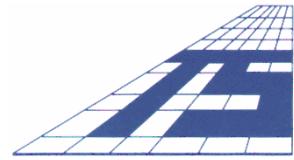


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Specialists in Mineral Exploration:

Geology and Computing



**EPM13049 ROCKLANDS GROUP
PROJECT ANNUAL REPORT FOR THE
TWELVE MONTH PERIOD ENDING 7th
OCTOBER 2008
APPENDIX 16.4
Technical Studies Relevant to Preliminary
Feasibility Study : MLA Analysis of
CuDeco Rocklands Project Ores Final
Report**

**Prepared for Cudeco Limited
November 2008**

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Townsville, November 2008



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11-May-2007

CuDeco Limited

Attention: Peter Hutchinson
CuDeco Limited
Mount Norma
Cloncurry
Queensland

Re: Report - JKTech Job No. 7077

Dear Peter

Enclosed please find a copy of a report by the undersigned titled 'MLA Analysis of Ore Samples from CuDeco Ltd's Rocklands Project – Final Report'.

If you have any queries about the report please do not hesitate to contact either Eugene Louwrens or myself.

Regards

Debra Burrows
Project Mineralogist

**MLA Analysis of Ore
Samples from CuDeco
Ltd's Rocklands Project
– Final Report**

CuDeco Ltd

May-2007

JKTech Pty Ltd

MLA Analysis of Ore Samples from CuDeco Ltd's Rocklands Project– Final Report

Debra Burrows

Submitted to

CuDeco Limited

Executive Summary

Nine CuDeco Rocklands Project ore samples were analysed using the MLA to quantify modal mineralogy, elemental deportment, grain size and mineral association.

Significant copper minerals identified are chalcopyrite, chalcocite and native copper. Chalcopyrite is a major source of copper in samples 04_145-147, 79_84-86, 79_91-93 and 79_172-1732. Chalcocite is an important source of copper in samples 07_50-51, 07_82-83, and 111 67_70. Native copper is a significant source of copper for samples 07_50-51, 07_82-83, 111_67-70 and 111_196-198.

Linnaeite was the only cobalt-bearing mineral found (samples 04_145-147, 79_91-93 and 79_107-109). The linnaeite is locked in pyrite mainly.

Pyrite occurs in significant quantities in samples 04_145-147, 79_84-86, 79_91-93, 79_107-109 and 100_172-173. The major NSG minerals are quartz, amphiboles and carbonates. Sample 79_84-86 had a significant amount of iron oxide while sample 07_83-83 had significant clay content. Carbonate content was high in samples 04_145-147 and 07_50-51.

The grain size distribution data revealed moderately coarse-grained chalcopyrite with eighty percent passing data > 140 microns. Some samples have chalcopyrite with twenty percent passing data > 400 microns.

Chalcocite grains have a P80 of >130 μm in samples 07_50-51 and 07_82-83.

In the two samples containing significant native copper the P80 of the metal is >180 μm .

Chalcopyrite was consistently associated with carbonates, amphiboles, quartz and silicates across all samples. Chalcocite has a consistent association with chalcopyrite across all samples. Native copper displayed a strong association with chalcopyrite in sample 04_145-147 and with chalcocite in sample 07_91-93. Rimming of native copper by copper-oxides/carbonates is reflected in the strong association between the two minerals in sample 111_67-70. Consistently strong associations with native copper were with carbonates and quartz.

The few gold particles found in sample 79_91-93 showed a strong association with sulphides (chalcopyrite and pyrite). The gold grains are <10 μm in size.

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BACKGROUND

CuDeco Limited requested JKTech. Pty. Ltd. to use the Mineral Liberation Analyser (MLA) to complete quantitative mineralogical analyses of copper ore samples from the Rocklands Project.

1. OBJECTIVE

The objectives of the analyses were to quantify the;

- copper, cobalt and gangue mineralogy,
- elemental deportment of copper and cobalt,
- grain associations with copper minerals,
- and the theoretical, target primary grind size of copper minerals.

In addition, the quantification of gold mineralogy for the sample with the highest gold-grade was required to determine;

- the deportment of gold,
- gold grain size,
- and any association data.

