5.78	43.7
		38	10.02	5.67	38.1
		20	12.48	7.06	31.0
MINS 20	CS5	8	17.75	10.04	21.0
CENTRIFUGE	CS6	2	23.24	13.15	7.8
		SUB	13.79	7.80	0.0
		TOTAL	176.7	100.0	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mount
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	Number
212	26.12	0.68	13.3	16.85	22.5	0.09	13.8	3.05	25.9	48.70	31.1	879194
106	17.40	1.37	17.8	18.40	16.4	0.08	8.2	2.45	13.8	45.60	19.4	879195
53	12.75	1.75	16.7	18.00	11.7	0.05	3.8	2.75	11.4	39.50	12.3	879196
20	12.73	2.23	21.2	21.20	13.8	0.16	12.0	2.71	11.2	39.90	12.4	879197
8	10.04	2.39	17.9	24.60	12.6	0.38	22.4	3.00	9.8	31.60	7.8	897198
2	13.15	0.51	5.0	21.70	14.6	0.25	19.3	4.16	17.8	34.70	11.2	
CAL <2	7.80	1.41	8.2	20.87	8.3	0.45	20.5	4.01	10.2	30.64	5.8	
ASSAY	100.0	1.34	100.0	19.55	100.0	0.17	100.0	3.08	100.0	40.90	100.0	

SIZE	WT	MnO		CaO		MgO		Al203	
um	%	%	dist	%	dist	%	dist	%	dist
212	26.12	0.44	20.2	0.84	23.1	3.76	26.5	9.05	27.7
106	17.40	0.63	19.2	1.00	18.3	3.62	17.0	7.87	16.0
53	12.75	0.61	13.6	1.01	13.6	3.01	10.4	6.34	9.5
20	12.73	0.71	15.9	1.29	17.3	3.28	11.3	6.64	9.9
8	10.04	0.78	13.7	1.20	12.7	3.27	8.9	6.28	7.4
2	13.15	0.44	10.2	0.85	11.8	4.13	14.7	10.65	16.4
CAL <2	7.80	0.53	7.2	0.40	3.3	5.32	11.2	14.50	13.2
ASSAY	100.0	0.57	100.0	0.95	100.0	3.70	100.0	8.55	100.0

PARTICLE MINERALOGY

Severn Report Format

Mineral species logged:
Py-pyrite Po-pyrrhotite Cs-cassiterite
St-stannite As-arsenopyrite
Cp-chalcopyrite SpGn-sphalerite/galena Ga-gangue

Sum of the weight fractions for the sizes examined

Total number of grains logged

All sizings combined 73% of sample

Average composition - all grains

Mineral content as area %

Average area % per grain when present

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
19.3	0.6	18.5	0.8	0.0	2.0	0.8	58.0	**300**
84	0	90	0	29	0	97	48	

ASSAYS

Assays calculated from mineral area % using theoretical compositions

Sizing assay if provided

	SG	Sn	S	As	Fe	Cu	
Calc'd	5.29	57.1	4.8	0.5	5.8	0.02	
Actual		**55.2**	**8.9**	**0.39**	**8.3**		

COMPOSITE PROPORTIONS

% of mineral fully liberated

% of mineral in grains with 2 minerals present

% of mineral in grains with 3 minerals present

% of mineral in grains with >3 minerals present

% of grains with this mineral

Average number of minerals per grain

	Py	Po	Cs	St	Cp	As	Ga	
Mono	49	0	63	0	0	42	72	
Binary	50	0	34	0	0	33	26	
Ternary	0	0	2	0	0	21	2	
Quat.y+	0	0	0	0	0	4	0	
% Grains	12	0	69	0	0	3	52	1.36

BINARY ASSOCIATION MATRIX

e.g. 95% of all binary Cs occurs with Ga

	Py	Po	Cs	St	Cp	As	Ga
Py		0	19	0	0	0	81
Po	0	0	0	0	0	0	0
Cs	0	0		0	0	4	95
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	4	0	7	0	0		89
Ga	13	0	86	0	0	0	

TOTAL ASSOCIATION MATRIX

These rows do not sum to 100% because of fully liberated and multi-mineral grains

e.g. 2% of all Cs occurs with As but 15% of all As occurs with Cs

of all

	Py	Po	Cs	St	Cp	As	Ga
Py		0	10	0	0	0	41
Po	0		0	0	0	0	0
Cs	2	0		0	0	2	35
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	12	0	15	8	6		50
Ga	3	0	25	0	0	2	

DISTRIBUTION MATRIX

e.g. while 63% of Cs is fully liberated, 2% occurs as binaries with As and 33% with Ga. 2% occurs with 2 other minerals

These rows will sum to 100% (unless binary SpGn occurs or unless minor rounding errors occur)

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	49		0	9	0	0	0	41	0	0
Po	0	0		0	0	0	0	0	0	0
Cs	63	0	0		0	0	2	33	2	0
St	0	0	0	0		0	0	0	0	0
Cp	0	0	0	0	0		0	0	0	0
As	42	1	0	2	0	0		30	21	4
Ga	72	3	0	23	0	0	0		2	0

MODA microscopy

PARTICLE MINERALOGY REPORT

GJMcA 23.7.14

Severn Bulk Comp Sulphide Tail

July 2014

A +212µm — 26 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
2.3	0.5	0.3	0.0	0.0	0.0	0.5	96.5	100
11	6	12	3	0	1	7	96	

ASSAYS

	SG	Sn	S	As	Fe	Cu
Calc'd	3.17	0.45	2.4	0.00	18.0	0.00
Actual		0.68	3.1		16.9	

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	0	0	0	0	0	0	68	
Binary	75	33	73	0	0	0	27	
Ternary	21	67	19	100	0	0	4	
Quat.y+	3	0	8	0	100	0	1	
#Grains	21	7	5	0	1	0	100	1.34

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	100
Cs	0	0		0	0	0	100
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	59	11	15	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		2	0	0	3	0	100
	Po	11		53	0	0	0	100
of	Cs	18	16		0	1	0	100
all	St	83	0	0		0	0	100
	Cp	100	0	0	0		0	100
	As	0	0	0	0	0		0
	Ga	19	7	5	0	1	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	0		0	0	0	0	0	75	21	3
Po	0	0		0	0	0	0	33	67	0
Cs	0	0	0		0	0	0	73	19	8
St	0	0	0	0		0	0	0	100	0
Cp	0	0	0	0	0		0	0	0	100
As	0	0	0	0	0	0		0	0	0
Ga	68	16	3	4	0	0	0		4	1

B +106µm — 17 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
5.1	0.4	1.9	0.0	0.0	0.0	0.1	92.5	100
39	21	30	6	0	0	5	96	

ASSAYS

	SG	Sn	S	As	Fe	Cu
Calc'd	3.28	3.15	4.4	0.00	18.7	0.00
Actual		1.37	2.5		18.4	

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	78	0	14	0	0	0	88	
Binary	11	93	77	0	0	0	11	
Ternary	11	7	8	19	0	0	1	
Quat.y+	0	0	2	81	0	0	0	
#Grains	13	2	5	0	0	0	96	1.16

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	100
Cs	4	4		0	0	0	92
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	63	6	22	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		3	8	0	0	0	22
	Po	7		0	0	0	0	100
of	Cs	12	5		0	1	0	80
all	St	73	8	81		92	0	100
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		0
	Ga	8	2	3	0	0	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	78		0	0	0	0	0	11	11	0
Po	0	0		0	0	0	0	93	7	0
Cs	14	3	3		0	0	0	70	8	2
St	0	0	0	0		0	0	0	19	81
Cp	0	0	0	0	0		0	0	0	0
As	0	0	0	0	0	0		0	0	0
Ga	88	7	1	2	0	0	0		1	0

C +53µm — 13 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
2.5	1.1	2.0	0.0	1.0	0.0	0.0	93.4	100
50	37	49	2	100	0	0	96	

ASSAYS

	SG	Sn	S	As	Fe	Cu
Calc'd	3.27	3.32	3.0	0.87	18.2	0.00
Actual		1.75	2.8		18.0	

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	40	91	50	0	0	100	93	
Binary	60	9	48	0	0	0	7	
Ternary	0	0	0	0	0	0	0	
Quat.y+	0	0	2	100	0	0	0	
#Grains	5	3	4	0	0	1	97	1.10

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	100
Cs	0	1		0	0	0	99
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	39	30	31	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		0	0	0	0	0	60
	Po	0		0	0	0	0	9
of	Cs	0	1		0	2	2	50
all	St	80	20	0		20	0	100
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		0
	Ga	3	2	2	0	0	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	40		0	0	0	0	0	60	0	0
Po	91	0		0	0	0	0	9	0	0
Cs	50	0	0		0	0	0	47	0	2
St	0	0	0	0		0	0	0	0	100
Cp	0	0	0	0	0		0	0	0	0
As	100	0	0	0	0	0		0	0	0
Ga	93	3	2	2	0	0	0		0	0

D +20µm — 13 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
2.8	1.0	0.1	0.0	0.0	0.0	0.0	96.2	100
55	100	75	1	0	0	0	99	

ASSAYS

	SG	Sn	S	As	Fe	Cu
Calc'd	3.17	0.17	2.9	0.00	18.7	0.00
Actual		2.23	3.0		21.2	

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	73	100	71	0	0	0	97	
Binary	27	0	28	0	0	0	3	
Ternary	0	0	1	100	0	0	0	
Quat.y+	0	0	0	0	0	0	0	
#Grains	5	1	1	0	0	0	97	1.04

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	0	0	0	0	100
Po	0		0	0	0	0	0
Cs	0	0		0	4	0	96
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	71	0	29	0	0	0	

TOTAL ASSOCIATION MATRIX

		Py	Po	Cs	St	Cp	As	Ga
	Py		0	0	0	0	0	27
	Po	0		0	0	0	0	0
of	Cs	0	0		0	1	0	28
all	St	0	0	0		100	0	100
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		0
	Ga	2	0	1	0	0	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	73		0	0	0	0	0	27	0	0
Po	100	0		0	0	0	0	0	0	0
Cs	71	0	0		0	1	0	27	1	0
St	0	0	0	0		0	0	0	100	0
Cp	0	0	0	0	0		0	0	0	0
As	0	0	0	0	0	0		0	0	0
Ga	97	2	0	1	0	0	0		0	0

E +8µm — 10 % by weight

Average composition - all grains

Py	Po	Cs	St	As	Cp	SpGn	Ga	n
4.4	0.0	2.3	0.0	0.0	0.0	1.0	92.3	100
63	0	87	0	0	0	100	99	

ASSAYS

	SG	Sn	S	As	Fe	Cu
Calc'd	3.29	3.80	4.0	0.00	17.8	0.00
Actual		2.39	3.0		24.6	

COMPOSITE PROPORTIONS

	Py	Po	Cs	St	Cp	As	Ga	
Mono	68	0	87	0	0	0	96	
Binary	32	0	12	0	0	0	4	
Ternary	0	0	1	0	0	0	0	
Quat.y+	0	0	0	0	0	0	0	
#Grains	7	0	4	0	0	0	93	1.04

BINARY ASSOCIATION MATRIX

	Py	Po	Cs	St	Cp	As	Ga
Py		0	61	0	0	0	39
Po	0		0	0	0	0	0
Cs	1	10		0	0	0	89
St	0	0	0		0	0	0
Cp	0	0	0	0		0	0
As	0	0	0	0	0		0
Ga	74	0	26	0	0	0	

TOTAL ASSOCIATION MATRIX

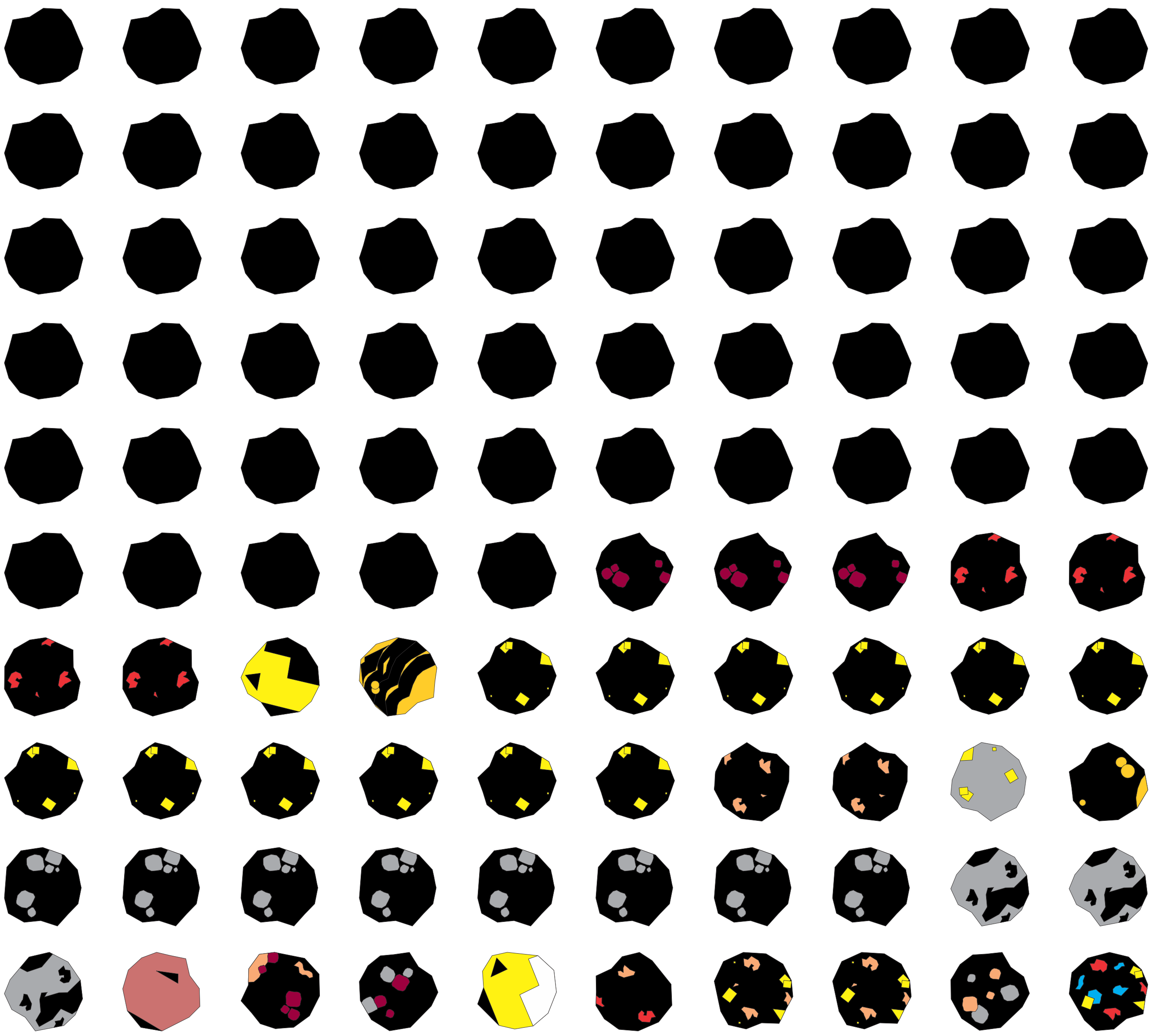
		Py	Po	Cs	St	Cp	As	Ga
	Py		0	19	0	0	0	12
	Po	0		0	0	0	0	0
of	Cs	0	2		0	0	0	11
all	St	0	0	0		0	0	0
	Cp	0	0	0	0		0	0
	As	0	0	0	0	0		0
	Ga	3	0	1	0	0	0	

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Py	Po	Cs	St	Cp	As	Ga		
Py	68		0	19	0	0	0	12	0	0
Po	0	0		0	0	0	0	0	0	0
Cs	87	0	1		0	0	0	10	1	0
St	0	0	0	0		0	0	0	0	0
Cp	0	0	0	0	0		0	0	0	0
As	0	0	0	0	0	0		0	0	0
Ga	96	3	0	1	0	0	0		0	0

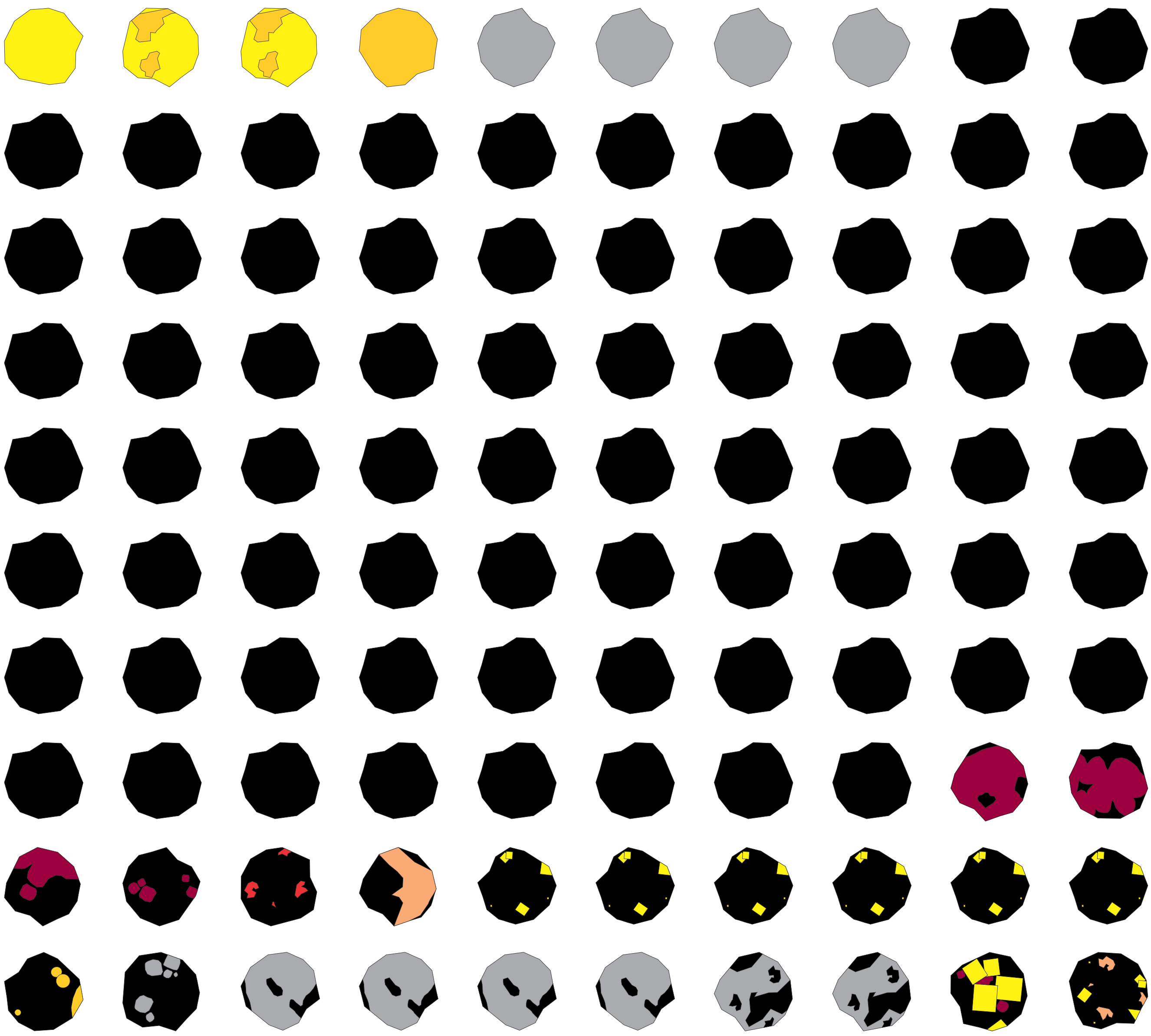
ALS Metallurgy - Heemskirk Sn Project Testwork

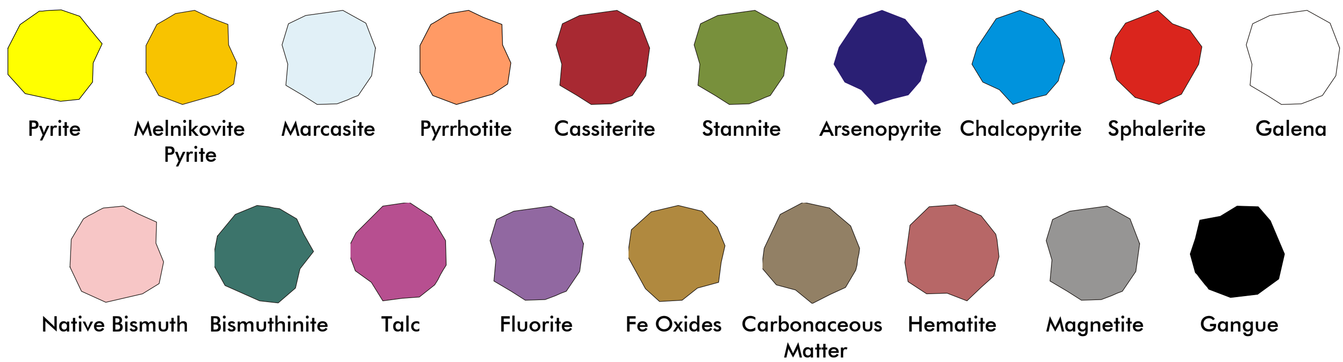
Severn Bulk Comp **A +212µm** **July** **2014**
Sulphide Tail



ALS Metallurgy - Heemskirk Sn Project Testwork

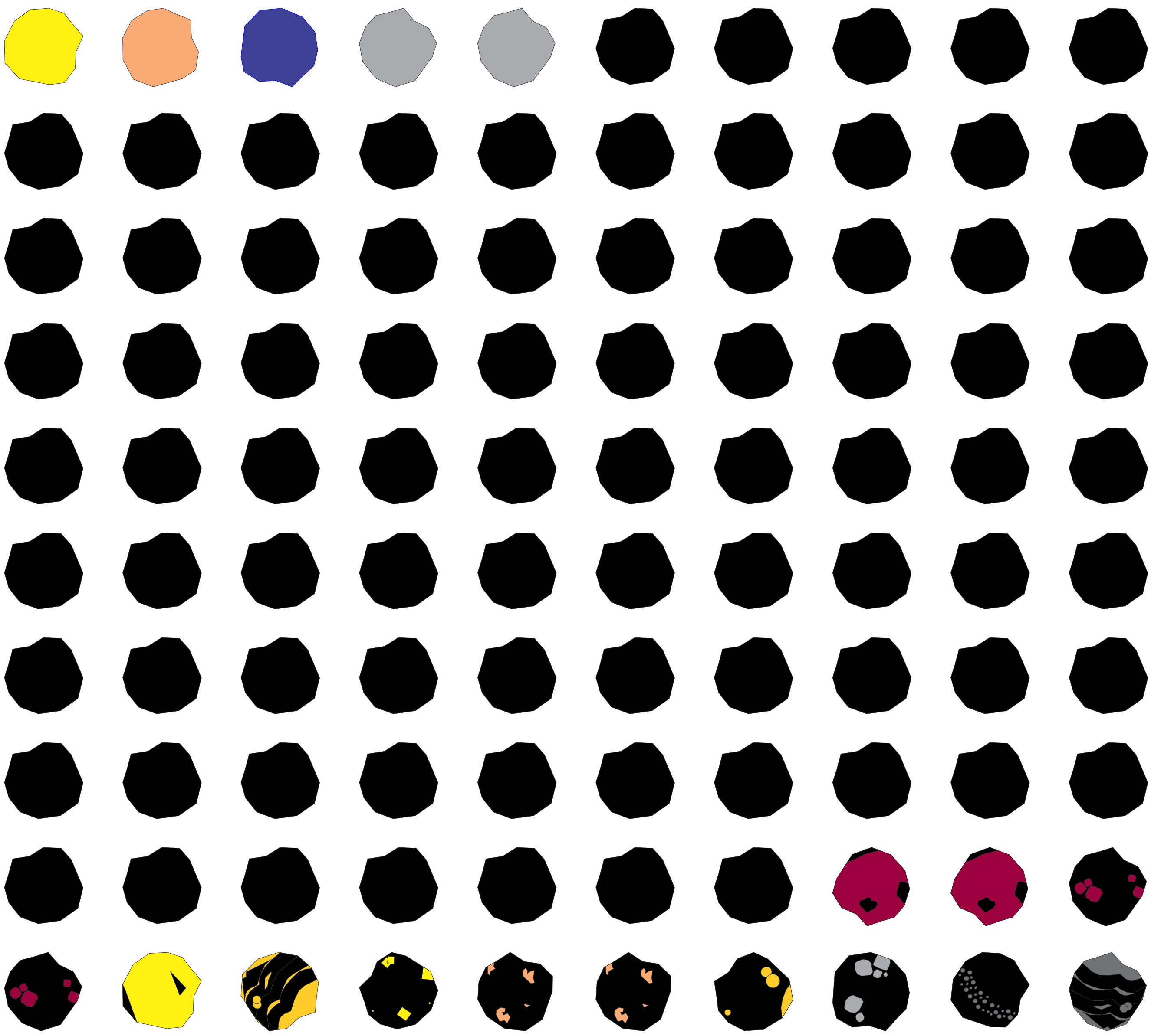
Severn Bulk Comp **B +106μm** **July** **2014**
Sulphide Tail

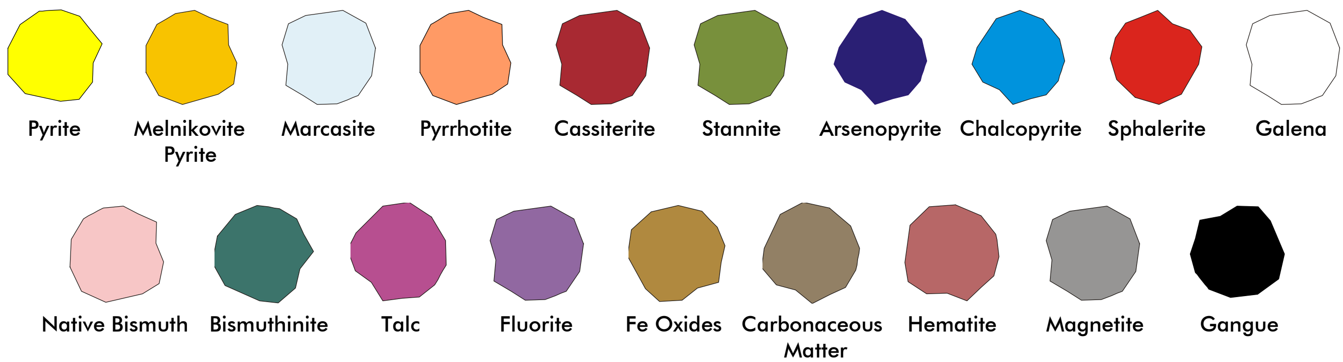




ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp Sulphide Tail | **C +53µm** | **July 2014**

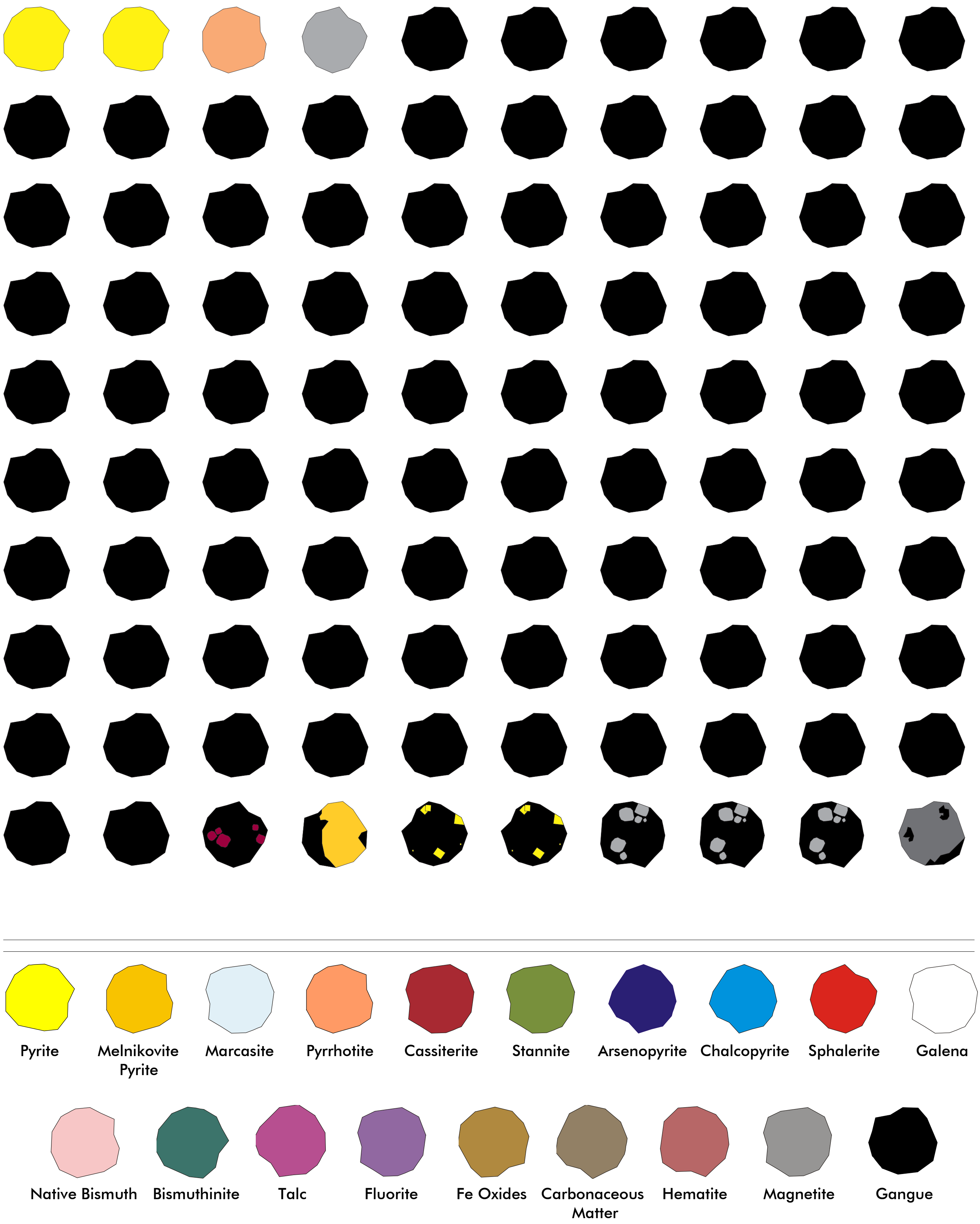




ALS Metallurgy - Heemskirk Sn Project Testwork

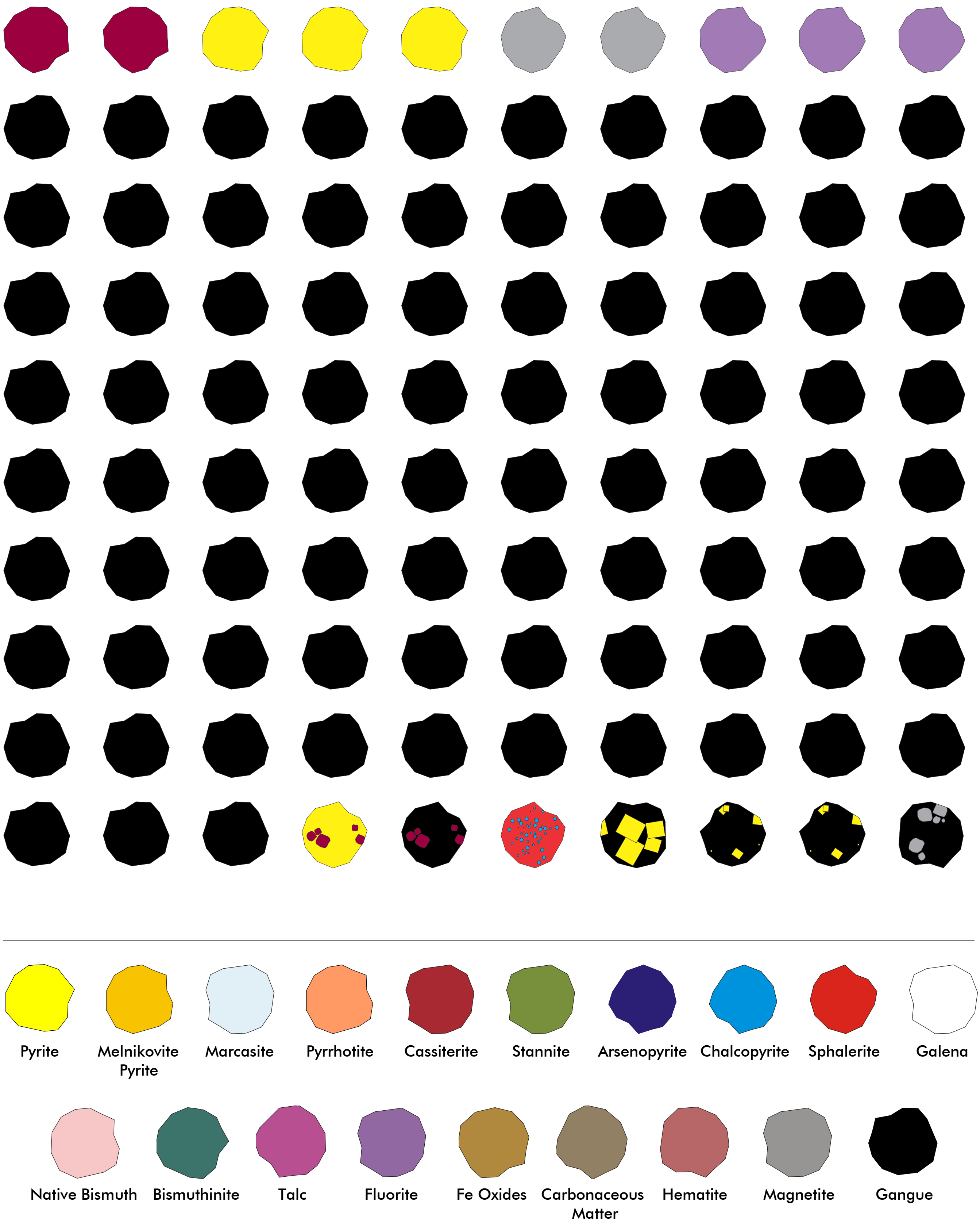
Severn Bulk Comp | **D +20µm** | **July 2014**

Sulphide Tail



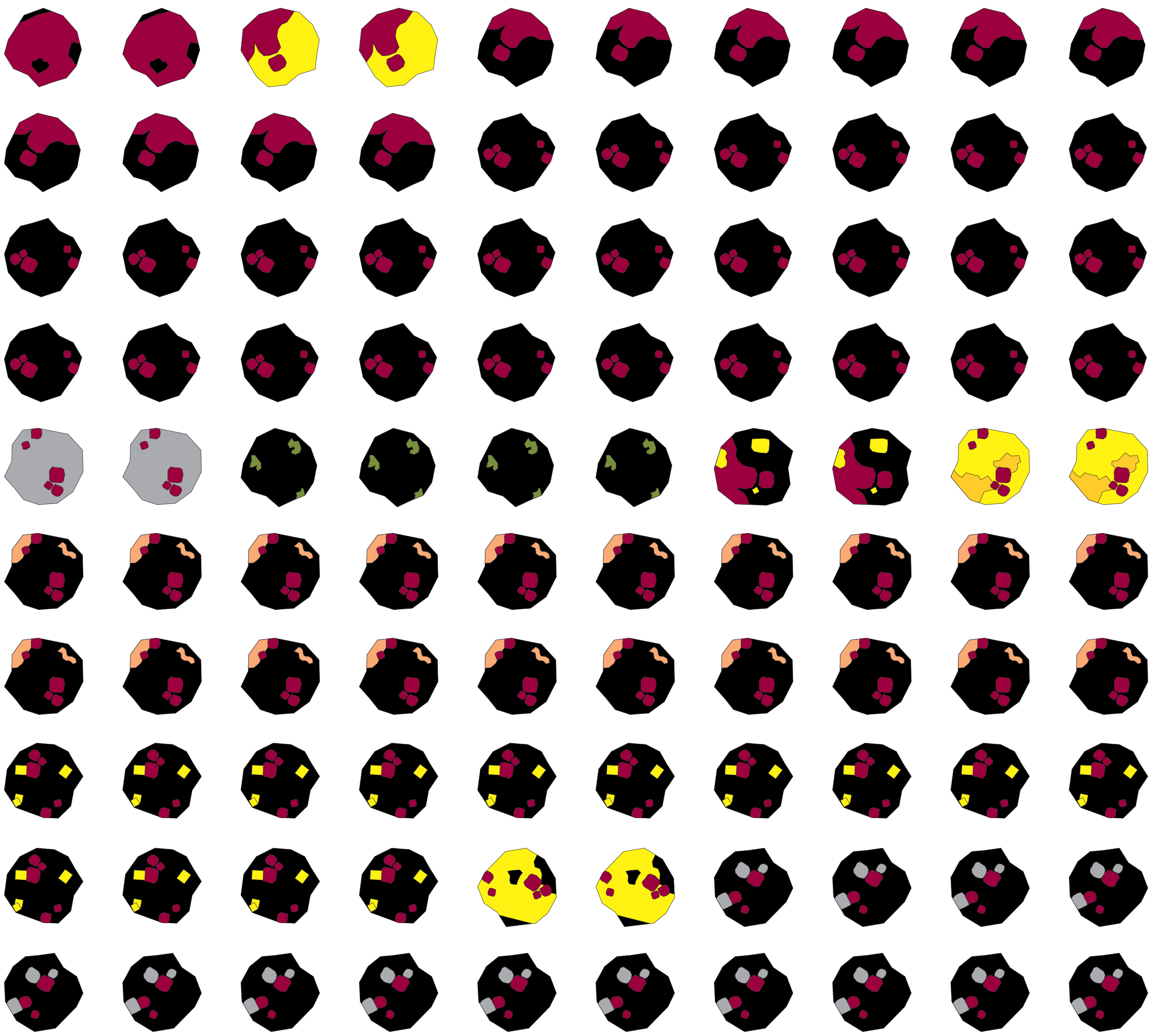
ALS Metallurgy - Heemskirk Sn Project Testwork

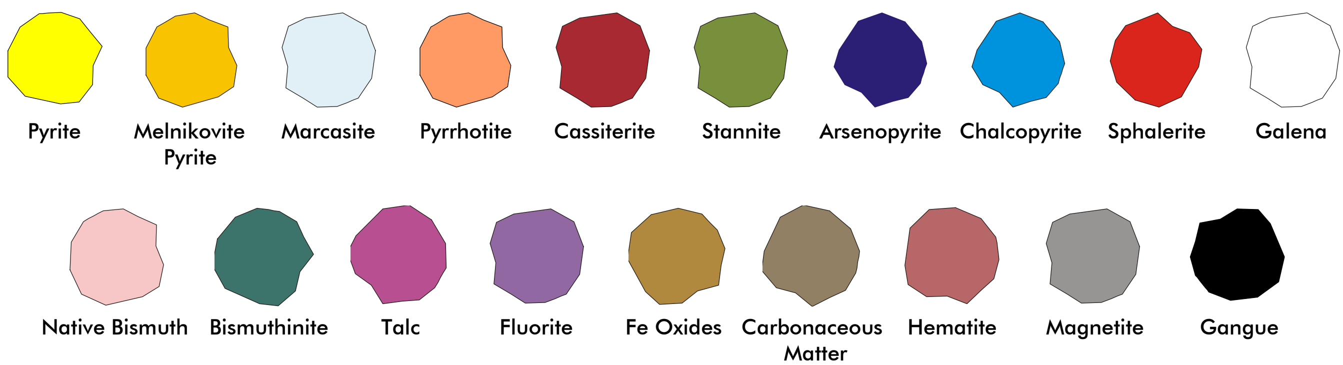
Severn Bulk Comp **E +8μm** **July 2014**
Sulphide Tail



ALS Metallurgy - Heemskirk Sn Project Testwork

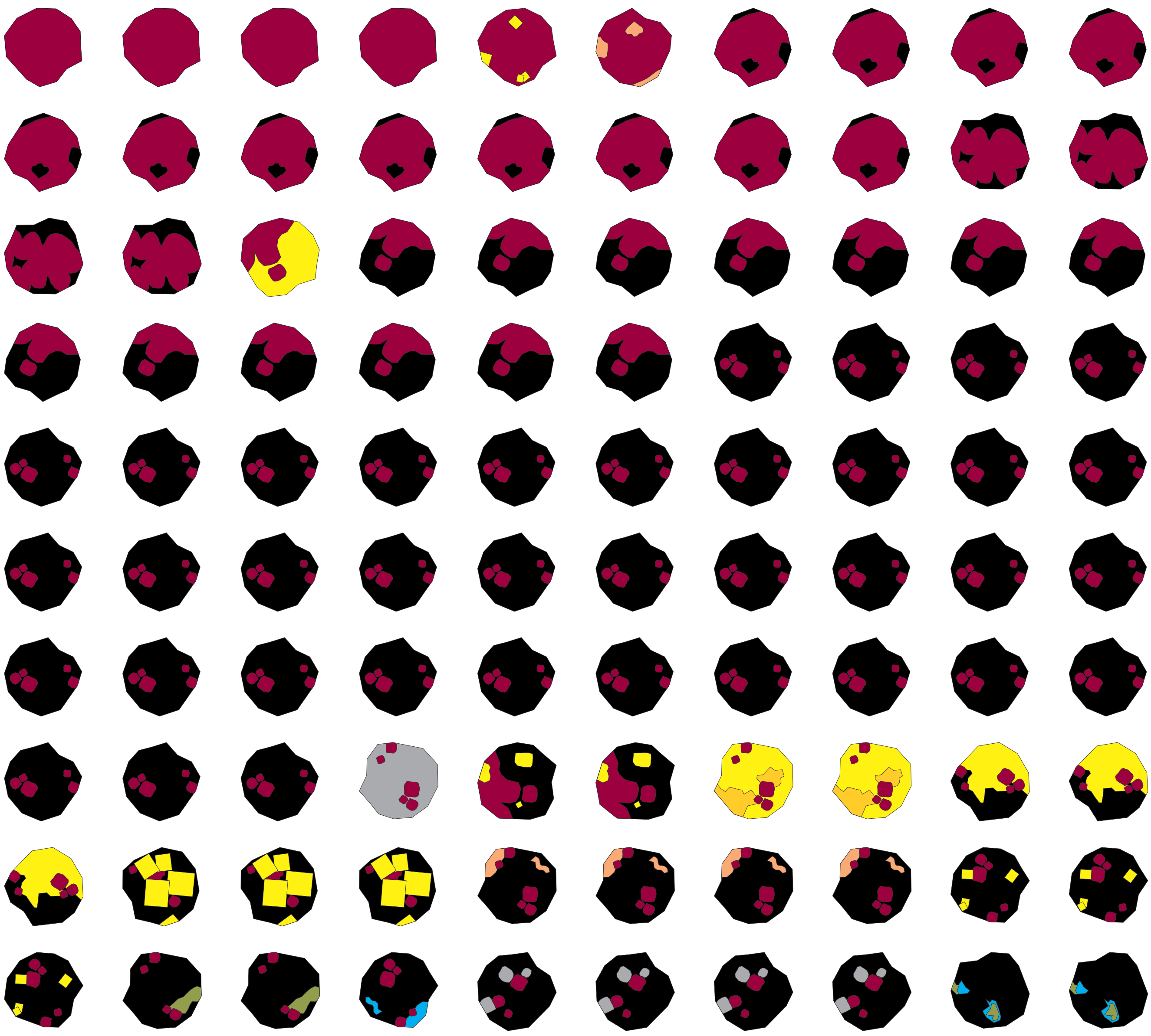
Severn Bulk Comp **A +212μm** **July** **2014**
Sulphide Tail Sn SCAN

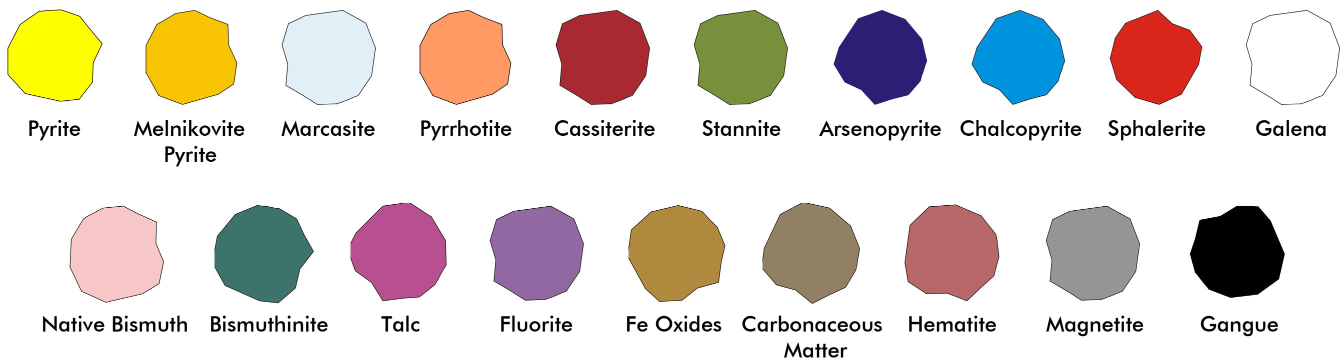




ALS Metallurgy - Heemskirk Sn Project Testwork

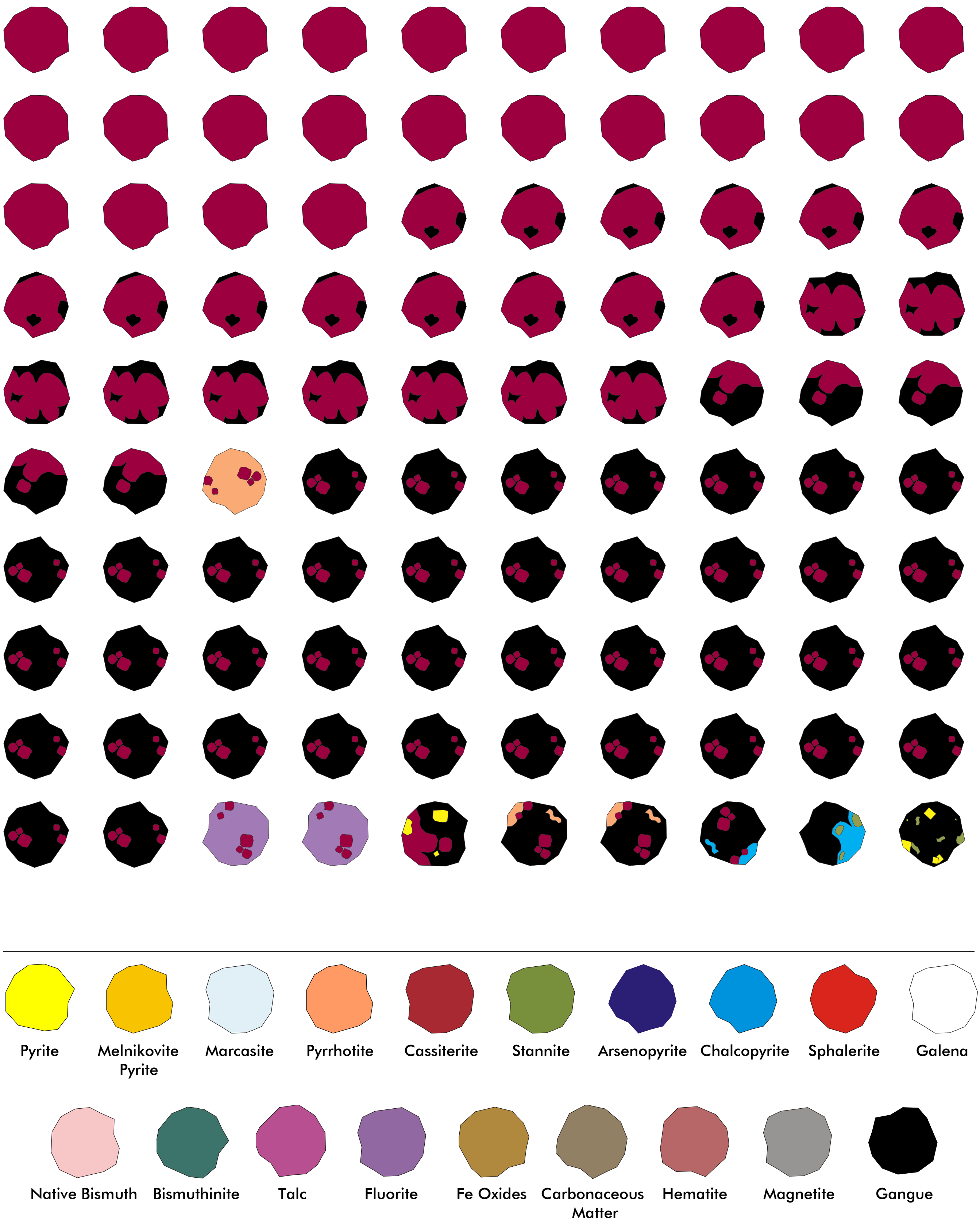
Severn Bulk Comp **B +106μm** **July** **2014**
Sulphide Tail Sn SCAN





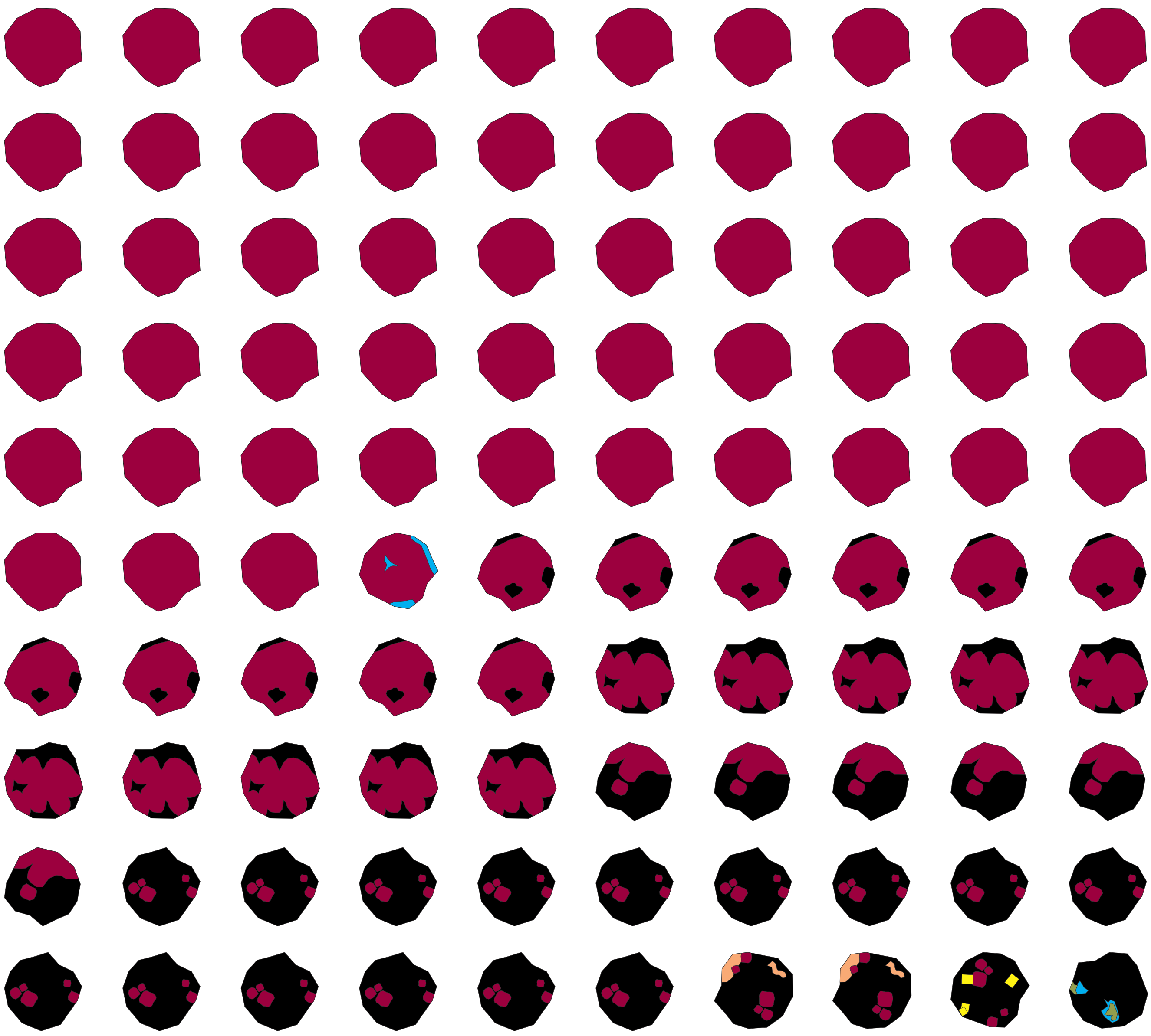
ALS Metallurgy - Heemskirk Sn Project Testwork

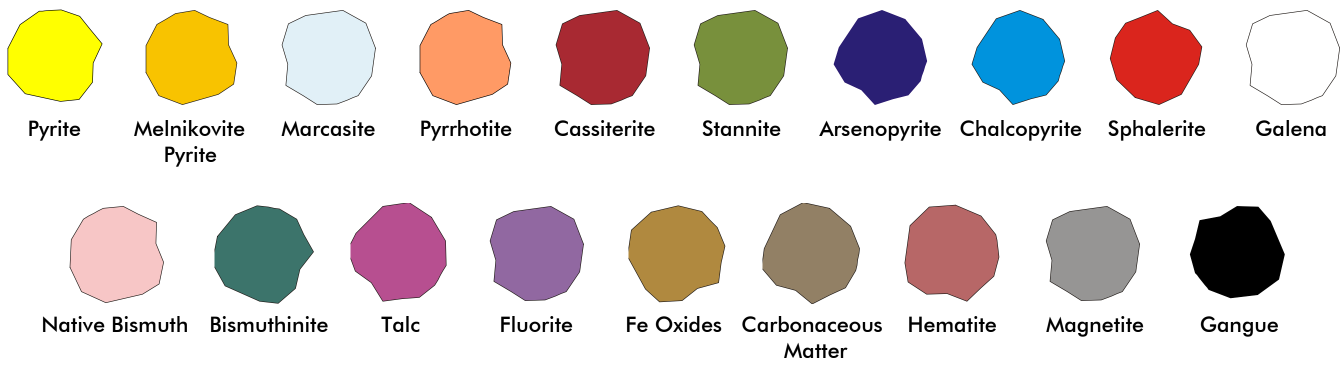
Severn Bulk Comp **C +53μm** **July 2014**
Sulphide Tail Sn SCAN



ALS Metallurgy - Heemskirk Sn Project Testwork

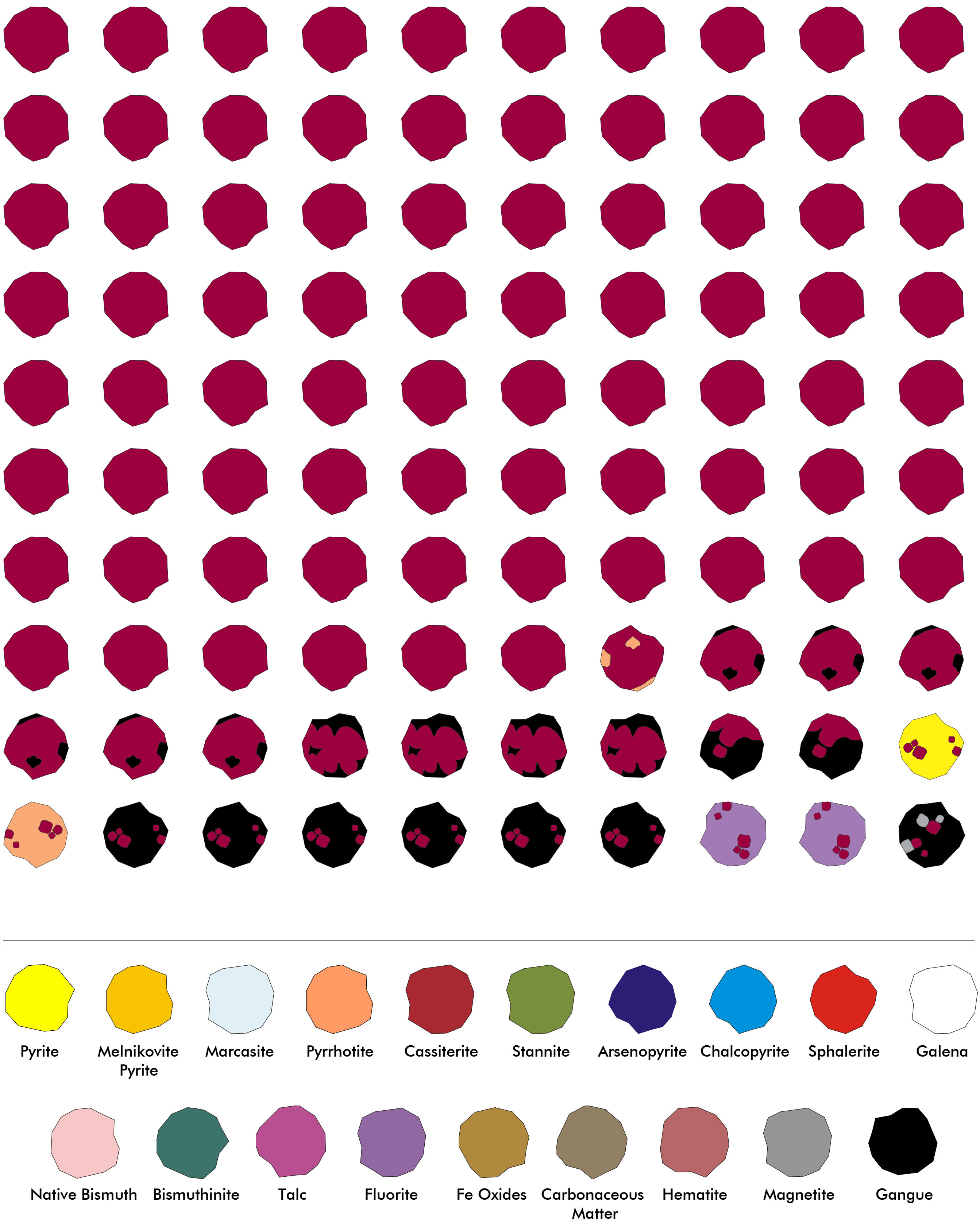
Severn Bulk Comp Sulphide Tail Sn SCAN | **D +20μm** | **July 2014**





ALS Metallurgy - Heemskirk Sn Project Testwork

Severn Bulk Comp **E +8µm** **July 2014**
Sulphide Tail Sn SCAN



ALS Metallurgy

STELLAR RESOURCES LTD
Heemskirk Tin Project

Severn Bulk Composite
Sulphide Tail Siderite Mineralogy

AUGUST 2014

MODA microscopy

McArthur Ore Deposit Assessments Pty Ltd

Gary J McArthur PhD FAusIMM MMICA MSEG

Suite 6, 1st Floor, Brownell Place, 11 Wilson St (P.O. Box 1303) Burnie TAS 7320 AUSTRALIA
Tel (03) 6431 1701 Fax (03) 6431 1278 Mobile 0419 367240 email gary@modapl.com.au

ALS METALLURGY

Stellar Resources – Severn
Bulk Composite Sulphide Tail Mineralogy
August 2014

Method

After a verbal request from Justin Resta (Worley Parsons metallurgical consultant for Stellar Resources), a sulphide tail produced from a Bulk Composite sample from Stellar Resources' Severn Prospect that was previously examined by MODA was re-assessed for siderite-cassiterite association. The sample was sized into 5 fractions: +212µm, +106µm, +53µm, +20µm and +8µm and these were mounted on two polished mounts by Australian Petrographics (Queanbeyan, NSW).

The standard MODA technique was adopted to quantify the mineralogy.

For each fraction, 100 grains containing *cassiterite* were selected at random and the area % of each mineral present was visually estimated. The minerals logged were: *siderite* (Sd), *quartz* (Qz), *cassiterite* (Cs), *pyrite+marcasite* (Py), *pyrrhotite* (Po), *fluorite* (Fl), other sulphides (*sphalerite*, *chalcopyrite*, *stannite*, *galena*; OS), and other undifferentiated *gangue* (*silicates, Fe-oxides, etc,* OG). [CAVEAT: Definitive identification of *cassiterite* in the finer fractions was difficult due to the presence of other minerals with similar optical properties].

The normal liberation and association parameters were calculated.

Results

The composition of the grains containing *cassiterite* is summarised below.

Severn Bulk Comp Sulphide Tail Composition Vol% (from Sn scan)

Fraction	Sn Wt%	Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	Siderite fraction% of non-sulphide Ga
+212µm	13.3	16.1	36.6	12.9	1.2	1.0	1.4	0.2	30.8	19
+106µm	17.8	18.7	17.1	41.6	4.4	0.3	0.5	0.2	17.3	35
+53µm	16.7	16.4	9.9	54.6	2.5	0	1.0	0	15.5	38
+20µm	21.2	14.1	10.2	67.7	0.8	0	1.4	Tr	5.7	45
+8µm	17.9	7.7	1.0	88.1	0	0	1.0	0	2.3	64
TOTAL	**86.9**	**14.5**	**13.7**	**55.7**	**1.8**	**0.2**	**1.1**	**0.1**	**13.1**	**34**

Sd=siderite, Qz=quartz, Cs=cassiterite, PyMa=pyrite/marcasite, Po=pyrrhotite, Fl=fluorite, OS=other sulphides, OG=other gangue

As would be expected, the grains containing *cassiterite* in the coarser fractions are more *quartz*-rich, and the finer fractions are more *siderite*-rich.

Liberation and Association

Essential summaries of the liberation parameters for *cassiterite* are:

Severn Bulk Comp Sulphide Tail Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary+
			Sd	Qz	PyMa	Po	Fl	OG	
+212µm	13.3	0	0	11	0	0	0	18	71
+106µm	17.8	26	16	9	2	0	0	22	22
+53µm	16.7	55	6	4	2	0	0	23	10
+20µm	21.2	64	11	4	0	0	0	14	7
+8µm	17.9	92	3	2	0	0	0	3	0
TOTAL	**86.9**	**50**	**8**	**6**	**1**	**0**	**0**	**16**	**19**

Severn Bulk Comp Sulphide Tail Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Sd	Qz	PyMa	Po	Fl	OG
+212µm	13.3	40	72	4	9	8	59
+106µm	17.8	31	17	6	2	1	37
+53µm	16.7	11	12	4	2	0	28
+20µm	21.2	14	9	0	0	0	19
+8µm	17.9	3	2	0	0	0	3
TOTAL	**86.9**	**19**	**19**	**3**	**2**	**1**	**27**

G.J.McArthur PhD FAusIMM MMICA MSEG
Principal Mineralogist
22.8.14

MODA microscopy

PARTICLE MINERALOGY REPORT

GJMcA 21.8.14

Severn Bulk Comp Flot Tail Cs SCAN

April 2013

A +212µm — 26 % by weight

Average composition - all grains

Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	n
16.1	36.6	12.9	1.2	1.0	1.4	0.2	30.8	100
47	49	13	11	7	12	5	42	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	3.47	20.24	1.5	0.00	11.6	0.03	
Actual		0.68	3.1		16.9		

COMPOSITE PROPORTIONS

	Sd	Qz	Cs	PyMa	Fl	Po	OG	
Mono			0					
Binary			29					
Ternary			40					
Quat.y+			31					
#Grains			100					3.19

BINARY ASSOCIATION MATRIX

	Sd	Qz	Cs	PyMa	Fl	Po	OG
Sd							
Qz							
Cs	0	37		0	0	0	63
PyMa							
Fl							
Po							
OG							

TOTAL ASSOCIATION MATRIX

		Sd	Qz	Cs	PyMa	Fl	Po	OG
	Sd							
	Qz							
of	Cs	40	72		4	9	8	59
all	PyMa							
	Fl							
	Po							
	OG							

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Sd	Qz	Cs	PyMa	Fl	Po	OG		
Sd										
Qz										
Cs	0	0	11		0	0	0	18	40	31
PyMa										
Fl										
Po										
OG										

B +106µm — 17 % by weight

Average composition - all grains

Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	n
18.7	17.1	41.6	4.4	0.3	0.5	0.2	17.3	100
44	50	42	27	9	10	3	39	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	4.78	47.32	2.6	0.00	10.2	0.02	
Actual		1.37	2.5		18.4		

COMPOSITE PROPORTIONS

	Sd	Qz	Cs	PyMa	Fl	Po	OG	
Mono			26					
Binary			52					
Ternary			18					
Quat.y+			4					
#Grains			100					2.44

BINARY ASSOCIATION MATRIX

	Sd	Qz	Cs	PyMa	Fl	Po	OG
Sd							
Qz							
Cs	30	18		4	0	0	43
PyMa							
Fl							
Po							
OG							

TOTAL ASSOCIATION MATRIX

		Sd	Qz	Cs	PyMa	Fl	Po	OG
	Sd							
	Qz							
of	Cs	31	17		6	2	1	37
all	PyMa							
	Fl							
	Po							
	OG							

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Sd	Qz	Cs	PyMa	Fl	Po	OG		
Sd										
Qz										
Cs	26	16	9		2	0	0	22	18	4
PyMa										
Fl										
Po										
OG										

C +53µm — 13 % by weight

Average composition - all grains

Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	n
16.4	9.9	54.6	2.5	0.0	1.0	0.0	15.5	100
63	45	55	31	0	33	0	46	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	5.26	56.49	1.3	0.00	7.5	0.00	
Actual		1.75	2.8		18.0		

COMPOSITE PROPORTIONS

	Sd	Qz	Cs	PyMa	Fl	Po	OG	
Mono			55					
Binary			35					
Ternary			8					
Quat.y+			2					
#Grains			100					1.93

BINARY ASSOCIATION MATRIX

	Sd	Qz	Cs	PyMa	Fl	Po	OG
Sd							
Qz							
Cs	18	12		5	0	0	65
PyMa							
Fl							
Po							
OG							

TOTAL ASSOCIATION MATRIX

		Sd	Qz	Cs	PyMa	Fl	Po	OG
	Sd							
	Qz							
of	Cs	11	12		4	2	0	28
all	PyMa							
	Fl							
	Po							
	OG							

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Sd	Qz	Cs	PyMa	Fl	Po	OG		
Sd										
Qz										
Cs	55	6	4		2	0	0	23	8	2
PyMa										
Fl										
Po										
OG										

D +20µm — 13 % by weight

Average composition - all grains

Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	n
14.1	10.2	67.7	0.8	0.0	1.4	0.0	5.7	100
54	51	68	40	0	47	2	27	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	5.74	64.11	0.4	0.00	5.2	0.00	
Actual		2.23	3.0		21.2		

COMPOSITE PROPORTIONS

	Sd	Qz	Cs	PyMa	Fl	Po	OG	
Mono			64					
Binary			30					
Ternary			7					
Quat.y+			0					
#Grains			100					1.72

BINARY ASSOCIATION MATRIX

	Sd	Qz	Cs	PyMa	Fl	Po	OG
Sd							
Qz							
Cs	39	14		0	0	0	47
PyMa							
Fl							
Po							
OG							

TOTAL ASSOCIATION MATRIX

		Sd	Qz	Cs	PyMa	Fl	Po	OG
	Sd							
	Qz							
of	Cs	14	9		0	0	0	19
all	PyMa							
	Fl							
	Po							
	OG							

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Sd	Qz	Cs	PyMa	Fl	Po	OG		
Sd										
Qz										
Cs	64	11	4		0	0	0	14	7	0
PyMa										
Fl										
Po										
OG										

E +8µm — 10 % by weight

Average composition - all grains

Sd	Qz	Cs	PyMa	Po	Fl	OS	OG	n
7.7	1.0	88.1	0.0	0.0	1.0	0.0	2.3	100
76	33	88	0	0	95	0	38	

ASSAYS

	SG	Sn	S	As	Fe	Cu	
Calc'd	6.50	73.67	0.0	0.00	2.3	0.00	
Actual		2.39	3.0		24.6		

COMPOSITE PROPORTIONS

	Sd	Qz	Cs	PyMa	Fl	Po	OG	
Mono			92					
Binary			8					
Ternary			0					
Quat.y+			0					
#Grains			100					1.20

BINARY ASSOCIATION MATRIX

	Sd	Qz	Cs	PyMa	Fl	Po	OG
Sd							
Qz							
Cs	33	26		0	1	0	40
PyMa							
Fl							
Po							
OG							

TOTAL ASSOCIATION MATRIX

		Sd	Qz	Cs	PyMa	Fl	Po	OG
	Sd							
	Qz							
of	Cs	3	2		0	0	0	3
all	PyMa							
	Fl							
	Po							
	OG							

DISTRIBUTION MATRIX

	Free	Binary							Tern	Quat
		Sd	Qz	Cs	PyMa	Fl	Po	OG		
Sd										
Qz										
Cs	92	3	2		0	0	0	3	0	0
PyMa										
Fl										
Po										
OG										

Appendix 3 – Comminution Testwork

BOND ROD MILL CLOSED CIRCUIT GRINDABILITY : 1180 MICROMETERS

SAMPLE IDENTITY	SBC Head
CLIENT	ALS Metallurgy Burnie
PROJECT No	P0603
DATE	28-Apr

PERIOD	REVS OF MILL	WT OF 1250 mls (g)	WT OF NEW FEED (g)	WT OF O/SIZE (g)*	WT OF U/SIZE (g)*	NET WT OF U/SIZE (g)*	NET WT OF U/SIZE PER REV (g)	CIRC'TING LOAD (%)	WT OF FRESH FEED ADDED TO NEXT CYCLE (g)	WT OF U/SIZE IN FEED TO NEXT CYCLE (g)
1	200	2297.0	2297.0	1103.5	1193.5	931.3	4.657	92	1193.5	136.2
2	217	2297.0	1193.5	1094.1	1202.8	1066.6	4.915	91	1202.8	137.3
3	206	2297.0	1202.8	1085.1	1211.9	1074.6	5.216	90	1211.9	138.3
4	194	2297.0	1211.9	1125.0	1172.0	1033.7	5.328	96	1172.0	133.8
5	190	2297.0	1172.0	1134.4	1162.6	1028.8	5.415	98	1162.6	132.7
6	188	2297.0	1162.6	1146.0	1151.0	1018.3	5.416	100	1151.0	131.4
7	187	2297.0	1151.0	1148.6	1148.4	1017.0	5.438	100	1148.4	131.1

Note : * = Ex grinding mill

PRODUCT IN THE FEED	**11.41 (%)**
BULK DENSITY	**1.8376 (t/m^3)**
IDEAL POTENTIAL PRODUCT	**1148.5 (g)**
AVERAGE EQUILIBRIUM CIRC LOAD	**100 (%)**
AVERAGE PRODUCT	**5.427 (g/rev)**
80 % PASSING FEED SIZE	**8646 (µm)**
80 % PASSING PRODUCT SIZE	**889 (µm)**

BOND ROD MILL WORK INDEX (Kilowatt hours / dry tonne) : 20.5

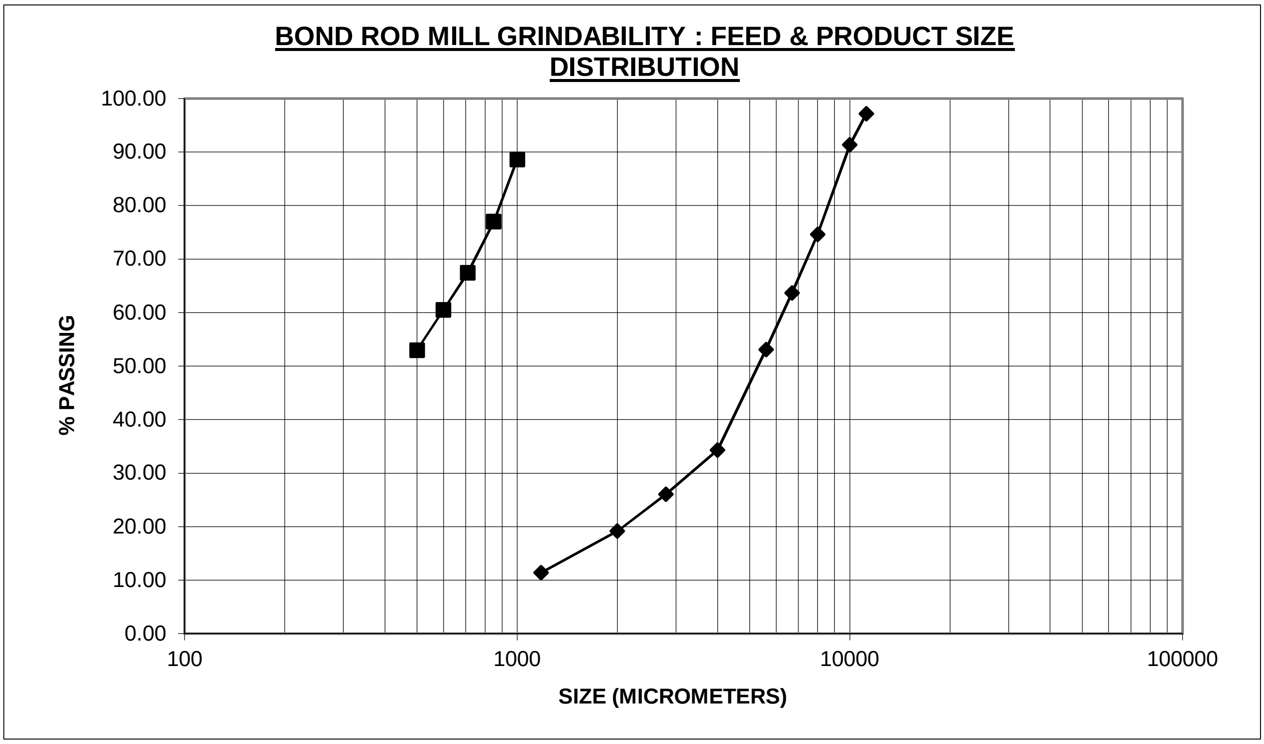
ALS Metallurgy

BOND ROD MILL GRINDABILITY TEST FEED AND PRODUCT SIZINGS

SBC Head
P0603

FEED TO PERIOD No. 1			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
11.200	28.7	2.86	97.14
10.000	58.3	5.82	91.32
8.000	167.5	16.72	74.60
6.700	109.7	10.95	63.65
5.600	105.7	10.55	53.09
4.000	187.9	18.76	34.34
2.800	82.8	8.26	26.08
2.000	69.3	6.91	19.16
1.180	77.6	7.75	11.41
-1.180	114.4	11.41	
TOTAL	1001.8	100.00	
F 80 (µm) :	**8646**		

EQUILIBRIUM PRODUCTS			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
1.000	130.9	11.39	88.61
0.850	133.5	11.62	76.98
0.710	109.4	9.52	67.46
0.600	79.9	6.96	60.50
0.500	86.3	7.52	52.98
-0.500	608.5	52.98	
TOTAL	1148.5	100.00	
P 80 (µm) :	**889**		



BOND BALL MILL CLOSED CIRCUIT GRINDABILITY : 212 MICROMETERS

SAMPLE IDENTITY	SBC Head
CLIENT	ALS Metallurgy Burnie
PROJECT No	**P0603**
DATE	Apr-14

PERIOD	REVS OF MILL	WT OF 700 mls (g)	WT OF NEW FEED (g)	WT OF O/SIZE (g)*	WT OF U/SIZE (g)*	NET WT OF U/SIZE (g)*	NET WT OF U/SIZE PER REV (g)	CIRC'TING LOAD (%)	WT OF FRESH FEED ADDED TO NEXT CYCLE (g)	WT OF U/SIZE IN FEED TO NEXT CYCLE (g)
1	200	1224.5	1224.5	862.9	361.6	240.9	1.205	239	361.6	35.6
2	261	1224.5	361.6	867.6	356.9	321.3	1.231	243	356.9	35.2
3	256	1224.5	356.9	856.2	368.3	333.1	1.301	232	368.3	36.3
4	241	1224.5	368.3	868.9	355.6	319.3	1.325	244	355.6	35.0
5	238	1224.5	355.6	875.1	349.4	314.3	1.321	250	349.4	34.4
6	240	1224.5	349.4	874.6	349.9	315.4	1.314	250	349.9	34.5

Note : * = Ex grinding mill

PRODUCT IN THE FEED	**9.86**	**(%)**
BULK DENSITY	**1.7493**	**(t/m^3)**
IDEAL POTENTIAL PRODUCT	**349.9**	**(g)**
AVERAGE EQUILIBRIUM CIRC LOAD	**250**	**(%)**
AVERAGE PRODUCT	**1.318**	**(g/rev)**
80 % PASSING FEED SIZE	**2343**	**(µm)**
80 % PASSING PRODUCT SIZE	**167**	**(µm)**

BOND BALL MILL WORK INDEX (Kilowatt hours / dry tonne) : 20.1

ALS Metallurgy

BOND BALL MILL GRINDABILITY TEST FEED AND PRODUCT SIZINGS

SBC Head

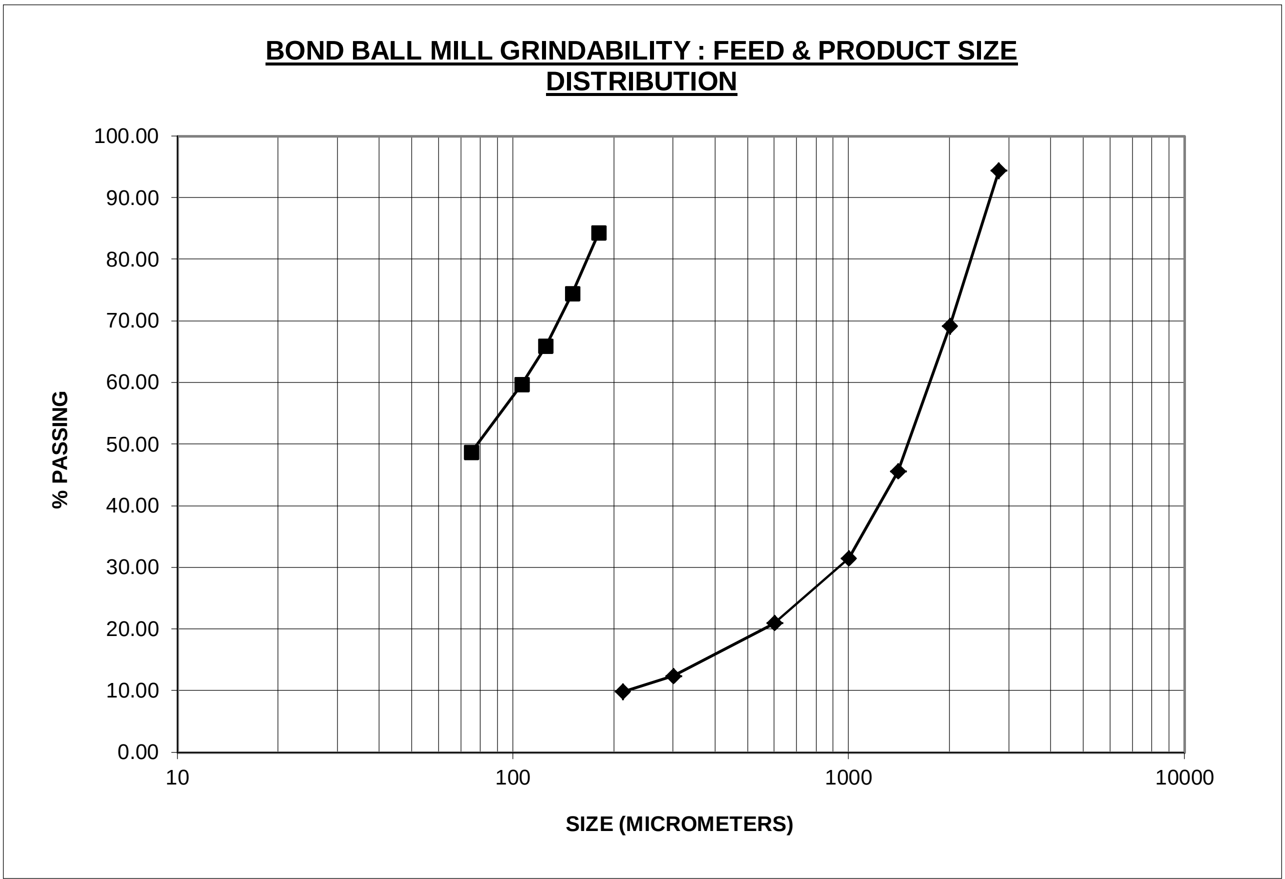
P0603

FEED TO PERIOD No. 1			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
2.800	55.7	5.55	94.45
2.000	253.9	25.31	69.14
1.400	236.2	23.54	45.60
1.000	141.9	14.15	31.46
0.600	105.1	10.47	20.98
0.300	86.2	8.59	12.40
0.212	25.5	2.54	9.86
-0.212	98.9	9.86	
TOTAL	1003.3	100.00	

F 80 (µm) : 2343

EQUILIBRIUM PRODUCTS			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
0.180	54.6	15.61	84.39
0.150	34.7	9.93	74.46
0.125	29.7	8.50	65.96
0.106	21.9	6.26	59.70
0.075	38.3	10.97	48.74
-0.075	170.4	48.74	
TOTAL	349.6	100.00	

P 80 (µm) : 167



ALS Metallurgy

Appendix 4 – Heavy Media Separation Results

BURNIE LABORATORY

HEAVY MEDIA SEPARATION REPORT SHEET

PROJECT	T0879
TEST NO	DRS01
DATE	MAY 2014
TECH	

START MATERIAL

Severn Composite SBC 9.50 to 2.35mm	
START WEIGHT (kg)	
MEDIA SG (kg/L)	2.95
FROM TEST NO	Ore

HEAVY MEDIA SEPARATION RESULTS

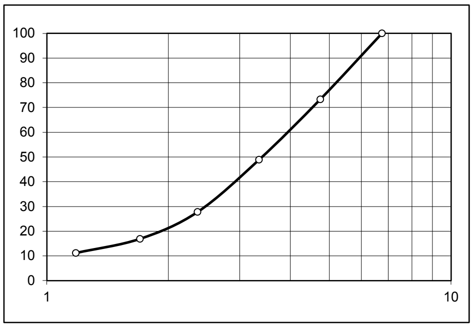
PRODUCT	Wt (kg)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	Al2O3 (%)	Dist (%)
DMS Sinks (> 2.95)	8365	42.98	2.31	77.0	30.00	55.5	22.40	27.6	16.95	72.0	6.20	30.2
DMS Floats (< 2.95)	6917	35.54	0.14	3.9	14.70	22.5	51.50	52.5	1.61	5.7	12.05	48.6
Fines (<2.35mm)	4180	21.48	1.15	19.2	23.80	22.0	32.40	19.9	10.55	22.4	8.69	21.2
CALC Head	19462	100.00	1.29	100.0	23.23	100.0	34.89	100.0	10.12	100.0	8.81	100.0

ALS Metallurgy

BURNIE LABORATORY: SIZE AND HEAVY LIQUID ANALYSIS

PROJECT	T0879
SAMPLE	SBC
TEST NO	T01
DATE	200514
TECHNICIAN	DK

LIQUID	hpt soln
MEASURED SG	2.95
TEMPERATURE	30
METHOD	beaker



SIZING

SIZE	WEIGHTS		
um	gm	(%)	%PASS
6.75	0.00	0.00	100.0
4.75	283.2	26.68	73.3
3.35	259.6	24.45	48.9
2.36	224.3	21.13	27.7
1.70	115.2	10.85	16.9
1.18	60.7	5.72	11.2
<1.18	118.6	11.17	0.0
TOTAL	1061.6	100.00	

SEPARATIONS

SIZE	WT	WT	Fraction		Fraction		Fraction		Fraction		Fraction		Fraction		Fraction		Fraction	
mm	gm	%	%Sn	dist	%Fe	dist	%As	dist	%S	dist	%SiO2	dist	%CaO	dist	%MgO	dist	%Al2O3	dist
Sinks+4.75	198.50	18.70	2.32	98.9	29.30	83.8	0.28	92.9	14.60	97.4	28.40	54.1	0.79	81.51	2.88	66.90	7.45	60.60
Floats+4.75	84.70	7.98	0.06	1.1	13.30	16.2	0.05	7.1	0.91	2.6	56.40	45.9	0.42	18.49	3.34	33.10	11.35	39.40
Calc 4.75 Total	283.20	26.68	1.64	100.0	24.51	100.0	0.21	100.0	10.51	100.0	36.77	100.0	0.68	100.00	3.02	100.00	8.62	100.00
Sinks+3.35	174.60	16.45	1.85	97.7	28.50	82.8	0.37	93.8	14.00	97.0	24.70	47.7	0.82	79.29	2.79	64.24	7.16	55.80
Floats+3.35	85.00	8.01	0.09	2.3	12.15	17.2	0.05	6.2	0.88	3.0	55.60	52.3	0.44	20.71	3.19	35.76	11.65	44.20
Calc 3.35 Total	259.60	24.45	1.27	100.0	23.15	100.0	0.27	100.0	9.70	100.0	34.82	100.0	0.70	100.00	2.92	100.00	8.63	100.00
Sinks+2.36	147.50	13.89	2.34	98.0	28.10	81.3	0.37	93.4	14.75	96.1	24.90	46.1	0.67	73.25	2.58	60.24	6.72	53.87
Floats+2.36	76.80	7.23	0.09	2.0	12.45	18.7	0.05	6.6	1.15	3.9	55.90	53.9	0.47	26.75	3.27	39.76	11.05	46.13
Calc 2.36 Total	224.30	21.13	1.57	100.0	22.74	100.0	0.26	100.0	10.09	100.0	35.51	100.0	0.60	100.00	2.82	100.00	8.20	100.00
Sinks+1.70	77.70	7.32	1.68	97.8	28.70	82.7	0.29	92.3	13.75	97.2	24.80	47.6	0.84	80.19	2.95	64.87	7.49	57.12
Floats+1.70	37.50	3.53	0.08	2.2	12.40	17.3	0.05	7.7	0.81	2.8	56.50	52.4	0.43	19.81	3.31	35.13	11.65	42.88
Calc 1.70 Total	115.20	10.85	1.16	100.0	23.39	100.0	0.21	100.0	9.54	100.0	35.12	100.0	0.71	100.00	3.07	100.00	8.84	100.00
Sinks+1.18	40.80	3.84	1.86	98.0	28.40	82.9	0.19	88.7	13.30	97.6	24.20	46.7	0.75	76.40	3.01	65.40	8.05	59.19
Floats+1.18	19.90	1.87	0.09	2.3	12.15	17.1	0.05	11.3	0.67	2.4	57.30	53.3	0.48	23.60	3.30	34.60	11.50	40.81
Calc +1.18 Total	60.70	5.72	1.28	100.3	23.11	100.0	0.14	100.0	9.19	100.0	34.97	100.0	0.66	100.00	3.10	100.00	9.17	100.00
Fines -1.18	118.60	11.17	1.12		24.80		0.18		8.99		33.30		0.63		3.09		8.93	
CALC FEED	1061.6	100.00	1.41		23.64		0.23		9.87		35.36		0.66		2.97		8.62	

*Number in red means less.

SUMMARY

FRACTIONS	Picno	WT	Overall		Overall		Overall		Overall		Overall		Overall		Overall		Overall	
mm	SG	%	%Sn	dist	%Fe	dist	%As	dist	%S	dist	%SiO2	dist	%CaO	dist	%MgO	dist	%Al2O3	dist
Sinks+4.75		18.70	2.32	30.86	29.30	23.18	0.28	23.01	14.60	27.66	28.40	15.02	0.79	22.27	2.88	18.13	7.45	16.15
Sinks+3.35		16.45	1.85	21.64	28.50	19.83	0.37	26.74	14.00	23.33	24.70	11.49	0.82	20.33	2.79	15.45	7.16	13.65
Sinks+2.36		13.89	2.34	23.13	28.10	16.52	0.37	22.59	14.75	20.76	24.90	9.78	0.67	14.03	2.58	12.07	6.72	10.83
Sinks+1.70		7.32	1.68	8.75	28.70	8.89	0.29	9.33	13.75	10.20	24.80	5.13	0.84	9.27	2.95	7.27	7.49	6.36
Sinks+1.18		3.84	1.86	5.09	28.40	4.62	0.19	3.21	13.30	5.18	24.20	2.63	0.75	4.35	3.01	3.90	8.05	3.59
Floats+4.75		7.98	0.06	0.34	13.30	4.49	0.05	1.75	0.91	0.74	56.40	12.72	0.42	5.05	3.34	8.97	11.35	10.50
Floats+3.35		8.01	0.09	0.51	12.15	4.12	0.05	1.76	0.88	0.71	55.60	12.59	0.44	5.31	3.19	8.60	11.65	10.82
Floats+2.36		7.23	0.09	0.46	12.45	3.81	0.05	1.59	1.15	0.84	55.90	11.44	0.47	5.13	3.27	7.97	11.05	9.27
Floats+1.70		3.53	0.08	0.20	12.40	1.85	0.05	0.78	0.81	0.29	56.50	5.64	0.43	2.29	3.31	3.94	11.65	4.77
Floats+1.18		1.87	0.09	0.12	12.15	0.96	0.05	0.41	0.67	0.13	57.30	3.04	0.48	1.36	3.30	2.08	11.50	2.50
Total Sinks		60.20	2.09	89.46	28.67	73.04	0.32	84.87	14.28	87.12	25.88	44.05	0.77	70.25	2.80	56.82	7.25	50.58
Total Floats		28.63	0.08	1.64	12.58	15.23	0.05	6.29	0.93	2.71	56.12	45.43	0.44	19.14	3.27	31.56	11.40	37.86
Fines -1.18		11.17	1.12	8.90	24.80	11.72	0.18	8.84	8.99	10.17	33.30	10.52	0.63	10.61	3.09	11.62	8.93	11.57
CALC FEED		**100.00**	**1.41**	**100.00**	**23.63**	**100.00**	**0.23**	**100.00**	**9.87**	**100.00**	**35.36**	**100.00**	**0.66**	**100.00**	**2.97**	**100.00**	**8.62**	**100.00**

Appendix 5 – HMS Evaluation

MEMORANDUM

DATE	14 October 2014
TO	Peter Blight
FROM	J Resta
COPY	
PROJECT	201010-00575
SUBJECT	Application of HMS in the Heemskirk Flowsheet (re-issued)
DOC NO	
FILE LOC	

1 INTRODUCTION

The Heemskirk Tin Project Prefeasibility Study process flowsheet included heavy media separation (HMS) prior to the primary milling circuit.

Due to the variability seen in results of the heavy media and heavy liquid testwork, in some cases relatively high Sn losses and a clear lack of applicability of HMS to some ore types (lower Queen Hill in particular); a review of the merits of inclusion of HMS in the flowsheet was recommended, along with additional HMS testwork.

Inclusion of a HMS circuit provides the advantages of rejecting mass early in the circuit, leading to reduced downstream equipment sizes and potentially capital costs, and reduced downstream operating costs. However, this comes at the expense of increased circuit complexity, increased Sn losses (via the HMS floats product), and increase Sn loss opportunities (HMS introduces another tailings stream).

Taking the Heemskirk Tin Project Prefeasibility Study as a base case an assessment was completed as to the impact of removal of the HMS circuit on CAPEX, OPEX and Sn recovery. This memo details the outcomes of this assessment.

2 IMPACT OF REMOVAL OF HEAVY MEDIA SEPARATION CIRCUIT ON CAPEX, OPEX AND RECOVERY

Impacts of the removal of the heavy media circuit from the flowsheet on capital and operating costs were estimated based on the capital and operating cost estimates developed by GRES for the Heemskirk Tin Project Prefeasibility Study.

The impacts of the removal of HMS on direct capital costs were estimated on an area by area basis by factoring these based on the expected change in throughput without HMS according to the following formula (the “6 tenths rule”);

$$\textit{Adjusted Direct costs} = \textit{Original direct cost} \times (\textit{New throughput}/\textit{Original throughput})^{0.6}$$

Indirect costs are calculated as a percentage of the total adjusted direct costs and summed to give the adjusted total capital estimate without HMS.

Similarly the impact on operating costs was estimated on an area by area basis by factoring these based on the expected change in throughput without HMS according to the following formula;

Adjusted operating costs = Original operating cost x (New throughput/Original throughput)

As the impacts of the removal of HMS on CAPEX and OPEX are expected to be sensitive to the mass rejection across the HMS circuit two cases were considered;

1. 23% mass rejection – as per the PFS PDC
2. 34.5% mass rejection – as per results of recent HMS testwork on the Severn bulk composite

Additionally the expected improvement in overall Sn recovery for these cases was estimated by assuming 72% downstream recovery (downstream of HMS) for those Sn units which would otherwise have been lost to the HMS floats product.

The key outcomes of this analysis are summarised in Table 1, with adjusted CAPEX and OPEX estimates for both cases considered in Appendix 1 and 2 respectively.

Table 1 – Summary: Expected Impact of Removal of Heavy Media Separation Circuit on Capital and Operating Costs

		Based on PFS PDC	Based on recent SBC HMS testwork results
Mass rejection in HMS		**23.3%**	**35.4%**
Sn loss in HMS		3.0%	3.9%
CAPEX:			
With HMS	M$	$80.04	$80.04
Without HMS	M$	$79.17	$81.75
Change in CAPEX	**M$**	**$0.88**	**-$1.70**
OPEX:			
With HMS	M$/y	$18.86	$18.86
Without HMS	M$/y	$19.26	$20.22
Change in OPEX	**M$/y**	**-$0.40**	**-$1.36**
Recovery Improvement necessary to offset increased in OPEX without HMS		0.3%	1.0%
Expected recovery improvement without HMS		**2.2%**	**2.8%**
Estimated improvement in net revenue without HMS	**M$/y**	**$2.62**	**$2.57**

Table 2 shows a summary of the expected impact of removal of the heavy media circuit on metal production and “net revenue” (calculated “net revenue” is net of process plant operating costs and smelting costs, but excludes mining costs) for both of these cases.

Table 2 - Summary: Expected Impact of Removal of Heavy Media Separation Circuit on Metal Production and "Net Revenue" (excludes mining costs)

		Based on PFS PDC	Based on recent SBC HMS testwork results
Mass rejection in HMS		**23.3%**	**35.4%**
Sn loss in HMS		3.0%	3.9%
With HMS:			
ROM throughput	kt/y	600	600
ROM Grade	% Sn	1.06%	1.06%
Sn Recovery		70.0%	70.0%
Sn Production		4,452	4,452
CAPEX	$/t Sn	$18,000	$18,000
OPEX	$/t Sn	$4,200	$4,200
Net Smelter Return per tonne Sn	$/t Sn	$22,000	$22,000
Gross Revenue (net of Smelter and Transport costs)	M$/y	$97.94	$97.94
Process Plant OPEX	M$/y	$18.86	$18.86
"Net Revenue" (Excluding mining costs)	**M$/y**	**$79.09**	**$79.09**
Without HMS:			
ROM throughput	kt/y	600	600
ROM Grade	% Sn	1.06%	1.06%
Sn Recovery without HMS		72.2%	72.8%
Sn Production without HMS		4,589	4,631
CAPEX	$/t Sn	$17,300	$17,700
OPEX	$/t Sn	$4,200	$4,400
Net Smelter Return per tonne Sn	$/t Sn	$22,000	$22,000
Gross Revenue (net of Smelter and Transport costs)	M$/y	$100.97	$101.87
Process Plant OPEX	M$/y	$19.26	$20.22
"Net Revenue" (Excluding mining costs)	**M$/y**	**$81.71**	**$81.65**
Increase in Net Revenue without HMS	**M$/y**	**$2.62**	**$2.56**

At the lower mass rejection considered, 23%, the analysis suggests removal of HMS would give a minor reduction of $0.9 M in total CAPEX, while at 35.4% mass rejection an increase in total CAPEX of $1.7 M was estimated. Within the accuracy of the PFS CAPEX estimate (+/- 25%) these changes are not considered significant.

In both cases considered OPEX is expected to increase with the removal of HMS due to increased throughputs, particularly in the primary grinding and gravity (particularly gravity regrind) circuits.

Assuming a mass rejection of 23%, OPEX is expected to increase by of the order of \$0.4 M /y (~\$0.70/t ROM), while at 35.4% mass rejection OPEX is expected to increase by of the order of \$1.4 M /y (~\$2.30/t).

These increases in OPEX would require an improvement in overall Sn recovery of 0.3% and 1% respectively to offset these (i.e. to remain revenue neutral). This compares with an expected increase in recovery of 2.2% and 2.8% respectively.

For both the without HMS cases CAPEX expressed in \$/t Sn falls, largely due to the increase metal output for these cases. OPEX expressed in \$/t Sn for the lower mass rejection case remains at similar level to that with HMS, and increases marginally for the higher mass rejection case. However, this increase in OPEX is more than offset due to the increase in tin production leading to an increase in overall "net revenue" of approximately \$2.6 M /y for both of the without HMS cases compared to with HMS.

3 CONCLUSIONS

- Over the range of mass rejection considered removal of HMS from the flowsheet is expected to have negligible impact on total CAPEX (within the accuracy of the estimate). However, operating costs are expected to rise with removal of HMS.
- The expected improvement in overall Sn recovery by the removal of HMS is expected to more than offset the increase in OPEX, leading to an improvement in net revenue of the order of \$2.6 M /y.
- Exclusion of HMS from the flowsheet simplifies the overall process flowsheet, and eliminates a loss opportunity (via HMS floats product) for Sn from the flowsheet.
- Previous testwork has shown HMS is not applicable to all ore types to be treated by the Heemskirk project.
- When considered from a processing only perspective HMS has no merits.

4 RECOMMENDATIONS

Based on the above analysis heavy media separation detracts value from the Heemskirk project when the treatment of <u>the same ROM (grade and tonnages of ore)</u> is considered. That is, HMS detracts value when considered from a processing only perspective. On this basis inclusion of HMS in the Heemskirk flowsheet is not recommended.

However, it is recommended to undertake further assessment as to whether HMS can provide any benefits in terms of mining costs and total ore reserves, before final decision is made as to the exclusion of HMS from the circuit. Key considerations in this further assessment are;

- Would inclusion of HMS allow an increase in overall ore reserves – Would a reduction in cut-off grade and average ROM grade allow reserves to be increased? Can the additional dilution be effectively rejected via HMS?
- Would inclusion of HMS allow mining costs to be reduced by adopting a less selective mining method?

- Could any mineralised waste which must be mined be converted into ore by treatment via HMS?

As HMS floats have previously been considered as a source of underground fill, consideration will also need to be given to alternative underground fill sources if HMS is removed from the circuit.

Appendix 1 – CAPEX and OPEX estimates assuming 23% mass rejection in HMS

Expected Impact of Removal of Heavy Media Separation Circuit on Capital Costs

Mass rejection in HMS **23%** (4) (as per PFS PDC)

		GRES PFS Capital Cost (+/-25%)					Factored Capital Cost			
Area	**Description**	**Equip/Matl $**	**Labour $**	**Freight $**	**Contingency $**	**TOTAL $**	**Original Throughput with HMS (kt/y)**	**New Throughput without HMS (kt/y)**	**Factor**	**Adjusted Costs $**
200	- PLANT SITE BULK EARTHWORKS	406,400	46,200	455	28,005	481,060	600	600	1.00	481,060
310	- CRUSHING	3,882,601	1,252,014	203,682	350,317	5,688,613	600	600	1.00	5,688,613
320	- ORE STORAGE	1,397,894	1,067,330	61,947	166,525	2,693,697	600	600	1.00	2,693,697
325	- HEAVY MEDIA SEPARATION	2,502,243	566,604	67,540	209,910	3,346,297	600	0	0.00	0
330	- GRINDING AND CLASSIFICATION	2,824,521	1,037,197	242,675	251,326	4,355,718	460	600	1.17	5,107,995
331	- SULPHIDE FLOTATION(5)	3,722,954	775,663	151,794	260,195	4,910,606				
	Roughing					1,636,869	460	600	1.17	1,919,573
	Regrind & cleaning					3,273,737	600	600	1.00	3,273,737
350	- COARSE GRAVITY	859,903	273,160	23,518	70,413	1,226,995	460	600	1.17	1,438,910
351	- SULPHIDE DRESSING FLOTATION	645,287	178,506	28,026	45,223	897,042	600	600	1.00	897,042
352	- GRAVITY REGRIND & CLASSIFICATION	1,971,471	718,330	116,172	148,629	2,954,602	460	600	1.17	3,464,892
353	- FINE GRAVITY	700,831	249,173	32,962	60,811	1,043,776	600	600	1.00	1,043,776
354	- SULPHIDE SCAVENGER FLOTATION	636,829	270,039	27,307	51,752	985,927	460	600	1.17	1,156,207
355	- SIILICA FLOTATION	860,888	310,195	42,994	69,252	1,283,330	460	600	1.17	1,504,974
356	- TIN FLOTATION	2,307,913	522,646	55,346	174,528	3,060,433	460	600	1.17	3,589,001
357	- CONCENTRATE ACID LEACHING	502,100	166,988	13,194	42,350	724,632	600	600	1.00	724,632
358	- TIN CONCENTRATE HANDLING AND FILTRATION	971,281	244,774	22,906	75,853	1,314,814	600	600	1.00	1,314,814
360	- REAGENTS	1,771,260	639,626	50,707	139,243	2,600,836	600	600	1.00	2,600,836
370	- POWER AND RETICULATION	5,645,930	2,708,343	114,296	503,643	8,972,213	600	600	1.00	8,972,213
390	- WATER SUPPLY	613,179	281,625	18,961	57,603	971,368	600	600	1.00	971,368
400	- TAILINGS	1,880,583	567,789	74,034	152,753	2,675,160	600	600	1.00	2,675,160
411	- FUEL FARM	292,119	55,806	6,670	22,954	377,550	600	600	1.00	377,550
420	- COMPRESSED AIR	446,899	57,070	11,327	28,121	543,417	600	600	1.00	543,417
490	- SITE BUILDINGS	581,010	242,279	47,363	50,012	920,664	600	600	1.00	920,664
495	- MOBILE PLANT & EQUIPMENT	1,755,000	7,768	70,525	91,859	1,925,152	600	600	1.00	1,925,152
499	- PLANT PIPING	2,064,532	2,262,628	9,373	294,385	4,630,918	600	600	1.00	4,630,918
804	- CONSTRUCTION EQUIPMENT	1,404,509	899,545	80,800	148,896	2,533,750	600	600	1.00	2,533,750
Total Direct Costs		**40,648,138**	**15,401,299**	**1,574,574**	**3,494,558**	**61,118,570**				**60,449,952**
Indirect Costs										
500	- ENGINEERING	107,500	13,139,963	0	671,623	13,919,086	23%			13,766,815
510	- COMMISSIONING	51,560	904,207	0	49,288	1,005,056	2%			994,061
600	- PRELIMINARIES AND GENERAL	2,096,131	74,820	116,878	114,391	2,402,221	4%			2,375,941
700	- OWNERS COSTS	1,598,636	0	0	0	1,598,636	3%			1,581,147
Total Indirect Costs		**3,853,827**	**14,118,990**	**116,878**	**835,303**	**18,924,997**	31%			**18,717,965**
TOTAL CAPITAL ESTIMATE		**44,501,965**	**29,520,289**	**1,691,452**	**4,329,861**	**80,043,567**				**79,167,917**
CHANGE IN TOTAL CAPITAL ESTIMATE										**$875,650**

Notes;

1. Only costs for areas 325, 330, 331 (roughing only), 350, 352, 355 and 356 (highlighted in red) are expected to be impacted by the removal of HMS from the circuit. Costs for other areas are not expected to be impacted within the accuracy of the estimate.
2. Adjusted Direct costs = Original direct cost x $(\text{New throughput/Original throughput})^{0.6}$
3. Indirect costs are calculated as a percentage of the total direct costs
4. Based on GR PFS PDC
5. Sulphide flotation costs are assumed to be split 1/3 roughing and 2/3 cleaning plus regrind.

