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STELLAR RESOURCES LIMITED

Saint Dizier Metallurgical Testwork Final Report

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SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

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PROJECT 201010-00575 - SAINT DIZIER METALLURGICAL TESTWORK

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1 SUMMARY

This report outlines the metallurgical testwork completed on samples collected from the Saint Dizier exploration lease, EL46/2003, over the period 2014/2015. A metallurgical testwork program was undertaken on samples collected from the lease for the purposes of preliminary scoping/concept level flowsheet development, and preliminary assessment of potentially achievable metallurgical performance.

The overall approach to treatment of the Saint Dizier ore included primary comminution followed by magnetic separation. Non-magnetics then formed the feed through gravity separation, de-slime and tin flotation circuits.

Considerable variability in properties of the various samples used in this program was observed. Given this it is recommended to assess the variability across the Saint Dizier deposit, to allow the results from the current program to be put into perspective in terms of the likely treatment response of the overall deposit.

Overall tin deportment based on the outcomes of the testwork program is summarised in the table below.

Saint Dizier: Summary of Tin Balance (based on outcomes for Composite 2+3)

Stream	Sn Distribution
ROM	100%
Magnetic con	18%
Gravity tail	5%
Slime tails	16%
Sulfide scavenger con	5%
Tin float tails	13%
Gravity con	29%
Tin flotation con	15%
Total final concentrate	43%

Losses to the magnetic concentrate are inherently high due to the very fine association of cassiterite with magnetite.

Losses to slimes are also expected to be inherently high due to both the fine grain size of cassiterite and the very high hardness of the ore.

A final gravity concentrate grade (post dressing and leaching) of 49.7% Sn was demonstrated on Composite 2+3. With further optimisation of sulfur rejection in the sulfide dressing circuit, final gravity concentrate grades of approximately 55% are expected to be readily achievable.

Tin flotation concentrate grades produced were modest. However, with further optimisation, particularly around sulfur, talc and slimes rejection, it is expected that improved grade/recovery



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response will be achievable in tin flotation. Since siderite is the major diluent present in the tin flotation concentrate, this is expected to upgrade significantly across concentrate leaching.

With further optimisation, approximately 45% to something <50% Sn recovery may be achievable.



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2 INTRODUCTION

This report outlines the metallurgical testwork completed on samples collected from the Saint Dizier exploration lease, EL46/2003. A metallurgical testwork program was undertaken on samples collected from the lease for the purposes of preliminary scoping/concept level flowsheet development, and preliminary assessment of potentially achievable metallurgical performance.

The current metallurgical testwork program represents the first program completed in recent times (only limited testwork has been completed on the Saint Dizier deposit since the 1960's).

Keys aims of the program were to:

- Understand likely achievable overall grade/recovery response and treatment issues
- Develop an appropriate flowsheet
- Understand how this potentially fits with the overall Heemskirk Tin project currently being considered by Stellar Resources.

The testwork program was largely completed by ALS Metallurgy Burnie laboratory with metallurgical assistance and input to Stellar Resources provided by WorleyParsons.

This report details results and analysis of results for the overall program.



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3 OUTLINE OF PROGRAM

The testwork program was completed on a series of 4 composite samples generated from samples collected from the exploration lease.

The program consisted of;

- Sample characterisation (both bulk sample and drill hole composites)
- Comminution testing (bulk sample only)
- Magnetic Separation (both bulk sample and drill hole composites)
- Gravity Separation (both bulk sample and drill hole composites)
- Gravity concentrate dressing including sulfide flotation, magnetic separation and concentrate leaching (drill hole composites only)
- De-slime (drill hole composites only)
- Tin flotation (drill hole composites only)

Figure 3-1 shows the conceptual block flowsheet which was considered by the testwork program.

The conceptual block flowsheet consisted of primary grinding to a relatively coarse grind size (P80 ~250 to 350 µm) followed by wet magnetic separation to remove magnetite ahead of gravity separation.

Magnetic separation consisted of roughing followed by regrind and cleaning of the magnetic product. This was largely focused on minimising tin losses to the magnetite concentrate, while reducing the quantity of magnetite in the feed to the gravity circuit to more manageable levels.

The combined rougher and cleaner non-mags products from the magnetic separation testwork formed the feed for the gravity separation testwork.

The gravity circuit considered, consisted of classification of the circuit feed into coarse and fine fractions to allow separate concentration of these, to produce a crude concentrate suitable for upgrade via the dressing circuits.

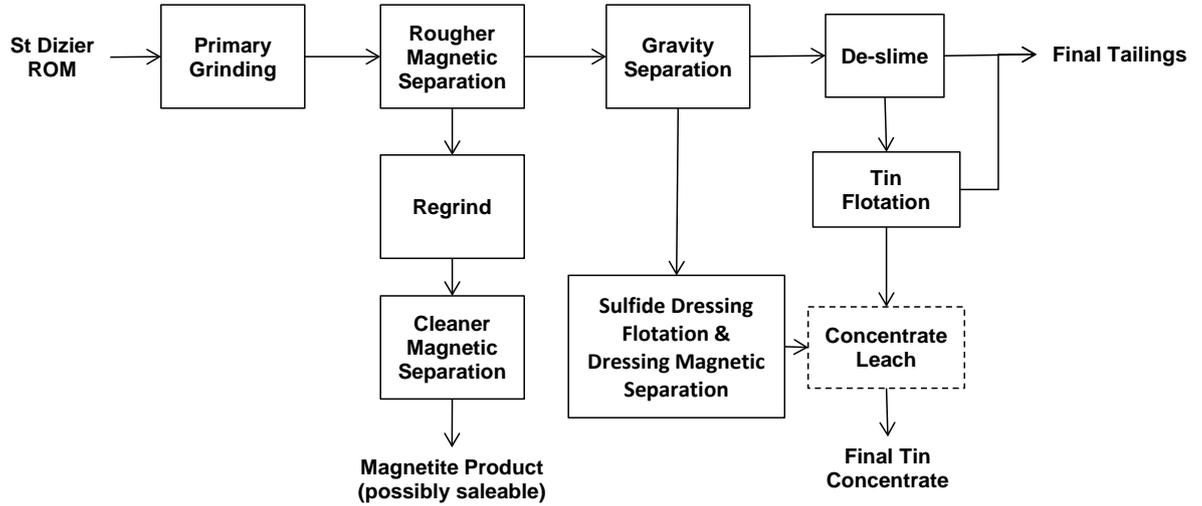
In addition to cassiterite, other high SG minerals present including: pyrite, magnetite and siderite were also strongly concentrated in the gravity circuit and were expected to be the major diluents present in the crude concentrate produced. As such, the dressing circuit is aimed at upgrading the concentrate to saleable Sn grades by removing these via sulfide flotation, magnetic separation and acid leaching.

Fine material exiting the gravity circuit is de-slimes, prior to sulfide scavenger flotation and tin flotation.



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Figure 3-1 – Conceptual Block Flowsheet





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4 SAMPLES USED IN TESTWORK PROGRAM

The testwork program was completed on a series of 4 composite samples generated from samples collected from the exploration lease. These samples were:

- Saint Dizier Bulk Composite (Composite 1)

The Bulk Composite sample was produced from several tonnes of material excavated from a costean

- Composite 2

Composite 2 was produced from ½ core from the metallurgical drill hole ST06, intervals 20.3 – 50m, sample numbers 290657 - 290685

- Composite 3

Composite 3 was generated from ½ core from the metallurgical drill hole ST06, intervals 57 – 86m, sample numbers 290693 - 290721

- Composite 4

Composite 4 was generated from ½ core from the metallurgical drill hole ST06, intervals 106 – 114m, sample numbers 290737 – 290744

- Composite 2+3

A fifth composite was produced by combining composites 2 and 3 in equal weights.

Figure 4-1 and Figure 4-2 show the locations of the bulk sample collection site and ST06 drill hole. Assays for the individual intervals forming Composites 2, 3 and 4 are contained in Appendix 1.



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Figure 4-1 - Drill hole and costean/bulk sample locations

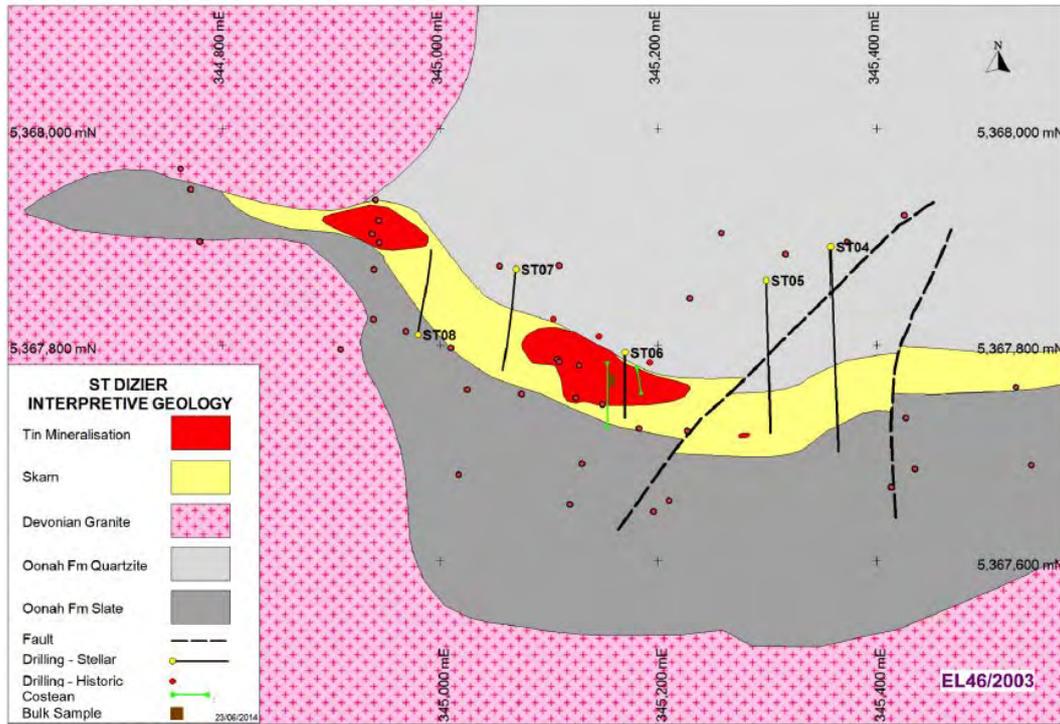
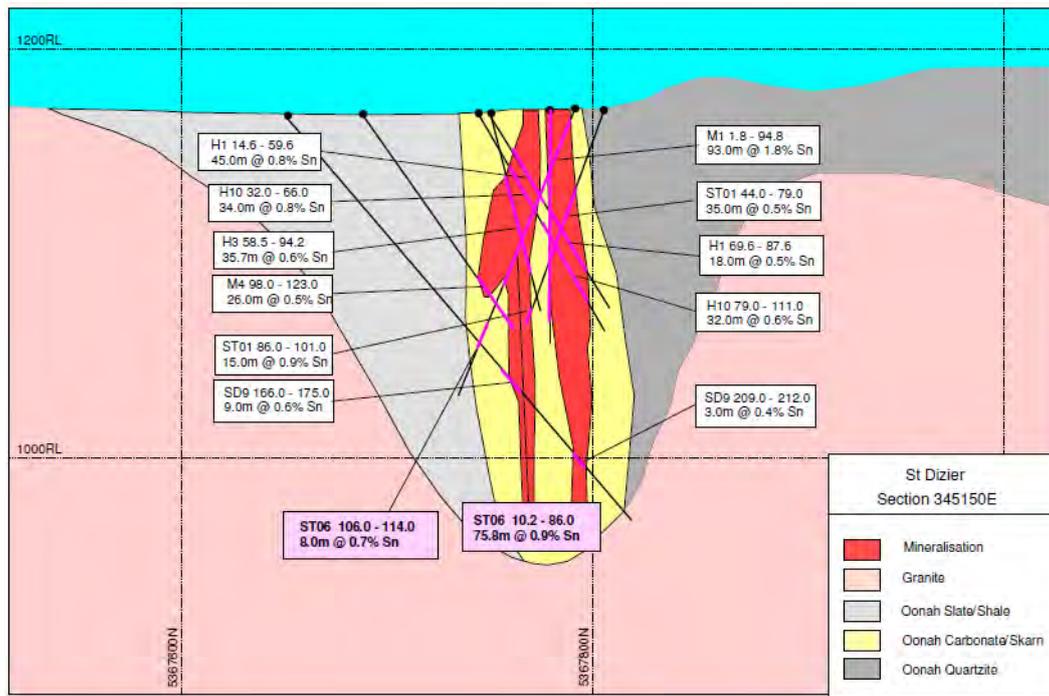


Figure 4-2 Saint Dizier Section





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Mineralogy and characterisation testwork were carried out on the Bulk Composite and Composites 2, 3 and 4.

The majority of the initial testwork program, including comminution, magnetic separation and gravity separation testing, was carried out using the Bulk Composite. However, as the work progressed it became apparent the Bulk Composite was heavily weathered, with a number of issues which are thought to be not representative of the overall mineable mineral resource. In particular, soluble tin levels in the Bulk Composite were significantly higher than those in the drill samples from ST06. Consequently the later part of the program has focused on Composite 2+3 which is thought to be more typical of the mineable mineral resource.

Key differences between the Bulk Composite and intersections from ST06 are:

- Portion of soluble tin (as a % of total tin);
Bulk sample; 22%, intersections - top; 8%, middle; 3%, bottom; 13.5%
- Liberation of the drill samples is poorer than the bulk sample
- Quantity of magnetite;
Bulk sample; 31%, intersections - top; 22%, middle; 35%, bottom; 59%
- Binary associations of cassiterite with magnetite;
Bulk sample; 11%, intersections top; 1%, middle; 3%, bottom; 21%
- Drill intersections have significantly less cassiterite locked with magnetite and less soluble tin associated with the magnetic fraction;

Magnetic separation testwork on the Bulk Composite sample showed very high losses of Sn to the magnetite product compared to the drill hole composites (Comp 2, 3 and 4), with a combination of both high soluble tin deportment to the magnetic fraction and very fine intergrowths of cassiterite in magnetite being key contributors to this high loss in the Bulk Composite.

- Drill intersections have;
 - less tin in the ultra-fine size fraction – likely lower slimes losses
 - higher sulfur ~5% c.f. 1.3%



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5 SAMPLE CHARACTERISATION

Sample characterisation consisted of optical mineralogy and completion of a Davis tube magnetic separation routine on both the Bulk Composite and drill hole composites.

The Davis tube characterisation routine consisted of sizing each of the samples into +212, +106, +53, +20, +8 (+CS5) and -8 (-CS5) μm size fractions. Each of the size fractions, excluding the -8 μm fraction, was then separated into magnetic and non-magnetic fractions by the Davis tube. The magnetic and non-magnetic fractions plus the -8 μm fraction were then assayed for Sn_{total} , $\text{Sn}_{\text{soluble}}$, Fe, SiO_2 and S.

Additional mineralogy (both optical and SEM) was completed on a magnetic fraction produced from the Saint Dizier Bulk Composite to better understand the apparent tin association with the magnetic material.

5.1 Bulk Composite

Full mineralogy reports for the Saint Dizier Bulk Composite are contained in Appendix 2, with full Davis tube characterisation results contained in Appendix 3.

The mineralogy is summarised in the extract and tables below. Notably magnetite makes up approximately 31% of the sample, with 24% of the observed cassiterite associated with magnetite.

The following minerals were identified, in approximate descending order:

- Gangue (*quartz, silicates, carbonate, tourmaline?, carbonaceous matter, fluorite, talc etc.*)
- Magnetite
- Goethite
- Pyrite (60% crystalline and 40% melnikovite)
- Arsenopyrite
- Cassiterite
- Chalcopyrite
- Pyrrhotite
- Hematite
- Sphalerite
- Covellite (rare)
- Chalcocite (very rare)
- Stannite (very rare)



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Table 1

St Dizier Bulk Comp Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	25.8	1.5	0.1	0.1	Tr	Tr	5.1	27.8	65.5
+106µm	22.3	1.7	0.1	Tr	Tr	Tr	6.3	31.9	60.1
+53µm	18.3	2.8	Tr	Tr	2.0	Tr	6.0	39.5	49.8
+25µm	13.9	1.0	Tr	Tr	Tr	Tr	4.8	24.7	69.6
+7µm	7.3	2.0	Tr	Tr	Tr	Tr	4.6	29.1	64.3
TOTAL	87.6	1.8	0.1	Tr	0.4	Tr	5.5	30.9	61.4

Py=pyrite, Po=pyrrhotite, As=arsenopyrite, Cs=cassiterite, Cp=chalcopyrite, GoHe=goethite+hematite, Mt=magnetite, Ga=gangue
count statistics very poor for the scarce cassiterite

St Dizier Bulk Comp Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary
			Py	Po	As	GoHe	Mt	Ga	
+212µm	20.0	0	0	0	0	0	10	42	48
+106µm	20.2	43	0	0	0	0	24	15	18
+53µm	16.9	65	1	0	0	0	1	23	11
+25µm	15.7	66	0	0	0	1	11	16	6
+7µm	12.0	82	0	0	0	3	5	8	1
TOTAL	84.6	47	0	0	0	1	11	22	19

St Dizier Bulk Comp Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	As	GoHe	Mt	Ga
+212µm	20.0	14	0	0	3	47	90
+106µm	20.2	9	0	0	0	33	33
+53µm	16.9	1	0	0	4	8	32
+25µm	15.7	0	0	0	2	17	22
+7µm	12.0	0	0	0	3	5	8
TOTAL	84.6	6	0	0	2	24	41

Davis tube characterisation results are summarised in Table 2 and Figure 5-1. These indicate of the total Sn present in the Bulk Composite (0.78% Sn_{total}), 22% is soluble Sn (0.17% Sn_{soluble}).

These indicate:



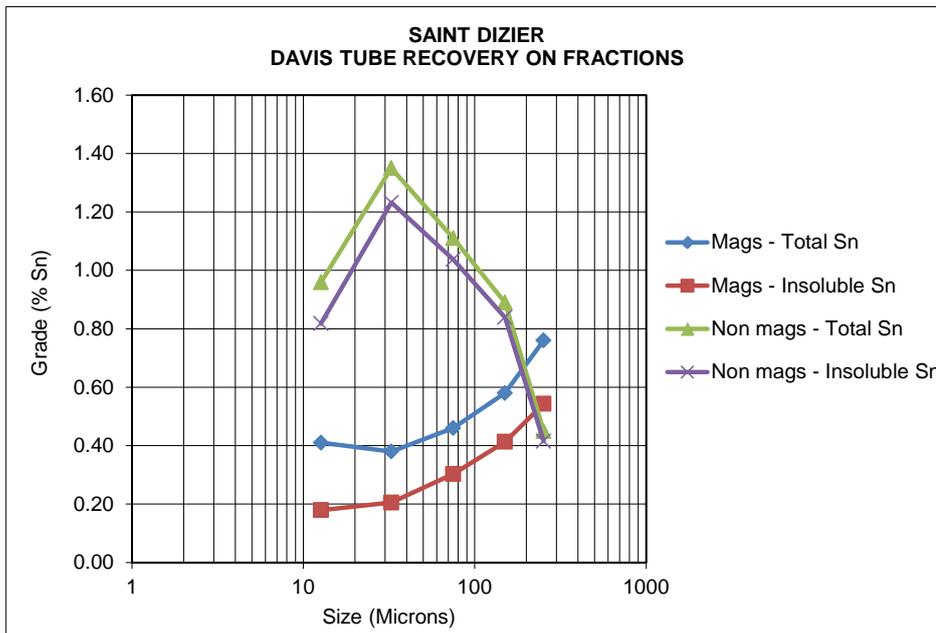
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- Sn losses to the magnetic fraction are approximately ~0.4% Sn ~75 µm
- High mass rejection to magnetic fraction; 44% of mass
- Fe grade is >64% in 53 µm fraction and below
- Soluble Sn accounts for about half of Sn present in finer fractions
- Of the insoluble Sn, 28.3% reported to the mags product, with 60.2% reporting to non-mags and 11.6% to the ultra-fines (-CS5) fraction.
- The soluble Sn present preferentially reports to both the mags product and the ultra-fines (-CS5), with 32% of Sn present in the mag product being soluble Sn, while 45% of Sn in the ultra-fines being soluble Sn.
- Of the non-mags product 8% of the total Sn is soluble, while only 45% of Sn in the ultra-fines (-CS5) is insoluble.

Table 2 – Saint Dizier Bulk Composite: Summary of Davis Tube Results

FRACTIONS	Picno	WT	Overall		Overall		Overall		Overall		Overall		% sol Sn	% of total Sn as Insol Sn
			%Sn	dist	%Insol Sn	dist	%Fe	dist	%SiO2	dist	%S	dist		
Mags+212		13.73	0.76	13.45	0.54	12.31	49.70	18.63	10.20	6.16	1.22	12.09	0.22	71%
Mags+106		12.58	0.58	9.40	0.41	8.58	61.70	21.19	3.95	2.19	0.56	5.09	0.17	71%
Mags+53		9.42	0.46	5.59	0.30	4.72	64.90	16.70	2.75	1.14	0.38	2.59	0.16	66%
Mags+20		5.61	0.38	2.75	0.21	1.90	66.60	10.20	2.08	0.51	0.24	0.97	0.18	54%
Mags+CS5		2.58	0.41	1.36	0.18	0.76	66.30	4.67	1.67	0.19	0.28	0.52	0.23	44%
Non Mags+212		12.05	0.45	6.99	0.42	8.26	12.05	3.97	45.60	24.17	1.85	16.10	0.04	92%
Non Mags+106		9.67	0.89	11.09	0.84	13.40	14.80	3.91	41.50	17.65	2.37	16.55	0.05	94%
Non Mags+53		8.91	1.11	12.75	1.04	15.27	14.90	3.63	38.40	15.05	2.17	13.97	0.07	93%
Non Mags+20		8.30	1.35	14.45	1.23	16.90	14.80	3.36	35.40	12.93	2.07	12.41	0.12	91%
Non Mags+CS5		4.69	0.96	5.79	0.82	6.33	17.10	2.19	32.30	6.66	2.58	8.73	0.14	85%
Total Mags		43.92	0.57	32.55	0.39	28.27	59.53	71.39	5.27	10.18	0.67	21.26	0.19	68%
Total Non Mags		43.62	0.91	51.07	0.83	60.16	14.31	17.04	39.85	76.45	2.15	67.76	0.07	92%
-CS5		12.46	1.02	16.38	0.56	11.57	34.00	11.57	24.40	13.37	1.22	10.98	0.46	55%
CALC FEED		100.00	0.78	100.00	0.61	100.00	36.62	100.00	22.74	100.00	1.38	100.00	0.17	78%

Figure 5-1





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5.1.1 Additional mineralogy completed on a magnetic fraction

Additional mineralogy (both optical and SEM) was completed on a magnetic fraction (-53 +20µm) produced from the Saint Dizier Bulk Composite to better understand the apparent tin association with the magnetic material.

The overall composition of the magnetic fraction based on the optical mineralogy is summarised in Table 3, with cassiterite liberation summarised in Table 4. However, a key observation of this work was there appeared to be insufficient cassiterite to account for the ~0.4% Sn grade of the fraction examined, with no sulfide tin being observed.

Table 3

St Dizier Bulk Comp Composition Vol% (from total scan)

Fraction	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+20µm	0.9	0.1	Tr	0.1	Tr	6.8	78.9	13.3

*Py=pyrite, Po=pyrrhotite, As=arsenopyrite, Cs=cassiterite, Cp=chalcopyrite, GoHe=goethite+hematite, Mt=magnetite, Ga=gangue
count statistics very poor for the scarce cassiterite*

Table 4

St Dizier Magnetics Cassiterite liberation distribution%

Fraction	Free	Binary with						Ternary
		Py	Po	As	GoHe	Mt	Ga	
+20µm	43	0	0	0	0	32	0	51

Subsequent SEM work (refer exact below and full report in Appendix 2) showed significant Sn to be present both as very fine intergrowths within magnetite and as schoenfliesite.

Based on this work it is strongly suspected that schoenfliesite is likely responsible for the significant quantity of soluble Sn seen in the ultra-fine (-CS5) fraction (refer Table 2).



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Extract for SEM-EDS Microanalysis report;

The author has assessed the analytical results and grouped them into mineral mixture groups. In many cases the phase grain size is smaller than the analytical beam width, so the analysis is of a mixture of two or more minerals. A full list of the analyses is provided at the end of the report but an essential summary follows:

Mineral Group	#	O	Mg	Al	Si	S	Ca	Ti	Mn	Fe	Br	Sn	W
<i>cassiterite</i> + minor magnetite	7	23.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	72.7	0.0
<i>cassiterite</i> + magnetite	4	36.7	0.7	0.0	0.7	0.0	0.0	0.0	0.0	27.9	0.0	34.0	0.0
magnetite + <i>cassiterite</i>	11	32.5	0.7	0.0	0.4	0.0	0.0	0.0	0.0	53.3	0.1	13.0	0.1
Fe oxide + minor <i>cassiterite</i>	7	30.5	0.8	0.0	0.7	0.0	0.0	0.0	0.7	65.0	0.0	1.4	0.9
Fe oxide + <i>schoenfliesite</i>	7	36.9	6.3	0.1	0.8	0.0	0.0	0.0	0.6	29.1	0.0	24.7	1.6
<i>magnetite</i>	12	27.5	0.2	0.0	0.2	0.0	0.0	0.0	0.0	72.2	0.0	0.0	0.0
Fe oxide + minor silicate	14	35.2	0.3	0.3	1.5	0.0	0.2	0.1	0.6	61.6	0.0	0.0	0.2
<i>pyrrhotite</i>	1	0.0	0.0	0.0	0.0	37.8	0.0	0.0	0.0	62.2	0.0	0.0	0.0
silicate	1	48.7	22.8	0.0	21.1	0.0	0.2	0.0	0.0	7.2	0.0	0.0	0.0

Most of the observed Sn occurs as very fine *cassiterite* inclusions in magnetite.

The mineral ***schoenfliesite* MgSn(OH)₆**, containing 48.4%Sn, was previously recognised at St Dizier during Renison drilling (*pers.comm. Ray Hazeldene, Stellar*). It is a secondary phase typically found in oxidised Sn-bearing minerals. The author is unfamiliar with this mineral, but upon re-examination, it may be possible to identify it optically. *Schoenfliesite* is documented to be usually fibrous with an SG of 3.48.

In the sample examined, *schoenfliesite* is fine-grained and mixed with *hematite* and *goethite*. Recovery would be extremely difficult.

5.2 Drill Hole Composites

Full mineralogy reports for Composites 2, 3 and 4 are contained in Appendix 9, with full Davis tube characterisation results contained in Appendix 10.

The mineralogy for Composites 2, 3 and 4 is summarised in the extract and tables below. Notably, although magnetite is present in similar levels to the Bulk Composite, significantly less cassiterite is associated with magnetite in Composites 2 and 3:

- binary associations of cassiterite with magnetite;

Bulk composite = 11%, Comp 2 = 1%, Comp 3 = 3%, Comp 4 = 21%

However, generally liberation of the drill samples is poorer than the bulk sample.



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The following minerals were identified, in approximate descending order:

- Gangué (*quartz, silicates, carbonate, fluorite, talc, carbonaceous matter, etc.*)
- Magnetite
- Pyrite (*crystalline and melnikovite varieties*)
- Pyrrhotite
- Arsenopyrite
- Cassiterite
- Chalcopyrite
- Sphalerite
- Bismuthinite (*rare*)
- Native bismuth (*rare*)
- Molybdenite (*very rare*)



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Table 5

St Dizier Comp 2 Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	18.4	4.2	1.0	0	0.1	Tr	0	12.2	82.5
+106µm	19.2	12.6	0.8	0.1	0.1	0.9	0	25.6	60.0
+53µm	18.7	9.0	1.9	0	0.2	0	0	13.8	75.2
+20µm	17.5	6.8	2.8	0.9	0.1	1.0	0	34.4	54.1
+7µm	10.0	12.3	5.9	1.0	Tr	0	0	26.7	54.2
TOTAL	83.8	8.7	2.1	0.3	0.1	0.4	0	22.0	66.4

Py=pyrite, Po=pyrrhotite, As=arsenopyrite, Cs=cassiterite, Cp=chalcopyrite, GoHe=goethite+hematite, Mt=magnetite, Ga=gangue
count statistics very poor for the scarce cassiterite

St Dizier Comp 3 Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	19.2	3.5	3.1	0	0.2	Tr	0	21.8	71.5
+106µm	20.9	4.5	6.2	1.0	0.2	0	0	44.1	44.1
+53µm	19.6	1.9	7.1	1.0	0.6	Tr	Tr	34.4	55.1
+20µm	17.7	3.8	14.2	0	1.0	0	0.1	40.3	40.7
+7µm	8.9	2.7	8.1	0	1.0	0	0	32.1	56.3
TOTAL	86.3	3.4	7.6	0.5	0.5	Tr	Tr	34.9	53.3

St Dizier Comp 4 Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	23.6	0.1	0.2	0.3	Tr	0	0	54.0	45.5
+106µm	24.0	0	0	1.4	0.2	0	0	68.7	29.8
+53µm	18.4	0.2	Tr	2.0	Tr	0	0	58.8	39.1
+20µm	15.7	0	1.0	3.0	Tr	0	0	54.4	41.7
+7µm	7.7	0	0.2	1.0	Tr	0	0	54.3	44.5
TOTAL	89.4	0.1	0.2	1.5	0.1	0	0	59.0	39.2



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Table 6

St Dizier Comp 2 Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with					Ternary
			Py	Po	As	Mt	Ga	
+212µm	15.8	0	0	0	0	0	26	74
+106µm	19.1	0	0	0	0	0	41	59
+53µm	17.9	21	1	0	0	5	51	22
+20µm	18.4	37	6	0	0	0	44	13
+7µm	17.4	84	2	0	1	1	9	3
TOTAL	88.6	28	2	0	0	1	35	34

St Dizier Comp 3 Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with					Ternary
			Py	Po	As	Mt	Ga	
+212µm	15.6	0	0	0	0	0	18	82
+106µm	22.6	16	3	7	0	0	38	36
+53µm	21.6	31	0	7	0	4	45	14
+20µm	21.0	60	0	5	0	7	21	7
+7µm	14.2	85	0	1	0	4	8	1
TOTAL	95.0	37	1	5	0	3	28	27

St Dizier Comp 4 Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with					Ternary
			Py	Po	As	Mt	Ga	
+212µm	14.1	0	0	0	0	38	48	13
+106µm	23.6	38	0	0	0	15	24	23
+53µm	19.5	39	0	0	0	37	15	10
+20µm	17.1	61	0	0	0	7	31	1
+7µm	12.0	85	0	0	0	4	8	2
TOTAL	86.3	43	0	0	0	21	25	11

Davis tube characterisation results for Composites 2, 3 and 4 are summarised in Table 7, Table 8 and Table 9. These indicate significantly less of the total Sn present is present as soluble Sn compared to the Bulk Composite; Comp 2 = 6.6% of total Sn is soluble, Comp 3 = 2.0% and Comp 4 = 7.4% compared with 22% for the Bulk Composite.



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Although total Sn losses to the magnetic fractions were high at 38.8%, 32.6% and 39.6% for Composites 2, 3 and 4 respectively, result indicate these can be significantly reduced by very fine regrind (to around 20 µm) and cleaning of the magnetic product.

Sn distribution to the ultra-fines is also more encouraging compared to the Bulk Composite at 13.5%, 5.9% and 12.2% for Composites 2, 3 and 4 respectively.

Table 7 – Saint Dizier Composite 2: Summary of Davis Tube Results

FRACTIONS um	Picno SG	WT %	Overall											
			%Tot Sn	dist	%Sol Sn	dist	%Cs Sn	dist	%Fe	dist	%SiO2	dist	%S	dist
Mags+212		11.77	1.03	15.87	0.11	25.16	0.92	15.18	33.50	14.84	20.60	9.65	4.10	7.47
Mags+106		9.26	0.95	11.51	0.06	10.61	0.89	11.58	42.70	14.89	13.35	4.92	8.45	12.11
Mags+53		7.17	0.72	6.75	0.05	6.84	0.67	6.75	52.10	14.05	9.00	2.57	6.51	7.22
Mags+20		5.77	0.49	3.70	0.05	4.96	0.45	3.61	58.60	12.73	5.09	1.17	5.13	4.58
Mags+CS5		2.18	0.34	0.97	0.04	1.54	0.30	0.93	63.50	5.21	3.03	0.26	4.44	1.50
Non Mags+212		9.58	0.39	4.89	0.03	5.48	0.36	4.84	9.44	3.40	38.70	14.75	3.94	5.84
Non Mags+106		9.66	0.71	8.97	0.03	5.35	0.68	9.24	14.60	5.31	32.20	12.37	7.89	11.79
Non Mags+53		10.38	0.91	12.37	0.03	6.14	0.88	12.82	16.00	6.25	30.50	12.60	9.17	14.74
Non Mags+20		11.06	1.10	15.92	0.04	8.65	1.06	16.45	16.50	6.87	29.10	12.80	9.73	16.65
Non Mags+CS5		4.79	0.89	5.58	0.04	3.87	0.85	5.71	30.94	5.58	20.86	3.98	8.15	6.04
Total Mags		36.16	0.82	38.81	0.07	49.11	0.75	38.05	45.36	61.73	12.91	18.57	5.88	32.88
Total Non Mags		45.46	0.80	47.72	0.03	29.50	0.77	49.07	16.02	27.41	31.23	56.50	7.83	55.06
-CS5		18.38	0.56	13.47	0.06	21.40	0.50	12.89	15.70	10.86	34.10	24.94	4.24	12.06
CALC FEED		100.00	0.76	100.00	0.05	100.00	0.71	100.00	26.57	100.00	25.13	100.00	6.46	100.00

Table 8 – Saint Dizier Composite 3: Summary of Davis Tube Results

FRACTIONS um	Picno SG	WT %	Overall											
			%Tot Sn	dist	%Sol Sn	dist	%Cs Sn	dist	%Fe	dist	%SiO2	dist	%S	dist
Mags+212		12.20	0.99	12.11	0.02	14.50	0.97	12.07	40.10	15.06	19.55	9.44	5.05	12.33
Mags+106		11.70	0.89	10.45	0.03	15.81	0.87	10.35	54.70	19.71	9.33	4.32	6.27	14.69
Mags+53		10.73	0.60	6.46	0.03	14.50	0.58	6.31	60.90	20.13	4.96	2.11	6.95	14.94
Mags+20		8.62	0.35	3.03	0.02	11.18	0.33	2.87	65.20	17.31	2.84	0.97	7.79	13.45
Mags+CS5		2.37	0.22	0.52	0.02	2.95	0.20	0.48	65.30	4.77	1.70	0.16	8.21	3.90
Non Mags+212		9.69	0.70	6.81	0.01	5.76	0.69	6.83	7.32	2.18	43.50	16.69	2.14	4.15
Non Mags+106		8.52	1.59	13.59	0.01	5.06	1.58	13.75	9.39	2.46	41.60	14.03	3.11	5.30
Non Mags+53		8.36	1.97	16.51	0.01	5.42	1.96	16.72	9.68	2.49	40.00	13.23	4.42	7.40
Non Mags+20		8.66	2.23	19.37	0.01	6.08	2.22	19.62	11.65	3.11	38.70	13.26	4.79	8.30
Non Mags+CS5		4.05	1.29	5.24	0.02	4.04	1.27	5.27	38.37	4.78	20.80	3.33	6.29	5.09
Total Mags		45.63	0.71	32.57	0.02	58.94	0.69	32.08	54.79	76.98	9.41	17.00	6.49	59.32
Total Non Mags		39.27	1.56	61.52	0.01	26.37	1.55	62.18	12.42	15.02	38.95	60.53	3.85	30.25
-CS5		15.10	0.39	5.91	0.02	14.69	0.37	5.74	17.20	8.00	37.60	22.47	3.45	10.43
CALC FEED		100.00	1.00	100.00	0.02	100.00	0.98	100.00	32.48	100.00	25.27	100.00	4.99	100.00

Table 9 – Saint Dizier Composite 4: Summary of Davis Tube Results

FRACTIONS um	Picno SG	WT %	Overall											
			%Tot Sn	dist	%Sol Sn	dist	%Cs Sn	dist	%Fe	dist	%SiO2	dist	%S	dist
Mags+212		20.31	0.53	13.35	0.04	15.83	0.49	13.17	51.80	27.71	11.10	13.28	0.63	15.85
Mags+106		19.78	0.61	14.96	0.05	15.76	0.57	14.90	57.80	30.10	6.54	7.62	0.51	12.49
Mags+53		13.92	0.55	9.50	0.04	10.60	0.51	9.41	62.20	22.80	5.22	4.28	0.23	3.97
Mags+20		2.64	0.33	1.08	0.04	1.87	0.29	1.02	65.40	4.54	3.17	0.49	0.36	1.18
Mags+CS5		3.93	0.15	0.73	0.03	2.37	0.12	0.61	67.40	6.97	1.73	0.40	0.34	1.65
Non Mags+212		6.98	0.38	3.29	0.03	3.58	0.35	3.27	2.97	0.55	36.00	14.79	0.49	4.23
Non Mags+106		4.07	0.86	4.34	0.07	5.05	0.79	4.29	3.92	0.42	32.80	7.87	1.20	6.05
Non Mags+53		4.08	1.42	7.18	0.09	6.43	1.33	7.24	4.78	0.51	32.20	7.73	1.89	9.55
Non Mags+20		11.77	2.02	29.49	0.11	23.56	1.91	29.94	4.91	1.52	32.10	22.26	2.03	29.60
Non Mags+CS5		1.82	1.71	3.86	0.10	3.21	1.61	3.91	15.98	0.77	26.80	2.87	1.72	3.89
Total Mags		60.58	0.53	39.62	0.04	46.43	0.48	39.11	57.75	92.13	7.31	26.07	0.47	35.15
Total Non Mags		28.72	1.35	48.17	0.08	41.83	1.27	48.64	4.98	3.77	32.82	55.52	1.50	53.32
-CS5		10.70	0.92	12.21	0.06	11.75	0.86	12.24	14.55	4.10	29.20	18.40	0.87	11.53
CALC FEED		100.00	0.81	100.00	0.06	100.00	0.75	100.00	37.98	100.00	16.98	100.00	0.81	100.00



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6 COMMINATION

Comminution testing was restricted to the Saint Dizier Bulk Composite sample. This consisted of determination of Impact Work Index, Bond Ball Mill Work Index, Bond Rod Mill Work Index, Bond Abrasion Index and SG.

Full results are contained in Appendix 4 and summarised in Table 10.

Table 10 – Saint Dizier Bulk Composite Comminution Parameters

Parameter	Value	Units
Impact Work Index	30.9	kWh/t
Bond Ball Mill Work Index	17.7	kWh/t
Bond Rod Mill Work Index	19.0	kWh/t
Bond Abrasion Index	0.1168	
SG	3.2	

Results indicate the bulk composite is moderately hard.

Laboratory grind sizes and times of the various Saint Dizier metallurgical composites, Severn Bulk Composite and Lower Queen Hill 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;

$$\text{Relative grindability} = W_i/W_r = (10/\sqrt{P_r} - 10/\sqrt{F_r}) / (10/\sqrt{P_t} - 10/\sqrt{F_t})$$

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

W_i = estimated Bond index of test sample

W_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 11.



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Table 11 – Relative Grindability of Various Heemskirk Composites

PROJECT Ore Sample	T0879 Severn Severn Bulk Composite	T0887 Saint Dizier St Dizier Bulk Composite	T0887 Saint Dizier Comp 2	T0887 Saint Dizier Comp 3	T0887 Saint Dizier Comp 4	T0887 Saint Dizier Comp 2+3	T0819 Lower Queen Hill Comp 6 Sinks/Fines	T0819 Lower Queen Hill Comp 6 Sinks/Fines/Floats (whole ore)	T0714 Severn 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 11 there is considerable variability in ore competency.

The Saint Dizier drill hole composites produced from drill hole ST06 (Comp 2, 3, 4 and 2+3) shown are significantly more competent (harder) than the both the Saint Dizier bulk composite and the Severn Bulk Composite.

The Saint Dizier drill hole composites (Comp 2, 3, 4 and 2+3) are exceptionally hard ores.



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7 MAGNETIC SEPARATION

Magnetic separation testing consisted of roughing of the ground ore followed by regrind and cleaning of the magnetic product in a single stage. This was largely focused on minimising tin losses to the magnetite concentrate, while reducing the quantity of magnetite in the feed to the gravity circuit to more manageable levels.

Magnetic separation testwork was carried out on both the Saint Dizier Bulk Composite and Saint Dizier Composite 2+3 samples. Both the roughing and cleaning separation stages were carried out using a laboratory SALA wet drum low intensity magnetic separator.

The combined rougher and cleaner non-mags products from the magnetic separation testwork formed the feed for the gravity separation testwork.

7.1 Bulk Composite

Results for the magnetic separation testwork completed on the Saint Dizier Bulk Composite are contained in Appendix 5 and summarised in Table 12. The magnetic separation consisted of roughing following a primary grind to 100% passing 212 µm. The rougher mags product was reground to 100% passing 53 µm and cleaned in a single stage. Both rougher and cleaner non-mags products were combine to form feed to the subsequent gravity testwork.

Table 12 - Saint Dizier Bulk Composite: Summary of Magnetic Separation Results (tests LC01+02)

Primary grind size = 100% passing 212 µm, Regrind size = 100% passing 53 µm

Sample Description	Weight (g)	Assays			
		% Sn	% Fe	% S	% SiO ₂
Coarse/Rougher Non Mags	4935.0	0.95	14.2	1.85	39.8
Fine/Cleaner Mags	3815.7	0.46	62.2	0.47	3.94
Fine/Cleaner Non Mags	558.4	1.71	16.1	2.58	29.8
Total Non-Mags (rougher + cleaner)	5493.4	1.03	14.4	1.92	38.8
Calc Feed	9309.1	0.79	33.99	1.33	24.50
Distributions:	Weight	Sn	Fe	S	SiO₂
Coarse/Rougher Non Mags	53.0%	63.4	22.1	73.8	86.1
Fine/Cleaner Non Mags	6.0%	12.9	2.8	11.7	7.3
Recovery to Total Non-Mags (rougher + cleaner)	59.0%	76.3	25.0	85.5	93.4
Fine/Cleaner Mags	41.0%	23.7	75.0	14.5	6.6



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41% of the feed mass deported to the final magnetite product, at an Fe grade of 62.2%. The final magnetite product was relatively clean containing 0.47% S and 3.94% SiO₂.

Sn grade of the final magnetite product was 0.46%, representing a loss of 23.7% of the feed Sn units. Of this 23.7% loss, it is estimated ~8% (0.15% Sn_{soluble}) is soluble Sn based on results of the Davis tube characterisation work (refer Section 5.1).

Overall mass recovery to the non-mags product (rougher plus cleaner non-mags) was 59%, with Sn recovery at 76.3%, at a grade of 1.03% Sn. Magnetite content of the non-mags was reduced to manageable levels for gravity separation.

7.2 Composite 2+3

Results for the magnetic separation testwork completed on the Saint Dizier Composite 2 + 3 are contained in Appendix 11 and summarised in Table 13. The magnetic separation consisted of roughing following a primary grind to 80% passing 250 µm. The rougher mags product was reground to 80% passing 31 µm and cleaned in a single stage. Both rougher and cleaner non-mags products were combine to form feed to the subsequent gravity testwork.

Table 13 - Saint Dizier Composite 2+3: Summary of Magnetic Separation Results (T15+T16)

TEST TYPE	Rghr		Cleaner													
	SALA Wet Drum	SALA Wet Drum	SALA Wet Drum	SALA Wet Drum												
Feed Solids (g)	2000.0	2000.0			FEED MATERIAL Composite 2+3											
Feed Water (L)	17.6	17.6														
Pump Flow Rate (lpm)	1.4	1.4														
Density (%)	10.0	10.0														
Time (min)	17.5	18														
Pump 01 Output (%)	56	56														
Pump 02 Output (%)	56	56														
Comments	Rghr mag sep followed by regrind and cleaner mag sep. Primary grind P80 = 250 um, R/G P80 = 31 um															
Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)							Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Cleaner Magnetics	723.0	37.7	0.46	18.3							60.9	74.2	5.40	8.2	5.25	37.3
Cleaner Non Magnetics	185.7	9.7	1.97	20.1	13.1	4.1	34.4	13.5	5.12	9.3						
Rougher Non Magnetics	1009.6	52.6	1.11	61.6	12.8	21.8	36.7	78.3	5.39	53.4						
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0						
Cummulated Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)						
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.40	8.2	5.25	37.3						
Rougher Magnetics	908.7	47.4	0.77	38.4	51.1	78.2	11.3	21.7	5.22	46.6						
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0						
Cummulated Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)						
Rougher+cleaner Non-Magnetics	1195.4	62.3	1.24	81.7	12.8	25.8	36.3	91.8	5.35	62.7						
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.4	8.2	5.25	37.3						
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0						



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38% of the feed mass deported to the final magnetite product, at an Fe grade of 60.9%. The final magnetite product contained 0.46% Sn, 5.25% S and 5.4% SiO₂.

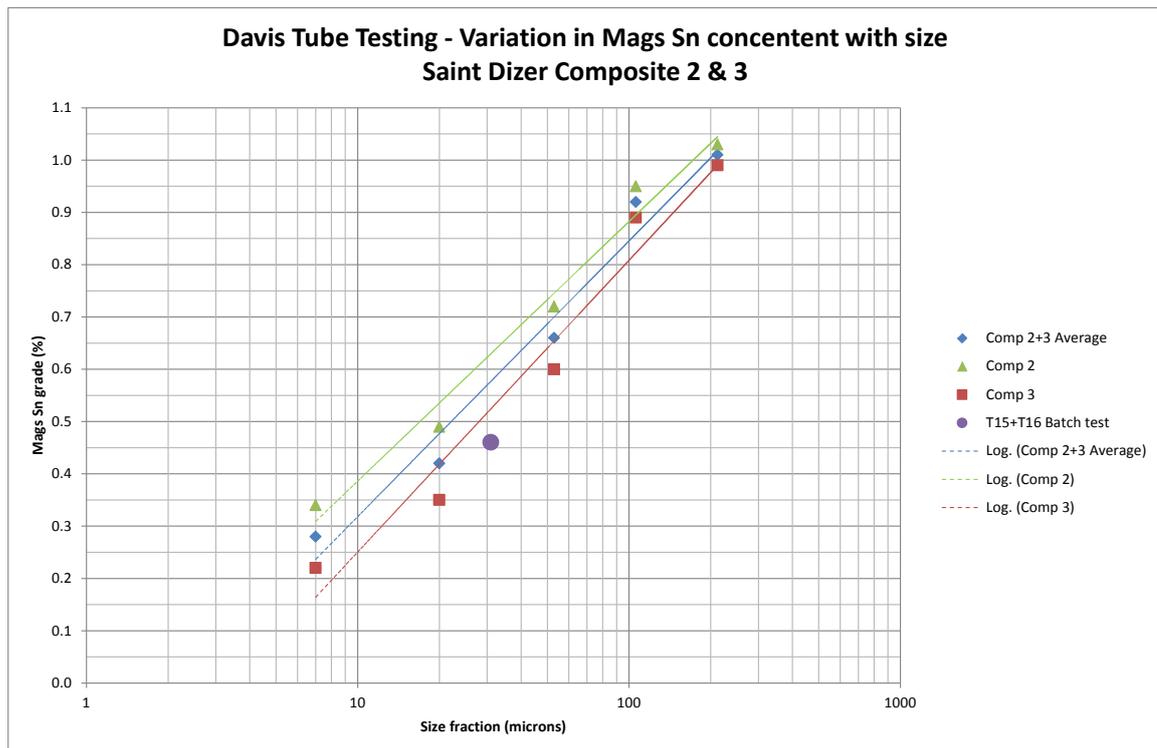
The final magnetite product represented a loss of 18.3% of the feed Sn units at a Sn grade of 0.46% Sn.

Overall mass recovery to the non-mags product (rougher plus cleaner non-mags) was 62%, with Sn recovery at 81.7%, at a grade of 1.24% Sn.

The magnetic separation rejects a significant amount of mass from the feed to the gravity circuit while reducing magnetite content to manageable levels for gravity separation.

Figure 7-1 compares the variation in Sn grade of the magnetic fraction with size, seen in the Davis tube characterisation testwork, with that achieved in the cleaner mags product from T15+T16. Sn loss in the cleaner mags product was in-line with the Davis tube results.

Figure 7-1



Sn loss to the cleaner mags product could potentially be reduced by a further reduction in regrind size (regrind size in T15+T16 was P80 = 31µm).

At a grind size of P80 <20 µm, Sn loss to the cleaner mags could potentially be reduced to <15%. However, at such fine regrind size it is expected additional Sn liberated (compared with a regrind size of 31 µm) from magnetite would be largely lost to slimes.



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8 GRAVITY SEPARATION

Gravity separation testwork was carried out on the combined rougher and cleaner non-mags products produced from magnetic separation testwork on the respective composites for both the Saint Dizier Bulk Composite and Saint Dizier Composite 2+3.

8.1 Bulk Composite

Full results for gravity separation testwork completed on the saint Dizier Bulk Composite are contained in Appendix 6.

The combined rougher and cleaner non-mags products produced from tests LC01+LC02 formed the feed to the gravity separation testwork completed on the Saint Dizier Bulk Composite. This consisted of lock cycle testing (test LC03) via the flowsheet shown in Figure 8-1.

Figure 8-1 – Saint Dizier Bulk Composite: Gravity Lock Cycle Test LC03 Flowsheet

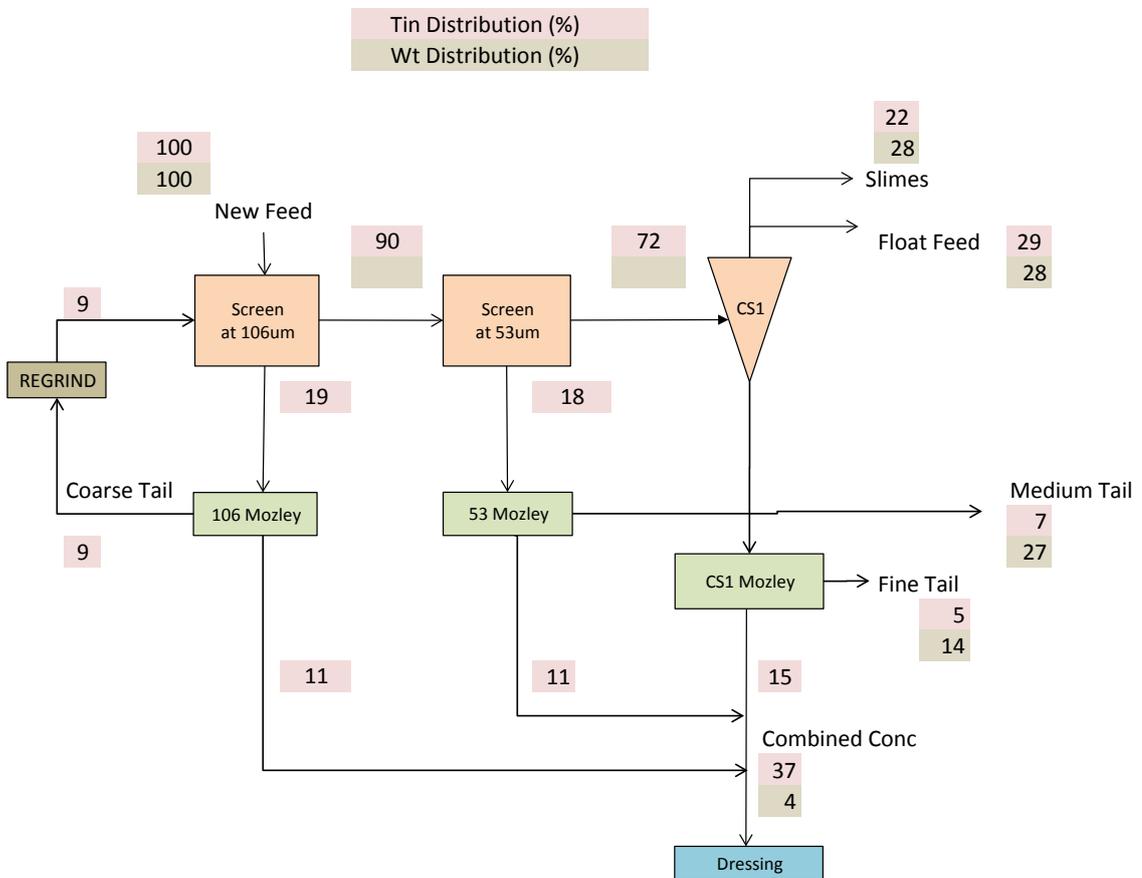


Table 14 shows the size by size analysis of the gravity feed material.



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Table 14 – Saint Dizier Bulk Composite: Size by Size Analysis of combine non-mags/gravity feed, P80 = 139 µm

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
150	17.00	0.61	10.1	13.15	15.5	1.9	16.6	44.50	19.3
106	12.19	0.78	9.3	14.00	11.8	2.0	12.5	44.30	13.8
75	10.26	0.90	9.0	14.20	10.1	2.0	10.6	41.60	10.9
53	8.21	0.99	7.9	14.45	8.2	1.9	8.0	40.60	8.5
38	8.74	1.09	9.3	14.45	8.7	2.0	8.9	37.90	8.5
28	4.43	3.44	14.9	23.10	7.1	5.4	12.0	25.30	2.9
8	16.55	1.16	18.7	14.50	16.6	1.7	14.3	38.00	16.1
<8	22.62	0.94	20.8	14.00	21.9	1.5	17.1	34.70	20.1
CALC	100.00	1.02	100.0	14.44	100.0	2.0	100.0	39.14	100.0
ASSAY		1.04		14.35		1.9		38.10	

Notably 20.8% of the Sn is present in the <8 µm fraction, indicating slimes losses are expected to be inherently high.

Results for the gravity lock cycle testing are shown in Table 15 and Figure 8-2.

Both concentrate grade and recovery were quite stable across the 10 cycles completed. Overall recovery to the combined concentrates averaged 37% of gravity circuit feed (28.2% based on ore feed) at an average grade 9.9% Sn for the final 4 cycles.

Major diluents in the combined concentrates were Fe at 36.5% and S at 19.4%, with only 6.3% SiO₂.

Losses from the gravity circuit for the final four cycles averaged:

- Medium tail (+53 µm) = 6.7% of gravity circuit feed (5.1% based on ore feed)
- Fine tail (CS2/CS1 = 4.1% of gravity circuit feed (3.1% based on ore feed)
- Tin float feed (CS3/CS2-CS5) = 28.8% of gravity circuit feed (22% based on ore feed)
- Slimes (<CS5) = 22.2% of gravity circuit feed (16.9% based on ore feed)

Given the modest gravity recovery and very high losses to both the magnetite concentrate (23.7%) and slimes tails (16.9%), is it expected that overall Sn recovery for the Saint Dizier Bulk Composite is limited to something less than 50%.



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Table 15 – Saint Dizier Bulk Composite Lock Cycle Gravity Results (test LC03)



BURNIE LABORATORY: LOCKED CYCLE GRAVITY TEST

Table with 2 columns: Field (PROJECT, TEST NO, FEED, DATE, TECH) and Value (T0887, LC03, LC02 NON MAGS, 60614, ID)

EXIT STREAMS

Main data table with columns for Cycle No (1-7), various chemical components (gm, %Sn, %Fe, %S, %SiO2), and an AV(8-9) column. Rows include Gravity final conc, dry wt and assays, Gravity Final Tail, CS3/CS2-CS5, and COMBINED CONCENTRATE.

REGRIND DATA

Table with 2 columns: Parameter (New Feed, Re grind feed, Re grind Time, Re grind D/C) and values for cycles 1-10.

INTERNAL STREAMS

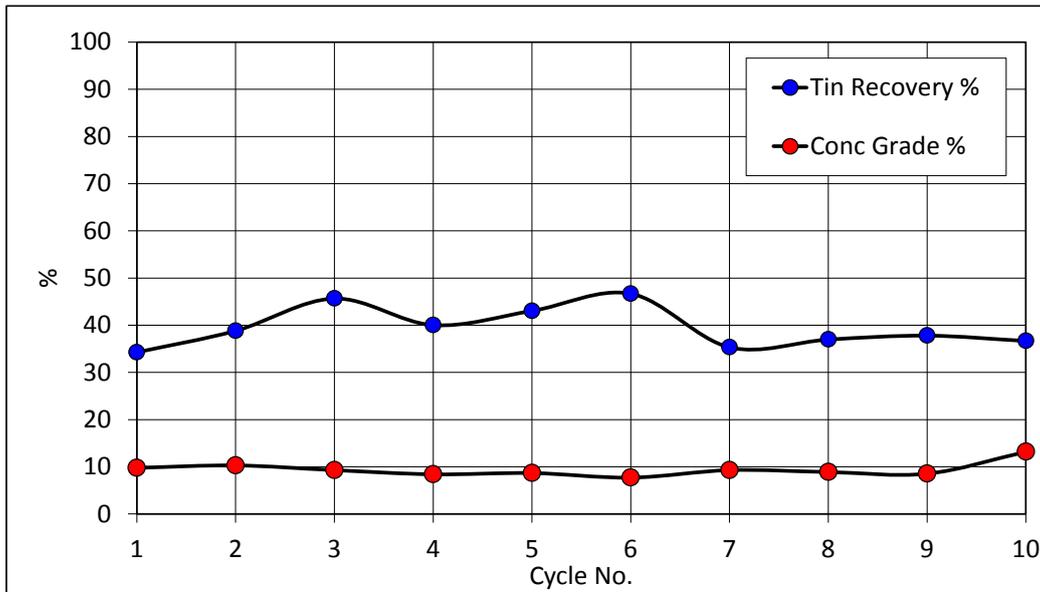
Table with 4 columns: Medium Mids Recycle, Fine Mids Recycle, End Re grind Feed, and NEW FEED. Includes chemical composition data for Sn, Fe, S, and SiO2.

DISTRIBUTIONS table with columns for AV (8-9) and FROM NEW FEED (%) across cycles 1-10. Rows list components like MASS, TIN, IRON, SULPHUR, and SILICA with their respective concentrations.



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Figure 8-2 – Saint Dizier Bulk Composite: Gravity Lock Cycle Test (LC03)





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8.2 Composite 2+3

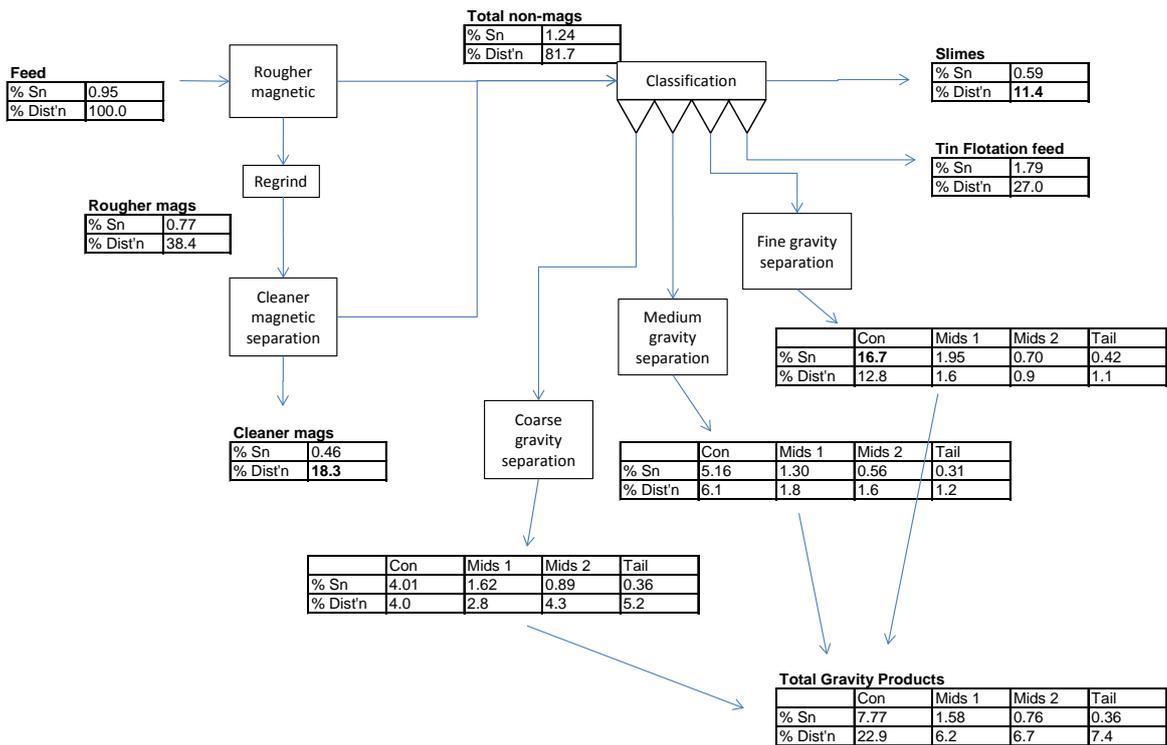
Full results for gravity separation testwork completed on Saint Dizier Composite 2+3 are contained in Appendix 12.

The combined rougher and cleaner non-mags products produced from tests T15+T16 formed the feed to the gravity separation testwork completed on the Saint Dizier Composite 2+3. This consisted initially of batch magnetic separation testing (test T07) followed by lock cycle testing (test LC08).

8.2.1 Batch testings

Figure 8-3 summarises the overall Sn deportment across the magnetic separation an initial batch gravity tests completed on the Saint Dizier Composite 2+3, with release curves shown in Figure 8-4.

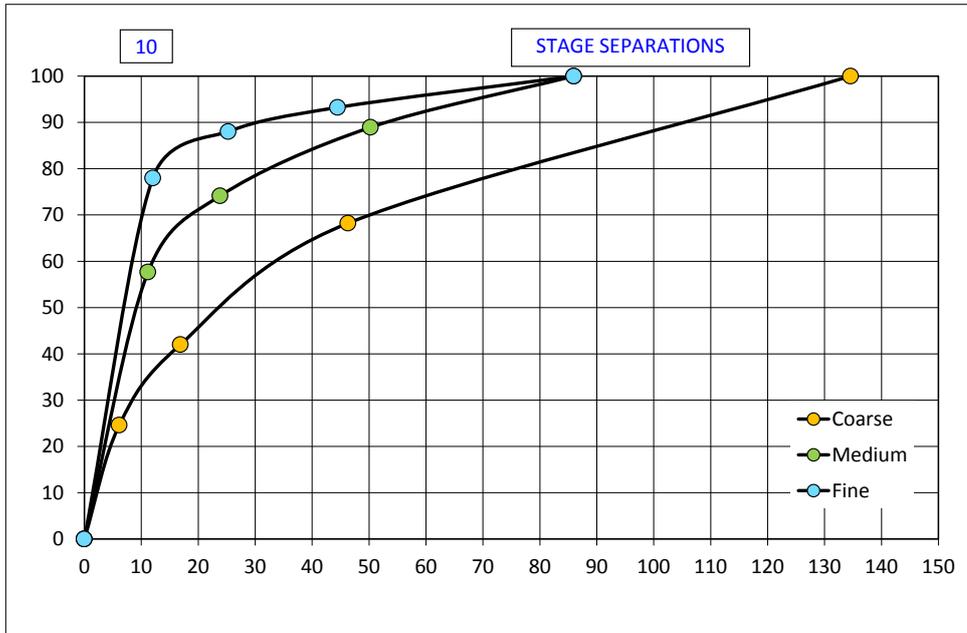
Figure 8-3 - Saint Dizier Comp 2+3 Batch magnetic and gravity separation Sn deportment summary





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Figure 8-4 – Saint Dizier Composite 2+3: Batch Gravity Separation Release Curves



81.7% of the Sn was recovered to the gravity feed. This material was sized into 5 size fractions; “coarse” (+106 µm), “medium” (+53 µm) and “fine” (+33 µm) gravity feed fractions, “tin float feed” (-33 +7 µm), and “slimes” (-7 µm) with batch gravity separations carried out on the “coarse”, “medium” and “fine” fractions.

11.4% of the Sn reported to the slimes fraction, 27% to the “tin float feed” fraction, and 43.3% to the gravity feed fractions.

For the 3 gravity fractions, overall 22.3% of the Sn was recovered to the gravity concentrates. However, as these were only batch tests the middling products and tails were not recycled and reground, so this does not provide a direct indication of the overall achievable gravity recovery.

Although the gravity performance on the coarse fraction was fairly poor, this improved considerably in the medium and particularly the fine fraction. The fine fraction gave 78% recovery (based on feed to that fraction) to a 16.7% Sn concentrate, with the dilution largely as sulfides and magnetite, so it should upgrade readily in concentrate dressing.

8.2.2 Lock cycle testing

Given the encouraging results seen in batch gravity testing, lock cycle testing was completed (LC08).

Table 16 shows size by size analysis of the combined non-mags/gravity feed to the lock cycle gravity test, while Figure 8-5 shows the gravity lock cycle test flowsheet.



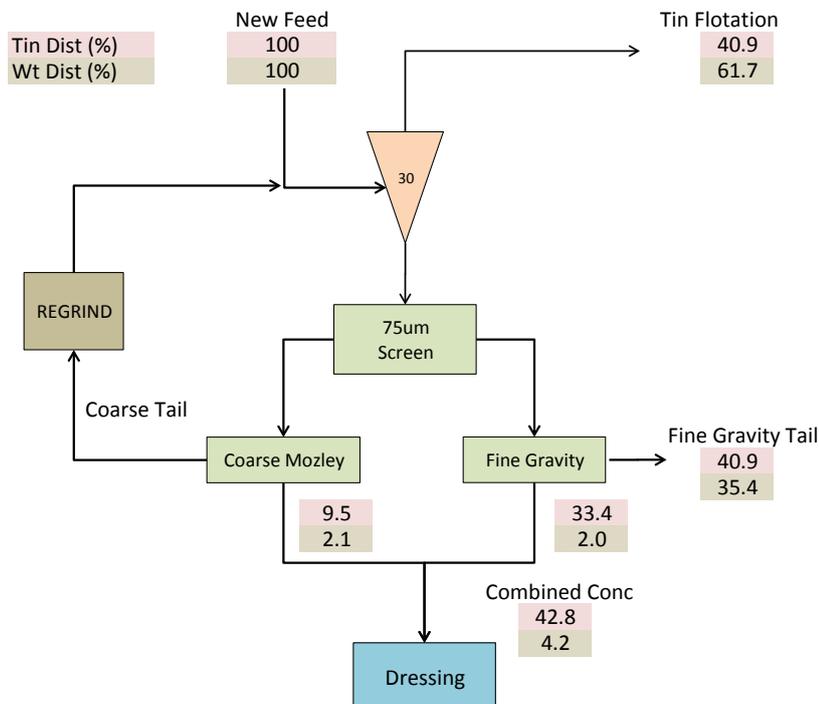
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Table 16 Saint Dizier Composite 2+3: Size by Size Analysis of combine non-mags/gravity feed, P80 = 191 µm

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
150	23.81	0.72	13.5	10.75	20.3	4.51	21.5	38.10	25.1
106	6.10	1.18	5.7	14.00	6.8	5.97	7.3	34.50	5.8
75	5.59	1.28	5.6	13.65	6.1	6.33	7.1	34.90	5.4
53	5.98	1.31	6.2	13.00	6.2	4.53	5.4	35.80	5.9
38	6.96	1.33	7.3	12.00	6.6	5.17	7.2	35.40	6.8
28	4.95	4.80	18.7	23.10	9.1	14.50	14.4	21.70	3.0
19	7.41	1.79	10.5	13.85	8.2	6.33	9.4	33.10	6.8
12	7.54	1.58	9.4	12.65	7.6	5.11	7.7	34.50	7.2
8	4.02	1.37	4.3	12.30	3.9	5.07	4.1	35.40	3.9
CALC-8	27.63	0.87	18.9	11.55	25.3	2.90	16.0	39.50	30.1
ASSAY	100.00	1.27	100.00	12.60	100.00	5.00	100.00	36.20	100.00

Notably 18.9% of the Sn is present in the <8 µm fraction, indicating slimes losses are expected to be inherently high.

Figure 8-5 – Saint Dizier Composite 2+3: Summary of Gravity Lock Cycle Test (LC08)



Results for the gravity lock cycle testing are shown in Table 17 and Figure 8-6.



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Table 17 Saint Dizier Composite 2+3 Lock Cycle Gravity Results (test LC08)



Table with 2 columns: PROJECT (T0887), TEST NO (LC08), FEED, FROM TEST, DATE, TECH

EXIT STREAMS

Main data table with columns: CYCLE NO, 1-10, WT AV. Rows include Gravity coarse conc, Gravity fine conc, Gravity Final Tail, Over Flow, and Combined Concentrate.

REGRIND DATA

Table with 11 columns for regrind parameters: New Feed (gm) (dry), Regrind feed Damp Wt (gm), Regrind Time (min per 100gm), Regrind Time (min.sec), Underflow (%Wt).

t75 tail

INTERNAL STREAMS

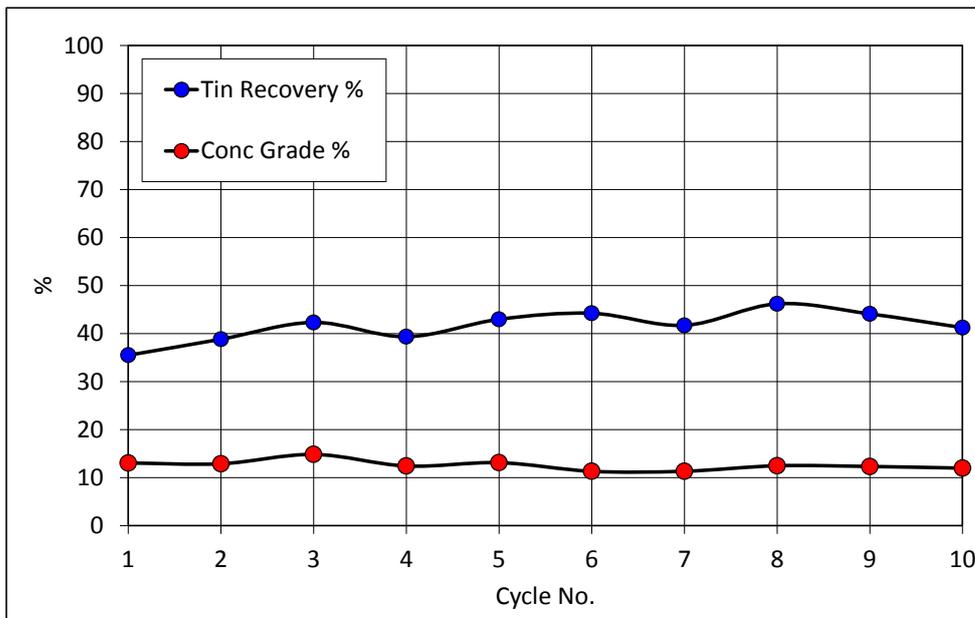
Summary table for internal streams: Final Regrind Feed, Final Reg Discharge, Mids-75, NEW FEED, CALC, 10.

DISTRIBUTIONS table with columns: DISTRIBUTIONS, AV, FROM NEW FEED (%), Cyc 1-10. Rows include MASS, TIN, IRON, SULPHUR, SILICA.



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Figure 8-6 – Saint Dizier Composite 2+3: Gravity Lock Cycle Test (LC08)



Both concentrate grade and recovery were quite stable across the 10 cycles completed. Overall recovery to the combined concentrates averaged 42.8% of gravity circuit feed (35% based on ore feed) at an average grade of 12.1% Sn for the final 7 cycles.

Major diluents in the combined concentrates were Fe at 33.7% and S at 27.6% (equivalent to ~52% pyrite), with only 4.31% SiO₂. Give this, the concentrate should upgrade readily in concentrate dressing.

18.9% of the gravity circuit feed tin units (15.4% based on ore feed) were lost to the -75µm tails. However, screening this at 38-40 µm and directing the undersize to the de-slime feed will significantly reduce the loss associated with this tail to 5.7% of the gravity circuit feed (4.7% based on ore feed).

40.9% of the gravity circuit feed tin units (33.4% based on ore feed) deported to the cyclone overflow. This combined with the undersize from the fine gravity tail will give 54% tin recovery (44.1% based on ore feed) to de-slime feed.

As expected due to the fine cassiterite mineralogy, overall recovery will be very dependent on tin flotation.



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9 GRAVITY CONCENTRATE DRESSING

Full gravity concentrate dressing results are contained in Appendix 13.

Gravity concentrate dressing testwork was carried out on both gravity concentrate produced from the Saint Dizier Bulk Composite via LC03 and Composite 2+3 via LC08.

9.1 Bulk Composite

Gravity concentrate dressing testwork on gravity concentrate produced from the bulk sample consisted of a single sulfide dressing flotation test followed by dry magnetic separation of the tailings.

Sulfide dressing flotation results are shown in Table 18.

Table 18 – Saint Dizier Bulk Composite: Sulfide Dressing Flotation

Milling	Primary	Regrind												
Mill type	0	0												
Media type	0	0												
Media kg	0	0												
Solids g	0	0												
Water g	0	0												
Time min/sec	0	0												
Speed rpm	0	0												
Lime g	0	0												
End pH	0	0												
End p80 µm	0	0												

Float Cell	Volume	Regrind	Power												
Rougher	1.5	Start													
Cleaner	0	Finish													
Speed	800	W/h	kWh/t												

PROJECT	T0887
TEST NO	T10
DATE	030714
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
LC03 Feed Non Mags

NOTES
Sulphide Rougher Cleaner
LC03 Combined Conc

	pH	1 ASS	0.1 PAX	0.495 MIBC				Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	3.9	257						3					
Condition			36	152				5					
Sulphide Ro C1	3.9		26	51				2	2-4	1.0	1.0	50	
Condition								1					
Sulphide Ro C2	4.0		26	51				2	3-4	1.5	2.5	80	
Condition								1					
Sulphide Ro C3	4.1		26	51				2	4-5	1.5	4.0	100	
Condition								1					
Sulphide Ro C4	4.2			51				2	4-5	1.5	5.5	100	
Condition								1					
Sulphide C1 Con	4.1	103	26	102				2	4-5	5.0	5.0	300	17
REAGENT TOTALS (g/t)		359	139	407									

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T10 C1 Con	52.0	26.7	0.88	2.8	40.8	29.3	40.4	57.3	2.50	11.9
Ro Tail	142.8	73.3	11.3	97.2	35.9	70.7	11.0	42.7	6.71	88.1
CALC	194.8	100.0	8.52	100.0	37.2	100.0	18.8	100.0	5.59	100.0
ASSAY HEAD			8.55		37.2		17.4		5.48	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T10 C1 Con	52.0	26.7	0.88	2.8	40.8	29.3	40.4	57.3	2.50	11.9
FEED	194.8	100.0	8.52	100.0	37.2	100.0	18.8	100.0	5.59	100.0



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Further work is required to improve sulfur rejection.

Test T11 consisted of a dry magnetic separation test (refer Table 19) carried out on tailings produced from T10.

Table 19 – Test T11; Dry magnetic separation of gravity concentrate

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics 1 (1500 gauss)	48.2	48.2	35.92	4.87	15.7	44.90	45.1	2.31	12.4	14.95	51.1
Magnetics 2 (5000 gauss)	26.7	26.7	19.90	6.25	11.2	37.50	20.9	5.54	16.5	6.13	11.6
Non Magnetics	59.3	59.3	44.19	18.45	73.1	27.60	34.1	10.75	71.1	8.85	37.2
TOTAL	134.20		100.00	11.15	100.0	35.78	100.0	6.68	100.0	10.50	100.0

Table 20 shows results of QXRD analysis carried out on the products from test T11 (refer Appendix 2 for full QXRD and SEM analysis). Clearly the major diluents present in the concentrate are pyrite, marcasite, magnetite and siderite. SEM results also indicate significant intergrowths of cassiterite and both magnetite and siderite.

In test T11 magnetite largely reported (~97% recovery) to the 1500 gauss magnetic product, while siderite reported to both the 1500 and 5000 gauss products, giving a combined recovery of ~83%.

Although high intensity magnetic separation has provided good removal of siderite from the concentrate, this has been at the expense of significant tin loss (11.2% to the 5000 gauss product). Given this high Sn loss, sulfuric acid leaching of the concentrate will provide a superior overall outcome for the removal of siderite from the concentrate (total leaching costs are expected to be well less than the value of Sn loss in high intensity magnetic separation).



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Table 20 – QXRD of products from test T11

Phase	Mag 1 - 1500 Gauss	Mag 2 - 5000 Gauss	Non Mag - 5000 Gauss
Cassiterite	5.9	7.3	23.3
Pyrite	14.9	5.7	10.4
Pyrrhotite	0	0	0
Siderite	39.2	62.6	12.3
Arsenopyrite	1.5	0.8	1.6
Goethite	1.6	10.1	21.9
Quartz	1	1.8	4.9
Marcasite	10.8	5.9	10
Topaz	0.1	0.6	0
Zircon	0.1	0.1	0.8
Diopside (pyrox)	0	0.6	5.5
Forsterite (ol)?	0.7	1.8	4
Fluorite	0.1	0	0
Phlogopite	0	0	0
Dravite (tourm)	0	0.1	3.3
Galena	0.1	0	0
Microcline	0	0	0.9
Magnetite	21.7	0.5	0.3
Chlorite	0.3	0.4	0
Dolomite	1.9	1.7	0.9

9.2 Composite 2+3

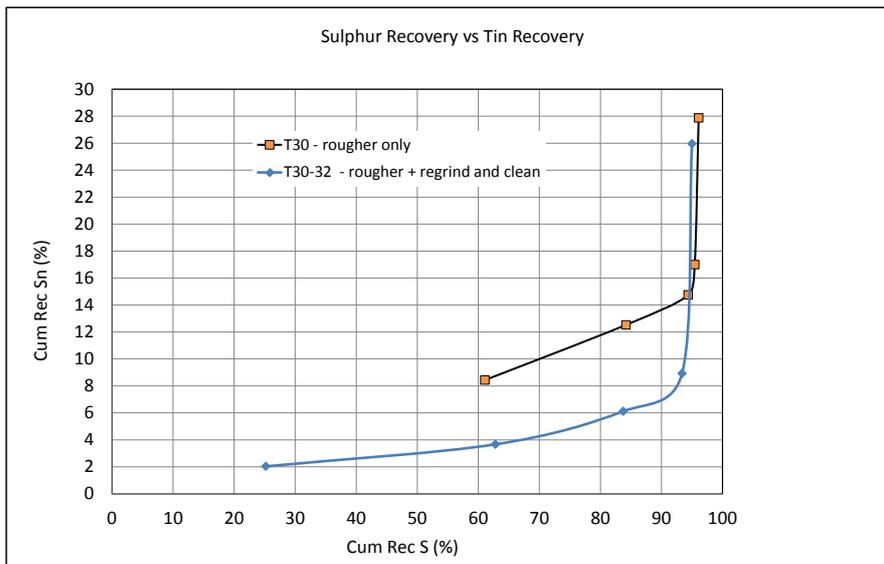
Gravity concentrate dressing testwork carried out on the concentrate produced in test LC08 from Saint Dizier Comp2+3 included sulfide dressing flotation, followed by magnetic separation and concentrate leaching to remove sulfides, magnetite and carbonate minerals; which are the major diluents present in the gravity concentrate.



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Sulfide dressing flotation consisted of roughing (T30) with regrind and cleaning of the rougher concentrate (T32) to reduce Sn losses to the sulfide concentrate. Results are shown in Figure 9-1 and Table 18.

Figure 9-1 – Sulfide Dressing Flotation of Composite 2+3



With approximately 70% mass rejection to the sulfide concentrate, the gravity concentrate upgraded very well in sulfide dressing flotation from 12.9% Sn to 32% Sn.

Without regrind Sn losses to the sulfide concentrate were high. Sn losses were improved significantly with a moderate regrind of 10 kWh/t. It is expected that with further optimisation of regrind, size/energy input Sn losses to the sulfide concentrate could likely be reduced further.

Sulfur was reduced to moderate levels in the rougher tail (3.9% S). Again with further optimisation it is expected S levels could likely be reduced further.

Overall it is thought that the high levels of sulfur in the gravity circuit feed have likely exacerbated issues of both S rejection and Sn losses in sulfide dressing flotation. With a primary sulfide flotation circuit incorporated into the overall flowsheet, it is expected issues in sulfide dressing would likely be significantly reduced.



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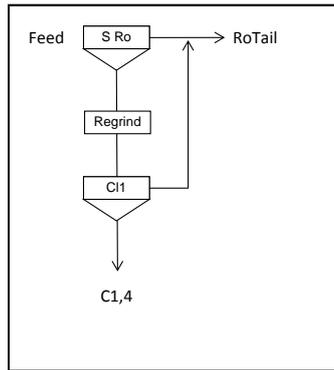
Table 21 – Sulfide Dressing Flotation of Composite 2+3



BURNIE LABORATORY: Flotation: Rougher/Cleaner Sheet

Milling		Primary	Regrind
Mill	type	0	Stirred
Media	type	0	Ceramic
Media	kg	0	2
Solids	g	0	417
Water	g	0	300
Time	min/sec	0	0
Speed	rpm	0	1200
Lime	g	0	0
End pH	pH	0	4.67
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	41219
Cleaner		Finish	41223
0		W/h	4.17
Speed	800	kWh/t	10.0



PROJECT	T0887
TEST NO	T30-T32
DATE	270115
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
Feed Non Mags

NOTES
Sulphide Rougher Cleaner
Combined Ro Con T30
10kWh/t Regrind
Re-Floated

	pH	1 ASS	0.5 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	3.1	270							3					
Condition	3.1		51						5					
Condition				51					1					
Sulphide Ro C1	3.2				42					1-3	3.0	3.0	400	
Condition				34					2					
Condition					17				1					
Sulphide Ro C2	3.5									3-4	4.0	7.0	300	
Condition				34					2					
Condition					17				1					
Sulphide Ro C3	3.8									4-5	3.0	10.0	150	
Condition				17					2					
Condition					17				1					
Sulphide Ro C4	3.9									4-5	3.0	13.0	150	
Regrind	4.7								2					
Condition	4.5	84							2					
Condition			42	27	42				1					
Sulphide Cl1C1	4.6									1-2	3.0	3.0	200	47
Cl1C2	4.6			10	8					2-4	3.0	6.0	200	63
Cl1C3	4.6			10	8					2-5	3.0	9.0	200	58
Cl1C4	4.7			10	17					3-7	4.0	13.0	130	31
REAGENT TOTALS (g/t)		355	93	193	167									

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T30 -T32 Cl1Con1	93.9	15.9	1.65	2.0	41.7	19.9	36.6	25.2	3.22	10.6
Cl1C2	125.6	21.2	0.99	1.6	43.2	27.5	40.9	37.6	1.39	6.1
Cl1C3	115.9	19.6	1.61	2.5	41.4	24.3	24.7	21.0	2.02	8.2
Cl1C4	40.4	6.8	5.30	2.8	40.0	8.2	32.6	9.6	3.82	5.4
Cl1Tail	39.9	6.7	32.5	17.0	20.2	4.1	5.55	1.6	8.76	12.2
Ro Tail	176.2	29.8	32.0	74.0	17.9	16.0	3.88	5.0	9.35	57.6
CALC	591.9	100.0	12.9	100.0	33.3	100.0	23.1	100.0	4.84	100.0
ASSAY HEAD			12.9		33.5		26.7		4.17	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T30 -T32 Cl1Con1	93.9	15.9	1.65	2.0	41.7	19.9	36.6	25.2	3.22	10.6
Cl1C2	219.5	37.1	1.27	3.7	42.6	47.4	39.1	62.8	2.17	16.7
Cl1C3	335.4	56.7	1.39	6.1	42.2	71.8	34.1	83.7	2.12	24.8
Cl1C4	375.8	63.5	1.81	8.9	41.9	80.0	33.9	93.4	2.30	30.2
Cl1Tail	415.7	70.2	4.76	26.0	39.8	84.0	31.2	95.0	2.92	42.4
FEED	591.9	100.0	12.9	100.0	33.3	100.0	23.1	100.0	4.84	100.0



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The concentrate dressing magnetic separation testing was completed using a dry magnetic separator due to restrictions in available sample mass. Testing consisted of roughing plus regrind and cleaning of the rougher magnetic product. This was completed on the combined rougher and cleaner tails produced from T30-32. Results are shown in Table 22.

Table 22 - Concentrate Dressing Magnetic Separation

Roughing:

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)
Magnetics	56.2	56.2	27.02	16.08	13.1	30.05	46.8	6.08	41.1	10.02	30.4
Non Magnetics	151.8	151.8	72.98	39.40	86.9	12.65	53.2	3.23	58.9	8.50	69.6
TOTAL	208.00		100.00	33.10	100.0	17.35	100.0	4.00	100.0	8.91	100.0

Cleaning (post regrind of mags):

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)
Magnetics	44.2	44.2	78.65	19.00	92.9	33.80	88.5	8.32	107.6	6.33	49.7
Non Magnetics	12.0	12.0	21.35	5.34	7.1	16.21	11.5	-2.17	-7.6	23.60	50.3
TOTAL	56.20		100.00	16.08	100.0	30.05	100.0	6.08	100.0	10.02	100.0

Overall:

NAME	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)
Cleaner Magnetics	21.3	19.0	12.2	33.8	41.4	8.3	44.2	6.3	15.1
Cleaner Non Magnetics	5.8	5.3	0.9	16.2	5.4	-2.2	-3.1	23.6	15.3
Rougher Non Magnetics	73.0	39.4	86.9	12.7	53.2	3.2	58.9	8.5	69.6
TOTAL	100.0	33.1	100.0	17.4	100.0	4.0	100.0	8.9	100.0

A reasonable Sn upgrade and reduction in Fe content was achieved across the magnetic separation stage, with ~27% mass rejection to the magnetic product.

Sn losses to the rougher magnetics product were quite high, and only marginally reduced following regrind and cleaning. However, due to the very small mass of rougher concentrate available, the regrind was conducted via a pulveriser and it was not possible to sensibly determine the regrind size achieved.

Further work is recommended to both optimise the sulfide dressing and magnetic separation dressing stages. Due to the very low volume and high value represented by these streams, considerable effort can be economically expended on minimising Sn losses here.

The non-magnetic product produced from concentrate dressing magnetic separation was leached to remove carbonates and determine achievable final concentrate grade. Results are summarised in Table 23, with detailed analysis of the final gravity concentrate shown in Table 24.

Table 23 - Final Gravity Concentrate: Concentrate Leach Results (T36)

Acid consumption = 317 kg/t, leach time = 8 hours, Leach temperature = 90°C

Stream	Mass (gm)	Sn		Fe		S		SiO2		C		Corg		Cinorg	
		(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Start Solids	50.0	36.60		14.25		4.10		8.95		2.21		0.05		2.16	
Final Residue	36.7	49.70	100.0	5.69	29.7	5.93	99.5	11.65	97.6	0.05	1.7	0.05	73.4	0.02	0.7



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Table 24 – “Final Gravity Concentrate” Analysis (post leaching)

Analyte		T36 LEACH RESIDUE
Ag	ppm	2.59
Al	%	0.16
As	ppm	9310
Ba	ppm	50
Be	ppm	4.91
Bi	ppm	54.8
Ca	%	2.56
Cd	ppm	<0.02
Ce	ppm	196
Co	ppm	45.9
Cr	ppm	156
Cs	ppm	0.33
Cu	ppm	135.5
Fe	%	5.14
Ga	ppm	1.36
Ge	ppm	0.16
Hf	ppm	1.1
In	ppm	1.375
K	%	0.01
La	ppm	69.2
Li	ppm	1.6
Mg	%	0.65
Mn	ppm	361
Mo	ppm	67.7
Na	%	0.01
Nb	ppm	0.1
Ni	ppm	32.5
P	ppm	80
Pb	ppm	90.8
Rb	ppm	1.2
Re	ppm	0.014
S	%	5.74
Sb	ppm	10.35
Sc	ppm	0.5
Se	ppm	1
Sr	ppm	11.7
Ta	ppm	<0.05
Te	ppm	1.09
Th	ppm	1.3
Ti	%	0.059
Tl	ppm	0.33
U	ppm	0.8
V	ppm	6
W	ppm	1570
Y	ppm	22.2
Zn	ppm	70
Zr	ppm	50
Hg	ppm	2.67



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A final concentrate grade of 49.7% Sn was achieved, with no significant penalty elements identified.

It is expected that with further optimisation of sulfide dressing flotation, S level could be reduced, which would also give a further increase in final concentrate Sn grade.



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10 DE-SLIME AND TIN FLOTATION

Full results of de-slime and tin flotation testwork are contained in Appendix 13.

De-sliming and tin flotation testwork consisted of an initial series of scouting tests, followed by a more detailed series of tests carried out on a composite of combined gravity cyclone overflow and <40 µm fraction of the fine gravity tails generated from lock cycle gravity test T0887 LC08 (conducted on Saint Dizier Composite 2+3).

10.1 Preliminary/scouting tests

The feed material to the preliminary/scouting tests is summarised in Table 25.

Table 25 – Summary of preliminary/scouting tin flotation tests

Test number	Feed material description
T0887 test T08	Non-mags product produced from test LC02. LC02 was the cleaning stage of the roughing, plus regrind and cleaning magnetic separation test carried out on the Saint Dizier Bulk Composite.
T0887 test T20 to T24	Comp 2+3, ground to P80 = 53µm and de-slimed via cyclosizer at CS4 prior to tin flotation

Direct flotation of the reground non-mags product in test T08 gave very poor results. Flotation of this product was not explored further.

Tests T20 to T24 explored the “direct tin flotation” of Comp 2+3, following a primary grind to P80 = 53µm and de-sliming via cyclosizer at CS4, in a series of roughing only tests. Table 26 summarises tin flotation conditions for these, with results shown in Figure 10-1, Figure 10-2 and Figure 10-3.

Table 26 – Summary of tin float conditions for tests T20 to T24

Test	SSF (g/t)	Na ₂ SO ₃ (g/t)	SPA (g/t)
T20	397	298	893 (dosed in 2 stages)
T23	393	-	393
T24	-	-	394

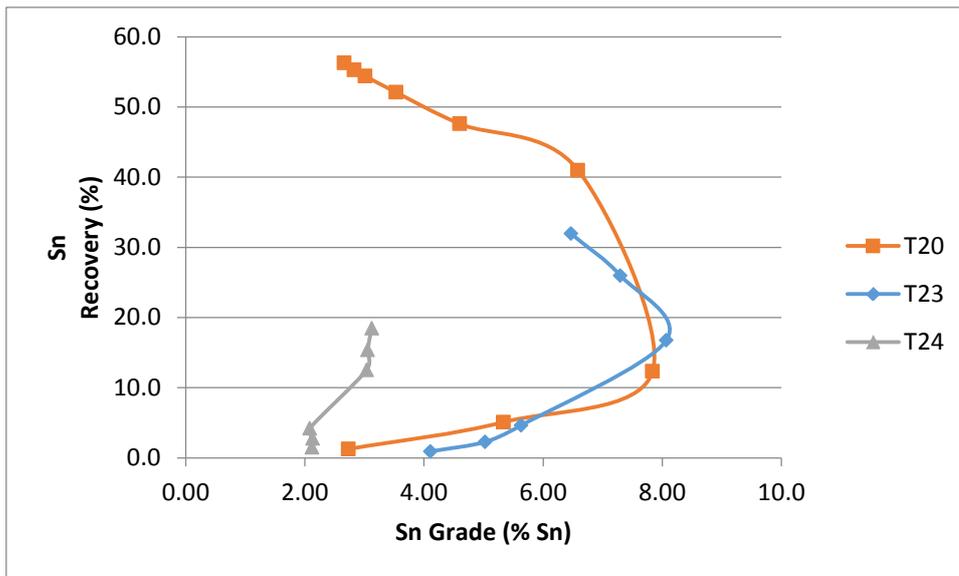
- Results for this series of tests (particularly T20) are encouraging in terms of the tin grades achieved (from roughing only). Although recoveries to tin rougher concentrate were only modest, there is likely room for significant optimisation of the overall grade/recovery response.



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- Sulfide scavenger flotation response was good under the conditions for these tests with over 90% of sulfur rejected. However, further work is required to reduce Sn losses from this stage.
- The very high levels of magnetite present in these tests did not appear to be particularly detrimental to tin flotation. Initially magnetite did not float strongly in these tests until SPA doses were increased to well beyond 400 g/t. At doses less than this reasonable selectivity against magnetite and siderite was achieved.
- Sodium sulfite was dosed to test its application as a siderite depressant. Although this did not particularly impact selectivity achieved, initial flotation kinetics were improved compared to tests without sodium sulfite dosed. However, in all tests initial flotation kinetics were poor suggesting an activation/conditioning issue.
- With no SSF doses tin flotation performance was extremely poor

Figure 10-1 – Saint Dizier Comp 2+3 “Direct Tin Flotation” tests; Sn grade vs Sn recovery





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Figure 10-2– Saint Dizier Comp 2+3 “Direct Tin Flotation” tests; Sn recovery vs time

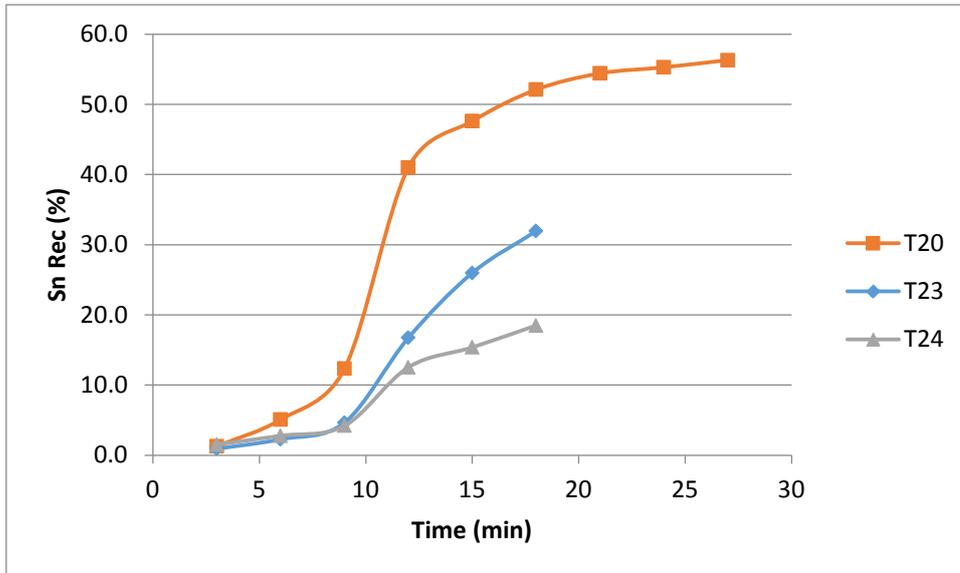
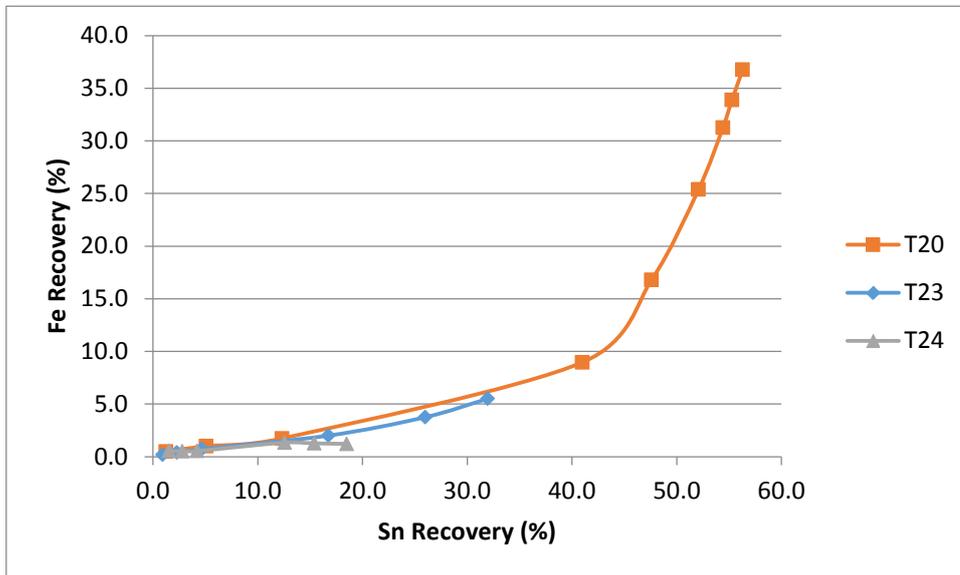


Figure 10-3– Saint Dizier Comp 2+3 “Direct Tin Flotation” tests; Sn recovery vs Fe recovery



10.2 Tin flotation of tin flotation feed material produced from LC08

Following on from the preliminary/scouter tests, de-slime and tin flotation testwork on the combined gravity cyclone overflow and <40 µm fraction of the fine gravity tails generated from lock cycle gravity test T0887 LC08 was completed.