2. SCOPE OF WORK

CuDeco Limited required the MLA analysis of nine ore samples. The nine samples were screened and sized.

Approximately three grams of each sample were separated using micro-riffle and micro-rotary splitters. The separated particles were mounted in epoxy resin and cut and polished to produce a section through the particles.

Investigation of the coarsest size fractions determined the -850/+600 size fraction preserved *in situ* ore textures and thus all coarse particle measurements were completed using this size fraction. The -300/+212 size fraction was selected for the gold analyses.

The MLA used the technology of both Scanning Electron Microscopy and Energy Dispersive X-rays Detectors to analyse the particle sections. Back scattered electron (BSE) images were used to accurately define particle and mineral grain boundaries whilst X-ray analysis was employed to characterise the mineralogy of each grain.

The MLA GXMapping technique was used to analyse the -850/+600 size fractions. This technique used BSE images and X-ray analysis to define the grain boundaries, with additional X-ray mapping employed to ensure accurate classification of some non-sulphide gangue minerals. The GXMapping overcame the problem of gangue minerals with very close BSE grey-scales as the grain boundaries may not be accurately defined by BSE alone.

Quantification of gold bearing minerals used the Sparse Phase X-ray mapping technique (SPL). This technique used BSE images to target bright mineral phases within the sample. BSE grey-scale images and X-ray mapping are then used to quantify the mineralogy and texture of the particles that contain bright phases. The SPL technique provides elemental deportment, grain size and association data for

the gold-bearing minerals only. Bulk modal mineralogy, grain size and association data is not available using the SPL method.

3. DESCRIPTION OF WORK CONDUCTED

3.1 Composite Sample Details

Nine ore samples were analysed. The samples were a mixture of crushed diamond drill core (LMDH samples) and crushed chip samples (DORC). The sample details and relevant MLA assays are included in Table 1. Chemical assays were not obtained for the size fractions sampled.

Table 1 Sample Details and Assays

MLA Sample Name	Hole ID	To	From	MLA Assay Cu (Wt%)
04_145-147	LMDH004	145	147	4.44
07_50-51	LMDH007	50	51	18.46
07_82-83	LMDH007	82	83	6.54
79_84-86	DORC79	84	86	1.16
79_91-93	DORC79	91	93	8.6
79_107-109	DORC79	107	109	1.76
100_172-173	DORC100	172	173	1.26
111_67-70	DORC111	67	70	0.85
111_196-198	DORC111	196	198	0.66

3.2 Mineral List

The mineral reference list (Table 2) details the minerals identified from the MLA analysis of the samples and the chemical formula assigned to each mineral. Where repeats of the same mineral (or mineral group) are given they reflect the variation in elemental composition however, minor difference in elemental composition would not have been detected during the MLA analysis of the samples. The elemental composition of the minerals is detailed in Appendix 1. Grouping of gangue minerals was used to simplify the display of modal mineralogy, grain size and association data (Table 3).