Expected Impact of Removal of Heavy Media Separation Circuit on Operating Costs

Mass rejection in HMS **23%** [5] (as per PFS PDC)

GRES PFS OPEX (+/-25%)				**Severn Factored OPEX**			
AREA	**Description**	**Queen Hill ($/y)**	**Severn ($/y)**	**Original Throughput with HMS (kt/y)**	**New Throughput without HMS (kt/y)**	**Factor**	**Adjusted Operating Costs ($/y)**
310	- CRUSHING & SCREENING	1,464,254	1,464,254	600	600	1.00	1,464,254
320	- FINE ORE STORAGE	174,567	174,567	600	600	1.00	174,567
325	- HEAVY MEDIA SEPARATION (HMS)	1,001,435	957,347	600	0	0.00	0
330	- GRINDING AND CLASSIFICATION	2,423,864	2,423,864	460	600	1.30	3,161,012
331	- SULPHIDE FLOAT & REGRIND	2,392,313	1,617,679	460	600	1.10	1,779,447
350	- COARSE GRAVITY	126,078	123,962	460	600	1.30	161,661
351	- SULPHIDE DRESSING FLOTATION	157,703	97,368	600	600	1.00	97,368
353	- GRAVITY REGRIND & CLASSIFICATION	680,187	713,443	460	600	1.30	930,416
354	- FINE GRAVITY	174,389	174,389	600	600	1.00	174,389
355	- TIN FLOAT DESLIME	155,810	155,810	460	600	1.30	203,195
356	- TIN SULPHIDE PRE FLOTATION	346,202	198,573	460	600	1.30	258,963
357	- TIN SILICA FLOAT	359,167	326,558	460	600	1.30	425,871
360	- TIN FLOTATION & CONCENTRATE HANDLING	1,961,786	1,267,385	600	600	1.00	1,267,385
370	- TIN CONCENTRATE ACID LEACHING	2,622,986	1,392,420	600	600	1.00	1,392,420
380	- REAGENTS	297,120	297,120	600	600	1.00	297,120
390	- WATER SUPPLY	96,533	96,533	600	600	1.00	96,533
400	- TAILINGS	260,004	298,739	600	600	1.00	298,739
420	- AIR SERVICES	171,992	171,992	600	600	1.00	171,992
490	- SITE BUILDINGS	50,548	50,548	600	600	1.00	50,548
499	- PLANT PIPING	211,678	211,678	600	600	1.00	211,678
410	- POWER AND RETICULATION	317,837	317,837	600	600	1.00	317,837
	Workshop	205,230	205,230	600	600	1.00	205,230
	Laboratory	230,710	230,710	600	600	1.00	230,710
	Administration	606,988	606,988	600	600	1.00	606,988
	Management & Services	773,500	773,500	600	600	1.00	773,500
	Production Labour	2,892,500	2,892,500	600	600	1.00	2,892,500
	Maintenance Labour	1,614,600	1,614,600	600	600	1.00	1,614,600
	Total	**21,769,983**	**18,855,595**				**19,258,924**
	$/Tonne Treated	**36.28**	**31.43**				**32.10**
CHANGE IN OPEX ESTIMATE							
Total							**-$403,329**
$/Tonne Treated							**-$0.67**
Recovery Improvement necessary to offset increased in OPEX without HMS							
Net payment/% Sn recovery[1]				AU$/y/% Sn recovery			$1,400,000
Recovery Improvement necessary to offset increased in OPEX without HMS							0.3%
Expected recovery improvement without HMS[4]							**2.2%**

Notes;

1. Average value based on Net Smelter Return analysis
2. Only costs for areas 325, 330, 331, 350, 353, 355, 356, 357 and 380 (highlighted in red) are expected to be impacted by the removal of HMS from the circuit. Costs for other areas are not expected to be impacted within the accuracy of the estimate.
3. Adjusted operating costs = Original operating cost x (New throughput/Original throughput)
4. Expected recovery improvement is based on GR PFS PDC which showed 3.0% Sn loss to floats for Severn. Expected recovery improvement =3.0% x 72% downstream Sn recovery = 2.2%
5. Based on GR PFS PDC

Appendix 2 – CAPEX and OPEX estimates assuming 34.5% mass rejection in HMS

Expected Impact of Removal of Heavy Media Separation Circuit on Capital Costs

Mass rejection in HMS **35.4%** [4] (as per recent HMS testwork)

		GRES PFS Capital Cost (+/-25%)					Factored Capital Cost			
Area	**Description**	**Equip/Matl $**	**Labour $**	**Freight $**	**Contingency $**	**TOTAL $**	**Original Throughput with HMS (kt/y)**	**New Throughput without HMS (kt/y)**	**Factor**	**Adjusted Costs $**
200	- PLANT SITE BULK EARTHWORKS	406,400	46,200	455	28,005	481,060	600	600	1.00	481,060
310	- CRUSHING	3,882,601	1,252,014	203,682	350,317	5,688,613	600	600	1.00	5,688,613
320	- ORE STORAGE	1,397,894	1,067,330	61,947	166,525	2,693,697	600	600	1.00	2,693,697
325	- HEAVY MEDIA SEPARATION	2,502,243	566,604	67,540	209,910	3,346,297	600	0	0.00	0
330	- GRINDING AND CLASSIFICATION	2,824,521	1,037,197	242,675	251,326	4,355,718	388	600	1.30	5,661,353
331	- SULPHIDE FLOTATION[5]	3,722,954	775,663	151,794	260,195	4,910,606				
	Roughing					1,636,869	388	600	1.30	2,127,523
	Regrind & cleaning					3,273,737	600	600	1.00	3,273,737
350	- COARSE GRAVITY	859,903	273,160	23,518	70,413	1,226,995	388	600	1.30	1,594,789
351	- SULPHIDE DRESSING FLOTATION	645,287	178,506	28,026	45,223	897,042	600	600	1.00	897,042
352	- GRAVITY REGRIND & CLASSIFICATION	1,971,471	718,330	116,172	148,629	2,954,602	388	600	1.30	3,840,250
353	- FINE GRAVITY	700,831	249,173	32,962	60,811	1,043,776	600	600	1.00	1,043,776
354	- SULPHIDE SCAVENGER FLOTATION	636,829	270,039	27,307	51,752	985,927	388	600	1.30	1,281,461
355	- SIILICA FLOTATION	860,888	310,195	42,994	69,252	1,283,330	388	600	1.30	1,668,011
356	- TIN FLOTATION	2,307,913	522,646	55,346	174,528	3,060,433	388	600	1.30	3,977,804
357	- CONCENTRATE ACID LEACHING	502,100	166,988	13,194	42,350	724,632	600	600	1.00	724,632
358	- TIN CONCENTRATE HANDLING AND FILTRATION	971,281	244,774	22,906	75,853	1,314,814	600	600	1.00	1,314,814
360	- REAGENTS	1,771,260	639,626	50,707	139,243	2,600,836	600	600	1.00	2,600,836
370	- POWER AND RETICULATION	5,645,930	2,708,343	114,296	503,643	8,972,213	600	600	1.00	8,972,213
390	- WATER SUPPLY	613,179	281,625	18,961	57,603	971,368	600	600	1.00	971,368
400	- TAILINGS	1,880,583	567,789	74,034	152,753	2,675,160	600	600	1.00	2,675,160
411	- FUEL FARM	292,119	55,806	6,670	22,954	377,550	600	600	1.00	377,550
420	- COMPRESSED AIR	446,899	57,070	11,327	28,121	543,417	600	600	1.00	543,417
490	- SITE BUILDINGS	581,010	242,279	47,363	50,012	920,664	600	600	1.00	920,664
495	- MOBILE PLANT & EQUIPMENT	1,755,000	7,768	70,525	91,859	1,925,152	600	600	1.00	1,925,152
499	- PLANT PIPING	2,064,532	2,262,628	9,373	294,385	4,630,918	600	600	1.00	4,630,918
804	- CONSTRUCTION EQUIPMENT	1,404,509	899,545	80,800	148,896	2,533,750	600	600	1.00	2,533,750
Total Direct Costs		**40,648,138**	**15,401,299**	**1,574,574**	**3,494,558**	**61,118,570**				**62,419,590**
Indirect Costs										
500	- ENGINEERING	107,500	13,139,963	0	671,623	13,919,086	23%			14,215,379
510	- COMMISSIONING	51,560	904,207	0	49,288	1,005,056	2%			1,026,450
600	- PRELIMINARIES AND GENERAL	2,096,131	74,820	116,878	114,391	2,402,221	4%			2,453,357
700	- OWNERS COSTS	1,598,636	0	0	0	1,598,636	3%			1,632,666
Total Indirect Costs		**3,853,827**	**14,118,990**	**116,878**	**835,303**	**18,924,997**	31%			**19,327,852**
TOTAL CAPITAL ESTIMATE		**44,501,965**	**29,520,289**	**1,691,452**	**4,329,861**	**80,043,567**				**81,747,442**
CHANGE IN TOTAL CAPITAL ESTIMATE										**-$1,703,875**

Notes;

1. Only costs for areas 325, 330, 331 (roughing only), 350, 352, 355 and 356 (highlighted in red) are expected to be impacted by the removal of HMS from the circuit. Costs for other areas are not expected to be impacted within the accuracy of the estimate.

2. Adjusted Direct costs = Original direct cost x (New throughput/Original throughput)$^{0.6}$

3. Indirect costs are calculated as a percentage of the total direct costs

4. Based on results for ALS Metallurgy job no. T0879 test no. DRS01 which showed 35.4% mass rejection for SBC

5. Sulphide flotation costs are assumed to be split 1/3 roughing and 2/3 cleaning plus regrind.

Expected Impact of Removal of Heavy Media Separation Circuit on Operating Costs

Mass rejection in HMS **35.4%** [(5)] (as per recent HMS testwork)

GRES PFS OPEX (+/-25%)				Severn Factored OPEX			
AREA	**Description**	**Queen Hill ($/y)**	**Severn ($/y)**	**Original Throughput with HMS (kt/y)**	**New Throughput without HMS (kt/y)**	**Factor**	**Adjusted Operating Costs ($/y)**
310	- CRUSHING & SCREENING	1,464,254	1,464,254	600	600	1.00	1,464,254
320	- FINE ORE STORAGE	174,567	174,567	600	600	1.00	174,567
325	- HEAVY MEDIA SEPARATION (HMS)	1,001,435	957,347	600	0	0.00	0
330	- GRINDING AND CLASSIFICATION	2,423,864	2,423,864	388	600	1.55	3,752,111
331	- SULPHIDE FLOAT & REGRIND	2,392,313	1,617,679	388	600	1.10	1,779,447
350	- COARSE GRAVITY	126,078	123,962	388	600	1.55	191,892
351	- SULPHIDE DRESSING FLOTATION	157,703	97,368	600	600	1.00	97,368
353	- GRAVITY REGRIND & CLASSIFICATION	680,187	713,443	388	600	1.55	1,104,401
354	- FINE GRAVITY	174,389	174,389	600	600	1.00	174,389
355	- TIN FLOAT DESLIME	155,810	155,810	388	600	1.55	241,192
356	- TIN SULPHIDE PRE FLOTATION	346,202	198,573	388	600	1.55	307,389
357	- TIN SILICA FLOAT	359,167	326,558	388	600	1.55	505,508
360	- TIN FLOTATION & CONCENTRATE HANDLING	1,961,786	1,267,385	600	600	1.00	1,267,385
370	- TIN CONCENTRATE ACID LEACHING	2,622,986	1,392,420	600	600	1.00	1,392,420
380	- REAGENTS	297,120	297,120	600	600	1.00	297,120
390	- WATER SUPPLY	96,533	96,533	600	600	1.00	96,533
400	- TAILINGS	260,004	298,739	600	600	1.00	298,739
420	- AIR SERVICES	171,992	171,992	600	600	1.00	171,992
490	- SITE BUILDINGS	50,548	50,548	600	600	1.00	50,548
499	- PLANT PIPING	211,678	211,678	600	600	1.00	211,678
410	- POWER AND RETICULATION	317,837	317,837	600	600	1.00	317,837
	Workshop	205,230	205,230	600	600	1.00	205,230
	Laboratory	230,710	230,710	600	600	1.00	230,710
	Administration	606,988	606,988	600	600	1.00	606,988
	Management & Services	773,500	773,500	600	600	1.00	773,500
	Production Labour	2,892,500	2,892,500	600	600	1.00	2,892,500
	Maintenance Labour	1,614,600	1,614,600	600	600	1.00	1,614,600
	Total	**21,769,983**	**18,855,595**				**20,220,297**
	$/Tonne Treated	**36.28**	**31.43**				**33.70**
CHANGE IN OPEX ESTIMATE							
Total							**-$1,364,702**
$/Tonne Treated							**-$2.27**
Recovery Improvement necessary to offset increased in OPEX without HMS							
Net payment/% Sn recovery[(1)]				AU$/y/% Sn recovery			$1,400,000
Recovery Improvement necessary to offset increased in OPEX without HMS							1.0%
Expected recovery improvement without HMS[(4)]							**2.8%**

Notes;

1. Average value based on Net Smelter Return analysis
2. Only costs for areas 325, 330, 331, 350, 353, 355, 356 and 357 (highlighted in red) are expected to be impacted by the removal of HMS from the circuit. Costs for other areas are not expected to be impacted within the accuracy of the estimate.
3. Adjusted operating costs = Original operating cost x (New throughput/Original throughput)
4. Expected recovery improvement is based on results for ALS Metallurgy job no. T0879 test no. DRS01 which showed 3.9% Sn loss to floats for SBC. Expected recovery improvement =3.9% x 72% downstream Sn recovery = 2.8%
5. Based on results for ALS Metallurgy job no. T0879 test no. DRS01 which showed 35.4% mass rejection for SBC

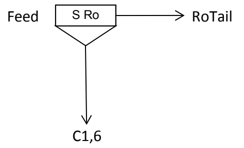
Appendix 6 – Sulfide Flotation Results

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	0
Solids	g	2000	0
Water	g	1000	0
Time	min/sec	26	0
Speed	rpm	50	0
Lime	g	0	0
End pH	pH	6.7	0
End p80	µm	100	0

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	2.7	Finish	
0		W/h	
Speed	900	kWh/t	



PROJECT	T0879
TEST NO	T02
DATE	220514
TECHNICIAN	MJR

PRODUCT FLOATED

Severn Ore Comp

SBC

NOTES

Sulphide Rougher

Feed P80 100um

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		1601						2					
Condition		50		25					2					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3	300	40
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.1					7				3-8	3.0	6	350	52
Condition		50		50					2					
Condition					15				1					
Sulphide Ro C3	4.8					7				4-8	3.0	9	330	36
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	4.7					7				4-9	3.0	12	340	45
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	4.8					10				4-9	4.0	16	400	26
Condition									2					
Condition	5.0				15				2					
Sulphide Ro C6						15				4-9	4.0	20	400	15
REAGENT TOTALS (g/t)		226	1601	100	130	69								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T02 RoC1	121.0	6.1	0.29	1.7	37.5	8.7	0.30	6.7	39.8	16.0	4.62	0.9
RoC2	183.2	9.2	0.20	1.8	43.5	15.2	0.29	9.8	42.4	25.7	3.51	1.1
RoC3	118.4	5.9	0.27	1.6	39.7	9.0	0.41	8.9	38.0	14.9	6.19	1.2
RoC4	153.0	7.7	0.24	1.8	42.0	12.3	0.38	10.7	44.0	22.3	4.54	1.2
RoC5	105.4	5.3	0.51	2.7	37.4	7.5	0.79	15.3	32.0	11.2	12.8	2.3
RoC6	58.6	2.9	0.76	2.2	31.1	3.5	2.38	25.6	18.9	3.7	21.5	2.1
Ro Tail	1255.8	62.9	1.41	88.1	18.4	43.9	0.10	23.1	1.50	6.2	42.7	91.1
CALC	1995.4	100.00	1.01	100.0	26.3	100.0	0.27	100.0	15.1	100.0	29.5	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T02 RoC1	121.0	6.1	0.29	1.7	37.5	8.7	0.30	6.7	39.8	16.0	4.62	0.9
RoC2	304.2	15.2	0.24	3.6	41.1	23.8	0.29	16.4	41.4	41.7	3.95	2.0
RoC3	422.6	21.2	0.25	5.2	40.7	32.8	0.33	25.3	40.4	56.6	4.58	3.3
RoC4	575.6	28.8	0.24	7.0	41.1	45.1	0.34	36.0	41.4	78.9	4.57	4.5
RoC5	681.0	34.1	0.29	9.7	40.5	52.6	0.41	51.3	39.9	90.1	5.83	6.8
RoC6	739.6	37.1	0.32	11.9	39.7	56.1	0.57	76.9	38.3	93.8	7.08	8.9
FEED	1995.4	100.0	1.01	100.0	26.3	100.0	0.27	100.0	15.1	100.0	29.5	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T02 RoC1	121.0	6.1	0.13	1.2	0.79	1.8	0.96	1.0	0.07	1.3
RoC2	183.2	9.2	0.10	1.4	0.38	1.3	0.83	1.2	0.07	1.9
RoC3	118.4	5.9	0.16	1.4	0.57	1.3	1.47	1.4	0.10	1.8
RoC4	153.0	7.7	0.13	1.5	0.46	1.3	1.05	1.3	0.06	1.4
RoC5	105.4	5.3	0.33	2.6	1.13	2.2	3.04	2.6	0.14	2.2
RoC6	58.6	2.9	0.52	2.3	1.88	2.0	5.07	2.4	0.23	2.0
Ro Tail	1255.8	62.9	0.96	89.7	3.87	90.1	8.73	90.0	0.48	89.5
CALC	1995.4	100.00	0.67	100.0	2.70	100.0	6.11	100.0	0.34	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T02 RoC1	121.0	6.1	0.13	1.2	0.79	1.8	0.96	1.0	0.07	1.3
RoC2	304.2	15.2	0.11	2.5	0.54	3.1	0.88	2.2	0.07	3.2
RoC3	422.6	21.2	0.13	3.9	0.55	4.3	1.05	3.6	0.08	4.9
RoC4	575.6	28.8	0.13	5.4	0.53	5.6	1.05	4.9	0.07	6.3
RoC5	681.0	34.1	0.16	8.0	0.62	7.8	1.36	7.6	0.08	8.5
RoC6	739.6	37.1	0.19	10.3	0.72	9.9	1.65	10.0	0.10	10.5
FEED	1995.4	100.0	0.67	100.0	2.70	100.0	6.11	100.0	0.34	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail	1255.8	62.9	1.41	88.1	18.4	43.9	0.10	23.1	1.50	6.2	42.7	91.1
FEED		100.0	1.01	100.0	26.3	100.0	0.27	100.0	15.1	100.0	29.5	100.0

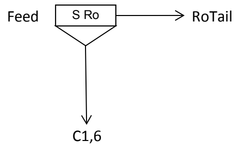
CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail	1255.8	62.9	0.96	89.7	3.87	90.1	8.73	90.0	0.48	89.5
FEED		200.0	0.67	100.0	2.70	100.0	6.11	100.0	0.34	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6
Solids	g	2000	0
Water	g	1000	0
Time	min/sec	23	0
Speed	rpm	50	0
Lime	g	0	0
End pH	pH	6.72	0
End p80	µm	130	0

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	2.7	Finish	
0		W/h	
Speed	900	kWh/t	



PROJECT	T0879
TEST NO	T03
DATE	220514
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 130um

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		1375						4					
Condition		50		25					4					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3	350	55
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.1					7				3-8	3.0	6	400	49
Condition		50		50					2					
Condition					15				1					
Sulphide Ro C3	4.8					7			2	4-8	3.0	9	340	31
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	4.7					7				4-9	3.0	12	330	30
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	4.8					10				4-9	4.0	16	300	25
Condition									2					
Condition	5.0				15				2					
Sulphide Ro C6						15				4-9	4.0	20	370	17
REAGENT TOTALS (g/t)		**225**	**1375**	**100**	**130**	**69**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T03 RoC1	192.0	9.6	0.16	1.5	41.4	15.2	0.58	20.3	45.3	29.1	2.61	0.8
RoC2	194.7	9.8	0.28	2.7	41.2	15.3	0.34	12.1	41.2	26.9	4.46	1.5
RoC3	105.6	5.3	0.40	2.1	40.5	8.2	0.48	9.2	34.8	12.3	7.85	1.4
RoC4	98.0	4.9	0.37	1.8	39.3	7.4	0.49	8.7	36.6	12.0	8.48	1.4
RoC5	75.3	3.8	0.54	2.0	37.6	5.4	0.91	12.5	31.3	7.9	12.1	1.5
RoC6	61.7	3.1	0.76	2.3	32.8	3.9	1.67	18.8	20.5	4.2	19.9	2.1
Ro Tail	1268.8	63.6	1.39	87.5	18.4	44.6	0.08	18.5	1.77	7.5	42.7	91.3
CALC	1996.1	100.0	1.01	100.0	26.2	100.0	0.28	100.0	15.0	100.0	29.7	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T03 RoC1	192.0	9.6	0.16	1.5	41.4	15.2	0.58	20.3	45.3	29.1	2.61	0.8
RoC2	386.7	19.4	0.22	4.2	41.3	30.5	0.46	32.3	43.2	56.0	3.54	2.3
RoC3	492.3	24.7	0.26	6.3	41.1	38.7	0.46	41.5	41.4	68.3	4.47	3.7
RoC4	590.3	29.6	0.28	8.1	40.8	46.1	0.47	50.3	40.6	80.3	5.13	5.1
RoC5	665.6	33.3	0.31	10.1	40.5	51.5	0.52	62.8	39.6	88.2	5.91	6.6
RoC6	727.3	36.4	0.35	12.5	39.8	55.4	0.62	81.5	38.0	92.5	7.10	8.7
FEED	1996.1	100.0	1.01	100.0	26.2	100.0	0.28	100.0	15.0	100.0	29.7	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T03 RoC1	192.0	9.6	0.08	1.1	0.34	1.2	0.63	1.0	0.04	1.2
RoC2	194.7	9.8	0.12	1.7	0.45	1.6	1.04	1.6	0.07	2.0
RoC3	105.6	5.3	0.20	1.6	0.71	1.4	1.82	1.5	0.12	1.9
RoC4	98.0	4.9	0.23	1.7	0.79	1.4	2.10	1.7	0.11	1.6
RoC5	75.3	3.8	0.32	1.8	1.13	1.6	2.92	1.8	0.15	1.7
RoC6	61.7	3.1	0.49	2.3	1.85	2.1	4.74	2.4	0.23	2.1
Ro Tail	1268.8	63.6	0.95	89.8	3.82	90.6	8.82	90.1	0.47	89.5
CALC	1996.1	100.0	0.67	100.0	2.68	100.0	6.22	100.0	0.33	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T03 RoC1	192.0	9.6	0.08	1.1	0.34	1.2	0.63	1.0	0.04	1.2
RoC2	386.7	19.4	0.10	2.9	0.40	2.9	0.84	2.6	0.06	3.2
RoC3	492.3	24.7	0.12	4.5	0.46	4.3	1.05	4.2	0.07	5.1
RoC4	590.3	29.6	0.14	6.1	0.52	5.7	1.22	5.8	0.08	6.7
RoC5	665.6	33.3	0.16	7.9	0.59	7.3	1.41	7.6	0.08	8.4
RoC6	727.3	36.4	0.19	10.2	0.69	9.4	1.70	9.9	0.10	10.5
FEED	1996.1	100.0	0.67	100.0	2.68	100.0	6.22	100.0	0.33	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail	1268.8	63.6	1.39	87.5	18.4	44.6	0.08	18.5	1.77	7.5	42.7	91.3
FEED		100.0	1.01	100.0	26.2	100.0	0.28	100.0	15.0	100.0	29.7	100.0

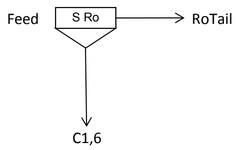
CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail	1268.8	63.6	0.95	89.8	3.82	90.6	8.82	90.1	0.47	89.5
FEED		200.0	0.67	100.0	2.68	100.0	6.22	100.0	0.33	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6
Solids	g	2000	0
Water	g	1000	0
Time	min/sec	20	0
Speed	rpm	50	0
Lime	g	0	0
End pH	pH	6.69	0
End p80	µm	160	0

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	2.7	Finish	
0		W/h	
Speed	900	kWh/t	



PROJECT	T0879
TEST NO	T04
DATE	220514
TECHNICIAN	MJR

PRODUCT FLOATED

Severn Ore Comp

SBC

NOTES

Sulphide Rougher

Feed P80 160um

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		1273						4					
Condition		50		25					4					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3	400	58
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.1					7				3-8	3.0	6	364	45
Condition		50		50					2					
Condition					15				1					
Sulphide Ro C3	4.8					7			2	4-8	3.0	9	260	36
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	4.7					7				4-9	3.0	12	310	35
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	4.8					10				4-9	4.0	16	300	26
Condition									2					
Condition	5.0				15				2					
Sulphide Ro C6						15				4-9	4.0	20	300	17
REAGENT TOTALS (g/t)		**225**	**1273**	**100**	**130**	**69**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T04 RoC1	232.2	11.6	0.20	2.3	41.5	18.2	0.48	20.1	44.9	34.5	3.01	1.2
RoC2	165.2	8.3	0.26	2.1	42.2	13.2	0.35	10.4	40.6	22.2	4.44	1.2
RoC3	93.8	4.7	0.36	1.7	39.7	7.0	0.60	10.2	35.2	10.9	7.13	1.1
RoC4	107.8	5.4	0.37	2.0	39.8	8.1	0.59	11.5	38.3	13.7	7.71	1.4
RoC5	79.2	4.0	0.65	2.6	36.4	5.4	1.55	22.2	27.8	7.3	13.2	1.8
RoC6	51.1	2.6	0.88	2.2	30.9	3.0	1.03	9.5	18.2	3.1	22.7	2.0
Ro Tail	1272.2	63.6	1.38	87.1	18.8	45.1	0.07	16.1	1.98	8.3	42.7	91.4
CALC	2001.5	100.0	1.01	100.0	26.5	100.0	0.28	100.0	15.1	100.0	29.7	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T04 RoC1	232.2	11.6	0.20	2.3	41.5	18.2	0.48	20.1	44.9	34.5	3.01	1.2
RoC2	397.4	19.9	0.22	4.4	41.8	31.3	0.43	30.6	43.1	56.7	3.60	2.4
RoC3	491.2	24.5	0.25	6.1	41.4	38.4	0.46	40.7	41.6	67.6	4.28	3.5
RoC4	599.0	29.9	0.27	8.1	41.1	46.5	0.48	52.2	41.0	81.3	4.90	4.9
RoC5	678.2	33.9	0.32	10.6	40.6	51.9	0.61	74.4	39.5	88.6	5.87	6.7
RoC6	729.3	36.4	0.36	12.9	39.9	54.9	0.64	83.9	38.0	91.7	7.04	8.6
FEED	2001.5	100.0	1.01	100.0	26.5	100.0	0.28	100.0	15.1	100.0	29.7	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T04 RoC1	232.2	11.6	0.09	1.5	0.35	1.5	0.68	1.2	0.05	1.7
RoC2	165.2	8.3	0.12	1.4	0.48	1.4	1.06	1.4	0.08	1.9
RoC3	93.8	4.7	0.19	1.3	0.71	1.2	1.68	1.2	0.11	1.5
RoC4	107.8	5.4	0.22	1.7	0.79	1.5	1.92	1.6	0.10	1.6
RoC5	79.2	4.0	0.37	2.1	1.28	1.8	3.13	2.0	0.18	2.1
RoC6	51.1	2.6	0.57	2.1	2.10	1.9	5.23	2.1	0.28	2.1
Ro Tail	1272.2	63.6	1.00	90.0	3.93	90.6	9.02	90.4	0.48	89.1
CALC	2001.5	100.0	0.71	100.0	2.76	100.0	6.34	100.0	0.34	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T04 RoC1	232.2	11.6	0.09	1.5	0.35	1.5	0.68	1.2	0.05	1.7
RoC2	397.4	19.9	0.10	2.9	0.40	2.9	0.84	2.6	0.06	3.6
RoC3	491.2	24.5	0.12	4.1	0.46	4.1	1.00	3.9	0.07	5.1
RoC4	599.0	29.9	0.14	5.8	0.52	5.7	1.16	5.5	0.08	6.7
RoC5	678.2	33.9	0.16	7.9	0.61	7.5	1.39	7.5	0.09	8.8
RoC6	729.3	36.4	0.19	10.0	0.71	9.4	1.66	9.6	0.10	10.9
FEED	2001.5	100.0	0.71	100.0	2.76	100.0	6.34	100.0	0.34	100.0

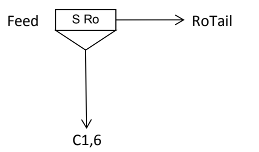
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail	1272.2	63.6	1.38	87.1	18.8	45.1	0.07	16.1	1.98	8.3	42.7	91.4
FEED		100.0	1.01	100.0	26.5	100.0	0.28	100.0	15.1	100.0	29.7	100.0

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail	1272.2	63.6	1.00	90.0	3.93	90.6	9.02	90.4	0.48	89.1
FEED		200.0	0.71	100.0	2.76	100.0	6.34	100.0	0.34	100.0

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6
Solids	g	2000	0
Water	g	1000	0
Time	min/sec	16	0
Speed	rpm	50	0
Lime	g	0	0
End pH	pH	6.73	0
End p80	µm	240	0

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	2.7	Finish	
0		W/h	
Speed	900	kWh/t	



PROJECT	T0879
TEST NO	T05
DATE	220514
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 240um

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		1133						4					
Condition		50		25					4					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3	386	58
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.1					7				3-8	3.0	6	260	52
Condition		50		50					2					
Condition					15				1					
Sulphide Ro C3	4.8					7			2	4-8	3.0	9	60	46
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	4.7					7				4-9	3.0	12	250	42
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	4.8					10				4-9	4.0	16	350	36
Condition									2					
Condition	5.0				15				2					
Sulphide Ro C6						15				4-9	4.0	20	350	18
REAGENT TOTALS (g/t)		226	1133	101	131	70								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T05 RoC1	223.0	11.2	0.19	2.1	41.1	17.5	0.35	14.0	44.4	33.9	3.02	1.1
RoC2	134.0	6.7	0.22	1.4	43.3	11.1	0.32	7.7	39.4	18.1	3.70	0.8
RoC3	27.7	1.4	0.25	0.3	39.6	2.1	0.58	2.9	38.8	3.7	4.88	0.2
RoC4	105.3	5.3	0.28	1.4	39.9	8.0	0.55	10.4	40.2	14.5	5.76	1.0
RoC5	126.3	6.3	0.52	3.2	39.8	9.6	1.29	29.3	35.7	15.4	8.33	1.8
RoC6	64.1	3.2	0.85	2.6	32.2	4.0	1.26	14.5	21.1	4.6	20.2	2.2
Ro Tail	1309.6	65.8	1.40	88.9	19.0	47.6	0.09	21.2	2.19	9.8	42.1	92.8
CALC	1990.0	100.0	1.04	100.0	26.3	100.0	0.28	100.0	14.7	100.0	29.8	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T05 RoC1	223.0	11.2	0.19	2.1	41.1	17.5	0.35	14.0	44.4	33.9	3.02	1.1
RoC2	357.0	17.9	0.20	3.5	41.9	28.7	0.34	21.7	42.5	52.0	3.28	2.0
RoC3	384.7	19.3	0.20	3.8	41.8	30.8	0.36	24.6	42.3	55.6	3.39	2.2
RoC4	490.0	24.6	0.22	5.3	41.4	38.8	0.40	35.0	41.8	70.1	3.90	3.2
RoC5	616.3	31.0	0.28	8.4	41.0	48.4	0.58	64.3	40.6	85.6	4.81	5.0
RoC6	680.4	34.2	0.34	11.1	40.2	52.4	0.64	78.8	38.7	90.2	6.26	7.2
FEED	1990.0	100.0	1.04	100.0	26.3	100.0	0.28	100.0	14.7	100.0	29.8	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T05 RoC1	223.0	11.2	0.09	1.4	0.37	1.5	0.70	1.2	0.05	1.6
RoC2	134.0	6.7	0.11	1.0	0.39	0.9	0.86	0.9	0.06	1.1
RoC3	27.7	1.4	0.14	0.3	0.53	0.3	1.27	0.3	0.08	0.3
RoC4	105.3	5.3	0.16	1.2	0.59	1.1	1.50	1.2	0.08	1.2
RoC5	126.3	6.3	0.23	2.1	0.79	1.8	1.93	1.9	0.12	2.2
RoC6	64.1	3.2	0.50	2.3	1.76	2.0	4.38	2.2	0.26	2.4
Ro Tail	1309.6	65.8	0.99	91.7	3.92	92.4	8.93	92.2	0.49	91.2
CALC	1990.0	100.0	0.71	100.0	2.79	100.0	6.37	100.0	0.35	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T05 RoC1	223.0	11.2	0.09	1.4	0.37	1.5	0.70	1.2	0.05	1.6
RoC2	357.0	17.9	0.10	2.5	0.38	2.4	0.76	2.1	0.05	2.7
RoC3	384.7	19.3	0.10	2.7	0.39	2.7	0.80	2.4	0.06	3.0
RoC4	490.0	24.6	0.11	3.9	0.43	3.8	0.95	3.7	0.06	4.2
RoC5	616.3	31.0	0.14	6.0	0.51	5.6	1.15	5.6	0.07	6.4
RoC6	680.4	34.2	0.17	8.3	0.62	7.6	1.45	7.8	0.09	8.8
FEED	1990.0	100.0	0.71	100.0	2.79	100.0	6.37	100.0	0.35	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail	1309.6	65.8	1.40	88.9	19.0	47.6	0.09	21.2	2.19	9.8	42.1	92.8
FEED		100.0	1.04	100.0	26.3	100.0	0.28	100.0	14.7	100.0	29.8	100.0

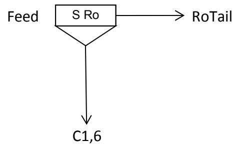
CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail	1309.6	65.8	0.99	91.7	3.92	92.4	8.93	92.2	0.49	91.2
FEED		200.0	0.71	100.0	2.79	100.0	6.37	100.0	0.35	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6
Solids	g	2000	0
Water	g	1000	0
Time	min/sec	11/5/3	0
Speed	rpm	50	0
Lime	g	0	0
End pH	pH	6.75	0
End p80	µm	240	0

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	2.7	Finish	
0		W/h	
Speed	900	kWh/t	



PROJECT	T0879
TEST NO	T06
DATE	260514
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 240um

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		1037						4					
Condition		50		25					4					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3	380	56
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.1					7				3-8	3.0	6	200	48
Condition		50		50					2					
Condition					15				1					
Sulphide Ro C3	4.8					7			2	4-8	3.0	9	100	25
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	4.8					7				4-9	3.0	12	220	37
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	4.8					10				4-9	4.0	16	400	38
Condition									2					
Condition	4.8				15				2					
Sulphide Ro C6						15				4-9	4.0	20	450	23
REAGENT TOTALS (g/t)		227	1037	101	131	70								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T06 RoC1	213.9	10.8	0.18	1.9	41.0	16.7	0.34	13.3	43.8	31.0	2.89	1.1
RoC2	96.4	4.9	0.22	1.1	41.2	7.6	0.56	9.9	40.4	12.9	4.33	0.7
RoC3	25.3	1.3	0.29	0.4	39.4	1.9	0.79	3.7	35.2	2.9	8.40	0.4
RoC4	81.6	4.1	0.27	1.1	40.1	6.2	0.86	12.9	39.2	10.6	6.27	0.9
RoC5	151.9	7.7	0.40	3.0	40.6	11.8	0.79	22.0	39.5	19.8	6.61	1.7
RoC6	105.4	5.3	0.77	4.1	36.5	7.3	0.99	19.1	29.6	10.3	13.7	2.5
Ro Tail	1309.4	66.0	1.35	88.4	19.4	48.5	0.08	19.2	2.88	12.5	41.3	92.8
CALC	1983.9	100.0	1.01	100.0	26.4	100.0	0.28	100.0	15.2	100.0	29.4	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T06 RoC1	213.9	10.8	0.18	1.9	41.0	16.7	0.34	13.3	43.8	31.0	2.89	1.1
RoC2	310.3	15.6	0.19	3.0	41.1	24.3	0.41	23.2	42.7	43.9	3.34	1.8
RoC3	335.6	16.9	0.20	3.4	40.9	26.2	0.44	26.9	42.2	46.8	3.72	2.1
RoC4	417.2	21.0	0.21	4.5	40.8	32.4	0.52	39.7	41.6	57.4	4.22	3.0
RoC5	569.1	28.7	0.26	7.5	40.7	44.2	0.59	61.7	41.0	77.2	4.86	4.7
RoC6	674.5	34.0	0.34	11.6	40.1	51.5	0.65	80.8	39.2	87.5	6.23	7.2
FEED	1983.9	100.0	1.01	100.0	26.4	100.0	0.28	100.0	15.2	100.0	29.4	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T06 RoC1	213.9	10.8	0.08	1.3	0.35	1.4	0.67	1.2	0.05	1.6
RoC2	96.4	4.9	0.11	0.8	0.47	0.8	1.01	0.8	0.07	1.0
RoC3	25.3	1.3	0.21	0.4	0.88	0.4	2.10	0.4	0.11	0.4
RoC4	81.6	4.1	0.16	1.0	0.60	0.9	1.46	1.0	0.08	1.0
RoC5	151.9	7.7	0.18	2.0	0.60	1.7	1.28	1.6	0.09	2.0
RoC6	105.4	5.3	0.33	2.5	1.11	2.2	2.61	2.3	0.18	2.8
Ro Tail	1309.4	66.0	0.96	92.1	3.81	92.6	8.46	92.6	0.47	91.2
CALC	1983.9	100.0	0.69	100.0	2.72	100.0	6.03	100.0	0.34	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T06 RoC1	213.9	10.8	0.08	1.3	0.35	1.4	0.67	1.2	0.05	1.6
RoC2	310.3	15.6	0.09	2.0	0.39	2.2	0.78	2.0	0.06	2.6
RoC3	335.6	16.9	0.10	2.4	0.42	2.6	0.88	2.5	0.06	3.0
RoC4	417.2	21.0	0.11	3.4	0.46	3.6	0.99	3.5	0.06	4.0
RoC5	569.1	28.7	0.13	5.4	0.50	5.2	1.07	5.1	0.07	6.0
RoC6	674.5	34.0	0.16	7.9	0.59	7.4	1.31	7.4	0.09	8.8
FEED	1983.9	100.0	0.69	100.0	2.72	100.0	6.03	100.0	0.34	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail	1309.4	66.0	1.35	88.4	19.4	48.5	0.08	19.2	2.88	12.5	41.3	92.8
FEED		100.0	1.01	100.0	26.4	100.0	0.28	100.0	15.2	100.0	29.4	100.0

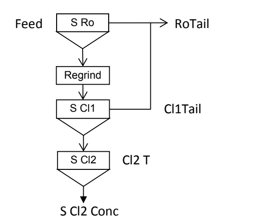
CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail	1309.4	66.0	0.96	92.1	3.81	92.6	8.46	92.6	0.47	91.2
FEED		200.0	0.69	100.0	2.72	100.0	6.03	100.0	0.34	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Stirred
Media	type	MS ball	Ceramic
Media	kg	12	2
Solids	g	2000	852
Water	g	1000	450
Time	min/sec	11/5/4	4
Speed	rpm	50	1200
Lime	g	0	0
End pH	pH	6.6	6.3
End p80	µm	250	26

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	38844
Cleaner	2.7	Finish	38859
0		W/h	14.48
Speed	900	kWh/t	20.0



PROJECT	T0879
TEST NO	T07
DATE	020614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
20kWh/t

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		718						2					
Condition		51		25					2					
Condition					41				1					
Sulphide Ro C1	5.3					23				3-7	3.0	3.0	550	
Condition		51		25					2					
Condition					31				1					
Sulphide Ro C2	5.3					8				3-8	3.0	6.0	300	
Condition		51		51					2					
Condition					25				1					
Sulphide Ro C3	5.2					8				4-8	3.0	9.0	200	
Condition		51							2					
Condition					15				1					
Sulphide Ro C4	5.3					8				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.3					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.3					15				4-9	4.0	20.0	300	
Regrind														
Condition	5.0		185	25					2					
Condition		102							1					
Condition					69	25			2					
Sulphide Cl1	5.0									3-9	20.0	20.0	2000	
Condition			10			3								
Sulphide Cl2C1	4.9									2-9	3.0	3.0	400	46
Condition						5								
Sulphide Cl2C2										2-9	3.0	6.0	400	26
Condition						5								
Sulphide Cl2C3					5					2-9	4.0	10.0	500	12
Condition						5								
Sulphide Cl2C4					10					2-9	6.0	16.0	500	9
REAGENT TOTALS (g/t)		**331**	**913**	**127**	**227**	**113**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T07 Cl2Con1	185.2	9.4	0.13	1.3	40.8	14.9	0.23	8.1	46.1	30.9	0.94	0.3
Cl2Con2	102.7	5.2	0.10	0.5	46.4	9.4	0.26	5.1	41.4	15.4	1.52	0.3
Cl2Con3	62.3	3.2	0.09	0.3	43.8	5.4	0.37	4.4	43.4	9.8	1.98	0.2
Cl2Con4	44.3	2.3	0.10	0.2	42.1	3.7	0.51	4.3	45.9	7.4	2.48	0.2
Cl2 Tail	54.5	2.8	0.43	1.2	34.1	3.7	0.79	8.2	29.0	5.7	14.5	1.3
Cl1 Tail	266.7	13.6	0.92	12.8	31.2	16.4	1.05	53.3	21.2	20.4	20.4	9.1
Ro Tail	1248.7	63.6	1.29	83.7	18.9	46.6	0.07	16.6	2.32	10.5	42.6	88.7
CALC	1964.4	100.0	0.98	100.0	25.8	100.0	0.27	100.0	14.1	100.0	30.5	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T07 Cl2Con1	185.2	9.4	0.13	1.3	40.8	14.9	0.23	8.1	46.1	30.9	0.94	0.3
Cl2Con2	287.9	14.7	0.12	1.8	42.8	24.3	0.24	13.2	44.4	46.2	1.15	0.6
Cl2Con3	350.2	17.8	0.11	2.1	43.0	29.7	0.26	17.6	44.2	56.0	1.30	0.8
Cl2Con4	394.5	20.1	0.11	2.3	42.9	33.4	0.29	21.9	44.4	63.4	1.43	0.9
Cl2 Tail	449.0	22.9	0.15	3.5	41.8	37.0	0.35	30.1	42.6	69.1	3.01	2.3
Cl1 Tail	715.7	36.4	0.44	16.3	37.9	53.4	0.61	83.4	34.6	89.5	9.49	11.3
FEED	1964.4	100.0	0.98	100.0	25.8	100.0	0.27	100.0	14.1	100.0	30.5	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T07 Cl2Con1	185.2	9.4	0.03	0.4	0.14	0.5	0.23	0.3	0.02	0.4
Cl2Con2	102.7	5.2	0.05	0.4	0.20	0.4	0.39	0.3	0.05	0.6
Cl2Con3	62.3	3.2	0.06	0.3	0.26	0.3	0.51	0.2	0.05	0.4
Cl2Con4	44.3	2.3	0.06	0.2	0.27	0.2	0.70	0.2	0.04	0.2
Cl2 Tail	54.5	2.8	0.32	1.2	1.39	1.4	4.14	1.8	0.22	1.4
Cl1 Tail	266.7	13.6	0.46	8.7	1.69	8.2	4.41	9.1	0.33	10.1
Ro Tail	1248.7	63.6	1.00	88.8	3.91	89.0	9.08	88.0	0.61	87.0
CALC	1964.4	100.0	0.72	100.0	2.79	100.0	6.56	100.0	0.45	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T07 Cl2Con1	185.2	9.4	0.03	0.4	0.14	0.5	0.23	0.3	0.02	0.4
Cl2Con2	287.9	14.7	0.04	0.8	0.16	0.8	0.29	0.6	0.03	1.0
Cl2Con3	350.2	17.8	0.04	1.0	0.18	1.1	0.33	0.9	0.03	1.4
Cl2Con4	394.5	20.1	0.04	1.2	0.19	1.4	0.37	1.1	0.03	1.6
Cl2 Tail	449.0	22.9	0.08	2.5	0.33	2.7	0.83	2.9	0.06	2.9
Cl1 Tail	715.7	36.4	0.22	11.2	0.84	11.0	2.16	12.0	0.16	13.0
FEED	1964.4	100.0	0.72	100.0	2.79	100.0	6.56	100.0	0.45	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail+Cl1Tail Comb	1515.4	77.1	1.22	96.5	21.1	63.0	0.24	69.9	5.64	30.9	38.7	97.7
FEED		100.0	0.98	100.0	25.8	100.0	0.27	100.0	14.1	100.0	30.5	100.0

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail+Cl1Tail Comb	1515.4	77.1	0.90	97.5	3.52	97.3	8.26	97.1	0.56	97.1
FEED		200.0	0.72	100.0	2.79	100.0	6.56	100.0	0.45	100.0

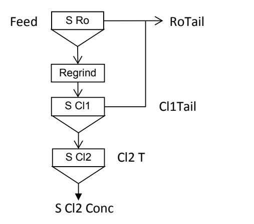
CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT	1248.7	63.6	1.29	83.7	18.9	46.6	0.07	16.6	2.32	10.5	42.6	88.7	1.00	88.8
FEED	1964.4	200.0	0.49	100.0	12.9	100.0	0.13	100.0	7.04	100.0	15.3	100.0	0.36	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Stirred
Media	type	MS ball	Ceramic
Media	kg	12	2
Solids	g	2000	842
Water	g	1000	450
Time	min/sec	11/5/4	5
Speed	rpm	50	1200
Lime	g	0	0
End pH	pH	6.75	5.9
End p80	µm	250	25

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	38959
Cleaner	2.7	Finish	38973
0		W/h	14.32
Speed	900	kWh/t	20.0



PROJECT	T0879
TEST NO	T08
DATE	030614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
20kWh/t
CuSO4 in Regrind

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		1091						2					
Condition		51		25					2					
Condition					40				1					
Sulphide Ro C1	5.4					23				3-7	3.0	3.0	550	
Condition		51		25					2					
Condition					30				1					
Sulphide Ro C2	5.2					8				3-8	3.0	6.0	300	
Condition		51		51					2					
Condition					25				1					
Sulphide Ro C3	5.0					8				4-8	3.0	9.0	200	
Condition		51							2					
Condition					15				1					
Sulphide Ro C4	5.2					8				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.2					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.2					15				4-9	4.0	20.0	300	
Regrind				76										
Condition	5.0		164						2					
Condition		101							1					
Condition					69	25			2					
Sulphide Cl1	5.2									3-9	20.0	20.0	2000	
Condition			10			3								
Sulphide Cl2C1	4.8									2-9	3.0	3.0	400	49
Condition						5								
Sulphide Cl2C2										2-9	3.0	6.0	400	29
Condition						5								
Sulphide Cl2C3					5					2-9	4.0	10.0	500	15
Condition						5								
Sulphide Cl2C4					10					2-9	6.0	16.0	500	10
REAGENT TOTALS (g/t)		329	1265	177	226	113								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T08 Cl2Con1	194.7	9.9	0.10	1.0	41.6	15.8	0.27	9.9	46.6	31.0	1.03	0.3
Cl2Con2	115.2	5.8	0.11	0.6	44.9	10.1	0.33	7.1	42.6	16.8	2.24	0.4
Cl2Con3	73.4	3.7	0.11	0.4	44.0	6.3	0.54	7.4	45.2	11.3	2.47	0.3
Cl2Con4	51.9	2.6	0.10	0.3	41.5	4.2	0.64	6.2	46.3	8.2	3.58	0.3
Cl2 Tail	65.5	3.3	0.45	1.5	33.5	4.3	0.82	10.1	28.4	6.4	15.3	1.7
Cl1 Tail	238.8	12.1	0.83	10.0	30.2	14.1	1.01	45.3	21.6	17.6	20.6	8.3
Ro Tail	1236.4	62.6	1.38	86.2	18.7	45.1	0.06	13.9	2.06	8.7	42.5	88.6
CALC	1975.9	100.0	1.00	100.0	25.9	100.0	0.27	100.0	14.8	100.0	30.0	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T08 Cl2Con1	194.7	9.9	0.10	1.0	41.6	15.8	0.27	9.9	46.6	31.0	1.03	0.3
Cl2Con2	309.9	15.7	0.10	1.6	42.8	26.0	0.29	17.0	45.1	47.8	1.48	0.8
Cl2Con3	383.3	19.4	0.10	2.0	43.1	32.3	0.34	24.5	45.1	59.1	1.67	1.1
Cl2Con4	435.2	22.0	0.10	2.3	42.9	36.5	0.38	30.7	45.3	67.3	1.90	1.4
Cl2 Tail	500.7	25.3	0.15	3.8	41.6	40.8	0.43	40.8	43.1	73.7	3.64	3.1
Cl1 Tail	739.5	37.4	0.37	13.8	37.9	54.9	0.62	86.1	36.1	91.3	9.12	11.4
FEED	1975.9	100.0	1.00	100.0	25.9	100.0	0.27	100.0	14.8	100.0	30.0	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T08 Cl2Con1	194.7	9.9	0.03	0.4	0.16	0.6	0.34	0.5	0.02	0.5
Cl2Con2	115.2	5.8	0.07	0.6	0.30	0.6	0.82	0.8	0.04	0.5
Cl2Con3	73.4	3.7	0.09	0.5	0.32	0.4	0.82	0.5	0.05	0.4
Cl2Con4	51.9	2.6	0.11	0.4	0.37	0.4	1.03	0.4	0.04	0.2
Cl2 Tail	65.5	3.3	0.33	1.6	1.58	1.9	4.45	2.3	0.22	1.7
Cl1 Tail	238.8	12.1	0.48	8.5	1.81	8.0	4.74	9.0	0.31	8.6
Ro Tail	1236.4	62.6	0.96	88.0	3.87	88.1	8.78	86.5	0.61	88.0
CALC	1975.9	100.0	0.68	100.0	2.75	100.0	6.35	100.0	0.43	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T08 Cl2Con1	194.7	9.9	0.03	0.4	0.16	0.6	0.34	0.5	0.02	0.5
Cl2Con2	309.9	15.7	0.04	1.0	0.21	1.2	0.52	1.3	0.03	1.0
Cl2Con3	383.3	19.4	0.05	1.5	0.23	1.6	0.58	1.8	0.03	1.4
Cl2Con4	435.2	22.0	0.06	1.9	0.25	2.0	0.63	2.2	0.03	1.7
Cl2 Tail	500.7	25.3	0.10	3.5	0.42	3.9	1.13	4.5	0.06	3.3
Cl1 Tail	739.5	37.4	0.22	12.0	0.87	11.9	2.30	13.5	0.14	12.0
FEED	1975.9	100.0	0.68	100.0	2.75	100.0	6.35	100.0	0.43	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail+Cl1Tail Comb	1475.2	74.7	1.29	96.2	20.5	59.2	0.21	59.2	5.22	26.3	39.0	96.9
FEED		100.0	1.00	100.0	25.9	100.0	0.27	100.0	14.8	100.0	30.0	100.0

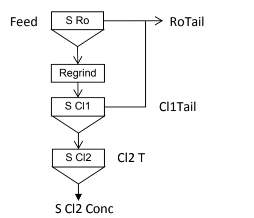
CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail+Cl1Tail Comb	1475.2	74.7	0.88	96.5	3.54	96.1	8.13	95.5	0.56	96.7
FEED		200.0	0.68	100.0	2.75	100.0	6.35	100.0	0.43	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT	1236.4	62.6	1.38	86.2	18.7	45.1	0.06	13.9	2.06	8.7	42.5	88.6	0.96	88.0
FEED	1975.9	200.0	0.50	100.0	12.9	100.0	0.13	100.0	7.41	100.0	15.0	100.0	0.34	100.0

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6.0 Reg
Solids	g	2000	866
Water	g	1000	400
Time	min/sec	11/5/4	9
Speed	rpm	50	50
Lime	g	0	0
End pH	pH	6.75	6.75
End p80	µm	250	67

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	2.7	Finish	
0		W/h	
Speed	900	kWh/t	



PROJECT	T0879
TEST NO	T09
DATE	040614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
Ballmill Regrind

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		932						2					
Condition		50		25					2					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3.0	550	
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.3					7				3-8	3.0	6.0	300	
Condition		50		50					2					
Condition					25				1					
Sulphide Ro C3	5.2					7				4-8	3.0	9.0	200	
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	5.3					7				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.3					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.3					15				4-9	4.0	20.0	300	
Regrind														
Condition	5.0		397						2					
Condition		100		25					1					
Condition					40	25			2					
Sulphide Cl1	5.4									3-9	10.0	10.0	1400	
Condition			20			2								
Sulphide Cl2C1	5.2									2-9	1.5	1.5	400	61
Condition						5								
Sulphide Cl2C2										2-9	2.0	3.5	400	54
Condition						5								
Sulphide Cl2C3										2-9	3.0	6.5	300	38
Condition						5								
Sulphide Cl2C4										2-9	3.0	9.5	200	9
REAGENT TOTALS (g/t)		**325**	**1348**	**125**	**180**	**111**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T09 Cl2Con1	244.1	12.2	0.15	1.8	42.3	19.8	0.59	25.9	46.4	38.2	1.59	0.6
Cl2Con2	217.1	10.9	0.19	2.1	42.6	17.7	0.66	25.8	45.7	33.5	1.85	0.7
Cl2Con3	115.0	5.8	0.36	2.1	41.8	9.2	0.93	19.2	36.8	14.3	5.60	1.1
Cl2Con4	17.1	0.9	0.75	0.6	32.8	1.1	1.10	3.4	24.7	1.4	18.5	0.5
Cl2 Tail	25.1	1.3	0.78	1.0	29.3	1.4	0.53	2.4	14.2	1.2	24.9	1.0
Cl1 Tail	152.1	7.6	1.33	10.1	24.4	7.1	0.37	10.1	7.22	3.7	32.7	8.3
Ro Tail	1228.2	61.4	1.35	82.4	18.6	43.7	0.06	13.2	1.86	7.7	42.8	87.7
CALC	1998.7	100.00	1.01	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.0	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T09 Cl2Con1	244.1	12.2	0.15	1.8	42.3	19.8	0.59	25.9	46.4	38.2	1.59	0.6
Cl2Con2	461.2	23.1	0.17	3.9	42.4	37.5	0.62	51.6	46.1	71.7	1.71	1.3
Cl2Con3	576.2	28.8	0.21	5.9	42.3	46.7	0.68	70.9	44.2	86.0	2.49	2.4
Cl2Con4	593.3	29.7	0.22	6.6	42.0	47.8	0.70	74.2	43.7	87.4	2.95	2.9
Cl2 Tail	618.4	30.9	0.25	7.5	41.5	49.2	0.69	76.6	42.5	88.6	3.84	4.0
Cl1 Tail	770.5	38.6	0.46	17.6	38.1	56.3	0.63	86.8	35.5	92.3	9.54	12.3
FEED	1998.7	100.0	1.01	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.0	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T09 Cl2Con1	244.1	12.2	0.07	1.2	0.15	0.7	0.31	0.6	0.05	1.4
Cl2Con2	217.1	10.9	0.07	1.1	0.17	0.7	0.38	0.7	0.04	1.0
Cl2Con3	115.0	5.8	0.17	1.4	0.47	1.0	1.08	1.0	0.12	1.6
Cl2Con4	17.1	0.9	0.43	0.5	1.18	0.4	3.10	0.4	0.30	0.6
Cl2 Tail	25.1	1.3	0.59	1.1	2.60	1.2	6.29	1.3	0.37	1.1
Cl1 Tail	152.1	7.6	0.72	8.0	2.84	7.9	6.75	8.3	0.50	8.7
Ro Tail	1228.2	61.4	0.97	86.7	3.95	88.3	8.87	87.8	0.61	85.7
CALC	1998.7	100.00	0.69	100.0	2.75	100.0	6.21	100.0	0.44	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T09 Cl2Con1	244.1	12.2	0.07	1.2	0.15	0.7	0.31	0.6	0.05	1.4
Cl2Con2	461.2	23.1	0.07	2.3	0.16	1.3	0.34	1.3	0.05	2.4
Cl2Con3	576.2	28.8	0.09	3.8	0.22	2.3	0.49	2.3	0.06	4.0
Cl2Con4	593.3	29.7	0.10	4.3	0.25	2.7	0.57	2.7	0.07	4.6
Cl2 Tail	618.4	30.9	0.12	5.4	0.34	3.9	0.80	4.0	0.08	5.6
Cl1 Tail	770.5	38.6	0.24	13.3	0.84	11.7	1.97	12.2	0.16	14.3
FEED	1998.7	100.0	0.69	100.0	2.75	100.0	6.21	100.0	0.44	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail+Cl1Tail Comb	1380.3	69.1	1.35	92.5	19.2	50.8	0.09	23.4	2.45	11.4	41.7	96.0
FEED		100.0	1.01	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.0	100.0

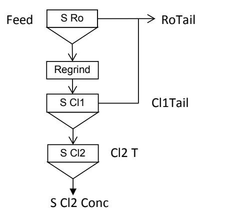
CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail+Cl1Tail Comb	1380.3	69.1	0.94	94.6	3.83	96.1	8.64	96.0	0.60	94.4
FEED		100.0	0.69	100.0	2.75	100.0	6.21	100.0	0.44	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	1422.5	71.2	1.33	94.1	19.5	53.3	0.11	29.1	2.92	14.0	41.1	97.6	0.93	96.2
FEED	1998.7	100.0	1.01	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.0	100.0	0.00	100.0

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6.0 Reg
Solids	g	2000	843
Water	g	1000	400
Time	min/sec	11/5/4	12
Speed	rpm	50	50
Lime	g	0	0
End pH	pH	6.75	6.84
End p80	µm	250	54

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	0.0
Cleaner	2.7	Finish	0.0
0		W/h	0.00
Speed	900	kWh/t	-



PROJECT	T0879
TEST NO	T10
DATE	050614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
Ballmill Regrind

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		950						2					
Condition		50		25					2					
Condition					40				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3.0	550	
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.3					7				3-8	3.0	6.0	300	
Condition		50		50					2					
Condition					25				1					
Sulphide Ro C3	5.2					7				4-8	3.0	9.0	200	
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	5.2					7				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.3					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.3					15				4-9	4.0	20.0	300	
Regrind														
Condition	5.0		686						2					
Condition		100		25					1					
Condition					30	25			2					
Sulphide Cl1	5.6									3-9	15.0	15.0	1700	
Condition			24			2								
Sulphide Cl2C1	5.0									2-9	1.5	1.5	400	60
Condition						5								
Sulphide Cl2C2										2-9	3.0	4.5	400	51
Condition						5								
Sulphide Cl2C3										2-9	3.0	7.5	200	26
Condition						5								
Sulphide Cl2C4										2-9	3.0	10.5	200	9
REAGENT TOTALS (g/t)		325	1661	125	170	111								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T10 Cl2Con1	241.1	12.1	0.15	1.9	40.9	18.7	0.49	21.7	42.4	35.5	1.36	0.5
Cl2Con2	205.3	10.3	0.17	1.8	42.8	16.6	0.58	21.9	44.0	31.4	2.12	0.7
Cl2Con3	52.4	2.6	0.26	0.7	44.6	4.4	0.75	7.2	37.4	6.8	5.11	0.4
Cl2Con4	18.2	0.9	0.35	0.3	42.0	1.4	0.79	2.6	30.9	2.0	7.40	0.2
Cl2 Tail	53.9	2.7	0.50	1.4	37.0	3.8	1.06	10.5	29.6	5.5	13.1	1.2
Cl1 Tail	186.4	9.3	1.16	11.2	31.0	10.9	0.65	22.3	14.3	9.2	25.0	7.8
Ro Tail	1243.4	62.1	1.29	82.8	18.8	44.1	0.06	13.7	2.20	9.5	42.9	89.1
CALC	2000.7	100.0	0.97	100.0	26.4	100.0	0.27	100.0	14.4	100.0	29.9	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T10 Cl2Con1	241.1	12.1	0.15	1.9	40.9	18.7	0.49	21.7	42.4	35.5	1.36	0.5
Cl2Con2	446.4	22.3	0.16	3.7	41.8	35.3	0.53	43.6	43.1	66.9	1.71	1.3
Cl2Con3	498.8	24.9	0.17	4.4	42.1	39.7	0.55	50.8	42.5	73.8	2.07	1.7
Cl2Con4	517.0	25.8	0.18	4.7	42.1	41.2	0.56	53.5	42.1	75.7	2.25	1.9
Cl2 Tail	570.9	28.5	0.21	6.1	41.6	44.9	0.61	64.0	40.9	81.3	3.27	3.1
Cl1 Tail	757.3	37.9	0.44	17.2	39.0	55.9	0.62	86.3	34.4	90.5	8.62	10.9
FEED	2000.7	100.0	0.97	100.0	26.4	100.0	0.27	100.0	14.4	100.0	29.9	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T10 Cl2Con1	241.1	12.1	0.09	1.6	0.13	0.6	0.28	0.6	0.04	1.1
Cl2Con2	205.3	10.3	0.09	1.3	0.23	0.9	0.43	0.7	0.06	1.4
Cl2Con3	52.4	2.6	0.16	0.6	0.42	0.4	0.88	0.4	0.11	0.7
Cl2Con4	18.2	0.9	0.24	0.3	0.59	0.2	1.30	0.2	0.14	0.3
Cl2 Tail	53.9	2.7	0.28	1.1	1.42	1.4	3.34	1.5	0.20	1.2
Cl1 Tail	186.4	9.3	0.56	7.6	2.06	7.1	4.94	7.5	0.41	8.7
Ro Tail	1243.4	62.1	0.97	87.5	3.90	89.5	8.79	89.2	0.61	86.6
CALC	2000.7	100.0	0.69	100.0	2.71	100.0	6.13	100.0	0.44	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T10 Cl2Con1	241.1	12.1	0.09	1.6	0.13	0.6	0.28	0.6	0.04	1.1
Cl2Con2	446.4	22.3	0.09	2.9	0.18	1.4	0.35	1.3	0.05	2.5
Cl2Con3	498.8	24.9	0.10	3.5	0.20	1.9	0.40	1.6	0.06	3.2
Cl2Con4	517.0	25.8	0.10	3.8	0.22	2.1	0.44	1.8	0.06	3.5
Cl2 Tail	570.9	28.5	0.12	4.9	0.33	3.5	0.71	3.3	0.07	4.7
Cl1 Tail	757.3	37.9	0.23	12.5	0.76	10.5	1.75	10.8	0.16	13.4
FEED	2000.7	100.0	0.69	100.0	2.71	100.0	6.13	100.0	0.44	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail+Cl1Tail Comb	1429.8	71.5	1.27	93.9	20.3	55.1	0.14	36.0	3.77	18.7	40.6	96.9
FEED	2000.7	100.0	0.97	100.0	26.4	100.0	0.27	100.0	14.4	100.0	29.9	100.0

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail+Cl1Tail Comb	1429.8	71.5	0.92	95.1	3.66	96.5	8.29	96.7	0.58	95.3
FEED	2000.7	100.0	0.69	100.0	2.71	100.0	6.13	100.0	0.44	100.0

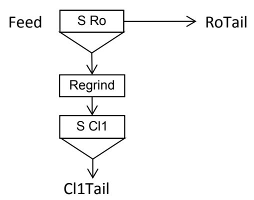
CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT	1243.4	62.1	1.29	82.8	18.8	44.1	0.06	13.7	2.20	9.5	42.9	89.1	0.97	87.5
FEED	2000.7	100.0	0.97	100.0	26.4	100.0	0.27	100.0	14.4	100.0	29.9	100.0	0.69	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Short
Media	type	MS ball	MS ball
Media	kg	12	6.0 Reg
Solids	g	2000	760
Water	g	1000	400
Time	min/sec	11/5/4	20
Speed	rpm	50	50
Lime	g	0	0
End pH	pH	6	6.3
End p80	µm	250	41

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	0.0
Cleaner	2.7	Finish	0.0
0		W/h	0.00
Speed	900	kWh/t	-



PROJECT	T0879
TEST NO	T11
DATE	100614
TECHNICIAN	BR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
Ballmill Regrind

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		956						2					
Condition		50		25					2					
Condition					40				1					
Sulphide Ro C1	5.5					35				3-7	3.0	3.0	550	
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.3					7				3-8	3.0	6.0	360	
Condition		50		50					2					
Condition					25				1					
Sulphide Ro C3	5.2					7				4-8	3.0	9.0	200	
Condition		50							2					
Condition					15				1					
Sulphide Ro C4	5.2					7				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.3					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.3					15				4-9	4.0	20.0	300	
Regrind														
Condition	5.0		986						2					
Condition		101		25					1					
Condition					40	25			2					
Sulphide Cl1	5.4									3-9	15.0	15.0	1700	21
REAGENT TOTALS (g/t)		327	1942	126	181	107								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST
T11 Cl1Con	358.0	18.0	0.16	2.8	40.3	28.0	0.52	35.2	43.0	54.6	3.31	2.0
Cl1 Tail	322.5	16.2	0.57	9.1	36.5	22.9	0.78	47.5	29.5	33.7	14.1	7.6
Ro Tail	1307.8	65.8	1.36	88.1	19.4	49.1	0.07	17.3	2.52	11.7	41.4	90.5
CALC	1988.3	100.0	1.02	100.0	25.9	100.0	0.27	100.0	14.2	100.0	30.1	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
T11 Cl1Con	358.0	18.0	0.16	2.8	40.3	28.0	0.52	35.2	43.0	54.6	3.31	2.0
Cl1 Tail	680.5	34.2	0.35	11.9	38.5	50.9	0.64	82.7	36.6	88.3	8.40	9.5
FEED	1988.3	100.0	1.02	100.0	25.9	100.0	0.27	100.0	14.2	100.0	30.1	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T11 Cl1Con	358.0	18.0	0.13	3.2	0.39	2.5	0.88	2.5	0.06	2.4
Cl1 Tail	322.5	16.2	0.35	7.7	1.32	7.6	3.12	7.9	0.21	7.6
Ro Tail	1307.8	65.8	1.00	89.1	3.84	89.9	8.72	89.6	0.61	89.9
CALC	1988.3	100.0	0.74	100.0	2.81	100.0	6.40	100.0	0.45	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
T11 Cl1Con	358.0	18.0	0.13	3.2	0.39	2.5	0.88	2.5	0.06	2.4
Cl1 Tail	680.5	34.2	0.23	10.9	0.83	10.1	1.94	10.4	0.13	10.1
FEED	1988.3	100.0	0.74	100.0	2.81	100.0	6.40	100.0	0.45	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST
RoTail+Cl1Tail Comb	1630.3	82.0	1.20	97.2	22.7	72.0	0.21	64.8	7.86	45.4	36.0	98.0
FEED		100.0	1.02	100.0	25.9	100.0	0.27	100.0	14.2	100.0	30.1	100.0

CUM PRODUCTS	CUM Wt	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST
RoTail+Cl1Tail Comb	1630.3	82.0	0.87	96.8	3.34	97.5	7.61	97.5	0.53	97.6
FEED		100.0	0.74	100.0	2.81	100.0	6.40	100.0	0.45	100.0

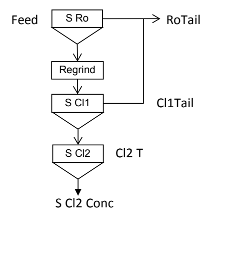
CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT	1307.8	65.8	1.36	88.1	19.4	49.1	0.07	17.3	2.52	11.7	41.4	90.5	1.00	89.1
FEED	4345.0	100.0	1.02	100.0	25.9	100.0	0.27	100.0	14.2	100.0	30.1	100.0	0.00	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Stirred
Media	type	MS ball	Ceramic
Media	kg	12	2
Solids	g	2000	893
Water	g	1000	450
Time	min/sec	11/5/4	2
Speed	rpm	50	1200
Lime	g	0	0
End pH	pH	6.4	6.15
End p80	µm	250	37

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	39015
Cleaner	2.7	Finish	39023
0		W/h	7.59
Speed	900	kWh/t	10.0



PROJECT	T0879
TEST NO	T12
DATE	160614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
10kWh/t
CuSO4 in Regrind
No Acid in Cleaners

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		872						2					
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C1	5.4					22				3-7	3.0	3.0	550	
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.2					7				3-8	3.0	6.0	300	
Condition		50		50					2					
Condition					25				1					
Sulphide Ro C3	5.3					7				4-8	3.0	9.0	200	
Condition		50							2					
Condition					25				1					
Sulphide Ro C4	5.3					7				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.4					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.4					15				4-9	4.0	20.0	300	
Regrind				101										
Condition	6.2	101							1					
Condition					50	25			1					
Sulphide Cl1	6.2									3-9	4.0	4.0	800	
Condition					10	7			1					
Sulphide Cl1 scav1										3-9	4.0	8.0	400	
Condition					10	7			2					
Sulphide Cl1 Scav2										3-9	9.0	17.0	600	
Condition						2			1					
Sulphide Cl2C1	5.7									2-9	1.5	1.5	400	60
Condition						2			1					
Sulphide Cl2C2										2-9	2.5	4.0	400	54
Condition						5			1					
Sulphide Cl2C3					5					2-9	4.0	8.0	350	30
Condition						5			1					
Sulphide Cl2C4					10					2-9	5.0	13.0	350	6
REAGENT TOTALS (g/t)		**327**	**872**	**201**	**226**	**124**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST	Sn Acid Sol ppm	DIST
T12 Cl2Con1	240.5	12.1	0.12	1.4	42.1	19.5	0.54	23.1	46.8	38.3	1.13	0.5	0.05	0.8	360	26.2
Cl2Con2	215.1	10.8	0.12	1.3	43.4	18.0	0.57	21.8	45.7	33.4	1.35	0.5	0.06	0.9	370	24.1
Cl2Con3	105.4	5.3	0.21	1.1	43.8	8.9	0.87	16.3	41.4	14.8	3.59	0.6	0.11	0.8	240	7.6
Cl2Con4	21.0	1.1	0.57	0.6	36.3	1.5	2.19	8.2	29.2	2.1	12.4	0.4	0.28	0.4	150	1.0
Cl2 Tail	33.5	1.7	0.96	1.6	27.3	1.8	0.63	3.8	11.6	1.3	27.2	1.5	0.64	1.5	120	1.2
Cl1 Tail	175.1	8.8	1.55	13.4	22.5	7.6	0.38	11.8	5.14	3.1	35.7	10.4	0.83	10.1	70	3.7
Ro Tail	1199.4	60.3	1.36	80.6	18.6	42.9	0.07	14.9	1.71	7.0	43.1	86.1	1.03	85.5	100	36.3
CALC	1990.0	100.0	1.02	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.2	100.0	0.73	100.0	166	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00					

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST	Sn Acid Sol ppm	DIST
T12 Cl2Con1	240.5	12.1	0.12	1.4	42.1	19.5	0.54	23.1	46.8	38.3	1.13	0.5	0.05	0.8	360	26.2
Cl2Con2	455.6	22.9	0.12	2.7	42.7	37.4	0.55	44.9	46.3	71.7	1.23	0.9	0.05	1.7	365	50.2
Cl2Con3	561.0	28.2	0.14	3.8	42.9	46.3	0.61	61.3	45.4	86.6	1.68	1.6	0.07	2.5	341	57.9
Cl2Con4	582.0	29.2	0.15	4.4	42.7	47.8	0.67	69.5	44.8	88.6	2.06	2.0	0.07	2.9	334	58.8
Cl2 Tail	615.5	30.9	0.20	6.0	41.8	49.5	0.67	73.2	43.0	90.0	3.43	3.5	0.10	4.4	323	60.0
Cl1 Tail	790.6	39.7	0.50	19.4	37.6	57.1	0.60	85.1	34.6	93.0	10.6	13.9	0.26	14.5	267	63.7
FEED	1990.0	100.0	1.02	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.2	100.0	0.73	100.0	166	100.0

PRODUCTS	WT g	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T12 Cl2Con1	240.5	12.1	0.17	0.7	0.29	0.6	0.02	0.6	0.26	35.9	2.36	45.9	2.78	43.6
Cl2Con2	215.1	10.8	0.20	0.8	0.35	0.6	0.03	0.8	0.24	29.6	1.98	34.4	2.61	36.6
Cl2Con3	105.4	5.3	0.37	0.7	0.73	0.6	0.06	0.7	0.14	8.5	0.71	6.0	2.11	14.5
Cl2Con4	21.0	1.1	1.12	0.4	2.39	0.4	0.18	0.4	0.10	1.2	0.40	0.7	0.87	1.2
Cl2 Tail	33.5	1.7	2.58	1.6	7.23	1.9	0.40	1.6	0.06	1.2	0.33	0.9	0.18	0.4
Cl1 Tail	175.1	8.8	2.79	8.9	6.86	9.6	0.53	10.8	0.03	3.0	0.17	2.4	0.11	1.3
Ro Tail	1199.4	60.3	4.00	86.9	9.03	86.3	0.61	85.2	0.03	20.6	0.10	9.7	0.03	2.3
CALC	1990.0	100.0	2.77	100.0	6.30	100.0	0.43	100.0	0.09	100.0	0.62	100.0	0.77	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T12 Cl2Con1	240.5	12.1	0.17	0.7	0.29	0.6	0.02	0.6	0.26	35.9	2.36	45.9	2.78	43.6
Cl2Con2	455.6	22.9	0.18	1.5	0.32	1.2	0.02	1.3	0.25	65.5	2.18	80.3	2.70	80.3
Cl2Con3	561.0	28.2	0.22	2.2	0.40	1.8	0.03	2.0	0.23	74.0	1.90	86.3	2.59	94.8
Cl2Con4	582.0	29.2	0.25	2.7	0.47	2.2	0.04	2.5	0.23	75.2	1.85	87.0	2.53	96.0
Cl2 Tail	615.5	30.9	0.38	4.2	0.84	4.1	0.06	4.0	0.22	76.3	1.77	87.9	2.40	96.4
Cl1 Tail	790.6	39.7	0.91	13.1	2.17	13.7	0.16	14.8	0.17	79.4	1.41	90.3	1.89	97.7
FEED	1990.0	100.0	2.77	100.0	6.30	100.0	0.43	100.0	0.09	100.0	0.62	100.0	0.77	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoTail+Cl1Tail Comb	1374.5	69.1	1.38	94.0	19.1	50.5	0.11	26.8	2.15	10.0	42.2	96.5	1.00	95.6
FEED		100.0	1.02	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.2	100.0	0.73	100.0

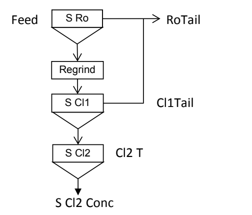
CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST	Sn Acid Sol ppm	DIST
RoTail+Cl1Tail Comb	1374.5	69.1	3.85	95.8	8.75	95.9	0.60	96.0	0.03	23.7	0.11	12.1	0.04	3.6	96	40.0
FEED		100.0	2.77	100.0	6.30	100.0	0.43	100.0	0.09	100.0	0.62	100.0	0.77	100.0	166	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	1429.0	71.8	1.36	96.2	19.5	53.7	0.15	38.7	2.76	13.4	41.4	98.4	0.99	97.5
FEED	1990.0	100.0	1.02	100.0	26.1	100.0	0.28	100.0	14.8	100.0	30.2	100.0	0.73	100.0

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Long	Stirred
Media	type	MS ball	Ceramic
Media	kg	12	2
Solids	g	2000	873
Water	g	1000	450
Time	min/sec	11/5/4	4
Speed	rpm	50	1200
Lime	g	0	0
End pH	pH	6.45	6.1
End p80	µm	250	25

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	39203
Cleaner	2.7	Finish	39218
0		W/h	14.84
Speed	900	kWh/t	20.0



PROJECT	T0879
TEST NO	T13
DATE	160614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
Sulphide Rougher
Feed P80 250um
20kWh/t
CuSO4 in Regrind
No Acid in Cleaners

	pH	0.5 GUAR g/t	98 H2SO4 g/t	1 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		858						2					
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C1	5.5					22				3-7	3.0	3.0	550	
Condition		50		25					2					
Condition					30				1					
Sulphide Ro C2	5.2					7				3-8	3.0	6.0	300	
Condition		50		50					2					
Condition					25				1					
Sulphide Ro C3	5.3					7				4-8	3.0	9.0	200	
Condition		50							2					
Condition					25				1					
Sulphide Ro C4	5.3					7				4-9	3.0	12.0	300	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	5.4					10				4-9	4.0	16.0	300	
Condition					15				2					
Sulphide Ro C6	5.4					15				4-9	4.0	20.0	300	
Regrind				100										
Condition	6.2	100							1					
Condition					50	25			1					
Sulphide Cl1	6.2									3-9	4.0	4.0	700	
Condition					10	7			1					
Sulphide Cl1 scav1										3-9	4.0	8.0	400	
Condition					10	7			2					
Sulphide Cl1 Scav2										3-9	9.0	17.0	600	
Condition						2			1					
Sulphide Cl2C1	5.7									2-9	1.5	1.5	400	57
Condition						5			1					
Sulphide Cl2C2										2-9	3.0	4.5	400	50
Condition						5			1					
Sulphide Cl2C3					5					2-9	5.0	9.5	350	34
Condition						5			1					
Sulphide Cl2C4					10					2-9	7.0	16.5	350	8
REAGENT TOTALS (g/t)		**325**	**858**	**200**	**225**	**126**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST	Sn Acid Sol ppm	DIST
T13 Cl2Con1	228.2	11.4	0.09	1.0	41.4	18.1	0.35	14.0	47.2	37.0	1.95	0.7	0.11	1.8	400	26.3
Cl2Con2	199.2	10.0	0.09	0.9	43.8	16.7	0.41	14.3	44.5	30.5	1.24	0.4	0.06	0.8	350	20.1
Cl2Con3	120.0	6.0	0.12	0.7	45.3	10.4	0.62	13.0	41.6	17.1	2.13	0.4	0.10	0.8	230	7.9
Cl2Con4	28.5	1.4	0.34	0.5	37.8	2.1	2.98	14.9	36.1	3.5	7.06	0.3	0.16	0.3	250	2.1
Cl2 Tail	29.4	1.5	0.95	1.4	27.2	1.5	1.30	6.7	11.1	1.1	26.9	1.3	0.61	1.3	120	1.0
Cl1 Tail	174.9	8.8	1.59	13.6	22.9	7.7	0.72	22.1	4.44	2.7	34.7	10.0	0.80	9.8	80	4.0
Ro Tail	1218.4	61.0	1.38	82.0	18.7	43.6	0.07	15.0	1.93	8.1	43.1	86.8	1.00	85.2	110	38.6
CALC	1998.6	100.0	1.03	100.0	26.2	100.0	0.29	100.0	14.6	100.0	30.3	100.0	0.72	100.0	174	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00					

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST	Sn Acid Sol ppm	DIST
T13 Cl2Con1	228.2	11.4	0.09	1.0	41.4	18.1	0.35	14.0	47.2	37.0	1.95	0.7	0.11	1.8	400	26.3
Cl2Con2	427.4	21.4	0.09	1.9	42.5	34.8	0.38	28.3	45.9	67.5	1.62	1.1	0.09	2.6	377	46.4
Cl2Con3	547.4	27.4	0.10	2.6	43.1	45.2	0.43	41.4	45.0	84.6	1.73	1.6	0.09	3.4	345	54.3
Cl2Con4	575.9	28.8	0.11	3.1	42.9	47.2	0.56	56.3	44.5	88.1	1.99	1.9	0.09	3.7	340	56.4
Cl2 Tail	605.3	30.3	0.15	4.4	42.1	48.8	0.59	63.0	42.9	89.3	3.20	3.2	0.12	5.0	329	57.4
Cl1 Tail	780.2	39.0	0.47	18.0	37.8	56.4	0.62	85.0	34.3	91.9	10.3	13.2	0.27	14.8	273	61.4
FEED	1998.6	100.0	1.03	100.0	26.2	100.0	0.29	100.0	14.6	100.0	30.3	100.0	0.72	100.0	174	100.0

PRODUCTS	WT g	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T13 Cl2Con1	228.2	11.4	0.12	0.5	0.33	0.6	0.03	0.8	0.34	44.3	2.43	42.7	2.59	36.4
Cl2Con2	199.2	10.0	0.18	0.7	0.34	0.5	0.02	0.5	0.20	22.8	2.37	36.4	2.41	29.6
Cl2Con3	120.0	6.0	0.24	0.5	0.57	0.5	0.04	0.6	0.11	7.5	0.72	6.7	2.77	20.5
Cl2Con4	28.5	1.4	0.72	0.4	1.58	0.4	0.11	0.4	0.10	1.6	0.32	0.7	4.17	7.3
Cl2 Tail	29.4	1.5	2.59	1.4	7.56	1.8	0.40	1.4	0.05	0.8	0.39	0.9	0.30	0.5
Cl1 Tail	174.9	8.8	2.70	8.7	7.25	10.0	0.54	11.0	0.02	2.0	0.17	2.3	0.25	2.7
Ro Tail	1218.4	61.0	3.92	87.8	8.98	86.2	0.60	85.4	0.03	20.9	0.11	10.3	0.04	3.0
CALC	1998.6	100.0	2.72	100.0	6.35	100.0	0.43	100.0	0.09	100.0	0.65	100.0	0.81	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T13 Cl2Con1	228.2	11.4	0.12	0.5	0.33	0.6	0.03	0.8	0.34	44.3	2.43	42.7	2.59	36.4
Cl2Con2	427.4	21.4	0.15	1.2	0.33	1.1	0.03	1.3	0.27	67.1	2.40	79.1	2.51	66.0
Cl2Con3	547.4	27.4	0.17	1.7	0.39	1.7	0.03	1.8	0.24	74.6	2.03	85.8	2.56	86.4
Cl2Con4	575.9	28.8	0.20	2.1	0.45	2.0	0.03	2.2	0.23	76.3	1.95	86.5	2.64	93.8
Cl2 Tail	605.3	30.3	0.31	3.5	0.79	3.8	0.05	3.6	0.22	77.1	1.87	87.4	2.53	94.3
Cl1 Tail	780.2	39.0	0.85	12.2	2.24	13.8	0.16	14.6	0.18	79.1	1.49	89.7	2.02	97.0
FEED	1998.6	100.0	2.72	100.0	6.35	100.0	0.43	100.0	0.09	100.0	0.65	100.0	0.81	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoTail+Cl1Tail Comb	1393.3	69.7	1.41	95.6	19.2	51.2	0.15	37.0	2.25	10.7	42.0	96.8	0.97	95.0
FEED		100.0	1.03	100.0	26.2	100.0	0.29	100.0	14.6	100.0	30.3	100.0	0.72	100.0

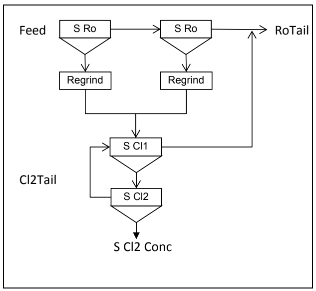
CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST	Sn Acid Sol ppm	DIST
RoTail+Cl1Tail Comb	1393.3	69.7	3.77	96.5	8.76	96.2	0.59	96.4	0.03	22.9	0.12	12.6	0.07	5.7	106	42.6
FEED		100.0	2.72	100.0	6.35	100.0	0.43	100.0	0.09	100.0	0.65	100.0	0.81	100.0	174	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	1451.2	72.6	1.38	97.4	19.8	54.8	0.23	58.6	3.09	15.4	41.1	98.4	0.95	96.6
FEED	1998.6	100.0	1.03	100.0	26.2	100.0	0.29	100.0	14.6	100.0	30.3	100.0	0.72	100.0

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Large	Stirred
Media	type	MS ball	Sand
Media	kg	40	3
Solids	kg	12	5251
Water	kg	6	3000
Time	min/sec	17.5	7
Speed	rpm	50	1000
Lime	g	0	0
End pH	pH	6.4	6
End p80	µm	250	82

Float Cell	Volume	Regrind Power	
Rougher	30	Start	39985
Cleaner1	30	Finish	40052
Cleaner2	30	W/h	66.95
Speed	900	kWh/t	15.0



PROJECT	T0879
TEST NO	T14+T15
DATE	200614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
2*12Kg Test
Feed P80 250um
15kWh/t
CuSO4 in Regrind
No Acid in Cleaners

	pH	0.5 GUAR g/t	98 H2SO4 g/t	6 CuSO4 g/t	1.5 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		732						2					
Condition		25		25					2					
Condition					30				1					
Sulphide Ro C1	5.4					16				20-30	3.0	3.0	4400	
Condition		12		25					2					
Condition					30				1					
Sulphide Ro C2						8				20-30	3.0	6.0	5000	
Condition		12		50					2					
Condition					25				1					
Sulphide Ro C3						4				20-50	3.0	9.0	2200	
Condition		12							2					
Condition					25				1					
Sulphide Ro C4						4				20-50	3.0	12.0	2200	
Condition		6							2					
Condition					15				1					
Sulphide Ro C5						6				20-60	4.0	16.0	2600	
Condition					15				2					
Sulphide Ro C6	5.2					6				20-60	4.0	20.0	2900	
Regrind				100										
Condition	5.4	25							1					
Condition					50	6			1					
Sulphide Cl1	5.4									20-60	4.0	4.0	9000	
Condition					12	2			1					
Sulphide Cl1 scav1										20-60	4.0	8.0	3000	
Condition					12	3			2					
Sulphide Cl1 Scav2										20-60	9.0	17.0	2600	
Condition						2			1					
Sulphide Cl2C1	5.6									20-30	1.5	1.5	4900	70
Condition						1			1					
Sulphide Cl2C2										20-30	3.0	4.5	3800	69
Condition						2			1					
Sulphide Cl2C3					5					20-50	5.0	9.5	1300	63
Condition						2			1					
Sulphide Cl2C4					10					20-50	5.0	14.5	1200	19
REAGENT TOTALS (g/t)		**93**	**732**	**199**	**229**	**64**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T14+15 Cl2Con1	3432.2	14.2	0.13	1.8	43.2	23.8	0.40	20.6	47.3	47.4	1.60	0.7	0.08	1.5
Cl2Con2	2628.6	10.9	0.20	2.2	42.6	17.9	0.56	22.1	42.1	32.3	2.38	0.8	0.10	1.4
Cl2Con3	813.2	3.4	0.54	1.8	38.7	5.0	1.89	23.1	31.6	7.5	9.26	1.0	0.22	1.0
Cl2Con4	231.1	1.0	1.00	0.9	32.9	1.2	2.25	7.8	23.5	1.6	19.0	0.6	0.39	0.5
Cl2 Tail	440.3	1.8	1.01	1.8	30.0	2.1	0.54	3.6	15.8	2.0	23.1	1.4	0.54	1.3
Cl1 Tail	1956.7	8.1	1.99	15.9	22.2	7.0	0.25	7.4	3.40	1.9	37.6	9.9	0.94	10.0
RoTail	14587.0	60.6	1.27	75.5	18.4	43.0	0.07	15.4	1.72	7.3	43.4	85.5	1.06	84.3
CALC	24089.0	100.0	1.01	100.0	25.9	100.0	0.28	100.0	14.2	100.0	30.7	100.0	0.76	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00			

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T14+15 Cl2Con1	3432.2	14.2	0.13	1.8	43.2	23.8	0.40	20.6	47.3	47.4	1.60	0.7	0.08	1.5
Cl2Con2	6060.8	25.2	0.16	4.0	42.9	41.7	0.47	42.8	45.0	79.7	1.94	1.6	0.09	2.9
Cl2Con3	6874.0	28.5	0.21	5.8	42.4	46.7	0.64	65.9	43.5	87.2	2.80	2.6	0.10	3.9
Cl2Con4	7105.1	29.5	0.23	6.7	42.1	48.0	0.69	73.7	42.8	88.7	3.33	3.2	0.11	4.4
Cl2 Tail	7545.4	31.3	0.28	8.5	41.4	50.1	0.68	77.3	41.2	90.8	4.48	4.6	0.14	5.7
Cl1 Tail	9502.1	39.4	0.63	24.5	37.5	57.0	0.59	84.6	33.4	92.7	11.3	14.5	0.30	15.7
FEED	24089.0	100.0	1.01	100.0	25.9	100.0	0.28	100.0	14.2	100.0	30.7	100.0	0.76	100.0

PRODUCTS	WT g	WT %	MgO %	DIST	Al2O3 %	DIST	MnO %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T14+15 Cl2Con1	3432.2	14.2	0.13	0.7	0.36	0.8	0.02	0.7	0.21	33.2	1.70	38.1	1.04	20.0
Cl2Con2	2628.6	10.9	0.22	0.9	0.44	0.8	0.04	1.0	0.26	31.5	2.30	39.5	3.17	46.7
Cl2Con3	813.2	3.4	0.67	0.8	1.29	0.7	0.14	1.1	0.21	7.9	1.18	6.3	5.62	25.6
Cl2Con4	231.1	1.0	1.27	0.4	2.75	0.4	0.27	0.6	0.15	1.6	0.67	1.0	2.07	2.7
Cl2 Tail	440.3	1.8	2.07	1.4	5.30	1.6	0.36	1.5	0.10	2.0	0.76	2.2	1.00	2.5
Cl1 Tail	1956.7	8.1	2.60	7.8	6.27	8.2	0.61	11.6	0.04	3.6	0.27	3.4	0.24	2.6
RoTail	14587.0	60.6	3.96	88.0	9.03	87.6	0.59	83.5	0.03	20.2	0.10	9.5	0.00	0.0
CALC	24089.0	100.0	2.72	100.0	6.24	100.0	0.43	100.0	0.09	100.0	0.64	100.0	0.74	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	MnO %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T14+15 Cl2Con1	3432.2	14.2	0.13	0.7	0.36	0.8	0.02	0.7	0.21	33.2	1.70	38.1	1.04	20.0
Cl2Con2	6060.8	25.2	0.17	1.6	0.39	1.6	0.03	1.7	0.23	64.7	1.96	77.6	1.96	66.6
Cl2Con3	6874.0	28.5	0.23	2.4	0.50	2.3	0.04	2.8	0.23	72.6	1.87	83.8	2.40	92.2
Cl2Con4	7105.1	29.5	0.26	2.8	0.57	2.7	0.05	3.4	0.23	74.2	1.83	84.8	2.39	94.9
Cl2 Tail	7545.4	31.3	0.37	4.2	0.85	4.3	0.07	4.9	0.22	76.2	1.77	87.0	2.30	97.4
Cl1 Tail	9502.1	39.4	0.83	12.0	1.97	12.4	0.18	16.5	0.18	79.8	1.46	90.5	1.88	100.0
FEED	24089.0	100.0	2.72	100.0	6.24	100.0	0.43	100.0	0.09	100.0	0.64	100.0	0.74	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoTail+Cl1Tail Comb	16543.7	68.7	1.35	91.5	18.8	49.9	0.09	22.7	1.91	9.2	42.7	95.4	1.05	94.3
FEED		100.0	1.01	100.0	25.9	100.0	0.28	100.0	14.2	100.0	30.7	100.0	0.76	100.0

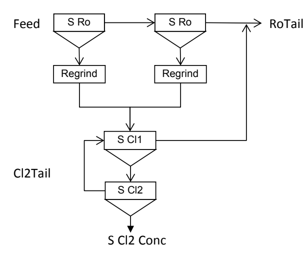
CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	MnO %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
RoTail+Cl1Tail Comb	16543.7	68.7	3.79	95.8	8.70	95.7	0.59	95.1	0.03	23.8	0.12	13.0	0.03	2.6
FEED		100.0	2.72	100.0	6.24	100.0	0.43	100.0	0.09	100.0	0.64	100.0	0.74	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	17215.0	71.5	1.34	94.2	19.3	53.3	0.13	34.1	2.56	12.8	41.9	97.4	1.02	96.1
FEED		100.0	1.01	100.0	25.9	100.0	0.28	100.0	14.2	100.0	30.7	100.0	0.76	100.0

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Large	Stirred
Media	type	MS ball	Sand
Media	kg	40	5
Solids	kg	12	2650
Water	kg	6	3000
Time	min/sec	17.5	9
Speed	rpm	50	1000
Lime	g	0	0
End pH	pH	6.4	6
End p80	µm	250	38

Float Cell	Volume	Regrind Power	
Rougher	30	Start	40227
Cleaner1	30	Finish	40272
Cleaner2	30	W/h	45.06
Speed	900	kWh/t	20.0



PROJECT	T0879
TEST NO	T16+T17
DATE	250614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
2*12Kg Test
Feed P80 250um

CuSO4 in Regrind
No Acid in Cleaners

	pH	0.5 GUAR g/t	98 H2SO4 g/t	6 CuSO4 g/t	1.5 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		737						2					
Condition		25		25					2					
Condition					30				1					
Sulphide Ro C1	5.4					17				20-30	3.0	3.0	4400	
Condition		13		25					2					
Condition					30				1					
Sulphide Ro C2						8				20-30	3.0	6.0	5000	
Condition		13		50					2					
Condition					25				1					
Sulphide Ro C3						4				20-50	3.0	9.0	2200	
Condition		13							2					
Condition					25				1					
Sulphide Ro C4						4				20-50	3.0	12.0	2200	
Condition		6							2					
Condition					15				1					
Sulphide Ro C5						6				20-60	4.0	16.0	2600	
Condition					15				2					
Sulphide Ro C6	5.2					6				20-60	4.0	20.0	2900	
Regrind				100										
Condition	5.4	25							1					
Condition					50	6			1					
Sulphide Cl1	5.4									20-60	5.0	5.0	9000	
Condition					13	2			1					
Sulphide Cl1 scav1										20-60	5.0	10.0	3000	
Condition					13	3			2					
Sulphide Cl1 Scav2										20-60	12.0	22.0	2600	
Condition						2			1					
Sulphide Cl2C1	5.6									20-30	1.5	1.5	4900	63
Condition						1			1					
Sulphide Cl2C2										20-30	3.0	4.5	3800	58
Condition						2			1					
Sulphide Cl2C3					5					20-50	5.0	9.5	1300	73
Condition						2			1					
Sulphide Cl2C4					10					20-50	5.0	14.5	1200	26
REAGENT TOTALS (g/t)		**94**	**737**	**200**	**231**	**64**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T16+17 Cl2Con1	3092.7	12.9	0.08	1.0	42.2	21.2	0.36	17.3	44.7	43.3	1.00	0.4	0.04	0.7
Cl2Con2	2214.6	9.2	0.13	1.2	42.3	15.2	0.52	17.9	41.2	28.6	1.39	0.4	0.17	2.1
Cl2Con3	955.3	4.0	0.18	0.7	45.4	7.0	1.21	18.0	37.6	11.3	2.70	0.3	0.09	0.5
Cl2Con4	309.2	1.3	0.41	0.5	41.6	2.1	2.92	14.0	33.2	3.2	7.60	0.3	0.16	0.3
Cl2 Tail	459.6	1.9	1.01	2.0	31.4	2.3	1.04	7.4	16.6	2.4	20.9	1.3	0.45	1.2
Cl1 Tail	2285.4	9.5	1.62	15.6	23.0	8.5	0.36	12.8	5.29	3.8	36.1	11.2	0.74	9.6
Ro Tail	14629.0	61.1	1.28	78.9	18.3	43.6	0.06	12.5	1.62	7.4	43.5	86.0	1.03	85.5
CALC	23945.8	100.00	0.99	100.0	25.7	100.0	0.27	100.0	13.3	100.0	30.9	100.0	0.73	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00			

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T16+17 Cl2Con1	3092.7	12.9	0.08	1.0	42.2	21.2	0.36	17.3	44.7	43.3	1.00	0.4	0.04	0.7
Cl2Con2	5307.3	22.2	0.10	2.3	42.2	36.4	0.43	35.2	43.2	71.9	1.16	0.8	0.09	2.9
Cl2Con3	6262.6	26.2	0.11	3.0	42.7	43.5	0.55	53.2	42.4	83.2	1.40	1.2	0.09	3.3
Cl2Con4	6571.8	27.4	0.13	3.5	42.7	45.6	0.66	67.3	41.9	86.4	1.69	1.5	0.10	3.6
Cl2 Tail	7031.4	29.4	0.18	5.5	41.9	47.9	0.68	74.7	40.3	88.8	2.94	2.8	0.12	4.8
Cl1 Tail	9316.8	38.9	0.54	21.1	37.3	56.4	0.60	87.5	31.7	92.6	11.1	14.0	0.27	14.5
FEED	23945.8	100.0	0.99	100.0	25.7	100.0	0.27	100.0	13.3	100.0	30.9	100.0	0.73	100.0

PRODUCTS	WT g	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T16+17 Cl2Con1	3092.7	12.9	0.10	0.5	0.19	0.4	0.01	0.3	0.22	33.6	1.84	40.5	2.00	35.6
Cl2Con2	2214.6	9.2	0.14	0.5	0.28	0.4	0.02	0.4	0.29	31.7	2.33	36.7	3.48	44.3
Cl2Con3	955.3	4.0	0.31	0.5	0.51	0.3	0.04	0.4	0.16	7.6	0.78	5.3	2.38	13.1
Cl2Con4	309.2	1.3	0.73	0.3	1.26	0.3	0.10	0.3	0.13	2.0	0.52	1.1	0.95	1.7
Cl2 Tail	459.6	1.9	1.93	1.3	4.80	1.5	0.32	1.4	0.11	2.5	0.69	2.3	0.51	1.3
Cl1 Tail	2285.4	9.5	2.37	8.2	6.11	9.2	0.54	12.0	0.04	4.5	0.32	5.2	0.14	1.8
Ro Tail	14629.0	61.1	3.99	88.7	9.11	88.0	0.60	85.2	0.03	18.1	0.09	8.9	0.03	2.1
CALC	23945.8	100.00	2.75	100.0	6.33	100.0	0.43	100.0	0.08	100.0	0.59	100.0	0.73	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T16+17 Cl2Con1	3092.7	12.9	0.10	0.5	0.19	0.4	0.01	0.3	0.22	33.6	1.84	40.5	2.00	35.6
Cl2Con2	5307.3	22.2	0.12	0.9	0.23	0.8	0.01	0.7	0.25	65.4	2.04	77.2	2.62	79.9
Cl2Con3	6262.6	26.2	0.15	1.4	0.27	1.1	0.02	1.1	0.24	72.9	1.85	82.5	2.58	93.0
Cl2Con4	6571.8	27.4	0.17	1.7	0.32	1.4	0.02	1.4	0.23	74.9	1.79	83.7	2.50	94.7
Cl2 Tail	7031.4	29.4	0.29	3.1	0.61	2.8	0.04	2.8	0.22	77.4	1.72	85.9	2.37	96.1
Cl1 Tail	9316.8	38.9	0.80	11.3	1.96	12.0	0.16	14.8	0.18	81.9	1.37	91.1	1.83	97.9
FEED	23945.8	100.0	2.75	100.0	6.33	100.0	0.43	100.0	0.08	100.0	0.59	100.0	0.73	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoTail+Cl1Tail Comb	16914.3	70.6	1.33	94.5	19.0	52.1	0.10	25.3	2.12	11.2	42.5	97.2	0.99	95.2
FEED		100.0	0.99	100.0	25.7	100.0	0.27	100.0	13.3	100.0	30.9	100.0	0.73	100.0

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
RoTail+Cl1Tail Comb	16914.3	70.6	3.77	96.9	8.70	97.2	0.59	97.2	0.03	22.6	0.12	14.1	0.04	3.9
FEED		100.0	2.75	100.0	6.33	100.0	0.43	100.0	0.08	100.0	0.59	100.0	0.73	100.0

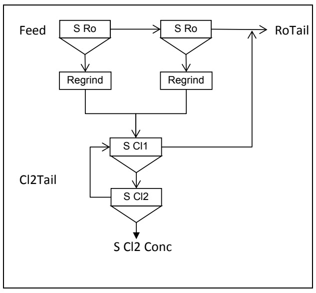
CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	17683.2	73.8	1.30	97.0	19.7	56.5	0.17	46.8	3.04	16.8	41.3	98.8	0.96	96.7
FEED		100.0	0.99	100.0	25.7	100.0	0.27	100.0	13.3	100.0	30.9	100.0	0.73	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Large	Stirred
Media	type	MS ball	Sand
Media	kg	40	5
Solids	kg	12	2678
Water	kg	6	3000
Time	min/sec	17.5	7
Speed	rpm	50	1000
Lime	g	0	0
End pH	pH	6.4	6
End p80	µm	250	38

Float Cell	Volume	Regrind Power	
Rougher	30	Start	40334
Cleaner1	30	Finish	40375
Cleaner2	30	W/h	40.97
Speed	900	kWh/t	18



PROJECT	T0879
TEST NO	T18+T19
DATE	270614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
2*12Kg Test
Feed P80 250um
CuSO4 in Regrind
No Acid in Cleaners

	pH	0.5 GUAR g/t	98 H2SO4 g/t	6 CuSO4 g/t	1.5 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		734						2					
Condition		25		25					2					
Condition					30				1					
Sulphide Ro C1	5.4					16				20-30	3.0	3.0	2200	
Condition		12		25					2					
Condition					30				1					
Sulphide Ro C2						8				20-30	3.0	6.0	2500	
Condition		12		50					2					
Condition					25				1					
Sulphide Ro C3						4				20-50	3.0	9.0	1100	
Condition		12							2					
Condition					25				1					
Sulphide Ro C4						4				20-50	3.0	12.0	1100	
Condition		6							2					
Condition					15				1					
Sulphide Ro C5						6				20-60	4.0	16.0	1300	
Condition					15				2					
Sulphide Ro C6	5.2					6				20-60	4.0	20.0	1450	
Regrind				100										
Condition	5.4	25							1					
Condition					50	6			1					
Sulphide Cl1	5.4									20-60	5.0	5.0	9000	
Condition					12	2			1					
Sulphide Cl1 scav1										20-60	5.0	10.0	3000	
Condition					12	3			2					
Sulphide Cl1 Scav2										20-60	12.0	22.0	3000	
Condition						2			1					
Sulphide Cl2C1	5.6									20-30	1.5	1.5	5000	62
Condition						1			1					
Sulphide Cl2C2										20-30	3.0	4.5	4000	62
Condition						2			1					
Sulphide Cl2C3					5					20-50	5.0	9.5	2000	58
Condition						2			1					
Sulphide Cl2C4					10					20-50	5.0	14.5	1200	22
REAGENT TOTALS (g/t)		94	734	200	230	64								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T18+19 Cl2Con1	3109.0	12.9	0.08	1.1	42.6	21.2	0.39	17.3	47.3	42.2	0.86	0.4	0.05	0.9
Cl2Con2	2463.4	10.2	0.13	1.4	42.7	16.9	0.45	15.8	44.0	31.1	1.23	0.4	0.06	0.9
Cl2Con3	1158.4	4.8	0.19	1.0	43.8	8.1	1.14	18.9	38.9	12.9	2.97	0.5	0.10	0.7
Cl2Con4	260.7	1.1	0.59	0.7	38.4	1.6	4.48	16.7	28.9	2.2	11.0	0.4	0.23	0.4
Cl2 Tail	413.7	1.7	1.03	1.9	30.0	2.0	0.79	4.7	15.3	1.8	22.2	1.3	0.52	1.3
Cl1 Tail	2081.2	8.7	1.64	14.9	23.1	7.7	0.37	11.0	4.81	2.9	35.2	10.1	0.77	9.4
Ro Tail	14549.9	60.5	1.25	79.1	18.2	42.4	0.08	15.6	1.66	6.9	43.6	87.0	1.01	86.5
CALC	24036.4	100.0	0.95	100.0	25.9	100.0	0.29	100.0	14.5	100.0	30.3	100.0	0.71	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T18+19 Cl2Con1	3109.0	12.9	0.08	1.1	42.6	21.2	0.39	17.3	47.3	42.2	0.86	0.4	0.05	0.9
Cl2Con2	5572.4	23.2	0.10	2.5	42.6	38.1	0.42	33.1	45.8	73.3	1.02	0.8	0.05	1.8
Cl2Con3	6730.8	28.0	0.12	3.4	42.8	46.3	0.54	52.0	44.6	86.2	1.36	1.3	0.06	2.5
Cl2Con4	6991.5	29.1	0.13	4.1	42.7	47.9	0.69	68.7	44.1	88.4	1.72	1.6	0.07	2.8
Cl2 Tail	7405.2	30.8	0.18	6.0	42.0	49.9	0.69	73.4	42.4	90.2	2.86	2.9	0.09	4.1
Cl1 Tail	9486.5	39.5	0.50	20.9	37.8	57.6	0.62	84.4	34.2	93.1	9.96	13.0	0.24	13.5
FEED	24036.4	100.0	0.95	100.0	25.9	100.0	0.29	100.0	14.5	100.0	30.3	100.0	0.71	100.0