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De-sliming was completed using a cyclone test rig fitted with a 44 mm Mozley cyclone, with vortex finder and spigot sizes adjusted to achieve a cut point of ~6 µm. Mass split and metal deportment across the de-sliming are shown in Table 27.

Table 27 – De-slime Test T33: Estimated cut point ~6 µm (feed material; cyclone off plus -40 fine tail produced from LC08)

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
OF	5357.3	5357.3	45.18	0.63	32.6	11.17	41.4	41.20	49.2	2.97	31.2
UF	6500.7	6500.7	54.82	1.07	67.4	13.05	58.6	35.00	50.8	5.38	68.8
TOTAL	11858.00		100.00	0.87	100.0	12.20	100.0	37.80	100.0	4.29	100.0

Sn losses to the slimes were quite high at 32.6% of de-slime feed units ≡ 14.4% based on ore feed Sn units. 67.4% of de-slime feed Sn units ≡ 29.7% based on ore feed Sn units deported to the de-slime underflow/tin flotation feed.

Initial tin flotation tests highlighted issues with poor sulfur rejection and talc rejection in the sulfide scavenger stage, leading to significant interference with subsequent tin flotation. Sn losses to the sulfide scavenger concentrate were also very high. These issues are highlighted in Table 28 and Figure 10-4.

Table 28 summarises results for T40 with Sn and S grades from the tin rougher highlighted in yellow; S and SiO2 float strongly initially, diluting the Sn grade and consuming SPA, leading to a poor overall Sn response.

Table 28 – T40: Summary of results

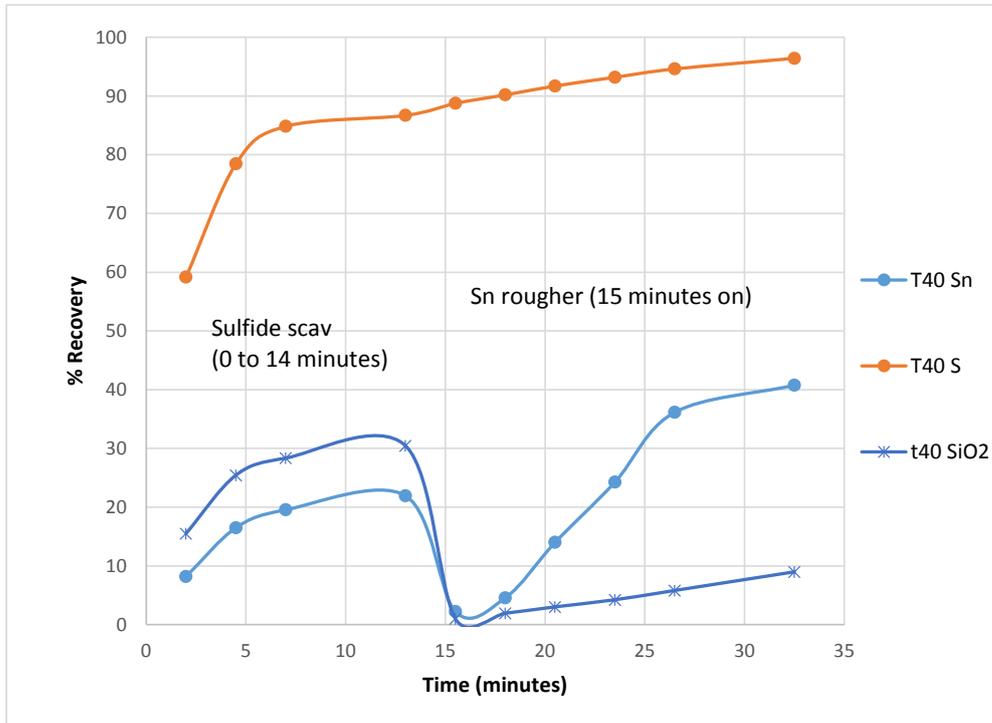
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
S Ro C1	85.4	17.2	0.49	8.0	21.9	29.1	19.0	59.2	31.7	15.5
C2	132.0	26.6	0.64	16.2	20.2	41.5	16.2	78.4	33.6	25.4
C3	147.4	29.7	0.68	19.2	20.0	45.8	15.7	84.8	33.5	28.4
C4	157.1	31.6	0.71	21.5	19.6	47.8	15.1	86.7	33.8	30.5
Sn Ro C1	5.7	1.1	2.00	2.2	18.5	1.6	9.84	2.1	30.9	1.0
C2	10.9	2.2	2.13	4.5	18.0	3.0	8.78	3.5	31.0	1.9
C3	20.3	4.1	3.52	13.7	20.5	6.5	6.75	5.0	26.0	3.0
C4	30.8	6.2	4.02	23.8	21.6	10.3	5.77	6.5	24.0	4.2
C5	45.6	9.2	4.05	35.5	23.0	16.3	4.75	7.9	22.3	5.8
C6	67.8	13.6	3.85	50.2	22.1	23.4	3.92	9.7	23.1	9.0

Figure 10-4 shows sulfur and tin flotation rates. Sulfur recovery is seen to flat line after 7 or so minutes in the sulfide scavenger stage at mid 80's recovery. Once SPA is dosed in the tin rougher (starts at 15 minutes) sulfur takes off again at the expense of the initial tin rate.



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Figure 10-4 T40: Sn, S and SiO₂ flotation rates across sulfide scavenging and tin roughing



In order to achieve reasonable Sn response it is thought that sulfur recovery needs to be in the range of about 90 to 95%, equivalent to about ~0.6% sulfur in the feed to the tin rougher.

An aggressive sulfide scavenging reagent regime, utilising CuSO₄ and PAX, followed by sulfidation with NaSH to collect oxidised sulfides present, provided some improvement in sulfide scavenging S rejection and subsequent Sn roughing response in T42 and T43.



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Figure 10-5 - Tin Flotation Roughing Response

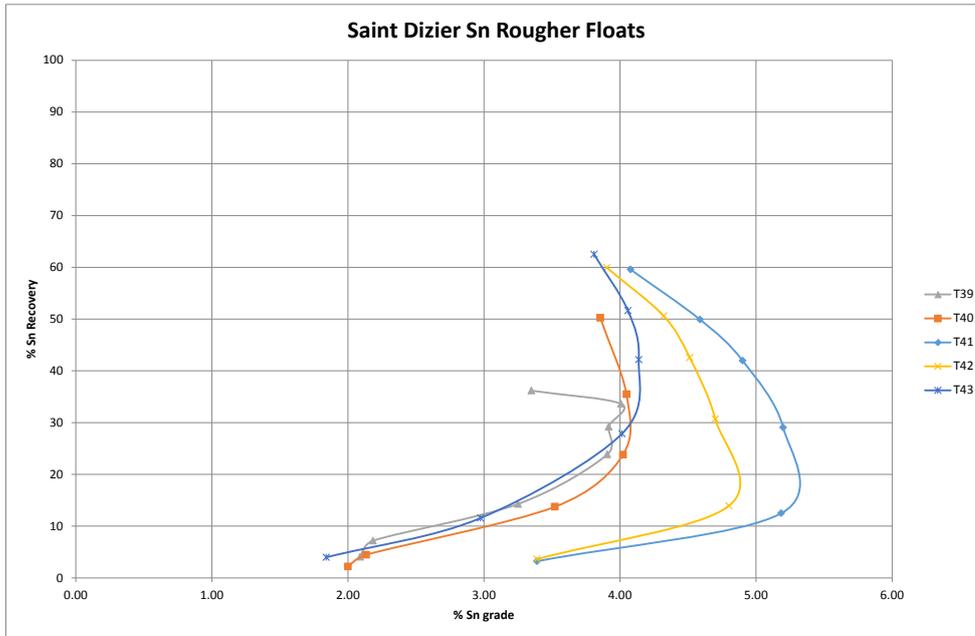


Figure 10-5 shows tin flotation roughing response. Again the hook shape grade recovery curves reflect interference of sulfides and talc in the initial part of the tin float. In these tests approximately 20% of the feed units reported to the sulfide scavenger concentrate. Table 30 and



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Table 31 show results of size by size analysis and QXRD analysis of the sulfide scavenger cleaner concentrate produced in T43.



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Table 29 – Complete results and conditions for T43

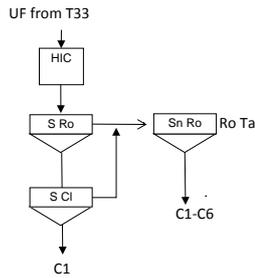


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PROJECT	T0887
TEST NO	T43
DATE	06/03/15
TECHNICIAN	MW

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			
End p80			

Float Cell		Volume	Regrind Power
Rougher Clnr1	2.5		Start
	2.5		Finish
Speed	850		W/h
			kWh/t



PRODUCT FLOATED	
UF from T33	

NOTES	
UF from T33	

	pH	10.0 H2SO4 g/t	0.5 CuSO4 g/t	0.5 PAX g/t	1.0 SSF g/t	1.0 NaSH g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	2014			201				5					
Water Change		604	50											
Condition	4.8			81					3					
S Ro C1	5.0	282	50							3-11	3.0	3.0	300	
Condition														
S Ro C2	5.0									7-12	4.5	7.5	300	
Condition		322	50			504			3					
Condition				40					3					
S Ro C3	5.5					101				7-12	5.0	12.5	300	
Condition				40					3					
S Ro C4	5.9					81				7-11	3.0		150	89
Condition				40					3					
S Ro C5	6.1									8-9	2.5		130	7
Condition														
S Cl Conc														
Condition									3					
Condition									3					
Condition									3					
Sn Ro C1	5.0							302		6-9	2.5	2.5	125	9
Sn Ro C2	5.2							101	3	7-9	2.5	5.0	130	7
Sn Ro C3	5.4							302	3	7-9	2.5	7.5	135	12
Sn Ro C4	5.6							101	3	8-10	3.0	10.5	150	11
Sn Ro C5	5.7							101	3	7-9	3.0	10.5	150	9
Sn Ro C6	5.9							101	3	8-11	6.0	16.5	300	6
REAGENT TOTALS (g/t)		3223	151	201	201	685		1007						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T43 Cl1 S Con	133.2	26.8	0.61	15.8	21.0	43.1	17.3	82.6	33.0	25.1
Sn Ro C1	11.1	2.2	1.84	4.0	17.0	2.9	9.32	3.7	33.6	2.1
C2	8.9	1.8	4.39	7.6	18.5	2.5	6.06	1.9	28.9	1.5
C3	15.7	3.2	5.34	16.3	26.4	6.4	3.30	1.9	17.5	1.6
C4	16.7	3.4	4.40	14.3	26.9	6.9	3.58	2.1	17.1	1.6
C5	13.0	2.6	3.74	9.5	23.8	4.8	3.13	1.5	21.4	1.6
C6	19.0	3.8	2.95	10.9	18.0	5.3	3.08	2.1	28.4	3.1
Ro Tail	278.9	56.2	0.40	21.7	6.53	28.1	0.42	4.2	39.9	63.5
CALC	496.5	100.0	1.04	100.0	13.1	100.0	5.62	100.0	35.3	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T43 Cl1 S Con	133.2	26.8	0.61	15.8	21.0	43.1	17.3	82.6	33.0	25.1
Sn Ro C1	11.1	2.2	1.84	4.0	17.0	2.9	9.32	3.7	33.6	2.1
C2	20.0	4.0	2.97	11.6	17.6	5.4	7.87	5.6	31.5	3.6
C3	35.7	7.2	4.01	27.9	21.5	11.8	5.86	7.5	25.3	5.2
C4	52.4	10.6	4.14	42.2	23.2	18.8	5.13	9.6	22.7	6.8
C5	65.4	13.2	4.06	51.6	23.3	23.5	4.74	11.1	22.5	8.4
C6	84.4	17.0	3.81	62.5	22.1	28.8	4.36	13.2	23.8	11.5



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Sn losses are biased towards the coarser size fractions suggesting losses could be reduced considerably by regrind of the sulfide scavenger concentrate.

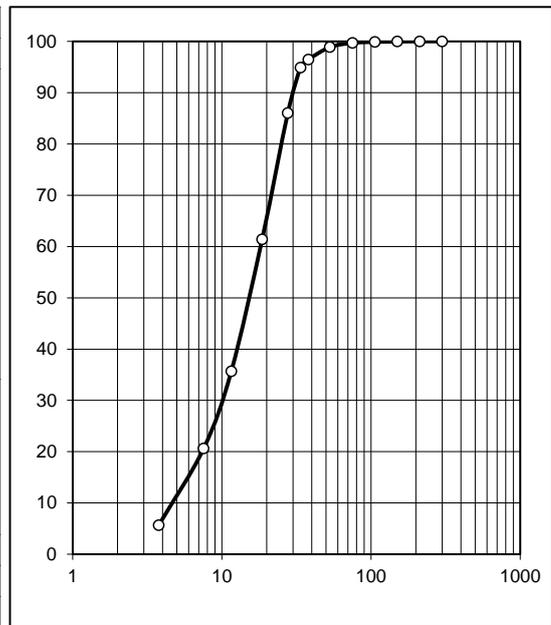
Table 30 – Size Distribution and Size by Size assay and metal Distribution of T43 Sulfide Scavenger Cleaner Concentrate



5

PROJECT	T0887
SAMPLE	S Cl1 Con
TEST NO	T43
DATE	190315
TECHNICIAN	MS

S Cl1 Con		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	0.04	100.0
		106	0.06	0.07	99.9
		75	0.16	0.19	99.7
		53	0.68	0.82	98.9
		25	38	2.01	2.43
CYCLOSIZER	CS1	34	1.28	1.55	94.9
FLOW 185	CS2	28	7.35	8.88	86.0
TEMP 21	CS3	19	20.40	24.64	61.4
SG 2.50	CS4	12	21.28	25.71	35.7
MINS 20	CS5	8	12.47	15.06	20.6
CENTRIFUGE	CS6	4	12.39	14.97	5.6
		SUB	4.67	5.64	0.0
		TOTAL	82.78	100.0	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
28	13.98	0.87	20.9	28.0	18.6	23.4	20.7	23.3	10.0
19	24.64	0.73	30.9	22.7	26.6	17.8	27.8	29.8	22.5
12	25.71	0.61	26.9	20.3	24.8	15.6	25.4	32.8	25.9
8	15.06	0.48	12.4	19.5	13.9	12.9	12.3	35.2	16.3
4	20.61	0.25	8.9	16.3	16.0	10.6	13.8	40.1	25.4
CALC	100.0	0.58	100.0	21.0	100.0	15.8	100.0	32.6	100.0
ASSAY		0.61		21.0		17.3		33.0	



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Table 31 – QXRD Analysis of T43 Sulfide Scavenger Cleaner Concentrate

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

Clearly talc is responsible for the majority of SiO₂ present in the sulfide scavenger concentrate.

Overall grade/recovery response following roughing plus two stage cleaning following the 'improved' sulfide scavenging routine (from T42/43) is shown in Figure 10-6, with complete conditions and results in Table 32.

Overall a modest response was achieved with 40% Sn recovery (54% based on sulfide scavenging tails) achieved to a grade of 8.6% Sn.

Although only low grade tin flotation concentrates were produced, these are expected to upgrade significantly in concentrate leaching, as siderite is the major diluent present in the concentrate. Figure 10-7 shows estimated upgrade tin flotation concentrate grade across concentrate leaching based on the outcomes of the Severn flowsheet optimisation program.



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Figure 10-6 T44: roughing plus 2 stage cleaning grade recovery response

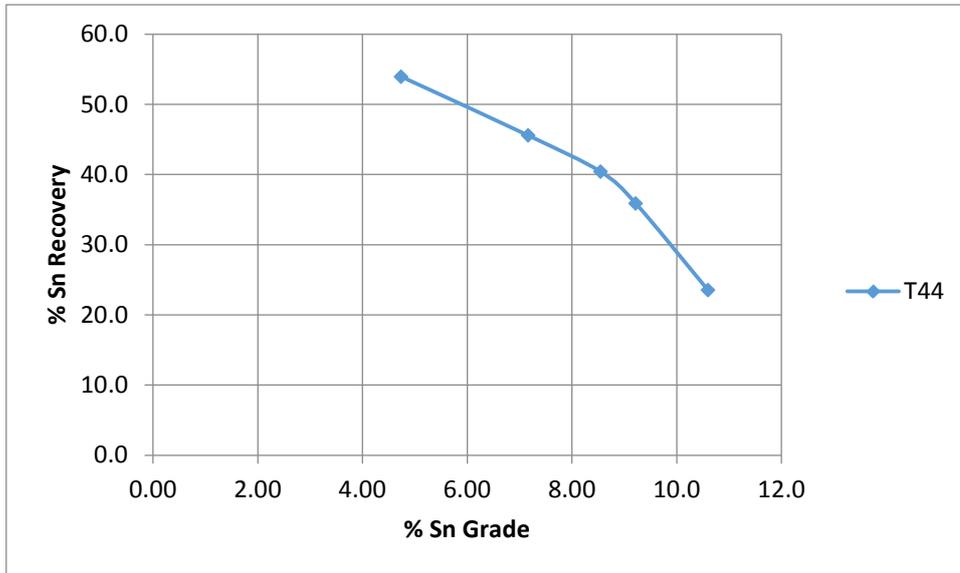
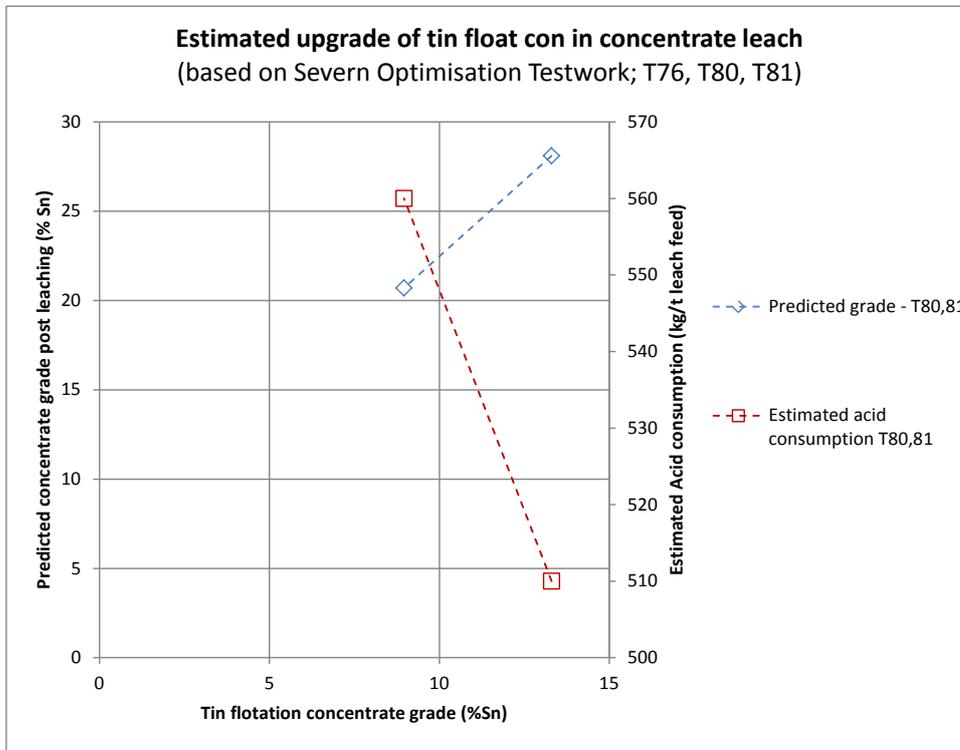


Figure 10-7





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Table 32 – T44: roughing plus 2 stage cleaning

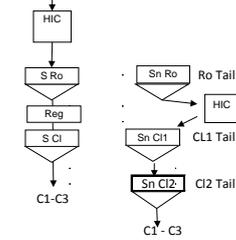


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UF from T33

PROJECT	T0887
TEST NO	T44
DATE	20/03/15
TECHNICIAN	MW

Milling	Primary	Regrind
Mill type	0	HIC
Media type		Sand
Media kg		1500
Solids g	0	194
Water g	0	200
Time min	0.0	35s
Speed rpm	0	60HZ
Lime g		
End pH		
End p80		



PRODUCT FLOATED	
UF from T33	

NOTES	
UF from T33	

Float Cell	Volume	Regrind	Power
Rougher	2.5	Start	41439
Clnr1	1.5	Finish	41442
Speed	0.5	W/h	2.91
	850	kWh/t	#REF!

	pH	10.0 H2SO4 g/t	0.5 CuSO4 g/t	0.5 PAX g/t	1.0 SSF g/t	1.0 NaSH g/t	1.0 Na2SO3 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)	2.5	2400			200					5					
Water Change															
Condition		800	50							3					
S Ro C1	4.8			80						3					
Condition	4.8	400	50							3	3-11	3.0	3.0	300	
S Ro C2	4.8	400	50	40						3	7-12	4.5	7.5	300	
Condition						500				3					
S Ro C3	5.5			40						3	7-12	5.0	12.5	300	
Condition										3					
S Ro C4	6.0	80		40						3	7-11	3.0	15.5	150	
Condition						80				3					
S Ro C5	6.0			40						3	8-9	2.5	18.0	130	
Condition	7.5		50							3					
Regrind 15kw		320		40						3					
S Cl1 C1	5.2									20	0.5-1	1.0	19.0	100	
Condition	5.3			40						3	3-9	2.5	20.5	200	
S Cl1 C2										20					
Condition	5.3	400			200					3	3-9	11.0	31.5	600	
S Cl1 C3										3					
Condition										3					
Condition										3					
Sn Ro C1	5.5							300		3	7-9	2.5	34.0	125	
Condition										3					
Sn Ro C2	5.1	160						300		3	7-9	2.5	36.5	130	
Condition										3					
Sn Ro C3	5.5							100		3	7-9	2.5	39.0	135	
Condition										3					
Sn Ro C4	5.4	40						100		3	8-10	3.0	42.0	150	
Condition										3					
Sn Ro C5	5.6							100		3	7-9	6.0	48.0	300	
Condition										5					
HIC Cond (60HZ)					100					3					
Condition										3					
Condition										3					
Sn Cl1 C	6.3							100		20	5-11	7.5	55.5	400	
Sn Cl2 C1	6.6									10	4-5	3.5	51.5	50	
Sn Cl2 C2	6.7									10	6-8	3.5	59.0	60	
Sn Cl2 C3	6.8									10	3-7	4.0	59.5	70	
REAGENT TOTALS (g/t)		4999	200	320	500	680	400	1000	238						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T44 S Cl1 C1	36.9	7.4	0.35	2.5	23.9	13.6	21.4	32.9	28.5	5.8
S Cl1 C2	52.9	10.6	0.51	5.3	19.3	15.8	12.0	26.5	36.2	10.6
S Cl1 C3	49.7	9.9	0.84	8.2	18.6	14.2	12.0	24.9	35.4	9.7
S Cl1 Tail	33.3	6.7	1.44	9.4	17.1	8.8	5.30	7.4	35.4	6.5
Sn Cl2 C1	11.3	2.3	10.6	23.5	29.6	5.2	3.42	1.6	9.09	0.6
Sn Cl2 C2	8.5	1.7	7.39	12.4	30.9	4.1	3.34	1.2	9.90	0.5
Sn Cl2 C3	4.2	0.8	5.42	4.5	30.5	2.0	3.19	0.6	11.8	0.3
Sn Cl1 Tail	8.3	1.7	3.17	5.2	24.3	3.1	2.38	0.8	21.3	1.0
Sn Cl2 Tail	25.6	5.1	1.67	8.4	18.1	7.1	1.54	1.6	29.3	4.1
Ro Tail	269.3	53.9	0.39	20.6	6.29	26.1	0.23	2.6	40.9	60.9
CALC	500.1	100.00	1.02	100.0	13.0	100.0	4.80	100.0	36.2	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

CUM PRODUCTS	CUM WT	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T44 S Cl1 C1	36.9	7.4	0.35	2.5	23.9	13.6	21.4	32.9	28.5	5.8
S Cl1 C2	89.8	18.0	0.44	7.8	21.2	29.4	15.9	59.4	33.0	16.4
S Cl1 C3	139.5	27.9	0.59	16.0	20.2	43.6	14.5	84.2	33.9	26.1
S Cl1 Tail	172.8	34.6	0.75	25.4	19.6	52.4	12.7	91.6	34.2	32.7
Sn Cl2 C1	11.3	2.3	10.6	23.5	29.6	5.2	3.42	1.6	9.09	0.6
Sn Cl2 C2	19.8	4.0	9.22	35.9	30.2	9.2	3.39	2.8	9.44	1.0
Sn Cl2 C3	24.1	4.8	8.55	40.4	30.2	11.2	3.35	3.4	9.85	1.3
Sn Cl1 Tail	32.4	6.5	7.17	45.5	28.7	14.3	3.10	4.2	12.8	2.3
Sn Cl2 Tail	58.0	11.6	4.74	53.9	24.0	21.5	2.41	5.8	20.1	6.4



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Overall the tin flotation of Saint Dizier Composite 2+3 has proved challenging with issues exacerbated by the high levels of sulfur and talc deporting to tin flotation feed under the flowsheet as tested.

With the inclusion of a primary sulfide flotation circuit (possibly with talc prefloat) the quantity of sulfur and talc deporting to tin flotation feed would be very considerably reduced, considerably reducing the issues these have posed. Additionally, coarsening of de-slime size could potential improve both talc and slimes rejection, leading to improved tin flotation response.



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11 PRIMARY SULFIDE FLOTATION

When the Saint Dizier metallurgical testing program was commenced, the Saint Dizier deposit was viewed as an opportunity for early treatment, prior to the major underground ore sources, with reduced CAPEX and mining costs and potentially a simplified flowsheet, compared to the overall Heemskirk Tin Project.

In particular due to the significantly lower sulfur levels compared to the other Heemskirk deposits, primary sulfide flotation was excluded from the flowsheet, as this was seen as a key opportunity to reduce initial CAPEX. It was envisaged the sulfide flotation circuit would be installed following the treatment of Saint Dizier, prior to commencement of treatment of the Queen Hill, Severn and Montana deposits. As such the testwork program was focused on an approach which excluded primary sulfide flotation from the routine. Compared with Severn this resulted in significantly higher levels of sulfur in feed to:

- the gravity circuit
- gravity concentrate dressing
- tin flotation.

The high levels of sulfur have clearly exacerbated issues in sulfur management and associated Sn losses in both gravity concentrate dressing and particularly sulfide scavenger flotation ahead of tin flotation.

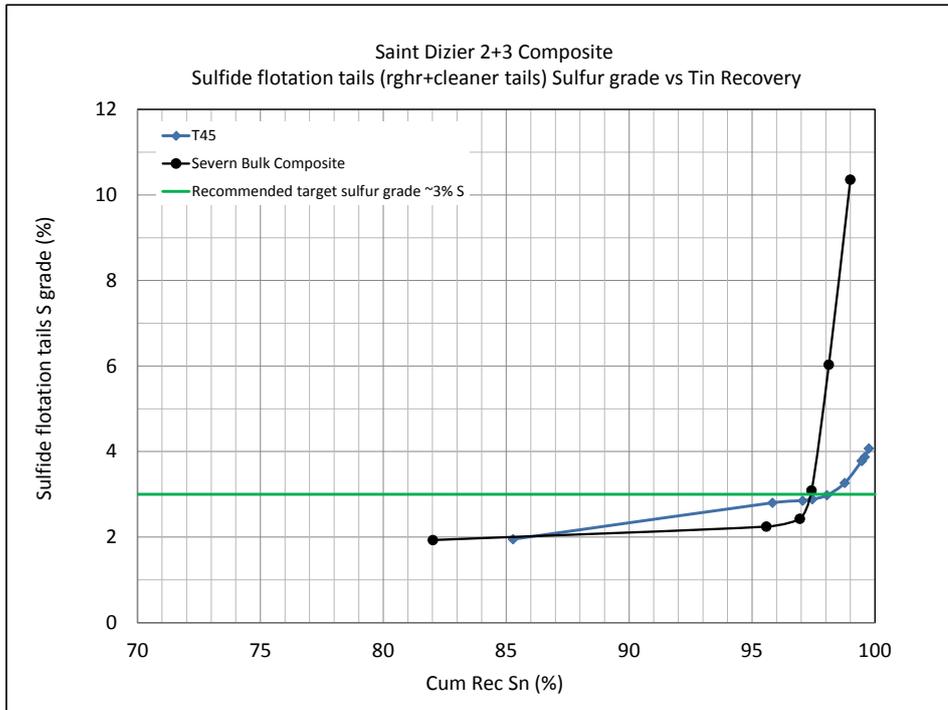
In parallel with the metallurgical testing, mining studies on Saint Dizier highlighted that this would be most economically extracted at only relatively low rates (~150 kt/y compared with 600 kt/y for the overall project) which would necessitate the treatment of Saint Dizier in a low ratio blend with other Heemskirk ores. As a result it is now expected the circuit treating Saint Dizier ore will incorporate a primary sulfide flotation circuit.

Two sulfide flotation tests were carried out under conditions comparable to those developed for the Severn deposit to assess potential performance and Sn losses (refer Appendix 15 for full results), with response summarised in Figure 11-1.



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Figure 11-1 Sulfide Flotation Response: Saint Dizier 2+3 composite



At a target S grade of 3% in sulfide flotation tails, Sn losses to the final sulfide concentrate are comparable with those for the Severn Bulk Composite, at 2-3% of ore feed units. This represents a reasonable reduction in Sn losses compared to those seen in the sulfide scavenger flotation tests undertaken on Saint Dizier 2+3 composite.

Although Sn grade of the final sulfide concentrate produced from Saint Dizier is considerably higher than that from Severn (0.4% c.f. 0.09% Sn), this is largely offset by the significantly reduced mass rejection to the final sulfide concentrate for Saint Dizier compared to Severn.

A moderate Cu response was seen in the sulfide flotation tests with a small amount of low grade Cu concentrate (5% Cu at 54% Cu recovery) produced. Given the very low Cu grade of the Saint Dizier 2+3 composite, ~0.09% Cu, this is considered of “curiosity value” only. However, if higher Cu grades are expected, it is recommended further consideration be given to the potential for production of a Cu concentrate by-product.



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12 CONCLUSIONS

12.1 Bulk Composite

The Saint Dizier Bulk Composite sample collected from the costean is heavily weathered, and is not thought to be representative of the overall mineable Saint Dizier mineral resource.

The overall metallurgy of the Bulk Composite is difficult. Given the very high soluble tin content, modest gravity recovery, very high losses to both the magnetite concentrate (23.7%) and slimes tails (16.9%), it is expected that overall Sn recovery for the Saint Dizier Bulk Composite is limited to something less than 50%.

Results for the Composite 2+3 material to date are more encouraging.

Key differences between the Bulk Composite and intersections from ST06 (from which Composite 2+3 was produced) are:

- Portion of soluble tin (as a % of total tin);
Bulk sample; 22%, intersections - top; 8%, middle; 3%, bottom; 13.5%
- Liberation of the drill samples is poorer than the bulk sample
- Quantity of magnetite;
Bulk sample; 31%, intersections - top; 22%, middle; 35%, bottom; 59%
- binary associations of cassiterite with magnetite;
Bulk sample; 11%, intersections top; 1%, middle; 3%, bottom; 21%
- Drill intersections have significantly less cassiterite locked with magnetite and less soluble tin associated with the magnetic fraction;
Magnetic separation testwork on the Bulk Composite sample showed very high losses of Sn to the magnetite product compared to the drill hole composites (Comp 2, 3 and 4), being a combination of both high soluble tin deportment to the magnetic fraction and very fine intergrowths of cassiterite in magnetite.
- Drill intersections have;
 - less tin in ultra-fine size fraction – likely lower slimes losses
 - higher sulfur ~5% c.f. 1.3%

12.2 Composite 2+3

In the absence of further information the representativity of Composite 2+3 must be questioned. Clearly there is considerably variability in mineralogy, soluble Sn content, ore competency and other



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properties across the intersections from ST06 and the bulk sample. As such any conclusions drawn from the work on composite 2+3 must be treated with caution.

The Saint Dizier drill hole composites (Comp 2, 3, 4 and 2+3) are exceptionally hard ores, with BBWi estimated in the mid to high 20's.

The magnetic separation stage represents a significant Sn loss for the overall circuit at 18.3%. However, this gives a significant mass reduction feeding into the gravity circuit with magnetite levels in the gravity feed reduced to more manageable levels.

38% of the feed mass deported to the final magnetite product, at an Fe grade of 60.9%. The final magnetite product contained 0.46% Sn, 5.25% S and 5.4% SiO₂. This could potentially form a saleable by-product into a magnetite producer with the ability to dilute out Sn, S and other impurities to acceptable levels.

Overall recovery to the combined gravity concentrates averaged 35% based on ore feed at an average grade of 12.1% Sn in lock cycle gravity testing.

Major diluents in the combined gravity concentrates were Fe at 33.7% and S at 27.6% (equivalent to ~52% pyrite), with only 4.31% SiO₂.

Losses to slimes are inherently due to both the fine grain size of cassiterite and the very high hardness of the ore.

Due to the fine cassiterite mineralogy, overall recovery from Composite 2+3 is very dependent on tin flotation response. Overall the tin flotation of Saint Dizier Composite 2+3 has proved challenging with issues exacerbated by the high levels of sulfur and talc deporting to tin flotation feed under the flowsheet as tested.

With the inclusion of a primary sulfide flotation circuit (and possibly talc prefloat) the quantity of sulfur and talc deporting to tin flotation feed would be very considerably reduced, considerably reducing the issues these have posed. Additionally, coarsening of de-slime size could potential improve both talc and slimes rejection, leading to improved tin flotation response.

12.3 Overall Metallurgical Performance

An overall tin balance was constructed based on the outcomes of testwork completed on Saint Dizier..

Table 33 shows a summary of Sn distribution in the output streams while the full balance is presented in Table 34.

Losses to the magnetic concentrate are inherently high due to the very fine association of cassiterite with magnetite. There is some scope for further reducing these by increased regrind in the magnetic separation circuit. However, at the regrind sizes required to achieve this, it is expected any gains would be largely offset by increased slimes losses.



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Losses to slimes are also expected to be inherently due to both the fine grain size of cassiterite and the very high hardness of the ore. This very high hardness is expected to exacerbate tin slimes generation in any size reduction steps within the circuit.

Table 33 – Saint Dizier: Summary of Tin Balance

(based on outcomes for Composite 2+3)

Stream	Sn Distribution
ROM	100%
Magnetic con	18%
Gravity tail	5%
Slime tails	16%
Sulfide scavenger con	5%
Tin float tails	13%
Gravity con	29%
Tin flotation con	15%
Total final concentrate	43%

The major opportunities for potential upside in overall recovery are:

1. Reduction in Sn losses associated with sulfide scavenging

Sn losses in sulfide scavenging were greatly exacerbated by the high levels of sulfur (~5%) in tin flotation feed. These could potentially be reduced by a primary sulfide flotation circuit with heavy regrind (as for Severn). This would result in significantly reduced sulfur deportment through the gravity, concentrate dressing and sulfur scavenging circuits.

2. Optimisation of tin flotation

Clearly both high levels of sulfur and talc contributed to the issues seen in tin flotation, with optimisation in the approach to managing these likely to yield gains in tin flotation performance.

Potentially reduction in sulfur content to the feed to the gravity circuit would allow some improvement in gravity recovery due to reduced issues in management of recirculating loads of sulfur. However, gravity recovery is fundamentally limited by the fine grained nature of cassiterite in the ore.

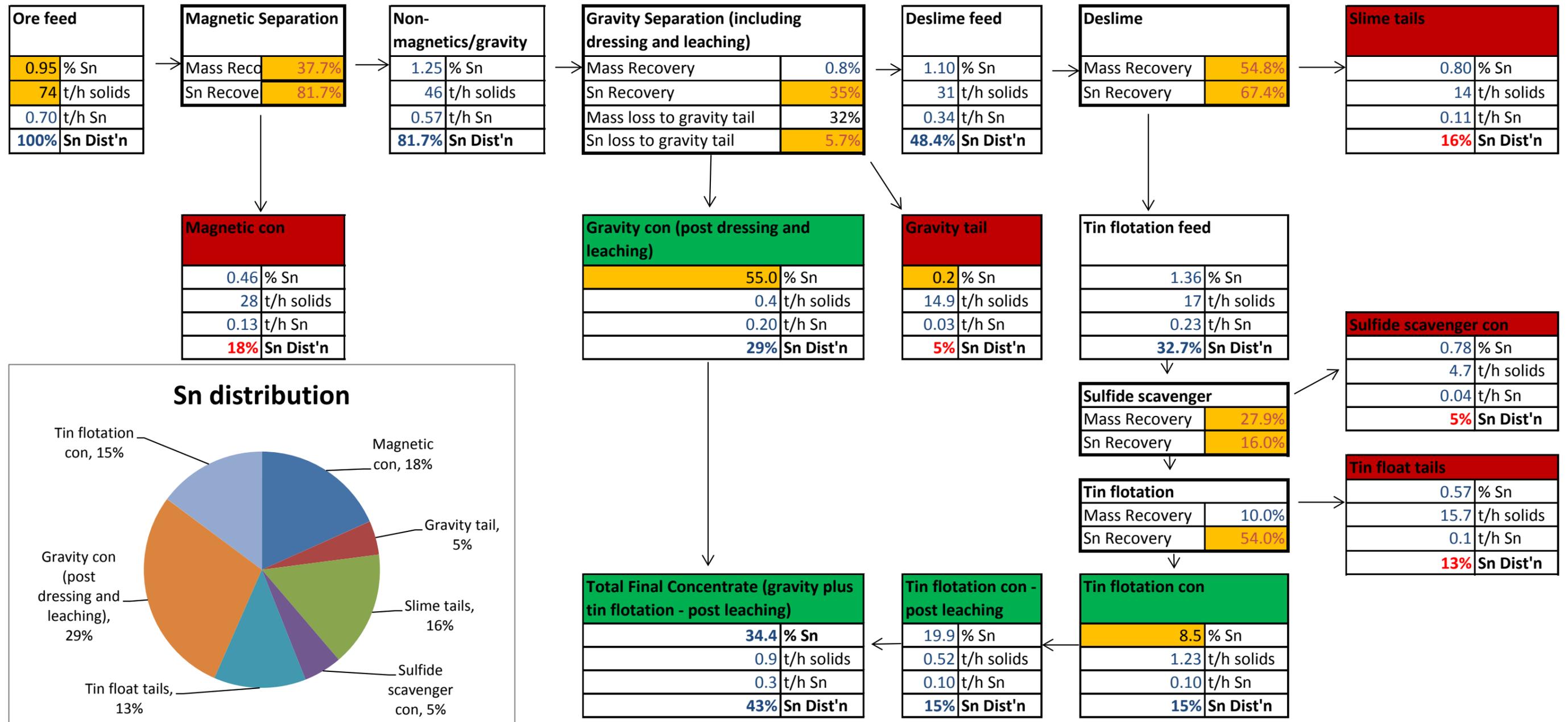
A final gravity concentrate grade (post dressing and leaching) of 49.7% Sn was demonstrated on Composite 2+3. With further optimisation of sulfur rejection in the sulfide dressing circuit, final gravity concentrate grades of approximately 55% are expected to be readily achievable.

Tin flotation concentrate grades produced were modest. However, with further optimisation, particularly around sulfur, talc and slimes rejection it is expected higher concentrate grades will be achievable in tin flotation. As siderite is the major diluent present in the tin flotation concentrate, this is expected to upgrade significantly across concentrate leaching.

With further optimisation approximately 45% to something <50% Sn recovery may be achievable.



Table 34 - Saint Dizier Overall Tin Balance (based on outcomes on composite 2+3)





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13 RECOMMENDED FURTHER WORK

Given the considerable variability in properties of the various samples used in this program, further work is recommended to assess the variability across the Saint Dizier deposit, to allow the results from the current program to be put into perspective in terms of the likely treatment response of the overall deposit.

Further work to optimise response is required in the following areas:

- Sulfur management – specifically it is recommended this focus on an upfront/primary sulfide circuit (similar to Severn and Queen Hill)
- Talc management/rejection ahead of tin flotation
- Tin flotation (including de-slime cut point) optimisation
- Gravity concentrate dressing to reduce losses associated with both the magnetic separation and sulfide dressing stages.

Given it is now expected that treatment of Saint Dizier ore would be in a low ratio blend with other Heemskirk ores, it is recommended further testwork should be carried out on appropriate blends of Saint Dizier with other Heemskirk ores.

The other Heemskirk deposits; Upper Queen Hill, Lower Queen Hill and Montana are considered as higher priorities for further testwork than Saint Dizier.



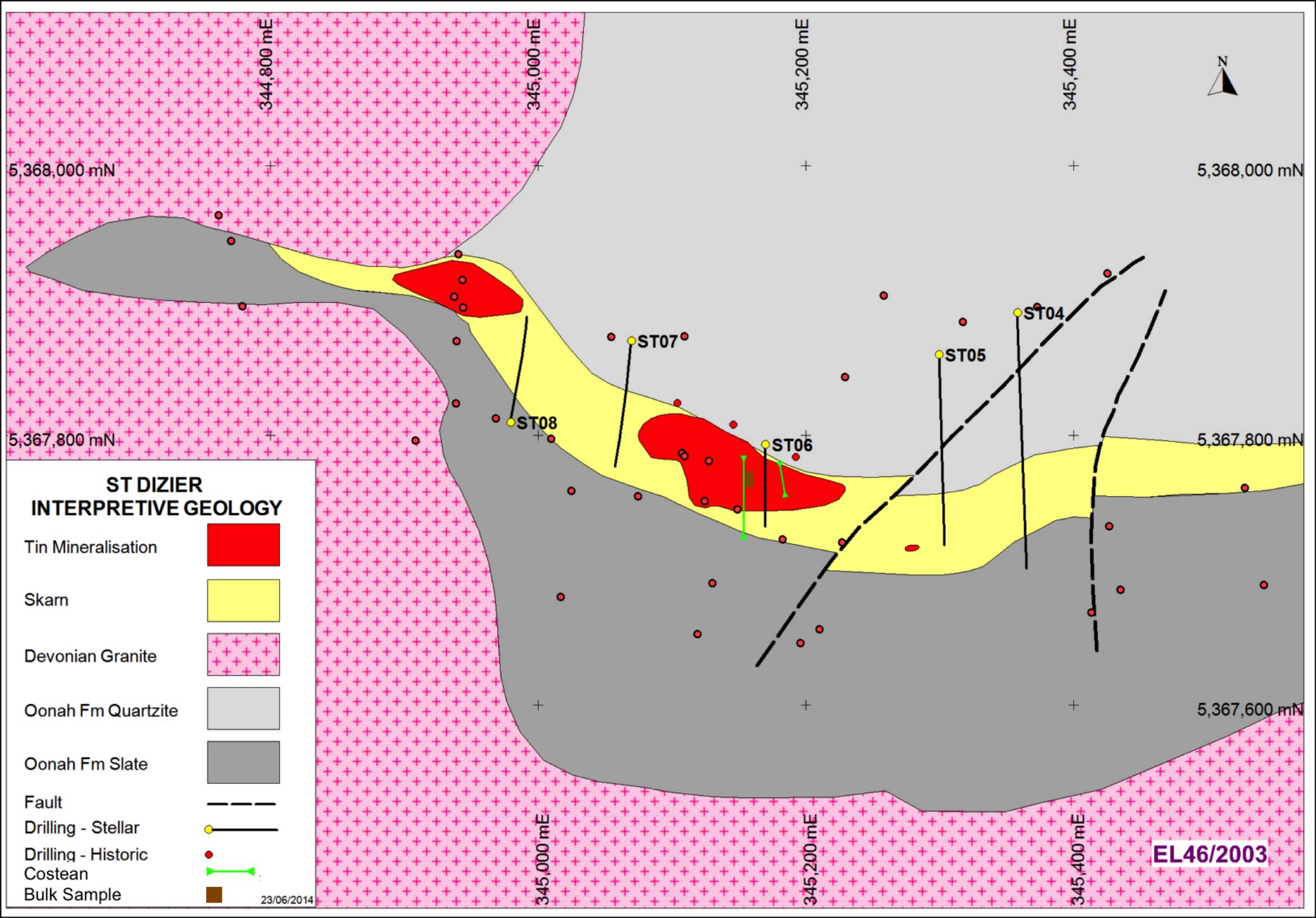
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Appendix 1 – Sample Details



1200RL

1000RL

5367600N

5367800N

H1 14.6 - 59.6
45.0m @ 0.8% Sn

H10 32.0 - 66.0
34.0m @ 0.8% Sn

H3 58.5 - 94.2
35.7m @ 0.6% Sn

M4 98.0 - 123.0
26.0m @ 0.5% Sn

ST01 86.0 - 101.0
15.0m @ 0.9% Sn

SD9 166.0 - 175.0
9.0m @ 0.6% Sn

ST06 106.0 - 114.0
8.0m @ 0.7% Sn

ST06 10.2 - 86.0
75.8m @ 0.9% Sn

M1 1.8 - 94.8
93.0m @ 1.8% Sn

ST01 44.0 - 79.0
35.0m @ 0.5% Sn

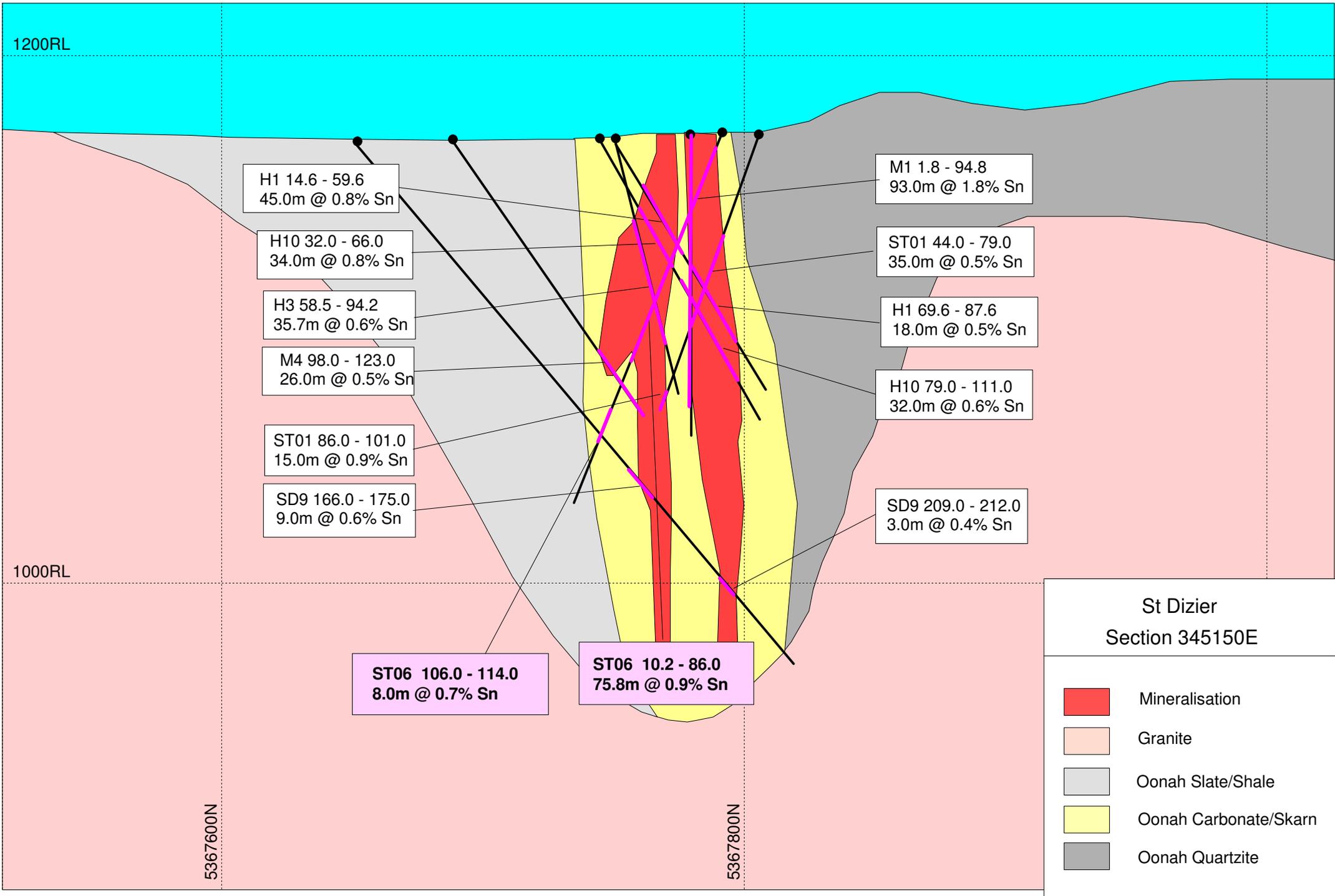
H1 69.6 - 87.6
18.0m @ 0.5% Sn

H10 79.0 - 111.0
32.0m @ 0.6% Sn

SD9 209.0 - 212.0
3.0m @ 0.4% Sn

St Dizier Section 345150E

- Mineralisation
- Granite
- Oonah Slate/Shale
- Oonah Carbonate/Skarn
- Oonah Quartzite



Stellar Resources Ltd - Drill Hole Assay Data

Project	Prospect	Hole_id	Depth_from	Depth_to	Sample_id	Sn %	S_Sn ppm	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Fe %	S %	As ppm	Bi ppm	WO3 ppm	SG
Heemskirk	St Dizier	ST06	4.2	5.7	290647	0.01	80.00	342.00	130.00	2150.00	8.00	5.24	4.30	750.00	30.00	0.04	2.73
Heemskirk	St Dizier	ST06	7.2	8.7	290648	0.05	170.00	1510.00	<10	370.00	3.00	22.60	23.50	19300.00	360.00	0.04	3.43
Heemskirk	St Dizier	ST06	10.2	11.7	290649	2.10	3550.00	3780.00	10.00	1740.00	9.00	24.00	25.30	25100.00	1090.00	0.06	3.55
Heemskirk	St Dizier	ST06	11.7	13.2	290650	0.55	300.00	2420.00	10.00	1350.00	4.00	17.80	16.45	27600.00	220.00	0.04	3.31
Heemskirk	St Dizier	ST06	13.2	14.6	290651	1.56	80.00	3590.00	<10	150.00	2.00	26.00	26.70	9820.00	150.00	0.06	3.69
Heemskirk	St Dizier	ST06	14.6	15.4	290652	1.97	280.00	3000.00	<10	950.00	5.00	24.70	26.40	3850.00	170.00	0.04	3.65
Heemskirk	St Dizier	ST06	15.4	16.2	290653	0.51	220.00	2770.00	<10	1100.00	7.00	21.20	21.20	9440.00	250.00	0.05	3.49
Heemskirk	St Dizier	ST06	16.2	17.7	290654	0.49	100.00	988.00	<10	150.00	<1	10.95	9.09	260.00	10.00	0.02	3.11
Heemskirk	St Dizier	ST06	17.7	19.2	290655	2.58	420.00	2740.00	<10	120.00	2.00	27.80	16.85	2270.00	90.00	0.05	3.53
Heemskirk	St Dizier	ST06	19.2	20.3	290656	0.23	220.00	494.00	90.00	110.00	3.00	19.70	3.72	710.00	50.00	0.01	2.12
Heemskirk	St Dizier	ST06	20.3	21.9	290657	0.19	80.00	720.00	<10	110.00	<1	11.45	4.32	130.00	40.00	0.02	2.94
Heemskirk	St Dizier	ST06	21.9	23.0	290658	0.44	80.00	1330.00	<10	130.00	1.00	16.05	9.57	350.00	40.00	0.03	2.95
Heemskirk	St Dizier	ST06	23.0	24.0	290659	1.98	60.00	2550.00	<10	80.00	1.00	24.60	16.00	860.00	100.00	0.04	3.38
Heemskirk	St Dizier	ST06	24.0	25.0	290660	1.38	280.00	1530.00	10.00	40.00	<1	27.20	10.25	7880.00	130.00	0.04	3.13
Heemskirk	St Dizier	ST06	25.0	26.0	290661	1.16	210.00	2440.00	<10	70.00	1.00	29.80	16.55	1070.00	120.00	0.04	3.14
Heemskirk	St Dizier	ST06	26.0	27.0	290662	1.31	240.00	1680.00	<10	40.00	1.00	29.50	10.75	60.00	70.00	0.03	3.26
Heemskirk	St Dizier	ST06	27.0	28.0	290663	1.33	120.00	2600.00	<10	50.00	<1	30.30	16.40	7230.00	130.00	0.05	3.39
Heemskirk	St Dizier	ST06	28.0	29.0	290664	1.88	230.00	3250.00	<10	70.00	1.00	31.90	20.00	340.00	80.00	0.05	3.45
Heemskirk	St Dizier	ST06	29.0	30.0	290665	1.41	210.00	3190.00	<10	60.00	1.00	30.10	16.85	660.00	90.00	0.04	3.38
Heemskirk	St Dizier	ST06	30.0	31.0	290666	1.74	190.00	1610.00	<10	50.00	1.00	35.60	9.85	760.00	90.00	0.05	3.30
Heemskirk	St Dizier	ST06	31.0	32.0	290667	0.67	450.00	219.00	<10	40.00	<1	46.60	1.20	150.00	20.00	0.04	3.14
Heemskirk	St Dizier	ST06	32.0	33.0	290668	0.62	500.00	243.00	<10	50.00	<1	52.40	1.02	140.00	90.00	0.05	3.03
Heemskirk	St Dizier	ST06	33.0	34.0	290669	0.26	220.00	1060.00	<10	70.00	<1	35.30	6.53	3060.00	170.00	0.04	3.00
Heemskirk	St Dizier	ST06	34.0	35.0	290670	0.82	530.00	743.00	<10	220.00	<1	27.30	6.23	8260.00	150.00	0.04	3.40
Heemskirk	St Dizier	ST06	35.0	36.0	290671	1.25	770.00	301.00	<10	1720.00	<1	37.00	0.33	270.00	60.00	0.05	3.48
Heemskirk	St Dizier	ST06	36.0	37.0	290672	0.20	430.00	999.00	<10	160.00	<1	25.80	5.07	8010.00	170.00	0.06	3.61
Heemskirk	St Dizier	ST06	37.0	38.0	290673	0.82	810.00	503.00	<10	70.00	<1	29.80	0.20	1070.00	<10	0.04	3.09
Heemskirk	St Dizier	ST06	38.0	39.0	290674	0.39	460.00	293.00	<10	140.00	<1	25.10	2.31	1450.00	30.00	0.04	3.44
Heemskirk	St Dizier	ST06	39.0	40.0	290675	0.15	640.00	45.00	<10	130.00	<1	17.70	0.40	60.00	<10	0.03	2.39
Heemskirk	St Dizier	ST06	40.0	41.0	290676	0.13	780.00	18.00	<10	30.00	<1	21.80	0.38	110.00	<10	0.03	2.15
Heemskirk	St Dizier	ST06	41.0	42.0	290677	0.04	310.00	174.00	<10	260.00	<1	9.37	0.22	80.00	<10	0.02	2.57
Heemskirk	St Dizier	ST06	42.0	43.0	290678	0.28	690.00	89.00	<10	210.00	<1	7.87	0.15	60.00	40.00	0.03	2.58
Heemskirk	St Dizier	ST06	43.0	44.0	290679	0.71	1090.00	61.00	20.00	380.00	<1	21.30	0.09	50.00	90.00	0.04	3.03
Heemskirk	St Dizier	ST06	44.0	45.0	290680	0.29	1220.00	66.00	10.00	220.00	<1	13.35	0.08	50.00	30.00	0.04	3.11
Heemskirk	St Dizier	ST06	45.0	46.0	290681	0.19	490.00	56.00	<10	60.00	<1	9.58	0.05	70.00	30.00	0.03	2.60
Heemskirk	St Dizier	ST06	46.0	47.0	290682	0.23	650.00	155.00	<10	80.00	<1	26.00	0.59	260.00	60.00	0.04	3.04
Heemskirk	St Dizier	ST06	47.0	48.0	290683	1.37	1480.00	644.00	<10	60.00	<1	26.90	1.19	390.00	80.00	0.05	2.89
Heemskirk	St Dizier	ST06	48.0	49.0	290684	1.25	7150.00	107.00	<10	350.00	<1	20.20	0.85	170.00	40.00	0.07	3.19
Heemskirk	St Dizier	ST06	49.0	50.0	290685	0.64	1300.00	32.00	<10	40.00	<1	21.10	0.38	120.00	40.00	0.03	2.68
Heemskirk	St Dizier	ST06	50.0	51.0	290686	0.13	280.00	155.00	<10	220.00	<1	16.50	0.98	100.00	10.00	0.02	3.17
Heemskirk	St Dizier	ST06	51.0	52.0	290687	0.11	320.00	329.00	10.00	110.00	<1	7.08	1.53	30.00	10.00	0.02	2.94
Heemskirk	St Dizier	ST06	52.0	53.0	290688	0.13	400.00	364.00	10.00	130.00	<1	9.76	2.43	50.00	10.00	0.03	2.93
Heemskirk	St Dizier	ST06	53.0	54.0	290689	0.08	320.00	466.00	40.00	150.00	<1	8.50	2.33	80.00	<10	0.02	3.16
Heemskirk	St Dizier	ST06	54.0	55.0	290690	0.05	250.00	467.00	150.00	600.00	1.00	8.19	2.72	90.00	10.00	0.02	3.20
Heemskirk	St Dizier	ST06	55.0	56.0	290691	0.02	150.00	479.00	10.00	100.00	<1	7.46	3.03	70.00	<10	0.02	3.17
Heemskirk	St Dizier	ST06	56.0	57.0	290692	0.03	100.00	423.00	<10	310.00	<1	7.12	2.77	30.00	<10	0.02	3.00
Heemskirk	St Dizier	ST06	57.0	58.0	290693	0.67	110.00	1020.00	<10	290.00	<1	14.00	6.07	20.00	40.00	0.03	3.23
Heemskirk	St Dizier	ST06	58.0	59.0	290694	0.78	120.00	642.00	<10	80.00	<1	20.50	3.48	190.00	30.00	0.03	3.16
Heemskirk	St Dizier	ST06	59.0	60.0	290695	0.19	90.00	755.00	<10	910.00	<1	11.25	4.12	400.00	20.00	0.02	3.14
Heemskirk	St Dizier	ST06	60.0	61.0	290696	0.28	230.00	2280.00	<10	220.00	1.00	29.50	1.99	50.00	20.00	0.02	3.30
Heemskirk	St Dizier	ST06	61.0	62.0	290697	0.67	180.00	1150.00	<10	80.00	1.00	22.40	2.92	270.00	20.00	0.02	3.27
Heemskirk	St Dizier	ST06	62.0	63.0	290698	0.37	260.00	702.00	<10	130.00	1.00	47.80	2.04	260.00	80.00	0.04	3.38
Heemskirk	St Dizier	ST06	63.0	64.0	290699	1.20	650.00	198.00	<10	90.00	<1	49.80	0.56	680.00	120.00	0.05	3.28
Heemskirk	St Dizier	ST06	64.0	65.0	290700	0.42	490.00	648.00	<10	100.00	<1	53.30	1.80	1530.00	120.00	0.07	4.16
Heemskirk	St Dizier	ST06	65.0	66.0	290701	0.06	280.00	187.00	<10	140.00	<1	57.00	0.06	140.00	20.00	0.05	4.43
Heemskirk	St Dizier	ST06	66.0	67.0	290702	1.67	490.00	215.00	<10	370.00	1.00	53.10	1.99	350.00	20.00	0.08	3.97

39.8m @ 0.90%Sn

Project	Prospect	Hole_id	Depth_from	Depth_to	Sample_id	Sn %	S_Sn ppm	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Fe %	S %	As ppm	Bi ppm	WO3 ppm	SG
Heemskirk	St Dizier	ST06	67.0	68.0	290703	2.47	670.00	768.00	<10	30.00	1.00	44.30	1.35	1920.00	70.00	0.28	3.75
Heemskirk	St Dizier	ST06	68.0	69.0	290704	1.08	400.00	829.00	<10	50.00	<1	29.00	6.92	40.00	<10	0.05	3.99
Heemskirk	St Dizier	ST06	69.0	70.0	290705	1.84	440.00	306.00	<10	60.00	<1	37.20	1.89	30.00	<10	0.07	3.67
Heemskirk	St Dizier	ST06	70.0	71.0	290706	0.29	200.00	629.00	<10	100.00	<1	24.00	3.57	1010.00	100.00	0.04	2.74
Heemskirk	St Dizier	ST06	71.0	72.0	290707	1.20	90.00	935.00	<10	100.00	<1	23.90	7.27	110.00	50.00	0.06	3.27
Heemskirk	St Dizier	ST06	72.0	73.0	290708	0.26	170.00	848.00	<10	130.00	<1	34.10	6.11	3700.00	70.00	0.04	3.50
Heemskirk	St Dizier	ST06	73.0	74.0	290709	0.76	180.00	611.00	<10	80.00	<1	24.20	4.03	30.00	20.00	0.04	2.76
Heemskirk	St Dizier	ST06	74.0	75.0	290710	2.84	120.00	2430.00	<10	110.00	<1	32.90	17.30	<10	130.00	0.06	3.58
Heemskirk	St Dizier	ST06	75.0	76.0	290711	1.67	260.00	1220.00	<10	80.00	1.00	46.90	8.06	2520.00	120.00	0.05	3.61
Heemskirk	St Dizier	ST06	76.0	77.0	290712	0.23	310.00	131.00	<10	160.00	<1	42.90	1.27	20.00	30.00	0.05	3.59
Heemskirk	St Dizier	ST06	77.0	78.0	290713	1.63	240.00	1010.00	<10	70.00	<1	42.50	7.63	1530.00	110.00	0.06	3.78
Heemskirk	St Dizier	ST06	78.0	79.0	290714	0.75	270.00	337.00	<10	70.00	<1	50.50	2.96	210.00	50.00	0.05	4.23
Heemskirk	St Dizier	ST06	79.0	80.0	290715	0.61	180.00	379.00	<10	160.00	<1	12.05	3.65	10350.00	30.00	0.03	2.90
Heemskirk	St Dizier	ST06	80.0	81.0	290716	0.55	220.00	397.00	<10	100.00	<1	16.60	2.90	420.00	40.00	0.03	3.51
Heemskirk	St Dizier	ST06	81.0	82.0	290717	0.22	180.00	513.00	<10	110.00	<1	12.75	4.48	1800.00	120.00	0.04	2.81
Heemskirk	St Dizier	ST06	82.0	83.0	290718	0.06	60.00	245.00	<10	590.00	<1	5.84	0.74	10.00	<10	0.02	2.92
Heemskirk	St Dizier	ST06	83.0	84.0	290719	1.20	440.00	849.00	<10	240.00	<1	33.70	4.57	560.00	50.00	0.04	4.35
Heemskirk	St Dizier	ST06	84.0	85.0	290720	3.41	290.00	2650.00	<10	160.00	<1	32.60	16.95	10.00	80.00	0.06	3.90
Heemskirk	St Dizier	ST06	85.0	86.0	290721	1.19	90.00	880.00	<10	760.00	<1	15.70	7.15	80.00	60.00	0.04	3.50
Heemskirk	St Dizier	ST06	86.0	87.0	290722	0.07	<50	30.00	<10	40.00	<1	3.88	0.26	<10	10.00	0.06	3.20
Heemskirk	St Dizier	ST06	87.0	88.0	290723	0.08	70.00	214.00	<10	570.00	<1	5.40	1.35	200.00	20.00	0.02	2.72
Heemskirk	St Dizier	ST06	88.0	89.0	290724	0.01	<50	32.00	<10	180.00	<1	3.04	0.16	20.00	<10	0.02	2.99
Heemskirk	St Dizier	ST06	89.0	90.0	290725	0.03	250.00	22.00	<10	320.00	<1	6.99	0.08	210.00	10.00	0.02	2.63
Heemskirk	St Dizier	ST06	90.0	91.0	290726	0.02	80.00	6.00	<10	500.00	<1	4.14	0.06	60.00	<10	0.02	2.86
Heemskirk	St Dizier	ST06	91.0	92.0	290727	0.03	350.00	<5	<10	250.00	<1	5.49	0.06	450.00	10.00	0.02	2.91
Heemskirk	St Dizier	ST06	92.0	93.0	290728	0.09	810.00	7.00	<10	720.00	<1	5.73	0.08	150.00	<10	0.02	2.96
Heemskirk	St Dizier	ST06	93.0	94.0	290729	0.18	1950.00	30.00	<10	1790.00	<1	19.35	0.14	210.00	10.00	0.02	2.82
Heemskirk	St Dizier	ST06	94.0	95.0	290730	0.19	1810.00	42.00	<10	550.00	<1	12.00	0.15	1190.00	<10	0.02	3.01
Heemskirk	St Dizier	ST06	95.0	96.0	290731	0.03	330.00	5.00	<10	540.00	<1	3.96	0.06	210.00	<10	0.02	2.68
Heemskirk	St Dizier	ST06	96.0	97.0	290732	0.02	290.00	14.00	<10	900.00	<1	5.30	0.10	420.00	<10	0.02	2.67
Heemskirk	St Dizier	ST06	97.0	98.0	290733	<0.01	70.00	20.00	<10	370.00	<1	2.43	0.04	50.00	<10	0.02	2.65
Heemskirk	St Dizier	ST06	98.0	99.0	290734	<0.01	<50	51.00	<10	670.00	<1	2.11	0.08	40.00	<10	0.02	2.79
Heemskirk	St Dizier	ST06	104.0	105.0	290735	<0.01	120	<5	<10	50	<1	1.04	0.01	10	<10	0.08	2.47
Heemskirk	St Dizier	ST06	105.0	106.0	290736	0.11	460	<5	<10	180	<1	42.6	0.41	6700	20	0.07	4.27
Heemskirk	St Dizier	ST06	106.0	107.0	290737	1.37	1490	<5	<10	150	<1	55.8	0.38	6460	20	0.06	4.06
Heemskirk	St Dizier	ST06	107.0	108.0	290738	0.11	550	38	<10	70	<1	48.9	0.36	4620	30	0.05	3.6
Heemskirk	St Dizier	ST06	108.0	109.0	290739	0.04	370	306	<10	40	<1	29.2	0.49	3280	30	0.04	3.86
Heemskirk	St Dizier	ST06	109.0	110.0	290740	0.45	680	215	<10	250	<1	42.5	0.95	20700	90	0.04	2.6
Heemskirk	St Dizier	ST06	110.0	111.0	290741	0.08	430	19	<10	160	<1	45.7	2.14	20800	130	0.06	3.79
Heemskirk	St Dizier	ST06	111.0	112.0	290742	0.05	380	84	<10	380	<1	21.1	0.24	2540	30	0.04	2.73
Heemskirk	St Dizier	ST06	112.0	113.0	290743	2.96	2620	12	<10	80	<1	47.6	0.47	11500	40	0.05	4.2
Heemskirk	St Dizier	ST06	113.0	114.0	290744	0.57	1020	308	<10	1120	<1	32.3	0.52	1950	20	0.05	3.33
Heemskirk	St Dizier	ST06	114.0	115.0	290745	0.1	200	48	<10	500	<1	25.1	0.1	350	<10	0.04	4.38
Heemskirk	St Dizier	ST06	115.0	116.0	290746	0.11	310	<5	<10	90	<1	2.05	0.02	210	10	0.02	3.17
Heemskirk	St Dizier	ST06	116.0	117.0	290747	<0.01	50	<5	10	170	<1	3.14	0.09	30	20	0.03	2.77
Heemskirk	St Dizier	ST06	117.0	118.0	290748	0.2	710	105	<10	1490	1	25.5	0.15	270	30	0.07	2.87
Heemskirk	St Dizier	ST06	118.0	119.0	290749	0.42	990	209	<10	13900	1	40.8	0.96	220	<10	0.05	3.82
Heemskirk	St Dizier	ST06	119.0	120.0	290750	0.03	210	235	30	1770	<1	10	0.18	920	10	0.03	2.85
Heemskirk	St Dizier	ST06	120.0	121.0	290751	0.07	300	510	130	2040	1	15.05	0.21	270	10	0.03	2.86
Heemskirk	St Dizier	ST06	121.0	122.0	290752	<0.01	<50	140	30	280	<1	4.01	1.56	160	10	0.02	2.96
Heemskirk	St Dizier	ST06	130.0	131.0	290753	0.09	280	820	<10	1620	1	10.35	1.08	190	140	0.02	2.84
Heemskirk	St Dizier	ST06	131.0	132.0	290754	0.08	230	241	10	5780	<1	9.38	0.93	1190	70	0.02	3.21
Heemskirk	St Dizier	ST06	135.0	136.0	290755	0.36	2030	1275	40	3090	2	10.9	3.4	7680	220	0.03	2.99

29m @ 0.99%Sn

8m @ 0.70% Sn



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EcoNomics™

STELLAR RESOURCES LIMITED
SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

Appendix 2 – Bulk Composite Mineralogy

ALS Metallurgy

Stellar Resources Limited St Dizier Project Bulk Composite Mineralogy

June 2014



McArthur Ore Deposit Assessments Pty Ltd

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ALS METALLURGY

Stellar Resources – St Dizier Bulk Composite Mineralogy June 2014

Method

A surface Bulk Composite sample from Stellar Resources' St Dizier Prospect was submitted for mineralogical assessment. The sample was sized into 5 fractions: +212 μ m, +106 μ m, +53 μ m, +20 μ m, and +8 μ m) and these were mounted on two polished mounts by Australian Petrographics (Queanbeyan, NSW).

The standard MODA technique was adopted to quantify the mineralogy.

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* (Py), *pyrrhotite* (Po), *arsenopyrite* (As), *cassiterite* (Cs), *chalcopyrite* (Cp), *goethite+hematite* (GoHe), *magnetite* (Mt) and *gangue* (*quartz, silicates, carbonates, etc*, Ga). This allowed calculation of an overall mineralogical composition.

In a second scan, for each fraction, up to 50 grains containing Sn (almost exclusively *cassiterite*) were selected at random and logged as per the first scan.

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, tourmaline?, carbonaceous matter, fluorite, talc* etc.)
- *Magnetite*
- *Goethite*
- *Pyrite* (60% crystalline and 40% *melnikovite*)
- *Arsenopyrite*
- *Cassiterite*
- *Chalcopyrite*
- *Pyrrhotite*
- *Hematite*
- *Sphalerite*
- *Covellite* (rare)
- *Chalcocite* (very rare)
- *Stannite* (very rare)

The overall composition of the Bulk Composite is summarised below:

St Dizier Bulk Comp Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	25.8	1.5	0.1	0.1	Tr	Tr	5.1	27.8	65.5
+106µm	22.3	1.7	0.1	Tr	Tr	Tr	6.3	31.9	60.1
+53µm	18.3	2.8	Tr	Tr	2.0	Tr	6.0	39.5	49.8
+25µm	13.9	1.0	Tr	Tr	Tr	Tr	4.8	24.7	69.6
+7µm	7.3	2.0	Tr	Tr	Tr	Tr	4.6	29.1	64.3
TOTAL	87.6	1.8	0.1	Tr	0.4	Tr	5.5	30.9	61.4

Py=pyrite, Po=pyrrhotite, As=arsenopyrite, Cs=cassiterite, Cp=chalcopyrite, GoHe=goethite+hematite, Mt=magnetite, Ga=gangue
count statistics very poor for the scarce cassiterite

Liberation

An essential summary of the liberation parameters for *cassiterite* is:

St Dizier Bulk Comp Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with						Ternary
			Py	Po	As	GoHe	Mt	Ga	
+212µm	20.0	0	0	0	0	0	10	42	48
+106µm	20.2	43	0	0	0	0	24	15	18
+53µm	16.9	65	1	0	0	0	1	23	11
+25µm	15.7	66	0	0	0	1	11	16	6
+7µm	12.0	82	0	0	0	3	5	8	1
TOTAL	84.6	47	0	0	0	1	11	22	19

St Dizier Bulk Comp Cassiterite association%

Fraction	Sn Wt%	%associated with					
		Py	Po	As	GoHe	Mt	Ga
+212µm	20.0	14	0	0	3	47	90
+106µm	20.2	9	0	0	0	33	33
+53µm	16.9	1	0	0	4	8	32
+25µm	15.7	0	0	0	2	17	22
+7µm	12.0	0	0	0	3	5	8
TOTAL	84.6	6	0	0	2	24	41

Stannite is a very rare component, generally hosted by *chalcopyrite*. This *stannite* scarcity was unexpected given the core assays have sulphide Sn at an average of 6% of the total Sn (data provided by Ray Hazeldene, Stellar Resources). The limited correlation of sulphide Sn with Bi (rather than Cu) suggests a Bi-SnS phase may exist.

G.J.McArthur PhD FAusIMM MMICA MSEG

Principal Mineralogist

11.6.14

As=arsenopyrite
Cp=chalcopyrite
Cs=cassiterite
Ga=gangue
Go=goethite
He=hematite
Me=melnikovite pyrite
Mt=magnetite
Py=crystalline pyrite
Tc=talc

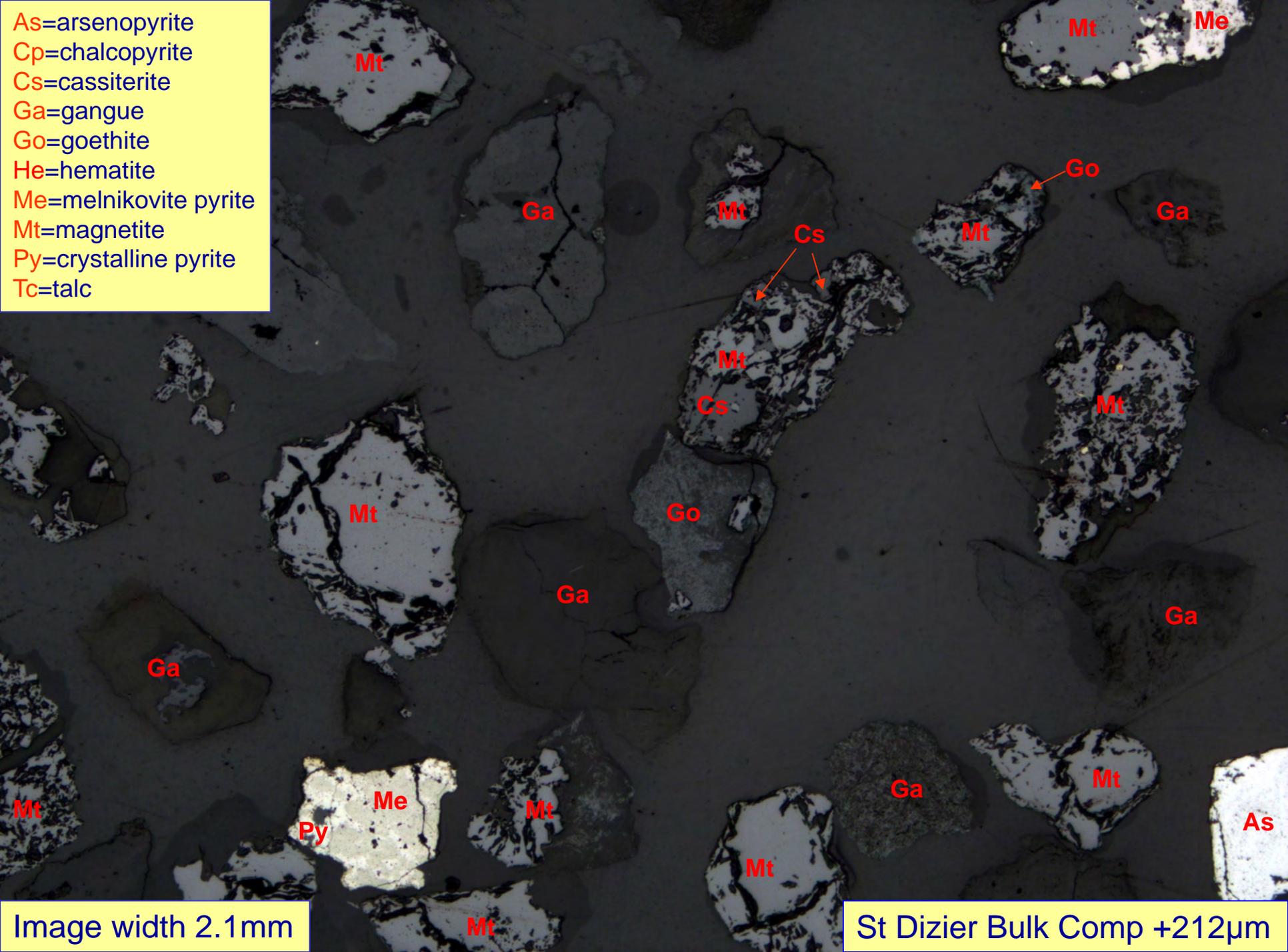


Image width 2.1mm

St Dizier Bulk Comp +212µm

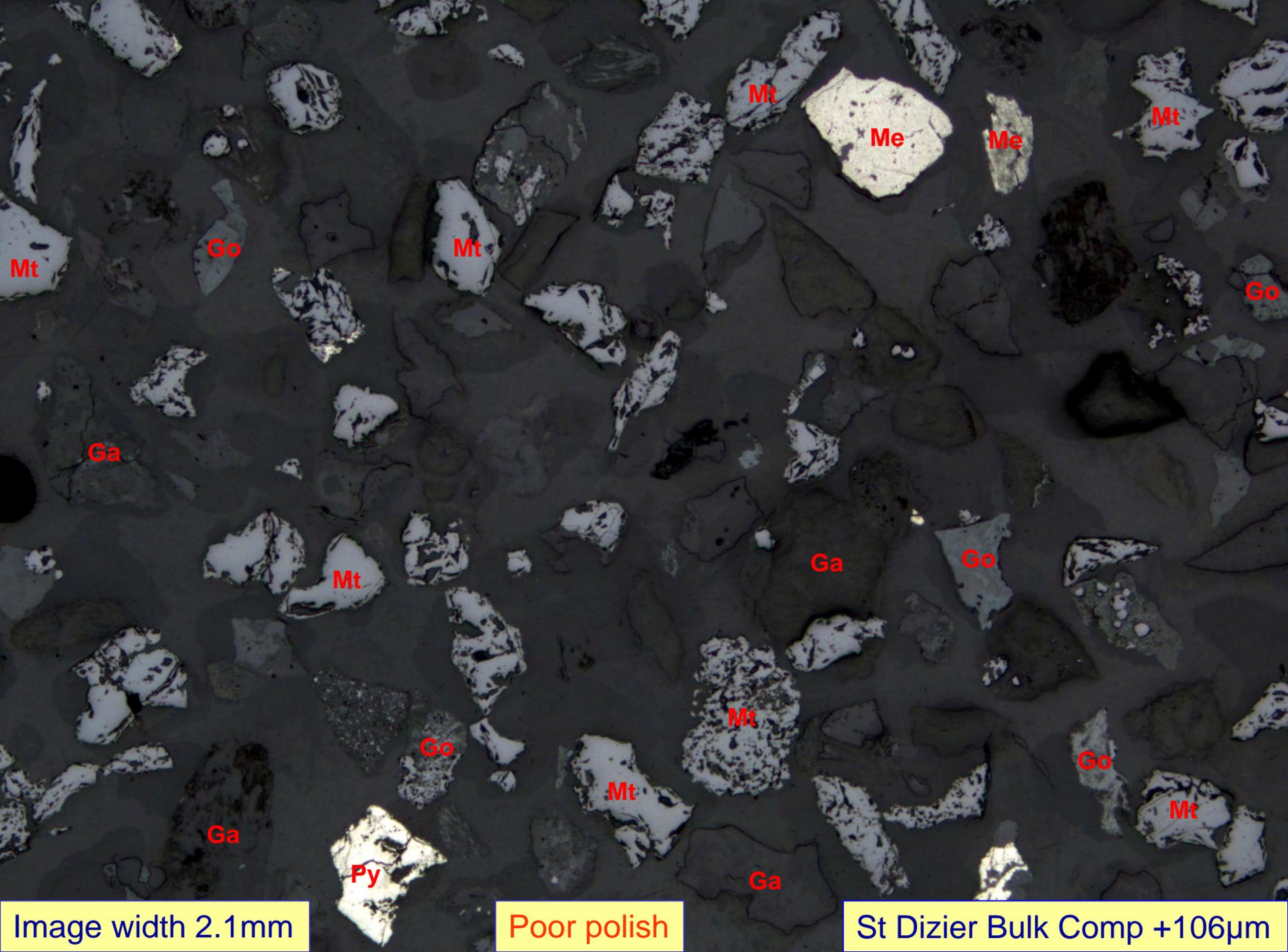


Image width 2.1mm

Poor polish

St Dizier Bulk Comp +106µm

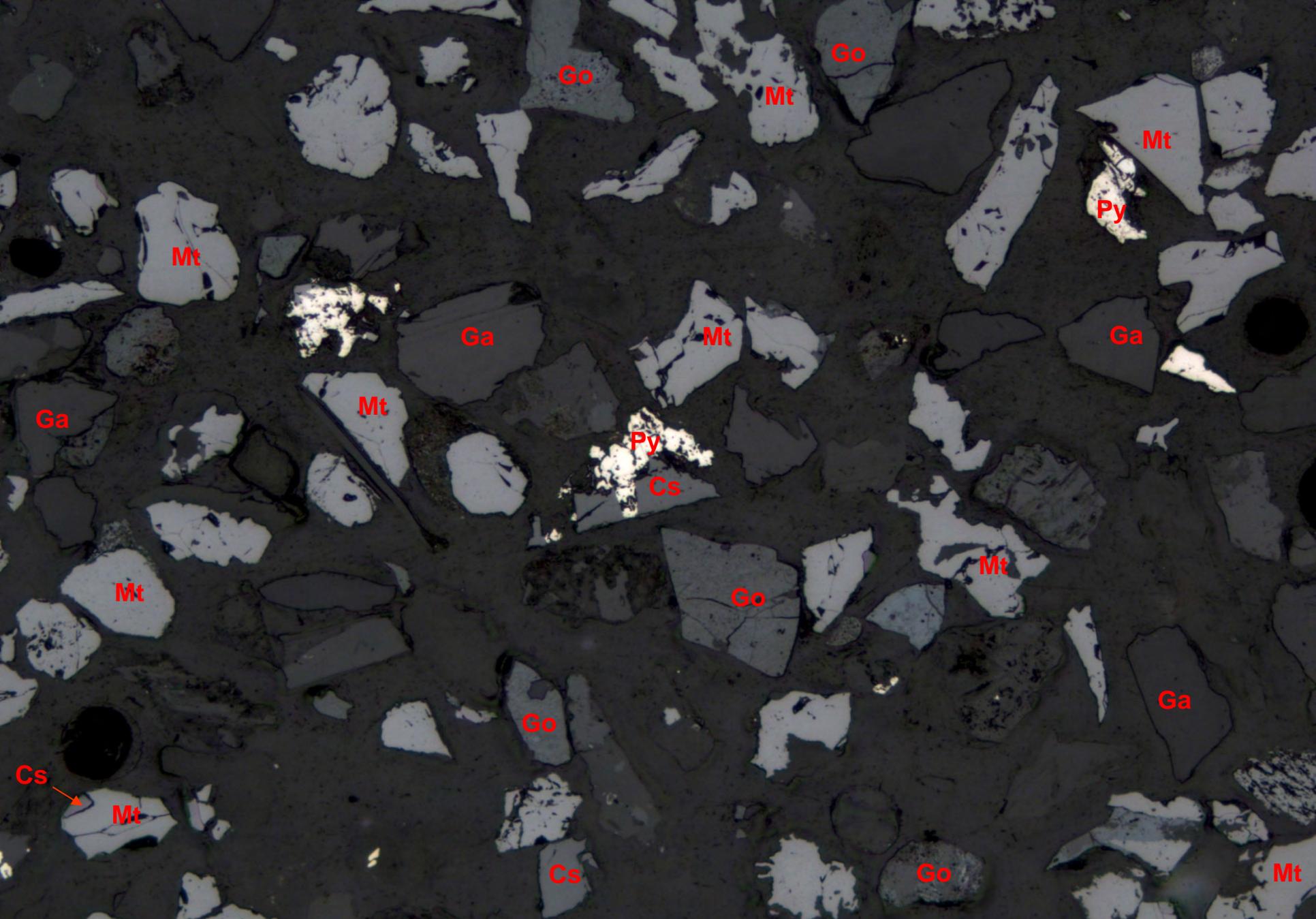


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St Dizier Bulk Comp +53µm

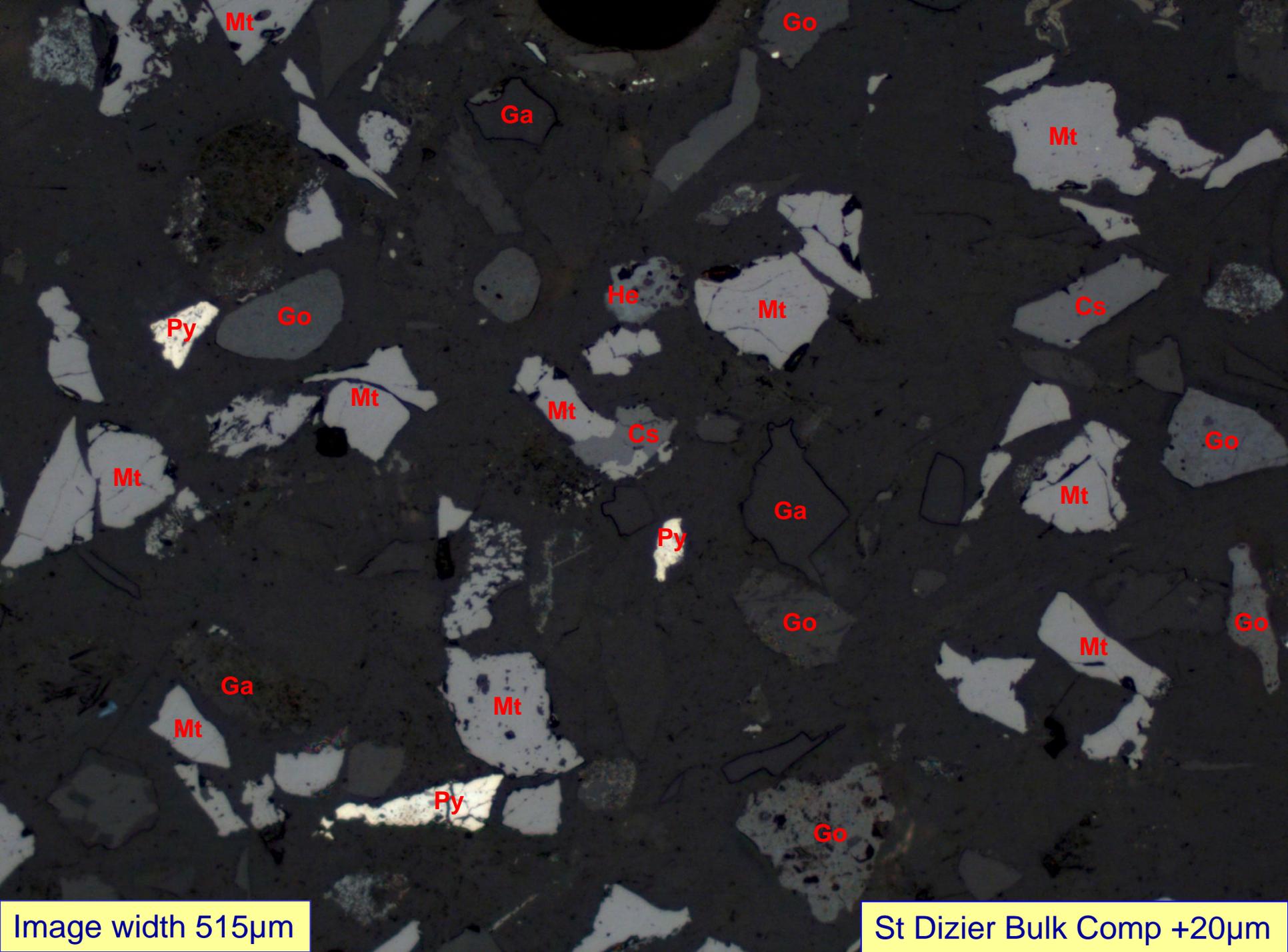
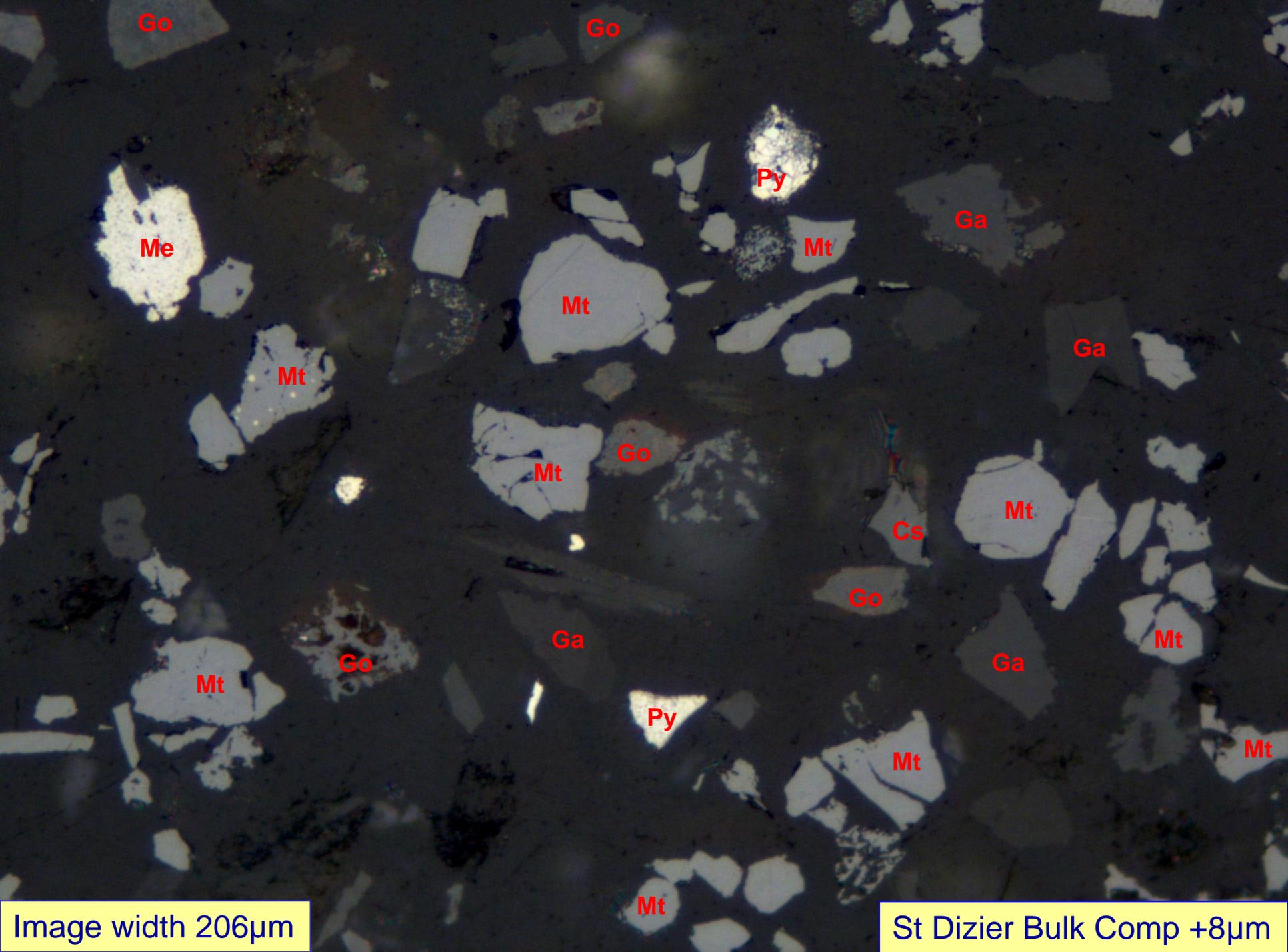


Image width 515µm

St Dizier Bulk Comp +20µm



Go

Go

Py

Me

Ga

Mt

Mt

Ga

Mt

Mt

Go

Cs

Mt

Go

Ga

Mt

Mt

Go

Ga

Py

Mt

Mt

Mt

Image width 206µm

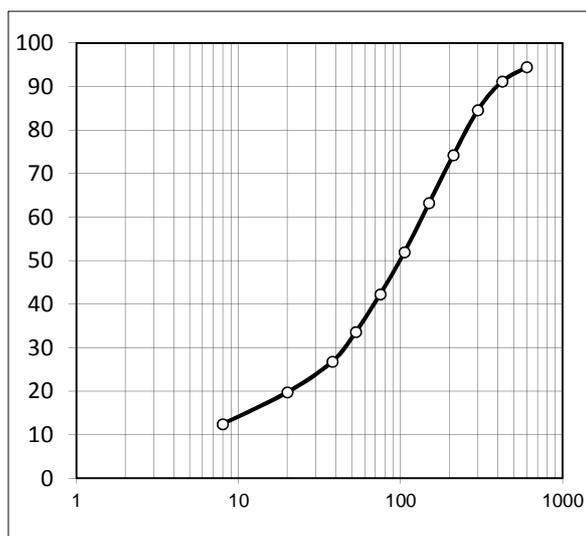
St Dizier Bulk Comp +8µm



BURNIE LABORATORY
MINERALOGY SIZING

PROJECT	T0887
SAMPLE	St Dizier Comp
FROM TEST	
DATE	160514
TECHNICIAN	MS

St Dizier Comp		SIZE um	WEIGHTS		
			gm	(%)	%PASS
P80	261	600	9.27	5.56	94.4
		425	5.39	3.23	91.2
		300	11.02	6.61	84.6
		212	17.27	10.36	74.2
		150	18.30	10.98	63.2
		106	18.77	11.27	52.0
		75	16.16	9.70	42.3
		53	14.39	8.64	33.6
		38	11.36	6.82	26.8
		20	11.82	7.09	19.7
	CS5	8	12.11	7.27	12.5
		SUB	20.76	12.46	
		TOTAL	166.62	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2		Mount Number
		%	dist	%	dist	%	dist	%	dist	
212	25.78	0.64	20.0	29.20	21.8	1.34	27.5	28.80	30.8	887004
106	22.25	0.75	20.2	40.20	25.9	1.36	24.1	21.60	19.9	887005
53	18.34	0.76	16.9	41.20	21.9	1.18	17.2	19.45	14.8	887006
20	13.91	0.93	15.7	38.40	15.5	1.26	13.9	20.50	11.8	887007
8	7.27	1.36	12.0	36.10	7.6	1.60	9.3	20.90	6.3	
<8	12.46	1.02	15.4	20.70	7.5	0.81	8.0	31.50	16.3	
CALC	100.00	0.83	100.0	34.57	100.0	1.26	100.0	24.09	100.0	
ASSAY		0.82		34.00		1.22		24.40		