Table 2 Mineral Reference List

Mineral	Emp. Formula
Chalcocite	(Cu,Fe)2S
Chalcopyrite	CuFeS2
Covellite	CuS
Native_Copper	Cu
CuO/Carbonate*	(Cu,Fe)O
Linnaeite	(Co,Ni,Fe,Cu)2S4
Molybdenite	MoS2
Pyrite	FeS2
FeO	Fe3O4
FeO_Sil_Int**	Fe3O4/CaMgCuAlSiO
Ilmenite	(Fe,Mn)TiO3
Rutile	TiO2
Apatite	Ca5(PO4)3F
Xenotime	(Y,Fe,Yb,Ca)((P,Si,Al)O4)
Alunite	(K,Ba)(Al,Fe)3(S,SiO4)2(OH)6
Calcite	CaCO3
Calcite_Mn	(Ca,Mn)CO3
Dolomite	CaMg(CO3)2
Siderite	(Fe,Ca)CO3
Siderite_2	(Fe,Mn,Ca,Mg)CO3
Albite	NaAlSi3O8
Albite_2	(Na,Ca)AlSi3O8
Amphibole	(Ca,Na)2(Mg,Fe)5(Si,Al)8O22(OH)2
Amphibole_2	(Ca,Mn,Na)2(Mg,Fe)5(Si,Al)8O22(OH)2
Amphibole_3	(Ca,Na,Mn)2(Mg,Fe)5(Si,Al)8O22(OH)2
Biotite	K(Fe,Mg)3(AlSi3O10)(OH)2
Biotite_2**	K(Fe,Mg,Ti,Cu)3(AlSi3O10)(OH)2
Biotite_3**	K(Fe,Mg,Ti,Cu)3(AlSi3O10)(OH)2
Chlorite	(Fe,Mg,Al)3(Al,Si)4O10(OH)8
Chlorite_2	(Fe,Mg,Al,Mn)3(Al,Si)4O10(OH)8
Chlorite_3	(Fe,Mg,Al)3(Al,Si)4O10(OH)8
Chlorite_4	(Fe,Mg,Al)3(Al,Si)4O10(OH)8
Chlorite_5	(Fe,Mg,Al,K,Ca)3(Al,Si)4O10(OH)8
Fe_Clay	(Fe,Al,Mg,Ca,K,Cl)2-3Si2O5(OH)4
Fe_Clay_2	(Fe,Al,Mg,Ca,K,Cl)2-3Si2O5(OH)4
Fe_Clay_3	(Fe,Al,Mg,Ca,K,Cl)2-3Si2O5(OH)4
Ferrosilite	(Fe,Mg,Al)SiO3
Illite	(K,(H3O))Al2(Si3AlO10)(OH)2
Orthoclase	KAlSi3O8
Prehnite	Ca2Al2Si3O10(OH)2
Pyrophyllite	Al4Si8O20(OH)4
Pyrophyllite_2	Al4Si8O20(OH)4
Pyroxene	(Ca,Na)(Mg,Fe,Al)(Si,Al)2O8
Titanite	CaTi(Si,Al)O5
Quartz	SiO2

Note: * CuO/Carbonate – trace of probable copper oxide detected in one sample but cannot definitively be distinguished from copper carbonate minerals using MLA analysis. ** Trace occurrences of copper were detected in biotite_2 and biotite_3. and an intergrowth of FeO and what appeared to be a silicate mineral. The presence of copper did not appear

to result from intimate intergrowths with copper-sulphides and may be the result of alteration of silicates by copper-rich fluids.

Table 3 Grouping List

Group/Mineral	Minerals in Group
Chalcocite	Chalcocite
Chalcopyrite	Chalcopyrite
Covellite	Covellite
Native Copper	Native Copper
CuOxide/Carbonate	CuO
Linnaeite	Linnaeite
Molybdenite	Molybdenite
Pyrite	Pyrite
FeO	FeO FeO_Silicate_Intergrowth
Ilmenite	Ilmenite
Rutile	Rutile
Apatite	Apatite
Xenotime	Xenotime
Alunite	Alunite
Calcite	Calcite Calcite_Mn
Dolomite	Dolomite
Siderite	Siderite Siderite_2
Albite	Albite Albite_2
Amphibole	Amphibole Amphibole_2 Amphibole_3
Biotite	Biotite Biotite_2 Biotite_3
Chlorite	Chlorite
	Chlorite_2
	Chlorite_3
	Chlorite_4
	Chlorite_5
Fe_Clay	Fe_Clay Fe_Clay_2 Fe_Clay_3
Ferrosilite	Ferroxilite
Illite	Illite
Orthoclase	Orthoclase
Prehnite	Prehnite
Pyrophyllite	Pyrophyllite Pyrphyllite_2
Pyroxene	Pyroxene
Titanite	Titanite
Quartz	Quartz

3.3 Mineral Abundances

Table 4 details the grouped mineral abundances for all samples. The full lists of mineral abundances and grain count data are displayed in Appendix 2.