PRODUCTS	WT g	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T18+19 Cl2Con1	3109.0	12.9	0.08	0.4	0.21	0.4	0.02	0.6	0.25	38.2	2.11	41.3	1.79	29.3
Cl2Con2	2463.4	10.2	0.14	0.5	0.27	0.4	0.03	0.7	0.27	32.7	2.35	36.4	3.14	40.7
Cl2Con3	1158.4	4.8	0.33	0.6	0.56	0.4	0.05	0.6	0.16	9.1	0.95	6.9	3.87	23.6
Cl2Con4	260.7	1.1	1.11	0.4	1.85	0.3	0.16	0.4	0.10	1.3	0.48	0.8	1.12	1.5
Cl2 Tail	413.7	1.7	2.17	1.4	5.43	1.5	0.37	1.5	0.07	1.4	0.56	1.5	0.45	1.0
Cl1 Tail	2081.2	8.7	2.47	7.9	6.23	8.5	0.57	11.7	0.03	3.1	0.27	3.5	0.12	1.3
Ro Tail	14549.9	60.5	3.95	88.7	9.22	88.4	0.59	84.5	0.02	14.3	0.11	9.6	0.03	2.7
CALC	24036.4	100.0	2.70	100.0	6.32	100.0	0.42	100.0	0.08	100.0	0.66	100.0	0.79	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T18+19 Cl2Con1	3109.0	12.9	0.08	0.4	0.21	0.4	0.02	0.6	0.25	38.2	2.11	41.3	1.79	29.3
Cl2Con2	5572.4	23.2	0.11	0.9	0.24	0.9	0.02	1.3	0.26	70.8	2.22	77.7	2.39	69.9
Cl2Con3	6730.8	28.0	0.14	1.5	0.29	1.3	0.03	1.9	0.24	79.9	2.00	84.6	2.64	93.5
Cl2Con4	6991.5	29.1	0.18	2.0	0.35	1.6	0.03	2.3	0.24	81.2	1.94	85.4	2.59	95.1
Cl2 Tail	7405.2	30.8	0.29	3.3	0.63	3.1	0.05	3.8	0.23	82.6	1.86	86.8	2.47	96.0
Cl1 Tail	9486.5	39.5	0.77	11.3	1.86	11.6	0.17	15.5	0.18	85.7	1.51	90.4	1.95	97.3
FEED	24036.4	100.0	2.70	100.0	6.32	100.0	0.42	100.0	0.08	100.0	0.66	100.0	0.79	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoTail+Cl1Tail Comb	16631.1	69.2	1.30	94.0	18.8	50.1	0.11	26.6	2.06	9.8	42.6	97.1	0.98	95.9
FEED		100.0	0.95	100.0	25.9	100.0	0.29	100.0	14.5	100.0	30.3	100.0	0.71	100.0

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
RoTail+Cl1Tail Comb	16631.1	69.2	3.77	96.7	8.85	96.9	0.59	96.2	0.02	17.4	0.13	13.2	0.05	4.0
FEED		100.0	2.70	100.0	6.32	100.0	0.42	100.0	0.08	100.0	0.66	100.0	0.79	100.0

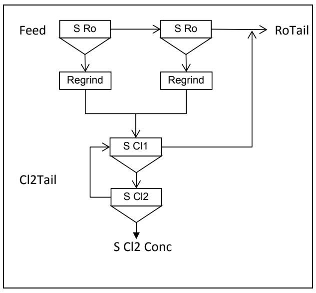
CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	17305.6	72.0	1.28	96.6	19.4	53.7	0.19	48.0	2.78	13.8	41.6	98.7	0.96	97.5
FEED		100.0	0.95	100.0	25.9	100.0	0.29	100.0	14.5	100.0	30.3	100.0	0.71	100.0

ALS Metallurgy

BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	Large	Stirred
Media	type	MS ball	Sand
Media	kg	40	5
Solids	kg	12	2678
Water	kg	6	3000
Time	min/sec	17.5	7
Speed	rpm	50	1000
Lime	g	0	0
End pH	pH	6.4	6
End p80	µm	250	38

Float Cell	Volume	Regrind Power	
Rougher	30	Start	40334
Cleaner1	30	Finish	40375
Cleaner2	30	W/h	40.97
Speed	900	kWh/t	18



PROJECT	T0879
TEST NO	T20+T21
DATE	300614
TECHNICIAN	MJR

PRODUCT FLOATED
Severn Ore Comp
SBC

NOTES
2*12Kg Test
Feed P80 250um

CuSO4 in Regrind
No Acid in Cleaners

	pH	0.5 GUAR g/t	98 H2SO4 g/t	6 CuSO4 g/t	1.5 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		734						2					
Condition		25		25					2					
Condition					30				1					
Sulphide Ro C1	5.4					16				20-30	3.0	3.0	2200	
Condition		12		25					2					
Condition					30				1					
Sulphide Ro C2						8				20-30	3.0	6.0	2500	
Condition		12		50					2					
Condition					25				1					
Sulphide Ro C3						4				20-50	3.0	9.0	1100	
Condition		12							2					
Condition					25				1					
Sulphide Ro C4						4				20-50	3.0	12.0	1100	
Condition		6							2					
Condition					15				1					
Sulphide Ro C5						6				20-60	4.0	16.0	1300	
Condition					15				2					
Sulphide Ro C6	5.2					6				20-60	4.0	20.0	1450	
Regrind				100										
Condition	5.4	25							1					
Condition					50	6			1					
Sulphide Cl1	5.4									20-60	5.0	5.0	9000	
Condition					12	2			1					
Sulphide Cl1 scav1										20-60	5.0	10.0	3000	
Condition					12	3			2					
Sulphide Cl1 Scav2										20-60	12.0	22.0	3000	
Condition						2			1					
Sulphide Cl2C1	5.6									20-30	1.5	1.5	5000	63
Condition						1			1					
Sulphide Cl2C2										20-30	3.0	4.5	4000	59
Condition						2			1					
Sulphide Cl2C3					5					20-50	5.0	9.5	2000	56
Condition						2			1					
Sulphide Cl2C4					10					20-50	5.0	14.5	1200	18
REAGENT TOTALS (g/t)		**94**	**734**	**200**	**230**	**64**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T20+21 Cl2Con1	3173.3	13.2	0.09	1.2	42.3	21.6	0.39	18.4	46.9	43.8	0.91	0.4	0.04	0.7
Cl2Con2	2371.2	9.9	0.14	1.4	42.9	16.4	0.53	18.6	43.6	30.4	1.29	0.4	0.06	0.8
Cl2Con3	1121.1	4.7	0.22	1.1	44.6	8.1	1.47	24.4	39.3	13.0	3.46	0.5	0.10	0.6
Cl2Con4	212.8	0.9	0.52	0.5	38.2	1.3	2.97	9.4	30.1	1.9	10.9	0.3	0.23	0.3
Cl2 Tail	348.3	1.4	1.08	1.6	30.0	1.7	0.91	4.7	13.7	1.4	23.5	1.1	0.54	1.1
Cl1 Tail	2055.9	8.6	1.74	15.4	22.9	7.6	0.30	9.1	4.06	2.5	35.4	10.0	0.80	9.5
Ro Tail	14759.9	61.4	1.24	78.8	18.3	43.4	0.07	15.3	1.65	7.1	43.0	87.2	1.02	86.9
CALC	24042.5	100.0	0.97	100.0	25.8	100.0	0.28	100.0	14.1	100.0	30.2	100.0	0.72	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00			

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
T20+21 Cl2Con1	3173.3	13.2	0.09	1.2	42.3	21.6	0.39	18.4	46.9	43.8	0.91	0.4	0.04	0.7
Cl2Con2	5544.5	23.1	0.11	2.7	42.6	38.0	0.45	37.0	45.5	74.2	1.07	0.8	0.05	1.6
Cl2Con3	6665.6	27.7	0.13	3.7	42.9	46.0	0.62	61.4	44.4	87.1	1.47	1.4	0.06	2.2
Cl2Con4	6878.4	28.6	0.14	4.2	42.8	47.4	0.69	70.8	44.0	89.0	1.77	1.7	0.06	2.5
Cl2 Tail	7226.7	30.1	0.19	5.8	42.1	49.0	0.70	75.5	42.5	90.4	2.81	2.8	0.09	3.6
Cl1 Tail	9282.6	38.6	0.53	21.2	37.9	56.6	0.61	84.7	34.0	92.9	10.0	12.8	0.24	13.1
FEED	24042.5	100.0	0.97	100.0	25.8	100.0	0.28	100.0	14.1	100.0	30.2	100.0	0.72	100.0

PRODUCTS	WT g	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T20+21 Cl2Con1	3173.3	13.2	0.11	0.5	0.24	0.5	0.01	0.3	0.24	37.1	2.20	45.8	2.08	36.0
Cl2Con2	2371.2	9.9	0.13	0.5	0.30	0.5	0.02	0.5	0.26	30.1	2.14	33.3	3.40	43.9
Cl2Con3	1121.1	4.7	0.37	0.6	0.68	0.5	0.06	0.7	0.17	9.3	0.87	6.4	2.62	16.0
Cl2Con4	212.8	0.9	1.27	0.4	1.97	0.3	0.15	0.3	0.11	1.1	0.47	0.7	0.40	0.5
Cl2 Tail	348.3	1.4	2.37	1.3	5.54	1.3	0.39	1.3	0.08	1.4	0.48	1.1	0.27	0.5
Cl1 Tail	2055.9	8.6	2.58	8.1	6.28	8.5	0.58	11.6	0.03	3.0	0.22	3.0	0.06	0.7
Ro Tail	14759.9	61.4	3.95	88.6	9.13	88.5	0.60	85.4	0.03	18.0	0.10	9.7	0.03	2.4
CALC	24042.5	100.0	2.73	100.0	6.33	100.0	0.43	100.0	0.09	100.0	0.63	100.0	0.76	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
T20+21 Cl2Con1	3173.3	13.2	0.11	0.5	0.24	0.5	0.01	0.3	0.24	37.1	2.20	45.8	2.08	36.0
Cl2Con2	5544.5	23.1	0.12	1.0	0.27	1.0	0.01	0.8	0.25	67.2	2.17	79.2	2.64	79.9
Cl2Con3	6665.6	27.7	0.16	1.6	0.34	1.5	0.02	1.4	0.24	76.5	1.95	85.6	2.64	95.9
Cl2Con4	6878.4	28.6	0.20	2.0	0.39	1.7	0.03	1.7	0.23	77.6	1.91	86.2	2.57	96.4
Cl2 Tail	7226.7	30.1	0.30	3.3	0.63	3.0	0.04	3.1	0.22	79.0	1.84	87.3	2.46	96.9
Cl1 Tail	9282.6	38.6	0.80	11.4	1.88	11.5	0.16	14.6	0.18	82.0	1.48	90.3	1.93	97.6
FEED	24042.5	100.0	2.73	100.0	6.33	100.0	0.43	100.0	0.09	100.0	0.63	100.0	0.76	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoTail+Cl1Tail Comb	16815.8	69.9	1.30	94.2	18.8	51.0	0.10	24.5	1.94	9.6	42.0	97.2	0.99	96.4
FEED		100.0	0.97	100.0	25.8	100.0	0.28	100.0	14.1	100.0	30.2	100.0	0.72	100.0

CUM PRODUCTS	CUM Wt	WT %	MgO %	DIST	Al2O3 %	DIST	Mn %	DIST	Cu %	DIST	Pb %	DIST	Zn %	DIST
RoTail+Cl1Tail Comb	16815.8	69.9	3.78	96.7	8.78	97.0	0.59	96.9	0.03	21.0	0.11	12.7	0.03	3.1
FEED		100.0	2.73	100.0	6.33	100.0	0.43	100.0	0.09	100.0	0.63	100.0	0.76	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	CaO %	DIST
RoT, Con4 Comb	17376.9	72.3	1.29	96.3	19.3	54.0	0.15	38.6	2.52	12.9	41.3	98.6	0.97	97.8
FEED		100.0	0.97	100.0	25.8	100.0	0.28	100.0	14.1	100.0	30.2	100.0	0.72	100.0

Calcuated heads

Test	Sn %	Sn Acid Sol ppm	Fe %	As %	S %	SiO2 %	CaO %	MgO %	Al2O3 %	Mn %	Cu %	Pb %	Zn %
T02	1.01		26.28	0.27	15.12	29.50	0.67	2.70	6.11	0.34			
T03	1.01		26.20	0.28	14.95	29.73	0.67	2.68	6.22	0.33			
T04	1.01		26.48	0.28	15.10	29.71	0.71	2.76	6.34	0.34			
T05	1.04		26.25	0.28	14.68	29.85	0.71	2.79	6.37	0.35			
T06	1.01		26.43	0.28	15.24	29.38	0.69	2.72	6.03	0.34			
T07	0.98		25.81	0.27	14.08	30.54	0.72	2.79	6.56	0.45			
T08	1.00		25.87	0.27	14.81	30.01	0.68	2.75	6.35	0.43			
T09	1.01		26.10	0.28	14.83	29.98	0.69	2.75	6.21	0.44			
T10	0.97		26.41	0.27	14.38	29.92	0.69	2.71	6.13	0.44			
T11	1.02		25.90	0.27	14.18	30.11	0.74	2.81	6.40	0.45			
T12	1.02	166	26.13	0.28	14.77	30.18	0.73	2.77	6.30	0.43	0.09	0.62	0.77
T13	1.03	174	26.16	0.29	14.57	30.28	0.72	2.72	6.35	0.43	0.09	0.65	0.81
T14+T15	1.01		25.90	0.28	14.23	30.71	0.76	2.72	6.24	0.43	0.09	0.64	0.74
T16+T17	0.99		25.70	0.27	13.33	30.89	0.73	2.75	6.33	0.43	0.08	0.59	0.73
T18+T19	0.95		25.94	0.29	14.50	30.33	0.71	2.70	6.32	0.42	0.08	0.66	0.79
T20+T21	0.97		25.83	0.28	14.14	30.24	0.72	2.73	6.33	0.43	0.09	0.63	0.76
Average	1.00	170	26.1	0.28	14.6	30.1	0.71	2.74	6.29	0.40	0.09	0.63	0.77

Sn %	Sn Acid Sol ppm	Fe %	As %	S %	SiO_2 %	CaO %	MgO %	Al_2O_3 %	Mn %	Cu %	Pb %	Zn %
1.00	170	26.1	0.28	14.6	30.1	0.71	2.74	6.29	0.40	0.09	0.63	0.77

TEST	Ore	Primary Grind P80 (um)	pH	ROUGHER H2SO4	GUAR	CuSO4	PAX	MIBC	pH	Regrind kWh/t	Regrind Ball (min)	Regrind CuSO4	Regrind P80 (um)	CLEANER H2SO4	GUAR	CuSO4	PAX	MIBC	pH	RoTail Size(um	NOTES
T02	SBC	100	6.70	1601	226	100	130	69	5.4											104	Standard Rougher Float
T03	SBC	130	6.72	1375	225	100	130	69	5.4											131	Standard Rougher Float
T04	SBC	160	6.69	1273	225	100	130	69	5.4											185	Standard Rougher Float
T05	SBC	240	6.73	1133	226	100	131	70	5.4											278	Standard Rougher Float
T06	SBC	240	6.75	1037	227	101	131	70	5.4											258	Standard Rougher Float
T07	SBC	250	6.60	718	229	102	143	71	5.3	20		0	26	195	102	25	85	43	4.9		Stirred Mill Regrind (slow cleaner float response)
T08	SBC	250	6.75	1091	228	101	142	70	5.4	20		76	25	174	101	0	84	43	4.8		Stirred Mill Regrind (slow cleaner float response)
T09	SBC	250	6.80	932	225	100	140	69	5.4		8.50	0	67	417	100	25	40	42	5.2		Ball Mill Regrind (Fast cleaner float response)
T10	SBC	250	6.65	950	225	100	140	69	5.4		12.45	0	54	710	100	25	30	42	5.0		Ball Mill Regrind (Medium cleaner float response)
T11	SBC	250	6.00	956	226	101	141	82	5.5		20.00	0	41	986	101	25	40	25	5.0		Ball Mill Regrind (Medium cleaner float response)
T12	SBC	250	6.40	872	226	101	141	70	5.4	10		101	37	0	101	0	85	55	5.7		Stirred Mill Regrind (Fast cleaner float response)
T13	SBC	250	6.45	858	225	100	140	69	5.5	20		100	25	0	100	0	85	57	5.7		Stirred Mill Regrind (Fast cleaner float response)
T14/T15	SBC	250	6.40	732	68	100	139	45	5.4	15		100	82	0	25	0	90	18	5.6		
T16/T17	SBC	250	6.40	732	68	100	139	45	5.4	18		100	38	0	25	0	90	18	5.6		
T18/T19	SBC	250	6.40	732	68	100	139	45	5.4	18		100	38	0	25	0	90	18	5.6		
T20/T21	SBC	250	6.40	732	68	100	139	45	5.4	18		100	38	0	25	0	90	18	5.6		

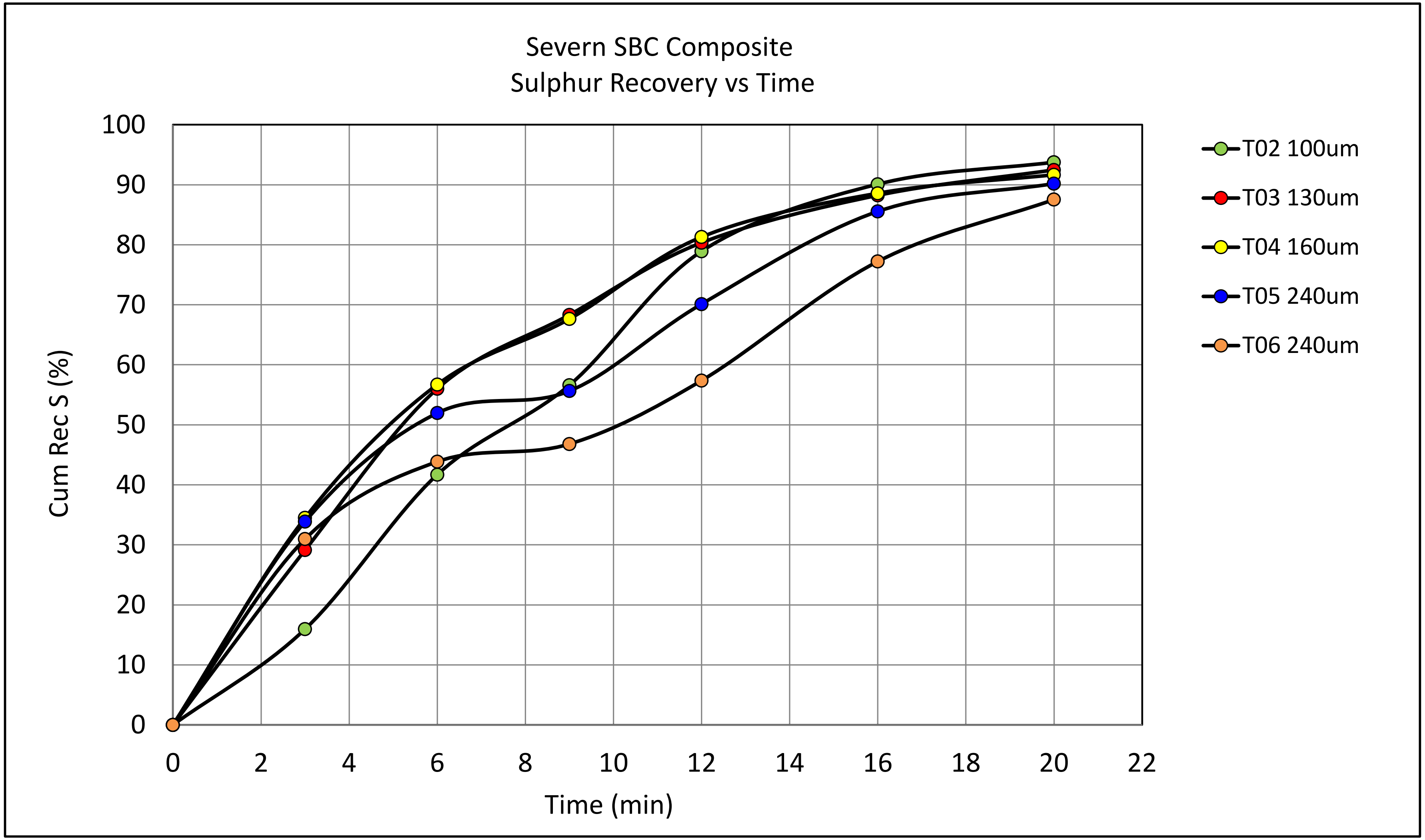
TEST	Product	WT %	Sn %	Dist %	Fe %	Dist %	As %	Dist %	S %	Dist %	SiO2 %	Dist %	CaO %	Dist %	MgO %	Dist %	Al2O3 %	Dist %	Mn %	Dist %	Cu %	Dist %	Pb %	Dist %	Zn %	Dist %	Sn Acid Sol ppm	Dist %
T02	RoCon	37.1	0.32	11.9	39.75	56.1	0.57	76.9	38.25	93.8	7.08	8.9	0.19	10.3	0.72	9.9	1.65	10.0	0.10	10.5								
T03	RoCon	36.4	0.35	12.5	39.81	55.4	0.62	81.5	37.95	92.5	7.10	8.7	0.19	10.2	0.69	9.4	1.70	9.9	0.10	10.5								
T04	RoCon	36.4	0.36	12.9	39.88	54.9	0.64	83.9	37.98	91.7	7.04	8.6	0.19	10.0	0.71	9.4	1.66	9.6	0.10	10.9								
T05	RoCon	34.2	0.34	11.1	40.21	52.4	0.64	78.8	38.73	90.2	6.26	7.2	0.17	8.3	0.62	7.6	1.45	7.8	0.09	8.8								
T06	RoCon	34.0	0.34	11.6	40.07	51.5	0.65	80.8	39.25	87.5	6.23	7.2	0.16	7.9	0.59	7.4	1.31	7.4	0.09	8.8								
T07	Cl2Con	20.1	0.11	2.3	42.88	33.4	0.29	21.9	44.43	63.4	1.43	0.9	0.04	1.2	0.19	1.4	0.37	1.1	0.03	1.6								
T08	Cl2Con	22.0	0.10	2.3	42.87	36.5	0.38	30.7	45.27	67.3	1.90	1.4	0.06	1.9	0.25	2.0	0.63	2.2	0.03	1.7								
T09	Cl2Con	29.7	0.22	6.6	42.04	47.8	0.70	74.2	43.66	87.4	2.95	2.9	0.10	4.3	0.25	2.7	0.57	2.7	0.07	4.6								
T10	Cl2Con	25.8	0.18	4.7	42.07	41.2	0.56	53.5	42.12	75.7	2.25	1.9	0.10	3.8	0.22	2.1	0.44	1.8	0.06	3.5								
T11	Cl1Con	18.0	0.16	2.8	40.30	28.0	0.52	35.2	43.00	54.6	3.31	2.0	0.13	3.2	0.39	2.5	0.88	2.5	0.06	2.4								
T12	Cl2Con	29.2	0.15	4.4	42.68	47.8	0.67	69.5	44.78	88.6	2.06	2.0	0.07	2.9	0.25	2.7	0.47	2.2	0.04	2.5	0.23	75.2	1.85	87.0	2.53	96.0	334	58.8
T13	Cl2Con	28.8	0.11	3.1	42.86	47.2	0.56	56.3	44.55	88.1	1.99	1.9	0.09	3.7	0.20	2.1	0.45	2.0	0.03	2.2	0.23	76.3	1.95	86.5	2.64	93.8	340	56.4
T14/T15	Cl2Con	29.5	0.23	6.7	42.13	48.0	0.69	73.7	42.81	88.7	3.33	3.2	0.11	4.4	0.26	2.8	0.57	2.7	0.05	3.4	0.23	74.2	1.83	84.8	2.39	94.9		
T16/T17	Cl2Con	27.4	0.13	3.5	42.67	45.6	0.66	67.3	41.95	86.4	1.69	1.5	0.10	3.6	0.17	1.7	0.32	1.4	0.02	1.4	0.23	74.9	1.79	83.7	2.50	94.7		
T18/T19	Cl2Con	29.1	0.13	4.1	42.68	47.9	0.69	68.7	44.06	88.4	1.72	1.6	0.07	2.8	0.18	2.0	0.35	1.6	0.03	2.3	0.24	81.2	1.94	85.4	2.59	95.1		
T20/T21	Cl2Con	28.6	0.14	4.2	42.75	47.4	0.69	70.8	44.00	89.0	1.77	1.7	0.06	2.5	0.20	2.0	0.39	1.7	0.03	1.7	0.23	77.6	1.91	86.2	2.57	96.4		

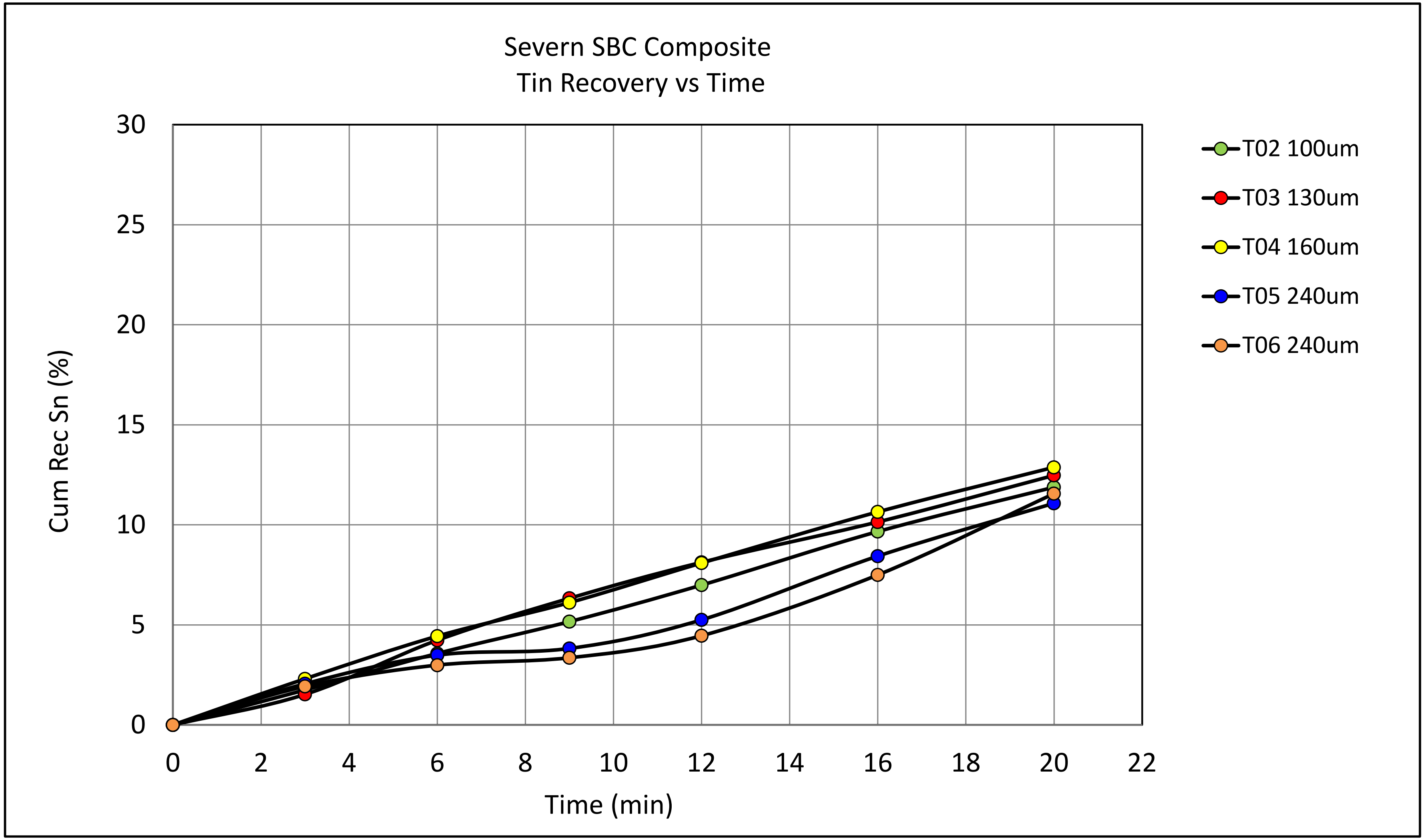
TEST	Product	WT %	Sn %	Dist %	Fe %	Dist %	As %	Dist %	S %	Dist %	SiO2 %	Dist %	CaO %	Dist %	MgO %	Dist %	Al2O3 %	Dist %	Mn %	Dist %	Cu %	Dist %	Pb %	Dist %	Zn %	Dist %	Sn Acid Sol ppm	Dist %
T02	RoTail	62.9	1.41	88.1	18.35	43.9	0.10	23.1	1.50	6.2	42.70	91.1	0.96	89.7	3.87	90.1	8.73	90.0	0.48	89.5								
T03	RoTail	63.6	1.39	87.5	18.40	44.6	0.08	18.5	1.77	7.5	42.70	91.3	0.95	89.8	3.82	90.6	8.82	90.1	0.47	89.5								
T04	RoTail	63.6	1.38	87.1	18.80	45.1	0.07	16.1	1.98	8.3	42.70	91.4	1.00	90.0	3.93	90.6	9.02	90.4	0.48	89.1								
T05	RoTail	65.8	1.40	88.9	19.00	47.6	0.09	21.2	2.19	9.8	42.10	92.8	0.99	91.7	3.92	92.4	8.93	92.2	0.49	91.2								
T06	RoTail	66.0	1.35	88.4	19.40	48.5	0.08	19.2	2.88	12.5	41.30	92.8	0.96	92.1	3.81	92.6	8.46	92.6	0.47	91.2								
T07	RoT/Cl1tail	77.1	1.22	96.5	21.06	63.0	0.24	69.9	5.64	30.9	38.69	97.7	0.90	97.5	3.52	97.3	8.26	97.1	0.56	97.1								
T08	RoT/Cl1tail	74.7	1.29	96.2	20.52	59.2	0.21	59.2	5.22	26.3	38.95	96.9	0.88	96.5	3.54	96.1	8.13	95.5	0.56	96.7								
T09	RoT/Cl1tail	69.1	1.35	92.5	19.19	50.8	0.09	23.4	2.45	11.4	41.69	96.0	0.94	94.6	3.83	96.1	8.64	96.0	0.60	94.4								
T10	RoT/Cl1tail	71.5	1.27	93.9	20.35	55.1	0.14	36.0	3.77	18.7	40.57	96.9	0.92	95.1	3.66	96.5	8.29	96.7	0.58	95.3								
T11	RoT/Cl1tail	82.0	1.20	97.2	22.74	72.0	0.21	64.8	7.86	45.4	35.99	98.0	0.87	96.8	3.34	97.5	7.61	97.5	0.53	97.6								
T12	RoT/Cl1tail	69.1	1.38	94.0	19.10	50.5	0.11	26.8	2.15	10.0	42.16	96.5	1.00	95.6	3.85	95.8	8.75	95.9	0.60	96.0	0.03	23.7	0.11	12.1	0.04	3.6	96	40.0
T13	RoT/Cl1tail	69.7	1.41	95.6	19.23	51.2	0.15	37.0	2.25	10.7	42.05	96.8	0.97	95.0	3.77	96.5	8.76	96.2	0.59	96.4	0.03	22.9	0.12	12.6	0.07	5.7	106	42.6
T14/T15	RoT/Cl1tail	68.7	1.35	91.5	18.83	49.9	0.09	22.7	1.91	9.2	42.67	95.4	1.05	94.3	3.79	95.8	8.70	95.7	0.59	95.1	0.03	23.8	0.12	13.0	0.03	2.6		
T16/T17	RoT/Cl1tail	70.6	1.33	94.5	18.96	52.1	0.10	25.3	2.12	11.2	42.50	97.2	0.99	95.2	3.77	96.9	8.70	97.2	0.59	97.2	0.03	22.6	0.12	14.1	0.04	3.9		
T18/T19	RoT/Cl1tail	69.2	1.30	94.0	18.80	50.1	0.11	26.6	2.06	9.8	42.55	97.1	0.98	95.9	3.77	96.7	8.85	96.9	0.59	96.2	0.02	17.4	0.13	13.2	0.05	4.0		
T20/T21	RoT/Cl1tail	69.9	1.30	94.2	18.82	51.0	0.10	24.5	1.94	9.6	42.03	97.2	0.99	96.4	3.78	96.7	8.78	97.0	0.59	96.9	0.03	21.0	0.11	12.7	0.03	3.1		

Blend For Gravity Circuit

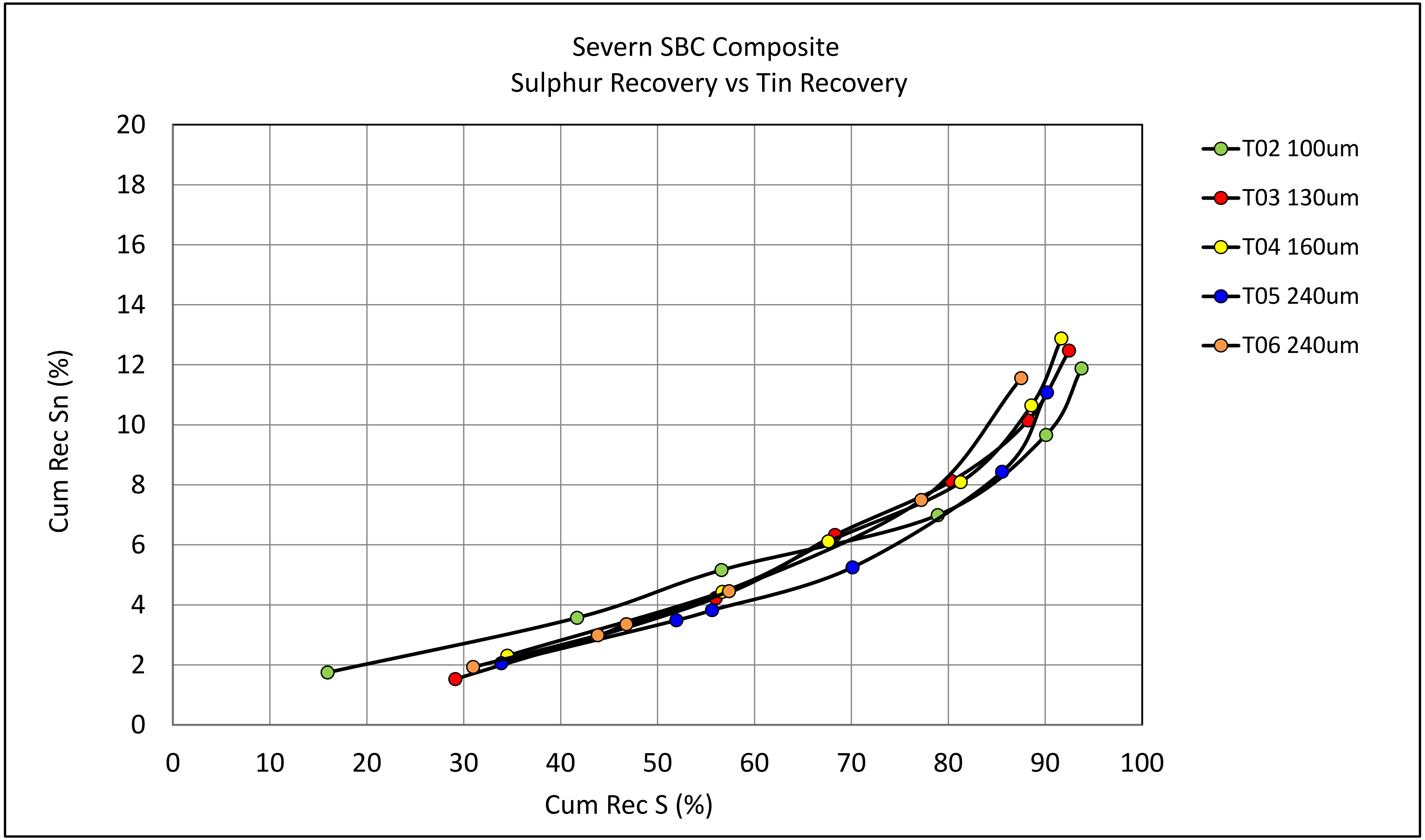
TEST	Product	WT %	WT gm	Sn %	Dist %	Fe %	Dist %	As %	Dist %	S %	Dist %	SiO2 %	Dist %	CaO %	Dist %
T07	RoT/Cl1tail	1.9	1515.4	1.22	96.5	21.06	63.0	0.24	69.9	5.64	30.9	38.69	97.7	0.90	97.5
T08	RoT/Cl1tail	1.8	1475.2	1.29	96.2	20.52	59.2	0.21	59.2	5.22	26.3	38.95	96.9	0.88	96.5
T09	RoT, Con4	1.8	1422.5	1.33	94.1	19.54	53.3	0.11	29.1	2.92	14.0	41.11	97.6	0.93	96.2
T10	RoT/Cl1tail	1.8	1429.8	1.27	93.9	20.35	55.1	0.14	36.0	3.77	18.7	40.57	96.9	0.92	95.1
T11	RoT/Cl1tail	2.0	1630.3	1.20	97.2	22.74	72.0	0.21	64.8	7.86	45.4	35.99	98.0	0.87	96.8
T12	RoT, Con4	1.8	1429.0	1.36	96.2	19.54	53.7	0.15	38.7	2.76	13.4	41.37	98.4	0.99	97.5
T13	RoT, Con4	1.8	1451.2	1.38	97.4	19.75	54.8	0.23	58.6	3.09	15.4	41.05	98.4	0.95	96.6
T14/T15	RoT, Con4	21.5	17215.0	1.34	94.2	19.30	53.3	0.13	34.1	2.56	12.8	41.85	97.4	1.02	96.1
T16/T17	RoT, Con4	22.1	17683.2	1.30	97.0	19.68	56.5	0.17	46.8	3.04	16.8	41.33	98.8	0.96	96.7
T18/T19	RoT, Con4	21.6	17305.6	1.28	96.6	19.36	53.7	0.19	48.0	2.78	13.8	41.59	98.7	0.96	97.5
T20/T21	RoT, Con4	21.7	17376.9	1.29	96.3	19.28	54.0	0.15	38.6	2.52	12.9	41.27	98.6	0.97	97.8
Total		**100.0**	**79934.1**	**1.30**	**96.0**	**19.55**	**55.0**	**0.16**	**43.1**	**2.96**	**15.4**	**41.26**	**98.3**	**0.97**	**97.0**

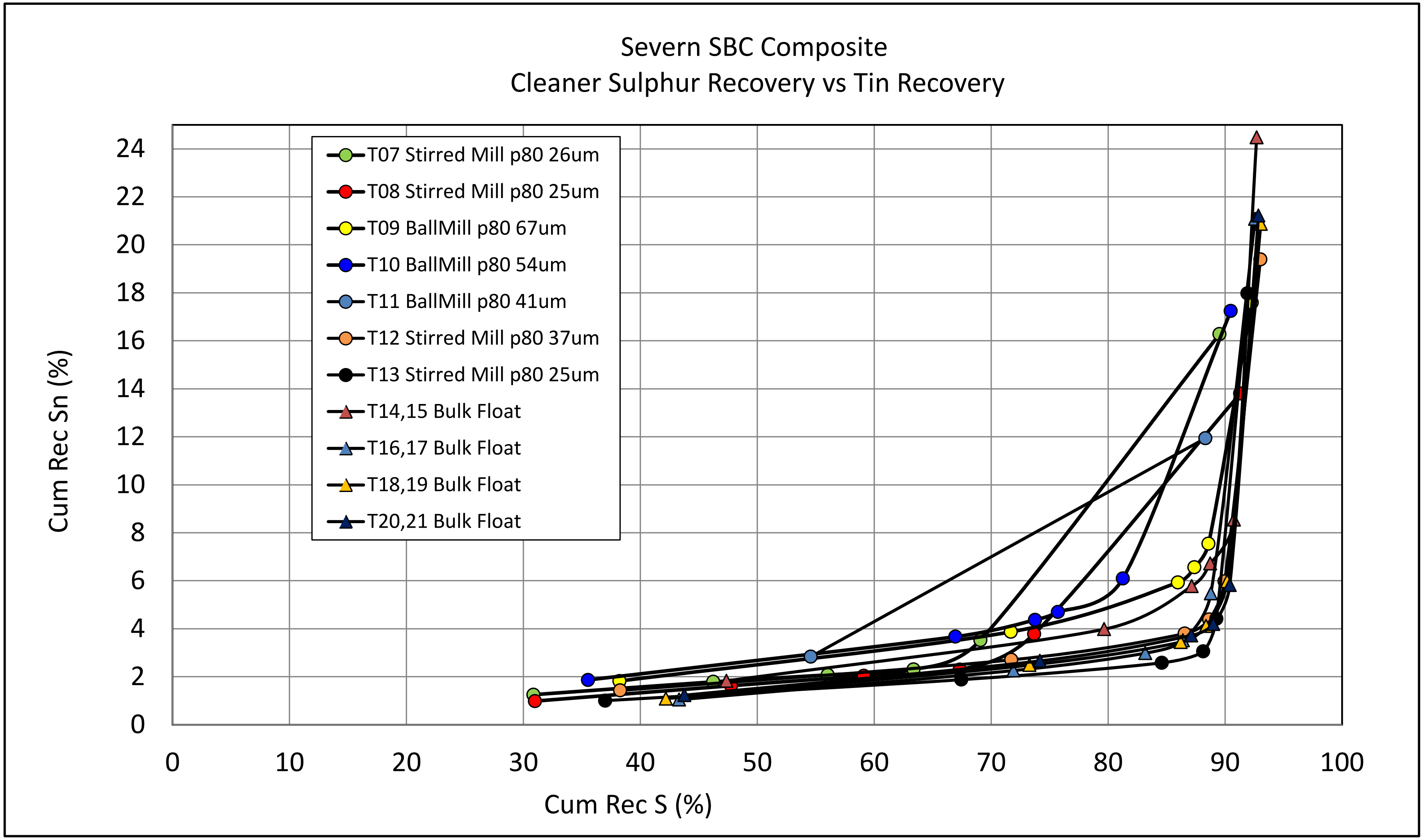
Target 3% Sulphur


Severn SBC Composite
Sulphur Recovery vs Time
Cum Rec S (%)
Time (min)
0
10
20
30
40
50
60
70
80
90
100
0
2
4
6
8
10
12
14
16
18
20
22
T02 100um
T03 130um
T04 160um
T05 240um
T06 240um

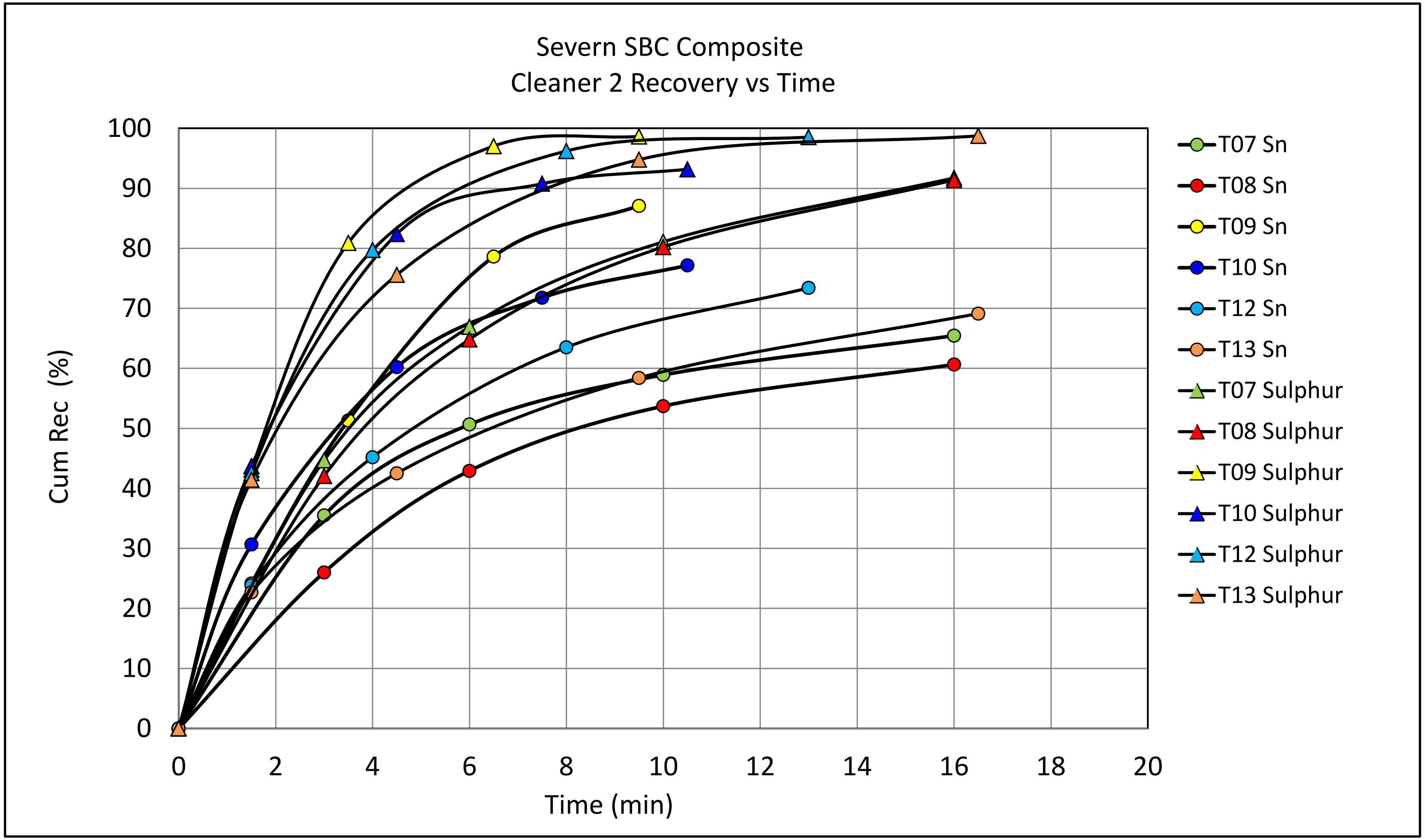


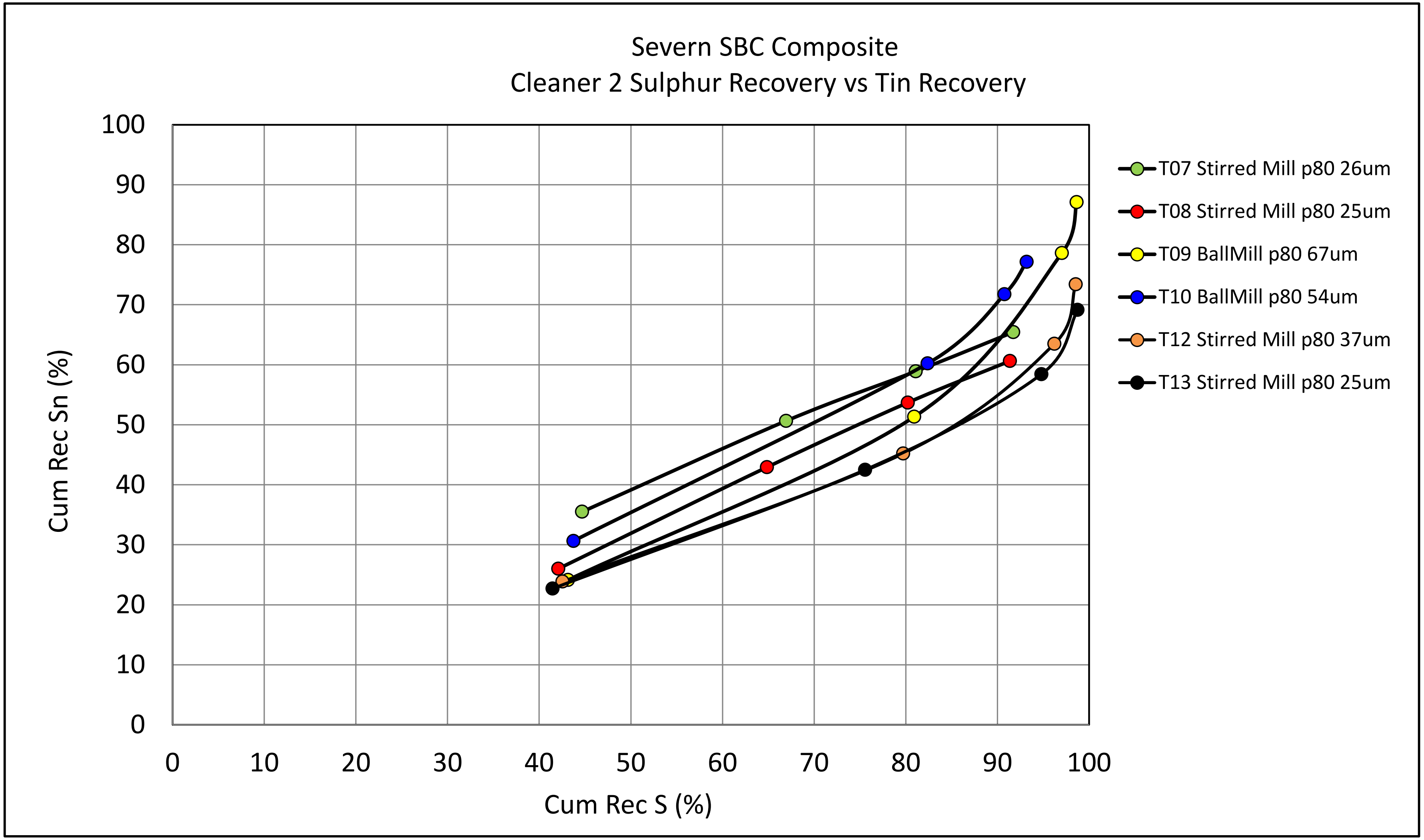
Severn SBC Composite
Tin Recovery vs Time
Cum Rec Sn (%)
Time (min)
0
5
10
15
20
25
30
0
2
4
6
8
10
12
14
16
18
20
22
T02 100um
T03 130um
T04 160um
T05 240um
T06 240um


Severn SBC Composite
Sulphur Recovery vs Tin Recovery
Cum Rec Sn (%)
Cum Rec S (%)
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40
50
60
70
80
90
100
T02 100um
T03 130um
T04 160um
T05 240um
T06 240um

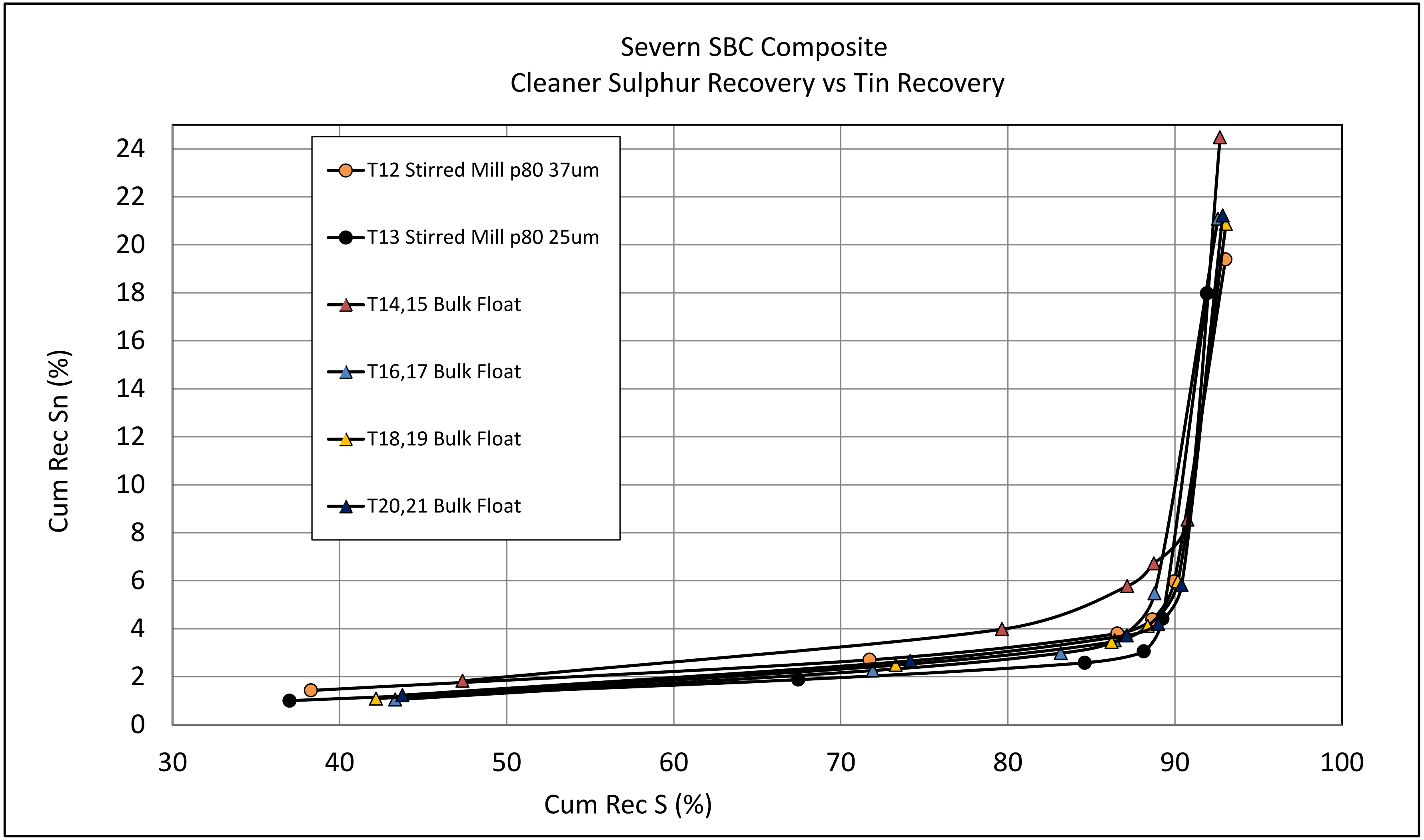


Severn SBC Composite
Cleaner Sulphur Recovery vs Tin Recovery
T07 Stirred Mill p80 26um
T08 Stirred Mill p80 25um
T09 BallMill p80 67um
T10 BallMill p80 54um
T11 BallMill p80 41um
T12 Stirred Mill p80 37um
T13 Stirred Mill p80 25um
T14,15 Bulk Float
T16,17 Bulk Float
T18,19 Bulk Float
T20,21 Bulk Float
Cum Rec Sn (%)
Cum Rec S (%)
0
2
4
6
8
10
12
14
16
18
20
22
24
0
10
20
30
40
50
60
70
80
90
100


Severn SBC Composite
Cleaner 2 Recovery vs Time
Cum Rec (%)
Time (min)
0
10
20
30
40
50
60
70
80
90
100
0
2
4
6
8
10
12
14
16
18
20
T07 Sn
T08 Sn
T09 Sn
T10 Sn
T12 Sn
T13 Sn
T07 Sulphur
T08 Sulphur
T09 Sulphur
T10 Sulphur
T12 Sulphur
T13 Sulphur



Severn SBC Composite
Cleaner 2 Sulphur Recovery vs Tin Recovery
Cum Rec Sn (%)
Cum Rec S (%)
0
10
20
30
40
50
60
70
80
90
100
T07 Stirred Mill p80 26um
T08 Stirred Mill p80 25um
T09 BallMill p80 67um
T10 BallMill p80 54um
T12 Stirred Mill p80 37um
T13 Stirred Mill p80 25um

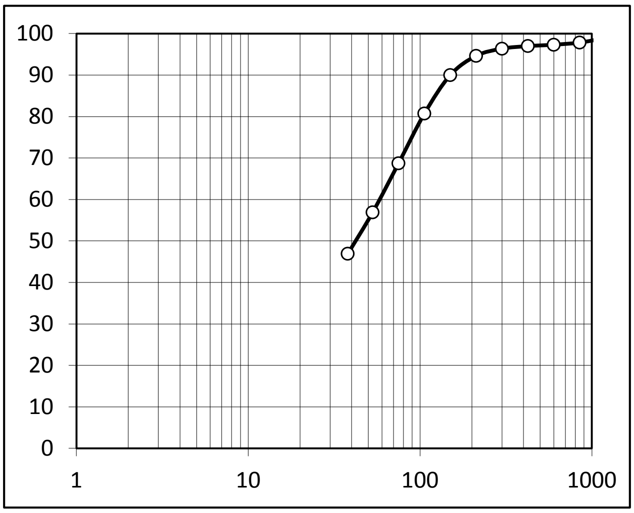

Severn SBC Composite
Cleaner Sulphur Recovery vs Tin Recovery
Cum Rec Sn (%)
Cum Rec S (%)
T12 Stirred Mill p80 37um
T13 Stirred Mill p80 25um
T14,15 Bulk Float
T16,17 Bulk Float
T18,19 Bulk Float
T20,21 Bulk Float
0
2
4
6
8
10
12
14
16
18
20
22
24
30
40
50
60
70
80
90
100

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	RoTail
FROM TEST	T02
DATE	260514
TECHNICIAN	MS

RoTail T02	SIZE um	WEIGHTS gm	 (%)	 %PASS
p80	1700	0.00	0.00	100.0
	1180	2.55	1.11	98.9
	850	2.44	1.06	97.8
	600	1.18	0.51	97.3
	425	0.78	0.34	97.0
	300	1.40	0.61	96.4
	212	4.02	1.74	94.6
	150	10.67	4.63	90.0
	106	21.42	9.29	80.7
104	75	27.62	11.97	68.8
	53	27.30	11.84	56.9
	38	23.04	9.99	46.9
	SUB	108.24	46.93	0.0
	TOTAL	230.66	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	ppm	dist	%	dist
600	2.67	1.25	2.4	18.75	2.8	0.17	4.2	8.25	13.2	43.30	2.7	0.21	1.2
212	2.69	0.44	0.9	12.50	1.8	0.08	2.0	2.34	3.8	55.70	3.5	0.17	1.0
150	4.63	0.44	1.5	14.55	3.7	0.07	3.0	2.06	5.7	53.30	5.8	0.30	3.1
106	9.29	0.70	4.7	16.40	8.4	0.11	9.5	2.08	11.5	48.80	10.6	0.40	8.2
75	11.97	1.22	10.6	17.45	11.5	0.16	17.7	1.90	13.6	47.10	13.2	0.47	12.4
<75	68.75	1.61	80.0	19.00	71.8	0.10	63.6	1.27	52.2	40.10	64.3	0.49	74.1
CALC	100.00	1.38	100.0	18.19	100.0	0.11	100.0	1.67	100.0	42.86	100.0	0.45	100.0
ASSAY		1.38		18.20		0.11		1.69		43.00		0.47	

ANALYSES

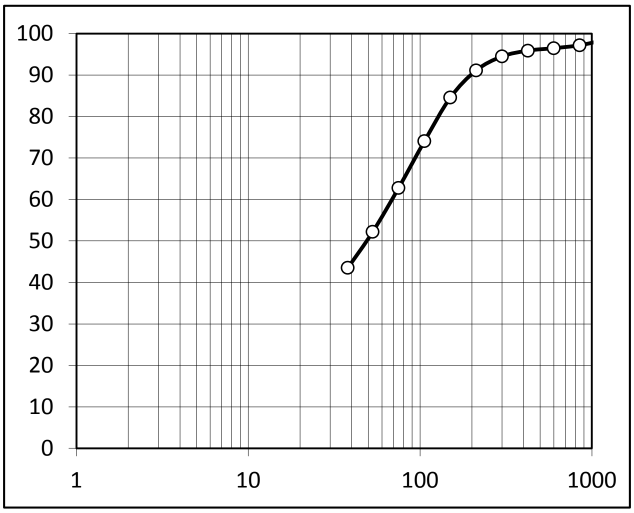
SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
600	2.67	0.57	1.6	2.59	1.8	9.46	2.9
212	2.69	0.65	1.8	3.53	2.5	9.75	3.0
150	4.63	0.66	3.2	3.74	4.6	9.18	4.8
106	9.29	0.78	7.6	3.62	8.9	8.15	8.6
75	11.97	0.89	11.2	3.54	11.2	7.65	10.4
<75	68.75	1.03	74.5	3.92	71.1	9.07	70.5
CALC	100.00	0.95	100.0	3.79	100.0	8.85	100.0
ASSAY		0.96		3.82		8.89	

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	RoTail
FROM TEST	T03
DATE	260514
TECHNICIAN	MS

RoTail T03	SIZE um	WEIGHTS gm	(%)	%PASS
p80	1700	0.00	0.00	100.0
	1180	3.19	1.52	98.5
	850	2.71	1.29	97.2
	600	1.49	0.71	96.5
	425	1.23	0.58	95.9
	300	2.96	1.41	94.5
	212	7.10	3.37	91.1
	150	13.80	6.56	84.6
131	106	22.16	10.53	74.0
	75	23.70	11.26	62.8
	53	22.32	10.60	52.2
	38	18.25	8.67	43.5
	SUB	91.59	43.51	0.0
	TOTAL	210.50	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	ppm	dist	%	dist
600	3.51	0.91	2.4	18.00	3.4	0.16	6.4	7.75	14.2	46.00	3.8	0.16	1.2
212	5.36	0.43	1.7	14.25	4.1	0.06	3.7	2.60	7.3	53.50	6.7	0.22	2.6
150	6.56	0.62	3.0	16.15	5.7	0.10	7.5	2.57	8.8	49.60	7.6	0.36	5.1
106	10.53	0.97	7.6	17.30	9.8	0.10	12.0	2.31	12.7	47.60	11.7	0.43	9.8
75	11.26	1.47	12.3	17.80	10.8	0.10	12.9	1.85	10.9	45.90	12.0	0.49	12.0
<75	62.78	1.57	73.1	19.50	66.1	0.08	57.5	1.40	46.0	39.90	58.3	0.51	69.4
CALC	100.00	1.35	100.0	18.52	100.0	0.09	100.0	1.91	100.0	42.97	100.0	0.46	100.0
ASSAY		1.35		18.25		0.09		1.92		43.00		0.46	

ANALYSES

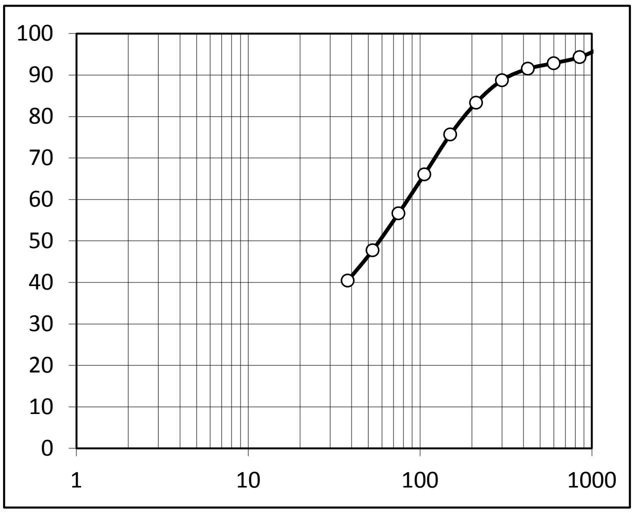
SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
600	3.51	0.52	1.9	2.78	2.5	9.40	3.7
212	5.36	0.62	3.5	3.55	5.0	9.32	5.7
150	6.56	0.71	4.9	3.63	6.2	8.54	6.3
106	10.53	0.80	8.9	3.55	9.7	7.86	9.4
75	11.26	0.94	11.2	3.48	10.2	7.40	9.4
<75	62.78	1.04	69.4	4.05	66.3	9.19	65.4
CALC	100.00	0.94	100.0	3.83	100.0	8.82	100.0
ASSAY		0.95		3.85		8.82	

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	RoTail
FROM TEST	T04
DATE	260514
TECHNICIAN	MS

RoTail	SIZE	WEIGHTS		
T04	um	gm	(%)	%PASS
p80	1700	0.00	0.00	100.0
	1180	8.03	3.07	96.9
	850	6.82	2.61	94.3
	600	3.81	1.46	92.9
	425	3.52	1.35	91.5
	300	7.19	2.75	88.8
	212	14.23	5.44	83.3
185	150	20.08	7.67	75.7
	106	25.16	9.61	66.1
	75	24.55	9.38	56.7
	53	23.28	8.90	47.8
	38	19.25	7.36	40.4
	SUB	105.76	40.42	0.0
	TOTAL	261.68	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	ppm	dist	%	dist
600	7.13	1.02	5.4	20.00	7.6	0.24	19.4	9.81	28.5	42.30	7.1	0.20	3.2
212	9.53	0.57	4.0	15.25	7.8	0.06	6.5	3.45	13.4	51.10	11.5	0.26	5.5
150	7.67	0.84	4.7	16.90	6.9	0.09	7.8	2.80	8.8	48.30	8.7	0.39	6.6
106	9.61	1.15	8.1	17.35	8.9	0.08	8.7	2.16	8.5	47.80	10.8	0.46	9.8
75	9.38	1.59	11.0	17.95	9.0	0.06	6.4	1.64	6.3	46.40	10.2	0.52	10.8
<75	56.67	1.60	66.8	19.75	59.8	0.08	51.3	1.50	34.6	38.80	51.7	0.51	64.1
CALC	100.00	1.36	100.0	18.72	100.0	0.09	100.0	2.45	100.0	42.53	100.0	0.45	100.0
ASSAY		1.31		18.30		0.07		2.37		42.80		0.45	

ANALYSES

SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
600	7.13	0.59	4.5	2.60	4.9	8.46	6.9
212	9.53	0.63	6.4	3.48	8.8	8.70	9.5
150	7.67	0.74	6.0	3.50	7.1	8.03	7.1
106	9.61	0.86	8.8	3.51	9.0	7.76	8.6
75	9.38	0.99	9.9	3.52	8.8	7.34	7.9
<75	56.67	1.07	64.4	4.08	61.4	9.22	60.0
CALC	100.00	0.94	100.0	3.77	100.0	8.71	100.0
ASSAY		0.94		3.73		8.78	

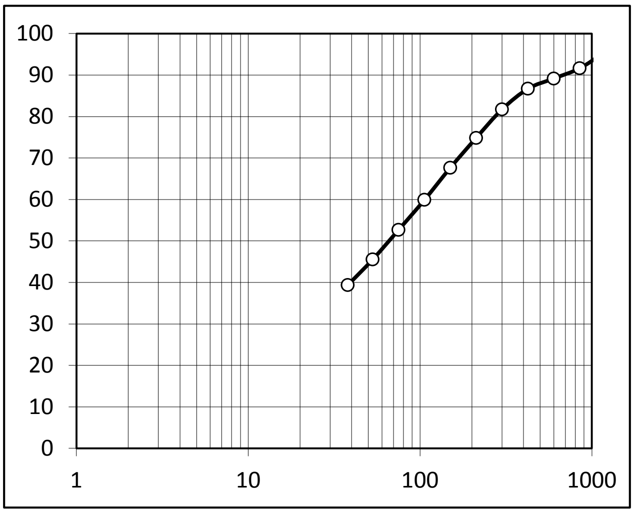
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	RoTail
FROM TEST	T05
DATE	260514
TECHNICIAN	MS

RoTail	SIZE	WEIGHTS		
T05	um	gm	(%)	%PASS
p80	1700	0.00	0.00	100.0
	1180	10.66	4.50	95.5
	850	9.13	3.86	91.6
	600	5.84	2.47	89.2
	425	5.82	2.46	86.7
	300	11.79	4.98	81.7
278	212	16.31	6.89	74.8
	150	17.02	7.19	67.7
	106	18.37	7.76	59.9
	75	17.11	7.23	52.7
	53	16.89	7.13	45.5
	38	14.62	6.18	39.4
	SUB	93.20	39.36	0.0
	TOTAL	236.76	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	ppm	dist	%	dist
600	10.83	0.98	7.9	20.80	11.7	0.17	19.0	10.40	36.6	40.70	10.5	0.20	4.9
212	14.33	0.71	7.6	17.00	12.7	0.11	16.2	4.20	19.6	48.90	16.7	0.31	10.0
150	7.19	1.00	5.4	17.30	6.5	0.09	6.7	2.77	6.5	48.40	8.3	0.42	6.8
106	7.76	1.31	7.6	17.70	7.1	0.07	5.6	2.25	5.7	47.00	8.7	0.48	8.4
75	7.23	1.75	9.4	18.25	6.9	0.05	3.7	1.86	4.4	45.60	7.8	0.52	8.4
<75	52.67	1.58	62.1	20.10	55.1	0.09	48.8	1.59	27.3	38.30	48.0	0.52	61.6
CALC	100.00	1.34	100.0	19.21	100.0	0.10	100.0	3.07	100.0	42.01	100.0	0.44	100.0
ASSAY		1.32		19.10		0.08		3.21		41.70		0.44	

ANALYSES

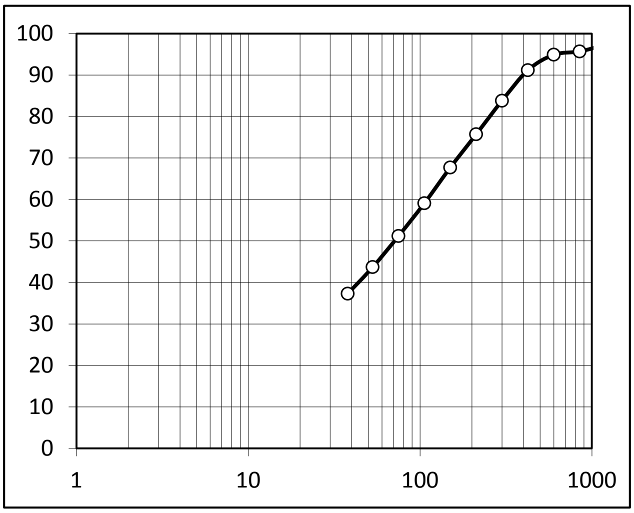
SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
600	10.83	0.59	6.9	2.67	7.7	7.78	9.8
212	14.33	0.66	10.2	3.47	13.3	8.28	13.9
150	7.19	0.79	6.1	3.55	6.8	7.64	6.4
106	7.76	0.89	7.5	3.45	7.2	7.37	6.7
75	7.23	0.99	7.7	3.39	6.6	6.79	5.7
<75	52.67	1.08	61.5	4.14	58.4	9.34	57.5
CALC	100.00	0.92	100.0	3.73	100.0	8.56	100.0
ASSAY		0.94		3.81		8.53	

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	RoTail
FROM TEST	T06
DATE	270514
TECHNICIAN	MS

RoTail T06	SIZE um	WEIGHTS gm	(%)	%PASS
p80	1700	0.00	0.00	100.0
	1180	7.25	2.64	97.4
	850	4.54	1.65	95.7
	600	2.21	0.80	94.9
	425	10.17	3.70	91.2
	300	20.20	7.36	83.8
258	212	22.31	8.13	75.7
	150	21.98	8.00	67.7
	106	23.60	8.59	59.1
	75	21.71	7.91	51.2
	53	20.68	7.53	43.7
	38	17.47	6.36	37.3
	SUB	102.46	37.32	0.0
	TOTAL	274.58	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 ppm	SiO2 dist	MnO %	MnO dist
600	5.10	0.93	3.6	17.60	4.7	0.19	10.2	7.95	12.9	46.90	5.8	0.18	2.0
212	19.19	0.87	12.8	18.95	18.9	0.17	34.5	6.10	37.3	43.90	20.3	0.35	14.9
150	8.00	1.07	6.6	17.75	7.4	0.08	6.8	3.09	7.9	46.30	8.9	0.44	7.8
106	8.59	1.31	8.7	18.10	8.1	0.07	6.4	2.54	7.0	45.70	9.5	0.48	9.2
75	7.91	1.57	9.6	18.25	7.5	0.05	4.2	2.16	5.4	45.30	8.6	0.52	9.1
<75	51.21	1.49	58.7	20.10	53.5	0.07	37.9	1.80	29.4	38.10	47.0	0.50	56.9
CALC	100.00	1.30	100.0	19.25	100.0	0.09	100.0	3.13	100.0	41.54	100.0	0.45	100.0
ASSAY		1.30		1.00		0.05		3.30		41.40		0.45	

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist
600	5.10	0.66	3.6	2.44	3.4	8.65	5.2
212	19.19	0.70	14.5	3.27	17.1	7.64	17.3
150	8.00	0.87	7.5	3.47	7.6	7.66	7.2
106	8.59	0.94	8.7	3.49	8.2	7.54	7.7
75	7.91	1.02	8.7	3.44	7.4	7.29	6.8
<75	51.21	1.03	56.9	4.05	56.4	9.23	55.8
CALC	100.00	0.93	100.0	3.68	100.0	8.47	100.0
ASSAY		0.93		3.69		8.53	

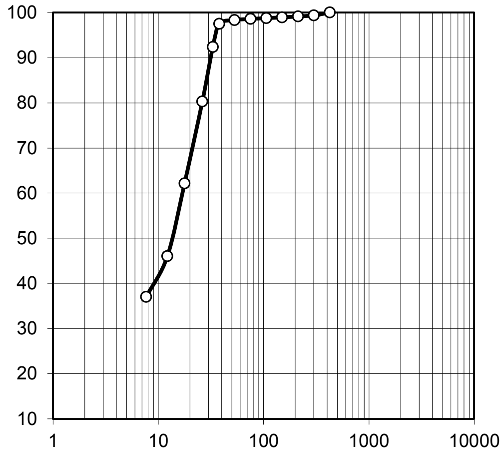
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regrind D/C 20kwh/t
TEST NO	T07
DATE	30614
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind D/C 20kwh/t		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.68	0.63	99.4	
		212	0.26	0.24	99.1	
		150	0.21	0.20	98.9	
		106	0.18	0.17	98.8	
		75	0.19	0.18	98.6	
		53	0.27	0.25	98.3	
		38	0.91	0.85	97.5	
CYCLOSIZER	CS1	33	5.49	5.11	92.4	
FLOW 185	CS2	26	13.00	12.10	80.3	
TEMP 21	CS3	18	19.46	18.12	62.2	**26**
SG **3.00**	CS4	12	17.33	16.14	46.0	
MINS 20	CS5	8	9.67	9.00	37.0	
CENTRIFUGE	0	4	0.00	0.00	37.0	
		SUB	39.75	37.0	0.0	
		TOTAL	107.40	100.00		



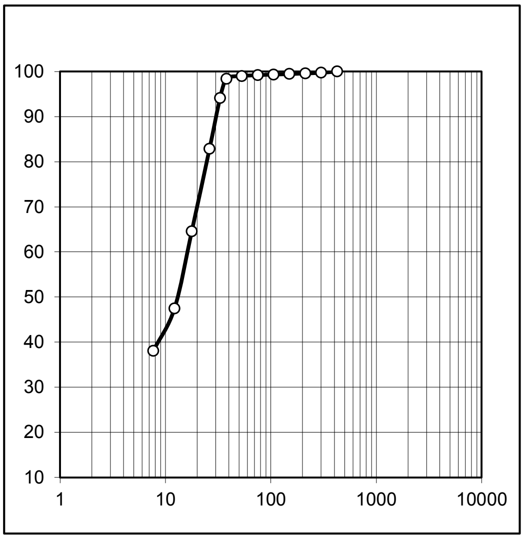
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regrind D/C 20kwh/t
TEST NO	T08
DATE	50614
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind D/C 20kwh/t		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.30	0.27	99.7	
		212	0.16	0.14	99.6	
		150	0.15	0.14	99.4	
		106	0.13	0.12	99.3	
		75	0.14	0.13	99.2	
		53	0.23	0.21	99.0	
		38	0.70	0.63	98.4	
CYCLOSIZER	CS1	33	4.70	4.25	94.1	
FLOW 185	CS2	26	12.44	11.24	82.9	
TEMP 21	CS3	18	20.27	18.32	64.5	**25**
SG **3.00**	CS4	12	18.89	17.07	47.5	
MINS 20	CS5	8	10.38	9.38	38.1	
CENTRIFUGE	0	4	0.00	0.00	38.1	
		SUB	42.14	38.1	0.0	
		TOTAL	110.63	100.00		

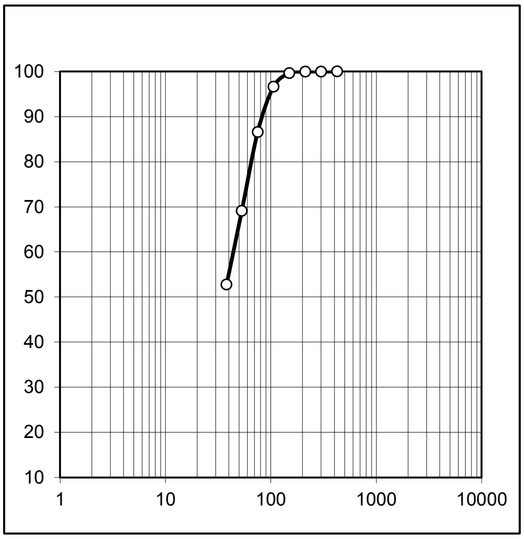


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regrind Ballmill D/C
TEST NO	T09
DATE	50614
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind Ballmill D/C		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.02	0.02	100.0	
		212	0.03	0.03	100.0	
		150	0.38	0.33	99.6	
		106	3.46	3.01	96.6	
		75	11.53	10.03	86.6	
		53	20.08	17.47	69.1	**67**
		38	18.80	16.35	52.8	
CYCLOSIZER	CS1	33	0.00	0.00	52.8	
FLOW 185	CS2	26	0.00	0.00	52.8	
TEMP 21	CS3	18	0.00	0.00	52.8	
SG **3.00**	CS4	12	0.00	0.00	52.8	
MINS 20	CS5	8	0.00	0.00	52.8	
CENTRIFUGE	0	4	0.00	0.00	52.8	
		SUB	60.66	52.8	0.0	
		TOTAL	114.96	100.00		



ALS Metallurgy

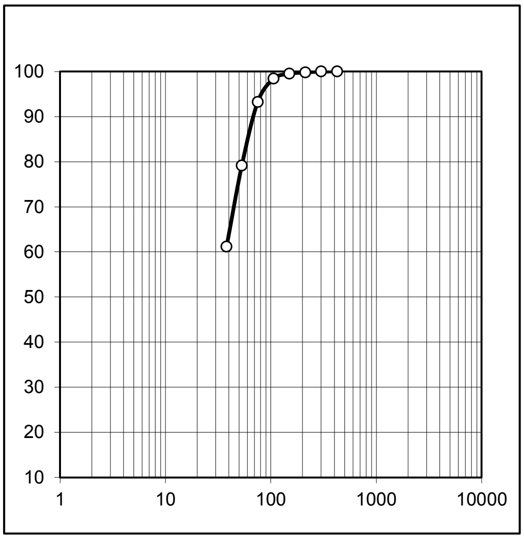
BURNIE LABORATORY

GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regrind Ballmill D/C
TEST NO	T10
DATE	60614
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind Ballmill D/C		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.19	0.21	99.8	
		150	0.26	0.29	99.5	
		106	1.00	1.10	98.4	
		75	4.70	5.15	93.3	
		53	12.86	14.10	79.2	**54**
		38	16.39	17.97	61.2	
CYCLOSIZER	CS1	33	0.00	0.00	61.2	
FLOW 185	CS2	26	0.00	0.00	61.2	
TEMP 21	CS3	18	0.00	0.00	61.2	
SG **3.00**	CS4	12	0.00	0.00	61.2	
MINS 20	CS5	8	0.00	0.00	61.2	
CENTRIFUGE	0	4	0.00	0.00	61.2	
		SUB	55.79	61.2	0.0	
		TOTAL	91.19	100.00		



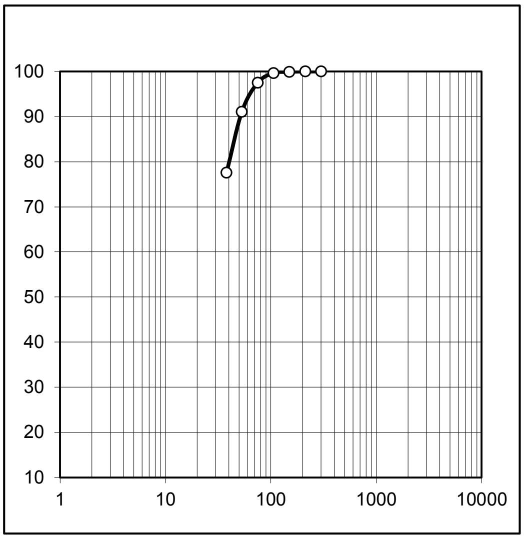
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regring DC ballmill
TEST NO	Comb T11
DATE	110614
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regring DC ballmill		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.08	0.08	99.9	
		106	0.27	0.26	99.7	
		75	2.19	2.14	97.5	
		53	6.61	6.47	91.0	
		38	13.74	13.46	77.6	**41**
CYCLOSIZER	CS1	33	0.00	0.00	77.6	
FLOW 185	CS2	26	0.00	0.00	77.6	
TEMP 21	CS3	18	0.00	0.00	77.6	
SG **3.00**	CS4	12	0.00	0.00	77.6	
MINS 20	CS5	8	0.00	0.00	77.6	
CENTRIFUGE	0	4	0.00	0.00	77.6	
		SUB	79.21	77.6	0.0	
		TOTAL	102.10	100.00		



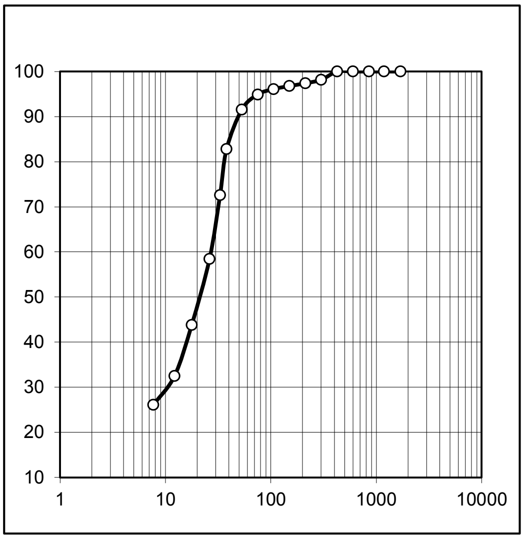
ALS Metallurgy

BURNIE LABORATORY

GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Regrind DC Ballmill
TEST NO	T12
DATE	170614
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind DC Ballmill		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	2.16	1.82	98.2	
		212	0.93	0.79	97.4	
		150	0.72	0.61	96.8	
		106	0.80	0.68	96.1	
		75	1.42	1.20	94.9	
		53	3.98	3.36	91.5	
		38	10.35	8.74	82.8	
CYCLOSIZER	CS1	33	12.07	10.19	72.6	**37**
FLOW 185	CS2	26	16.78	14.17	58.4	
TEMP 21	CS3	18	17.32	14.63	43.8	
SG **3.00**	CS4	12	13.40	11.32	32.5	
MINS 20	CS5	8	7.59	6.41	26.1	
CENTRIFUGE	0	4	0.00	0.00	26.1	
		SUB	30.90	26.1	0.0	
		TOTAL	118.42	100.00		

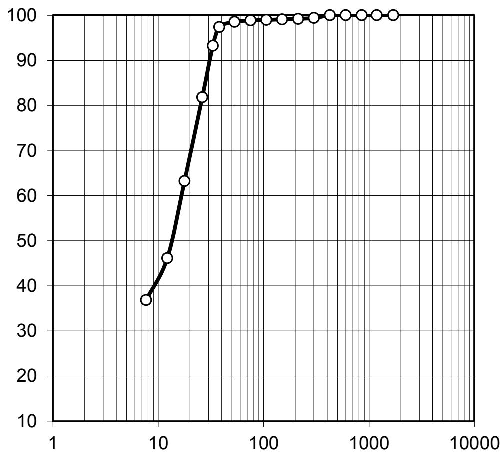


11

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Regrind DC Ballmill
TEST NO	T13
DATE	170614
TECHNICIAN	DK

SAMPLE SIZED			SIZE	WEIGHTS			P80
Regrind DC Ballmill			um	gm	(%)	% Pass	um
			1700	0.00	0.00	100.0	
			1180	0.00	0.00	100.0	
			850	0.00	0.00	100.0	
			600	0.00	0.00	100.0	
			425	0.00	0.00	100.0	
			300	0.70	0.60	99.4	
			212	0.21	0.18	99.2	
			150	0.15	0.13	99.1	
			106	0.13	0.11	99.0	
			75	0.16	0.14	98.8	
			53	0.33	0.28	98.6	
			38	1.40	1.20	97.4	
CYCLOSIZER		CS1	33	4.83	4.12	93.2	
FLOW	185	CS2	26	13.35	11.40	81.9	
TEMP	21	CS3	18	21.78	18.59	63.3	**25**
SG	**3.00**	CS4	12	20.03	17.10	46.2	
MINS	20	CS5	8	10.88	9.29	36.9	
CENTRIFUGE		0	4	0.00	0.00	36.9	
			SUB	43.19	36.9	0.0	
			TOTAL	117.14	100.00		



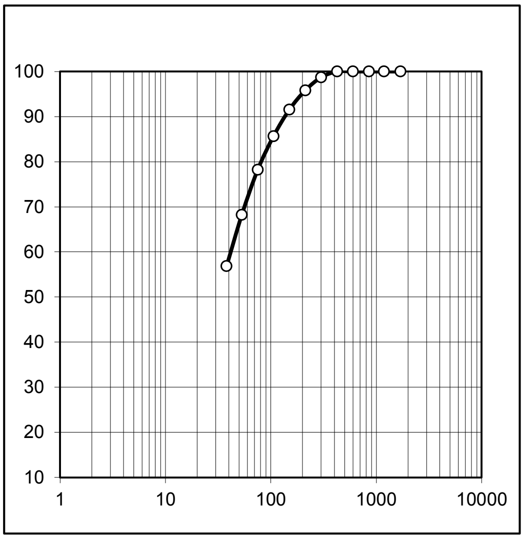
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regrind DC
TEST NO	T14-T15
DATE	220614
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind DC		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	1.76	1.29	98.7	
		212	3.95	2.90	95.8	
		150	5.79	4.24	91.6	
		106	8.05	5.90	85.7	
		75	10.18	7.46	78.2	**82**
		53	13.60	9.97	68.2	
		38	15.52	11.38	56.9	
CYCLOSIZER	CS1	33	0.00	0.00	56.9	
FLOW 185	CS2	26	0.00	0.00	56.9	
TEMP 21	CS3	18	0.00	0.00	56.9	
SG **3.00**	CS4	12	0.00	0.00	56.9	
MINS 20	CS5	8	0.00	0.00	56.9	
CENTRIFUGE	0	4	0.00	0.00	56.9	
		SUB	77.55	56.9	0.0	
		TOTAL	136.40	100.00		



ALS Metallurgy

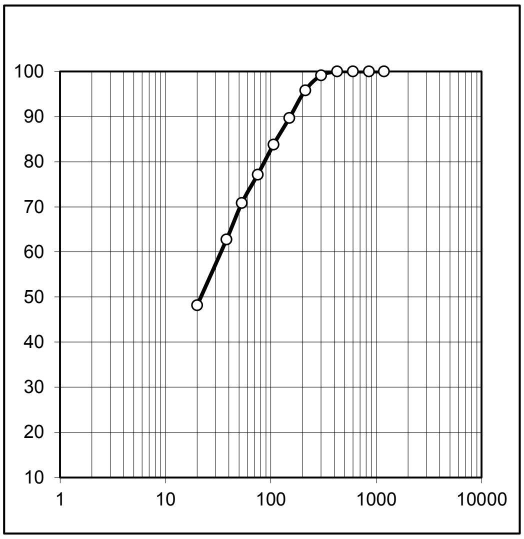
BURNIE LABORATORY

GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Regrind DC 10kwh/t
TEST NO	T16
DATE	220614
TECHNICIAN	DK

SAMPLE SIZED			SIZE	WEIGHTS			P80
Regrind DC 10kwh/t			um	gm	(%)	% Pass	um
			1180	0.00	0.00	100.0	
			850	0.00	0.00	100.0	
			600	0.00	0.00	100.0	
			425	0.00	0.00	100.0	
			300	0.48	0.86	99.1	
			212	1.83	3.30	95.8	
			150	3.40	6.13	89.7	
			106	3.29	5.93	83.8	
			75	3.68	6.63	77.2	**88**
			53	3.51	6.32	70.8	
			38	4.47	8.05	62.8	
			20	8.10	14.59	48.2	
CYCLOSIZER		CS1	33	0.00	0.00	48.2	
FLOW	185	CS2	26	0.00	0.00	48.2	
TEMP	21	CS3	18	0.00	0.00	48.2	
SG	**3.00**	CS4	12	0.00	0.00	48.2	
MINS	20	CS5	8	0.00	0.00	48.2	
CENTRIFUGE		0	4	0.00	0.00	48.2	
			SUB	26.74	48.2	0.0	
			TOTAL	55.50	100.00		

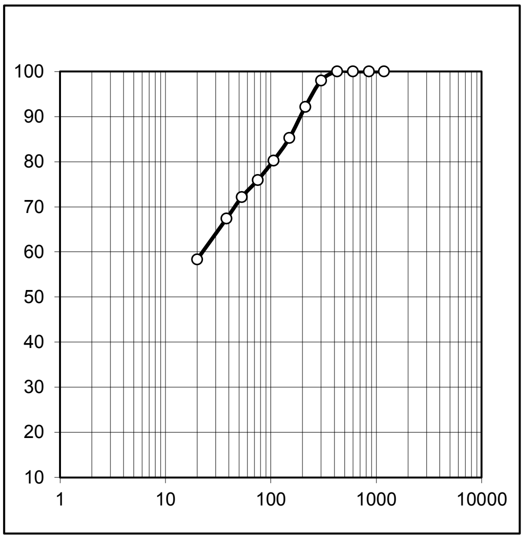


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Regrind DC 20kwh/t
TEST NO	T16
DATE	250614
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Regrind DC 20kwh/t		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	1.09	2.00	98.0	
		212	3.18	5.84	92.2	
		150	3.76	6.90	85.3	
		106	2.72	4.99	80.3	
		75	2.37	4.35	75.9	**104**
		53	2.04	3.74	72.2	
		38	2.60	4.77	67.4	
		20	4.93	9.05	58.4	
CYCLOSIZER	CS1	33	0.00	0.00	58.4	
FLOW 185	CS2	26	0.00	0.00	58.4	
TEMP 21	CS3	18	0.00	0.00	58.4	
SG **3.00**	CS4	12	0.00	0.00	58.4	
MINS 20	CS5	8	0.00	0.00	58.4	
CENTRIFUGE	0	4	0.00	0.00	58.4	
		SUB	31.79	58.4	0.0	
		TOTAL	54.48	100.00		



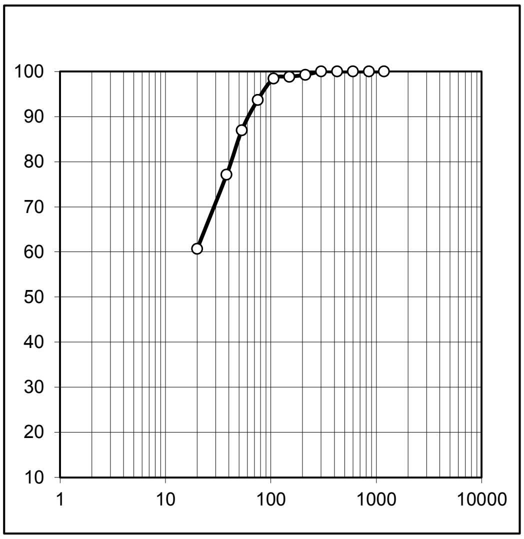
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Ro Con -106
TEST NO	T16
DATE	260614
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Ro Con -106		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	1.65	0.75	99.3	
		150	0.91	0.41	98.8	
		106	0.95	0.43	98.4	
		75	10.49	4.74	93.7	
		53	14.84	6.70	87.0	
		38	21.85	9.87	77.1	**42**
		20	36.35	16.42	60.7	
CYCLOSIZER	CS1	33	0.00	0.00	60.7	
FLOW 185	CS2	26	0.00	0.00	60.7	
TEMP 21	CS3	18	0.00	0.00	60.7	
SG **3.00**	CS4	12	0.00	0.00	60.7	
MINS 20	CS5	8	0.00	0.00	60.7	
CENTRIFUGE	0	4	0.00	0.00	60.7	
		SUB	134.36	60.7	0.0	
		TOTAL	221.40	100.00		

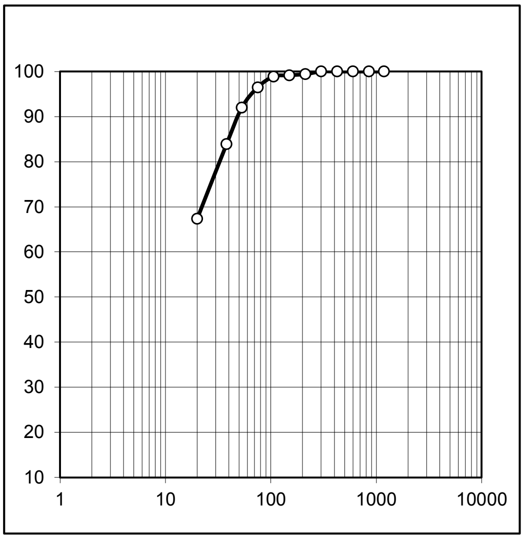


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Ro Con -106
TEST NO	T18
DATE	260614
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Ro Con -106		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.58	0.58	99.4	
		150	0.25	0.25	99.2	
		106	0.28	0.28	98.9	
		75	2.40	2.40	96.5	
		53	4.48	4.48	92.0	
		38	8.10	8.10	83.9	
		20	16.54	16.54	67.4	**34**
CYCLOSIZER	CS1	33	0.00	0.00	67.4	
FLOW 185	CS2	26	0.00	0.00	67.4	
TEMP 21	CS3	18	0.00	0.00	67.4	
SG **3.00**	CS4	12	0.00	0.00	67.4	
MINS 20	CS5	8	0.00	0.00	67.4	
CENTRIFUGE	0	4	0.00	0.00	67.4	
		SUB	67.37	67.4	0.0	
		TOTAL	100.00	100.00		



Appendix 7 – Gravity Separation Results

Feed

p80 um	Sn	Fe	SiO2	S
250	100.0			
	0.99	25.70	30.90	13.30
	100.0	100.0	100.0	100.0

SBC Comp.