PARTICLE MINERALOGY REPORT

**St Dizier Bulk Comp
June 2014**

A +212µm 26 % by weight

**GJMcA 5.6.14
B +106µm 22 % by weight**

C +53µm 18 % by weight

D +20µm 14 % by weight

E +8µm 7 % by weight

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
1.5	0.1	0.1	0.0	0.0	5.1	27.8	65.5	100
16	5	10	0	1	22	54	79	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
1.7	0.1	0.0	0.0	0.0	6.3	31.9	60.1	100
41	10	0	0	0	42	72	82	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
2.8	0.0	0.0	2.0	0.0	6.0	39.5	49.8	100
69	0	0	100	0	35	96	83	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
1.0	0.0	0.0	0.0	0.0	4.8	24.7	69.6	100
50	0	0	0	0	30	88	93	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
2.0	0.0	0.0	0.0	0.0	4.6	29.1	64.3	100
100	0	0	0	0	46	94	96	

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.58	0.01	0.00		0.1	1.2	37.0
Actual			0.64		1.3	29.2

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.69	0.00	0.00		0.0	1.3	40.7
Actual			0.75		1.4	40.2

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.97	0.00	2.74		0.0	1.9	44.9
Actual			0.76		1.2	41.2

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.49	0.00	0.00		0.0	0.8	34.2
Actual			0.93		1.3	38.4

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.62	0.00	0.00		0.0	1.5	37.9
Actual			1.36		1.6	36.1

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	0	0	0	0	20	50	55
Binary	17	100	0	0	50	33	30
Ternary	59	0	100	0	30	16	11
Quat.y+	24	0	0	0	1	0	4
#Grains	9	1	1	0	23	51	83

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	60	0	0	0	32	72	77
Binary	36	100	0	0	39	21	15
Ternary	4	0	0	0	29	7	8
Quat.y+	0	0	0	0	0	0	0
#Grains	4	1	0	0	15	44	73

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	36	0	0	100	34	89	74
Binary	33	0	0	0	64	11	26
Ternary	31	0	0	0	2	0	0
Quat.y+	0	0	0	0	0	0	0
#Grains	4	0	0	2	17	41	60

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	0	0	0	0	62	85	81
Binary	100	0	0	0	36	11	19
Ternary	0	0	0	0	1	4	0
Quat.y+	0	0	0	0	0	0	0
#Grains	2	0	0	0	16	28	75

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	100	0	0	0	65	96	89
Binary	0	0	0	0	35	4	11
Ternary	0	0	0	0	0	0	0
Quat.y+	0	0	0	0	0	0	0
#Grains	2	0	0	0	10	31	67

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	7	93
Mt	0	0	0	0	0	20	80
Ga	19	5	0	0	13	63	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	8	92
Mt	0	0	0	0	0	12	88
Ga	4	10	0	0	19	67	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	0
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	0	100
Mt	0	0	0	0	0	0	100
Ga	9	0	0	0	80	12	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	95	5
Po	0	0	0	0	0	0	0
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	0	100
Mt	2	0	0	0	0	0	98
Ga	7	0	0	0	76	17	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	0
Po	0	0	0	0	0	0	0
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	0	100
Mt	0	0	0	0	0	0	100
Ga	0	0	0	0	74	26	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	57	0	6	24	100
Po	0	0	0	0	0	0	100
As	100	0	0	0	0	0	100
Cs	0	0	0	0	0	0	0
GoHe	2	0	0	0	0	32	77
Mt	0	0	0	0	0	23	43
Ga	11	1	0	0	18	32	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	3	1	40
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	4	0	0	0	0	28	65
Mt	0	0	0	0	0	9	25
Ga	3	1	0	0	9	17	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	31	0	64
Po	0	0	0	0	0	0	0
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	2	0	0	0	0	0	66
Mt	0	0	0	0	0	0	11
Ga	2	0	0	0	20	3	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	95	5
Po	0	0	0	0	0	0	0
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	1	37
Mt	0	0	0	0	0	4	15
Ga	1	0	0	0	15	3	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	0
Po	0	0	0	0	0	0	0
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	0
GoHe	0	0	0	0	0	0	35
Mt	0	0	0	0	0	0	4
Ga	0	0	0	0	8	3	

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py	0	0	0	0	0	0	17		

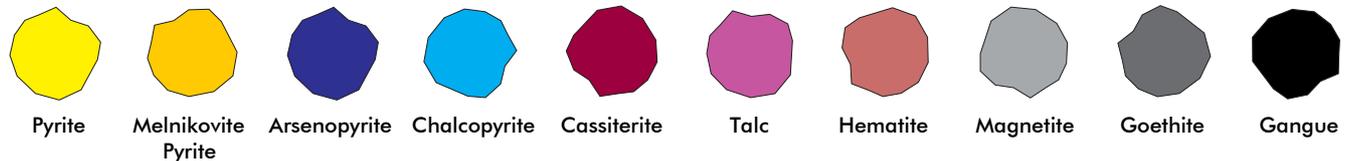
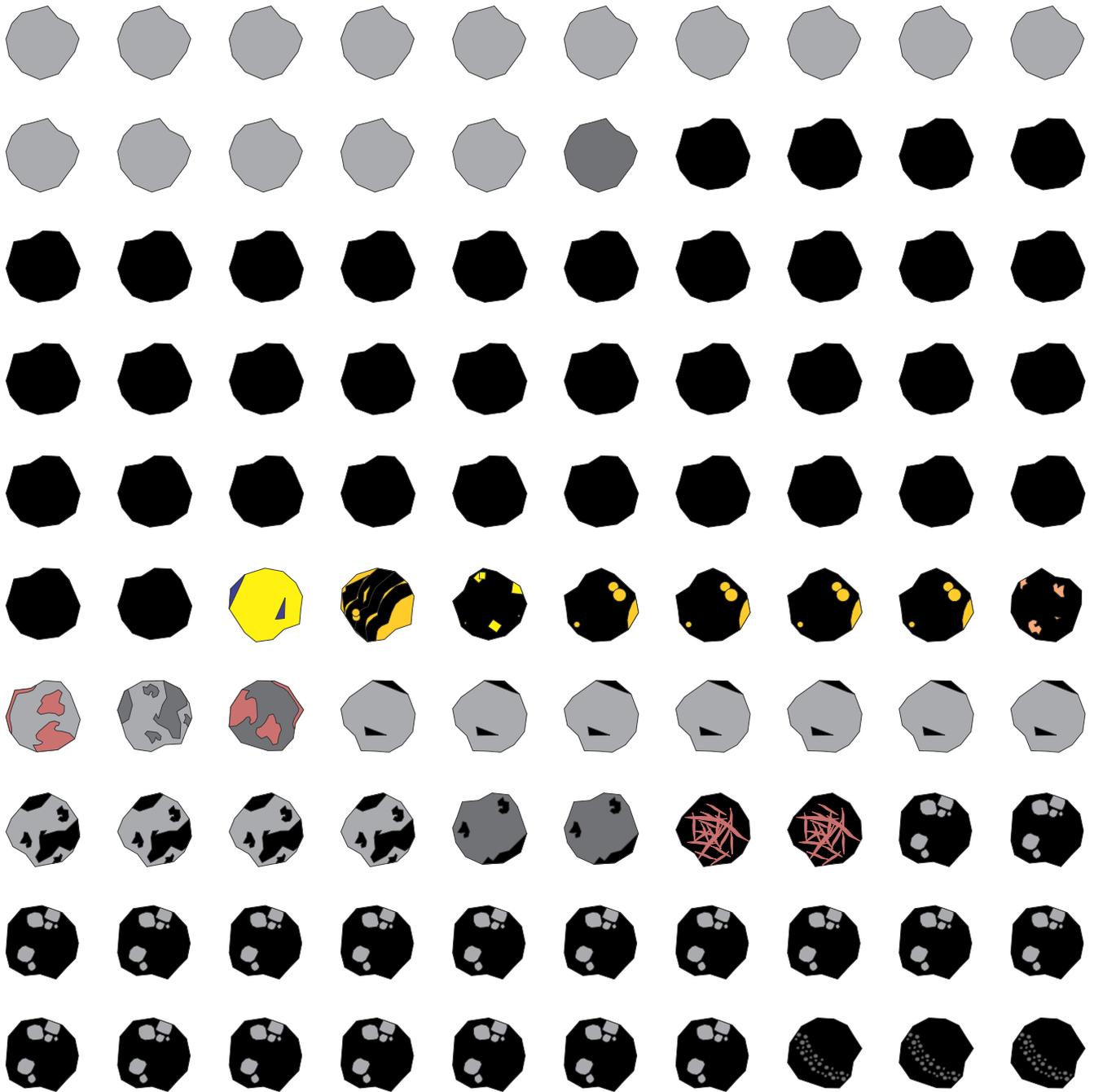
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp

A +212 μ m

June

2014



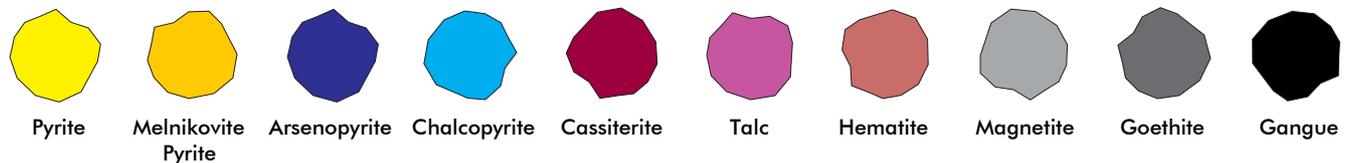
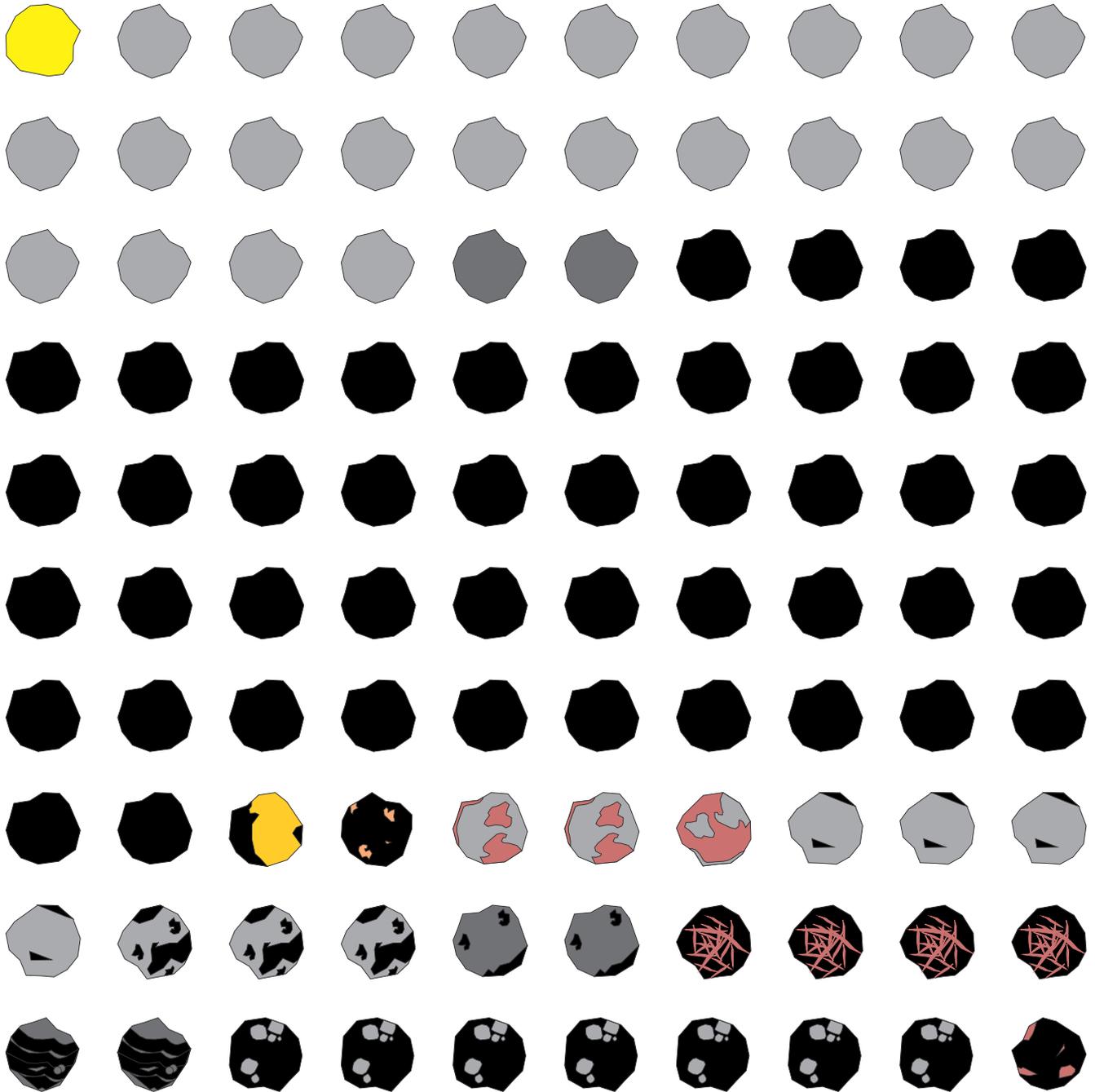
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp

B + 106µm

June

2014



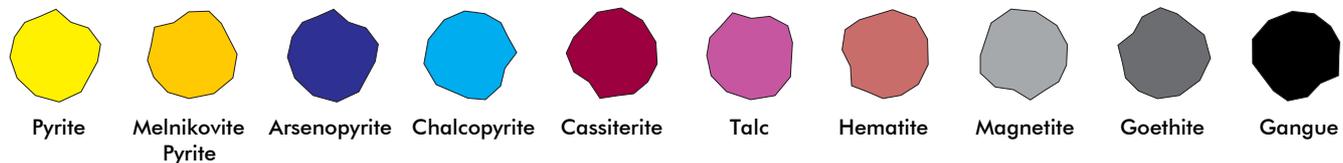
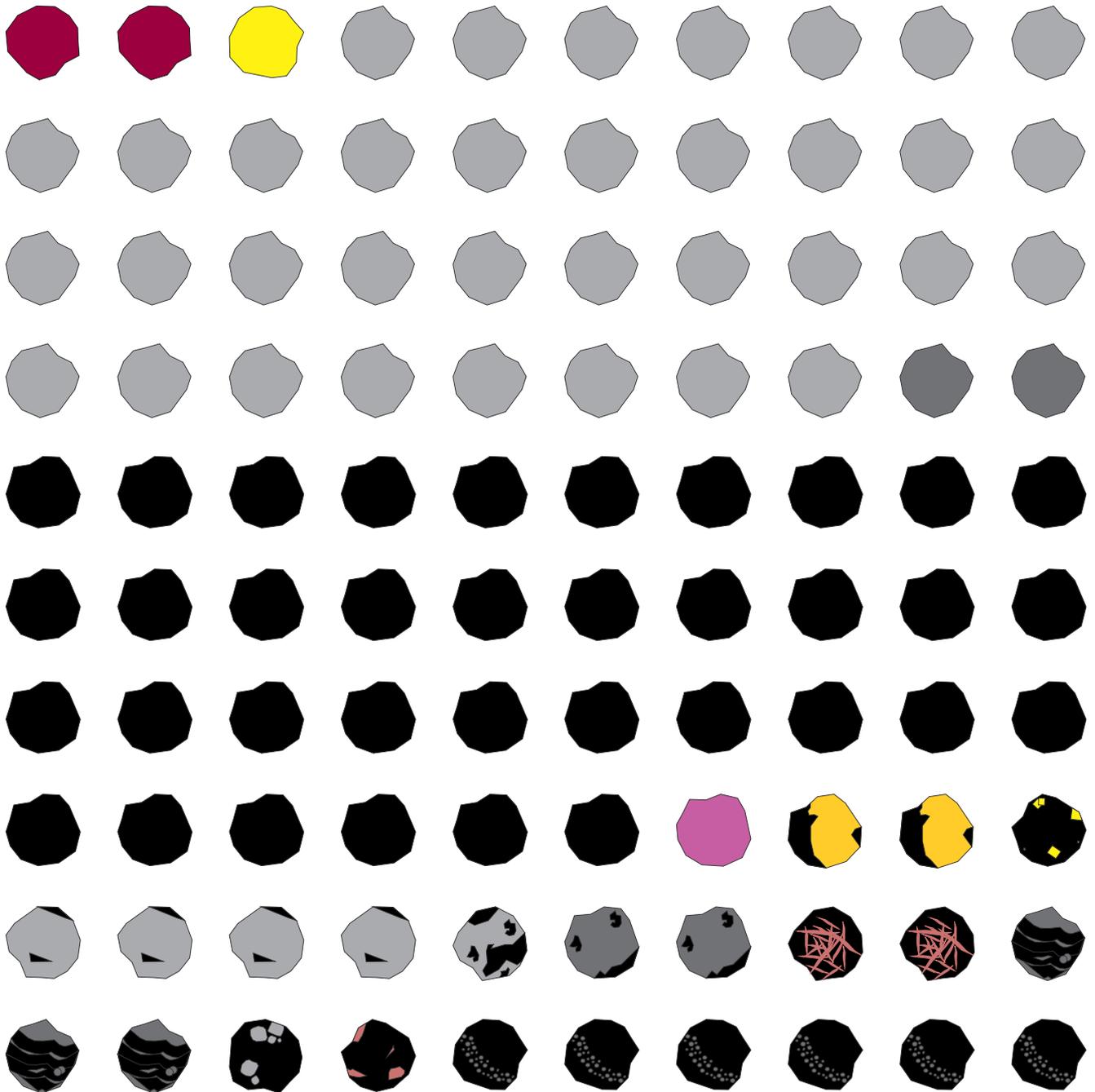
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp

C +53µm

June

2014



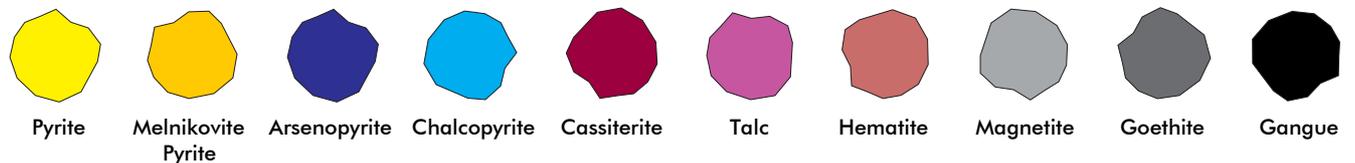
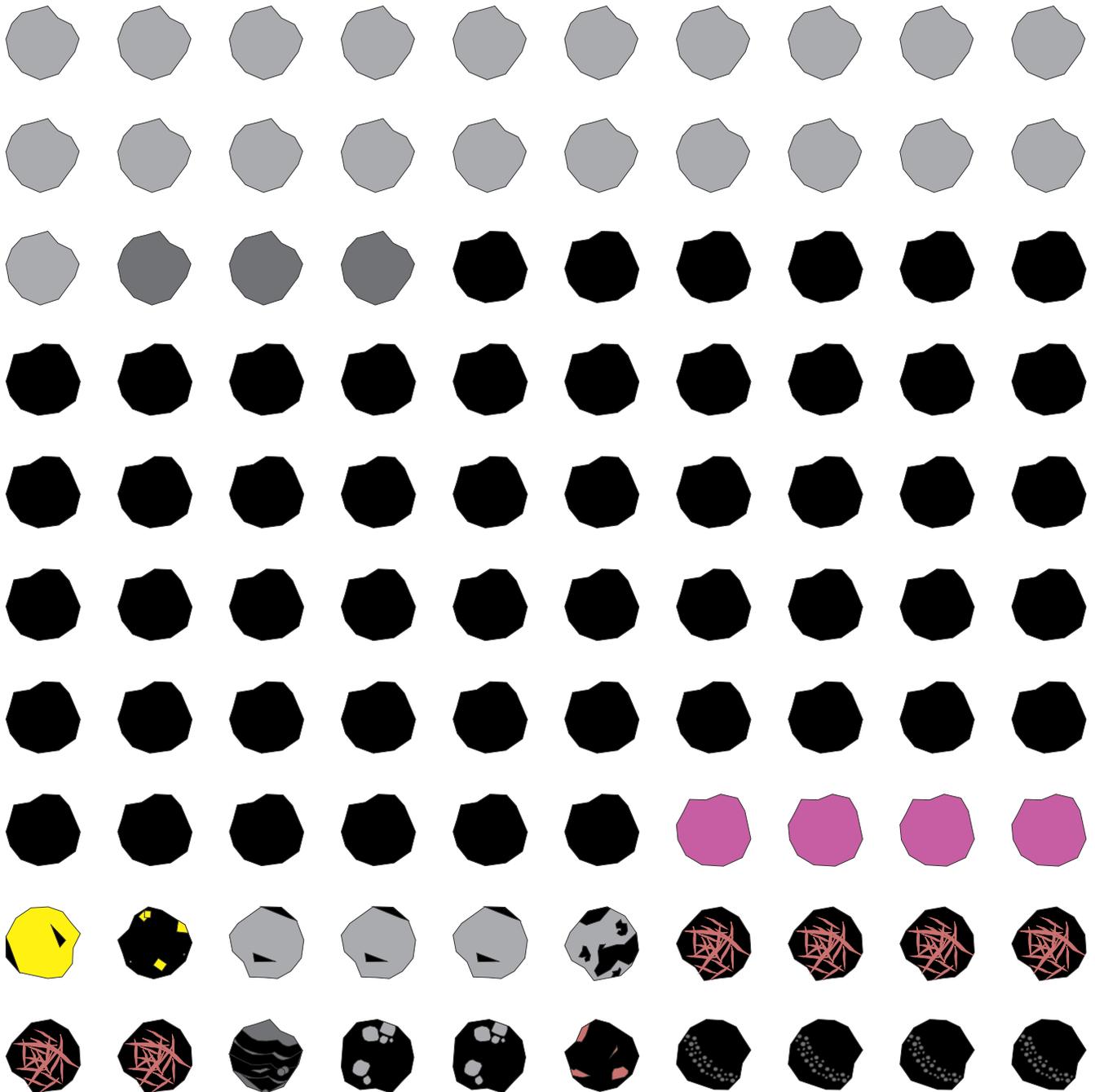
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp

D +20 μ m

June

2014



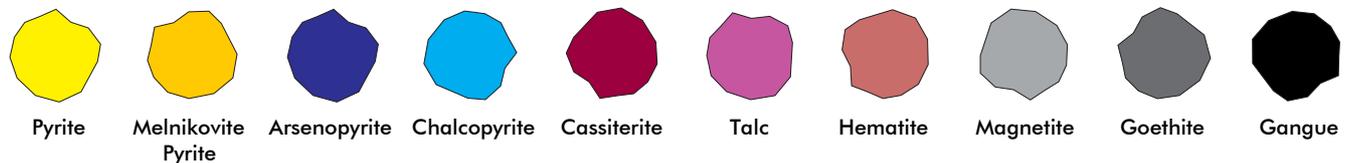
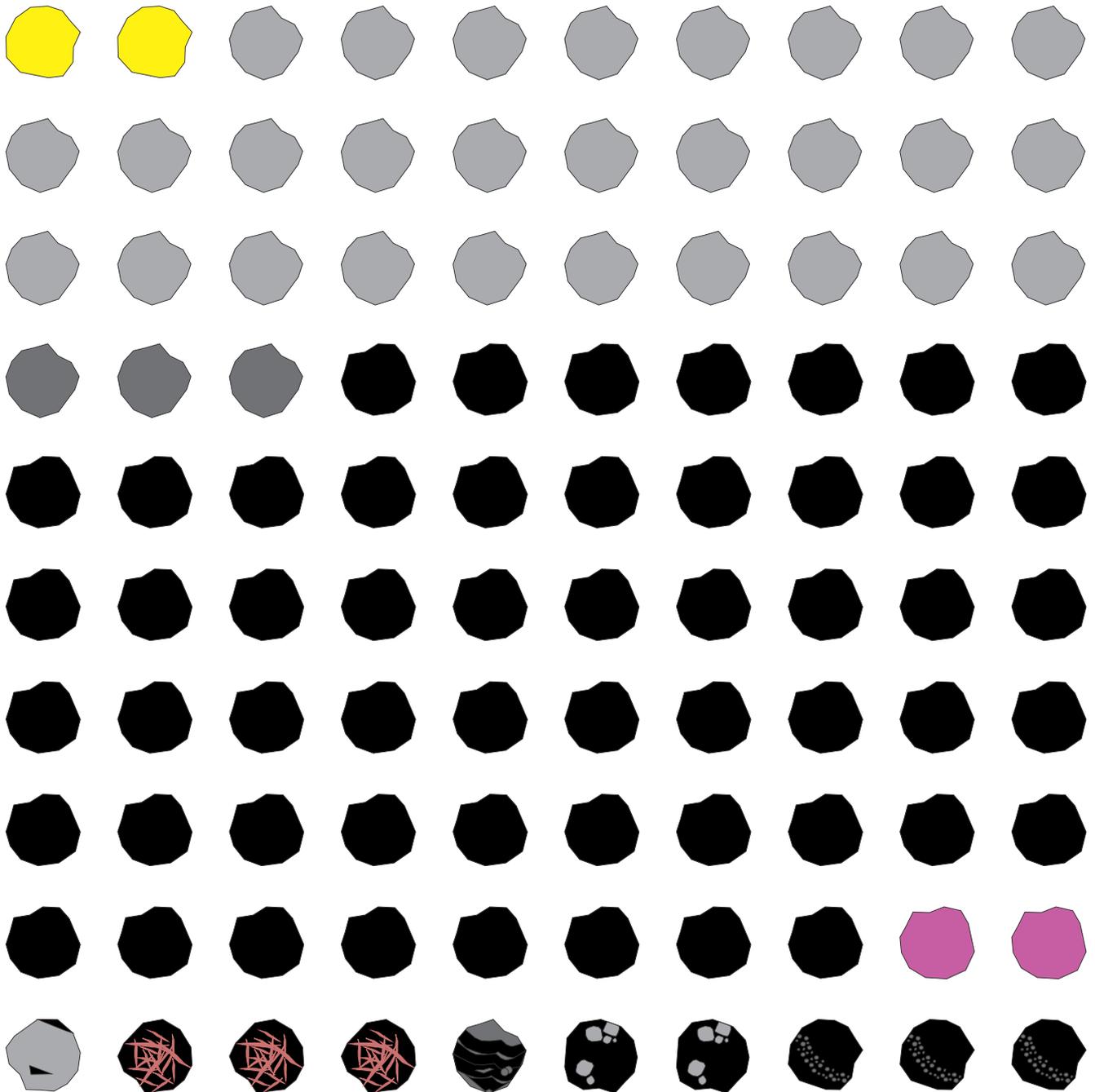
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp

E +8 μ m

June

2014





PARTICLE MINERALOGY REPORT

St Dizier Bulk Comp Sn SCAN
June 2014

A +212µm 26 % by weight

B +106µm 22 % by weight

C +53µm 18 % by weight

D +20µm 14 % by weight

E +8µm 7 % by weight

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
6.3	0.0	0.0	6.9	1.1	1.7	19.7	64.3	44
25	0	0	7	12	17	29	66	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
8.4	0.0	2.9	32.8	0.1	1.8	24.3	29.8	43
44	0	95	33	4	90	46	53	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
5.8	0.0	0.0	58.5	0.1	2.9	11.7	21.0	50
41	0	0	58	2	29	49	48	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
3.8	0.0	0.0	72.7	1.3	1.8	13.3	7.1	50
95	0	0	73	33	30	48	27	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
0.0	0.0	0.0	83.1	0.1	1.7	6.5	8.6	50
0	0	2	83	5	42	54	48	

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
	3.75	0.42	9.99		0.0	4.9
Actual			0.64		1.3	29.2

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
	5.04	0.03	35.41		1.6	5.2
Actual			0.75		1.4	40.2

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
	5.65	0.04	56.29		0.0	2.8
Actual			0.76		1.2	41.2

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
	6.22	0.31	63.52		0.0	1.9
Actual			0.93		1.3	38.4

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
	6.39	0.02	70.70		0.0	0.0
Actual			1.4		1.6	36.1

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono				0			
Binary				52			
Ternary				32			
Quat.y+				16			
#Grains				100			3.10

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono				43			
Binary				39			
Ternary				18			
Quat.y+				0			
#Grains				100			2.36

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono				65			
Binary				24			
Ternary				9			
Quat.y+				2			
#Grains				100			1.98

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono				66			
Binary				28			
Ternary				5			
Quat.y+				1			
#Grains				100			1.68

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono				82			
Binary				18			
Ternary				1			
Quat.y+				0			
#Grains				100			1.38

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	0	0	0		0	19	81
GoHe							
Mt							
Ga							

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	1	0	0		0	61	38
GoHe							
Mt							
Ga							

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	3	0	0		1	2	94
GoHe							
Mt							
Ga							

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	1	0	0		3	39	56
GoHe							
Mt							
Ga							

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	0	0	0		16	27	45
GoHe							
Mt							
Ga							

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	14	0	0		3	47	90
GoHe							
Mt							
Ga							

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	9	0	0		0	33	33
GoHe							
Mt							
Ga							

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	1	0	0		4	8	32
GoHe							
Mt							
Ga							

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	0	0	0		2	17	22
GoHe							
Mt							
Ga							

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py							
Po							
As							
Cs	0	0	0		3	5	8
GoHe							
Mt							
Ga							

of all

of all

of all

of all

of all

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py									
Po									
As									
Cs	0	0	0	0	0	10	42	32	16
GoHe									
Mt									
Ga									

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py									
Po									
As									
Cs	43	0	0	0	0	24	15	18	0
GoHe									
Mt									
Ga									

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py									
Po									
As									
Cs	65	1	0	0	0	1	23	9	2
GoHe									
Mt									
Ga									

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py									
Po									
As									
Cs	66	0	0	0	1	11	16	5</	

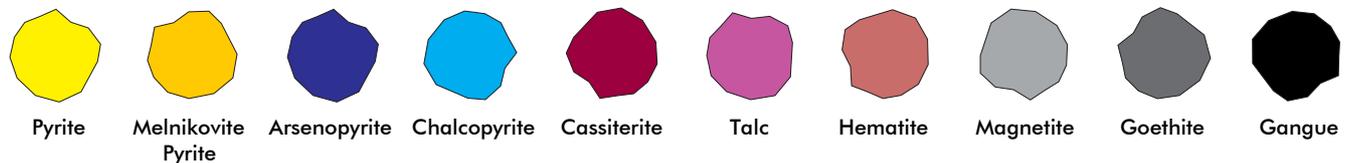
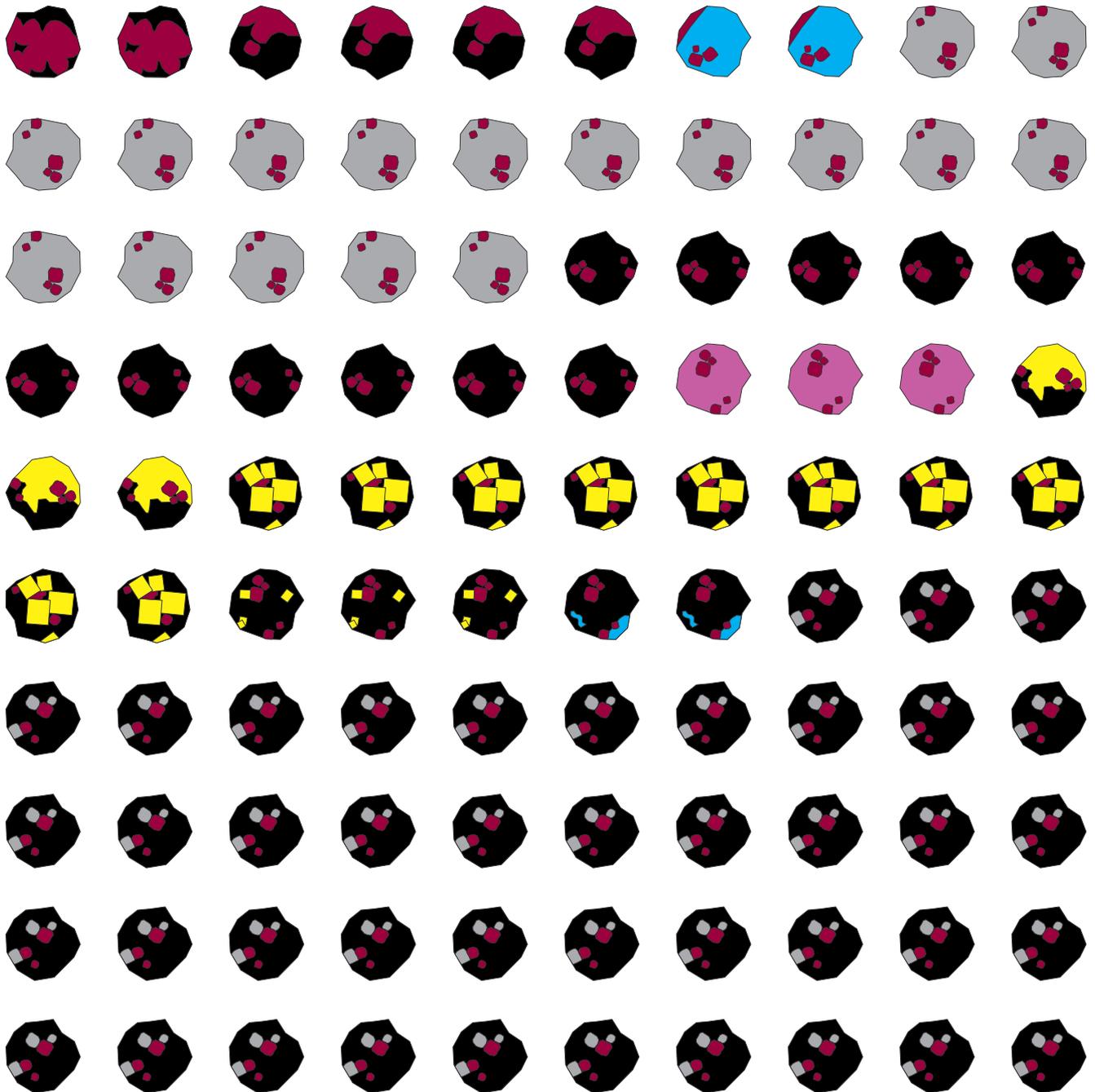
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp
Sn SCAN

A +212 μ m

June

2014



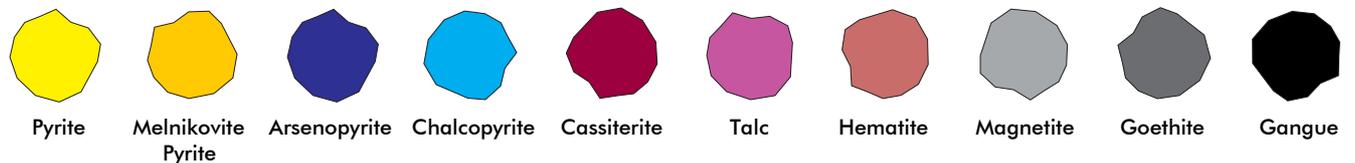
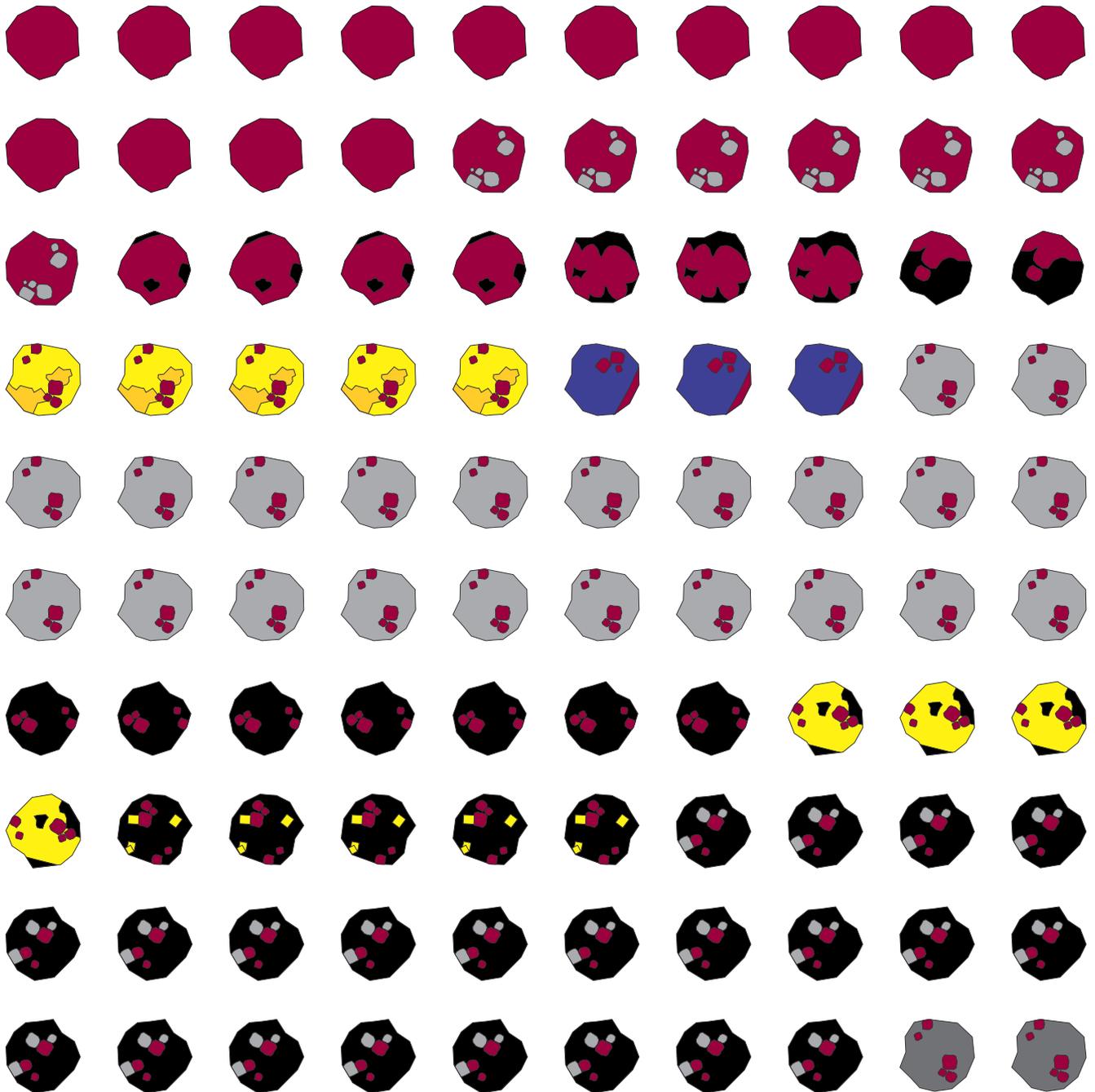
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp
Sn SCAN

B + 106µm

June

2014



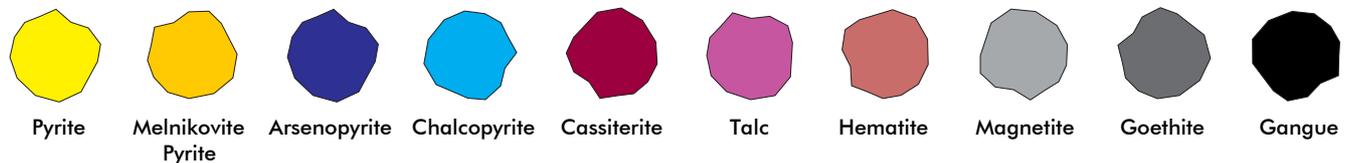
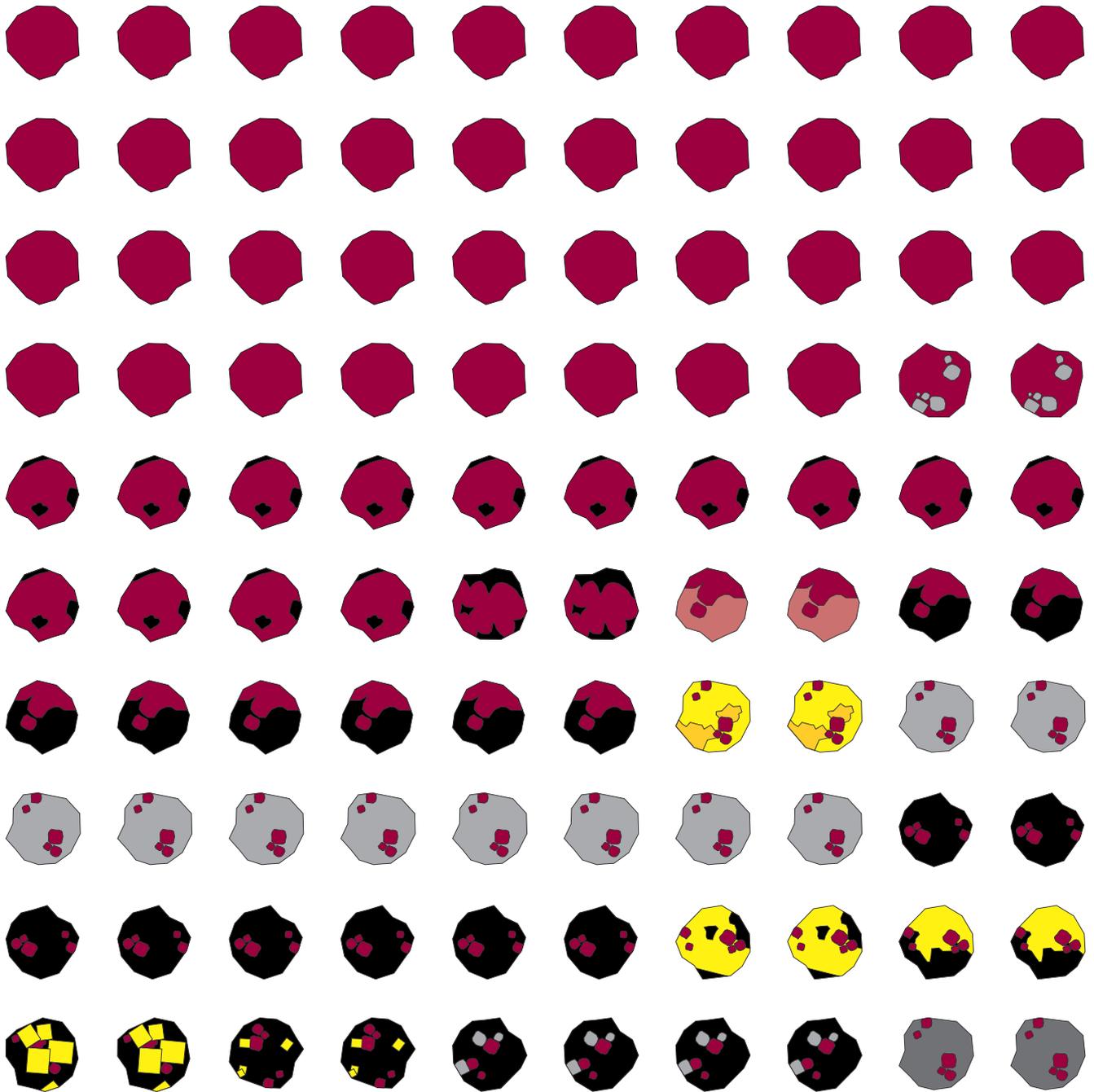
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp
Sn SCAN

C +53µm

June

2014



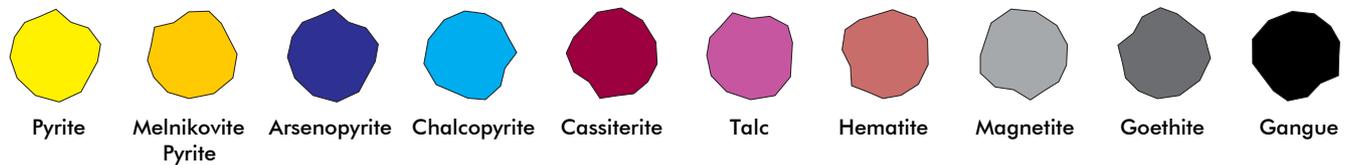
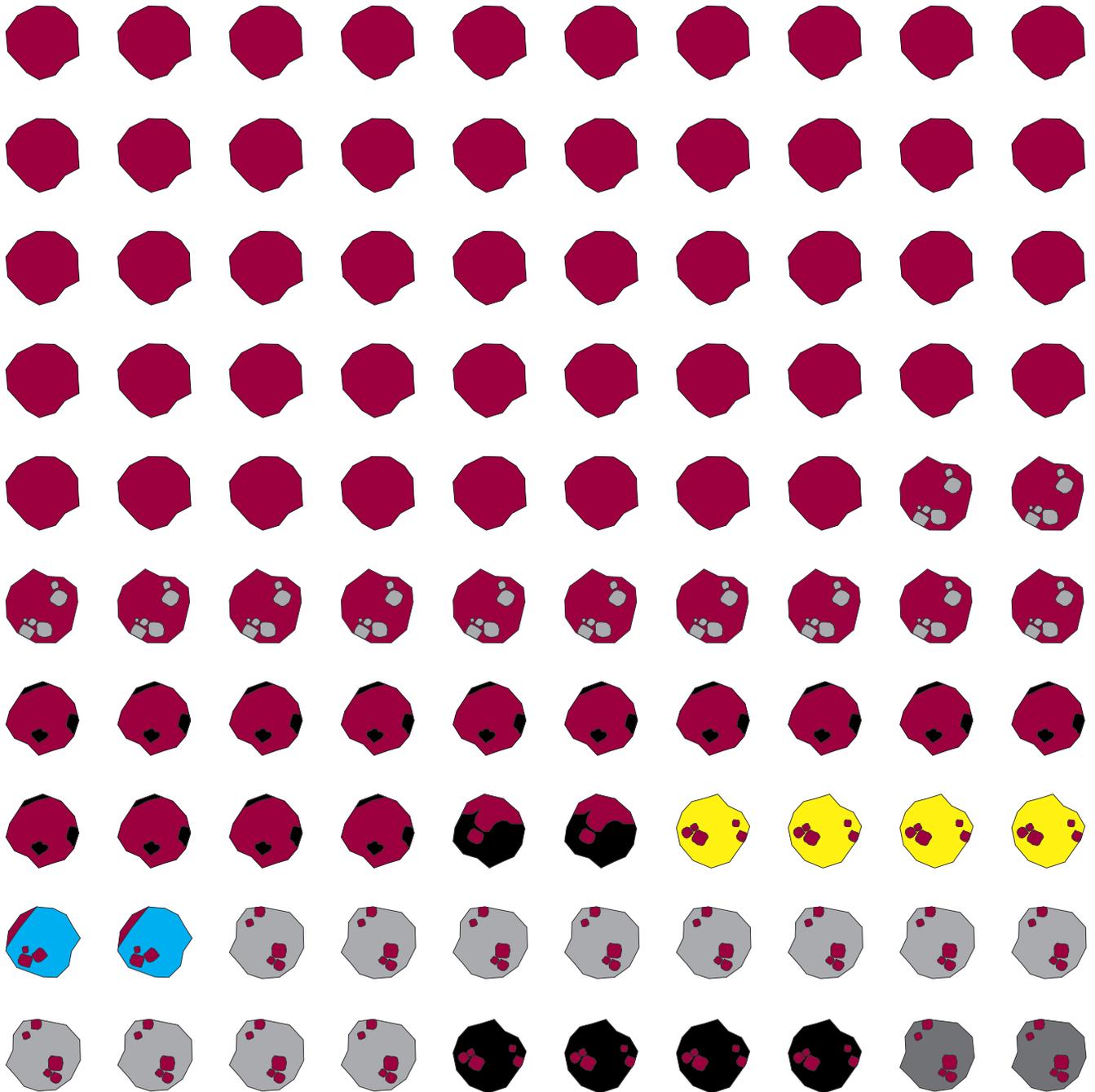
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp
Sn SCAN

D +20µm

June

2014



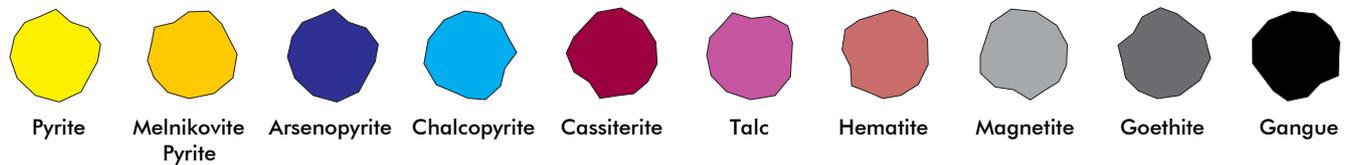
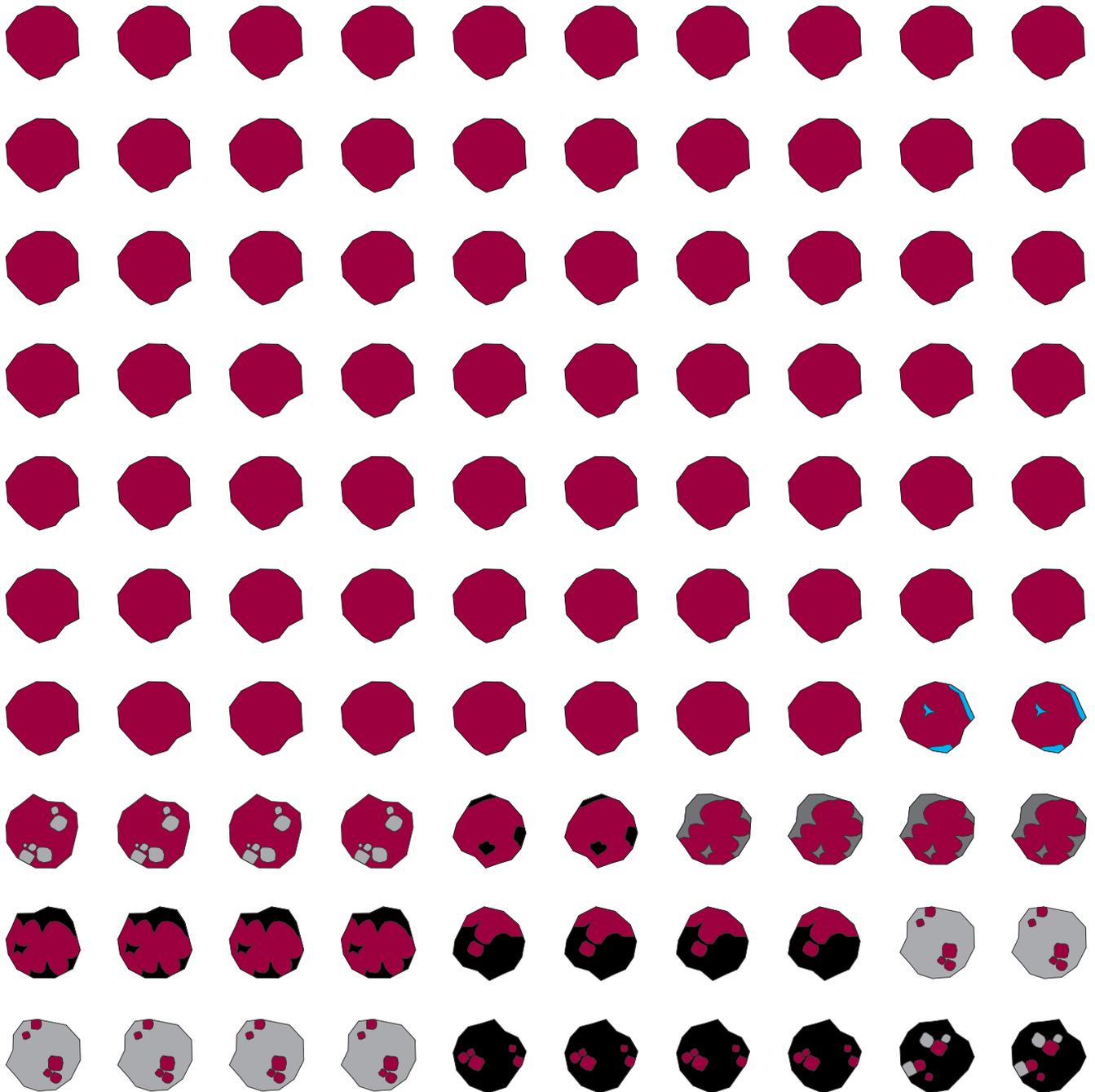
ALS Metallurgy - Stellar Resources Testwork

St Dizier Bulk Comp
Sn SCAN

E +8 μ m

June

2014



ALS Metallurgy

Stellar Resources Limited St Dizier Project Magnetics Mineralogy

June 2014



McArthur Ore Deposit Assessments Pty Ltd

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ALS METALLURGY

Stellar Resources – St Dizier

Magnetics Mineralogy

June 2014

Method

A magnetic fraction (-53+20µm) from the Stellar Resources' St Dizier testwork was submitted for mineralogical assessment. The sample was mounted as a polished mount by Australian Petrographics (Queanbeyan, NSW).

The standard MODA technique was adopted to quantify the mineralogy.

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* (Py), *pyrrhotite* (Po), *arsenopyrite* (As), *cassiterite* (Cs), *chalcopyrite* (Cp), *goethite+hematite* (GoHe), *magnetite* (Mt) and *gangue* (*quartz, silicates, carbonates, etc*, Ga). This allowed calculation of an overall mineralogical composition.

In a second scan, for each fraction, 25 grains containing Sn (exclusively *cassiterite*) were selected at random and logged as per the first scan.

The normal liberation and association parameters were calculated.

Photomicrographs were taken, and annotated using PowerPoint.

Results

Composition

The following minerals were identified, in approximate descending order:

- *Magnetite*
- *Gangue* (*quartz, silicates, carbonate, carbonaceous matter, etc.*)
- *Hematite*
- *Goethite*
- *Pyrite*
- *Cassiterite*
- *Pyrrhotite*
- *Chalcopyrite*
- *Covellite* (rare)
- *Ilmenite* (very rare)

The overall composition of the magnetic fraction is summarised below:

St Dizier Bulk Comp Composition Vol% (from total scan)

Fraction	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+20µm	0.9	0.1	Tr	0.1	Tr	6.8	78.9	13.3

Py=pyrite, Po=pyrrhotite, As=arsenopyrite, Cs=cassiterite, Cp=chalcopyrite, GoHe=goethite+hematite, Mt=magnetite, Ga=gangue
 # count statistics very poor for the scarce cassiterite

Cassiterite Liberation

An essential summary of the liberation parameters for *cassiterite* is:

St Dizier Magnetics *Cassiterite* liberation distribution%

Fraction	Free	Binary with						Ternary
		Py	Po	As	GoHe	Mt	Ga	
+20µm	43	0	0	0	0	32	0	51

Comments

- There appears to be insufficient identifiable Sn minerals to account for the ~0.4%Sn grade, and no sulphide (acid soluble) Sn was observed. The author suggests Sn may have been scavenged by the *goethite* and *hematite*, but this would require SEM/microanalysis for confirmation. MODA can arrange this at UTas, if required.
- Binaries of *magnetite* and coarsely flaked *carbonaceous matter* were observed.

G.J.McArthur PhD FAusIMM MMICA MSEG
 Principal Mineralogist
 20.6.14

Cp=chalcopyrite
Cs=cassiterite
Ga=gangue
Go=goethite
He=hematite
Me=melnikovite pyrite
Mt=magnetite
Py=crystalline pyrite

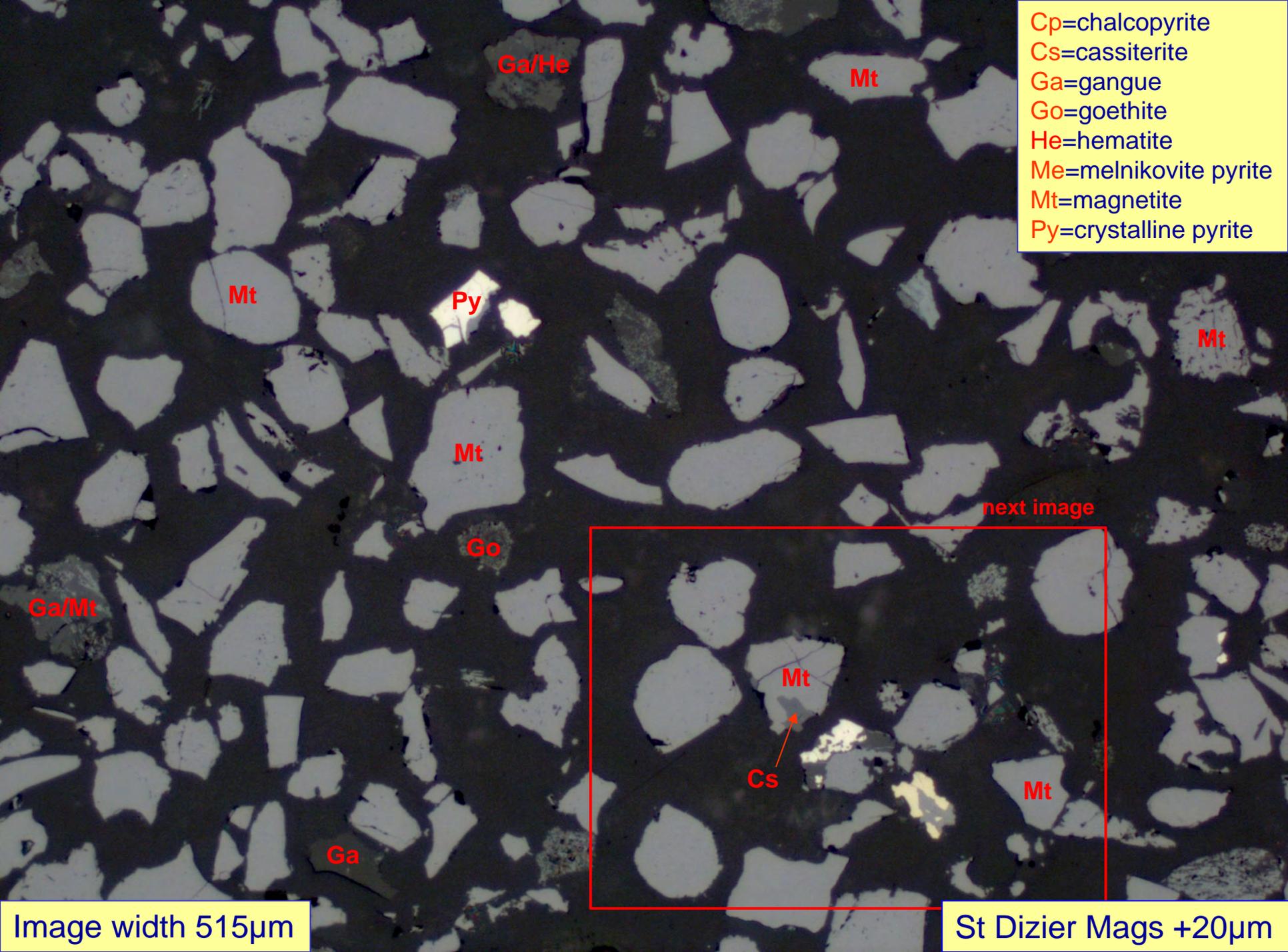


Image width 515µm

St Dizier Mags +20µm

Detail from previous image

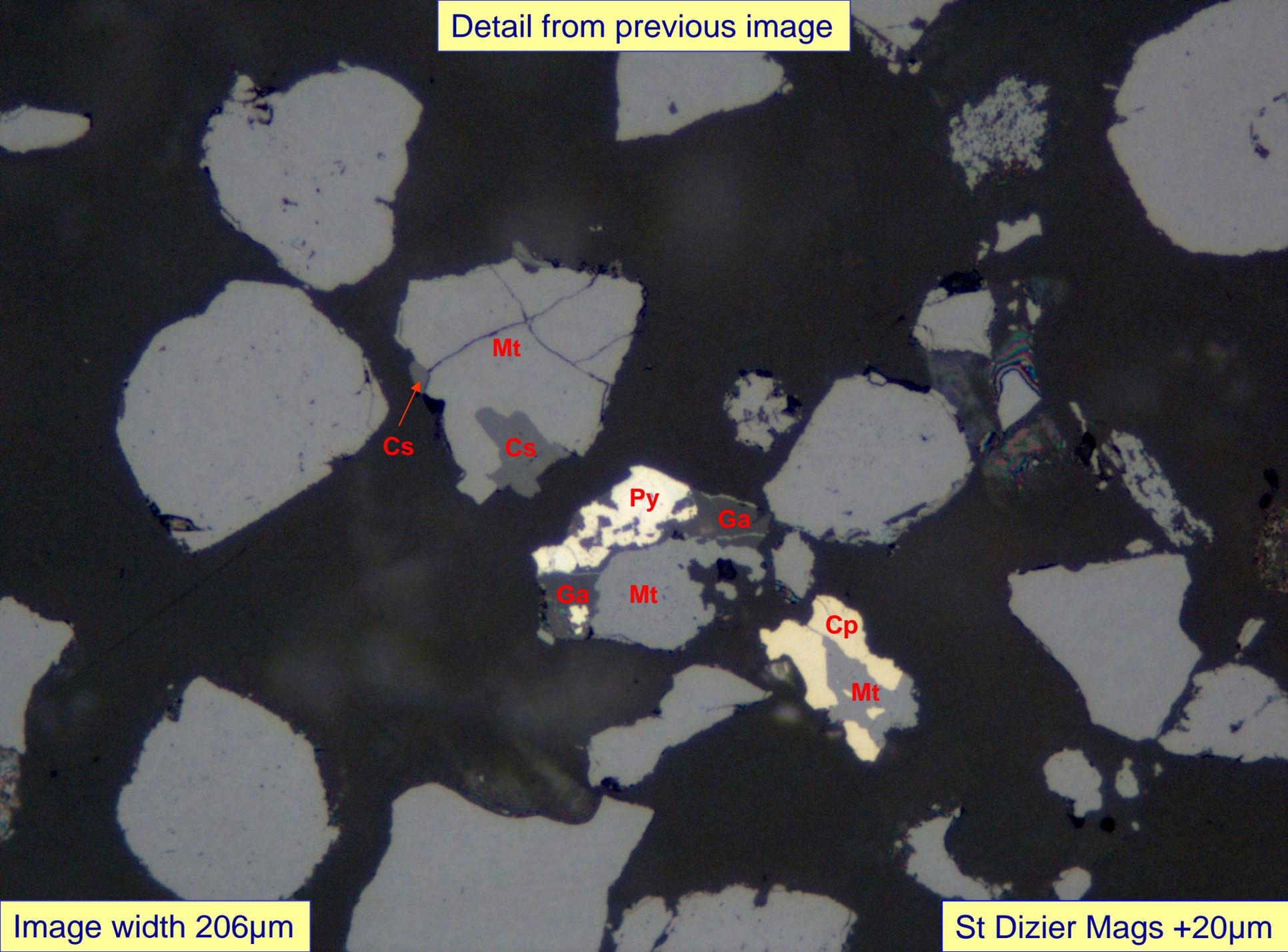
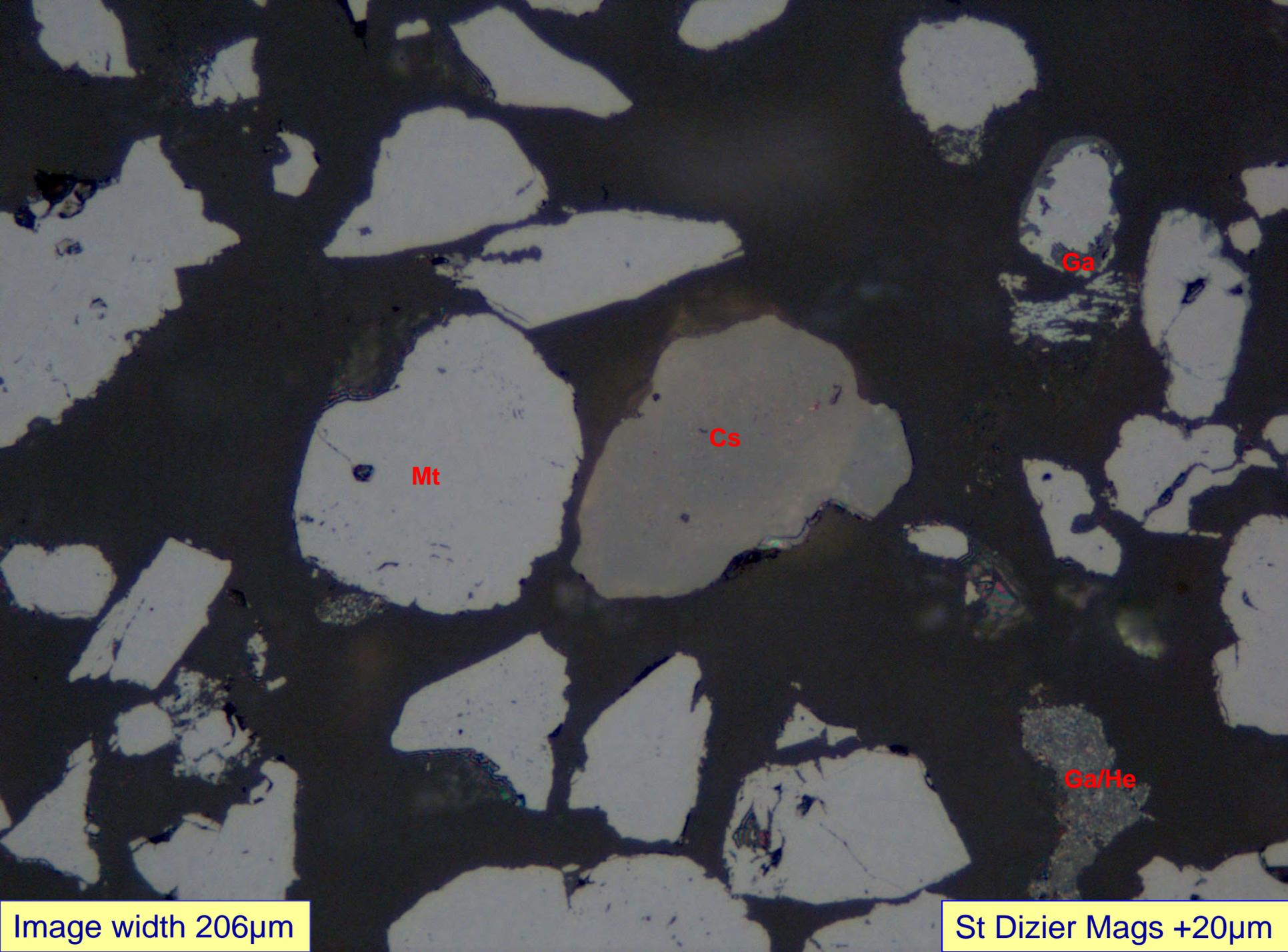


Image width 206µm

St Dizier Mags +20µm



Mt

Cs

Ga

Ga/He

Image width 206µm

St Dizier Mags +20µm

St Dizier Mags

GJMcA 20.6.14

-53+20µm

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
0.9	0.1	0.0	0.1	0.0	6.8	78.9	13.3	100
43	5	0	28	0	38	90	51	

ASSAYS

	SG	Cu	Sn		As	S	Fe
Calc'd	4.76	0.00	0.08		0.0	0.5	66.3
Actual							

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga	
Mono	0	0	0	43	15	89	0	
Binary	0	100	0	36	82	9	69	
Ternary	100	0	0	19	3	2	31	
Quat.y+	0	0	0	2	0	0	0	
#Grains	2	1	0	1	18	88	26	1.36

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py		0	0	0	0	0	0
Po	0		0	0	0	100	0
As	0	0		0	0	0	0
Cs	0	0	0		0	90	0
GoHe	0	0	0	0		5	95
Mt	0	13	0	0	24		62
Ga	0	0	0	0	62	38	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py		0	0	0	0	100	100
Po	0		0	0	0	100	0
As	0	0		0	0	0	0
Cs	4	0	0		11	41	21
GoHe	0	0	0	0		7	82
Mt	0	1	0	0	4		8
Ga	6	0	0	6	61	57	

of all

DISTRIBUTION MATRIX

	Free	Binary						Tern	Quat	
		Py	Po	As	Cs	GoHe	Mt			Ga
Py	0		0	0	0	0	0	0	100	0
Po	0	0		0	0	0	100	0	0	0
As	0	0	0		0	0	0	0	0	0
Cs	43	0	0	0		0	32	0	19	2
GoHe	15	0	0	0	0		4	78	3	0
Mt	89	0	1	0	0	2		6	2	0
Ga	0	0	0	0	0	43	27		31	0

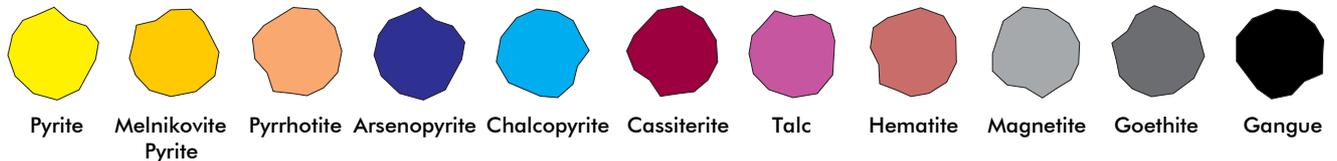
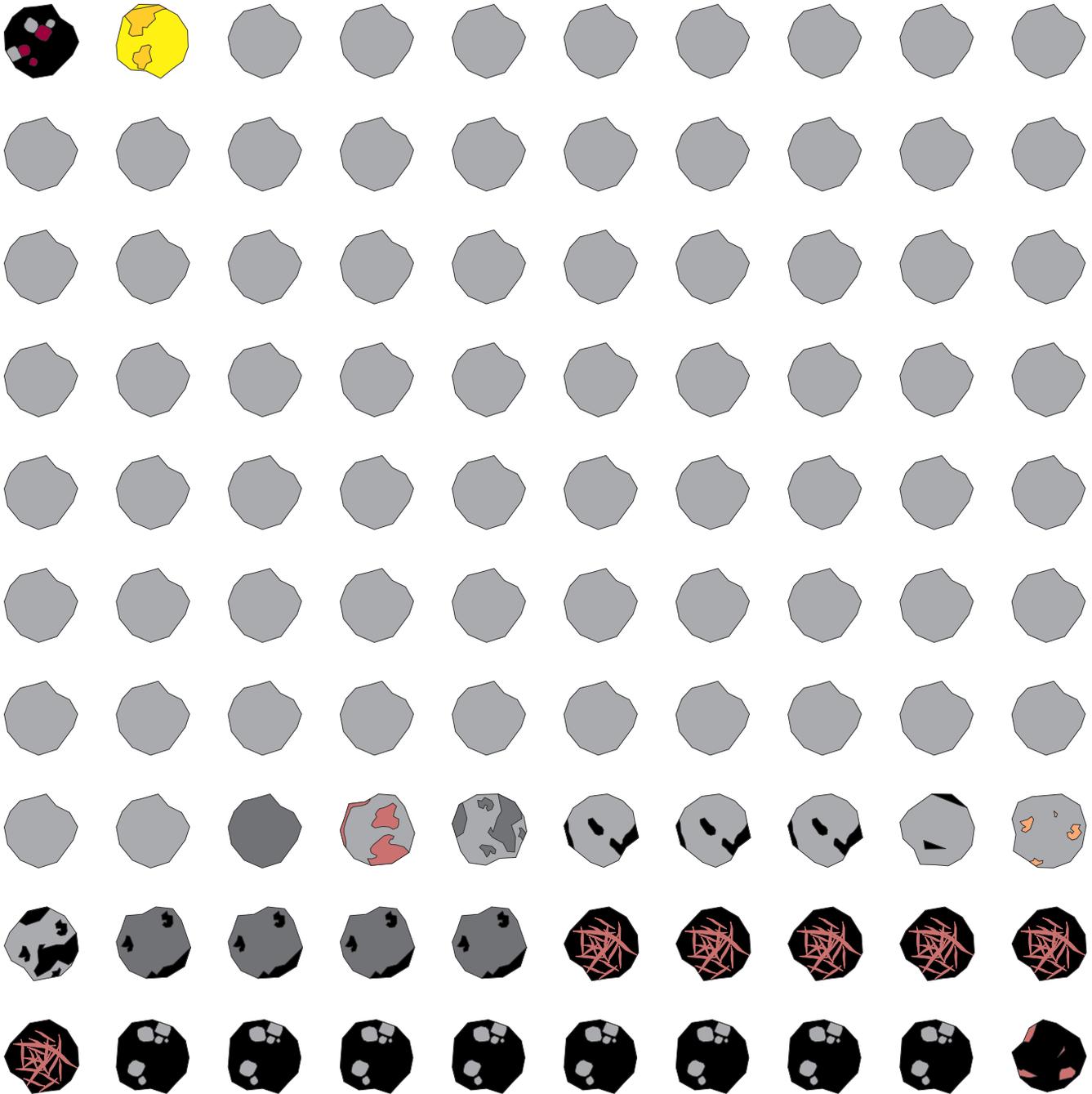
ALS Metallurgy - Stellar Resources Testwork

St Dizier Mags

-53+20µm

June

2014



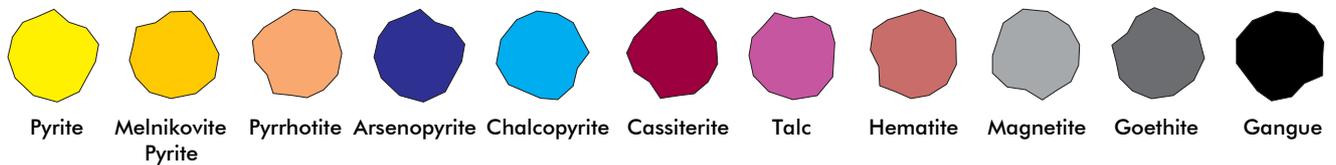
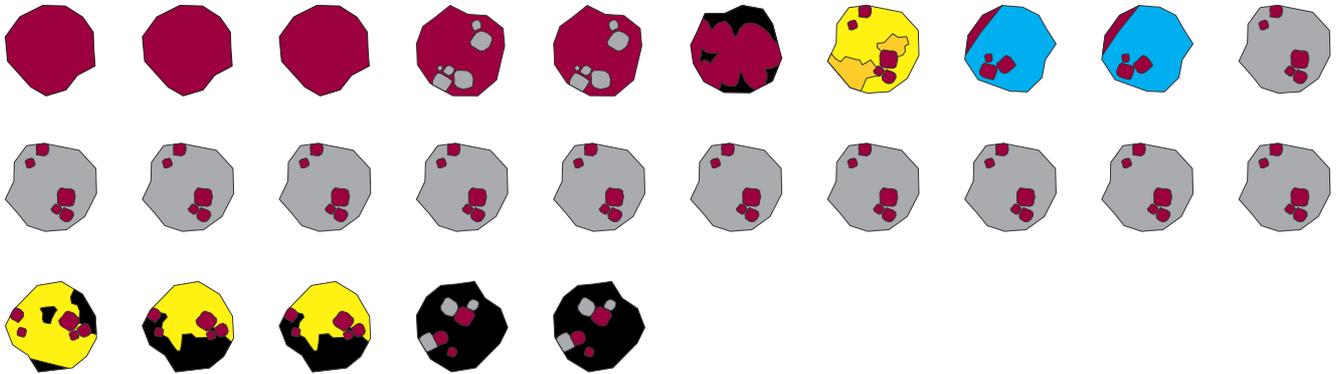
ALS Metallurgy - Stellar Resources Testwork

St Dizier Mags Sn
SCAN

-53+20 μ m

June

2014



ALS Metallurgy

Stellar Resources Limited St Dizier Project Magnetics Mineralogy SEM-EDS Microanalysis

June 2014



McArthur Ore Deposit Assessments Pty Ltd

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ALS METALLURGY

Stellar Resources – St Dizier Magnetics Mineralogy – SEM Microanalysis June 2014

Method

A magnetic fraction (-53+20µm) from the Stellar Resources' St Dizier testwork was submitted to the Central Science Laboratory (CSL) of the University of Tasmania (UTas) in Hobart for Scanning Electron Microscopy (SEM) and Energy-dispersive X-ray Spectrometry (EDS) to locate non-*cassiterite* Sn. 64 points were analysed using EDS and imaged from back-scattering.

Previous optical mineralogy by MODA had identified minor *cassiterite* but insufficient to account for the 0.4%Sn.

Results

The author has assessed the analytical results and grouped them into mineral mixture groups. In many cases the phase grain size is smaller than the analytical beam width, so the analysis is of a mixture of two or more minerals. A full list of the analyses is provided at the end of the report but an essential summary follows:

Mineral Group	#	O	Mg	Al	Si	S	Ca	Ti	Mn	Fe	Br	Sn	W
<i>cassiterite</i> + minor magnetite	7	23.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	72.7	0.0
<i>cassiterite</i> + magnetite	4	36.7	0.7	0.0	0.7	0.0	0.0	0.0	0.0	27.9	0.0	34.0	0.0
magnetite + <i>cassiterite</i>	11	32.5	0.7	0.0	0.4	0.0	0.0	0.0	0.0	53.3	0.1	13.0	0.1
Fe oxide + minor <i>cassiterite</i>	7	30.5	0.8	0.0	0.7	0.0	0.0	0.0	0.7	65.0	0.0	1.4	0.9
Fe oxide + <i>schoenfliesite</i>	7	36.9	6.3	0.1	0.8	0.0	0.0	0.0	0.6	29.1	0.0	24.7	1.6
<i>magnetite</i>	12	27.5	0.2	0.0	0.2	0.0	0.0	0.0	0.0	72.2	0.0	0.0	0.0
Fe oxide + minor silicate	14	35.2	0.3	0.3	1.5	0.0	0.2	0.1	0.6	61.6	0.0	0.0	0.2
<i>pyrrhotite</i>	1	0.0	0.0	0.0	0.0	37.8	0.0	0.0	0.0	62.2	0.0	0.0	0.0
silicate	1	48.7	22.8	0.0	21.1	0.0	0.2	0.0	0.0	7.2	0.0	0.0	0.0

Most of the observed Sn occurs as very fine *cassiterite* inclusions in magnetite.

The mineral ***schoenfliesite* MgSn(OH)₆**, containing 48.4%Sn, was previously recognised at St Dizier during Renison drilling (*pers.comm. Ray Hazeldene, Stellar*). It is a secondary phase typically found in oxidised Sn-bearing minerals. The author is unfamiliar with this mineral, but upon re-examination, it may be possible to identify it optically. *Schoenfliesite* is documented to be usually fibrous with an SG of 3.48.

In the sample examined, *schoenfliesite* is fine-grained and mixed with *hematite* and *goethite*. Recovery would be extremely difficult.

G.J.McArthur PhD FAusIMM MMICA MSEG
Principal Mineralogist
27.6.14

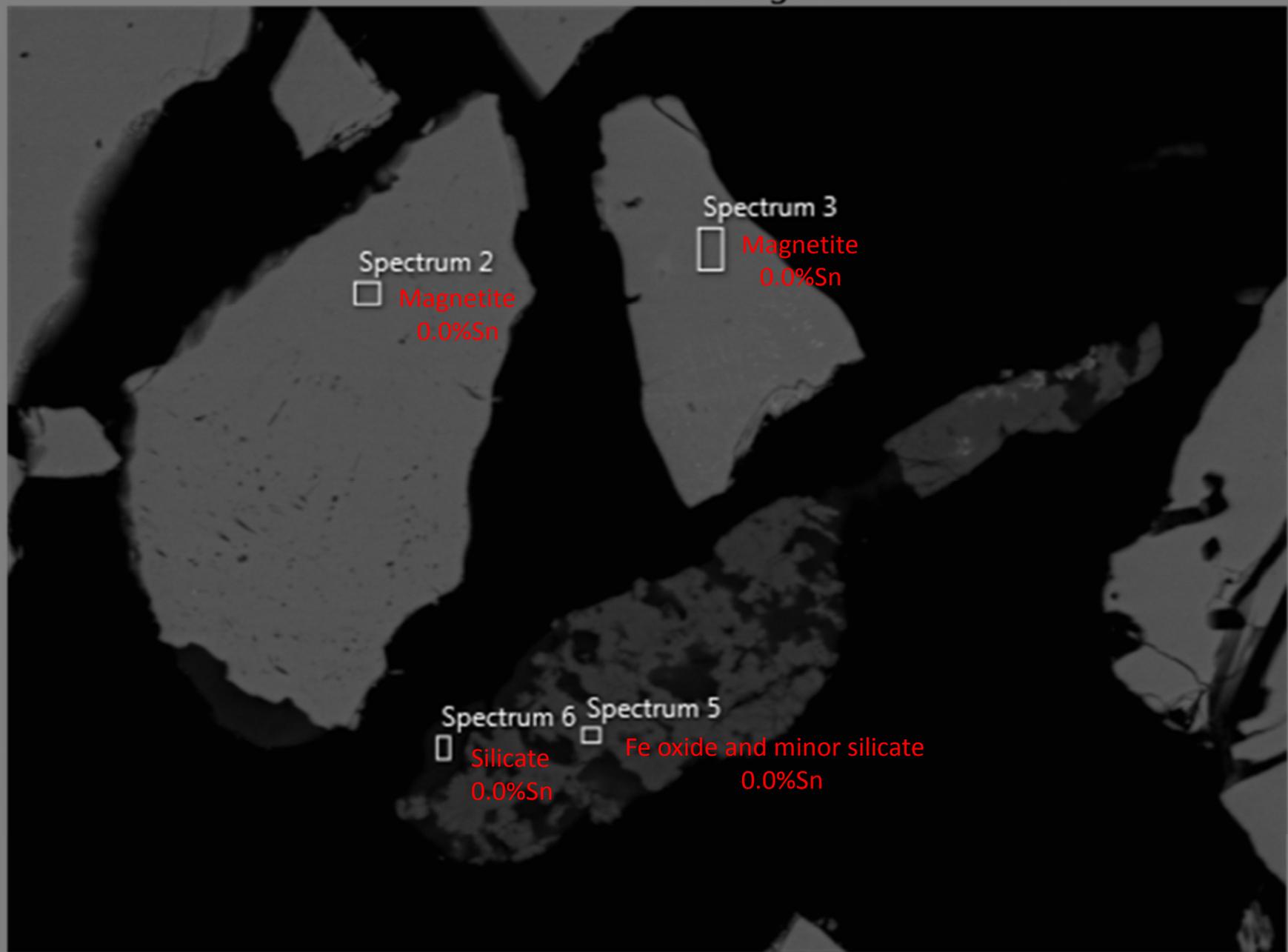
ST DIZIER MAGS +20microns

SEM-EDS by Karsten Goemann (Utas)

26.6.14

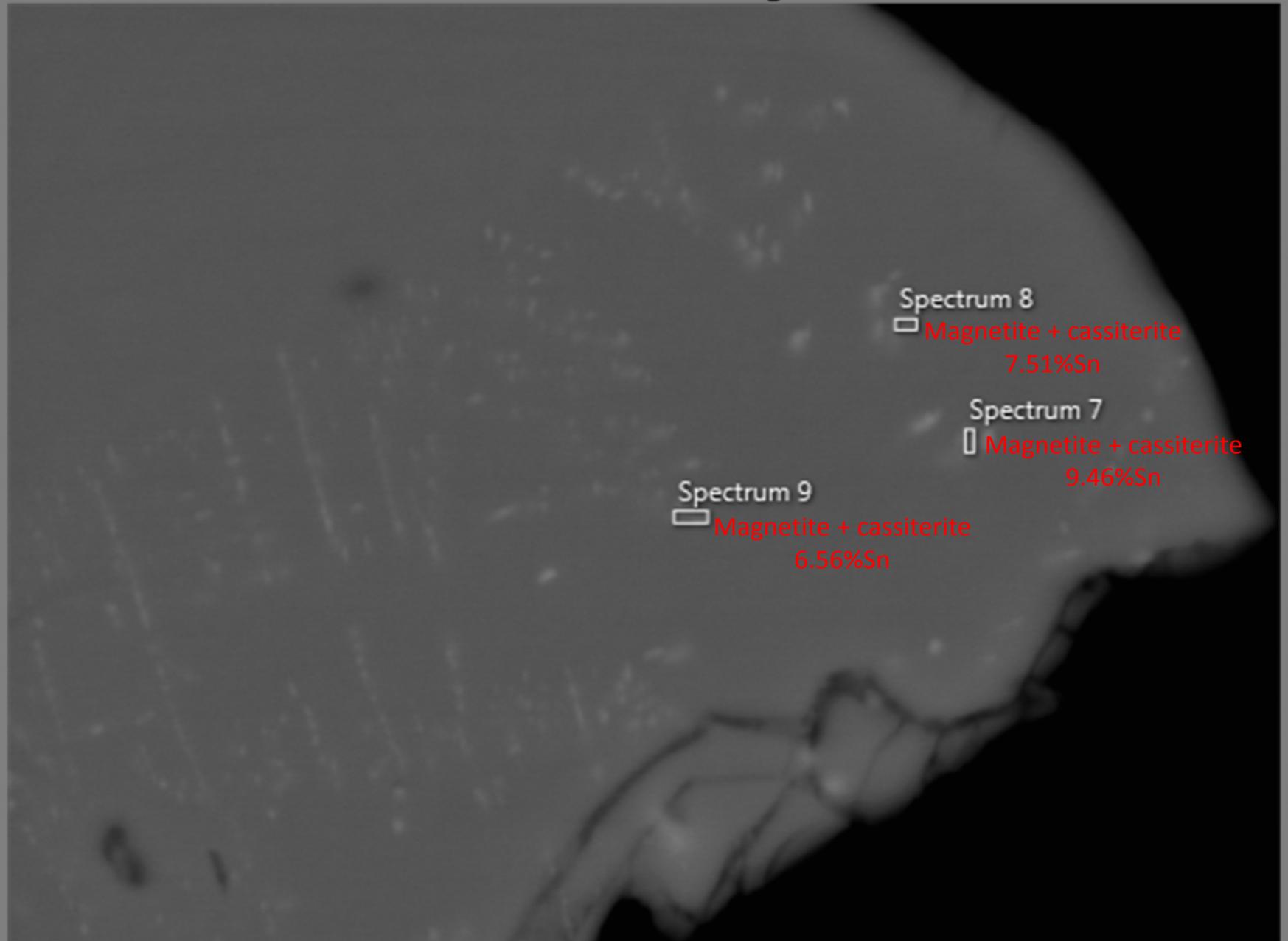
SITE	SPECTRUM	O	Mg	Al	Si	S	Ca	Ti	Mn	Fe	Br	Sn	W	Total	Phase?
Site 13	Spectrum 41	22.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.23	0.00	75.09	0.00	100	cassiterite + minor Fe oxide
Site 11	Spectrum 35	23.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.00	75.07	0.00	100	cassiterite + minor magnetite
Site 12	Spectrum 39	23.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24	0.00	73.69	0.00	100	cassiterite + minor magnetite
Site 12	Spectrum 37	23.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.34	0.00	73.57	0.00	100	cassiterite + minor magnetite
Site 14	Spectrum 44	23.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21	0.00	73.54	0.00	100	cassiterite + minor Fe oxide
Site 12	Spectrum 38	23.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.93	0.00	69.27	0.00	100	cassiterite + minor magnetite
Site 12	Spectrum 36	25.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.98	0.00	68.34	0.00	100	cassiterite + minor magnetite
MEAN	7	23.5	0.0	3.8	0.0	72.7	0.0	100	cassiterite + minor magnetite						
Site 9	Spectrum 31	35.52	0.00	0.00	0.19	0.00	0.00	0.00	0.00	26.11	0.00	38.18	0.00	100	cassiterite + magnetite
Site 10	Spectrum 33	34.07	0.00	0.00	0.21	0.00	0.00	0.00	0.00	27.91	0.00	37.81	0.00	100	cassiterite + magnetite
Site 9	Spectrum 30	38.82	1.41	0.00	1.17	0.00	0.00	0.00	0.00	28.52	0.00	30.08	0.00	100	cassiterite + magnetite
Site 10	Spectrum 32	38.37	1.47	0.00	1.23	0.00	0.00	0.00	0.00	28.88	0.00	30.05	0.00	100	cassiterite + magnetite
MEAN	4	36.7	0.7	0.0	0.7	0.0	0.0	0.0	0.0	27.9	0.0	34.0	0.0	100	cassiterite + magnetite
Site 7	Spectrum 24	36.96	1.16	0.00	0.73	0.00	0.00	0.00	0.00	36.09	0.57	24.49	0.00	100	magnetite + cassiterite
Site 7	Spectrum 23	33.53	0.44	0.00	0.24	0.00	0.00	0.00	0.00	48.65	0.00	17.15	0.00	100	magnetite + cassiterite
Site 6	Spectrum 20	32.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.13	0.00	16.51	0.00	100	magnetite + cassiterite
Site 6	Spectrum 19	33.24	0.32	0.00	0.25	0.00	0.00	0.00	0.00	50.57	0.00	15.61	0.00	100	magnetite + cassiterite
Site 3	Spectrum 12	33.39	0.54	0.00	0.49	0.00	0.00	0.00	0.00	51.53	0.00	14.05	0.00	100	magnetite + cassiterite
Site 3	Spectrum 10	32.56	0.57	0.00	0.50	0.00	0.00	0.00	0.00	53.35	0.00	13.03	0.00	100	magnetite + cassiterite
Site 3	Spectrum 11	31.12	0.48	0.00	0.50	0.00	0.00	0.00	0.00	56.80	0.00	11.10	0.00	100	magnetite + cassiterite
Site 2	Spectrum 7	31.36	0.68	0.00	0.53	0.00	0.00	0.00	0.00	57.98	0.00	9.46	0.00	100	magnetite + cassiterite
Site 2	Spectrum 8	30.35	0.57	0.00	0.62	0.00	0.00	0.00	0.00	60.96	0.00	7.51	0.00	100	magnetite + cassiterite
Site 14	Spectrum 46	32.16	1.96	0.00	0.34	0.00	0.00	0.00	0.00	57.10	0.00	7.43	1.02	100	Fe oxide + cassiterite
Site 2	Spectrum 9	29.99	0.54	0.00	0.56	0.00	0.00	0.00	0.00	62.35	0.00	6.56	0.00	100	magnetite + cassiterite
MEAN	11	32.5	0.7	0.0	0.4	0.0	0.0	0.0	0.0	53.3	0.1	13.0	0.1	100	magnetite + cassiterite
Site 15	Spectrum 48	29.61	1.90	0.00	0.92	0.00	0.00	0.00	0.00	64.33	0.00	2.64	0.61	100	Fe oxide + minor cassiterite
Site 15	Spectrum 51	29.62	1.01	0.00	0.18	0.00	0.00	0.00	0.31	65.69	0.00	2.56	0.63	100	Fe oxide + minor cassiterite
Site 18	Spectrum 62	34.28	0.78	0.00	1.26	0.00	0.00	0.00	0.89	59.58	0.00	1.43	1.78	100	Fe oxide + minor cassiterite
Site 13	Spectrum 42	27.27	0.32	0.00	0.16	0.00	0.00	0.00	2.12	68.41	0.00	1.22	0.50	100	Fe oxide + minor cassiterite
Site 7	Spectrum 25	27.69	0.51	0.00	0.32	0.00	0.00	0.00	0.00	70.52	0.00	0.96	0.00	100	magnetite + minor cassiterite
Site 18	Spectrum 64	33.80	0.47	0.00	1.18	0.00	0.00	0.00	0.62	62.34	0.00	0.50	1.08	100	Fe oxide + minor cassiterite
Site 18	Spectrum 66	31.50	0.40	0.00	1.11	0.00	0.00	0.00	0.76	64.32	0.00	0.42	1.49	100	Fe oxide + minor cassiterite
MEAN	7	30.5	0.8	0.0	0.7	0.0	0.0	0.0	0.7	65.0	0.0	1.4	0.9	100	Fe oxide + minor cassiterite
Site 15	Spectrum 47	43.28	9.75	0.00	0.93	0.00	0.00	0.00	0.00	5.06	0.00	39.05	1.92	100	schoenfliesite + Fe oxide
Site 16	Spectrum 56	44.41	6.31	0.29	1.84	0.00	0.00	0.00	2.06	13.83	0.00	29.29	1.96	100	schoenfliesite + Fe oxide
Site 16	Spectrum 54	43.67	6.75	0.27	1.58	0.00	0.00	0.00	1.75	14.85	0.00	29.18	1.94	100	schoenfliesite + Fe oxide
Site 14	Spectrum 45	30.85	5.76	0.00	0.17	0.00	0.00	0.00	0.00	35.21	0.00	26.45	1.56	100	schoenfliesite + Fe oxide
Site 15	Spectrum 49	37.37	6.60	0.00	0.25	0.00	0.00	0.00	0.00	31.98	0.00	22.47	1.32	100	schoenfliesite + Fe oxide
Site 15	Spectrum 52	25.60	3.75	0.00	0.34	0.00	0.00	0.00	0.42	55.66	0.00	13.23	1.00	100	schoenfliesite + Fe oxide
Site 15	Spectrum 50	33.45	4.93	0.00	0.59	0.00	0.00	0.00	0.00	46.97	0.00	12.88	1.17	100	schoenfliesite + Fe oxide
MEAN	7	36.9	6.3	0.1	0.8	0.0	0.0	0.0	0.6	29.1	0.0	24.7	1.6	100	schoenfliesite + Fe oxide
															MgSn(OH)6 + FeO.OH
Site 8	Spectrum 27	27.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.59	0.00	0.00	0.00	100	magnetite
Site 9	Spectrum 28	27.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.47	0.00	0.00	0.00	100	magnetite
Site 6	Spectrum 22	27.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.43	0.00	0.00	0.00	100	magnetite
Site 1	Spectrum 2	27.43	0.00	0.00	0.21	0.00	0.00	0.00	0.00	72.36	0.00	0.00	0.00	100	magnetite
Site 17	Spectrum 60	27.13	0.52	0.00	0.00	0.00	0.00	0.00	0.00	72.35	0.00	0.00	0.00	100	magnetite
Site 5	Spectrum 18	27.35	0.29	0.00	0.00	0.00	0.00	0.00	0.00	72.35	0.00	0.00	0.00	100	magnetite
Site 7	Spectrum 26	27.31	0.36	0.00	0.00	0.00	0.00	0.00	0.00	72.33	0.00	0.00	0.00	100	magnetite
Site 11	Spectrum 34	27.48	0.00	0.00	0.25	0.00	0.00	0.00	0.00	72.27	0.00	0.00	0.00	100	magnetite
Site 12	Spectrum 40	27.63	0.00	0.00	0.55	0.00	0.00	0.00	0.00	71.82	0.00	0.00	0.00	100	magnetite
Site 14	Spectrum 43	27.78	0.00	0.00	0.21	0.00	0.21	0.00	0.00	71.80	0.00	0.00	0.00	100	magnetite
Site 1	Spectrum 3	27.59	0.41	0.00	0.38	0.00	0.00	0.00	0.00	71.61	0.00	0.00	0.00	100	magnetite
Site 3	Spectrum 13	27.23	0.63	0.00	0.67	0.00	0.00	0.00	0.00	71.46	0.00	0.00	0.00	100	magnetite
MEAN	12	27.5	0.2	0.0	0.2	0.0	0.0	0.0	0.0	72.2	0.0	0.0	0.0	100	magnetite
Site 17	Spectrum 59	30.31	0.00	1.61	0.51	0.00	0.28	0.00	0.00	67.29	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 17	Spectrum 58	32.55	0.00	1.90	0.46	0.00	0.19	0.00	0.00	64.90	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 18	Spectrum 67	32.59	0.32	0.00	0.82	0.00	0.00	0.00	0.63	64.27	0.00	0.00	1.37	100	Fe oxide + minor silicate
Site 4	Spectrum 14	34.25	0.00	0.00	1.01	0.00	0.37	0.00	0.52	63.84	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 16	Spectrum 53	32.16	0.52	0.35	2.27	0.00	0.20	0.24	0.75	63.53	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 18	Spectrum 63	32.90	0.43	0.00	1.52	0.00	0.00	0.00	0.64	63.45	0.00	0.00	1.07	100	Fe oxide + minor silicate
Site 16	Spectrum 55	32.68	0.00	0.00	3.18	0.00	0.21	0.27	0.55	63.10	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 16	Spectrum 57	34.42	0.00	0.34	1.62	0.00	0.00	0.26	0.75	62.61	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 4	Spectrum 15	35.82	0.00	0.00	0.81	0.00	0.38	0.00	0.73	62.25	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 4	Spectrum 16	35.27	2.58	0.00	2.83	0.00	0.26	0.00	0.00	59.07	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 18	Spectrum 65	38.88	0.00	0.00	2.19	0.00	0.00	0.00	0.00	58.93	0.00	0.00	0.00	100	Fe oxide + minor silicate
Site 18	Spectrum 61	38.70	0.00	0.00	3.14	0.00	0.19	0.00	0.29	57.69	0.00	0.00	0.00	100	Fe oxide + minor sil