Table 4 Grouped Mineral Abundances (Wt%)

Mineral	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172-173	111_67-70	111_196-198
Chalcocite	0.18	10.62	3.80	0.00	0.01			0.18	
Chalcopyrite	12.36	0.09	0.12	3.28	24.68	5.06	3.63	0.03	0.06
Covellite		0.02						0.00	
Native Copper	0.01	10.02	3.44		0.03			0.54	0.61
CuO/Carbonate								0.13	
Linnaeite	0.03				0.04	0.02	0.00		
Molybdenite		0.00							0.00
Pyrite	15.52	0.05	0.00	6.35	17.52	4.66	8.12	0.00	0.26
FeO	1.82	3.47	6.41	15.85	2.52	6.05	1.57	1.16	13.62
Ilmenite				0.00	0.00	0.00	0.00	0.07	0.26
Rutile	0.00	0.00	0.05		0.00	0.00	0.00	0.25	0.00
Apatite	0.20	1.34	0.61	0.36	0.24	0.19	0.20	0.12	0.62
Xenotime		0.00	0.06					0.01	0.00
Alunite					0.00		0.00		
Calcite	21.85	33.87	9.50	5.98	4.32	41.10	22.70	1.02	3.84
Dolomite	0.20	0.83	0.62	0.07	0.07	0.47	0.83	0.02	0.08
Siderite*	3.16	17.56	6.73	0.01	8.42	0.55	0.98	1.98	0.23
Albite	2.06	0.01	0.01	3.66	0.92	2.02	2.29	0.04	49.86
Amphibole	10.32	3.06	1.65	32.58	30.32	7.01	24.62	0.12	13.15
Biotite	0.69	0.10	0.34	0.44	0.27	0.20	0.21	3.25	0.75
Chlorite	0.89	0.20	0.66	0.16	1.09	0.61	0.72	0.98	0.28
Fe_Clay	0.87	2.93	27.72	0.42	1.13	0.68	0.88	7.38	1.12
Ferrosilite	0.08	0.14	0.08	0.02	0.81	0.02	0.07	0.02	0.01
Illite	0.02	0.00	0.01	0.00	0.06	0.00	0.00	0.00	0.00
Orthoclase	0.14	0.00	0.03	1.74	0.02	0.02	0.33	0.10	0.80
Prehnite	0.21	0.47	0.60	0.43	0.11	0.63	0.97	0.08	0.74
Pyrophyllite	0.18	0.11	0.32	0.13	0.10	0.08	0.09	0.60	0.34
Pyroxene	0.38	0.91	0.09	7.51	0.40	0.97	2.17	0.02	0.25
Titanite	0.03	0.00	0.06	0.10	0.02	0.11	0.19	0.01	5.76
Quartz	28.80	14.20	37.11	20.91	6.92	29.56	29.41	81.91	7.37
Total	100	100	100	100	100	100	100	100	100

Notes: '0' indicates a zero occurrence whilst '0.00' indicates a trace occurrence of >0.01 Wt%.

* The accuracy of the classification of siderite can be variable as the X-ray spectra generated by siderite are similar to those generated by intimate intergrowths of calcite and iron-bearing minerals.