Sulphide Flotation

Sulphide Tail

p80 um	Sn	Fe	SiO2	S
263	73.8			
	1.30	19.70	41.30	3.04
	97.0	56.5	98.8	16.8

Sulphide Conc

Sn	Fe	SiO2	S
26.2			
0.11	42.72	1.40	42.38
3.0	43.5	1.2	83.2

Cyclone 1

Overflow1

p80 um	Sn	Fe	SiO2	S
14	27.2			
	0.82	20.78	36.03	3.09
	23.4	13.6	23.8	4.0

Underflow1

p80 um	Sn	Fe	SiO2	S
299	46.6			
	1.58	19.07	44.38	3.01
	73.6	42.9	75.0	12.8

Cyclone 2

Overflow2

p80 um	Sn	Fe	SiO2	S
<4	19.3			
	0.53	21.20	34.40	3.40
	10.7	6.2	10.9	1.8

Underflow2

p80 um	Sn	Fe	SiO2	S
41	7.9			
	1.54	19.75	40.00	2.33
	12.7	7.4	12.9	2.2

Gravity

Gravity Tails Grind D/C

p80 um	Sn	Fe	SiO2	S
97	34.4			
	0.31	14.20	54.60	1.36
	11.2	6.5	11.4	1.9

Gravity Mids

Sn	Fe	SiO2	S
7.3			
1.11	28.40	25.70	4.53
8.5	5.0	8.7	1.5

Gravity Concs

Sn	Fe	SiO2	S
4.8			
10.75	35.70	6.19	12.05
53.9	31.4	54.9	9.3

0.732543

ALS Metallurgy

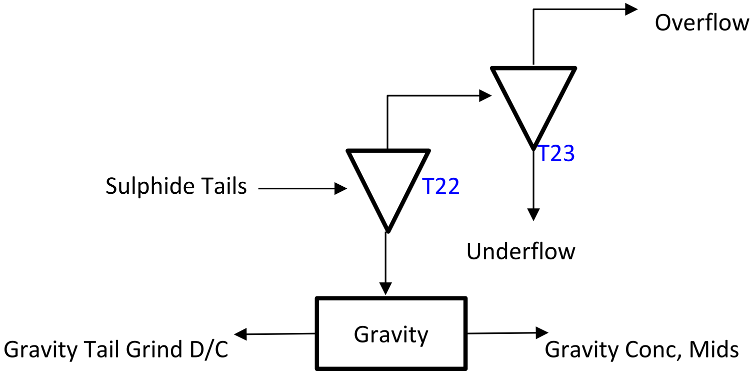
BURNIE LABORATORY
Stellar Resources
T0879 SBC ORE MASS BALANCE
ALS Metallurgy Burnie 0714
Sulphide Flotation: T16,17
Cyclone and Gravity:T22,23,24

Key
% Mass
%Sn
Sn Dist

ALS Metallurgy

BURNIE LABORATORY: SEPARATION REPORT SHEET

TEST TYPE	Cyclone & Gravity Separation
Stage 1	Cyclone T22
Stage 2	Cyclone T23
Stage 3	Mozley Separation T24



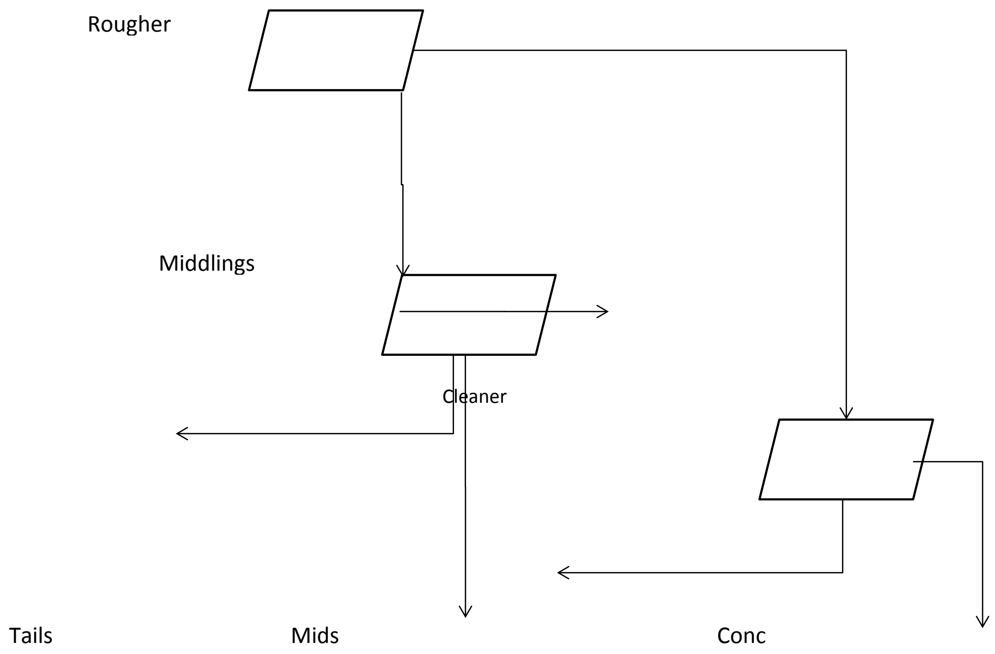
PROJECT	T0879
TEST NO	T22, T23, T24
DATE	21/07/14
TECH	MS

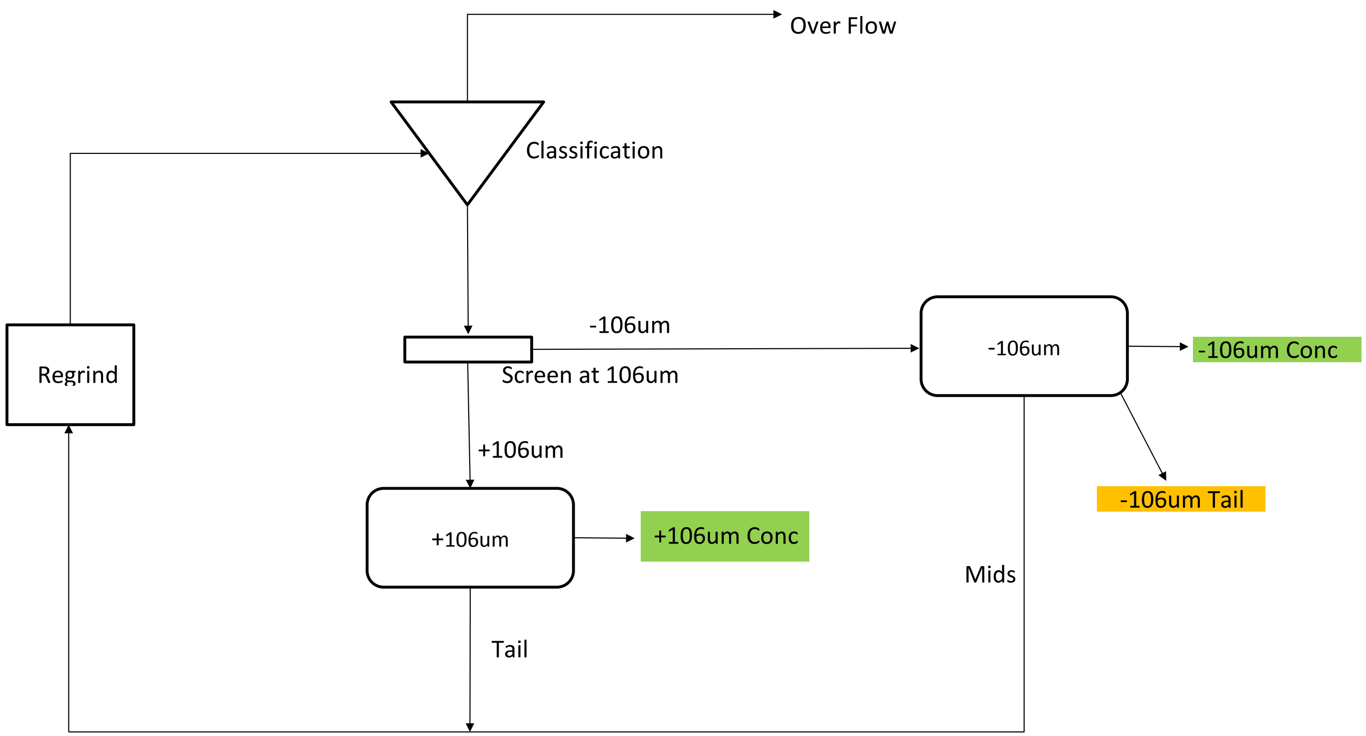
START MATERIAL	
SBC - SRT (T22 cyclone) Feed	
FROM TEST NO	
START WEIGHT (gm)	1852.45

SEPARATION RESULTS

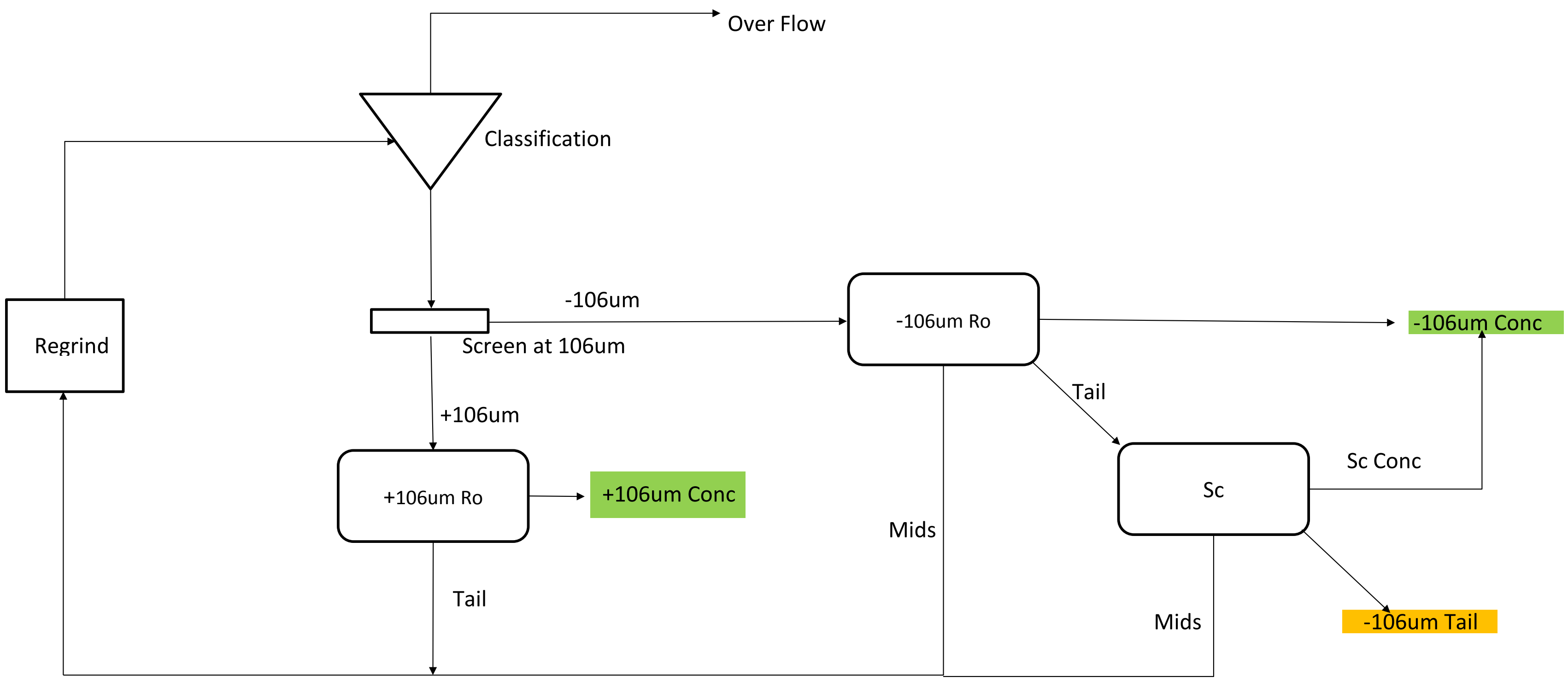
Product	Weight (gm)	P80 (Sizing)	Weight (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	As (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)	MnO (%)	Dist (%)
T23 Overflow	484.30	<8	26.14	0.53	11.0	21.20	28.5	0.21	38.8	3.40	29.6	34.40	21.6	0.44	20.8
Underflow	198.80	41	10.73	1.54	13.1	19.75	10.9	0.20	15.2	2.33	8.3	40.00	10.3	0.65	12.6
T24 Gravity Conc	120.39		6.50	10.75	55.6	35.70	11.9	0.52	23.9	12.05	26.0	6.19	1.0	1.07	12.6
Gravity Mids	184.36		9.95	1.11	8.8	28.40	14.5	0.08	5.6	4.53	15.0	25.70	6.1	1.12	20.2
Gravity Tail Grind D/C	864.60	97	46.67	0.31	11.5	14.20	34.1	0.05	16.5	1.36	21.1	54.60	61.1	0.40	33.8
Total	1852.45		100.00	1.26	100.0	19.44	100.0	0.14	100.0	3.01	100.0	41.73	100.0	0.55	100.0

Product	Weight (gm)	P80 (Sizing)	Weight (%)	CaO (%)	Dist (%)	MgO (%)	Dist (%)	Al2O3 (%)	Dist (%)	Sample No
T23 Overflow	484.30	>8	26.14	0.52	15.8	4.35	31.4	11.90	36.4	879201
Underflow	198.80	41	10.73	1.13	14.0	3.33	9.9	6.64	8.3	879202
T24 Gravity Conc	120.39		6.50	0.69	5.2	2.02	3.6	2.17	1.6	879203
Gravity Mids	184.36		9.95	1.37	15.8	3.60	9.9	6.33	7.4	879204
Gravity Tail Grind D/C	864.60	97	46.67	0.91	49.2	3.52	45.3	8.49	46.3	879205
Total	1852.45		100.00	0.86	100.0	3.63	100.0	8.56	100.0	

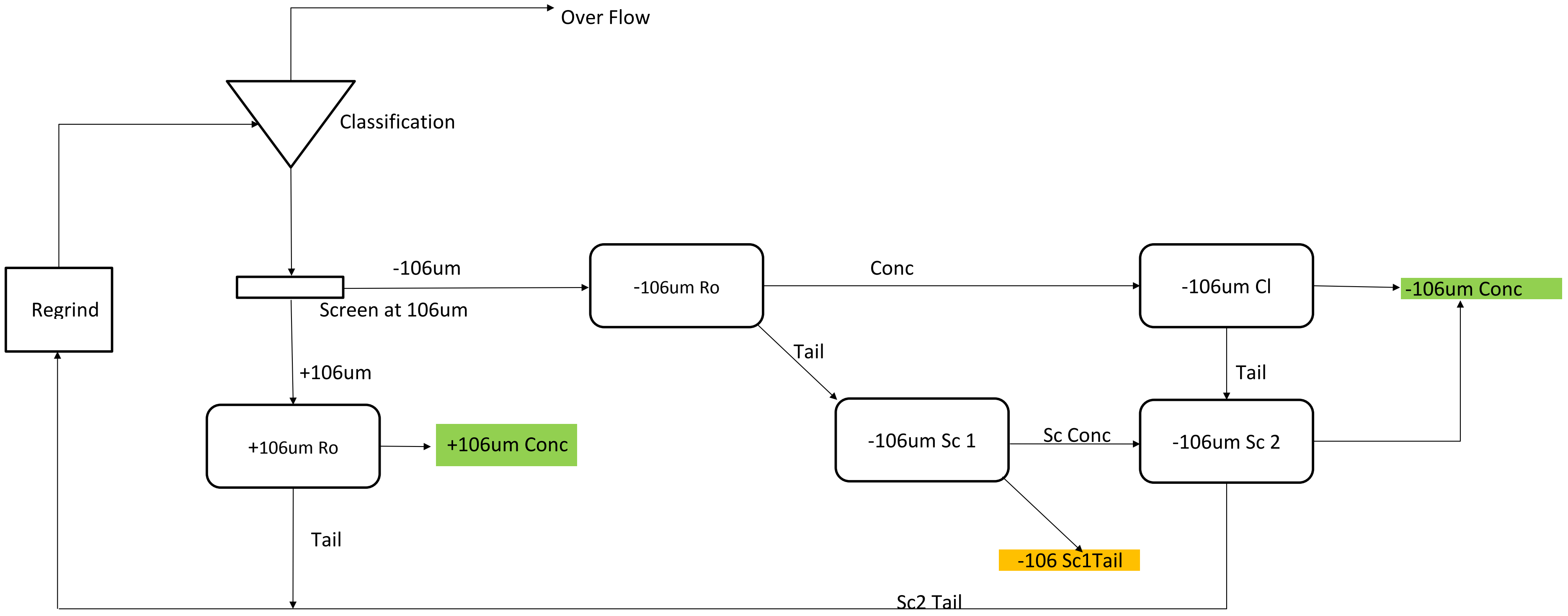

Rougher
Middlings
Cleaner
Tails
Mids
Conc



T0879 LC01 C1-4



T0879 LC01 C05



T0879 LC01 C06

ALS Metallurgy

BURNIE LABORATORY: LOCKED CYCLE GRAVITY TEST

PROJECT	T0879
TEST NO	LC01
FEED	SULPHIDE TAILS
FROM TEST	
DATE	50814
TECH	ID

EXIT STREAMS

CYCLE NO		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Gravity final conc 1	gm	**35.54**	**40.57**	**43.98**	**45.58**	**44.50**	**46.95**	**49.10**	**53.20**	**48.70**	**58.10**	**52.10**	**54.90**	**54.40**	**54.70**	**52.70**
(+106 Conc)	%Sn	9.49	9.19	8.14	9.01	8.92	9.90	9.16	8.80	8.31	8.00	9.04	9.68	9.68	9.68	9.68
dry wt and assays	%Fe	37.50	38.10	38.60	37.60	37.80	39.50	34.30	38.10	37.90	38.40	38.00	36.60	36.60	36.60	36.60
	%S	11.10	11.75	11.40	11.55	13.15	9.61	11.75	10.80	9.33	9.97	9.61	11.40	11.40	11.40	11.40
	%SiO2	6.23	6.10	6.10	6.21	6.23	5.27	6.86	5.26	6.57	6.31	5.83	6.21	6.21	6.21	6.21
Gravity final conc 2	gm	**24.79**	**26.80**	**35.20**	**44.30**	**41.26**	**43.37**	**58.80**	**46.40**	**70.80**	**65.80**	**46.50**	**52.90**	**62.10**	**66.70**	**64.90**
(-106 Conc)	%Sn	26.50	30.30	30.40	26.50	30.00	28.6	18.65	24.10	19.20	19.20	22.20	25.60	25.60	25.60	25.60
dry wt and assays	%Fe	31.70	29.20	29.00	31.70	29.10	29.0	37.7	34.40	35.20	36.50	27.60	29.20	29.20	29.20	29.20
	%S	14.70	15.95	17.30	20.20	19.35	18.5	19.2	10.80	16.30	12.55	11.75	17.60	17.60	17.60	17.60
	%SiO2	2.50	2.12	1.85	1.83	1.86	1.86	1.87	1.97	2.30	2.26	3.18	2.15	2.15	2.15	2.15
Gravity Final Tail	gm	**364.80**	**522.30**	**953.69**	**1018.90**	**1021.80**	**1231.30**	**877.60**	**956.50**	**1120.10**	**967.70**	**863.50**	**1086.80**	**1022.70**	**1013.50**	**1029.30**
(-106 Tails)	%Sn	0.30	0.42	0.44	0.47	0.38	0.41	0.42	0.44	0.32	0.34	0.38	0.36	0.33	0.38	0.38
dry wt and assays	%Fe	13.60	16.75	18.15	18.25	16.95	16.3	18.75	16.90	15.30	16.25	16.60	16.75	17.20	17.00	16.80
	%S	1.08	1.41	1.78	1.28	1.79	1.76	1.64	1.72	1.14	1.50	1.10	1.63	1.56	1.65	1.58
	%SiO2	55.40	50.20	46.00	47.30	48.50	48.3	45.7	49.00	52.80	48.30	50.50	48.70	48.30	47.50	48.60
Over Flow	gm	**739.1**	**1109.8**	**885.4**	**802.0**	**874.0**	**707.7**	**1283.6**	**846.2**	**912.0**	**904.8**	**989.9**	**871.8**	**920.9**	**943.6**	**929.1**
	%Sn	0.65	0.65	0.65	0.65	0.65	0.65	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
dry wt and assays	%Fe	19.35	19.35	19.35	19.35	19.35	19.35	20.34	20.34	20.34	20.34	20.34	20.34	20.34	20.34	20.34
	%S	2.96	2.96	2.96	2.96	2.96	2.96	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
	%SiO2	39.70	39.70	39.70	39.70	39.70	39.7	37.44	37.44	37.44	37.44	37.44	37.44	37.44	37.44	37.44
Combined Concentrate	gm	**60.33**	**67.37**	**79.18**	**89.88**	**85.76**	**90.32**	**107.90**	**99.60**	**119.50**	**123.90**	**98.60**	**107.80**	**116.50**	**121.40**	**117.60**
	%Sn	16.48	17.59	18.04	17.63	19.06	18.88	14.33	15.93	14.76	13.95	15.25	17.49	18.17	18.43	18.47
	%Fe	35.12	34.56	34.33	34.69	33.61	34.46	36.15	36.38	36.30	37.39	33.10	32.97	32.66	32.53	32.52
	%S	12.58	13.42	14.02	15.81	16.13	13.88	15.81	10.80	13.46	11.34	10.62	14.44	14.70	14.81	14.82
	%SiO2	4.70	4.52	4.21	4.05	4.13	3.63	4.14	3.73	4.04	4.16	4.58	4.22	4.05	3.98	3.97

CYCLE NO		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVERAGE
Gravity final conc 1	gm	**53.60**	**58.40**	**53.10**	**56.70**	**55.90**	**54.30**	**55.20**	**51.50**	**53.90**	**54.40**	**54.10**	**56.70**	**51.40**	**51.70**	**52.40**	**56.70**	**870.00**
(+106 Conc)	%Sn	9.10	9.10	9.10	9.06	9.21	9.21	9.21	19.80	19.80	19.80	9.15	9.15	9.15	10.45	10.45	10.45	11.34
dry wt and assays	%Fe	37.40	37.40	37.40	36.60	37.10	37.10	37.10	35.20	35.20	35.20	36.60	36.60	36.60	43.70	43.70	43.70	37.91
	%S	11.10	11.10	11.10	9.62	10.80	10.80	10.80	18.25	18.25	18.25	11.45	11.45	11.45	12.90	12.90	12.90	12.70
	%SiO2	6.38	6.38	6.38	7.78	6.61	6.61	6.61	2.24	2.24	2.24	7.05	7.05	7.05	7.47	7.47	7.47	6.06
Gravity final conc 2	gm	**61.90**	**61.50**	**63.80**	**63.00**	**64.30**	**59.10**	**58.40**	**55.50**	**54.90**	**60.40**	**60.10**	**59.40**	**59.80**	**57.10**	**65.70**	**63.30**	**968.20**
(-106 Conc)	%Sn	20.70	20.70	20.70	22.90	22.90	22.90	21.20	19.80	19.80	19.80	20.90	20.90	20.90	23.50	23.50	23.50	21.57
dry wt and assays	%Fe	33.00	33.00	33.00	31.70	31.70	31.70	34.50	35.20	35.20	35.20	35.70	35.70	35.70	44.90	44.90	44.90	36.02
	%S	17.60	17.60	17.60	16.30	16.30	16.30	19.85	18.25	18.25	18.25	18.60	18.60	18.60	17.60	17.60	17.60	17.79
	%SiO2	2.99	2.99	2.99	2.59	2.59	2.59	2.04	2.24	2.24	2.24	2.54	2.54	2.54	2.32	2.32	2.32	2.51
Gravity Final Tail	gm	**1039.20**	**883.30**	**1068.10**	**1081.30**	**1058.10**	**1067.20**	**1028.40**	**1070.30**	**984.70**	**1023.40**	**955.00**	**1039.10**	**1064.40**	**1053.40**	**1096.00**	**998.30**	**16510.20**
(-106 Tails)	%Sn	0.41	0.41	0.41	0.39	0.39	0.39	0.39	0.40	0.40	0.40	0.37	0.37	0.37	0.39	0.39	0.39	0.39
dry wt and assays	%Fe	17.45	17.45	17.45	17.20	17.20	17.20	17.70	17.15	17.15	17.15	17.10	17.10	17.10	16.55	16.55	16.55	17.12
	%S	1.69	1.69	1.69	1.52	1.52	1.52	1.69	1.62	1.62	1.62	1.64	1.64	1.64	1.56	1.56	1.56	1.61
	%SiO2	48.20	48.20	48.20	48.30	48.30	48.30	47.10	47.90	47.90	47.90	47.70	47.70	47.70	48.90	48.90	48.90	48.14
Over Flow	gm	**791.7**	**1045.9**	**711.1**	**793.2**	**827.0**	**818.0**	**848.6**	**843.4**	**929.7**	**925.0**	**954.4**	**894.5**	**935.6**	**871.3**	**812.0**	**753.8**	**13755.24**
	%Sn	0.53	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
dry wt and assays	%Fe	20.34	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.70	20.68
	%S	3.16	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
	%SiO2	37.44	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40	37.40
Combined Concentrate	gm	**115.50**	**119.90**	**116.90**	**119.70**	**120.20**	**113.40**	**113.60**	**107.00**	**108.80**	**114.80**	**114.20**	**116.10**	**111.20**	**108.80**	**118.10**	**120.00**	**1838.20**
	%Sn	15.32	15.05	15.43	16.34	16.53	16.34	15.37	19.80	19.80	19.80	15.33	15.16	15.47	17.30	17.71	17.33	16.73
	%Fe	35.04	35.14	35.00	34.02	34.21	34.29	35.76	35.20	35.20	35.20	36.13	36.14	36.12	44.33	44.37	44.33	36.91
	%S	14.58	14.43	14.65	13.14	13.74	13.67	15.45	18.25	18.25	18.25	15.21	15.11	15.30	15.37	15.51	15.38	15.36
	%SiO2	4.56	4.64	4.53	5.05	4.46	4.51	4.26	2.24	2.24	2.24	4.68	4.74	4.62	4.77	4.61	4.75	4.20

REGRIND DATA

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
New Feed (gm) (dry)	2003	2005	2005	2007	2010	2010	2010	2010	2010	2010	2001	2001	2007	2003	2006
Regrind feed Damp Wt (gm)	0.0	736.2	927	1099	1249	1314	1475	1178	1344	1237	1346	1371	1298	1268	1246
Regrind Time (min per 100gm)	3.0	3.0	2.8	3.0	3.0	3.0	3.0	3.3	3.5	3.5	3.5	4.0	4.0	4.0	4.0
Regrind Time (min.sec)	0.0	22.1	26.0	33.0	37.5	39.4	44.3	38.9	46.4	42.7	47.3	51.9	50.7	49.8	51.6
Regrind D/C underflow (%Wt)															

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
New Feed (gm) (dry)	2001	2003	2006	2008	2008	2003	2015	2006	2008	2008	2001	2008	2007	2008	2003	2007	
Regrind feed Damp Wt (gm)	1290	1310	1172	1334	1294	1281	1251	1280	1277	1302	1225	1258	1301	1278	1284	1296	
Regrind Time (min per 100gm)	4.0	4.0	4.0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
Regrind Time (min.sec)	52.4	46.9	53.4	53.7	53.2	51.9	53.1	53.0	54.0	50.8	52.2	54.0	53.0	53.3	53.8	53.7	
Regrind D/C underflow (%Wt)																	

DISTRIBUTIONS		AV	FROM NEW FEED (%)														
		16-31	Cyc 1	Cyc 2	Cyc 3	Cyc 4	Cyc 5	Cyc 6	Cyc 7	Cyc 8	Cyc 9	Cyc 10	Cyc 11	Cyc 12	Cyc 13	Cyc 14	Cyc 15
MASS	+106 Conc	2.70	1.76	2.01	2.18	2.26	2.21	2.33	2.44	2.64	2.42	2.88	2.59	2.72	2.70	2.71	2.61
	-106 Conc	3.00	1.23	1.33	1.75	2.20	2.05	2.15	2.92	2.30	3.51	3.26	2.31	2.62	3.08	3.31	3.22
	-106 Tail	51.20	18.10	25.92	47.32	50.56	50.70	61.10	43.55	47.46	55.58	48.02	42.85	53.93	50.75	50.29	51.07
	Over Flow	42.66	36.67	55.07	43.93	39.79	43.37	35.12	63.69	41.99	45.25	44.90	49.12	43.26	45.69	46.82	46.10
	Calc Recycle	0.44	42.23	15.68	4.82	5.19	1.68	-0.69	-12.59	5.61	-6.76	0.94	3.14	-2.53	-2.22	-3.13	-3.01
TIN	+106 Conc	23.08	12.62	13.95	13.40	15.37	14.86	17.40	16.83	17.52	15.15	17.40	17.63	19.89	19.71	19.82	19.09
	-106 Conc	48.85	24.59	30.39	40.05	43.94	46.33	46.43	41.05	41.85	50.88	47.29	38.64	50.69	59.50	63.91	62.19
	-106 Tail	15.13	4.10	8.21	15.71	17.92	14.53	18.90	13.80	15.75	13.42	12.31	12.28	14.64	12.63	14.42	14.64
	Over Flow	15.23	17.98	27.00	21.54	19.51	21.26	17.22	25.46	16.79	18.09	17.95	19.64	17.29	18.27	18.72	18.43
	Calc Recycle	-2.31	40.71	20.44	9.30	3.25	3.02	0.06	2.86	8.08	2.47	5.05	11.81	-2.52	-10.11	-16.86	-14.35
TIN REC OA (%)		**71.94**	**37.21**	**44.35**	**53.45**	**59.31**	**61.19**	**63.82**	**57.88**	**59.38**	**66.03**	**64.68**	**56.27**	**70.58**	**79.21**	**83.73**	**81.28**
TIN REC GRAVITY (%)		**82.55**	**90.08**	**84.38**	**77.29**	**76.79**	**80.81**	**77.16**	**80.75**	**79.03**	**83.11**	**84.01**	**82.08**	**82.82**	**86.25**	**85.31**	**84.74**
IRON	+106 Conc	5.23	3.38	3.93	4.31	4.35	4.27	4.71	4.28	5.15	4.69	5.67	5.03	5.10	5.06	5.08	4.90
	-106 Conc	5.53	2.00	1.99	2.59	3.57	3.05	3.19	5.63	4.05	6.33	6.10	3.26	3.92	4.60	4.95	4.81
	-106 Tail	44.87	12.60	22.22	43.96	47.22	43.98	50.97	41.79	41.05	43.52	39.93	36.40	46.23	44.67	43.75	43.91
	Over Flow	45.15	36.32	54.53	43.51	39.41	42.95	34.77	66.30	43.71	47.11	46.73	51.13	45.03	47.57	48.74	47.99
	Calc Recycle	-0.79	45.70	17.34	5.64	5.45	5.75	6.36	-17.99	6.04	-1.64	1.57	4.18	-0.28	-1.89	-2.52	-1.61
SULPHUR	+106 Conc	11.48	6.58	7.95	8.36	8.78	9.76	7.53	9.62	9.58	7.58	9.66	8.35	10.44	10.34	10.40	10.02
	-106 Conc	17.95	6.08	7.13	10.16	14.93	13.32	13.38	18.83	8.36	19.25	13.77	9.11	15.53	18.23	19.58	19.05
	-106 Tail	27.71	6.57	12.28	28.32	21.76	30.51	36.15	24.01	27.44	21.30	24.21	15.84	29.55	26.61	27.90	27.13
	Over Flow	45.05	36.49	54.80	43.72	39.60	43.15	34.94	67.66	44.60	48.07	47.69	52.18	45.95	48.54	49.74	48.97
	Calc Recycle	-2.19	44.27	17.84	9.44	14.94	3.26	8.00	-20.12	10.01	3.80	4.66	14.51	-1.47	-3.73	-7.62	-5.18
SILICA	+106 Conc	0.398	0.27	0.30	0.32	0.34	0.33	0.30	0.40	0.34	0.38	0.44	0.37	0.41	0.41	0.41	0.39
	-106 Conc	0.183	0.07	0.07	0.08	0.10	0.09	0.10	0.13	0.11	0.20	0.18	0.18	0.14	0.16	0.17	0.17
	-106 Tail	59.72	24.30	31.52	52.75	57.95	59.58	71.51	48.22	56.35	71.11	56.20	52.43	63.64	59.39	57.88	60.15
	Over Flow	38.66	35.28	52.97	42.26	38.28	41.72	33.78	57.78	38.09	41.05	40.73	44.56	39.24	41.45	42.48	41.82
	Calc Recycle	1.04	40.08	15.14	4.59	3.34	-1.73	-5.68	-6.54	5.11	-12.74	2.45	2.47	-3.43	-1.41	-0.94	-2.53

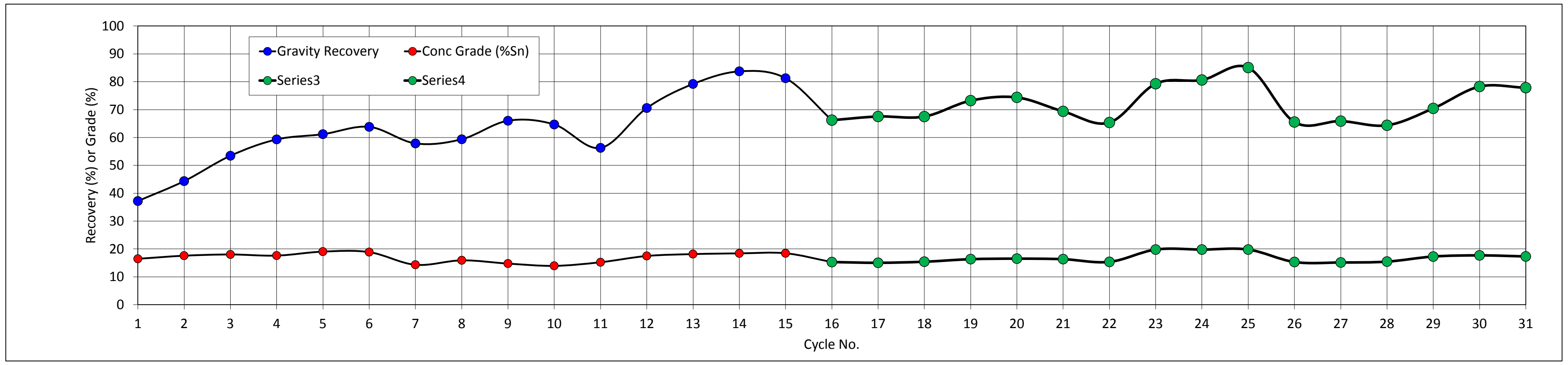
DISTRIBUTIONS		Cyc 16	Cyc 17	Cyc 18	Cyc 19	Cyc 20	Cyc 21	Cyc 22	Cyc 23	Cyc 24	Cyc 25	Cyc 26	Cyc 27	Cyc 28	Cyc 29	Cyc 30	Cyc 31
MASS	+106 Conc	2.66	2.90	2.63	2.81	2.77	2.69	2.74	2.56	2.67	2.70	2.68	2.81	2.55	2.57	2.60	2.81
	-106 Conc	3.07	3.05	3.17	3.13	3.19	2.93	2.90	2.75	2.72	3.00	2.98	2.95	2.97	2.83	3.26	3.14
	-106 Tail	51.56	43.83	53.00	53.65	52.50	52.95	51.03	53.11	48.86	50.78	47.39	51.56	52.81	52.27	54.38	49.53
	Over Flow	39.28	51.90	35.28	39.36	41.03	40.59	42.11	41.85	46.13	45.90	47.36	44.38	46.42	43.23	40.29	37.40
	Calc Recycle	3.42	-1.67	5.92	1.05	0.50	0.83	1.23	-0.26	-0.39	-2.37	-0.41	-1.70	-4.76	-0.90	-0.53	7.11
TIN	+106 Conc	18.26	19.89	18.09	19.23	19.27	18.72	19.03	38.17	39.95	40.32	18.53	19.42	17.60	20.22	20.50	22.18
	-106 Conc	47.96	47.65	49.43	54.00	55.11	50.66	46.34	41.13	40.69	44.76	47.01	46.47	46.78	50.22	57.79	55.68
	-106 Tail	15.95	13.56	16.39	15.78	15.45	15.58	15.01	16.02	14.74	15.32	13.23	14.39	14.74	15.38	16.00	14.57
	Over Flow	15.71	18.40	12.51	13.95	14.55	14.39	14.93	14.84	16.35	16.27	16.79	15.74	16.46	15.33	14.28	13.26
	Calc Recycle	2.13	0.51	3.58	-2.96	-4.38	0.66	4.69	-10.16	-11.73	-16.67	4.44	3.99	4.42	-1.15	-8.57	-5.69
TIN REC OA (%)		**66.22**	**67.54**	**67.52**	**73.23**	**74.38**	**69.37**	**65.37**	**79.30**	**80.63**	**85.08**	**65.54**	**65.89**	**64.38**	**70.45**	**78.28**	**77.85**
TIN REC GRAVITY (%)		**80.59**	**83.29**	**80.47**	**82.27**	**82.81**	**81.66**	**81.32**	**83.19**	**84.54**	**84.74**	**83.21**	**82.07**	**81.37**	**82.08**	**83.03**	**84.23**
IRON	+106 Conc	5.09	5.55	5.04	5.27	5.27	5.12	5.20	4.60	4.82	4.86	5.03	5.27	4.78	5.74	5.81	6.29
	-106 Conc	5.19	5.15	5.35	5.07	5.18	4.76	5.12	4.96	4.91	5.40	5.45	5.38	5.42	6.51	7.49	7.22
	-106 Tail	46.05	39.14	47.33	47.23	46.21	46.61	46.22	46.61	42.88	44.57	41.47	45.12	46.22	44.27	46.06	41.96
	Over Flow	40.89	54.98	37.38	41.69	43.47	43.00	44.61	44.33	48.87	48.62	50.17	47.02	49.18	45.80	42.68	39.63
	Calc Recycle	2.78	-4.82	4.90	0.74	-0.13	0.52	-1.15	-0.51	-1.48	-3.45	-2.11	-2.80	-5.60	-2.32	-2.05	4.91
SULPHUR	+106 Conc	9.92	10.81	9.83	9.10	10.07	9.78	9.94	15.68	16.41	16.56	10.33	10.83	9.82	11.12	11.28	12.20
	-106 Conc	18.17	18.06	18.73	17.13	17.48	16.07	19.34	16.90	16.71	18.39	18.65	18.43	18.55	16.76	19.29	18.58
	-106 Tail	29.30	24.90	30.11	27.42	26.83	27.06	28.99	28.92	26.61	27.66	26.13	28.43	29.12	27.41	28.52	25.98
	Over Flow	41.73	54.78	37.25	41.55	43.32	42.85	44.45	44.18	48.70	48.45	49.99	46.85	49.00	45.64	42.53	39.48
	Calc Recycle	0.88	-8.55	4.08	4.81	2.30	4.24	-2.72	-5.67	-8.43	-11.05	-5.10	-4.54	-6.49	-0.94	-1.62	3.75
SILICA	+106 Conc	0.41	0.45	0.41	0.53	0.44	0.43	0.44	0.14	0.15	0.15	0.46	0.48	0.44	0.46	0.47	0.51
	-106 Conc	0.22	0.22	0.23	0.20	0.20	0.18	0.14	0.15	0.15	0.16	0.18	0.18	0.18	0.16	0.18	0.18
	-106 Tail	60.22	51.19	61.90	62.79	61.45	61.98	58.24	61.64	56.71	58.94	54.77	59.59	61.04	61.93	64.44	58.69
	Over Flow	35.64	47.03	31.98	35.67	37.19	36.78	38.16	37.93	41.81	41.59	42.92	40.22	42.07	39.18	36.51	33.90
	Calc Recycle	3.50	1.11	5.49	0.81	0.72	0.63	3.02	0.15	1.19	-0.84	1.67	-0.48	-3.73	-1.74	-1.61	6.72

INTERNAL STREAMS

Final Regrind Feed	
gm	1116.6
%Sn	0.63
%Fe	21.00
%S	3.09
%SiO2	40.80
p80	342

Final Reg Discharge	
gm	1080.0
%Sn	0.63
%Fe	21.00
%S	3.09
%SiO2	40.80
p80	84

NEW FEED	CALC	31
gm	62476	2015.4
%Sn	1.33	1.34
%Fe	19.54	19.55
%S	2.97	3.08
%SiO2	41.27	40.90



SBC LC01	Coarse Gravity Conc		Fine Gravity Conc		Gravity Fine Tail		Over Flow		Feed		Combined Conc	
%Wt		2.79		3.11		52.05		42.04		100.0	5.90	
%Sn	9.14	19.0	21.72	50.5	0.40	15.5	0.48	15.0	1.34	100.0	15.77	69.5
%Fe	37.16	5.2	32.64	5.1	17.37	45.7	20.65	43.9	19.78	100.0	34.78	10.4
%S	10.76	10.0	17.34	18.0	1.61	28.0	3.14	44.0	3.00	100.0	14.23	28.0
%SiO2	6.68	0.5	2.69	0.2	48.09	61.0	37.41	38.3	41.03	100.0	4.57	0.7

MASS	+106 Conc	2.81	2.79
	-106 Conc	3.13	3.11
	-106 Tail	52.36	52.05
	Over Flow	42.29	42.04
	Calc Recycle	-0.59	
TIN	+106 Conc	19.29	
	-106 Conc	51.14	
	-106 Tail	15.69	
	Over Flow	15.21	
	Calc Recycle	-1.33	
TIN REC OA (%)		70.43	
TIN REC GRAVITY (%)		81.77	
IRON	+106 Conc	5.26	
	-106 Conc	5.16	
	-106 Tail	45.90	
	Over Flow	44.06	
	Calc Recycle	-0.39	
SULPHUR	+106 Conc	10.12	
	-106 Conc	18.20	
	-106 Tail	28.34	
	Over Flow	44.55	
	Calc Recycle	-1.21	
SILICA	+106 Conc	0.44	
	-106 Conc	0.20	
	-106 Tail	59.69	
	Over Flow	37.50	
	Calc Recycle	2.16	
	Calc Recycle	0.61	

C16-22		
Gravity final conc 1	gm	387.2
(+106 Conc)	%Sn	9.14
dry wt and assays	%Fe	37.16
	%S	10.76
	%SiO2	6.68
Gravity final conc 2	gm	432.00
(-106 Conc)	%Sn	21.72
dry wt and assays	%Fe	32.64
	%S	17.34
	%SiO2	2.69
Gravity Final Tail	gm	7225.60
(-106 Tails)	%Sn	0.40
dry wt and assays	%Fe	17.37
	%S	1.61
	%SiO2	48.09
Over Flow	gm	5835.50
	%Sn	0.48
dry wt and assays	%Fe	20.65
	%S	3.14
	%SiO2	37.41

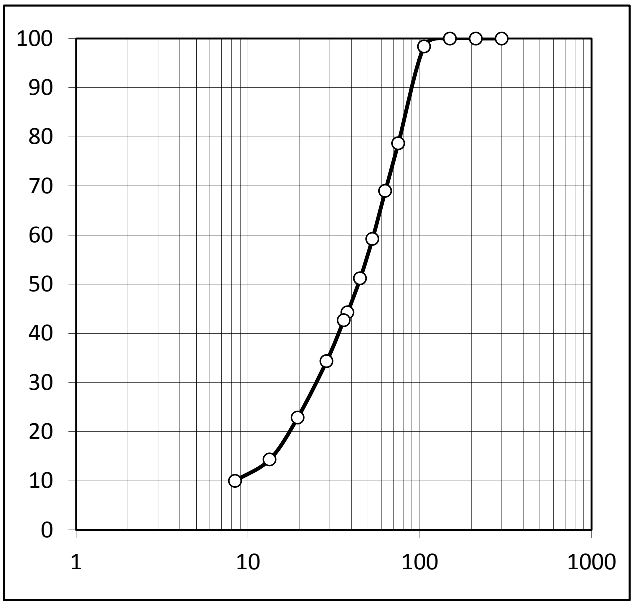
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc6 -106
	Mozley Tail
DATE	110814
TECHNICIAN	MS

LC01 Cyc6 -106 Mozley Tail		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.02	0.02	100.0
		106	1.91	1.62	98.4
	77	75	23.19	19.68	78.7
		63	11.41	9.68	69.0
		53	11.55	9.80	59.2
		45	9.45	8.02	51.2
		38	8.16	6.92	44.3
CYCLOSIZER	CS1	36	1.88	1.60	42.7
FLOW 185	CS2	29	9.79	8.31	34.4
TEMP 21	CS3	19	13.56	11.51	22.9
SG **2.60**	CS4	13	10.06	8.54	14.3
MINS 20	CS5	8	5.09	4.32	10.0
		SUB	11.78	10.00	0.0
		TOTAL	117.85	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mn	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
75	21.32	0.23	11.1	12.05	15.7	0.06	13.5	0.77	9.8	57.40	24.8	0.26	13.6
63	9.68	0.22	4.8	12.55	7.4	0.05	5.1	0.90	5.2	57.20	11.2	0.29	6.9
53	9.80	0.22	4.9	12.70	7.6	0.06	6.2	0.91	5.3	57.50	11.4	0.31	7.5
45	8.02	0.22	4.0	13.75	6.7	0.06	5.1	1.06	5.1	55.90	9.1	0.35	6.9
38	6.92	0.20	3.1	14.45	6.1	0.05	3.6	1.04	4.3	53.80	7.5	0.40	6.8
26	9.90	0.49	10.9	23.90	14.5	0.08	8.3	2.48	14.7	35.90	7.2	0.71	17.3
12	20.04	0.77	34.8	19.50	23.9	0.14	29.5	2.42	29.1	42.60	17.3	0.50	24.6
<12	14.31	0.82	26.5	20.70	18.1	0.19	28.6	3.08	26.4	39.70	11.5	0.47	16.5
CALC	100.00	0.44	100.0	16.37	100.0	0.09	100.0	1.67	100.0	49.39	100.0	0.41	100.0
ASSAY		0.41		16.45		0.10		1.68		49.70		0.40	

ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
75	21.32	0.92	19.3	3.62	22.0	8.82	23.8				
63	9.68	0.93	8.9	3.47	9.6	8.46	10.4				
53	9.80	0.92	8.9	3.38	9.5	8.29	10.3				
45	8.02	1.01	8.0	3.47	7.9	8.13	8.3				
38	6.92	1.07	7.3	3.48	6.9	7.98	7.0				
26	9.90	1.25	12.2	3.28	9.3	6.85	8.6				
12	20.04	1.06	20.9	3.42	19.6	7.05	17.9				
<12	14.31	1.04	14.6	3.75	15.3	7.59	13.8				
CALC	100.00	1.02	100.0	3.51	100.0	7.89	100.0				
ASSAY		0.99		3.65		8.21					

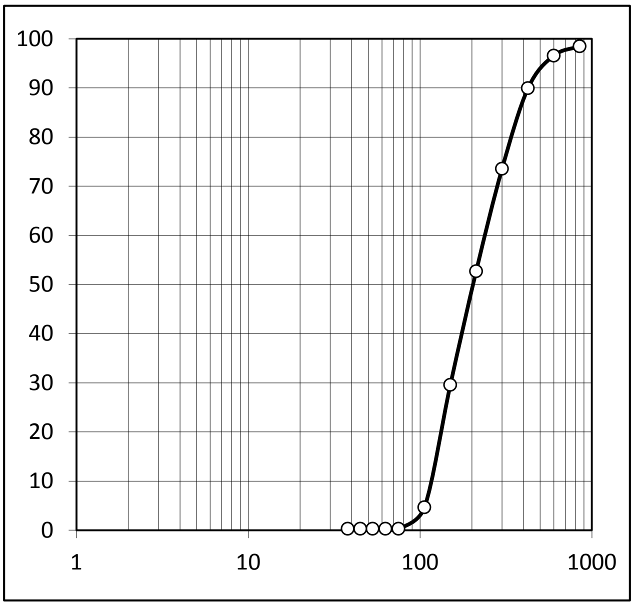
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc6 +106
	Mozley Tail
DATE	190814
TECHNICIAN	MS

LC01 Cyc6 +106 Mozley Tail		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	1.90	1.53	98.5
		600	2.37	1.90	96.6
		425	8.26	6.63	89.9
	349	300	20.42	16.39	73.5
		212	26.00	20.87	52.7
		150	28.79	23.11	29.6
		106	31.04	24.92	4.6
		75	5.40	4.34	0.3
		63	0.00	0.00	0.3
		53	0.00	0.00	0.3
		45	0.00	0.00	0.3
		38	0.00	0.00	0.3
CYCLOSIZER	CS1	36	0.00	0.00	0.3
FLOW 185	CS2	29	0.00	0.00	0.3
TEMP 21	CS3	19	0.00	0.00	0.3
SG **2.60**	CS4	13	0.00	0.00	0.3
MINS 20	CS5	8	0.00	0.00	0.3
		SUB	0.38	0.31	0.0
		TOTAL	124.56	98.47	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mn	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
425	10.06	1.00	10.1	2.00	10.1	3.00	10.1	4.00	10.1	5.00	10.1	6.00	10.1
300	16.39	1.00	16.4	2.00	16.4	3.00	16.4	4.00	16.4	5.00	16.4	6.00	16.4
212	20.87	1.00	20.9	2.00	20.9	3.00	20.9	4.00	20.9	5.00	20.9	6.00	20.9
150	23.11	1.00	23.1	2.00	23.1	3.00	23.1	4.00	23.1	5.00	23.1	6.00	23.1
106	24.92	1.00	24.9	2.00	24.9	3.00	24.9	4.00	24.9	5.00	24.9	6.00	24.9
<106	4.64	1.00	4.6	2.00	4.6	3.00	4.6	4.00	4.6	5.00	4.6	6.00	4.6
CALC	100.00	1.00	100.0	2.00	100.0	3.00	100.0	4.00	100.0	5.00	100.0	6.00	100.0
ASSAY		1.00		2.00		3.00		4.00		5.00		6.00	

ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
425	10.06	1.00	10.1	2.00	10.1	3.00	10.1				
300	16.39	1.00	16.4	2.00	16.4	3.00	16.4				
212	20.87	1.00	20.9	2.00	20.9	3.00	20.9				
150	23.11	1.00	23.1	2.00	23.1	3.00	23.1				
106	24.92	1.00	24.9	2.00	24.9	3.00	24.9				
<106	4.64	1.00	4.6	2.00	4.6	3.00	4.6				
CALC	100.00	1.00	100.0	2.00	100.0	3.00	100.0				
ASSAY		1.00		2.00		3.00					

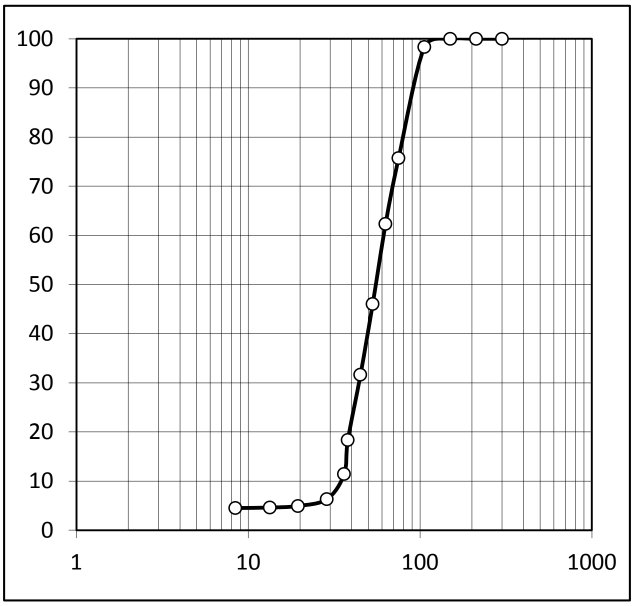
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc6 -106
	Mozley Mids
DATE	110814
TECHNICIAN	MS

LC01 Cyc6 -106 Mozley Mids		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.03	0.03	100.0
		106	1.70	1.67	98.3
	81	75	23.04	22.59	75.7
		63	13.65	13.38	62.3
		53	16.63	16.30	46.0
		45	14.68	14.39	31.6
		38	13.54	13.27	18.4
CYCLOSIZER	CS1	36	7.09	6.95	11.4
FLOW 185	CS2	29	5.19	5.09	6.3
TEMP 21	CS3	19	1.42	1.39	4.9
SG **2.60**	CS4	13	0.33	0.32	4.6
MINS 20	CS5	8	0.10	0.10	4.5
		SUB	4.60	4.51	0.0
		TOTAL	102.00	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mn %	Mn dist
75	24.28	1.73	24.6	36.90	22.2	0.1	14.6	8.33	21.8	11.65	35.9	1.09	25.8
63	13.38	1.81	14.2	39.50	13.1	0.1	11.0	10.70	15.4	8.61	14.6	1.06	13.8
53	16.30	1.83	17.5	41.30	16.7	0.2	23.2	7.57	13.3	8.76	18.1	1.08	17.1
45	14.39	1.58	13.3	41.30	14.7	0.1	13.0	11.70	18.1	6.27	11.5	1.07	15.0
38	12.04	1.35	9.5	41.60	12.4	0.1	8.1	10.55	13.7	6.00	9.2	1.10	12.9
26	12.04	1.36	9.6	44.40	13.3	0.2	14.4	9.73	12.6	4.17	6.4	1.01	11.8
<26	6.32	3.03	11.2	48.10	7.5	0.3	15.6	7.59	5.2	5.28	4.2	0.58	3.6
CALC	98.76	1.71	100.0	40.32	100.0	0.1	100.0	9.29	100.0	7.87	100.0	1.03	100.0
ASSAY		1.63		40.70		0.1		10.20		7.61		1.06	

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
75	24.28	1.02	30.0	3.10	29.4	3.92	30.5				
63	13.38	0.92	14.9	2.74	14.3	3.02	13.0				
53	16.30	0.90	17.8	2.63	16.7	4.87	25.4				
45	14.39	0.80	14.0	2.46	13.8	2.39	11.0				
38	12.04	0.74	10.8	2.43	11.4	2.31	8.9				
26	12.04	0.57	8.3	2.14	10.1	1.98	7.6				
<26	6.32	0.54	4.1	1.74	4.3	1.73	3.5				
CALC	98.76	0.82	100.0	2.6	100.0	3.12	100.0				
ASSAY		0.83		2.58		2.81					

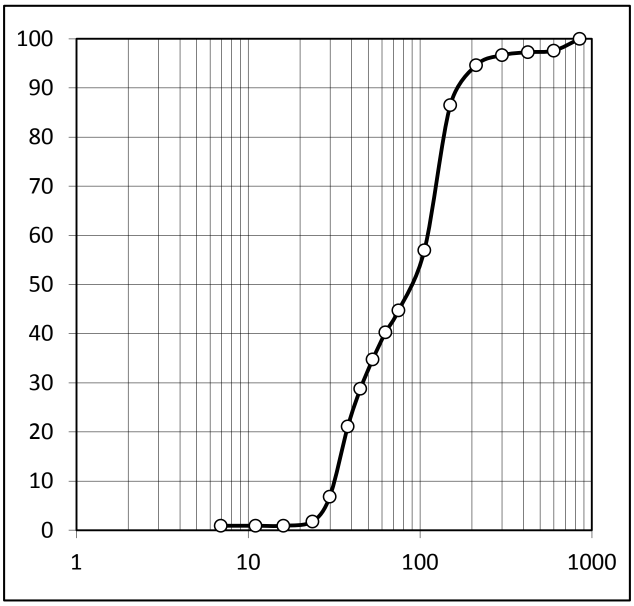
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Combined Conc
DATE	210814
TECHNICIAN	MS

LC01 Combined Conc			SIZE	WEIGHTS		
0			um	gm	(%)	%PASS
		p80	850	0.00	0.00	100.0
			600	2.83	2.41	97.6
			425	0.36	0.31	97.3
			300	0.73	0.62	96.7
			212	2.39	2.04	94.6
			150	9.50	8.10	86.5
		140	106	34.62	29.53	57.0
			75	14.39	12.28	44.7
			63	5.20	4.44	40.3
			53	6.47	5.52	34.8
			45	7.00	5.97	28.8
			38	8.97	7.65	21.1
CYCLOSIZER		CS1	30	16.79	14.32	6.8
FLOW	185	CS2	24	5.90	5.03	1.8
TEMP	21	CS3	16	1.02	0.87	0.9
SG	**3.50**	CS4	11	0.00	0.00	0.9
MINS	20	CS5	7	0.00	0.00	0.9
			SUB	1.06	0.90	0.0
			TOTAL	117.23	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mn	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	13.49	17.80	13.0	37.00	14.5	1.15	17.0	21.80	18.7	2.90	9.8	0.16	4.1
106	29.53	7.61	12.1	38.70	33.2	0.22	7.1	10.45	19.7	5.31	39.1	1.06	59.1
75	12.28	16.25	10.8	31.50	11.2	0.65	8.8	7.61	5.9	7.60	23.3	0.87	20.1
63	4.44	28.30	6.8	27.80	3.6	1.32	6.4	18.25	5.2	4.75	5.3	0.24	2.0
53	5.52	26.50	7.9	31.00	5.0	1.23	7.5	21.10	7.4	2.88	4.0	0.16	1.7
45	5.97	23.00	7.4	33.80	5.9	1.11	7.3	22.50	8.6	2.21	3.3	0.16	1.8
38	7.65	21.80	9.0	35.40	7.9	1.11	9.3	20.30	9.9	2.15	4.1	0.21	3.0
24	19.36	29.60	31.0	29.70	16.7	1.48	31.5	18.40	22.7	2.09	10.1	0.18	6.6
Cal <24	1.77	20.80	2.0	39.18	2.0	2.60	5.1	17.34	2.0	2.66	1.2	0.49	1.6
ASSAY	100.00	18.50	100.0	34.40	100.0	0.91	100.0	15.70	100.0	4.01	100.0	0.53	100.0

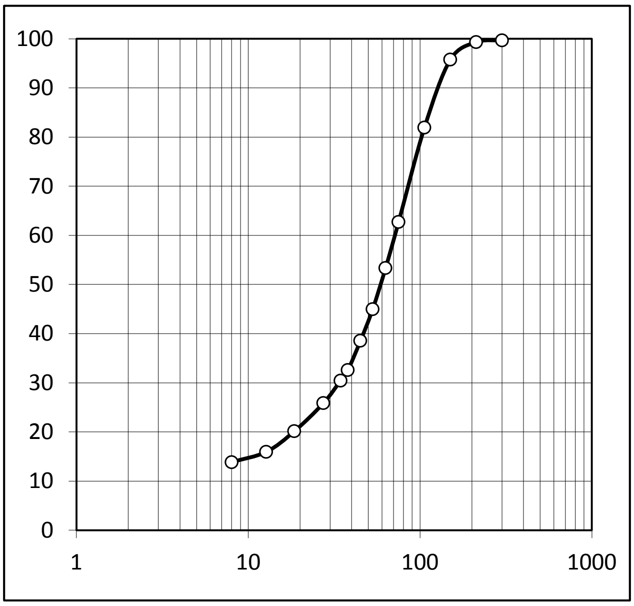
ANALYSES

SIZE	WT	CaO		MgO		Al2O3		C		C inorganic	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist
150	13.49	0.25	7.6	0.85	8.2	0.98	9.7	0.93	5.4	0.71	4.5
106	29.53	0.75	49.8	2.53	53.4	2.00	43.4	4.21	53.1	4.03	55.4
75	12.28	0.92	25.4	2.42	21.2	2.88	26.0	3.56	18.7	3.41	19.5
63	4.44	0.33	3.3	0.88	2.8	1.36	4.4	1.18	2.2	1.09	2.2
53	5.52	0.20	2.5	0.60	2.4	0.78	3.2	0.88	2.1	0.80	2.1
45	5.97	0.16	2.1	0.55	2.3	0.56	2.5	0.95	2.4	0.82	2.3
38	7.65	0.14	2.4	0.56	3.1	0.58	3.3	1.24	4.1	1.06	3.8
24	19.36	0.14	6.1	0.44	6.1	0.49	7.0	1.08	8.9	1.01	9.1
Cal <24	1.77	0.22	0.9	0.46	0.6	0.43	0.6	4.10	3.1	1.55	1.3
ASSAY	100.00	0.45	100.0	1.40	100.0	1.36	100.0	2.34	100.0	2.15	100.0

BURNIE LABORATORY
[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc6
	Regrind Discharge
DATE	210814
TECHNICIAN	MS

LC01 Cyc6 Regrind Discharge		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.40	0.30	99.7
		212	0.51	0.39	99.3
		150	4.71	3.57	95.7
		106	18.26	13.83	81.9
	103	75	25.34	19.20	62.7
		63	12.34	9.35	53.4
		53	11.07	8.39	45.0
		45	8.46	6.41	38.6
		38	7.92	6.00	32.6
CYCLOSIZER	CS1	34	2.79	2.11	30.4
FLOW 185	CS2	27	6.07	4.60	25.9
TEMP 21	CS3	19	7.54	5.71	20.1
SG **2.80**	CS4	13	5.53	4.19	15.9
MINS 20	CS5	8	2.76	2.09	13.9
		SUB	18.29	13.86	0.0
		TOTAL	131.99	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mn %	Mn dist
150	4.26	0.25	1.7	12.75	2.8	0.06	3.6	1.26	1.4	55.70	5.5	0.21	1.9
106	13.83	0.31	7.0	14.35	10.2	0.06	11.9	1.17	4.4	54.50	17.3	0.31	9.3
75	19.20	0.47	14.8	16.30	16.1	0.06	16.5	2.67	13.9	49.90	22.0	0.39	16.3
63	9.35	0.67	10.3	19.35	9.3	0.08	10.7	4.12	10.4	44.50	9.6	0.48	9.8
53	8.39	0.80	11.0	21.10	9.1	0.08	9.6	4.97	11.3	41.40	8.0	0.54	9.8
45	6.41	0.92	9.7	23.50	7.7	0.10	9.2	5.43	9.4	38.20	5.6	0.60	8.4
38	6.00	0.94	9.2	24.20	7.5	0.09	7.7	5.71	9.3	35.90	5.0	0.63	8.2
27	6.71	1.79	19.7	33.10	11.4	0.13	12.5	6.65	12.1	20.60	3.2	0.85	12.4
13	9.90	0.67	10.9	20.10	10.2	0.08	11.3	3.80	10.2	43.00	9.8	0.49	10.5
8	2.09	0.43	1.5	20.10	2.2	0.08	2.4	3.22	1.8	42.60	2.0	0.44	2.0
CALC<8	13.86	0.18	4.2	18.93	13.5	0.02	4.7	4.25	15.9	37.83	12.1	0.38	11.3
ASSAY	100.00	0.61	100.0	19.45	100.0	0.07	100.0	3.70	100.0	43.50	100.0	0.46	100.0

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
150	4.26	0.59	3.0	4.03	4.8	10.20	5.5				
106	13.83	0.72	11.9	4.11	16.0	9.51	16.6				
75	19.20	0.78	17.8	3.57	19.3	8.22	20.0				
63	9.35	0.83	9.2	3.34	8.8	7.38	8.7				
53	8.39	0.87	8.7	3.14	7.4	6.74	7.1				
45	6.41	0.92	7.0	3.07	5.5	6.20	5.0				
38	6.00	0.90	6.4	3.09	5.2	6.05	4.6				
27	6.71	0.93	7.4	2.70	5.1	4.61	3.9				
13	9.90	1.00	11.8	3.40	9.5	7.19	9.0				
8.0239	2.09	0.98	2.4	3.84	2.3	7.82	2.1				
CALC	13.86	0.87	14.3	4.17	16.2	9.97	17.5				
ASSAY	100.00	0.84	100.0	3.56	100.0	7.91	100.0				

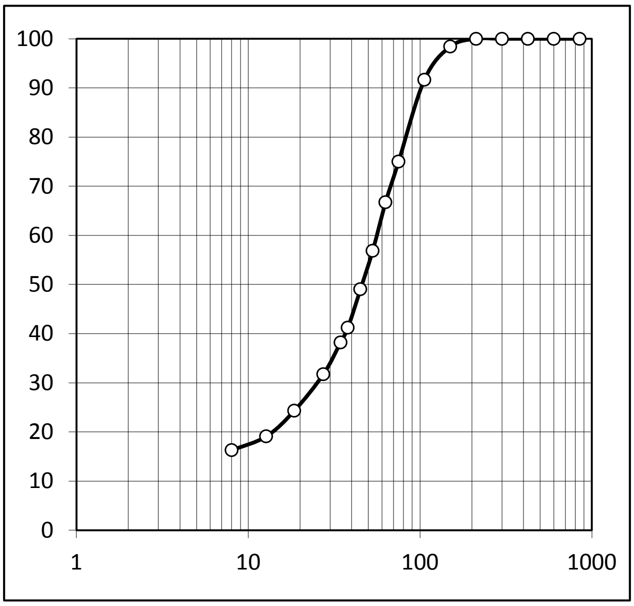
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc10
	Regrind Discharge
DATE	210814
TECHNICIAN	MS

LC01 Cyc10 Regrind Discharge		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	2.30	1.58	98.4
		106	9.85	6.75	91.7
	84	75	24.31	16.66	75.0
		63	12.10	8.29	66.7
		53	14.35	9.84	56.9
		45	11.45	7.85	49.0
		38	11.44	7.84	41.2
CYCLOSIZER	CS1	34	4.35	2.98	38.2
FLOW 185	CS2	27	9.44	6.47	31.7
TEMP 21	CS3	19	10.82	7.42	24.3
SG **2.80**	CS4	13	7.63	5.23	19.1
MINS 20	CS5	8	4.11	2.82	16.3
		SUB	23.74	16.27	0.0
		TOTAL	145.89	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mn %	Mn dist
150	1.58	0.24	0.6	12.50	0.9	0.07	1.4	1.10	0.5	55.90	2.1	0.21	0.6
106	6.75	0.28	3.1	14.05	4.6	0.07	5.9	1.12	2.2	53.60	8.6	0.29	3.7
75	16.66	0.38	10.4	16.05	12.9	0.07	14.6	1.83	8.8	50.60	20.0	0.38	11.9
63	8.29	0.58	7.9	19.35	7.7	0.07	7.3	1.82	4.4	46.90	9.2	0.50	7.8
53	9.84	0.64	10.3	20.10	9.5	0.06	7.4	3.72	10.6	42.80	10.0	0.56	10.4
45	7.85	0.74	9.5	22.80	8.6	0.08	7.8	4.28	9.7	39.10	7.3	0.64	9.5
38	7.84	0.78	10.0	24.20	9.1	0.08	7.8	4.40	10.0	36.70	6.8	0.71	10.5
27	9.45	1.44	22.3	33.30	15.1	0.13	15.4	6.23	17.1	20.40	4.6	0.90	16.1
13	12.65	0.65	13.5	21.20	12.9	0.10	15.8	3.20	11.7	41.40	12.4	0.56	13.4
8	2.82	0.45	2.1	20.50	2.8	0.08	2.8	2.32	1.9	42.60	2.8	0.51	2.7
CALC<8	16.27	0.39	10.3	20.31	15.9	0.07	13.8	4.89	23.1	42.14	16.3	0.44	13.4
ASSAY	100.00	0.61	100.0	20.80	100.0	0.08	100.0	3.45	100.0	42.20	100.0	0.53	100.0

ANALYSES

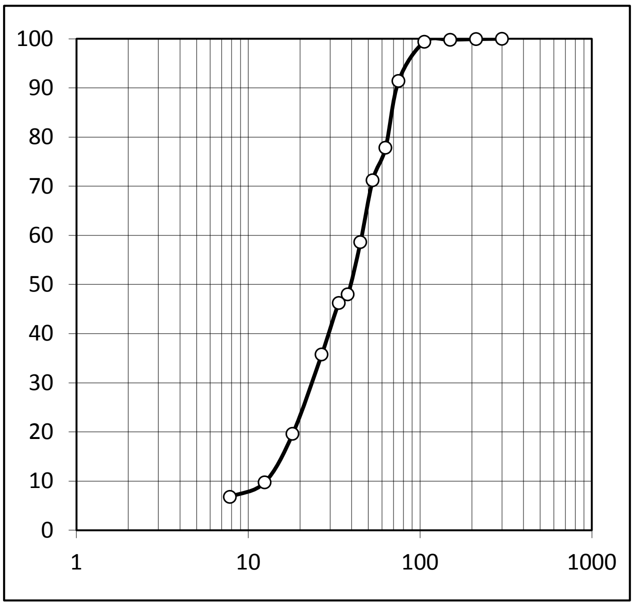
SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
150	1.58	0.62	1.2	4.40	1.9	10.25	2.1				
106	6.75	0.66	5.4	4.29	8.1	9.48	8.2				
75	16.66	0.74	14.9	3.81	17.8	8.61	18.4				
63	8.29	0.83	8.3	3.51	8.2	7.62	8.1				
53	9.84	0.84	10.0	3.22	8.9	6.89	8.7				
45	7.85	0.87	8.2	3.19	7.0	6.41	6.5				
38	7.84	0.90	8.5	3.13	6.9	5.97	6.0				
27	9.45	0.88	10.0	2.69	7.1	4.33	5.3				
13	12.65	1.00	15.2	3.31	11.7	6.63	10.8				
8.0239	2.82	1.00	3.4	3.82	3.0	7.56	2.7				
CALC	16.27	0.76	15.0	4.25	19.4	11.14	23.3				
ASSAY	100.00	0.83	100.0	3.57	100.0	7.79	100.0				

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc16 -106
	Mozley Tail
DATE	81014
TECHNICIAN	MS

LC01 Cyc16 -106		SIZE	WEIGHTS		
Mozley Tail		um	gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.06	0.07	99.9
		150	0.14	0.16	99.8
		106	0.33	0.37	99.4
		75	7.07	7.99	91.4
	65	63	12.01	13.58	77.8
		53	5.87	6.64	71.2
		45	11.13	12.58	58.6
		38	9.39	10.61	48.0
CYCLOSIZER	CS1	34	1.58	1.79	46.2
FLOW 185	CS2	27	9.27	10.48	35.7
TEMP 21	CS3	18	14.28	16.14	19.6
SG **2.90**	CS4	12	8.75	9.89	9.7
MINS 20	CS5	8	2.60	2.94	6.8
		SUB	5.99	6.77	0.0
		TOTAL	88.47	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
75	8.59	0.25	5.1	12.85	6.3	0.05	4.6	0.83	4.3	55.60	10.0	0.37	5.4
63	13.58	0.22	7.1	13.05	10.1	0.06	8.8	0.87	7.2	56.20	16.0	0.40	9.2
53	6.64	0.22	3.5	13.90	5.3	0.07	5.0	0.97	3.9	54.90	7.7	0.44	5.0
45	12.58	0.22	6.6	14.15	10.2	0.05	6.8	0.98	7.5	55.40	14.6	0.47	10.0
38	10.61	0.23	5.8	15.10	9.2	0.05	5.7	1.16	7.5	51.60	11.5	0.54	9.7
26	12.26	0.48	14.0	26.10	18.3	0.08	10.6	2.47	18.4	32.50	8.4	1.00	20.8
12	26.03	0.65	40.3	19.45	28.9	0.13	36.5	2.20	34.8	43.40	23.7	0.66	29.2
<12	9.71	0.76	17.6	21.10	11.7	0.21	22.0	2.79	16.5	39.20	8.0	0.65	10.7
CALC	100.00	0.42	100.0	17.49	100.0	0.09	100.0	1.65	100.0	47.58	100.0	0.59	100.0
ASSAY		0.40		17.35		0.09		1.69		47.80		0.59	

ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
75	8.59	0.88	7.3	3.84	9.3	8.97	10.0				
63	13.58	0.90	11.7	3.76	14.4	8.70	15.3				
53	6.64	0.95	6.1	3.59	6.7	8.52	7.3				
45	12.58	0.98	11.9	3.66	13.0	8.26	13.5				
38	10.61	1.06	10.8	3.53	10.6	7.97	11.0				
26	12.26	1.28	15.1	3.26	11.3	6.58	10.5				
12	26.03	1.07	26.8	3.35	24.6	6.90	23.3				
<12	9.71	1.11	10.4	3.65	10.0	7.35	9.2				
CALC	100.00	1.04	100.0	3.54	100.0	7.72	100.0				
ASSAY		1.04		3.59		7.87					

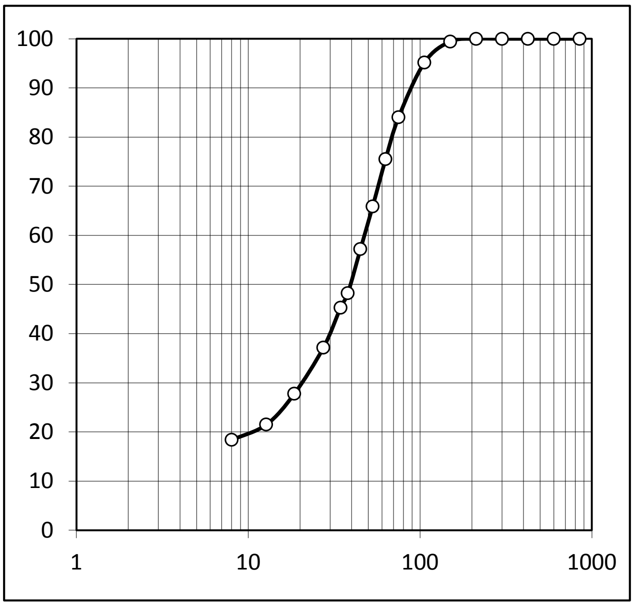
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc 16
	Regrind Discharge
DATE	81014
TECHNICIAN	MS

LC01 Cyc 16 Regrind Discharge		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.63	0.56	99.4
		106	4.83	4.29	95.2
		75	12.51	11.11	84.0
	69	63	9.63	8.55	75.5
		53	10.79	9.58	65.9
		45	9.77	8.68	57.2
		38	10.12	8.99	48.2
CYCLOSIZER	CS1	34	3.34	2.97	45.3
FLOW 185	CS2	27	9.16	8.14	37.1
TEMP 21	CS3	19	10.54	9.36	27.8
SG **2.80**	CS4	13	7.08	6.29	21.5
MINS 20	CS5	8	3.50	3.11	18.4
		SUB	20.69	18.38	0.0
		TOTAL	112.59	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mn %	Mn dist
150	0.56	0.20	0.2	12.80	0.3	0.05	0.3	1.28	0.2	55.40	0.8	0.31	0.3
106	4.29	0.24	1.7	13.35	2.8	0.05	2.7	1.01	1.4	53.50	5.6	0.36	2.3
75	11.11	0.31	5.6	15.00	8.0	0.06	8.3	1.57	5.7	51.60	13.9	0.44	7.2
63	8.55	0.47	6.6	17.75	7.3	0.05	5.3	2.36	6.6	47.80	9.9	0.57	7.2
53	9.58	0.61	9.6	19.35	8.9	0.06	7.2	3.11	9.7	44.50	10.3	0.68	9.6
45	8.68	0.74	10.5	21.80	9.1	0.07	7.6	2.60	7.3	41.60	8.7	0.77	9.8
38	8.99	0.82	12.1	22.70	9.8	0.07	7.9	4.06	11.8	37.10	8.1	0.85	11.2
27	11.10	1.47	26.8	32.80	17.5	0.12	16.7	6.60	23.8	19.75	5.3	1.15	18.8
13	15.65	0.63	16.2	21.20	16.0	0.09	17.6	3.05	15.5	41.50	15.7	0.71	16.3
8	3.11	0.42	2.1	20.00	3.0	0.08	3.1	2.44	2.5	43.40	3.3	0.63	2.9
CALC<8	18.38	0.29	8.6	19.61	17.3	0.10	23.3	2.61	15.5	41.51	18.5	0.54	14.5
ASSAY	100.00	0.61	100.0	20.80	100.0	0.08	100.0	3.08	100.0	41.30	100.0	0.68	100.0

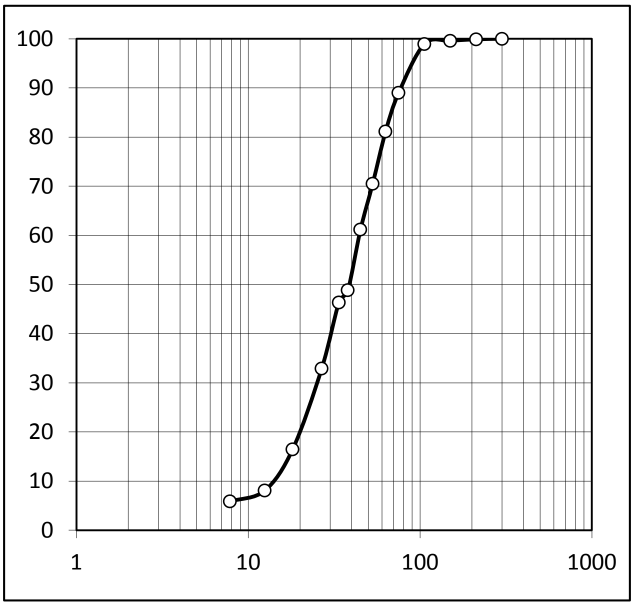
ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
150	0.56	0.59	0.4	4.57	0.7	10.00	0.7				
106	4.29	0.64	3.1	4.45	5.3	9.96	5.5				
75	11.11	0.73	9.2	4.00	12.3	9.09	13.1				
63	8.55	0.82	8.0	3.73	8.9	8.06	8.9				
53	9.58	0.87	9.5	3.45	9.2	7.42	9.2				
45	8.68	0.96	9.5	3.34	8.1	6.89	7.7				
38	8.99	0.94	9.6	3.15	7.9	6.11	7.1				
27	11.10	0.95	12.0	2.68	8.3	4.30	6.2				
13	15.65	1.03	18.3	3.25	14.1	6.67	13.5				
8.0239	3.11	1.03	3.6	3.73	3.2	7.55	3.0				
CALC	18.38	0.81	16.8	4.32	22.1	10.52	25.0				
ASSAY	100.00	0.88	100.0	3.60	100.0	7.73	100.0				

BURNIE LABORATORY
[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc25 -106
	Mozley Tail
DATE	221014
TECHNICIAN	DK

LC01 Cyc25 -106		SIZE	WEIGHTS		
Mozley Tail		um	gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.13	0.11	99.9
		150	0.37	0.31	99.6
		106	0.76	0.64	98.9
		75	11.85	9.96	89.0
		63	9.35	7.86	81.1
	62	53	12.61	10.60	70.5
		45	11.13	9.36	61.2
		38	14.67	12.33	48.8
CYCLOSIZER	CS1	34	2.99	2.51	46.3
FLOW 185	CS2	27	15.97	13.43	32.9
TEMP 21	CS3	18	19.52	16.41	16.5
SG **2.90**	CS4	12	10.01	8.42	8.0
MINS 20	CS5	8	2.62	2.20	5.8
		SUB	6.95	5.84	0.0
		TOTAL	118.93	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
106	1.06	0.18	0.5	9.0	0.6	0.06	0.7	0.55	0.4	66.5	1.5	0.16	0.3
75	9.96	0.19	4.7	11.7	6.8	0.05	5.5	0.52	3.2	60	12.5	0.28	4.6
63	7.86	0.19	3.7	12.4	5.7	0.06	5.2	0.6	2.9	58.4	9.6	0.34	4.5
53	10.60	0.19	5.0	13.0	8.0	0.06	7.1	0.73	4.8	57.7	12.8	0.4	7.1
45	9.36	0.21	4.9	14.2	7.7	0.06	6.2	0.68	3.9	56.8	11.1	0.47	7.3
38	12.33	0.22	6.8	15.2	10.9	0.06	8.2	1.1	8.4	51.6	13.3	0.57	11.7
27	15.94	0.47	18.7	24.8	23.1	0.08	14.2	2.89	28.4	33.4	11.1	1.01	26.8
12	24.83	0.69	42.8	20.0	29.0	0.15	41.4	2.22	34.0	42.6	22.1	0.71	29.4
8	2.20	0.75	4.1	21.0	2.7	0.19	4.7	2.51	3.4	39.2	1.8	0.65	2.4
CALC-8	5.84	0.59	8.6	16.34	5.6	0.10	6.8	2.93	10.6	35.28	4.3	0.60	5.9
ASSAY	100.00	0.40	100.00	17.15	100.00	0.09	100.00	1.62	100.00	47.90	100.00	0.60	100.00

ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
106	1.06	0.62	0.7	3.51	1.0	8.52	1.1				
75	9.96	0.81	8.0	3.78	10.6	8.97	11.3				
63	7.86	0.86	6.7	3.63	8.0	8.65	8.6				
53	10.60	0.91	9.6	3.65	10.9	8.36	11.2				
45	9.36	1.00	9.3	3.56	9.4	8.39	9.9				
38	12.33	1.07	13.1	3.52	12.2	7.84	12.2				
27	15.94	1.24	19.6	3.31	14.8	6.45	13.0				
12	24.83	1.11	27.3	3.38	23.6	6.87	21.6				
8	2.20	1.15	2.5	3.81	2.4	7.57	2.1				
CALC-8	5.84	0.59	3.4	4.37	7.2	11.92	8.8				
ASSAY	100.00	1.01	100.00	3.56	100.00	7.90	100.00				

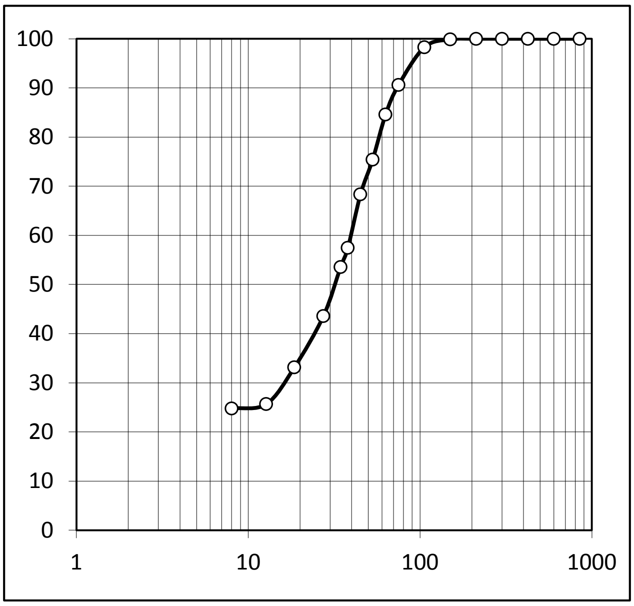
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc 25
	Regrind Discharge
DATE	221014
TECHNICIAN	DK

LC01 Cyc 25 Regrind Discharge		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.14	0.13	99.9
		106	1.76	1.59	98.3
		75	8.49	7.67	90.6
		63	6.65	6.01	84.6
	58	53	10.15	9.18	75.4
		45	7.84	7.09	68.3
		38	12.05	10.89	57.4
CYCLOSIZER	CS1	34	4.33	3.91	53.5
FLOW 185	CS2	27	11.02	9.96	43.6
TEMP 21	CS3	19	11.54	10.43	33.1
SG **2.80**	CS4	13	8.26	7.47	25.7
MINS 20	CS5	8	1.00	0.90	24.8
		SUB	27.39	24.76	0.0
		TOTAL	110.62	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	Mn %	Mn dist
106	1.72	0.24	0.7	14.00	1.1	0.07	1.5	0.91	0.5	54.40	2.3	0.36	0.9
75	7.67	0.33	4.0	15.70	5.7	0.07	6.7	1.58	3.9	51.40	9.7	0.47	5.2
63	6.01	0.43	4.1	18.00	5.2	0.06	4.5	2.22	4.3	47.40	7.0	0.59	5.1
53	9.18	0.55	8.0	19.25	8.4	0.07	8.0	2.71	8.0	45.40	10.2	0.69	9.2
45	7.09	0.56	6.3	20.50	6.9	0.06	5.3	2.88	6.6	43.00	7.5	0.72	7.4
38	10.89	0.74	12.8	22.20	11.5	0.08	10.9	3.53	12.4	39.60	10.6	0.84	13.3
27	13.88	1.49	32.8	32.20	21.3	0.13	22.5	5.00	22.5	24.40	8.3	1.10	22.1
13	17.90	0.71	20.2	20.60	17.6	0.08	17.9	3.30	19.1	42.40	18.6	0.68	17.6
8	0.90	0.45	0.6	20.60	0.9	0.07	0.8	2.82	0.8	43.70	1.0	0.63	0.8
CALC<8	24.76	0.27	10.5	18.15	21.4	0.07	21.8	2.72	21.8	41.09	24.9	0.51	18.3
ASSAY	100.00	0.63	100.0	21.00	100.0	0.08	100.0	3.09	100.0	40.80	100.0	0.69	100.0

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
106	1.72	0.72	1.4	4.84	2.4	9.90	2.2				
75	7.67	0.72	6.4	4.17	9.1	8.95	9.1				
63	6.01	0.77	5.3	3.71	6.3	7.96	6.3				
53	9.18	0.85	9.0	3.54	9.2	7.36	8.9				
45	7.09	0.87	7.1	3.33	6.7	6.87	6.4				
38	10.89	0.93	11.6	3.19	9.9	6.31	9.1				
27	13.88	0.95	15.2	2.80	11.0	4.76	8.7				
13	17.90	0.99	20.4	3.17	16.1	6.50	15.4				
8	0.90	0.99	1.0	3.50	0.9	7.13	0.9				
CALC	24.76	0.80	22.7	4.03	28.3	10.08	33.0				
ASSAY	100.00	0.87	100.0	3.52	100.0	7.57	100.0				

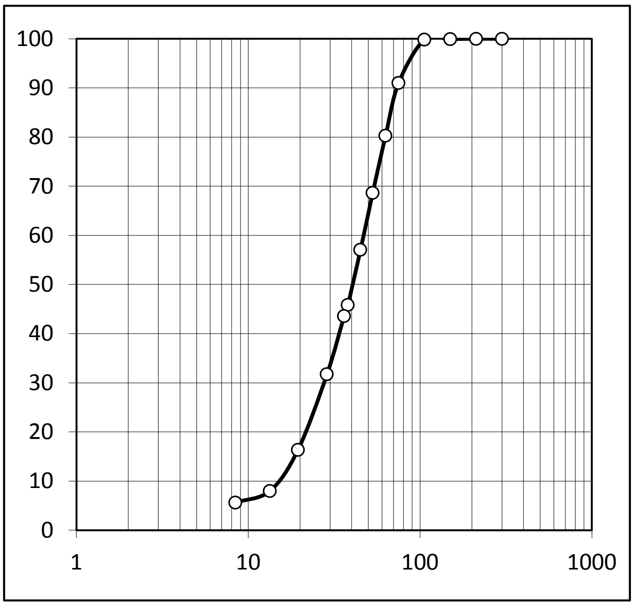
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc31 -106
	Mozley Tail
DATE	041114
TECHNICIAN	MS

LC01 Cyc31 -106 Mozley Tail		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.07	0.06	99.9
		106	0.10	0.09	99.8
		75	9.72	8.85	91.0
		63	11.75	10.70	80.3
	63	53	12.82	11.68	68.6
		45	12.71	11.58	57.0
		38	12.31	11.21	45.8
CYCLOSIZER	CS1	36	2.47	2.25	43.6
FLOW 185	CS2	29	13.01	11.85	31.7
TEMP 21	CS3	19	16.91	15.40	16.3
SG **2.60**	CS4	13	9.16	8.34	8.0
MINS 20	CS5	8	2.60	2.37	5.6
		SUB	6.17	5.62	0.0
		TOTAL	109.80	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	MnO %	MnO dist
75	9.01	0.21	4.9	12.35	6.7	0.05	5.0	0.50	2.9	59.60	11.0	0.33	5.2
63	10.70	0.22	6.0	13.00	8.4	0.06	7.1	0.75	5.1	57.40	12.6	0.38	7.1
53	11.68	0.21	6.3	13.05	9.2	0.05	6.5	0.83	6.2	56.60	13.5	0.41	8.4
45	11.58	0.22	6.5	14.15	9.9	0.07	9.0	0.99	7.3	55.60	13.2	0.49	10.0
38	11.21	0.22	6.3	14.90	10.1	0.05	6.2	0.98	7.0	53.00	12.2	0.55	10.8
29	14.10	0.49	17.7	23.40	19.9	0.07	11.0	2.60	23.5	35.10	10.1	0.94	23.2
13	23.74	0.64	39.0	19.20	27.5	0.14	36.9	1.65	25.1	45.50	22.1	0.67	27.9
8	2.37	0.67	4.1	21.10	3.0	0.19	5.0	2.43	3.7	41.10	2.0	0.64	2.7
CALC-8	5.62	0.64	9.2	16.14	5.5	0.21	13.2	5.29	19.1	29.86	3.4	0.47	4.7
ASSAY	100.00	0.39	100.00	16.60	100.00	0.09	100.00	1.56	100.00	48.90	100.00	0.57	100.00

ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
75	9.01	0.85	7.7	3.84	9.8	8.95	10.2				
63	10.70	0.82	8.8	3.72	11.2	8.62	11.6				
53	11.68	0.87	10.2	3.56	11.7	8.20	12.1				
45	11.58	0.98	11.3	3.58	11.7	8.01	11.7				
38	11.21	1.02	11.4	3.57	11.3	7.71	10.9				
29	14.10	1.24	17.5	3.19	12.7	6.49	11.5				
13	23.74	1.10	26.1	3.48	23.3	7.16	21.4				
8	2.37	1.12	2.7	3.63	2.4	7.25	2.2				
CALC-8	5.62	0.78	4.4	3.63	5.8	11.85	8.4				
ASSAY	100.00	1.00	100.00	3.54	100.00	7.93	100.00				

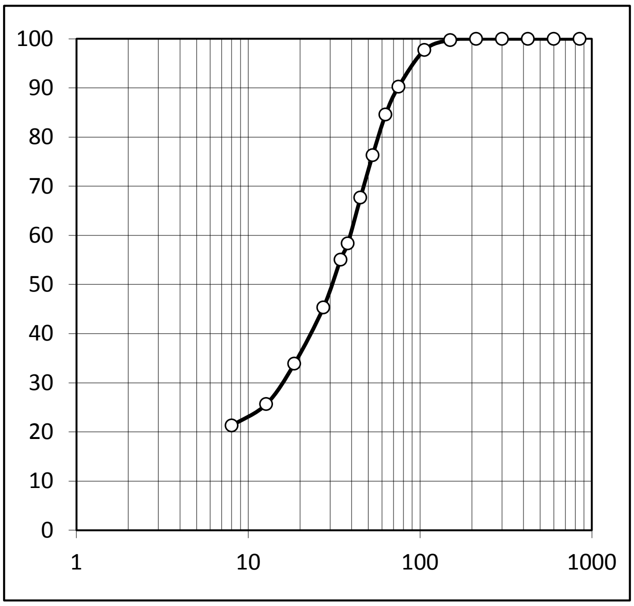
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	LC01 Cyc 231
	Regrind Discharge
DATE	71114
TECHNICIAN	MS

LC01 Cyc 231 Regrind Discharge		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.26	0.25	99.7
		106	2.09	2.04	97.7
		75	7.63	7.44	90.3
		63	5.83	5.68	84.6
	57	53	8.47	8.26	76.3
		45	8.88	8.66	67.7
		38	9.53	9.29	58.4
CYCLOSIZER	CS1	34	3.39	3.31	55.1
FLOW 185	CS2	27	10.02	9.77	45.3
TEMP 21	CS3	19	11.72	11.43	33.9
SG **2.80**	CS4	13	8.43	8.22	25.7
MINS 20	CS5	8	4.48	4.37	21.3
		SUB	21.83	21.29	0.0
		TOTAL	102.56	100.00	



ANALYSES

SIZE um	WT %	Sn %	Sn dist	Fe %	Fe dist	As %	As dist	S %	S dist	SiO2 %	SiO2 dist	MnO %	MnO dist
106	2.29	0.26	1.0	15.50	1.7	0.06	1.5	1.34	1.1	51.50	2.9	0.37	1.2
75	7.44	0.28	3.6	15.90	5.8	0.07	5.8	1.47	3.9	50.50	9.1	0.45	4.9
63	5.68	0.36	3.5	17.85	5.0	0.06	3.8	1.94	4.0	47.40	6.5	0.59	4.9
53	8.26	0.47	6.7	19.10	7.7	0.09	8.3	2.16	6.4	46.00	9.2	0.67	8.1
45	8.66	0.56	8.4	20.80	8.8	0.08	7.7	2.68	8.3	42.90	9.0	0.76	9.7
38	9.29	0.63	10.1	20.90	9.5	0.09	9.3	3.08	10.3	41.30	9.3	0.80	10.9
34	3.31	2.99	17.0	40.60	6.6	0.19	7.0	9.93	11.8	7.97	0.6	1.29	6.3
27	9.77	0.92	15.5	26.40	12.6	0.10	10.9	4.25	14.9	30.10	7.1	1.02	14.7
19	11.43	0.73	14.4	20.60	11.5	0.12	15.2	2.68	11.0	42.90	11.9	0.73	12.3
13	8.22	0.59	8.4	20.10	8.1	0.11	10.0	2.64	7.8	45.00	9.0	0.65	7.9
8	4.37	0.43	3.2	19.65	4.2	0.09	4.4	2.49	3.9	45.40	4.8	0.62	4.0
CALC<8	21.29	0.22	8.2	17.58	18.3	0.07	16.2	2.20	16.8	40.07	20.7	0.48	15.1
ASSAY	100.00	0.58	100.0	20.40	100.0	0.09	100.0	2.79	100.0	41.30	100.0	0.68	100.0

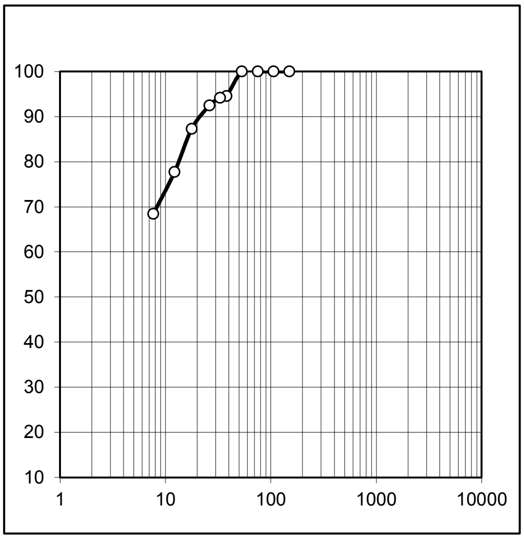
ANALYSES

SIZE um	WT %	CaO %	CaO dist	MgO %	MgO dist	Al2O3 %	Al2O3 dist				
106	2.29	0.64	1.6	4.51	2.9	9.39	2.8				
75	7.44	0.72	5.8	4.12	8.5	8.98	8.6				
63	5.68	0.82	5.1	3.82	6.0	8.31	6.1				
53	8.26	0.89	8.0	3.59	8.2	7.83	8.3				
45	8.66	0.97	9.1	3.44	8.3	7.21	8.0				
38	9.29	0.98	9.9	3.36	8.6	6.92	8.3				
34	3.31	0.69	2.5	2.39	2.2	2.48	1.1				
27	9.77	1.13	12.0	3.07	8.3	5.99	7.5				
19	11.43	1.02	12.7	3.24	10.3	6.80	10.0				
13	8.22	1.01	9.0	3.34	7.6	6.90	7.3				
8	4.37	0.99	4.7	3.45	4.2	7.32	4.1				
CALC	21.29	0.85	19.6	4.24	25.0	10.14	27.8				
ASSAY	100.00	0.92	100.0	3.61	100.0	7.76	100.0				

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Cyclone O/F
TEST NO	T22
DATE	150714
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Cyclone O/F		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		38	1.31	5.42	94.6	
CYCLOSIZER	CS1	33	0.10	0.41	94.2	
FLOW 175	CS2	26	0.41	1.70	92.5	
TEMP 21	CS3	18	1.25	5.17	87.3	
SG **3.00**	CS4	12	2.32	9.59	77.7	**14**
MINS 20	CS5	8	2.24	9.26	68.4	
CENTRIFUGE	0	4	0.00	0.00	68.4	
		SUB	16.55	68.4	0.0	
		TOTAL	24.18	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Cyclone U/F
TEST NO	T22
DATE	150714
TECHNICIAN	MS

	SAMPLE SIZED CYCLONE FEED				SAMPLE SIZED CYCLONE UF				SAMPLE SIZED CYCLONE OF						
SIZE	WEIGHTS		100	SIZE	WEIGHTS		60	SIZE	WEIGHTS		40		P80	P80	P80
um	gm	(%)	%PASS	um	gm	(%)	% Pass	um	gm	(%)	%PASS				
1700	0.00	0.00	100.0	1700	0.00	0.00	100.0				100.0				
1180	0.00	0.00	100.0	1180	0.00	0.00	100.0				100.0				
850	0.00	0.00	100.0	850	1.48	1.12	98.9				100.0				
600	4.32	2.44	97.6	600	2.14	1.63	97.2	600		3.7	96.3	39.9			
425	7.34	4.15	93.4	425	6.58	5.00	92.2	425		2.9	93.4	72.3			
300	15.89	8.99	84.4	300	15.79	12.00	80.2	300		4.5	89.0	80.1	**263**	**299**	
212	18.62	10.54	73.9	212	19.33	14.69	65.6	212		4.3	84.7	83.7			
150	17.83	10.09	63.8	150	19.61	14.90	50.6	150		2.9	81.8	88.6			
106	12.92	7.31	56.5	106	14.57	11.07	39.6	106		1.7	80.1	90.9			**103**
75	12.33	6.98	49.5	75	13.98	10.63	29.0	75		1.5	78.6	91.4			
53	10.21	5.78	43.7	53	11.32	8.60	20.3	53		1.5	77.1	89.4			
38	10.02	5.67	38.1	38	11.15	8.47	11.9	38		1.5	75.6	89.7			
SUB	67.26	38.06		SUB	15.62	11.9		SUB		77.3		18.7			
TOTAL	176.7	100.0		TOTAL	131.57	100.00		TOTAL		101.7					

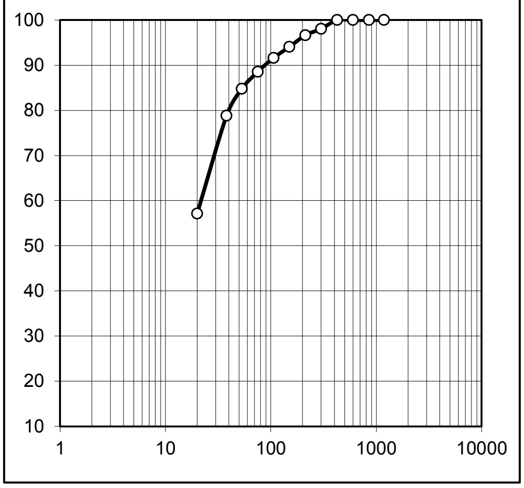
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Cyclone U/F
TEST NO	T23
DATE	170714
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Cyclone U/F		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	1.99	1.94	98.1	
		212	1.49	1.45	96.6	
		150	2.61	2.54	94.1	
		106	2.53	2.46	91.6	
		75	3.14	3.06	88.5	
		53	3.87	3.77	84.8	
		38	6.11	5.95	78.8	**41**
		20	22.25	21.67	57.2	
CYCLOSIZER	CS1	33	0.00	0.00	57.2	
FLOW 185	CS2	26	0.00	0.00	57.2	
TEMP 21	CS3	18	0.00	0.00	57.2	
SG **3.00**	CS4	12	0.00	0.00	57.2	
MINS 20	CS5	8	0.00	0.00	57.2	
CENTRIFUGE	0	4	0.00	0.00	57.2	
		SUB	58.68	57.2	0.0	
		TOTAL	102.67	100.00		



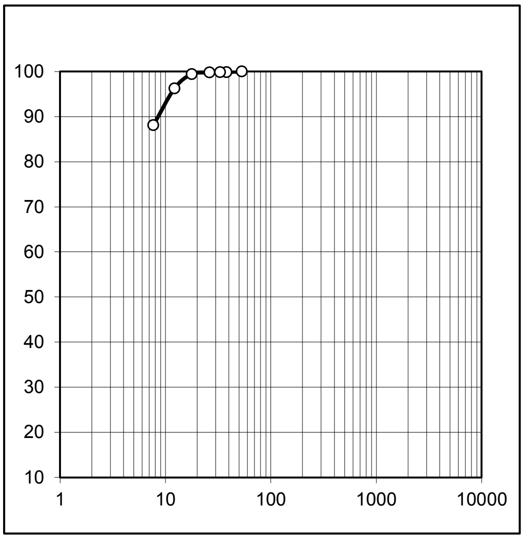
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Cyclone OF
TEST NO	T23
DATE	180714
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Cyclone OF		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		38	0.09	0.13	99.9	
CYCLOSIZER	CS1	33	0.02	0.03	99.8	
FLOW 175	CS2	26	0.04	0.06	99.8	
TEMP 21	CS3	18	0.25	0.37	99.4	
SG **3.00**	CS4	12	2.09	3.13	96.3	
MINS 20	CS5	8	5.45	8.17	88.1	
CENTRIFUGE	0	4	0.00	0.00	88.1	
		SUB	58.74	88.1	0.0	
		TOTAL	66.68	100.00		



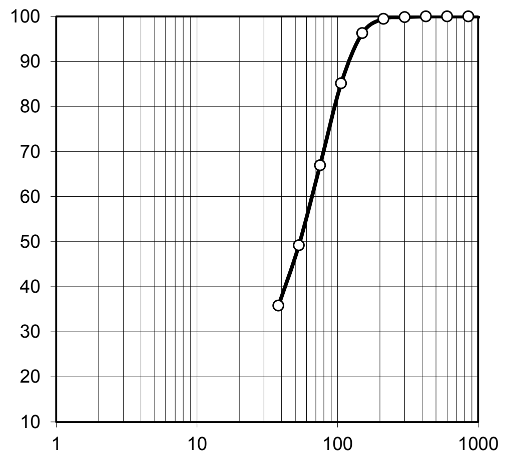
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Grind Discharge
TEST NO	T24
DATE	180714
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Grind Discharge		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.16	0.16	99.8	
		212	0.36	0.37	99.5	
		150	3.11	3.18	96.3	
		106	10.90	11.15	85.1	
		75	17.78	18.19	66.9	**97**
		53	17.36	17.76	49.2	
		38	13.08	13.38	35.8	
CYCLOSIZER	CS1	33	0.80	0.82	35.0	
FLOW 175	CS2	26	5.30	5.42	29.6	
TEMP 21	CS3	18	8.46	8.65	20.9	
SG **3.00**	CS4	12	4.84	4.95	16.0	
MINS 20	CS5	8	2.57	2.63	13.3	
CENTRIFUGE	0	4	0.00	0.00	13.3	
		SUB	13.03	13.3	0.0	
		TOTAL	97.75	100.00		

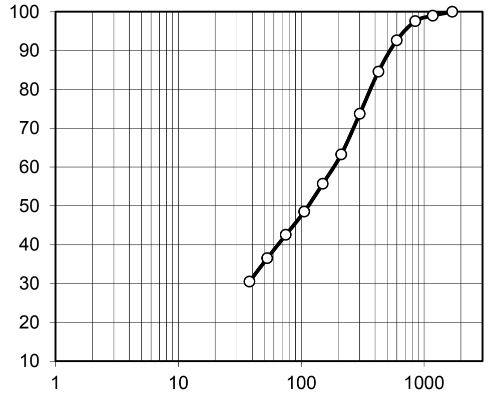


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Bulk Sulphide Tail
TEST NO	
DATE	100914
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Bulk Sulphide Tail		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	5.06	0.99	99.0	
		850	7.32	1.43	97.6	
		600	25.08	4.91	92.7	
		425	41.38	8.11	84.6	
		300	55.15	10.81	73.7	**372**
		212	53.42	10.47	63.3	
		150	38.61	7.57	55.7	
		106	36.70	7.19	48.5	
		75	30.59	5.99	42.5	
		53	30.62	6.00	36.5	
		38	30.62	6.00	30.5	
CYCLOSIZER		20	35.72	7.00	23.5	
FLOW 175	CS2	16	0.00	0.00	23.5	
TEMP 21	CS3	11	0.00	0.00	23.5	
SG **6.50**	CS4	7	0.00	0.00	23.5	
MINS 20	CS5	5	0.00	0.00	23.5	
CENTRIFUGE	0	2	0.00	0.00	23.5	
		SUB	120.03	23.52	0.0	
		TOTAL	510.30	100.00		

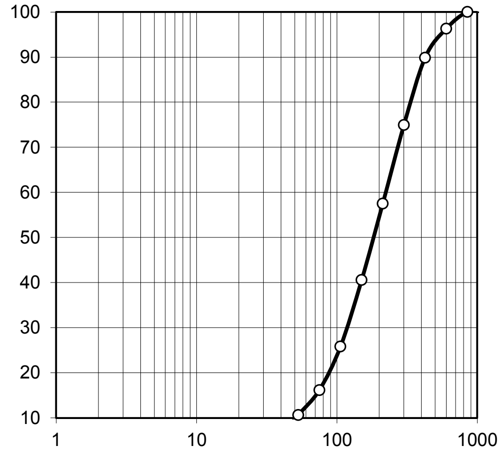


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	LC01 Cyc 10 Comb
	Mids + Tail
DATE	110914
TECHNICIAN	MS

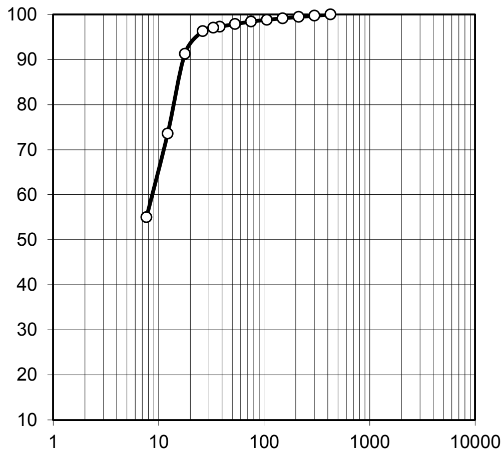
SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 10 Comb		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	2.65	3.72	96.3	
		425	4.56	6.40	89.9	
		300	10.66	14.96	74.9	**342**
		212	12.42	17.43	57.5	
		150	12.07	16.94	40.6	
		106	10.51	14.75	25.8	
		75	6.86	9.63	16.2	
		53	3.95	5.54	10.6	
		38	3.80	5.33	5.3	
CYCLOSIZER	CS1	33	0.00	0.00	5.3	
FLOW 175	CS2	26	0.00	0.00	5.3	
TEMP 21	CS3	18	0.00	0.00	5.3	
SG **3.00**	CS4	12	0.00	0.00	5.3	
MINS 20	CS5	8	0.00	0.00	5.3	
CENTRIFUGE	0	4	0.00	0.00	5.3	
		SUB	3.78	5.3	0.0	
		TOTAL	71.26	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Cyc U/F
TEST NO	T43
DATE	260914
TECHNICIAN	DK

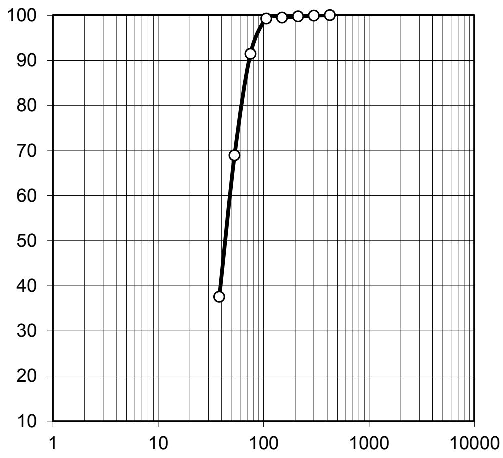
SAMPLE SIZED		SIZE	WEIGHTS			P80
Cyc U/F		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.23	0.28	99.7	
		212	0.22	0.27	99.5	
		150	0.26	0.32	99.1	
		106	0.25	0.30	98.8	
		75	0.35	0.43	98.4	
		53	0.43	0.52	97.9	
		38	0.49	0.60	97.3	
CYCLOSIZER	CS1	33	0.19	0.23	97.1	
FLOW 185	CS2	26	0.62	0.75	96.3	
TEMP 21	CS3	18	4.13	5.02	91.3	
SG **3.00**	CS4	12	14.57	17.70	73.6	**14**
MINS 20	CS5	8	15.30	18.59	55.0	
CENTRIFUGE	0	4	0.00	0.00	55.0	
		SUB	45.28	55.0	0.0	
		TOTAL	82.32	100.00		



PROJECT	T0879
SAMPLE	LC01 Cyc 16 -106
	Mozley Mids
DATE	61014
TECHNICIAN	DK

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

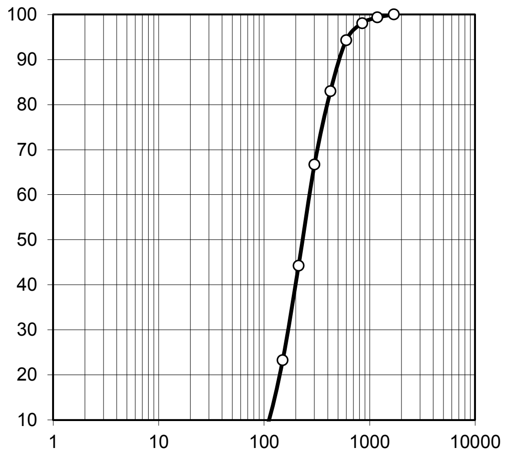
SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 16 -106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.06	0.07	99.9	
		212	0.18	0.21	99.7	
		150	0.20	0.23	99.5	
		106	0.21	0.24	99.3	
		75	6.82	7.80	91.5	
		53	19.67	22.50	69.0	**64**
		38	27.44	31.39	37.6	
CYCLOSIZER	CS1	33	0.00	0.00	37.6	
FLOW 185	CS2	26	0.00	0.00	37.6	
TEMP 21	CS3	18	0.00	0.00	37.6	
SG **3.00**	CS4	12	0.00	0.00	37.6	
MINS 20	CS5	8	0.00	0.00	37.6	
CENTRIFUGE	0	4	0.00	0.00	37.6	
		SUB	32.85	37.6	0.0	
		TOTAL	87.43	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	LC01 Cyc 16 +106
	Mozley Tails
DATE	61014
TECHNICIAN	DK