887085 Electron Image 1



25µm

887085 Electron Image 2



5 μ m

887085 Electron Image 3

Spectrum 13

Magnetite
0.0%Sn

Spectrum 12

+ Magnetite + cassiterite
14.05%Sn

Magnetite + cassiterite

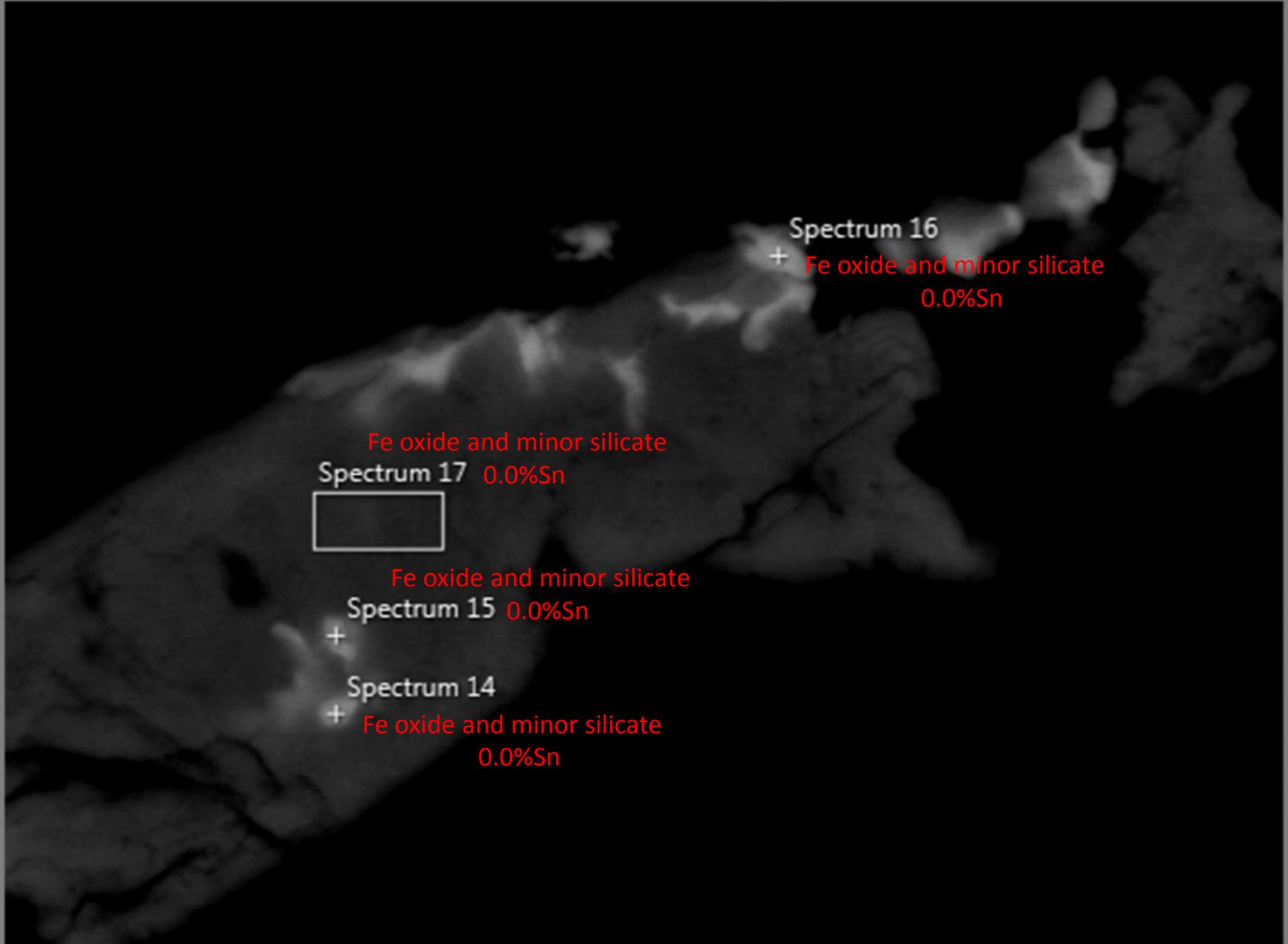
Spectrum 11 11.1%Sn

+ Spectrum 10

+ Magnetite + cassiterite
13.03%Sn

1 μ m

887085 Electron Image 4



5 μ m

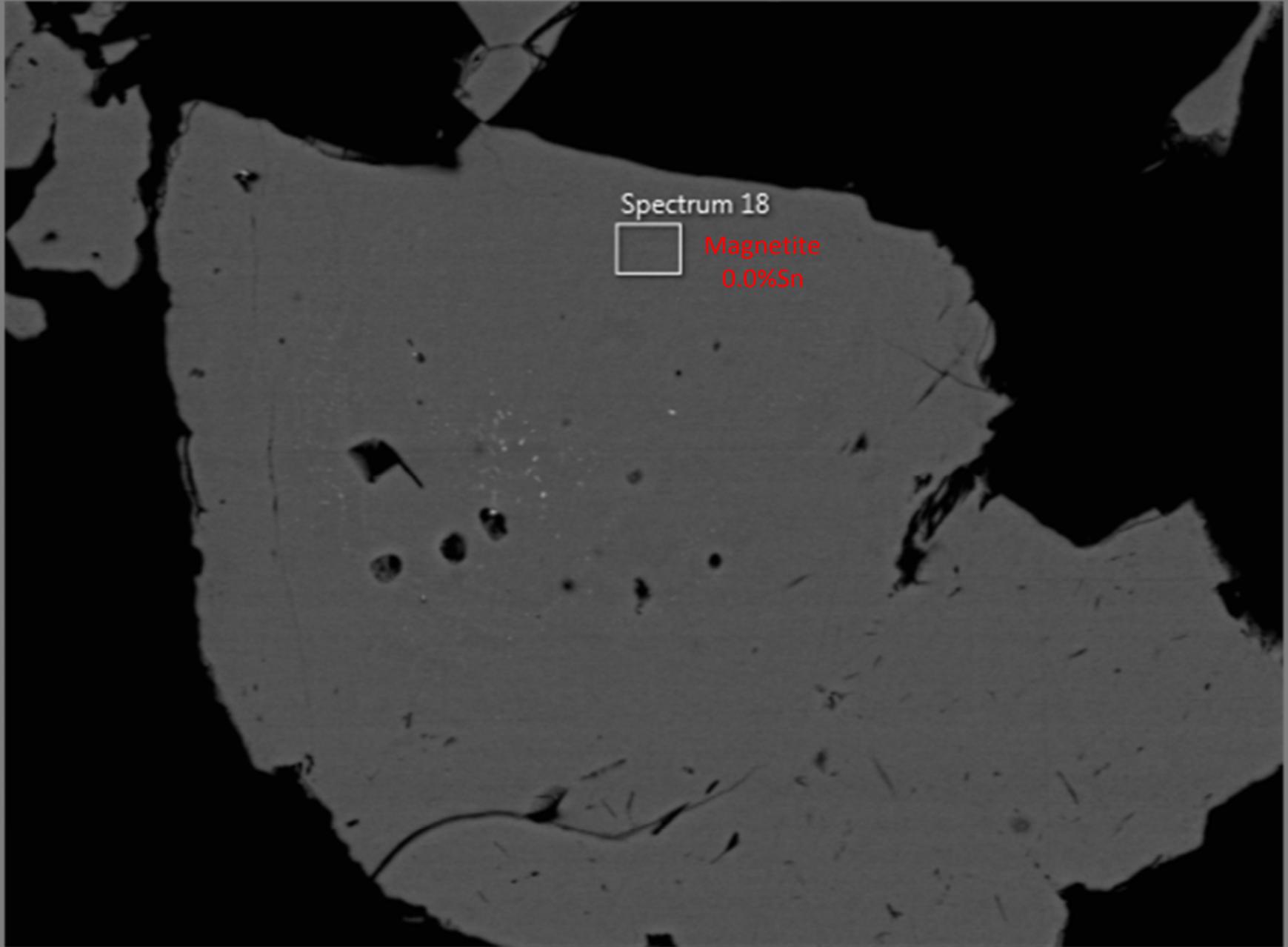
887085 Electron Image 5

Spectrum 18

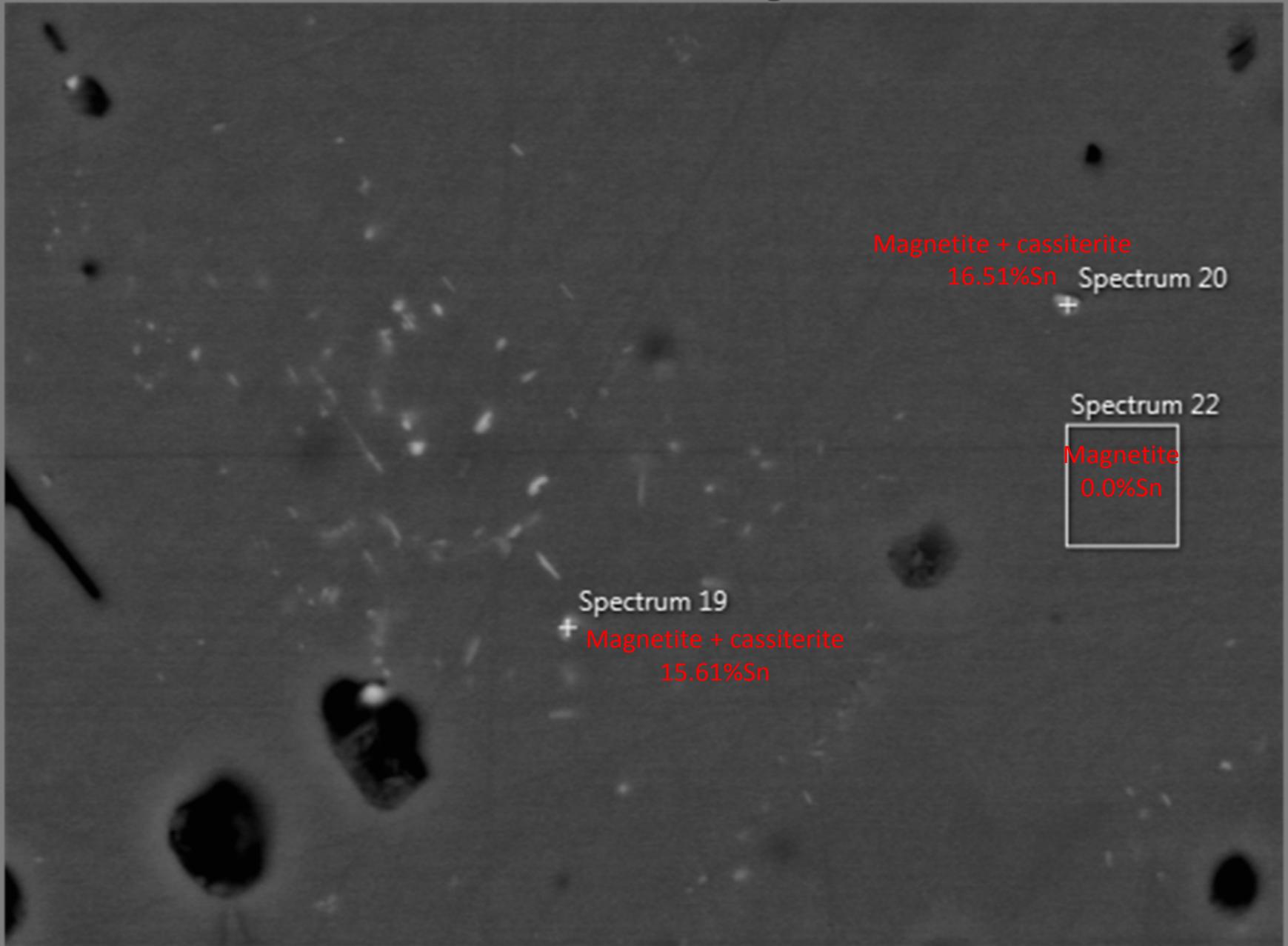


Magnetite
0.0%Sn

25μm

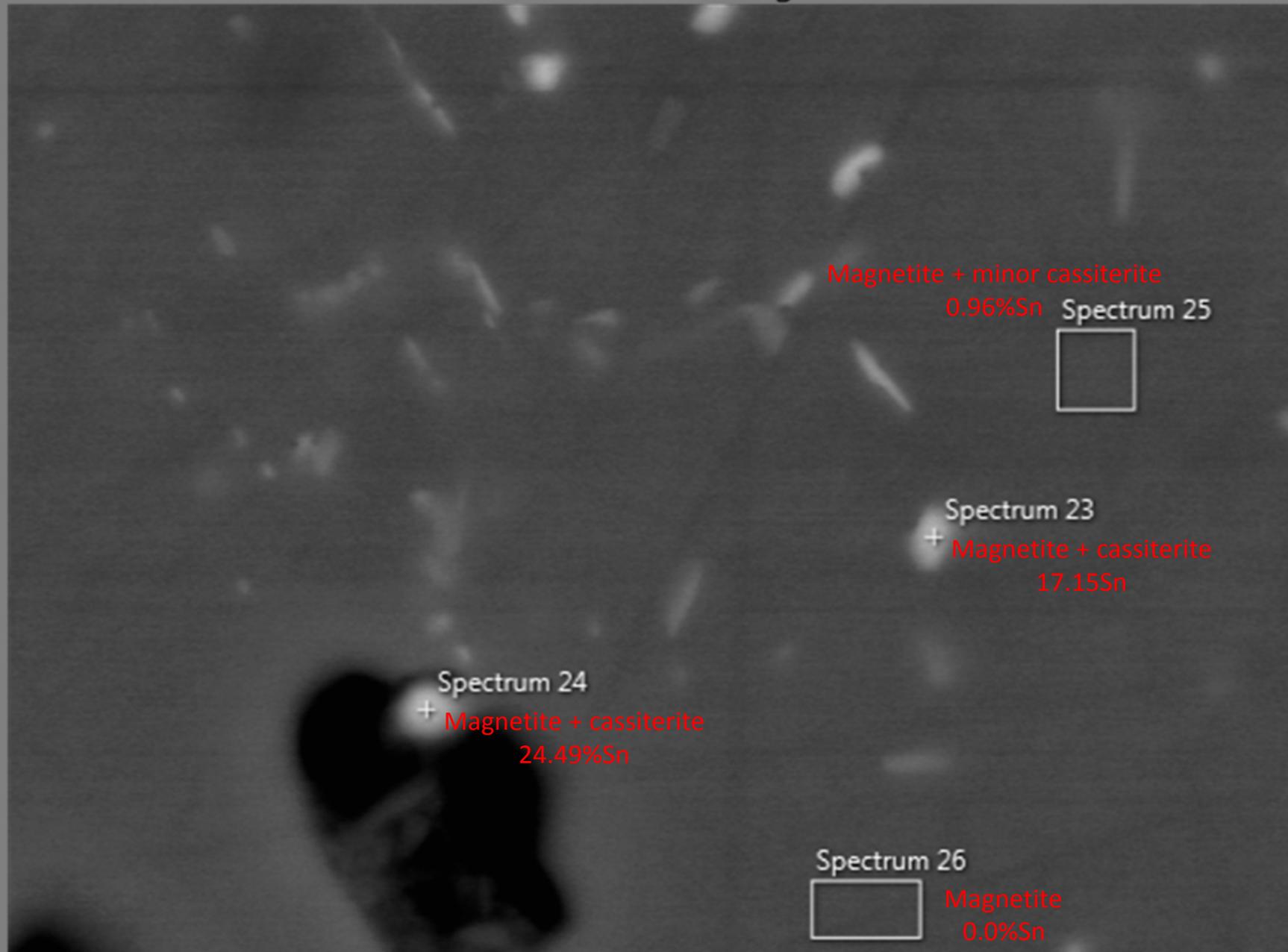


887085 Electron Image 6



5µm

887085 Electron Image 7



2.5µm

887085 Electron Image 8



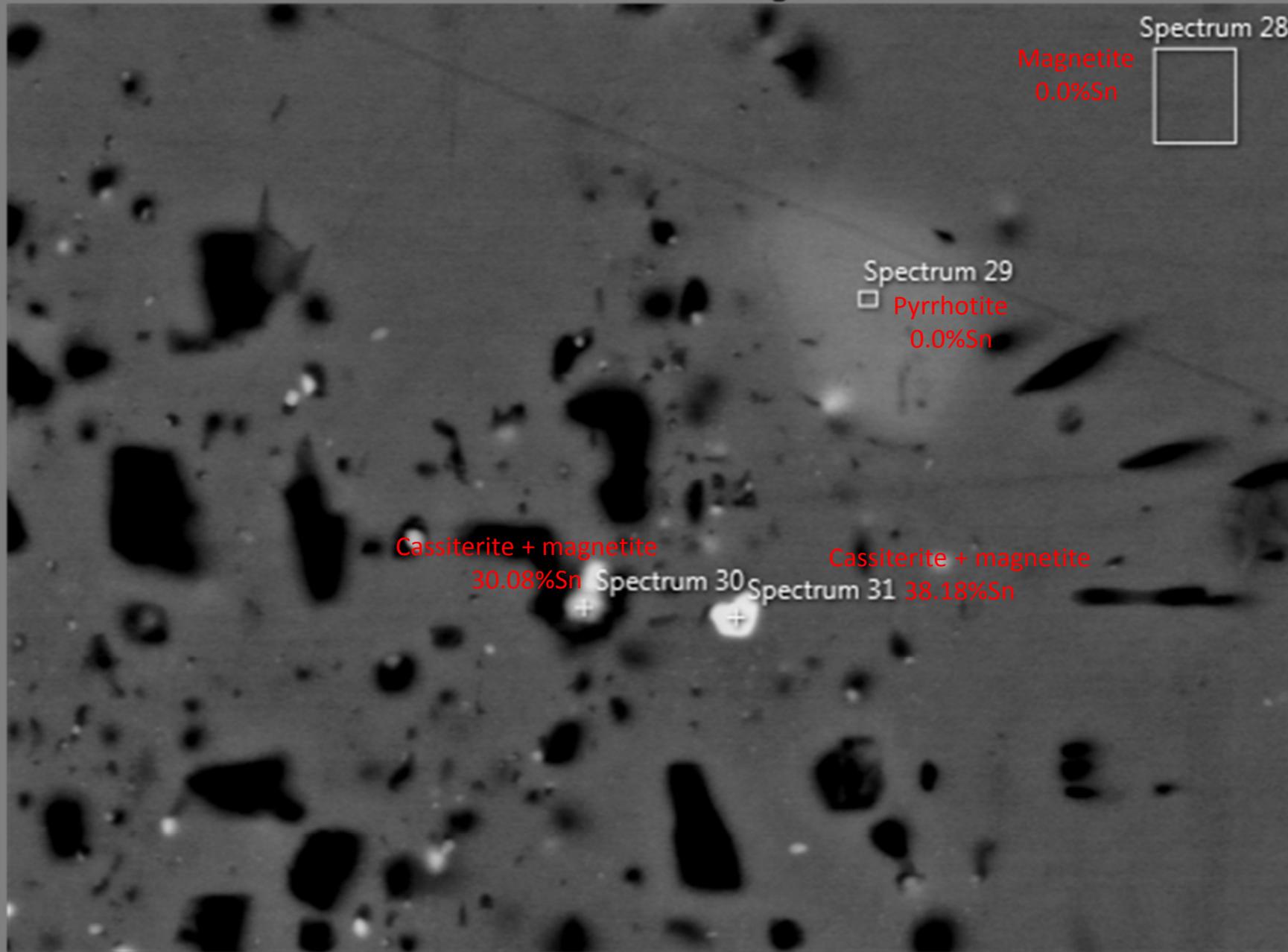
Spectrum 27



Magnetite
0.0%Sn

25µm

887085 Electron Image 9



Spectrum 28

Magnetite
0.0%Sn



Spectrum 29

Pyrrhotite
0.0%Sn

Cassiterite + magnetite
30.08%Sn

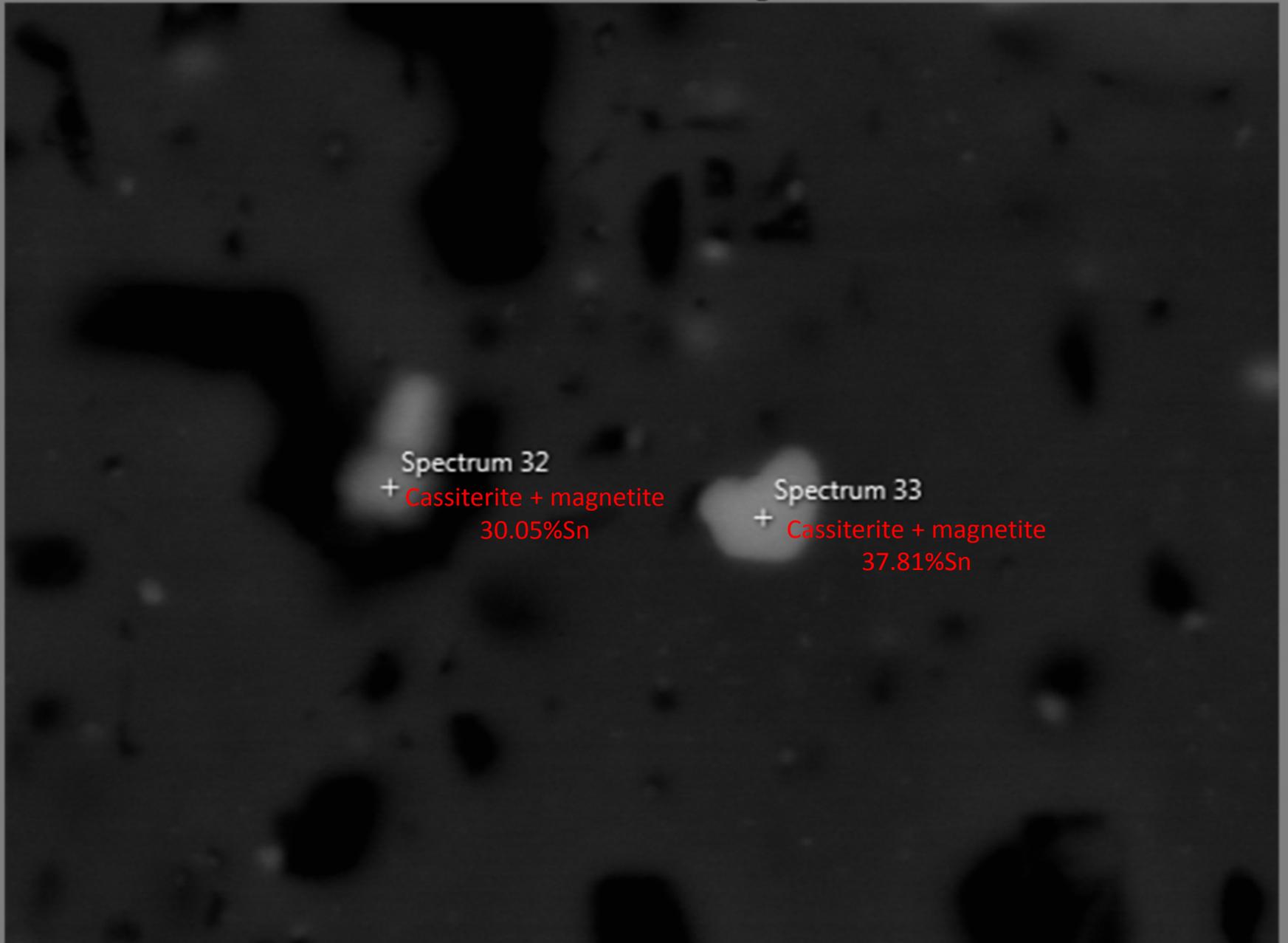
Spectrum 30

Cassiterite + magnetite
38.18%Sn

Spectrum 31

5µm

887085 Electron Image 10



Spectrum 32
+ Cassiterite + magnetite
30.05%Sn

Spectrum 33
+ Cassiterite + magnetite
37.81%Sn

2.5µm

887085 Electron Image 11



Spectrum 34
□ Magnetite
0.0%Sn

Spectrum 35
□ Cassiterite + minor magnetite
75.07%Sn

10μm

887085 Electron Image 12

Cassiterite + minor magnetite
Spectrum 36 68.34%Sn

Cassiterite + minor magnetite
Spectrum 37 73.57%Sn

Spectrum 38
Cassiterite + minor magnetite
69.27%Sn

Spectrum 40
Magnetite
0.0%Sn

Spectrum 39
Cassiterite + minor magnetite
73.69%Sn

25µm

887085 Electron Image 13

Spectrum 41

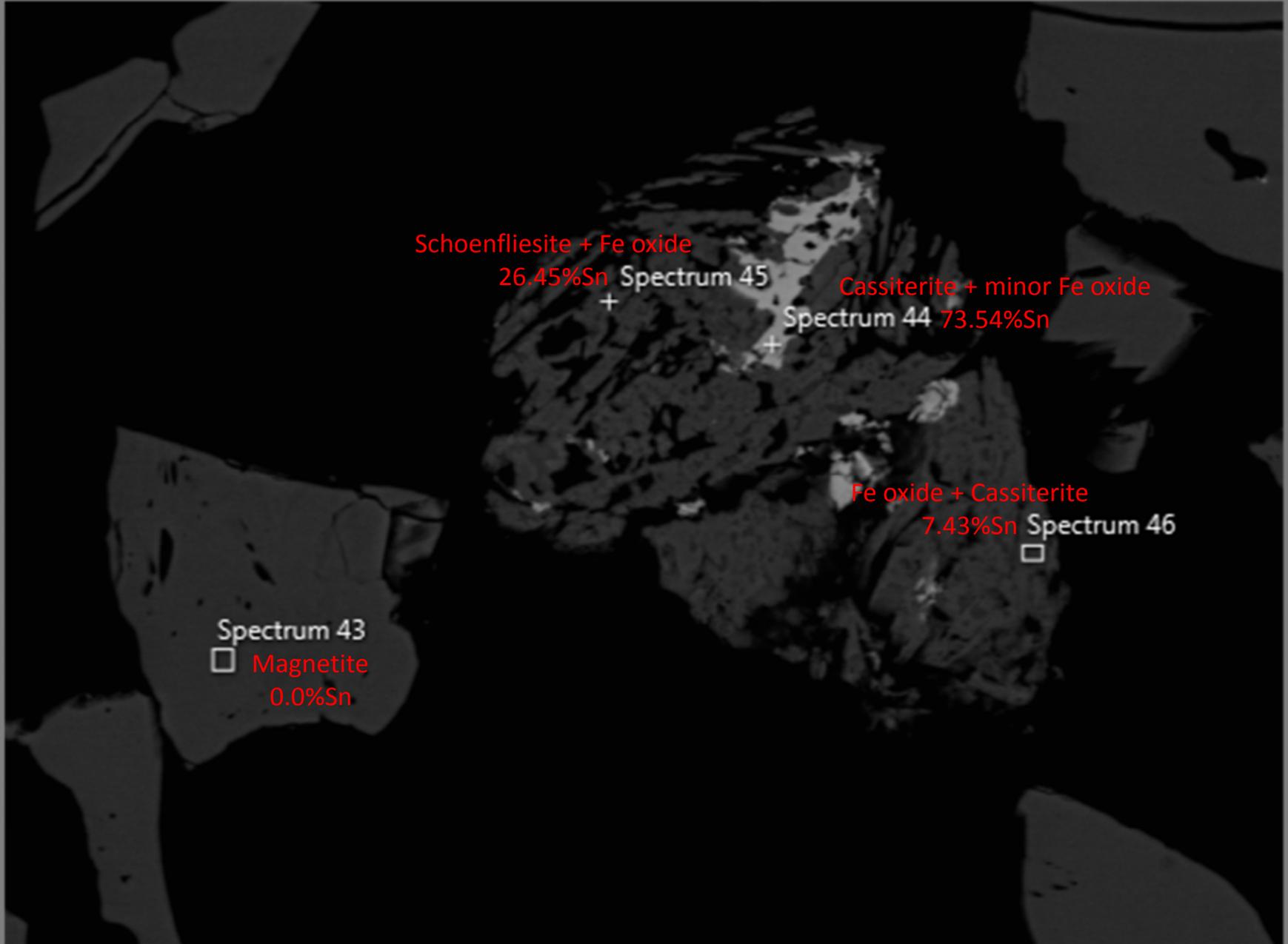
Cassiterite + minor Fe oxide
75.09%Sn

Spectrum 42

Fe oxide + minor Cassiterite
1.22%Sn

25µm

887085 Electron Image 14



Schoenfliesite + Fe oxide

26.45%Sn Spectrum 45



Cassiterite + minor Fe oxide

Spectrum 44 73.54%Sn



Fe oxide + Cassiterite

7.43%Sn Spectrum 46



Spectrum 43



Magnetite

0.0%Sn

25µm

887085 Electron Image 15

Fe oxide + minor Cassiterite
2.64%Sn Spectrum 48



Schoenfliesite + Fe oxide
22.47%Sn Spectrum 49



Spectrum 47
Schoenfliesite + Fe oxide
39.05%Sn



Schoenfliesite + Fe oxide
12.88%Sn Spectrum 50



Schoenfliesite + Fe oxide
13.23%Sn

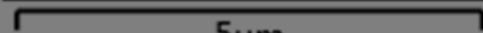
Fe oxide + minor Cassiterite
2.56%Sn Spectrum 51



Spectrum 52



5 μ m



887085 Electron Image 16

Spectrum 57

▣ Fe oxide + minor Silicate
0.0%Sn

Fe oxide + minor Silicate

0.0%Sn

Spectrum 55



Spectrum 53



Fe oxide + minor Silicate
0.0%Sn

Schoenfliesite + Fe oxide

29.18%Sn

Spectrum 54



Spectrum 56



Schoenfliesite + Fe oxide
29.29%Sn

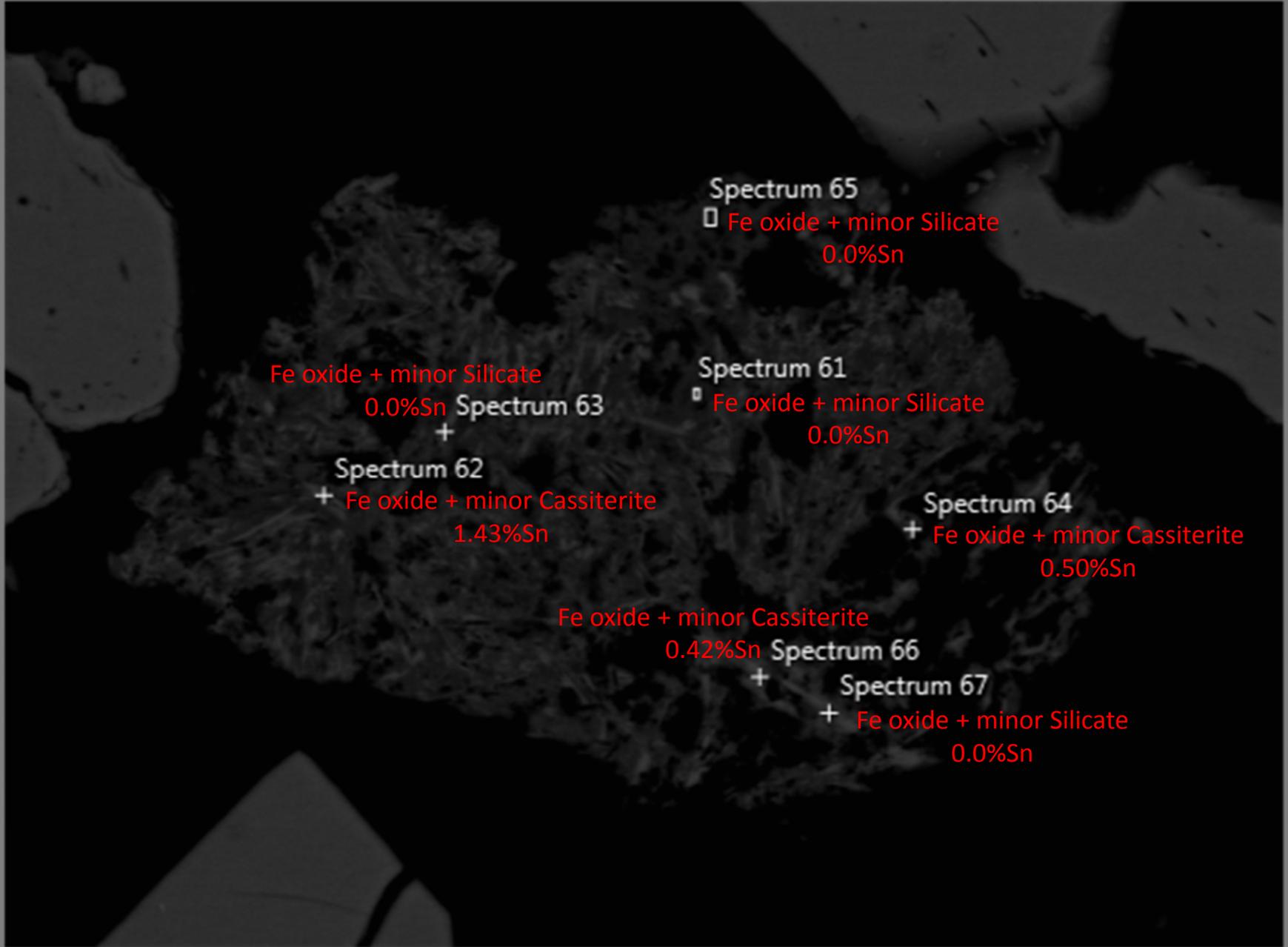
10μm

887085 Electron Image 17



25µm

887085 Electron Image 18



Spectrum 65

□ Fe oxide + minor Silicate
0.0%Sn

Fe oxide + minor Silicate
0.0%Sn Spectrum 63
+

Spectrum 61

□ Fe oxide + minor Silicate
0.0%Sn

Spectrum 62

+ Fe oxide + minor Cassiterite
1.43%Sn

Spectrum 64

+ Fe oxide + minor Cassiterite
0.50%Sn

Fe oxide + minor Cassiterite

0.42%Sn Spectrum 66

+ Spectrum 67

+ Fe oxide + minor Silicate
0.0%Sn

10μm

**MINERALOGICAL REPORT ON CASSITERITE
MAG AND NON-MAG CON SAMPLES SUPPLIED
BY ALS METALLURGY BURNIE**

Attn: John Glen - Manager

S W McKnight

SITE

Mount Helen Campus

Ph 0353279262

Fax 0353279144

s.mcknight@ballarat.edu.au

27th July 2014

Samples Supplied:

Mag Cons

887133	T11 Mag 1 - 1500 Gauss
887134	Mag 2 - 5000 Gauss
887135	Non Mag - 5000 Gauss

QXRD Results – semiquantitative wt%

Phase	887133	887134	887135
Cassiterite	5.9	7.3	23.3
Pyrite	14.9	5.7	10.4
Pyrrhotite	0	0	0
Siderite	39.2	62.6	12.3
Arsenopyrite	1.5	0.8	1.6
Goethite	1.6	10.1	21.9
Quartz	1	1.8	4.9
Marcasite	10.8	5.9	10
Topaz	0.1	0.6	0
Zircon	0.1	0.1	0.8
Diopside (pyrox)	0	0.6	5.5
Forsterite (ol)?	0.7	1.8	4
Fluorite	0.1	0	0
Phlogopite	0	0	0
Dravite (tourm)	0	0.1	3.3
Galena	0.1	0	0
Microcline	0	0	0.9
Magnetite	21.7	0.5	0.3
Chlorite	0.3	0.4	0
Dolomite	1.9	1.7	0.9

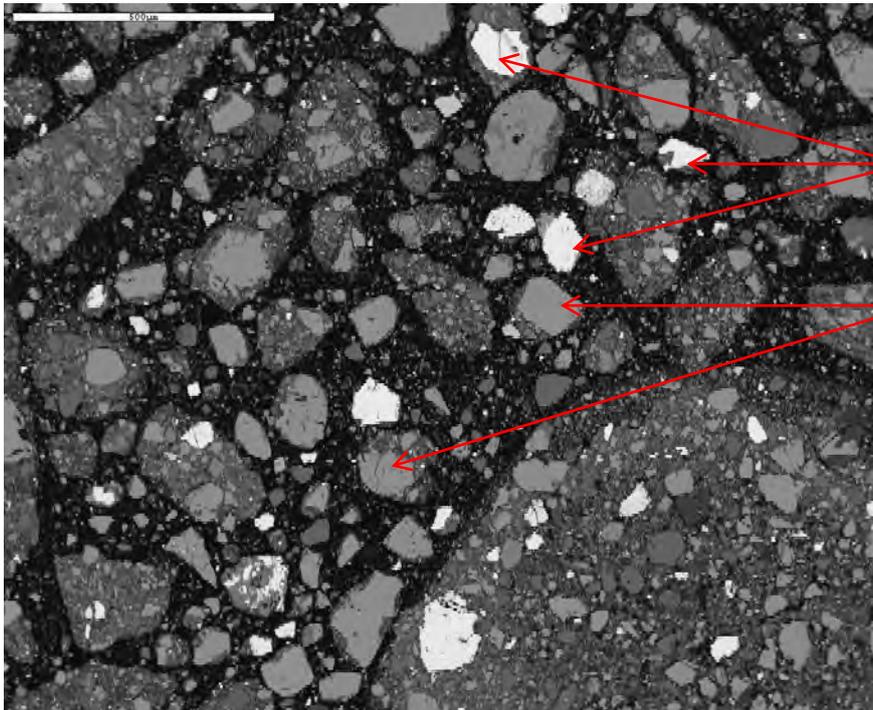
Observation

Cassiterite is present at greatest levels in the non-mag fraction, however, it is present in both mag fractions at similar lower levels.

SEM observations do not appear to indicate any significant different characters of the cassiterite in the mag or non mag fractions.

SEM Analyses

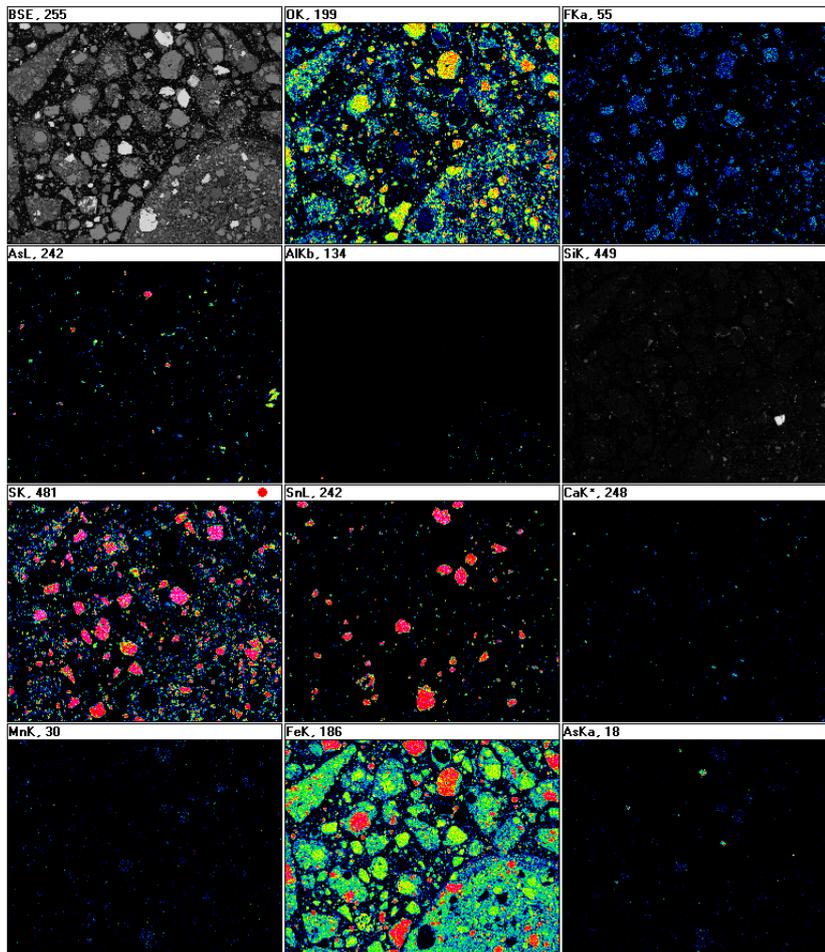
#887133 Mag 1 - 1500 Gauss



cassiterite

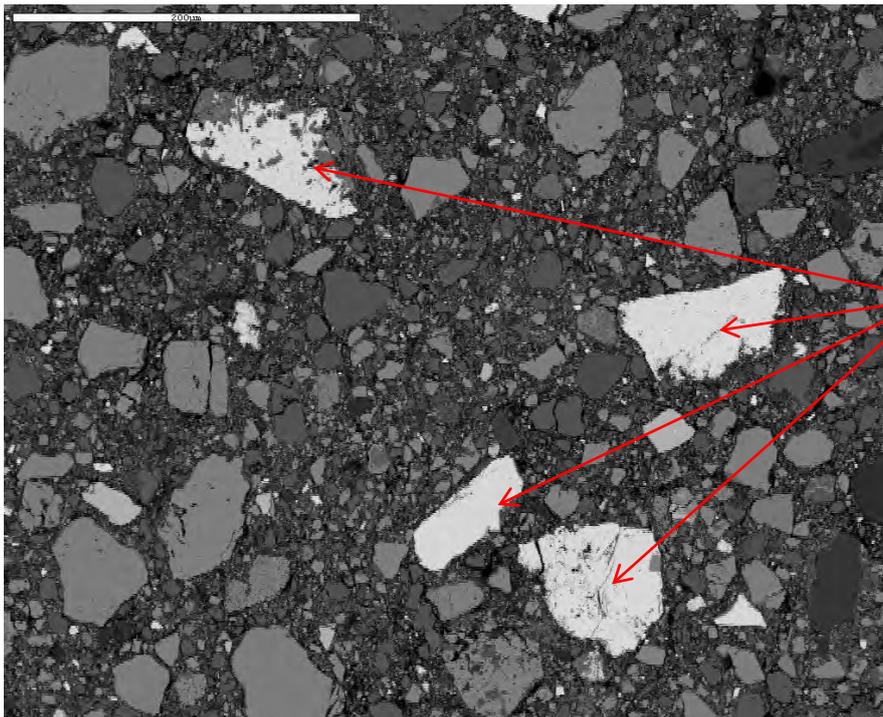
pyrite and marcasite

SEM BSE Image

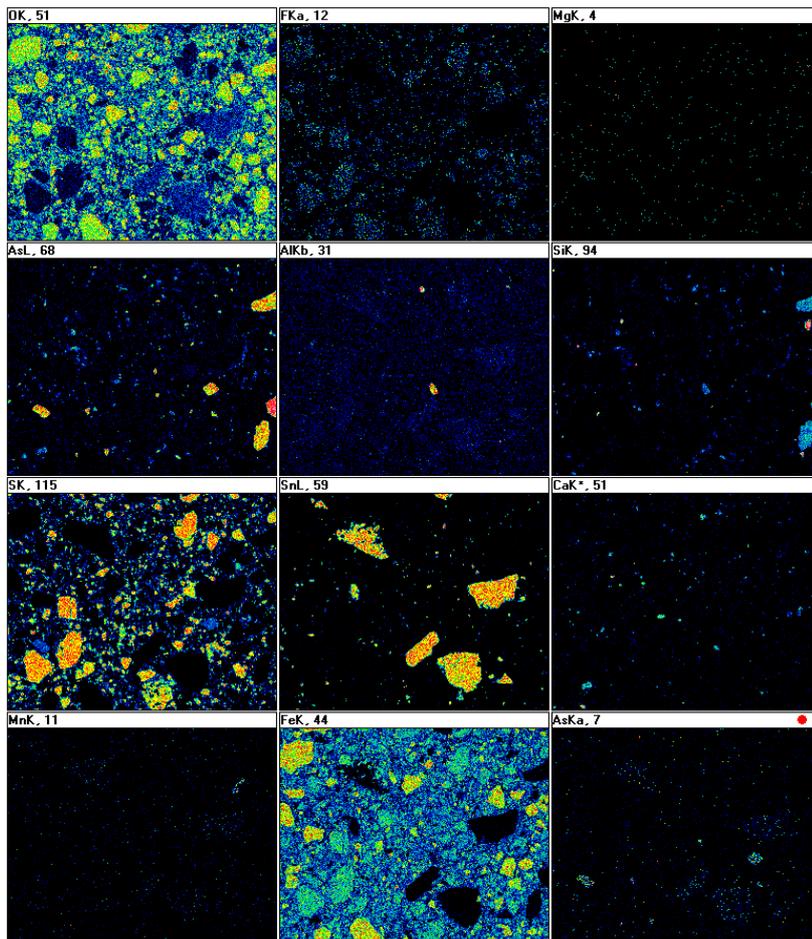


Element x-ray maps obtained from the same field as shown in the SEM BSE image above – phases present can be recognised in the BSE image by inspection of the element map panels

#887133

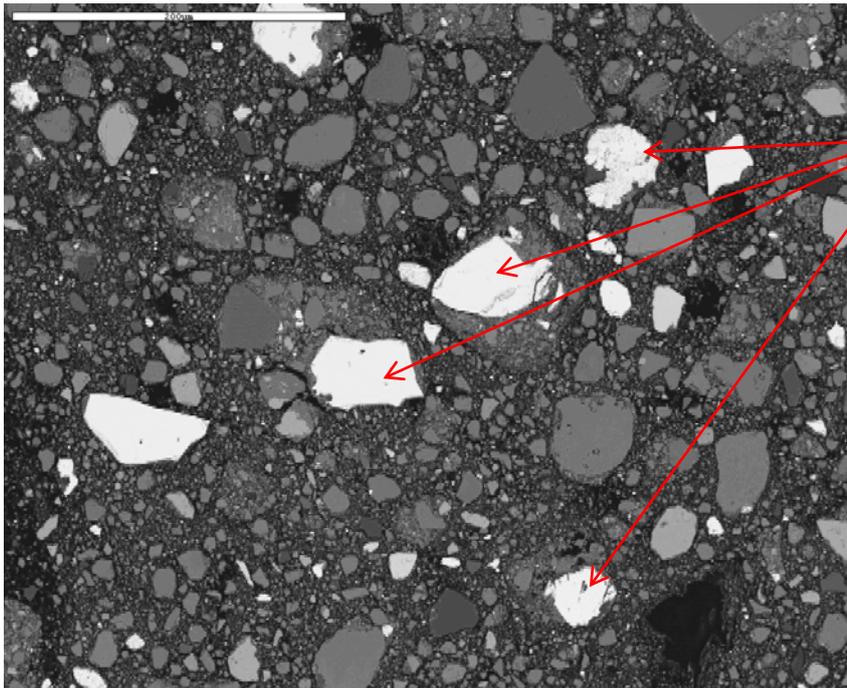


SEM BSE Image



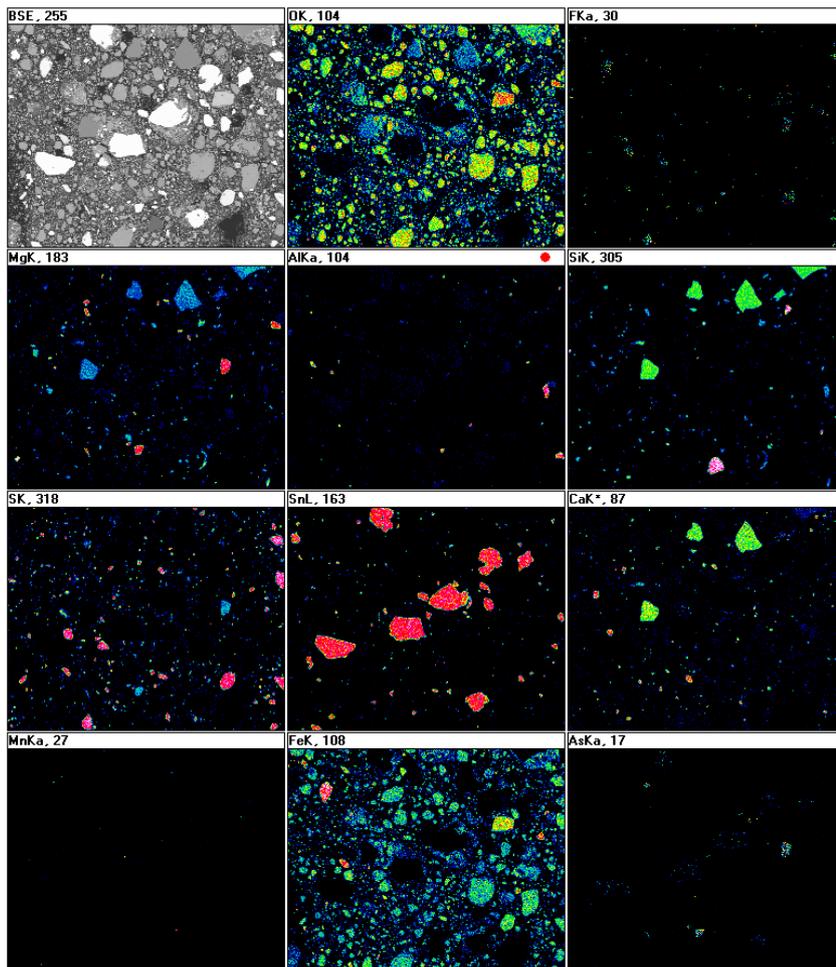
Element x-ray maps obtained from the same field as shown in the SEM BSE image above. Arsenopyrite grains are green in the AsKa panel other phases present can be recognised in the BSE image by inspection of the element map panels

#887134 Mag 2 - 5000 Gauss



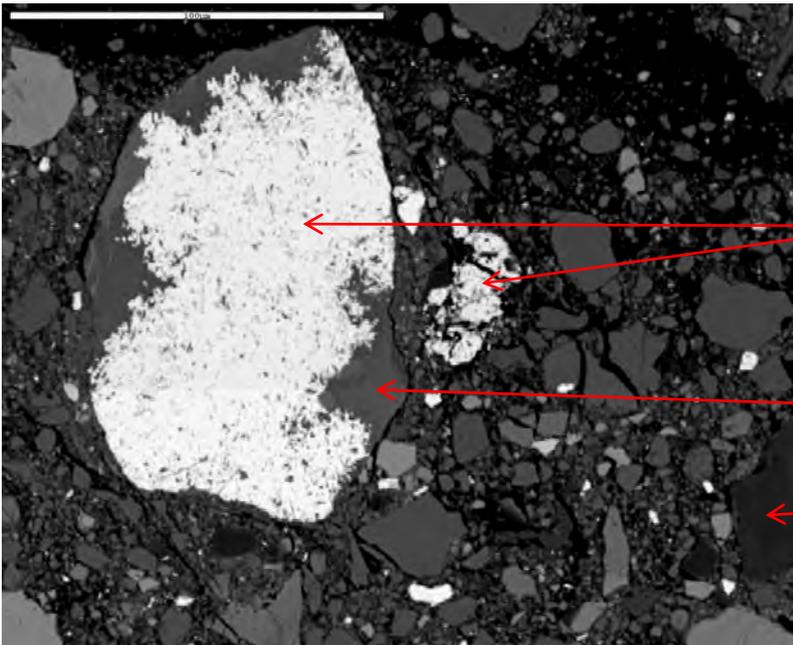
cassiterite

SEM BSE Image



Element x-ray maps obtained from the same field as shown in the SEM BSE image above. Arsenopyrite grains are green in the As K map panel (red in the Mg panel) – other phases present can be recognised in the BSE image by inspection of the element map panels

#887134 Mag 2 - 5000 Gauss

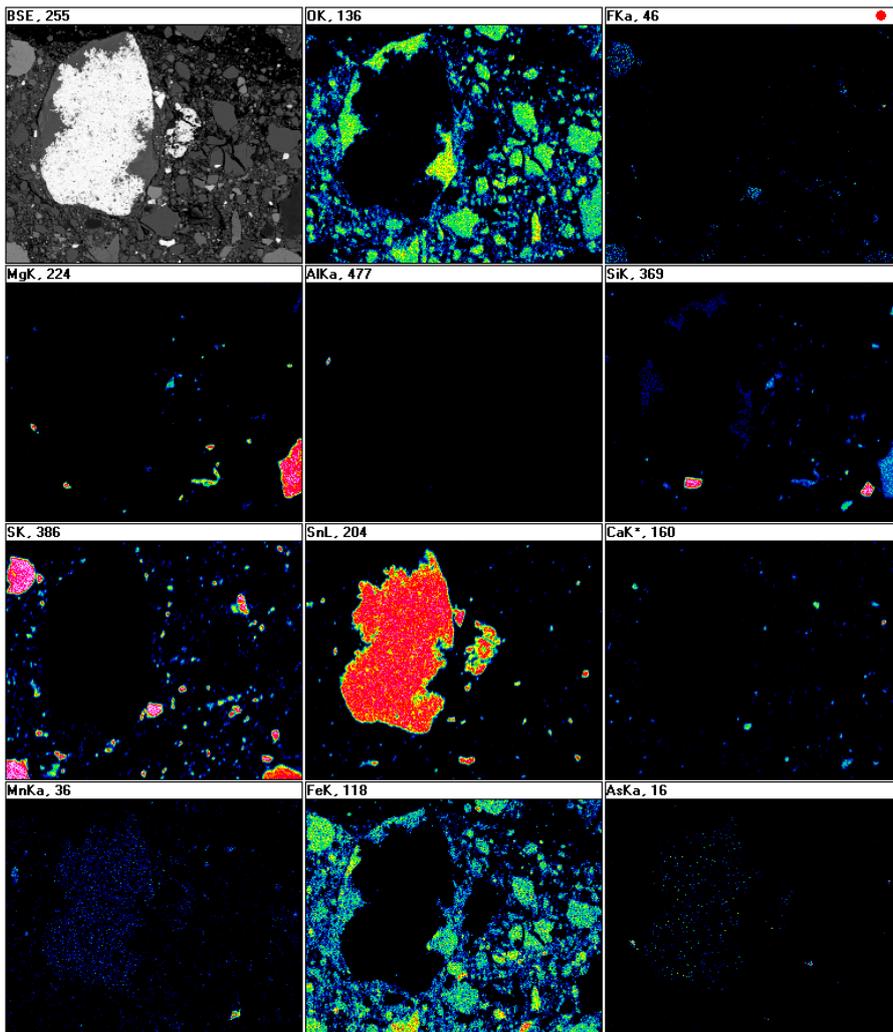


Note the large irregular composite (porous?) grains of cassiterite

Fe oxide or carbonate

olivine

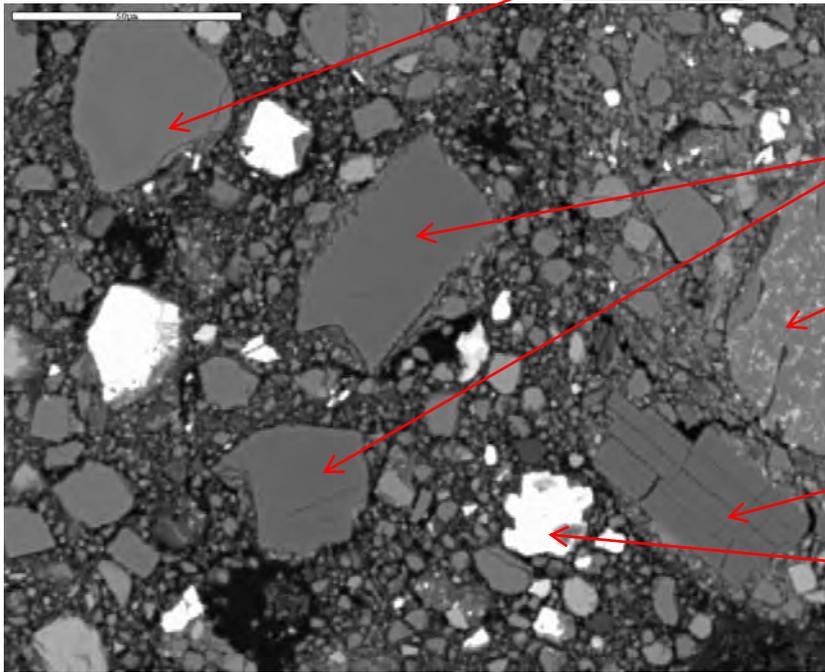
SEM BSE Image



Element x-ray maps obtained from the same field as shown in the SEM BSE image above – various phases present can be identified in the BSE image by inspection of the maps

#887135 Non Mag - 5000 Gauss

siderite



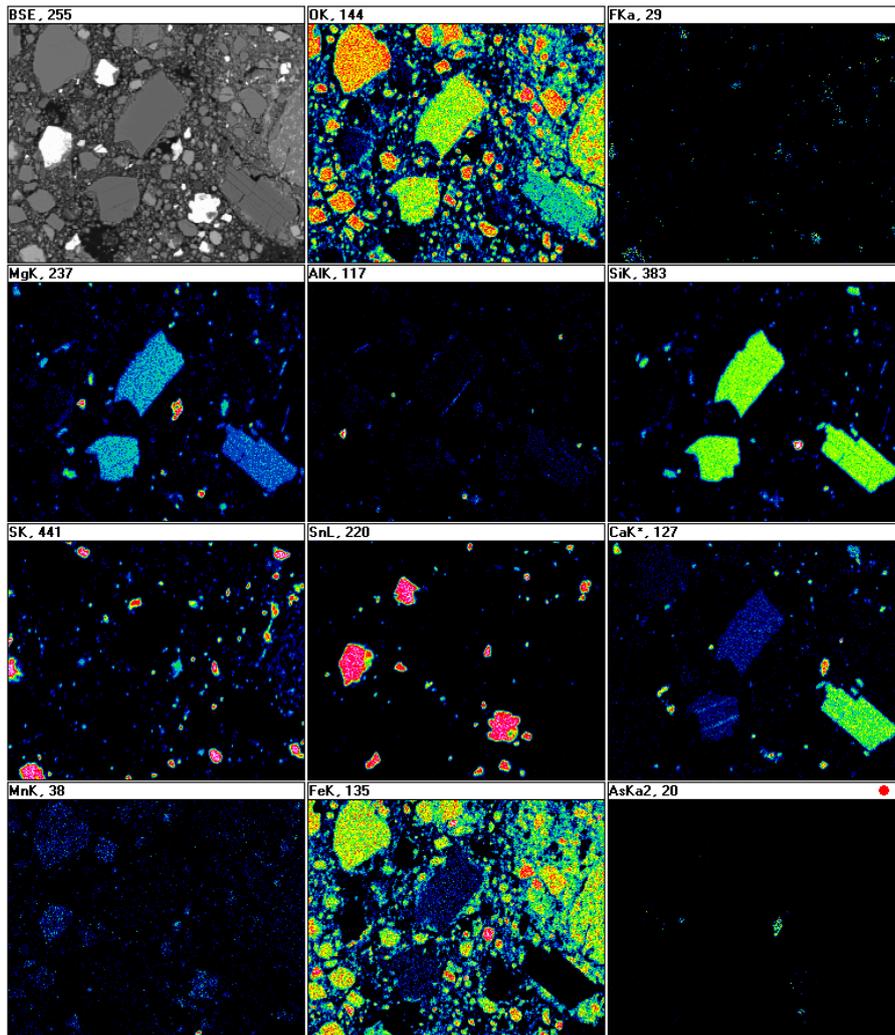
Olivine (forsterite)

goethite

diopside (pyrox)

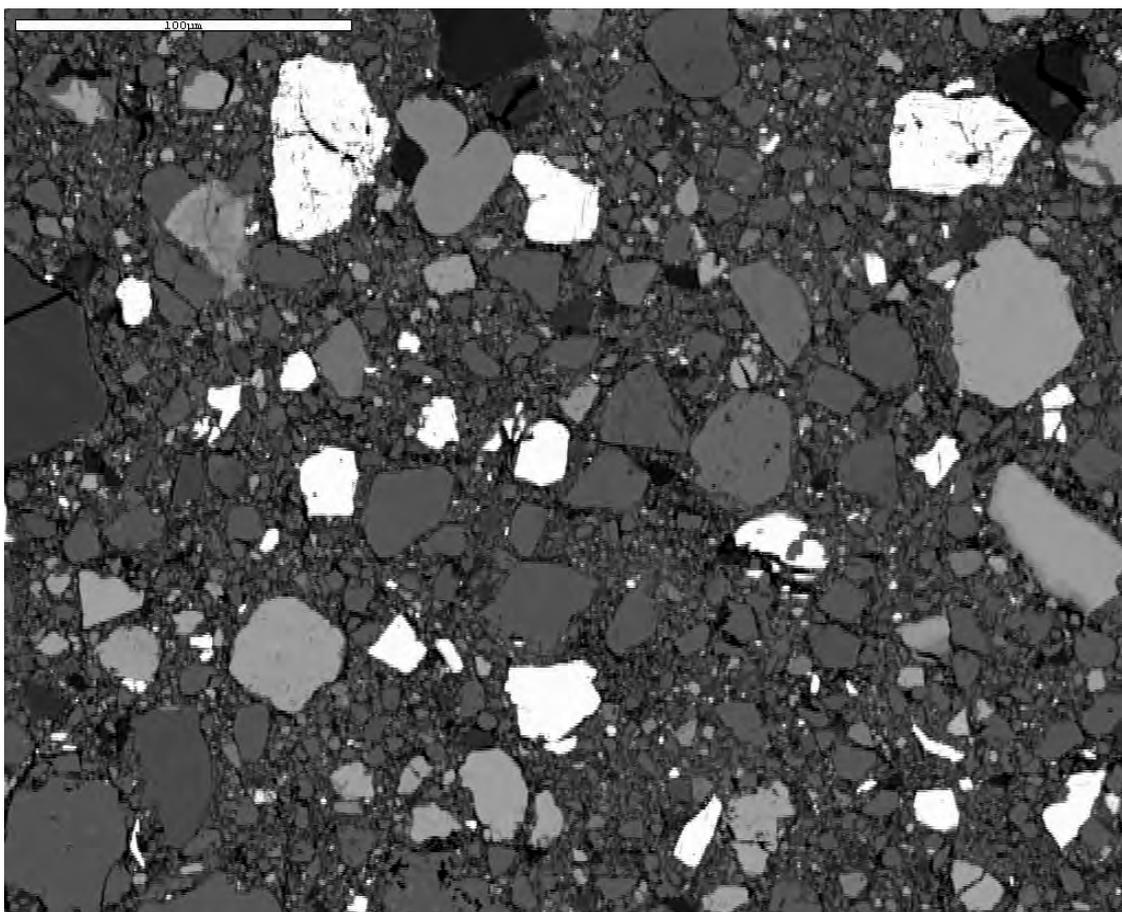
cassiterite with attached phases

SEM BSE Image



Element x-ray maps obtained from the same field as shown in the SEM BSE image above. Arsenopyrite grains are green in the As K map panel

#887135 Non Mag - 5000 Gauss



SEM BSE Image

All bright grains are cassiterite, mid grey grains are sulphides



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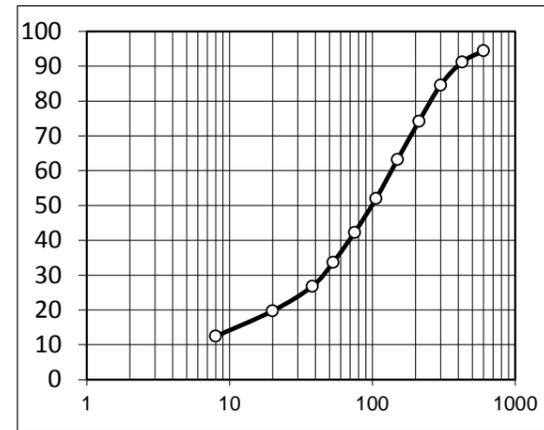
Appendix 3 – Bulk Composite Davis Tube Results

PROJECT	T0887
SAMPLE	St Dizier Composite
FROM TEST NO	
DATE	230514
TECHNICIAN	ID

DAVIS TUBE RECOVERY ON FRACTIONS

SIZING

SIZE um	WEIGHTS	
	(%)	%PASS
212	25.78	100
106	22.25	77.8
53	18.34	59.4
20	13.91	45.5
8	7.27	38.2
<8	12.46	25.8
TOTAL	100.00	



SEPARATIONS

Products	WT %	WT %	Fraction		Fraction		Fraction		Fraction		Fraction		% sol Sn	% of total Sn as Insol Sn
			%Sn	dist	%Insol Sn	dist	%Fe	dist	%SiO2	dist	%S	dist		
Mags+212	53.25	13.73	0.76	65.8	0.54	59.8	49.70	82.4	10.20	20.3	1.22	42.9	0.22	71%
Non Mags+212	46.75	12.05	0.45	34.2	0.42	40.2	12.05	17.6	45.60	79.7	1.85	57.1	0.04	92%
Calc +212 Total	100.00	25.78	0.62	100.0	0.48	100.0	32.10	100.0	26.75	100.0	1.51	100.0	0.13	79%
Mags+106	56.54	12.58	0.58	45.9	0.41	39.0	61.70	84.4	3.95	11.0	0.56	23.5	0.17	71%
Non Mags+106	43.46	9.67	0.89	54.1	0.84	61.0	14.80	15.6	41.50	89.0	2.37	76.5	0.05	94%
Calc +106 Total	100.00	22.25	0.71	100.0	0.60	100.0	41.32	100.0	20.27	100.0	1.35	100.0	0.12	84%
Mags+53	51.40	9.42	0.46	30.5	0.30	23.6	64.90	82.2	2.75	7.0	0.38	15.6	0.16	66%
Non Mags+53	48.60	8.91	1.11	69.5	1.04	76.4	14.90	17.8	38.40	93.0	2.17	84.4	0.07	93%
Calc +53 Total	100.00	18.34	0.78	100.0	0.66	100.0	40.60	100.0	20.08	100.0	1.25	100.0	0.12	85%
Mags+20	40.32	5.61	0.38	16.0	0.21	10.1	66.60	75.2	2.08	3.8	0.24	7.3	0.18	54%
Non Mags+20	59.68	8.30	1.35	84.0	1.23	89.9	14.80	24.8	35.40	96.2	2.07	92.7	0.12	91%
Calc +20 Total	100.00	13.91	0.96	100.0	0.82	100.0	35.69	100.0	21.97	100.0	1.33	100.0	0.14	85%
Mags+CS5	35.50	2.58	0.41	11.2	0.18	5.6	66.30	72.4	1.67	3.4	0.28	6.8	0.23	44%
Non Mags+CS5	64.50	4.69	2.06	83.4	1.90	88.0	17.10	27.6	32.30	96.6	2.58	93.2	0.16	92%
Calc +CS5 Total	100.00	7.27	1.47	94.6	1.29	93.6	36.94	100.0	19.95	100.0	1.65	100.0	0.19	87%
-CS5		12.46	1.02		0.56		34.00		24.40		1.22		0.46	55%
CALC FEED		100.00	0.83		0.66		32.56		19.59		1.22		0.17	79%

SUMMARY

FRACTIONS	Picno SG	WT %	Overall		Overall		Overall		Overall		Overall		% sol Sn	% of total Sn as Insol Sn
			%Sn	dist	%Insol Sn	dist	%Fe	dist	%SiO2	dist	%S	dist		
Mags+212		13.73	0.76	13.45	0.54	12.31	49.70	18.63	10.20	6.16	1.22	12.09	0.22	71%
Mags+106		12.58	0.58	9.40	0.41	8.58	61.70	21.19	3.95	2.19	0.56	5.09	0.17	71%
Mags+53		9.42	0.46	5.59	0.30	4.72	64.90	16.70	2.75	1.14	0.38	2.59	0.16	66%
Mags+20		5.61	0.38	2.75	0.21	1.90	66.60	10.20	2.08	0.51	0.24	0.97	0.18	54%
Mags+CS5		2.58	0.41	1.36	0.18	0.76	66.30	4.67	1.67	0.19	0.28	0.52	0.23	44%
Non Mags+212		12.05	0.45	6.99	0.42	8.26	12.05	3.97	45.60	24.17	1.85	16.10	0.04	92%
Non Mags+106		9.67	0.89	11.09	0.84	13.40	14.80	3.91	41.50	17.65	2.37	16.55	0.05	94%
Non Mags+53		8.91	1.11	12.75	1.04	15.27	14.90	3.63	38.40	15.05	2.17	13.97	0.07	93%
Non Mags+20		8.30	1.35	14.45	1.23	16.90	14.80	3.36	35.40	12.93	2.07	12.41	0.12	91%
Non Mags+CS5		4.69	0.96	5.79	0.82	6.33	17.10	2.19	32.30	6.66	2.58	8.73	0.14	85%
Total Mags		43.92	0.57	32.55	0.39	28.27	59.53	71.39	5.27	10.18	0.67	21.26	0.19	68%
Total Non Mags		43.62	0.91	51.07	0.83	60.16	14.31	17.04	39.85	76.45	2.15	67.76	0.07	92%
-CS5		12.46	1.02	16.38	0.56	11.57	34.00	11.57	24.40	13.37	1.22	10.98	0.46	55%
CALC FEED		100.00	0.78	100.00	0.61	100.00	36.62	100.00	22.74	100.00	1.38	100.00	0.17	78%

PROJECT	T0730
TEST NO	T01
DATE	160514
TECHNICIAN	TF

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	10.01
Magnetic Sample (gms)	5.33
Non-magnetic sample(gms)	4.68
Magnetics Mass (%)	53.25

SAMPLE TESTED

St Dizier Composite +212um

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SolSn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	53.25	0.76	65.8	0.22	87.6	49.70	82.4	10.20	20.3	1.22	42.9
Non Magnetics	46.75	0.45	34.2	0.04	12.4	12.05	17.6	45.60	79.7	1.85	57.1
Total	100.00	0.62	100.0	0.13	100.0	32.10	100.0	26.75	100.0	1.51	100.0
Head		0.62		0.14		30.40		27.70		1.32	

PROJECT	T0730
TEST NO	T02
DATE	160514
TECHNICIAN	TF

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	10.01
Magnetic Sample (gms)	5.66
Non-magnetic sample(gms)	4.35
Magnetics Mass (%)	56.54

SAMPLE TESTED

St Dizier Composite +106um

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SoISn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	56.54	0.58	45.9	0.17	81.0	61.70	84.4	3.95	11.0	0.56	23.5
Non Magnetics	43.46	0.89	54.1	0.05	19.0	14.80	15.6	41.50	89.0	2.37	76.5
Total	100.00	0.71	100.0	0.12	100.0	41.32	100.0	20.27	100.0	1.35	100.0
Head		0.74		0.13		40.90		21.00		1.38	

PROJECT	T0730
TEST NO	T03
DATE	160514
TECHNICIAN	TF

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	10.02
Magnetic Sample (gms)	5.15
Non-magnetic sample(gms)	4.87
Magnetics Mass (%)	51.40

SAMPLE TESTED	
St Dizier Composite +53um	

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SoISn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	51.40	0.46	30.5	0.16	69.5	64.90	82.2	2.75	7.0	0.38	15.6
Non Magnetics	48.60	1.11	69.5	0.07	30.5	14.90	17.8	38.40	93.0	2.17	84.4
Total	100.00	0.78	100.0	0.12	100.0	40.60	100.0	20.08	100.0	1.25	100.0
Head		0.78		0.13		41.00		19.35		1.20	

PROJECT	T0730
TEST NO	T04
DATE	160514
TECHNICIAN	TF

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	10.02
Magnetic Sample (gms)	4.04
Non-magnetic sample(gms)	5.98
Magnetics Mass (%)	40.32

SAMPLE TESTED	
St Dizier Composite +20um	

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SoISn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	40.32	0.38	16.0	0.18	50.0	66.60	75.2	2.08	3.8	0.24	7.3
Non Magnetics	59.68	1.35	84.0	0.12	50.0	14.80	24.8	35.40	96.2	2.07	92.7
Total	100.00	0.96	100.0	0.14	100.0	35.69	100.0	21.97	100.0	1.33	100.0
Head		0.95		0.16		36.70		21.60		1.30	

PROJECT	T0730
TEST NO	T05
DATE	160514
TECHNICIAN	TF

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	10.00
Magnetic Sample (gms)	3.55
Non-magnetic sample(gms)	6.45
Magnetics Mass (%)	35.50

SAMPLE TESTED
St Dizier Composite +CSS

MAGNETIC SEPARATION RESULTS											
PRODUCT	Wt (%)	Sn (%)	Dist (%)	SolSn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	35.50	0.41	9.9	0.23	44.1	66.30	68.1	1.67	2.8	0.28	5.6
Non Magnetics	64.50	2.06	90.1	0.16	55.9	17.10	31.9	32.30	97.2	2.58	94.4
Total	100.00	1.47	100.0	0.19	100.0	34.57	100.0	21.43	100.0	1.76	100.0
Head		1.45		0.20		35.00		20.50		1.67	



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Appendix 4 – Bulk Composite Comminution Results

BOND ROD MILL CLOSED CIRCUIT GRINDABILITY : 1180 MICROMETERS

SAMPLE IDENTITY	T0887 Costean Lump Ore
CLIENT	Stellar Resources
PROJECT No	P0608 St Dizier Project
DATE	27-May

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	100	2246.1	2246.1	1092.1	1154.1	663.7	6.637	95	1154.1	251.9
2	131	2246.1	1154.1	1198.0	1048.1	796.2	6.078	114	1048.1	228.8
3	147	2246.1	1048.1	1161.8	1084.3	855.5	5.820	107	1084.3	236.7
4	152	2246.1	1084.3	1122.8	1123.3	886.6	5.833	100	1123.3	245.2
5	151	2246.1	1123.3	1117.5	1128.6	883.4	5.850	99	1128.6	246.4
6	150	2246.1	1128.6	1123.6	1122.5	876.1	5.841	100	1122.5	245.0

Note : * = Ex grinding mill

PRODUCT IN THE FEED	21.83 (%)
BULK DENSITY	1.7969 (t/m³)
IDEAL POTENTIAL PRODUCT	1123.1 (g)
AVERAGE EQUILIBRIUM CIRC LOAD	100 (%)
AVERAGE PRODUCT	5.846 (g/rev)
80 % PASSING FEED SIZE	8811 (µm)
80 % PASSING PRODUCT SIZE	859 (µm)

BOND ROD MILL WORK INDEX (Kilowatt hours / dry tonne) :	19.0
------------------------------------------------------------------	-------------



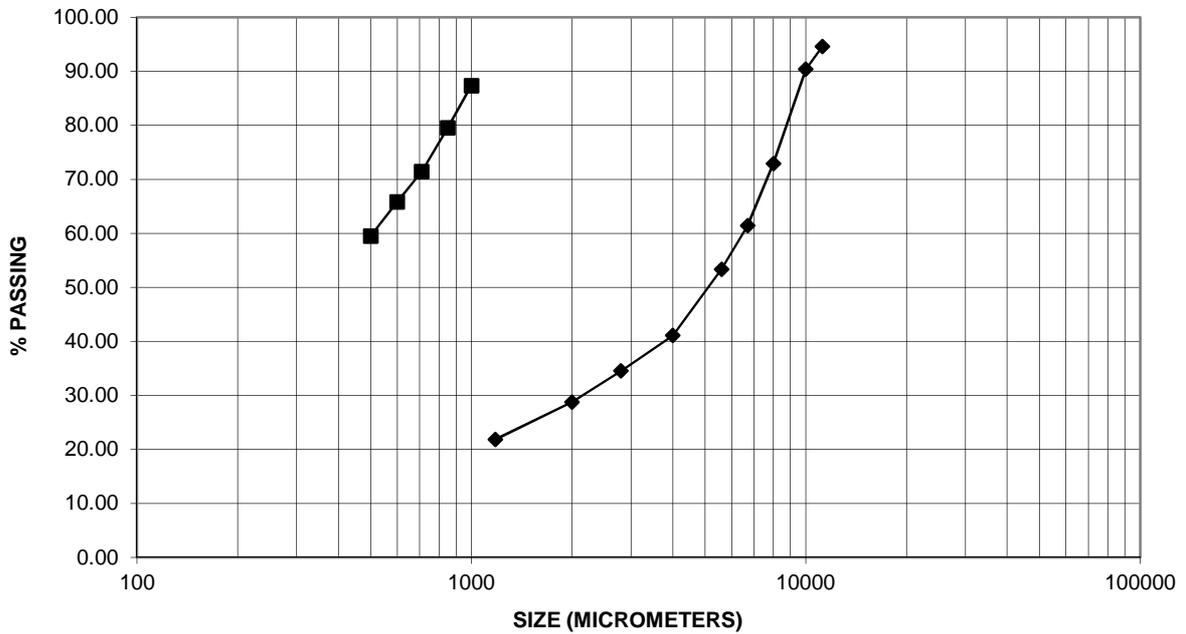
BOND ROD MILL GRINDABILITY TEST FEED AND PRODUCT SIZINGS

T0887 Costean Lump Ore
P0608 St Dizier Project

FEED TO PERIOD No. 1			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
11.200	54.3	5.42	94.58
10.000	42.0	4.20	90.38
8.000	174.6	17.46	72.92
6.700	115.1	11.51	61.41
5.600	80.7	8.06	53.35
4.000	122.8	12.27	41.07
2.800	65.7	6.56	34.51
2.000	57.7	5.76	28.75
1.180	69.2	6.92	21.83
-1.180	218.3	21.83	
TOTAL	1000.2	100.00	
F 80 (µm) :		8811	

EQUILIBRIUM PRODUCTS			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
1.000	142.2	12.66	87.34
0.850	87.8	7.81	79.53
0.710	90.7	8.08	71.45
0.600	63.3	5.64	65.81
0.500	71.0	6.32	59.49
-0.500	668.1	59.49	
TOTAL	1123.1	100.00	
P 80 (µm) :		859	

BOND ROD MILL GRINDABILITY : FEED & PRODUCT SIZE DISTRIBUTION



BOND BALL MILL CLOSED CIRCUIT GRINDABILITY : 150 MICROMETERS

SAMPLE IDENTITY	T0887 Costean Lump Ore
CLIENT	Stellar Resources
PROJECT No	P0608 St Dizier Project
DATE	

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	150	1221.1	1221.1	857.7	363.4	197.4	1.316	236	363.4	49.4
2	228	1221.1	363.4	876.1	345.0	295.6	1.296	254	345.0	46.9
3	233	1221.1	345.0	875.5	345.6	298.7	1.282	253	345.6	47.0
4	236	1221.1	345.6	885.2	335.9	288.9	1.224	264	335.9	45.7
5	248	1221.1	335.9	855.4	365.6	320.0	1.290	234	365.6	49.7
6	232	1221.1	365.6	874.1	346.9	297.2	1.281	252	346.9	47.2
7	235	1221.1	346.9	874.0	347.1	299.9	1.276	252	347.1	47.2

Note : * = Ex grinding mill

PRODUCT IN THE FEED	13.59 (%)
BULK DENSITY	1.7444 (t/m³)
IDEAL POTENTIAL PRODUCT	348.9 (g)
AVERAGE EQUILIBRIUM CIRC LOAD	252 (%)
AVERAGE PRODUCT	1.279 (g/rev)
80 % PASSING FEED SIZE	2351 (µm)
80 % PASSING PRODUCT SIZE	118 (µm)

BOND BALL MILL WORK INDEX (Kilowatt hours / dry tonne) : 17.7

BOND BALL MILL GRINDABILITY TEST FEED AND PRODUCT SIZINGS

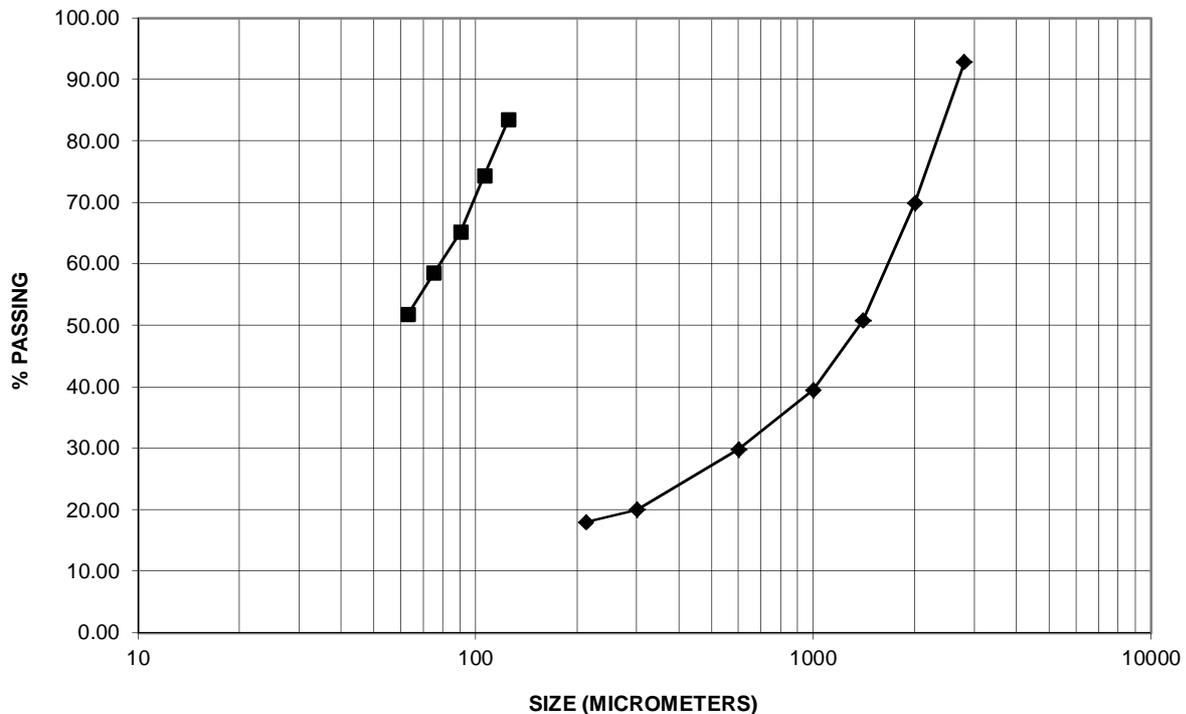
T0887 Costean Lump Ore

P0608 St Dizier Project

FEED TO PERIOD No. 1			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
2.800	71.8	7.17	92.83
2.000	228.9	22.86	69.97
1.400	192.0	19.18	50.78
1.000	112.8	11.27	39.51
0.600	96.9	9.68	29.83
0.300	98.3	9.82	20.01
0.212	20.0	2.00	18.02
0.150	44.3	4.42	13.59
-0.150	136.1	13.59	
TOTAL	1001.1	100.00	
F 80 (µm) :		2351	

EQUILIBRIUM PRODUCTS			
Size (mm)	Weight (g)	Retained (%)	Passing (%)
0.125	57.4	16.46	83.54
0.106	31.9	9.14	74.39
0.090	32.0	9.16	65.23
0.075	23.3	6.68	58.55
0.063	23.4	6.69	51.85
0.045	30.4	8.71	43.14
-0.045	150.5	43.14	0.00
TOTAL	348.9	100.00	
P 80 (µm) :		118	

BOND BALL MILL GRINDABILITY : FEED & PRODUCT SIZE DISTRIBUTION



BOND ABRASION INDEX DETERMINATION

SAMPLE IDENTITY	T0887 Costean Lump Ore
CLIENT	Stellar Resources
PROJECT No	P0608 St Dizier Project
DATE	May-14

SIZE ANALYSIS : ABRASION INDEX PRODUCT

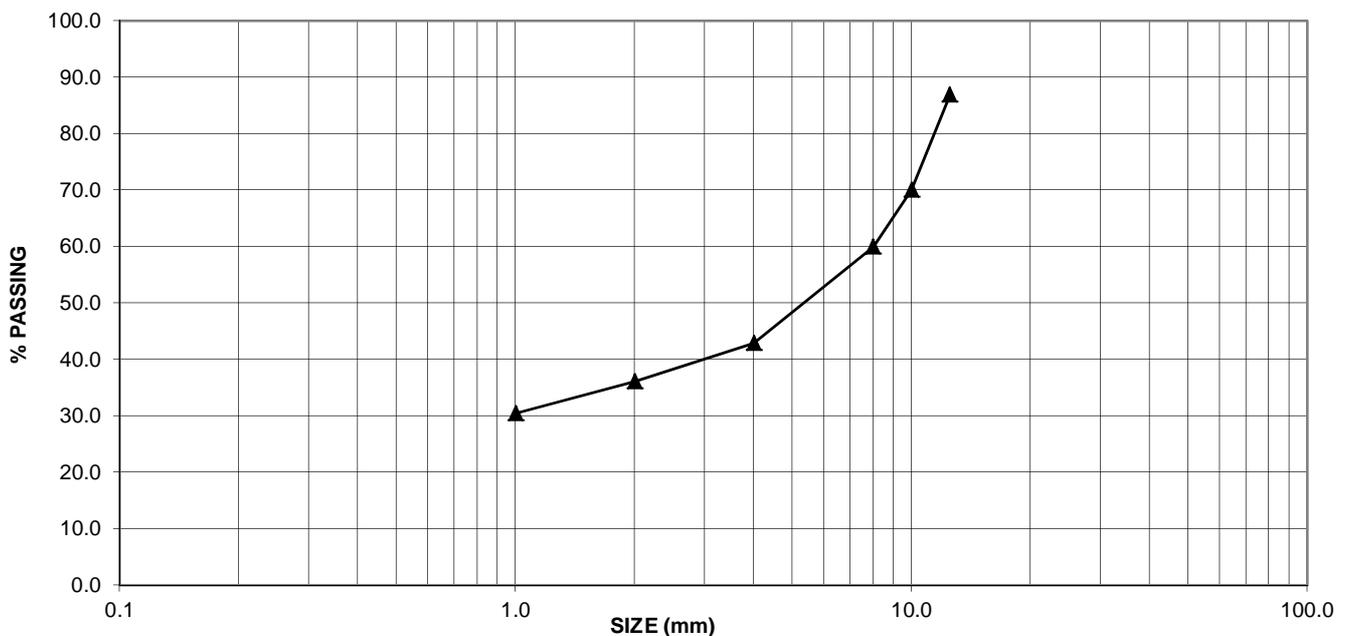
Operation	Size (mm)	Weight (g)	Weight (%)	Weight % <
Screening	12.5	209.2	13.1	86.9
	10.0	269.8	16.9	70.1
	8.0	160.7	10.0	60.0
	4.0	273.9	17.1	42.9
	2.0	108.0	6.8	36.1
	1.0	91.0	5.7	30.4
	-1.0	486.9	30.4	
Total		1599.4	100.00	

PADDLE WEIGHT BEFORE TEST (g) : 88.8398

PADDLE WEIGHT AFTER TEST (g) : 88.7230

BOND ABRASION INDEX (Ai) : 0.1168

BOND ABRASION PRODUCT SIZE ANALYSIS





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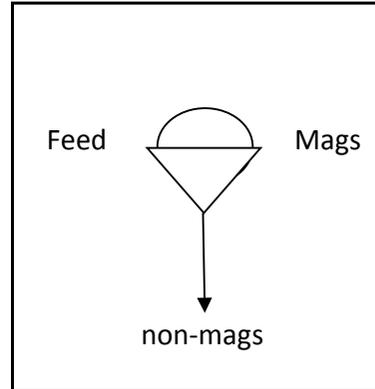
Appendix 5 – Bulk Composite Magnetic Separation Results



BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0001
TEST NO	LC01
DATE	230511
TECH	ID

TEST TYPE	SALA Wet Drum
Feed Solids (g)	9769.3
Feed Water (L)	90.0
Pump Flow Rate (lpm)	2.0
Density (%)	8.0
Time (min)	45.0
Pump 01 Output (%)	62.0
Pump 02 Output (%)	62.0
Comments	



FEED MATERIAL LC01 -212	
FROM TEST NO	LC01
START WT (gm)	9769.3

MAGNETIC SEPARATION RESULTS

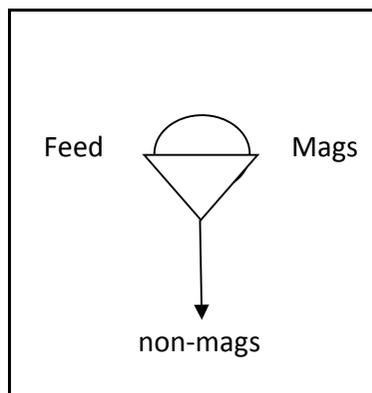
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics	4622	4622	47.31	0.62	37.0	57.50	78.4	6.90	13.5	0.70	25.4		
Non Magnetics	5147	5147	52.69	0.95	63.0	14.20	21.6	39.80	86.5	1.85	74.6		
TOTAL	9769.00		100.00	0.79	100.0	34.69	100.0	24.23	100.0	1.31	100.0		

Cal dry mass

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0001
TEST NO	LC02
DATE	280511
TECH	ID

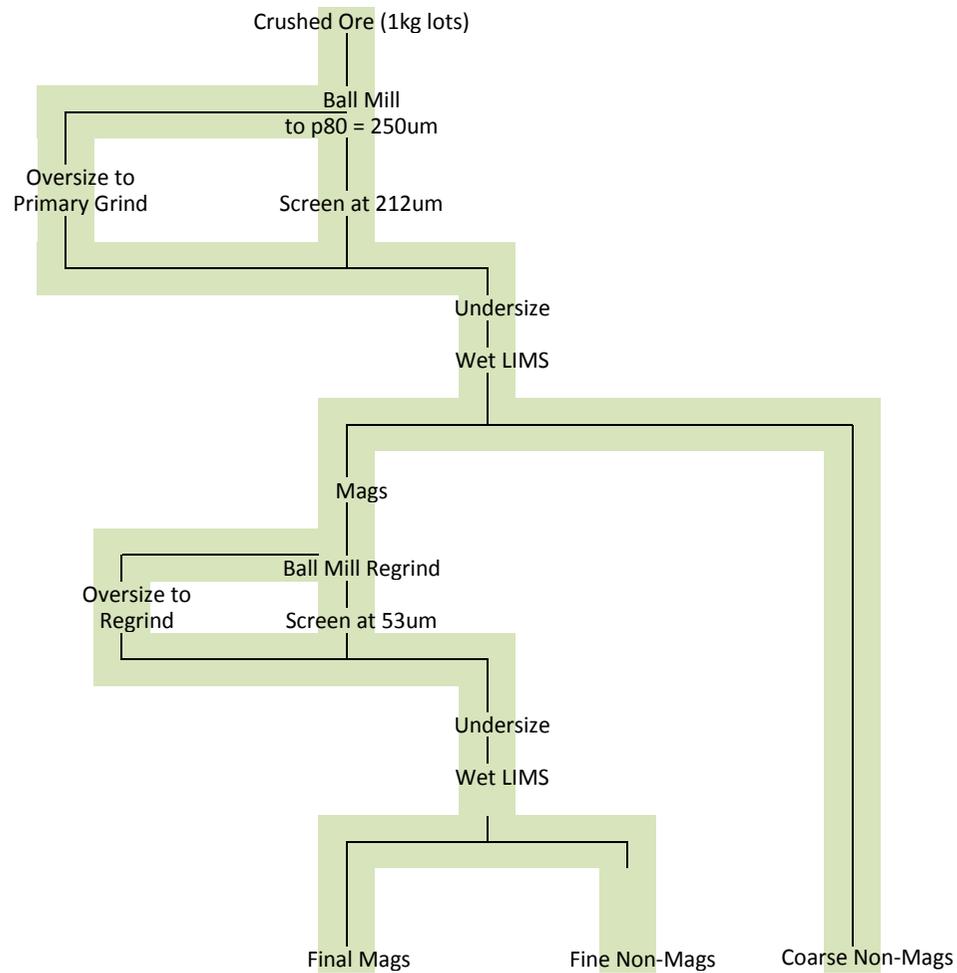
TEST TYPE	SALA Wet Drum
Feed Solids (g)	4498.0
Feed Water (L)	50.0
Pump Flow Rate (lpm)	2.0
Density (%)	8.0
Time (min)	25.0
Pump 01 Output (%)	62.0
Pump 02 Output (%)	62.0
Comments	



FEED MATERIAL	
LC02 -53	
FROM TEST NO	LC01
START WT (gm)	4498

MAGNETIC SEPARATION RESULTS

PRODUCT			Tin		Iron		Silica		Sulphur				
NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics	3815.7	3815.7	87.23	0.46	64.8	62.20	96.4	3.94	47.5	0.47	55.5		
Non Magnetics	558.4	558.4	12.77	1.71	35.2	16.10	3.6	29.80	52.5	2.58	44.5		
TOTAL	4374.10		100.00	0.62	100.0	56.31	100.0	7.24	100.0	0.74	100.0		



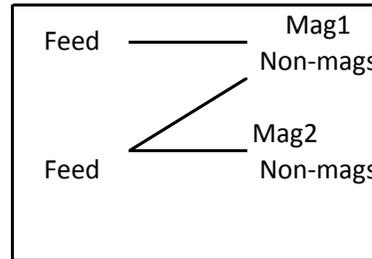
Sample Description	Weight (gm)	SAMPLE DESCRIPTION	ME-XRF15d	ME-XRF15d	ME-XRF15d	ME-XRF15d
			Sn	Fe	S	SiO2
LC01 -212 Mags	4622.0	887028	0.62	57.5	0.7	6.9
-212 Non Mags	4935.0	887029	0.95	14.2	1.85	39.8
LC02 -53 Mags	3815.7	887030	0.46	62.2	0.47	3.94
-53 Non Mags	558.4	887031	1.71	16.1	2.58	29.8
Calc Feed	9309.10		0.79	33.99	1.33	24.50
-212 Non Mags	53.01		63.4	22.1	73.8	86.1
LC02 -53 Mags	40.99		23.7	75.0	14.5	6.6
-53 Non Mags	6.00		12.9	2.8	11.7	7.3
Rec to Non-Mags	59.01		76.3	25.0	85.5	93.4

Sample Description	Weight (gm)	% Sn	% Fe	% S	% SiO2
Coarse Non Mags	4935.0	0.95	14.2	1.85	39.8
Fine Mags	3815.7	0.46	62.2	0.47	3.94
Fine Non Mags	558.4	1.71	16.1	2.58	29.8
Distributions:	Weight	Sn	Fe	S	SiO2
Coarse Non Mags	53.01	63.4	22.1	73.8	86.1
Fine Non Mags	6.00	12.9	2.8	11.7	7.3
Rec to Non-Mags	59.01	76.3	25.0	85.5	93.4
Fine Mags	40.99	23.7	75.0	14.5	6.6
Calc Feed	9309.10	0.79	33.99	1.33	24.50

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T11
DATE	030714
TECH	ID

TEST TYPE	Rapid Magnetic Sep
Feed Solids (g)	134.2
Current (A)	0.1, 0.6
Magnetic intense1 (G)	1500
Magnetic intense2 (G)	5000
Comments	



FEED MATERIAL	
Ro Tail + CI Tail	
FROM TEST NO	T10
START WT (gm)	134.2

QXRD 27 July 14

MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics 1 (1500 gauss)	48.2	48.2	35.92	4.87	15.7	44.90	45.1	2.31	12.4	14.95	51.1		
Magnetics 2 (5000 gauss)	26.7	26.7	19.90	6.25	11.2	37.50	20.9	5.54	16.5	6.13	11.6		
Non Magnetics	59.3	59.3	44.19	18.45	73.1	27.60	34.1	10.75	71.1	8.85	37.2		
TOTAL	134.20		100.00	11.15	100.0	35.78	100.0	6.68	100.0	10.50	100.0		

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics 1+2	74.9	74.9	55.81	5.36	26.9	42.26	65.9	3.46	28.9	11.81	62.8		
Non Magnetics	59.3	59.3	44.19	18.45	73.1	27.60	34.1	10.75	71.1	8.85	37.2		
TOTAL	134.20		100.00	11.15	100.0	35.78	100.0	6.68	100.0	10.50	100.0		