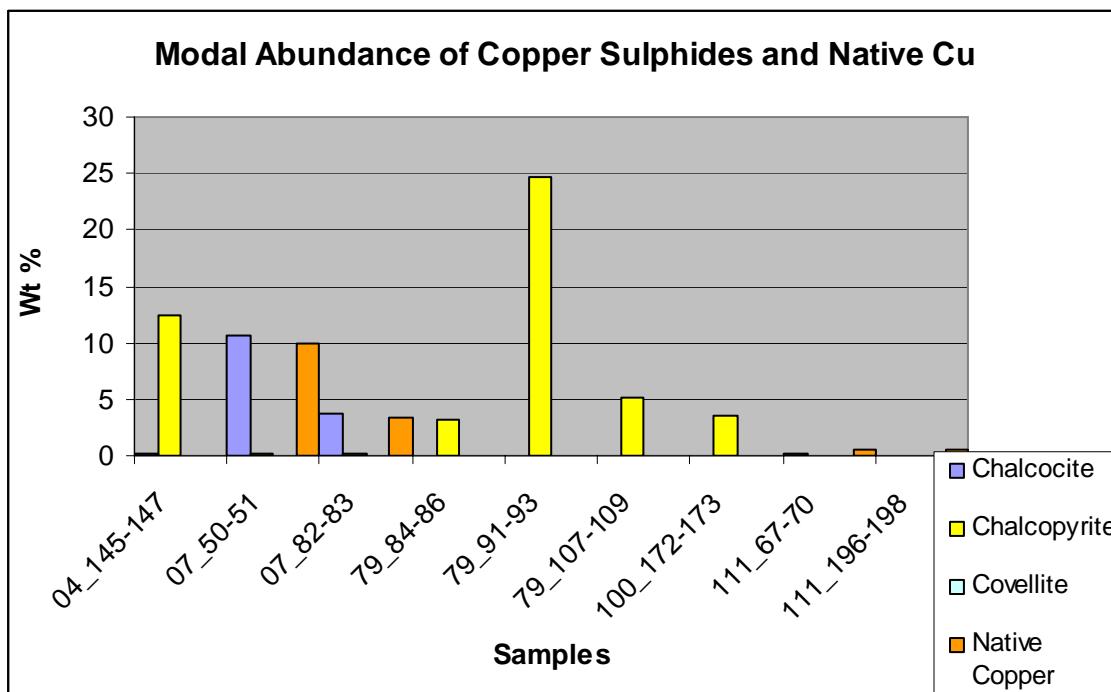


Figure 1 Modal Abundance of Significant Copper Mineralogy (Wt%)

Significant copper sulphide minerals identified by the MLA analyses included chalcopyrite and chalcocite (Table 4 and Figure 1). A trace of covellite was detected in samples 07_50-51 and 111_67-70. Chalcopyrite was the prevalent copper sulphide in samples 04_145-147, 79_84-86, 79_91-93, 79_107-109, and 100_172-173. Samples 04_145-147 and 79_91-93 were distinguished by the high grade of chalcopyrite at 12.4 and 24.7 Wt% respectively. The occurrences of chalcocite and chalcopyrite displays a negative correlation; in samples with relatively large concentrations of chalcopyrite, chalcocite is a minor occurrence and visa versa.

Bornite was included in the measurement standard as it was suspected to be a minor copper-sulphide occurrence. No bornite was detected in any of the measured samples.

Native copper was a significant occurrence in samples 07_50-51 and 07_82-83; it tends to be associated with chalcocite-rich samples.