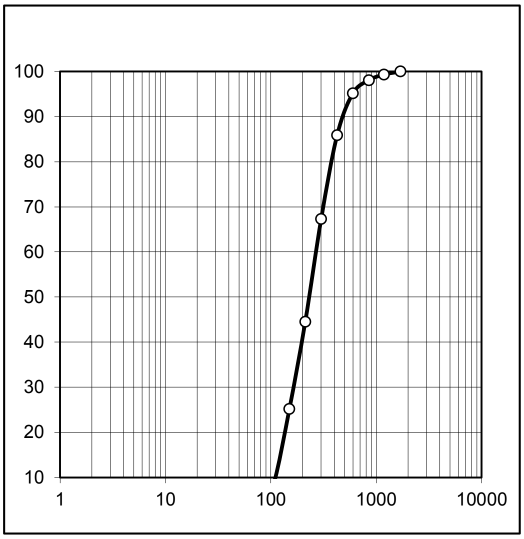
SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 16 +106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.62	0.66	99.3	
		850	1.19	1.27	98.1	
		600	3.54	3.78	94.3	
		425	10.62	11.34	82.9	
		300	15.25	16.28	66.7	**402**
		212	21.03	22.45	44.2	
		150	19.63	20.96	23.3	
		106	14.01	14.96	8.3	
		75	7.59	8.10	0.2	
		53	0.05	0.05	0.1	
		38	0.05	0.05	0.1	
CYCLOSIZER	CS1	33	0.00	0.00	0.1	
FLOW 185	CS2	26	0.00	0.00	0.1	
TEMP 21	CS3	18	0.00	0.00	0.1	
SG **3.00**	CS4	12	0.00	0.00	0.1	
MINS 20	CS5	8	0.00	0.00	0.1	
CENTRIFUGE	0	4	0.00	0.00	0.1	
		SUB	0.08	0.1	0.0	
		TOTAL	93.66	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	LC01 Cyc 25 +106
	Mozley Tails
DATE	211014
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 25 +106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.70	0.67	99.3	
		850	1.31	1.26	98.1	
		600	3.03	2.91	95.2	
		425	9.68	9.30	85.9	
		300	19.35	18.58	67.3	**386**
		212	23.70	22.76	44.5	
		150	20.13	19.33	25.2	
		106	17.51	16.81	8.4	
		75	8.59	8.25	0.1	
		53	0.05	0.05	0.1	
		38	0.05	0.05	0.0	
CYCLOSIZER	CS1	33	0.00	0.00	0.0	
FLOW 185	CS2	26	0.00	0.00	0.0	
TEMP 21	CS3	18	0.00	0.00	0.0	
SG **3.00**	CS4	12	0.00	0.00	0.0	
MINS 20	CS5	8	0.00	0.00	0.0	
CENTRIFUGE	0	4	0.00	0.00	0.0	
		SUB	0.04	0.0	0.0	
		TOTAL	104.14	100.00		

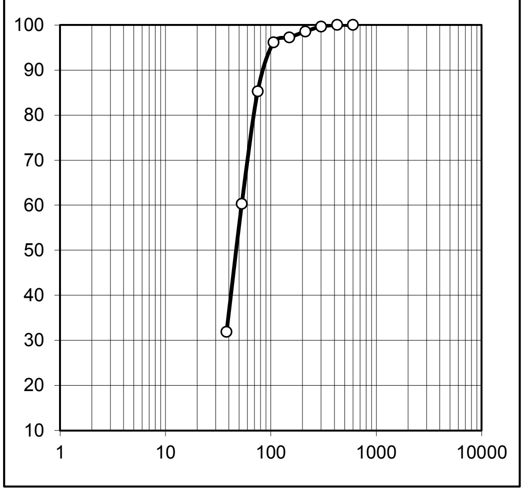


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	LC01 Cyc 25 -106
	Mozley Mids
DATE	211014
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 25 -106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.35	0.34	99.7	
		212	1.12	1.10	98.6	
		150	1.35	1.32	97.2	
		106	1.15	1.13	96.1	
		75	11.09	10.85	85.3	
		53	25.52	24.97	60.3	**70**
		38	29.02	28.40	31.9	
CYCLOSIZER	CS1	33	0.00	0.00	31.9	
FLOW 185	CS2	26	0.00	0.00	31.9	
TEMP 21	CS3	18	0.00	0.00	31.9	
SG **3.00**	CS4	12	0.00	0.00	31.9	
MINS 20	CS5	8	0.00	0.00	31.9	
CENTRIFUGE	0	4	0.00	0.00	31.9	
		SUB	32.60	31.9	0.0	
		TOTAL	102.20	100.00		

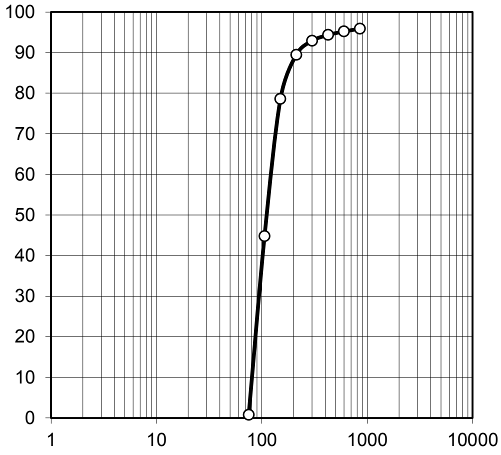


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	LC01 Cyc11-31 +106
	CONC
DATE	311014
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc11-31 +106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	2.20	4.13	95.9	
		600	0.36	0.68	95.2	
		425	0.45	0.84	94.4	
		300	0.78	1.46	92.9	
		212	1.83	3.43	89.5	
		150	5.81	10.89	78.6	**158**
		106	18.02	33.79	44.8	
		75	23.47	44.01	0.8	
		53	0.00	0.00	0.8	
		38	0.00	0.00	0.8	
CYCLOSIZER	CS1	33	0.00	0.00	0.8	
FLOW 185	CS2	26	0.00	0.00	0.8	
TEMP 21	CS3	18	0.00	0.00	0.8	
SG **3.00**	CS4	12	0.00	0.00	0.8	
MINS 20	CS5	8	0.00	0.00	0.8	
CENTRIFUGE	0	4	0.00	0.00	0.8	
		SUB	0.41	0.8	0.0	
		TOTAL	53.33	100.00		



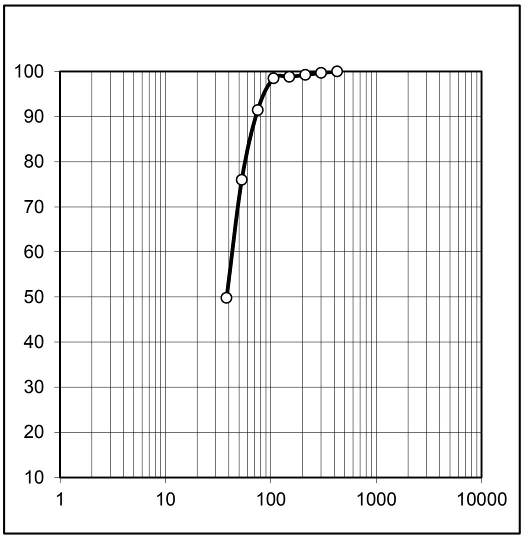
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	LC01 Cyc11-31 -106 Moz Conc
DATE	311014
TECHNICIAN	MS

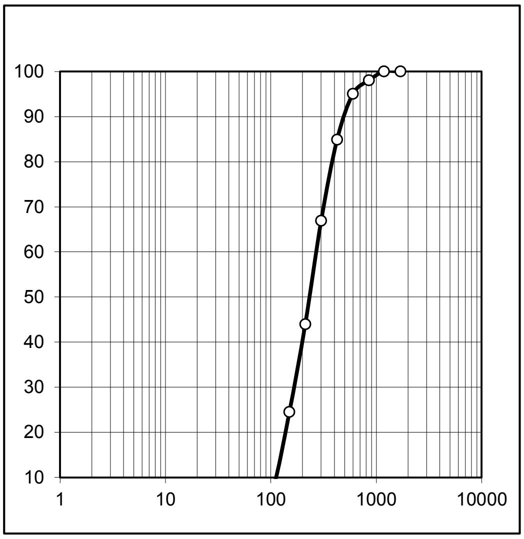
SAMPLE SIZED		SIZE	WEIGHTS			P80
#REF!		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.17	0.33	99.7	
		212	0.22	0.43	99.2	
		150	0.22	0.43	98.8	
		106	0.18	0.35	98.5	
		75	3.62	7.03	91.4	
		53	7.95	15.44	76.0	**59**
		38	13.49	26.19	49.8	
CYCLOSIZER	CS1	33	0.00	0.00	49.8	
FLOW 185	CS2	26	0.00	0.00	49.8	
TEMP 21	CS3	18	0.00	0.00	49.8	
SG **3.00**	CS4	12	0.00	0.00	49.8	
MINS 20	CS5	8	0.00	0.00	49.8	
CENTRIFUGE	0	4	0.00	0.00	49.8	
		SUB	25.65	49.8	0.0	
		TOTAL	51.50	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	LC01 Cyc 31 +106
	Mozley Tails
DATE	311014
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 31 +106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	1.98	1.97	98.0	
		600	3.02	3.01	95.0	
		425	10.16	10.11	84.9	
		300	18.07	17.99	66.9	**391**
		212	23.05	22.95	44.0	
		150	19.55	19.46	24.5	
		106	16.72	16.65	7.9	
		75	7.78	7.75	0.1	
		53	0.05	0.05	0.1	
		38	0.05	0.05	0.0	
CYCLOSIZER	CS1	33	0.00	0.00	0.0	
FLOW 185	CS2	26	0.00	0.00	0.0	
TEMP 21	CS3	18	0.00	0.00	0.0	
SG **3.00**	CS4	12	0.00	0.00	0.0	
MINS 20	CS5	8	0.00	0.00	0.0	
CENTRIFUGE	0	4	0.00	0.00	0.0	
		SUB	0.02	0.0	0.0	
		TOTAL	100.45	100.00		

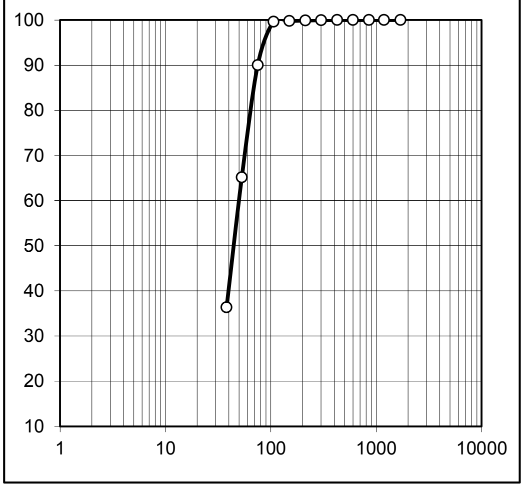


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	LC01 Cyc 31 -106
	Mozley Mids
DATE	41114
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
LC01 Cyc 31 -106		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.03	0.03	100.0	
		212	0.07	0.08	99.9	
		150	0.10	0.11	99.8	
		106	0.11	0.12	99.7	
		75	8.63	9.63	90.0	
		53	22.28	24.87	65.2	**66**
		38	25.80	28.79	36.4	
CYCLOSIZER	CS1	33	0.00	0.00	36.4	
FLOW 185	CS2	26	0.00	0.00	36.4	
TEMP 21	CS3	18	0.00	0.00	36.4	
SG **3.00**	CS4	12	0.00	0.00	36.4	
MINS 20	CS5	8	0.00	0.00	36.4	
CENTRIFUGE	0	4	0.00	0.00	36.4	
		SUB	32.58	36.4	0.0	
		TOTAL	89.60	100.00		

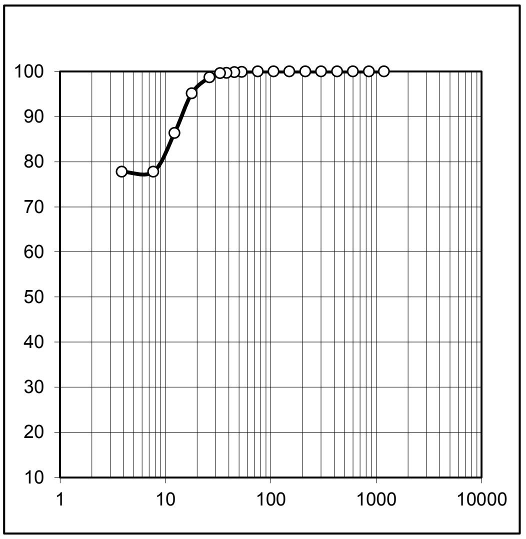


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	LC01 Cyc11-31 Cyclone O/F
TEST NO	
DATE	61114
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
0		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.07	0.07	99.9	
		45	0.06	0.06	99.9	
		38	0.20	0.20	99.7	
CYCLOSIZER	CS1	33	0.06	0.06	99.6	
FLOW 185	CS2	26	0.94	0.92	98.7	
TEMP 21	CS3	18	3.64	3.56	95.1	
SG **3.00**	CS4	12	8.95	8.76	86.4	
MINS 20	CS5	8	8.77	8.59	77.8	**9**
CENTRIFUGE	0	4	0.00	0.00	77.8	
		SUB	79.45	77.8	0.0	
		TOTAL	102.14	100.00		

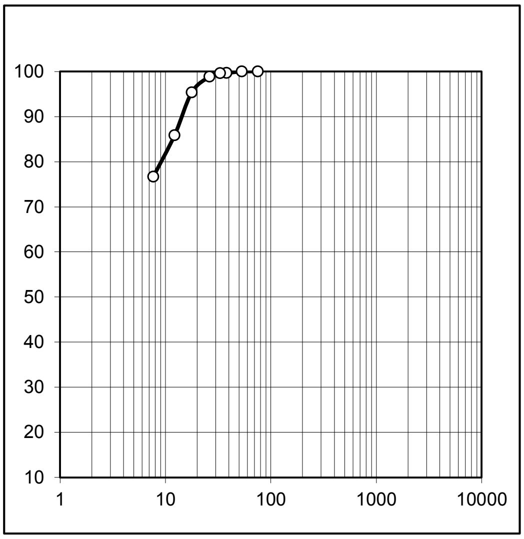


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	LC01 CYC 11-31 Cyclone OF
TEST NO	
DATE	131114
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
0		um	gm	(%)	% Pass	um
		1700	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		38	0.37	0.33	99.7	
CYCLOSIZER	CS1	33	0.06	0.05	99.6	
FLOW 185	CS2	26	0.87	0.77	98.8	
TEMP 21	CS3	18	3.93	3.49	95.4	
SG **3.00**	CS4	12	10.71	9.51	85.9	
MINS 20	CS5	8	10.31	9.15	76.7	**9**
CENTRIFUGE	0	4	0.00	0.00	76.7	
		SUB	86.41	76.7	0.0	
		TOTAL	112.66	100.00		

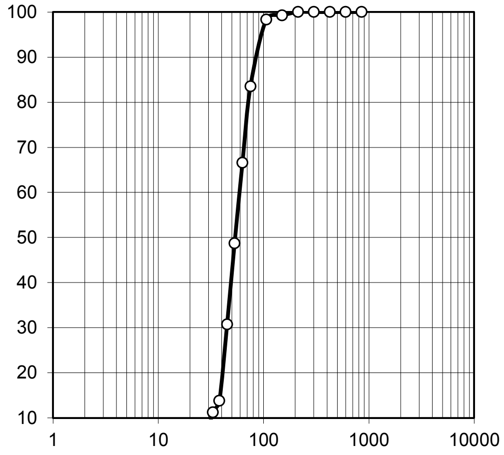


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	LC01 Cyc11-31 Fine Tail +40
TEST NO	
DATE	61114
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
0		um	gm	(%)	% Pass	um
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.74	0.74	99.3	
		106	0.92	0.92	98.3	
		75	14.86	14.82	83.5	
		63	16.97	16.92	66.6	**72**
		53	17.94	17.89	48.7	
		45	18.04	17.99	30.7	
		38	17.00	16.95	13.8	
CYCLOSIZER	CS1	33	2.53	2.52	11.3	
FLOW 185	CS2	26	8.24	8.22	3.0	
TEMP 21	CS3	18	1.84	1.83	1.2	
SG **3.00**	CS4	12	0.05	0.05	1.2	
MINS 20	CS5	8	0.03	0.03	1.1	
CENTRIFUGE	0	4	0.00	0.00	1.1	
		SUB	1.13	1.1	0.0	
		TOTAL	100.29	100.00		

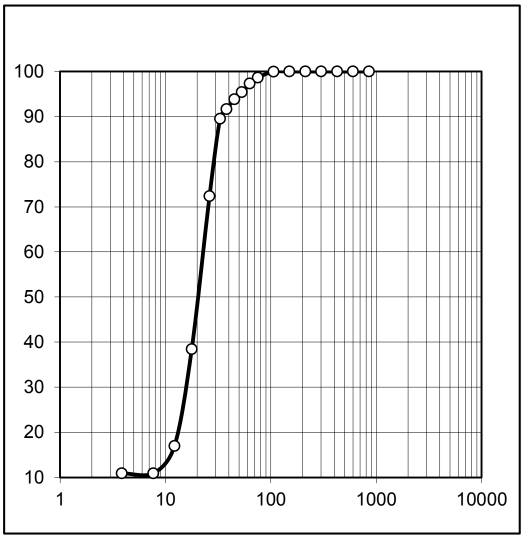


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	LC01 Cyc11-31 Fine Tail -40
TEST NO	
DATE	61114
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
0		um	gm	(%)	% Pass	um
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.05	0.05	100.0	
		75	1.38	1.28	98.7	
		63	1.45	1.35	97.3	
		53	2.05	1.90	95.4	
		45	1.70	1.58	93.8	
		38	2.37	2.20	91.6	
CYCLOSIZER	CS1	33	2.28	2.12	89.5	
FLOW 185	CS2	26	18.48	17.15	72.4	**29**
TEMP 21	CS3	18	36.57	33.94	38.4	
SG **3.00**	CS4	12	23.10	21.44	17.0	
MINS 20	CS5	8	6.54	6.07	10.9	
CENTRIFUGE	0	4	0.00	0.00	10.9	
		SUB	11.77	10.9	0.0	
		TOTAL	107.74	100.00		



BURNIE LABORATORY: BATCH UF FALCON SEPARATION

PROJECT	T0879
TEST NO	T25
DATE	120814
TECHNICIAN	ID

CONDITIONS

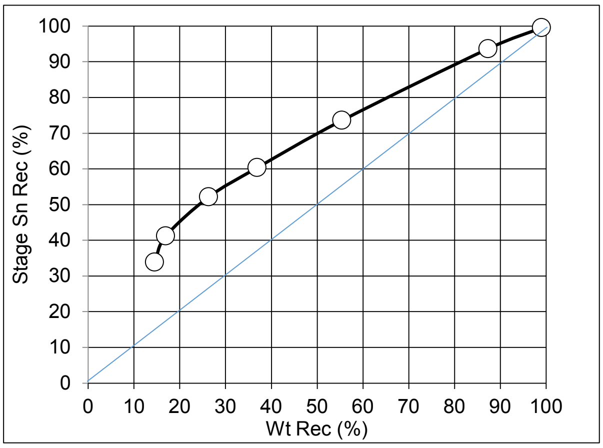
Separation of	Sn
Feed Pulp Density (%)	12
Feed In Time (min)	16
UF-100 Speed (g's)	218
Total Feed Weight (gm)	3987.7
Calc Feed Rate (gm/min)	249.2
	34.3 Ltr H2O

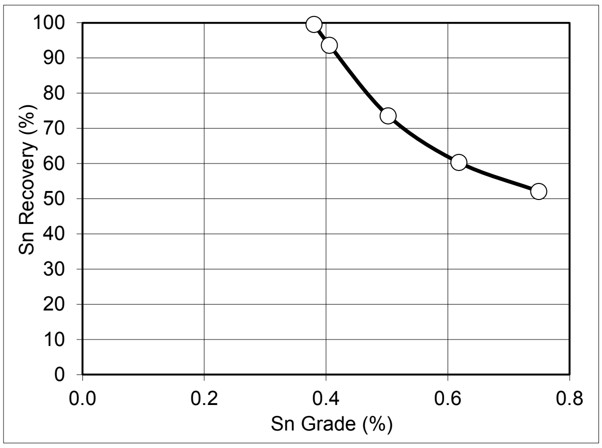
FEED MATERIAL
LC01 cyc 1-6
Mozley tail -106

Product	Feed on Time (min)	Product Mass (gm)	Product Mass (%)	Calc Feed Mass (gm)	Calc Mass to Conc (gm)	Calc Mass to Conc (%)	Sn Tail (%)	Sn Dist (%)	Sn Stage Rec (%)	Sn Calc Conc (%)
Tail	1.00	2.3	0.1	249.2	246.9	99.1	0.19	0.0	99.5	0.38
Tail	2.00	60.8	1.5	498.5	435.4	87.3	0.19	0.8	93.6	0.41
Tail	4.00	381.1	9.6	996.9	552.7	55.4	0.23	5.8	73.6	0.50
Tail	6.00	499.3	12.5	1495.4	551.9	36.9	0.25	8.3	60.3	0.62
Tail	8.00	525.8	13.2	1993.9	524.6	26.3	0.26	9.1	52.1	0.75
Tail	12.00	1015.1	25.5	2990.8	508.7	16.9	0.30	20.2	41.2	0.92
Tail	16.00	923.6	23.2	3987.7	579.7	14.5	0.36	22.0	33.8	0.88
Conc		579.7	14.5				0.88	33.8		
Total		3987.7	100.0				0.38	100.0		
Head							0.52			

	Fe %	Dist %	S %	Dist %	SiO2 %	Dist %	Al2O3 %	Dist %	As %	Dist %
Tail	12.25	0.0	1.11	0.0	57.20	0.1	10.30	0.1	0.08	0.1
Tail	11.00	1.0	0.64	0.7	60.50	1.9	8.66	1.7	0.05	1.0
Tail	13.95	7.9	0.97	6.4	53.40	10.4	8.36	10.0	0.05	6.1
Tail	16.00	11.9	1.20	10.4	51.20	13.1	8.23	13.0	0.07	11.1
Tail	16.45	12.9	1.40	12.8	48.90	13.2	8.08	13.4	0.06	10.0
Tail	17.25	26.1	1.10	19.3	49.00	25.5	7.98	25.5	0.07	22.6
Tail	17.15	23.6	1.72	27.5	48.00	22.7	7.75	22.6	0.08	23.5
SRT Con	19.20	16.6	2.28	22.9	43.80	13.0	7.52	13.7	0.14	25.8
Calc Head	16.83	100.0	1.45	100.0	48.88	100.0	7.95	100.0	0.08	100.0
Assay Head	17.45		1.79		46.60		7.66		0.1	

*Number in red means less





PROJECT	T0879
TEST NO	T26
DATE	180814
TECHNICIAN	ID

BURNIE LABORATORY: BATCH UF FALCON SEPARATION

CONDITIONS

Separation of	Sn
Feed Pulp Density (%)	12
Feed In Time (min)	8
UF-100 Speed (g's)	218
Total Feed Weight (gm)	1206.6
Calc Feed Rate (gm/min)	150.8

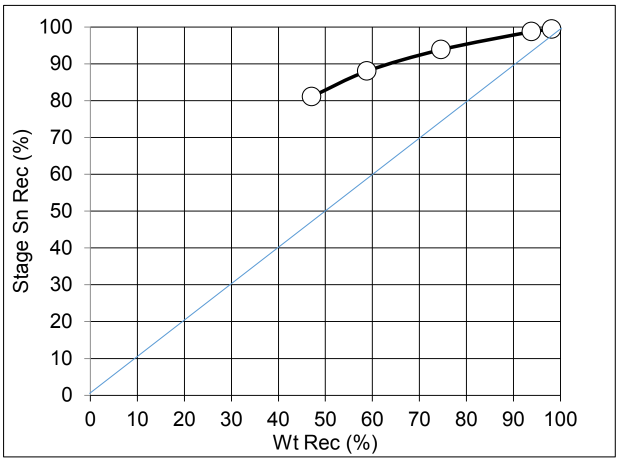
32.2 Ltr H2O

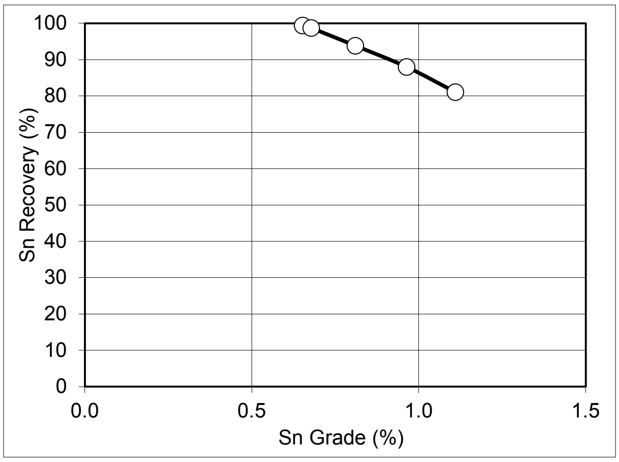
FEED MATERIAL
LC01 cyc 1-6
-106 Mozley tail
-38um

Product	Feed on Time (min)	Product Mass (gm)	Product Mass (%)	Calc Feed Mass (gm)	Calc Mass to Conc (gm)	Calc Mass to Conc (%)	Sn Tail (%)	Sn Dist (%)	Sn Stage Rec (%)	Sn Calc Conc (%)
Tail	1.00	2.8	0.2	150.8	148.0	98.1	0.23	0.1	99.3	0.65
Tail	2.00	15.8	1.3	301.7	283.1	93.8	0.12	0.2	98.7	0.68
Tail	4.00	134.7	11.2	603.3	450.0	74.6	0.16	2.8	93.8	0.81
Tail	6.00	219.2	18.2	905.0	532.5	58.8	0.21	5.9	88.0	0.96
Tail	8.00	266.1	22.1	1206.6	568.0	47.1	0.29	9.9	81.1	1.11
Conc		568.0	47.1				1.11	81.1		
Total		1206.6	100.0				0.64	100.0		
Head							0.58			

	Fe %	Dist %	S %	Dist %	SiO2 %	Dist %	Al2O3 %	Dist %	As %	Dist %
Tail	17.45	0.2	1.93	0.2	40.20	0.2	14.00	0.4	0.11	0.2
Tail	10.35	0.6	0.61	0.3	61.90	2.1	9.49	1.7	0.05	0.5
Tail	14.95	7.6	0.85	3.7	52.80	15.5	8.75	13.3	0.07	5.7
Tail	18.80	15.5	1.34	9.5	44.20	21.1	8.10	20.0	0.06	8.0
Tail	21.00	21.0	1.89	16.3	40.80	23.7	7.73	23.2	0.08	13.0
SRT Con	25.90	55.2	3.79	69.9	30.10	37.3	6.44	41.3	0.21	72.6
Calc Head	22.08	100.0	2.55	100.0	38.00	100.0	7.34	100.0	0.14	100.0
Assay Head	21.70		2.45		38.30		7.36		0.12	

*Number in red means less





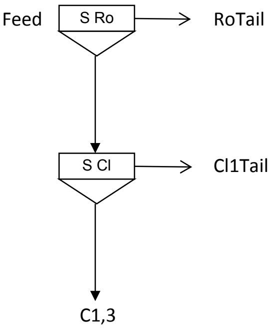
Appendix 8 – Gravity Concentrate Dressing

BURNIE LABORATORY: ROUGHER/CLEANER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T30
DATE	270814
TECHNICIAN	MJR

Milling			
Mill	type		
Media	type		
Media	kg		
Solids	g		
Water	g		
Time	min		
Speed	rpm		
Lime	g		
End pH	pH		
End p80	µm		

Float Cell	Volume	Regrind Power	
Rougher	0.5	Start	
Cleaner	0.5	Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
LC01 Comb Conc Cyc 1-6

NOTES
Sulphide Rougher/Cleaner

	pH	100 H2SO4 g/t	1 ASS g/t	1 CuS04 g/t	0.1 PAX g/t		0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	4.3								2					
Condition	3.6		248						2					
Condition				62					2					
Condition					31		61		1					
S Ro Conc 1	4.1									2-5	2.0	2.0	100	
Condition					47		46		1					
S Ro Conc 2	4.4									2-5	3.0	5.0	200	
Condition		16			47		77		1					
S Ro Conc 3	4.7									2-5	5.0	10.0	400	
Condition			93						1					
Condition							46		1					
S Cl1 C1	4.0									1-3	2.0	2.0	150	56
Condition					9		46		1					
S Cl1 C2	4.3									2-4	3.0	5.0	100	13
Condition					16		31		1					
S Cl1 C3	4.6									2-5	3.0	8.0	150	4
REAGENT TOTALS (g/t)		16	341	62	149		307							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
S Cl1C1	83.6	25.9	0.62	0.87	42.8	33.0	2.60	79.6	47.1	78.9	1.81	11.7	0.04	1.9
S Cl1C2	13.2	4.1	2.28	0.50	40.7	5.0	1.89	9.1	30.3	8.0	4.15	4.2	0.13	1.0
S Cl1C3	5.6	1.7	6.39	0.60	37.3	1.9	0.62	1.3	23.1	2.6	6.15	2.7	0.30	1.0
S Cl1 Tail	9.0	2.8	20.0	3.01	31.7	2.6	0.45	1.5	7.39	1.3	5.64	3.9	0.51	2.6
Ro Tail	210.8	65.43	27.0	95.0	29.6	57.5	0.11	8.5	2.16	9.1	4.77	77.5	0.78	93.6
CALC	322.2	100.0	18.6	100.0	33.7	100.0	0.85	100.0	15.5	100.0	4.02	100.0	0.55	100.0
ASSAY HEAD			19.2		34.4		0.91		12.3		3.84		0.53	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
S Cl1C1	83.6	25.9	0.62	0.9	42.8	33.0	2.60	79.6	47.1	78.9	1.81	11.7	0.04	1.9
S Cl1C2	96.8	30.0	0.85	1.4	42.5	37.9	2.50	88.8	44.8	86.9	2.13	15.9	0.05	2.9
S Cl1C3	102.4	31.8	1.15	2.0	42.2	39.9	2.40	90.0	43.6	89.5	2.35	18.5	0.07	3.8
S Cl1 Tail	111.4	34.6	2.67	5.0	41.4	42.5	2.24	91.5	40.7	90.9	2.61	22.5	0.10	6.4
FEED	322.2	100.0	18.6	100.0	33.7	100.0	0.85	100.0	15.5	100.0	4.02	100.0	0.55	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	C %	DIST	C organic %	DIST	C inorg %	DIST
S Cl1C1	83.6	25.9	0.12	6.8	0.24	4.4	0.58	10.9	0.59	6.5	0.04	5.4	0.54	6.4
S Cl1C2	13.2	4.1	0.30	2.7	0.71	2.1	1.41	4.2	1.65	2.8	0.16	3.4	1.50	2.8
S Cl1C3	5.6	1.7	0.47	1.8	1.38	1.7	2.13	2.7	2.81	2.1	0.25	2.2	2.55	2.0
S Cl1 Tail	9.0	2.8	0.52	3.2	1.72	3.4	1.98	4.0	3.36	4.0	0.31	4.5	3.06	3.9
Ro Tail	210.8	65.4	0.60	85.6	1.89	88.3	1.65	78.2	3.07	84.7	0.25	84.5	2.83	84.8
CALC	322.2	100.0	0.46	100.0	1.40	100.0	1.38	100.0	2.37	100.0	0.19	100.0	2.18	100.0
ASSAY HEAD			0.43		1.40		1.33		2.34		0.48		1.86	

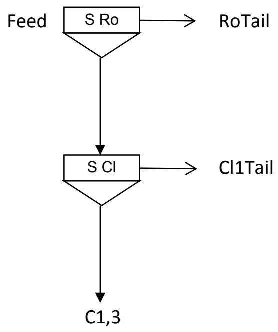
CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	C inorg %	CUM
S Cl1C1	83.6	25.9	0.12	6.8	0.24	4.4	0.58	10.9	0.59	6.5	0.04	5.4	0.54	6.4
S Cl1C2	96.8	30.0	0.14	9.5	0.30	6.5	0.69	15.1	0.73	9.3	0.06	8.8	0.67	9.2
S Cl1C3	102.4	31.8	0.16	11.2	0.36	8.2	0.77	17.8	0.85	11.4	0.07	11.0	0.77	11.3
S Cl1 Tail	111.4	34.6	0.19	14.4	0.47	11.7	0.87	21.8	1.05	15.3	0.09	15.5	0.96	15.2
FEED	322.2	100.0	0.46	100.0	1.40	100.0	1.38	100.0	2.37	100.0	0.19	100.0	2.18	100.0

ALS Metallurgy

BURNIE LABORATORY: ROUGHER/CLEANER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T49
DATE	311014
TECHNICIAN	MJR

Milling			
Mill	type		
Media	type		
Media	kg		
Solids	g		
Water	g		
Time	min		
Speed	rpm		
Lime	g		
End pH	pH		
End p80	µm		



PRODUCT FLOATED
LC01 Comb Conc Cyc 11-31

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	1.5	Finish	
		W/h	
Speed	850	kWh/t	

NOTES
Sulphide Rougher/Cleaner
Feed +106 1021g, -106 915g

	pH	100 H2SO4 g/t	1 ASS g/t	1 CuS04 g/t	0.2 PAX g/t		0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	4.2								2					
Condition	3.9		254						2					
Condition				62					2					
Condition					31		18		1					
S Ro Conc 1	4.1									2-5	2.5	2.5	500	
Condition					31		13		1					
S Ro Conc 2	4.2									2-5	3.5	6.0	300	
Condition					42		13		1					
S Ro Conc 3	4.4									2-5	5.0	11.0	400	
Condition			104						1					
Condition							8		1					
S Cl1 C1	4.0									1-3	1.5	1.5	500	70
Condition					9		8		1					
S Cl1 C2	4.2									2-4	3.0	4.5	300	55
Condition					16		5		1					
S Cl1 C3	4.4									2-5	3.0	7.5	150	22
REAGENT TOTALS (g/t)			358	62	129		64							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T49 S Cl1C1	348.4	18.1	0.74	0.89	44.2	22.6	2.14	53.9	40.2	55.2	1.62	6.0	0.04	0.9
S Cl1C2	165.6	8.6	1.06	0.61	42.7	10.4	2.47	29.6	40.2	26.3	2.39	4.2	0.08	0.9
S Cl1C3	32.3	1.7	5.24	0.59	41.3	2.0	1.73	4.0	21.8	2.8	5.57	1.9	0.29	0.6
S Cl1 Tail	20.1	1.0	18.2	1.26	32.9	1.0	0.49	0.7	8.73	0.7	5.66	1.2	0.72	1.0
Ro Tail	1360.4	70.60	20.5	96.6	32.2	64.2	0.12	11.8	2.80	15.0	6.03	86.7	1.06	96.6
CALC	1926.8	100.0	15.0	100.0	35.4	100.0	0.72	100.0	13.2	100.0	4.91	100.0	0.77	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T49 S Cl1C1	348.4	18.1	0.74	0.9	44.2	22.6	2.14	53.9	40.2	55.2	1.62	6.0	0.04	0.9
S Cl1C2	514.0	26.7	0.84	1.5	43.7	32.9	2.25	83.5	40.2	81.5	1.87	10.2	0.05	1.8
S Cl1C3	546.3	28.4	1.10	2.1	43.6	34.9	2.22	87.5	39.1	84.3	2.09	12.1	0.07	2.4
S Cl1 Tail	566.4	29.4	1.71	3.4	43.2	35.8	2.15	88.2	38.0	85.0	2.21	13.3	0.09	3.4
FEED	1926.8	100.0	15.0	100.0	35.4	100.0	0.72	100.0	13.2	100.0	4.91	100.0	0.77	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	C %	DIST	C organic %	DIST	C inorg %	DIST
T49 S Cl1C1	348.4	18.1	0.09	2.6	0.20	2.2	0.45	4.8	0.46	3.1	0.08	16.0	0.38	2.6
S Cl1C2	165.6	8.6	0.15	2.0	0.34	1.8	0.69	3.5	0.87	2.8	0.10	9.5	0.77	2.5
S Cl1C3	32.3	1.7	0.37	1.0	1.08	1.1	1.85	1.8	2.29	1.4	0.15	2.8	2.14	1.4
S Cl1 Tail	20.1	1.0	0.49	0.8	1.69	1.1	1.91	1.2	3.42	1.3	0.14	1.6	3.29	1.3
Ro Tail	1360.4	70.6	0.84	93.6	2.16	93.8	2.11	88.6	3.49	91.4	0.09	70.2	3.40	92.1
CALC	1926.8	100.0	0.63	100.0	1.63	100.0	1.68	100.0	2.70	100.0	0.09	100.0	2.61	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	C inorg %	CUM
T49 S Cl1C1	348.4	18.1	0.09	2.6	0.20	2.2	0.45	4.8	0.46	3.1	0.08	16.0	0.38	2.6
S Cl1C2	514.0	26.7	0.11	4.6	0.25	4.0	0.53	8.4	0.59	5.9	0.09	25.5	0.51	5.2
S Cl1C3	546.3	28.4	0.12	5.6	0.29	5.1	0.61	10.2	0.69	7.3	0.09	28.2	0.60	6.6
S Cl1 Tail	566.4	29.4	0.14	6.4	0.34	6.2	0.65	11.4	0.79	8.6	0.09	29.8	0.70	7.9
FEED	1926.8	100.0	0.63	100.0	1.63	100.0	1.68	100.0	2.70	100.0	0.09	100.0	2.61	100.0

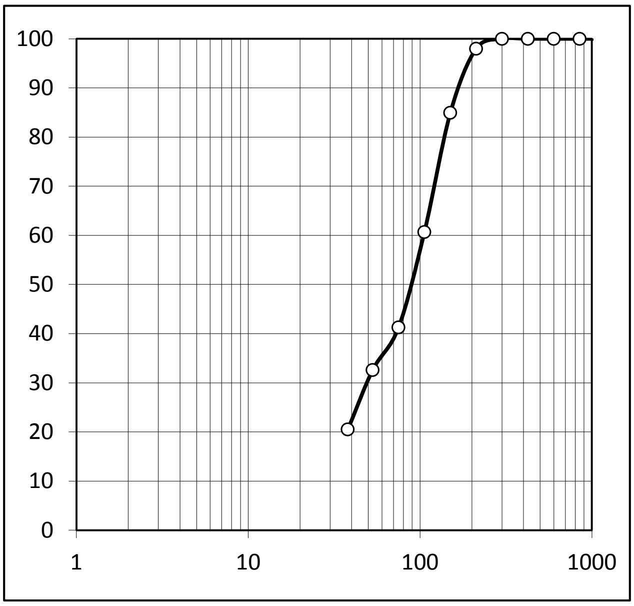
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	RoT+CL1T 1000G Mags
TEST NO	T49
DATE	7/11/2014
TECHNICIAN	MS

RoT+CL1T 1000G Mags		SIZE	WEIGHTS		
T49		um	gm	(%)	%PASS
	p80	1700	0.00	0.00	100.0
		1180	0.00	0.00	100.0
		850	0.00	0.00	100.0
		600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.95	2.01	98.0
		150	6.17	13.07	84.9
	141	106	11.45	24.25	60.7
		75	9.15	19.38	41.3
		53	4.10	8.68	32.6
		38	5.71	12.09	20.5
CYCLOSIZER	CS1	37	0.00	0.00	20.5
FLOW 185	CS2	29	0.00	0.00	20.5
TEMP 21	CS3	20	0.00	0.00	20.5
SG **2.50**	CS4	14	0.00	0.00	20.5
MINS 20	CS5	9	0.00	0.00	20.5
		SUB	9.68	20.50	0.0
		TOTAL	47.21	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		Mn	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	15.08	2.58	16.2	62.70	15.6	0.09	19.3	2.12	27.3	2.72	9.9	0.30	7.1
106	24.25	1.20	12.2	59.50	23.8	0.07	24.1	1.90	39.3	3.71	21.7	0.75	28.5
75	19.38	1.20	9.7	54.70	17.5	0.05	13.8	1.48	24.5	5.42	25.3	1.27	38.6
53	8.68	1.31	4.8	65.90	9.4	0.06	7.4	0.28	2.1	3.41	7.1	0.37	5.0
38	12.09	0.94	4.7	66.70	13.3	0.07	12.0	0.25	2.6	4.00	11.7	0.31	5.9
-38	20.50	6.12	52.4	60.00	20.3	0.08	23.3	0.24	4.2	4.93	24.4	0.46	14.8
CALC	100.00	2.40	100.0	60.58	100.0	0.07	100.0	1.17	100.0	4.15	100.0	0.64	100.0
ASSAY	200.00	2.89		59.10		0.06		1.22		4.20		0.66	

ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
150	15.08	0.13	9.0	2.01	12.7	0.44	10.0				
106	24.25	0.23	25.6	2.84	28.8	0.66	24.1				
75	19.38	0.36	32.1	3.43	27.8	1.21	35.3				
53	8.68	0.11	4.4	1.58	5.7	0.29	3.8				
38	12.09	0.13	7.2	1.27	6.4	0.27	4.9				
-38	20.50	0.23	21.7	2.18	18.7	0.71	21.9				
CALC HEAD	100.00	0.22	100.0	2.39	100.0	0.66	100.0				
ASSAY	200.00	0.22		2.18		0.71					

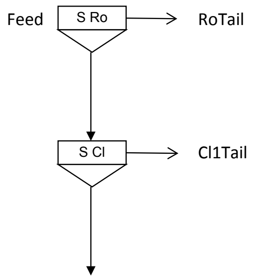
ALS Metallurgy

BURNIE LABORATORY: ROUGHER/CLEANER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T57
DATE	241114
TECHNICIAN	MJR

Milling			
Mill	type		
Media	type		
Media	kg		
Solids	g		
Water	g		
Time	min		
Speed	rpm		
Lime	g		
End pH	pH		
End p80	µm		

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	
Cleaner	1.5	Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
LC01 Comb Conc Cyc 11-31

NOTES
Sulphide Rougher/Cleaner
Feed
T50 Non Mags 435.8
T55 Non Mags 39.4

	pH	100 H2SO4 g/t	1 ASS g/t	1 CuS04 g/t	0.2 PAX g/t		0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	4.2								2					
Condition	3.9		254						2					
Condition				64					2					
Condition					30		42		1					
S Ro Conc 1	4.1									2-5	2.0	2.0	100	
Condition					30		21		1					
S Ro Conc 2	4.2									2-5	3.0	5.0	200	
Condition					64		31		1					
S Ro Conc 3	4.4									2-5	5.0	10.0	350	
Condition			127						1					
Condition							31		1					
S Cl1 C1	4.0									1-3	1.5	1.5	80	21
Condition					8		21		1					
S Cl1 C2	4.2									2-4	1.5	3.0	80	#REF!
Condition					17		21		1					
S Cl1 C3	4.4									2-5	3.0	6.0	200	9
REAGENT TOTALS (g/t)			381	64	148		168							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T57 S Cl1C1+2	17.1	3.6	2.85	0.40	38.4	6.2	0.52	16.6	28.9	41.4	6.55	3.4	0.36	1.0
S Cl1C3	18.1	3.8	4.90	0.72	36.9	6.3	0.28	9.4	19.0	28.7	7.55	4.1	0.50	1.5
S Cl1 Tail	20.1	4.3	12.6	2.06	29.3	5.5	0.11	4.1	3.60	6.1	9.66	5.9	1.34	4.3
Ro Tail	417.1	88.29	28.4	96.8	20.9	82.0	0.09	69.9	0.68	23.8	6.87	86.6	1.39	93.2
CALC	472.4	100.0	25.9	100.0	22.5	100.0	0.11	100.0	2.53	100.0	7.00	100.0	1.32	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00		0.00	

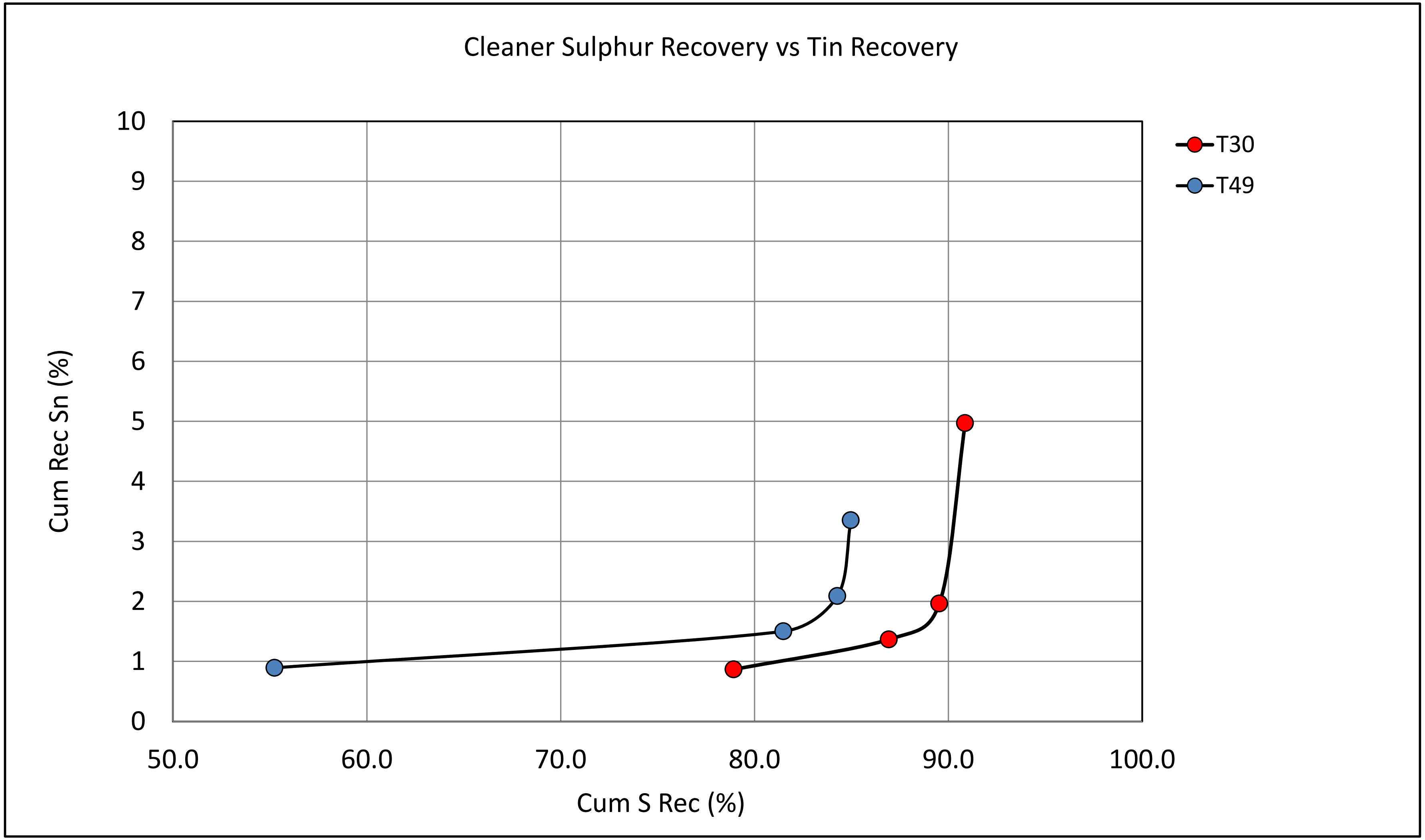
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T57 S Cl1C1+2	17.1	3.6	2.85	0.4	38.4	6.2	0.52	16.6	28.9	41.4	6.55	3.4	0.36	1.0
S Cl1C3	35.2	7.5	3.90	1.1	37.6	12.5	0.40	26.0	23.8	70.2	7.06	7.5	0.43	2.4
S Cl1 Tail	55.3	11.7	7.05	3.2	34.6	18.0	0.29	30.1	16.4	76.2	8.01	13.4	0.76	6.8
FEED	472.4	100.0	25.9	100.0	22.5	100.0	0.11	100.0	2.53	100.0	7.00	100.0	1.32	100.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	C %	DIST	C organic %	DIST	C inorg %	DIST
T57 S Cl1C1+2	17.1	3.6	0.40	1.3	2.01	2.9	1.82	2.4	2.37	1.9	0.22	9.3	2.15	1.8
S Cl1C3	18.1	3.8	0.58	2.0	1.81	2.8	2.61	3.6	3.32	2.9	0.20	9.0	3.12	2.7
S Cl1 Tail	20.1	4.3	0.76	3.0	3.93	6.7	3.18	4.9	4.91	4.7	0.19	9.5	4.72	4.6
Ro Tail	417.1	88.3	1.15	93.6	2.48	87.6	2.79	89.1	4.57	90.5	0.07	72.3	4.50	90.9
CALC	472.4	100.0	1.08	100.0	2.50	100.0	2.76	100.0	4.46	100.0	0.09	100.0	4.37	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	C inorg %	CUM
T57 S Cl1C1+2	17.1	3.6	0.40	1.3	2.01	2.9	1.82	2.4	2.37	1.9	0.22	9.3	2.15	1.8
S Cl1C3	35.2	7.5	0.49	3.4	1.91	5.7	2.23	6.0	2.86	4.8	0.21	18.3	2.65	4.5
S Cl1 Tail	55.3	11.7	0.59	6.4	2.64	12.4	2.57	10.9	3.60	9.5	0.20	27.7	3.40	9.1
FEED	472.4	100.0	1.08	100.0	2.50	100.0	2.76	100.0	4.46	100.0	0.09	100.0	4.37	100.0

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
Ro Tail+Cl1 Tail+Cl1 C3	455.3	96.4	26.8	99.6	21.9	93.8	0.10	83.4	1.54	58.6	7.02	96.6	1.35	99.0
Ro Tail+Cl1 Tail	**437.2**	**92.5**	**27.7**	**98.9**	**21.3**	**87.5**	**0.09**	**74.0**	**0.81**	**29.8**	**7.00**	**92.5**	**1.39**	**97.6**
Ro Tail	417.1	88.3	28.4	96.8	20.9	82.0	0.09	69.9	0.68	23.8	6.87	86.6	1.39	93.2

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	C inorg %	CUM
Ro Tail+Cl1 Tail+Cl1 C3	455.3	96.4	1.11	98.7	2.52	97.1	2.80	97.6	4.54	98.1	0.08	90.7	4.45	98.2
Ro Tail+Cl1 Tail	**437.2**	**92.5**	**1.13**	**96.6**	**2.55**	**94.3**	**2.81**	**94.0**	**4.59**	**95.2**	**0.08**	**81.7**	**4.51**	**95.5**
Ro Tail	417.1	88.3	1.15	93.6	2.48	87.6	2.79	89.1	4.57	90.5	0.07	72.3	4.50	90.9

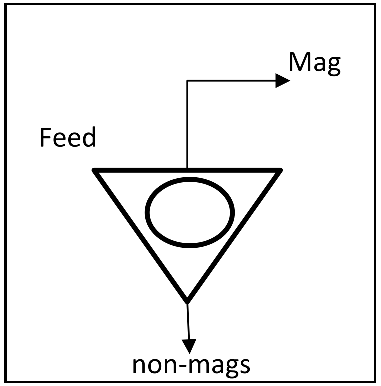


Cleaner Sulphur Recovery vs Tin Recovery
Cum Rec Sn (%)
10
9
8
7
6
5
4
3
2
1
0
50.0
60.0
70.0
80.0
90.0
100.0
Cum S Rec (%)
T30
T49

PROJECT	T0879
TEST NO	T34
DATE	
TECH	MW

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	T30 Sulphide Tails
Current (A)	
Magnetic intense1 (G)	1000.0
Magnetic intense2 (G)	
Comments	Pre mag sep.



FEED MATERIAL	
T 30 sulphide tail	
FROM TEST NO	T30
START WT (gm)	100.60

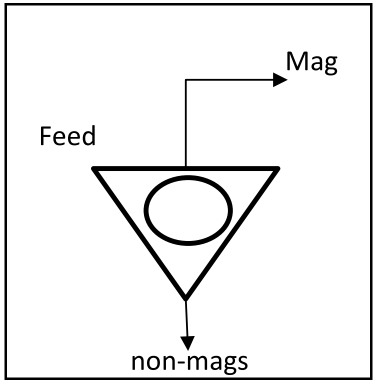
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	25.5	25.5	25.35	1.37	1.5	63.20	50.7	4.23	20.2	0.99	14.5	0.15	5.4
Non Magnetics	75.1	75.1	74.65	31.50	98.5	20.90	49.3	5.69	79.8	1.98	85.5	0.90	94.6
TOTAL	100.60		100.00	23.86	100.0	31.62	100.0	5.32	100.0	1.73	100.0	0.71	100.0

PROJECT	T0879
TEST NO	T50
DATE	06/11/14
TECH	MW

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	T49 Ro Tail+Cl1 Tail
Current (A)	
Magnetic intense1 (G)	1000.0
Magnetic intense2 (G)	
Comments	



FEED MATERIAL	
T49 Ro Tail+Cl1 Tail	
FROM TEST NO	T49
START WT (gm)	1299.28

Await for CO3

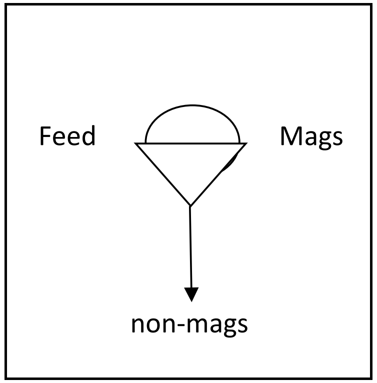
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	342.8	342.8	26.38	2.89	3.8	59.10	48.3	4.20	17.2	1.22	10.3	0.22	6.4
Non Magnetics	894.3	894.3	68.83	27.60	94.6	21.80	46.5	7.03	75.3	2.43	53.6	1.19	90.9
>300um	62.2	62.18	4.79	6.72	1.6	35.40	5.2	10.05	7.5	23.50	36.1	0.51	2.7
TOTAL	1299.28		100.00	20.08	100.0	32.29	100.0	6.43	100.0	3.12	100.0	0.90	100.0

PROJECT	T0879
TEST NO	T55
DATE	191114
TECH	ID

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	SALA Wet Drum
Feed Solids (g)	286.0
Feed Water (L)	
Pump Flow Rate (lpm)	1.2
Density (%)	
Time (min)	6.3
Pump 01 Output (%)	
Pump 02 Output (%)	
Comments	No pumps, water hose,sample washed in



FEED MATERIAL 1000 Gauss Mags ground to P80=34	
FROM TEST NO	T50
START WT (gm)	286

MAGNETIC SEPARATION RESULTS

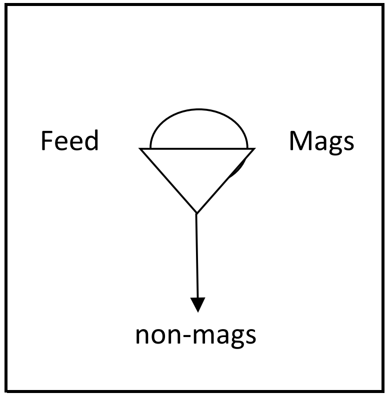
PRODUCT				Tin		Iron		Silica		Sulphur			
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics	227.3	227.3	80.04	0.48	15.6	67.90	90.1	2.80	51.5	0.62	43.5		
Non Magnetics(calc)	56.7	56.7	19.96	10.45	84.4	30.00	9.9	10.55	48.5	3.23	56.5		
TOTAL	284.00		100.00	2.47	100.0	60.33	100.0	4.35	100.0	1.14	100.0		

ALS Metallurgy

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0879
TEST NO	T35
DATE	010914
TECH	ID

TEST TYPE	SALA Wet Drum
Feed Solids (g)	1897.0
Feed Water (L)	20.0
Pump Flow Rate (lpm)	1.5
Density (%)	8.0
Time (min)	18.0
Pump 01 Output (%)	60
Pump 02 Output (%)	60
Comments	



FEED MATERIAL Sulphide float tails	
FROM TEST NO	
START WT (gm)	1897

MAGNETIC SEPARATION RESULTS

PRODUCT				Tin		Iron		Silica		Sulphur		Calcium Oxide	
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	84.3	84.3	4.44	0.83	2.8	49.70	11.2	12.95	1.4	4.76	7.0	0.32	1.5
Non Magnetics	1812.7	1812.7	95.56	1.32	97.2	18.25	88.8	42.20	98.6	2.96	93.0	0.96	98.5
TOTAL	1897.00		100.00	1.30	100.0	19.65	100.0	40.90	100.0	3.04	100.0	0.93	100.0

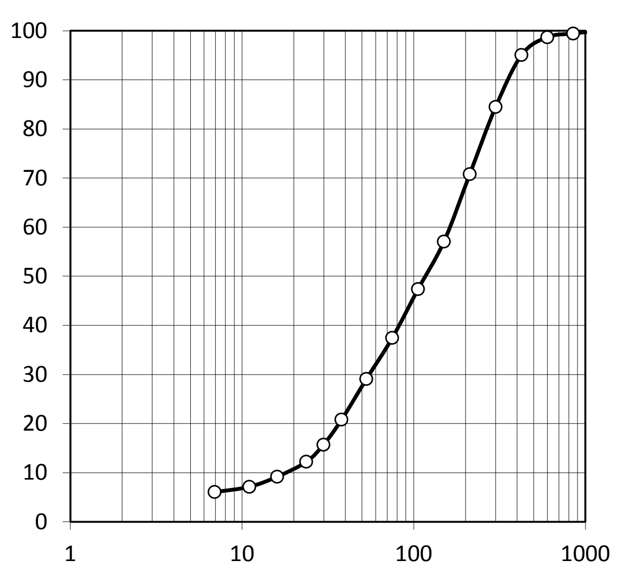
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	T35 Mags
DATE	100914
TECHNICIAN	MS

T35 Mags		SIZE	WEIGHTS		
		um	gm	(%)	%PASS
	p80	1700	0.00	0.00	100.0
		1180	0.00	0.00	100.0
		850	0.35	0.56	99.4
		600	0.46	0.74	98.7
		425	2.25	3.62	95.1
		300	6.57	10.58	84.5
	271	212	8.51	13.70	70.8
		150	8.52	13.72	57.1
		106	6.01	9.68	47.4
		75	6.18	9.95	37.4
		53	5.20	8.37	29.1
		38	5.14	8.28	20.8
CYCLOSIZER	CS1	30	3.16	5.09	15.7
FLOW 185	CS2	24	2.17	3.49	12.2
TEMP 21	CS3	16	1.87	3.01	9.2
SG **3.50**	CS4	11	1.29	2.08	7.1
MINS 20	CS5	7	0.67	1.08	6.0
		SUB	3.75	6.04	0.0
		TOTAL	62.10	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	42.93	0.96	49.7	46.90	40.5	0.07	33.4	3.34	30.1	13.90	46.1	0.41	44.0
75	19.63	0.63	14.9	54.80	21.6	0.09	19.6	7.52	31.0	10.40	15.8	0.36	17.7
38	16.65	1.08	21.7	59.60	20.0	0.13	24.1	5.41	18.9	6.68	8.6	0.37	15.4
24	8.58	0.72	7.4	44.50	7.7	0.14	13.4	3.76	6.8	18.75	12.4	0.46	9.9
7	6.17	0.71	5.3	53.40	6.6	0.08	5.5	5.19	6.7	10.20	4.9	0.39	6.0
CALC<7	6.04	0.15	1.1	29.34	3.6	0.06	4.1	5.07	6.4	26.34	12.3	0.47	7.0
ASSAY	100.00	0.83	100.0	49.70	100.0	0.09	100.0	4.76	100.0	12.95	100.0	0.40	100.0

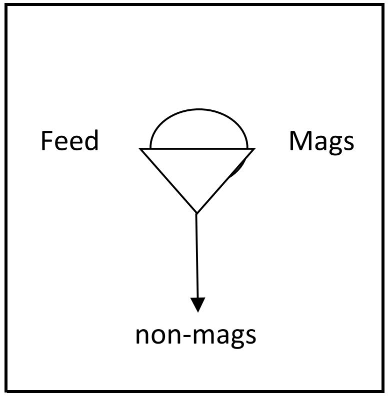
ANALYSES

SIZE	WT	CaO		MgO		Al2O3					
um	%	%	dist	%	dist	%	dist				
150	42.93	0.32	42.9	7.47	64.4	1.80	37.5				
75	19.63	0.32	19.6	2.78	11.0	1.56	14.9				
38	16.65	0.29	15.1	1.66	5.6	0.98	7.9				
24	8.58	0.61	16.4	2.86	4.9	3.18	13.2				
7	6.17	0.28	5.4	4.47	5.5	1.44	4.3				
CALC<7	6.04	0.03	0.6	7.12	8.6	7.55	22.1				
ASSAY	100.00	0.32	100.0	4.98	100.0	2.06	100.0				

PROJECT	T0879
TEST NO	T47
DATE	101014
TECH	ID

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	SALA Wet Drum
Feed Solids (g)	1000.0
Feed Water (L)	10.0
Pump Flow Rate (lpm)	1.4
Density (%)	10.0
Time (min)	7.3
Pump 01 Output (%)	52
Pump 02 Output (%)	52
Comments	



FEED MATERIAL	
-38 from LC01 cyc 1-10	
-106 Mozley tail	
FROM TEST NO	LC01
START WT (gm)	1000

MAGNETIC SEPARATION RESULTS

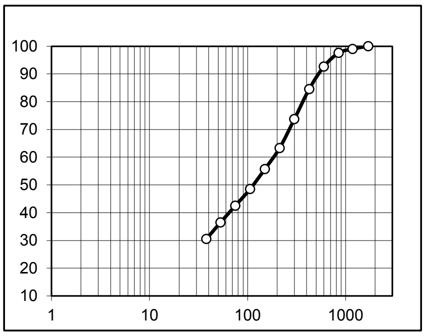
PRODUCT				Tin		Iron		Silica		Sulphur			
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics	98.8	98.8	9.88	0.61	15.5	37.90	22.4	23.10	11.9	4.93	32.3		
Non Magnetics(calc)	901.2	901.2	90.12	0.37	84.5	14.40	77.6	18.72	88.1	1.14	67.7		
TOTAL	1000.00		100.00	0.39	100.0	16.72	100.0	19.15	100.0	1.51	100.0		

ALS Metallurgy

PROJECT	T0879
SAMPLE	Bulk Sulphide Tail
FROM TEST NO	
DATE	110914
TECHNICIAN	DG

BURNIE LABORATORY: SIZE AND MAGNETIC SEPARATION ANALYSIS

RAPID MAGNETIC SEPERATION RECOVERY ON FRACTIONS (3000 Gauss)



SIZING

SIZE	WEIGHTS	
um	(%)	%PASS
150	44.29	100
75	13.19	86.8
38	12.00	74.8
20	7.00	67.8
<20	23.52	44.3
TOTAL	100.00	

SEPARATIONS

Products	WT	WT	Fraction		Fraction		Fraction		Fraction		Fraction	
	%	%	%Sn	dist	%Fe	dist	%SiO2	dist	%S	dist	%CaO	dist
Mags+150	29.77	13.19	0.72	23.7	31.80	52.2	23.50	15.2	1.63	16.9	0.73	25.6
Non Mags+150	70.23	31.10	0.98	76.3	12.35	47.8	55.50	84.8	3.39	83.1	0.90	74.4
Calc +150 Total	100.00	44.29	0.90	100.0	18.14	100.0	45.97	100.0	2.87	100.0	0.85	100.0
Mags+75	23.60	3.11	0.75	9.7	36.40	44.8	17.00	9.1	2.44	21.0	0.57	12.9
Non Mags+75	76.40	10.08	2.15	90.3	13.85	55.2	52.20	90.9	2.84	79.0	1.19	87.1
Calc +75 Total	100.00	13.19	1.82	100.0	19.17	100.0	43.89	100.0	2.75	100.0	1.04	100.0
Mags+38	14.02	1.68	0.70	4.5	40.30	28.2	15.65	5.2	3.63	18.0	0.48	6.3
Non Mags+38	85.98	10.32	2.42	95.5	16.75	71.8	46.10	94.8	2.69	82.0	1.16	93.7
Calc +38 Total	100.00	12.00	2.18	100.0	20.05	100.0	41.83	100.0	2.82	100.0	1.06	100.0
Mags+20	7.12	0.50	0.56	1.7	53.20	17.6	9.70	1.8	4.32	13.5	0.36	2.3
Non Mags+20	92.88	6.50	2.47	98.3	19.05	82.4	39.90	98.2	2.13	86.5	1.17	97.7
Calc +20 Total	100.00	7.00	2.33	100.0	21.48	100.0	37.75	100.0	2.29	100.0	1.11	100.0
-20		23.52	1.21		22.90		33.40		2.52		0.92	
CALC FEED		100.00	1.35		19.86		41.67		2.72		0.94	
ASSAY HEAD			1.34		19.55		40.90		3.08		0.95	

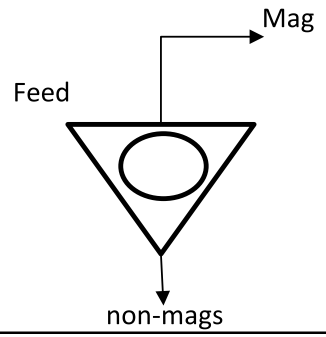
SUMMARY

FRACTIONS	Picno	WT	Overall		Overall		Overall		Overall		Overall	
um	SG	%	%Sn	dist	%Fe	dist	%SiO2	dist	%S	dist	%CaO	dist
Mags+150		13.19	0.72	7.04	31.80	21.11	23.50	7.44	1.63	7.89	0.73	10.28
Mags+75		3.11	0.75	1.73	36.40	5.71	17.00	1.27	2.44	2.79	0.57	1.90
Mags+38		1.68	0.70	0.87	40.30	3.41	15.65	0.63	3.63	2.24	0.48	0.86
Mags+20		0.50	0.56	0.21	53.20	1.34	9.70	0.12	4.32	0.79	0.36	0.19
Non Mags+150		31.10	0.98	22.59	12.35	19.34	55.50	41.43	3.39	38.73	0.90	29.91
Non Mags+75		10.08	2.15	16.06	13.85	7.03	52.20	12.62	2.84	10.51	1.19	12.81
Non Mags+38		10.32	2.42	18.51	16.75	8.70	46.10	11.42	2.69	10.19	1.16	12.79
Non Mags+20		6.50	2.47	11.90	19.05	6.24	39.90	6.23	2.13	5.09	1.17	8.13
Total Mags		18.48	0.72	9.85	33.93	31.57	21.32	9.45	2.02	13.72	0.67	13.24
Total Non Mags		58.00	1.61	69.06	14.14	41.31	51.51	71.69	3.03	64.52	1.03	63.64
-20		23.52	1.21	21.09	22.90	27.12	33.40	18.85	2.52	21.77	0.92	23.12
CALC FEED		**100.00**	**1.35**	**100.00**	**19.86**	**100.00**	**41.67**	**100.00**	**2.72**	**100.00**	**0.94**	**100.00**
ASSAY HEAD			1.34		19.55		40.90		3.08		0.95	

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T39-1
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	3000.0
Magnetic intense2 (G)	
Comments	+150 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

MAGNETIC SEPARATION RESULTS

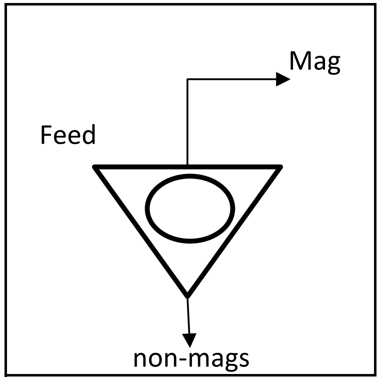
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	18.6	18.55	29.77	0.72	23.7	31.80	52.2	23.50	15.2	1.63	16.9	0.73	25.6
Non Magnetics	43.8	43.76	70.23	0.98	76.3	12.35	47.8	55.50	84.8	3.39	83.1	0.90	74.4
TOTAL	62.31		100.00	0.90	100.0	18.14	100.0	45.97	100.0	2.87	100.0	0.85	100.0

ALS Metallurgy

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T39-2
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	3000.0
Magnetic intense2 (G)	
Comments	+75 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

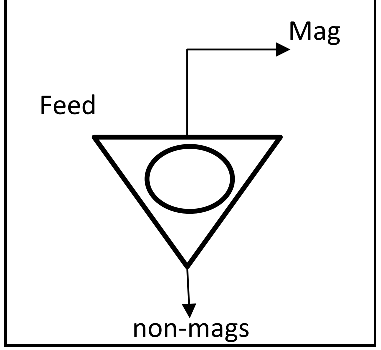
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	5.9	5.91	23.60	0.75	9.7	36.40	44.8	17.00	9.1	2.44	21.0	0.57	12.9
Non Magnetics	19.1	19.13	76.40	2.15	90.3	13.85	55.2	52.20	90.9	2.84	79.0	1.19	87.1
TOTAL	25.04		100.00	1.82	100.0	19.17	100.0	43.89	100.0	2.75	100.0	1.04	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T39-3
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	3000.0
Magnetic intense2 (G)	
Comments	+38 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

MAGNETIC SEPARATION RESULTS

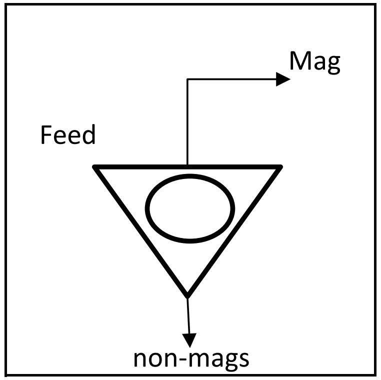
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	2.8	2.82	14.02	0.70	4.5	40.30	28.2	15.65	5.2	3.63	18.0	0.48	6.3
Non Magnetics	17.3	17.3	85.98	2.42	95.5	16.75	71.8	46.10	94.8	2.69	82.0	1.16	93.7
TOTAL	20.12		100.00	2.18	100.0	20.05	100.0	41.83	100.0	2.82	100.0	1.06	100.0

PROJECT	T0887
TEST NO	T39-4
DATE	110914
TECH	DG

ALS Metallurgy

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	3000.0
Magnetic intense2 (G)	
Comments	+20 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

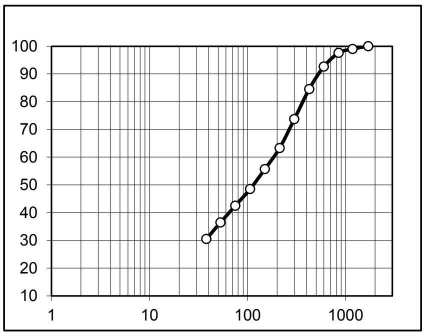
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	0.8	0.8	7.12	0.56	1.7	53.20	17.6	9.70	1.8	4.32	13.5	0.36	2.3
Non Magnetics	10.4	10.43	92.88	2.47	98.3	19.05	82.4	39.90	98.2	2.13	86.5	1.17	97.7
TOTAL	11.23		100.00	2.33	100.0	21.48	100.0	37.75	100.0	2.29	100.0	1.11	100.0

PROJECT	T0879
SAMPLE	Bulk Sulphide Tail
FROM TEST NO	
DATE	110914
TECHNICIAN	DG

BURNIE LABORATORY: SIZE AND MAGNETIC SEPARATION ANALYSIS

RAPID MAGNETIC SEPERATION RECOVERY ON FRACTIONS (6000 Gauss)



SIZING

SIZE	WEIGHTS	
um	(%)	%PASS
150	44.29	100
75	13.19	86.8
38	12.00	74.8
20	7.00	67.8
<20	23.52	44.3
TOTAL	100.00	

SEPARATIONS

Products	WT	WT	Fraction		Fraction		Fraction		Fraction		Fraction	
	%	%	%Sn	dist	%Fe	dist	%SiO2	dist	%S	dist	%CaO	dist
Mags+150	72.26	32.00	0.72	62.2	21.20	89.6	38.20	58.7	2.48	60.0	0.73	63.1
Non Mags+150	27.74	12.29	1.14	37.8	6.44	10.4	70.10	41.3	4.31	40.0	1.11	36.9
Calc +150 Total	100.00	44.29	0.84	100.0	17.11	100.0	47.05	100.0	2.99	100.0	0.84	100.0
Mags+75	65.79	8.68	0.87	35.5	25.50	89.5	30.20	45.2	1.84	45.8	0.72	45.6
Non Mags+75	34.21	4.51	3.04	64.5	5.74	10.5	70.30	54.8	4.18	54.2	1.65	54.4
Calc +75 Total	100.00	13.19	1.61	100.0	18.74	100.0	43.92	100.0	2.64	100.0	1.04	100.0
Mags+38	61.50	7.38	0.85	24.2	28.60	86.6	26.30	39.2	1.58	34.2	0.71	40.6
Non Mags+38	38.50	4.62	4.26	75.8	7.06	13.4	65.10	60.8	4.85	65.8	1.66	59.4
Calc +38 Total	100.00	12.00	2.16	100.0	20.31	100.0	41.24	100.0	2.84	100.0	1.08	100.0
Mags+20	68.17	4.77	1.06	31.6	26.90	84.4	29.20	52.8	1.75	51.3	0.87	54.0
Non Mags+20	31.83	2.23	4.92	68.4	10.65	15.6	55.90	47.2	3.56	48.7	1.59	46.0
Calc +20 Total	100.00	7.00	2.29	100.0	21.73	100.0	37.70	100.0	2.33	100.0	1.10	100.0
-20		23.52	1.21		22.90		33.40		2.52		0.92	
CALC FEED		100.00	1.29		19.39		42.07		2.77		0.93	
ASSAY HEAD			1.34		19.55		40.90		3.08		0.95	

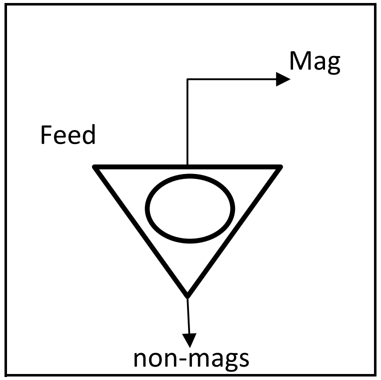
SUMMARY

FRACTIONS	Picno	WT	Overall		Overall		Overall		Overall		Overall	
um	SG	%	%Sn	dist	%Fe	dist	%SiO2	dist	%S	dist	%CaO	dist
Mags+150		32.00	0.72	17.90	21.20	34.99	38.20	29.06	2.48	28.68	0.73	25.14
Mags+75		8.68	0.87	5.86	25.50	11.41	30.20	6.23	1.84	5.77	0.72	6.72
Mags+38		7.38	0.85	4.87	28.60	10.89	26.30	4.61	1.58	4.21	0.71	5.64
Mags+20		4.77	1.06	3.93	26.90	6.62	29.20	3.31	1.75	3.02	0.87	4.47
Non Mags+150		12.29	1.14	10.88	6.44	4.08	70.10	20.47	4.31	19.13	1.11	14.67
Non Mags+75		4.51	3.04	10.65	5.74	1.34	70.30	7.54	4.18	6.82	1.65	8.01
Non Mags+38		4.62	4.26	15.28	7.06	1.68	65.10	7.15	4.85	8.10	1.66	8.25
Non Mags+20		2.23	4.92	8.52	10.65	1.22	55.90	2.96	3.56	2.87	1.59	3.81
Total Mags		52.83	0.79	32.56	23.45	63.90	34.41	43.21	2.18	41.68	0.74	41.97
Total Non Mags		23.65	2.47	45.33	6.82	8.32	67.82	38.12	4.32	36.91	1.37	34.75
-20		23.52	1.21	22.10	22.90	27.77	33.40	18.67	2.52	21.42	0.92	23.28
CALC FEED		**100.00**	**1.29**	**100.00**	**19.39**	**100.00**	**42.07**	**100.00**	**2.77**	**100.00**	**0.93**	**100.00**
ASSAY HEAD			1.34		19.55		40.90		3.08		0.95	

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T40-1
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	6000.0
Magnetic intense2 (G)	
Comments	+150 um fraction



FEED MATERIAL	
Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

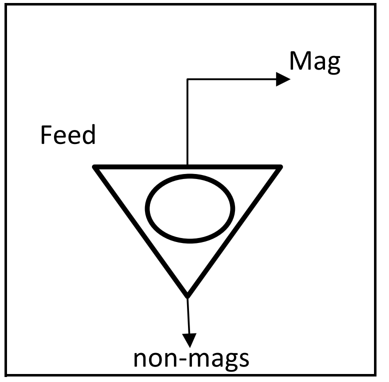
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	44.9	44.86	72.26	0.72	62.2	21.20	89.6	38.20	58.7	2.48	60.0	0.73	63.1
Non Magnetics	17.2	17.22	27.74	1.14	37.8	6.44	10.4	70.10	41.3	4.31	40.0	1.11	36.9
TOTAL	62.08		100.00	0.84	100.0	17.11	100.0	47.05	100.0	2.99	100.0	0.84	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T40-2
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	6000.0
Magnetic intense2 (G)	
Comments	+75 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

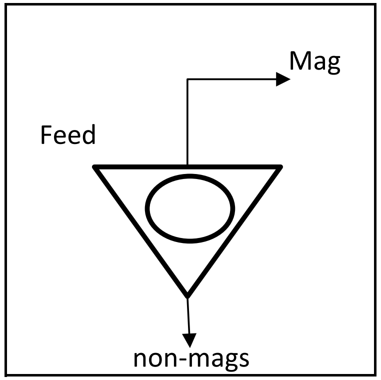
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	16.5	16.48	65.79	0.87	35.5	25.50	89.5	30.20	45.2	1.84	45.8	0.72	45.6
Non Magnetics	8.6	8.57	34.21	3.04	64.5	5.74	10.5	70.30	54.8	4.18	54.2	1.65	54.4
TOTAL	25.05		100.00	1.61	100.0	18.74	100.0	43.92	100.0	2.64	100.0	1.04	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T40-3
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	6000.0
Magnetic intense2 (G)	
Comments	+38 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

MAGNETIC SEPARATION RESULTS

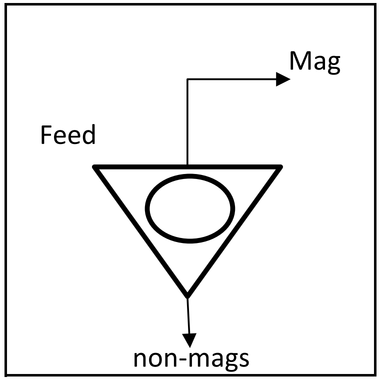
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	12.4	12.43	61.50	0.85	24.2	28.60	86.6	26.30	39.2	1.58	34.2	0.71	40.6
Non Magnetics	7.8	7.78	38.50	4.26	75.8	7.06	13.4	65.10	60.8	4.85	65.8	1.66	59.4
TOTAL	20.21		100.00	2.16	100.0	20.31	100.0	41.24	100.0	2.84	100.0	1.08	100.0

ALS Metallurgy

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T40-4
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	6000.0
Magnetic intense2 (G)	
Comments	+20 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

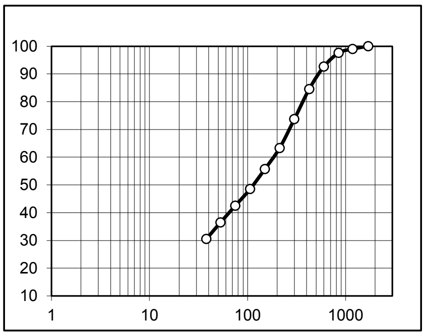
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	7.9	7.88	68.17	1.06	31.6	26.90	84.4	29.20	52.8	1.75	51.3	0.87	54.0
Non Magnetics	3.7	3.68	31.83	4.92	68.4	10.65	15.6	55.90	47.2	3.56	48.7	1.59	46.0
TOTAL	11.56		100.00	2.29	100.0	21.73	100.0	37.70	100.0	2.33	100.0	1.10	100.0

BURNIE LABORATORY: SIZE AND MAGNETIC SEPARATION ANALYSIS

PROJECT	T0879
SAMPLE	Bulk Sulphide Tail
FROM TEST NO	
DATE	110914
TECHNICIAN	DG

RAPID MAGNETIC SEPERATION RECOVERY ON FRACTIONS (10000 Gauss)



SIZING

SIZE um	WEIGHTS (%)	%PASS
150	44.29	100
75	13.19	86.8
38	12.00	74.8
20	7.00	67.8
<20	23.52	44.3
TOTAL	100.00	

SEPARATIONS

Products	WT	WT	Fraction		Fraction		Fraction		Fraction		Fraction	
	%	%	%Sn	dist	%Fe	dist	%SiO2	dist	%S	dist	%CaO	dist
Mags+150	92.18	40.83	0.81	86.7	18.30	97.9	44.50	87.3	2.77	88.1	0.80	88.4
Non Mags+150	7.82	3.46	1.46	13.3	4.71	2.1	76.20	12.7	4.40	11.9	1.24	11.6
Calc +150 Total	100.00	44.29	0.86	100.0	17.24	100.0	46.98	100.0	2.90	100.0	0.83	100.0
Mags+75	92.18	12.16	0.81	86.7	18.30	97.9	44.50	87.3	2.77	88.1	0.80	88.4
Non Mags+75	7.82	1.03	1.46	13.3	4.71	2.1	76.20	12.7	4.40	11.9	1.24	11.6
Calc +75 Total	100.00	13.19	0.86	100.0	17.24	100.0	46.98	100.0	2.90	100.0	0.83	100.0
Mags+38	73.43	8.81	1.16	39.3	25.40	92.2	30.80	54.9	2.13	51.9	0.78	54.1
Non Mags+38	26.57	3.19	4.95	60.7	5.90	7.8	70.00	45.1	5.46	48.1	1.83	45.9
Calc +38 Total	100.00	12.00	2.17	100.0	20.22	100.0	41.21	100.0	3.01	100.0	1.06	100.0
Mags+20	76.32	5.34	1.23	39.7	26.40	93.0	28.70	58.6	1.56	54.1	0.84	58.4
Non Mags+20	23.68	1.66	6.02	60.3	6.42	7.0	65.40	41.4	4.26	45.9	1.93	41.6
Calc +20 Total	100.00	7.00	2.36	100.0	21.67	100.0	37.39	100.0	2.20	100.0	1.10	100.0
-20		23.52	1.21		22.90		33.40		2.52		0.92	
CALC FEED		100.00	1.20		19.24		42.42		2.77		0.90	
ASSAY HEAD			1.34		19.55		40.90		3.08		0.95	

SUMMARY

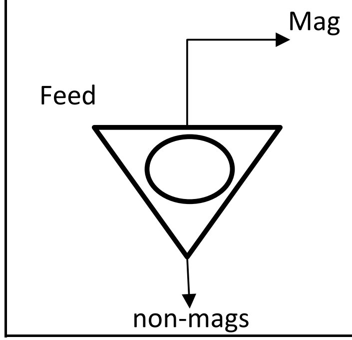
FRACTIONS	Picno	WT	Overall		Overall		Overall		Overall		Overall	
um	SG	%	%Sn	dist	%Fe	dist	%SiO2	dist	%S	dist	%CaO	dist
Mags+150		40.83	0.81	27.45	18.30	38.84	44.50	42.83	2.77	40.77	0.80	36.29
Mags+75		12.16	0.81	8.17	18.30	11.57	44.50	12.75	2.77	12.14	0.80	10.81
Mags+38		8.81	1.16	8.48	25.40	11.63	30.80	6.40	2.13	6.77	0.78	7.64
Mags+20		5.34	1.23	5.45	26.40	7.33	28.70	3.61	1.56	3.00	0.84	4.99
Non Mags+150		3.46	1.46	4.20	4.71	0.85	76.20	6.22	4.40	5.49	1.24	4.77
Non Mags+75		1.03	1.46	1.25	4.71	0.25	76.20	1.85	4.40	1.64	1.24	1.42
Non Mags+38		3.19	4.95	13.10	5.90	0.98	70.00	5.26	5.46	6.28	1.83	6.48
Non Mags+20		1.66	6.02	8.28	6.42	0.55	65.40	2.56	4.26	2.55	1.93	3.55
Total Mags		67.14	0.89	49.56	19.88	69.37	41.44	65.59	2.59	62.68	0.80	59.73
Total Non Mags		9.34	3.46	26.82	5.42	2.63	72.17	15.89	4.74	15.95	1.56	16.23
-20		23.52	1.21	23.62	22.90	28.00	33.40	18.52	2.52	21.37	0.92	24.04
CALC FEED		**100.00**	**1.20**	**100.00**	**19.24**	**100.00**	**42.42**	**100.00**	**2.77**	**100.00**	**0.90**	**100.00**
ASSAY HEAD			1.34		19.55		40.90		3.08		0.95	

ALS Metallurgy

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T41-1
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	10000.0
Magnetic intense2 (G)	
Comments	+150 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

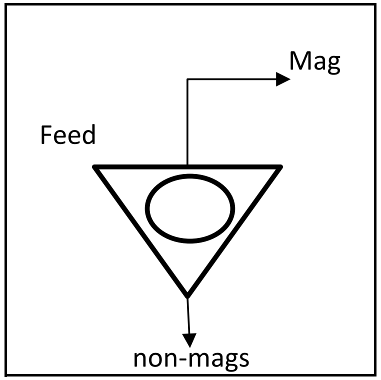
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	56.6	56.6	92.18	0.81	86.7	18.30	97.9	44.50	87.3	2.77	88.1	0.80	88.4
Non Magnetics	4.8	4.8	7.82	1.46	13.3	4.71	2.1	76.20	12.7	4.40	11.9	1.24	11.6
TOTAL	61.40		100.00	0.86	100.0	17.24	100.0	46.98	100.0	2.90	100.0	0.83	100.0

PROJECT	T0887
TEST NO	T41-2
DATE	110914
TECH	DG

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	10000.0
Magnetic intense2 (G)	
Comments	+75 um fraction



FEED MATERIAL	
Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

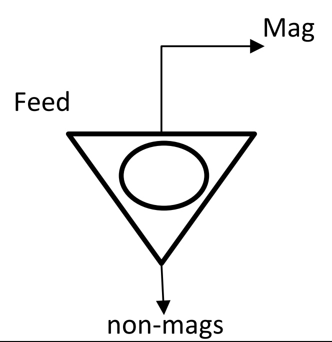
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	56.6	56.6	92.18	0.81	86.7	18.30	97.9	44.50	87.3	2.77	88.1	0.80	88.4
Non Magnetics	4.8	4.8	7.82	1.46	13.3	4.71	2.1	76.20	12.7	4.40	11.9	1.24	11.6
TOTAL	61.40		100.00	0.86	100.0	17.24	100.0	46.98	100.0	2.90	100.0	0.83	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T41-3
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	10000.0
Magnetic intense2 (G)	
Comments	+38 um fraction



FEED MATERIAL Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

MAGNETIC SEPARATION RESULTS

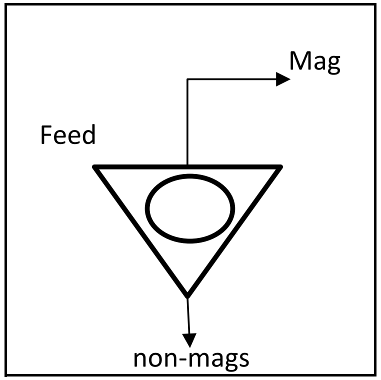
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	14.9	14.87	73.43	1.16	39.3	25.40	92.2	30.80	54.9	2.13	51.9	0.78	54.1
Non Magnetics	5.4	5.38	26.57	4.95	60.7	5.90	7.8	70.00	45.1	5.46	48.1	1.83	45.9
TOTAL	20.25		100.00	2.17	100.0	20.22	100.0	41.21	100.0	3.01	100.0	1.06	100.0

ALS Metallurgy

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T41-4
DATE	110914
TECH	DG

TEST TYPE	Rapid Mag Sep
Feed Solids (g)	Sulphide Bulk Tail
Current (A)	
Magnetic intense1 (G)	10000.0
Magnetic intense2 (G)	
Comments	+20 um fraction



FEED MATERIAL	
Sulphide Bulk Tail	
FROM TEST NO	
START WT (gm)	

MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
Magnetics	8.8	8.8	76.32	1.23	39.7	26.40	93.0	28.70	58.6	1.56	54.1	0.84	58.4
Non Magnetics	2.7	2.73	23.68	6.02	60.3	6.42	7.0	65.40	41.4	4.26	45.9	1.93	41.6
TOTAL	11.53		100.00	2.36	100.0	21.67	100.0	37.39	100.0	2.20	100.0	1.10	100.0

Appendix 9 – Final Gravity Concentrate Analysis

Element	Sn	Fe	As	S	SiO_2	Mn	CaO	MgO	Al_2O_3	C_{total}	$C_{organic}$
Units	%	%	%	%	%	%	%	%	%	%	%
Sample Description											
T66 End Leach Res A	54.4	3.80	0.13	1.13	13.5	0.11	0.7	0.56	2.84	0.61	0.16
T66 End Leach Res B	56.1	3.83	0.13	1.16	12.8	0.11	0.71	0.56	2.73	0.57	0.14
Final Gravity Concentrate	55.3	3.82	0.13	1.15	13.1	0.11	0.71	0.56	2.785	0.59	0.15
T66 Leach Feed	28.8	21	0.08	0.66	7	1.09	1.17	2.57	2.65	4.45	0.09

C inorganic %	Ag ppm	Al %	As ppm	Au ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cs ppm	Cu ppm	Fe %
0.44	3.28	0.2	100	0.2	20	190	2.7	18.7	0.4	<0.01	59	5	240	1.6	154	3.10
0.43	3.12	0.2	93.9	<0.2	20	180	2.9	18.1	0.4	<0.01	60	4.7	273	1.5	146	3.02
0.435	3.2	0.2	97	0.2	20	185	2.8	18.4	0.4	<0.01	59	4.9	257	1.6	150	3.06
4.36	1.67	0.9	125	<0.2	20	120	4.4	52.2	0.7	<0.01	39	3.4	122	3.8	127	19.3

Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re
ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
1.8	0.1	0.2	0.3	1.11	0.1	28	6.8	0.2	978	137	0	<0.05	30	90	685	15	0
1.8	0.1	0.2	0.3	1.12	0.1	28	6.8	0.2	917	129	0	<0.05	28	90	630	15	0
1.8	0.1	0.2	0.3	1.11	0.1	28	6.8	0.2	948	133	0	<0.05	29	90	658	15	0
6.3	0.3	0.2	0.2	7.28	0.1	17	18	1.3	9860	78.9	0	0.14	15	440	377	23	0

S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
1.3	5.8	1.2	0.2	490	36	<0.01	0.01	2.1	0.01	0.3	0.6	6	145	5.7	57	5.1
1.3	5.6	1.1	0.3	500	34	<0.01	0.01	2.0	0.01	0.3	0.5	6	145	5.7	54	5.0
1.3	5.7	1.2	0.3	495	35	<0.01	0.01	2.1	0.01	0.3	0.5	6	145	5.7	56	5.1
0.7	6	7	0.3	166	35	<0.01	0	1.8	0.01	0.4	0.8	39	560	8.3	98	5.7

McKnight Mineralogy

ABN 65962932907

PO Box 451 Buninyong
VIC 3357

Ph 03 53279262
M 0407860394
s.mcknight@ballarat.edu.au
mineralogy@hotkey.net.au

QXRD Analysis of Leach Sample Supplied by ALS Metallurgy Burnie (amended)

Attn: John Glen

S W McKnight
16/12/2014

Samples Supplied

Leach Con: 879733 T66 END LEACH RESIDUE

Phases Identified in the Sample

Cassiterite	Pyrrhotite	Arsenopyrite?
Siderite	Gypsum	Zircon
Quartz	Scheelite	Phlogopite
Dravite	Pyrite	Rhodocrosite?
Rutile	Topaz	

<u>Results – semiquantitative –</u> amended to 55.0 wt% Sn as per assay:

Phase	Weight%
Arsenopyrite	**0.2**
Cassiterite	**70.1**
Chlorite	**0**
Diopside	**0**
Dolomite	**0**
Dravite	**4.2**
Gypsum	**0.9**
Marcasite	**0**
Microcline	**0**
Phlogopite	**0**
Pyrite	**0.7**
Pyrrhotite-4C	**1**
Quartz	**7.4**
Rhodocrosite?	**0.4**
Rutile	**1.6**
Scheelite	**0.7**
Siderite	**12**
Topaz	**0.6**
Zircon	**0.1**

Appendix 10 – De-sliming Results

CYCLONE TEST DATA

SAMPLE	Float tails	
TEST TYPE		
	Cyclone test	(white cyclone foot)

PROJECT	T0887
TEST NO	T22
DATE	110714
PERFORMED BY	ID

Run #	Spigot, mm	Vortex finder, mm	Under flow +53	Under flow -53	Over flow +53	Over flow -53	KPA
	4	18	44.4	10.4	-	-	100
	5	18	43.8	1.6	-	-	100
1	5	18	54.4	3.4	72.3	119.2	200
2	4	18	30.3	1.3	39.9	82.7	100
3	4	18	58.2	2.1	71.9	83.6	200
-	8	18	108.7	34.4	0.04	41.9	200
Run #	Spigot, mm	Vortex finder, mm	Under flow +75	Under flow -75	Over flow +75	Over flow -75	KPA
4	6	18	155	25.2	0.02	107.1	200
5	5	18	105.3	43.6	0.01	84.3	200
6	4	18	45.9	4.7	78	126.9	200
7	5	14	128.9	53.8	0.08	56.4	200
T22							
Vortex finder, mm	Spigot, mm						
14	5						

CYCLONE TEST DATA

SAMPLE	Feed from T22 cyclone over flow	
TEST TYPE		
	Cyclone test	(red cyclone foot)

PROJECT	T0879
TEST NO	T23
DATE	150714
PERFORMED BY	ID

Run #	**Spigot, mm**	**Vortex finder, mm**	**Under flow +20**	**Under flow -20**	**Over flow +20**	**Over flow -20**	KPA
1	6	14	14.1	35.1	0.02	50	200
2	4.5	14	11	25.3	0.04	43.2	200
3	3	14	15.9	32.6	0.06	67.3	200
4	3	18	28.1	40.1	0.2	127.2	200
							200
T23							
Vortex finder, mm	Spigot, mm						
18	3						

CYCLONE TEST DATA

SAMPLE	Feed from LC01 cyclone over flow
TEST TYPE	
	Cyclone test (red cyclone foot)

PROJECT	T0879
TEST NO	T27-T28
DATE	190814
PERFORMED BY	ID

Run #	**Spigot, mm**	**Vortex finder, mm**	**Under flow (DAMP)**	**Over flow (DAMP)**	Over flow/Total %		KPA
1	6	18	150.1	194.7			200
2	9.5	18	187.1	171.7			200
3	9.5	14	96.7	66.1			200
4	9.5	11	144.6	52.5			200
5	4.5	18	216.3	376			200
6	4.5	14	212.8	254.9			200
T27	4.5	18					
T28	4.5	14					
T27	CYC U/F (dry wt),gm	CYC O/F (dry wt),gm	OF/(OF+UF)				
Mimic 12um	809.3	1141.2	58.5				
T28	CYC U/F (dry wt),gm	CYC O/F (dry wt),gm					
Mimic 8um	1727.5	1613.5	48.3				
T43							
Feed; LC01 cyc 11-12 overflow							
Spigot, mm	**Vortex finder, mm**						
4.5	18						

CYCLONE TEST DATA

SAMPLE	Feed from LC01 cyclone over flow cyc 11-12
TEST TYPE	
	Cyclone test (red cyclone foot)
	Deslime

PROJECT	T0879
TEST NO	T43
DATE	250914
PERFORMED BY	ID

Run #	**Spigot, mm**	**Vortex finder, mm**	**sample time**		**Tare (gm)**	**Tare + Pulp (gm)**	**Damp Cake (gm)**	Over flow/Total %	KPA
1	4.5	18	-	O/F	827	10511	362.7		200
				U/F	366.9	746.1	106.9		
2	4.5	14	10 sec	O/F	833	7805	218		200
				U/F	360	750	92.5		
3	6	14	10 sec	O/F	833	8251	194		200
				U/F	360	1220	104		
4	9	14	10 sec	O/F	833	6967	170		200
				U/F	360	2476	165		
5	6	11	10 sec	O/F	833	5450	128		200
				U/F	360	1687	130		
6	4.5	11	10 sec	O/F	833	6240	153		200
				U/F	360	927	90		

CYCLONE TEST DATA

SAMPLE	Feed from LC01 C11-31 cyclone over flow+-40um from GLC -106 tails		
TEST TYPE			
	Cyclone test	(red cyclone foot)	

PROJECT	T0879
TEST NO	T51
DATE	181114
PERFORMED BY	ID

Run #	**Spigot, mm**	**Vortex finder, mm**	**Under flow (DAMP)**	**Over flow (DAMP)**	Over flow/Total %	**Cutpoint**	KPA
1	4.5	18	189	593.7	75.9		200
2	4.5	14	269	517	65.8	~12um	200
3	9.5	11	550	205	27.2		200
4	6	11	607	468	43.5	~8um	200
5	6	8	371	128	25.7		200
6	4.5	8	433	322	42.6		200
Run #	**Under flow (Dry,gm)**	**Over flow (Dry,gm)**	Over flow/Total %	Underflow flow/Total %	Cutpoint		
2	435.8	645.5	59.70	40.30	~12um		
4	540	324	37.50	62.50	~5um		
6	383.9	221.9	36.63	63.37	~5um		
	Cyclone O/f		**Cyclone U/f**				
Run #	Tare (gm)	Tare + Pulp (gm)	Tare (gm)	Tare + Pulp (gm)			
1	355	2945	79	324			
2	355	2825	79	438			
3	355	1675	280	1700			
4	355	3205	280	1395			
5	355	1360	280	1200			
6							

Test 27
Cyclone u/f
Mass split: 41.49

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150	18.05	0.62	10.3	15.80	14.9	0.08	10.3	2.51	19.7	50.90	19.5	0.42	12.4	0.79	14.0	3.64	17.8	9.00	20.4
126	106	5.78	0.84	4.5	15.50	4.7	0.05	2.1	1.66	4.2	51.40	6.3	0.52	4.9	0.89	5.0	3.62	5.7	8.05	5.8
89	75	7.22	0.78	5.2	15.35	5.8	0.09	4.6	1.77	5.6	52.90	8.1	0.50	5.9	0.91	6.4	3.49	6.8	7.76	7.0
63	53	8.54	0.83	6.5	16.30	7.2	0.10	6.1	1.75	6.5	54.10	9.8	0.55	7.7	0.97	8.1	3.42	7.9	7.58	8.1
49	45	4.38	0.89	3.6	16.70	3.8	0.09	2.8	2.02	3.8	50.80	4.7	0.56	4.0	0.99	4.2	3.30	3.9	7.14	3.9
41	38	4.31	0.93	3.7	17.65	4.0	0.11	3.4	1.51	2.8	51.60	4.7	0.61	4.3	1.08	4.6	3.54	4.1	7.35	4.0
33	29	7.41	2.75	18.7	25.00	9.6	0.22	11.6	3.76	12.1	31.30	4.9	0.90	10.9	1.19	8.6	3.05	6.1	6.02	5.6
19	13	29.49	1.13	30.6	19.85	30.5	0.19	40.0	2.13	27.3	42.80	26.8	0.66	31.9	1.13	32.7	3.51	28.0	6.99	25.9
10	8	7.81	1.05	7.5	22.00	8.9	0.26	14.5	3.00	10.2	37.60	6.2	0.65	8.3	1.12	8.6	3.76	8.0	7.43	7.3
3	Cal <8	7.03	1.49	9.6	29.00	10.6	0.09	4.5	2.55	7.8	59.52	8.9	0.83	9.6	1.12	7.7	6.09	11.6	13.47	11.9
	ASSAY	100.00	1.09	100.0	19.20	100.0	0.14	100.0	2.30	100.0	47.10	100.0	0.61	100.0	1.02	100.0	3.69	100.0	7.96	100.0

Cyclone o/f
Mass split: 58.51

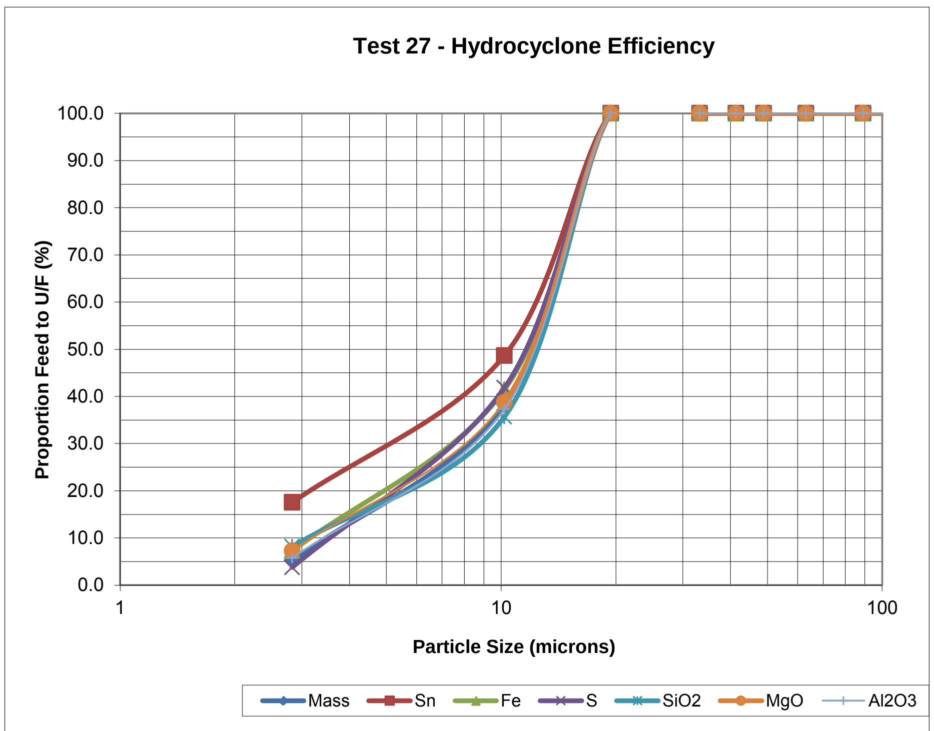
Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150																			
126	106																			
89	75																			
63	53																			
49	45																			
41	38																			
33	29																			
19	13																			
10	8	8.89	0.69	15.0	19.40	8.5	0.18	8.4	2.60	6.6	42.20	10.1	0.55	11.9	1.04	11.9	3.70	7.9	7.78	5.9
3	CALC<8	91.11	0.38	85.0	20.28	91.5	0.19	91.6	3.58	93.4	36.71	89.9	0.40	88.1	0.75	88.1	4.24	92.1	12.03	94.1
	ASSAY	100.00	0.41	100.0	20.20	100.0	0.19	100.0	3.49	100.0	37.20	100.0	0.41	100.0	0.78	100.0	4.19	100.0	11.65	100.0