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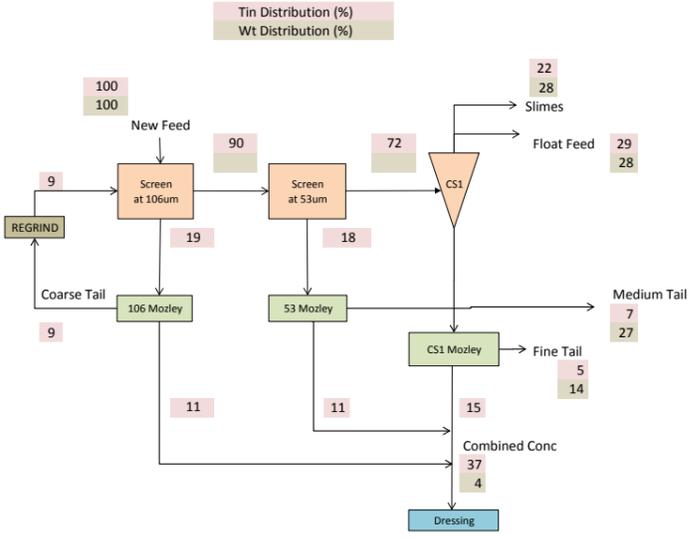
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Appendix 6 – Bulk Composite Gravity Separation Results

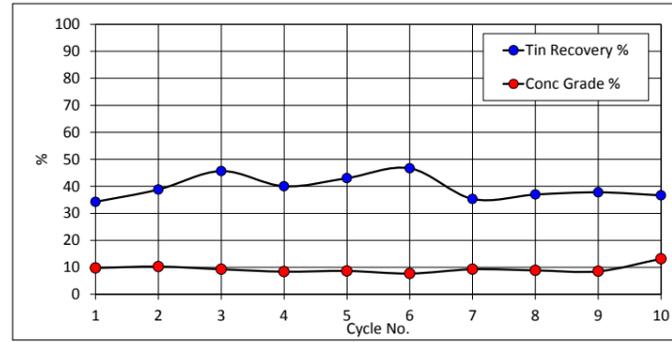
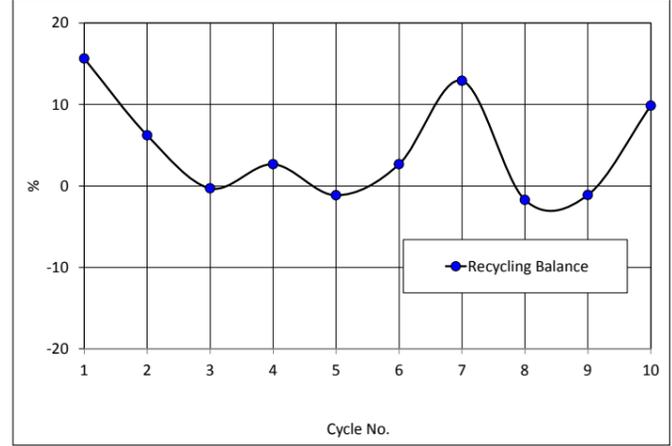
EXIT STREAMS		1	2	3	4	5	6	7	8	9	10	AV(8-9)	
1	Gravity final conc 1 (+150/106 Conc)	gm	3.01	3.18	3.87	3.39	3.50	4.48	8.08	10.61	10.53	6.47	10.57
	dry wt and assays	%Sn	4.91	4.95	4.46	4.91	4.99	4.27	6.11	5.13	5.15	7.03	5.14
		%Fe	41.80	41.40	40.40	39.40	40.90	40.60	37.30	36.10	37.10	36.40	36.60
		%S	24.40	24.20	21.60	23.30	24.00	20.90	19.40	17.40	18.05	10.40	17.73
2	Gravity final conc 2 (+53 Conc)	gm	10.19	10.16	12.31	12.70	12.28	16.93	5.02	5.87	7.02	4.01	6.45
	dry wt and assays	%Sn	8.03	8.44	7.36	7.19	7.48	6.28	10.35	9.30	8.94	14.70	9.12
		%Fe	37.70	35.70	36.80	38.00	37.40	37.0	36.70	37.60	37.70	34.90	37.65
		%S	22.50	20.00	18.10	20.30	19.20	17.1	22.00	20.70	19.95	8.92	20.33
3	Gravity final conc 3 (+CS2 Conc)	gm	4.89	6.14	9.19	8.50	9.85	9.87	6.53	5.00	5.31	3.89	5.16
	dry wt and assays	%Sn	16.40	16.10	13.90	11.60	11.45	11.7	12.40	16.35	14.70	21.80	15.53
		%Fe	33.10	34.30	33.90	36.30	36.00	35.8	36.40	34.10	35.90	32.60	35.00
		%S	19.40	23.10	17.65	18.55	18.00	17.05	18.60	23.30	20.50	8.50	21.90
4	Gravity Final Tail (+53 Medium Tails)	gm	132.80	168.60	182.00	168.70	180.80	163.30	112.30	129.30	140.90	126.50	135.10
	dry wt and assays	%Sn	0.27	0.28	0.27	0.26	0.27	0.29	0.35	0.26	0.27	0.23	0.265
		%Fe	10.70	11.90	11.60	11.30	11.30	10.5	14.80	10.90	11.45	10.15	11.18
		%S	0.37	0.57	0.48	0.46	0.47	0.39	0.96	0.37	0.45	0.26	0.41
5	Gravity Final Tail (+CS2/CS1 Tails)	gm	66.20	68.40	78.60	72.90	80.60	71.10	51.40	70.80	65.50	53.10	68.15
	dry wt and assays	%Sn	0.59	0.45	0.47	0.54	0.47	0.51	0.37	0.35	0.36	0.33	0.36
		%Fe	13.70	13.40	14.30	14.55	14.15	14.4	12.70	13.10	13.25	12.80	13.18
		%S	1.01	0.95	0.98	1.20	0.99	0.91	0.83	0.60	0.81	0.41	0.71
6	CS3/CS2-CS5 (Tin Float Feed)	gm	88.26	92.94	95.59	97.14	96.78	96.25	120.76	144.84	132.54	124.86	138.69
	dry wt and assays	%Sn	1.10	1.09	1.07	1.02	1.08	1.06	1.24	1.04	1.13	1.16	1.09
		%Fe	14.30	14.40	14.50	14.20	14.60	14.6	15.90	15.45	15.60	15.00	15.53
		%S	1.63	1.69	1.61	1.63	1.64	1.69	2.03	1.80	1.83	0.59	1.82
7	<CS5 (Slime)	gm	112.80	115.50	115.60	119.20	117.60	120.60	127.60	137.80	139.40	128.00	138.60
	dry wt and assays	%Sn	0.96	0.97	0.94	0.90	0.91	0.91	0.82	0.85	0.85	0.87	0.84
		%Fe	14.30	14.50	14.70	14.25	14.50	14.6	14.45	15.00	14.15	14.45	14.58
		%S	0.93	0.95	0.99	1.34	1.27	1.43	1.19	1.22	1.27	1.06	1.25
COMBINED CONCENTRATE		gm	18.09	19.48	25.37	24.59	25.63	31.28	19.63	21.48	22.86	14.37	22.17
	%Sn	9.77	10.28	9.29	8.40	8.67	7.70	9.29	8.88	8.53	13.17	8.71	
	%Fe	37.14	36.19	36.30	37.61	37.34	37.14	36.85	36.04	37.01	34.95	36.52	
	%S	21.98	21.66	18.47	20.11	19.39	17.63	19.80	19.68	19.20	9.47	19.44	
	%SiO2	4.61	4.76	5.56	5.10	5.41	6.00	4.66	6.81	5.87	7.02	6.34	
			418.15	464.92	497.16	482.53	501.41	482.53	431.69	504.22	501.20	446.83	502.71

REGRIND DATA		1	2	3	4	5	6	7	8	9	10
New Feed (gm) (dry)		720	720	720	720	720	720	720	720	720	720
Regrind feed Damp Wt (gm)		70	94	98	103	91	96	196	192	195	188
Regrind Time (min.sec)		2.00	2.30	2.45	3.00	2.50	3.30	4.00	3.45	3.50	3.50
Regrind D/C +75 (%Wt)		21.0	23.0	23.0	14.6	18.0	26.0	22.0	32.0	43.0	27.0

INTERNAL STREAMS			GRIND D/C P80=93			NEW FEED			CALC		
Medium Mids Recycle	Fine Mids Recycle	End Re grind Feed				gm	4957	4957	10		
gm	gm	gm				%Sn	1.04	1.04			
%Sn	%Sn	%Sn				%Fe	14.55	14.35			
%Fe	%Fe	%Fe				%S	1.80	1.92			
%S	%S	%S				%SiO2	39.46	38.10			
%SiO2	%SiO2	%SiO2									



DISTRIBUTIONS	AV (8-9)	FROM NEW FEED (%)										
		Cyc 1	Cyc 2	Cyc 3	Cyc 4	Cyc 5	Cyc 6	Cyc 7	Cyc 8	Cyc 9	Cyc 10	
MASS	Conc 1	2.13	0.61	0.64	0.78	0.68	0.71	0.90	1.63	2.14	2.12	1.31
	Conc 2	1.30	2.06	2.05	2.48	2.56	2.48	3.42	1.01	1.18	1.42	0.81
	Conc 3	1.04	0.99	1.24	1.85	1.71	1.99	1.99	1.32	1.01	1.07	0.78
	53 Tail	27.25	26.79	34.01	36.72	34.03	36.47	32.94	22.65	26.08	28.42	25.52
	CS2/CS1 Tail	13.75	13.35	13.80	15.86	14.71	16.26	14.34	14.28	13.21	13.21	10.71
	CS3/CS2-CS5	27.98	17.80	18.75	19.28	19.60	19.52	19.42	24.36	29.22	26.74	25.19
	<CS5 Slimes	27.96	22.76	23.30	23.32	24.05	23.72	24.33	25.74	27.80	28.12	25.82
Calc Recycle	-1.41	15.65	6.21	-0.29	2.66	-1.15	2.66	12.91	-1.72	-1.11	9.86	
TIN	Conc 1	10.53	2.86	3.05	3.34	3.23	3.38	3.71	9.57	10.55	10.51	8.81
	Conc 2	11.37	15.86	16.62	17.56	17.69	17.80	20.60	10.07	10.58	12.16	11.42
	Conc 3	15.48	15.54	19.15	24.75	19.11	21.85	22.38	15.69	15.84	15.12	16.43
	53 Tail	6.94	6.95	9.15	9.52	8.50	9.46	9.18	7.62	6.51	7.37	5.64
	CS2/CS1 Tail	4.69	7.57	5.96	7.16	7.63	7.34	7.03	3.69	4.80	4.57	3.40
	CS3/CS2-CS5	29.10	18.81	19.63	19.82	19.20	20.25	19.77	29.02	29.19	29.02	28.06
	<CS5 Slimes	22.43	20.98	21.71	21.06	20.79	20.74	21.97	22.50	21.89	22.96	21.58
Calc Recycle	-0.54	11.43	4.73	-3.21	3.86	-0.83	-4.62	1.86	0.64	-1.72	4.66	
TIN REC OA (%)	37.38	34.26	38.82	45.65	40.02	43.04	46.68	35.32	36.97	37.79	36.67	
TIN REC GRAVITY (%)	76.28	70.24	71.98	73.24	71.28	71.92	74.24	75.76	76.56	75.99	80.23	
IRON	Conc 1	5.36	1.74	1.83	2.17	1.85	1.98	2.52	4.18	5.31	5.42	3.27
	Conc 2	3.36	5.33	5.03	6.28	6.69	6.37	8.68	2.55	3.06	3.67	1.94
	Conc 3	2.50	2.24	2.92	4.32	4.28	4.92	4.90	3.30	2.36	2.64	1.76
	53 Tail	20.95	19.70	27.82	29.27	26.43	28.33	23.77	23.04	19.54	22.37	17.80
	CS2/CS1 Tail	12.45	12.57	12.71	15.58	14.71	15.81	14.20	9.05	12.86	12.03	9.42
	CS3/CS2-CS5	29.85	17.50	18.56	19.22	19.13	19.59	19.48	26.62	31.03	28.67	25.97
	<CS5 Slimes	28.00	22.36	23.22	23.56	23.55	23.64	24.41	25.56	28.66	27.35	25.64
Calc Recycle	-2.48	18.55	7.93	-0.40	3.37	-0.64	2.03	5.69	-2.82	-2.14	14.20	
SULPHUR	Conc 1	21.00	8.23	8.62	9.37	8.85	9.41	10.49	17.57	20.69	21.30	7.54
	Conc 2	14.66	25.69	22.77	24.97	28.89	26.42	32.44	12.38	13.62	15.70	4.01
	Conc 3	12.63	10.63	15.90	18.18	17.67	19.87	18.86	13.61	13.06	12.20	3.71
	53 Tail	6.23	5.51	10.77	9.79	8.70	9.52	7.14	12.08	5.36	7.11	3.69
	CS2/CS1 Tail	5.35	7.49	7.28	8.63	9.80	8.94	7.25	4.78	4.76	5.95	2.44
	CS3/CS2-CS5	28.20	16.12	17.60	17.25	17.75	17.79	18.23	27.47	29.22	27.18	8.26
	<CS5 Slimes	19.34	11.76	12.30	12.83	17.90	16.74	19.33	17.02	18.84	19.84	15.21
Calc Recycle	-7.41	14.56	4.76	-1.01	-9.56	-8.70	-13.74	-4.91	-5.55	-9.27	55.16	
SILICA	Conc 1	0.52	0.06	0.07	0.10	0.12	0.09	0.13	0.28	0.57	0.48	0.35
	Conc 2	0.13	0.26	0.31	0.40	0.35	0.38	0.61	0.09	0.12	0.14	0.11
	Conc 3	0.06	0.10	0.09	0.22	0.17	0.24	0.22	0.09	0.06	0.06	0.06
	53 Tail	32.68	32.32	40.25	43.73	41.31	44.83	41.16	24.06	31.14	34.22	32.34
	CS2/CS1 Tail	14.65	13.30	13.78	15.67	14.76	16.24	14.39	10.70	15.31	14.00	11.94
	CS3/CS2-CS5	26.89	16.65	17.68	18.47	18.92	18.80	18.85	21.92	28.36	25.41	24.83
	<CS5 Slimes	25.33	21.11	21.38	21.69	21.57	21.94	22.32	22.90	24.94	25.73	23.75
Calc Recycle	-0.27	16.20	6.44	-0.29	2.79	-2.52	2.32	19.97	-0.49	-0.04	6.62	





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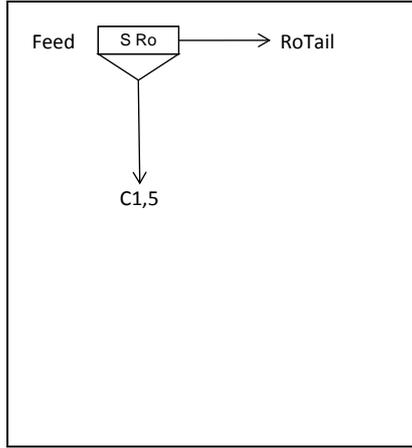
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STELLAR RESOURCES LIMITED
SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

Appendix 7 – Bulk Composite Sulfide Flotation Results

Milling		Primary	Regrind
Mill	type	0	0
Media	type	0	0
Media	kg	0	0
Solids	g	0	0
Water	g	0	0
Time	min/sec	0	0
Speed	rpm	0	0
Lime	g	0	0
End pH	pH	0	0
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	
Cleaner		Finish	
0		W/h	
Speed	800	kWh/t	



PROJECT	T0887
TEST NO	T06
DATE	300514
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
LC03 Feed Non Mags

NOTES
Sulphide Rougher
The tail from this
was floated in LC03, Cyc10

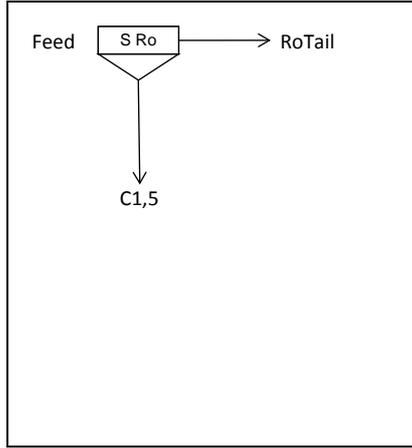
	pH	0.5 GUAR g/t	98 H2SO4 g/t	0.5 CuSO4 g/t	0 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	5.0		2807						4					
Condition		48		58					4					
Condition					39				1					
Sulphide Ro C1	5.1					48				2-4	1.0	1.0	40	32
Condition		48		29					2					
Condition					29				1					
Sulphide Ro C2	5.2					10				3-4	1.5	2.5	70	10
Condition		48		29					2					
Condition					10				1					
Sulphide Ro C3	5.4					10				4-5	1.5	4.0	70	7
Condition		48							2					
Condition					10				2					
Sulphide Ro C4						10				4-5	1.5	5.5	80	6
Condition		48							2					
Condition					10				1					
Sulphide Ro C5						10				4-5	2.0	7.5	100	5
REAGENT TOTALS (g/t)		242	2807	116	97	86								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T06 RoC1	12.6	2.4	0.24	0.6	31.3	5.8	30.6	39.1	16.0	0.9
RoC2	7.2	1.4	0.45	0.7	22.1	2.3	17.3	12.6	29.2	1.0
RoC3	5.0	1.0	0.59	0.6	20.3	1.5	13.9	7.1	31.4	0.7
RoC4	4.5	0.9	0.71	0.7	17.3	1.1	8.61	3.9	34.8	0.7
RoC5	4.8	0.9	0.85	0.8	15.6	1.1	5.06	2.5	37.0	0.8
Ro Tail	482.6	93.4	0.98	96.6	12.5	88.2	0.71	34.8	42.5	95.8
CALC	516.7	100.0	0.95	100.0	13.2	100.0	1.91	100.0	41.4	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T06 RoC1	12.6	2.4	0.24	0.6	31.3	5.8	30.6	39.1	16.0	0.9
RoC2	19.8	3.8	0.32	1.3	28.0	8.1	25.8	51.8	20.8	1.9
RoC3	24.8	4.8	0.37	1.9	26.4	9.6	23.4	58.8	22.9	2.7
RoC4	29.3	5.7	0.42	2.5	25.0	10.7	21.1	62.8	24.8	3.4
RoC5	34.1	6.6	0.48	3.4	23.7	11.8	18.8	65.2	26.5	4.2
FEED	516.7	100.0	0.95	100.0	13.2	100.0	1.91	100.0	41.4	100.0

Milling		Primary	Regrind
Mill	type	0	0
Media	type	0	0
Media	kg	0	0
Solids	g	0	0
Water	g	0	0
Time	min/sec	0	0
Speed	rpm	0	0
Lime	g	0	0
End pH	pH	0	0
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	
Cleaner		Finish	
0		W/h	
Speed	800	kWh/t	



PROJECT	T0887
TEST NO	T09
DATE	290614
TECHNICIAN	BR

PRODUCT FLOATED
St Dizier
Non Mags

NOTES
Sulphide Rougher

	pH	0.5 GUAR g/t	98	0.5 FeSO4 g/t	0.1 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								4					
Condition		51		61					4					
Condition					41				1					
Sulphide Ro C1	5.1					50				2-4	1.0	1.0	40	
Condition		51		30					2					
Condition					30				1					
Sulphide Ro C2	5.2					10				3-4	1.5	2.5	70	
Condition		51		30					2					
Condition					10				1					
Sulphide Ro C3	5.4					10				4-5	1.5	4.0	70	
Condition		51							2					
Condition					10				2					
Sulphide Ro C4						10				4-5	1.5	5.5	80	
Condition		51							2					
Condition					10				1					
Sulphide Ro C5						10				4-5	2.0	7.5	100	
REAGENT TOTALS (g/t)		254		122	102	90								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T09 S Ro C1	6.9	1.4	0.61	0.9	13.2	1.3	5.07	4.1	39.5	1.4
C2	10.0	2.0	0.69	1.4	16.9	2.4	8.09	9.5	34.8	1.7
C3	70.0	14.2	0.93	13.5	13.9	14.1	1.73	14.3	37.1	12.9
C3.2	51.1	10.4	0.84	8.9	13.6	10.1	2.53	15.2	37.7	9.6
Ro Tail	354.5	72.0	1.02	75.2	14.0	72.1	1.36	56.8	42.3	74.5
CALC	492.5	100.0	0.98	100.0	14.0	100.0	1.72	100.0	40.9	100.0
ASSAY HEAD										

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T09 S Ro C1	6.9	1.4	0.61	0.9	13.2	1.3	5.07	4.1	39.5	1.4
C2	16.9	3.4	0.66	2.3	15.3	3.8	6.86	13.7	36.7	3.1
C3	86.9	17.6	0.88	15.9	14.1	17.8	2.73	27.9	37.0	16.0
C3.2	138.0	28.0	0.86	24.8	13.9	27.9	2.65	43.2	37.3	25.5
FEED	492.5	100.0	0.98	100.0	14.0	100.0	1.72	100.0	40.9	100.0



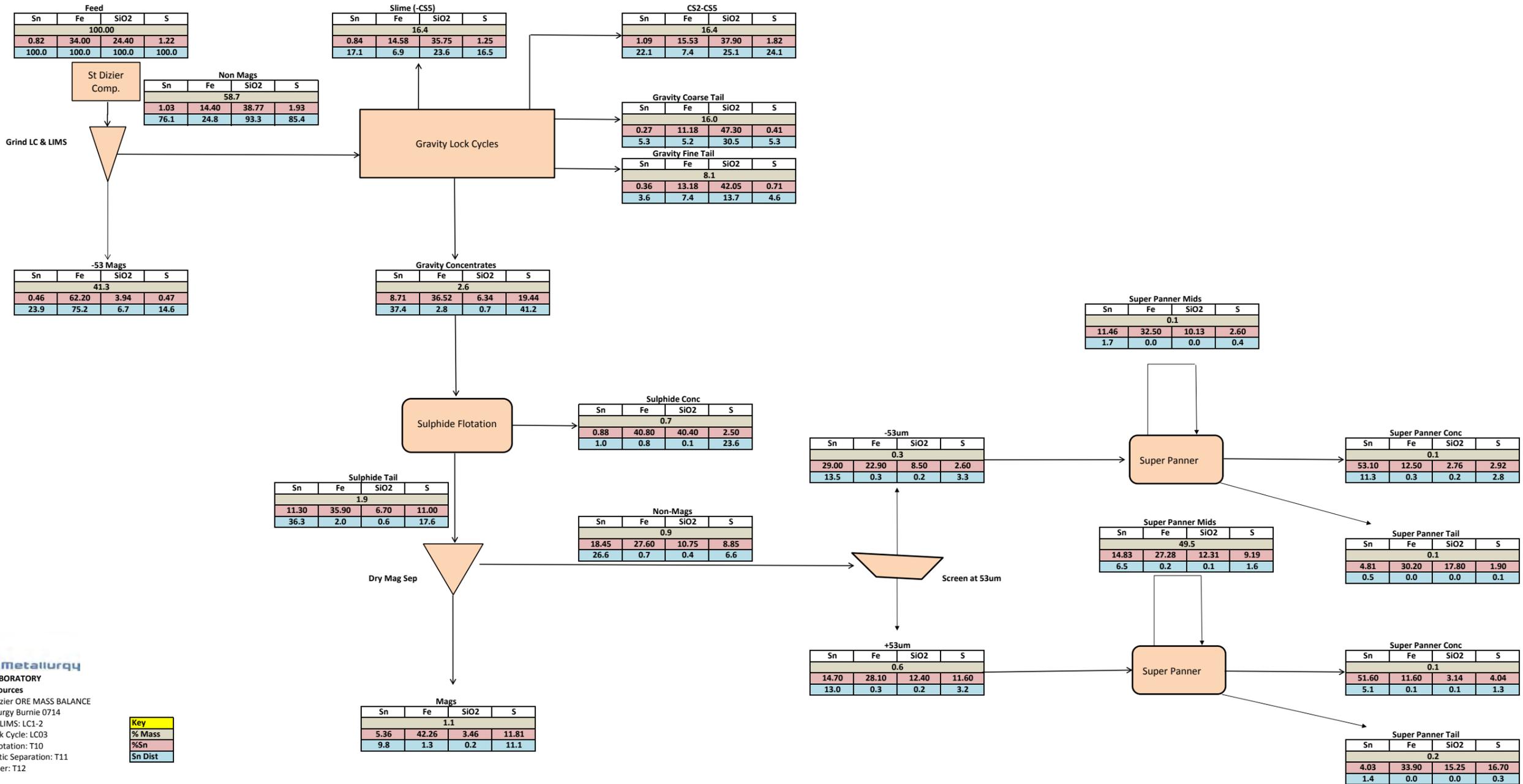
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FINAL REPORT

Appendix 8 – Bulk Composite Overall Balance





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Appendix 9 – Drill Hole Composites Mineralogy

ALS Metallurgy

Stellar Resources Limited St Dizier Project Drillhole Composite Mineralogy

August 2014



McArthur Ore Deposit Assessments Pty Ltd

Gary J McArthur PhD FAusIMM MMICA MSEG

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ALS METALLURGY

Stellar Resources – St Dizier Drillhole Composites Mineralogy August 2014

Method

Three drillhole composites (Comp 2, Comp3, Comp 4) from drillhole ST06 at the Stellar Resources' St Dizier prospect were submitted for mineralogical assessment. The samples were sized into 5 fractions (+212µm, +106µm, +53µm, +20µ and +7µm) and these were mounted on two polished mounts for each sample by Australian Petrographics (Queanbeyan, NSW).

The standard MODA technique was adopted to quantify the mineralogy.

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* (Py), *pyrrhotite* (Po), *arsenopyrite* (As), *cassiterite* (Cs), *chalcopyrite* (Cp), *goethite+hematite* (GoHe), *magnetite* (Mt) and *gangue* (*quartz, silicates, fluorite, carbonates, etc*, Ga). This allowed calculation of an overall mineralogical composition.

In a second scan, for each fraction, 25-100 grains containing Sn (exclusively *cassiterite*) were selected at random and logged as per the first scan.

The normal liberation and association parameters were calculated.

Photomicrographs were taken of the +106µm fraction and annotated using PowerPoint.

Results

Composition

The following minerals were identified, in approximate descending order:

- Gangue (*quartz, silicates, carbonate, fluorite, talc, carbonaceous matter, etc.*)
- *Magnetite*
- *Pyrite (crystalline and melnikovite varieties)*
- *Pyrrhotite*
- *Arsenopyrite*
- *Cassiterite*
- *Chalcopyrite*
- *Sphalerite*
- *Bismuthinite (rare)*
- *Native bismuth (rare)*
- *Molybdenite (very rare)*

The overall composition of each composite is summarised below:

St Dizier Comp 2 Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	18.4	4.2	1.0	0	0.1	Tr	0	12.2	82.5
+106µm	19.2	12.6	0.8	0.1	0.1	0.9	0	25.6	60.0
+53µm	18.7	9.0	1.9	0	0.2	0	0	13.8	75.2
+20µm	17.5	6.8	2.8	0.9	0.1	1.0	0	34.4	54.1
+7µm	10.0	12.3	5.9	1.0	Tr	0	0	26.7	54.2
TOTAL	83.8	8.7	2.1	0.3	0.1	0.4	0	22.0	66.4

Py=pyrite, Po=pyrrhotite, As=arsenopyrite, Cs=cassiterite, Cp=chalcopyrite, GoHe=goethite+hematite, Mt=magnetite, Ga=gangue
count statistics very poor for the scarce cassiterite

St Dizier Comp 3 Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	19.2	3.5	3.1	0	0.2	Tr	0	21.8	71.5
+106µm	20.9	4.5	6.2	1.0	0.2	0	0	44.1	44.1
+53µm	19.6	1.9	7.1	1.0	0.6	Tr	Tr	34.4	55.1
+20µm	17.7	3.8	14.2	0	1.0	0	0.1	40.3	40.7
+7µm	8.9	2.7	8.1	0	1.0	0	0	32.1	56.3
TOTAL	86.3	3.4	7.6	0.5	0.5	Tr	Tr	34.9	53.3

St Dizier Comp 4 Composition Vol% (from total scan)

Fraction	Wt%	Py	Po	As	Cs [#]	Cp	GoHe	Mt	Ga
+212µm	23.6	0.1	0.2	0.3	Tr	0	0	54.0	45.5
+106µm	24.0	0	0	1.4	0.2	0	0	68.7	29.8
+53µm	18.4	0.2	Tr	2.0	Tr	0	0	58.8	39.1
+20µm	15.7	0	1.0	3.0	Tr	0	0	54.4	41.7
+7µm	7.7	0	0.2	1.0	Tr	0	0	54.3	44.5
TOTAL	89.4	0.1	0.2	1.5	0.1	0	0	59.0	39.2

Cassiterite Liberation

An essential summary of the liberation parameters for *cassiterite* is:

St Dizier Comp 2 Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with					Ternary
			Py	Po	As	Mt	Ga	
+212µm	15.8	0	0	0	0	0	26	74
+106µm	19.1	0	0	0	0	0	41	59
+53µm	17.9	21	1	0	0	5	51	22
+20µm	18.4	37	6	0	0	0	44	13
+7µm	17.4	84	2	0	1	1	9	3
TOTAL	88.6	28	2	0	0	1	35	34

St Dizier Comp 3 Cassiterite liberation distribution%

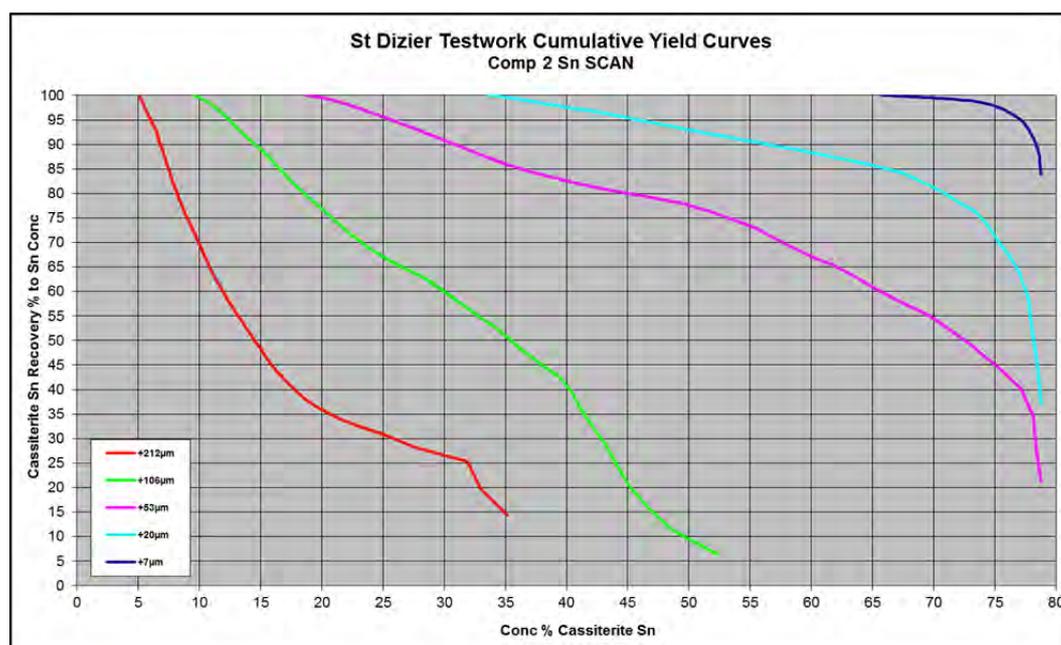
Fraction	Sn Wt%	Free	Binary with					Ternary
			Py	Po	As	Mt	Ga	
+212µm	15.6	0	0	0	0	0	18	82
+106µm	22.6	16	3	7	0	0	38	36
+53µm	21.6	31	0	7	0	4	45	14
+20µm	21.0	60	0	5	0	7	21	7
+7µm	14.2	85	0	1	0	4	8	1
TOTAL	95.0	37	1	5	0	3	28	27

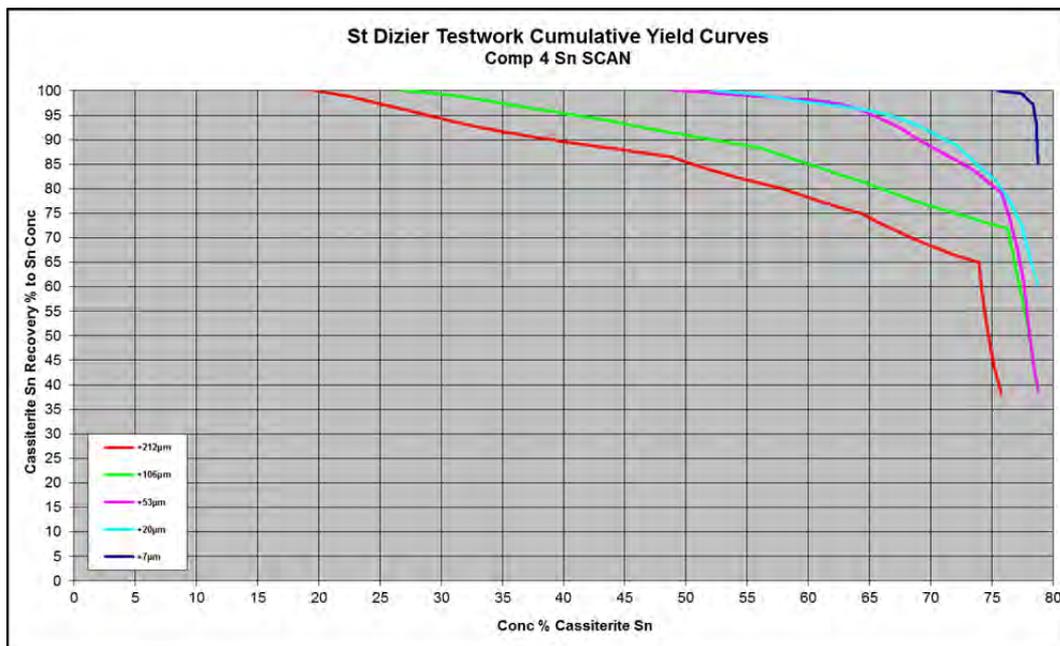
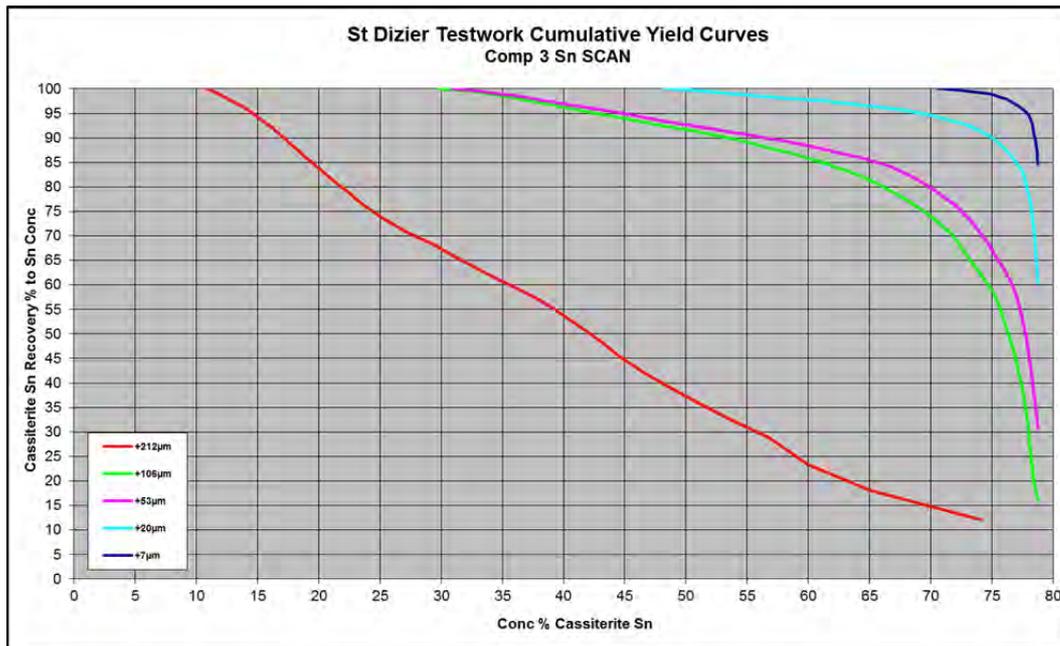
St Dizier Comp 4 Cassiterite liberation distribution%

Fraction	Sn Wt%	Free	Binary with					Ternary
			Py	Po	As	Mt	Ga	
+212µm	14.1	0	0	0	0	38	48	13
+106µm	23.6	38	0	0	0	15	24	23
+53µm	19.5	39	0	0	0	37	15	10
+20µm	17.1	61	0	0	0	7	31	1
+7µm	12.0	85	0	0	0	4	8	2
TOTAL	86.3	43	0	0	0	21	25	11

Cumulative Yield (Grade-Recovery) Curves

Cumulative yield curves for *cassiterite* Sn have been calculated from the quantitative mineralogy for each fraction of each sample. These indicate the maximum possible recovery achievable – actual plant recoveries will be much lower. They are presented for comparative purposes only.





Comments

There appears to be insufficient identifiable Sn minerals to account for the Sn grades (especially in Composite 4), but no sulphide or hydroxide (acid soluble) Sn was identified.

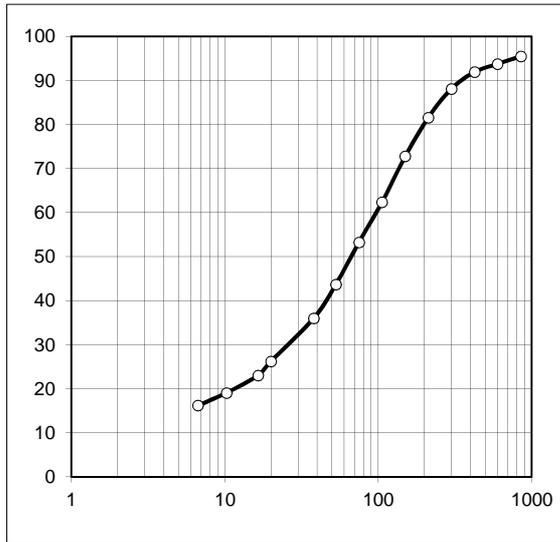
The author suggests caution be exercised when using the results from Composite 4, due to the difficulty experienced distinguishing carbonate from *cassiterite*.



BURNIE LABORATORY
Mineralogy sizing sheet

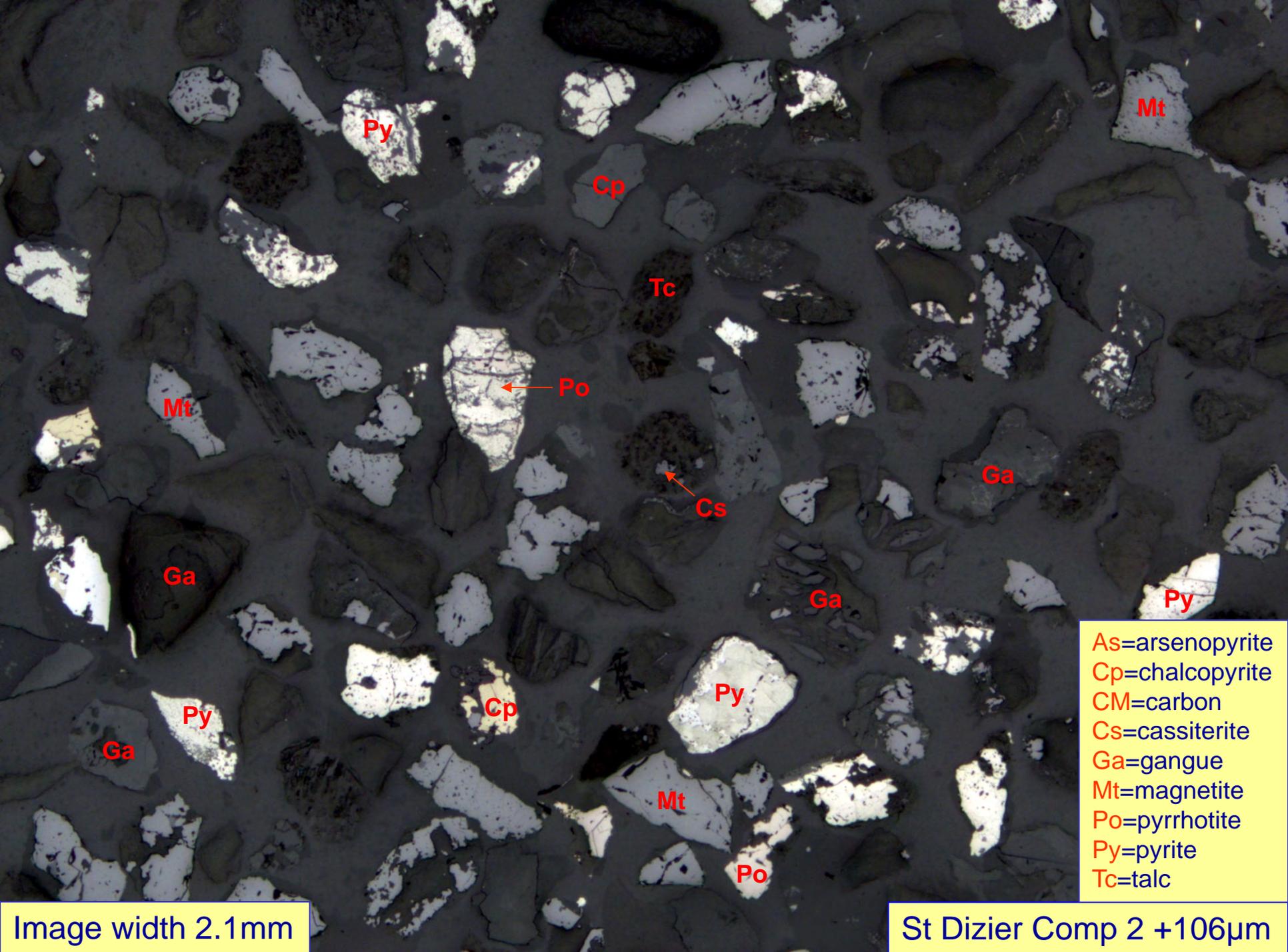
PROJECT	T0887
SAMPLE	St Dizier Comp 2
FROM TEST NO	
DATE	50814
TECHNICIAN	MS

St Dizier Comp 2		SIZE um	WEIGHTS			
			gm	(%)	%PASS	
P80	201	850	8.07	4.54	95.5	
		600	3.03	1.71	93.8	
		425	3.25	1.83	91.9	
		300	6.73	3.79	88.1	
		212	11.63	6.55	81.6	
		150	15.60	8.78	72.8	
		106	18.49	10.41	62.4	
		75	16.20	9.12	53.3	
		53	17.02	9.58	43.7	
		38	13.62	7.67	36.0	
20	17.38	9.78	26.2			
TEMP	21	CS3	17	5.63	3.17	23.1
SG	3.00	CS4	10	7.09	3.99	19.1
MINS	20	CS5	7	5.08	2.86	16.2
		SUB	28.83	16.23		
		TOTAL	177.65	100.00		



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2		Mount Number
		%	dist	%	dist	%	dist	%	dist	
212	18.4	0.71	15.8	21.30	14.7	3.22	10.4	29.20	21.3	887148
106	19.2	0.82	19.1	28.60	20.6	6.76	22.8	23.30	17.7	887149
53	18.7	0.79	17.9	30.90	21.7	7.10	23.3	21.80	16.1	887150
20	17.5	0.87	18.4	31.30	20.5	6.47	19.8	21.80	15.0	887151
7	10.0	1.43	17.4	34.00	12.8	8.39	14.7	18.60	7.4	887152
<7	16.2	0.58	11.4	15.80	9.6	3.16	9.0	35.10	22.5	
CALC	100.0	0.83	100.0	26.62	100.0	5.70	100.0	25.29	100.0	
ASSAY		0.82		26.20		6.02		25.00		



As=arsenopyrite
Cp=chalcopyrite
CM=carbon
Cs=cassiterite
Ga=gangue
Mt=magnetite
Po=pyrrhotite
Py=pyrite
Tc=talc

Image width 2.1mm

St Dizier Comp 2 +106µm



PARTICLE MINERALOGY REPORT

**St Dizier Comp 2
August 2014**

A +212µm 18 % by weight

**GJMcA 11.8.14
B +106µm 19 % by weight**

C +53µm 19 % by weight

D +20µm 18 % by weight

E +7µm 10 % by weight

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
4.2	1.0	0.0	0.1	0.0	0.0	12.2	82.5	100
47	10	0	3	1	0	41	85	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
12.6	0.8	0.1	0.1	0.9	0.0	25.6	60.0	100
63	16	5	7	21	0	66	71	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
9.0	1.9	0.0	0.2	0.0	0.0	13.8	75.2	100
53	26	0	14	0	0	55	83	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
6.8	2.8	0.9	0.1	1.0	0.0	34.4	54.1	100
97	93	90	30	100	0	91	86	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
12.3	5.9	1.0	0.0	0.0	0.0	26.7	54.2	100
95	97	100	75	0	0	89	90	

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.25	0.00	0.15		0.0	4.1	22.7
Actual			0.71		3.2	21.3

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.74	0.33	0.10		0.0	9.7	37.3
Actual			0.82		6.8	28.6

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.40	0.00	0.32		0.0	8.0	27.0
Actual			0.79		7.1	30.9

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.88	0.37	0.07		0.7	6.7	42.6
Actual			0.87		6.5	31.3

ASSAYS

Calc'd	SG	Cu	Sn	As	S	Fe
3.87	0.00	0.00		0.7	11.6	40.6
Actual			1.43		8.4	34.0

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga	n
Mono	0	0	0	0	0	25	65	
Binary	95	34	0	26	0	74	29	
Ternary	5	39	0	49	0	1	5	
Quat.y+	0	26	0	25	0	0	1	
#Grains	9	10	0	3	0	30	97	1.50

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga	n
Mono	24	0	0	0	0	39	65	
Binary	57	85	100	41	0	58	29	
Ternary	15	6	0	48	0	1	5	
Quat.y+	4	9	0	11	0	2	1	
#Grains	20	5	1	4	0	39	84	1.57

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga	n
Mono	22	0	0	21	0	51	72	
Binary	60	5	0	56	0	49	25	
Ternary	16	95	0	19	0	0	2	
Quat.y+	2	0	0	3	0	0	1	
#Grains	17	7	0	4	0	25	91	1.44

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga	n
Mono	74	71	0	37	0	84	93	
Binary	14	29	100	51	0	16	7	
Ternary	12	0	0	12	0	0	0	
Quat.y+	0	0	0	1	0	0	0	
#Grains	7	3	1	1	0	38	63	1.14

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga	n
Mono	81	85	100	84	0	90	92	
Binary	19	15	0	13	0	10	8	
Ternary	0	0	0	3	0	0	0	
Quat.y+	0	0	0	0	0	0	0	
#Grains	13	6	1	0	0	30	60	1.10

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	100
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	13	20	0	0	0	0	68

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	13	0	0	0	8	75
Po	0	0	0	0	0	0	100
As	100	0	0	0	0	0	0
Cs	0	0	0	0	0	0	100
GoHe	0	0	0	0	0	0	0
Mt	3	0	0	0	0	0	97
Ga	21	7	0	0	0	0	61

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	2	0	0	0	0	8	90
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	20	10	0	15	0	55	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	100
Cs	12	0	0	0	0	1	87
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	1	5	3	0	0	91	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	14	1	9	0	0	10	65
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	17	4	0	0	0	80	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	5	0	0	100
Po	33	0	0	29	0	3	100
As	0	0	0	0	0	0	0
Cs	26	39	0	0	0	22	100
GoHe	0	0	0	0	0	0	0
Mt	0	1	0	0	0	0	75
Ga	5	11	0	3	0	22	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	8	8	14	0	7	62
Po	10	0	0	4	0	5	100
As	100	0	0	0	0	0	0
Cs	36	15	0	0	0	13	100
GoHe	0	0	0	0	0	0	0
Mt	3	2	0	0	0	0	59
Ga	10	5	0	3	0	21	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	16	0	2	0	2	78
Po	95	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	14	5	0	0	0	11	73
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	49
Ga	8	5	0	5	0	15	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	12	0	0	26
Po	0	0	0	0	0	0	29
As	0	0	0	0	0	0	100
Cs	17	1	0	0	0	1	56
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	16
Ga	0	0	0	0	0	0	7

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	19
Po	0	0	0	0	0	0	15
As	0	0	0	0	0	0	0
Cs	3	0	1	0	0	2	11
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	10
Ga	1	0	0	0	0	0	6

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py	0	0	0	0	0	0	95	5	0
Po	0	0	0	0	0	0	34	39	26
As	0	0	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	26	49	25
GoHe	0	0	0	0	0	0	0	0	0
Mt	25	0	0	0	0	0	74	1	0
Ga	65	4	6	0	0	0	19	5	1

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py	24	0	8	0	0	4	43</		

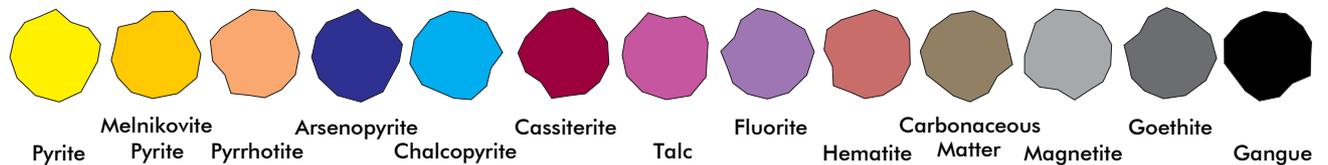
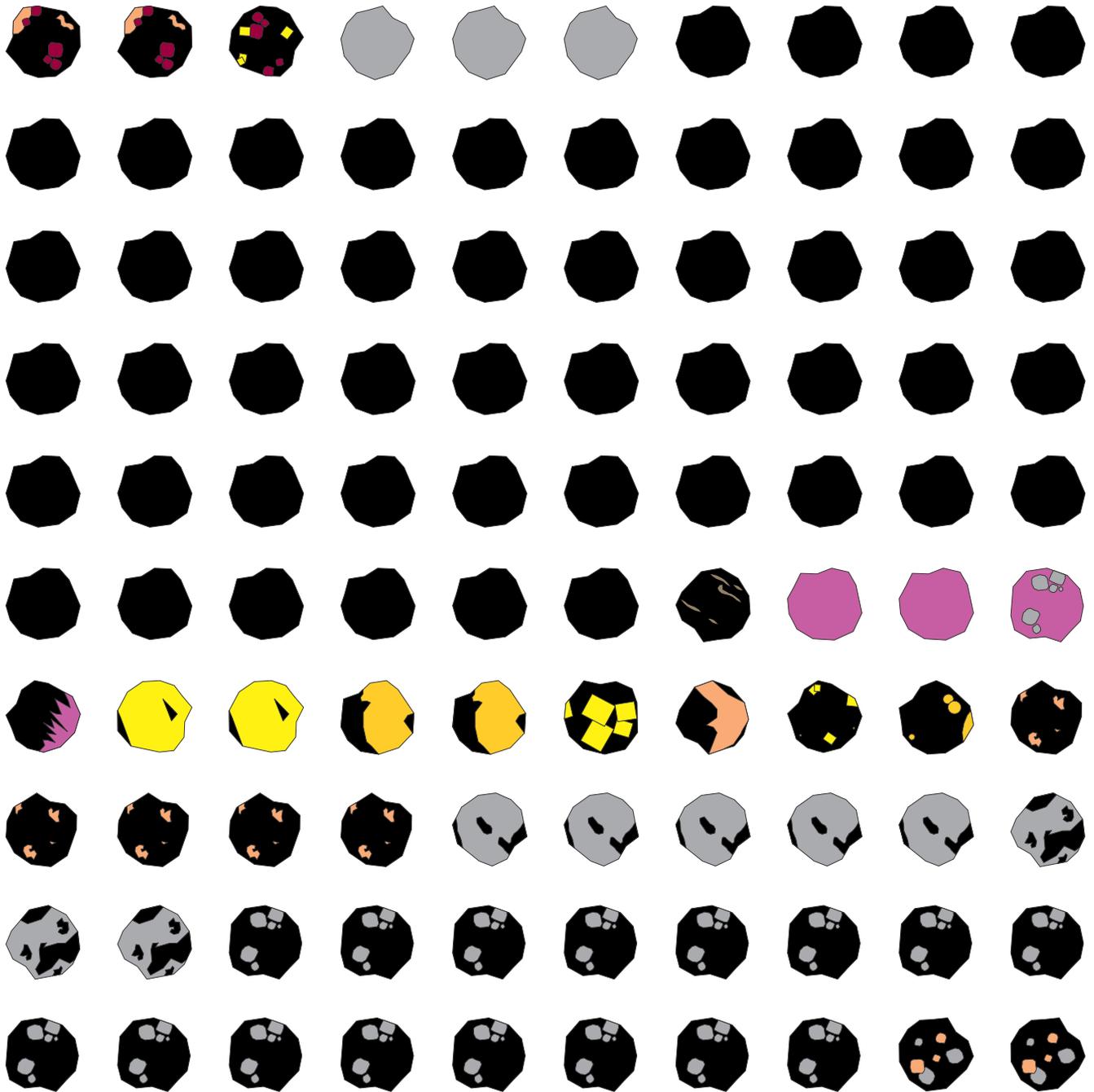
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2

A +212µm

August

2014



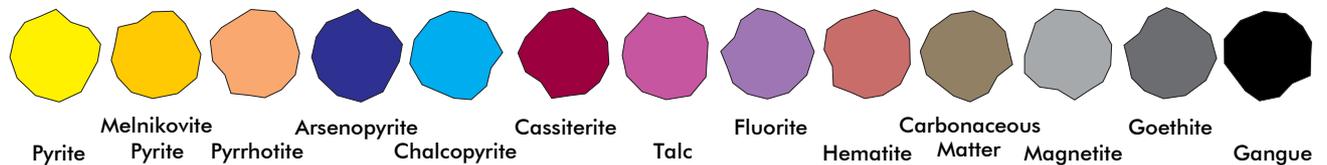
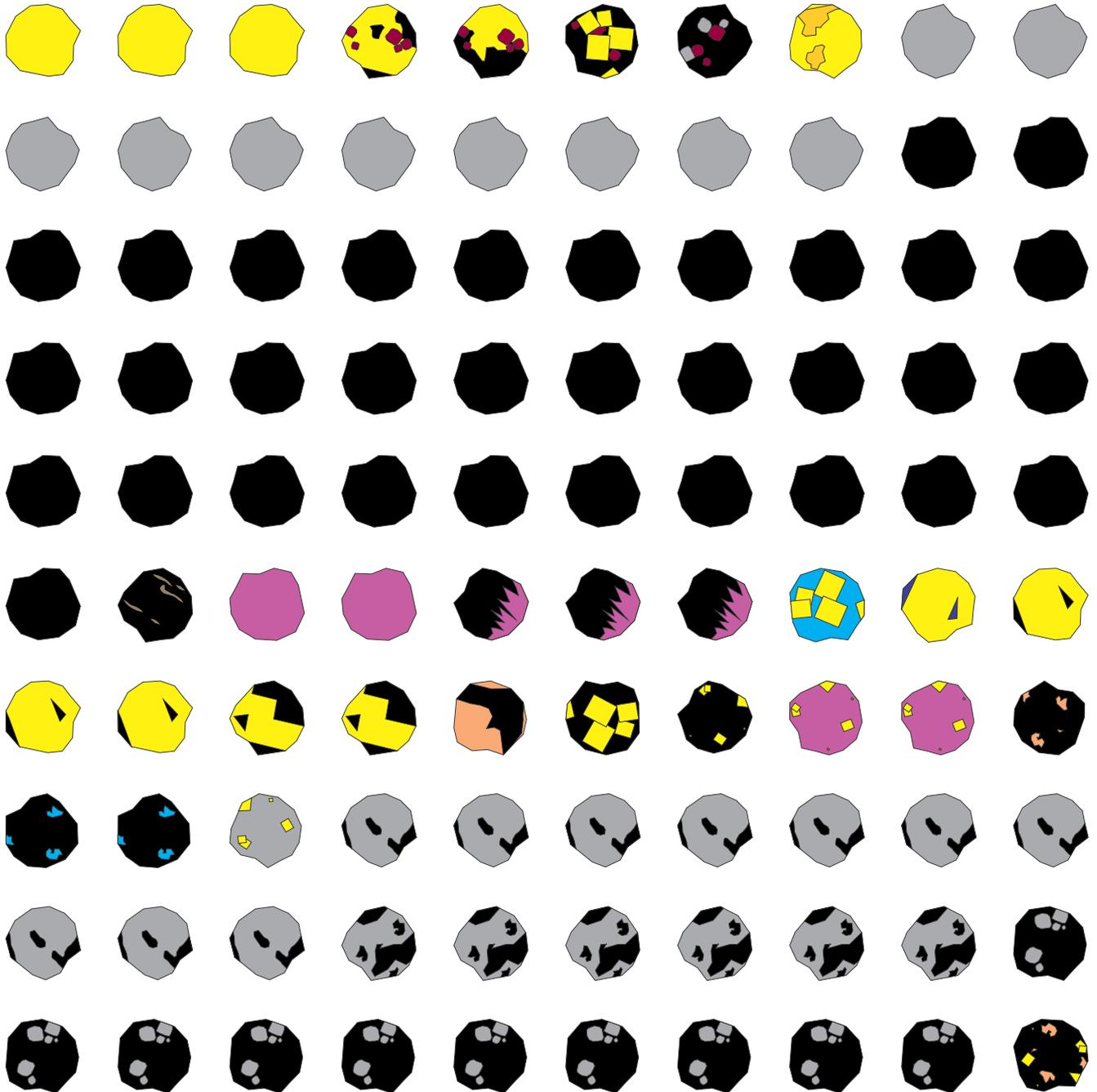
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2

B + 106µm

August

2014



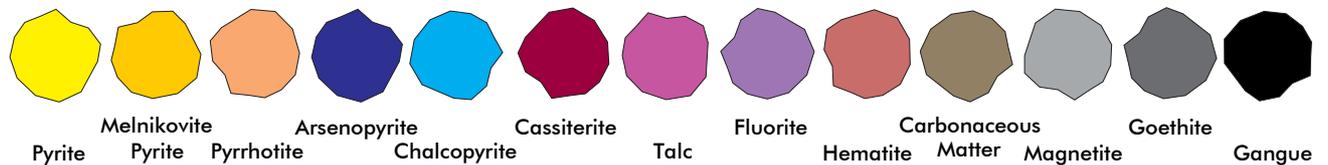
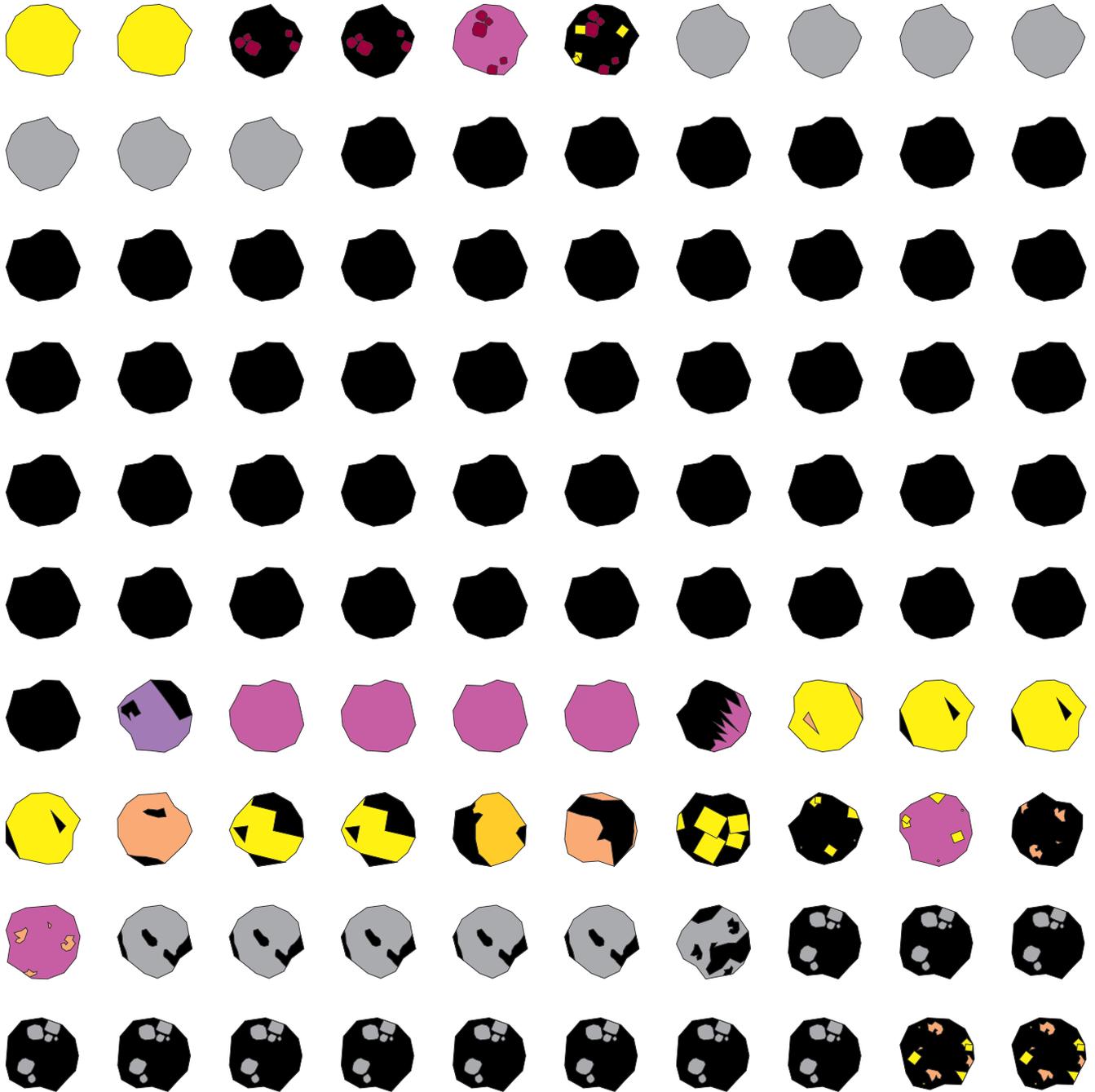
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2

C +53µm

August

2014



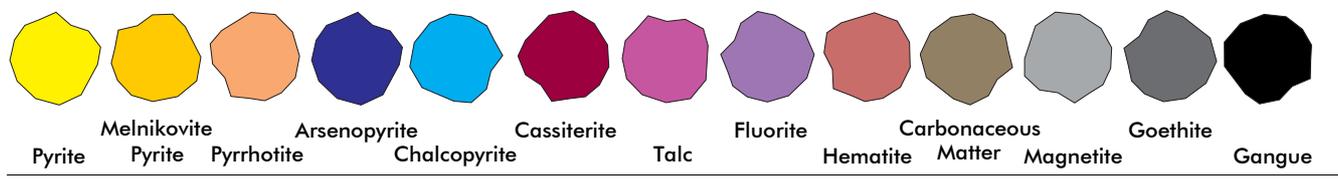
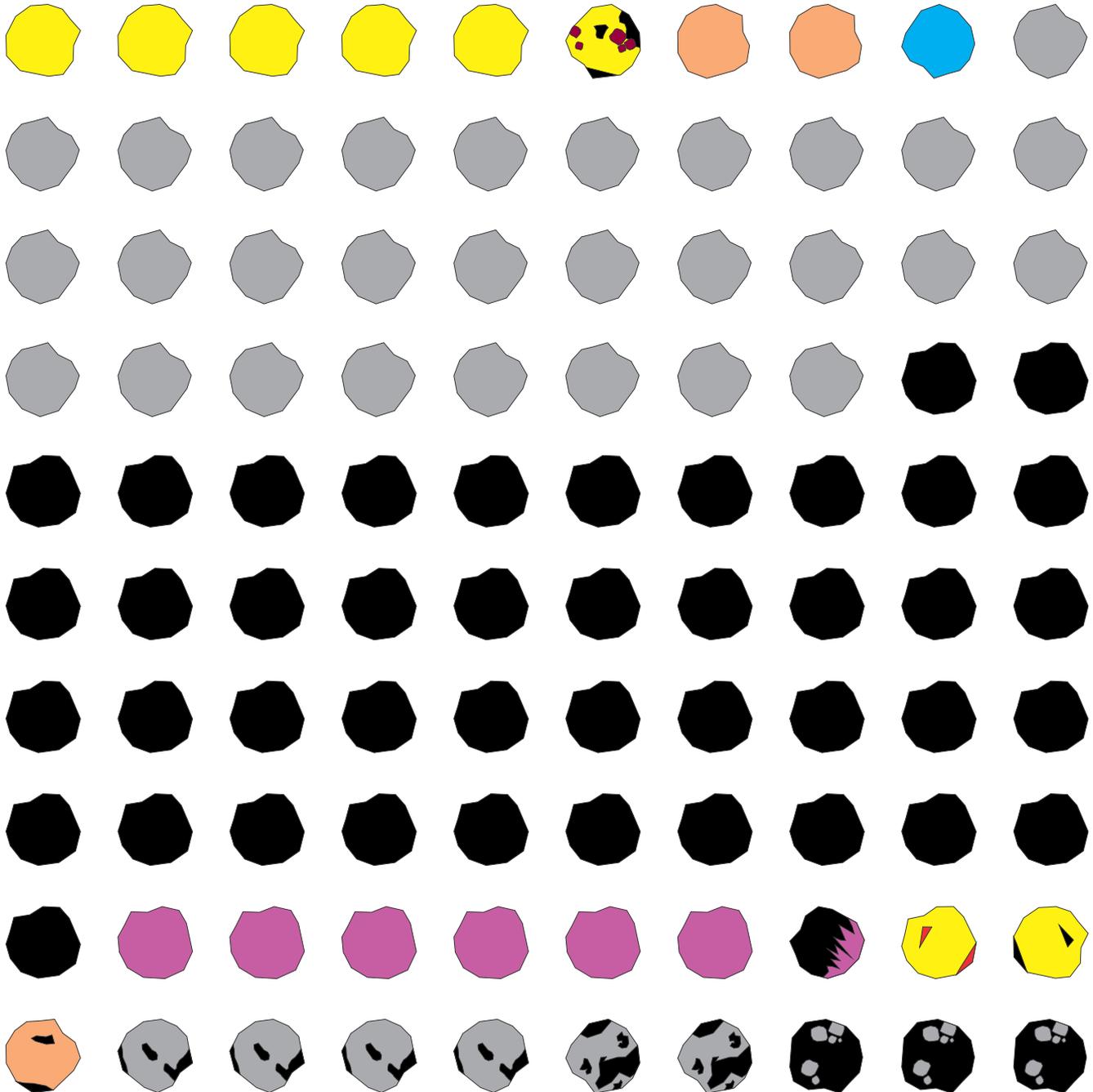
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2

D +20µm

August

2014



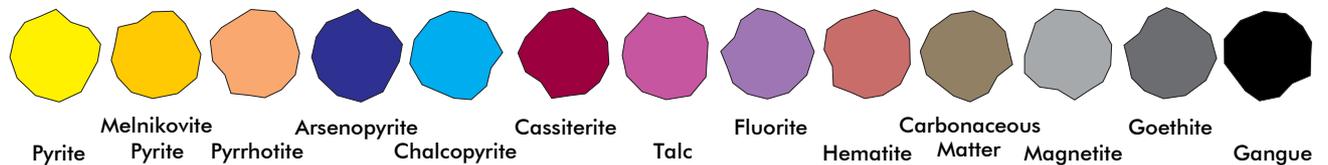
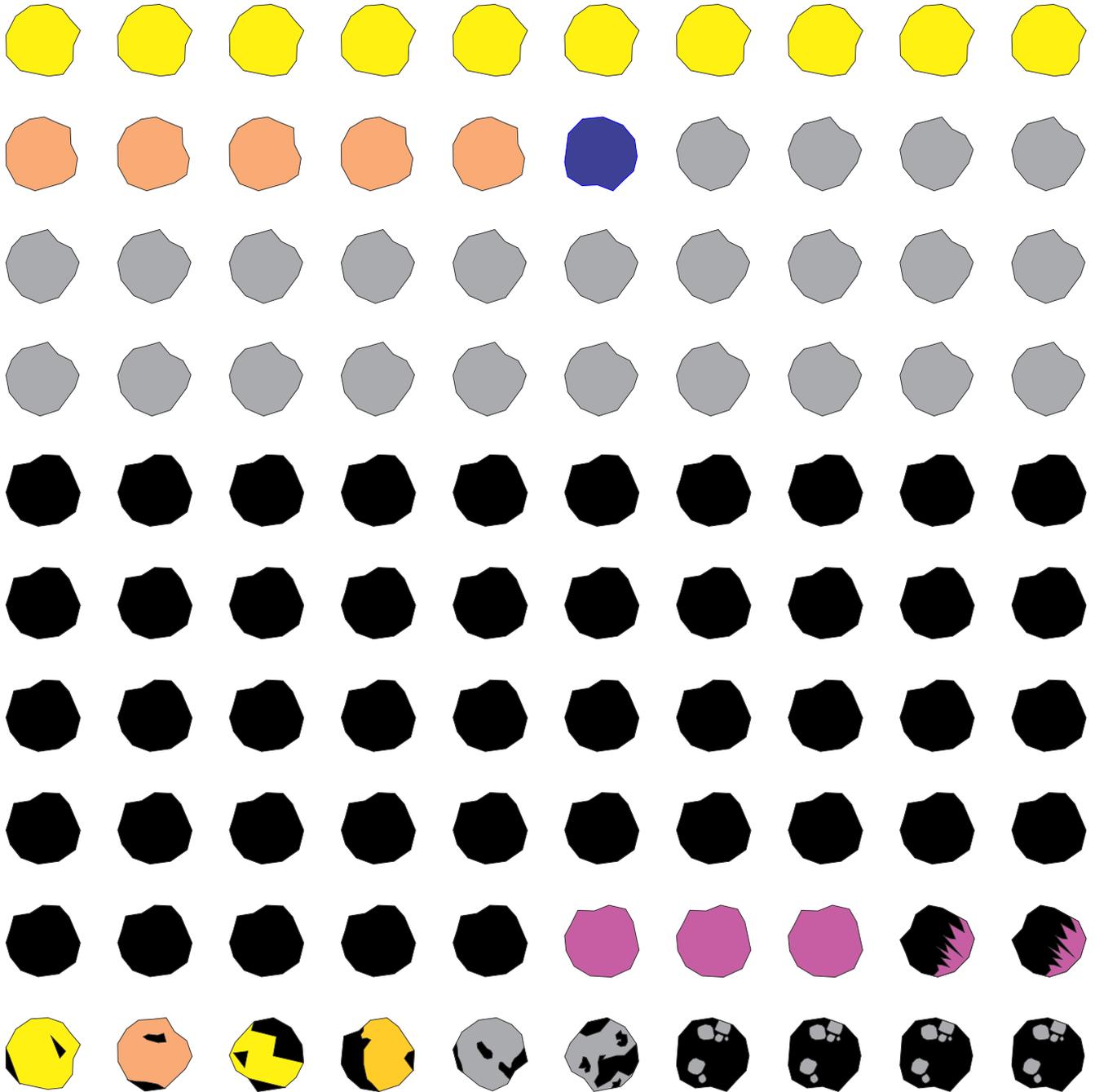
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2

E +7 μ m

August

2014



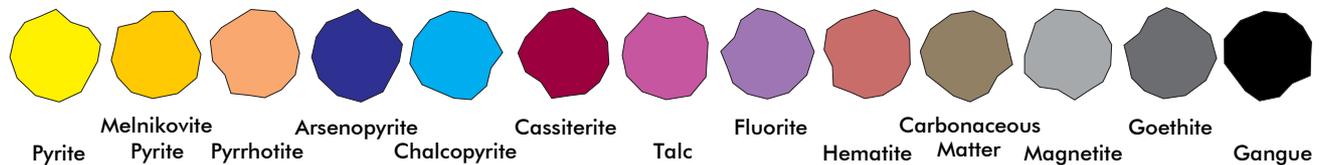
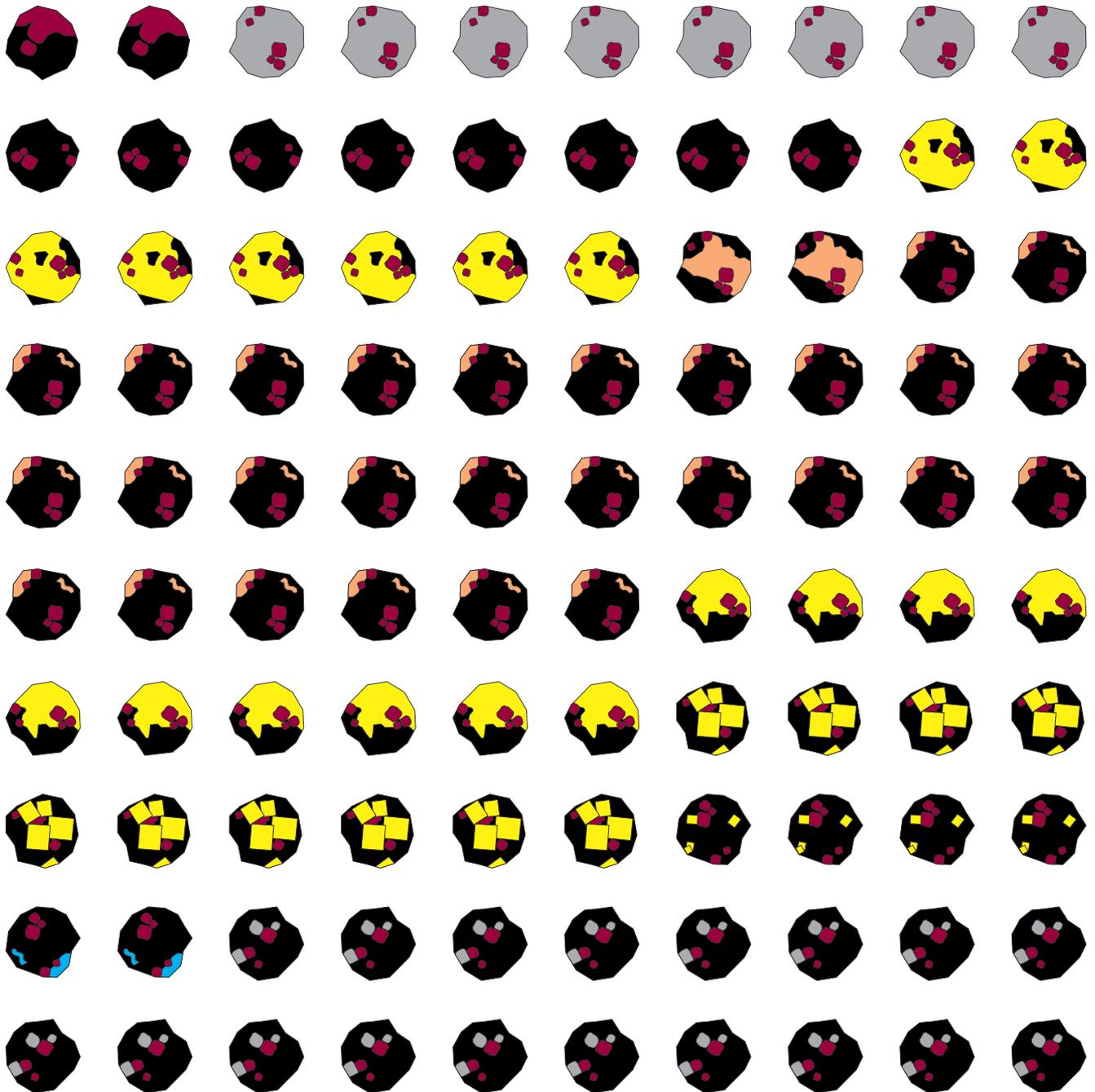
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2 Sn
SCAN

A +212µm

August

2014



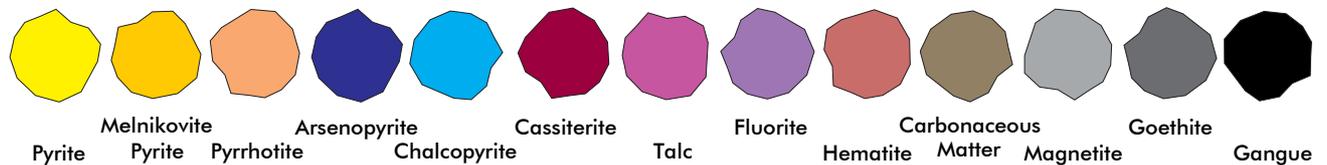
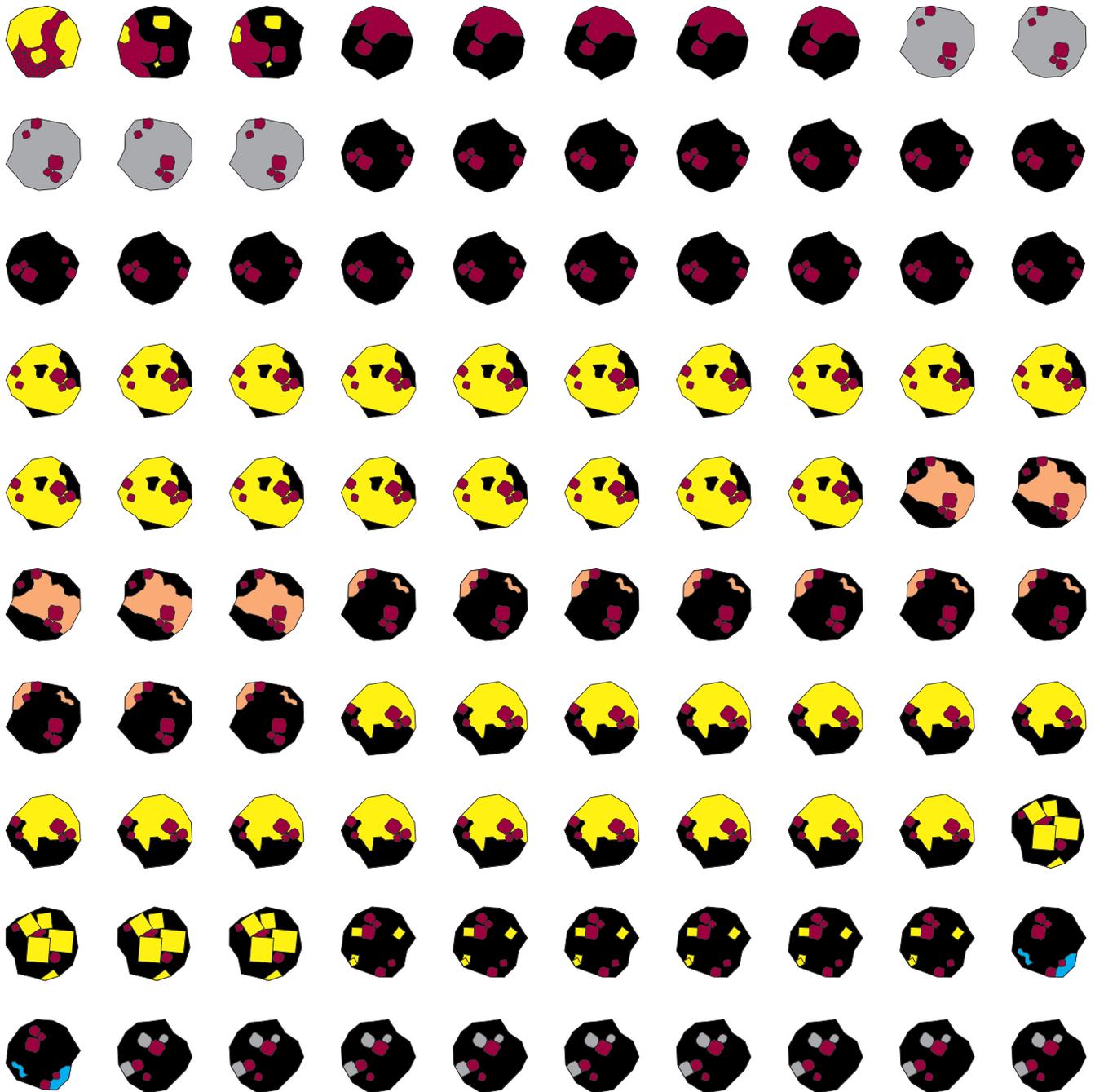
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2 Sn
SCAN

B + 106µm

August

2014



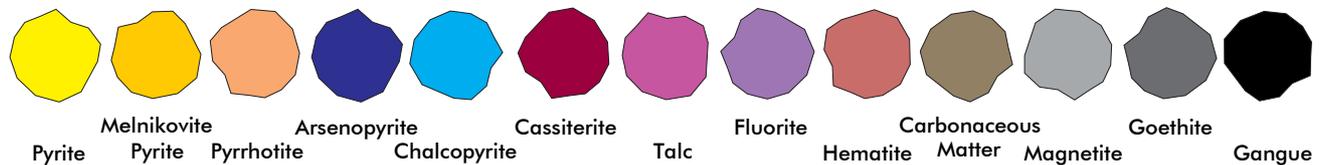
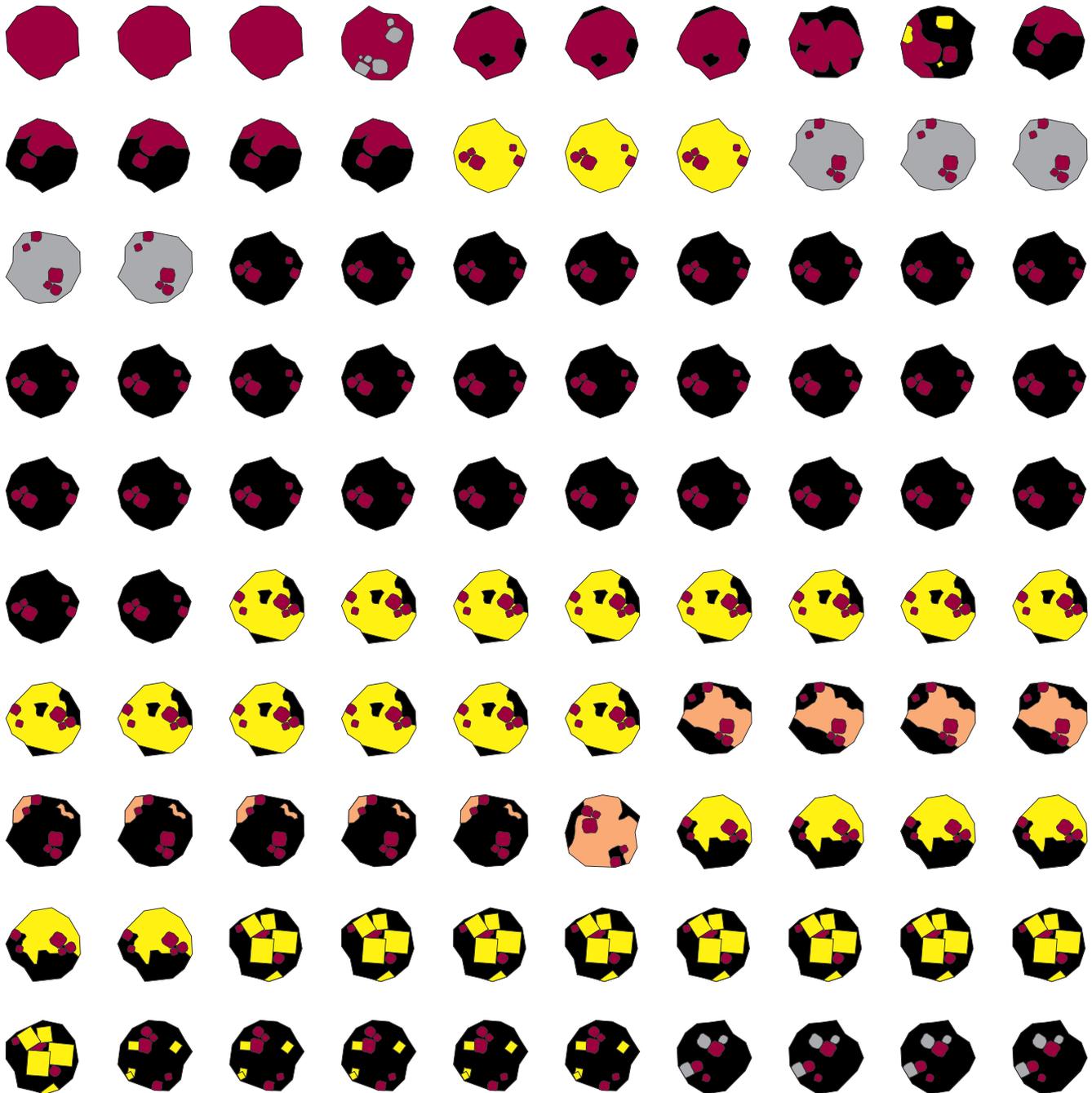
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2 Sn
SCAN

C +53µm

August

2014



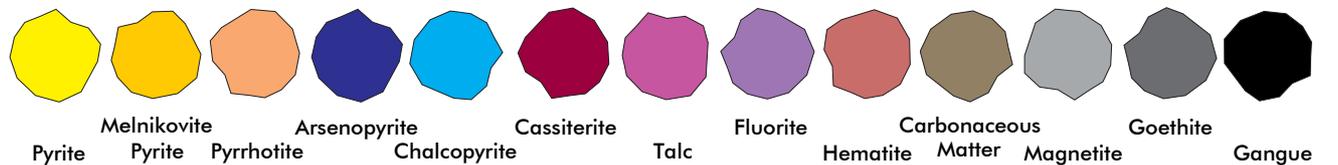
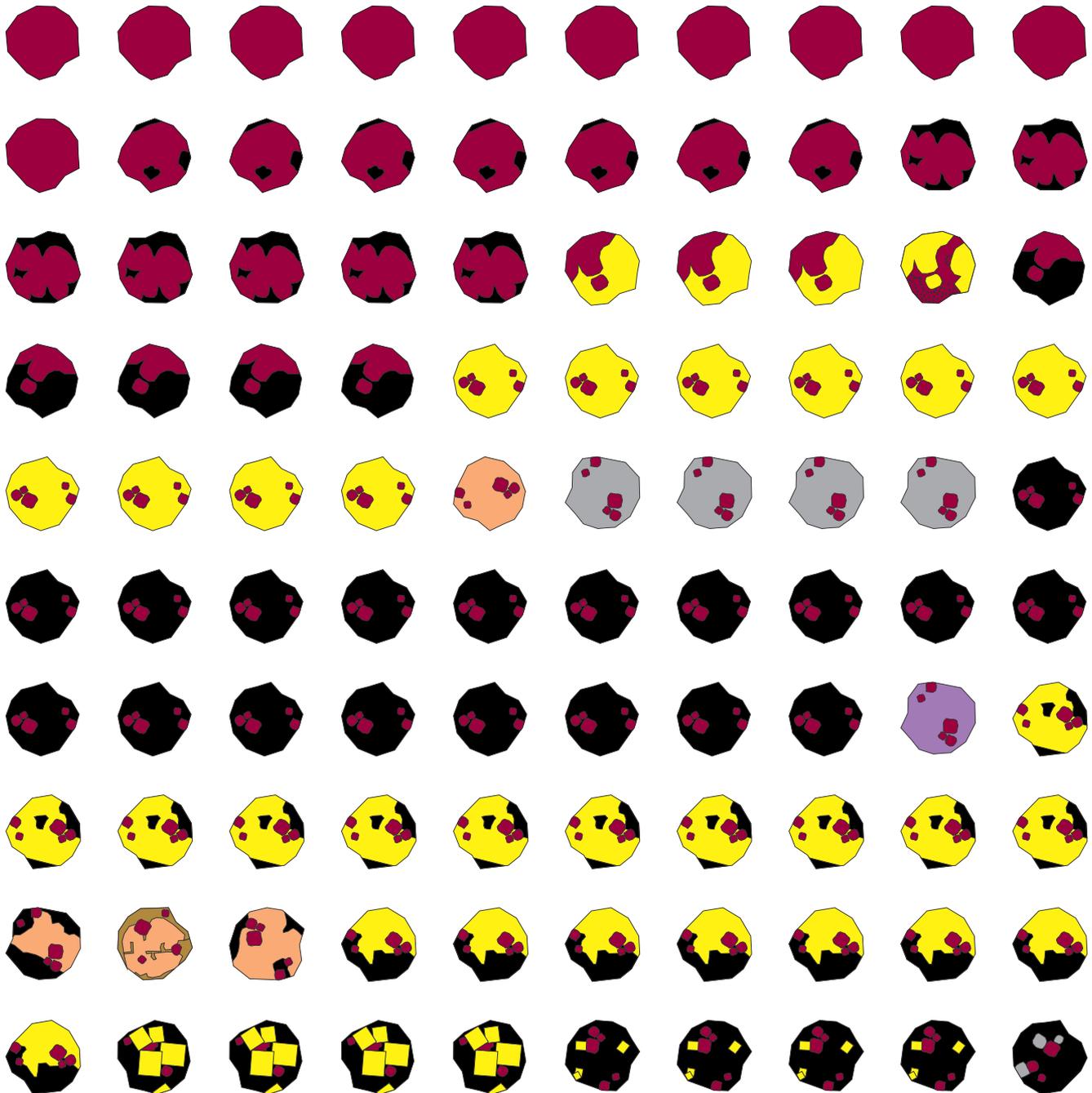
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2 Sn
SCAN

D +20µm

August

2014



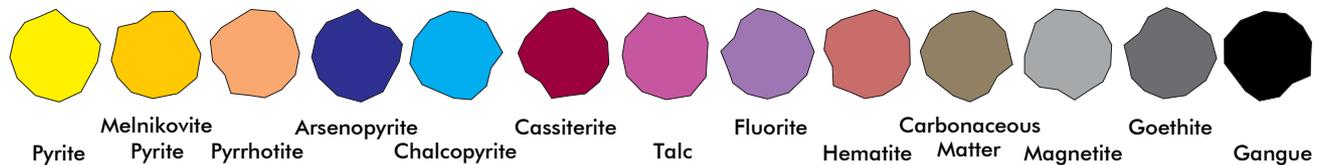
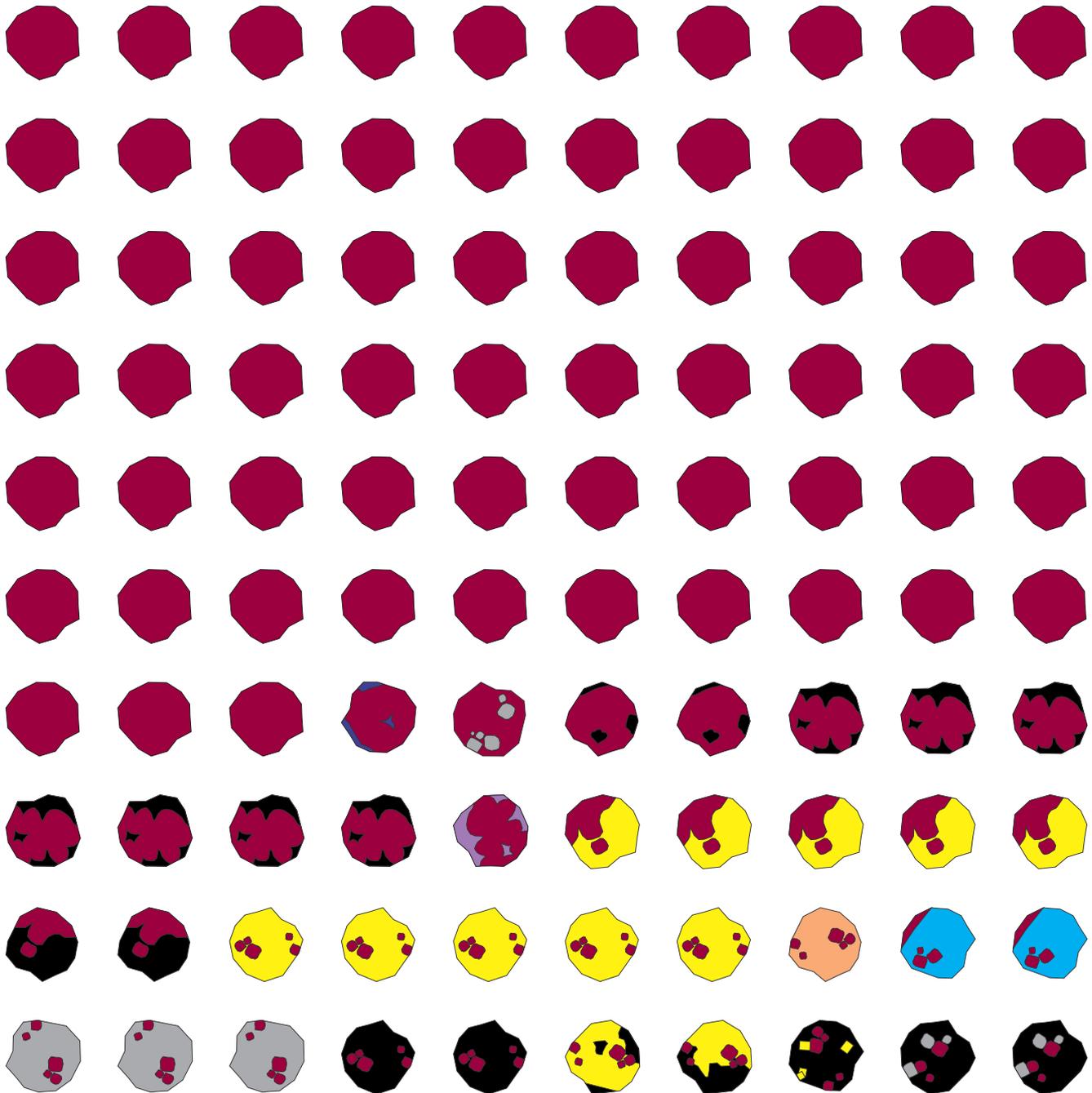
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 2 Sn
SCAN