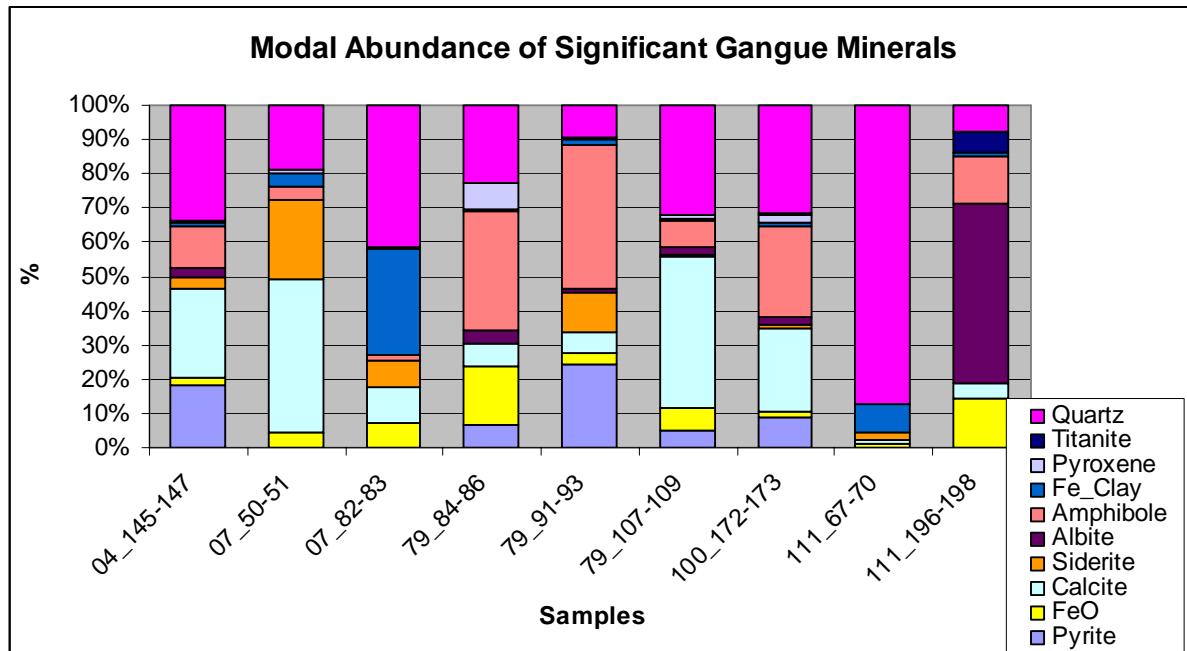


Figure 2 Distribution of Significant Gangue Minerals

The gangue mineralogy varied across samples however quartz, carbonates, and amphiboles were common to most samples (Table 4 and Figure 2). Samples 04_145-147 and 79_91-93 were significant for relatively high concentrations of pyrite (15.5 and 17.5 Wt% respectively), whilst sample 79_84-86 was distinguished by a relatively high concentration of iron-oxide (15.9 Wt%). Sample 111_67-70 was predominantly quartz (82 Wt%), and samples 79_84-86, 79_91-93 and 100_172-173 contained relatively high concentrations of amphiboles. Sample 07_82-83 contained the largest concentration of clay at 27.7 Wt%. Carbonates were present in very high concentrations in samples 04_145-147 and 07_50-51 (approximately 25 and 50 Wt % respectively).

3.4 Elemental Department

The elemental department data for copper and iron are presented below in Tables 5 - 7 and Figures 3 - 7. The complete department data for each sample is presented in Appendix 3. Cobalt department was an objective of the analysis however the only cobalt-bearing mineral detected was linnaeite and it was present as a trace occurrence only (<0.05 Wt%) in samples 04_145-147, 79_91-93 and 79_107-109. Fluorite reported to apatite alone however it should be noted that micaceous minerals can be a significant source of fluorite if the mineral abundances are significantly large (the MLA analysis is not sensitive enough to detect the trace levels of fluorine in mica).

3.4.1 Copper Department

Chalcopyrite, chalcocite and native copper were significant contributors of elemental copper (Table 5 and Figure 3).

Figure 4 illustrates the importance of chalcopyrite as a source of copper in samples 04_145-147, 79_84-86, 79_91-93 and 79_172-1732. Chalcocite was an important source of copper in samples 07_50-51, 07_82-83, and 111_67_70.

Native copper was a significant source of copper for samples 07_50-51, 07_82-83, 111_67-70 and 111_196-198.

Covellite was a trace occurrence in samples 07_50-51 and 111_67-70 and thus contributed minor copper to these samples only. Copper oxide/carbonate was present as a minor occurrence, rimming native copper, in sample 111_67-70 and thus contributed copper to this sample only (12 %).

Of the gangue minerals, iron-oxide silicate intergrowth and biotite contributed significant copper to samples 11_67-70 and 11_196-198. It should be noted that the quantity of copper in the individual grains of these minerals was very small (<2 Wt%) and the quantification of such a minor percentage is not very reliable.

Table 5 Copper Department (%)

Mineral	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172-173	111_67-70	111_196-198
Chalcocite	3.24	45.35	45.80	0.03	0.06			16.86	
Chalcopyrite	96.44	0.17	0.61	98.21	99.43	99.61	99.56	1.18	3.15
Covellite		0.05						0.24	
Native_Copper	0.12	54.27	52.63		0.33			64.28	92.51
CuO								12.09	
Linnaeite	0.00				0.00	0.01	0.00		
FeO_Sil_Int	0.06	0.14	0.88	1.40	0.15	0.26	0.25	1.10	3.10
Biotite_2	0.07	0.00	0.00	0.24	0.02	0.02	0.08	0.94	0.48
Biotite_3	0.07	0.01	0.07	0.12	0.01	0.10	0.11	3.32	0.77
Total	100	100	100	100	100	100	100	100	100