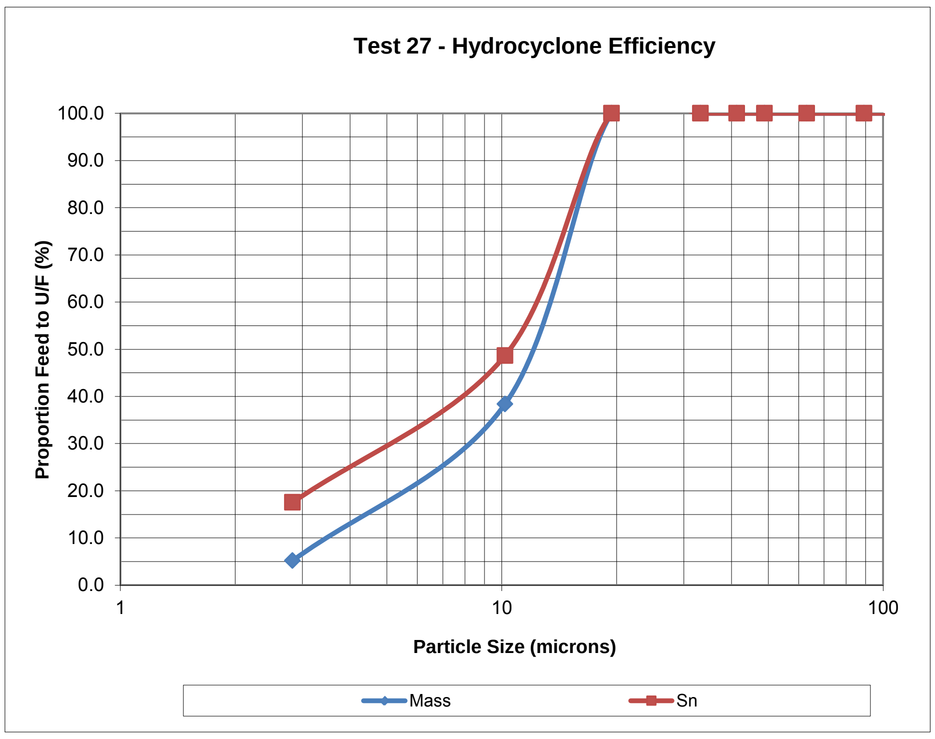
Cyclone feed
Mass split: 100.00

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150	7.49	0.62	6.7	15.8	6.0	0.08	3.5	2.51	6.3	50.9	9.2	0.42	6.4	0.79	6.7	3.64	6.8	9.0	6.7
126	106	2.40	0.84	2.9	15.5	1.9	0.05	0.7	1.66	1.3	51.4	3.0	0.52	2.5	0.89	2.4	3.62	2.2	8.1	1.9
89	75	2.99	0.78	3.4	15.4	2.3	0.09	1.6	1.77	1.8	52.9	3.8	0.50	3.0	0.91	3.1	3.49	2.6	7.8	2.3
63	53	3.54	0.83	4.2	16.3	2.9	0.10	2.1	1.75	2.1	54.1	4.6	0.55	4.0	0.97	3.9	3.42	3.0	7.6	2.7
49	45	1.82	0.89	2.3	16.7	1.5	0.09	1.0	2.02	1.2	50.8	2.2	0.56	2.1	0.99	2.0	3.30	1.5	7.1	1.3
41	38	1.79	0.93	2.4	17.7	1.6	0.11	1.2	1.51	0.9	51.6	2.2	0.61	2.2	1.08	2.2	3.54	1.6	7.4	1.3
33	29	3.07	2.75	12.2	25.0	3.9	0.22	4.0	3.76	3.9	31.3	2.3	0.90	5.6	1.19	4.2	3.05	2.4	6.0	1.8
19	13	12.24	1.13	20.0	19.9	12.3	0.19	13.7	2.13	8.7	42.8	12.7	0.66	16.4	1.13	15.7	3.51	10.8	7.0	8.5
10	8	8.44	0.83	10.1	20.4	8.7	0.21	10.5	2.75	7.8	40.4	8.3	0.59	10.1	1.07	10.3	3.72	7.9	7.6	6.4
3	<8	56.22	0.44	35.7	20.7	58.9	0.19	61.7	3.52	66.1	37.9	51.6	0.42	47.8	0.77	49.5	4.33	61.2	12.1	67.2
	ASSAY	100.00	0.69	100.0	19.8	100.0	0.17	100.0	3.00	100.0	41.3	100.0	0.49	100.0	0.88	100.0	3.98	100.0	10.1	100.0

Recoveries to u/f

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
126	106	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
89	75	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
63	53	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
49	45	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
41	38	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
33	29	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
19	13	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
10	8	38.4	48.7		41.4		47.4		41.8		35.7		42.4		40.1		38.8		37.3	
3	<8	5.2	17.5		7.3		2.5		3.8		8.2		10.3		7.5		7.3		5.8	
	ASSAY	41.5	65.3		40.3		34.3		31.9		47.3		51.3		48.1		38.4		32.6	
	D50	**11.9**	**10.4**		11.6		10.7		11.5		12.2		11.4		11.7		11.9		12.1	





Test 28

Cyclone u/f

Mass split: 51.71

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150	13.41	0.56	8.1	15.60	11.2	0.07	5.9	2.33	12.8	51.90	15.8	0.40	9.6	0.78	10.7	3.61	13.4	9.01	15.3
126	106	4.48	0.74	3.6	15.70	3.8	0.07	2.0	1.37	2.5	52.70	5.4	0.50	4.0	0.89	4.1	3.59	4.5	8.05	4.6
89	75	5.55	0.68	4.1	15.10	4.5	0.07	2.4	1.73	3.9	53.40	6.7	0.47	4.7	0.86	4.9	3.34	5.2	7.53	5.3
63	53	6.77	0.75	5.5	15.55	5.6	0.07	3.0	1.94	5.4	53.10	8.2	0.50	6.0	0.92	6.4	3.24	6.1	7.10	6.1
49	45	3.46	0.80	3.0	16.10	3.0	0.08	1.7	1.89	2.7	51.90	4.1	0.54	3.3	1.00	3.5	3.26	3.1	7.09	3.1
41	38	3.44	0.94	3.5	17.45	3.2	0.10	2.2	1.82	2.6	51.40	4.0	0.60	3.7	1.09	3.8	3.45	3.3	7.17	3.1
33	29	6.74	2.47	17.9	24.50	8.9	0.20	8.4	3.29	9.1	32.70	5.0	0.89	10.7	1.19	8.2	3.07	5.7	6.08	5.2
19	13	26.56	1.10	31.4	19.95	28.4	0.19	31.5	1.77	19.2	42.90	25.8	0.66	31.3	1.09	29.5	3.53	26.0	7.03	23.7
10	8	10.83	0.91	10.6	22.30	12.9	0.26	17.6	3.13	13.8	41.60	10.2	0.64	12.4	1.13	12.5	3.94	11.9	8.03	11.0
3	Cal <8	18.76	0.62	12.5	18.34	18.4	0.22	25.3	3.68	28.2	34.93	14.9	0.43	14.3	0.86	16.5	3.99	20.8	9.40	22.4
	ASSAY	100.00	0.93	100.0	18.65	100.0	0.16	100.0	2.45	100.0	44.10	100.0	0.56	100.0	0.98	100.0	3.60	100.0	7.87	100.0

Cyclone o/f

Mass split: 48.29

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150																			
126	106																			
89	75																			
63	53																			
49	45																			
41	38																			
33	29																			
19	13																			
10	8	5.02	0.71	8.9	19.75	4.8	0.18	5.0	2.73	4.8	41.00	5.6	0.53	6.6	1.11	7.4	3.66	4.3	7.64	3.2
3	CALC<8	94.98	0.38	91.1	20.54	95.2	0.18	95.0	2.85	95.2	36.26	94.4	0.39	93.4	0.73	92.6	4.33	95.7	12.18	96.8
	ASSAY	100.00	0.40	100.0	20.50	100.0	0.18	100.0	2.84	100.0	36.50	100.0	0.40	100.0	0.75	100.0	4.30	100.0	11.95	100.0

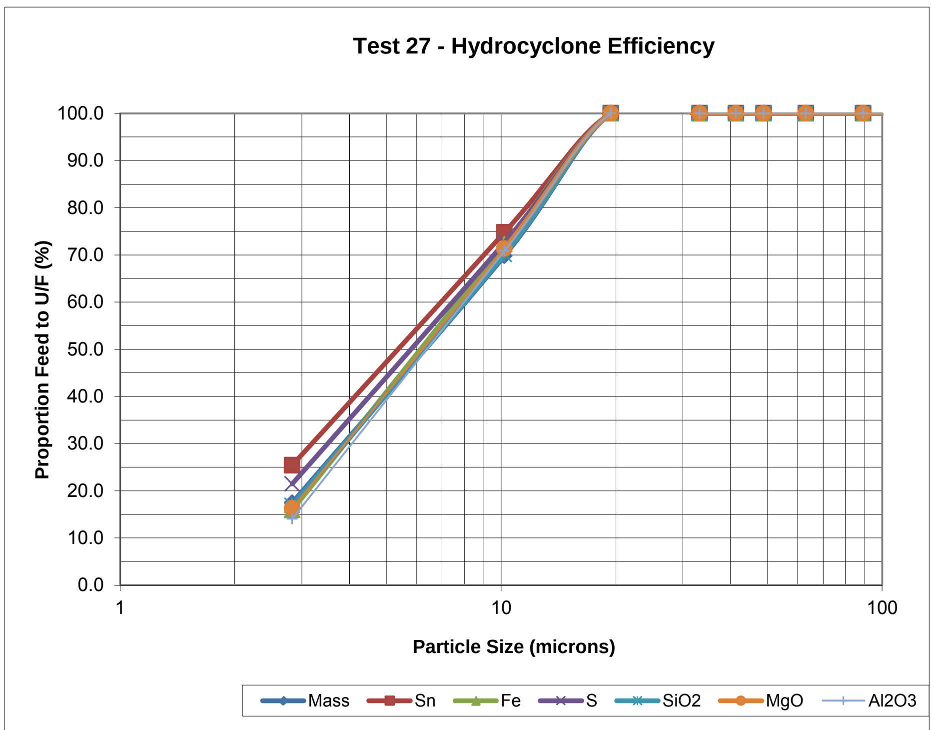
Cyclone feed

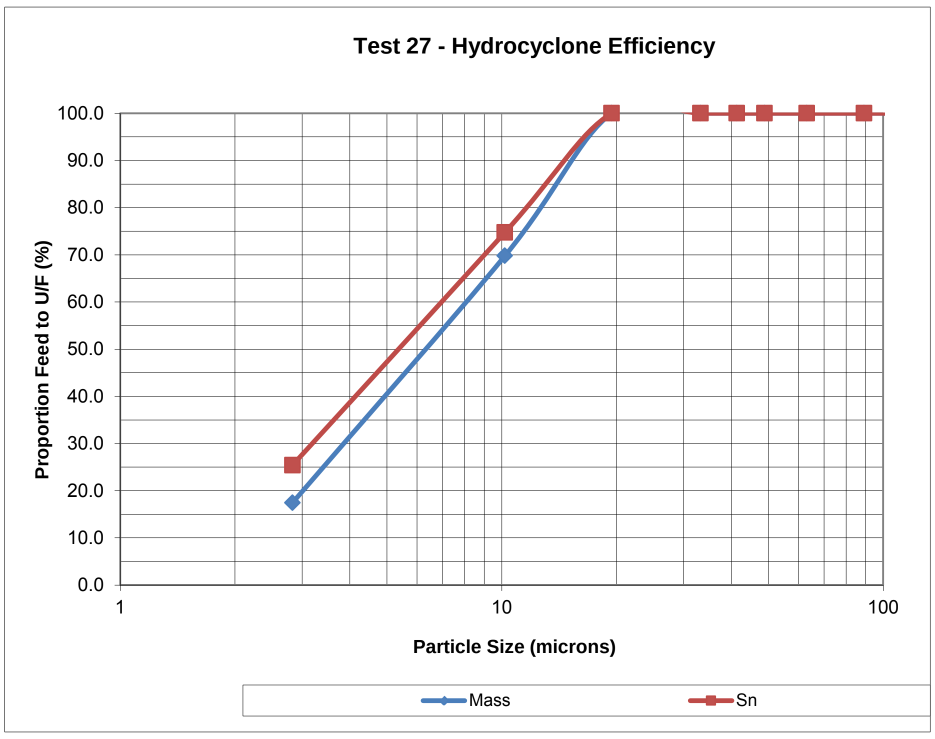
Mass split: 100.00

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150	6.93	0.56	5.8	15.6	5.5	0.07	2.9	2.33	6.1	51.9	8.9	0.40	5.7	0.78	6.2	3.61	6.4	9.0	6.3
126	106	2.31	0.74	2.5	15.7	1.9	0.07	1.0	1.37	1.2	52.7	3.0	0.50	2.4	0.89	2.4	3.59	2.1	8.1	1.9
89	75	2.87	0.68	2.9	15.1	2.2	0.07	1.2	1.73	1.9	53.4	3.8	0.47	2.8	0.86	2.8	3.34	2.4	7.5	2.2
63	53	3.50	0.75	3.9	15.6	2.8	0.07	1.4	1.94	2.6	53.1	4.6	0.50	3.6	0.92	3.7	3.24	2.9	7.1	2.5
49	45	1.79	0.80	2.1	16.1	1.5	0.08	0.8	1.89	1.3	51.9	2.3	0.54	2.0	1.00	2.1	3.26	1.5	7.1	1.3
41	38	1.78	0.94	2.5	17.5	1.6	0.10	1.0	1.82	1.2	51.4	2.3	0.60	2.2	1.09	2.2	3.45	1.6	7.2	1.3
33	29	3.48	2.47	12.8	24.5	4.4	0.20	4.1	3.29	4.3	32.7	2.8	0.89	6.4	1.19	4.8	3.07	2.7	6.1	2.2
19	13	13.74	1.10	22.4	20.0	14.0	0.19	15.4	1.77	9.2	42.9	14.6	0.66	18.8	1.09	17.2	3.53	12.3	7.0	9.8
10	8	8.02	0.85	10.1	21.5	8.8	0.24	11.2	3.01	9.2	41.4	8.2	0.61	10.1	1.12	10.4	3.86	7.9	7.9	6.5
3	<8	55.57	0.42	35.0	20.2	57.3	0.19	61.0	2.99	63.0	36.0	49.5	0.40	45.9	0.75	48.2	4.27	60.3	11.7	66.0
	ASSAY	100.00	0.67	100.0	19.5	100.0	0.17	100.0	2.64	100.0	40.4	100.0	0.48	100.0	0.87	100.0	3.94	100.0	9.8	100.0

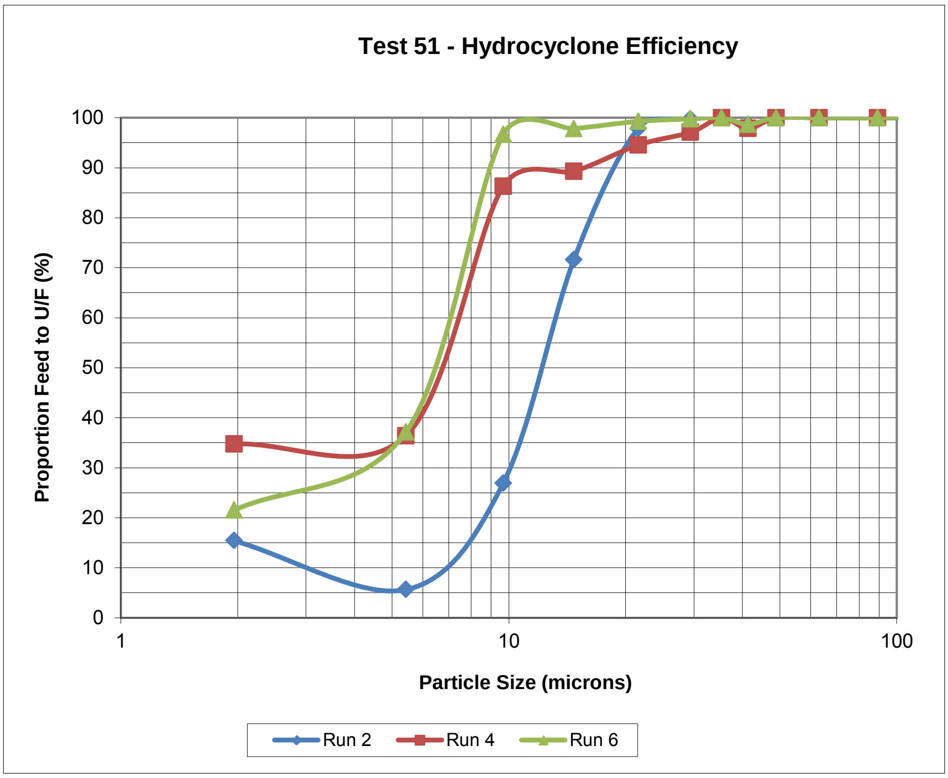
Recoveries to u/f

Mean size	SIZE	WT	Sn		Fe		As		S		SiO2		MnO		CaO		MgO		Al2O3	
600	um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
300	150	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
126	106	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
89	75	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
63	53	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
49	45	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
41	38	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
33	29	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
19	13	100.0	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
10	8	69.8	74.8		72.3		76.9		72.6		70.1		73.6		70.2		71.3		70.8	
3	<8	17.5	25.4		15.9		20.2		21.5		16.9		18.7		19.9		16.3		14.0	
	ASSAY	51.7	71.3		49.3		48.8		48.0		56.4		60.0		58.3		47.3		41.4	
	D50	**7.4**	**6.5**		7.3		6.7		6.9		7.4		7.0		7.2		7.3		7.5	





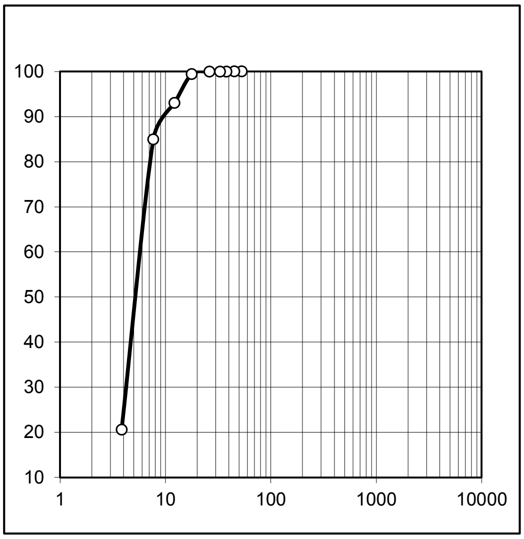
		Run 2				Run 4				Run 6			
		O/F	U/F	Feed	Rec to u/f	O/F	U/F	Feed	Rec to u/f	O/F	U/F	Feed	Rec to u/f
	Mass split	59.7	40.3	100.0		37.5	62.5	100.0		36.6	63.4	100.0	
Mean size	Size (um)												
252	212	0.0	0.1	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	
178	150	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.1	0.0	100.0
126	106	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
89	75	0.0	0.1	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
63	53	0.0	1.3	0.5	100.0	0.0	0.9	0.5	100.0	0.0	0.9	0.5	100.0
49	45	0.0	2.8	1.1	100.0	0.0	1.9	1.2	100.0	0.0	1.9	1.2	100.0
41	38	0.0	3.8	1.5	98.6	0.1	2.5	1.6	97.8	0.1	2.4	1.5	98.7
35	33	0.0	1.6	0.6	100.0	0.0	1.2	0.7	100.0	0.0	1.3	0.8	100.0
29	26	0.0	14.7	5.9	99.7	0.5	10.3	6.6	97.1	0.0	11.3	7.2	99.8
22	18	0.5	36.2	14.9	97.9	2.2	23.0	15.2	94.5	0.3	23.5	15.0	99.3
15	12	6.4	23.9	13.4	71.6	3.9	19.6	13.7	89.3	0.8	21.5	14.0	97.8
10	8	8.0	4.4	6.6	26.9	2.7	10.1	7.3	86.3	0.6	10.8	7.1	96.7
5	4	64.4	5.7	40.7	5.6	65.5	22.5	38.6	36.4	58.7	20.0	34.2	37.1
2	SUB	20.6	5.6	14.5	15.4	25.2	8.0	14.5	34.8	39.4	6.2	18.4	21.5
	TOTAL	100.0	100.0	100.0	40.3	100.0	100.0	100.0	62.5	100.0	100.0	100.0	63.4
	D50				**12.3**				**6.6**				**6.3**



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Run 2 O/F
TEST NO	T51
DATE	191114
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Run 2 O/F		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		45	0.00	0.00	100.0	
		38	0.04	0.04	100.0	
CYCLOSIZER	CS1	33	0.00	0.00	100.0	
FLOW 185	CS2	26	0.03	0.03	99.9	
TEMP 21	CS3	18	0.60	0.53	99.4	
SG **3.00**	CS4	12	7.21	6.40	93.0	
MINS 20	CS5	8	9.05	8.04	85.0	
CENTRIFUGE	0	4	72.48	64.37	20.6	7
		SUB	23.19	20.6	0.0	
		TOTAL	112.60	100.00		

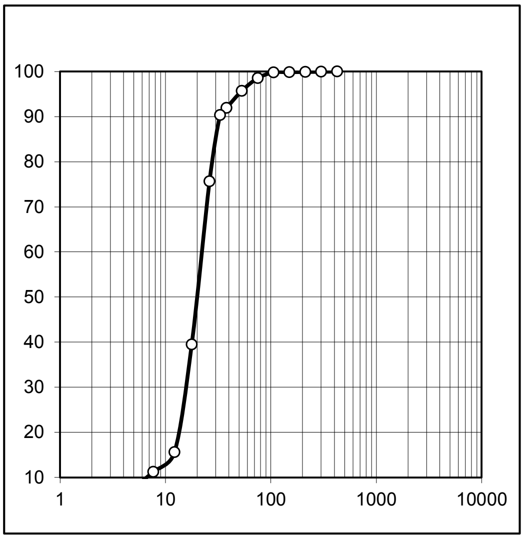


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Run 2 U/F
TEST NO	T51
DATE	191114
TECHNICIAN	DK

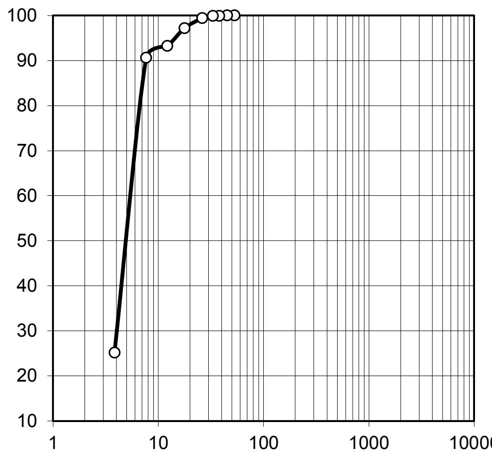
SAMPLE SIZED		SIZE	WEIGHTS			P80
Run 2 U/F		um	gm	(%)	% Pass	um
		2360	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.07	0.06	99.9	
		212	0.05	0.04	99.9	
		150	0.06	0.05	99.9	
		106	0.08	0.07	99.8	
		75	1.52	1.26	98.5	
		53	3.40	2.82	95.7	
		38	4.53	3.75	92.0	
CYCLOSIZER	CS1	33	1.94	1.61	90.4	
FLOW 185	CS2	26	17.76	14.71	75.6	**28**
TEMP 21	CS3	18	43.66	36.15	39.5	
SG **3.00**	CS4	12	28.84	23.88	15.6	
MINS 20	CS5	8	5.29	4.38	11.2	
CENTRIFUGE	0	4	6.86	5.68	5.6	
		SUB	6.71	5.6	0.0	
		TOTAL	120.77	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Run 4 O/F
TEST NO	T51
DATE	191114
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Run 4 O/F		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		45	0.00	0.00	100.0	
		38	0.09	0.09	99.9	
CYCLOSIZER	CS1	33	0.00	0.00	99.9	
FLOW 185	CS2	26	0.51	0.51	99.4	
TEMP 21	CS3	18	2.19	2.21	97.2	
SG **3.00**	CS4	12	3.89	3.92	93.3	
MINS 20	CS5	8	2.64	2.66	90.6	
CENTRIFUGE	0	4	64.93	65.45	25.2	7
		SUB	24.95	25.2	0.0	
		TOTAL	99.20	100.00		

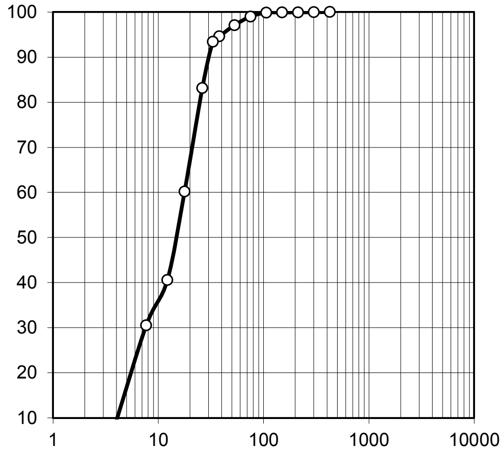


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Run 4 U/F
TEST NO	T51
DATE	191114
TECHNICIAN	DK

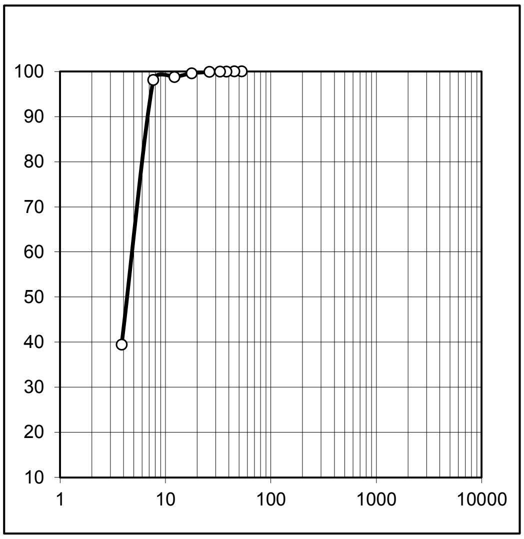
SAMPLE SIZED		SIZE	WEIGHTS			P80
Run 4 U/F		um	gm	(%)	% Pass	um
		2360	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.05	0.04	100.0	
		212	0.03	0.02	99.9	
		150	0.04	0.03	99.9	
		106	0.05	0.04	99.9	
		75	1.06	0.87	99.0	
		53	2.32	1.90	97.1	
		38	3.02	2.48	94.6	
CYCLOSIZER	CS1	33	1.46	1.20	93.4	
FLOW 185	CS2	26	12.53	10.28	83.1	
TEMP 21	CS3	18	28.00	22.97	60.2	**25**
SG **3.00**	CS4	12	23.89	19.60	40.6	
MINS 20	CS5	8	12.26	10.06	30.5	
CENTRIFUGE	0	4	27.39	22.47	8.0	
		SUB	9.80	8.0	0.0	
		TOTAL	121.90	100.00		



BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Run 6 O/F
TEST NO	T51
DATE	191114
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Run 6 O/F		um	gm	(%)	% Pass	um
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		45	0.00	0.00	100.0	
		38	0.06	0.05	99.9	
CYCLOSIZER	CS1	33	0.00	0.00	99.9	
FLOW 185	CS2	26	0.05	0.05	99.9	
TEMP 21	CS3	18	0.32	0.29	99.6	
SG **3.00**	CS4	12	0.91	0.83	98.8	
MINS 20	CS5	8	0.71	0.65	98.1	
CENTRIFUGE	0	4	64.39	58.69	39.4	**6**
		SUB	43.27	39.4	0.0	
		TOTAL	109.71	100.00		

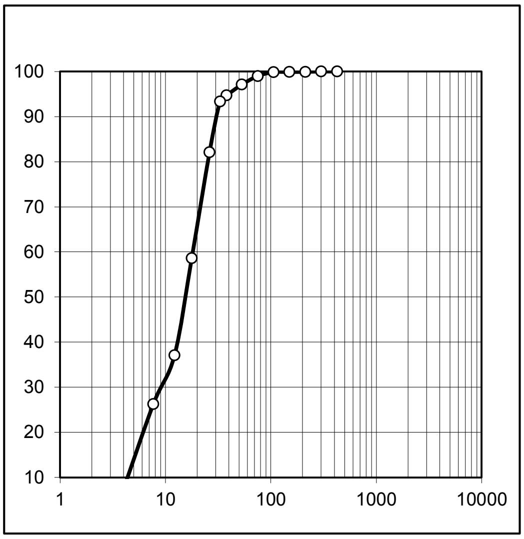


ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

PROJECT	T0879
SAMPLE	Run 6 U/F
TEST NO	T51
DATE	191114
TECHNICIAN	DK

SAMPLE SIZED		SIZE	WEIGHTS			P80
Run 6 U/F		um	gm	(%)	% Pass	um
		2360	0.00	0.00	100.0	
		1180	0.00	0.00	100.0	
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.08	0.07	99.9	
		150	0.04	0.04	99.9	
		106	0.05	0.04	99.8	
		75	0.97	0.86	99.0	
		53	2.13	1.89	97.1	
		38	2.69	2.39	94.7	
CYCLOSIZER	CS1	33	1.51	1.34	93.4	
FLOW 185	CS2	26	12.71	11.28	82.1	
TEMP 21	CS3	18	26.44	23.47	58.6	**25**
SG **3.00**	CS4	12	24.28	21.55	37.1	
MINS 20	CS5	8	12.17	10.80	26.3	
CENTRIFUGE	0	4	22.56	20.02	6.2	
		SUB	7.04	6.2	0.0	
		TOTAL	112.67	100.00		



CYCLONE TEST DATA

SAMPLE	Feed from LC01 C11-31 cyclone over flow+-40um from GLC -106 tails		
TEST TYPE			
	Cyclone test	(red cyclone foot)	

PROJECT	T0879
TEST NO	T51
DATE	181114
PERFORMED BY	ID

Run #	**Spigot, mm**	**Vortex finder, mm**	**Under flow (DAMP)**	**Over flow (DAMP)**	Over flow/Total %	**Cutpoint**	KPA
1	4.5	18	189	593.7	75.9		200
2	4.5	14	269	517	65.8	12.3	200
3	9.5	11	550	205	27.2		200
4	6	11	607	468	43.5	6.6	200
5	6	8	371	128	25.7		200
6	4.5	8	433	322	42.6	6.3	200
Run #	**Under flow (Dry,gm)**	**Over flow (Dry,gm)**	Over flow/Total %	Underflow flow/Total %	Cutpoint		
2	435.8	645.5	59.70	40.30	~12um		
4	540	324	37.50	62.50	~5um		
6	383.9	221.9	36.63	63.37	~5um		
	Cyclone O/f			**Cyclone U/f**			
Run #	Tare (gm)	Tare + Pulp (gm)		Tare (gm)	Tare + Pulp (gm)		
1	355	2945		79	324		
2	355	2825	26.1	79	438	121.4	
3	355	1675		280	1700		
4	355	3205	11.4	280	1395	48.4	
5	355	1360		280	1200		
6			#DIV/0!			#DIV/0!	

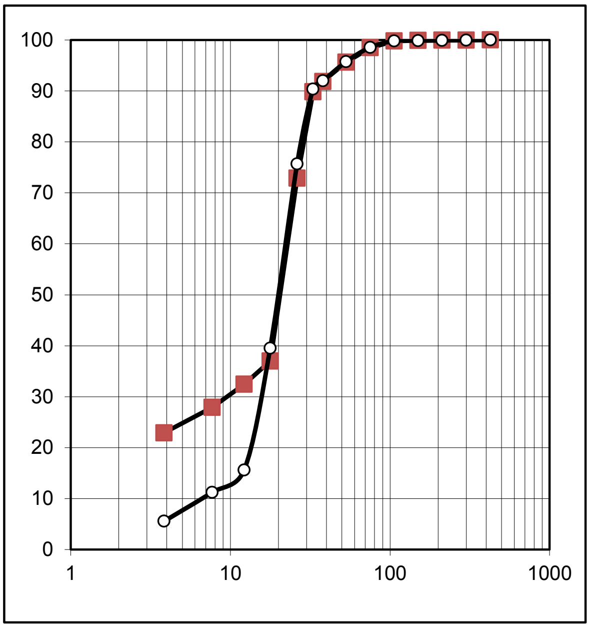
BURNIE LABORATORY

SIZE ANALYSIS REPORT SHEET WITH CS6

PROJECT	T0879
SAMPLE	Cyc U/F
	T56
DATE	251114
TECHNICIAN	MS

SIZING

Product Sized Cyc U/F		SIZE um	WEIGHTS gm	(%)	%PASS
	P80	425	0.00	0.00	100.0
		300	0.03	0.04	100.0
		212	0.03	0.04	99.9
		150	0.04	0.05	99.9
		106	0.07	0.08	99.8
		75	1.10	1.32	98.5
		53	2.37	2.85	95.6
		38	3.15	3.79	91.8
CYCLOSIZER		33	1.68	2.02	89.8
FLOW 185	**29**	26	14.08	16.93	72.9
TEMP 21		18	29.84	35.88	37.0
SG **3.00**		12	3.80	4.57	32.4
MINS 20		8	3.77	4.53	27.9
CENTRIFUGE	CS6	4	4.16	5.00	22.9
		SUB	19.04	22.90	0.0
		TOTAL	83.16	100.0	



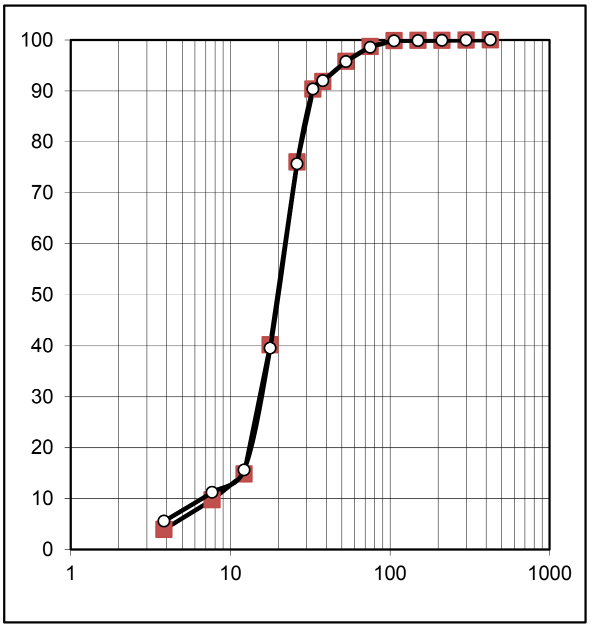
BURNIE LABORATORY

SIZE ANALYSIS REPORT SHEET WITH CS6

PROJECT	T0879
SAMPLE	Cyc U/F
	T56.B
DATE	261114
TECHNICIAN	MS

SIZING

Product Sized		SIZE	WEIGHTS		
Cyc U/F		um	gm	(%)	%PASS
	P80	425	0.00	0.00	100.0
		300	0.06	0.06	99.9
		212	0.03	0.03	99.9
		150	0.04	0.04	99.9
		106	0.06	0.06	99.8
		75	1.18	1.15	98.7
		53	2.95	2.88	95.8
		38	4.05	3.95	91.8
CYCLOSIZER		33	1.55	1.51	90.3
FLOW 185	**28**	26	14.65	14.29	76.0
TEMP 21		18	36.81	35.89	40.1
SG **3.00**		12	25.99	25.34	14.8
MINS 20		8	5.19	5.06	9.7
CENTRIFUGE	CS6	4	5.95	5.80	3.9
		SUB	4.04	3.94	0.0
		TOTAL	102.55	100.0	

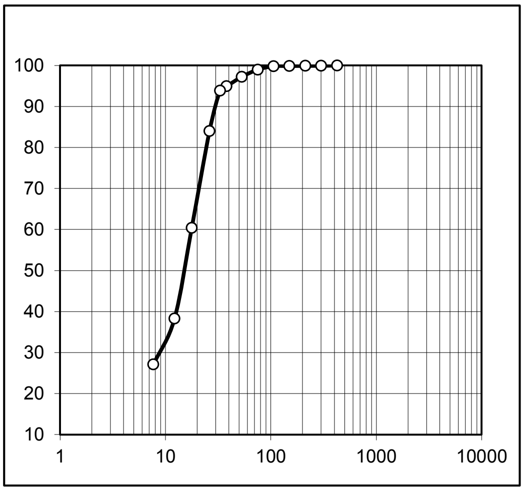


BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Cyclone U/F
TEST NO	T63
DATE	51214
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Cyclone U/F		um	gm	(%)	% Pass	um
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.07	0.06	99.9	
		212	0.03	0.03	99.9	
		150	0.04	0.03	99.9	
		106	0.06	0.05	99.8	
		75	0.96	0.84	99.0	
		53	1.99	1.74	97.3	
		38	2.66	2.32	94.9	
CYCLOSIZER	CS1	33	1.24	1.08	93.8	
FLOW 185	CS2	26	11.25	9.82	84.0	
TEMP 21	CS3	18	27.09	23.64	60.4	**25**
SG **3.00**	CS4	12	25.35	22.12	38.3	
MINS 20	CS5	8	12.83	11.20	27.1	
CENTRIFUGE	0	4	0.00	0.00	27.1	
		SUB	31.03	27.1	0.0	
		TOTAL	114.60	100.00		



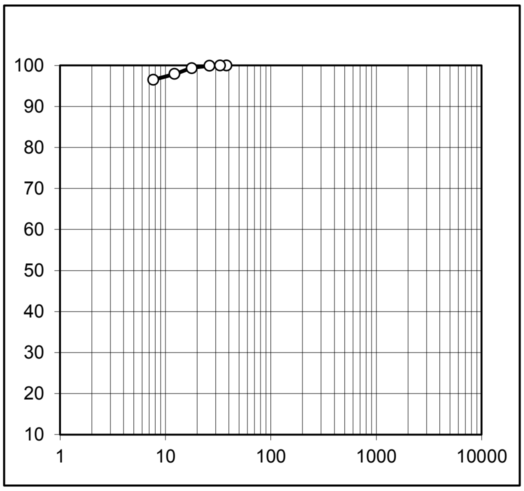
ALS Metallurgy

BURNIE LABORATORY
GENERAL SIZING REPORT SHEET

11

PROJECT	T0879
SAMPLE	Cyclone O/F
TEST NO	T63
DATE	51214
TECHNICIAN	MS

SAMPLE SIZED		SIZE	WEIGHTS			P80
Cyclone O/F		um	gm	(%)	% Pass	um
		850	0.00	0.00	100.0	
		600	0.00	0.00	100.0	
		425	0.00	0.00	100.0	
		300	0.00	0.00	100.0	
		212	0.00	0.00	100.0	
		150	0.00	0.00	100.0	
		106	0.00	0.00	100.0	
		75	0.00	0.00	100.0	
		53	0.00	0.00	100.0	
		38	0.00	0.00	100.0	
CYCLOSIZER	CS1	33	0.00	0.00	100.0	
FLOW 185	CS2	26	0.09	0.09	99.9	
TEMP 21	CS3	18	0.60	0.57	99.3	
SG **3.00**	CS4	12	1.50	1.42	97.9	
MINS 20	CS5	8	1.47	1.39	96.5	
CENTRIFUGE	0	4	0.00	0.00	96.5	
		SUB	102.20	96.5	0.0	
		TOTAL	105.86	100.00		

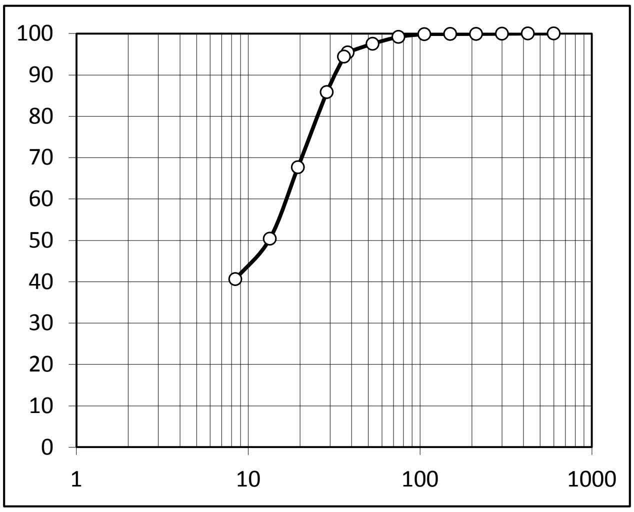


BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	Cyclone Underflow
TEST NO	T70
DATE	230115
TECHNICIAN	MS

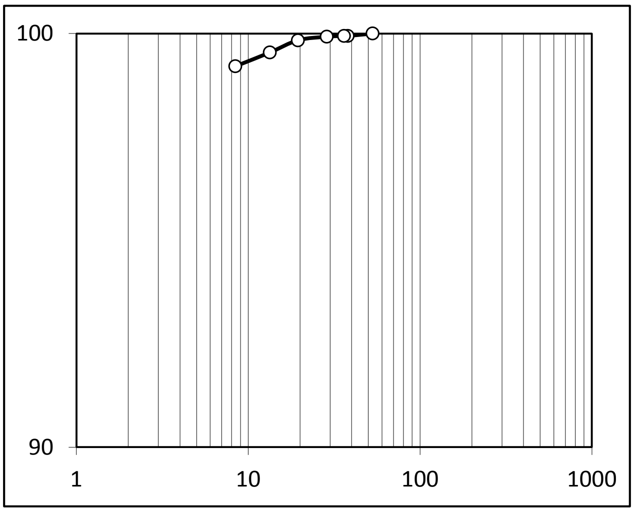
Cyclone Underflow T70		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.07	0.06	99.9
		212	0.03	0.03	99.9
		150	0.04	0.04	99.9
		106	0.06	0.05	99.8
		75	0.71	0.64	99.2
		53	1.83	1.65	97.5
		38	2.30	2.08	95.4
CYCLOSIZER		36	1.14	1.03	94.4
FLOW 185		29	9.49	8.57	85.8
TEMP 21	26	19	20.11	18.17	67.7
SG **2.60**		13	19.10	17.25	50.4
MINS 20		8	10.85	9.80	40.6
		SUB	44.97	40.62	0.0
		TOTAL	110.70	100.00	



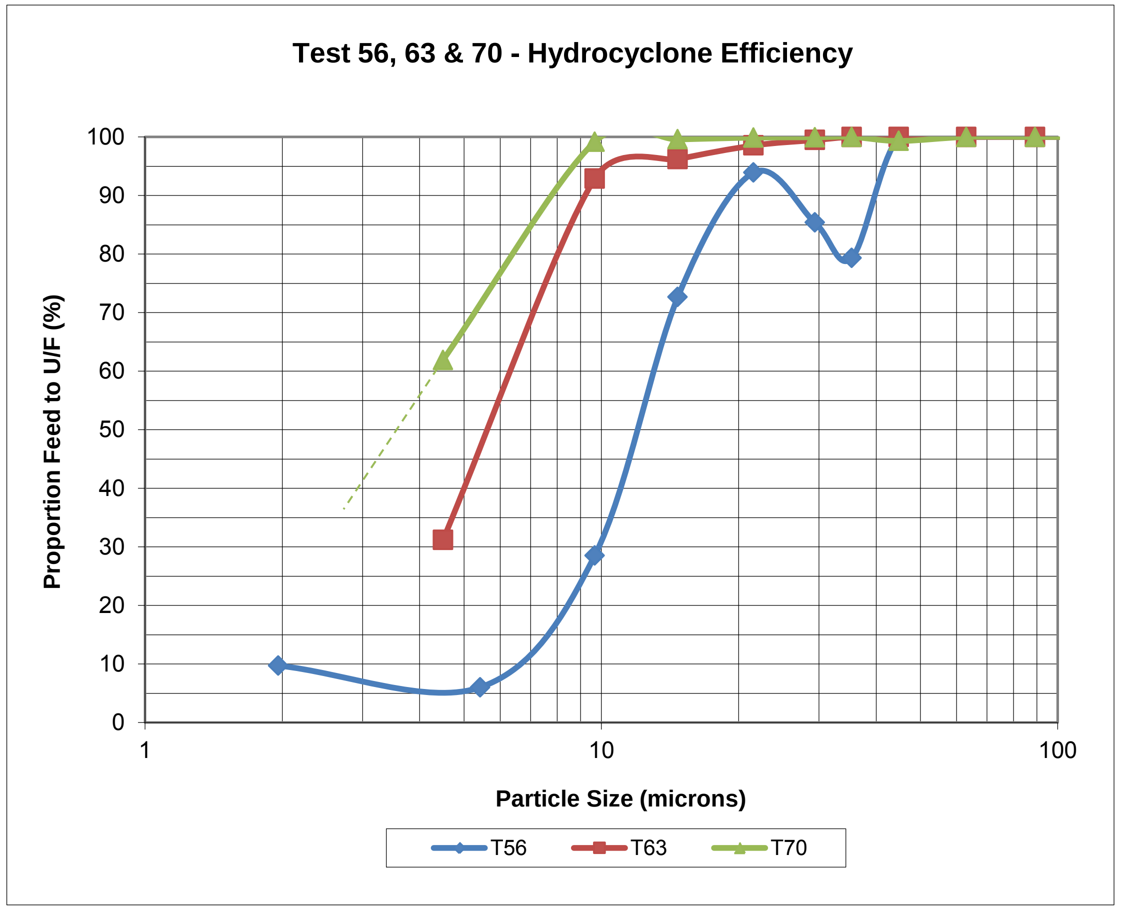
ALS Metallurgy
BURNIE LABORATORY
[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	Cyclone Overflow
TEST NO	T70
DATE	270115
TECHNICIAN	MS

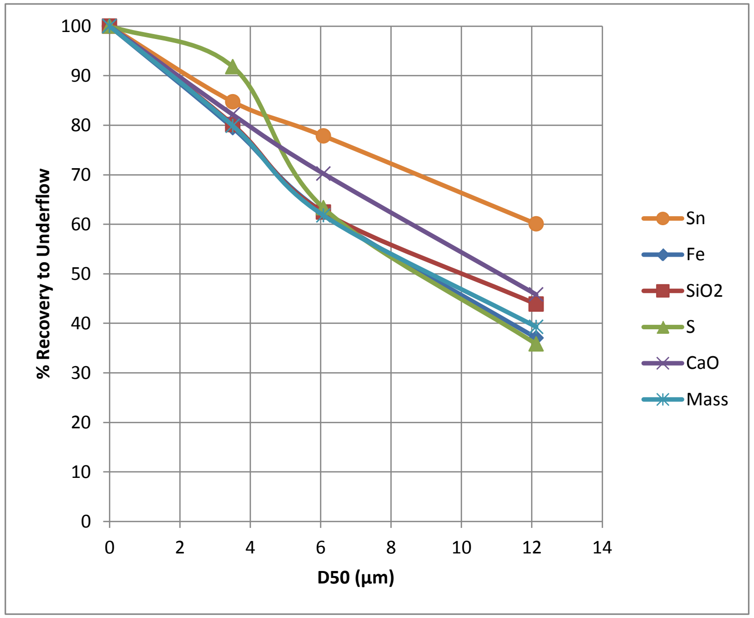
Cyclone Overflow T70		SIZE um	WEIGHTS gm	(%)	%PASS
	p80	600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.00	0.00	100.0
		106	0.00	0.00	100.0
		75	0.00	0.00	100.0
		53	0.00	0.00	100.0
		38	0.06	0.06	99.9
CYCLOSIZER		36	0.00	0.00	99.9
FLOW	185	29	0.02	0.02	99.9
TEMP	21	19	0.09	0.09	99.8
SG	**2.60**	13	0.31	0.30	99.5
MINS	20	8	0.35	0.33	99.2
		SUB	104.20	99.21	0.0
		TOTAL	105.03	100.00	

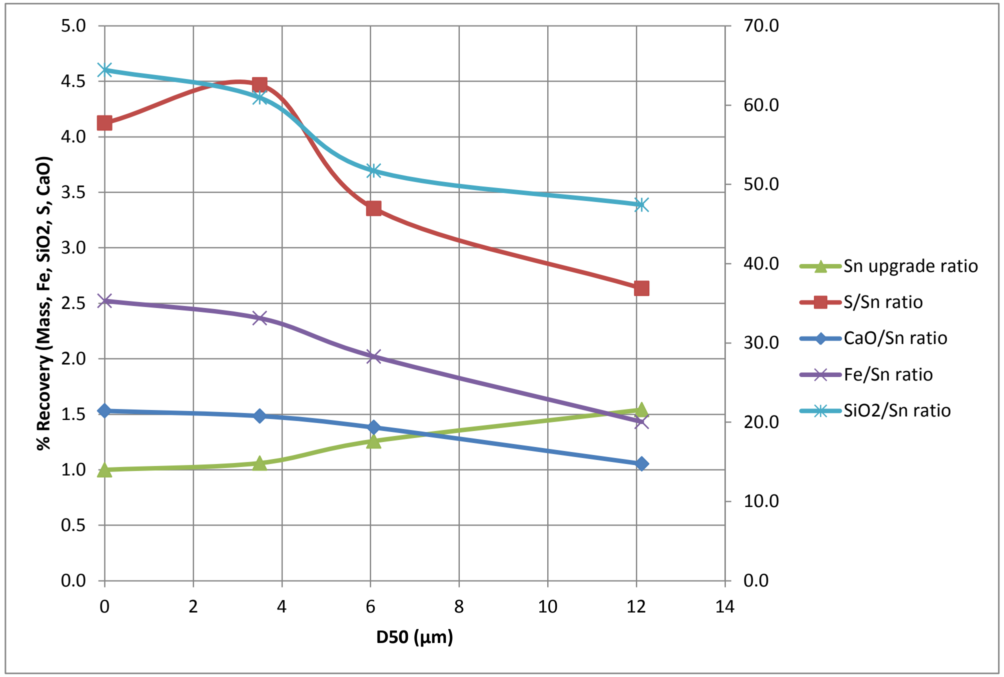


Test no.		T56						T63				T70					
Product		O/F	U/F	Feed	Rec to u/f			O/F	U/F	Feed	Rec to u/f	O/F	U/F	Feed	Rec to u/f		
Mass split		60.7	39.3	100.0				38.2	61.8	100.0		20.1	79.9	100.0			
Mean size	Size (um)					Mean size	Size (um)										
252	212	0.0	0.1	0.1	100.0	252	212	0.0	0.1	0.1	100.0	0.0	0.1	0.1	100.0	0.1	0.1
178	150	0.0	0.0	0.0	100.0	178	150	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0
126	106	0.0	0.1	0.0	100.0	126	106	0.0	0.1	0.0	100.0	0.0	0.1	0.0	100.0	0.0	0.0
89	75	0.0	1.2	0.5	100.0	89	75	0.0	0.8	0.5	100.0	0.0	0.6	0.5	100.0	0.5	0.5
63	53	0.0	2.9	1.1	100.0	63	53	0.0	1.7	1.1	100.0	0.0	1.7	1.3	100.0	1.2	1.3
45	38	0.0	3.9	1.6	99.9	45	38	0.0	2.3	1.4	100.0	0.1	2.1	1.7	99.3	1.6	1.8
35	33	0.3	1.5	0.7	79.3	35	33	0.0	1.1	0.7	100.0	0.0	1.0	0.8	100.0	0.7	0.9
29	26	1.6	14.3	6.6	85.4	29	26	0.1	9.8	6.1	99.5	0.0	8.6	6.9	99.9	6.5	7.8
22	18	1.5	35.9	15.0	93.9	22	18	0.6	23.6	14.8	98.5	0.1	18.2	14.5	99.9	14.7	17.9
15	12	6.2	25.3	13.7	72.6	15	12	1.4	22.1	14.2	96.2	0.3	17.3	13.8	99.6	14.0	16.3
10	8	8.2	5.1	7.0	28.5	10	8	1.4	11.2	7.4	92.9	0.3	9.8	7.9	99.2	7.7	8.3
5	4	58.6	5.8	37.8	6.0	5	SUB	96.5	27.1	53.6	31.2	99.2	40.6	52.4	61.9	53.0	45.0
2	SUB	23.6	3.9	15.9	9.7											100.0	100.0
	TOTAL	100.0	100.0	100.0	39.3		TOTAL	100.0	100.0	100.0	61.8	100.0	100.0	100.0	79.9		
	D50				12.1		D50				6.1				4		
Sn distribution		39.9	60.1	100.0	60.1			22.2	77.8	100.0	77.8	15.3	84.7	100.0	84.7		



Test no.	D50 (μm)	% Mass Recovery to U/F	U/F % <CS5 (<8 μm)	% Sn	% Recovery to U/F	% Fe	% Recovery to U/F	% SiO_2	% Recovery to U/F	% S	% Recovery to U/F	% CaO	% Recovery to U/F	Sn upgrade ratio	Fe/Sn ratio	SiO_2/Sn ratio	S/Sn ratio	CaO/Sn ratio
T56	12.1	39.3	9.7	0.93	60.1	18.7	37.1	44.1	43.9	2.45	35.8	0.98	45.8	1.54	20.1	47.4	2.6	1.05
T63	6.1	61.8	27.1	0.76	77.8	21.5	62.4	39.3	62.5	2.55	63.3	1.05	70.2	1.26	28.3	51.7	3.4	1.38
T70	4	79.9	40.6	0.64	84.7	21.2	79.5	39.0	80.1	2.86	91.8	0.95	82.1	1.06	33.1	60.9	4.5	1.48
Feed	0	100.0	53.0	0.60	100.0	21.3	100.0	38.9	100.0	2.49	100.0	0.92	100.0	1.00	35.3	64.4	4.1	1.53





PROJECT	T0879
TEST NO	T27
DATE	010914
TECH	ID

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

TEST TYPE	Cyclone Separation
Feed Solids (g)	1950.5
Spigot (mm)	4.5
Vortex finder (mm)	18.0
KPA	200.0
Comments	Mimic 12um Cutpoint

Feed
OF
UF

FEED MATERIAL	
From LC01 cyclone overflow	
FROM TEST NO	
START WT (gm)	1950.5

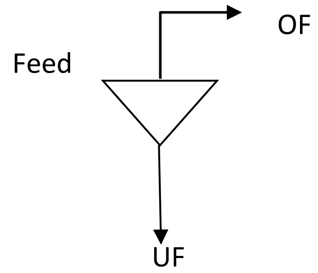
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	1141.2	1141.2	58.51	0.41	34.7	20.20	59.7	37.20	52.7	3.49	68.1	0.78	51.9
UF	809.3	809.3	41.49	1.09	65.3	19.20	40.3	47.10	47.3	2.30	31.9	1.02	48.1
TOTAL	1950.50		100.00	0.69	100.0	19.79	100.0	41.31	100.0	3.00	100.0	0.88	100.0

PROJECT	T0879
TEST NO	T28
DATE	010914
TECH	ID

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

TEST TYPE	Cyclone Separation
Feed Solids (g)	3341.0
Spigot (mm)	4.5
Vortex finder (mm)	14.0
KPA	200.0
Comments	Mimic 8um Cutpoint



FEED MATERIAL	
From LC01 cyclone over flow	
FROM TEST NO	
START WT (gm)	3341.0

MAGNETIC SEPARATION RESULTS

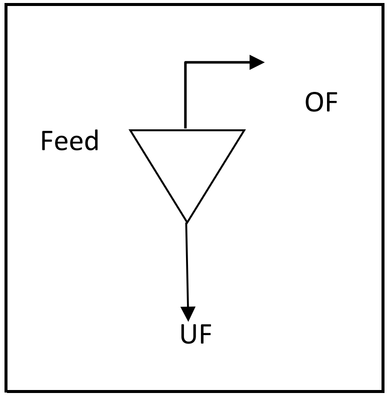
PRODUCT				Tin		Iron		Silica		Sulphur		Calcium Oxide	
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	1613.5	1613.5	48.29	0.40	28.7	20.50	50.7	36.50	43.6	2.84	52.0	0.75	41.7
UF	1727.5	1727.5	51.71	0.93	71.3	18.65	49.3	44.10	56.4	2.45	48.0	0.98	58.3
TOTAL	3341.00		100.00	0.67	100.0	19.54	100.0	40.43	100.0	2.64	100.0	0.87	100.0

ALS Metallurgy

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

PROJECT	T0879
TEST NO	T37
DATE	110914
TECH	DG

TEST TYPE	Mini Cyclone Sep
Feed Solids (g)	2524.9
Spigot (mm)	6.0
Vortex finder (mm)	5.5
KPA	
Comments	Lazer Sizings Part of diagnostic tin float



FEED MATERIAL	
From LC01 cyc7-10 Overflow	
FROM TEST NO	
START WT (gm)	2524.9

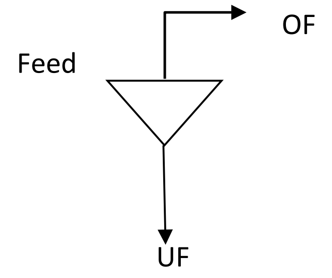
SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	350.2	350.2	13.87	0.33	8.7	20.60	14.0	35.80	13.3	3.32	14.6	0.65	11.1
UF	2174.7	2174.7	86.13	0.56	91.3	20.30	86.0	37.70	86.7	3.13	85.4	0.84	88.9
TOTAL	2524.90		100.00	0.53	100.0	20.34	100.0	37.44	100.0	3.16	100.0	0.81	100.0

PROJECT	T0879
TEST NO	T43
DATE	250914
TECH	ID

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

TEST TYPE	Cyclone Separation
Feed Solids (g)	2211.5
Spigot (mm)	4.5
Vortex finder (mm)	11.0
KPA	200.0
Comments	Red foot



FEED MATERIAL	
From LC01 cyclone over flow	
FROM TEST NO	LC01
START WT (gm)	2211.5

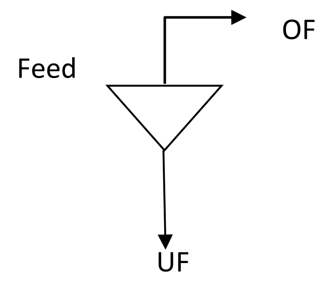
MAGNETIC SEPARATION RESULTS

PRODUCT				Tin		Iron		Silica		Sulphur		Calcium Oxide	
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	1613.5	1613.5	72.96	0.40	53.7	20.50	74.8	36.50	69.1	2.84	75.8	0.75	67.4
calc UF	598	598	27.04	0.93	46.3	18.65	25.2	44.10	30.9	2.45	24.2	0.98	32.6
TOTAL	2211.50		100.00	0.54	100.0	20.00	100.0	38.56	100.0	2.73	100.0	0.81	100.0

PROJECT	T0879
TEST NO	T56
DATE	241114
TECH	ID

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

TEST TYPE	Cyclone Separation
Feed Solids (g)	
Spigot (mm)	4.5
Vortex finder (mm)	14.0
KPA	200.0
Comments	Red foot



FEED MATERIAL	
cyclone over flow, -40 fine tail combined	
FROM TEST NO	LC01
START WT (gm)	0.0

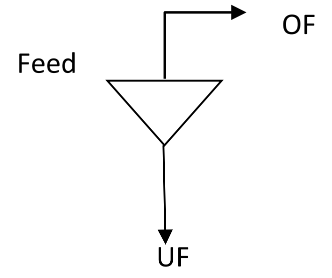
MAGNETIC SEPARATION RESULTS

PRODUCT				Tin		Iron		Silica		Sulphur		Calcium Oxide	
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	6015.2	6015.2	60.71	0.40	39.9	20.50	62.9	36.50	56.1	2.84	64.2	0.75	54.2
calc UF	3892.9	3892.9	39.29	0.93	60.1	18.65	37.1	44.10	43.9	2.45	35.8	0.98	45.8
TOTAL	9908.10		100.00	0.61	100.0	19.77	100.0	39.49	100.0	2.69	100.0	0.84	100.0

PROJECT	T0879
TEST NO	T63
DATE	031214
TECH	ID

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

TEST TYPE	Cyclone Separation
Feed Solids (g)	
Spigot (mm)	4.5
Vortex finder (mm)	8.0
KPA	200.0
Comments	Red foot 22% solids



FEED MATERIAL	
cyclone over flow, -40 fine tail combined	
FROM TEST NO	LC01
START WT (gm)	0.0

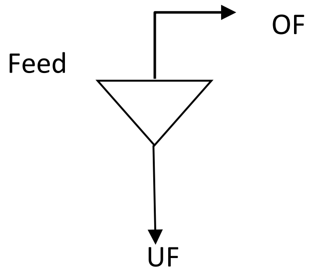
MAGNETIC SEPARATION RESULTS

PRODUCT				Tin		Iron		Silica		Sulphur		Calcium Oxide	
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	1392.1	1392.1	38.20	0.35	22.2	21.00	37.6	38.20	37.5	2.39	36.7	0.72	29.8
calc UF	2252.4	2252.4	61.80	0.76	77.8	21.50	62.4	39.30	62.5	2.55	63.3	1.05	70.2
TOTAL	3644.50		100.00	0.60	100.0	21.31	100.0	38.88	100.0	2.49	100.0	0.92	100.0

PROJECT	T0879
TEST NO	T70
DATE	220115
TECH	ID

BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

TEST TYPE	Cyclone Separation
Feed Solids (g)	
Spigot (mm)	4.5
Vortex finder (mm)	8.0
KPA	200.0
Comments	Red foot 22% solids



FEED MATERIAL cyclone over flow, -40 fine tail combined	
FROM TEST NO	LC01
START WT (gm)	4223.8

MAGNETIC SEPARATION RESULTS

PRODUCT				Tin		Iron		Silica		Sulphur		Calcium Oxide	
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)	CaO (%)	Dist (%)
OF	849.6	849.6	20.11	0.46	15.3	21.74	20.5	38.40	19.9	1.01	8.2	0.82	17.9
calc UF	3374.2	3374.2	79.89	0.64	84.7	21.20	79.5	39.00	80.1	2.86	91.8	0.95	82.1
TOTAL	4223.80		100.00	0.60	100.0	21.31	100.0	38.88	100.0	2.49	100.0	0.92	100.0

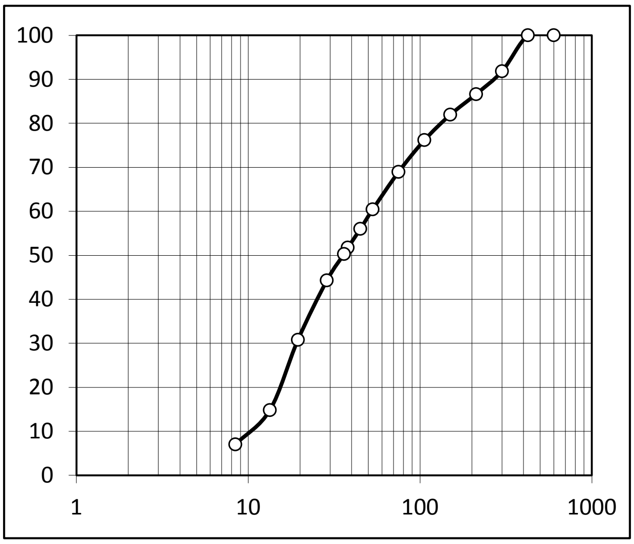
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	T27 Cyclone underflow
DATE	260814
TECHNICIAN	MS

T27 Cyclone underflow		SIZE	WEIGHTS		
0		um	gm	(%)	%PASS
	p80	600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	10.32	8.17	91.8
		212	6.55	5.18	86.7
		150	5.94	4.70	82.0
	135	106	7.30	5.78	76.2
		75	9.12	7.22	69.0
		53	10.79	8.54	60.4
		45	5.53	4.38	56.0
		38	5.45	4.31	51.7
CYCLOSIZER	CS1	36	1.78	1.41	50.3
FLOW 185	CS2	29	7.58	6.00	44.3
TEMP 21	CS3	19	17.08	13.51	30.8
SG **2.60**	CS4	13	20.19	15.97	14.8
MINS 20	CS5	8	9.87	7.81	7.0
		SUB	8.89	7.03	0.0
		TOTAL	126.39	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	18.05	0.62	10.3	15.80	14.9	0.08	10.3	2.51	19.7	50.90	19.5	0.42	12.4
106	5.78	0.84	4.5	15.50	4.7	0.05	2.1	1.66	4.2	51.40	6.3	0.52	4.9
75	7.22	0.78	5.2	15.35	5.8	0.09	4.6	1.77	5.6	52.90	8.1	0.50	5.9
53	8.54	0.83	6.5	16.30	7.2	0.10	6.1	1.75	6.5	54.10	9.8	0.55	7.7
45	4.38	0.89	3.6	16.70	3.8	0.09	2.8	2.02	3.8	50.80	4.7	0.56	4.0
38	4.31	0.93	3.7	17.65	4.0	0.11	3.4	1.51	2.8	51.60	4.7	0.61	4.3
29	7.41	2.75	18.7	25.00	9.6	0.22	11.6	3.76	12.1	31.30	4.9	0.90	10.9
13	29.49	1.13	30.6	19.85	30.5	0.19	40.0	2.13	27.3	42.80	26.8	0.66	31.9
8	7.81	1.05	7.5	22.00	8.9	0.26	14.5	3.00	10.2	37.60	6.2	0.65	8.3
Cal <8	7.03	1.49	9.6	29.00	10.6	0.09	4.5	2.55	7.8	59.52	8.9	0.83	9.6
ASSAY	100.00	1.09	100.0	19.20	100.0	0.14	100.0	2.30	100.0	47.10	100.0	0.61	100.0

ANALYSES

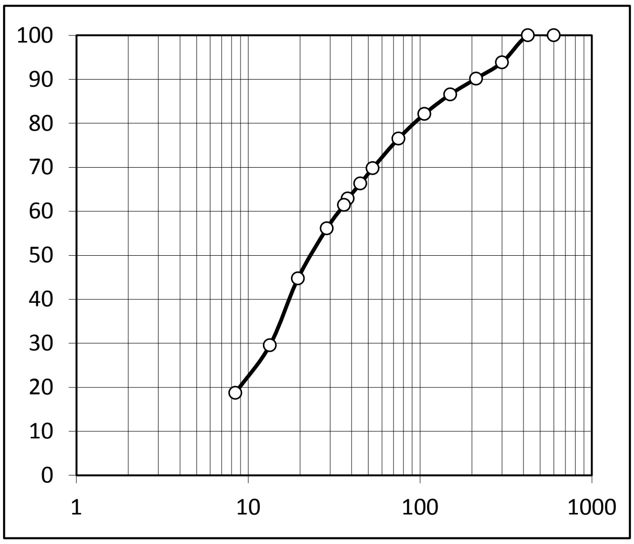
SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
150	18.05	0.79	14.0	3.64	17.8	9.00	20.4
106	5.78	0.89	5.0	3.62	5.7	8.05	5.8
75	7.22	0.91	6.4	3.49	6.8	7.76	7.0
53	8.54	0.97	8.1	3.42	7.9	7.58	8.1
45	4.38	0.99	4.2	3.30	3.9	7.14	3.9
38	4.31	1.08	4.6	3.54	4.1	7.35	4.0
29	7.41	1.19	8.6	3.05	6.1	6.02	5.6
13	29.49	1.13	32.7	3.51	28.0	6.99	25.9
8	7.81	1.12	8.6	3.76	8.0	7.43	7.3
Cal <8	7.03	1.12	7.7	6.09	11.6	13.47	11.9
ASSAY	100.00	1.02	100.0	3.69	100.0	7.96	100.0

ALS Metallurgy

BURNIE LABORATORY
[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	T28 Cyclone underflow
DATE	260814
TECHNICIAN	MS

T28 Cyclone underflow		SIZE	WEIGHTS		
0		um	gm	(%)	%PASS
	p80	600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	7.62	6.16	93.8
		212	4.53	3.66	90.2
		150	4.44	3.59	86.6
		106	5.54	4.48	82.1
	94	75	6.87	5.55	76.6
		53	8.38	6.77	69.8
		45	4.28	3.46	66.3
		38	4.26	3.44	62.9
CYCLOSIZER	CS1	36	1.74	1.41	61.5
FLOW 185	CS2	29	6.60	5.33	56.1
TEMP 21	CS3	19	14.10	11.39	44.8
SG **2.60**	CS4	13	18.77	15.17	29.6
MINS 20	CS5	8	13.40	10.83	18.8
		SUB	23.21	18.76	0.0
		TOTAL	123.74	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	13.41	0.56	8.1	15.60	11.2	0.07	5.9	2.33	12.8	51.90	15.8	0.40	9.6
106	4.48	0.74	3.6	15.70	3.8	0.07	2.0	1.37	2.5	52.70	5.4	0.50	4.0
75	5.55	0.68	4.1	15.10	4.5	0.07	2.4	1.73	3.9	53.40	6.7	0.47	4.7
53	6.77	0.75	5.5	15.55	5.6	0.07	3.0	1.94	5.4	53.10	8.2	0.50	6.0
45	3.46	0.80	3.0	16.10	3.0	0.08	1.7	1.89	2.7	51.90	4.1	0.54	3.3
38	3.44	0.94	3.5	17.45	3.2	0.10	2.2	1.82	2.6	51.40	4.0	0.60	3.7
29	6.74	2.47	17.9	24.50	8.9	0.20	8.4	3.29	9.1	32.70	5.0	0.89	10.7
13	26.56	1.10	31.4	19.95	28.4	0.19	31.5	1.77	19.2	42.90	25.8	0.66	31.3
8	10.83	0.91	10.6	22.30	12.9	0.26	17.6	3.13	13.8	41.60	10.2	0.64	12.4
Cal <8	18.76	0.62	12.5	18.34	18.4	0.22	25.3	3.68	28.2	34.93	14.9	0.43	14.3
ASSAY	100.00	0.93	100.0	18.65	100.0	0.16	100.0	2.45	100.0	44.10	100.0	0.56	100.0

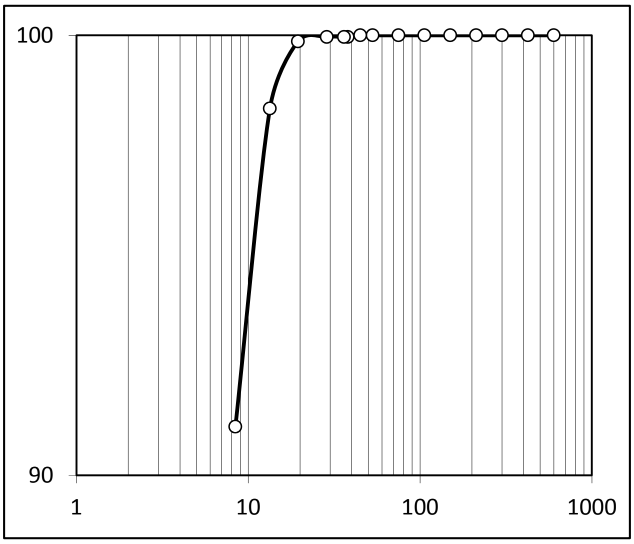
ANALYSES

SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
150	13.41	0.78	10.7	3.61	13.4	9.01	15.3
106	4.48	0.89	4.1	3.59	4.5	8.05	4.6
75	5.55	0.86	4.9	3.34	5.2	7.53	5.3
53	6.77	0.92	6.4	3.24	6.1	7.10	6.1
45	3.46	1.00	3.5	3.26	3.1	7.09	3.1
38	3.44	1.09	3.8	3.45	3.3	7.17	3.1
29	6.74	1.19	8.2	3.07	5.7	6.08	5.2
13	26.56	1.09	29.5	3.53	26.0	7.03	23.7
8	10.83	1.13	12.5	3.94	11.9	8.03	11.0
Cal <8	18.76	0.86	16.5	3.99	20.8	9.40	22.4
ASSAY	100.00	0.98	100.0	3.60	100.0	7.87	100.0

ALS Metallurgy
BURNIE LABORATORY
[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	T27 Cyclone Overflow
DATE	260814
TECHNICIAN	MS

T27 Cyclone Overflow		SIZE	WEIGHTS		
0		um	gm	(%)	%PASS
	p80	600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.00	0.00	100.0
		106	0.00	0.00	100.0
		75	0.00	0.00	100.0
		53	0.00	0.00	100.0
		45	0.00	0.00	100.0
		38	0.04	0.04	100.0
CYCLOSIZER		36	0.00	0.00	100.0
FLOW 185		29	0.00	0.00	100.0
TEMP 21		19	0.12	0.11	99.9
SG **2.60**		13	1.74	1.52	98.3
MINS 20		8	8.26	7.23	91.1
		SUB	104.11	91.11	0.0
		TOTAL	114.27	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
8	8.89	0.69	15.0	19.40	8.5	0.18	8.4	2.60	6.6	42.20	10.1	0.55	11.9
CALC<8	91.11	0.38	85.0	20.28	91.5	0.19	91.6	3.58	93.4	36.71	89.9	0.40	88.1
ASSAY	100.00	0.41	100.0	20.20	100.0	0.19	100.0	3.49	100.0	37.20	100.0	0.41	100.0

ANALYSES

SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
8	8.89	1.04	11.9	3.70	7.9	7.78	5.9
CALC<8	91.11	0.75	88.1	4.24	92.1	12.03	94.1
ASSAY	100.0	0.78	100.0	4.19	100.0	11.65	100.0

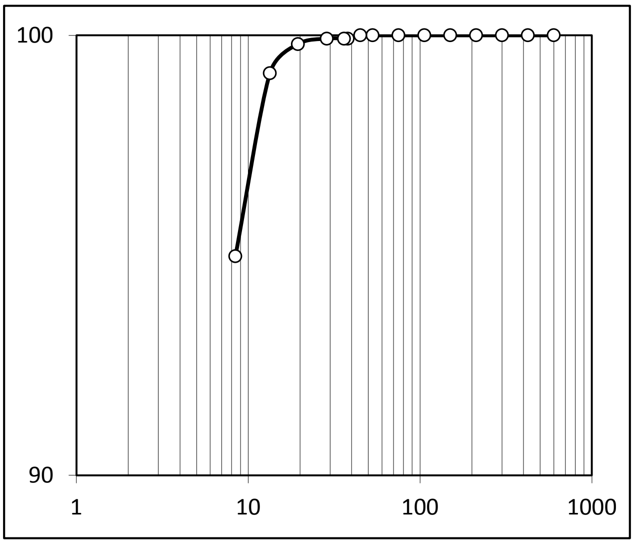
ALS Metallurgy

BURNIE LABORATORY

[04] SIZING WITH FRACTION ASSAYS

PROJECT	T0879
SAMPLE NAME	T27 Cyclone Overflow
DATE	260814
TECHNICIAN	MS

T27 Cyclone Overflow		SIZE	WEIGHTS		
0		um	gm	(%)	%PASS
	p80	600	0.00	0.00	100.0
		425	0.00	0.00	100.0
		300	0.00	0.00	100.0
		212	0.00	0.00	100.0
		150	0.00	0.00	100.0
		106	0.00	0.00	100.0
		75	0.00	0.00	100.0
		53	0.00	0.00	100.0
		45	0.00	0.00	100.0
		38	0.09	0.07	99.9
CYCLOSIZER		36	0.00	0.00	99.9
FLOW 185		29	0.00	0.00	99.9
TEMP 21		19	0.15	0.12	99.8
SG **2.60**		13	0.80	0.66	99.1
MINS 20		8	5.03	4.16	95.0
		SUB	114.90	94.98	0.0
		TOTAL	120.97	100.00	



ANALYSES

SIZE	WT	Sn		Fe		As		S		SiO2		MnO	
um	%	%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
8	5.02	0.71	8.9	19.75	4.8	0.18	5.0	2.73	4.8	41.00	5.6	0.53	6.6
CALC<8	94.98	0.38	91.1	20.54	95.2	0.18	95.0	2.85	95.2	36.26	94.4	0.39	93.4
ASSAY	100.00	0.40	100.0	20.50	100.0	0.18	100.0	2.84	100.0	36.50	100.0	0.40	100.0

ANALYSES

SIZE	WT	CaO		MgO		Al2O3	
um	%	%	dist	%	dist	%	dist
8	5.02	1.11	7.4	3.66	4.3	7.64	3.2
CALC<8	94.98	0.73	92.6	4.33	95.7	12.18	96.8
ASSAY	100.0	0.75	100.0	4.30	100.0	11.95	100.0

Appendix 11 – Tin Flotation Results

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

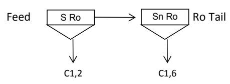
PROJECT	T0879
TEST NO	T29
DATE	270814
TECHNICIAN	MW

PRODUCT FLOATED
T28 Cyc Underflow

NOTES
500gm Feed

Milling		Primary	Regrind
Mill	type	HIC(2)	
Media	type		
Media	kg		
Solids	g	500	
Water	g	200	
Time	min	**5**	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	700	kWh/t	



	pH	1.0 CuSO4 g/t	0.5 PAX g/t	10.0 H2SO4 g/t	100.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Conditioning	4.5													
Conditioning			25											
S Ro C1	4.5						40			7-10	4.0	4.0	200	15
Conditioning			10											
S Ro C2										9-11	2.0	6.0	70	9
HIC Conditioning	4.0			41	203				5					
Condition	5.7			20										
Condition SSF					203				1					
Condition SPA						305			3					
Sn Ro Con1	4.7						80			4-9	6.5	6.5	200	9
Condition						305			3					
Sn Ro Con2	5.3						40			5.7	4.0	10.5	200	28
Condition						305			3					
Sn Ro Con3	5.5						20			5.7	3.5	14.0	200	30
Condition						305			3					
Sn Ro Con4	5.9			41			20			5-7	4.0	18.0	200	19
Condition						203			3					
Sn Ro Con5	5.5						20			5-7	4.0	22.0	200	15
Condition						203			3					
Sn Ro Con6	5.8						20			5-7	4.0	26.0	200	5
REAGENT TOTALS (g/t)			**36**	**102**	**406**	**1626**	**241**							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T29 S RoC1	30.9	6.3	0.62	4.0	30.1	9.9	1.17	44.9	15.1	42.1	23.5	3.3	0.22	3.1
S RoC2	6.6	1.3	0.93	1.3	25.4	1.8	0.56	4.6	10.9	6.5	31.4	1.0	0.35	1.0
SnRoC1	17.1	3.5	6.10	21.8	23.5	4.3	0.25	5.3	4.00	6.2	30.0	2.4	0.41	3.2
SnRoC2	55.7	11.3	2.93	34.1	30.4	18.1	0.12	8.3	1.68	8.4	26.1	6.7	0.80	20.1
SnRoC3	60.9	12.4	1.08	13.8	25.9	16.8	0.10	7.6	0.95	5.2	30.9	8.6	0.93	25.6
SnRoC4	38.9	7.9	0.66	5.4	19.9	8.3	0.09	4.3	1.06	3.7	43.3	7.7	0.77	13.5
SnRoC5	29.4	6.0	0.46	2.8	14.5	4.5	0.08	2.9	0.62	1.6	56.7	7.6	0.37	4.9
SnRoC6	10.2	2.1	0.49	1.0	16.4	1.8	0.08	1.0	1.01	0.9	46.1	2.2	0.49	2.3
Sn Ro T	242.4	49.3	0.31	15.7	13.4	34.5	0.07	21.1	1.16	25.4	54.5	60.6	0.24	26.3
CALC	492.1	100.0	0.97	100.0	19.0	100.0	0.16	100.0	2.25	100.0	44.3	100.0	0.45	100.0
ASSAY HEAD			0.93		18.7		0.16		2.45		44.1		0.56	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T29 S RoC1	30.9	6.3	0.62	4.0	30.1	9.9	1.17	44.9	15.1	42.1	23.5	3.3	0.22	3.1
S RoC2	37.5	7.6	0.67	5.3	29.3	11.7	1.06	49.5	14.4	48.5	24.9	4.3	0.24	4.1
SnRoC1	17.1	3.5	6.10	21.8	23.5	4.3	0.25	5.3	4.00	6.2	30.0	2.4	0.41	3.2
SnRoC2	72.8	14.8	3.67	56.0	28.8	22.4	0.15	13.6	2.22	14.6	27.0	9.0	0.71	23.3
SnRoC3	133.7	27.2	2.49	69.7	27.5	39.2	0.13	21.2	1.64	19.8	28.8	17.6	0.81	48.9
SnRoC4	172.6	35.1	2.08	75.1	25.8	47.4	0.12	25.5	1.51	23.5	32.1	25.4	0.80	62.4
SnRoC5	202.0	41.0	1.84	77.9	24.1	52.0	0.11	28.4	1.38	25.2	35.6	33.0	0.74	67.3
SnRoC6	212.2	43.1	1.78	79.0	23.7	53.8	0.11	29.5	1.36	26.1	36.1	35.2	0.73	69.6

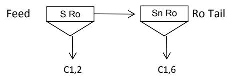
PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	C %	DIST	C organic %	DIST	C inorgar %	DIST
T29 S RoC1	30.9	6.3	0.50	3.3	2.33	4.2	4.38	3.5	2.58	6.4	0.44	18.0	2.14	5.8
S RoC2	6.6	1.3	0.69	1.0	2.58	1.0	5.94	1.0	2.87	1.5	0.35	3.1	0.35	0.2
SnRoC1	17.1	3.5	0.59	2.2	2.23	2.2	5.27	2.4	3.36	4.6	0.20	4.5	3.16	4.7
SnRoC2	55.7	11.3	0.72	8.6	2.56	8.2	4.08	6.0	5.54	24.9	0.10	7.4	5.44	26.4
SnRoC3	60.9	12.4	0.72	9.4	2.80	9.8	5.04	8.0	4.96	24.4	0.09	7.2	4.87	25.8
SnRoC4	38.9	7.9	0.91	7.6	2.94	6.6	6.78	6.9	3.36	10.6	0.11	5.7	3.26	11.0
SnRoC5	29.4	6.0	0.80	5.0	3.24	5.5	7.76	6.0	1.72	4.1	0.11	4.3	1.60	4.1
SnRoC6	10.2	2.1	1.67	3.6	4.16	2.4	9.66	2.6	2.04	1.7	0.14	1.9	1.90	1.7
Sn Ro T	242.4	49.3	1.15	59.5	4.30	60.1	10.0	63.6	1.11	21.7	0.15	48.0	0.96	20.3
CALC	492.1	100.0	0.95	100.0	3.52	100.0	7.75	100.0	2.52	100.0	0.15	100.0	2.33	100.0
ASSAY HEAD			0.98		3.60		7.87							

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	norganic %	CUM
T29 S RoC1	30.9	6.3	0.50	3.3	2.33	4.2	4.38	3.5	2.58	6.4	0.44	18.0	2.14	5.8
S RoC2	37.5	7.6	0.53	4.3	2.37	5.1	4.65	4.6	2.63	8.0	0.42	21.0	1.82	6.0
SnRoC1	17.1	3.5	0.59	2.2	2.23	2.2	5.27	2.4	3.36	4.6	0.20	4.5	3.16	4.7
SnRoC2	72.8	14.8	0.69	10.7	2.48	10.4	4.36	8.3	5.03	29.6	0.12	11.9	4.90	31.1
SnRoC3	133.7	27.2	0.70	20.1	2.63	20.2	4.67	16.4	5.00	54.0	0.11	19.1	4.89	56.9
SnRoC4	172.6	35.1	0.75	27.6	2.70	26.8	5.15	23.3	4.63	64.5	0.11	24.8	4.52	68.0
SnRoC5	202.0	41.0	0.76	32.6	2.78	32.3	5.53	29.3	4.20	68.6	0.11	29.0	4.10	72.1
SnRoC6	212.2	43.1	0.80	36.3	2.84	34.8	5.72	31.9	4.10	70.3	0.11	30.9	3.99	73.8

PROJECT	T0879
TEST NO	T31
DATE	270814
TECHNICIAN	MW

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

Milling		Primary	Regrind
Mill	type	HIC(2)	
Media	type		
Media	kg		
Solids	g	500	
Water	g	200	
Time	min	**5**	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		



PRODUCT FLOATED
T28 Cyc Underflow

NOTES
500gm Feed

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	700	kWh/t	

	pH	1.0 CuSO4 g/t	0.5 PAX g/t	10.0 H2SO4 g/t	100.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Conditioning	4.5	51												
Conditioning			25											
S Ro C1	4.5						40			7-13	4.0	4.0	200	17
Conditioning			10											
S Ro C2	4.5									7-13	7.0	11.0	250	7
HIC Conditioning	4.0			40	202				5					
Condition	5.5													
Condition SSF					202				1					
Condition SPA						303			3					
Sn Ro Con1	4.4						80			5-9	4.5	4.5	200	8
Condition						303			3					
Sn Ro Con2	4.7						40			5-7	3.5	8.0	200	25
Condition						303			3					
Sn Ro Con3	4.8						20			5-7	3.5	11.5	200	29
Condition						303			3					
Sn Ro Con4	4.9						20			5-7	4.0	15.5	200	22
Condition						202			3					
Sn Ro Con5	5.1						20			5-7	4.0	19.5	200	12
Condition						202			3					
Sn Ro Con6	5.3						20			5-7	4.0	23.5	200	7
REAGENT TOTALS (g/t)		**51**	**35**	**40**	**404**	**1618**	**240**							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T31 S RoC1	33.6	6.8	0.61	4.4	30.5	11.0	1.26	52.7	22.5	58.3	22.1	3.5	0.22	3.4
S RoC2	18.6	3.8	1.00	4.0	24.6	4.9	0.35	8.1	7.73	11.1	32.5	2.8	0.39	3.3
SnRoC1	16.8	3.4	7.18	25.9	23.1	4.2	0.15	3.1	2.16	2.8	28.8	2.3	0.44	3.4
SnRoC2	50.6	10.2	2.69	29.3	28.1	15.3	0.09	5.7	1.12	4.4	25.8	6.1	0.73	17.0
SnRoC3	57.1	11.5	1.08	13.3	26.6	16.3	0.09	6.4	0.67	3.0	31.4	8.3	0.92	24.2
SnRoC4	43.4	8.8	0.66	6.2	20.4	9.5	0.06	3.2	0.70	2.3	41.3	8.3	0.79	15.8
SnRoC5	24.5	5.0	0.51	2.7	16.5	4.3	0.06	1.8	0.65	1.2	49.1	5.6	0.57	6.4
SnRoC6	14.3	2.9	0.36	1.1	13.5	2.1	0.07	1.2	0.52	0.6	43.4	2.9	0.41	2.7
Sn Ro T	235.6	47.6	0.26	13.2	12.9	32.5	0.06	17.6	0.90	16.4	55.0	60.3	0.22	23.8
CALC	494.5	100.0	0.94	100.0	18.8	100.0	0.16	100.0	2.62	100.0	43.5	100.0	0.44	100.0
ASSAY HEAD			0.93		18.7		0.16		2.45		44.1		0.56	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T31 S RoC1	33.6	6.8	0.61	4.4	30.5	11.0	1.26	52.7	22.5	58.3	22.1	3.5	0.22	3.4
S RoC2	52.2	10.6	0.75	8.4	28.4	15.9	0.94	60.9	17.2	69.4	25.8	6.3	0.28	6.7
SnRoC1	16.8	3.4	7.18	25.9	23.1	4.2	0.15	3.1	2.16	2.8	28.8	2.3	0.44	3.4
SnRoC2	67.4	13.6	3.81	55.2	26.9	19.4	0.10	8.8	1.38	7.2	26.5	8.3	0.66	20.4
SnRoC3	124.5	25.2	2.56	68.5	26.7	35.7	0.10	15.2	1.05	10.1	28.8	16.7	0.78	44.5
SnRoC4	167.9	34.0	2.07	74.6	25.1	45.2	0.09	18.5	0.96	12.5	32.0	25.0	0.78	60.3
SnRoC5	192.4	38.9	1.87	77.3	24.0	49.6	0.08	20.3	0.92	13.7	34.2	30.6	0.75	66.7
SnRoC6	206.7	41.8	1.76	78.4	23.3	51.6	0.08	21.5	0.89	14.3	34.8	33.5	0.73	69.4

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	C %	DIST	C organic %	DIST	C inorgar %	DIST
T31 S RoC1	33.6	6.8	0.46	3.3	2.33	4.5	4.26	3.7	2.09	5.7	0.43	19.7	1.66	5.0
S RoC2	18.6	3.8	0.74	2.9	2.89	3.1	6.63	3.2	3.04	4.6	0.37	9.4	0.37	0.6
SnRoC1	16.8	3.4	0.84	3.0	2.27	2.2	5.19	2.3	3.44	4.7	0.19	4.4	3.25	4.9
SnRoC2	50.6	10.2	0.72	7.8	2.41	6.9	3.91	5.1	5.36	22.1	0.09	6.2	5.27	24.1
SnRoC3	57.1	11.5	0.68	8.3	2.92	9.5	5.18	7.7	5.02	23.4	0.09	7.0	4.93	25.4
SnRoC4	43.4	8.8	0.78	7.2	3.18	7.8	6.86	7.7	3.55	12.6	0.09	5.3	3.46	13.6
SnRoC5	24.5	5.0	0.88	4.6	3.49	4.9	8.12	5.2	2.42	4.8	0.11	3.7	2.31	5.1
SnRoC6	14.3	2.9	0.92	2.8	3.40	2.8	7.86	2.9	1.96	2.3	0.12	2.3	1.83	2.4
Sn Ro T	235.6	47.6	1.19	60.0	4.36	58.4	10.2	62.3	1.03	19.8	0.13	41.9	0.89	18.9
CALC	494.5	100.0	0.95	100.0	3.56	100.0	7.80	100.0	2.48	100.0	0.15	100.0	2.24	100.0
ASSAY HEAD			0.98				7.87							

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	norganic %	CUM
T31 S RoC1	33.6	6.8	0.46	3.3	2.33	4.5	4.26	3.7	2.09	5.7	0.43	19.7	1.66	5.0
S RoC2	52.2	10.6	0.56	6.2	2.53	7.5	5.10	6.9	2.43	10.3	0.41	29.2	1.20	5.7
SnRoC1	16.8	3.4	0.84	3.0	2.27	2.2	5.19	2.3	3.44	4.7	0.19	4.4	3.25	4.9
SnRoC2	67.4	13.6	0.75	10.8	2.38	9.1	4.23	7.4	4.88	26.8	0.11	10.6	4.77	29.0
SnRoC3	124.5	25.2	0.72	19.1	2.63	18.6	4.67	15.0	4.94	50.2	0.10	17.6	4.84	54.4
SnRoC4	167.9	34.0	0.73	26.4	2.77	26.4	5.23	22.8	4.58	62.8	0.10	23.0	4.48	68.0
SnRoC5	192.4	38.9	0.75	31.0	2.86	31.3	5.60	27.9	4.31	67.6	0.10	26.6	4.21	73.1
SnRoC6	206.7	41.8	0.76	33.8	2.90	34.1	5.76	30.8	4.15	69.9	0.10	29.0	4.04	75.4

ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

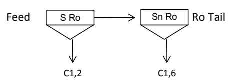
PROJECT	T0879
TEST NO	T32
DATE	280814
TECHNICIAN	MW

PRODUCT FLOATED
T27 Cyc Underflow

NOTES
500gm Feed

Milling		Primary	Regrind
Mill	type	HIC(2)	
Media	type		
Media	kg		
Solids	g	500	
Water	g	200	
Time	min	**5**	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	700	kWh/t	



	pH	1.0 CuSO4 g/t	0.5 PAX g/t	10.0 H2SO4 g/t	100.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Conditioning	4.8	51												
Conditioning			25											
S Ro C1	4.9						40			7-12	3.0	3.0	200	18
Conditioning			10											
S Ro C2										11-12	2.0	5.0	100	10
HIC Conditioning	4.0			20	203				5					
Condition	5.5													
Condition SSF					203				1					
Condition SPA						305			3					
Sn Ro Con1	4.8						80			5-8	4.0	4.0	200	8
Condition						305			3					
Sn Ro Con2	5.1						40			5-7	3.5	7.5	200	30
Condition						305			3					
Sn Ro Con3	5.4						20			5-7	3.0	10.5	200	24
Condition						305			3					
Sn Ro Con4	5.5						20			5-7	3.5	14.0	200	16
Condition						203			3					
Sn Ro Con5	5.7						20			5-7	4.0	18.0	200	8
Condition						203			3					
Sn Ro Con6	5.8						20			5-7	3.5	21.5	200	3
REAGENT TOTALS (g/t)		**51**	**36**	**20**	**406**	**1624**	**241**							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T32 S RoC1	35.8	7.3	0.87	5.9	31.9	12.5	1.21	59.5	21.3	59.6	20.5	3.3	0.26	4.1
S RoC2	10.0	2.0	1.59	3.0	26.8	2.9	0.30	4.1	5.57	4.4	29.6	1.3	0.48	2.1
SnRoC1	15.9	3.2	6.02	18.2	21.4	3.7	0.08	1.7	1.26	1.6	35.0	2.5	0.60	4.2
SnRoC2	60.1	12.2	2.84	32.4	27.1	17.8	0.06	5.0	0.60	2.8	27.7	7.5	0.88	23.5
SnRoC3	48.5	9.8	1.19	10.9	24.3	12.9	0.05	3.3	0.49	1.9	35.5	7.8	0.92	19.8
SnRoC4	31.4	6.4	0.87	5.2	19.5	6.7	0.05	2.2	0.49	1.2	43.9	6.2	0.75	10.5
SnRoC5	15.4	3.1	0.82	2.4	17.6	3.0	0.07	1.5	0.61	0.7	46.8	3.3	0.62	4.2
SnRoC6	6.7	1.4	0.90	1.1	17.7	1.3	0.06	0.6	0.53	0.3	45.9	1.4	0.58	1.7
Sn Ro T	268.7	54.6	0.41	20.9	13.4	39.2	0.06	22.1	1.31	27.5	54.9	66.7	0.25	29.8
CALC	492.5	100.0	1.07	100.0	18.6	100.0	0.15	100.0	2.60	100.0	44.9	100.0	0.46	100.0
ASSAY HEAD			1.09		19.2		0.14		2.02		47.1		0.61	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T32 S RoC1	35.8	7.3	0.87	5.9	31.9	12.5	1.21	59.5	21.3	59.6	20.5	3.3	0.26	4.1
S RoC2	45.8	9.3	1.03	8.9	30.8	15.4	1.01	63.6	17.9	64.0	22.5	4.7	0.31	6.3
SnRoC1	15.9	3.2	6.02	18.2	21.4	3.7	0.08	1.7	1.26	1.6	35.0	2.5	0.60	4.2
SnRoC2	76.0	15.4	3.51	50.5	25.9	21.5	0.06	6.7	0.74	4.4	29.2	10.0	0.82	27.7
SnRoC3	124.5	25.3	2.60	61.5	25.3	34.4	0.06	10.0	0.64	6.2	31.7	17.8	0.86	47.5
SnRoC4	155.9	31.7	2.25	66.6	24.1	41.1	0.06	12.2	0.61	7.5	34.1	24.0	0.84	58.0
SnRoC5	171.3	34.8	2.13	69.0	23.5	44.1	0.06	13.7	0.61	8.2	35.3	27.3	0.82	62.2
SnRoC6	178.0	36.1	2.08	70.2	23.3	45.4	0.06	14.2	0.61	8.5	35.7	28.7	0.81	63.9

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	C %	DIST	C organic %	DIST	C inorgai %	DIST
T32 S RoC1	35.8	7.3	0.51	3.9	2.12	4.5	3.51	3.4	2.39	7.0	0.34	16.7	2.05	6.6
S RoC2	10.0	2.0	0.85	1.8	2.79	1.7	5.71	1.6	3.66	3.0	0.30	4.1	0.30	0.3
SnRoC1	15.9	3.2	0.70	2.4	2.17	2.1	4.71	2.0	3.94	5.1	0.14	3.0	3.80	5.4
SnRoC2	60.1	12.2	0.68	8.8	2.44	8.8	3.86	6.3	5.49	26.9	0.07	5.8	5.42	29.1
SnRoC3	48.5	9.8	0.71	7.4	2.76	8.0	5.09	6.7	4.59	18.2	0.10	6.6	4.50	19.5
SnRoC4	31.4	6.4	0.87	5.9	2.97	5.6	6.46	5.5	3.41	8.7	0.11	4.7	3.31	9.3
SnRoC5	15.4	3.1	1.05	3.5	3.35	3.1	7.34	3.1	2.69	3.4	0.12	2.5	2.57	3.5
SnRoC6	6.7	1.4	1.52	2.2	4.04	1.6	8.94	1.6	2.43	1.3	0.14	1.3	2.29	1.4
Sn Ro T	268.7	54.6	1.11	64.1	4.03	64.7	9.52	69.7	1.20	26.3	0.15	55.2	1.04	25.0
CALC	492.5	100.0	0.94	100.0	3.40	100.0	7.45	100.0	2.49	100.0	0.15	100.0	2.27	100.0
ASSAY HEAD			1.02		3.69		7.96							

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	C %	CUM	C organic %	CUM	norganic %	CUM
T32 S RoC1	35.8	7.3	0.51	3.9	2.12	4.5	3.51	3.4	2.39	7.0	0.34	16.7	2.05	6.6
S RoC2	45.8	9.3	0.58	5.8	2.27	6.2	3.99	5.0	2.67	10.0	0.33	20.8	1.67	6.8
SnRoC1	15.9	3.2	0.70	2.4	2.17	2.1	4.71	2.0	3.94	5.1	0.14	3.0	3.80	5.4
SnRoC2	76.0	15.4	0.68	11.2	2.38	10.8	4.04	8.4	5.17	32.1	0.08	8.8	5.08	34.5
SnRoC3	124.5	25.3	0.69	18.6	2.53	18.8	4.45	15.1	4.94	50.2	0.09	15.5	4.85	54.0
SnRoC4	155.9	31.7	0.73	24.5	2.62	24.4	4.85	20.6	4.63	59.0	0.09	20.2	4.54	63.3
SnRoC5	171.3	34.8	0.76	27.9	2.68	27.5	5.08	23.7	4.46	62.4	0.10	22.7	4.37	66.8
SnRoC6	178.0	36.1	0.79	30.1	2.74	29.1	5.22	25.3	4.38	63.7	0.10	24.0	4.29	68.2

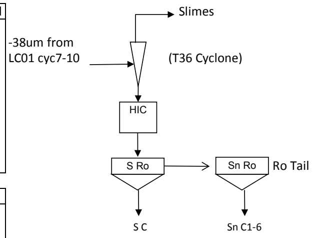
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T38
DATE	120914
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	1000	
Water	g	1500	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
T37 Cyc Underflow

NOTES
1000gm Feed SSF hot water solution SPA hot water solution

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (25HZ)	3.5	496							5					
HIC Cond (60HZ)				297					5					
Fresh Water Wash														
Conditioning	5.5		25											
S Ro C	5.6					29				3-13	18.0	18.0	1530	16
Condition SSF	4.9			446					3					
Condition SPA					496				3					
Sn Ro Con1	4.8									3-9	5.0	5.0	210	19
Sn Ro Con2	5.1					5				8-14	5.0	10.0	210	16
Sn Ro Con3	5.2									8-14	5.0	15.0	205	14
Condition					496				3					
Sn Ro Con4	4.6					5				3-8	5.0	20.0	210	20
Sn Ro Con5	4.8					5				5-9	5.0	25.0	215	21
Sn Ro Con6	4.9									8-11	5.0	30.0	220	20
REAGENT TOTALS (g/t)		**496**	**25**	**744**	**992**	**44**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T38 S RoC	248.7	24.7	0.49	20.7	24.9	29.8	0.53	69.3	11.1	84.1	30.7	19.8	0.29	19.0
SnRoC1	40.2	4.0	2.30	15.7	29.0	5.6	0.15	3.2	3.33	4.1	22.5	2.3	0.51	5.4
SnRoC2	34.4	3.4	2.60	15.2	28.8	4.8	0.13	2.4	2.85	3.0	22.4	2.0	0.52	4.7
SnRoC3	29.4	2.9	2.23	11.1	27.2	3.9	0.11	1.7	2.09	1.9	24.9	1.9	0.50	3.9
SnRoC4	42.0	4.2	1.17	8.3	27.3	5.5	0.12	2.7	1.52	2.0	25.6	2.8	0.56	6.2
SnRoC5	44.2	4.4	1.20	9.0	27.5	5.9	0.10	2.3	0.81	1.1	26.8	3.1	0.61	7.1
SnRoC6	44.7	4.4	0.99	7.5	27.4	5.9	0.08	1.9	0.76	1.0	26.4	3.1	0.67	7.9
Sn Ro T	524.9	52.0	0.14	12.5	15.3	38.7	0.06	16.6	0.18	2.9	47.8	65.0	0.33	45.7
CALC	1008.5	100.0	0.58	100.0	20.6	100.0	0.19	100.0	3.24	100.0	38.2	100.0	0.38	100.0
ASSAY HEAD														

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T38 S RoC	248.7	24.7	0.49	20.7	24.9	29.8	0.53	69.3	11.1	84.1	30.7	19.8	0.29	19.0
SnRoC1	40.2	4.0	2.30	15.7	29.0	5.6	0.15	3.2	3.33	4.1	22.5	2.3	0.51	5.4
SnRoC2	74.6	7.4	2.44	30.9	28.9	10.4	0.14	5.5	3.11	7.1	22.5	4.3	0.51	10.1
SnRoC3	104.0	10.3	2.38	42.0	28.4	14.2	0.13	7.2	2.82	9.0	23.1	6.2	0.51	14.0
SnRoC4	146.0	14.5	2.03	50.3	28.1	19.8	0.13	9.9	2.45	10.9	23.9	9.0	0.52	20.2
SnRoC5	190.2	18.9	1.84	59.3	28.0	25.6	0.12	12.2	2.07	12.0	24.5	12.1	0.54	27.3
SnRoC6	234.9	23.3	1.68	66.8	27.9	31.5	0.11	14.1	1.82	13.1	24.9	15.2	0.57	35.2

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T38 S RoC	248.7	24.7	0.61	17.9	3.52	21.3	8.92	21.3
SnRoC1	40.2	4.0	0.37	1.8	2.89	2.8	6.31	2.4
SnRoC2	34.4	3.4	0.40	1.6	2.86	2.4	6.13	2.0
SnRoC3	29.4	2.9	0.45	1.6	2.94	2.1	6.64	1.9
SnRoC4	42.0	4.2	0.54	2.7	3.37	3.4	7.72	3.1
SnRoC5	44.2	4.4	0.63	3.3	3.49	3.7	7.64	3.2
SnRoC6	44.7	4.4	0.67	3.5	3.45	3.7	7.13	3.1
Sn Ro T	524.9	52.0	1.09	67.6	4.74	60.5	12.5	63.0
CALC	1008.5	100.0	0.84	100.0	4.08	100.0	10.3	100.0
ASSAY HEAD								

CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T38 S RoC	248.7	24.7	0.61	17.9	3.52	21.3	8.92	21.3
SnRoC1	40.2	4.0	0.37	1.8	2.89	2.8	6.31	2.4
SnRoC2	74.6	7.4	0.38	3.4	2.88	5.2	6.23	4.5
SnRoC3	104.0	10.3	0.40	4.9	2.89	7.3	6.34	6.3
SnRoC4	146.0	14.5	0.44	7.6	3.03	10.8	6.74	9.4
SnRoC5	190.2	18.9	0.49	10.9	3.14	14.5	6.95	12.7
SnRoC6	234.9	23.3	0.52	14.5	3.20	18.3	6.98	15.7

ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

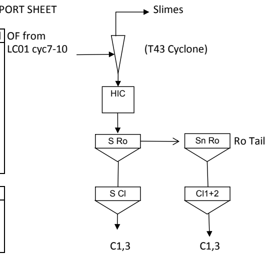
PROJECT	T0879
TEST NO	T44
DATE	250914
TECHNICIAN	MW