E +7 μ m

August

2014

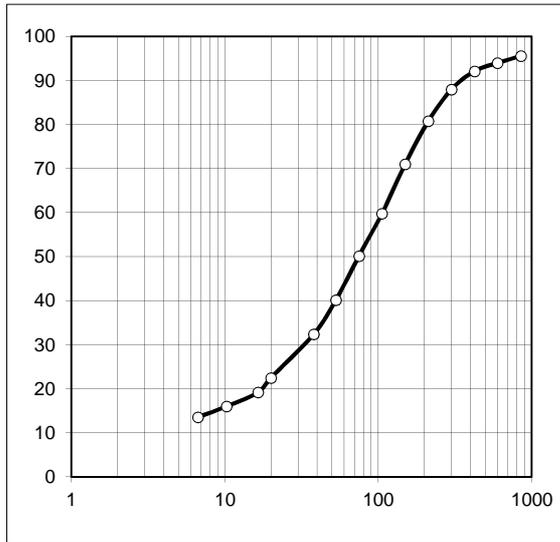




BURNIE LABORATORY
Mineralogy sizing sheet

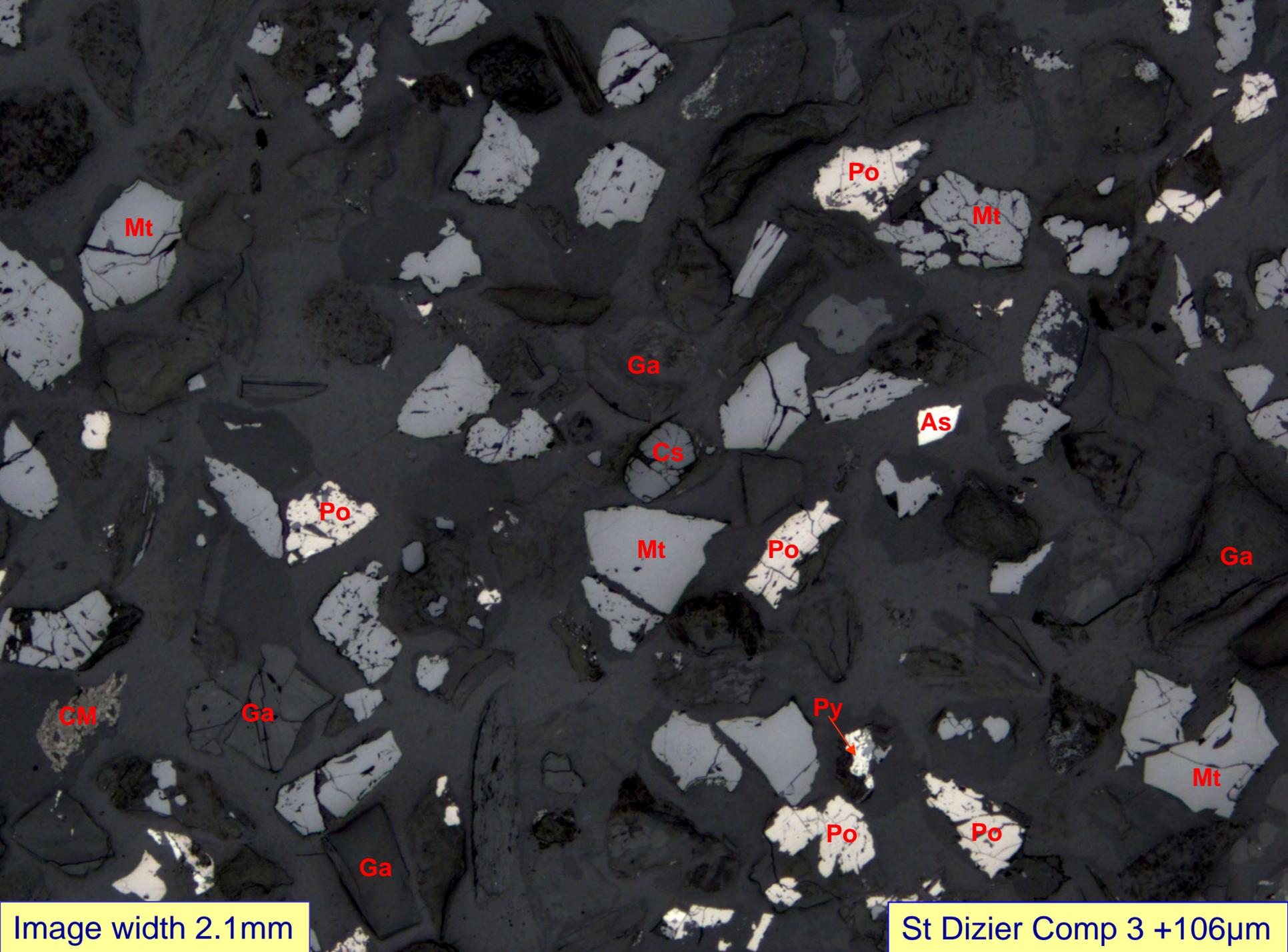
PROJECT	T0887
SAMPLE	St Dizier Comp 3
FROM TEST NO	
DATE	50814
TECHNICIAN	MS

St Dizier Comp 3			SIZE	WEIGHTS		
			um	gm	(%)	%PASS
P80	207	850	7.62	4.42	95.6	
		600	2.76	1.60	94.0	
		425	3.20	1.86	92.1	
		300	7.12	4.13	88.0	
		212	12.45	7.23	80.8	
		150	16.78	9.74	71.0	
		106	19.30	11.20	59.8	
		75	16.60	9.63	50.2	
		53	17.24	10.01	40.2	
		38	13.40	7.78	32.4	
20	17.05	9.90	22.5			
TEMP	21	CS3	17	5.69	3.30	19.2
SG	3.00	CS4	10	5.51	3.20	16.0
MINS	20	CS5	7	4.19	2.43	13.6
SUB			23.38	13.57		
TOTAL			172.29	100.00		



ANALYSES

SIZE	WT	Sn		Fe		S		SiO2		Mount Number
		%	dist	%	dist	%	dist	%	dist	
212	19.2	0.82	15.6	23.60	13.9	3.35	14.2	31.50	24.0	887155
106	20.9	1.09	22.6	37.20	23.8	4.68	21.5	22.00	18.3	887156
53	19.6	1.11	21.6	38.90	23.3	4.82	20.8	20.90	16.3	887157
20	17.7	1.20	21.0	38.40	20.7	5.80	22.5	20.60	14.4	887158
7	8.9	1.60	14.2	41.40	11.3	5.89	11.6	18.75	6.6	887159
<7	13.6	0.37	5.0	16.95	7.0	3.17	9.4	37.80	20.3	
CALC	100.0	1.01	100.0	32.76	100.0	4.55	100.0	25.22	100.0	
ASSAY		1.04		32.20		4.80		24.90		



Mt

Po

Mt

Ga

As

Po

Mt

Po

Ga

CM

Ga

Py

Mt

Ga

Po

Po

Image width 2.1mm

St Dizier Comp 3 +106µm



PARTICLE MINERALOGY REPORT

**St Dizier Comp 3
August 2014**

A +212µm 19 % by weight

GJMcA 12.8.14

B +106µm 21 % by weight

C +53µm 20 % by weight

D +20µm 18 % by weight

E +7µm 9 % by weight

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
3.5	3.1	0.0	0.2	0.0	0.0	21.8	71.5	100
49	22	0	7	1	0	54	80	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
4.5	6.2	1.0	0.2	0.0	0.0	44.1	44.1	100
56	56	100	25	0	0	80	69	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
1.9	7.1	1.0	0.6	0.0	0.0	34.4	55.1	100
62	64	100	26	2	2	84	85	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
3.8	14.2	0.0	1.0	0.0	0.1	40.3	40.7	100
48	89	0	48	0	4	94	88	

Average composition - all grains

Py	Po	As	Cs	Cp	GoHe	Mt	Ga	n
2.7	8.1	0.0	1.0	0.0	0.0	32.1	56.3	100
88	89	0	84	0	0	97	99	

ASSAYS

	SG	Cu	Sn	As	S	Fe
Calc'd	3.49	0.00	0.28	0.0	4.3	32.0
Actual			0.82		3.4	23.6

ASSAYS

	SG	Cu	Sn	As	S	Fe
Calc'd	4.11	0.00	0.24	0.7	6.0	49.2
Actual			1.09		4.7	37.2

ASSAYS

	SG	Cu	Sn	As	S	Fe
Calc'd	3.86	0.01	0.83	0.7	4.9	42.6
Actual			1.11		4.8	38.9

ASSAYS

	SG	Cu	Sn	As	S	Fe
Calc'd	4.15	0.00	1.32	0.0	8.7	49.7
Actual			1.20		5.8	38.4

ASSAYS

	SG	Cu	Sn	As	S	Fe
Calc'd	3.83	0.00	1.42	0.0	5.7	41.5
Actual			1.60		5.9	41.4

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	0	0	0	0	0	46	66
Binary	55	6	0	18	0	53	24
Ternary	39	83	0	60	0	1	8
Quat.+	6	11	0	22	0	0	2
#Grains	7	14	0	6	0	40	89

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	0	16	100	16	0	68	70
Binary	49	70	0	48	0	31	24
Ternary	51	13	0	28	0	1	5
Quat.+	0	0	0	8	0	0	0
#Grains	8	11	1	4	0	55	64

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	54	71	100	31	0	79	78
Binary	0	1	0	55	0	21	17
Ternary	24	8	0	12	0	0	5
Quat.+	22	21	0	2	100	0	0
#Grains	3	11	1	8	1	41	65

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	79	64	0	60	0	89	96
Binary	20	24	0	33	0	7	2
Ternary	1	12	0	7	62	1	2
Quat.+	0	0	0	0	37	2	0
#Grains	8	16	0	2	2	43	46

COMPOSITE PROPORTIONS

	Py	Po	As	Cs	GoHe	Mt	Ga
Mono	75	99	0	85	0	100	96
Binary	25	1	0	15	0	0	4
Ternary	0	0	0	1	0	0	0
Quat.+	0	0	0	0	0	0	0
#Grains	3	9	0	1	0	33	57

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	50	0	0	0	0	0	50
Po	25	0	0	0	0	0	75
As	0	0	0	0	0	0	0
Cs	0	0	0	0	0	0	100
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	0	17	0	6	0	78	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	18	0	0	0	0	0	82
Po	14	0	0	22	0	38	26
As	0	0	0	0	0	0	0
Cs	5	14	0	0	0	0	80
GoHe	0	0	0	0	0	0	0
Mt	0	3	0	0	0	0	97
Ga	20	17	0	0	0	62	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	0
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	0	12	0	0	0	8	81
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	0	10	0	39	0	51	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	13	0	0	0	0	0	87
Po	55	0	0	0	0	19	26
As	0	0	0	0	0	0	0
Cs	1	16	0	0	0	20	63
GoHe	0	0	0	0	0	0	0
Mt	0	12	0	0	0	0	87
Ga	35	10	0	0	0	55	

BINARY ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	100
Po	0	0	0	0	0	0	100
As	0	0	0	0	0	0	0
Cs	1	6	0	0	4	31	58
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	100
Ga	16	42	0	0	0	42	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	55	0	0	6	0	17	72
Po	37	0	0	52	0	8	98
As	0	0	0	0	0	0	0
Cs	19	52	0	0	0	38	100
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	54
Ga	3	12	0	6	0	24	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	9	0	19	0	32	91	
Po	10	0	28	0	27	32	
As	0	0	0	0	0	0	
Cs	6	25	0	1	25	67	
GoHe	0	0	0	0	0	0	
Mt	0	2	0	0	0	31	
Ga	6	8	0	3	0	18	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	46	0	0	22	24	22	
Po	15	0	14	8	7	22	
As	0	0	0	0	0	0	
Cs	1	12	0	0	13	58	
GoHe	100	100	0	0	0	100	
Mt	0	0	0	0	0	21	
Ga	0	5	0	12	0	10	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	4	0	0	2	0	17	
Po	20	0	0	6	10	12	
As	0	0	0	0	0	0	
Cs	1	7	0	0	11	27	
GoHe	100	62	0	37	0	37	
Mt	2	2	0	2	2	7	
Ga	1	2	0	0	0	3	

TOTAL ASSOCIATION MATRIX

	Py	Po	As	Cs	GoHe	Mt	Ga
Py	0	0	0	0	0	0	25
Po	0	0	0	0	0	0	1
As	0	0	0	0	0	0	0
Cs	1	1	0	0	1	5	9
GoHe	0	0	0	0	0	0	0
Mt	0	0	0	0	0	0	0
Ga	1	2	0	0	0	2	

DISTRIBUTION MATRIX

Free	Binary							Tern	Quat
	Py	Po	As	Cs	GoHe	Mt	Ga		
Py									

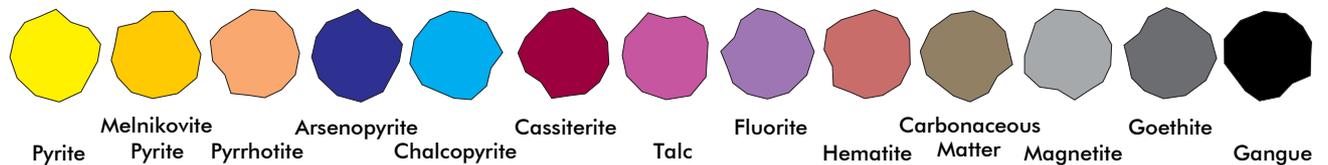
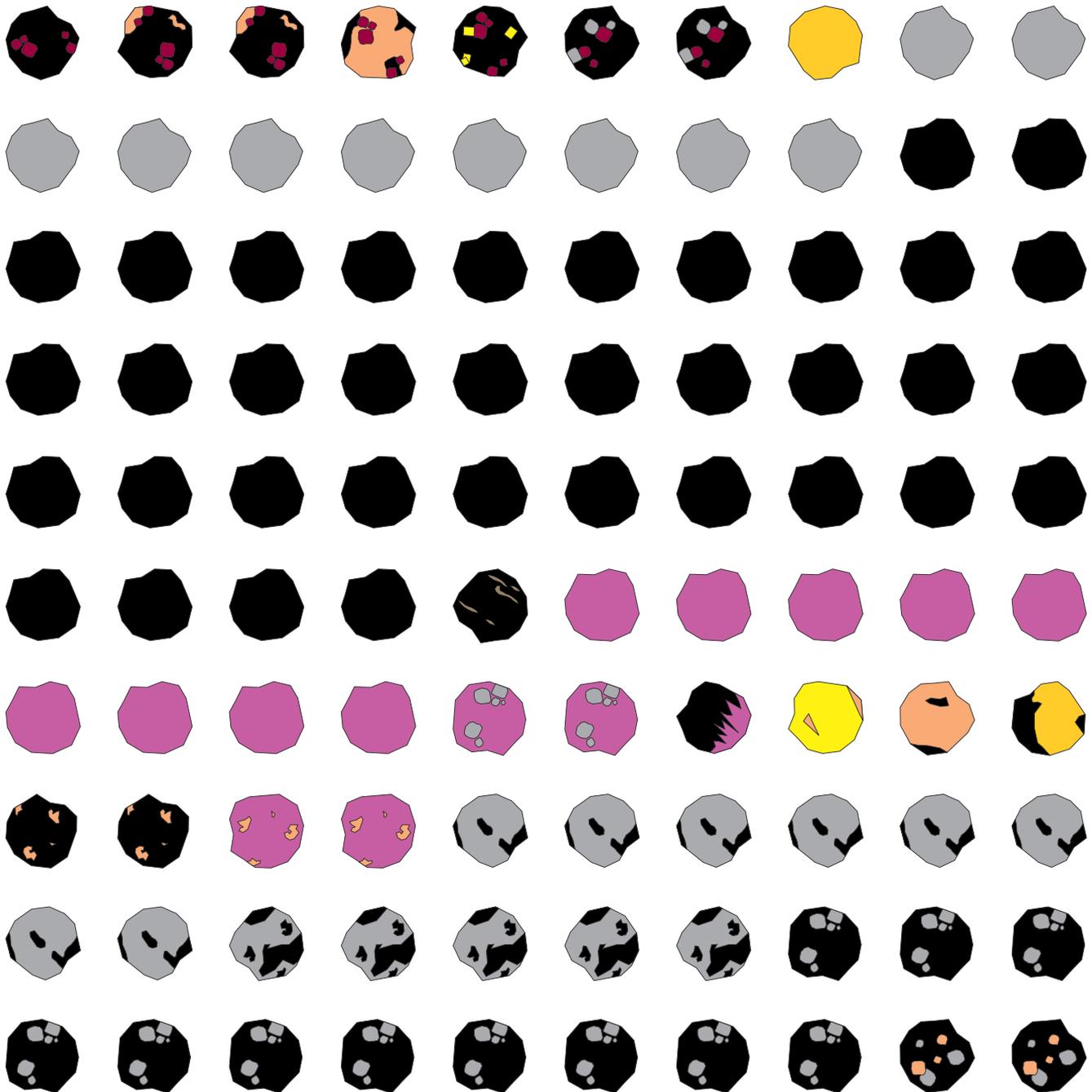
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3

A +212µm

August

2014



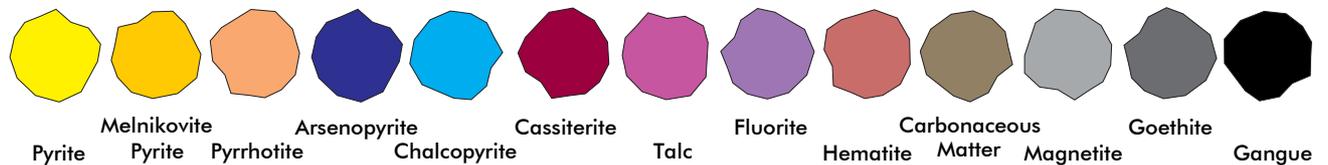
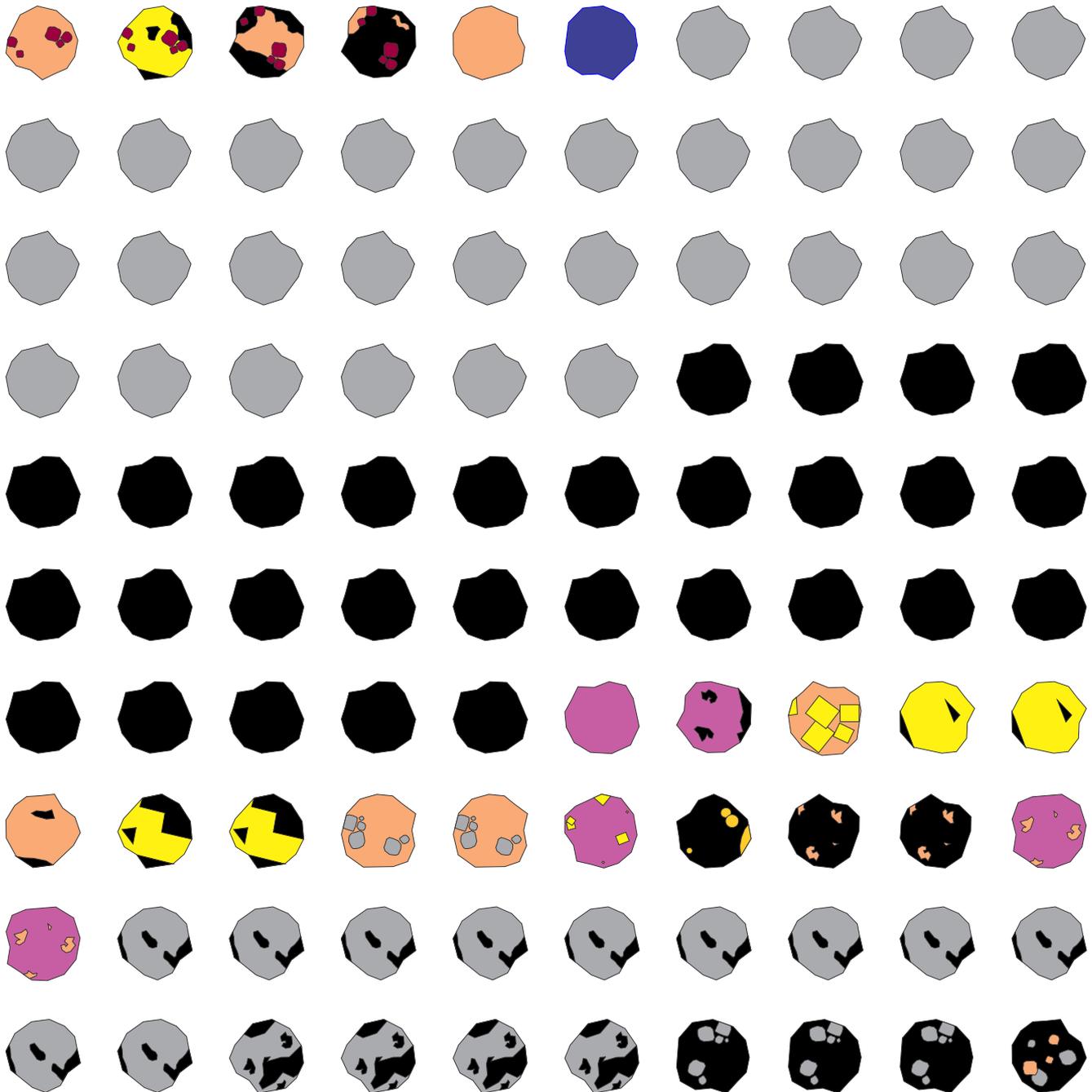
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3

B + 106µm

August

2014



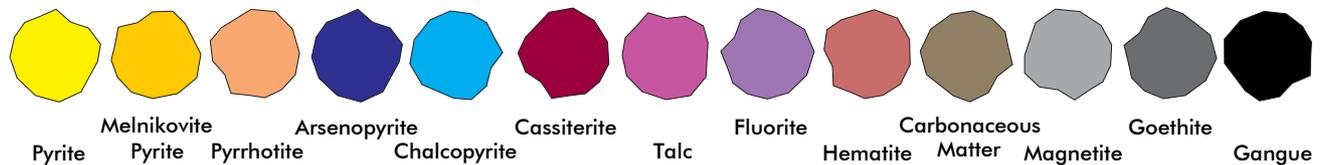
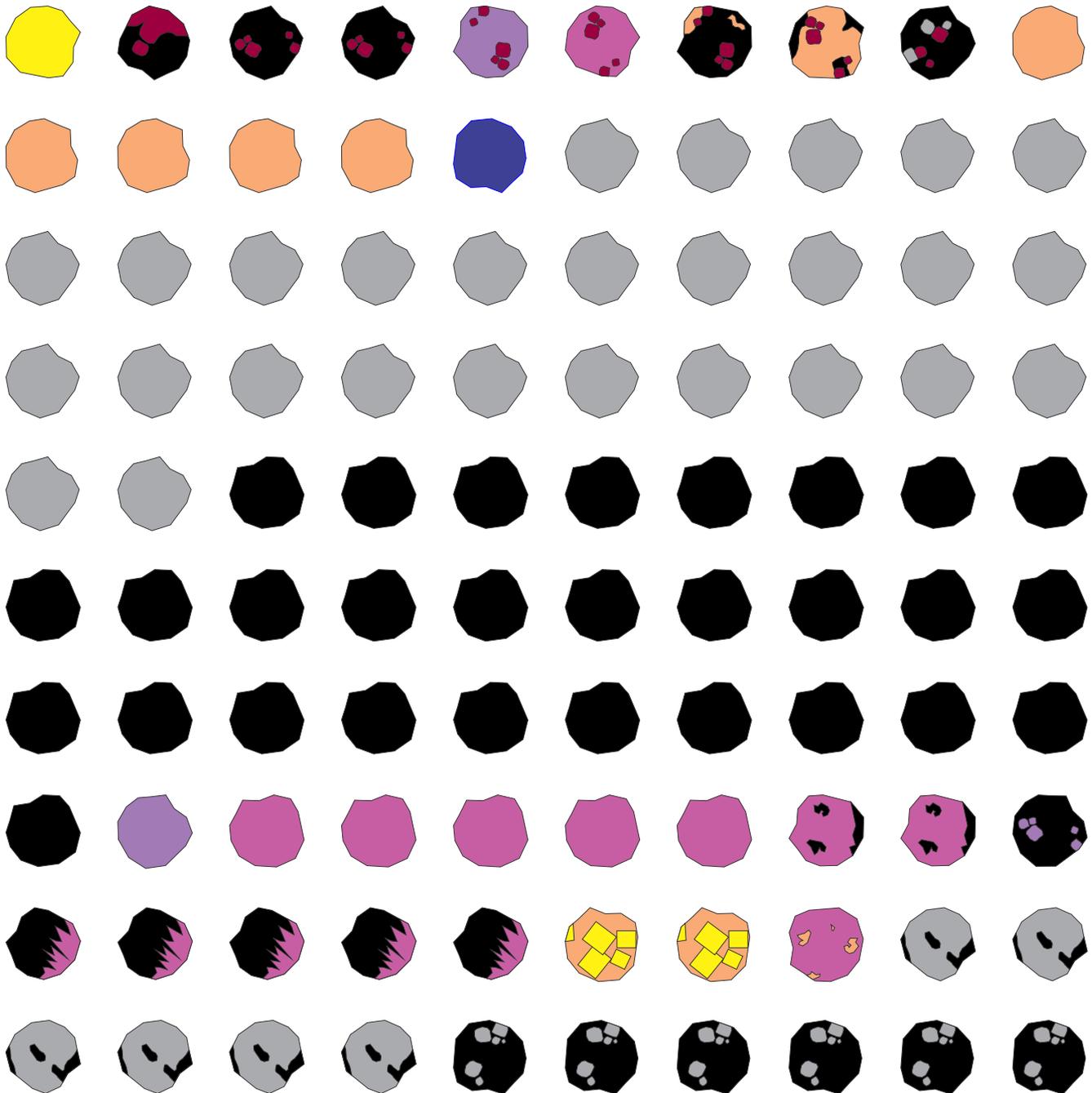
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3

C +53µm

August

2014



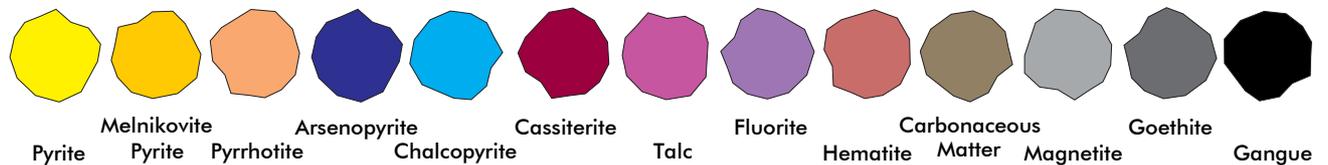
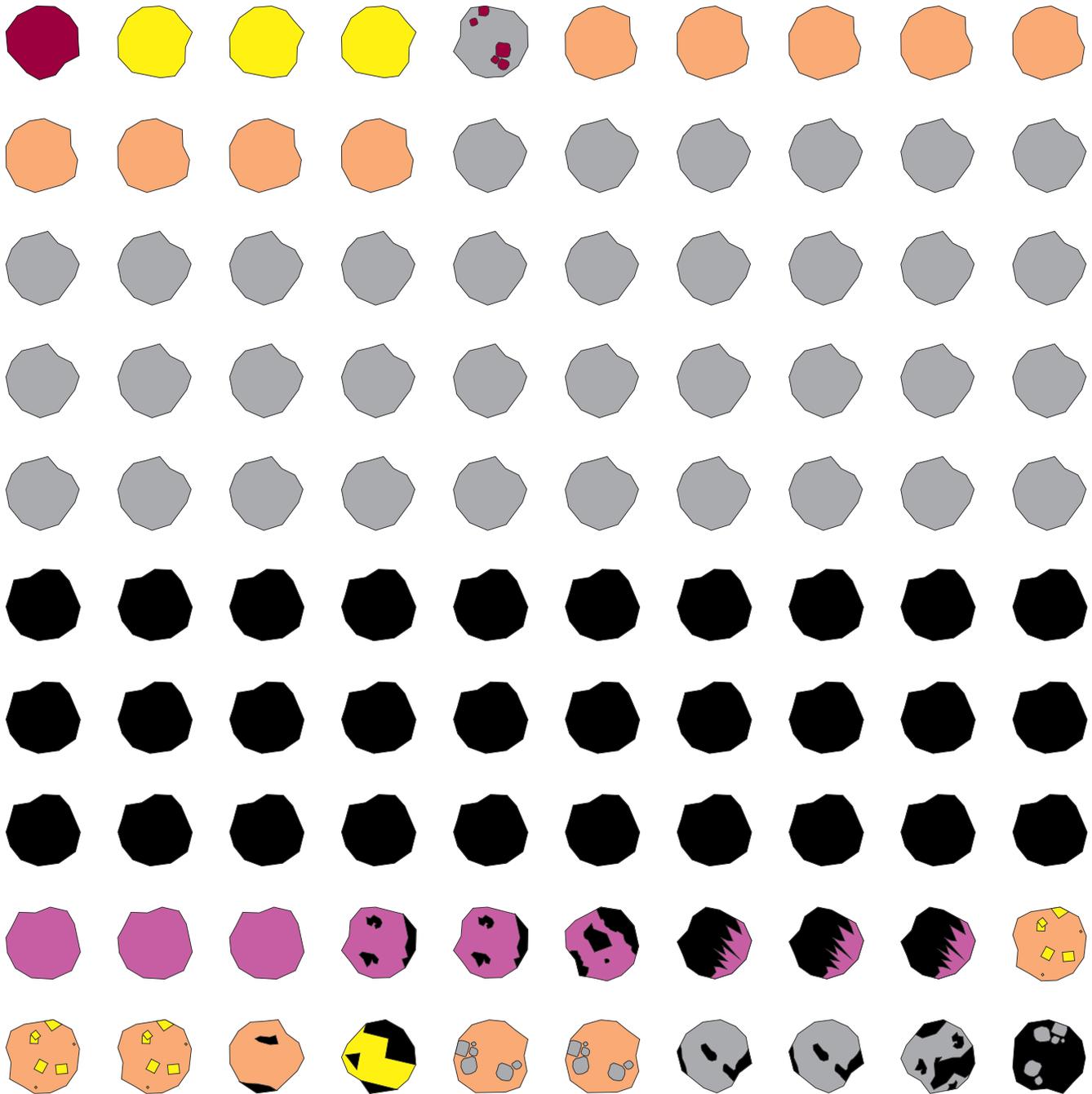
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3

D +20µm

August

2014



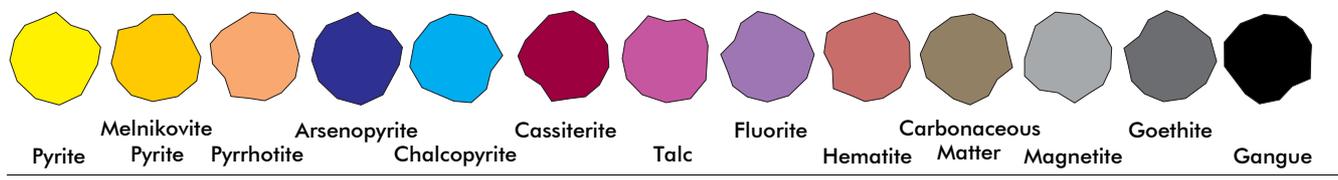
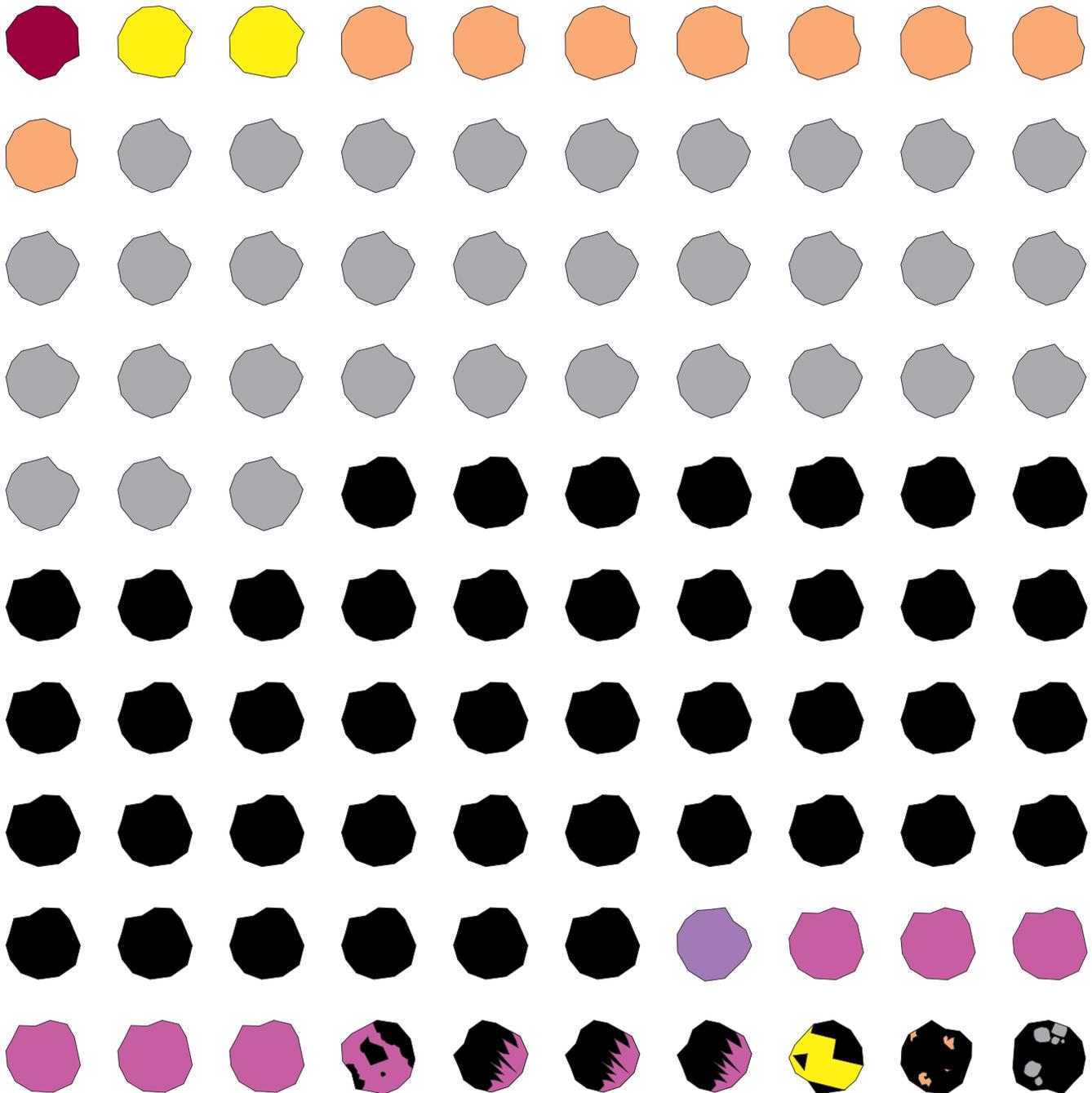
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3

E +7 μ m

August

2014



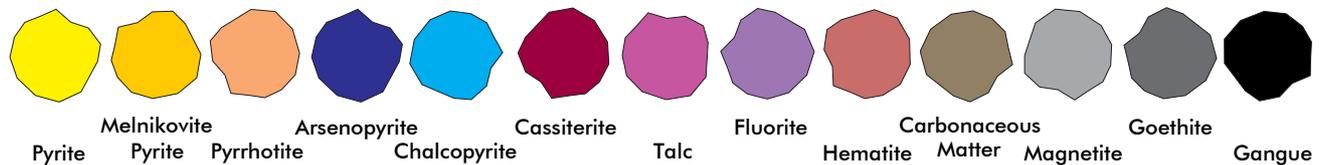
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3 Sn
SCAN

A +212µm

August

2014



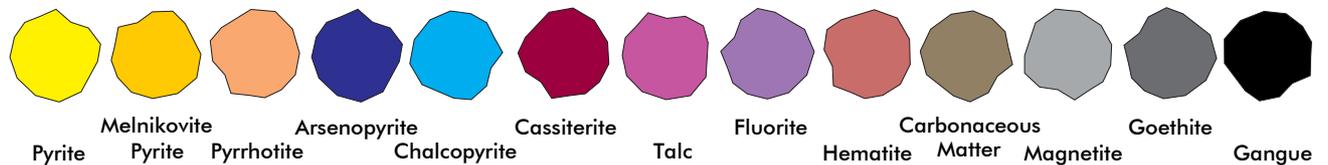
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3 Sn
SCAN

B + 106µm

August

2014



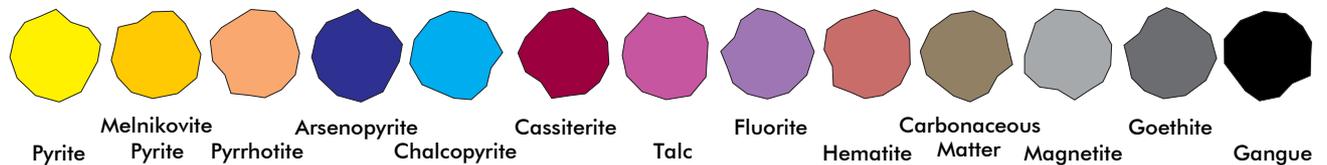
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3 Sn
SCAN

C +53µm

August

2014



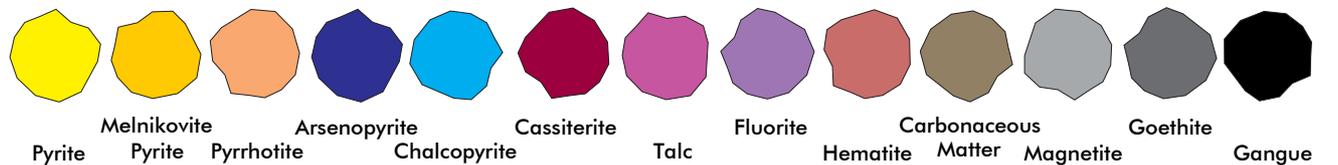
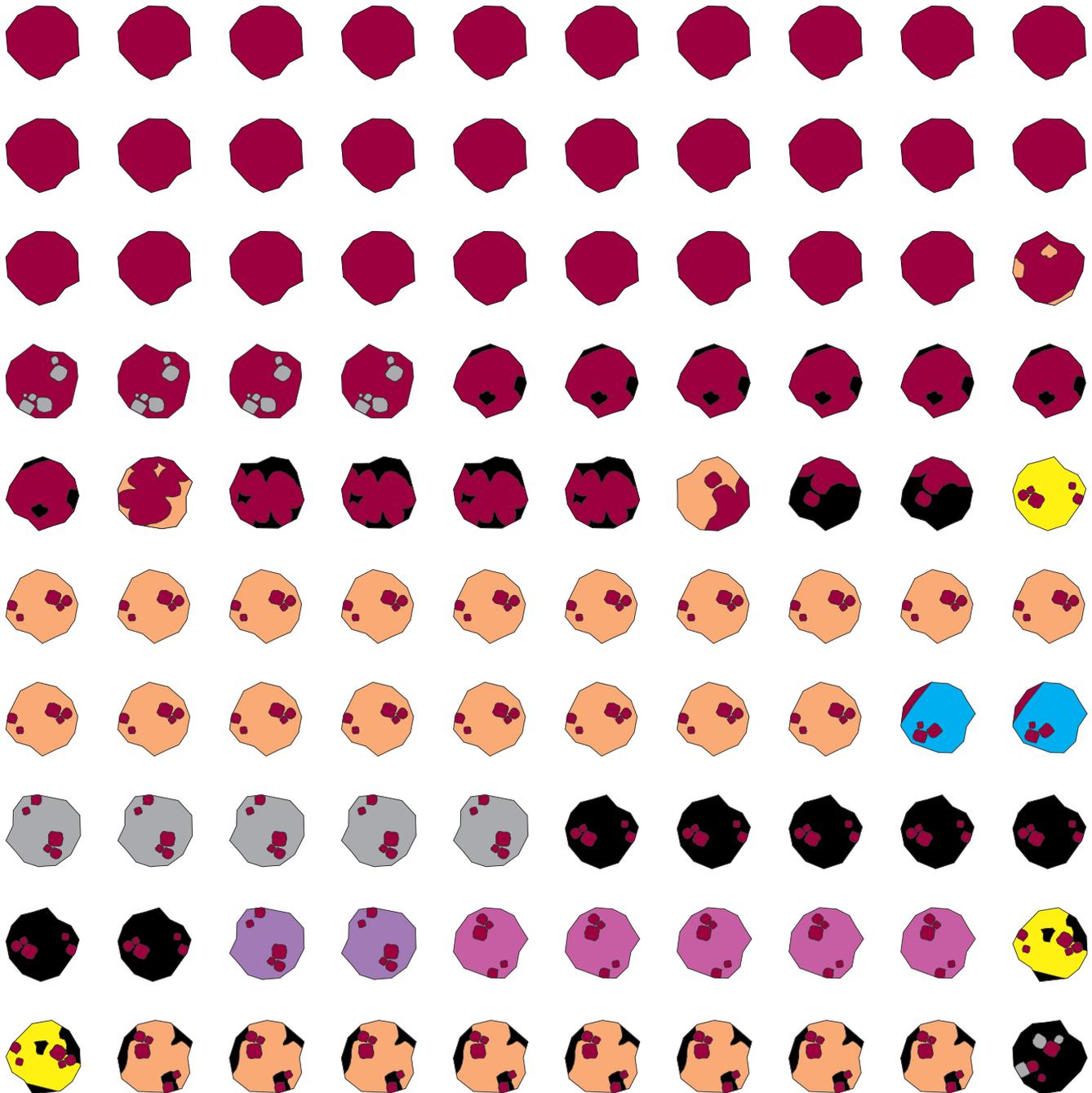
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3 Sn
SCAN

D +20µm

August

2014



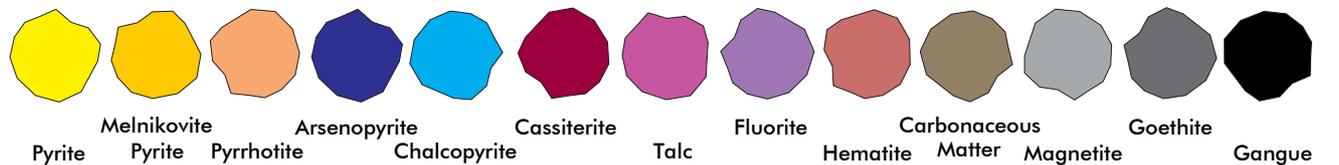
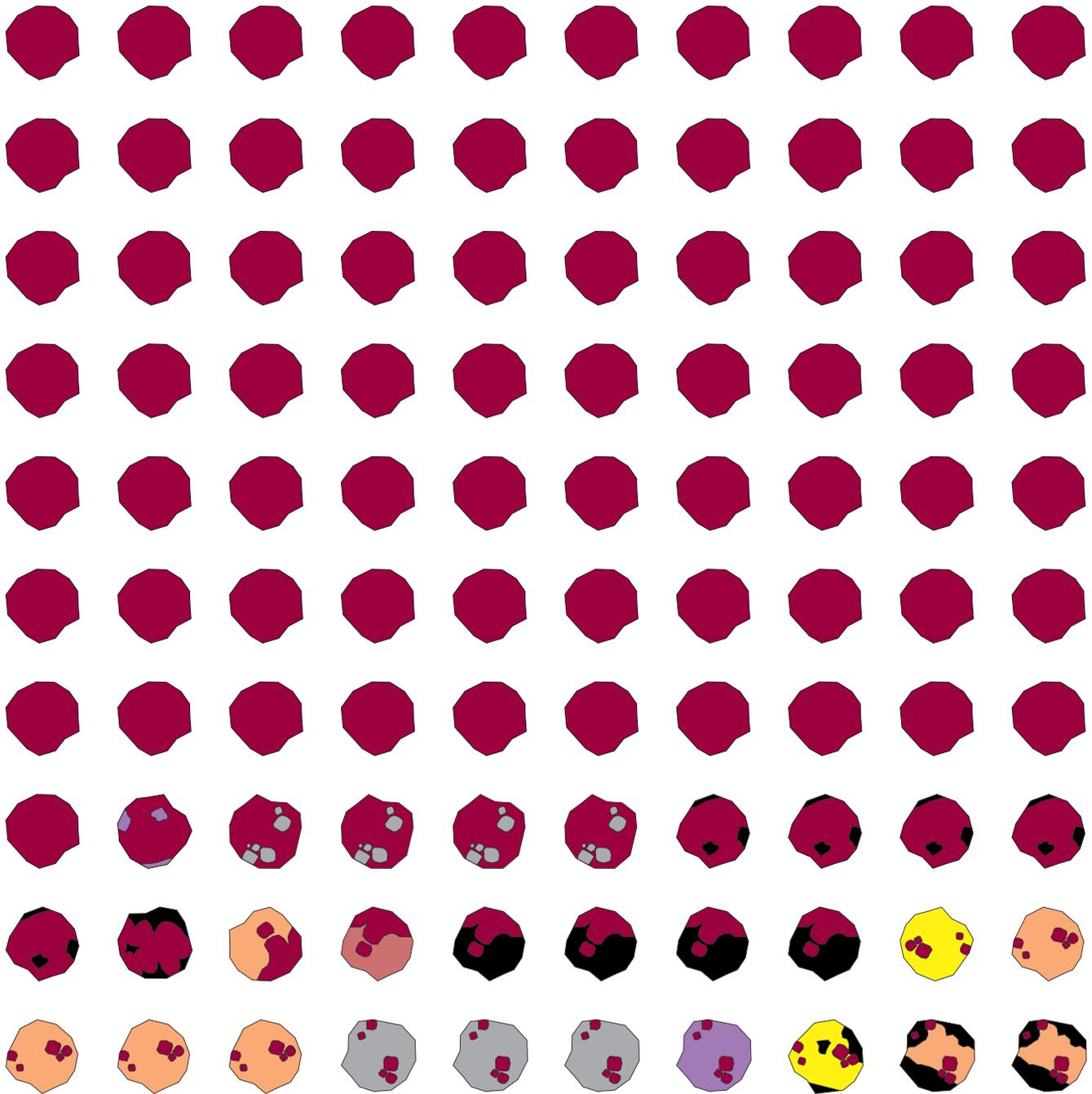
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 3 Sn
SCAN

E +7 μ m

August

2014

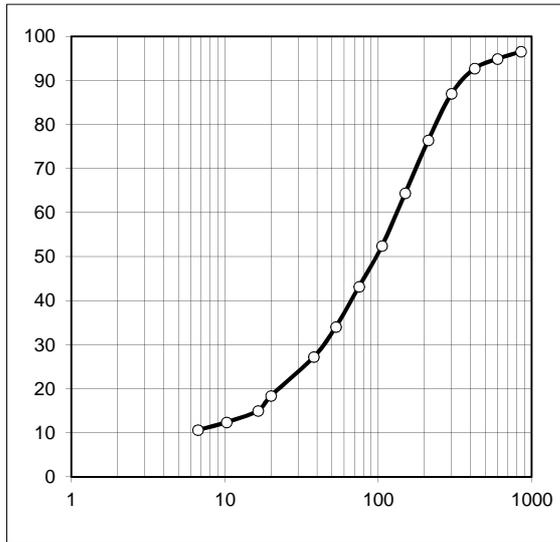




BURNIE LABORATORY
Mineralogy sizing sheet

PROJECT	T0887
SAMPLE	St Dizier Comp 4
FROM TEST NO	
DATE	50814
TECHNICIAN	MS

St Dizier Comp 4		SIZE um	WEIGHTS			
			gm	(%)	%PASS	
P80	242	850	6.33	3.44	96.6	
		600	3.06	1.66	94.9	
		425	3.95	2.15	92.8	
		300	10.61	5.76	87.0	
		212	19.40	10.54	76.4	
		150	22.16	12.04	64.4	
		106	21.98	11.94	52.5	
		75	17.05	9.26	43.2	
		53	16.79	9.12	34.1	
		38	12.56	6.82	27.3	
20	16.26	8.83	18.4			
TEMP	21	CS3	17	6.21	3.37	15.0
SG	3.00	CS4	10	4.82	2.62	12.4
MINS	20	CS5	7	3.22	1.75	10.7
SUB			19.65	10.68		
TOTAL			184.05	100.00		



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2		Mount Number
		%	dist	%	dist	%	dist	%	dist	
212	23.6	0.40	14.1	36.40	20.4	0.71	25.9	18.70	29.3	887162
106	24.0	0.66	23.6	49.20	28.0	0.58	21.5	11.60	18.5	887163
53	18.4	0.71	19.5	48.80	21.3	0.63	17.9	10.95	13.4	887164
20	15.7	0.73	17.1	47.10	17.5	0.53	12.8	12.55	13.1	887165
7	7.7	1.04	12.0	49.60	9.1	0.73	8.7	10.35	5.3	887166
<7	10.7	0.86	13.7	14.55	3.7	0.79	13.1	28.70	20.4	
CALC	100.0	0.67	100.0	42.11	100.0	0.65	100.0	15.03	100.0	
ASSAY		0.68		42.10		0.61		15.05		

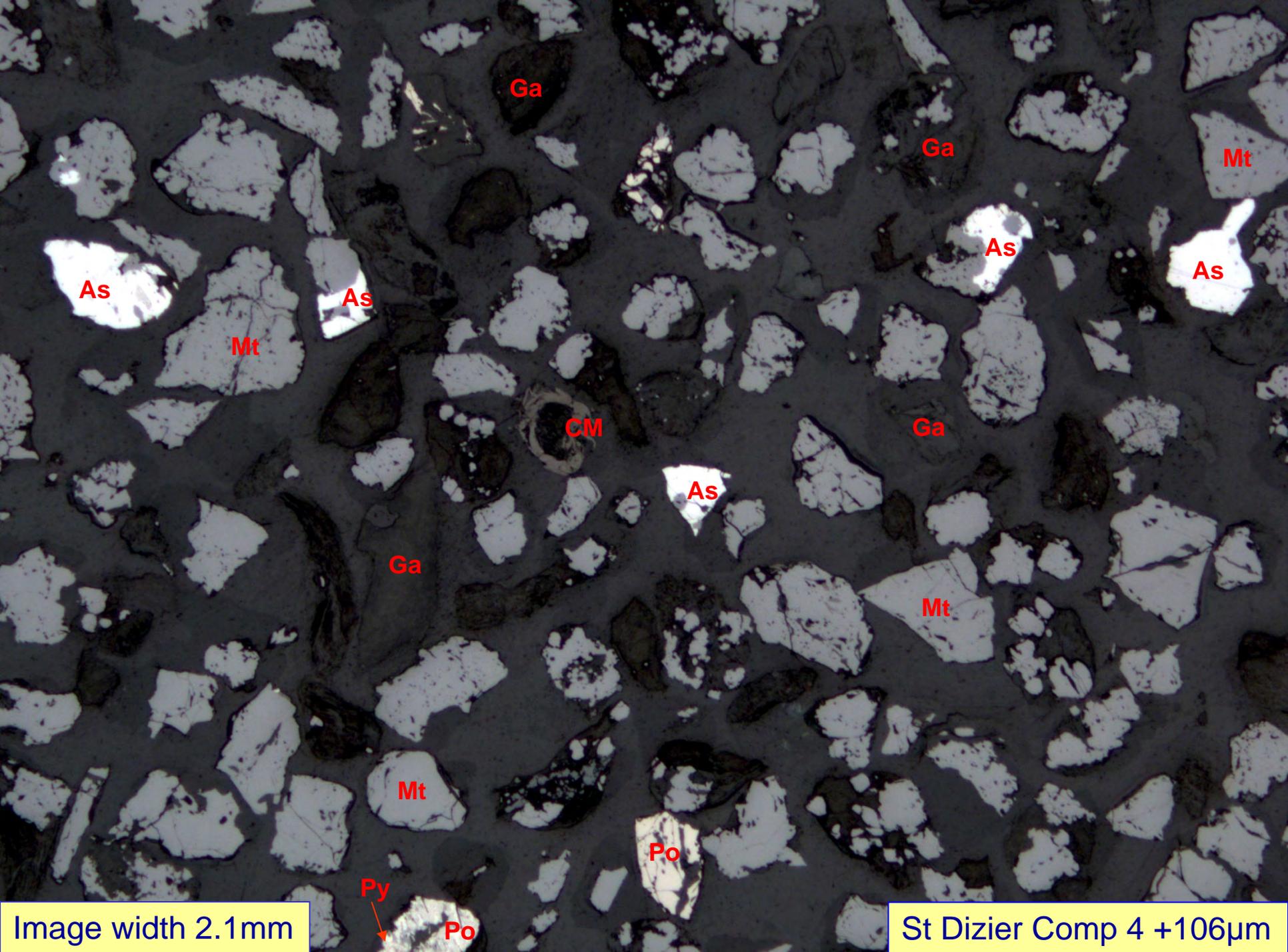


Image width 2.1mm

St Dizier Comp 4 +106µm

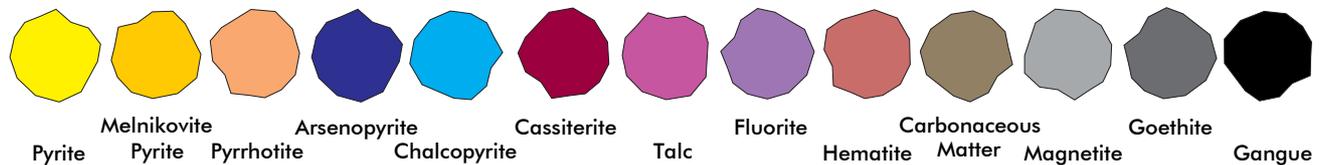
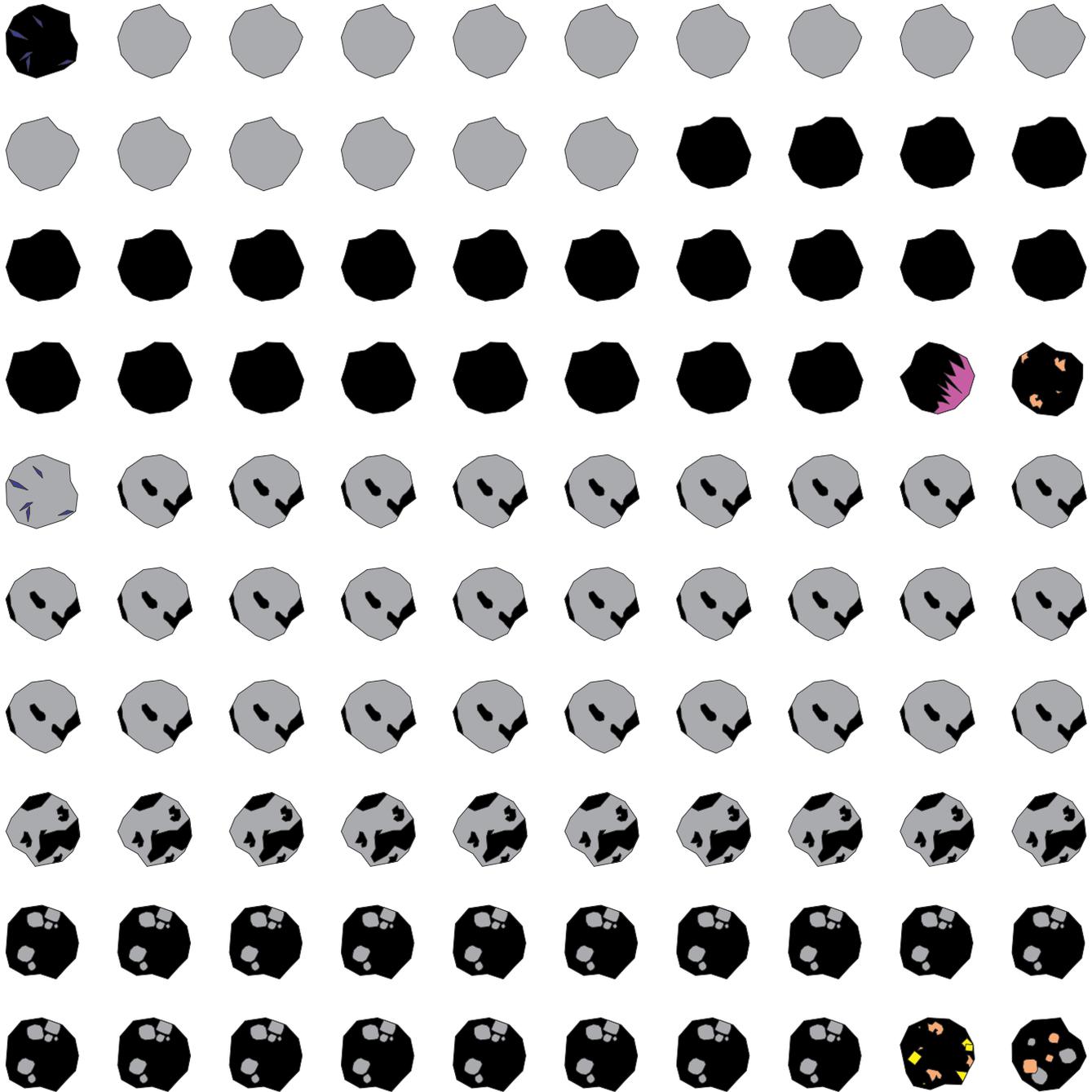
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4

A +212µm

August

2014



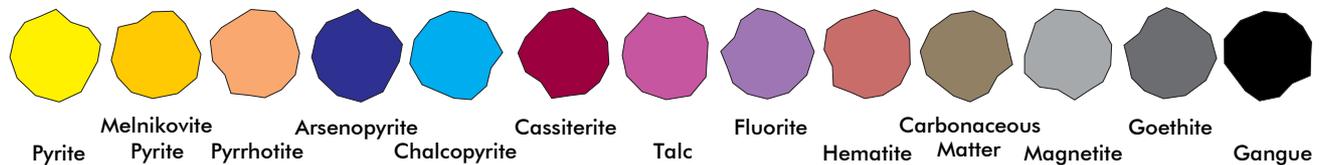
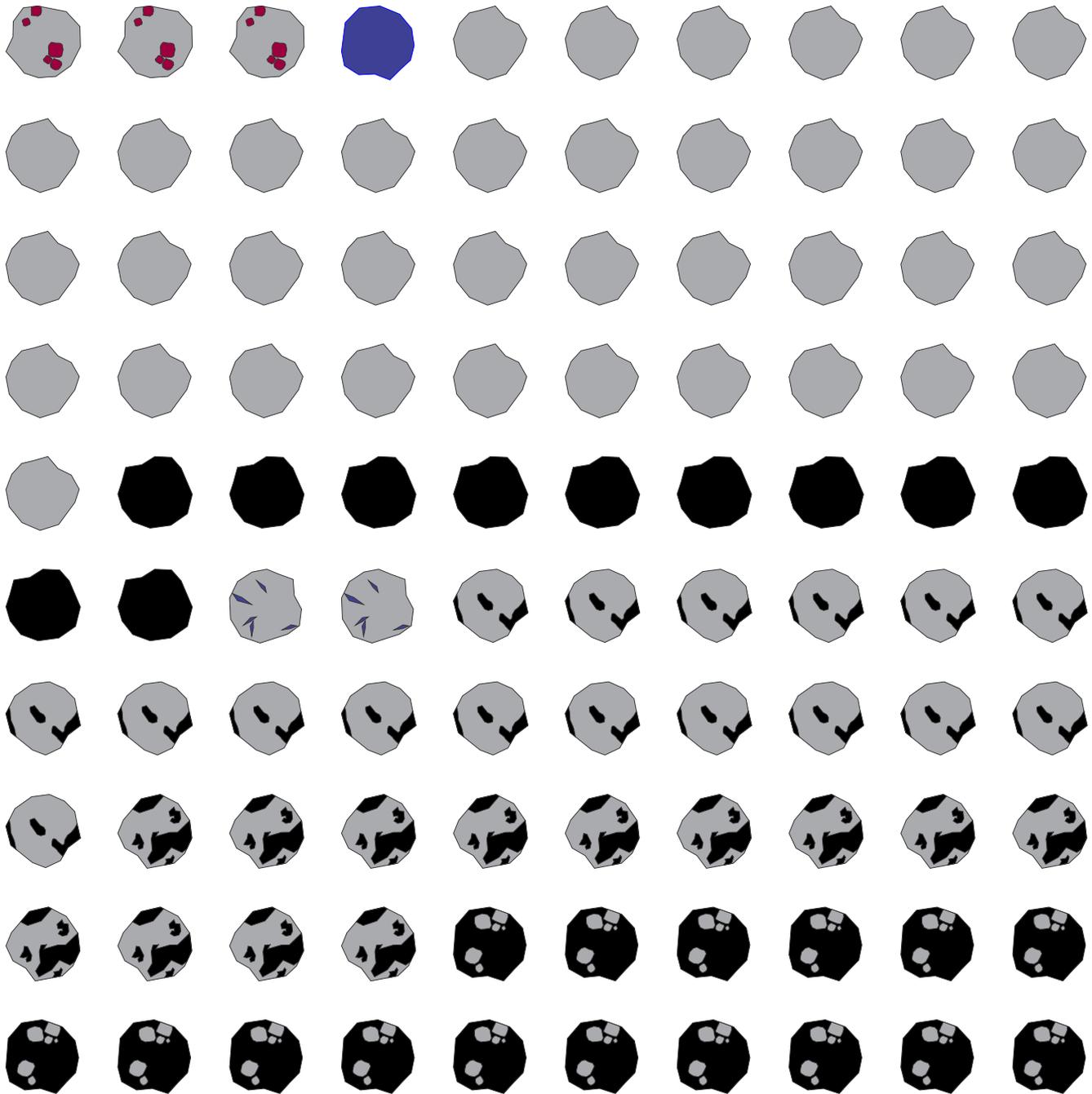
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4

B + 106µm

August

2014



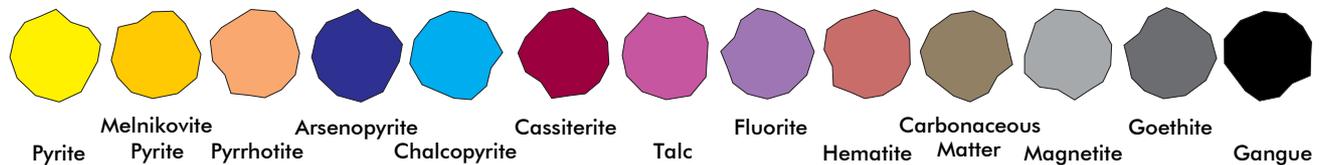
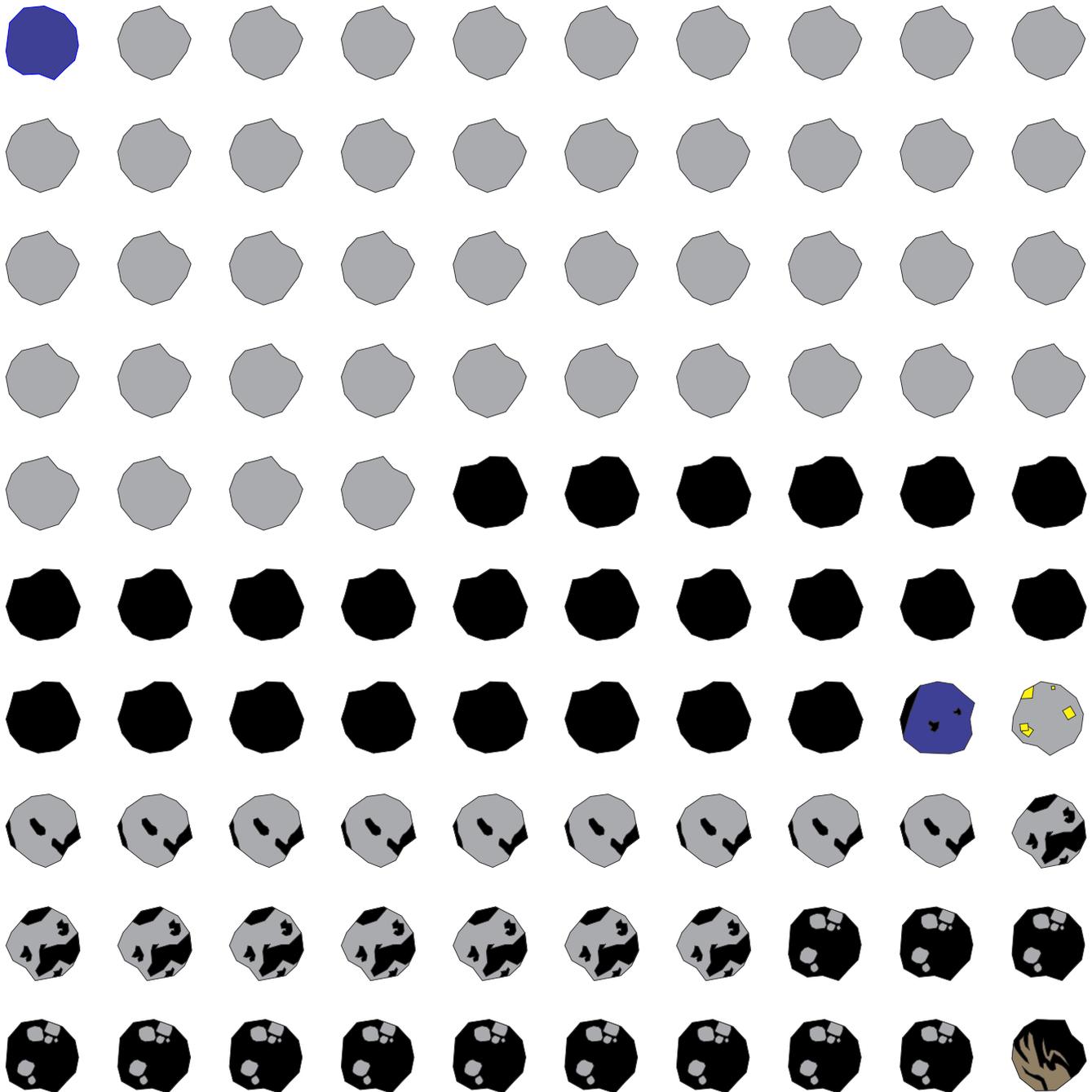
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4

C +53µm

August

2014



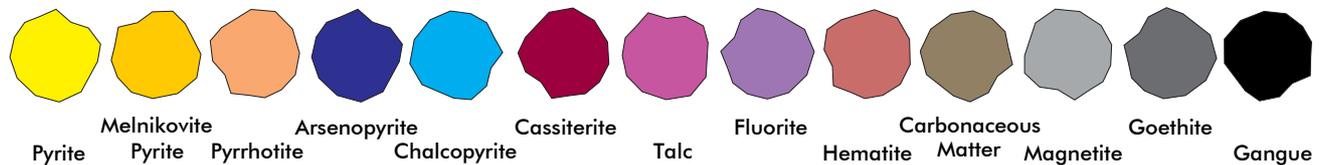
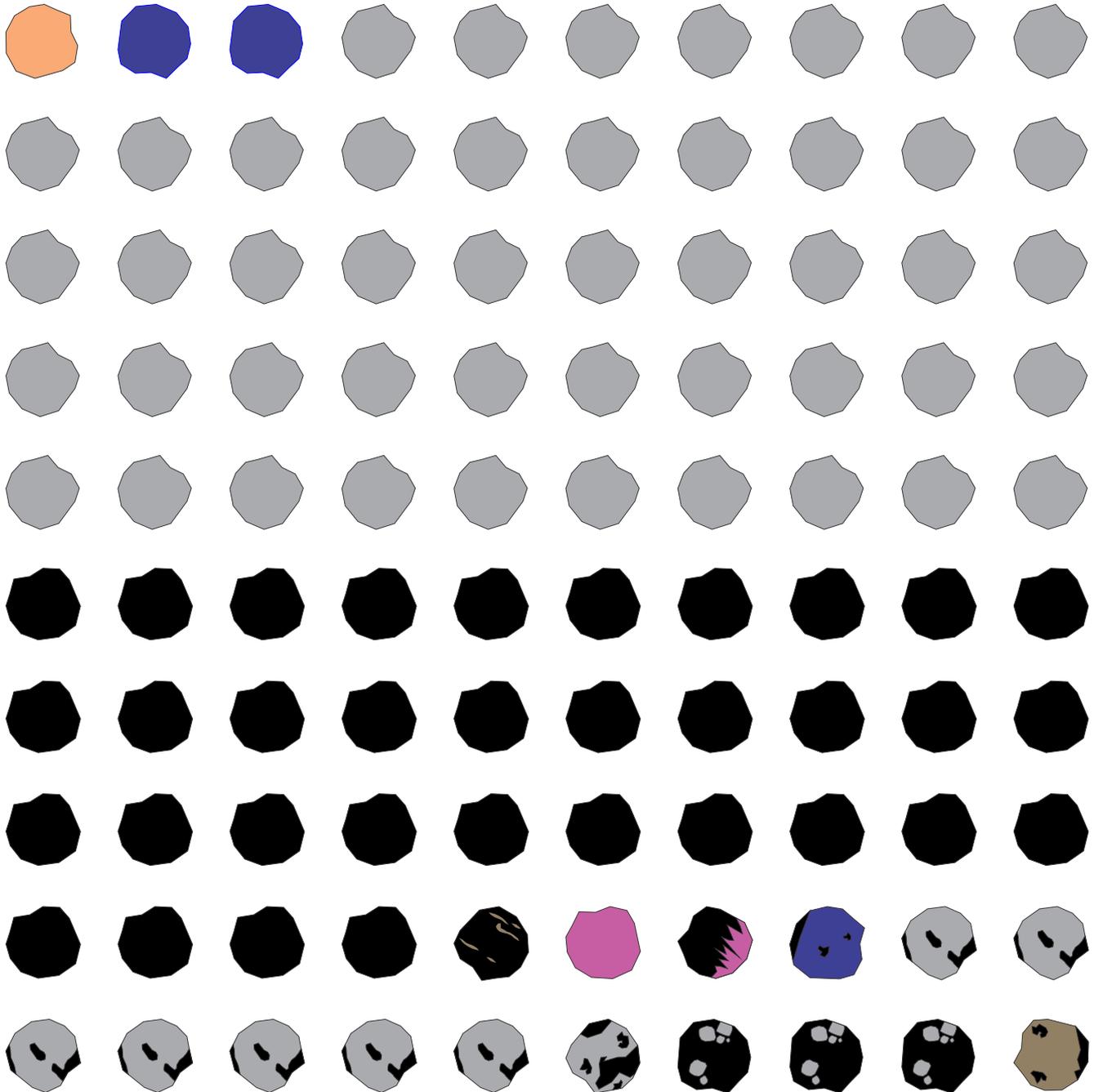
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4

D +20µm

August

2014



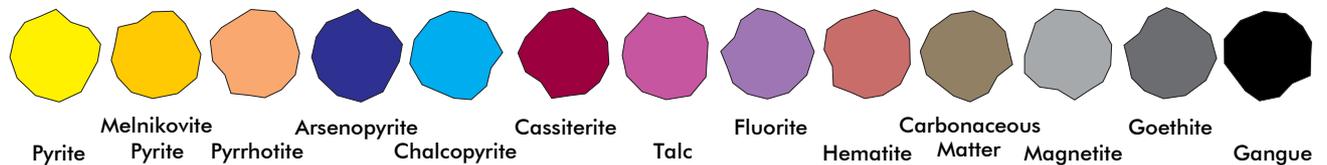
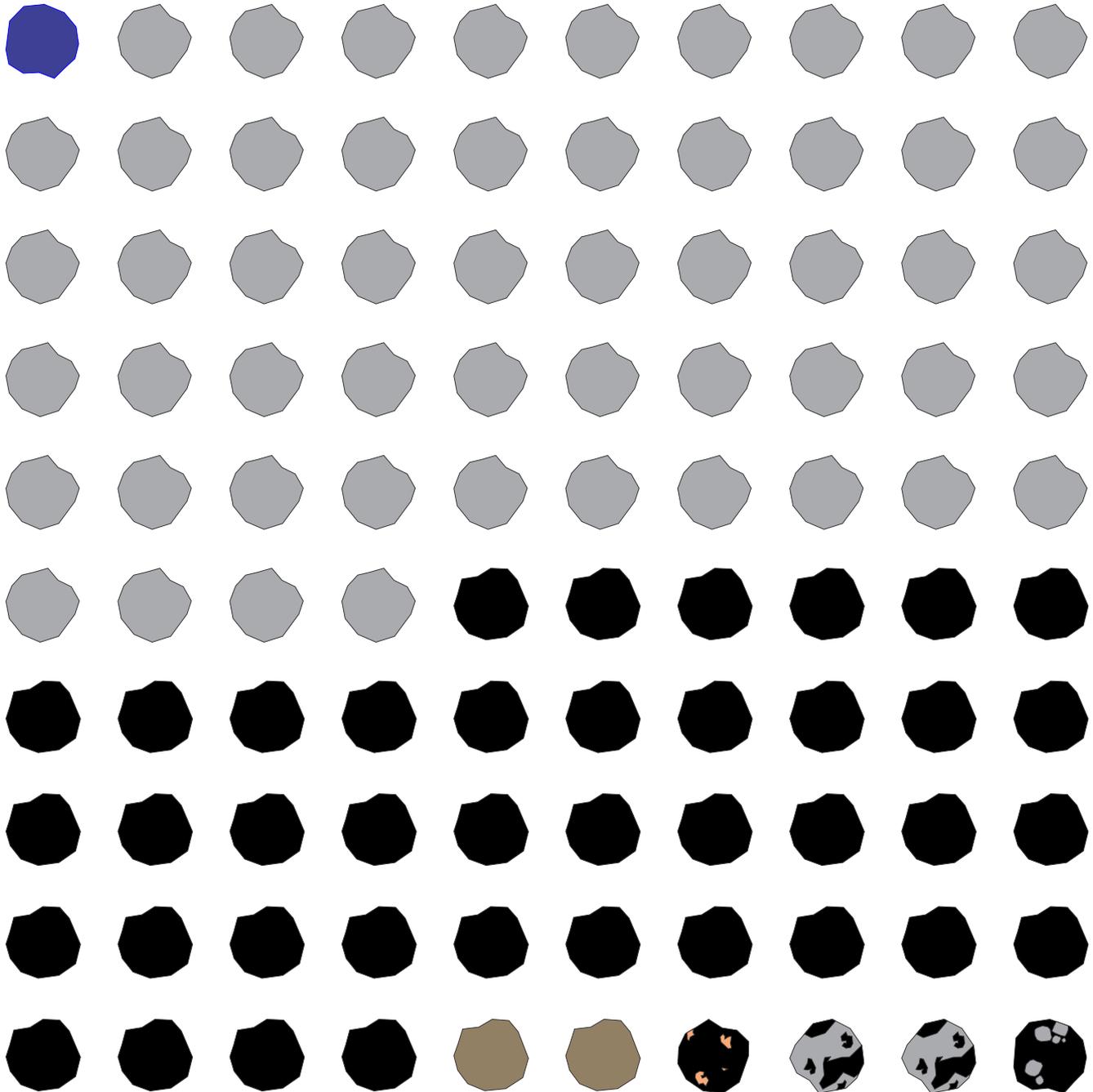
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4

E +7 μ m

August

2014



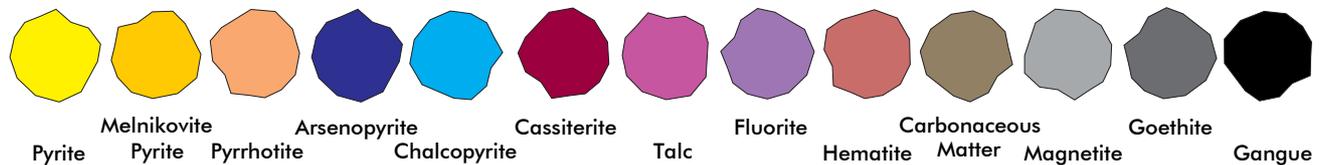
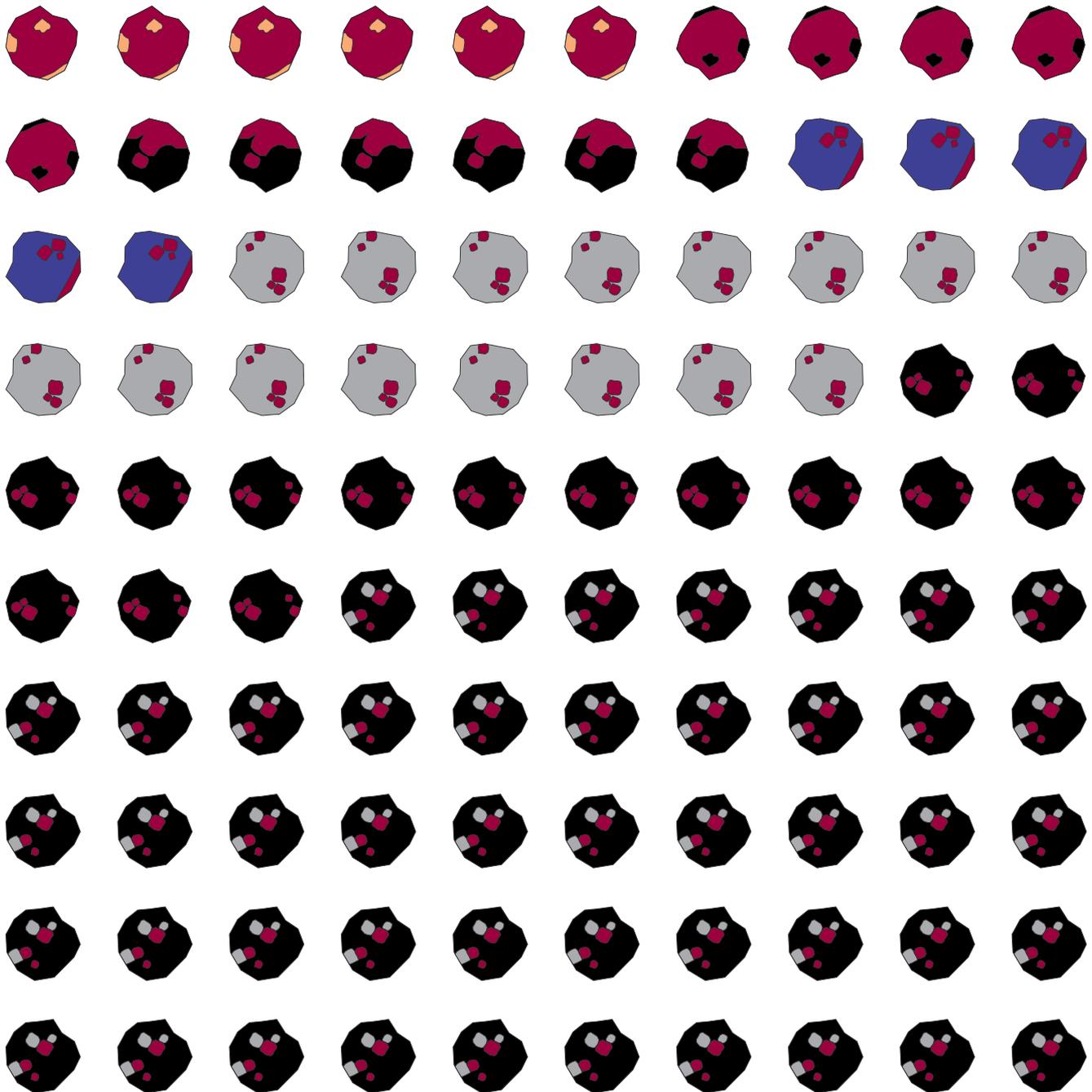
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4 Sn
SCAN

A +212µm

August

2014



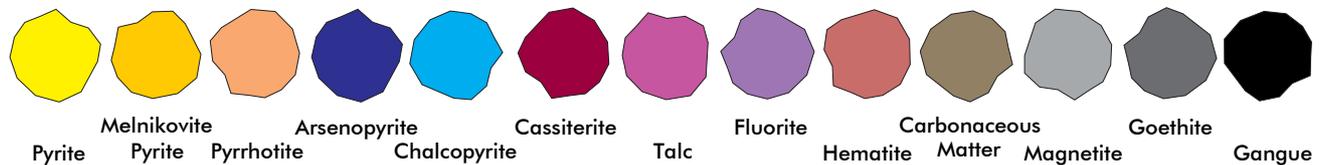
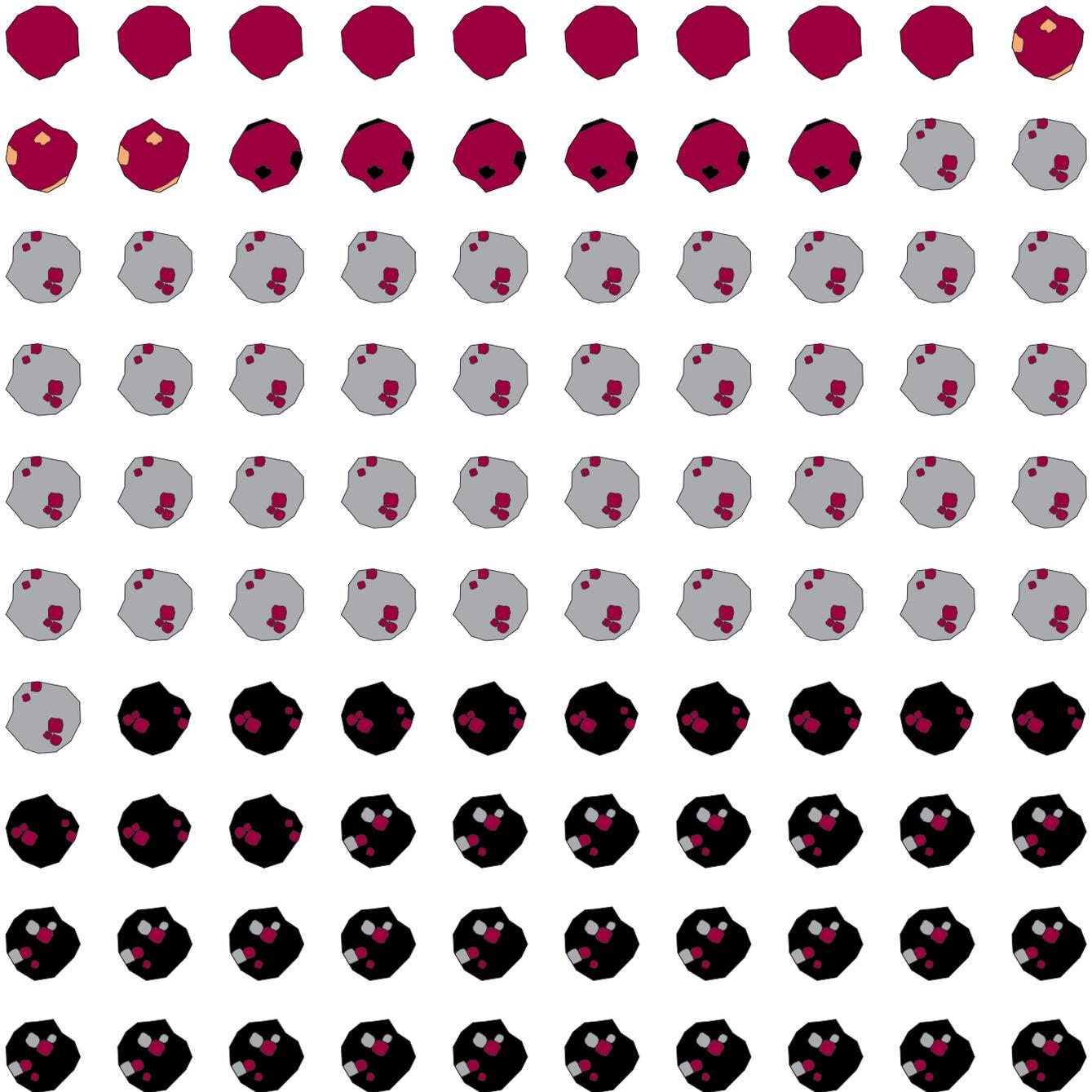
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4 Sn
SCAN

B + 106µm

August

2014



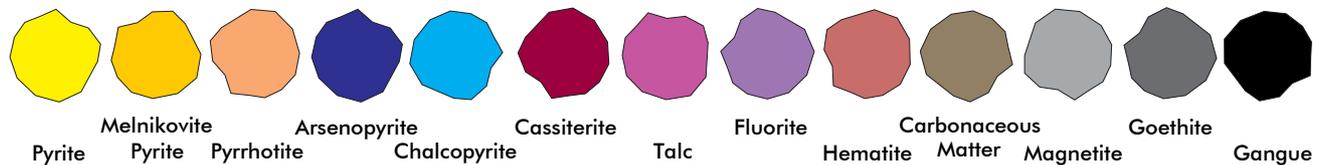
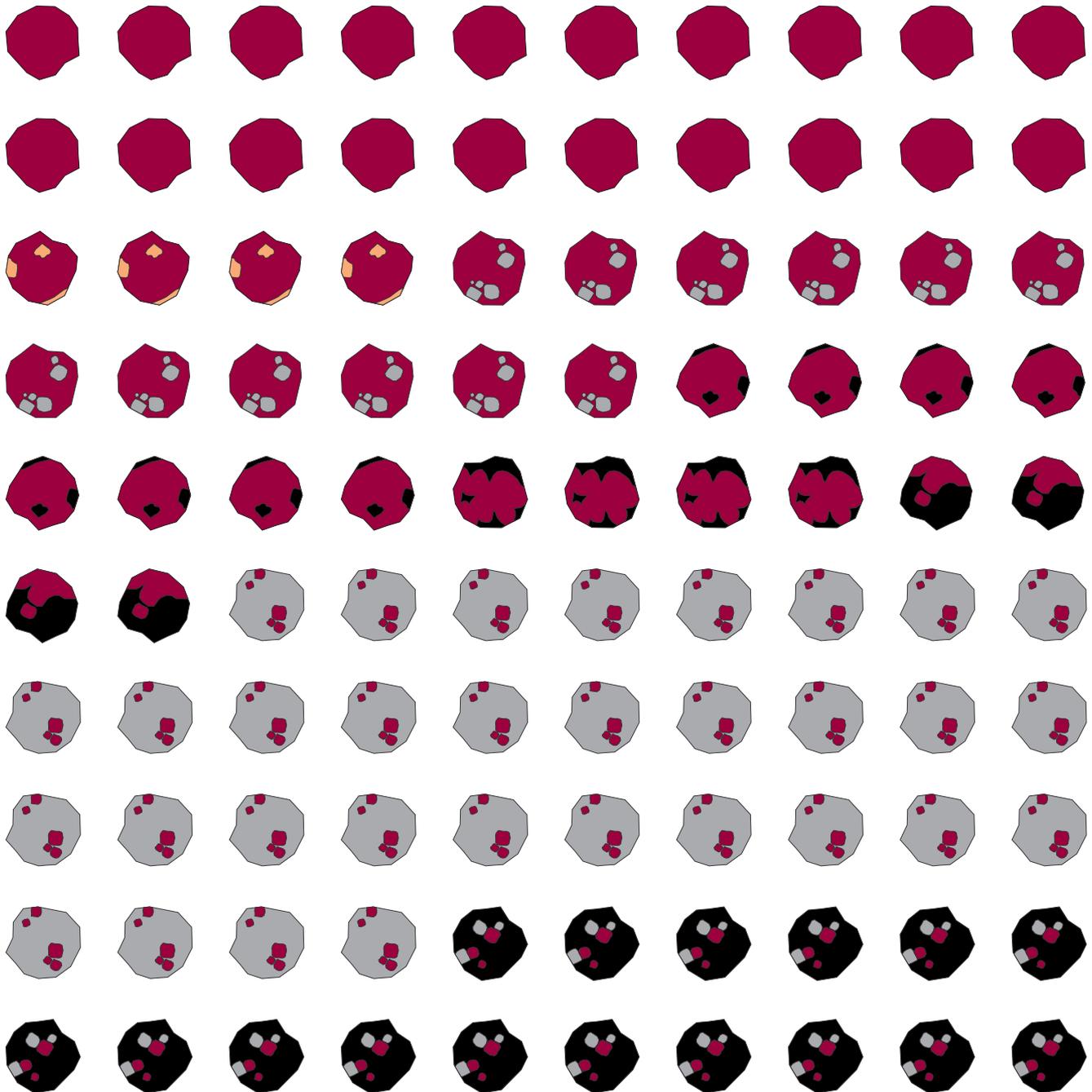
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4 Sn
SCAN

C +53µm

August

2014



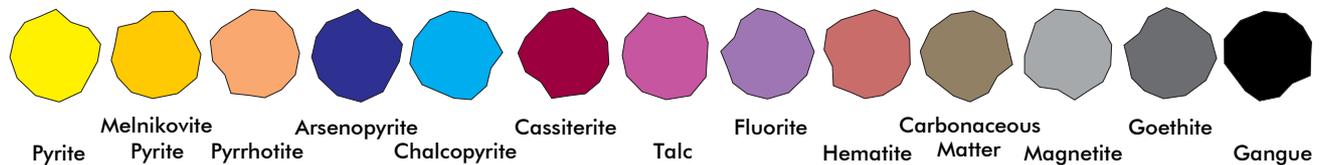
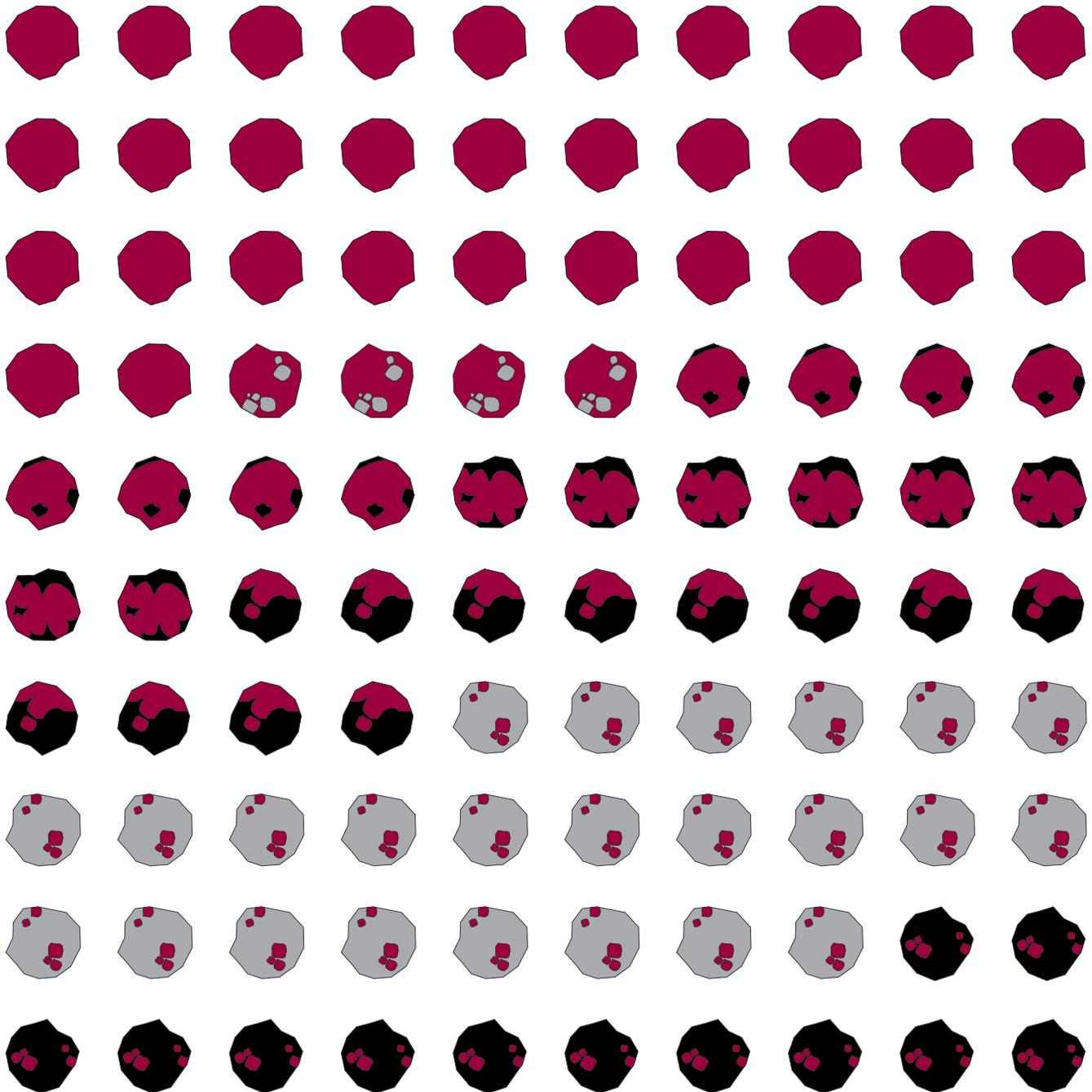
ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4 Sn
SCAN

D +20µm

August

2014

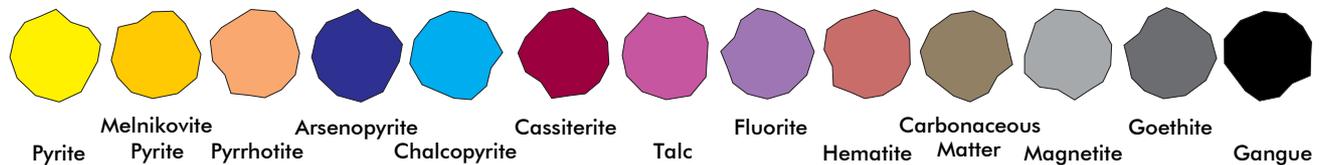
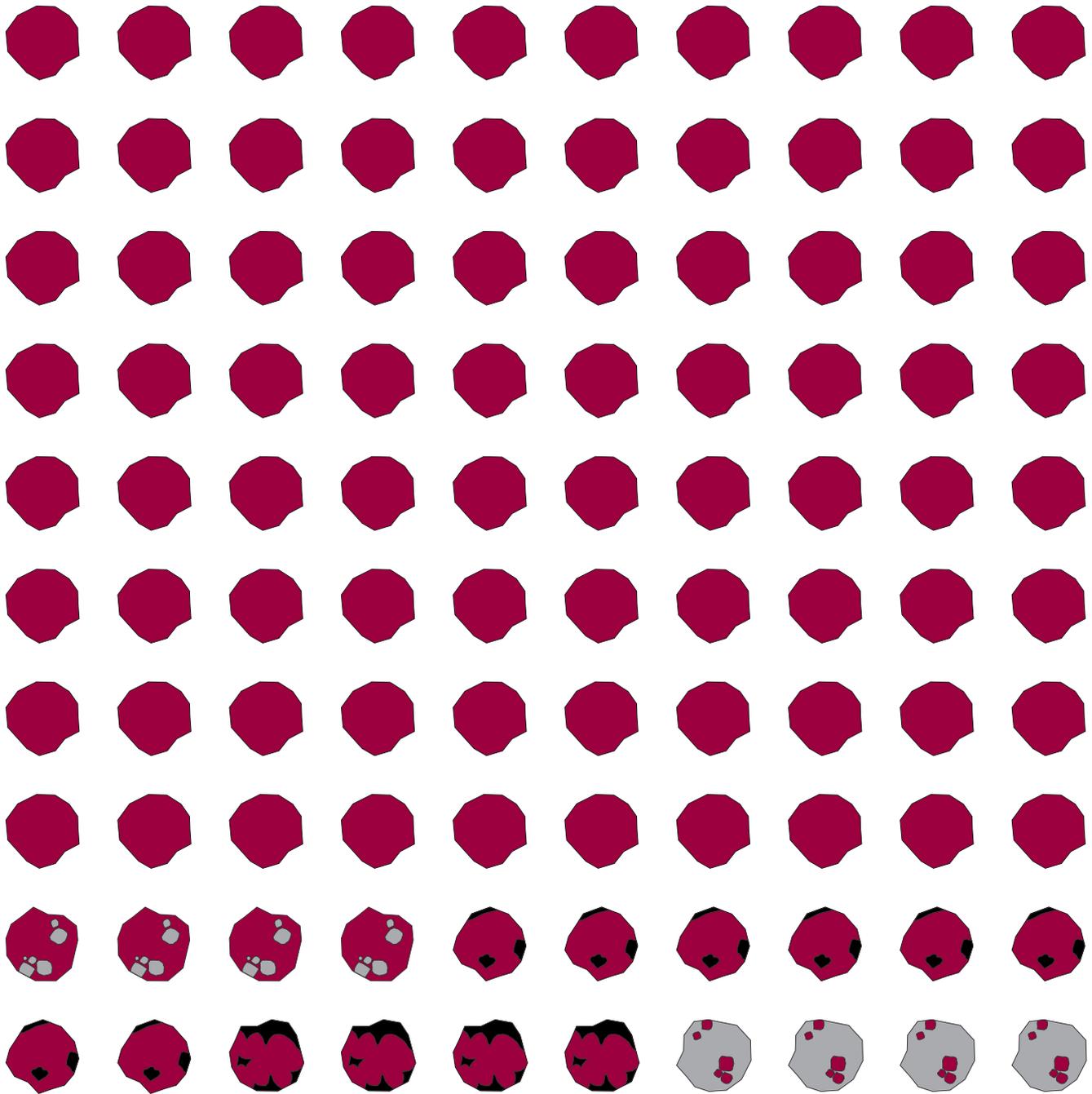


ALS Metallurgy - Stellar Resources Testwork

St Dizier Comp 4 Sn
SCAN

E +7 μ m

August 2014





WorleyParsons

resources & energy

EcoNomics™

STELLAR RESOURCES LIMITED
SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

Appendix 10 – Drill Hole Composites Davis Tube Results

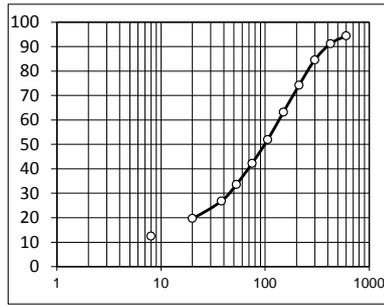
PROJECT	T0887
SAMPLE	St Dizier Composite 2
FROM TEST NO	T13
DATE	200814
TECHNICIAN	ID