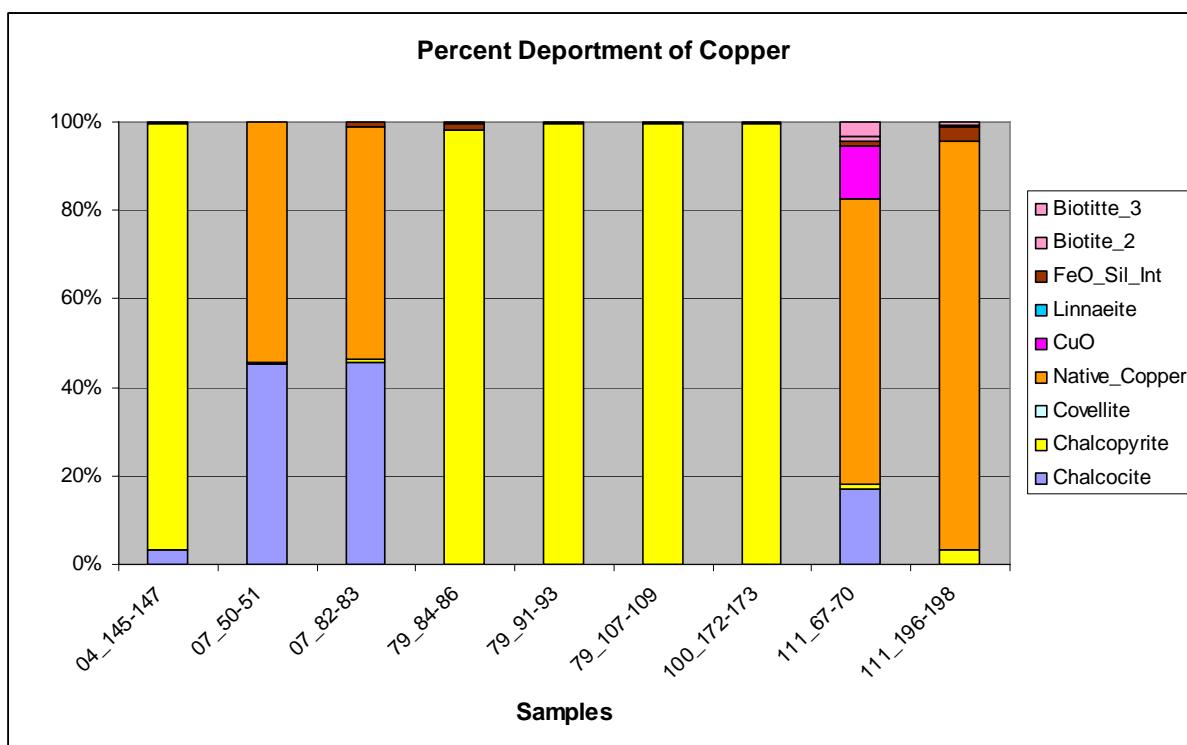


Figure 3 Percent Department of Copper

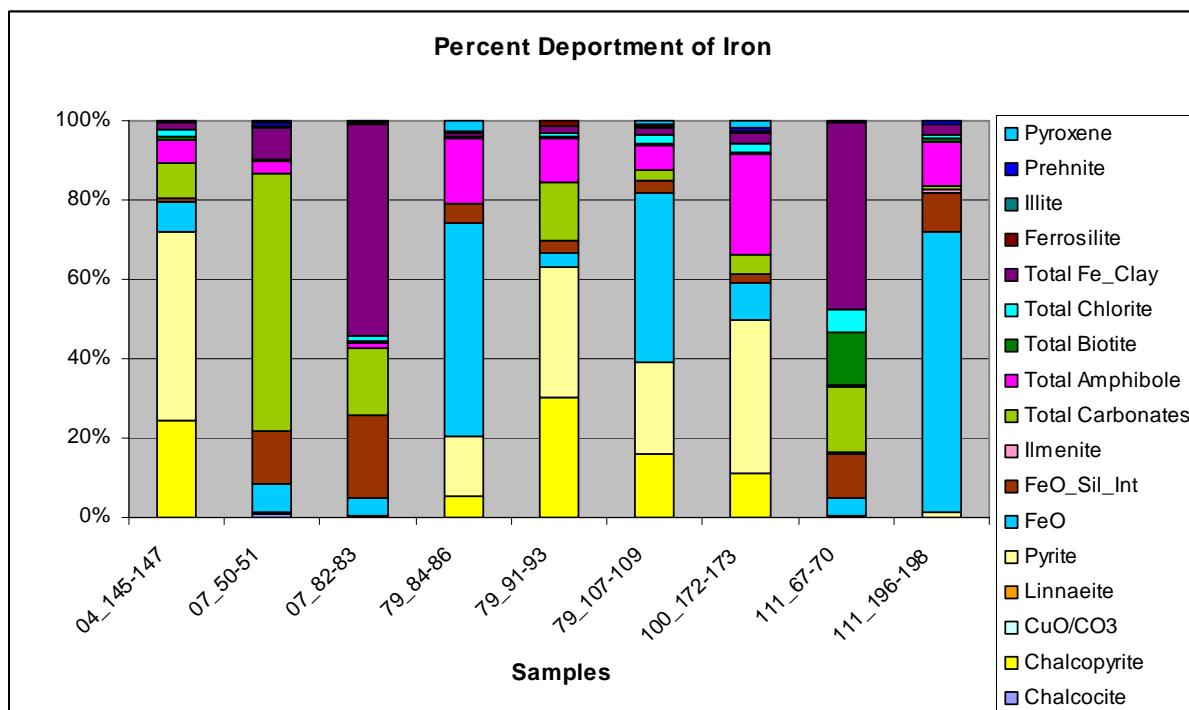
3.4.2 Iron Department

The department of iron data was variable across the nine measured samples however chalcopyrite, pyrite, iron-oxides, carbonates, amphiboles and clay were the most significant source of iron (Table 6 and Figure 4).

Chalcopyrite and pyrite contributed significant iron to samples 04_145-147 and 79_91-93, 79_197-109 and 100_172-173. Iron oxides contributed a large proportion of the elemental iron to samples 07_82-83, 79_84-86, 79_107-109 and 111_196-198. Total carbonates (siderite and dolomite) were very significant contributors of iron to samples 07_50-51, 07_82-83, and 111_67-70. It should be noted that the concentration of siderite was very high in sample 07_50-51 and that much of the siderite was likely to be calcite intimately intergrown with iron-bearing minerals, thus the department data for iron in carbonates for this sample was significantly overestimated.

Table 6 Iron Department (%)

Mineral	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172-173	111_67-70	111_196-198
Chalcocite	0.01	0.97	0.24	0.00	0.00			0.04	