PRODUCT FLOATED
T43 Cyc Underflow

NOTES
Hic Slurry Density 50%

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	850	kWh/t	



	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	3.5	1091		182					5					
Water Change														
Conditioning			45											
S Ro C	5.8					36				6-11	15.0	15.0	820	
Condition														
S Cl1 C1	6.2	36								4-5	1.5	16.5	80	29
Condition														
S Cl1 C2	5.0									5-9	2.0	18.5	100	11
S CL1 C3	5.0									5-13	4.0	22.5	200	3
Condition		455												
Condition SPA	4.5	182			546				3					
Sn Ro C1											5.0	5.0	200	
Condition	4.2				546	36								
Sn Ro C2	4.2	327								3-10	5.0	10.0	200	
Condition														
Sn Cl1 Con	4.2	36				9			3	0-5	8.0	18.0	250	
Sn Cl2 C1	3.2	36				9				0-3	3.0	21.0	20	33
Sn Cl2 C2										3-5	3.0	24.0	30	31
SnCl2 C3										3-5	5.0	29.0	100	23
REAGENT TOTALS (g/t)		**2164**	**45**	**182**	**1091**	**90**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T44 S Cl1 C1	22.8	4.1	0.18	1.0	38.9	7.8	2.49	54.6	37.2	51.3	6.56	0.7	0.07	0.5
C2	11.1	2.0	0.35	1.0	33.8	3.3	0.97	10.3	23.4	15.7	17.3	0.9	0.19	0.7
C3	6.6	1.2	0.57	1.0	28.4	1.6	0.48	3.0	14.4	5.7	26.0	0.8	0.32	0.7
S Cl1 Tail	39.7	7.2	0.74	7.5	22.3	7.8	0.16	6.1	4.07	9.8	35.1	6.6	0.50	6.5
Sn Cl2 C1	6.6	1.2	3.36	5.7	36.2	2.1	0.12	0.8	2.50	1.0	8.79	0.3	1.00	2.2
C2	9.2	1.7	3.40	8.0	36.4	2.9	0.11	1.0	2.56	1.4	8.36	0.4	1.03	3.1
C3	22.5	4.1	3.05	17.5	36.9	7.3	0.08	1.7	1.22	1.7	8.42	0.9	1.15	8.5
Sn Cl2 Tail	24.6	4.5	2.07	13.0	32.1	6.9	0.09	2.1	1.67	2.5	17.1	2.0	1.19	9.6
Sn Cl1 Tail	28.7	5.2	1.56	11.4	28.5	7.2	0.08	2.2	1.21	2.1	22.7	3.1	1.10	10.3
Ro Tail	378.0	68.8	0.35	33.8	16.0	53.0	0.05	18.2	0.39	8.9	47.1	84.4	0.47	58.0
CALC	549.8	100.0	0.71	100.0	20.7	100.0	0.19	100.0	3.01	100.0	38.4	100.0	0.56	100.0
ASSAY HEAD			0.74		20.9		0.21		2.92		38.6		0.57	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T44 S Cl1 C1	22.8	4.1	0.18	1.0	38.9	7.8	2.49	54.6	37.2	51.3	6.56	0.7	0.07	0.5
C2	33.9	6.2	0.24	2.0	37.2	11.1	1.99	64.9	32.7	66.9	10.1	1.6	0.11	1.2
C3	40.5	7.4	0.29	3.0	35.8	12.7	1.75	67.9	29.7	72.7	12.7	2.4	0.14	1.9
S Cl1 Tail	80.2	14.6	0.51	10.5	29.1	20.5	0.96	74.0	17.0	82.4	23.8	9.0	0.32	8.4
Sn Cl2 C1	6.6	1.2	3.36	5.7	36.2	2.1	0.12	0.8	2.50	1.0	8.79	0.3	1.00	2.2
C2	15.8	2.9	3.38	13.7	36.3	5.0	0.11	1.7	2.53	2.4	8.54	0.6	1.02	5.3
C3	38.3	7.0	3.19	31.2	36.7	12.3	0.09	3.5	1.76	4.1	8.47	1.5	1.10	13.7
Sn Cl2 Tail	62.9	11.4	2.75	44.2	34.9	19.3	0.09	5.6	1.73	6.6	11.8	3.5	1.13	23.3
Sn Cl1 Tail	91.6	16.7	2.38	55.7	32.9	26.5	0.09	7.8	1.56	8.7	15.2	6.6	1.12	33.6

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T44 S Cl1 C1	22.8	4.1	0.15	0.6	1.10	1.2	1.20	0.6
C2	11.1	2.0	0.35	0.7	2.23	1.2	3.23	0.8
C3	6.6	1.2	0.51	0.6	3.14	1.0	5.56	0.8
S Cl1 Tail	39.7	7.2	0.76	5.4	3.66	6.8	8.82	7.4
Sn Cl2 C1	6.6	1.2	0.32	0.4	2.51	0.8	2.54	0.4
C2	9.2	1.7	0.32	0.5	2.45	1.1	2.30	0.4
C3	22.5	4.1	0.37	1.5	2.59	2.7	2.01	1.0
Sn Cl2 Tail	24.6	4.5	0.52	2.3	3.01	3.5	4.11	2.1
Sn Cl1 Tail	28.7	5.2	0.76	3.9	3.27	4.4	5.72	3.5
Ro Tail	378.0	68.8	1.23	84.0	4.39	77.5	10.4	83.1
CALC	549.8	100.0	1.01	100.0	3.89	100.0	8.60	100.0
ASSAY HEAD			1.05		3.91		8.60	

CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T44 S Cl1 C1	22.8	4.1	0.15	0.6	1.10	1.2	1.20	0.6
C2	33.9	6.2	0.22	1.3	1.47	2.3	1.86	1.3
C3	40.5	7.4	0.26	1.9	1.74	3.3	2.47	2.1
S Cl1 Tail	80.2	14.6	0.51	7.4	2.69	10.1	5.61	9.5
Sn Cl2 C1	6.6	1.2	0.32	0.4	2.51	0.8	2.54	0.4
C2	15.8	2.9	0.32	0.9	2.48	1.8	2.40	0.8
C3	38.3	7.0	0.35	2.4	2.54	4.5	2.17	1.8
Sn Cl2 Tail	62.9	11.4	0.42	4.7	2.73	8.0	2.93	3.9
Sn Cl1 Tail	91.6	16.7	0.52	8.7	2.90	12.4	3.80	7.4

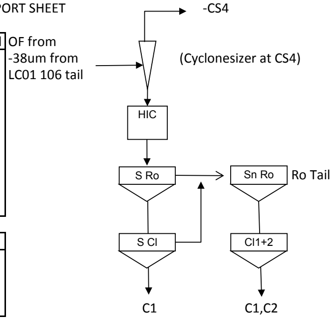
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T45
DATE	011014
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
-38 from LC01 -106 tail Deslimed at CS4

NOTES
Hic Slurry Density 50%

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	3.5	398		199					5					
Water Change														
Conditioning			50						3					
S Ro C	5.8					39				6-11	7.0	7.0	300	
Condition														
S Cl1 C1	6.9					20				2-9	5.0	12.0	163	20
Condition	6.1			100					3					
Condition SPA					597	20			3					
Sn Ro C1											10.0	10.0	275	
Condition					597				3					
Sn Ro C2	6.8									5-11	10.0	20.0	330	
Condition	5.0	80			299	20			3					
Sn Ro C3	6.0									7-8	5.0	25.0	170	
Sn Cl1 C1	6.4									0.5-11	12.0	37.0	415	
Sn Cl2 C1	6.5					10				0.5-1	1.0	38.0	20	55
SnCl2 C2	6.5									0.5-1	1.0	39.0	30	50
REAGENT TOTALS (g/t)		**478**	**50**	**299**	**1494**	**108**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T45 S Cl1 C1	31.9	6.4	0.22	1.9	38.6	10.9	1.38	59.9	32.9	81.6	9.82	1.6	0.14	1.1
Sn Cl2 C1	10.9	2.2	3.63	10.6	37.7	3.6	0.08	1.2	0.86	0.7	6.13	0.4	1.46	3.9
C2	15.0	3.0	4.20	16.9	37.2	4.9	0.07	1.4	0.92	1.1	5.96	0.5	1.40	5.1
Sn Cl2 Tail	168.8	33.6	1.31	59.5	35.2	52.5	0.06	13.8	0.79	10.4	11.9	10.5	1.62	67.1
Sn Cl1 Tail	90.7	18.1	0.29	7.1	15.0	12.0	0.07	8.6	0.66	4.7	51.9	24.7	0.76	16.9
Ro Tail	184.8	36.8	0.08	4.0	9.87	16.1	0.06	15.1	0.11	1.6	64.2	62.3	0.13	5.9
CALC	502.1	100.0	0.74	100.0	22.6	100.0	0.15	100.0	2.56	100.0	37.9	100.0	0.81	100.0
ASSAY HEAD			0.75		22.1		0.14		2.57		37.0		0.79	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T45 S Cl1 C1	31.9	6.4	0.22	1.9	38.6	10.9	1.38	59.9	32.9	81.6	9.82	1.6	0.14	1.1
Sn Cl2 C1	10.9	2.2	3.63	10.6	37.7	3.6	0.08	1.2	0.86	0.7	6.13	0.4	1.46	3.9
C2	25.9	5.2	3.96	27.6	37.4	8.6	0.07	2.6	0.89	1.8	6.03	0.8	1.43	9.1
Sn Cl2 Tail	194.7	38.8	1.66	87.1	35.5	61.0	0.06	16.4	0.80	12.2	11.1	11.4	1.59	76.1
Sn Cl1 Tail	285.4	56.8	1.23	94.1	29.0	73.0	0.06	25.0	0.76	16.8	24.1	36.1	1.33	93.0

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T45 S Cl1 C1	31.9	6.4	0.27	1.5	1.04	2.0	1.96	1.8
Sn Cl2 C1	10.9	2.2	0.79	1.5	2.68	1.7	2.82	0.9
C2	15.0	3.0	0.78	2.0	2.55	2.3	2.71	1.2
Sn Cl2 Tail	168.8	33.6	0.87	25.5	3.04	30.3	3.76	18.6
Sn Cl1 Tail	90.7	18.1	1.65	25.9	3.09	16.5	7.72	20.5
Ro Tail	184.8	36.8	1.36	43.6	4.34	47.3	10.5	56.9
CALC	502.1	100.0	1.15	100.0	3.38	100.0	6.79	100.0
ASSAY HEAD			1.12		3.30		6.68	

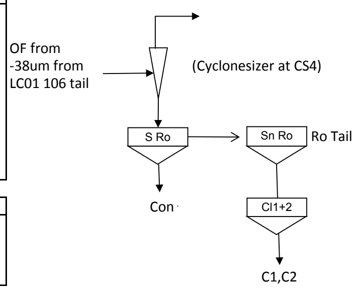
CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T45 S Cl1 C1	31.9	6.4	0.27	1.5	1.04	2.0	1.96	1.8
Sn Cl2 C1	10.9	2.2	0.79	1.5	2.68	1.7	2.82	0.9
C2	25.9	5.2	0.78	3.5	2.60	4.0	2.76	2.1
Sn Cl2 Tail	194.7	38.8	0.86	29.0	2.98	34.2	3.63	20.7
Sn Cl1 Tail	285.4	56.8	1.11	54.9	3.02	50.8	4.93	41.2

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T46
DATE	011014
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
-38 from LC01 -106 tail Deslimed at CS4

NOTES

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Conditioning	6.5		50						3					
S Ro C	6.5					39				6-11	7.0	7.0	300	12
Condition				199					3					
Condition SPA	4.4				298				3					
Sn Ro C1											10.0	10.0	345	
Condition					298				3					
Sn Ro C2	6.1									7-12	10.0	20.0	310	
Condition					199	20			3					
Sn Ro C3	6.4									6-9	5.0	25.0	150	
Sn Cl1 C1	6.1									1-11	12.0	37.0	395	
Sn Cl2 C1	6.3					10				0.5-1	1.0	38.0	20	52
SnCl2 C2	6.3									0.5-1	1.0	39.0	30	50
REAGENT TOTALS (g/t)			**50**	**199**	**796**	**69**								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	Mn %	DIST
T46 S Ro Con	34.7	6.9	0.61	5.6	34.1	10.4	1.27	59.0	27.5	73.5	11.6	2.1	0.31	2.6
Sn Cl2 C1	10.4	2.1	4.30	11.9	39.6	3.6	0.07	1.0	0.92	0.7	3.47	0.2	1.49	3.8
C2	14.9	3.0	4.83	19.2	40.1	5.3	0.09	1.8	0.88	1.0	3.19	0.3	1.47	5.4
Sn Cl2 Tail	135.8	27.0	1.36	49.2	38.1	45.5	0.07	12.7	1.08	11.3	8.42	6.1	1.62	53.9
Sn Cl1 Tail	64.4	12.8	0.41	7.0	23.1	13.1	0.07	6.0	1.55	7.7	35.0	12.0	1.31	20.7
Ro Tail	242.6	48.2	0.11	7.1	10.4	22.2	0.06	19.5	0.31	5.8	61.4	79.3	0.23	13.7
CALC	502.8	100.0	0.75	100.0	22.6	100.0	0.15	100.0	2.58	100.0	37.3	100.0	0.81	100.0
ASSAY HEAD			0.75		22.1		0.14		2.57		37.0		0.79	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	Mn %	CUM
T46 S Ro Con	34.7	6.9	0.61	5.6	34.1	10.4	1.27	59.0	27.5	73.5	11.6	2.1	0.31	2.6
Sn Cl2 C1	10.4	2.1	4.30	11.9	39.6	3.6	0.07	1.0	0.92	0.7	3.47	0.2	1.49	3.8
C2	25.3	5.0	4.61	31.1	39.9	8.9	0.08	2.8	0.90	1.7	3.31	0.4	1.48	9.2
Sn Cl2 Tail	161.1	32.0	1.87	80.2	38.4	54.3	0.07	15.5	1.05	13.0	7.62	6.5	1.60	63.0
Sn Cl1 Tail	225.5	44.8	1.45	87.3	34.0	67.4	0.07	21.5	1.19	20.7	15.4	18.5	1.52	83.7

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T46 S Ro Con	34.7	6.9	2.56	15.8	1.74	3.6	2.64	2.7
Sn Cl2 C1	10.4	2.1	0.33	0.6	2.41	1.5	1.36	0.4
C2	14.9	3.0	0.30	0.8	2.39	2.1	1.21	0.5
Sn Cl2 Tail	135.8	27.0	0.51	12.3	2.88	23.2	2.56	10.3
Sn Cl1 Tail	64.4	12.8	1.09	12.5	3.24	12.4	6.55	12.5
Ro Tail	242.6	48.2	1.35	58.1	3.98	57.3	10.3	73.6
CALC	502.8	100.0	1.12	100.0	3.35	100.0	6.72	100.0
ASSAY HEAD			1.12		3.30		6.68	

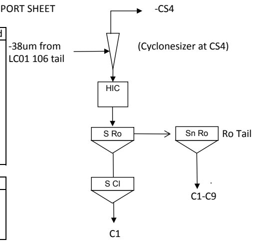
CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T46 S Ro Con	34.7	6.9	2.56	15.8	1.74	3.6	2.64	2.7
Sn Cl2 C1	10.4	2.1	0.33	0.6	2.41	1.5	1.36	0.4
C2	25.3	5.0	0.31	1.4	2.40	3.6	1.27	1.0
Sn Cl2 Tail	161.1	32.0	0.48	13.7	2.80	26.8	2.36	11.2
Sn Cl1 Tail	225.5	44.8	0.65	26.1	2.93	39.2	3.55	23.7

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T48
DATE	131014
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
-38 from LC01 Cyc1-10 -106 Tail Non Mags Deslimed at CS4

NOTES
From T47 LIMS test

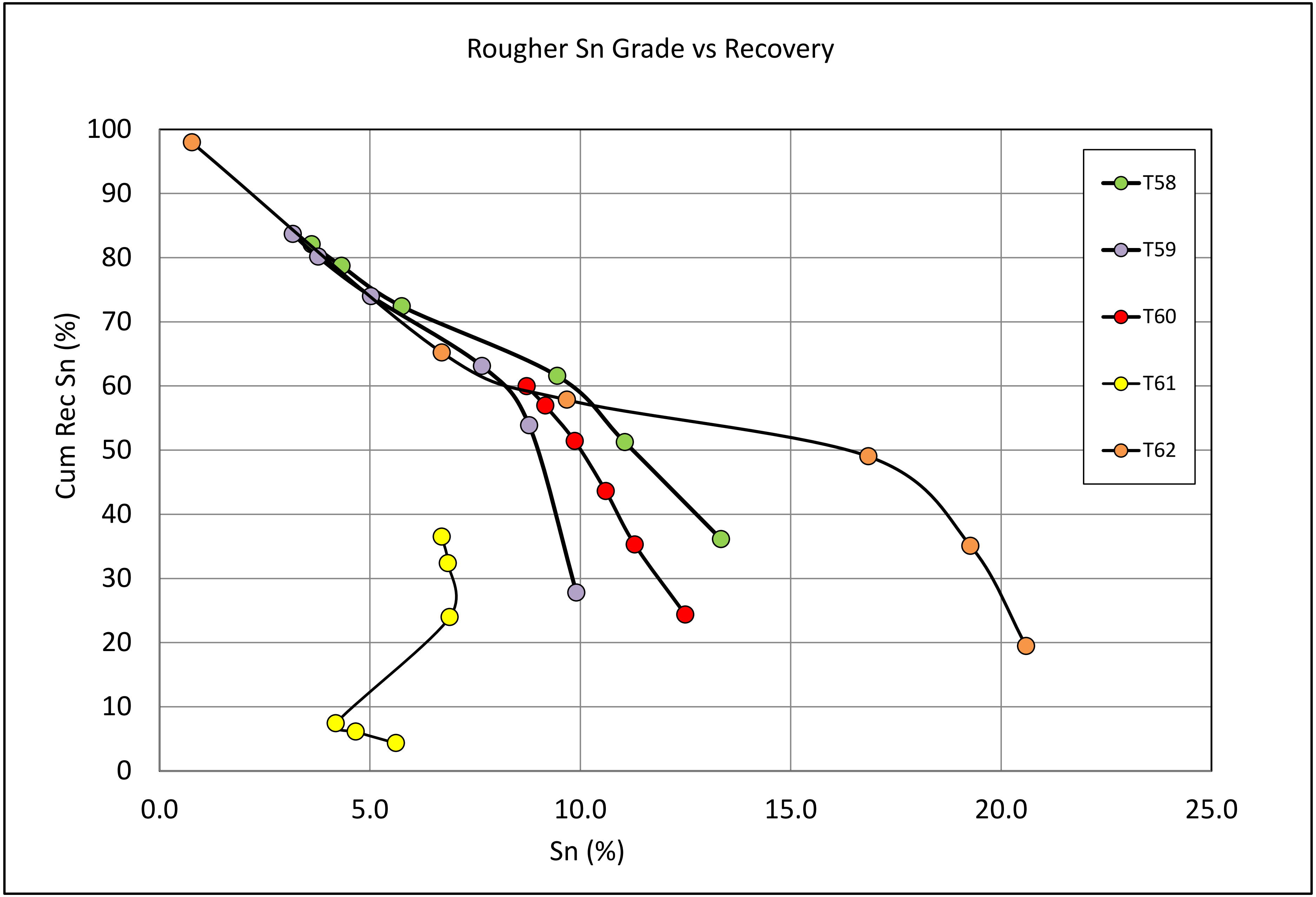
	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	584		195					5					
Water Change														
Conditioning			49						3					
S Ro C	5.6						58			7-9	5.0	5.0	300	
Condition														
S Cl1 C1	6.6						19			3-7	3.5	8.5	120	24
Condition	4.0	39		195					3					
Condition					292				3					
Condition						292			3					
Sn Ro C1											3.0	3.0	125	22
Sn Ro C2	4.8									7-8	3.0	6.0	130	22
Sn Ro C3	4.9						19			6-7	3.0	9.0	135	19
Condition						292			3					
Sn Ro C4	5.5									6-8	3.0	12.0	150	34
Sn Ro C5	5.5						19			7-8	3.0	15.0	150	30
Sn Ro C6	5.8									7-9	3.0	18.0	130	24
Condition						292			3					
Sn Ro C7	6.2									7-9	3.0	21.0	115	15
Sn Ro C8	6.2						19			7-8	3.0	24.0	125	8
Sn Ro C9	6.2									7-9	3.0	27.0	110	6
REAGENT TOTALS (g/t)		**623**	**49**	**389**	**292**	**876**	135							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T48 S Cl1 C1	28.8	5.6	0.19	1.4	38.1	10.2	1.61	61.2	35.5	86.8	9.03	1.3	0.11	0.7
S Cl1 Tail	7.9	1.5	0.61	1.2	26.7	2.0	0.22	2.3	6.96	4.7	28.7	1.1	0.53	1.0
Sn Ro C1	27.8	5.4	7.29	50.5	33.1	8.5	0.05	1.8	0.43	1.0	5.73	0.8	1.62	10.5
C2	28.6	5.6	2.38	17.0	36.5	9.7	0.05	1.9	0.38	0.9	6.58	0.9	1.73	11.5
C3	25.6	5.0	1.29	8.2	36.4	8.6	0.05	1.7	0.41	0.9	8.41	1.1	1.59	9.5
C4	50.5	9.8	0.55	6.9	36.1	16.9	0.06	4.0	0.22	0.9	9.42	2.4	1.91	22.4
C5	44.7	8.7	0.42	4.7	30.2	12.5	0.06	3.5	0.38	1.4	17.1	3.8	1.75	18.2
C6	30.6	6.0	0.37	2.8	23.4	6.6	0.06	2.4	0.31	0.8	29.4	4.5	1.43	10.2
C7	17.7	3.4	0.28	1.2	20.3	3.3	0.06	1.4	0.24	0.4	32.2	2.8	1.54	6.3
C8	9.6	1.9	0.35	0.8	16.5	1.5	0.05	0.6	0.25	0.2	42.4	2.0	0.94	2.1
C9	7.0	1.4	0.31	0.5	14.5	0.9	0.05	0.5	0.28	0.2	48.0	1.7	0.71	1.2
Ro Tail	234.8	45.7	0.08	4.7	8.82	19.2	0.06	18.6	0.09	1.8	66.0	77.5	0.12	6.5
CALC	513.6	100.0	0.78	100.0	21.0	100.0	0.15	100.0	2.29	100.0	38.9	100.0	0.84	100.0
ASSAY HEAD			0.78		20.8		0.14		2.40		38.4		0.83	

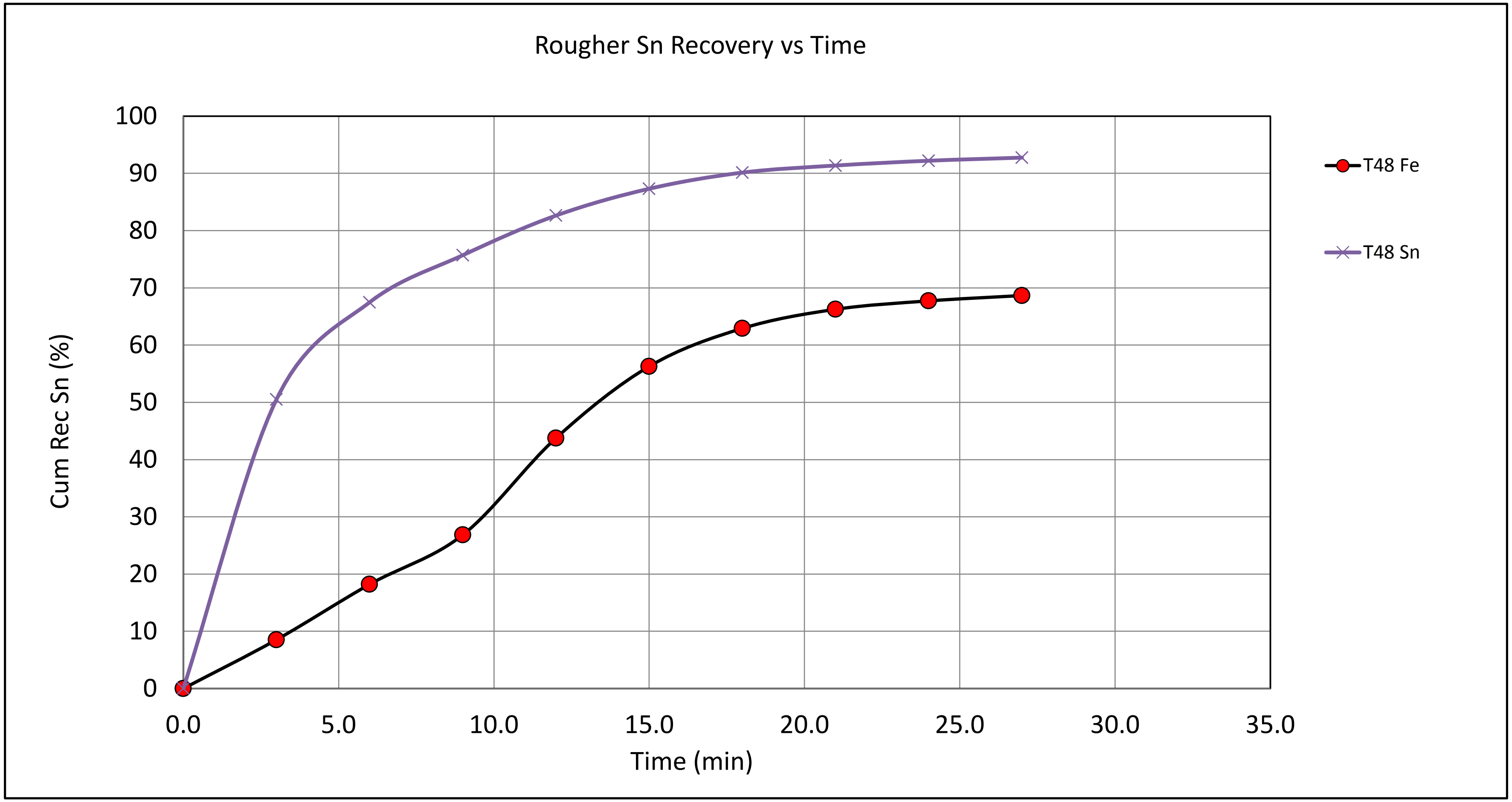
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T48 S Cl1 C1	28.8	5.6	0.19	1.36	38.1	10.2	1.61	61.2	35.5	86.8	9.03	1.30	0.11	0.74
S Cl1 Tail	36.7	7.1	0.28	2.6	35.6	12.1	1.31	63.5	29.4	91.5	13.3	2.4	0.20	1.7
Sn Ro C1	27.8	5.4	7.29	50.5	33.1	8.5	0.05	4.1	0.43	1.0	5.73	0.8	1.62	10.5
C2	56.4	11.0	4.80	67.5	34.8	18.2	0.05	6.0	0.40	1.9	6.16	1.7	1.68	22.0
C3	82.0	16.0	3.70	75.7	35.3	26.9	0.05	7.7	0.41	2.8	6.86	2.8	1.65	31.4
C4	132.5	25.8	2.50	82.6	35.6	43.8	0.05	11.7	0.34	3.8	7.84	5.2	1.75	53.8
C5	177.2	34.5	1.98	87.3	34.2	56.3	0.06	15.3	0.35	5.2	10.2	9.0	1.75	72.0
C6	207.8	40.5	1.74	90.1	32.7	62.9	0.06	17.7	0.34	6.0	13.0	13.5	1.70	82.2
C7	225.5	43.9	1.63	91.4	31.7	66.3	0.06	19.1	0.33	6.4	14.5	16.4	1.69	88.5
C8	235.1	45.8	1.57	92.2	31.1	67.7	0.06	19.7	0.33	6.6	15.7	18.4	1.66	90.6
C9	242.1	47.1	1.54	92.8	30.6	68.7	0.06	20.2	0.33	6.7	16.6	20.1	1.63	91.7

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T48 S Cl1 C1	28.8	5.6	0.24	1.2	1.13	1.9	1.76	1.7
S Cl1 Tail	7.9	1.5	0.87	1.2	2.96	1.4	5.23	1.4
Sn Ro C1	27.8	5.4	1.17	5.6	2.60	4.2	1.94	1.8
C2	28.6	5.6	0.82	4.0	2.90	4.8	2.23	2.1
C3	25.6	5.0	0.68	3.0	2.99	4.5	2.84	2.4
C4	28.6	9.8	0.82	7.1	2.90	8.5	2.23	3.7
C5	25.6	8.7	0.68	5.2	2.99	4.5	2.84	2.4
C6	25.6	6.0	0.68	3.6	2.99	4.5	2.84	2.4
C7	25.6	3.4	0.68	2.1	2.99	4.5	2.84	2.4
C8	25.6	1.9	0.68	1.1	2.99	4.5	2.84	2.4
C9	7.0	1.4	1.65	2.0	3.55	1.4	9.91	2.3
Ro Tail	234.8	45.7	1.59	64.0	4.04	55.3	9.69	75.1
CALC	491.5	100.0	1.14	100.0	3.34	100.0	5.90	100.0
ASSAY HEAD			1.22		3.44		6.86	

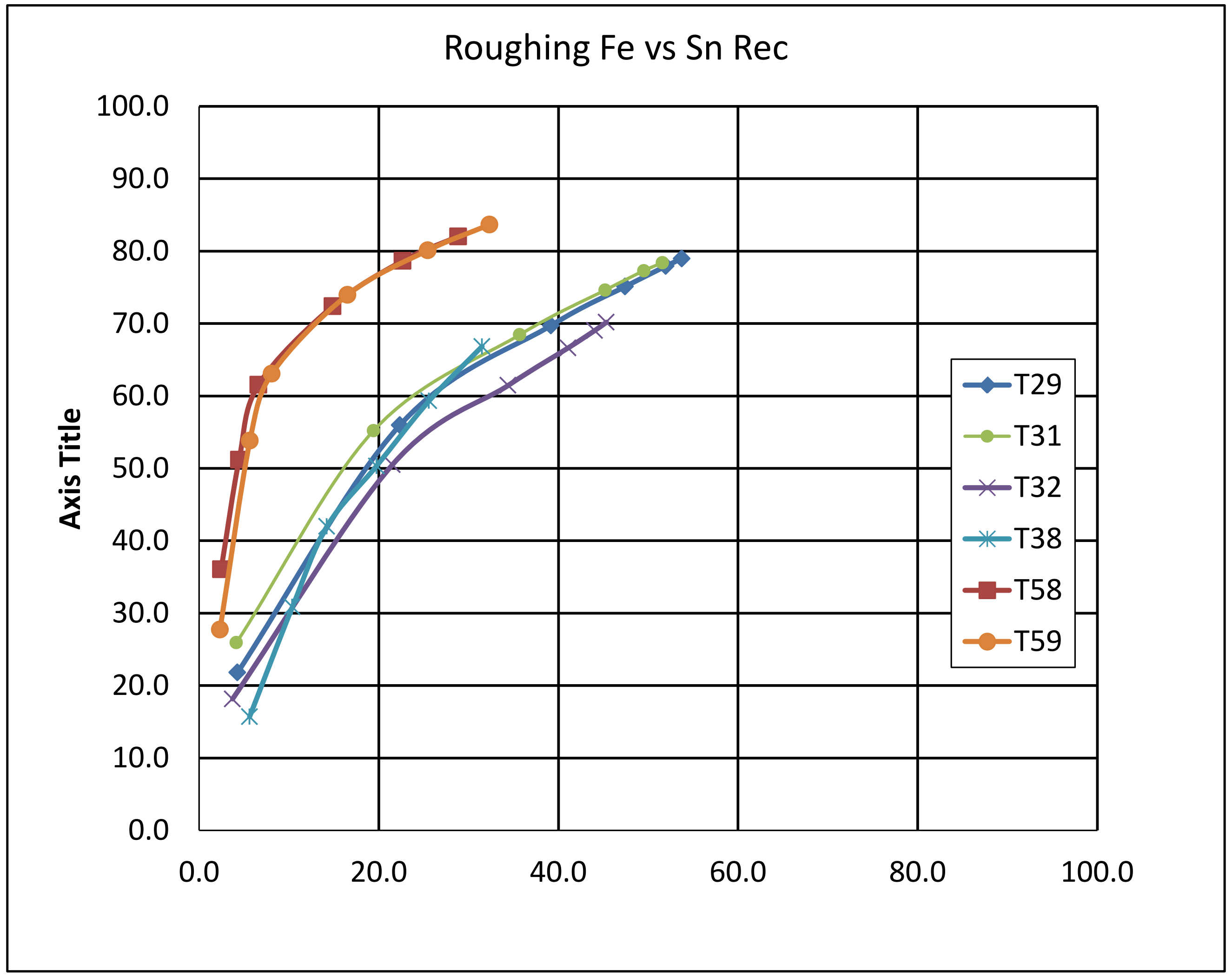
CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T48 S Cl1 C1	28.8	5.6	0.24	1.2	1.13	1.9	1.76	1.7
S Cl1 Tail	36.7	7.1	0.38	2.4	1.52	3.3	2.51	3.0
Sn Ro C1	27.8	5.4	1.17	5.6	2.60	4.2	1.94	1.8
C2	56.4	11.0	0.99	9.6	2.75	9.1	2.09	3.9
C3	82.0	16.0	0.89	12.6	2.83	13.5	2.32	6.3
C4	132.5	25.8	0.87	19.7	2.85	22.1	2.29	10.0
C5	177.2	34.5	0.82	24.9	2.89	26.5	2.43	12.4
C6	207.8	40.5	0.80	28.5	2.90	31.0	2.49	14.8
C7	225.5	43.9	0.79	30.5	2.91	35.5	2.52	17.2
C8	235.1	45.8	0.79	31.6	2.91	39.9	2.53	19.6
C9	242.1	47.1	0.81	33.6	2.93	41.4	2.74	21.9

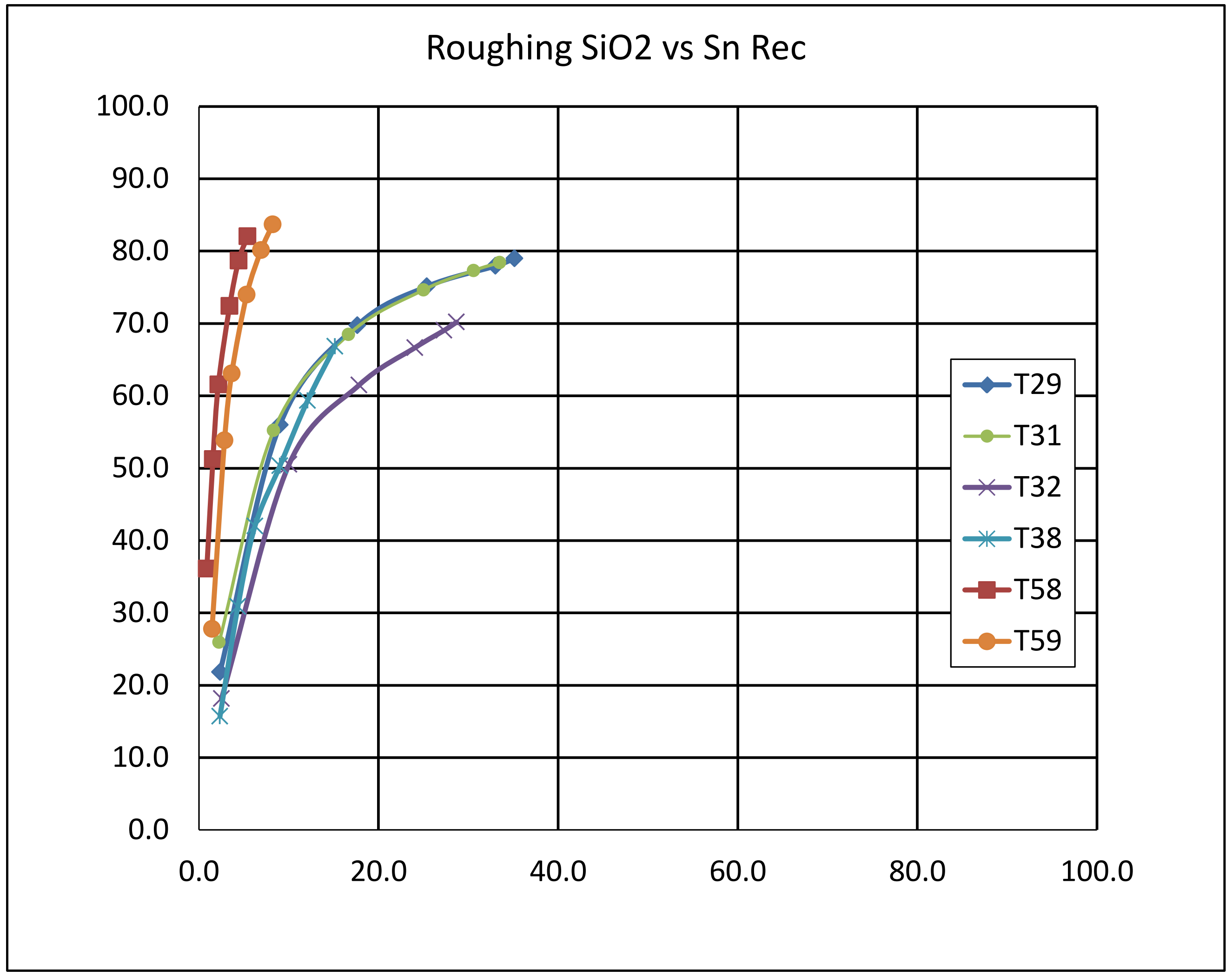


Rougher Sn Grade vs Recovery
Cum Rec Sn (%)
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
20.0
25.0
Sn (%)
T58
T59
T60
T61
T62



Rougher Sn Recovery vs Time
Cum Rec Sn (%)
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Time (min)
T48 Fe
T48 Sn

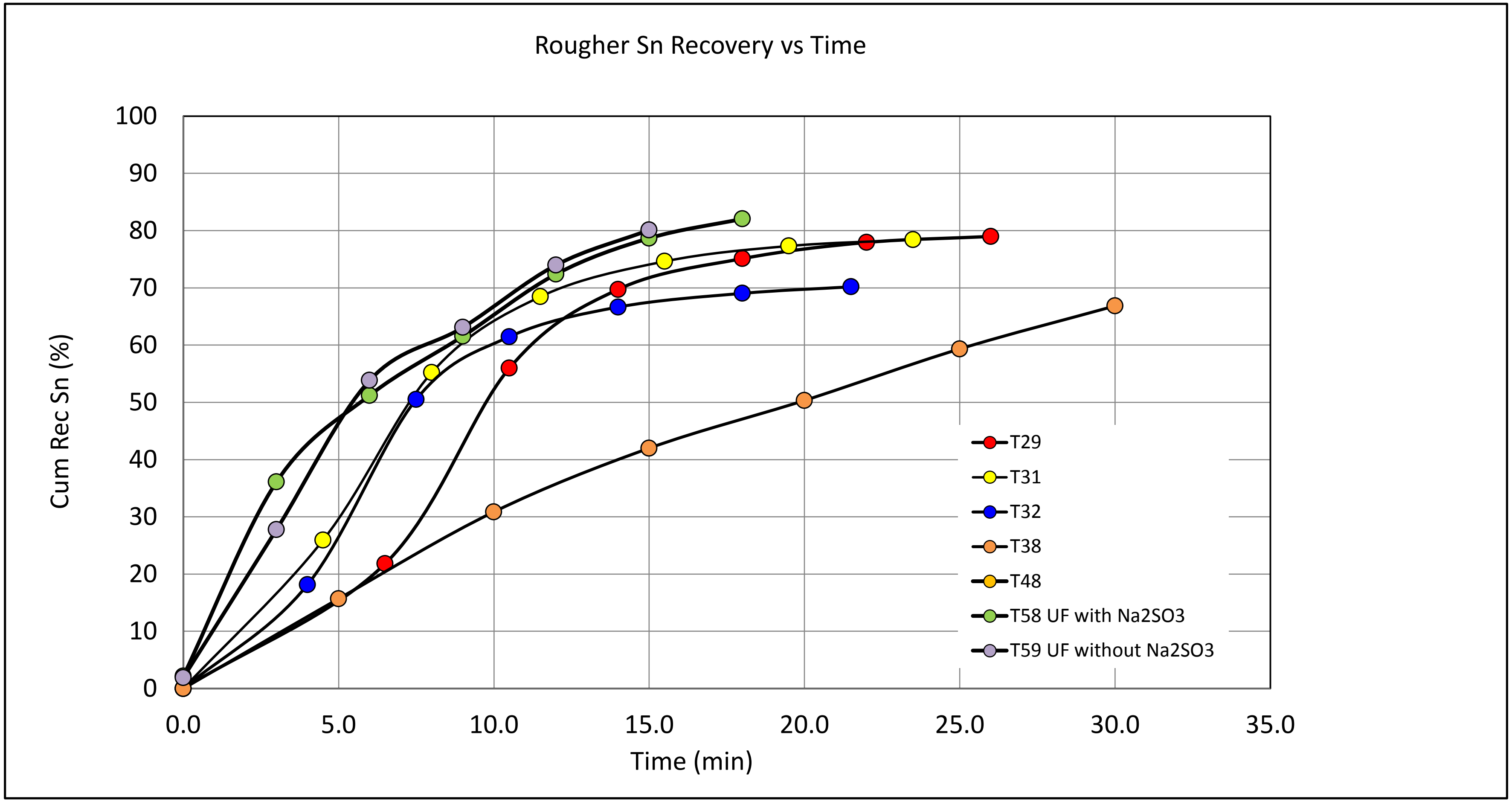




Make larger deslime cut

Use copper sulphate
Use Pax in sulphide float

Use low spa doses
Use low frother dose in roughing


Rougher Sn Recovery vs Time
Cum Rec Sn (%)
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Time (min)
T29
T31
T32
T38
T48
T58 UF with Na2SO3
T59 UF without Na2SO3

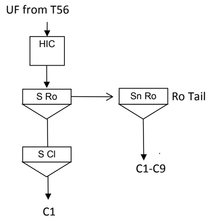
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T58
DATE	0
TECHNICIAN	SL

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
UF from T56

NOTES
UF from T56

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	401		200					5					
Water Change														
Conditioning			50						3					
S Ro C	5.7						60			7-9	6.0	6.0	175	
Condition														
S Cl1 C1	6.6									1-3	5.5	11.5	90	32
Condition	4.0	180		200					3					
Condition	3.9				301				3					
Condition	4.2					301			3					
Sn Ro C1											3.0	3.0	125	9
Sn Ro C2	4.5									7-8	3.0	6.0	130	6
Sn Ro C3	4.6									6-7	3.0	9.0	135	6
Condition						100			3					
Sn Ro C4	4.6						20			9-11	3.0	12.0	150	16
Sn Ro C5	4.7									9-11	3.0	15.0	150	15
Sn Ro C6	4.8						20			9-11	3.0	18.0	130	14
REAGENT TOTALS (g/t)		**581**	**50**	**401**	**301**	**401**	99							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T58 S Cl1 C1	29.0	5.8	0.14	1.0	42.4	11.1	1.30	49.9	24.5	72.3	6.43	1.0	0.08	0.6
S Cl1 Tail	8.1	1.6	0.56	1.1	33.6	2.5	1.12	12.0	14.0	11.5	19.9	0.8	0.39	0.8
Sn Ro C1	10.8	2.2	13.4	36.1	25.1	2.5	0.12	1.7	1.45	1.6	15.6	0.9	0.68	1.9
C2	7.7	1.5	7.85	15.1	28.7	2.0	0.10	1.0	1.16	0.9	17.0	0.7	0.77	1.6
C3	7.5	1.5	5.50	10.3	31.9	2.2	0.08	0.8	0.79	0.6	15.4	0.6	0.86	1.7
C4	24.2	4.9	1.79	10.8	37.7	8.3	0.06	1.9	0.58	1.4	9.97	1.3	1.31	8.3
C5	22.4	4.5	1.12	6.3	38.6	7.8	0.06	1.8	0.46	1.0	8.56	1.0	1.46	8.6
C6	18.0	3.6	0.75	3.4	38.0	6.2	0.06	1.4	0.42	0.8	10.6	1.0	1.55	7.3
Ro Tail	371.1	74.4	0.17	15.8	17.2	57.6	0.06	29.5	0.26	9.8	47.9	92.8	0.71	69.2
CALC	498.8	100.0	0.80	100.0	22.2	100.0	0.15	100.0	1.97	100.0	38.4	100.0	0.76	100.0
ASSAY HEAD			0.78		22.1		0.16		2.43		37.9		0.77	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T58 S Cl1 C1	29.0	5.8	0.14	1.02	42.4	11.1	1.30	49.9	24.5	72.3	6.43	0.97	0.08	0.61
S Cl1 Tail	37.1	7.4	0.23	2.2	40.5	13.6	1.26	61.9	22.2	83.8	9.37	1.8	0.15	1.4
Sn Ro C1	10.8	2.2	13.4	36.1	25.1	2.5	0.12	13.7	1.45	1.6	15.6	0.9	0.68	1.9
C2	18.5	3.7	11.1	51.2	26.6	4.4	0.11	14.7	1.33	2.5	16.2	1.6	0.72	3.5
C3	26.0	5.2	9.46	61.6	28.1	6.6	0.10	15.5	1.17	3.1	15.9	2.2	0.76	5.2
C4	50.2	10.1	5.76	72.4	32.7	14.9	0.08	17.5	0.89	4.5	13.1	3.4	1.02	13.5
C5	72.6	14.6	4.33	78.7	34.5	22.7	0.08	19.2	0.76	5.6	11.7	4.4	1.16	22.1
C6	90.6	18.2	3.62	82.1	35.2	28.9	0.07	20.7	0.69	6.4	11.5	5.4	1.24	29.4

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T58 S Cl1 C1	29.0	5.8	0.20	1.0	0.70	1.2	1.37	1.1
S Cl1 Tail	8.1	1.6	0.58	0.8	2.35	1.1	4.41	1.0
Sn Ro C1	10.8	2.2	1.55	2.9	2.10	1.3	4.24	1.3
C2	7.7	1.5	1.23	1.6	2.42	1.1	4.42	1.0
C3	7.5	1.5	0.98	1.3	2.48	1.1	4.00	0.8
C4	7.7	4.9	1.23	5.1	2.42	3.5	4.42	3.0
C5	7.5	4.5	0.98	3.8	2.48	3.3	4.00	2.5
C6	7.5	3.6	0.98	3.0	2.48	2.6	4.00	2.0
Ro Tail	371.1	74.4	1.27	80.6	3.85	84.7	8.31	87.2
CALC	456.9	100.0	1.17	100.0	3.38	100.0	7.09	100.0
ASSAY HEAD			1.12		3.38		6.89	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T58 S Cl1 C1	29.0	5.8	0.20	1.0	0.70	1.2	1.37	1.1
S Cl1 Tail	37.1	7.4	0.28	1.8	1.06	2.3	2.03	2.1
Sn Ro C1	10.8	2.2	1.55	2.9	2.10	1.3	4.24	1.3
C2	18.5	3.7	1.42	4.5	2.23	2.4	4.31	2.3
C3	26.0	5.2	1.29	5.7	2.30	3.6	4.22	3.1
C4	50.2	10.1	1.26	10.8	2.36	7.0	4.32	6.1
C5	72.6	14.6	1.17	14.6	2.40	10.3	4.22	8.7
C6	90.6	18.2	1.14	17.6	2.41	13.0	4.18	10.7

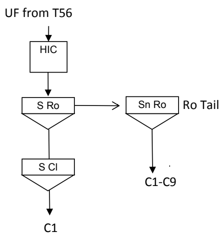
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T59
DATE	0
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED

UF from T56

NOTES

UF from T56

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 SPA7080 g/t	0.495 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	440		200					5					
Water Change														
Conditioning			50						3					
S Ro C	6.0					79				7-9	5.0	5.0	175	
Condition	4.0	200		200					3					
Condition	3.8								3					
Condition	4.0				300				3					
Sn Ro C1											3.0	3.0	125	9
Sn Ro C2	4.3									7-8	3.0	6.0	130	10
Sn Ro C3	4.5					20				6-7	3.0	9.0	135	6
Condition					100				3					
Sn Ro C4	4.7									6-8	3.0	12.0	150	17
Sn Ro C5	4.8					20				7-8	3.0	15.0	150	17
Sn Ro C6	4.8									7-9	3.0	18.0	130	16
REAGENT TOTALS (g/t)		**639**	**50**	**400**	**400**	119								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T59 S Ro C	34.8	7.0	0.22	1.9	39.9	12.5	1.34	59.8	33.9	83.8	8.98	1.6	0.14	1.3
Sn Ro C1	11.2	2.2	9.91	27.8	23.0	2.3	0.15	2.2	1.78	1.4	25.0	1.5	0.52	1.5
C2	13.3	2.7	7.84	26.1	27.7	3.3	0.12	2.0	1.10	1.0	20.1	1.4	0.62	2.1
C3	8.4	1.7	4.40	9.2	32.3	2.4	0.11	1.2	0.89	0.5	18.3	0.8	0.74	1.6
C4	25.9	5.2	1.68	10.9	36.1	8.4	0.07	2.3	0.57	1.0	12.4	1.7	1.21	8.1
C5	26.1	5.2	0.94	6.1	37.9	8.9	0.08	2.7	0.36	0.7	11.8	1.6	1.44	9.7
C6	20.6	4.1	0.69	3.6	37.0	6.9	0.08	2.1	0.50	0.7	11.9	1.3	1.52	8.1
Ro Tail	360.2	72.0	0.16	14.4	17.0	55.1	0.06	27.7	0.42	10.7	48.0	90.2	0.73	67.7
CALC	500.5	100.0	0.80	100.0	22.1	100.0	0.16	100.0	2.81	100.0	38.3	100.0	0.78	100.0
ASSAY HEAD			0.78		22.1		0.16		2.43		37.9		0.77	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T59 S Ro C	34.8	7.0	0.22	1.92	39.9	12.5	1.34	59.8	33.9	83.8	8.98	1.63	0.14	1.25
Sn Ro C1	11.2	2.2	9.91	27.8	23.0	2.3	0.15	2.2	1.78	1.4	25.0	1.5	0.52	1.5
C2	24.5	4.9	8.79	53.8	25.6	5.7	0.13	4.2	1.41	2.5	22.3	2.9	0.57	3.6
C3	32.9	6.6	7.67	63.1	27.3	8.1	0.13	5.4	1.28	3.0	21.3	3.7	0.62	5.2
C4	58.8	11.7	5.03	74.0	31.2	16.5	0.10	7.7	0.97	4.0	17.4	5.3	0.88	13.3
C5	84.9	17.0	3.77	80.1	33.2	25.5	0.10	10.4	0.78	4.7	15.7	6.9	1.05	23.0
C6	105.5	21.1	3.17	83.7	34.0	32.4	0.09	12.5	0.73	5.4	14.9	8.2	1.14	31.0

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T59 S Ro C	34.8	7.0	0.30	1.8	0.99	2.1	1.97	1.9
Sn Ro C1	11.2	2.2	1.49	2.9	2.20	1.5	5.67	1.8
C2	13.3	2.7	1.28	2.9	2.18	1.7	4.79	1.8
C3	8.4	1.7	0.94	1.4	2.48	1.2	4.76	1.1
C4	13.3	5.2	1.28	5.7	2.18	3.4	4.79	3.5
C5	8.4	5.2	0.94	4.2	2.48	3.9	4.76	3.5
C6	8.4	4.1	0.94	3.3	2.48	3.0	4.76	2.7
Ro Tail	360.2	72.0	1.25	77.7	3.87	83.2	8.30	83.7
CALC	458.0	100.0	1.16	100.0	3.35	100.0	7.14	100.0
ASSAY HEAD			1.12		3.38		6.89	

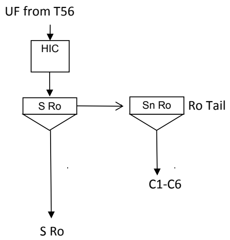
CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T59 S Ro C	34.8	7.0	0.30	1.8	0.99	2.1	1.97	1.9
Sn Ro C1	11.2	2.2	1.49	2.9	2.20	1.5	5.67	1.8
C2	24.5	4.9	1.38	5.8	2.19	3.2	5.19	3.6
C3	32.9	6.6	1.26	7.2	2.26	4.4	5.08	4.7
C4	58.8	11.7	1.27	12.9	2.23	7.8	4.95	8.2
C5	84.9	17.0	1.17	17.1	2.30	11.7	4.89	11.6
C6	105.5	21.1	1.12	20.5	2.34	14.7	4.87	14.4

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T60
DATE	02/12/14
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED

UF from T56

NOTES

UF from T56

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	399		200					5					
Water Change														
Conditioning			50						3					
S Ro C	5.2						59			7-9	6.0	6.0	175	
Condition	5.0	100		200					3					
Condition	4.0				299				3					
Condition	4.2					299			3					
Sn Ro C1											3.0	3.0	125	6
Sn Ro C2	4.4									7-8	3.0	6.0	130	4
Sn Ro C3	4.5									6-7	3.0	9.0	135	3
Sn Ro C4	4.5						20			9-11	3.0	12.0	150	3
Sn Ro C5	4.5									9-11	3.0	15.0	150	3
Sn Ro C6	4.6						20			9-11	3.0	18.0	130	2
REAGENT TOTALS (g/t)		**499**	**50**	**399**	**299**	**299**	99							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T60 S Ro C	34.5	6.9	0.24	2.1	38.1	12.0	1.02	41.5	32.6	82.3	10.4	1.9	0.16	1.4
Sn Ro C1	7.9	1.6	12.5	24.3	23.4	1.7	0.25	2.3	1.94	1.1	16.5	0.7	0.55	1.1
C2	4.7	0.9	9.30	10.9	24.5	1.1	0.22	1.2	1.72	0.6	19.4	0.5	0.54	0.7
C3	4.0	0.8	8.43	8.4	25.5	0.9	0.21	1.0	1.39	0.4	19.5	0.4	0.54	0.6
C4	4.4	0.9	7.11	7.8	26.4	1.1	0.19	1.0	1.16	0.4	20.6	0.5	0.57	0.7
C5	4.0	0.8	5.52	5.5	26.5	1.0	0.17	0.8	0.88	0.3	22.8	0.5	0.62	0.7
C6	2.7	0.5	4.59	3.0	27.1	0.7	0.16	0.5	1.07	0.2	23.2	0.3	0.62	0.4
Ro Tail	438.7	87.6	0.35	38.0	20.4	81.6	0.10	51.7	0.46	14.8	41.4	95.3	0.82	94.4
CALC	500.9	100.0	0.81	100.0	21.9	100.0	0.17	100.0	2.73	100.0	38.1	100.0	0.76	100.0
ASSAY HEAD			0.78		22.1		0.16		2.43		37.9		0.77	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T60 S Ro C	34.5	6.9	0.24	2.05	38.1	12.0	1.02	41.5	32.6	82.3	10.4	1.87	0.16	1.45
Sn Ro C1	7.9	1.6	12.5	24.3	23.4	1.7	0.25	2.3	1.94	1.1	16.5	0.7	0.55	1.1
C2	12.6	2.5	11.3	35.2	23.8	2.7	0.24	3.5	1.86	1.7	17.6	1.2	0.55	1.8
C3	16.6	3.3	10.6	43.6	24.2	3.7	0.23	4.5	1.74	2.1	18.0	1.6	0.54	2.4
C4	21.0	4.2	9.87	51.4	24.7	4.7	0.22	5.5	1.62	2.5	18.6	2.0	0.55	3.0
C5	25.1	5.0	9.17	56.9	25.0	5.7	0.21	6.3	1.50	2.8	19.3	2.5	0.56	3.7
C6	27.7	5.5	8.73	59.9	25.2	6.4	0.21	6.8	1.46	3.0	19.6	2.9	0.57	4.1

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T60 S Ro C	34.5	6.9	0.31	1.9	1.19	2.4	2.25	2.2
Sn Ro C1	7.9	1.6	2.75	3.9	2.21	1.0	5.10	1.2
C2	4.7	0.9	1.88	1.6	2.50	0.7	5.69	0.8
C3	4.0	0.8	1.41	1.0	2.56	0.6	5.62	0.6
C4	4.7	0.9	1.88	1.5	2.50	0.6	5.69	0.7
C5	4.0	0.8	1.41	1.0	2.56	0.6	5.62	0.6
C6	4.0	0.5	1.41	0.7	2.56	0.4	5.62	0.4
Ro Tail	438.7	87.6	1.11	88.3	3.69	93.7	7.42	93.4
CALC	502.5	100.0	1.10	100.0	3.45	100.0	6.96	100.0
ASSAY HEAD			1.12		3.38		6.89	

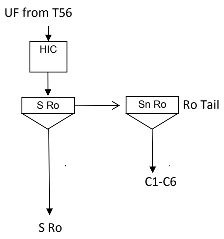
CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T60 S Ro C	34.5	6.9	0.31	1.9	1.19	2.4	2.25	2.2
Sn Ro C1	7.9	1.6	2.75	3.9	2.21	1.0	5.10	1.2
C2	12.6	2.5	2.42	5.5	2.32	1.7	5.32	1.9
C3	16.6	3.3	2.18	6.6	2.38	2.3	5.39	2.6
C4	21.0	4.2	2.12	8.1	2.40	2.9	5.46	3.3
C5	25.1	5.0	2.00	9.1	2.43	3.5	5.48	3.9
C6	27.7	5.5	1.95	9.8	2.44	3.9	5.50	4.4

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T61
DATE	01/12/14
TECHNICIAN	SL

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
UF from T56

NOTES
UF from T56 12 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	298		199					5					
~~Water Change~~														
Conditioning			50						3					
S Ro C	3.7						59			7-9	6.0	6.0	175	
Condition	3.8			199					3					
Condition	3.4				298				3					
Condition	3.3					298			3					
Sn Ro C1											3.0	3.0	125	2
Sn Ro C2	3.5									8-10	3.0	6.0	130	2
Sn Ro C3	3.6									6-7	3.0	9.0	135	1
Condition						99			3					
Sn Ro C4	3.4						20			9-11	3.0	12.0	150	5
Sn Ro C5	3.5									9-11	3.0	15.0	150	3
Sn Ro C6	3.6						20			9-11	3.0	18.0	130	2
REAGENT TOTALS (g/t)		**298**	**50**	**398**	**298**	**398**	98							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T61 S Ro Conc	36.2	7.2	0.25	2.3	38.0	12.4	1.07	44.2	30.5	84.8	10.5	1.9	0.16	1.5
Sn Ro C1	3.1	0.6	5.62	4.3	25.1	0.7	0.30	1.0	2.75	0.6	20.7	0.3	0.86	0.7
C2	2.2	0.4	3.32	1.8	21.3	0.4	0.24	0.6	2.38	0.4	31.0	0.3	0.59	0.3
C3	1.8	0.4	2.81	1.3	21.1	0.3	0.21	0.4	1.41	0.2	32.8	0.3	0.59	0.3
C4	6.8	1.4	9.68	16.6	23.7	1.5	0.17	1.3	1.20	0.6	16.9	0.6	0.78	1.4
C5	5.0	1.0	6.75	8.4	24.8	1.1	0.17	1.0	1.13	0.4	21.0	0.5	0.79	1.0
C6	2.9	0.6	5.75	4.1	23.5	0.6	0.18	0.6	1.16	0.3	25.0	0.4	0.67	0.5
Ro Tail	444.7	88.5	0.55	61.3	20.7	83.0	0.10	50.8	0.37	12.6	41.8	95.6	0.82	94.3
CALC	502.6	100.00	0.79	100.0	22.1	100.0	0.17	100.0	2.59	100.0	38.7	100.0	0.77	100.0
ASSAY HEAD			0.78		22.1		0.16		2.43		37.9		0.77	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T61 S Ro Conc	36.2	7.2	0.25	2.27	38.0	12.4	1.07	44.2	30.5	84.8	10.5	1.95	0.16	1.50
Sn Ro C1	3.1	0.6	5.62	4.3	25.1	0.7	0.30	1.0	2.75	0.6	20.7	0.3	0.86	0.7
C2	5.2	1.0	4.67	6.1	23.5	1.1	0.28	1.6	2.60	1.0	25.0	0.7	0.75	1.0
C3	7.0	1.4	4.19	7.4	22.9	1.5	0.26	2.1	2.29	1.2	27.0	1.0	0.71	1.3
C4	13.9	2.8	6.90	23.9	23.3	2.9	0.21	3.4	1.75	1.9	22.0	1.6	0.74	2.7
C5	18.8	3.7	6.86	32.4	23.7	4.0	0.20	4.4	1.59	2.3	21.7	2.1	0.76	3.7
C6	21.7	4.3	6.71	36.5	23.7	4.6	0.20	5.0	1.53	2.6	22.2	2.5	0.74	4.2

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T61 S Ro Conc	36.2	7.2	0.33	2.2	1.34	2.8	2.35	2.4
Sn Ro C1	3.1	0.6	1.75	1.0	3.10	0.5	6.77	0.6
C2	2.2	0.4	1.75	0.7	3.51	0.4	8.54	0.5
C3	1.8	0.4	1.70	0.6	3.66	0.4	8.75	0.4
C4	2.2	1.4	1.75	2.2	3.51	1.4	8.54	1.7
C5	1.8	1.0	1.70	1.5	3.66	1.0	8.75	1.2
C6	1.8	0.6	1.70	0.9	3.66	0.6	8.75	0.7
Ro Tail	444.7	88.5	1.13	91.0	3.66	92.9	7.34	92.4
CALC	493.7	100.00	1.10	100.0	3.49	100.0	7.03	100.0
ASSAY HEAD			1.12		3.38		6.89	

CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T61 S Ro Conc	36.2	7.2	0.33	2.2	1.34	2.8	2.35	2.4
Sn Ro C1	3.1	0.6	1.75	1.0	3.10	0.5	6.77	0.6
C2	5.2	1.0	1.75	1.7	3.27	1.0	7.50	1.1
C3	7.0	1.4	1.74	2.2	3.37	1.4	7.82	1.6
C4	13.9	2.8	1.74	4.4	3.44	2.7	8.18	3.2
C5	18.8	3.7	1.73	5.9	3.50	3.8	8.33	4.4
C6	21.7	4.3	1.73	6.8	3.52	4.4	8.38	5.2

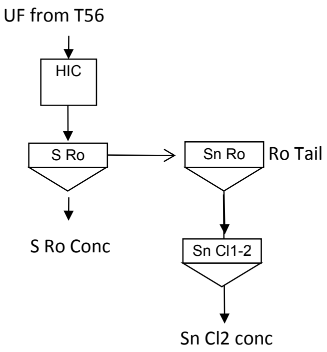
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T62
DATE	02/12/14
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
UF from T56

NOTES
UF from T56

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	400		200					5					
Water Change														
Conditioning			50						3					
S Ro C	5.2						59			7-9	6.0	6.0	175	
Condition	4.0	180		200					3					
Condition	3.9				300				3					
Condition	4.1					300			3					
Sn Ro C1											9.0	9.0	380	
Condition						100			3					
Sn Ro C2	4.3						20			7-8	3.0	12.0	120	
Sn Cl1 Conc	4.6									3-9	9.5	21.5	250	
Sn Cl2 C1	5.5									1-4	2.0	14.0	20	17
Sn Cl2 C2	5.5									4-8	2.5		30	11
Sn Cl2 C3	5.5									5-7	5.0		60	7
REAGENT TOTALS (g/t)		**580**	**50**	**400**	**300**	**400**	79							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T62 S Ro C	33.3	6.7	0.23	2.1	39.0	11.9	1.13	48.5	31.6	81.0	9.69	1.7	0.15	1.3
Sn Cl2 C1	3.5	0.7	20.6	19.4	25.4	0.8	0.14	0.6	0.71	0.2	6.48	0.1	0.37	0.3
Sn Cl2 C2	3.2	0.6	17.9	15.6	25.4	0.8	0.16	0.7	1.40	0.3	7.90	0.1	0.38	0.3
Sn Cl2 C3	4.0	0.8	12.8	13.9	30.8	1.1	0.15	0.8	1.25	0.4	8.90	0.2	0.43	0.5
Sn Cl2 Tail	11.3	2.3	2.88	8.8	34.3	3.5	0.14	2.0	1.12	1.0	15.2	0.9	0.80	2.4
Sn Cl1 Tail	13.8	2.8	1.97	7.4	30.6	3.9	0.16	2.8	1.04	1.1	19.8	1.4	1.13	4.1
Ro Tail	431.3	86.2	0.28	32.7	19.8	78.0	0.08	44.5	0.48	15.9	42.3	95.5	0.80	91.1
CALC	500.4	100.0	0.74	100.0	21.8	100.0	0.15	100.0	2.59	100.0	38.2	100.0	0.76	100.0
ASSAY HEAD			0.78		22.1		0.16		2.43		37.9		0.77	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T62 S Ro C	33.3	6.7	0.23	2.08	39.0	11.9	1.13	48.5	31.6	81.0	9.69	1.69	0.15	1.32
Sn Cl2 C1	3.5	0.7	20.6	19.4	25.4	0.8	0.14	0.6	0.71	0.2	6.48	0.1	0.37	0.3
Sn Cl2 C2	6.7	1.3	19.3	35.1	25.4	1.6	0.15	1.3	1.04	0.5	7.16	0.3	0.37	0.7
Sn Cl2 C3	10.7	2.1	16.8	49.0	27.4	2.7	0.15	2.1	1.12	0.9	7.81	0.4	0.40	1.1
Sn Cl2 Tail	22.0	4.4	9.68	57.8	31.0	6.2	0.14	4.1	1.12	1.9	11.6	1.3	0.60	3.5
Sn Cl1 Tail	35.8	7.2	6.71	65.2	30.8	10.1	0.15	7.0	1.09	3.0	14.7	2.8	0.81	7.6
Ro Tail	467.1	93.3	0.77	97.9	20.6	88.1	0.09	51.5	0.53	19.0	40.2	98.3	0.80	98.7

PRODUCTS	WT g	WT %	CaO	DIST	MgO %	DIST	Al2O3	DIST
T62 S Ro C	33.3	6.7	0.30	1.2	1.09	4.3	2.09	4.7
Sn Cl2 C1	3.5	0.7	2.85	1.2	1.40	0.6	2.30	0.5
Sn Cl2 C2	3.2	0.6	2.17	0.8	1.54	0.6	2.71	0.6
Sn Cl2 C3	4.0	0.8	1.80	0.8	1.76	0.8	3.02	0.8
Sn Cl2 Tail	3.2	2.3	2.17	2.9	1.54	2.0	2.71	2.1
Sn Cl1 Tail	4.0	2.8	1.80	2.9	1.76	2.8	3.02	2.8
Ro Tail	4.0	86.2	1.80	90.3	1.76	88.9	3.02	88.4
CALC	55.30	100.0	1.72	100.0	1.71	100.0	2.94	100.0
ASSAY HEAD			1.12		3.38		6.89	

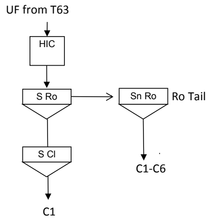
CUM PRODUCTS	CUM Wt	WT %	CaO	CUM	MgO %	CUM	Al2O3	CUM
T62 S Ro C	33.3	6.7	0.30	1.2	1.09	4.3	2.09	4.7
Sn Cl2 C1	3.5	0.7	2.85	1.2	1.40	0.6	2.30	0.5
Sn Cl2 C2	6.7	1.3	2.52	2.0	1.47	1.2	2.50	1.1
Sn Cl2 C3	10.7	2.1	2.25	2.8	1.58	2.0	2.69	2.0
Sn Cl2 Tail	22.0	4.4	2.21	5.7	1.56	4.0	2.70	4.0
Sn Cl1 Tail	35.8	7.2	2.05	8.6	1.64	6.9	2.82	6.9
Ro Tail	467.1	93.3	1.82	98.8	1.75	95.7	3.00	95.3

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T64
DATE	04/12/14
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
UF from T63

NOTES
UF from T63 Cut at 6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	397		199					5					
Water Change														
Conditioning			50						3					
S Ro C	5.1						59			7-9	7.5	7.5	300	
Condition														
S Cl1 C1	6.3						10			6-9	3.0	10.5	120	25
Condition	5.2	179		199					3					
Condition	4.2				298				3					
Condition	4.4					298			3					
Sn Ro C1											3.0	3.0	125	6
Sn Ro C2	4.5									9-10	3.0	6.0	130	5
Sn Ro C3	4.6									10-12	3.0	9.0	135	5
Condition						99			3					
Sn Ro C4	4.7									9-12	3.0	12.0	150	8
Sn Ro C5	4.8						20			9-11	3.0	15.0	150	7
Sn Ro C6	4.8									9-11	3.0	18.0	130	6
REAGENT TOTALS (g/t)		**576**	**50**	**397**	**298**	**397**	88							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T64 S Cl1 C1	29.9	5.9	0.13	1.1	40.5	11.4	1.45	57.4	36.5	80.5	6.90	1.1	0.08	0.7
S Cl1 Tail	11.1	2.2	0.52	1.7	27.1	2.8	0.54	7.9	8.62	7.1	28.9	1.6	0.43	1.4
Sn Ro C1	6.9	1.4	8.80	17.4	22.6	1.5	0.15	1.4	2.77	1.4	24.5	0.9	0.47	1.0
C2	6.3	1.3	7.66	13.9	23.0	1.4	0.12	1.0	2.07	1.0	26.2	0.8	0.50	0.9
C3	6.2	1.2	6.11	10.9	23.0	1.3	0.11	0.9	1.82	0.8	27.2	0.9	0.50	0.9
C4	11.3	2.2	4.50	14.6	28.4	3.0	0.11	1.6	1.03	0.9	24.0	1.4	0.61	2.1
C5	10.3	2.0	2.96	8.7	28.7	2.8	0.10	1.4	1.08	0.8	23.0	1.2	0.63	1.9
C6	7.5	1.5	2.05	4.4	29.7	2.1	0.10	1.0	0.96	0.5	23.7	0.9	0.70	1.6
Ro Tail	414.1	82.2	0.23	27.4	19.0	73.8	0.05	27.4	0.23	7.0	43.2	91.3	0.72	89.4
CALC	503.5	100.0	0.69	100.0	21.1	100.0	0.15	100.0	2.69	100.0	38.9	100.0	0.66	100.0
ASSAY HEAD			0.76		21.5		0.17		2.55		39.3		0.68	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T64 S Cl1 C1	29.9	5.9	0.13	1.12	40.5	11.4	1.45	57.4	36.5	80.5	6.90	1.05	0.08	0.72
S Cl1 Tail	41.0	8.1	0.24	2.8	36.9	14.2	1.20	65.3	29.0	87.6	12.9	2.7	0.17	2.1
Sn Ro C1	6.9	1.4	8.80	17.4	22.6	1.5	0.15	9.3	2.77	1.4	24.5	0.9	0.47	1.0
C2	13.2	2.6	8.26	31.3	22.8	2.8	0.14	10.3	2.44	2.4	25.3	1.7	0.48	1.9
C3	19.4	3.9	7.57	42.2	22.9	4.2	0.13	11.2	2.24	3.2	25.9	2.6	0.49	2.8
C4	30.7	6.1	6.44	56.7	24.9	7.2	0.12	12.8	1.79	4.1	25.2	3.9	0.53	4.9
C5	40.9	8.1	5.57	65.5	25.8	9.9	0.12	14.2	1.62	4.9	24.7	5.1	0.56	6.8
C6	48.4	9.6	5.02	69.9	26.4	12.0	0.11	15.2	1.51	5.4	24.5	6.1	0.58	8.4

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T64 S Cl1 C1	29.9	5.9	0.18	1.0	0.81	1.3	1.42	1.1
S Cl1 Tail	11.1	2.2	0.97	2.1	3.32	2.0	6.79	1.9
Sn Ro C1	6.9	1.4	0.59	0.8	2.75	1.0	6.86	1.2
C2	6.3	1.3	0.70	0.9	2.81	1.0	6.89	1.1
C3	6.2	1.2	0.73	0.9	2.97	1.0	6.97	1.1
C4	6.3	2.2	0.70	1.5	2.81	1.7	6.89	2.0
C5	6.2	2.0	0.73	1.5	2.97	1.7	6.97	1.8
C6	6.2	1.5	0.73	1.1	2.97	1.2	6.97	1.3
Ro Tail	414.1	82.2	1.12	90.3	3.92	89.0	8.30	88.4
CALC	493.2	100.0	1.02	100.0	3.62	100.0	7.73	100.0
ASSAY HEAD			1.05		3.68		7.68	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T64 S Cl1 C1	29.9	5.9	0.18	1.0	0.81	1.3	1.42	1.1
S Cl1 Tail	41.0	8.1	0.39	3.1	1.49	3.3	2.87	3.0
Sn Ro C1	6.9	1.4	0.59	0.8	2.75	1.0	6.86	1.2
C2	13.2	2.6	0.64	1.6	2.78	2.0	6.87	2.3
C3	19.4	3.9	0.67	2.5	2.84	3.0	6.91	3.4
C4	30.7	6.1	0.68	4.1	2.83	4.8	6.90	5.4
C5	40.9	8.1	0.69	5.5	2.86	6.4	6.92	7.3
C6	48.4	9.6	0.70	6.6	2.88	7.6	6.93	8.6

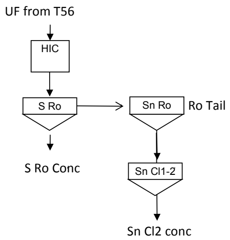
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T65
DATE	05/12/14
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
UF from T56

NOTES
UF from T56 12 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	199		199					5					
Water Change														
Conditioning			50						3					
S Ro C	5.0						59			7-9	6.0	6.0	175	
Condition	4.0	100		199					3					
Condition	3.9				299				3					
Condition	4.1					299			3					
Sn Ro C1											9.0	9.0	390	
Condition						100			3					
Sn Ro C2	4.3						20			7-8	9.5	18.5	430	
Sn Cl1 Conc	4.8									3-11	9.0	27.5	350	
Sn Cl2 C1	5.5									1-4	2.0	20.5	20	16
Sn Cl2 C2	5.5									4-8	2.5		30	8
Sn Cl2 C3	5.5									5-7	5.0		60	5
REAGENT TOTALS (g/t)		**299**	**50**	**398**	**299**	**398**	79							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T65 S Ro C	34.3	6.8	0.24	2.1	38.7	11.9	0.97	44.3	30.9	78.8	10.3	1.8	0.16	1.4
Sn Cl2 C1	3.1	0.6	19.8	15.6	25.4	0.7	0.19	0.8	1.00	0.2	6.84	0.1	0.48	0.4
Sn Cl2 C2	2.5	0.5	16.9	10.6	24.4	0.5	0.20	0.7	1.74	0.3	8.29	0.1	0.44	0.3
Sn Cl2 C3	3.2	0.6	15.0	12.1	26.7	0.8	0.22	0.9	1.58	0.4	9.36	0.2	0.49	0.4
Sn Cl2 Tail	10.5	2.1	4.97	13.3	31.9	3.0	0.22	3.1	1.61	1.3	13.0	0.7	0.89	2.5
Sn Cl1 Tail	21.2	4.2	2.34	12.6	29.2	5.6	0.17	4.8	1.16	1.8	21.3	2.4	1.10	6.1
Ro Tail	427.4	85.1	0.31	33.6	20.2	77.5	0.08	45.5	0.54	17.2	42.1	94.7	0.79	88.9
CALC	502.2	100.0	0.78	100.0	22.2	100.0	0.15	100.0	2.68	100.0	37.8	100.0	0.76	100.0
ASSAY HEAD			0.78		22.1		0.16		2.43		37.9		0.77	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T65 S Ro C	34.3	6.8	0.24	2.09	38.7	11.9	0.97	44.3	30.9	78.8	10.3	1.85	0.16	1.44
Sn Cl2 C1	3.1	0.6	19.8	15.6	25.4	0.7	0.19	0.8	1.00	0.2	6.84	0.1	0.48	0.4
Sn Cl2 C2	5.6	1.1	18.5	26.3	25.0	1.3	0.19	1.4	1.33	0.6	7.48	0.2	0.46	0.7
Sn Cl2 C3	8.8	1.8	17.2	38.4	25.6	2.0	0.20	2.4	1.42	0.9	8.16	0.4	0.47	1.1
Sn Cl2 Tail	19.3	3.8	10.5	51.7	29.0	5.0	0.21	5.5	1.52	2.2	10.8	1.1	0.70	3.6
Sn Cl1 Tail	40.5	8.1	6.25	64.3	29.1	10.6	0.19	10.2	1.33	4.0	16.3	3.5	0.91	9.7
Ro Tail	467.9	93.2	0.82	97.9	21.0	88.1	0.09	55.7	0.61	21.2	39.9	98.2	0.80	98.6

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T65 S Ro C	34.3	6.8	0.29	0.9	1.17	4.4	2.29	4.9
Sn Cl2 C1	3.1	0.6	3.34	1.0	1.56	0.5	2.51	0.5
Sn Cl2 C2	2.5	0.5	2.52	0.6	1.65	0.5	2.97	0.5
Sn Cl2 C3	3.2	0.6	2.21	0.7	1.85	0.7	3.29	0.7
Sn Cl2 Tail	2.5	2.1	2.52	2.5	1.65	1.9	2.97	1.9
Sn Cl1 Tail	3.2	4.2	2.21	4.5	1.85	4.3	3.29	4.3
Ro Tail	3.2	85.1	2.21	89.8	1.85	87.6	3.29	87.3
CALC	51.95	100.0	2.09	100.0	1.80	100.0	3.21	100.0
ASSAY HEAD			1.12		3.38		6.89	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T65 S Ro C	34.3	6.8	0.29	0.9	1.17	4.4	2.29	4.9
Sn Cl2 C1	3.1	0.6	3.34	1.0	1.56	0.5	2.51	0.5
Sn Cl2 C2	5.6	1.1	2.98	1.6	1.60	1.0	2.71	0.9
Sn Cl2 C3	8.8	1.8	2.70	2.3	1.69	1.6	2.92	1.6
Sn Cl2 Tail	19.3	3.8	2.60	4.8	1.67	3.6	2.95	3.5
Sn Cl1 Tail	40.5	8.1	2.40	9.2	1.76	7.9	3.13	7.9
Ro Tail	467.9	93.2	2.23	99.1	1.84	95.6	3.28	95.1

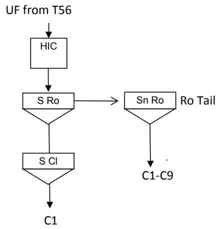
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T67
DATE	15/12/14
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T63

NOTES
UF from T63 Cut at 6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	499		200					5					
Water Change														
Conditioning			50						3					
S Ro C	5.3						59			7-9	7.5	7.5	300	
Condition														
S Cl1 C1	6.3						10			6-9	3.0	10.5	120	23
Condition	5.6	120		200					3					
Condition	4.2				300				3					
Condition	4.4					300			3					
Sn Ro C1							10				15.0	15.0	670	
Condition	4.5					100			3					
Sn Ro C2	4.7									10-12	15.0	30.0	730	
Condition														
Sn Cl1 C	5.1									9-12	3.0	33.0	330	
Sn Cl2 C1	5.7						20			9-11	3.0	36.0	20	8
Sn Cl2 C2										9-11	3.0	39.0	30	6
Sn Cl2 C3	5.7									9-11	3.0	42.0	65	3
REAGENT TOTALS (g/t)		**619**	**50**	**399**	**300**	**399**	99							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T67 S Cl1 C1	27.6	5.5	0.15	1.2	40.3	10.2	1.34	44.6	36.4	76.3	7.36	1.0	0.08	0.6
S Cl1 Tail	12.4	2.5	0.58	2.1	28.7	3.3	0.82	12.3	9.65	9.1	25.8	1.6	0.38	1.4
Sn Cl2 C1	1.5	0.3	21.7	9.4	18.5	0.3	0.29	0.5	1.89	0.2	11.0	0.1	0.28	0.1
C2	1.9	0.4	19.2	10.6	20.1	0.4	0.25	0.6	1.51	0.2	12.4	0.1	0.30	0.2
C3	2.1	0.4	14.5	8.9	22.1	0.4	0.24	0.6	2.49	0.4	15.3	0.2	0.33	0.2
Sn Cl2 Tail	8.8	1.8	3.63	9.2	25.5	2.1	0.21	2.2	2.37	1.6	26.7	1.2	0.49	1.3
Sn Cl1 Tail	41.3	8.2	2.06	24.6	23.6	8.9	0.20	10.0	1.34	4.2	32.4	6.6	0.66	7.9
Ro Tail	405.0	80.9	0.29	33.9	20.1	74.5	0.06	29.3	0.26	8.0	45.0	89.4	0.75	88.3
CALC	500.7	100.0	0.69	100.0	21.8	100.0	0.17	100.0	2.63	100.0	40.7	100.0	0.69	100.0
ASSAY HEAD			0.76		21.5		0.17		2.55		39.3		0.68	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T67 S Cl1 C1	27.6	5.5	0.15	1.20	40.3	10.2	1.34	44.6	36.4	76.3	7.36	1.00	0.08	0.64
S Cl1 Tail	40.0	8.0	0.28	3.3	36.7	13.4	1.18	56.8	28.1	85.4	13.1	2.6	0.17	2.0
Sn Cl2 C1	1.5	0.3	21.7	9.4	18.5	0.3	0.29	12.8	1.89	0.2	11.0	0.1	0.28	0.1
C2	3.4	0.7	20.3	20.0	19.4	0.6	0.27	13.4	1.68	0.4	11.8	0.2	0.29	0.3
C3	5.6	1.1	18.0	29.0	20.4	1.0	0.26	14.0	1.99	0.8	13.1	0.4	0.31	0.5
Sn Cl2 Tail	14.4	2.9	9.21	38.2	23.5	3.1	0.23	16.2	2.22	2.4	21.4	1.5	0.42	1.7
Sn Cl1 Tail	55.7	11.1	3.90	62.8	23.6	12.0	0.21	26.2	1.57	6.6	29.6	8.1	0.60	9.7

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T67 S Cl1 C1	27.6	5.5	0.19	2.9	1.11	3.2	1.55	2.1	0.79	1.5
S Cl1 Tail	12.4	2.5	0.64	4.3	3.15	4.1	5.94	3.6	2.44	2.1
Sn Cl2 C1	1.5	0.3	0.35	0.3	1.52	0.2	3.13	0.2	1.94	0.2
C2	1.9	0.4	0.35	0.4	1.68	0.3	3.53	0.3	2.13	0.3
C3	2.1	0.4	0.37	0.4	1.92	0.4	4.20	0.4	2.55	0.4
Sn Cl2 Tail	1.9	1.8	0.35	1.7	1.68	1.6	3.53	1.5	2.93	1.8
Sn Cl1 Tail	2.1	8.2	0.37	8.3	1.92	8.3	4.20	8.5	3.21	9.4
Ro Tail	2.1	80.9	0.37	81.7	1.92	81.8	4.20	83.3	2.93	84.2
CALC	51.76	100.0	0.37	100.0	1.90	100.0	4.08	100.0	2.82	100.0
ASSAY HEAD			1.05		3.68		7.68		2.79	

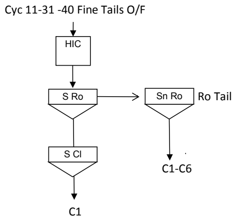
CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T67 S Cl1 C1	27.6	5.5	0.19	2.9	1.11	3.2	1.55	2.1	0.79	1.5
S Cl1 Tail	40.0	8.0	0.33	7.2	1.74	7.3	2.91	5.7	1.30	3.7
Sn Cl2 C1	1.5	0.3	0.35	0.3	1.52	0.2	3.13	0.2	1.94	0.2
C2	3.4	0.7	0.35	0.7	1.61	0.6	3.35	0.6	2.05	0.5
C3	5.6	1.1	0.36	1.1	1.73	1.0	3.68	1.0	2.24	0.9
Sn Cl2 Tail	14.4	2.9	0.35	2.8	1.70	2.6	3.59	2.5	2.66	2.7
Sn Cl1 Tail	55.7	11.1	0.37	11.1	1.86	10.9	4.04	11.0	3.07	12.1

PROJECT	T0879
TEST NO	T68
DATE	13/01/15
TECHNICIAN	MW

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
Cyc 11-31 -40 Fine Tails O/F

NOTES
Cyc 11-31 -40 Fine Tails O/F

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	298		198					5					
Water Change														
Conditioning			50						3					
S Ro C	5.3						59			7-15	15.0	15.0	560	
Condition														
S Cl1 C1	5.8									6-9	3.0	18.0	120	21
Condition	5.4	298		198					3					
Condition	4.2				298				3					
Condition	4.4					298			3					
Sn Ro C1							9.8214				4.0	4.0	125	6
Sn Ro C2	4.6									9-10	3.5	7.5	130	5
Sn Ro C3	4.7									10-12	3.0	10.5	135	5
Condition						99			3					
Sn Ro C4	4.6									9-12	3.0	13.5	150	7
Sn Ro C5	4.8						20			9-11	3.0	16.5	150	6
Sn Ro C6	4.8									9-11	3.0	19.5	130	6
REAGENT TOTALS (g/t)		**595**	**50**	**397**	**298**	**397**	**88**							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T68 S Cl1 C1	24.9	4.9	0.14	1.2	38.2	9.2	1.52	42.1	36.2	65.5	7.43	1.0	0.05	0.6
S Cl1 Tail	21.7	4.3	0.43	3.3	23.9	5.0	0.38	9.2	7.53	11.9	32.6	3.7	0.27	2.8
Sn Ro C1	7.3	1.4	3.38	8.7	25.1	1.8	0.17	1.4	3.99	2.1	28.3	1.1	0.33	1.2
C2	6.9	1.4	2.79	6.8	24.0	1.6	0.15	1.2	2.70	1.4	30.8	1.1	0.34	1.1
C3	6.4	1.3	2.20	5.0	23.1	1.4	0.14	1.0	2.58	1.2	32.2	1.1	0.34	1.0
C4	9.9	2.0	2.65	9.3	25.8	2.5	0.15	1.7	1.85	1.3	29.6	1.5	0.39	1.9
C5	8.7	1.7	2.52	7.8	24.6	2.1	0.13	1.3	2.38	1.5	28.0	1.3	0.37	1.5
C6	7.7	1.5	2.08	5.7	23.8	1.8	0.13	1.1	1.99	1.1	30.5	1.2	0.37	1.4
Ro Tail	410.5	81.4	0.36	52.3	18.9	74.7	0.09	41.1	0.47	14.0	41.6	88.2	0.45	88.5
CALC	504.0	100.0	0.56	100.0	20.5	100.0	0.18	100.0	2.73	100.0	38.4	100.0	0.41	100.0
ASSAY HEAD			0.56		20.9		0.19		2.56		38.7		0.43	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T68 S Cl1 C1	24.9	4.9	0.14	1.23	38.2	9.18	1.52	42.1	36.2	65.5	7.43	0.96	0.05	0.60
S Cl1 Tail	46.6	9.2	0.28	4.5	31.5	14.2	0.99	51.3	22.8	77.4	19.2	4.6	0.15	3.4
Sn Ro C1	7.3	1.4	3.38	8.7	25.1	1.8	0.17	10.6	3.99	2.1	28.3	1.1	0.33	1.2
C2	14.2	2.8	3.09	15.5	24.6	3.4	0.16	11.7	3.36	3.5	29.5	2.2	0.33	2.3
C3	20.6	4.1	2.82	20.5	24.1	4.8	0.15	12.7	3.12	4.7	30.3	3.2	0.34	3.3
C4	30.5	6.1	2.76	29.8	24.7	7.3	0.15	14.4	2.71	6.0	30.1	4.7	0.35	5.2
C5	39.2	7.8	2.71	37.5	24.6	9.3	0.15	15.6	2.63	7.5	29.6	6.0	0.36	6.7
C6	46.9	9.3	2.61	43.2	24.5	11.1	0.14	16.7	2.53	8.6	29.8	7.2	0.36	8.1

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T68 S Cl1 C1	24.9	4.9	0.14	0.8	1.43	1.8	1.54	0.8
S Cl1 Tail	21.7	4.3	0.65	3.2	4.11	4.4	9.38	4.2
Sn Ro C1	7.3	1.4	0.47	0.8	3.34	1.2	8.59	1.3
C2	6.9	1.4	0.54	0.9	3.56	1.2	9.27	1.3
C3	6.4	1.3	0.58	0.8	3.73	1.2	9.75	1.3
C4	6.9	2.0	0.54	1.2	3.56	1.7	9.27	1.9
C5	6.4	1.7	0.58	1.2	3.73	1.6	9.75	1.8
C6	6.4	1.5	0.58	1.0	3.73	1.4	9.75	1.6
Ro Tail	410.5	81.4	0.96	90.1	4.24	85.5	10.1	85.9
CALC	497.4	100.0	0.87	100.0	4.04	100.0	9.58	100.0
ASSAY HEAD			0.89		4.00		9.49	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T68 S Cl1 C1	24.9	4.9	0.14	0.8	1.43	1.8	1.54	0.8
S Cl1 Tail	46.6	9.2	0.38	4.0	2.68	6.1	5.19	5.0
Sn Ro C1	7.3	1.4	0.47	0.8	3.34	1.2	8.59	1.3
C2	14.2	2.8	0.50	1.6	3.45	2.4	8.92	2.6
C3	20.6	4.1	0.53	2.5	3.53	3.6	9.18	3.9
C4	30.5	6.1	0.53	3.7	3.54	5.3	9.21	5.8
C5	39.2	7.8	0.54	4.9	3.58	6.9	9.33	7.6
C6	46.9	9.3	0.55	5.9	3.61	8.3	9.40	9.1

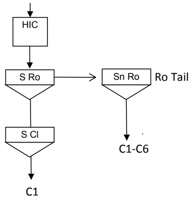
BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T69
DATE	13/01/15
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	

Cyc 11-31 -40 Fine Tails O/F +CS6



PRODUCT FLOATED
Cyc 11-31 -40 Fine Tails O/F +CS6

NOTES
LC01 Cyc 11- 31 Cyclone -40 Fine Tail Comb from centrifuge 6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	783		196					5					
Water Change														
Conditioning			49						3					
S Ro C	5.0						58			7-9	8.5	8.5	440	
Condition														
S Cl1 C1	5.8						10			6-9	3.0	11.5	120	21
Condition	5.2	176		196					3					
Condition	4.2				294				3					
Condition	4.4					294			3					
Sn Ro C1											3.0	3.0	125	7
Sn Ro C2	4.5									9-10	3.0	6.0	130	7
Sn Ro C3	4.6						10			10-12	3.0	9.0	135	6
Condition						98			3					
Sn Ro C4	5.0									9-12	3.0	12.0	150	8
Sn Ro C5	4.6						19			9-11	3.0	15.0	150	7
Sn Ro C6	4.7									9-11	3.0	18.0	130	6
REAGENT TOTALS (g/t)		**959**	**49**	**392**	**294**	**392**	97							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T69 S Cl1 C1	24.8	4.9	0.13	1.1	39.6	9.4	1.61	45.3	36.6	67.5	6.83	0.9	0.05	0.6
S Cl1 Tail	19.2	3.8	0.43	2.9	25.3	4.6	0.42	9.1	7.56	10.8	30.3	2.9	0.27	2.4
Sn Ro C1	9.0	1.8	3.92	12.3	25.7	2.2	0.17	1.7	4.19	2.8	25.2	1.1	0.34	1.4
C2	8.6	1.7	3.55	10.6	24.4	2.0	0.15	1.5	3.16	2.0	27.7	1.2	0.35	1.4
C3	7.6	1.5	2.90	7.7	24.1	1.7	0.14	1.2	2.78	1.6	29.1	1.1	0.36	1.2
C4	11.8	2.3	2.54	10.4	25.2	2.8	0.08	1.1	2.16	1.9	24.0	1.4	0.38	2.0
C5	10.8	2.1	2.13	8.0	25.4	2.6	0.13	1.6	1.95	1.6	28.3	1.5	0.40	2.0
C6	8.2	1.6	1.96	5.6	25.9	2.0	0.13	1.2	1.39	0.8	28.9	1.2	0.42	1.6
Ro Tail	410.7	80.4	0.29	41.4	18.5	72.5	0.08	37.3	0.36	11.0	42.7	88.6	0.47	87.5
CALC	510.7	100.0	0.56	100.0	20.5	100.0	0.17	100.0	2.63	100.0	38.8	100.0	0.43	100.0
ASSAY HEAD			0.57		20.7		0.18		2.85		39.3		0.44	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T69 S Cl1 C1	24.8	4.9	0.13	1.12	39.6	9.38	1.61	45.3	36.6	67.5	6.83	0.86	0.05	0.56
S Cl1 Tail	44.0	8.6	0.26	4.0	33.4	14.0	1.09	54.4	23.9	78.3	17.1	3.8	0.15	2.9
Sn Ro C1	9.0	1.8	3.92	12.3	25.7	2.2	0.17	10.9	4.19	2.8	25.2	1.1	0.34	1.4
C2	17.6	3.4	3.74	22.9	25.1	4.2	0.16	12.3	3.69	4.8	26.4	2.3	0.34	2.8
C3	25.2	4.9	3.49	30.6	24.8	6.0	0.15	13.6	3.41	6.4	27.2	3.5	0.35	4.0
C4	37.0	7.2	3.18	41.0	24.9	8.8	0.13	14.6	3.01	8.3	26.2	4.9	0.36	6.0
C5	47.8	9.4	2.95	49.0	25.0	11.4	0.13	16.2	2.77	9.9	26.7	6.4	0.37	8.0
C6	56.0	11.0	2.80	54.6	25.1	13.4	0.13	17.4	2.57	10.7	27.0	7.6	0.38	9.5

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T69 S Cl1 C1	24.8	4.9	0.15	0.8	1.23	1.5	1.50	0.8
S Cl1 Tail	19.2	3.8	0.60	2.6	3.82	3.6	8.52	3.4
Sn Ro C1	9.0	1.8	0.44	0.9	3.09	1.4	7.38	1.4
C2	8.6	1.7	0.51	1.0	3.24	1.4	7.96	1.4
C3	7.6	1.5	0.54	0.9	3.39	1.3	8.32	1.3
C4	8.6	2.3	0.51	1.3	3.24	1.9	7.96	2.0
C5	7.6	2.1	0.54	1.3	3.39	1.8	8.32	1.9
C6	7.6	1.6	0.54	1.0	3.39	1.4	8.32	1.4
Ro Tail	410.7	80.4	0.99	90.2	4.21	85.7	10.0	86.3
CALC	503.7	100.0	0.88	100.0	3.95	100.0	9.32	100.0
ASSAY HEAD			0.91		4.02		9.32	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T69 S Cl1 C1	24.8	4.9	0.15	0.8	1.23	1.5	1.50	0.8
S Cl1 Tail	44.0	8.6	0.35	3.4	2.36	5.1	4.56	4.2
Sn Ro C1	9.0	1.8	0.44	0.9	3.09	1.4	7.38	1.4
C2	17.6	3.4	0.47	1.9	3.16	2.8	7.66	2.8
C3	25.2	4.9	0.49	2.8	3.23	4.0	7.86	4.2
C4	37.0	7.2	0.50	4.1	3.23	5.9	7.89	6.1
C5	47.8	9.4	0.51	5.4	3.27	7.7	7.99	8.0
C6	56.0	11.0	0.51	6.4	3.29	9.1	8.04	9.5

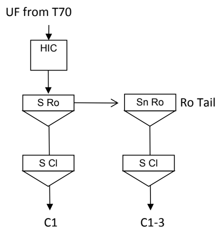
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T71
DATE	230115
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T70

NOTES
LC01 Cyc 11- 31 Cyclone
-40 Fine Tail Comb
UF from T70
6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	592		197					5					
Water Change														
Conditioning			49						3					
S Ro C	5.4						59			7-9	7.5	7.5	300	
Condition														
S Cl1 C1	6.4						10			3-7	3.0	10.5	120	23
Condition	5.6	197		197					3					
Condition	4.2				296				3					
Condition	4.4					296			3					
Sn Ro C1							20				15.0	15.0	670	
Condition	4.8					99			3					
Sn Ro C2	4.9									10-12	15.0	30.0	730	
Condition														
Sn Cl1 C	5.0									9-12	6.0	36.0	330	
Sn Cl2 C1	5.6									0.5-1	1.0	37.0	20	6
Sn Cl2 C2										1-2	1.5	38.5	30	6
Sn Cl2 C3	5.7									2-5	3.0	41.5	60	4
REAGENT TOTALS (g/t)		**789**	**49**	**395**	**296**	**395**	88							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T71 S Cl1 C1	27.2	5.4	0.15	1.3	40.8	10.3	1.48	47.6	37.3	72.0	6.92	5.2	0.06	0.7
S Cl1 Tail	12.6	2.5	0.46	1.9	27.7	3.2	0.61	9.1	11.8	10.6	27.0	9.5	0.26	1.4
Sn Cl2 C1	1.2	0.2	20.8	8.1	20.0	0.2	0.14	0.2	2.50	0.2	11.8	0.4	0.22	0.1
C2	1.9	0.4	17.9	10.7	21.8	0.4	0.12	0.3	2.51	0.3	12.6	0.7	0.24	0.2
C3	2.5	0.5	13.4	10.8	24.0	0.6	0.14	0.4	3.11	0.6	14.9	1.0	0.26	0.3
Sn Cl2 Tail	9.8	1.9	4.11	12.9	26.5	2.4	0.15	1.7	2.45	1.7	26.1	7.1	0.32	1.3
Sn Cl1 Tail	45.5	9.0	1.22	17.8	22.1	9.3	0.13	7.0	1.85	6.0	35.0	44.4	0.37	7.1
Ro Tail	406.0	80.1	0.28	36.5	19.5	73.5	0.07	33.6	0.30	8.6	2.80	31.7	0.52	88.9
CALC	506.7	100.0	0.62	100.0	21.2	100.0	0.17	100.0	2.78	100.0	7.08	100.0	0.47	100.0
ASSAY HEAD			0.64		21.2		0.18		2.86		39.0		0.47	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T71 S Cl1 C1	27.2	5.4	0.15	1.31	40.8	10.3	1.48	47.6	37.3	72.0	6.92	5.24	0.06	0.69
S Cl1 Tail	39.8	7.9	0.25	3.2	36.7	13.5	1.20	56.7	29.2	82.6	13.3	14.7	0.12	2.1
Sn Cl2 C1	1.2	0.2	20.8	8.1	20.0	0.2	0.14	9.3	2.50	0.2	11.8	0.4	0.22	0.1
C2	3.1	0.6	19.0	18.8	21.1	0.6	0.13	9.6	2.51	0.5	12.3	1.1	0.23	0.3
C3	5.6	1.1	16.5	29.7	22.4	1.2	0.13	10.0	2.78	1.1	13.4	2.1	0.24	0.6
Sn Cl2 Tail	15.4	3.0	8.62	42.6	25.0	3.6	0.14	11.7	2.57	2.8	21.5	9.2	0.29	1.9
Sn Cl1 Tail	60.9	12.0	3.09	60.4	22.8	12.9	0.13	18.7	2.03	8.8	31.6	53.6	0.35	9.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T71 S Cl1 C1	27.2	5.4	0.17	2.8	1.13	3.2	1.44	2.0	0.61	1.3
S Cl1 Tail	12.6	2.5	0.58	4.4	3.31	4.4	6.97	4.6	2.02	1.9
Sn Cl2 C1	1.2	0.2	0.33	0.2	1.64	0.2	3.14	0.2	2.08	0.2
C2	1.9	0.4	0.32	0.4	1.73	0.3	3.38	0.3	2.24	0.3
C3	2.5	0.5	0.33	0.5	1.89	0.5	3.85	0.5	2.63	0.5
Sn Cl2 Tail	1.9	1.9	0.32	1.9	1.73	1.8	3.38	1.7	2.71	2.0
Sn Cl1 Tail	2.5	9.0	0.33	9.1	1.89	9.0	3.85	9.1	2.57	8.9
Ro Tail	2.5	80.1	0.33	80.8	1.89	80.5	3.85	81.5	2.73	84.8
CALC	52.32	100.0	0.33	100.0	1.88	100.0	3.79	100.0	2.58	100.0
ASSAY HEAD			0.95		3.86		8.42		2.50	

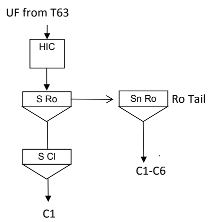
CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T71 S Cl1 C1	27.2	5.4	0.17	2.8	1.13	3.2	1.44	2.0	0.61	1.3
S Cl1 Tail	39.8	7.9	0.30	7.2	1.82	7.6	3.19	6.6	1.06	3.2
Sn Cl2 C1	1.2	0.2	0.33	0.2	1.64	0.2	3.14	0.2	2.08	0.2
C2	3.1	0.6	0.32	0.6	1.69	0.5	3.29	0.5	2.18	0.5
C3	5.6	1.1	0.33	1.1	1.78	1.0	3.54	1.0	2.38	1.0
Sn Cl2 Tail	15.4	3.0	0.32	3.0	1.75	2.8	3.44	2.8	2.59	3.1
Sn Cl1 Tail	60.9	12.0	0.33	12.0	1.85	11.9	3.75	11.9	2.58	12.0

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T72
DATE	280115
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
S Cl1	1.5	Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
UF from T70

NOTES
LC01 Cyc 11- 31 Cyclone
-40 Fine Tail Comb
UF from T70
6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	3.1	394		197					5					
Water Change														
Conditioning			49						3					
S Ro C	5.6						59			7-9	7.5	7.5	300	
Condition														
S Cl1 C1	6.7						10			6-9	3.0	10.5	120	22
Condition	5.9	177		197					3					
Condition	4.7				296				3					
Condition	4.9					296			3					
Sn Ro C1											3.0	3.0	125	6
Sn Ro C2	5.1									9-10	3.0	6.0	130	5
Sn Ro C3	5.2									10-12	3.0	9.0	135	8
Condition						99			3					
Sn Ro C4	5.1									9-12	3.0	12.0	150	6
Sn Ro C5	5.2						20			9-11	3.0	15.0	150	5
Sn Ro C6	5.2									9-11	3.0	18.0	130	9
REAGENT TOTALS (g/t)		**572**	**49**	**394**	**296**	**394**	88							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T72 S Cl1 C1	26.6	5.2	0.17	1.3	41.2	10.2	1.54	49.4	36.8	74.5	7.14	0.9	0.08	0.7
S Cl1 Tail	6.8	1.3	0.46	0.9	27.6	1.8	0.71	5.8	12.2	6.3	27.6	0.9	0.34	0.7
Sn Ro C1	6.9	1.4	5.82	12.0	22.4	1.4	0.22	1.8	3.85	2.0	30.7	1.1	0.40	0.9
C2	6.2	1.2	5.10	9.4	21.8	1.3	0.16	1.2	2.57	1.2	31.8	1.0	0.43	0.9
C3	10.2	2.0	3.87	11.8	21.9	2.1	0.15	1.8	2.33	1.8	32.8	1.7	0.44	1.4
C4	9.3	1.8	4.64	12.9	24.0	2.1	0.14	1.6	1.31	0.9	28.9	1.3	0.48	1.4
C5	7.8	1.5	2.91	6.8	23.4	1.7	0.11	1.0	1.51	0.9	31.3	1.2	0.50	1.3
C6	11.9	2.3	2.35	8.3	24.3	2.7	0.12	1.7	1.53	1.4	31.4	1.9	0.51	1.9
Ro Tail	421.7	83.1	0.29	36.5	19.5	76.7	0.07	35.6	0.34	10.9	43.0	90.0	0.67	90.8
CALC	507.4	100.0	0.66	100.0	21.1	100.0	0.16	100.0	2.59	100.0	39.7	100.0	0.61	100.0
ASSAY HEAD			0.64		21.2		0.18		2.86		39.0		0.47	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T72 S Cl1 C1	26.6	5.2	0.17	1.35	41.2	10.2	1.54	49.4	36.8	74.5	7.14	0.94	0.08	0.68
S Cl1 Tail	33.4	6.6	0.23	2.3	38.4	12.0	1.37	55.2	31.8	80.8	11.3	1.9	0.13	1.4
Sn Ro C1	6.9	1.4	5.82	12.0	22.4	1.4	0.22	7.7	3.85	2.0	30.7	1.1	0.40	0.9
C2	13.1	2.6	5.48	21.4	22.1	2.7	0.19	8.8	3.24	3.2	31.2	2.0	0.41	1.7
C3	23.3	4.6	4.77	33.2	22.0	4.8	0.17	10.7	2.84	5.0	31.9	3.7	0.43	3.2
C4	32.6	6.4	4.74	46.1	22.6	6.9	0.16	12.3	2.41	6.0	31.1	5.0	0.44	4.6
C5	40.4	8.0	4.38	52.9	22.7	8.6	0.15	13.3	2.23	6.9	31.1	6.2	0.45	5.9
C6	52.3	10.3	3.92	61.2	23.1	11.3	0.15	15.0	2.07	8.3	31.2	8.1	0.47	7.8