DAVIS TUBE RECOVERY ON FRACTIONS

SIZING

SIZE um	WEIGHTS	
	(%)	%PASS
212	21.35	100
106	18.92	81.1
53	17.55	63.5
20	16.83	46.7
8	6.97	39.7
<8	18.38	21.4
TOTAL	100.00	

102.74



SEPARATIONS

Products	WT %	WT %	Fraction											
			%Tot Sn	dist	%Sol Sn	dist	%Cs Sn	dist	%Fe	dist	%SiO2	dist	%S	dist
Mags+212	55.14	11.77	1.03	76.4	0.11	82.1	0.92	75.8	33.50	81.4	20.60	39.6	4.10	56.1
Non Mags+212	44.86	9.58	0.39	23.6	0.03	17.9	0.36	24.2	9.44	18.6	38.70	60.4	3.94	43.9
Calc +212 Total	100.00	21.35	0.74	100.0	0.08	100.0	0.67	100.0	22.71	100.0	28.72	100.0	4.03	100.0
Mags+106	48.96	9.26	0.95	56.2	0.06	66.5	0.89	55.6	42.70	73.7	13.35	28.5	8.45	50.7
Non Mags+106	51.04	9.66	0.71	43.8	0.03	33.5	0.68	44.4	14.60	26.3	32.20	71.5	7.89	49.3
Calc +106 Total	100.00	18.92	0.83	100.0	0.04	100.0	0.78	100.0	28.36	100.0	22.97	100.0	8.16	100.0
Mags+53	40.83	7.17	0.72	35.3	0.05	52.7	0.67	34.5	52.10	69.2	9.00	16.9	6.51	32.9
Non Mags+53	59.17	10.38	0.91	64.7	0.03	47.3	0.88	65.5	16.00	30.8	30.50	83.1	9.17	67.1
Calc +53 Total	100.00	17.55	0.83	100.0	0.04	100.0	0.79	100.0	30.74	100.0	21.72	100.0	8.08	100.0
Mags+20	34.30	5.77	0.49	18.9	0.05	36.4	0.45	18.0	58.60	65.0	5.09	8.4	5.13	21.6
Non Mags+20	65.70	11.06	1.10	81.1	0.04	63.6	1.06	82.0	16.50	35.0	29.10	91.6	9.73	78.4
Calc +20 Total	100.00	16.83	0.89	100.0	0.04	100.0	0.85	100.0	30.94	100.0	20.86	100.0	8.15	100.0
Mags+CS5	31.29	2.18	0.34	6.7	0.04	27.1	0.30	7.0	63.50	63.1	3.03	5.9	4.44	15.6
Non Mags+CS5	68.71	4.79	2.15	93.3	0.05	72.9	2.10	93.0	19.40	36.9	25.30	94.1	12.55	84.4
Calc +CS5 Total	100.00	6.97	1.58	100.0	0.05	100.0	1.48	100.0	34.53	100.0	17.66	100.0	9.77	100.0
-CS5		18.38	0.56		0.06		0.50		15.70		34.10		4.24	
CALC FEED		100.00	0.82		0.04		0.68		23.22		19.03		5.88	

SUMMARY

FRACTIONS um	Picno SG	WT %	Overall											
			%Tot Sn	dist	%Sol Sn	dist	%Cs Sn	dist	%Fe	dist	%SiO2	dist	%S	dist
Mags+212		11.77	1.03	15.87	0.11	25.16	0.92	15.18	33.50	14.84	20.60	9.65	4.10	7.47
Mags+106		9.26	0.95	11.51	0.06	10.61	0.89	11.58	42.70	14.89	13.35	4.92	8.45	12.11
Mags+53		7.17	0.72	6.75	0.05	6.84	0.67	6.75	52.10	14.05	9.00	2.57	6.51	7.22
Mags+20		5.77	0.49	3.70	0.05	4.96	0.45	3.61	58.60	12.73	5.09	1.17	5.13	4.58
Mags+CS5		2.18	0.34	0.97	0.04	1.54	0.30	0.93	63.50	5.21	3.03	0.26	4.44	1.50
Non Mags+212		9.58	0.39	4.89	0.03	5.48	0.36	4.84	9.44	3.40	38.70	14.75	3.94	5.84
Non Mags+106		9.66	0.71	8.97	0.03	5.35	0.68	9.24	14.60	5.31	32.20	12.37	7.89	11.79
Non Mags+53		10.38	0.91	12.37	0.03	6.14	0.88	12.82	16.00	6.25	30.50	12.60	9.17	14.74
Non Mags+20		11.06	1.10	15.92	0.04	8.65	1.06	16.45	16.50	6.87	29.10	12.80	9.73	16.65
Non Mags+CS5		4.79	0.89	5.58	0.04	3.87	0.85	5.71	30.94	5.58	20.86	3.98	8.15	6.04
Total Mags		36.16	0.82	38.81	0.07	49.11	0.75	38.05	45.36	61.73	12.91	18.57	5.88	32.88
Total Non Mags		45.46	0.80	47.72	0.03	29.50	0.77	49.07	16.02	27.41	31.23	56.50	7.83	55.06
-CS5		18.38	0.56	13.47	0.06	21.40	0.50	12.89	15.70	10.86	34.10	24.94	4.24	12.06
CALC FEED		100.00	0.76	100.00	0.05	100.00	0.71	100.00	26.57	100.00	25.13	100.00	6.46	100.00

PROJECT	T0887
TEST NO	T13
DATE	200814
TECHNICIAN	ID

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	11.77
Magnetic Sample (gms)	6.49
Non-magnetic sample(gms)	5.28
Magnetics Mass (%)	55.14

SAMPLE TESTED

St Dizier Composite 2 +212um

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Sn (ppm)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	55.14	1.03	76.4	1120	82.1	33.50	81.4	20.60	39.6	4.10	56.1
Non Magnetics	44.86	0.39	23.6	300	17.9	9.44	18.6	38.70	60.4	3.94	43.9
Total	100.00	0.74	100.0	752	100.0	22.71	100.0	28.72	100.0	4.03	100.0
Head		0.72		710		23.10		29.00		2.58	

PROJECT	T0887
TEST NO	T13
DATE	200814
TECHNICIAN	ID

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	11.97
Magnetic Sample (gms)	5.86
Non-magnetic sample(gms)	6.11
Magnetics Mass (%)	48.96

SAMPLE TESTED

St Dizier Composite 2 +106um

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SoISn (ppm)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	48.96	0.95	56.2	600	66.5	42.70	73.7	13.35	28.5	8.45	50.7
Non Magnetics	51.04	0.71	43.8	290	33.5	14.60	26.3	32.20	71.5	7.89	49.3
Total	100.00	0.83	100.0	442	100.0	28.36	100.0	22.97	100.0	8.16	100.0
Head		0.83		460		28.70		23.40		7.69	

PROJECT	T0887
TEST NO	T13
DATE	200814
TECHNICIAN	ID

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	11.29
Magnetic Sample (gms)	4.61
Non-magnetic sample(gms)	6.68
Magnetics Mass (%)	40.83

SAMPLE TESTED

St Dizier Composite 2 +53um

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SoISn (ppm)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	40.83	0.72	35.3	500	52.7	52.10	69.2	9.00	16.9	6.51	32.9
Non Magnetics	59.17	0.91	64.7	310	47.3	16.00	30.8	30.50	83.1	9.17	67.1
Total	100.00	0.83	100.0	388	100.0	30.74	100.0	21.72	100.0	8.08	100.0
Head		0.84		420		31.90		21.80		5.85	

PROJECT	T0887
TEST NO	T13
DATE	200814
TECHNICIAN	ID

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	12.01
Magnetic Sample (gms)	4.12
Non-magnetic sample(gms)	7.89
Magnetics Mass (%)	34.30

SAMPLE TESTED

St Dizier Composite 2 +20um

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SoISn (ppm)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	34.30	0.49	18.9	450	36.4	58.60	65.0	5.09	8.4	5.13	21.6
Non Magnetics	65.70	1.10	81.1	410	63.6	16.50	35.0	29.10	91.6	9.73	78.4
Total	100.00	0.89	100.0	424	100.0	30.94	100.0	20.86	100.0	8.15	100.0
Head		0.86		430		31.70		21.10		7.89	

PROJECT	T0887
TEST NO	T13
DATE	200814
TECHNICIAN	ID

Electric Current (A)	1.40
Water Flowrate (mls/min)	570
Run Time (min)	15
Sample Start Weight (gms)	10.29
Magnetic Sample (gms)	3.22
Non-magnetic sample(gms)	7.07
Magnetics Mass (%)	31.29

SAMPLE TESTED
St Dizier Composite 2 +CS5

MAGNETIC SEPARATION RESULTS

PRODUCT	Wt (%)	Sn (%)	Dist (%)	SolSn (ppm)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	31.29	0.34	6.7	370	24.5	63.50	59.9	3.03	5.2	4.44	13.9
Non Magnetics	68.71	2.15	93.3	520	75.5	19.40	40.1	25.30	94.8	12.55	86.1
Total	100.00	1.58	100.0	473	100.0	33.20	100.0	18.33	100.0	10.01	100.0
Head		1.51		480		34.10		18.70		6.89	



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Appendix 11 – Composite 2+3 Magnetic Separation Results



BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T15+T16
DATE	220914
TECH	DG

	Rghr	Cleaner
TEST TYPE	SALA Wet Drum	SALA Wet Drum
Feed Solids (g)	2000.0	2000.0
Feed Water (L)	17.6	17.6
Pump Flow Rate (lpm)	1.4	1.4
Density (%)	10.0	10.0
Time (min)	17.5	18
Pump 01 Output (%)	56	56
Pump 02 Output (%)	56	56
Comments	Rghr mag sep followed by regrind and cleaner mag sep. Primary grind P80 = 250 um, R/G P80 = 31 um	

FEED MATERIAL	Composite 2+3
---------------	---------------

Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.40	8.2	5.25	37.3
Cleaner Non Magnetics	185.7	9.7	1.97	20.1	13.1	4.1	34.4	13.5	5.12	9.3
Rougher Non Magnetics	1009.6	52.6	1.11	61.6	12.8	21.8	36.7	78.3	5.39	53.4
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0

Cummulated Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.40	8.2	5.25	37.3
Rougher Magnetics	908.7	47.4	0.77	38.4	51.1	78.2	11.3	21.7	5.22	46.6
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0

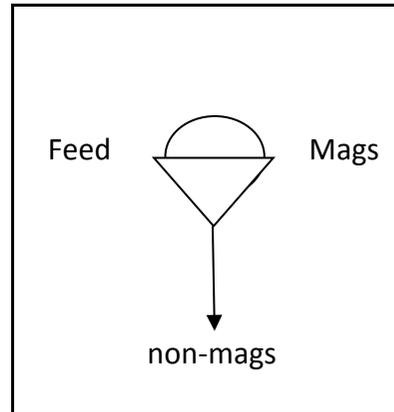
Cummulated Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Rougher+cleaner Non-Magnetics	1195.4	62.3	1.24	81.7	12.8	25.8	36.3	91.8	5.35	62.7
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.4	8.2	5.25	37.3
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0



BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T15
DATE	220914
TECH	DG

TEST TYPE	SALA Wet Drum
Feed Solids (g)	2000.0
Feed Water (L)	17.6
Pump Flow Rate (lpm)	1.4
Density (%)	10.0
Time (min)	17.5
Pump 01 Output (%)	56
Pump 02 Output (%)	56
Comments	



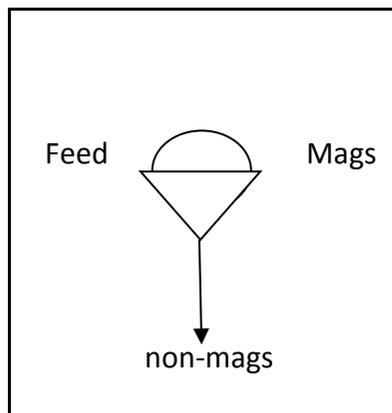
FEED MATERIAL	
Composite 2+3	
FROM TEST NO	
START WT (gm)	1918.3

MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	908.7	908.7	47.37	0.77	38.4	51.12	78.2	11.33	21.7	5.22	46.6
Non Magnetics	1009.6	1009.6	52.63	1.11	61.6	12.80	21.8	36.70	78.3	5.39	53.4
Total	1918.3		100.00	0.95	100.0	30.95	100.0	24.68	100.0	5.31	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

TEST TYPE	SALA Wet Drum
Feed Solids (g)	2000.0
Feed Water (L)	17.6
Pump Flow Rate (lpm)	1.4
Density (%)	10.0
Time (min)	18
Pump 01 Output (%)	56
Pump 02 Output (%)	56
Comments	



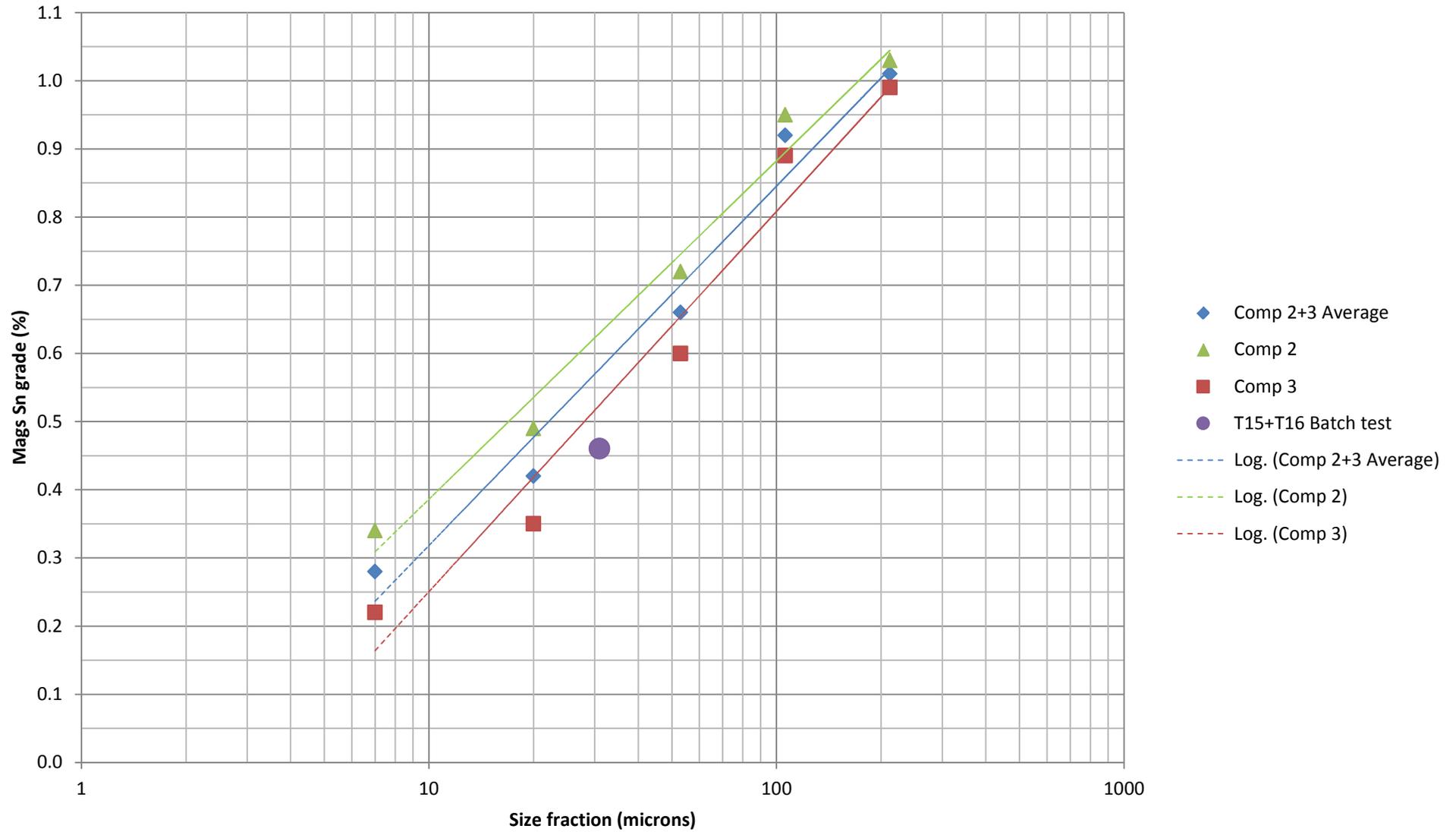
PROJECT	T0887
TEST NO	T16
DATE	220914
TECH	DG

FEED MATERIAL	
T15 Reground mags (p80=31um)	
FROM TEST NO	
START WT (gm)	908.74

MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)
Magnetics	723.0	723.0	79.56	0.46	47.6	60.90	94.8	5.40	37.9	5.25	80.0
Non Magnetics	185.7	185.7	20.44	1.97	52.4	13.05	5.2	34.40	62.1	5.12	20.0
TOTAL	908.7		100.00	0.77	100.0	51.12	100.0	11.33	100.0	5.22	100.0

Davis Tube Testing - Variation in Mags Sn concent with size Saint Dizer Composite 2 & 3





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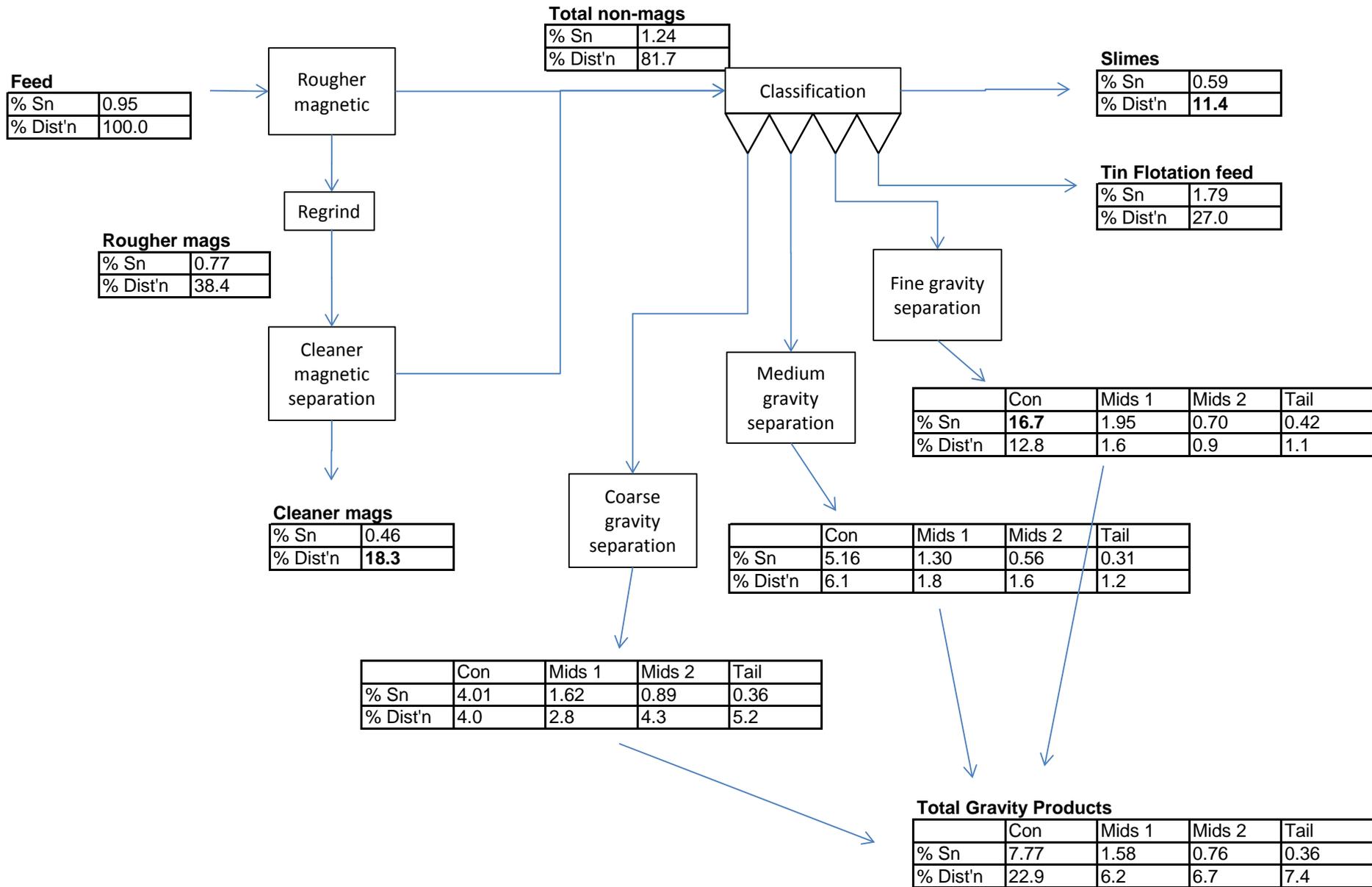
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Appendix 12 – Composite 2+3 Gravity Separation Results

Saint Dizier Comp 2+3 Batch magnetic and gravity separation Sn deportment summary





BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T15+T16
DATE	220914
TECH	DG

Rghr Cleaner

TEST TYPE	SALA Wet Drum	SALA Wet Drum
Feed Solids (g)	2000.0	2000.0
Feed Water (L)	17.6	17.6
Pump Flow Rate (lpm)	1.4	1.4
Density (%)	10.0	10.0
Time (min)	17.5	18
Pump 01 Output (%)	56	56
Pump 02 Output (%)	56	56
Comments	Rghr mag sep followed by regrind and cleaner mag sep. Primary grind P80 = 250 um, R/G P80 = 31 um	

FEED MATERIAL
Composite 2+3

Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.40	8.2	5.25	37.3
Cleaner Non Magnetics	185.7	9.7	1.97	20.1	13.1	4.1	34.4	13.5	5.12	9.3
Rougher Non Magnetics	1009.6	52.6	1.11	61.6	12.8	21.8	36.7	78.3	5.39	53.4
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0

Cummulated Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.40	8.2	5.25	37.3
Rougher Magnetics	908.7	47.4	0.77	38.4	51.1	78.2	11.3	21.7	5.22	46.6
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0

Cummulated Products	Wt (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO ₂ (%)	Dist (%)	S (%)	Dist (%)
Rougher+cleaner Non-Magnetics	1195.4	62.3	1.24	81.7	12.8	25.8	36.3	91.8	5.35	62.7
Cleaner Magnetics	723.0	37.7	0.46	18.3	60.9	74.2	5.4	8.2	5.25	37.3
Calc Feed	1918.4	100.0	0.95	100.0	31.0	100.0	24.7	100.0	5.31	100.0

TEST TYPE	Gravity
Stage 1	Grind to p80=250um
Stage 2	LIMS
Stage 3	Grind mags to p80=31um
Stage 4	LIMS
Stage 5	Combine non mags
Stage 6	Size to fractions to +CS1
Stage 7	Gravity separation each fraction by Mozley table

PROJECT	T0887
TEST NO	T19
DATE	31014
TECH	ID

START MATERIAL	
START WT (gm)	
FROM TEST NO	T18

GRAVITY SEPARATION RESULTS

Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)	Sn Dist of ore feed
+106 Conc	16.8	16.8	1.41	4.01	4.9	36.10	4.3	26.30	7.8	7.83	0.3	4.0
Mids 1	29.4	29.4	2.46	1.62	3.5	28.10	5.9	18.25	9.5	19.10	1.3	2.8
Mids 2	80.6	80.6	6.74	0.89	5.2	12.45	7.1	4.78	6.8	36.90	6.8	4.3
Tail	241.6	241.6	20.21	0.36	6.3	6.29	10.8	0.95	4.1	43.20	23.7	5.2
+53 Conc	20.0	20.0	1.67	5.16	7.5	36.60	5.2	29.40	10.4	5.97	0.3	6.1
Mids 1	22.7	22.7	1.90	1.30	2.1	20.70	3.3	8.63	3.5	25.40	1.3	1.8
Mids 2	47.3	47.3	3.96	0.56	1.9	7.45	2.5	1.10	0.9	41.60	4.5	1.6
Tail	63.9	63.9	5.35	0.31	1.4	5.79	2.6	0.46	0.5	44.10	6.4	1.2
+CS1 Conc	12.9	12.9	1.08	16.70	15.7	33.20	3.0	23.20	5.3	1.61	0.0	12.8
Mids 1	14.2	14.2	1.19	1.95	2.0	34.30	3.5	20.80	5.2	12.55	0.4	1.6
Mids 2	20.6	20.6	1.72	0.70	1.0	10.35	1.5	2.48	0.9	36.70	1.7	0.9
Tail	44.5	44.5	3.72	0.42	1.4	6.65	2.1	0.81	0.6	42.90	4.3	1.1
CS2-CS5	253.98	254.0	21.25	1.79	33.0	12.70	22.9	6.05	27.2	34.20	19.7	27.0
-CS5	326.8	326.8	27.34	0.59	14.0	10.95	25.4	2.95	17.1	39.40	29.3	11.4
Total	1195.3	1195.3	100.00	1.15	100.00	11.80	100.00	4.72	100.00	36.82	100.00	81.70
Head				1.20		12.20		3.23		37.10		

Overall Gravity Combine (coarse, medium and fine combine)

Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)	Sn Dist from gravity feed	Sn Dist of ore feed
Gravity Con	49.7		4.2	7.77	28.0	35.5	12.5	26.7	23.6	5.5	0.6	53.0	22.9
Mids 1	66.3		5.5	1.58	7.6	26.9	12.6	15.5	18.2	19.9	3.0	14.4	6.2
Mids 2	148.5		12.4	0.76	8.2	10.6	11.1	3.3	8.7	38.4	12.9	15.5	6.7
Gravity Tail	350.0		29.3	0.36	9.1	6.2	15.5	0.8	5.2	43.3	34.5	17.2	7.4
Tin float feed (CS2-CS5)	253.98		21.2	1.79	33.0	12.7	22.9	6.1	27.2	34.2	19.7		27.0
Slimes -CS5	326.8		27.3	0.59	14.0	11.0	25.4	3.0	17.1	39.4	29.3		11.4
Total	1195.3		100.0	1.15	100.0	11.8	100.0	4.7	100.0	36.8	100.0		81.7
Gravity Feed	614.5		51.4	1.19	53.0	11.89	51.8	5.11	55.7	36.53	51.0	100.0	43.3

Overall Department Summary

Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)	Sn Dist of gravity feed	Sn Dist of ore feed
Total +106	368.4		30.8	0.74	19.9	10.74	28.0	4.32	28.2	38.29	32.0	37.5	16.2
Total +53	153.9		12.9	1.16	13.0	12.50	13.6	5.62	15.3	35.62	12.5	24.6	10.6
Total +CS1	92.2		7.7	3.00	20.1	15.45	10.1	7.39	12.1	31.06	6.5	37.9	16.4
Tin float feed (CS2-CS5)	253.98		21.2	1.79	33.0	12.70	22.9	6.05	27.2	34.20	19.7		27.0
Slimes -CS5	326.8		27.3	0.59	14.0	10.95	25.4	2.95	17.1	39.40	29.3		11.4
Total	1195.3		100.0	1.15	100.0	11.80	100.0	4.72	100.0	36.82	100.0		81.7
Gravity Feed	614.5		51.4	1.19	53.0	11.89	51.8	5.11	55.7	36.53	51.0	100.0	43.3

Recovery to non-mags (feed to test) **81.7**
(from T15+T16)

TEST TYPE	Gravity
Stage 1	Grind to p80=250um
Stage 2	LIMS
Stage 3	Grind mags to p80=31um
Stage 4	LIMS
Stage 5	Combine non mags
Stage 6	Size to fractions to +CS1
Stage 7	Gravity separation each fraction by Mozley table

PROJECT	T0887
TEST NO	T19
DATE	31014
TECH	ID

START MATERIAL	
START WT (gm)	
FROM TEST NO	T18

GRAVITY SEPARATION RESULTS

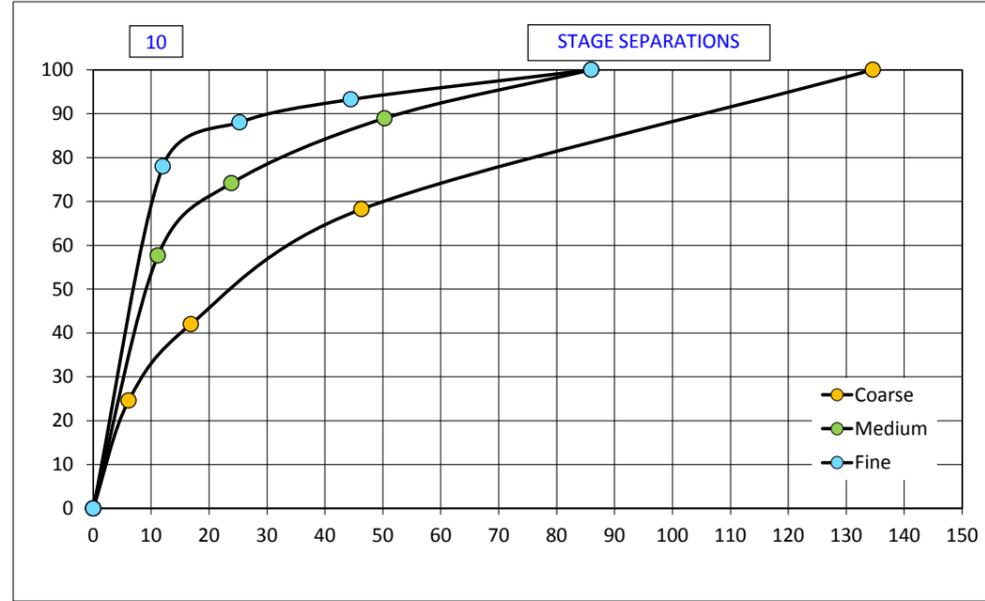
Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)						
+106 Conc	16.8	16.8	1.41	4.01	4.9	36.10	4.3	26.30	7.8	7.83	0.3						
Mids 1	29.4	29.4	2.46	1.62	3.5	28.10	5.9	18.25	9.5	19.10	1.3						
Mids 2	80.6	80.6	6.74	0.89	5.2	12.45	7.1	4.78	6.8	36.90	6.8						
Tail	241.6	241.6	20.21	0.36	6.3	6.29	10.8	0.95	4.1	43.20	23.7						
+53 Conc	20.0	20.0	1.67	5.16	7.5	36.60	5.2	29.40	10.4	5.97	0.3						
Mids 1	22.7	22.7	1.90	1.30	2.1	20.70	3.3	8.63	3.5	25.40	1.3						
Mids 2	47.3	47.3	3.96	0.56	1.9	7.45	2.5	1.10	0.9	41.60	4.5						
Tail	63.9	63.9	5.35	0.31	1.4	5.79	2.6	0.46	0.5	44.10	6.4						
+CS1 Conc	12.9	12.9	1.08	16.70	15.7	33.20	3.0	23.20	5.3	1.61	0.0						
Mids 1	14.2	14.2	1.19	1.95	2.0	34.30	3.5	20.80	5.2	12.55	0.4						
Mids 2	20.6	20.6	1.72	0.70	1.0	10.35	1.5	2.48	0.9	36.70	1.7						
Tail	44.5	44.5	3.72	0.42	1.4	6.65	2.1	0.81	0.6	42.90	4.3						
CS2-CS5	253.98	254.0	21.25	1.79	33.0	12.70	22.9	6.05	27.2	34.20	19.7						
-CS5	326.8	326.8	27.34	0.59	14.0	10.95	25.4	2.95	17.1	39.40	29.3						
Total	1195.3	1195.3	100.00	1.15	100.00	11.80	100.00	4.72	100.00	36.82	100.00						
Head				1.20		12.20		3.23		37.10							

GRAVITY SEPARATION BALANCE

PRODUCT Coarse	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
+106 Conc	4.56	4.0	24.6	24.6	6.14	6.1
Mids 1	7.98	1.6	17.4	42.0	10.74	16.9
Mids 2	21.88	0.9	26.2	68.2	29.45	46.3
Tail	65.58	0.4	31.8	100.0	88.27	134.6
	100.00	0.7	100.0			

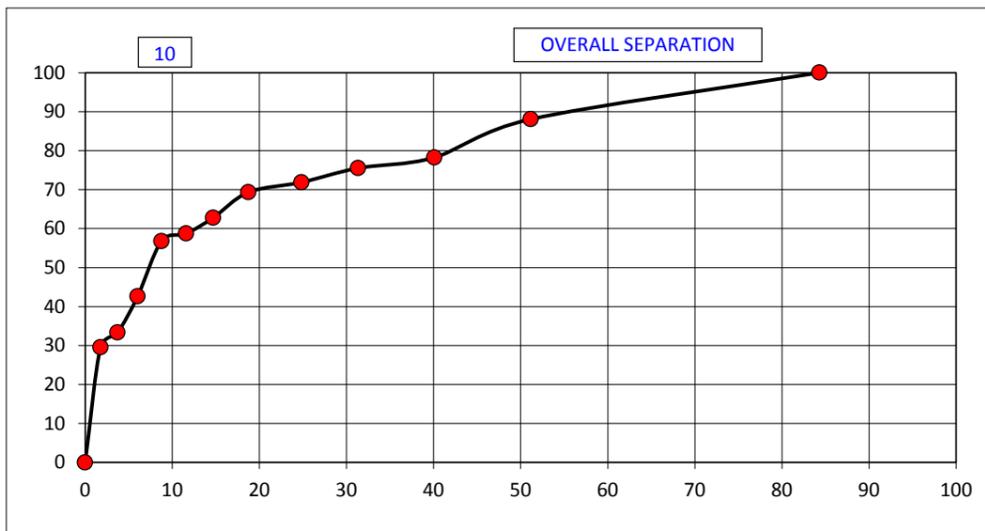
PRODUCT Medium	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
+53 Conc	13.00	5.2	57.7	57.7	11.17	11.2
Mids 1	14.75	1.30	16.5	74.1	12.68	23.9
Mids 2	30.73	0.56	14.8	88.9	26.42	50.3
Tail	41.52	0.31	11.1	100.0	35.70	86.0
	100.00	1.16	100.0			

PRODUCT Fine	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
+CS1 Conc	13.99	16.7	78.0	78.0	12.03	12.0
Mids 1	15.40	1.95	10.0	88.0	13.24	25.3
Mids 2	22.34	0.70	5.2	93.2	19.21	44.5
Tail	48.26	0.42	6.8	100.0	41.50	86.0
	100.00	3.00	100.0			



OVERALL SEPARATION

Product Wt (gm)	Sn (%)	Wt (%)	Dist (%)	Cum Dist	Units	Cum Units
12.9	16.70	2.10	29.55	29.55	1.77	1.77
14.2	1.95	2.31	3.80	33.35	1.95	3.72
16.8	4.01	2.73	9.24	42.59	2.30	6.02
20.0	5.16	3.25	14.16	56.75	2.74	8.77
20.6	0.70	3.35	1.98	58.73	2.83	11.59
22.7	1.30	3.69	4.05	62.78	3.11	14.71
29.4	1.62	4.78	6.53	69.31	4.03	18.74
44.5	0.42	7.24	2.56	71.88	6.10	24.84
47.3	0.56	7.70	3.63	75.51	6.49	31.33
63.9	0.31	10.40	2.72	78.23	8.77	40.10
80.6	0.89	13.12	9.84	88.07	11.06	51.16
241.6	0.36	39.32	11.93	100.00	33.14	84.30
614.5	1.19	100.00	100.0			



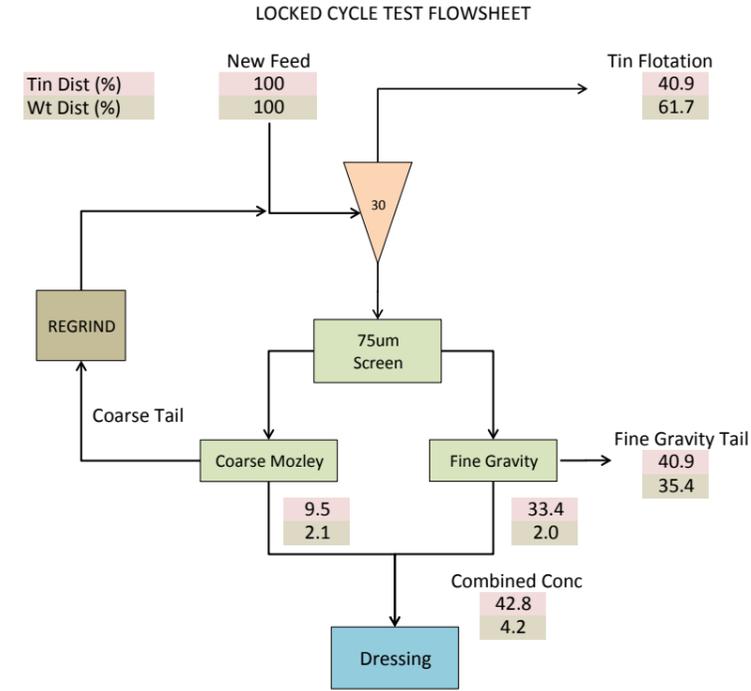


BURNIE LABORATORY: LOCKED CYCLE GRAVITY TEST

PROJECT	T0887
TEST NO	LC08
FEED	
FROM TEST	
DATE	
TECH	

EXIT STREAMS

CYCLE NO		1	2	3	4	5	6	7	8	9	10	WT AV
Gravity coarse conc (+75 Conc) dry wt and assays	gm	34.90	41.20	37.20	43.00	42.50	47.10	44.20	44.10	42.50	40.00	43.34
	%Sn	5.37	5.36	6.07	4.18	5.99	5.14	4.87	5.61	5.48	5.19	5.22
	%Fe	33.40	36.90	37.00	33.50	35.90	35.90	35.30	34.60	36.40	35.70	35.35
	%S	16.35	30.80	29.30	23.40	27.40	28.50	26.50	30.00	23.10	28.90	26.90
Gravity fine conc (-75 Conc) dry wt and assays	gm	29.90	30.60	30.80	32.50	35.60	46.10	43.60	44.20	42.80	42.10	40.99
	%Sn	22.00	23.00	25.40	23.30	21.60	17.6	17.85	19.30	19.10	18.40	19.48
	%Fe	29.90	29.10	28.40	28.90	29.80	33.9	33.5	31.20	32.30	32.80	31.87
	%S	26.00	26.90	18.20	25.90	23.20	33.1	23.6	30.80	29.10	30.80	28.21
Gravity Final Tail (-75 Tails) dry wt and assays	gm	276.30	508.10	736.50	715.30	597.80	721.50	652.30	763.80	788.30	778.30	716.76
	%Sn	0.59	0.65	0.63	0.72	0.61	0.6	0.6	0.62	0.59	0.65	0.63
	%Fe	8.89	10.35	11.35	11.40	11.15	10.9	10.1	11.20	10.60	10.90	10.88
	%S	2.62	3.55	3.78	3.19	3.47	3.52	3.1	4.61	2.52	3.84	3.47
Over Flow dry wt and assays	gm	897.2	993.1	1161.8	1198.1	1314.2	1246.8	1257.1	1320.9	1207.7	1191.5	1248.04
	%Sn	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
	%Fe	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45
	%S	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
Combined Concentrate	gm	64.80	71.80	68.00	75.50	78.10	93.20	87.80	88.30	85.30	82.10	84.33
	%Sn	13.04	12.88	14.83	12.41	13.11	11.30	11.32	12.46	12.31	11.96	12.10
	%Fe	31.79	33.58	33.10	31.52	33.12	34.91	34.41	32.90	34.34	34.21	33.68
	%S	20.80	29.14	24.27	24.48	25.49	30.78	25.06	30.40	26.11	29.87	27.56
Coarse Tail	gm	39.50	37.50	36.70	37.40	36.80	38.6	38.5	36.40	38.70	37.60	37.74
	%Sn	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
	%Fe	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45
	%S	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
Fine Gravity Tail	gm	9.5	2.1	33.4	2.0	42.8	4.2	40.9	35.4	40.9	35.4	35.4
	%Sn	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
	%Fe	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45
	%S	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
Dressing	gm	42.8	4.2	40.9	35.4	40.9	35.4	40.9	35.4	40.9	35.4	35.4
	%Sn	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
	%Fe	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45
	%S	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
Tin Flotation	gm	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9
	%Sn	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9
	%Fe	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9
	%S	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9	61.7	40.9



REGRIND DATA

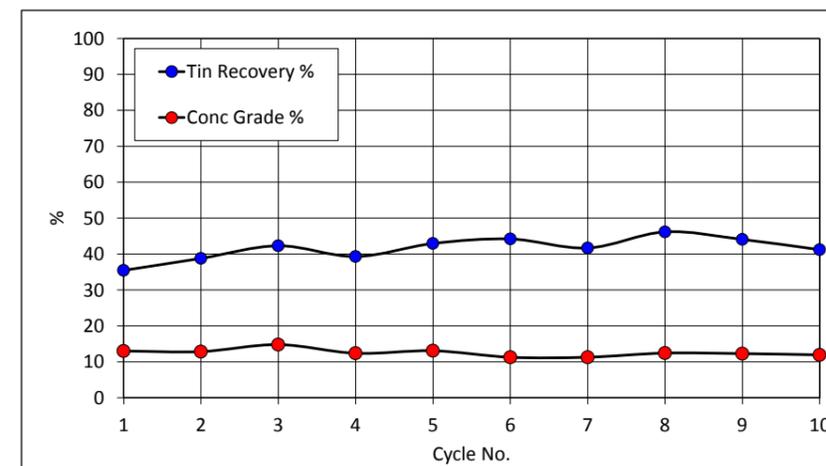
New Feed (gm) (dry)	1790	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Regrind feed Damp Wt (gm)		591.5	1089.3	1134	1134	1171	1175	1228	1122	1149	
Regrind Time (min per 100gm)	3.3	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
Regrind Time (min.sec)	0.0	24.5	45.2	47.1	47.1	48.6	48.8	51.0	46.6	47.7	
Underflow (%Wt)	49.9	61.7	62.4	61.8	58.1	60.7	60.4	59.1	61.3	62.2	

t75 tail

INTERNAL STREAMS

Final Regrind Feed		Final Reg Discharge		Mids-75		NEW FEED		CALC		10
gm	1114.0	gm	1114.0	gm	188.0	gm	20235	2023.5		
%Sn	0.54	%Sn	0.54	%Sn	1.72	%Sn	1.18	1.27		
%Fe	9.44	%Fe	9.44	%Fe	38.30	%Fe	12.00	12.60		
%S	3.08	%S	3.08	%S	26.20	%S	4.63	3.98		
%SiO2	39.60	%SiO2	39.60	%SiO2	9.29	%SiO2	36.77	36.20		
p80	342	p80	84	p80						

DISTRIBUTIONS	AV	FROM NEW FEED (%)										
		Cyc 1	Cyc 2	Cyc 3	Cyc 4	Cyc 5	Cyc 6	Cyc 7	Cyc 8	Cyc 9	Cyc 10	
MASS	+75 Conc	2.14	1.72	2.04	1.84	2.12	2.10	2.33	2.18	2.18	2.10	1.98
	-75 Conc	2.03	1.48	1.51	1.52	1.61	1.76	2.28	2.15	2.18	2.12	2.08
	-75 Tail	35.42	13.65	25.11	36.40	35.35	29.54	35.66	32.24	37.75	38.96	38.46
	Over Flow	61.68	44.34	49.08	57.41	59.21	64.95	61.61	62.12	65.28	59.68	58.88
	Calc Recycle	-1.26	38.81	22.27	2.83	1.71	1.65	-1.88	1.30	-7.39	-2.85	-1.40
TIN	+75 Conc	9.47	7.87	9.27	9.48	7.55	10.69	10.16	9.04	10.39	9.78	8.72
	-75 Conc	33.35	27.61	29.55	32.84	31.79	32.28	34.06	32.67	35.81	34.32	32.52
	-75 Tail	18.88	6.84	13.86	19.48	21.62	15.31	18.17	16.43	19.88	19.52	21.24
	Over Flow	40.87	29.38	32.52	38.04	39.23	43.03	40.83	41.16	43.25	39.55	39.02
	Calc Recycle	-2.57	28.30	14.80	0.16	-0.19	-1.31	-3.22	0.70	-9.33	-3.17	-1.49
TIN REC OA (%)	42.82	35.48	38.82	42.32	39.33	42.97	44.22	41.71	46.20	44.10	41.23	
TIN REC GRAVITY (%)	69.44	83.83	73.68	68.48	64.53	73.73	70.88	71.74	69.91	69.31	66.00	
IRON	+75 Conc	6.31	4.80	6.26	5.67	5.93	6.28	6.96	6.43	6.28	6.37	5.88
	-75 Conc	5.39	3.68	3.67	3.60	3.87	4.37	6.44	6.01	5.68	5.69	5.69
	-75 Tail	32.16	10.11	21.66	34.42	33.58	27.45	32.38	27.13	35.23	34.41	34.93
	Over Flow	58.85	42.30	46.83	54.78	56.49	61.97	58.79	59.27	62.28	56.94	56.18
	Calc Recycle	-2.70	39.10	21.59	1.53	0.13	-0.06	-4.57	1.16	-9.47	-3.42	-2.68
SULPHUR	+75 Conc	12.41	6.09	13.54	11.63	10.74	12.42	14.32	12.50	14.12	10.47	12.33
	-75 Conc	12.39	8.29	8.78	5.98	8.98	8.81	16.28	10.98	14.52	13.29	13.83
	-75 Tail	26.54	7.72	19.24	29.70	24.34	22.13	27.10	21.57	37.57	21.19	31.89
	Over Flow	52.20	37.52	41.53	48.59	50.11	54.96	52.14	52.58	55.24	50.51	49.83
	Calc Recycle	-3.54	40.37	16.90	4.10	5.83	1.67	-9.84	2.38	-21.45	4.53	-7.89
SILICA	+75 Conc	0.391	0.49	0.26	0.22	0.55	0.32	0.39	0.44	0.39	0.31	0.33
	-75 Conc	0.097	0.06	0.05	0.10	0.10	0.09	0.08	0.12	0.12	0.08	0.08
	-75 Tail	36.34	14.67	25.61	36.32	35.95	29.56	37.43	33.75	37.36	41.00	39.33
	Over Flow	64.07	46.06	50.98	59.64	61.50	67.46	64.00	64.53	67.81	62.00	61.17
	Calc Recycle	-0.90	38.73	23.10	3.72	1.89	2.56	-1.90	1.15	-5.68	-3.39	-0.91



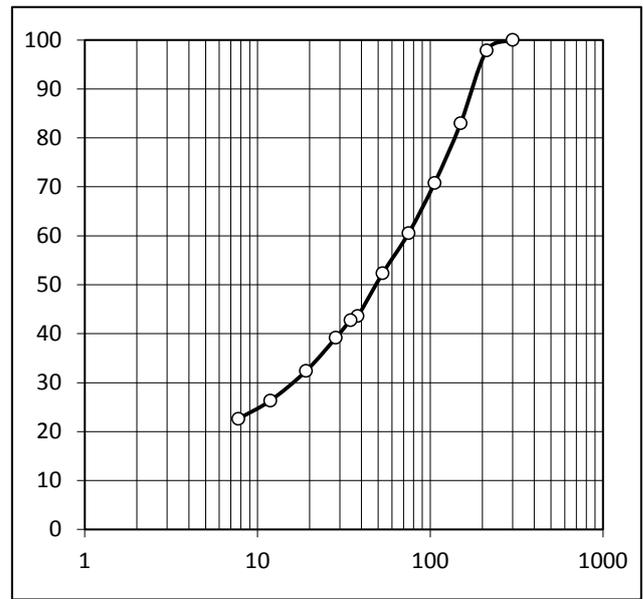


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	Comb Non Mags
FROM TEST	LC03 Feed
DATE	290514
TECHNICIAN	MS

Comb Non Mags LC03 Feed		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	3.03	2.17	97.8	
	150	20.74	14.83	83.0	
139	106	17.05	12.19	70.8	
	75	14.35	10.26	60.5	
	53	11.48	8.21	52.3	
	38	12.22	8.74	43.6	
CYCLOSIZER	CS1	35	1.15	0.82	42.8
FLOW 185	CS2	28	5.04	3.60	39.2
TEMP 21	CS3	19	9.45	6.76	32.4
SG 2.40	CS4	12	8.47	6.06	26.4
MINS 20	CS5	8	5.22	3.73	22.6
		SUB	31.63	22.62	0.0
		TOTAL	139.83	100.00	

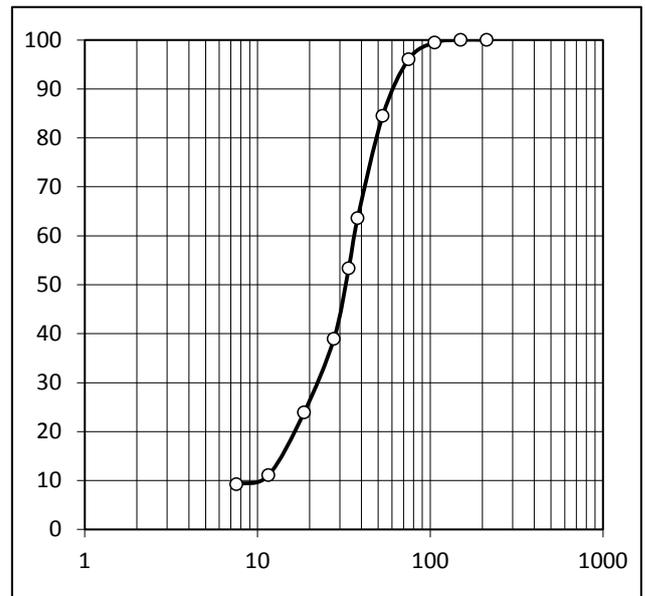


ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
150	17.00	0.61	10.1	13.15	15.5	1.9	16.6	44.50	19.3
106	12.19	0.78	9.3	14.00	11.8	2.0	12.5	44.30	13.8
75	10.26	0.90	9.0	14.20	10.1	2.0	10.6	41.60	10.9
53	8.21	0.99	7.9	14.45	8.2	1.9	8.0	40.60	8.5
38	8.74	1.09	9.3	14.45	8.7	2.0	8.9	37.90	8.5
28	4.43	3.44	14.9	23.10	7.1	5.4	12.0	25.30	2.9
8	16.55	1.16	18.7	14.50	16.6	1.7	14.3	38.00	16.1
<8	22.62	0.94	20.8	14.00	21.9	1.5	17.1	34.70	20.1
CALC	100.00	1.02	100.0	14.44	100.0	2.0	100.0	39.14	100.0
ASSAY		1.04		14.35		1.9		38.10	

PROJECT	T0887
SAMPLE NAME	S CL1 Conc
FROM TEST	T23
DATE	111114
TECHNICIAN	MS

S CL1 Conc T23		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	0.00	0.00	100.0	
	106	0.22	0.53	99.5	
	75	1.43	3.42	96.1	
	53	4.84	11.58	84.5	
50	38	8.72	20.86	63.6	
CYCLOSIZER	CS1	34	4.29	10.26	53.4
FLOW 185	CS2	28	6.03	14.42	38.9
TEMP 21	CS3	19	6.27	15.00	23.9
SG 2.50	CS4	12	5.37	12.84	11.1
MINS 20	CS5	8	0.78	1.87	9.2
SUB			3.86	9.23	0.0
TOTAL			41.81	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
38	36.38	0.87	35.6	27.00	29.8	16.3	28.4	28.00	47.2
34	10.26	1.54	17.8	49.10	15.3	34.3	16.8	2.49	1.2
28	14.42	1.09	17.7	40.30	17.6	24.7	17.0	13.35	8.9
19	15.00	0.78	13.1	33.40	15.2	20.8	14.9	21.90	15.2
12	12.84	0.54	7.8	34.20	13.3	13.9	8.5	22.90	13.6
8	1.87	0.33	0.7	34.10	1.9	15.4	1.4	23.50	2.0
CALC-8	9.23	0.71	7.4	24.80	6.9	29.28	12.9	27.83	11.9
ASSAY	100.00	0.89	100.0	33.00	100.0	20.9	100.0	21.60	100.0

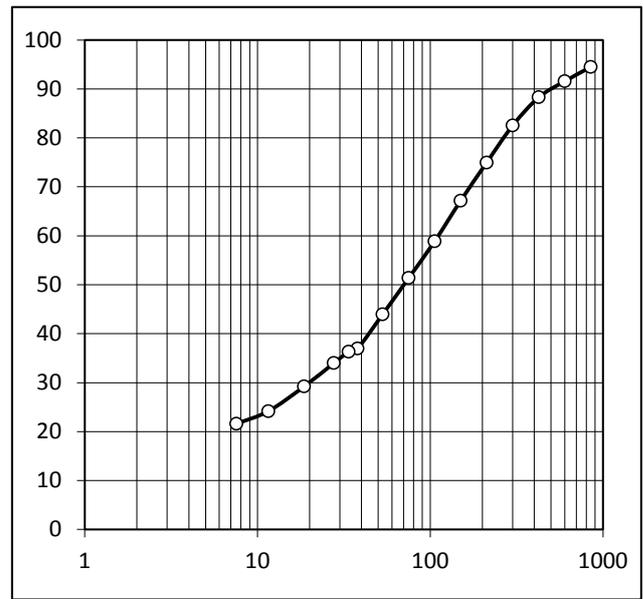


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	Non Mags
FROM TEST	T22
DATE	171114
TECHNICIAN	MS

Non Mags T22		SIZE um	WEIGHTS		
			gm	(%)	%PASS
p80 271	850	7.14	5.51	94.5	
	600	3.80	2.93	91.6	
	425	4.23	3.26	88.3	
	300	7.47	5.76	82.5	
	212	9.83	7.58	75.0	
	150	10.08	7.78	67.2	
	106	10.77	8.31	58.9	
	75	9.72	7.50	51.4	
	53	9.61	7.41	44.0	
	38	9.02	6.96	37.0	
CYCLOSIZER	CS1	34	0.87	0.67	36.3
FLOW 185	CS2	28	3.01	2.32	34.0
TEMP 21	CS3	19	6.19	4.78	29.2
SG 2.50	CS4	12	6.54	5.05	24.2
MINS 20	CS5	8	3.36	2.59	21.6
		SUB	27.99	21.59	0.0
		TOTAL	129.63	100.00	

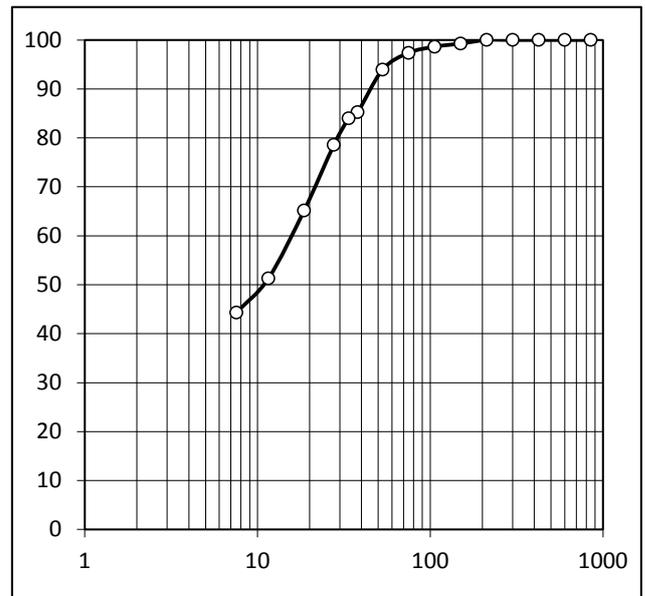


ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2					
		%	dist	%	dist	%	dist	%	dist				
300	17.47	0.52	8.3	8.61	12.6	3.1	11.4	39.70	18.6				
150	15.36	0.97	13.7	12.90	16.6	5.9	19.1	35.10	14.5				
75	15.81	1.17	17.0	13.35	17.7	6.4	21.4	34.20	14.5				
53	7.41	1.38	9.4	13.20	8.2	5.6	8.7	34.30	6.8				
38	6.96	1.45	9.3	12.90	7.5	5.5	8.1	34.50	6.4				
28	2.99	4.95	13.6	24.40	6.1	9.2	5.8	21.30	1.7				
19	4.78	1.57	6.9	13.05	5.2	5.6	5.7	34.60	4.4				
12	5.05	1.34	6.2	11.85	5.0	4.7	5.0	36.20	4.9				
8	2.59	1.13	2.7	11.45	2.5	4.2	2.3	37.40	2.6				
CALC-8	21.59	0.66	13.0	10.33	18.7	2.77	12.6	44.19	25.6				
ASSAY	100.00	1.09	100.0	11.95	100.0	4.8	100.0	37.30	100.0				

PROJECT	T0887
SAMPLE NAME	Non Mags
FROM TEST	T25
DATE	171114
TECHNICIAN	MS

Non Mags T25		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	0.80	0.73	99.3
		106	0.71	0.65	98.6
		75	1.36	1.24	97.4
	53	3.74	3.42	94.0	
	38	9.51	8.70	85.3	
CYCLOSIZER		34	1.41	1.29	84.0
FLOW 185	29	28	5.89	5.39	78.6
TEMP 21		19	14.66	13.41	65.2
SG 2.50		12	15.16	13.86	51.3
MINS 20		8	7.66	7.00	44.3
		SUB	48.46	44.31	0.0
	TOTAL	109.36	100.00		



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO ₂					
		%	dist	%	dist	%	dist	%	dist				
75	2.62	1.04	1.7	9.81	2.0	3.5	2.0	38.90	2.9				
53	3.42	0.95	2.0	8.46	2.2	2.2	1.6	41.10	4.1				
38	8.70	0.96	5.1	9.10	6.1	3.3	6.2	39.80	10.0				
28	6.68	5.84	23.6	24.70	12.6	17.4	25.0	18.40	3.5				
19	13.41	2.11	17.1	13.75	14.1	7.2	20.8	32.10	12.4				
12	13.86	1.79	15.0	13.00	13.8	5.8	17.4	33.20	13.3				
8	7.00	1.65	7.0	12.85	6.9	5.7	8.6	33.30	6.7				
CALC-8	44.31	1.06	28.5	12.45	42.3	1.93	18.4	36.89	47.1				
ASSAY	100.00	1.65	100.00	13.05	100.00	4.6	100.00	34.70	100.00				

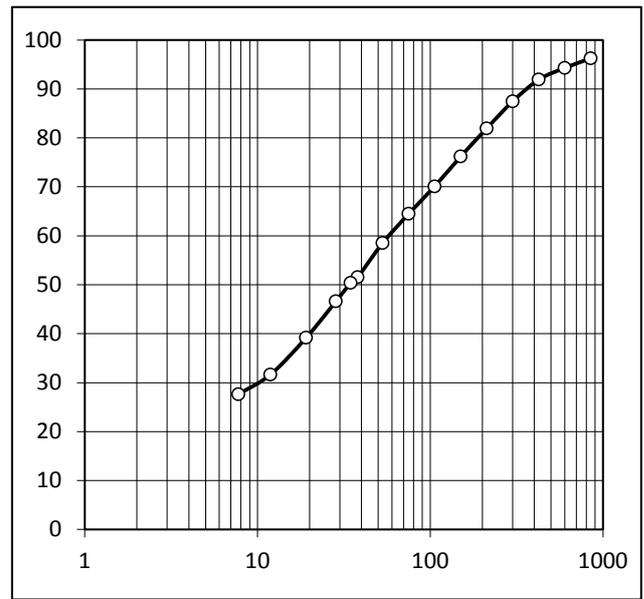


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Feed
FROM TEST	
DATE	261114
TECHNICIAN	MS

LC08 Feed		SIZE um	WEIGHTS		
			gm	(%)	%PASS
p80	191	850	4.33	3.76	96.2
		600	2.27	1.97	94.3
		425	2.73	2.37	91.9
		300	5.13	4.45	87.5
		212	6.37	5.52	81.9
		150	6.63	5.75	76.2
		106	7.03	6.10	70.1
		75	6.45	5.59	64.5
		53	6.89	5.98	58.5
		38	8.03	6.96	51.6
CYCLOSIZER	CS1	35	1.37	1.19	50.4
FLOW 185	CS2	28	4.34	3.76	46.6
TEMP 21	CS3	19	8.55	7.41	39.2
SG 2.40	CS4	12	8.69	7.54	31.7
MINS 20	CS5	8	4.64	4.02	27.6
		SUB	31.86	27.63	0.0
		TOTAL	115.31	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
150	23.81	0.72	13.5	10.75	20.3	4.51	21.5	38.10	25.1
106	6.10	1.18	5.7	14.00	6.8	5.97	7.3	34.50	5.8
75	5.59	1.28	5.6	13.65	6.1	6.33	7.1	34.90	5.4
53	5.98	1.31	6.2	13.00	6.2	4.53	5.4	35.80	5.9
38	6.96	1.33	7.3	12.00	6.6	5.17	7.2	35.40	6.8
28	4.95	4.80	18.7	23.10	9.1	14.50	14.4	21.70	3.0
19	7.41	1.79	10.5	13.85	8.2	6.33	9.4	33.10	6.8
12	7.54	1.58	9.4	12.65	7.6	5.11	7.7	34.50	7.2
8	4.02	1.37	4.3	12.30	3.9	5.07	4.1	35.40	3.9
CALC-8	27.63	0.87	18.9	11.55	25.3	2.90	16.0	39.50	30.1
ASSAY	100.00	1.27	100.00	12.60	100.00	5.00	100.00	36.20	100.00

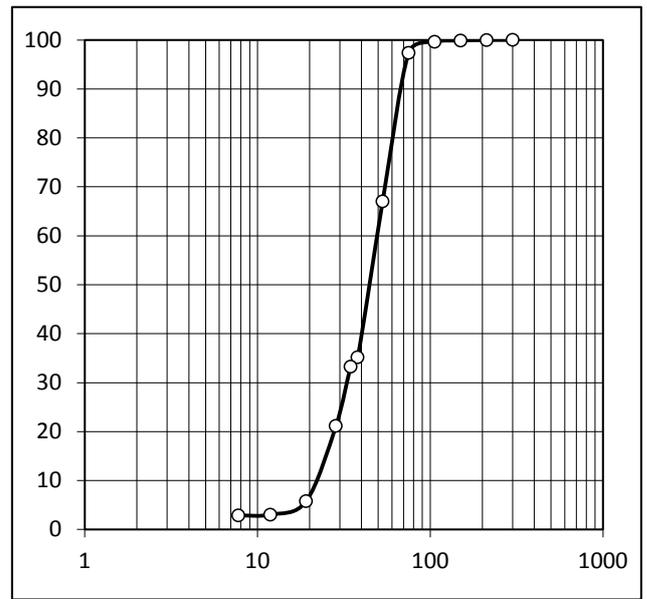


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc 2
FROM TEST	-75 Mozley Tail
DATE	051214
TECHNICIAN	MS

LC08 Cyc 2 -75 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	0.02	0.02	100.0	
	150	0.11	0.10	99.9	
	106	0.29	0.25	99.6	
	75	2.57	2.25	97.4	
62	53	34.62	30.37	67.0	
	38	36.30	31.84	35.2	
CYCLOSIZER	CS1	35	2.19	1.92	33.2
FLOW 185	CS2	28	13.80	12.11	21.1
TEMP 21	CS3	19	17.50	15.35	5.8
SG 2.40	CS4	12	3.13	2.75	3.0
MINS 20	CS5	8	0.20	0.18	2.9
SUB			3.27	2.87	0.0
TOTAL			114.00	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
75	2.6	0.30	1.2	5.97	1.5	0.63	0.5	43.90	3.1
53	30.4	0.37	17.3	6.67	19.6	0.87	7.4	42.20	34.2
38	31.8	0.49	24.0	7.92	24.4	1.48	13.3	39.80	33.8
28	14.0	1.02	22.0	18.65	25.3	6.65	26.3	29.30	11.0
8	18.3	1.25	35.1	14.75	26.0	7.59	39.1	31.90	15.5
CALC-8	2.9	0.08	0.3	11.68	3.2	16.68	13.5	32.13	2.5
ASSAY	100.0	0.65	100.00	10.35	100.00	3.55	100.00	37.50	100.00

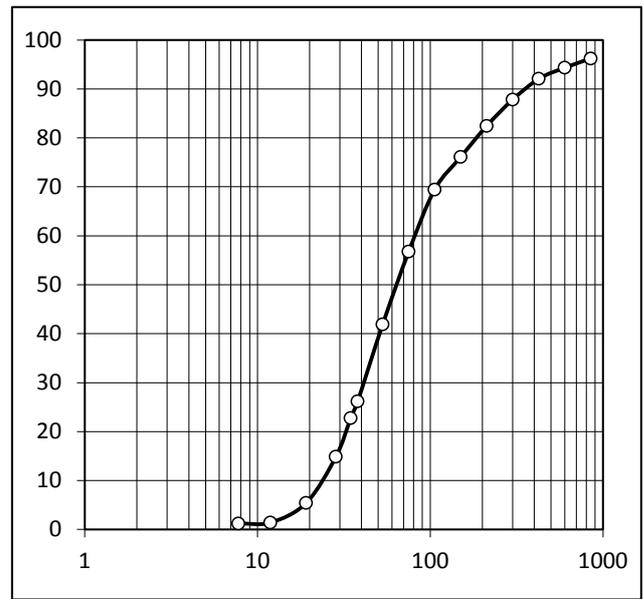


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc10
	Cyclone U/F
DATE	181214
TECHNICIAN	MS

LC08 Cyc10		SIZE um	WEIGHTS		
			gm	(%)	%PASS
p80	188	850	3.82	3.78	96.2
		600	1.92	1.90	94.3
		425	2.27	2.25	92.1
		300	4.31	4.26	87.8
		212	5.43	5.37	82.4
		150	6.42	6.35	76.1
		106	6.73	6.66	69.4
		75	12.80	12.66	56.8
		53	15.04	14.88	41.9
38	15.86	15.69	26.2		
CYCLOSIZER	CS1	35	3.45	3.41	22.8
FLOW 185	CS2	28	7.99	7.91	14.9
TEMP 21	CS3	19	9.54	9.44	5.4
SG 2.40	CS4	12	4.05	4.01	1.4
MINS 20	CS5	8	0.19	0.19	1.2
SUB			1.25	1.24	0.0
TOTAL			101.07	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
212	17.56	0.57	8.2	9.65	12.3	2.75	6.7	39.50	20.5
106	13.01	0.98	10.5	12.75	12.1	6.04	10.9	35.10	13.5
75	12.66	0.79	8.2	10.05	9.3	3.77	6.6	38.70	14.5
53	14.88	0.82	10.0	11.00	11.9	4.57	9.5	38.10	16.8
38	15.69	1.07	13.8	14.55	16.6	6.88	15.0	33.30	15.5
28	11.32	3.20	29.7	27.00	22.2	17.50	27.6	18.45	6.2
8	13.63	1.69	18.9	15.65	15.5	6.04	11.5	31.90	12.9
CALC-8	1.24	0.79	0.8	1.11	0.1	70.3	12.1	5.04	0.2
ASSAY	100.00	1.22	100.00	13.75	100.00	7.18	100.00	33.80	100.00

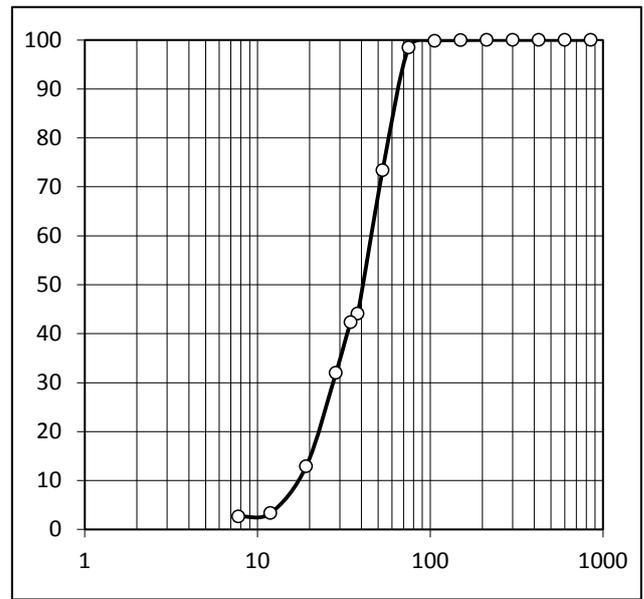


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc10
	-75 Mozley Tail
DATE	181214
TECHNICIAN	MS

LC08 Cyc10		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	0.06	0.05	99.9	
	106	0.17	0.15	99.8	
	75	1.55	1.36	98.4	
	59	53	28.61	25.05	73.4
	38	33.41	29.26	44.1	
CYCLOSIZER	CS1	35	2.04	1.79	42.3
FLOW 185	CS2	28	11.83	10.36	32.0
TEMP 21	CS3	19	21.80	19.09	12.9
SG 2.40	CS4	12	10.89	9.54	3.4
MINS 20	CS5	8	0.80	0.70	2.7
	SUB		3.04	2.66	0.0
	TOTAL		114.20	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
75	1.56	0.31	0.7	7.29	1.0	0.61	0.2	43.30	1.8
53	25.05	0.33	12.7	6.74	15.5	0.86	5.6	42.80	28.5
38	29.26	0.37	16.7	8.14	21.8	1.70	13.0	41.00	31.9
35	1.79	1.47	4.0	36.90	6.0	15.80	7.4	11.85	0.6
28	10.36	0.87	13.9	17.50	16.6	8.32	22.4	29.70	8.2
19	19.09	0.88	25.8	13.35	23.4	6.17	30.7	33.80	17.2
12	9.54	1.29	18.9	14.00	12.2	6.86	17.0	33.00	8.4
8	0.70	1.62	1.7	14.90	1.0	6.57	1.2	33.60	0.6
CALC-8	2.66	1.33	5.5	9.64	2.4	3.59	2.5	40.8	2.9
ASSAY	100.00	0.65	100.00	10.90	100.00	3.84	100.00	37.60	100.00

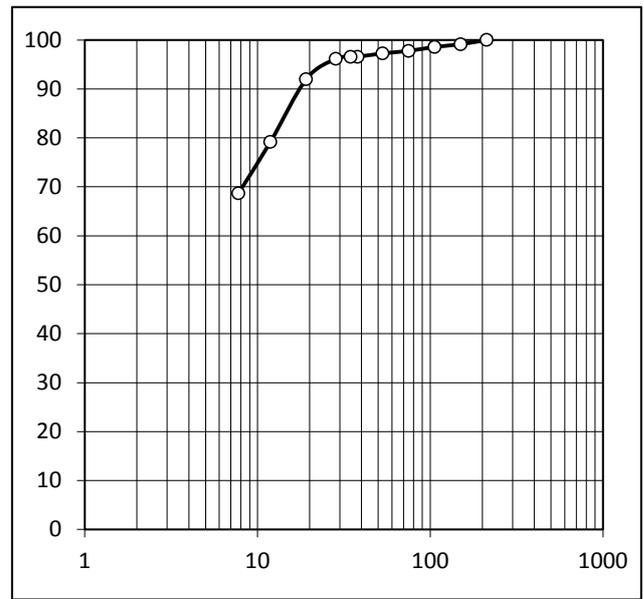


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc10
	Cyclone O/F
DATE	181214
TECHNICIAN	MS

LC08 Cyc10		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	1.12	0.87	99.1	
	106	0.71	0.55	98.6	
	75	1.03	0.80	97.8	
	53	0.65	0.51	97.3	
	38	0.88	0.69	96.6	
CYCLOSIZER		35	0.04	0.03	96.5
FLOW 185		28	0.52	0.41	96.1
TEMP 21		19	5.33	4.16	92.0
SG 2.40	12	12	16.37	12.78	79.2
MINS 20		8	13.46	10.51	68.7
		SUB	87.99	68.69	0.0
		TOTAL	128.10	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
38	3.43	0.59	2.8	10.95	3.2	3.06	3.4	38.80	3.4
28	0.44	1.30	0.8	14.75	0.6	6.85	1.0	33.20	0.4
19	4.16	0.81	4.7	11.00	3.9	4.49	6.0	35.70	3.8
12	12.78	1.09	19.2	12.25	13.5	4.87	19.9	35.50	11.7
8	10.51	1.21	17.6	12.75	11.5	5.49	18.5	35.30	9.6
<8	68.69	0.58	55.0	11.40	67.3	2.33	51.3	40.10	71.1
CALC	100.00	0.72	100.0	11.63	100.0	3.1	100.0	38.75	100.0
ASSAY	100.00	0.75		11.40		4.08		37.90	

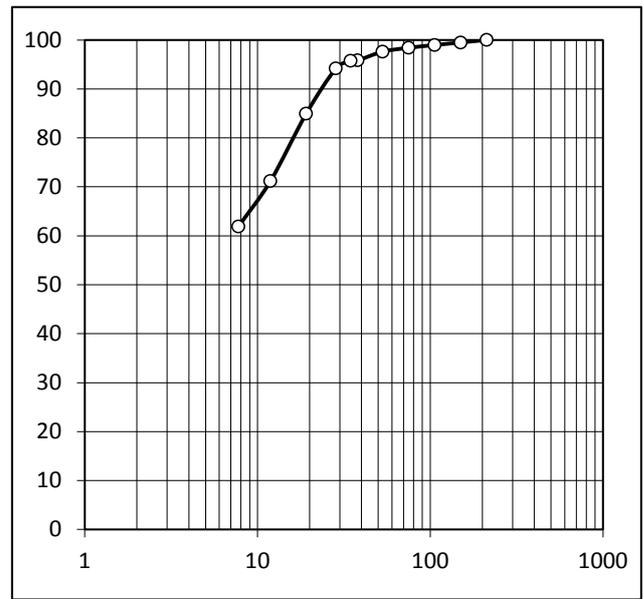


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc1-10
	Cyclone O/F
DATE	191214
TECHNICIAN	MS

LC08 Cyc1-10		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	0.70	0.51	99.5	
	106	0.71	0.52	99.0	
	75	0.76	0.56	98.4	
	53	1.08	0.79	97.6	
	38	2.43	1.79	95.8	
CYCLOSIZER		35	0.11	0.08	95.7
FLOW 185		28	2.14	1.57	94.2
TEMP 21		19	12.56	9.23	84.9
SG 2.40	17	12	18.71	13.75	71.2
MINS 20		8	12.64	9.29	61.9
		SUB	84.25	61.91	0.0
		TOTAL	136.09	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
38	4.17	0.43	2.5	8.93	3.4	1.90	2.5	41.10	4.6
28	1.65	0.98	2.2	13.85	2.1	5.16	2.7	33.40	1.5
19	9.23	0.96	12.2	12.05	10.0	4.76	13.8	36.50	9.0
12	13.75	1.24	23.4	12.80	15.9	3.19	13.8	36.40	13.4
8	9.29	1.22	15.6	12.70	10.6	5.49	16.1	35.90	8.9
<8	61.91	0.52	44.2	10.40	58.0	2.62	51.1	37.70	62.5
CALC	100.00	0.73	100.0	11.09	100.0	3.17	100.0	37.31	100.0
ASSAY	100.00	0.78		11.45		3.92		38.20	

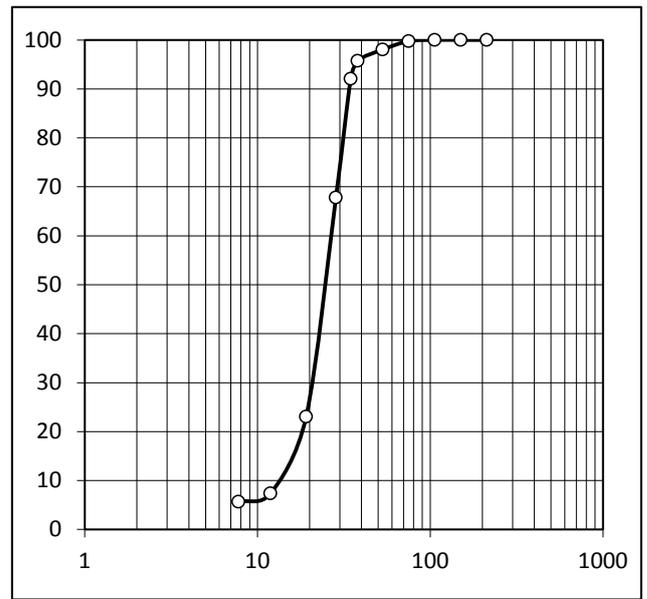


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc1-10
	Fine Tail -40
DATE	191214
TECHNICIAN	MS

LC08 Cyc1-10		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	0.00	0.00	100.0
		106	0.00	0.00	100.0
		75	0.25	0.24	99.8
		53	1.76	1.72	98.0
	38	2.34	2.29	95.8	
CYCLOSIZER	32	35	3.77	3.68	92.1
FLOW 185		28	24.83	24.26	67.8
TEMP 21		19	45.79	44.73	23.1
SG 2.40		12	16.07	15.70	7.4
MINS 20		8	1.71	1.67	5.7
SUB			5.84	5.71	0.0
TOTAL			102.36	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
38	4.25	0.36	1.3	7.54	1.8	1.22	0.6	41.30	5.8
28	27.94	1.21	28.9	24.60	39.3	13.00	42.7	22.40	20.7
19	44.73	1.05	40.1	14.85	38.0	7.21	37.9	31.90	47.1
12	15.70	1.58	21.2	14.95	13.4	6.97	12.9	32.90	17.0
8	1.67	1.56	2.2	13.65	1.3	6.41	1.3	34.00	1.9
CALC-8	5.71	1.28	6.2	19.07	6.2	6.82	4.6	40.01	7.5
ASSAY	100.00	1.17	100.00	17.50	100.00	8.50	100.00	30.30	100.00

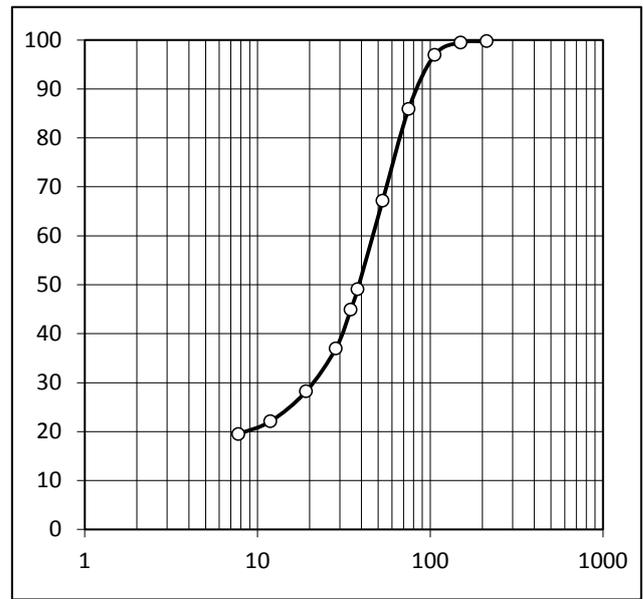


BURNIE LABORATORY

Sizing sheet with fraction assays and head

PROJECT	T0887
SAMPLE NAME	LC08 Cyc10
	Grind Discharge
DATE	191214
TECHNICIAN	MS

LC08 Cyc10		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	0.18	0.16	99.8	
	212	0.08	0.07	99.8	
	150	0.31	0.28	99.5	
	106	2.85	2.56	96.9	
	75	12.27	11.02	85.9	
68	53	20.86	18.73	67.2	
	38	20.14	18.08	49.1	
CYCLOSIZER	35	4.68	4.20	44.9	
FLOW 185	28	8.79	7.89	37.0	
TEMP 21	19	9.78	8.78	28.2	
SG 2.40	12	6.82	6.12	22.1	
MINS 20	8	2.89	2.59	19.5	
SUB		21.72	19.50	0.0	
TOTAL		111.37	100.00		



ANALYSES

SIZE um	WT %	Sn		Fe		S		SiO2	
		%	dist	%	dist	%	dist	%	dist
106	3.1	0.27	1.2	6.30	1.4	1.01	0.5	42.40	3.8
75	11.0	0.34	5.2	6.74	5.2	1.24	2.3	42.80	13.6
53	18.7	0.49	12.7	9.00	11.8	2.97	9.4	39.90	21.6
38	18.1	0.77	19.3	15.10	19.1	6.13	18.6	33.60	17.5
35	4.2	2.68	15.6	40.10	11.8	28.70	20.3	6.02	0.7
28	7.9	1.28	14.0	25.10	13.9	10.40	13.8	22.20	5.1
19	8.8	1.06	12.9	17.20	10.6	9.61	14.2	29.80	7.6
12	6.1	0.87	7.4	15.15	6.5	7.22	7.4	33.00	5.8
8	2.6	0.65	2.3	14.05	2.6	6.22	2.7	34.70	2.6
<8	19.5	0.34	9.2	12.55	17.2	3.29	10.8	38.60	21.7
CALC	100.00	0.72	100.0	14.27	100.0	5.95	100.0	34.64	100.0
ASSAY		0.75		14.45		6.82		34.50	



WorleyParsons

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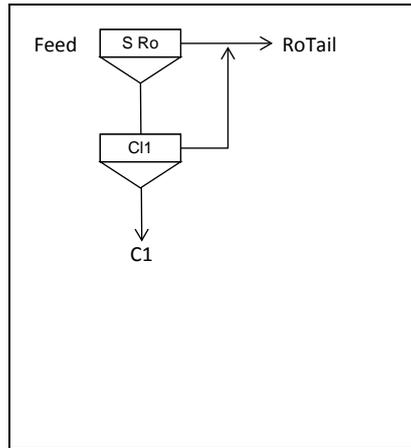
EcoNomics™

STELLAR RESOURCES LIMITED
SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

Appendix 13 – Gravity Concentrate Dressing Results

Milling		Primary	Regrind
Mill	type	0	0
Media	type	0	0
Media	kg	0	0
Solids	g	0	0
Water	g	0	0
Time	min/sec	0	0
Speed	rpm	0	0
Lime	g	0	0
End pH	pH	0	0
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	
Cleaner		Finish	
0		W/h	
Speed	800	kWh/t	



PROJECT	T0887
TEST NO	T10
DATE	030714
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
LC03 Feed Non Mags

NOTES
Sulphide Rougher Cleaner
LC03 Combined Conc

	pH	1 ASS	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	3.9	257							3					
Condition			36						5					
Condition				152					1					
Sulphide Ro C1	3.9									2-4	1.0	1.0	50	
Condition			26						2					
Condition				51					1					
Sulphide Ro C2	4.0									3-4	1.5	2.5	80	
Condition			26						2					
Condition				51					1					
Sulphide Ro C3	4.1									4-5	1.5	4.0	100	
Condition			26						2					
Condition				51					1					
Sulphide Ro C4	4.2									4-5	1.5	5.5	100	
Condition		103							2					
Condition			26						1					
Sulphide C1Con	4.1			102						4-5	5.0	5.0	300	17
REAGENT TOTALS (g/t)		359	139	407										

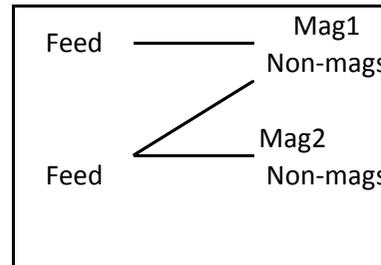
PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T10 C1Con	52.0	26.7	0.88	2.8	40.8	29.3	40.4	57.3	2.50	11.9
Ro Tail	142.8	73.3	11.3	97.2	35.9	70.7	11.0	42.7	6.71	88.1
CALC	194.8	100.0	8.52	100.0	37.2	100.0	18.8	100.0	5.59	100.0
ASSAY HEAD			8.55		37.2		17.4		5.48	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T10 C1Con	52.0	26.7	0.88	2.8	40.8	29.3	40.4	57.3	2.50	11.9
FEED	194.8	100.0	8.52	100.0	37.2	100.0	18.8	100.0	5.59	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T11
DATE	030714
TECH	ID

TEST TYPE	Rapid Magnetic Sep
Feed Solids (g)	134.2
Current (A)	0.1, 0.6
Magnetic intense1 (G)	1500
Magnetic intense2 (G)	5000
Comments	



FEED MATERIAL	
Ro Tail + Cl Tail	
FROM TEST NO	T10
START WT (gm)	134.2

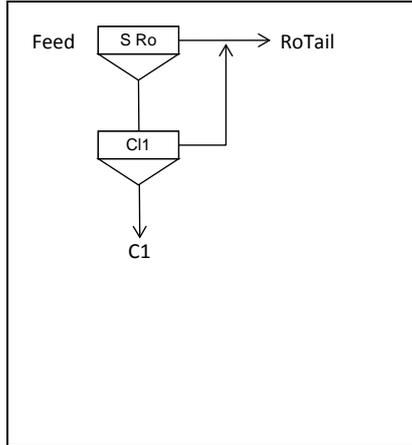
MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics 1	48.2	48.2	35.92	4.87	15.7	44.90	45.1	2.31	12.4	14.95	51.1		
Magnetics 2	26.7	26.7	19.90	6.25	11.2	37.50	20.9	5.54	16.5	6.13	11.6		
Non Magnetics	59.3	59.3	44.19	18.45	73.1	27.60	34.1	10.75	71.1	8.85	37.2		
TOTAL	134.20		100.00	11.15	100.0	35.78	100.0	6.68	100.0	10.50	100.0		

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
Magnetics 1+2	74.9	74.9	55.81	5.36	26.9	42.26	65.9	3.46	28.9	11.81	62.8		
Non Magnetics	59.3	59.3	44.19	18.45	73.1	27.60	34.1	10.75	71.1	8.85	37.2		
TOTAL	134.20		100.00	11.15	100.0	35.78	100.0	6.68	100.0	10.50	100.0		

Milling		Primary	Regrind
Mill	type	0	Stirred
Media	type	0	Ceramic
Media	kg	0	0
Solids	g	0	0
Water	g	0	0
Time	min/sec	0	0
Speed	rpm	0	0
Lime	g	0	0
End pH	pH	0	0
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	
Cleaner		Finish	
0		W/h	
Speed	800	kWh/t	



PROJECT	T0887
TEST NO	T30
DATE	200115
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
Feed Non Mags

NOTES
Sulphide Rougher Cleaner
LC08 Combined Cons
+75 393.6g
-75 350.2g

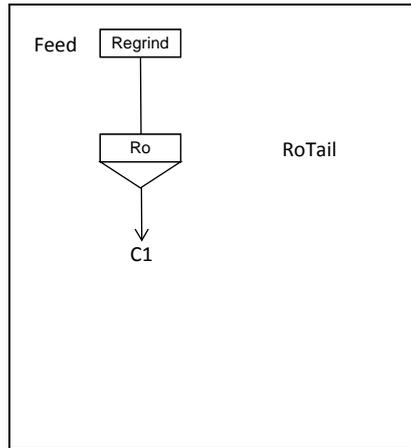
	pH	1 ASS	0.5 CuSO4 g/t	0.2 PAX g/t	0 MIBC g/t				Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	3.1	252							3					
Condition	3.1		47						5					
Condition				47					1					
Sulphide Ro C1	3.2				39					1-3	3.0	3.0	400	
Condition				31					2					
Condition					16				1					
Sulphide Ro C2	3.5									3-4	4.0	7.0	300	
Condition				31					2					
Condition					16				1					
Sulphide Ro C3	3.8									4-5	3.0	10.0	150	
Condition				16					2					
Condition					16				1					
Sulphide Ro C4	3.9									4-5	3.0	13.0	150	
Condition	3.7	94							2					
Condition				16	31				1					
Sulphide C1C1	3.7									1-2	2.0	2.0	400	67
C1C2										2-4	2.0	4.0	200	55
C1C3				6	8					2-5	2.0	6.0	150	35
C1C4				6	8					3-7	2.0	8.0	150	7
REAGENT TOTALS (g/t)		346	47	154	132									

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T30 C1Con1	266.8	42.0	2.47	8.4	40.8	51.5	40.0	61.1	2.03	18.8
C1C2	110.7	17.4	2.89	4.1	40.7	21.3	36.5	23.1	2.57	9.9
C1C3	52.9	8.3	3.29	2.2	39.6	9.9	33.7	10.2	3.40	6.2
C1C4	9.9	1.6	17.8	2.2	29.9	1.4	19.1	1.1	7.10	2.4
C1Tail	18.6	2.9	45.7	10.9	11.8	1.0	6.03	0.6	8.54	5.5
Ro Tail	176.2	27.7	32.0	72.1	17.9	14.9	3.88	3.9	9.35	57.2
CALC	635.1	100.0	12.3	100.0	33.3	100.0	27.5	100.0	4.54	100.0
ASSAY HEAD			12.9		33.5		26.7		4.17	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T30 C1Con1	266.8	42.0	2.47	8.4	40.8	51.5	40.0	61.1	2.03	18.8
C1C2	377.5	59.4	2.59	12.5	40.8	72.8	39.0	84.2	2.19	28.7
C1C3	430.4	67.8	2.68	14.7	40.6	82.7	38.3	94.4	2.34	34.9
C1C4	440.3	69.3	3.02	17.0	40.4	84.1	37.9	95.4	2.44	37.3
C1Tail	458.9	72.3	4.75	27.9	39.2	85.1	36.6	96.1	2.69	42.8
FEED	635.1	100.0	12.3	100.0	33.3	100.0	27.5	100.0	4.54	100.0

Milling		Primary	Regrind
Mill	type	0	Stirred
Media	type	0	Ceramic
Media	kg	0	2
Solids	g	0	417
Water	g	0	300
Time	min/sec	0	0
Speed	rpm	0	1200
Lime	g	0	0
End pH	pH	0	4.67
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	41219
Cleaner		Finish	41223
0		W/h	4.17
Speed	800	kWh/t	10.0



PROJECT	T0887
TEST NO	T32
DATE	230115
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
Feed Non Mags

NOTES
Feed T30 RoCon
Regrind 10kWh/t

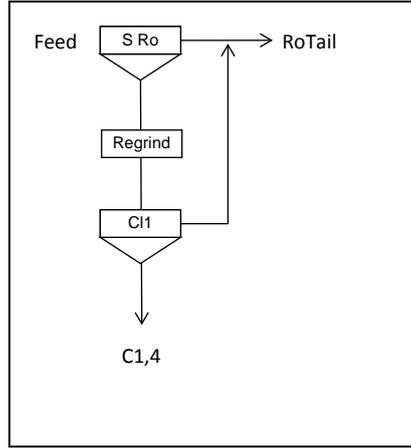
	pH	1 ASS	0.5 CuSO4 g/t	0.1 PAX g/t	0 MIBC g/t				Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	4.7	120							3					
Condition	4.5		60						5					
Condition				36					1					
Sulphide Ro C1	4.6				60					1-3	3.0	3.0	200	47
Condition				12					2					
Condition					12				1					
Sulphide Ro C2	4.6									3-4	3.0	6.0	200	63
Condition				12					2					
Condition					12				1					
Sulphide Ro C3	4.6									4-5	3.0	9.0	200	58
Condition				12					2					
Condition					24				1					
Sulphide Ro C4	4.7									4-5	4.0	13.0	130	31
REAGENT TOTALS (g/t)		120	60	72	107									

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T32 Ro Con1	93.9	22.6	1.65	7.8	41.7	23.6	36.6	26.5	3.22	24.9
C2	125.6	30.2	0.99	6.3	43.2	32.8	40.9	39.6	1.39	14.4
C3	115.9	27.9	1.61	9.4	41.4	29.0	24.7	22.1	2.02	19.3
C4	40.4	9.7	5.30	10.8	40.0	9.8	32.6	10.2	3.82	12.7
Ro Tail	39.9	9.6	32.5	65.6	20.2	4.9	5.55	1.7	8.76	28.8
CALC	415.7	100.0	4.76	100.0	39.8	100.0	31.2	100.0	2.92	100.0
ASSAY HEAD			0.00		0.00		0.00		0.00	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T32 Ro Con1	93.9	22.6	1.65	7.8	41.7	23.6	36.6	26.5	3.22	24.9
C2	219.5	52.8	1.27	14.1	42.6	56.4	39.1	66.1	2.17	39.3
C3	335.4	80.7	1.39	23.6	42.2	85.4	34.1	88.1	2.12	58.5
C4	375.8	90.4	1.81	34.4	41.9	95.1	33.9	98.3	2.30	71.2
FEED	415.7	100.0	4.76	100.0	39.8	100.0	31.2	100.0	2.92	100.0

Milling		Primary	Regrind
Mill	type	0	Stirred
Media	type	0	Ceramic
Media	kg	0	2
Solids	g	0	417
Water	g	0	300
Time	min/sec	0	0
Speed	rpm	0	1200
Lime	g	0	0
End pH	pH	0	4.67
End p80	µm	0	0

Float Cell	Volume	Regrind	Power
Rougher	1.5	Start	41219
Cleaner		Finish	41223
0		W/h	4.17
Speed	800	kWh/t	10.0



PROJECT	T0887
TEST NO	T30-T32
DATE	270115
TECHNICIAN	MJR

PRODUCT FLOATED
St Dizier
Feed Non Mags

NOTES
Sulphide Rougher Cleaner
Combined Ro Con T30
10kWh/t Regrind
Re-Floated

	pH	1 ASS	0.5 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	3.1	270							3					
Condition	3.1		51						5					
Condition				51					1					
Sulphide Ro C1	3.2				42					1-3	3.0	3.0	400	
Condition				34					2					
Condition					17				1					
Sulphide Ro C2	3.5									3-4	4.0	7.0	300	
Condition				34					2					
Condition					17				1					
Sulphide Ro C3	3.8									4-5	3.0	10.0	150	
Condition				17					2					
Condition					17				1					
Sulphide Ro C4	3.9									4-5	3.0	13.0	150	
Regrind	4.7								2					
Condition	4.5	84							2					
Condition			42	27	42				1					
Sulphide C1C1	4.6									1-2	3.0	3.0	200	47
C1C2	4.6			10	8					2-4	3.0	6.0	200	63
C1C3	4.6			10	8					2-5	3.0	9.0	200	58
C1C4	4.7			10	17					3-7	4.0	13.0	130	31
REAGENT TOTALS (g/t)		355	93	193	167									

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T30 -T32 C1Con1	93.9	15.9	1.65	2.0	41.7	19.9	36.6	25.2	3.22	10.6
C1C2	125.6	21.2	0.99	1.6	43.2	27.5	40.9	37.6	1.39	6.1
C1C3	115.9	19.6	1.61	2.5	41.4	24.3	24.7	21.0	2.02	8.2
C1C4	40.4	6.8	5.30	2.8	40.0	8.2	32.6	9.6	3.82	5.4
C1Tail	39.9	6.7	32.5	17.0	20.2	4.1	5.55	1.6	8.76	12.2
Ro Tail	176.2	29.8	32.0	74.0	17.9	16.0	3.88	5.0	9.35	57.6
CALC	591.9	100.0	12.9	100.0	33.3	100.0	23.1	100.0	4.84	100.0
ASSAY HEAD			12.9		33.5		26.7		4.17	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	DIST	SiO2 %	DIST
T30 -T32 C1Con1	93.9	15.9	1.65	2.0	41.7	19.9	36.6	25.2	3.22	10.6
C1C2	219.5	37.1	1.27	3.7	42.6	47.4	39.1	62.8	2.17	16.7
C1C3	335.4	56.7	1.39	6.1	42.2	71.8	34.1	83.7	2.12	24.8
C1C4	375.8	63.5	1.81	8.9	41.9	80.0	33.9	93.4	2.30	30.2
C1Tail	415.7	70.2	4.76	26.0	39.8	84.0	31.2	95.0	2.92	42.4
FEED	591.9	100.0	12.9	100.0	33.3	100.0	23.1	100.0	4.84	100.0

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T34A
DATE	280115
TECH	MW

TEST TYPE	Rapid Magnetic Sep
Feed Solids (g)	208.0
Current (A)	
Magnetic intense1 (G)	1000
Comments	



FEED MATERIAL	
Ro Tail + Cl Tail from T30/32	
FROM TEST NO	T30/32
START WT (gm)	208

MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S (%)	Dist (%)	SiO2 (%)	Dist (%)		
Magnetics	56.2	56.2	27.02	16.08	13.1	30.05	46.8	6.08	41.1	10.02	30.4		
Non Magnetics	151.8	151.8	72.98	39.40	86.9	12.65	53.2	3.23	58.9	8.50	69.6		
TOTAL	208.00		100.00	33.10	100.0	17.35	100.0	4.00	100.0	8.91	100.0		

BURNIE LABORATORY: MAGNETIC SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T34B
DATE	280115
TECH	MW

TEST TYPE	Rapid Magnetic Sep
Feed Solids (g)	56.2
Current (A)	
Magnetic intense1 (G)	1000
Comments	



FEED MATERIAL	
Reground Mags/10sec in LM2 from T34A	
FROM TEST NO	T34A
START WT (gm)	134.2

MAGNETIC SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	S(%)	Dist (%)	SiO2 (%)	Dist (%)		
Magnetics	44.2	44.2	78.65	19.00	92.9	33.80	88.5	8.32	107.6	6.33	49.7		
Non Magnetics	12.0	12.0	21.35	5.34	7.1	16.21	11.5	-2.17	-7.6	23.60	50.3		
TOTAL	56.20		100.00	16.08	100.0	30.05	100.0	6.08	100.0	10.02	100.0		



BURNIE LABORATORY: BATCH ATMOSPHERIC LEACH RESULTS SHEET

LIQUOR MAKE UP

LEACH TYPE	Acid
Liquor Volume (ml)	175
Total Liquor Mass (gm)	188
Liquor SG (kg/L)	1.0902
Start Free Acid (g/L)	160.7

PROJECT	T0887
TEST NO	T36
DATE	1/02/2015
TECHNICIAN	MW

LEACH CONDITIONS

Beaker Volume (ml)	500
Agitator (type)	MS
Agitator (rpm)	-
N2 Blanket (lpm)	1
Start Temp (deg)	90
Leach Time (hrs)	8.0
Start Solids (gm)	50.0
Liquor Volume Used (l)	0.175

LEACH FEED SAMPLE DETAILS
T34 combined non mags

MASS BALANCE

Beaker Mass (gm)	311.8
AgI (gm)	18.9
Start Solids (gm)	50
Start H2SO4 (98%) (gm)	29
Start Liquor (gm)	188
Total Start Mass (gm)	568.7
Total End Mass (gm)	585
End Solids Mass (gm)	36.7
End Liquor SG (kg/L)	1.1395
Calc End Liquor (gm)	217.6
Calc End Liquor (L)	0.191
End Free Acid (g/L)	62.1
End Fe2+ (g/L)	23.1

Hrs	Temp	Start pH	N2 Flow (lpm)
0	90	0.31	1
1	90	0.99	1
2	90	1.24	1
3	90	1.27	1
4	90	1.27	1
5	90	1.31	1
6	90	1.31	1
7	90	1.31	1
8	90	1.31	1

RESULTS

Stream	Vol (L)	Sn		Fe		As		Mn		Ca		Mg		Al	
		(g/L)	Rec (%)												
Start Liquor	0.175	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00		0.00		0.00	
Final Liquor	0.191	0.028	0.0	25.90	70.3	0.06	0.5	0.54	2.4	0.81		6.75		0.49	

Stream	Mass (gm)	Sn		Fe		S		SiO2		C		Corg		Cinorg	
		(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)	(%)	Rec (%)
Start Solids	50.0	36.60		14.25		4.10		8.95		2.21		0.05		2.16	
Final Residue	36.7	49.70	100.0	5.69	29.7	5.93	99.5	11.65	97.6	0.05	1.7	0.05	73.4	0.02	0.7

Calc Feed	50.0	36.49		14.07		4.38		8.76							
Assay Feed		36.60		14.25		4.10		8.95		2.21		0.05		2.16	



WorleyParsons

resources & energy

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STELLAR RESOURCES LIMITED
SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

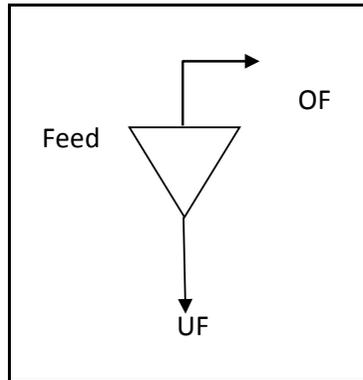
Appendix 14 – Tin Flotation Results



BURNIE LABORATORY: CYCLONE SEPARATION REPORT SHEET

PROJECT	T0887
TEST NO	T33
DATE	270115
TECH	ID

TEST TYPE	Cyclone Separation
Feed Solids (g)	11858.0
Spigot (mm)	4.5
Vortex finder (mm)	11.0
KPA	200.0
Comments	Same as T31 run #2 Red foot 22% solids tin float feed



FEED MATERIAL	
From LC08 cyc1-10 cyclone Overflow + -40 Fine tail	
FROM TEST NO	LC08
START WT (gm)	11858.0

SEPARATION RESULTS

NAME	Wt (gm)	Calc(gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	SiO2 (%)	Dist (%)	S (%)	Dist (%)		
OF	5357.3	5357.3	45.18	0.63	32.6	11.17	41.4	41.20	49.2	2.97	31.2		
UF	6500.7	6500.7	54.82	1.07	67.4	13.05	58.6	35.00	50.8	5.38	68.8		
TOTAL	11858.00		100.00	0.87	100.0	12.20	100.0	37.80	100.0	4.29	100.0		

CYCLONE TEST DATA

SAMPLE	LC08 Feed
TEST TYPE	
	Cyclone test

PROJECT	T0887
TEST NO	LC08
DATE	281114
PERFORMED BY	ID

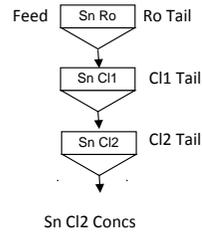
Run #		Spigot, mm	Vortex finder, mm	Tare,gm	Tare+Pulp,gm	Pulp	Dry,gm		KPA
1	U/F	5	14	78.9	289.3	210.4	91.9	White Foot	250
	O/F			825	4506	3681	28.6		
2	U/F	5	14	78.9	312.7	233.8	90.3	White Foot	200
	O/F			825	5158	4333	33.7		
3	U/F	5	18	109.8	160.4	80.6	38.3	White Foot	200
	O/F	Roping		825	5492	4667	86.7		
4	U/F	6	18	109.8	247.6	137.8	76.7	White Foot	200
	O/F			825	5106	4281	36.4		
5	U/F	5	11	110	426	316.5	52.8	White Foot	200
	O/F			825	2996	2171	18.1		
6	U/F	4	11	109.8	466	356.2	93.1	White Foot	200
	O/F			825	5469	4644	38.8		
7	U/F	3	11	109.8	355.7	245.9	73.3	Red Foot	200
	O/F			825	4548	3723	23		
8	U/F	3	14	109.8	378.3	268.5	120	Red Foot	200
	O/F			825	7044	6219	41.8		
9	U/F	3	18	109.8	273	163.2	106	Red Foot	200
	O/F			825	6317	5492	62		
10	U/F	5.5	18	109.8	219.5	109.7	83.7	White Foot	200
	O/F	Roping		825	6994	6169	63.9		
11	U/F	5.5	18	109.8	261.7	151.9	118.5	White Foot	250
	O/F	Roping		825	9311	8486	93.9		



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T08
DATE	180614
TECHNICIAN	MW

Milling		Primary	Regrind
Mill type			
Media type			
Media kg			
Solids g			
Water g			
Time min			
Speed rpm			
Lime g			
End pH			
End p80			



PRODUCT FLOATED
-53um Non mags

NOTES
no water change
0

kwh/t			
Float Cell	Volume	Regrind Power	
Rougher	2.5	Start	
Cl1	1.2	Finish	
Speed	0.8	W/h	
	700	kWh/t	

	pH	0.1 PAX g/t	H2SO4 g/t	0.495 MIBC g/t	100 SSF g/t	1.0 SS g/t	1.0 SPA7080 g/t		Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Sulphide Prefloat	7.1	60		40						5-10	3.0	3.0	110	
Filtration														
HIC Conditioning	3.5		3008		201				5					
Condition SSF	3.5								1					
Condition SS	5.2					301			3					
Condition SPA	5.2						602		3					
Sn Ro Con1	5.3			79			602			5-10	10.0	13.0	300	
Condition														
Sn Ro Con2	6.0			20			602			5-10	8.5	21.5	300	
Condition														
Sn Ro Con3	6.3			20			301		3	5-8	5.0	18.0	300	
Condition									3					
Sn Cl1 Con	7.0					100				3-7	9.0	30.5	280	
Condition														
Sn Cl2 Con1	7.1					201			3	4-7	1.5	32.0	20	14
Sn Cl2 Con2										4-7	2.0	34.0	30	10
Sn Cl2 Con3										4-7	2.5	34.5	60	5
REAGENT TOTALS (g/t)		60	3008	159	201	602	1504							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T30 Sulphide Prefloat	26.5	5.3	0.49	1.6	17.7	6.2	13.6	30.4	35.1	5.9
Sn Cl2 C1	2.8	0.6	1.15	0.4	40.7	1.5	34.1	8.1	2.81	0.0
Sn Cl2 C2	2.6	0.5	1.21	0.4	40.4	1.4	34.5	7.5	3.34	0.1
Sn Cl2 C3	3.0	0.6	1.74	0.6	39.5	1.5	29.8	7.5	4.65	0.1
Sn Cl2 Tail	29.2	5.9	5.63	20.0	34.6	13.4	2.28	5.6	7.28	1.3
Sn Cl1 Tail	21.8	4.4	2.96	7.8	22.9	6.6	2.52	4.7	23.7	3.3
Sn Ro T	330.1	66.2	1.43	57.3	11.9	52.2	0.98	27.4	34.7	72.4
Slimes (-CS6)	82.8	16.6	1.18	11.9	15.5	17.0	1.25	8.8	32.3	16.9
CALC	498.7	100.0	1.65	100.0	15.1	100.0	2.37	100.0	31.7	100.0
ASSAY HEAD										

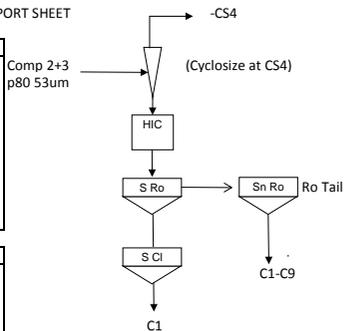
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
Sn Cl2 C1	2.8	0.6	1.15	0.4	40.7	1.5	34.1	8.1	2.81	0.0
Sn Cl2 C2	5.4	1.1	1.18	0.8	40.6	2.9	34.3	15.6	3.06	0.1
Sn Cl2 C3	8.3	1.7	1.38	1.4	40.2	4.4	32.7	23.1	3.63	0.2
Sn Cl2 Tail	37.5	7.5	4.69	21.4	35.8	17.9	9.03	28.7	6.47	1.5
Sn Cl1 Tail	59.3	11.9	4.05	29.2	31.1	24.5	6.63	33.4	12.8	4.8



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T20
DATE	151014
TECHNICIAN	MW

Milling		Primary	Regrind
Mill	type	HIC	
Media	type		
Solids	kg	500	
Water	g	400	
Time	min	5.0	
Speed	rpm	60HZ	
Lime	g		
End pH	pH		
End p80	µm		



PRODUCT FLOATED	
Comp. 2+3	
Deslimed at CS4	

NOTES	
P80=53um	
2kg lots 60mins grinding	
Use 1kg for desliming	

Float Cell		Volume	Regrind	Power
Rougher	2.5		Start	
C11	1.5		Finish	
Speed	850		W/h	
			kWh/t	

	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	1785		198					5					
Water Change	5.9		50						3					
Conditioning S Ro C	5.9						59			3-9	14.0	14.0	700	
Condition S Cl1 C1	6.4						20			1-9	4.5	18.5	350	37
Condition Condition	4.0	397		198					3					
Condition Condition					298				3					
Condition Condition						298			3					
Sn Ro C1	5.2									8-12	3.0	3.0	110	
Sn Ro C2	5.4									8-12	3.0	6.0	110	
Sn Ro C3	5.4						20		3		3.0	9.0	115	
Condition Sn Ro C4	6.0									7-10	3.0	12.0	140	
Sn Ro C5	6.0						20			7-9	3.0	15.0	160	
Sn Ro C6	6.2								3	8-10	3.0	18.0	155	
Condition Sn Ro C7	6.5									7-10	3.0	21.0	155	
Sn Ro C8	6.5						20			6-8	3.0	24.0	155	2
Sn Ro C9	6.6									7-9	3.0	27.0	145	2
REAGENT TOTALS (g/t)		2182	50	397	298	893	137.47							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T20 S Cl1 C1	129.0	25.6	0.84	19.2	33.2	24.5	21.8	93.1	21.4	25.4
S Cl1 Tail	8.2	1.6	1.53	2.2	34.2	1.6	3.77	1.0	24.1	1.8
Sn Ro C1	2.6	0.5	2.73	1.3	32.2	0.5	0.80	0.1	15.9	0.4
C2	2.8	0.6	7.75	3.8	33.3	0.5	0.63	0.1	13.9	0.4
C3	3.5	0.7	11.7	7.2	36.0	0.7	0.56	0.1	11.2	0.4
C4	26.3	5.2	6.16	28.7	48.0	7.2	0.19	0.2	7.34	1.8
C5	23.3	4.6	1.60	6.6	58.7	7.8	0.34	0.3	6.33	1.4
C6	24.9	4.9	1.02	4.5	60.3	8.6	0.40	0.3	6.19	1.4
C7	18.7	3.7	0.70	2.3	54.7	5.9	0.57	0.4	7.87	1.4
C8	8.3	1.6	0.59	0.9	55.1	2.6	0.92	0.3	8.80	0.7
C9	9.2	1.8	0.63	1.0	54.6	2.9	1.61	0.5	9.05	0.8
Ro Tail	247.3	49.1	0.51	22.3	26.2	37.1	0.47	3.8	28.3	64.4
CALC	504.1	100.0	1.12	100.0	34.6	100.0	5.99	100.0	21.6	100.0
ASSAY HEAD			1.16		30.4		5.87		23.7	

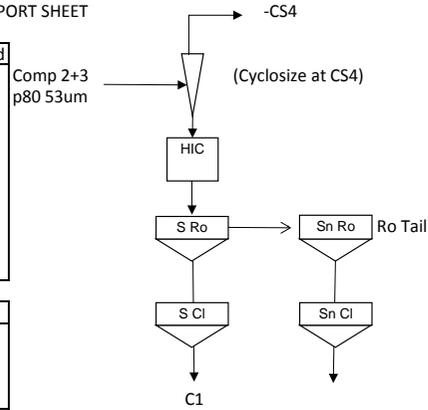
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T20 S Cl1 C1	129.0	25.6	0.84	19.2	33.2	24.5	21.8	93.1	21.4	25.4
S Cl1 Tail	137.2	27.2	0.88	21.4	33.3	26.1	20.7	94.1	21.6	27.2
Sn Ro C1	2.6	0.5	2.73	1.3	32.2	0.5	0.80	1.1	15.9	0.4
C2	5.4	1.1	5.33	5.1	32.8	1.0	0.71	1.2	14.8	0.7
C3	8.9	1.8	7.84	12.3	34.0	1.7	0.65	1.2	13.4	1.1
C4	35.2	7.0	6.58	41.0	44.5	9.0	0.31	1.4	8.87	2.9
C5	58.5	11.6	4.60	47.6	50.1	16.8	0.32	1.6	7.86	4.2
C6	83.4	16.5	3.53	52.1	53.2	25.4	0.34	2.0	7.36	5.6
C7	102.1	20.3	3.01	54.4	53.5	31.3	0.39	2.3	7.46	7.0
C8	110.4	21.9	2.83	55.3	53.6	33.9	0.43	2.6	7.56	7.7
C9	119.6	23.7	2.66	56.3	53.7	36.8	0.52	3.1	7.67	8.4



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T21
DATE	291014
TECHNICIAN	MW

Milling		Primary	Regrind
Mill type		HIC	
Media type			
Media kg		500	
Solids g		400	
Water g		5.0	
Time min		60HZ	
Speed rpm			
Lime g			
End pH			
End p80			



PRODUCT FLOATED	
Comp. 2+3 Deslimed at CS4	

NOTES	
P80=53um 2kg lots 60mins grinding Use 1kg for desliming	

Float Cell		Volume	Regrind Power
Rougher	2.5	Start	
C1	1.5	Finish	
Speed	850	W/h	kWh/t

	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	2151		196					5					
Water Change	5.9		49						3					
Conditioning S Ro C	5.9						39			3-10	5.0	5.0	350	
Condition S Cl1 C1	6.8						19			3-9	4.0	9.0	250	42
Condition Condition Sn Ro C1	4.0	352		196	293	293			3 3 3		9.0	9.0	335	
Condition Condition Sn Ro C2	6.2				293	293				10.14	7.5	16.5	300	
Condition Condition Sn Cl1 C1	6.5									7-10	2.0	18.5	30	
Condition Condition Sn Cl1 C2	6.5									8-11	3.0	21.5	50	
REAGENT TOTALS (g/t)		2503	49	391	587	587	58							

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST		
T21 S Cl1 C1	104.2	20.4	0.80	14.8	31.4	18.2	22.3	79.3	22.5	21.8		
S Cl1 Tail	6.7	1.3	1.65	2.0	30.0	1.1	4.65	1.1	27.2	1.7		
Sn Cl1 C1	11.6	2.3	5.95	12.3	30.5	2.0	4.52	1.8	17.9	1.9		
Sn Cl1 C2	7.3	1.4	5.51	7.2	31.6	1.3	4.75	1.2	18.2	1.2		
Sn Cl1 Tail	18.3	3.6	2.71	8.8	29.3	3.0	2.68	1.7	24.9	4.2		
Ro Tail	363.2	71.0	0.85	54.9	36.9	74.5	1.21	15.0	20.5	69.1		
CALC	511.3	100.0	1.10	100.0	35.2	100.0	5.73	100.0	21.1	100.0		
ASSAY HEAD			1.11		33.0		5.86		22.0			

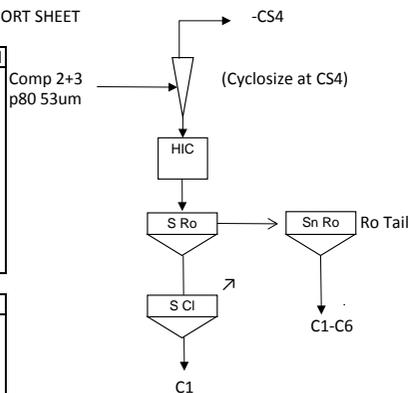
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM		
T21 S Cl1 C1	104.2	20.4	0.80	14.8	31.4	18.2	22.3	79.3	22.5	21.8		
S Cl1 Tail	110.9	21.7	0.85	16.8	31.3	19.3	21.2	80.4	22.8	23.5		
Sn Cl1 C1	11.6	2.3	5.95	12.3	30.5	2.0	4.52	2.9	17.9	1.9		
Sn Cl1 C2	18.9	3.7	5.78	19.4	30.9	3.2	4.61	4.0	18.0	3.2		
Sn Cl1 Tail	37.2	7.3	4.27	28.3	30.1	6.2	3.66	5.7	21.4	7.4		



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T23
DATE	071114
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			
End p80			



PRODUCT FLOATED
Comp. 2+3 Deslimed at CS4

NOTES
P80=53um 2kg lots 60mins grinding Use 1kg for desliming

kwh/t		Regrind Power
Float Cell Volume	2.5	Start Finish W/h kWh/t
Rougher Speed	850	

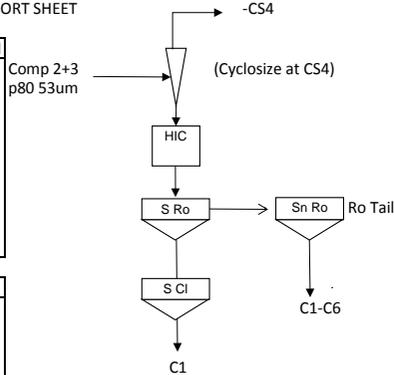
	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 SPA7080 g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	1574		197					5					
Water Change	6.3		49					3						
Conditioning	6.3					58				3-9	14.0	14.0	700	
S Ro C	6.3													
Condition	6.8									1-9	4.5	18.5	330	40
S Cl1 C1	6.8													
Condition	4.0	393		197				3						
Condition	4.0				295			3			3.0	3.0	110	1
Sn Ro C1	5.2									8-12	3.0	6.0	110	1
Sn Ro C2	5.5					19				8-12	3.0	9.0	115	2
Sn Ro C3	5.5				98									
Condition	5.8							3		7-10	3.0	12.0	140	5
Sn Ro C4	6.0					19				7-9	3.0	15.0	160	5
Sn Ro C5	6.2									8-10	3.0	18.0	155	5
Sn Ro C6	6.2													
REAGENT TOTALS (g/t)		1967	49	393	393	97								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T23 S Cl1 C1	130.8	25.7	0.89	21.1	32.7	24.7	20.9	92.9	21.1	25.7
Sn Ro C1	1.2	0.2	4.11	0.9	25.2	0.2	3.25	0.1	24.9	0.3
C2	1.3	0.2	5.92	1.4	27.7	0.2	2.82	0.1	22.3	0.3
C3	2.1	0.4	6.37	2.4	28.5	0.3	2.67	0.2	22.9	0.4
C4	6.9	1.4	9.67	12.1	32.1	1.3	0.93	0.2	14.8	0.9
C5	8.2	1.6	6.22	9.2	36.9	1.7	0.96	0.3	16.2	1.2
C6	7.6	1.5	4.33	6.0	39.8	1.7	1.30	0.3	15.9	1.1
Ro Tail	350.3	68.9	0.74	47.0	34.5	69.8	0.49	5.8	21.5	70.0
CALC	508.4	100.0	1.09	100.0	34.1	100.0	5.79	100.0	21.2	100.0
ASSAY HEAD			1.05		29.8		5.35		24.4	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T23 S Cl1 C1	130.8	25.7	0.89	21.1	32.7	24.7	20.9	92.9	21.1	25.7
Sn Ro C1	1.2	0.2	4.11	0.9	25.2	0.2	3.25	0.1	24.9	0.3
C2	2.5	0.5	5.03	2.3	26.5	0.4	3.03	0.3	23.6	0.5
C3	4.6	0.9	5.63	4.6	27.4	0.7	2.87	0.4	23.3	1.0
C4	11.5	2.3	8.07	16.7	30.2	2.0	1.70	0.7	18.1	1.9
C5	19.7	3.9	7.30	26.0	33.0	3.7	1.39	0.9	17.3	3.2
C6	27.3	5.4	6.47	31.9	34.9	5.5	1.37	1.3	16.9	4.3

PROJECT	T0887
TEST NO	T24
DATE	071114
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		



PRODUCT FLOATED	
Comp. 2+3	
Deslimed at CS4	

NOTES	
P80=53um	
2kg lots 60mins grinding	
Use 1kg for desliming	

Float Cell	Volume	Regrind Power
Rougher	2.5	Start
SCI1	0.5	Finish
Speed	900	W/h kWh/t

	pH	10.0 H2SO4 g/t	0.5 SIPX 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)	2.5	1577				5					
Water Change	6.3		49			3					
S Ro C	6.3				59		3-9	14.0	14.0	700	
Condition S Cl1 C1	7.3		5				1-4	6.0	20.0	300	31
Condition Sn Ro C1	4.0	394		296		3		3.0	3.0	110	3
Sn Ro C2	5.8					3	8-12	3.0	6.0	110	3
Sn Ro C3	6.1			99	20	3	8-12	3.0	9.0	115	3
Condition Sn Ro C4	6.4						7-10	3.0	12.0	140	8
Sn Ro C5	6.5				20		7-9	3.0	15.0	160	3
Sn Ro C6	6.7						8-10	3.0	18.0	155	3
REAGENT TOTALS (g/t)		1971	54	394	98						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T24 S Cl1 C1	93.8	18.5	0.81	14.3	28.4	16.2	13.3	53.4	27.3	21.9
S Cl Tail	44.0	8.7	1.11	9.2	40.8	10.9	19.9	37.4	14.4	5.4
Sn Ro C1	3.8	0.7	2.12	1.5	23.3	0.5	1.25	0.2	28.6	0.9
C2	3.1	0.6	2.15	1.3	25.9	0.5	1.48	0.2	23.6	0.6
C3	3.8	0.7	1.99	1.4	24.5	0.6	1.71	0.3	21.9	0.7
C4	11.2	2.2	3.95	8.3	30.7	2.1	0.76	0.4	13.4	1.3
C5	4.8	0.9	3.13	2.8	32.0	0.9	1.16	0.2	20.4	0.8
C6	4.7	0.9	3.52	3.1	33.7	1.0	1.48	0.3	19.2	0.8
Ro Tail	338.1	66.6	0.91	58.0	32.6	67.2	0.53	7.7	23.3	67.5
CALC	507.3	100.0	1.05	100.0	32.3	100.0	4.61	100.0	23.0	100.0
ASSAY HEAD			1.05		29.8		5.35		24.4	

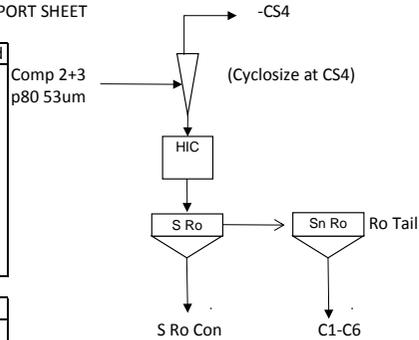
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T24 S Cl1 C1	93.8	18.5	0.81	14.3	28.4	16.2	13.3	53.4	27.3	21.9
S Cl Tail	137.8	27.2	0.91	23.5	32.4	14.6	15.4	48.3	23.2	16.7
Sn Ro C1	141.6	0.7	2.12	1.5	23.3	0.5	1.25	0.2	28.6	0.9
C2	144.7	1.4	2.13	2.8	24.5	0.5	1.35	0.2	26.4	0.8
C3	148.5	2.1	2.08	4.2	24.5	0.5	1.48	0.2	24.8	0.8
C4	159.7	4.3	3.04	12.5	27.7	1.3	1.11	0.3	18.9	1.0
C5	164.5	5.3	3.05	15.4	28.4	1.3	1.12	0.3	19.2	1.0
C6	169.2	6.2	3.12	18.5	29.2	1.2	1.2	0.3	19.2	1.0



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T26
DATE	171114
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			
End p80			



PRODUCT FLOATED
Comp. 2+3 Deslimed at CS4

NOTES
P80=53um 2kg lots 60mins grinding desliming at CS4 500gm feed

Float Cell	Volume	Regrind Power
Rougher	2.5	Start Finish 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)	2.5	960		192					5					
Water Change	5.9		48						3	3-9	14.0	14.0	700	
Conditioning	6.0					57								
S Ro C	4.0	192		192					3					
Condition					384				3					
Sn Ro C1											3.0	3.0	110	3
Sn Ro C2	5.2									8-12	3.0	6.0	110	5
Sn Ro C3	5.5				192					8-12	3.0	9.0	115	5
Condition									3					
Sn Ro C4	5.9					19				7-10	3.0	12.0	140	14
Sn Ro C5	6.0									7-9	3.0	15.0	160	13
Sn Ro C6	6.1									8-10	3.0	18.0	155	11
REAGENT TOTALS (g/t)		1153	48	384	576	76								

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T26 S Ro	126.2	24.2	0.91	20.4	32.4	21.5	21.2	84.1	21.2	25.7
Sn Ro C1	3.8	0.7	5.09	3.4	34.4	0.7	1.70	0.2	13.9	0.5
C2	5.0	1.0	7.30	6.5	38.5	1.0	1.31	0.2	11.6	0.6
C3	5.9	1.1	6.73	7.1	42.8	1.3	1.48	0.3	11.5	0.6
C4	20.2	3.9	4.49	16.1	49.3	5.2	1.05	0.7	8.22	1.6
C5	20.7	4.0	2.05	7.5	57.2	6.2	0.98	0.6	7.25	1.4
C6	17.6	3.4	1.30	4.1	56.9	5.3	1.88	1.0	7.27	1.2
Ro Tail	321.2	61.7	0.61	34.8	34.7	58.7	1.28	12.9	22.2	68.4
CALC	520.6	100.0	1.08	100.0	36.5	100.0	6.11	100.0	20.0	100.0
ASSAY HEAD			1.05		29.8		5.35		24.4	

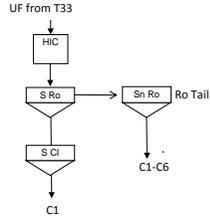
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T26 S Ro	126.2	24.2	0.91	20.4	32.4	21.5	21.2	84.1	21.2	25.7
Sn Ro C1	3.8	0.7	5.09	3.4	34.4	0.7	1.70	0.2	13.9	0.5
C2	8.8	1.7	6.35	9.9	36.7	1.7	1.48	0.4	12.6	1.1
C3	14.7	2.8	6.50	17.0	39.2	3.0	1.48	0.7	12.1	1.7
C4	34.9	6.7	5.34	33.1	45.0	8.3	1.23	1.3	9.87	3.3
C5	55.6	10.7	4.11	40.7	49.6	14.5	1.14	2.0	8.89	4.7
C6	73.2	14.1	3.44	44.7	51.3	19.8	1.32	3.0	8.50	6.0



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T35
DATE	31/01/15
TECHNICIAN	MW

Milling	Primary	Regrind
Mill type	HIC	
Media type		
Media kg	500	
Solids g	400	
Water g		
Time min	5.0	
Speed rpm	60HZ	
Lime g		
End pH		
End p80		



PRODUCT FLOATED
UF from T33

NOTES
UF from T33

Float Cell	Volume	Regrind	Power
Rougher	2.5	Start	
C1	1.5	Finish	
Speed	850	W/h	kWh/t

	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	3626		201				5					
Water Change			50										
S Ro C	6.1						60	3	7-9	7.5	7.5	300	
Condition S C1	6.7								6-9	3.0	10.5	120	46
Condition S C1 C1	6.5	1007		201				3					
Condition S C1 C1	4.0				302	302		3					
Sn Ro C1	4.9							3		3.0	3.0	125	23
Sn Ro C2	5.7								9-10	3.0	6.0	130	12
Sn Ro C3	5.8								10-12	3.0	9.0	135	8
Condition S C1 C1						101		3					
Sn Ro C4	6.0								9-12	3.0	12.0	150	9
Sn Ro C5	6.1						20		9-11	3.0	15.0	150	6
Sn Ro C6	6.2								9-11	3.0	18.0	130	5
REAGENT TOTALS (g/t)		4633	50	403	302	403	80						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST		DIST	
T35 S C1 C1	55.6	11.2	0.39	4.1	23.4	19.9	19.0	41.6	30.5	9.4	0.00	#DIV/0!	0.00
S C1 Tail	53.5	10.8	0.69	6.9	16.9	13.8	11.8	24.8	39.0	11.6	0.00	#DIV/0!	0.00
Sn Ro C1	28.9	5.8	1.67	9.1	20.3	9.0	13.6	15.5	32.2	5.2	0.00	#DIV/0!	0.00
C2	15.0	3.0	3.17	8.9	20.1	4.6	8.13	4.8	31.0	2.6	0.00	#DIV/0!	0.00
C3	10.2	2.1	4.12	7.9	18.1	2.8	7.49	3.0	30.6	1.7	0.00	#DIV/0!	0.00
C4	13.0	2.6	6.13	15.0	21.8	4.3	4.26	2.2	23.1	1.7	0.00	#DIV/0!	0.00
C5	8.8	1.8	4.00	6.6	20.2	2.7	3.33	1.2	26.2	1.3	0.00	#DIV/0!	0.00
C6	6.2	1.2	3.13	3.6	19.2	1.8	2.72	0.7	29.2	1.0	0.00	#DIV/0!	0.00
Ro Tail	305.2	61.5	0.66	37.9	8.81	41.1	0.52	6.3	38.8	65.6	0.00	#DIV/0!	0.00
CALC	496.4	100.0	1.07	100.0	13.2	100.0	5.10	100.0	36.3	100.0	0.00	#DIV/0!	0.00
ASSAY HEAD			1.07		13.1		5.38		35.0				

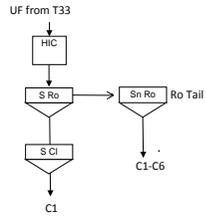
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM		CUM	
T35 S C1 C1	55.6	11.2	0.39	4.07	23.4	19.9	19.0	41.6	30.5	9.40	0.00	#DIV/0!	0.00
S C1 Tail	109.1	22.0	0.54	11.0	20.2	33.7	15.4	66.4	34.7	21.0	0.00	#DIV/0!	0.00
Sn Ro C1	28.9	5.8	1.67	9.1	20.3	9.0	13.6	40.3	32.2	5.2	0.00	#DIV/0!	0.00
C2	43.9	8.8	2.18	18.0	20.2	13.6	11.7	45.1	31.8	7.7	0.00	#DIV/0!	0.00
C3	54.1	10.9	2.55	25.9	19.8	16.4	10.9	48.1	31.6	9.5	0.00	#DIV/0!	0.00
C4	67.1	13.5	3.24	40.9	20.2	20.7	9.64	50.3	29.9	11.1	0.00	#DIV/0!	0.00
C5	75.9	15.3	3.33	47.5	20.2	23.4	8.91	51.5	29.5	12.4	0.00	#DIV/0!	0.00
C6	82.1	16.5	3.31	51.1	20.1	25.3	8.44	52.2	29.5	13.4	0.00	#DIV/0!	0.00

PRODUCTS	WT g	WT %	DIST	DIST	DIST
T35 S C1 C1	55.6	11.2	0.00	#DIV/0!	0.00
S C1 Tail	53.5	10.8	0.00	#DIV/0!	0.00
Sn Ro C1	28.9	5.8	0.00	#DIV/0!	0.00
C2	15.0	3.0	0.00	#DIV/0!	0.00
C3	10.2	2.1	0.00	#DIV/0!	0.00
C4	13.0	2.6	0.00	#DIV/0!	0.00
C5	8.8	1.8	0.00	#DIV/0!	0.00
C6	6.2	1.2	0.00	#DIV/0!	0.00
Ro Tail	305.2	61.5	0.00	#DIV/0!	0.00
CALC	503.8	100.0	0.00	#DIV/0!	0.00
ASSAY HEAD					

CUM PRODUCTS	CUM Wt	WT %	CUM	CUM	CUM
T35 S C1 C1	55.6	11.2	0.00	#DIV/0!	0.00
S C1 Tail	109.1	22.0	0.00	#DIV/0!	0.00
Sn Ro C1	28.9	5.8	0.00	#DIV/0!	0.00
C2	43.9	8.8	0.00	#DIV/0!	0.00
C3	54.1	10.9	0.00	#DIV/0!	0.00
C4	67.1	13.5	0.00	#DIV/0!	0.00
C5	75.9	15.3	0.00	#DIV/0!	0.00
C6	82.1	16.5	0.00	#DIV/0!	0.00

PROJECT	T0887
TEST NO	T38
DATE	13/02/15
TECHNICIAN	MW

Milling	Primary	Regrind
Mill type	HIC	
Media type		
Solids kg	500	
Water g	400	
Time min	5.0	
Speed rpm	60HZ	
Lime g		
End pH	pH	
End p80	µm	



PRODUCT FLOATED
UF from T33

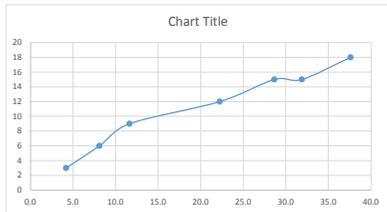
NOTES
UF from T33

Float Cell	Volume	Regrind	Power
Rougher	2.5	Start	
C1	1.5	Finish	
Speed	850	W/h	kWh/t

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SiO3 g/t	1.0 Na2SO3 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)	2.5	2974		198					5					
Water Change			79					59	3				620	
Conditioning S Ro C	6.2									2-8			300	40
Condition S C1 C1	6.6									0.5-2				
Condition	6.8	991		198	297				3					
Condition	4.0				297				3					
Condition	4.9					297			3				125	8
Sn Ro C1											3.0	3.0	130	6
Sn Ro C2	5.7									9-10	3.0	6.0	135	4
Sn Ro C3	5.9						99		3	10-12	3.0	9.0	150	4
Condition														
Sn Ro C4	6.1									9-12	3.0	12.0	150	5
Sn Ro C5	6.2							20		9-12	3.0	15.0	150	4
Sn Ro C6	6.4									9-11	3.0	18.0	135	5
Sn Ro C7	6.5						99	20	3	9-11	3.0	18.0	150	5
REAGENT TOTALS (g/t)		3966	79	397	297	297	496	98						

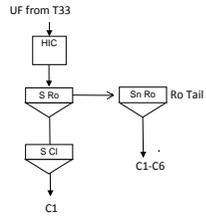
PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST		DIST		DIST
T35 S C1 C1	119.1	23.6	0.53	12.1	21.7	38.7	17.7	76.9	32.5	21.6				
S C1 Tail	32.0	6.3	1.19	7.3	15.3	7.3	7.20	8.4	38.2	6.8				
Sn Ro C1	10.0	2.0	2.19	4.2	18.6	2.8	8.73	3.2	32.0	1.8				
C2	7.3	1.4	2.81	3.9	15.8	1.7	5.93	1.6	33.2	1.4				
C3	5.6	1.1	3.30	3.5	14.5	1.2	3.30	0.7	34.4	1.1				
C4	8.2	1.6	6.75	10.6	17.9	2.2	3.10	0.9	26.6	1.2				
C5	6.3	1.2	5.32	6.4	17.4	1.6	2.83	0.7	28.1	1.0				
C6	4.4	0.9	3.85	3.2	15.4	1.0	2.22	0.4	31.1	0.8				
C7	7.4	1.5	4.03	5.7	22.3	2.5	1.63	0.4	22.8	0.9				
Ro Tail	304.0	60.3	0.74	43.0	8.97	40.9	0.61	6.8	37.3	63.4				
CALC	504.3	100.0	1.04	100.0	13.2	100.0	5.42	100.0	35.5	100.0				
ASSAY HEAD			1.07		13.1		5.38		35.0					

CUM PRODUCTS	CUM WT	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM				
T35 S C1 C1	119.1	23.6	0.53	12.1	21.7	38.7	17.7	76.9	32.5	21.6				
S C1 Tail	151.1	30.0	0.67	19.4	20.3	46.1	15.4	85.4	33.7	28.5				
Sn Ro C1	10.0	2.0	2.19	4.2	18.6	2.8	8.73	11.6	32.0	1.8				
C2	17.3	3.4	2.45	8.1	17.4	4.5	7.55	13.2	32.5	3.1				
C3	22.9	4.5	2.66	11.7	16.7	5.7	6.51	13.9	33.0	4.2				
C4	31.1	6.2	3.74	22.2	17.0	7.9	5.61	14.8	31.3	5.4				
C5	31.1	6.2	4.82	28.7	17.0	7.9	5.61	14.8	31.3	5.4				
C6	37.4	7.4	4.46	31.9	17.0	9.6	5.14	15.5	30.8	6.4				
C7	49.2	9.8	3.99	37.6	17.7	13.0	4.35	16.3	29.6	8.1				



PROJECT	T0887
TEST NO	T39
DATE	13/02/15
TECHNICIAN	MW

Milling	Primary	Regrind
Mill type	HIC	
Media type		
Solids kg	500	
Water g	400	
Time min	5.0	
Speed rpm	60HZ	
Lime g		
End pH	pH	
End p80	µm	



PRODUCT FLOATED
UF from T37

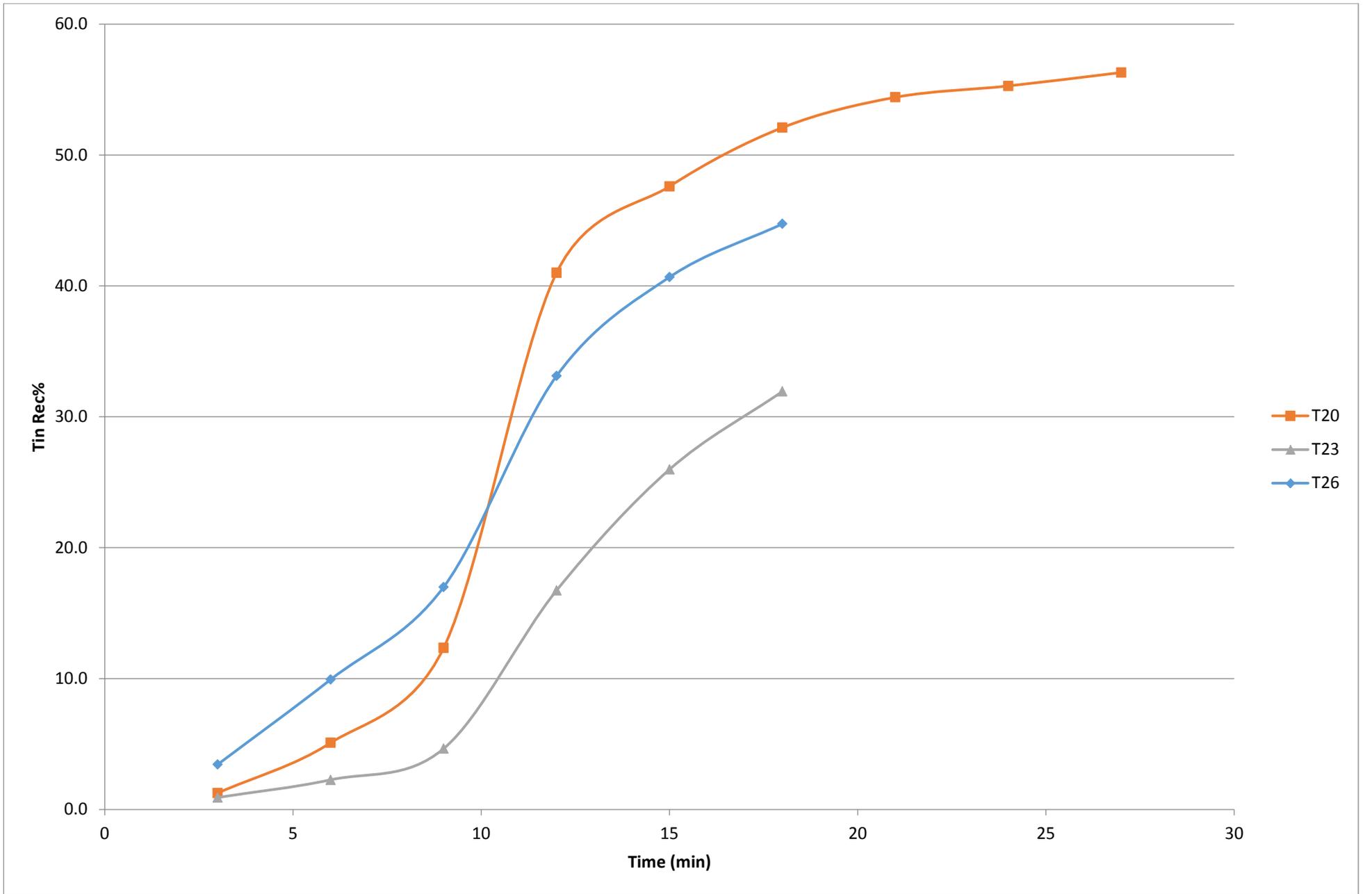
NOTES
T37 Non-mags from T33

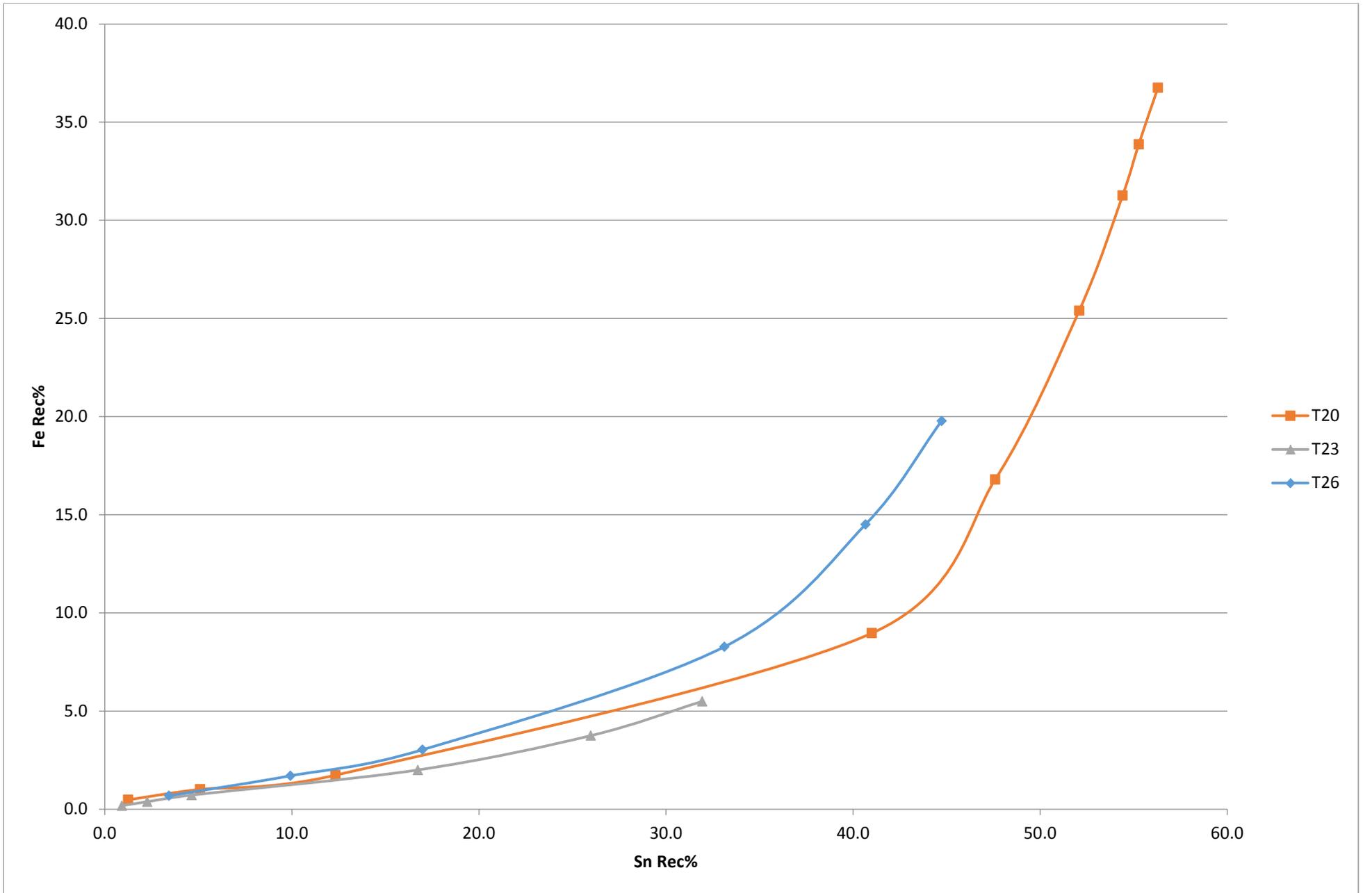
Float Cell	Volume	Regrind	Power
Rougher C1	2.5	Start	
	1.5	Finish	
Speed	850	W/h	kWh/t

	pH	10.0 H2SO4 g/t	0.5 SIPX g/t	1.0 SSF g/t	1.0 Na2SiO3 g/t	1.0 Na2SO3 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)	2.5	2862		191					5					
Water Change			76					57	3					
Conditioning S Ro C	6.1									2-8			620	
Condition S C1 C1	6.4									0.5-2			300	33
Condition	6.5	954		191	286				3					
Condition	4.0				286				3					
Condition	4.9						286		3					
Sn Ro C1	5.7									9-10	3.0	3.0	125	8
Sn Ro C2	5.7									10-12	3.0	6.0	130	5
Sn Ro C3	5.8						95		3		3.0	9.0	135	4
Condition														
Sn Ro C4	6.0									9-12	3.0	12.0	150	6
Sn Ro C5	6.0							19		9-12	3.0	15.0	150	5
Sn Ro C6	6.1									9-11	3.0	15.0	135	5
Sn Ro C7	6.4						95	19		9-11	3.0	18.0	150	8
REAGENT TOTALS (g/t)		3815	76	382	286	286	477	94						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T35 S C1 C1	100.2	19.1	0.53	10.1	22.1	28.7	10.6	32.4	33.2	18.2
S C1 Tail	44.6	8.5	1.27	10.8	15.5	8.9	8.76	12.0	36.5	8.9
Sn Ro C1	10.2	1.9	2.09	4.1	16.0	2.1	7.00	2.2	34.6	1.9
C2	7.1	1.4	2.32	3.1	14.6	1.3	5.15	1.1	35.1	1.4
C3	5.8	1.1	6.43	7.1	18.2	1.4	3.33	0.6	27.0	0.9
C4	9.0	1.7	5.59	9.6	18.2	2.1	3.41	0.9	27.9	1.4
C5	7.1	1.4	3.96	5.3	15.8	1.5	1.77	0.4	31.7	1.2
C6	4.9	0.9	4.74	4.4	25.6	1.6	2.32	0.3	18.1	0.5
C7	12.7	2.4	1.06	2.6	7.74	1.3	0.56	0.2	38.3	2.7
Ro Tail	322.6	61.5	0.70	43.0	12.3	51.1	5.03	49.8	35.8	63.1
CALC	524.2	100.0	1.00	100.0	14.7	100.0	6.22	100.0	34.9	100.0
ASSAY HEAD			0.84		33.8		9.12		20.2	

CUM PRODUCTS	CUM WT	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T35 S C1 C1	100.2	19.1	0.53	10.1	22.1	28.7	10.6	32.4	33.2	18.2
S C1 Tail	144.8	27.6	0.76	20.9	20.1	37.6	10.00	44.4	34.2	27.1
Sn Ro C1	10.2	1.9	2.09	4.1	16.0	2.1	7.00	14.2	34.6	1.9
C2	17.3	3.3	2.18	7.2	15.4	3.4	6.24	15.3	34.8	3.3
C3	23.1	4.4	3.25	14.3	16.1	4.8	5.51	15.9	32.8	4.1
C4	32.1	6.1	3.91	23.8	16.7	6.9	4.92	16.8	31.5	5.5
C5	39.2	7.5	3.92	29.2	16.5	8.4	4.35	17.2	31.5	6.7
C6	44.1	8.4	4.01	33.6	17.5	10.0	4.12	17.6	30.0	7.2
C7	56.8	10.8	3.35	36.2	15.3	11.3	3.33	17.8	31.9	9.9

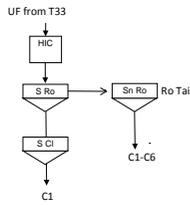




PROJECT	T0887
TEST NO	T40
DATE	24/02/15
TECHNICIAN	MW

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		
End p80 μ m		
kWh/t		

Float Cell	Volume	Regrind Power
Rougher C1	2.5	Start
Speed	850	Finish W/h kWh/t



PRODUCT FLOATED
UF from T33

NOTES
UF from T33

	pH	10.0 H2SO4 g/t	0.5 SiPX g/t	1.0 SSF g/t	1.0 Na2SO3 g/t	1.0 Na2SO3 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)	2.5	2012		201										
Water Change			80					30	3	3-6	2.0	2.0	200	43
Conditioning S Ro C1	6.1									6-11	2.5	4.5	200	23
Condition S Ro C2	6.4		40											
Condition S Ro C3	6.7	724						10	3	7-9	2.5	7.0	200	8
Condition S Ro C4	7.8		40											
Condition S Ro C4	5.4	724		201				30	3	7-10	6.0		300	3
Condition S Ro C4	6.7													
Condition S Ro C4	5.0						302							
Condition S Ro C4	5.1									6-8	2.5	2.5	125	5
Condition S Ro C4	5.3									7-9	2.5	5.0	130	4
Condition S Ro C4	5.5						302	20	3	6-8	2.5	7.5	135	7
Condition S Ro C4	5.7									8-10	3.0	10.5	150	7
Condition S Ro C4	5.8						302			6-9	3.0	10.5	150	10
Condition S Ro C4	5.9						101			8-11	6.0	16.5	300	7
REAGENT TOTALS (g/t)		3461	161	402			1006	90						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
S Ro C1	85.4	17.2	0.49	8.0	21.9	29.1	19.0	59.2	31.7	15.5
C2	46.6	9.4	0.91	8.2	17.1	12.4	11.3	19.3	37.1	9.9
C3	15.4	3.1	1.01	3.0	18.2	4.4	11.4	6.4	33.0	2.9
C4	9.7	2.0	1.26	2.3	13.4	2.0	5.22	1.9	37.7	2.1
Sn Ro C1	5.7	1.1	2.00	2.2	18.5	1.6	9.84	2.1	30.9	1.0
C2	5.2	1.0	2.28	2.3	17.5	1.4	7.61	1.4	31.2	0.9
C3	9.4	1.9	5.13	9.3	23.4	3.4	4.41	1.5	20.2	1.1
C4	10.5	2.1	4.99	10.1	23.7	3.9	3.87	1.5	20.1	1.2
C5	14.8	3.0	4.10	11.7	25.8	5.9	2.62	1.4	18.7	1.6
C6	22.2	4.5	3.46	14.8	20.5	7.1	2.23	1.8	24.9	3.2
Ro Tail	272.0	54.7	0.54	28.2	6.80	28.8	0.36	3.6	38.8	60.5
CALC	496.9	100.0	1.05	100.0	12.9	100.0	5.50	100.0	35.1	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
S Ro C1	85.4	17.2	0.49	8.0	21.9	29.1	19.0	59.2	31.7	15.5
C2	132.0	26.6	0.64	16.2	20.2	41.5	16.2	78.4	33.6	25.4
C3	147.4	29.7	0.68	19.2	20.0	45.8	15.7	84.8	33.5	28.4
C4	157.1	31.6	0.71	21.5	19.6	47.8	15.1	86.7	33.8	30.5
Sn Ro C1	5.7	1.1	2.00	2.2	18.5	1.6	9.84	2.1	30.9	1.0
C2	10.9	2.2	2.13	4.5	18.0	3.0	8.78	3.5	31.0	1.9
C3	20.3	4.1	3.52	13.7	20.5	6.5	6.75	5.0	26.0	3.0
C4	30.8	6.2	4.02	23.8	21.6	10.3	5.77	6.5	24.0	4.2
C5	45.6	9.2	4.05	35.5	23.0	16.3	4.75	7.9	22.3	5.8
C6	67.8	13.6	3.85	50.2	22.1	23.4	3.92	9.7	23.1	9.0

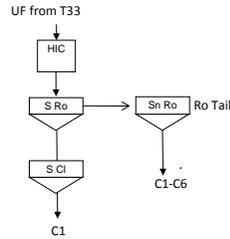


BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T41
DATE	03/03/15
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			
End p80			

kwh/t		Regrind Power
Float Cell Volume	2.5	Start
Rougher		Finish
Speed	850	W/h
		kWh/t



PRODUCT FLOATED
UF from T33

NOTES
UF from T33

	pH	10.0 H2SO4 g/t	0.5 CuSO4 g/t	0.5 PAX g/t	1.0 SSF g/t	1.0 NaSH g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	1994			199				5					
Water Change		598	50	80					3	3-11	3.0	3.0	300	35
Condition	4.8													
S Ro C1	5.3	279	50											
Condition	5.2		50	40					3	7-12	4.5	7.5	300	13
S Ro C2	5.3	319		40					3	7-12	5.0	12.5	300	5
Condition	5.2			40					3	7-11	1.5		100	7
S Ro C4	5.6	239		40		239			3	8-9	5.0		170	5
Condition	5.1							299	3					
S Ro C5	5.4								3	6-9	2.5	2.5	125	4
Condition	5.4								3	7-9	2.5	5.0	130	6
Condition	5.6								3	7-9	2.5	7.5	135	12
Condition	5.7								3	8-10	3.0	10.5	150	10
Sn Ro C1	5.8								3	7-9	3.0	10.5	150	8
Sn Ro C2	5.9								3	8-11	6.0	16.5	300	7
Sn Ro C3														
Sn Ro C4														
Sn Ro C5														
Sn Ro C6														
REAGENT TOTALS (g/t)		3749	150	199	199	239		997						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
S Ro C1	103.6	20.7	0.57	11.2	20.6	32.3	17.1	63.4	43.8	24.0
C2	38.3	7.6	1.03	7.5	18.4	10.6	11.7	16.0	35.0	7.1
C3	14.9	3.0	1.27	3.6	16.8	3.8	8.63	4.6	34.7	2.7
C4	3.4	0.7	1.18	0.8	16.7	0.9	8.10	1.0	34.4	0.6
C5	7.0	1.4	1.00	1.3	22.6	2.4	14.0	3.5	28.0	1.0
Sn Ro C1	5.0	1.0	3.39	3.2	18.7	1.4	6.64	1.2	29.5	0.8
C2	7.7	1.5	6.35	9.3	23.6	2.8	5.77	1.6	20.9	0.9
C3	16.8	3.3	5.21	16.6	28.6	7.3	3.06	1.8	15.1	1.3
C4	15.7	3.1	4.34	12.9	26.5	6.3	3.18	1.8	20.0	1.7
C5	12.2	2.4	3.43	7.9	21.5	4.0	2.75	1.2	25.0	1.6
C6	19.7	3.9	2.59	9.7	15.6	4.6	2.13	1.5	32.7	3.4
Ro Tail	257.2	51.3	0.33	16.1	6.07	23.6	0.27	2.5	40.4	54.9
CALC	501.5	100.0	1.05	100.0	13.2	100.0	5.57	100.0	37.7	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

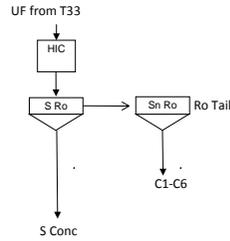
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
S Ro C1	103.6	20.7	0.57	11.2	20.6	32.3	17.1	63.4	43.8	24.0
C2	141.9	28.3	0.69	18.7	20.0	43.0	15.6	79.3	41.4	31.1
C3	156.8	31.3	0.75	22.3	19.7	46.7	15.0	83.9	40.8	33.8
C4	160.2	31.9	0.76	23.0	19.6	47.6	14.8	84.9	40.7	34.4
C5	167.2	33.3	0.77	24.3	19.7	50.0	14.8	88.4	40.1	35.4
Sn Ro C1	5.0	1.0	3.39	3.2	18.7	1.4	6.64	1.2	29.5	0.8
C2	12.7	2.5	5.18	12.5	21.7	4.2	6.11	2.8	24.3	1.6
C3	29.5	5.9	5.20	29.1	25.6	11.4	4.37	4.6	19.1	3.0
C4	45.2	9.0	4.90	42.0	25.9	17.7	3.96	6.4	19.4	4.6
C5	57.4	11.4	4.59	49.9	25.0	21.7	3.70	7.6	20.6	6.2
C6	77.1	15.4	4.08	59.6	22.6	26.4	3.30	9.1	23.7	9.6



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T42
DATE	06/03/15
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			
End p80			



PRODUCT FLOATED	
UF from T33	

NOTES	
UF from T33	

Float Cell		Volume	Regrind Power
Rougher	2.5	Start	
		Finish	
Speed	850	W/h	
		kWh/t	

	pH	10.0 H2SO4 g/t	0.5 CuSO4 g/t	0.5 PAX g/t	1.0 SSF g/t	1.0 NaSH g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	2187			219				5					
Water Change Condition	4.8	656	55	87					3	3-11	3.0	3.0	300	33
S Ro C1 Condition	5.1	219	55											
S Ro C2 Condition	5.2	350	55			262			3	7-12	4.5	7.5	300	11
S Ro C3 Condition	5.4			44		87			3	7-12	5.0	12.5	250	6
S Ro C4 Condition	5.2			44		87			3	7-11	1.5		150	2
S Ro C5 Condition	5.9			44					3	8-9	5.0		100	9
S Ro C6 Condition	6.2								3					
Sn Ro C1	5.3							328	3	6-9	2.5	2.5	125	4
Sn Ro C2	5.5							109	3	7-9	2.5	5.0	130	7
Sn Ro C3	5.7							328	3	7-9	2.5	7.5	135	13
Sn Ro C4	5.8							109	3	8-10	3.0	10.5	150	9
Sn Ro C5	5.9							109	3	7-9	3.0	10.5	150	7
Sn Ro C6	6.0							109	3	8-11	6.0	16.5	300	6
REAGENT TOTALS (g/t)		3412	164	219	219	437		1094						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T 42 S Ro C1	97.7	21.4	0.56	11.7	20.2	33.2	16.8	65.0	33.8	20.4
C2	31.5	6.9	0.99	6.7	18.6	9.8	11.7	14.6	33.8	6.6
C3	14.7	3.2	1.04	3.3	17.9	4.4	10.6	6.2	33.3	3.0
C4	6.1	1.3	1.05	1.4	18.0	1.8	9.51	2.3	32.6	1.2
C5	3.7	0.8	1.05	0.8	18.4	1.1	10.2	1.5	31.7	0.7
Sn Ro C1	5.0	1.1	3.39	3.6	17.3	1.5	4.98	1.0	30.2	0.9
C2	8.6	1.9	5.62	10.3	24.1	3.5	4.58	1.6	19.8	1.1
C3	17.0	3.7	4.62	16.8	28.9	8.3	2.78	1.9	14.8	1.6
C4	13.6	3.0	4.09	11.9	24.8	5.7	2.88	1.6	19.5	1.6
C5	10.7	2.3	3.53	8.1	18.9	3.4	2.35	1.0	26.3	1.7
C6	17.1	3.7	2.56	9.3	13.8	3.9	1.95	1.3	33.0	3.5
Ro Tail	231.5	50.6	0.33	16.3	6.03	23.4	0.24	2.2	40.2	57.6
CALC	457.2	100.0	1.03	100.0	13.0	100.0	5.53	100.0	35.3	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

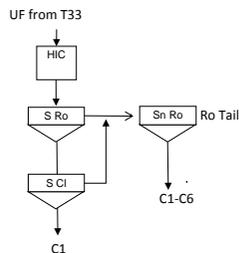
CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T 42 S Ro C1	97.7	21.4	0.56	11.7	20.2	33.2	16.8	65.0	33.8	20.4
C2	129.2	28.3	0.66	18.3	19.8	43.0	15.6	79.6	33.8	27.0
C3	143.9	31.5	0.70	21.6	19.6	47.4	15.1	85.7	33.7	30.0
C4	150.0	32.8	0.72	22.9	19.5	49.2	14.8	88.0	33.7	31.3
C5	153.7	33.6	0.73	23.8	19.5	50.4	14.7	89.5	33.7	32.0
Sn Ro C1	5.0	1.1	3.39	3.6	17.3	1.5	4.98	1.0	30.2	0.9
C2	13.6	3.0	4.80	13.9	21.6	4.9	4.73	2.5	23.6	2.0
C3	30.6	6.7	4.70	30.7	25.7	13.2	3.65	4.4	18.7	3.5
C4	44.2	9.7	4.51	42.5	25.4	18.9	3.41	6.0	18.9	5.2
C5	54.9	12.0	4.32	50.6	24.1	22.2	3.20	7.0	20.4	6.9
C6	72.0	15.7	3.90	59.9	21.7	26.2	2.91	8.3	23.4	10.4



BURNIE LABORATORY: ROUGHER FLOTATION REPORT SHEET

PROJECT	T0887
TEST NO	T43
DATE	06/03/15
TECHNICIAN	MW

Milling		Primary	Regrind
Mill type		HIC	
Media type			
Media kg		500	
Solids g		400	
Water g		5.0	
Time min		60HZ	
Speed rpm			
Lime g			
End pH			
End p80			



PRODUCT FLOATED	
UF from T33	

NOTES	
UF from T33	

kwh/t		Volume	Regrind Power
Float Cell			
Rougher	2.5	Start	
Clnr1	2.5	Finish	
Speed	850	W/h	
		kWh/t	

	pH	10.0 H2SO4 g/t	0.5 CuSO4 g/t	0.5 PAX g/t	1.0 SSF g/t	1.0 NaSH g/t	1.0 Na2SO3 g/t	1.0 SPA7080 g/t	Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
HIC Cond (60HZ)	2.5	2014			201				5					
Water Change		604	50	81					3	3-11	3.0	3.0	300	#REF!
Condition	4.8													
S Ro C1 Condition	5.0	282	50							7-12	4.5	7.5	300	#REF!
S Ro C2 Condition	5.0	322	50			504			3					
Condition				40					3					
S Ro C3 Condition	5.5					101			3	7-12	5.0	12.5	300	#REF!
Condition				40					3					
S Ro C4 Condition	5.9					81			3	7-11	3.0		150	89
Condition				40					3					
S Ro C5 Condition	6.1									8-9	2.5		130	7
Condition														
S Cl Conc Condition									3					
Condition									3					
Condition									3					
Sn Ro C1	5.0							302	3	6-9	2.5	2.5	125	9
Sn Ro C2	5.2							101	3	7-9	2.5	5.0	130	7
Sn Ro C3	5.4							302	3	7-9	2.5	7.5	135	12
Sn Ro C4	5.6							101	3	8-10	3.0	10.5	150	11
Sn Ro C5	5.7							101	3	7-9	3.0	10.5	150	9
Sn Ro C6	5.9							101	3	8-11	6.0	16.5	300	6
REAGENT TOTALS (g/t)		3223	151	201	201	685		1007						

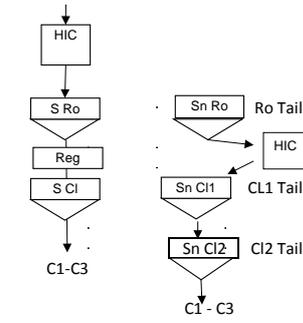
PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T43 Cl1 S Con	133.2	26.8	0.61	15.8	21.0	43.1	17.3	82.6	33.0	25.1
Sn Ro C1	11.1	2.2	1.84	4.0	17.0	2.9	9.32	3.7	33.6	2.1
C2	8.9	1.8	4.39	7.6	18.5	2.5	6.06	1.9	28.9	1.5
C3	15.7	3.2	5.34	16.3	26.4	6.4	3.30	1.9	17.5	1.6
C4	16.7	3.4	4.40	14.3	26.9	6.9	3.58	2.1	17.1	1.6
C5	13.0	2.6	3.74	9.5	23.8	4.8	3.13	1.5	21.4	1.6
C6	19.0	3.8	2.95	10.9	18.0	5.3	3.08	2.1	28.4	3.1
Ro Tail	278.9	56.2	0.40	21.7	6.53	28.1	0.42	4.2	39.9	63.5
CALC	496.5	100.0	1.04	100.0	13.1	100.0	5.62	100.0	35.3	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

CUM PRODUCTS	CUM WT	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T43 Cl1 S Con	133.2	26.8	0.61	15.8	21.0	43.1	17.3	82.6	33.0	25.1
Sn Ro C1	11.1	2.2	1.84	4.0	17.0	2.9	9.32	3.7	33.6	2.1
C2	20.0	4.0	2.97	11.6	17.6	5.4	7.87	5.6	31.5	3.6
C3	35.7	7.2	4.01	27.9	21.5	11.8	5.86	7.5	25.3	5.2
C4	52.4	10.6	4.14	42.2	23.2	18.8	5.13	9.6	22.7	6.8
C5	65.4	13.2	4.06	51.6	23.3	23.5	4.74	11.1	22.5	8.4
C6	84.4	17.0	3.81	62.5	22.1	28.8	4.36	13.2	23.8	11.5

UF from T33

PROJECT	T0887
TEST NO	T44
DATE	20/03/15
TECHNICIAN	MW

Milling		Primary	Regrind
Mill type		0	HIC
Media type			Sand
Media kg			1500
Solids g		0	194
Water g		0	200
Time min		0.0	35s
Speed rpm		0	60HZ
Lime g			
End pH			
End p80			



PRODUCT FLOATED
UF from T33

NOTES
UF from T33

Float Cell	Volume	Regrind Power
Rougher	2.5	Start 41439
Clnr1	1.5	Finish 41442
	0.5	W/h 2.91
Speed	850	kWh/t #REF!

	pH	10.0 H2SO4 g/t	0.5 CuSO4 g/t	0.5 PAX g/t	1.0 SSF g/t	1.0 NaSH g/t	1.0 Na2SO3 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)	2.5	2400			200					5					
Water Change		800	50							3					
Condition	4.8			80						3					
S Ro C1	4.8								30	3	3-11	3.0	3.0	300	
Condition		400	50	40						3					
S Ro C2	4.8								20	3	7-12	4.5	7.5	300	
Condition		400	50							3					
S Ro C3	5.5			40		500			20	3	7-12	5.0	12.5	300	
Condition						100				3					
S Ro C4	6.0			40					30	3	7-11	3.0	15.5	150	
Condition		80				80				3					
S Ro C5	6.0			40					20	3	8-9	2.5	18.0	130	
Regrind 15kw	7.5		50												
Condition		320		40						3					
S Cl1 C1	5.2								20		0.5-1	1.0	19.0	100	
Condition	5.3			40							3-9	2.5	20.5	200	
S Cl1 C3	5.3								20		3-9	11.0	31.5	600	
Condition		400			200					3					
Condition							300			3					
Sn Ro C1	5.5							300		3	7-9	2.5	34.0	125	
Condition		160						300		3					
Sn Ro C2	5.1							100	20	3	7-9	2.5	36.5	130	
Condition								100		3					
Sn Ro C3	5.5							100	20	3	7-9	2.5	39.0	135	
Condition		40						100		3					
Sn Ro C4	5.4							100		3	8-10	3.0	42.0	150	
Condition								100		3					
Sn Ro C5	5.6							100	10	3	7-9	6.0	48.0	300	
HIC Cond (60HZ)					100					5					
Condition							100			3					
Sn Cl1 C	6.3							100		3	5-11	7.5	55.5	400	
Sn Cl2 C1	6.6									3	4-5	3.5	51.5	50	
Sn Cl2 C2	6.7									3	6-8	3.5	59.0	60	
Sn Cl2 C3	6.8								10	3	3-7	4.0	59.5	70	
REAGENT TOTALS (g/t)		4999	200	320	500	680	400	1000	238						

PRODUCTS	WT g	WT %	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T44 S Cl1 C1	36.9	7.4	0.35	2.5	23.9	13.6	21.4	32.9	28.5	5.8
S Cl1 C2	52.9	10.6	0.51	5.3	19.3	15.8	12.0	26.5	36.2	10.6
S Cl1 C3	49.7	9.9	0.84	8.2	18.6	14.2	12.0	24.9	35.4	9.7
S Cl1 Tail	33.3	6.7	1.44	9.4	17.1	8.8	5.30	7.4	35.4	6.5
Sn Cl2 C1	11.3	2.3	10.6	23.5	29.6	5.2	3.42	1.6	9.09	0.6
Sn Cl2 C2	8.5	1.7	7.39	12.4	30.9	4.1	3.34	1.2	9.90	0.5
Sn Cl2 C3	4.2	0.8	5.42	4.5	30.5	2.0	3.19	0.6	11.8	0.3
Sn Cl1 Tail	8.3	1.7	3.17	5.2	24.3	3.1	2.38	0.8	21.3	1.0
Sn Cl2 Tail	25.6	5.1	1.67	8.4	18.1	7.1	1.54	1.6	29.3	4.1
Ro Tail	269.3	53.9	0.39	20.6	6.29	26.1	0.23	2.6	40.9	60.9
CALC	500.1	100.00	1.02	100.0	13.0	100.0	4.80	100.0	36.2	100.0
ASSAY HEAD			1.07		13.1		5.38		35.0	

CUM PRODUCTS	CUM Wt	WT %	Sn %	CUM	Fe %	CUM	S %	CUM	SiO2 %	CUM
T44 S Cl1 C1	36.9	7.4	0.35	2.5	23.9	13.6	21.4	32.9	28.5	5.8
S Cl1 C2	89.8	18.0	0.44	7.8	21.2	29.4	15.9	59.4	33.0	16.4
S Cl1 C3	139.5	27.9	0.59	16.0	20.2	43.6	14.5	84.2	33.9	26.1
S Cl1 Tail	33.3	6.7	1.44	9.4	17.1	8.8	5.30	7.4	35.4	6.5
Sn Cl2 C1	11.3	2.3	10.6	32.9	29.6	5.2	3.42	1.6	9.09	0.6
Sn Cl2 C2	19.8	4.0	9.22	35.9	30.2	9.2	3.39	2.8	9.44	1.0
Sn Cl2 C3	24.1	4.8	8.55	40.4	30.2	11.2	3.35	3.4	9.85	1.3
Sn Cl1 Tail	32.4	6.5	7.17	45.5	28.7	14.3	3.10	4.2	12.8	2.3
Sn Cl2 Tail	58.0	11.6	4.74	53.9	24.0	21.5	2.41	5.8	20.1	6.4



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**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

Results wt% (semiquantitative)

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, 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	Phlogopit e, -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



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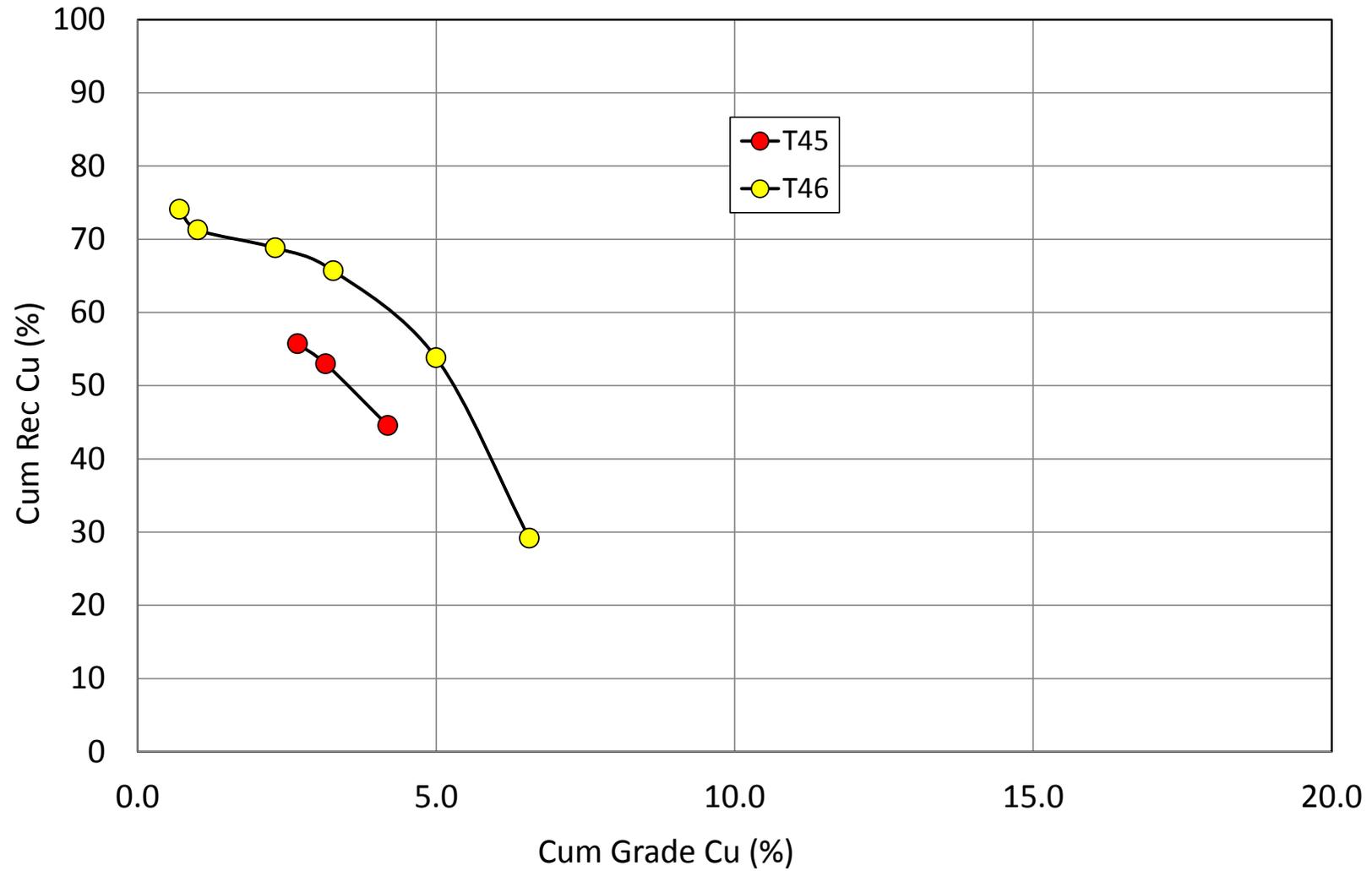
EcoNomics™

STELLAR RESOURCES LIMITED
SAINT DIZIER METALLURGICAL TESTWORK
FINAL REPORT

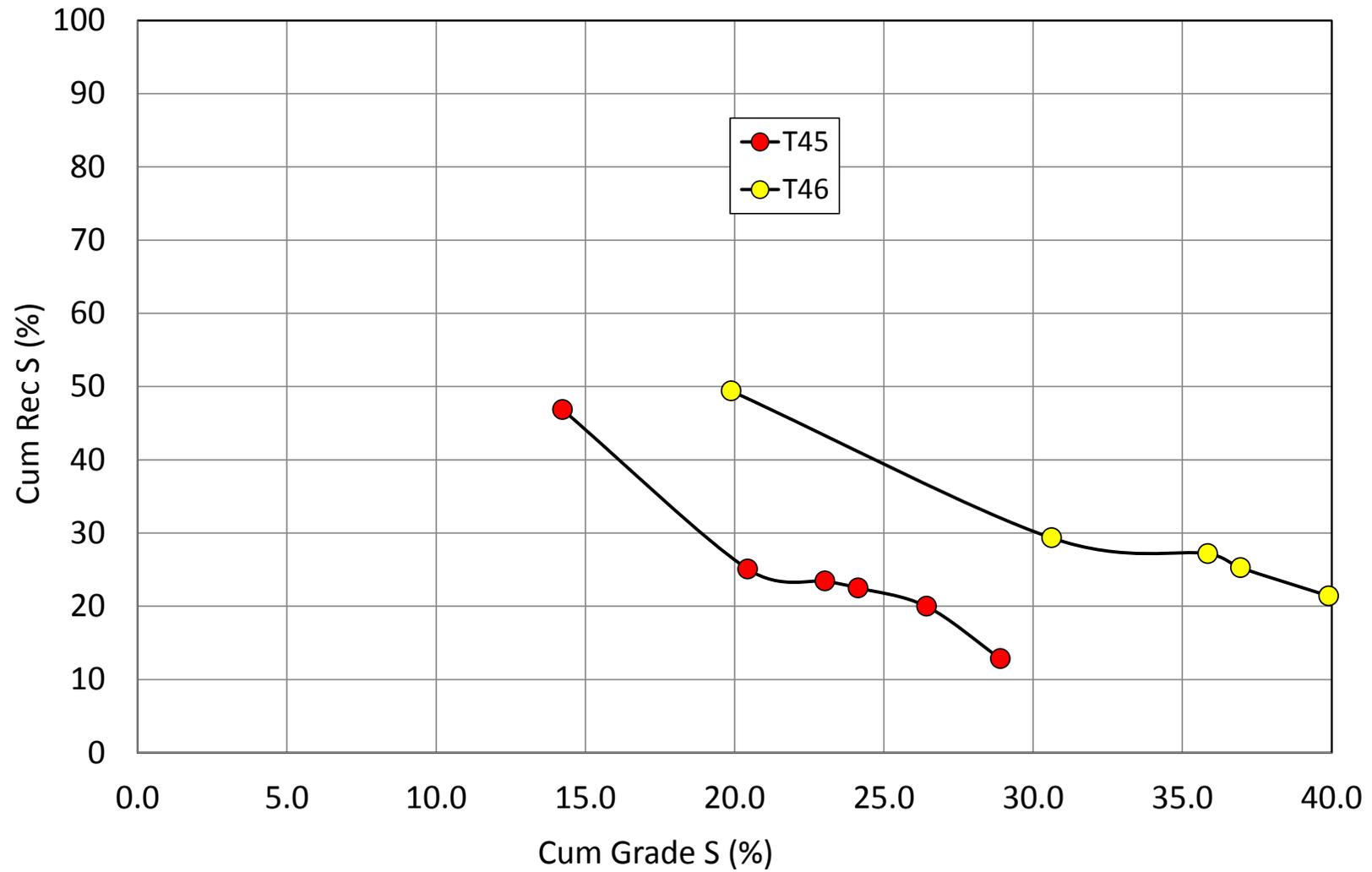
Appendix 15 – Sulfide Flotation Results

		Float Feed	Copper Rougher				Copper Cleaner					Suphhide Rougher					Suphhide Cleaner					NOTES			
TEST	Ore	Size	GUAR	X23	MIBC	pH	GUAR	X23	PAX	MIBC	pH	GUAR	H2SO4	CuSO4	PAX	MIBC	pH	GUAR	H2SO4	CuSO4	PAX	MIBC	pH		
T45	St Dizier Comp 2,3	253					100		1	25	7.4	225	2317	50	75	88	5.7								Needs Acid in Sulphide Cleaner circuit
T46	St Dizier Comp 2,3	254	51	83	21	8.2	38	22		21	9	229	3416	102	95	72	5.6	101	337	76	97	50	5.3		

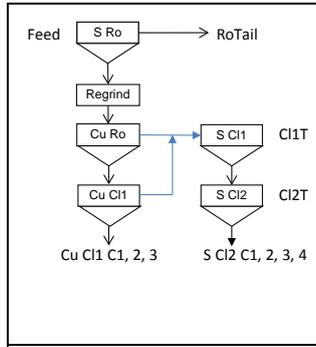
T0887 St Dizier Comp 2 3



T0887 St Dizier Comp 2 3



Milling		Primary	Regrind
Mill type	Long	MS ball	Stirred Ceramic
Media type	12	kg	1.5
Media	2000	g	408
Solids	1000	g	350
Water	20	min/sec	2m37s
Time	50	rpm	1200
Speed	0	g	0
Lime	8.1	pH	0
End pH	253	µm	0
End p80	41515		
Float Cell		Volume	Regrind Power
Rougher	3.8	Start	41515
S Clnr	2.7	Finish	41522
Cu Clnr 1, 2	1.2, 0.5	W/h	7.00
Speed	900	kWh/t	20.2



PROJECT	T0887
TEST NO	T45
DATE	020415
TECHNICIAN	ANB

PRODUCT FLOATED	
St Dizier	
Comp 2, 3	

NOTES	
Sulphide Rougher	
Feed P80 253µm	
20kWh/t	
CuSO4 in Regrind	
No Acid in Cleaners	

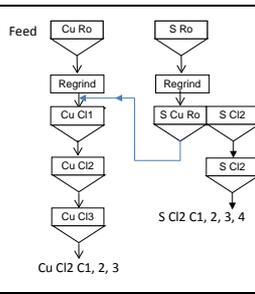
	pH	0.5 GUAR g/t	98 H2SO4 g/t	1.0 CuSO4 g/t	0.2 PAX g/t	0.5 MIBC g/t			Cond Time min	Air L/min	Float Time min	Cum Float Time	Wet Wt g	Con % Solids
Condition	8.1		1640						3					
Condition	5.0	50							2					
Condition	5.6			25					2					
Condition					10				1					
Sulphide Ro C1	5.7					25				4-8	3.0	3.0	216	
Condition		50		25					1					
Condition					10				1					
Sulphide Ro C2	6.0					20				5-8	3.0	6.0	220	
Condition		50							2					
Condition					15				1					
Sulphide Ro C3	6.5					7				5-8	3.0	9.0	190	
Condition	6.8		697						2					
Condition	5.0	50							2					
Condition					10				1					
Sulphide Ro C4	5.5					12				6-9	3.0	12.0	230	
Condition		25							2					
Condition					15				1					
Sulphide Ro C5	6.0					12				6-9	4.0	16.0	265	
Condition					15				1					
Sulphide Ro C6	6.4					12				6-9	4.0	20.0	270	
Regrind				76										
Condition		101							2					
Condition	7.4					25			1					
Copper Rghr	7.4				1					3-9	5.0	5.0	600	
Copper Clnr 1 C1										2-4	2.0	7.0	50	44
Copper Clnr 1 C2										3-5	2.0	9.0	50	25
Copper Clnr 1 C3										3-6	2.5	11.5	60	14
Condition					40	7			1					
Sulphide Cl1 Scav 1	7.6			50						5-9	4.0	15.5	400	
Condition									2					
Condition	7.2				40	7			1					
Sulphide Cl1 Scav 2					15					5-9	6.0	21.5	600	
Condition	7.3													
Sulphide Cl2C1									1	3-5	3.0	3	130	30
Condition						2								
Sulphide Cl2C2									1	2-4	3.0	6	180	15
Condition									1					
Sulphide Cl2C3					5	5				3-6	4.0	10	250	6
Condition					10				1					
Sulphide Cl2C4										3-7	5.0	15	300	3
REAGENT TOTALS (g/t)		328	2337	176	188	142								

PRODUCTS	WT g	WT %	Cu %	DIST	Sn %	DIST	Fe %	DIST	S %	DIST	SiO2 %	DIST
T45 Cu Cl2 C1	21.8	1.1	4.19	44.6	0.21	0.2	41.4	1.5	37.3	9.2	4.31	0.2
C2	12.7	0.6	1.36	8.4	0.24	0.2	42.4	0.9	34.5	5.0	7.30	0.2
C3	8.1	0.4	0.69	2.7	0.28	0.1	43.1	0.6	25.5	2.3	9.34	0.2
Cu Cl1T	17.2	0.9	0.49	4.1	0.49	0.5	32.6	0.9	20.5	4.0	21.4	0.7
S Cl2 C1	39.1	2.0	0.35	6.7	0.33	0.7	34.6	2.3	28.9	12.8	16.0	1.3
C2	27.4	1.4	0.10	1.3	0.49	0.7	33.5	1.5	22.9	7.1	20.5	1.1
C3	15.5	0.8	0.09	0.7	0.71	0.6	29.0	0.8	14.3	2.5	27.0	0.8
C4	7.5	0.4	0.12	0.4	0.98	0.4	22.2	0.3	10.9	0.9	34.7	0.5
S Cl2T	18.4	0.9	0.14	1.3	1.24	1.2	22.0	0.7	7.87	1.6	33.4	1.2
S Cl1T	181.6	9.2	0.11	9.7	1.08	10.6	23.9	7.3	10.6	21.8	31.6	11.6
RoT	1651.2	83.3	0.03	24.2	0.96	85.3	30.5	84.2	1.95	36.6	24.7	82.8
CALC	1983.3	100.0	0.10	100.0	0.94	100.5	30.1	100.9	4.44	104	24.8	100.7
ASSAY HEAD			0.00		0.95		29.4		5.50		24.7	

CUM PRODUCTS	CUM Wt	WT %	Cu %	CUM	Sn %	CUM	Fe %	DIST	S %	DIST	SiO2 %	DIST
T45 Cu Cl2 C1	21.8	1.1	4.19	44.6	0.21	0.2	41.4	1.5	37.3	9.2	4.31	0.2
C2	34.5	1.7	3.15	53.0	0.22	0.4	41.8	2.4	36.3	14.2	5.41	0.4
C3	42.6	2.1	2.68	55.7	0.23	0.5	42.0	3.0	34.2	16.6	6.16	0.5
Cu Cl1T	17.2	0.9	0.49	4.1	0.49	0.5	32.6	0.9	20.5	4.0	21.4	0.7
S Cl2 C1	39.1	2.0	0.35	6.7	0.33	0.7	34.6	2.3	28.9	12.8	16.0	1.3
C2	66.5	3.4	0.25	8.0	0.40	1.4	34.1	3.8	26.4	20.0	17.8	2.4
C3	82.0	4.1	0.22	8.7	0.46	2.0	33.2	4.6	24.1	22.5	19.6	3.3
C4	89.5	4.5	0.21	9.1	0.50	2.4	32.3	4.8	23.0	23.4	20.8	3.8
S Cl2T	107.9	5.4	0.20	10.4	0.63	3.6	30.5	5.5	20.4	25.1	23.0	5.0
S Cl1T	289.5	14.6	0.14	20.1	0.91	14.2	26.4	12.8	14.2	46.8	28.4	16.7
FEED	1983.3	100.0	0.10	100.0	0.94	100.5	30.1	100.9	4.44	104.0	24.8	100.7

Milling		Primary	Cu Reg	S Reg
Mill type	Long	Stirred	Stirred	
Media type	MS ball	Ceramic	Ceramic	
Media	kg	12	1.5	1.5
Solids	g	2000	180	373
Water	g	1000	200	260
Time	min/sec	20	53s	2m29S
Speed	rpm	50	1200	1200
Lime	g	0	0.2	0
End pH	pH	8.2	9	7.4
End p80	µm	253	0	0

Float Cell	Volume	Regrind Power	
Rougher	3.8	Start	41540
S Clnr	2.7, 1.2	Finish	41542
Cu Clnr 1, 2	1.2, 0.5	W/h	2.1
Speed	1000	kWh/t	13.9



PROJECT	T0887
TEST NO	T46
DATE	130415
TECHNICIAN	ANB

PRODUCT FLOATED	
St Dizier	
Comp 2, 3	

NOTES
Sulphide Rougher
Feed P80 253um

	pH	0.722 X23 g/t	0.5 GUAR g/t	98.0 H2SO4 g/t	1.0 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 Copper Ro C1	8.2	36					13	3		2-3		220	
Condition Copper Ro C2	8.3	18	51				8	1		2-5		200	
Condition Copper Ro C3	8.3	18						1		3-6		180	
Regrind		11						1					
Condition Copper Clnr 1	9.0		25					13		2-5	7.0	500	
Condition Copper Clnr 2	8.6	7	13							2-6	6.0	400	
Condition Copper Clnr 3 C1	8.6	7	13							1-3	1.0	20	42
Condition Copper Clnr 3 C2	8.6	7	13							3-4	1.5	30	39
Condition Copper Clnr 3 C3	8.6	7	13							2-5	4.0	130	13
Condition Sulphide Ro C1	8.3		51	2129									
Condition Sulphide Ro C1	5.0		51		51			2					
Condition Sulphide Ro C1	5.6		51		51	30		2					
Condition Sulphide Ro C1	5.5		51		51		25	1	2-5	3.0		230	
Condition Sulphide Ro C2	5.6		51		51			1					
Condition Sulphide Ro C2	6.2		51		51	10		1	2-6	3.0		220	
Condition Sulphide Ro C3	6.2		51		51			2					
Condition Sulphide Ro C3	6.9		51	658				1	3-6	3.0		200	
Condition Sulphide Ro C4	5.0		51					2					
Condition Sulphide Ro C4	5.6		25			15	13	2	5-6	3.0		220	
Condition Sulphide Ro C5	6.7		25			15	13	1					
Condition Sulphide Ro C5	5.0		25	629		15	13	2	5-7	4.0		290	
Condition Sulphide Ro C6	5.1		25			15	13	1					
Condition Sulphide Ro C6	5.1		25			15	13	2	6-9	4.0		270	
Regrind		11						3					
Condition Sulphide Cu Ro	7.4	11						3	2-6	4.0		215	
Condition Sulphide Cu Ro	7.4	11						3					
Condition Sulphide Cl 1	7.9		101	248	76			3					
Condition Sulphide Cl 1	5.0		101					3					
Condition Sulphide Cl 1	5.0		101					2					
Condition Sulphide Cl 1	5.0		101			20	13	1					
Condition Sulphide Cl 1	5.3		101					1	2-7	4.0		210	
Condition Sulphide Cl1 Scav 1	9.5		89			30	8	2	4-8	4.0		250	
Condition Sulphide Cl1 Scav 2	6.4		89			30	8	1					
Condition Sulphide Cl1 Scav 2	5.2		89			15	15	2	5-9	6.0		400	
Condition Sulphide Cl2C1	6.0							1	2-6	3.0		170	31
Condition Sulphide Cl2C2	6.0							1	2-6	3.0		180	8
Condition Sulphide Cl2C3	6.0					2	8	1	3-6	4.0		220	3
REAGENT TOTALS (g/t)		106	417	3753	177	194	160						

PRODUCTS	WT g	WT %	Cu %	DIST %	Sn %	DIST %	Fe %	DIST %	S %	DIST %	SiO2 %	DIST %
T46 Cu C13 C1	8.3	0.4	6.56	29.2	0.19	0.1	40.9	0.6	41.8	3.5	1.71	0.0
Cu C13 C2	11.8	0.6	3.90	24.6	0.21	0.1	43.1	0.9	42.0	5.0	2.08	0.1
Cu C13 C3	17.3	0.9	1.28	11.9	0.22	0.2	42.1	1.3	34.6	6.0	6.32	0.2
Cu C13T	18.3	0.9	0.32	3.1	0.36	0.4	16.6	0.5	11.2	2.1	39.7	1.5
Cu C12T	76.4	3.9	0.06	2.5	0.68	2.9	8.49	1.1	2.12	1.6	51.2	8.1
Cu C11T	65.3	3.3	0.08	2.8	1.14	4.2	19.6	2.2	8.52	5.6	35.7	4.8
T46 Cu Ro Con (s)	7.6	0.4	0.80	3.3	0.82	0.3	10.1	0.1	2.73	0.2	47.5	0.7
S C12 C1	53.2	2.7	0.09	2.6	0.19	0.6	46.0	4.2	39.9	21.4	1.99	0.2
S C12 C2	14.6	0.7	0.09	0.7	0.38	0.3	49.2	1.2	26.2	3.9	5.50	0.2
S C12 C3	7.4	0.4	0.10	0.4	0.56	0.2	45.1	0.6	25.8	1.9	9.81	0.1
S C12T	19.8	1.0	0.09	1.0	1.11	1.2	30.2	1.0	10.8	2.1	22.0	0.9
S C11T	151.3	7.6	0.06	4.9	1.35	11.4	32.1	8.4	13.2	20.1	20.6	6.4
ROT	1535.8	77.6	0.02	16.5	0.91	78.3	29.5	78.0	1.73	26.8	24.5	77.5
CALC	1979.5	100.0	0.09	100.0	0.90	100.0	29.33	100.0	5.01	100.0	24.53	100.0
ASSAY HEAD			0.00		0.95		29.4		5.50		24.7	

CUM PRODUCTS	CUM Wt	WT %	Cu %	CUM %	Sn %	CUM %	Fe %	DIST %	S %	DIST %	SiO2 %	DIST %
T46 Cu C13 C1	8.3	0.4	6.56	29.2	0.19	0.1	40.9	0.6	41.8	3.5	1.71	0.0
Cu C13 C2	20.1	1.0	5.00	53.8	0.20	0.2	42.2	1.5	41.9	8.5	1.93	0.1
Cu C13 C3	37.4	1.9	3.28	65.7	0.21	0.4	42.1	2.7	38.5	14.5	3.96	0.3
Cu C13T	55.7	2.8	2.31	68.8	0.26	0.8	33.8	3.2	29.5	16.6	15.7	1.8
Cu C12T	132.1	6.7	1.01	71.3	0.50	3.7	19.1	4.4	13.7	18.2	36.2	9.9
Cu C11T	197.4	10.0	0.70	74.1	0.71	7.9	19.3	6.6	12.0	23.8	36.1	14.7
T46 Cu Ro Con (s)	7.6	0.4	0.80	3.3	0.82	0.3	10.1	0.1	2.73	0.2	47.5	0.7
S C12 C1	53.2	2.7	0.09	2.6	0.19	0.6	46.0	4.2	39.9	21.4	1.99	0.2
S C12 C2	67.8	3.4	0.09	3.3	0.23	0.9	46.7	5.5	36.9	25.3	2.75	0.4
S C12 C3	75.2	3.8	0.09	3.7	0.26	1.1	46.5	6.0	35.9	27.2	3.44	0.5
S C12T	95.0	4.8	0.09	4.6	0.44	2.3	43.1	7.1	30.6	29.3	7.31	1.4
S C11T	246.3	12.4	0.07	9.5	1.00	13.8	36.4	15.4	19.9	49.4	15.5	7.8
FEED	1979.5	100.0	0.09	100.0	0.90	100.0	29.3	100.0	5.01	100.0	24.5	100.0



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Appendix 16 – ALS Metallurgy Report

(yet to be received at the time of writing)