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T72 S Cl1 C1	26.6	5.2	0.17	0.9	1.14	1.6	1.43	0.9
S Cl1 Tail	6.8	1.3	0.62	0.9	3.23	1.1	6.97	1.1
Sn Ro C1	6.9	1.4	0.71	1.0	3.26	1.2	7.29	1.2
C2	6.2	1.2	0.65	0.8	3.32	1.1	7.75	1.1
C3	10.2	2.0	0.61	1.3	3.36	1.8	8.14	2.0
C4	6.2	1.8	0.65	1.2	3.32	1.6	7.75	1.7
C5	10.2	1.5	0.61	1.0	3.36	1.4	8.14	1.5
C6	10.2	2.3	0.61	1.5	3.36	2.1	8.14	2.3
Ro Tail	421.7	83.1	1.07	91.5	4.04	88.3	8.90	88.3
CALC	505.0	100.0	0.97	100.0	3.80	100.0	8.38	100.0
ASSAY HEAD			0.95		3.86		8.42	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T72 S Cl1 C1	26.6	5.2	0.17	0.9	1.14	1.6	1.43	0.9
S Cl1 Tail	33.4	6.6	0.26	1.8	1.57	2.7	2.56	2.0
Sn Ro C1	6.9	1.4	0.71	1.0	3.26	1.2	7.29	1.2
C2	13.1	2.6	0.68	1.8	3.29	2.2	7.51	2.3
C3	23.3	4.6	0.65	3.1	3.32	4.0	7.78	4.3
C4	32.6	6.4	0.65	4.3	3.32	5.6	7.77	6.0
C5	40.4	8.0	0.64	5.3	3.33	7.0	7.85	7.5
C6	52.3	10.3	0.64	6.7	3.33	9.0	7.91	9.7

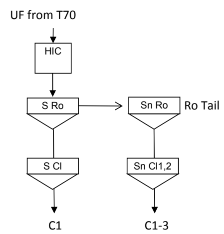
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T73
DATE	050215
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T70

NOTES
LC01 Cyc 11- 31 Cyclone -40 Fine Tail Comb from centrifuge 6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	4.8	391		196					5					
Water Change														
Conditioning			49						3					
S Ro C	5.4						58			6-9	4.5	4.5	300	
Condition														
S Cl1 C1	6.4						10			3-7	3.0	7.5	120	22
Condition	5.6	196		196					3					
Condition	4.3				293				3					
Condition	4.6					293			3					
Sn Ro C1							19				15.0	15.0	670	
Condition	4.8					98			3					
Sn Ro C2	5.1									5-12	15.0	30.0	730	
Condition														
Sn Cl1 C	5.2									2-12	6.0	36.0	330	
Sn Cl2 C1	5.6									0.5-1	1.0	37.0	20	12
Sn Cl2 C2										1-2	1.5	38.5	30	10
Sn Cl2 C3	5.7									2-5	3.0	41.5	60	5
REAGENT TOTALS (g/t)		**587**	**49**	**391**	**293**	**391**	87							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T73 S Cl1 C1	26.5	5.2	0.13	1.1	40.8	10.0	1.46	36.3	37.2	69.6	6.57	0.9	0.06	0.7
S Cl1 Tail	12.5	2.4	0.47	1.9	28.5	3.3	0.74	8.7	13.5	11.9	25.6	1.6	0.27	1.4
Sn Cl2 C1	2.3	0.5	15.9	11.6	24.1	0.5	0.05	0.1	1.94	0.3	13.6	0.2	0.29	0.3
C2	3.0	0.6	12.9	12.2	24.8	0.7	0.18	0.5	1.80	0.4	15.6	0.2	0.31	0.4
C3	3.3	0.6	8.86	9.1	25.9	0.8	0.06	0.2	2.36	0.5	19.7	0.3	0.33	0.4
Sn Cl2 Tail	14.2	2.8	3.33	15.0	26.1	3.4	0.20	2.7	2.07	2.1	28.7	2.1	0.36	2.1
Sn Cl1 Tail	54.0	10.6	1.27	21.7	21.9	11.0	0.21	10.6	1.66	6.3	35.9	9.9	0.40	8.9
Ro Tail	395.6	77.4	0.22	27.5	19.2	70.3	0.11	40.9	0.32	8.9	42.1	84.8	0.53	85.9
CALC	511.4	100.0	0.62	100.0	21.1	100.0	0.21	100.0	2.77	100.0	38.4	100.0	0.48	100.0
ASSAY HEAD			0.62		20.8		0.14		2.58		37.5		0.62	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T73 S Cl1 C1	26.5	5.2	0.13	1.09	40.8	10.0	1.46	36.3	37.2	69.6	6.57	0.89	0.06	0.65
S Cl1 Tail	39.0	7.6	0.24	2.9	36.9	13.3	1.23	45.0	29.6	81.4	12.7	2.5	0.13	2.0
Sn Cl2 C1	2.3	0.5	15.9	11.6	24.1	0.5	0.05	8.8	1.94	0.3	13.6	0.2	0.29	0.3
C2	5.3	1.0	14.2	23.8	24.5	1.2	0.12	9.3	1.86	0.7	14.7	0.4	0.30	0.7
C3	8.6	1.7	12.2	32.9	25.0	2.0	0.10	9.5	2.05	1.2	16.6	0.7	0.31	1.1
Sn Cl2 Tail	22.8	4.4	6.65	47.8	25.7	5.4	0.16	12.2	2.06	3.3	24.1	2.8	0.34	3.2
Sn Cl1 Tail	76.8	15.0	2.86	69.5	23.0	16.4	0.20	22.8	1.78	9.6	32.4	12.7	0.38	12.0

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T73 S Cl1 C1	26.5	5.2	0.16	2.6	0.85	2.3	1.12	1.5	0.66	1.3
S Cl1 Tail	12.5	2.4	0.53	4.1	2.99	3.8	6.35	3.9	1.89	1.8
Sn Cl2 C1	2.3	0.5	0.30	0.4	1.68	0.4	3.04	0.3	3.26	0.6
C2	3.0	0.6	0.30	0.6	1.70	0.5	3.40	0.5	3.37	0.8
C3	3.3	0.6	0.32	0.6	1.96	0.6	4.09	0.7	3.39	0.8
Sn Cl2 Tail	3.0	2.8	0.30	2.6	1.70	2.5	3.40	2.4	3.04	3.3
Sn Cl1 Tail	3.3	10.6	0.32	10.7	1.96	10.8	4.09	10.9	2.68	11.1
Ro Tail	3.3	77.4	0.32	78.3	1.96	79.1	4.09	79.8	2.63	80.2
CALC	57.04	100.0	0.32	100.0	1.92	100.0	3.96	100.0	2.54	100.0
ASSAY HEAD			0.96		3.61		8.24		2.58	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T73 S Cl1 C1	26.5	5.2	0.16	2.6	0.85	2.3	1.12	1.5	0.66	1.3
S Cl1 Tail	39.0	7.6	0.28	6.7	1.54	6.1	2.80	5.4	1.05	3.2
Sn Cl2 C1	2.3	0.5	0.30	0.4	1.68	0.4	3.04	0.3	3.26	0.6
C2	5.3	1.0	0.30	1.0	1.69	0.9	3.24	0.8	3.32	1.4
C3	8.6	1.7	0.31	1.6	1.79	1.6	3.57	1.5	3.35	2.2
Sn Cl2 Tail	22.8	4.4	0.30	4.3	1.74	4.0	3.46	3.9	3.16	5.5
Sn Cl1 Tail	76.8	15.0	0.31	15.0	1.89	14.8	3.90	14.8	2.82	16.7

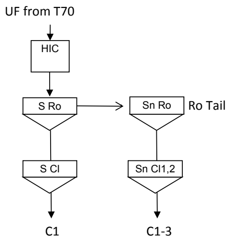
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T74
DATE	110215
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T70

NOTES
LC01 Cyc 11- 31 Cyclone -40 Fine Tail Comb

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	596		199					5					
Water Change														
Conditioning			50						3					
S Ro C	5.3						59			6-9	4.5	4.5	300	
Condition														
Condition	5.4	199		199					3					
Condition	4.2				298				3					
Condition	4.4					298			3					
Sn Ro C1							20				9.0	9.0	390	
Condition	4.8					99			3					
Sn Ro C2	4.9									5-12	9.0	18.0	430	
Condition														
Sn Cl1 C	5.1									2-12	7.5	25.5	420	
Sn Cl2 C1	5.7									0.5-1	1.0	26.5	30	4
Sn Cl2 C2										1-4	2.5	29.0	60	2
Sn Cl2 C3	5.9									4-5	3.5	32.5	60	2
REAGENT TOTALS (g/t)		**794**	**50**	**397**	**298**	**397**	79							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T74 S Ro C1	36.8	7.3	0.22	2.8	38.0	12.9	1.10	60.9	20.1	74.6	13.7	2.5	0.12	1.9
Sn Cl2 C1	1.1	0.2	22.8	8.5	18.7	0.2	0.14	0.2	3.49	0.4	12.5	0.1	0.20	0.1
C2	1.2	0.2	18.1	7.1	21.1	0.2	0.17	0.3	4.29	0.5	14.0	0.1	0.22	0.1
C3	1.1	0.2	10.8	3.9	23.9	0.2	0.21	0.3	5.47	0.6	18.4	0.1	0.24	0.1
Sn Cl2 Tail	6.5	1.3	4.14	9.2	24.8	1.5	0.17	1.7	3.37	2.2	27.1	0.9	0.28	0.8
Sn Cl1 Tail	23.4	4.6	1.20	9.6	21.8	4.7	0.11	3.9	1.98	4.7	36.4	4.3	0.35	3.5
Ro Tail	433.7	86.1	0.40	59.0	20.1	80.3	0.05	32.7	0.39	17.1	42.5	92.1	0.51	93.6
CALC	503.7	100.0	0.58	100.0	21.6	100.0	0.13	100.0	1.97	100.0	39.7	100.0	0.47	100.0
ASSAY HEAD			0.62		20.8		0.14		2.58		37.5		0.62	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T74 S Ro C1	36.8	7.3	0.22	2.76	38.0	12.9	1.10	60.9	20.1	74.6	13.7	2.52	0.12	1.87
Sn Cl2 C1	1.1	0.2	22.8	8.5	18.7	0.2	0.14	0.2	3.49	0.4	12.5	0.1	0.20	0.1
C2	2.3	0.4	20.4	15.6	19.9	0.4	0.16	0.5	3.90	0.9	13.2	0.1	0.21	0.2
C3	3.3	0.7	17.3	19.5	21.2	0.6	0.17	0.9	4.40	1.5	14.9	0.2	0.22	0.3
Sn Cl2 Tail	9.8	1.9	8.58	28.6	23.6	2.1	0.17	2.5	3.72	3.7	23.0	1.1	0.26	1.1
Sn Cl1 Tail	33.2	6.6	3.38	38.2	22.3	6.8	0.13	6.4	2.49	8.4	32.4	5.4	0.32	4.5

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T74 S Ro C1	36.8	7.3	0.28	5.8	1.66	5.6	3.23	5.2	1.01	2.9
Sn Cl2 C1	1.1	0.2	0.29	0.2	1.70	0.2	3.13	0.1	1.86	0.2
C2	1.2	0.2	0.30	0.2	1.76	0.2	3.58	0.2	2.09	0.2
C3	1.1	0.2	0.36	0.2	2.23	0.2	4.66	0.2	2.30	0.2
Sn Cl2 Tail	1.2	1.3	0.30	1.1	1.76	1.0	3.58	1.0	2.31	1.2
Sn Cl1 Tail	1.1	4.6	0.36	4.7	2.23	4.8	4.66	4.8	2.27	4.1
Ro Tail	1.1	86.1	0.36	87.8	2.23	88.1	4.66	88.5	2.71	91.3
CALC	43.39	100.0	0.35	100.0	2.18	100.0	4.54	100.0	2.56	100.0
ASSAY HEAD			0.96		3.61		8.24		2.58	

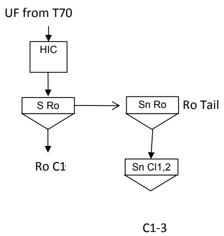
CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T74 S Ro C1	36.8	7.3	0.28	5.8	1.66	5.6	3.23	5.2	1.01	2.9
Sn Cl2 C1	1.1	0.2	0.29	0.2	1.70	0.2	3.13	0.1	1.86	0.2
C2	2.3	0.4	0.30	0.4	1.73	0.4	3.36	0.3	1.98	0.3
C3	3.3	0.7	0.32	0.6	1.89	0.6	3.78	0.5	2.08	0.5
Sn Cl2 Tail	9.8	1.9	0.31	1.7	1.80	1.6	3.65	1.6	2.23	1.7
Sn Cl1 Tail	33.2	6.6	0.34	6.4	2.10	6.4	4.36	6.3	2.26	5.8

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T75
DATE	110215
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T70

NOTES
LC01 Cyc 11- 31 Cyclone -40 Fine Tail Comb

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	595		198					5					
Water Change														
Conditioning			50						3					
S Ro C	5.3						59			6-9	4.5	4.5	300	
Condition														
Condition	5.6	198		198					3					
Condition	4.3				298				3					
Condition	4.7					298			3					
Sn Ro C1							20				9.0	9.0	390	
Condition	4.8					99			3					
Sn Ro C2	4.9									5-12	9.0	18.0	430	
HIC Cond (60HZ)	3.3			99					5					
Condition	4.6				99				3					
Condition	4.6					99			3					
Sn Cl1 C	4.6									2-12	7.5	25.5	420	
Sn Cl2 C1	5.2									0.5-1	1.0	26.5	30	6
Sn Cl2 C2										1-4	2.5	29.0	60	5
Sn Cl2 C3	5.3									4-5	3.5	32.5	60	3
REAGENT TOTALS (g/t)		**794**	**50**	**496**	**397**	**496**	79							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T75 S Ro C1	36.8	7.3	0.22	2.8	38.0	13.2	1.10	61.3	20.1	70.6	13.7	2.6	0.12	1.9
Sn Cl2 C1	1.7	0.3	18.4	10.8	22.5	0.4	0.16	0.4	3.40	0.6	11.9	0.1	0.24	0.2
C2	3.2	0.6	12.6	13.9	25.2	0.8	0.12	0.6	4.00	1.2	14.6	0.2	0.26	0.4
C3	1.7	0.3	7.70	4.3	27.2	0.4	0.17	0.4	3.93	0.6	18.4	0.2	0.29	0.2
Sn Cl2 Tail	7.1	1.4	2.35	5.7	25.2	1.7	0.16	1.7	3.77	2.6	26.8	1.0	0.32	1.0
Sn Cl1 Tail	19.3	3.8	0.50	3.3	19.7	3.6	0.09	2.6	1.56	2.9	40.7	4.0	0.34	2.8
Ro Tail	434.1	86.1	0.40	59.2	19.5	79.9	0.05	32.9	0.52	21.5	41.5	91.9	0.50	93.5
CALC	503.9	100.0	0.58	100.0	21.0	100.0	0.13	100.0	2.08	100.0	38.9	100.0	0.46	100.0
ASSAY HEAD			0.62		20.8		0.14		2.58		37.5		0.62	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T75 S Ro C1	36.8	7.3	0.22	2.76	38.0	13.2	1.10	61.3	20.1	70.6	13.7	2.57	0.12	1.90
Sn Cl2 C1	1.7	0.3	18.4	10.8	22.5	0.4	0.16	0.4	3.40	0.6	11.9	0.1	0.24	0.2
C2	5.0	1.0	14.6	24.7	24.3	1.1	0.13	1.0	3.79	1.8	13.7	0.3	0.25	0.5
C3	6.6	1.3	12.9	29.0	25.0	1.6	0.14	1.4	3.83	2.4	14.8	0.5	0.26	0.7
Sn Cl2 Tail	13.7	2.7	7.42	34.7	25.1	3.3	0.15	3.2	3.80	5.0	21.0	1.5	0.29	1.7
Sn Cl1 Tail	33.0	6.6	3.38	38.0	21.9	6.8	0.12	5.8	2.49	7.8	32.5	5.5	0.32	4.6

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T75 S Ro C1	36.8	7.3	0.28	6.3	1.66	5.9	3.23	5.0	0.94	2.7
Sn Cl2 C1	1.7	0.3	0.26	0.3	1.58	0.3	3.32	0.2	2.31	0.3
C2	3.2	0.6	0.28	0.6	1.78	0.6	3.94	0.5	2.62	0.7
C3	1.7	0.3	0.33	0.3	2.09	0.3	4.91	0.3	2.83	0.4
Sn Cl2 Tail	3.2	1.4	0.28	1.2	1.78	1.2	3.94	1.2	2.74	1.5
Sn Cl1 Tail	1.7	3.8	0.33	3.9	2.09	3.9	4.91	3.9	1.91	2.9
Ro Tail	1.7	86.1	0.33	87.4	2.09	87.8	4.91	88.8	2.73	91.6
CALC	49.96	100.0	0.33	100.0	2.05	100.0	4.76	100.0	2.57	100.0
ASSAY HEAD			0.96		3.61		8.24		2.58	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T75 S Ro C1	36.8	7.3	0.28	6.3	1.66	5.9	3.23	5.0	0.94	2.7
Sn Cl2 C1	1.7	0.3	0.26	0.3	1.58	0.3	3.32	0.2	2.31	0.3
C2	5.0	1.0	0.27	0.8	1.71	0.8	3.72	0.8	2.51	1.0
C3	6.6	1.3	0.29	1.2	1.81	1.2	4.02	1.1	2.59	1.3
Sn Cl2 Tail	13.7	2.7	0.28	2.4	1.79	2.4	3.98	2.3	2.67	2.8
Sn Cl1 Tail	33.0	6.6	0.31	6.3	1.97	6.3	4.52	6.2	2.23	5.7

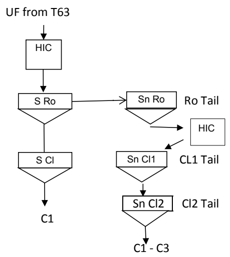
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T76
DATE	190215
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T70

NOTES
UF from T70 6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	1203		200					5					
Water Change														
Conditioning			50						3					
S Ro C	5.2						60			7-9	7.5	7.5	300	
Condition														
S Cl1 C1	6.4						10			3-7	3.0	10.5	120	20
Condition	5.3	241		200					3					
Condition	4.2				301				3					
Condition	4.4					301			3					
Sn Ro C1	4.6						20				9.0	9.0	405	
Condition	4.8					100			3					
Sn Ro C2	4.8					100	20		3	9-13	17.0	26.0	950	
HIC Condition				100					5					
Condition					100				3					
Condition						100			3					
Sn Cl1 C	5.0						20			5-12	7.0	33.0	420	
Sn Cl2 C1	5.2									0.5-1	1.5	34.5	30	11
Sn Cl2 C2	5.4									2-5	2.5	37.0	60	10
Sn Cl2 C3	5.4									5-7	3.5	40.5	100	5
REAGENT TOTALS (g/t)		**1443**	**50**	**501**	**401**	**601**	129							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T76 S Cl1 C1	23.9	4.8	0.13	0.9	37.7	8.6	1.17	42.1	37.8	67.9	6.75	0.8	0.07	0.5
S Cl1 Tail	12.4	2.5	0.42	1.6	33.4	4.0	1.05	19.6	16.2	15.1	21.3	1.4	0.29	1.1
Sn Cl2 C1	3.4	0.7	16.2	16.7	23.2	0.8	0.12	0.6	2.13	0.5	14.2	0.2	0.30	0.3
C2	6.1	1.2	12.5	23.0	25.0	1.5	0.12	1.1	2.07	1.0	16.0	0.5	0.33	0.6
C3	5.0	1.0	7.67	11.7	27.6	1.3	0.12	0.9	2.32	0.9	18.6	0.5	0.39	0.6
Sn Cl2 Tail	11.3	2.3	3.21	11.0	28.5	3.1	0.12	2.0	1.85	1.6	24.7	1.4	0.50	1.8
Sn Cl1 Tail	28.3	5.7	0.50	4.3	20.4	5.5	0.07	3.0	1.07	2.3	38.9	5.6	0.56	5.0
Ro Tail	408.4	81.9	0.25	30.8	19.3	75.2	0.05	30.7	0.35	10.7	42.8	89.5	0.70	90.0
CALC	498.9	100.00	0.66	100.0	20.9	100.0	0.13	100.0	2.67	100.0	39.1	100.0	0.64	100.0
ASSAY HEAD			0.76		21.5		0.17		2.55		39.3		0.68	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T76 S Cl1 C1	23.9	4.8	0.13	0.94	37.7	8.62	1.17	42.1	37.8	67.9	6.75	0.83	0.07	0.53
S Cl1 Tail	36.3	7.3	0.23	2.5	36.2	12.6	1.13	61.6	30.4	83.0	11.7	2.2	0.15	1.7
Sn Cl2 C1	3.4	0.7	16.2	16.7	23.2	0.8	0.12	20.2	2.13	0.5	14.2	0.2	0.30	0.3
C2	9.6	1.9	13.8	39.8	24.4	2.2	0.12	21.3	2.09	1.5	15.4	0.8	0.32	1.0
C3	14.6	2.9	11.7	51.4	25.5	3.6	0.12	22.2	2.17	2.4	16.5	1.2	0.34	1.6
Sn Cl2 Tail	25.9	5.2	7.98	62.4	26.8	6.6	0.12	24.3	2.03	4.0	20.1	2.7	0.41	3.4
Sn Cl1 Tail	54.2	10.9	4.07	66.7	23.5	12.2	0.09	27.2	1.53	6.2	29.9	8.3	0.49	8.3

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T76 S Cl1 C1	23.9	4.8	0.14	1.9	0.85	2.0	1.40	1.4	0.68	1.2
S Cl1 Tail	12.4	2.5	0.46	3.3	2.50	3.0	4.85	2.6	1.94	1.8
Sn Cl2 C1	3.4	0.7	0.29	0.6	1.67	0.6	3.91	0.6	2.00	0.5
C2	6.1	1.2	0.32	1.1	1.80	1.1	4.14	1.1	2.36	1.1
C3	5.0	1.0	0.36	1.0	2.15	1.0	4.83	1.1	2.81	1.0
Sn Cl2 Tail	6.1	2.3	0.32	2.1	1.80	2.0	4.14	2.0	2.95	2.4
Sn Cl1 Tail	5.0	5.7	0.36	5.8	2.15	5.9	4.83	5.9	2.59	5.4
Ro Tail	5.0	81.9	0.36	84.2	2.15	84.6	4.83	85.3	2.90	86.7
CALC	67.07	100.00	0.35	100.0	2.08	100.0	4.64	100.0	2.74	100.0
ASSAY HEAD			1.05		3.68		7.68		2.79	

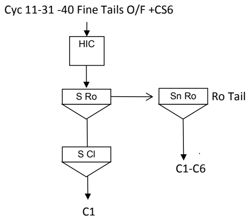
CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T76 S Cl1 C1	23.9	4.8	0.14	1.9	0.85	2.0	1.40	1.4	0.68	1.2
S Cl1 Tail	36.3	7.3	0.25	5.2	1.41	4.9	2.58	4.0	1.11	2.9
Sn Cl2 C1	3.4	0.7	0.29	0.6	1.67	0.6	3.91	0.6	2.00	0.5
C2	9.6	1.9	0.31	1.7	1.75	1.6	4.06	1.7	2.23	1.6
C3	14.6	2.9	0.33	2.7	1.89	2.7	4.32	2.7	2.43	2.6
Sn Cl2 Tail	25.9	5.2	0.32	4.8	1.85	4.6	4.24	4.7	2.66	5.0
Sn Cl1 Tail	54.2	10.9	0.34	10.6	2.01	10.5	4.55	10.7	2.62	10.4

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T78
DATE	24/02/15
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
		Finish	
		W/h	
Speed	850	kWh/t	



PRODUCT FLOATED
Cyc 11-31 -40 Fine Tails O/F +CS6

NOTES
LC01 Cyc 11- 31 Cyclone -40 Fine Tail Comb from centrifuge 6 micron Test routine per T69 EDTA Leach residue (T77)

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.6	1251		208					5					
Water Change														
Conditioning			52						3					
S Ro C	4.9						62			7-9	8.5	8.5	440	
Condition														
S Cl1 C1	5.9						10			6-9	3.0	11.5	120	14
Condition	5.1	208		208					3					
Condition	4.2				313				3					
Condition	4.4					313			3					
Sn Ro C1											3.0	3.0	125	3
Sn Ro C2	4.5									9-10	3.0	6.0	130	2
Sn Ro C3	4.6						10			10-12	3.0	9.0	135	3
Condition						104			3					
Sn Ro C4	5.0									9-12	3.0	12.0	150	2
Sn Ro C5	4.6						21			9-11	3.0	15.0	150	3
Sn Ro C6	4.7									9-11	3.0	18.0	130	2
REAGENT TOTALS (g/t)		**1459**	**52**	**417**	**313**	**417**	103							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T78 S Cl1 C1	17.3	3.6	0.16	0.9	38.9	6.7	0.66	19.2	37.6	53.0	8.94	0.8	0.10	0.6
S Cl1 Tail	16.9	3.5	0.40	2.3	27.7	4.7	0.33	9.4	13.8	18.9	26.8	2.4	0.34	2.1
Sn Ro C1	3.4	0.7	0.61	0.7	22.2	0.8	0.24	1.4	5.16	1.4	35.0	0.6	0.42	0.5
C2	2.7	0.6	0.57	0.5	21.9	0.6	0.21	1.0	4.05	0.9	35.7	0.5	0.41	0.4
C3	3.5	0.7	0.55	0.7	21.8	0.8	0.20	1.2	2.87	0.8	37.8	0.7	0.44	0.6
C4	3.7	0.8	1.11	1.4	21.0	0.8	0.20	1.2	2.47	0.7	35.9	0.7	0.43	0.6
C5	4.3	0.9	0.92	1.3	21.0	0.9	0.19	1.4	1.71	0.6	37.9	0.9	0.46	0.7
C6	3.1	0.6	0.80	0.8	20.4	0.6	0.18	0.9	1.93	0.5	37.7	0.6	0.43	0.5
Ro Tail	424.8	88.6	0.63	91.3	19.8	84.1	0.09	64.3	0.67	23.2	41.0	92.7	0.62	94.1
CALC	479.7	100.0	0.61	100.0	20.8	100.0	0.12	100.0	2.56	100.0	39.2	100.0	0.58	100.0
ASSAY HEAD			0.57		20.7		0.18		2.85		39.3		0.44	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T78 S Cl1 C1	17.3	3.6	0.16	0.94	38.9	6.75	0.66	19.2	37.6	53.0	8.94	0.82	0.10	0.62
S Cl1 Tail	34.2	7.1	0.28	3.2	33.4	11.4	0.50	28.6	25.8	71.9	17.8	3.2	0.22	2.7
Sn Ro C1	3.4	0.7	0.61	0.7	22.2	0.8	0.24	10.8	5.16	1.4	35.0	0.6	0.42	0.5
C2	6.1	1.3	0.59	1.2	22.1	1.3	0.23	11.7	4.67	2.3	35.3	1.1	0.42	0.9
C3	9.6	2.0	0.58	1.9	22.0	2.1	0.22	12.9	4.01	3.1	36.2	1.9	0.42	1.5
C4	13.3	2.8	0.73	3.3	21.7	2.9	0.21	14.1	3.58	3.9	36.1	2.6	0.43	2.0
C5	17.6	3.7	0.77	4.6	21.5	3.8	0.21	15.5	3.13	4.5	36.6	3.4	0.43	2.7
C6	20.7	4.3	0.78	5.5	21.4	4.4	0.20	16.4	2.95	5.0	36.7	4.0	0.43	3.2

PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST
T78 S Cl1 C1	17.3	3.6	0.17	0.7	1.26	1.2	1.82	0.8
S Cl1 Tail	16.9	3.5	0.53	2.0	3.13	3.0	6.97	2.9
Sn Ro C1	3.4	0.7	0.63	0.5	4.29	0.8	9.23	0.8
C2	2.7	0.6	0.65	0.4	4.22	0.6	10.0	0.7
C3	3.5	0.7	0.72	0.6	4.29	0.8	10.3	0.9
C4	2.7	0.8	0.65	0.5	4.22	0.9	10.0	0.9
C5	3.5	0.9	0.72	0.7	4.29	1.0	10.3	1.1
C6	3.5	0.6	0.72	0.5	4.29	0.7	10.3	0.8
Ro Tail	424.8	88.6	0.98	94.1	3.81	90.8	8.58	91.1
CALC	478.3	100.0	0.92	100.0	3.71	100.0	8.34	100.0
ASSAY HEAD			0.91		4.02		9.32	

CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM
T78 S Cl1 C1	17.3	3.6	0.17	0.7	1.26	1.2	1.82	0.8
S Cl1 Tail	34.2	7.1	0.35	2.7	2.18	4.2	4.36	3.7
Sn Ro C1	3.4	0.7	0.63	0.5	4.29	0.8	9.23	0.8
C2	6.1	1.3	0.64	0.9	4.26	1.5	9.57	1.5
C3	9.6	2.0	0.67	1.5	4.27	2.3	9.84	2.4
C4	13.3	2.8	0.66	2.0	4.26	3.2	9.88	3.3
C5	17.6	3.7	0.68	2.7	4.26	4.2	9.98	4.4
C6	20.7	4.3	0.68	3.2	4.27	5.0	10.0	5.2

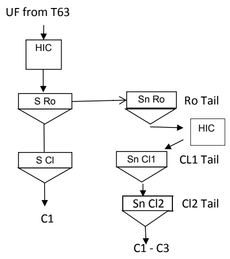
ALS Metallurgy

BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0879
TEST NO	T79
DATE	020315
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Media	kg		
Solids	g	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		
	kwh/t		

Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.5	Finish	
	0.8	W/h	
Speed	750	kWh/t	



PRODUCT FLOATED
UF from T63

NOTES
UF from T63
Cut at 6 micron

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	0.495 MIBC g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	1010		202					5					
Water Change														
Conditioning			50						3					
S Ro C	5.3						60			7-9	7.5	7.5	350	
Condition														
S Cl1 C1	6.4						10			3-7	3.0	10.5	120	19
Condition	5.3	242		202					3					
Condition	4.2				303				3					
Condition	4.4					454			3					
Sn Ro C1	4.4						20				9.0	9.0	400	
Condition	4.6					101			3					
Sn Ro C2	4.6						20		3	9-13	17.0	26.0	400	
HIC Condition				101					5					
Condition					101				3					
Condition						101			3					
Sn Cl1 C	5.1						20			5-12	8.0	34.0	420	
Sn Cl2 C1	5.4									0.5-2	1.5	35.5	30	15
Sn Cl2 C2	5.5									2-5	2.5	38.0	60	10
Sn Cl2 C3	5.6									5-7	3.5	41.5	100	5
REAGENT TOTALS (g/t)		**1252**	**50**	**505**	**404**	**656**	130							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	As %	DIST	S %	DIST	SiO2 %	DIST	MnO %	DIST
T76 S Cl1 C1	22.6	4.6	0.14	1.0	40.7	8.8	1.17	41.0	37.7	64.5	10.1	1.2	0.08	0.6
S Cl1 Tail	13.6	2.7	0.41	1.8	32.9	4.3	0.97	20.4	17.1	17.6	21.2	1.5	0.29	1.3
Sn Cl2 C1	4.4	0.9	14.7	20.4	25.2	1.1	0.10	0.7	1.81	0.6	13.5	0.3	0.36	0.5
C2	6.0	1.2	10.5	19.7	27.3	1.6	0.11	1.0	1.76	0.8	16.0	0.5	0.42	0.8
C3	5.2	1.1	6.62	10.9	30.3	1.5	0.14	1.1	2.01	0.8	27.3	0.7	0.51	0.8
Sn Cl2 Tail	10.9	2.2	2.80	9.6	31.6	3.3	0.11	1.9	1.64	1.4	22.5	1.3	0.62	2.2
Sn Cl1 Tail	26.4	5.3	0.70	5.8	22.7	5.7	0.06	2.5	1.21	2.4	36.8	5.0	0.68	5.7
Ro Tail	406.2	82.0	0.24	30.8	19.1	73.9	0.05	31.5	0.39	12.0	42.5	89.5	0.68	88.1
CALC	495.3	100.0	0.64	100.0	21.2	100.0	0.13	100.0	2.67	100.0	39.0	100.0	0.63	100.0
ASSAY HEAD			0.76		21.5		0.17		2.55		39.3		0.68	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	As %	CUM	S %	CUM	SiO2 %	CUM	MnO %	CUM
T76 S Cl1 C1	22.6	4.6	0.14	1.00	40.7	8.76	1.17	41.0	37.7	64.5	10.1	1.18	0.08	0.58
S Cl1 Tail	36.2	7.3	0.24	2.8	37.8	13.0	1.09	61.4	30.0	82.1	14.2	2.7	0.16	1.8
Sn Cl2 C1	4.4	0.9	14.7	20.4	25.2	1.1	0.10	21.1	1.81	0.6	13.5	0.3	0.36	0.5
C2	10.4	2.1	12.3	40.1	26.4	2.6	0.11	22.1	1.78	1.4	14.9	0.8	0.39	1.3
C3	15.6	3.1	10.4	51.0	27.7	4.1	0.12	23.3	1.86	2.2	19.1	1.5	0.43	2.2
Sn Cl2 Tail	26.5	5.3	7.25	60.6	29.3	7.4	0.11	25.1	1.77	3.5	20.5	2.8	0.51	4.3
Sn Cl1 Tail	52.9	10.7	3.98	66.5	26.0	13.1	0.09	27.6	1.49	6.0	28.6	7.8	0.59	10.0

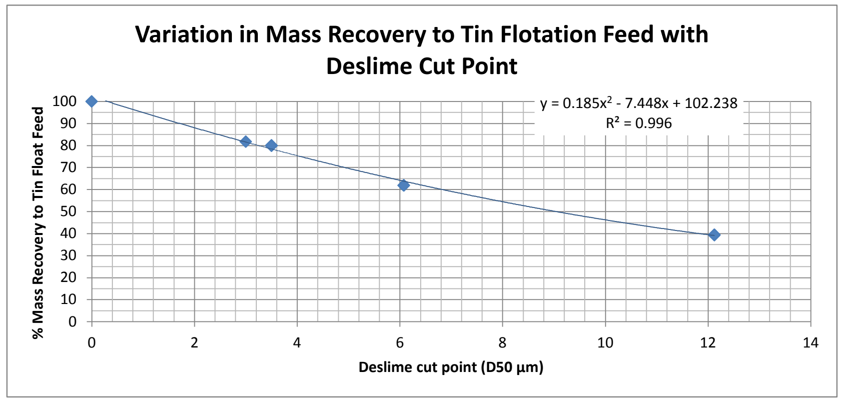
PRODUCTS	WT g	WT %	CaO %	DIST	MgO %	DIST	Al2O3 %	DIST	norganic %	DIST
T76 S Cl1 C1	22.6	4.6	0.19	1.9	1.11	1.9	2.97	1.6	0.73	1.3
S Cl1 Tail	13.6	2.7	0.48	2.9	2.53	2.5	5.35	1.7	1.71	1.8
Sn Cl2 C1	4.4	0.9	0.31	0.6	1.69	0.5	3.49	0.4	2.50	0.9
C2	6.0	1.2	0.35	0.9	1.96	0.9	4.38	0.6	2.99	1.4
C3	5.2	1.1	0.48	1.1	2.86	1.1	9.17	1.1	3.42	1.4
Sn Cl2 Tail	6.0	2.2	0.35	1.7	1.96	1.6	4.38	1.1	3.54	3.0
Sn Cl1 Tail	5.2	5.3	0.48	5.6	2.86	5.6	9.17	5.7	3.01	6.2
Ro Tail	5.2	82.0	0.48	85.4	2.86	85.9	9.17	87.8	2.65	84.0
CALC	68.19	100.0	0.46	100.0	2.73	100.0	8.57	100.0	2.59	100.0
ASSAY HEAD			1.05		3.68		7.68		2.79	

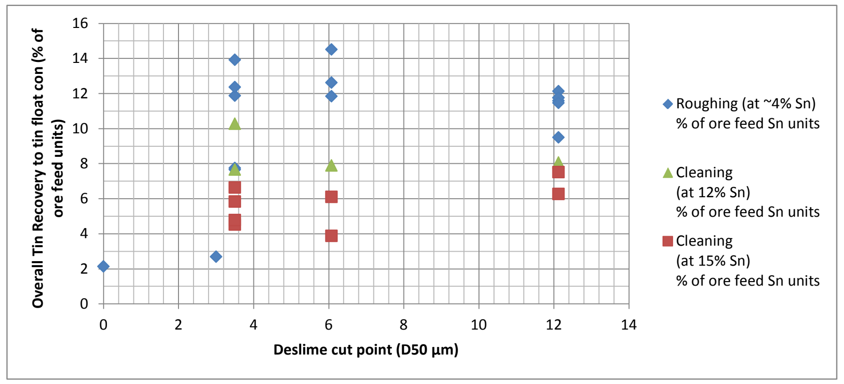
CUM PRODUCTS	CUM Wt	WT %	CaO %	CUM	MgO %	CUM	Al2O3 %	CUM	norganic %	CUM
T76 S Cl1 C1	22.6	4.6	0.19	1.9	1.11	1.9	2.97	1.6	0.73	1.3
S Cl1 Tail	36.2	7.3	0.30	4.7	1.64	4.4	3.86	3.3	1.10	3.1
Sn Cl2 C1	4.4	0.9	0.31	0.6	1.69	0.5	3.49	0.4	2.50	0.9
C2	10.4	2.1	0.33	1.5	1.85	1.4	4.00	1.0	2.78	2.3
C3	15.6	3.1	0.38	2.6	2.18	2.5	5.73	2.1	3.00	3.6
Sn Cl2 Tail	26.5	5.3	0.37	4.3	2.09	4.1	5.17	3.2	3.22	6.7
Sn Cl1 Tail	52.9	10.7	0.42	9.8	2.48	9.7	7.17	8.9	3.11	12.9

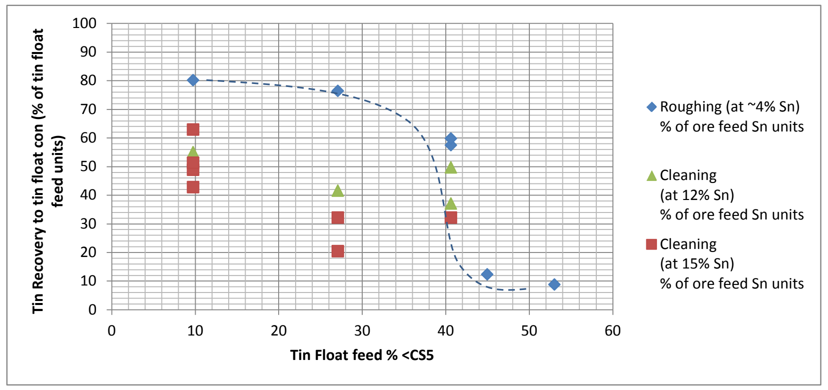
Summary of Tin Flotation Tests T58 to T79

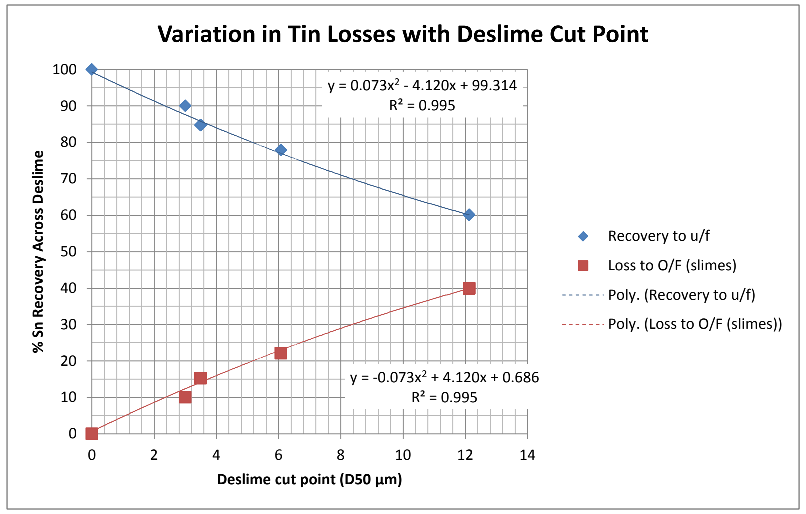
Date of deslime test	Date of float test	Time elasped (days) from deslime to float test	Time elasped (days) from 'comparable test'	Tin Flotation Test No.	Feed material: Deslime cut point (D50) µm	Feed material: Produced from test no.	Feed material: % <CS5 (<8 µm)	Deslime mass recovery to u/f % wt	Sulfide scav.: H_2SO_4 g/t	Sulfide scav.: SSF g/t	Sulfide scav.: Water change	Sulfide scav.: SIPX g/t	Tin float: H_2SO_4 g/t	Tin float: SSF g/t	Tin float: Na_2SO_3 g/t	Tin float: SPA7080 g/t	Tin float: MIBC g/t
24/11/2014	24/11/2014	0		T58	12.1	UF from T56	9.7	39.3	401	200	yes	50	180	200	301	401	99
24/11/2014	24/11/2014	0	0	T59	12.1	UF from T56	9.7	39.3	440	200	yes	50	200	200	0	400	119
24/11/2014	02/12/14	8		T60	12.1	UF from T56	9.7	39.3	399	200	yes	50	100	200	299	299	99
24/11/2014	01/12/14	7	1	T61	12.1	UF from T56	9.7	39.3	298	199	no	50	0	199	298	398	98
24/11/2014	**02/12/14**	**8**		**T62**	**12.1**	**UF from T56**	**9.7**	**39.3**	**400**	**200**	**yes**	**50**	**180**	**200**	**300**	**400**	**79**
24/11/2014	05/12/14	11	3	T65	12.1	UF from T56	9.7	39.3	199	199	yes	50	100	199	299	398	79
3/12/2014	04/12/14	1		T64	6.1	UF from T63	27.1	61.8	397	199	yes	50	179	199	298	397	88
3/12/2014	15/12/14	12	11	T67	6.1	UF from T63	27.1	61.8	499	200	yes	50	120	200	300	399	99
3/12/2014	2/03/2015	89	88	T79	6.1	UF from T63	27.1	61.8	1010	202	yes	50	242	303	404	656	130
22/01/2015	23/01/2015	1		**T71**	**4**	**UF from T70**	**40.6**	**79.9**	**592**	**197**	**yes**	**49**	**197**	**197**	**296**	**395**	**88**
22/01/2015	28/01/2015	6	5	T72	4	UF from T70	40.6	79.9	394	197	yes	49	177	197	296	394	88
22/01/2015	11/02/15	20	19	T74	4	UF from T70	40.6	79.9	596	199	yes	50	199	199	298	397	79
22/01/2015	11/02/15	20	19	T75	4	UF from T70	40.6	79.9	595	198	yes	50	198	298	397	496	79
22/01/2015	**19/2/15**	**28**	**27**	**T76**	**4**	**UF from T70**	**40.6**	**79.9**	**1203**	**200**	**yes**	**50**	**241**	**301**	**401**	**601**	**129**
13/01/2015	13/01/15	0		T69	3	LC Cyc 11-31: -40 Fine Tails + O/F, +CS6	45.0	81.7	783	196	yes	49	176	196	294	392	97
13/01/2015	13/01/15	0	0	T68	0	LC Cyc 11-31: -40 Fine Tails + O/F	53.0	100.0	298	198	yes	50	298	198	298	397	88

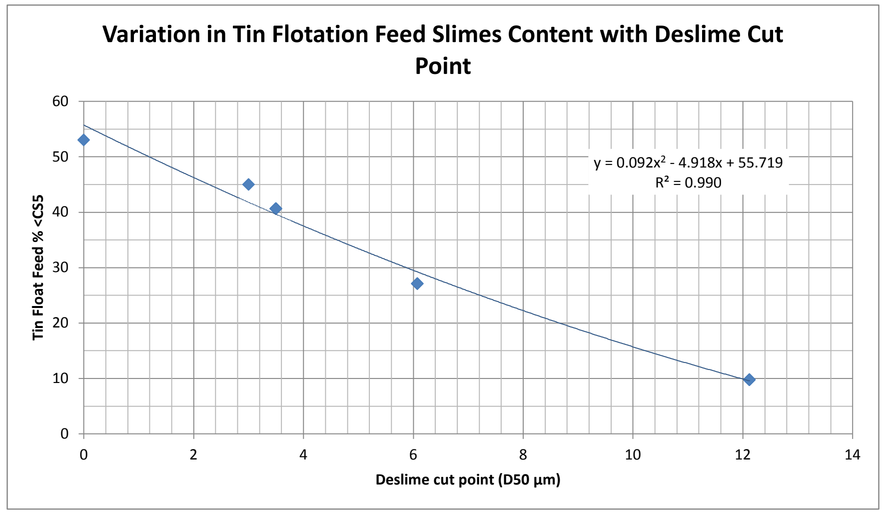
Tin Flotation Test No.	Tin Flotation Response: Roughing Grade (% Sn)	Roughing recovery	Cleaning Grade (% Sn)	Cleaning recovery	Cleaning Grade (% Sn)	Cleaning recovery	Deslime Performance: Tin recovery to U/F	Deslime Performance: Tin loss to O/F	Overall Tin deportment to Deslime feed % of ore feed Sn units	Overall Tin to Tin Float Feed % of ore feed Sn units	Overall Tin recovery to flotation con: Roughing (at ~4% Sn) % of ore feed Sn units	Cleaning (at 12% Sn) % of ore feed Sn units	Cleaning (at 15% Sn) % of ore feed Sn units	Overall Tin loss to Slime Tails % of ore feed Sn units	Overall Tin loss to Tin Float Tails % of ore feed Sn units	Combine loss; slimes + TFT % of ore feed Sn units
T58	4.0	80.2			9.0	62.9	60.1	39.9	24.4	14.7	11.8			9.7		
T59	4.0	79.0			9.0	48.9	60.1	39.9	24.4	14.7	11.6			9.7		
T60	4.0	82.7					60.1	39.9	24.4	14.7	12.1			9.7		
T61	4.0	64.7					60.1	39.9	24.4	14.7	9.5			9.7		
T62	**4.0**	**80.1**	**12.0**	**55.0**	**15.0**	**51.3**	**60.1**	**39.9**	**24.4**	**14.7**	**11.7**	**8.1**	**7.5**	**9.7**	**7.1**	**16.9**
T65	4.0	78.2			15.0	42.8	60.1	39.9	24.4	14.7	11.5		**6.3**	9.7	8.4	18.1
T64	4.0	76.4					77.8	22.2	24.4	19.0	14.5			5.4		
T67	4.0	62.3			15.0	32.1	77.8	22.2	24.4	19.0	11.8		**6.1**	5.4	12.9	18.3
T79	4.0	66.4	12.0	41.6	14.7	20.4	77.8	22.2	24.4	19.0	12.6	**7.9**	**3.9**	5.4	15.1	20.5
T71	**4.0**	**57.5**	**12.0**	**37.0**	**15.0**	**32.1**	**84.7**	**15.3**	**24.4**	**20.7**	**11.9**	**7.7**	**6.6**	**3.7**	**14.0**	**17.8**
T72	4.0	59.8					84.7	15.3	24.4	20.7	12.4			3.7		
T74	4.0	37.1			15.0	21.9	84.7	15.3	24.4	20.7	7.7		**4.5**	3.7	16.1	19.9
T75	4.0	37.5			15.0	23.1	84.7	15.3	24.4	20.7	7.8		**4.8**	3.7	15.9	19.6
T76	**4.0**	**67.3**	**12.0**	**49.7**	**15.0**	**28.2**	**84.7**	**15.3**	**24.4**	**20.7**	**13.9**	**10.3**	**5.8**	**3.7**	**14.8**	**18.6**
T69	**3.9**	12.3					90	10.0	24.4	22.0	**2.7**			2.4		
T68	**3.4**	8.7					100	0.0	24.4	24.4	**2.1**			0.0		

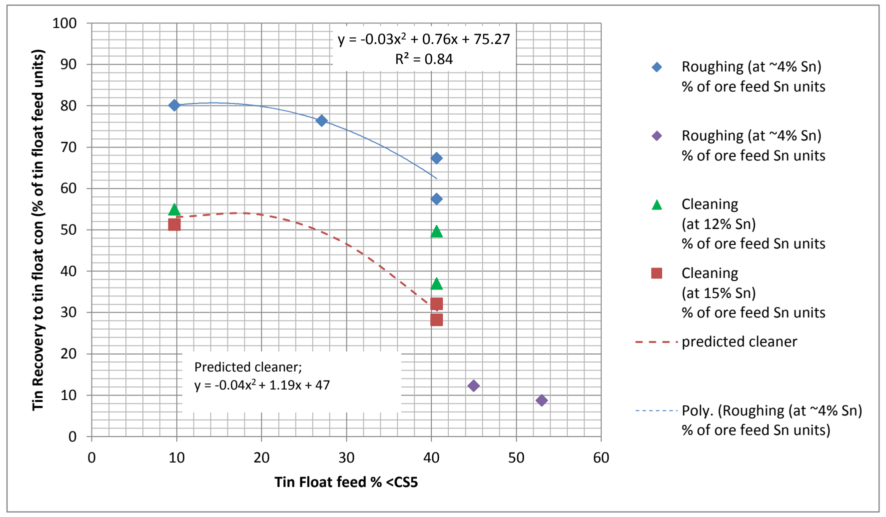












Appendix 12 – Final Tin Flotation Concentrate Analysis

McKnight
Mineralogy

ABN 65962932907

PO Box 451 Buninyong
VIC 3357

Ph 03 53279262
M 0407860394
s.mcknight@ballarat.edu.au
mineralogy@hotkey.net.au

QXRD Analysis of Scheelite Concentrate 932013 Supplied by ALS Metallurgy Burnie

Attn: Shengli Zhao
John Glen

S W McKnight
26/3/2015

Samples Supplied

Tin concentrates:

879829 CL2 CONC LOW GRADE COMP
879830 CL2 CONC MEDIUM GRADE COMP

887517 T43 S CLI CON

<u>Results wt% (semiquantitative)</u>

#879829 CL2 CONC LOW GRADE COMP

Phase	Weight%
Siderite	37.1
Cassiterite	13.1
Quartz	11.7
Rutile	11.5
Magnetite	7.5
Chlorite	4.6
Pyrite	3.9
Dravite/tourmaline	3.1
Anatase	2.8
Microcline	1.4
Diaspore?	1.4
Muscovite	1.2
Apatite	0.6
Calcite	0
Dolomite	0
Actinolite/tremolite	0

#879829 CL2 CONC LOW GRADE COMP

Element Distributions - approximate

		Cassiterite	**Anatase**	**Rutile**	**Siderite**	**Quartz**	**Pyrite**	**Calcite 2**	**Apatite**	**Microcline**	**Muscovite**	**Magnetite**	**Actinolite**	**Dravite**	**Dolomite**	**Diaspore**	**Chlorite**
Element	Totals	13.1	2.8	11.5	37.1	11.7	3.9	0	0.6	1.4	1.2	7.5	0	3.1	0	1.4	4.6
Sn	**10.36**	10.36															
O	**38.42**	2.79	1.13	4.59	15.38	6.22		0	0.24	0.67	0.57	2.08		1.62	0	0.74	2.39
Ti	**8.56**		1.69	6.87													
Fe	**25.13**				17.89		1.8					5.44					
C	**3.85**				3.85			0							0		
Si	**7.4**					5.46				0.44	0.25			0.55			0.7
S	**2.07**						2.07										
Ca	**0.24**							0	0.24						0		
P	**0.11**								0.11								
H	**0.11**								0		0.01			0.01		0.02	0.07
Cl	**0.01**								0.01								
F	**0.02**								0.02								
K	**0.32**									0.2	0.12						
Al	**1.98**									0.14	0.24			0.53		0.62	0.45
Na	**0.08**													0.08			
Mg	**1.25**													0.24	0		1.01
B	**0.11**													0.11			

#879830 CL2 CONC MEDIUM GRADE COMP

Phase	Weight%
Siderite	34.2
Cassiterite	18.9
Rutile	12
Quartz	10.2
Magnetite	9.1
Pyrite	2.9
Anatase	2.6
Apatite	2.4
Chlorite	2.1
Dravite/tourmaline	1.9
Diaspore?	1.6
Microcline	1.3
Muscovite	0.7
Calcite	0
Dolomite	0
Actinolite	0

#879830 CL2 CONC MEDIUM GRADE COMP

Element Distributions - approximate

		Cassiterite	Anatase	Rutile	Siderite	Quartz	Pyrite	Calcite	Apatite,	Microcline	Muscovite	Magnetite	Actinolite	Dravite	Dolomite	Diaspore	Chlorite
Element	Totals	18.9	2.6	12	34.2	10.2	2.9	0	2.4	1.3	0.7	9.1	0	1.9	0	1.6	2.1
Sn	**14.92**	14.92															
O	**36.82**	4.02	1.04	4.82	14.17	5.46		0	0.91	0.6	0.36	2.52		1	0	0.84	1.08
Ti	**8.77**		1.55	7.21													
Fe	**24.42**				16.49		1.33					6.59					
C	**3.55**				3.55			0							0		
Si	**6**					4.79				0.4	0.16			0.34			0.31
S	**1.53**						1.53										
Ca	**0.91**							0	0.9						0		
P	**0.43**								0.43								
H	**0.07**								0		0			0.01		0.03	0.03
Cl	**0.04**								0.04								
F	**0.07**								0.07								
K	**0.26**									0.18	0.07						
Al	**1.51**									0.13	0.15			0.33		0.7	0.2
Na	**0.05**													0.05			
Mg	**0.6**													0.15	0		0.45
B	**0.07**													0.07			

#887517 T43 S CLI CON

Phase	Weight%
Talc (triclinic)	**37**
Pyrite	**31.5**
Antigorite	**7.7**
Pyrrhotite	**3.8**
Calcite	**3.3**
Albite	**2.8**
Quartz	**2.7**
Apatite	**2.2**
Siderite	**2.1**
Phlogophite -Fe	**2.1**
Actinolite	**1.7**
Cassiterite	**1.1**
Magnetite	**0.9**
Chlorite	**0.7**
Dravite	**0.3**
Dolomite	**0.1**
Diaspore	**0**

#887517 T43 S CLI CON

Element Distributions - approximate

		Albite	Cassiterite	Siderite	Quartz	Pyrite	Calcite	Apatite	Magnetite	Antigorite	Talc	Actinolite	Dravite	Dolomite	Diaspore	Chlorite	Pyrrhotite-4C 1	Phlogophite, -Fe
Element	Totals	2.8	1.1	2.1	2.7	31.5	3.3	2.2	0.9	7.7	37	1.7	0.3	0.1	0	0.7	3.8	2.1
Na	**0.27**	0.25											0.01					0.01
Al	**0.43**	0.29											0.05		0	0.07		0.01
Si	**13.69**	0.91			1.25						10.97		0.05			0.11		0.4
O	**26.78**	1.39	0.23	0.89	1.42		1.56	0.83	0.24		18.75		0.16	0.03	0	0.37		0.91
Sn	**0.85**		0.85															
Fe	**18.89**			1.03		14.66			0.63								2.31	0.26
C	**0.62**			0.22			0.39							0.01				
S	**18.35**					16.83											1.51	
Ca	**2.15**						1.3	0.83						0.01				0.01
P	**0.39**							0.39										
H	**0.22**							0			0.2		0		0	0.01		0.01
Cl	**0.04**							0.04										
F	**0.06**							0.06										
Mg	**7.65**										7.12		0.02	0.01		0.16		0.33
B	**0.01**												0.01					
K	**0.19**																	0.19

Appendix 13 – Concentrate Leach Results

ALS Metallurgy

BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	100
Total Liquor Mass (gm)	114.9
Liquor SG (kg/L)	1.147

PROJECT	T0879
TEST NO	T52
DATE	181114
TECHNICIAN	BR

Start acid g/l	242
Start liq ml	100
start acid g	24
end acid g/l	34
end liq ml	87
end acid g	3
acid consumed g	21
acid consumption kg/t	**420**

LEACH CONDITIONS

Beaker Volume (ml)	200
Agitator (type)	mag
Agitator (rpm)	
N2 Sparge (lpm)	5
Start Temp (deg)	90
Leach Time (hrs)	4.0
Start Solids (gm)	50.6
Liquor Volume Used (l)	0.10

LEACH FEED SAMPLE DETAILS

Non-Mags
4hr Leach

End liquor diluted by 50% with water due to precipitate

MASS BALANCE

Beaker Mass (gm)	147.3
Agi (gm)	0
Start Solids (gm)	50.6
Start Liquor (gm)	112.6
Total Start Mass (gm)	310.5
Total End Mass (gm)	278.36
End Solids Mass (gm)	28.5
End Liquor SG (kg/L)	1.1805
Calc End Liquor (gm)	102.6
Calc End Liquor (L)	0.087
End Free Acid (g/L)	34.2
End Fe2+ (g/L)	46.3

Mins	Temp	Start pH	N2 Flow (lpm)
0	85	0.13	0
1	85	0.18	5
60	90	0.90	5
120	85	1.06	5
180	90	0.80	5
240	90	1.10	5

RESULTS

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al			
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)		
Start Liquor	0.1	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Final Liquor	0.1	0.008	0.0	107.60	80.5	0.02	4.4	5.36	89.1	0.62	18.9	7.36	86.4	4.66	51.4		

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al		C inorg	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Start Solids	50.6	27.60		21.80		0.11		1.29		1.19		2.25		2.71			
Final Residue	28.5	46.90	100.0	7.94	19.5	0.14	95.6	0.20	10.9	0.81	81.1	0.35	13.6	1.34	48.6	0.86	11.5

Calc Feed	50.6	26.42		22.95		0.08		1.03		0.57		1.46		1.56			
Assay Feed		27.60		21.80		0.11		1.29		1.19		2.25		2.71		4.23	

ALS Metallurgy

BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	100
Total Liquor Mass (gm)	114.9
Liquor SG (kg/L)	1.147

PROJECT	T0879
TEST NO	T53
DATE	191114
TECHNICIAN	BR

Start acid g/l	242
Start liq ml	100
start acid g	24
end acid g/l	29
end liq ml	108
end acid g	3
acid consumed g	21
acid consumption kg/t	**422**

LEACH CONDITIONS

Beaker Volume (ml)	200
Agitator (type)	mag
Agitator (rpm)	
N2 Sparge (lpm)	5
Start Temp (deg)	90
Leach Time (hrs)	6.0
Start Solids (gm)	50.0
Liquor Volume Used (l)	0.10

LEACH FEED SAMPLE DETAILS
Non-Mags
6hr Leach

MASS BALANCE

Beaker Mass (gm)	139.11
Agi (gm)	0
Start Solids (gm)	50
Start Liquor (gm)	111
Total Start Mass (gm)	300.11
Total End Mass (gm)	303.26
End Solids Mass (gm)	27.0
End Liquor SG (kg/L)	1.2684
Calc End Liquor (gm)	137.2
Calc End Liquor (L)	0.108
End Free Acid (g/L)	28.8
End Fe2+ (g/L)	70.3

Mins	Temp	Start pH	N2 Flow (lpm)
0	90	0.12	0
7	90	0.42	5
60	90	0.71	5
120	90	0.83	5
180	85	1.05	5
240	90	1.08	5
300	90	1.15	5
360	90	1.15	5

RESULTS

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al			
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)		
Start Liquor	0.1	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Final Liquor	0.1	0.006	0.0	83.00	83.2	0.01	3.6	4.00	92.0	0.54	24.1	5.23	87.7	3.13	49.3		

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al		C inorg	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Start Solids	50.0	27.60		21.80		0.11		1.29		1.19		2.25		2.71			
Final Residue	27.0	50.30	100.0	6.71	16.8	0.15	96.4	0.14	8.0	0.68	75.9	0.29	12.3	1.29	50.7	0.62	7.9
Calc Feed	50.0	27.11		21.57		0.08		0.94		0.48		1.29		1.37			
Assay Feed		27.60		21.80		0.11		1.29		1.19		2.25		2.71		4.23	

ALS Metallurgy

BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	1000
Total Liquor Mass (gm)	1148.6
Liquor SG (kg/L)	1.147

PROJECT	T0879
TEST NO	T54
DATE	191114
TECHNICIAN	BR

Start acid g/l	242
start acid g	23.7
end acid g	1.5
acid consumed g	22.2
acid consumption kg/t	**443**

LEACH CONDITIONS

Beaker Volume (ml)	200
Agitator (type)	mag
Agitator (rpm)	
N2 Sparge (lpm)	5
Start Temp (deg)	90
Leach Time (hrs)	6.0
Start Solids (gm)	50.0
Liquor Volume Used (l)	0.10

LEACH FEED SAMPLE DETAILS
Non-Mags
8hr Leach

MASS BALANCE

Beaker Mass (gm)	139.82
Agi (gm)	0
Start Solids (gm)	50
Start Liquor (gm)	112.2
Total Start Mass (gm)	302.02
Total End Mass (gm)	299.87
End Solids Mass (gm)	27.7
End Liquor SG (kg/L)	1.2685
Calc End Liquor (gm)	132.4
Calc End Liquor (L)	0.104
End Free Acid (g/L)	14.5
End Fe2+ (g/L)	71.1

Mins	Temp	Start pH	N2 Flow (lpm)
0	90	0.10	0
7	90	0.35	5
60	90	0.76	5
120	90	0.89	5
180	85	1.11	5
240	95	0.82	5
300	90	1.22	5
360	90	1.15	5
420	85	1.23	5
480	90	1.25	5

RESULTS

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al			
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)		
Start Liquor	0.1	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Final Liquor	0.1	0.007	0.0	86.40	81.6	0.01	4.0	4.15	90.7	0.55	24.6	5.20	84.9	3.19	47.8		

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al		CO3	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Start Solids	50.0	27.60		21.80		0.11		1.29		1.19		2.25		2.71			
Final Residue	27.7	47.70	100.0	7.34	18.4	0.13	96.0	0.16	9.3	0.63	75.4	0.35	15.1	1.31	52.2	2.90	7.6

Calc Feed	50.0	26.40		22.10		0.07		0.95		0.46		1.28		1.39			
Assay Feed		27.60		21.80		0.11		1.29		1.19		2.25		2.71		21.15	

ALS Metallurgy

BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	800
Total Liquor Mass (gm)	888.0
Liquor SG (kg/L)	1.1118

PROJECT	T0879
TEST NO	T66
DATE	081214
TECHNICIAN	MW

Start acid g/l	242
Start liq ml	799
start acid g	193
end acid g/l	30
end liq ml	830
end acid g	25
acid consumed g	168
acid consumption kg/t	**560**

LEACH CONDITIONS

Beaker Volume (ml)	2000
Agitator (type)	RT
Agitator (rpm)	250
N2 Blanket (lpm)	1
Start Temp (deg)	90
Leach Time (hrs)	8.0
Start Solids (gm)	300.0
Liquor Volume Used (l)	0.800

LEACH FEED SAMPLE DETAILS
T57 Float Ro Tail

MASS BALANCE

Beaker Mass (gm)	861.2
Agi (gm)	235.3
Start Solids (gm)	300
Start Liquor (gm)	888
Total Start Mass (gm)	2284.5
Total End Mass (gm)	2291.2
End Solids Mass (gm)	153.4
End Liquor SG (kg/L)	1.2553
Calc End Liquor (gm)	1041.3
Calc End Liquor (L)	30.400
End Free Acid (g/L)	30.4
End Fe2+ (g/L)	63.9

Hrs	Temp	Start pH	N2 Flow (lpm)
0	90	-0.9	1
1	90	0.36	1
2	90	0.59	1
3	90	0.71	1
4	90	0.74	1
5	90	0.77	1
6	90	0.77	1
7	90	0.77	1
8	90	0.77	1

RESULTS

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al			
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)		
Start Liquor	0.8	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Final Liquor	0.8	0.008	0.0	74.30	91.3	0.01	4.0	3.91	95.1	0.72	35.8	4.95	82.7	2.77	35.0		

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al			
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)		
Start Solids	300.0	28.80		21.00		0.10		1.10		1.20		2.60		2.70			
Final Residue	153.4	55.25	100.0	3.82	8.7	0.13	96.0	0.11	4.9	0.70	64.2	0.56	17.3	2.79	65.0		

Calc Feed	300.0	28.25		22.50		0.07		1.14		0.56		1.66		2.19			
Assay Feed		28.80		21.00		0.10		1.10		1.20		2.60		2.70			

BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	100
Total Liquor Mass (gm)	104.8
H2SO4 g/L	100.0
Start Free Acid g/L	98.0
Liquor SG (kg/L)	1.058

PROJECT	T0879
TEST NO	T80
DATE	180315
TECHNICIAN	MW/DG

start acid	g	9.7
end acid	g	6.8
acid consumption	g	2.9
acid consumption	kg/t	480

LEACH CONDITIONS

Beaker Volume (ml)	150
Agitator (type)	mag
Start Temp (deg)	90
Leach Time (hrs)	8.0
Start Solids (gm)	6.0086
Liquor Volume Used (l)	0.100

LEACH FEED SAMPLE DETAILS
Float Products
Cl2 Conc Medium Grade
N2 Blanket at Start

MASS BALANCE

Beaker Mass (gm)	46.6
Mag stirrer (gm)	3.48
Start Solids (gm)	6.0086
Start Liquor (gm)	104.8
Total Start Mass (gm)	160.89
Total End Mass (gm)	160.33
End Solids Mass (gm)	2.8384
End Liquor SG (kg/L)	1.0865
Calc End Liquor (gm)	107.4
Calc End Liquor (L)	0.099
End Free Acid (g/L)	69.0

RESULTS

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al			
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)		
Start Liquor	0.100	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Final Liquor	0.099	0.015	0.2	14.50	92.5	0.01	28.4	0.19	95.7	0.37	94.8	0.58	80.4	0.52	29.6		

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al		C inorg	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Final Residue	2.8384	28.10	100.0	4.12	7.5	0.05	71.6	0.03	4.3	0.07	5.2	0.49	19.6	4.29	70.4		
Calc Feed	6.0086	13.27		25.80		0.03		0.33		0.64		1.18		2.88			

ALS Metallurgy

BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	100
Total Liquor Mass (gm)	105.1
H2SO4 g/L	100.0
Start Free Acid g/L	98.0
Liquor SG (kg/L)	1.058

PROJECT	T0879
TEST NO	T81
DATE	180315
TECHNICIAN	MW/DG

start acid	g	9.7
end acid	g	6.6
acid consumption	g	3.2
acid consumption	kg/t	528

LEACH CONDITIONS

Beaker Volume (ml)	150
Agitator (type)	mag
Start Temp (deg)	90
Leach Time (hrs)	8.0
Start Solids (gm)	6.0069
Liquor Volume Used (l)	0.100

LEACH FEED SAMPLE DETAILS
Float Products
Cl2 Conc Low Grade
N2 Blanket at Start

MASS BALANCE

Beaker Mass (gm)	48.08
Mag stirrer (gm)	3.44
Start Solids (gm)	6.0086
Start Liquor (gm)	105.1
Total Start Mass (gm)	162.63
Total End Mass (gm)	165.08
End Solids Mass (gm)	2.5996
End Liquor SG (kg/L)	1.0801
Calc End Liquor (gm)	111.0
Calc End Liquor (L)	0.103
End Free Acid (g/L)	63.9

RESULTS

Stream	Vol	Sn		Fe		As		Mn		Ca		Mg		Al			
	(L)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)	(g/L)	Rec (%)		
Start Liquor	0.100	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Final Liquor	0.103	0.009	0.2	15.45	93.4	0.06	81.9	0.20	98.7	0.15	88.3	0.62	81.2	0.58	30.2		

Stream	Mass	Sn		Fe		As		Mn		Ca		Mg		Al		C inorg	
	(gm)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Final Residue	2.5996	20.70	100.0	4.30	6.6	0.05	18.1	0.01	1.3	0.08	11.7	0.57	18.8	5.26	69.8		
Calc Feed	6.0086	8.96		28.28		0.12		0.34		0.30		1.31		3.26			

Appendix 14 – Overall Tin Balances

Demonstrated; 4 micron deslime (deslime test T70, tin float test T76) 12% Sn float con

Ore feed	
1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation	
Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation con	
0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

Sulfide flotation tails/gravity feed	
1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)	
Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Gravity con	
55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail	
0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Deslime feed	
0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime	
Mass Recovery	79.9%
Sn Recovery	84.7%

Slime tails	
0.37	% Sn
8	t/h solids
0.03	t/h Sn
3.7%	**Sn Dist'n**

Tin flotation feed	
0.52	% Sn
31	t/h solids
0.16	t/h Sn
20.7%	**Sn Dist'n**

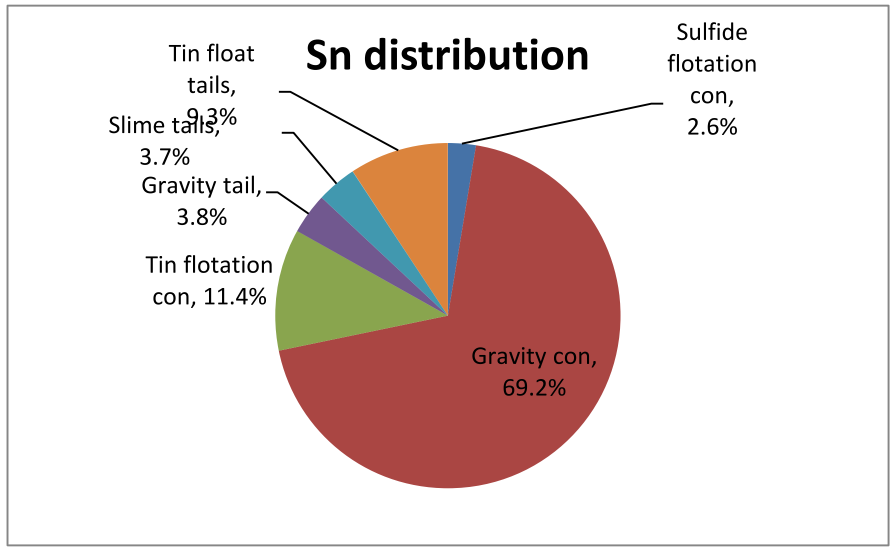
Tin flotation	
Mass Recovery	2.4%
Sn Recovery	55.1%

Tin float tails	
0.24	% Sn
29.8	t/h solids
0.1	t/h Sn
9.3%	**Sn Dist'n**

Tin flotation con	
12.0	% Sn
0.72	t/h solids
0.09	t/h Sn
11.4%	**Sn Dist'n**

Tin flotation con - post leaching	
19.0	% Sn
0.46	t/h solids
0.09	t/h Sn
11.4%	**Sn Dist'n**

Total Final Concentrate (gravity plus tin flotation - post leaching)	
43.4	**% Sn**
1.42	t/h solids
0.6	t/h Sn
80.5%	**Sn Dist'n**



Demonstrated; 4 micron deslime (deslime test T70, tin float test T76) 13% Sn float con

Ore feed	
1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation	
Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation tails/gravity feed	
1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)	
Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Deslime feed	
0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime	
Mass Recovery	79.9%
Sn Recovery	84.7%

Slime tails	
0.37	% Sn
8	t/h solids
0.03	t/h Sn
3.7%	**Sn Dist'n**

Sulfide flotation con	
0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

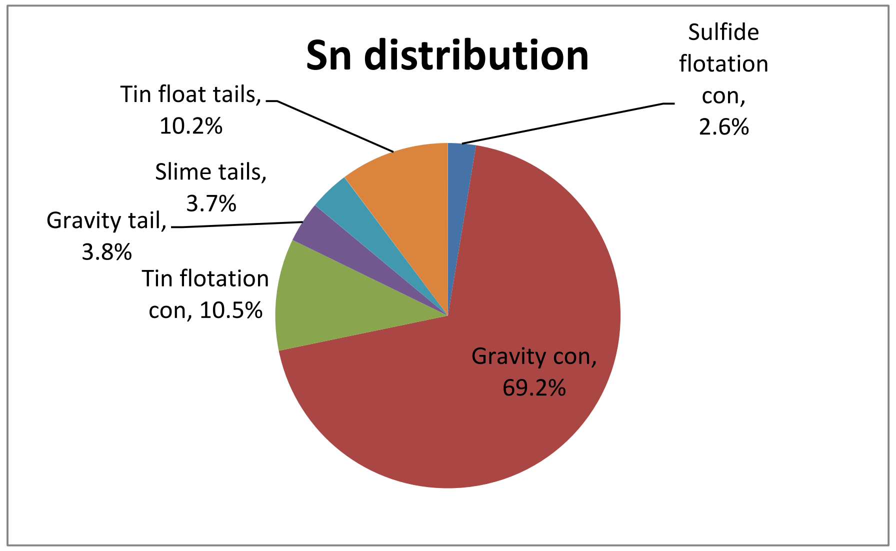
Gravity con	
55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail	
0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Tin flotation feed	
0.52	% Sn
31	t/h solids
0.16	t/h Sn
20.7%	**Sn Dist'n**

Tin flotation	
Mass Recovery	2.0%
Sn Recovery	50.6%

Tin float tails	
0.26	% Sn
29.9	t/h solids
0.1	t/h Sn
10.2%	**Sn Dist'n**



Total Final Concentrate (gravity plus tin flotation - post leaching)	
44.8	**% Sn**
1.36	t/h solids
0.6	t/h Sn
79.6%	**Sn Dist'n**

Tin flotation con - post leaching	
20.2	% Sn
0.40	t/h solids
0.08	t/h Sn
10.5%	**Sn Dist'n**

Tin flotation con	
13.0	% Sn
0.61	t/h solids
0.08	t/h Sn
10.5%	**Sn Dist'n**

Demonstrated; 4 micron deslime (deslime test T70, tin float test T76) 14% Sn float con

Ore feed	
1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation	
Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation con	
0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

Sulfide flotation tails/gravity feed	
1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)	
Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Gravity con	
55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail	
0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Deslime feed	
0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime	
Mass Recovery	79.9%
Sn Recovery	84.7%

Slime tails	
0.37	% Sn
8	t/h solids
0.03	t/h Sn
3.7%	**Sn Dist'n**

Tin flotation feed	
0.52	% Sn
31	t/h solids
0.16	t/h Sn
20.7%	**Sn Dist'n**

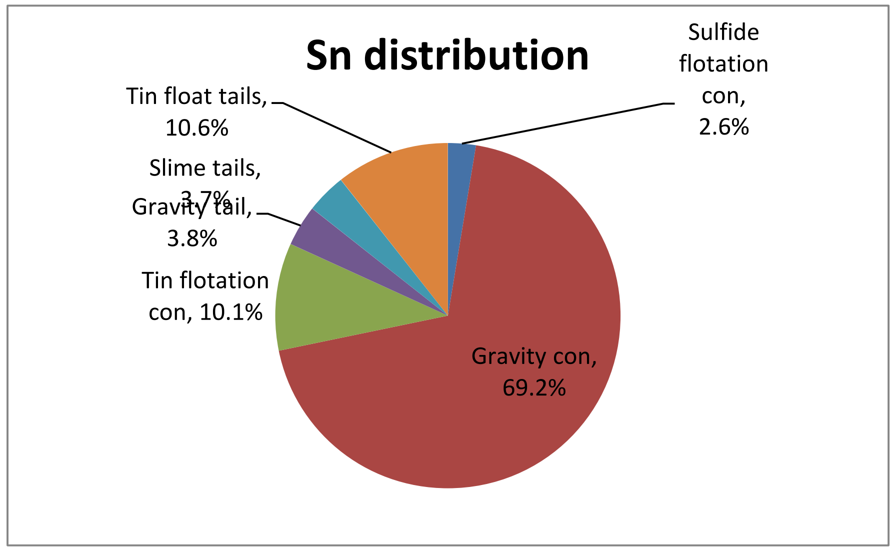
Tin flotation	
Mass Recovery	1.8%
Sn Recovery	48.6%

Tin float tails	
0.27	% Sn
30.0	t/h solids
0.1	t/h Sn
10.6%	**Sn Dist'n**

Tin flotation con	
14.0	% Sn
0.55	t/h solids
0.08	t/h Sn
10.1%	**Sn Dist'n**

Tin flotation con - post leaching	
21.3	% Sn
0.36	t/h solids
0.08	t/h Sn
10.1%	**Sn Dist'n**

Total Final Concentrate (gravity plus tin flotation - post leaching)	
45.8	**% Sn**
1.32	t/h solids
0.6	t/h Sn
79.2%	**Sn Dist'n**



Demonstrated; 4 micron deslime (deslime test T70, tin float test T76) 15% Sn float con

Ore feed	
1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation	
Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation con	
0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

Sulfide flotation tails/gravity feed	
1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)	
Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Gravity con	
55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail	
0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Deslime feed	
0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime	
Mass Recovery	79.9%
Sn Recovery	84.7%

Slime tails	
0.37	% Sn
8	t/h solids
0.03	t/h Sn
3.7%	**Sn Dist'n**

Tin flotation feed	
0.52	% Sn
31	t/h solids
0.16	t/h Sn
20.7%	**Sn Dist'n**

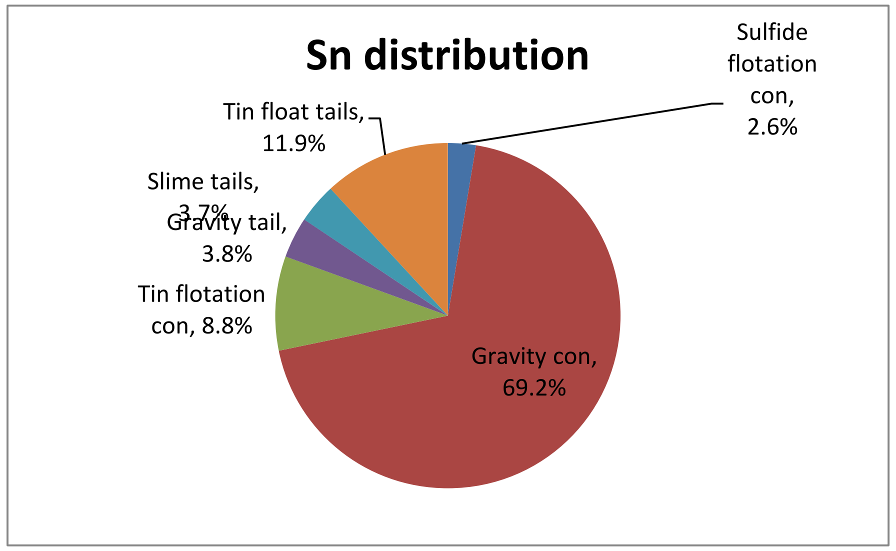
Tin flotation	
Mass Recovery	1.5%
Sn Recovery	42.6%

Tin float tails	
0.30	% Sn
30.1	t/h solids
0.1	t/h Sn
11.9%	**Sn Dist'n**

Tin flotation con	
15.0	% Sn
0.45	t/h solids
0.07	t/h Sn
8.8%	**Sn Dist'n**

Tin flotation con - post leaching	
22.5	% Sn
0.30	t/h solids
0.07	t/h Sn
8.8%	**Sn Dist'n**

Total Final Concentrate (gravity plus tin flotation - post leaching)	
47.3	**% Sn**
1.3	t/h solids
0.6	t/h Sn
78.0%	**Sn Dist'n**



Demonstrated; 12 micron deslime (deslime test T56, tin float test T62)

Ore feed	
1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation	
Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation con	
0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

Sulfide flotation tails/gravity feed	
1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)	
Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Gravity con	
55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail	
0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Deslime feed	
0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime	
Mass Recovery	39.3%
Sn Recovery	61.1%

Slime tails	
0.31	% Sn
23	t/h solids
0.07	t/h Sn
9.5%	**Sn Dist'n**

Tin flotation feed	
0.76	% Sn
15	t/h solids
0.11	t/h Sn
14.9%	**Sn Dist'n**

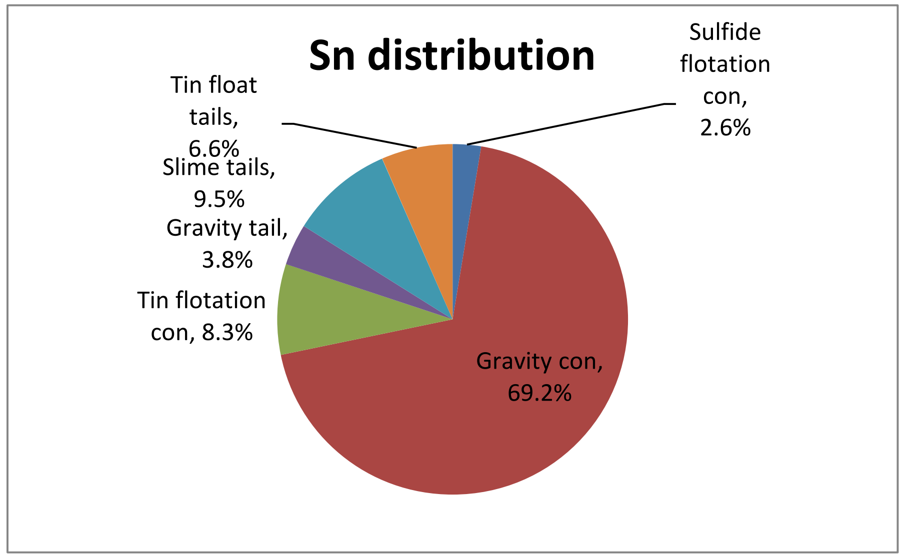
Tin flotation	
Mass Recovery	3.3%
Sn Recovery	55.9%

Tin float tails	
0.35	% Sn
14.5	t/h solids
0.1	t/h Sn
6.6%	**Sn Dist'n**

Tin flotation con	
13.0	% Sn
0.49	t/h solids
0.06	t/h Sn
8.3%	**Sn Dist'n**

Tin flotation con - post leaching	
20.2	% Sn
0.32	t/h solids
0.06	t/h Sn
8.3%	**Sn Dist'n**

Total Final Concentrate (gravity plus tin flotation - post leaching)	
46.4	**% Sn**
1.3	t/h solids
0.6	t/h Sn
77.5%	**Sn Dist'n**



Demonstrated; 12 micron deslime (deslime test T56, tin float test T62)

Ore feed

1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation

Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation con

0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

Sulfide flotation tails/gravity feed

1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)

Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Gravity con

55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail

0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Deslime feed

0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime

Mass Recovery	39.3%
Sn Recovery	61.1%

Slime tails

0.31	% Sn
23	t/h solids
0.07	t/h Sn
9.5%	**Sn Dist'n**

Tin flotation feed

0.76	% Sn
15	t/h solids
0.11	t/h Sn
14.9%	**Sn Dist'n**

Tin flotation

Mass Recovery	2.7%
Sn Recovery	52.8%

Tin float tails

0.37	% Sn
14.6	t/h solids
0.1	t/h Sn
7.0%	**Sn Dist'n**

Tin flotation con

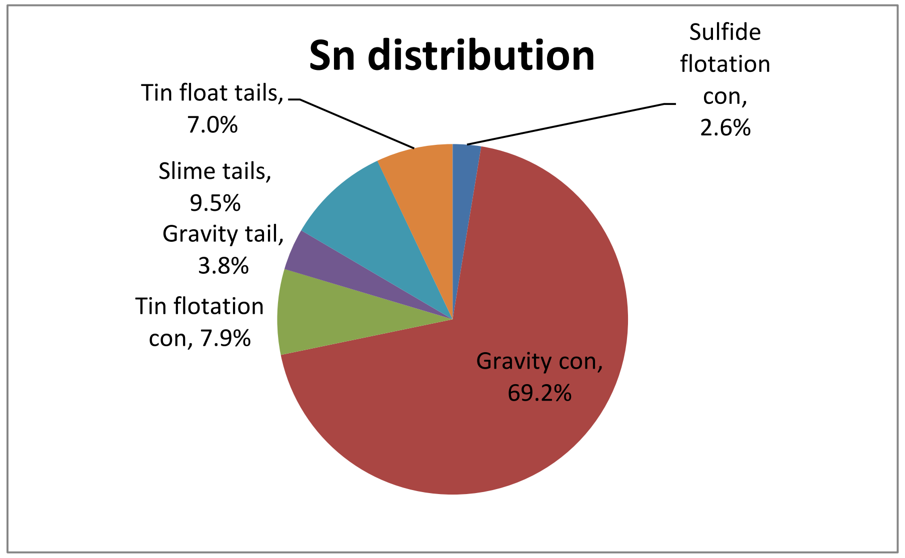
15.0	% Sn
0.40	t/h solids
0.06	t/h Sn
7.9%	**Sn Dist'n**

Tin flotation con - post leaching

22.5	% Sn
0.27	t/h solids
0.06	t/h Sn
7.9%	**Sn Dist'n**

Total Final Concentrate (gravity plus tin flotation - post leaching)

47.9	**% Sn**
1.2	t/h solids
0.6	t/h Sn
77.0%	**Sn Dist'n**



Demonstrated; 12 micron deslime (deslime test T56, tin float test T62)

Ore feed	
1.03	% Sn
74	t/h solids
0.76	t/h Sn
100%	**Sn Dist'n**

Sulfide flotation	
Mass Recovery	27.4%
Sn Recovery	97.4%

Sulfide flotation con	
0.10	% Sn
20	t/h solids
0.02	t/h Sn
2.6%	**Sn Dist'n**

Sulfide flotation tails/gravity feed	
1.38	% Sn
54	t/h solids
0.74	t/h Sn
97.4%	**Sn Dist'n**

Gravity Separation (including dressing and leaching)	
Mass Recovery	1.8%
Sn Recovery	71%
Mass loss to gravity tail	27%
Sn loss to gravity tail	3.9%

Gravity con	
55.0	% Sn
1.0	t/h solids
0.53	t/h Sn
69.2%	**Sn Dist'n**

Gravity tail	
0.2	% Sn
14.6	t/h solids
0.03	t/h Sn
3.8%	**Sn Dist'n**

Deslime feed	
0.49	% Sn
38	t/h solids
0.19	t/h Sn
24.4%	**Sn Dist'n**

Deslime	
Mass Recovery	39.3%
Sn Recovery	61.1%

Slime tails	
0.31	% Sn
23	t/h solids
0.07	t/h Sn
9.5%	**Sn Dist'n**

Tin flotation feed	
0.76	% Sn
15	t/h solids
0.11	t/h Sn
14.9%	**Sn Dist'n**

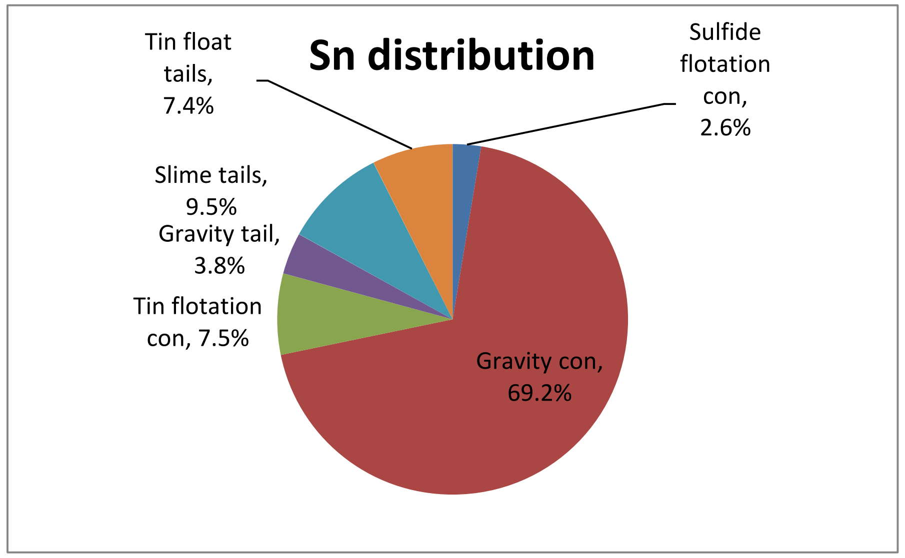
Tin flotation	
Mass Recovery	2.3%
Sn Recovery	50.1%

Tin float tails	
0.39	% Sn
14.7	t/h solids
0.1	t/h Sn
7.4%	**Sn Dist'n**

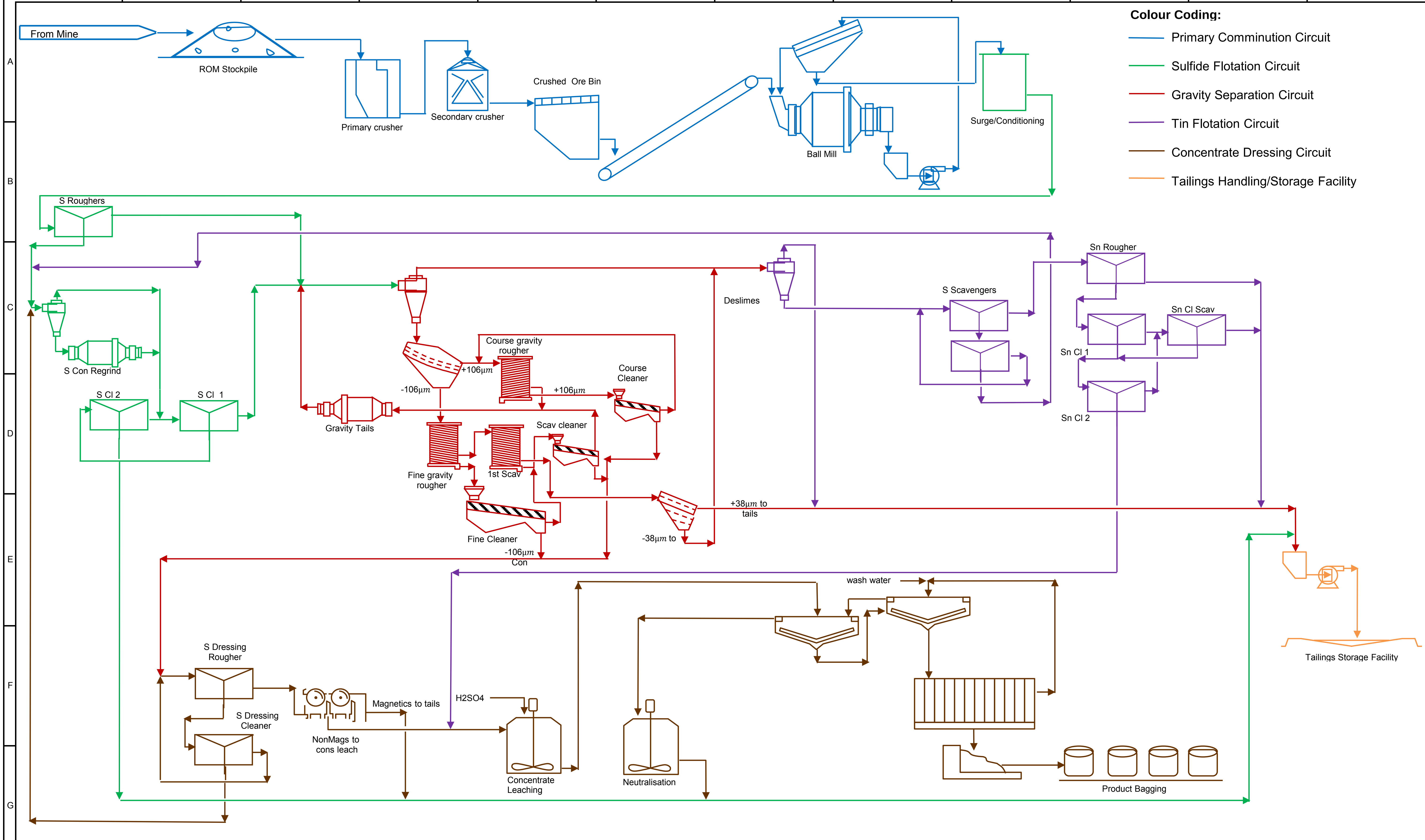
Tin flotation con	
16.8	% Sn
0.34	t/h solids
0.06	t/h Sn
7.5%	**Sn Dist'n**

Tin flotation con - post leaching	
24.7	% Sn
0.23	t/h solids
0.06	t/h Sn
7.5%	**Sn Dist'n**

Total Final Concentrate (gravity plus tin flotation - post leaching)	
49.1	**% Sn**
1.2	t/h solids
0.6	t/h Sn
76.6%	**Sn Dist'n**



Appendix 15 – Proposed Process Flowsheet



STELLAR

DRAWING No.	TITLE	No.	DATE	DRAWN	CHECKED	APPROVED	DESCRIPTION	ENG	CLIENT
			11-03-15	J. Resta					
			29-09-14	L.Bartsch			Heemskirk Tin Process Flowsheet		

REFERENCE DRAWINGS | REVISIONS

WorleyParsons SelectDraw Version 2.12

DRAWN: J. Resta DATE: 11/3/2015
CHECKED: DATE:
ENGINEER: DATE:
PROC ENG: DATE:

WorleyParsons
resources & energy

Heemskirk Tin Project
Process Flowsheet

SCALE	DRAWING NUMBER	REV
		B

Filename:C:\Users\Justin.Resta\Documents\Projects\Stellar\PFD's\[Stella Heemskirk PFD 170315.xlsm]Landscape

Appendix 16 – Testwork Scope of Work

WorleyParsons
resources & energy

Minerals & Metals
Level 12, 333 Collins Street
Melbourne VIC 3000
Australia
Telephone: +61 3 8676 3500
Facsimile: +61 3 8676 3505
www.worleyparsons.com
ABN 61 001 279 812

4 April 2014

Ref:
File:

John Glen, ALS Ammtec Burnie
39 River Road
Wivenhoe
Tasmania 7320

John

HEEMSKIRK TIN PROJECT – FURTHER FLOWSHEET DEVELOPMENT TESTWORK

WorleyParsons is currently assisting Stellar Resources with the ongoing development of the Heemskirk Tin project with a view to progressing this towards a Bankable Feasibility Study.

Significant additional flowsheet development and optimisation testwork is required, particularly with respect to tin flotation. The majority of this work is best undertaken for a single large composite "typical" of the major ore types. This will allow more robust testing to be undertaken (particularly in tin flotation).

Keys aims of this work are;

- Achieve improved overall performance with respect to tin recovery to saleable concentrate grades
- Better define the optimum flowsheet, process design criteria and expected performance
- Demonstrate achievable overall tin recovery to saleable concentrate grades

Later work will focus on ore variability testing, and other work necessary to support the BFS.

We invite you to submit a proposal for the testwork detailed below. All purchase orders for the program will be raised by Stellar Resources.

1. GENERAL

1.1 Reporting

Progressive report of the results of the testwork program will be essential to timely completion of the study.

- All testwork results are to be reported, in spreadsheet format, on a progressive basis as results become available. These are to be reported to both WorleyParsons and Stellar Resources.
- A final data report will be required on completion of all testwork.

2. TESTWORK

Suggested nominal targets for various circuits are below;

- Sulfide flotation tails S grade: ~3-4%
- Sulfide flotation concentrate S grade: ~42% (~80% sulfide mineral)
- Gravity concentrate Sn grade: ~50% Sn post sulfide dressing, post leaching. Target grade should be reviewed based on outcomes of leach and NSR assessments.
- Tin flotation feed S grade: <~1.0-0.5%
- Tin flotation concentrate Sn grade: ~15% or better
- Final tin concentrate (post sulfide dressing, post leaching):
  - Sn grade ~45-50%, pending further analysis
  - S grade - around 2-3% S, preferably <0.5%

These will be reviewed as further work (both testwork and other assessments such as NSR and concentrate leach modelling) progress.

Whole of ore treatment will be considered as the base case for the majority of the flowsheet development work outlined in this program. HMS sinks + fines product is to be tested under the “optimised” downstream flowsheet/conditions developed for the whole of ore.

2.1 Samples

Severn bulk composite:

A “Severn bulk composite” sample is to be produced from ½ core from holes ZS-109, ZS-111, ZS-111W, ZS-112a, ZS-112b, ZS-112c, ZS-112d, ZS-112W, ZS-115, ZS-120, ZS-123 currently in storage. Refer “Met Intercepts (JR040314).xlsx” for details.

This will be used for the majority of the flowsheet development/optimisation work.

Variability composites:

¼ core from holes ZS-109, ZS-111, ZS-111W, ZS-112a, ZS-112b, ZS-112c, ZS-112d, ZS-112W, ZS-115, ZS-120, ZS-123 is currently in storage on site. This will be held in reserve to produce variability composites for testing of the “optimised” flowsheet.

2.1.1 Sample Characterisation

Characterisation work will be completed on the following samples;

- ‘Severn bulk composite’
- Other variability composites (as applicable)

Characterisation work will consist of the following;

- Head assay
- Size by size assay
- Optical mineralogy – Fully and Sn scan
- QXRD

- Multi-element ICP scan
- SG determination
- Heavy liquid testing

2.2 Comminution

Bond rod mill and ball mill work indices should be determined for the following samples;

- 'Severn bulk composite'
- Other variability composites (as applicable)

2.3 Heavy Media Separation

Whole of ore treatment will be considered as the base case for the majority of the flowsheet development work outlined in this program.

- Heavy media testing (via DRS pilot rig) is to be completed on the "Severn bulk composite" to access achievable performance, and provide comparison with heavy liquid testing.
- Sufficient sinks + fines product should be produced from the "Severn bulk composite" to allow testing of the "optimised" downstream flowsheet.

2.3.1 Heavy liquid testing on previous composites

Heavy liquid testing should be completed on the following samples (if suitable rejects are available) to allow comparison with previous heavy media results;

- T0819 floats comp 4
- T0819 floats+sinks+fines
- T0714 comp 2 and 3

2.4 Sulfide Flotation

Sulfide flotation results utilising guar and adequate regrind to date are quite good.

Further work;

- Optimisation of both primary and regrind size/energy input over the ranges of;
  - Primary grind ~250 – 100 µm
  - Regrind ~75 – 30 µm
- Rougher rate tests to better quantify residence time requirements
- Lock cycle testing of 'optimised' sulfide flotation conditions
- Generation of sulfide flotation tailings under 'optimum' conditions for downstream testwork
  - Sulfide flotation work to produce sulfide flotation tailings for downstream work should ensure tailings at an appropriate S grade are produced

2.5 Gravity Separation

Further work needs to be completed on sulfide flotation tailings which are at an appropriate target sulfur grade (~3-4% S) following optimisation of sulfide flotation.

This must be aimed at producing target final con grades (both Sn and S) taking into account impacts of sulfide dressing and concentrate leach, and should aim to produce a range of grade recovery points to allow more thorough assessment of optimum grade target.

Further work;

- Lock cycle testing at various (say 3) grade recovery points (suggest adjusting table angle to achieve this?)
- Production of de-slime/tin flotation feed material
- Sulfide dressing flotation
    - Further work is required to better quantify achievable performance in terms of S rejection and Sn losses, and design criteria (particularly rate)
    - Investigate where in the circuit sulfide dressing flotation is best carried out. There may be some benefits in placing this further upstream; say following gravity roughing, or alternatively scavenging following sulfide flotation.
- Application of UF Falcon on
    - Fine gravity tails
    - Tin float feed
- Destination of fine gravity tails – The most appropriate destination, to either final tails or tin flotation feed, needs to be assessed
    - Comparative tin flotation tests under ‘optimised’ conditions should be completed with fine gravity tails included and excluded from tin flotation feed
    - For the purposes of generating tin flotation feed material fine gravity tails should be included in tin flotation feed.

2.6 Deslime and Tin Flotation

Deslime and tin flotation tests should be completed at larger scale than in previous work, to provide more robust results and allow cleaning stages in particular to be completed at more realistic pulp densities.

Areas for further testwork:

- De-slime cut point optimisation
    - De-slime testwork should be completed utilising the cyclone test rig
    - Suggested cut points; D50 ~7, ~10 and ~15 µm
    - Suggest tin float conditions as per T0797 test 4-6
- Tin flotation feed pre-treatment
    - Via WHIMS (utilising SLon)
    - Via UF Falcon

- WHIMS + UF Falcon
  - Suggest tin float conditions as per T0797 test 4-6
- Sulfide scavenger flotation optimisation
- Optimisation of mass pull in roughing – roughing tests should target maximum selectivity against Fe and SiO_2.
- Reagents for further investigation;
  - Acid, SSF, SPA (refer T0797 test 4-6)
  - Dispersants
    - Huntsman Polymax T10 (PEO)
    - Huntsman Polymax T12 (PEO)
    - Others??
  - NaSH
  - Oxalic acid (refer T0630 test 51 and 52)
  - Sodium silicate (refer T0630 test 26)

Initial tests investigating the above should be completed as roughing tests to allow appropriate mass pulls (maximising selectivity) for subsequent cleaning tests to determined.

Lock cycle testing should be completed once conditions have been further optimised.

Other areas for further investigation;

- Application of UF Falcon within the tin flotation circuit –
  - this may have benefits in reducing losses to slimes - slimes scavenging
  - tin float concentrate cleaning
- Application of Wet High Intensity Magnetic Separation for rejection of siderite in cleaning circuit

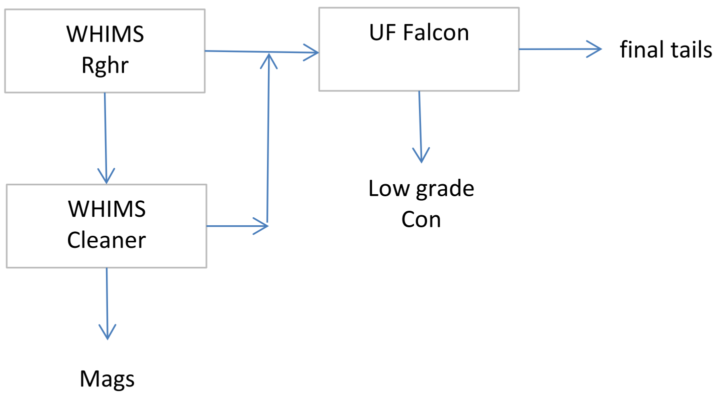
2.6.1 Cleaning of tin flotation concentrate by gravity means

Further upgrading of tin flotation concentrate by super panning showed considerable promise in T0630 test 28/29.

This should be investigated once tin flotation conditions have been further optimised, utilising either super panner or Mozley table.

2.7 WHIMS plus UF Falcon

Sighter WHIMS testwork has shown the potential to reject considerable siderite, and provide a moderate Sn upgrade into the non-mags product. In combination with UF Falcon (see below) with further optimisation they may be some potential to produce a low grade concentrate suitable for blended with the gravity concentrate as an alternative to tin flotation.



It is suggested a sighter test be completed to test this concept.

Suggested WHIMS conditions;

- Feed density; rghr ~25% solids, cleaner ~10% solids
- Field strength ~10,000 gauss

2.8 Concentrate Leaching

Concentrate leach tests are to be completed on selected samples; both gravity and tin flotation concentrates, and appropriate blends of these, generated from testwork.

Concentrate leach test conditions;

- Grind size; as is
- Mass solids; TBA
- Start Liquor volume ; TBA
- Start Liquor composition; 100 g/l H_2SO_4
- Acid addition; add concentrated acid to maintain pH 0.5 throughout tests
- Gas Sparging; none
- Temperature; 80^{O}C
- Leach Time; 60, 120, 240, 360 minutes (majority of tests will be conducted for a single time of 4 hours only)

pH of tests should be monitored and maintained at 0.5 throughout, with all acid additions recorded.

2.8.1 Samples from previous testwork

The following samples generated from previous testwork are to be leached under the conditions above for a fixed time of 4 hours.

- T0797 test 4 flotation concentrates
- T0797 test 6 flotation concentrates
- T0819 test 13 flotation concentrates

- T0714 LC02 concentrates
- T0819 LC01 concentrate

2.9 Assays

2.9.1 Solids Analysis

- Feed solids and products produced from all tests should be analysed for;

  Sn, Fe, As, Mg, Ca, Mn, SiO_2, Al, S, CO_3 by XRF fusion/Leco
- All composite head samples should be analysed for;

  acid soluble Sn, SG, ICP multi-elemental scans
- Feed solids and products produced from all tests should be analysed for;

  QXRD, acid soluble Sn

2.9.2 Liquor analysis

- All liquor samples from concentrate leach tests should be analysed for;

  Fe(total), Mn, Mg, Al and Ca by AAS
- All leach liquor end samples should be analysed for;

  Sn, Fe^{2+}, H_2SO_4 by titration in addition to the above

Please contact me if you have any questions on the proposed testwork.

Yours faithfully

J Resta

WorleyParsons

Appendix 17 – ALS Metallurgy Report

(yet to be received at the time of writing)