Chalcopyrite	24.62	0.26	0.22	5.18	30.23	16.21	11.29	0.18	0.15
CuO/CO3								0.02	
Linnaeite	0.00				0.00	0.00	0.00		
Pyrite	47.36	0.22	0.00	15.36	32.86	22.85	38.62	0.01	0.99
FeO	7.50	6.98	4.61	53.90	3.73	42.88	9.37	4.45	70.94
FeO_Sil_Int	0.97	13.34	20.71	4.77	3.05	2.73	1.86	11.07	9.67
Ilmenite				0.00	0.00	0.00	0.00	0.52	0.77
Total Carbonates	9.02	64.79	17.03	0.06	14.68	2.86	4.89	16.62	0.83
Total Amphibole	5.82	3.08	1.38	16.30	11.07	6.46	25.49	0.41	11.25
Total Biotite	0.83	0.19	0.45	0.38	0.19	0.43	0.40	13.43	1.16
Total Chlorite	1.57	0.53	1.16	0.22	1.30	1.88	2.24	5.57	0.61
Total Fe_Clay	1.74	8.02	53.49	0.66	1.39	2.10	2.72	47.29	2.71
Ferrosilite	0.20	0.51	0.21	0.03	1.33	0.07	0.31	0.13	0.04
Illite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prehnite	0.16	0.50	0.44	0.26	0.05	0.77	1.15	0.20	0.72
Pyroxene	0.18	0.61	0.04	2.88	0.12	0.75	1.64	0.04	0.15
Total	100	100	100	100	100	100	100	100	100

**Figure 4 Percent Department of Iron**

3.4.3 Cobalt Deportion

Linnaeite ($(\text{Co},\text{Ni},\text{Fe},\text{Cu})_2\text{S}_4$) was the only cobalt bearing mineral identified. The mineral was found in trace quantities in samples 04_145-147, 79_91-93 and 79_107-109.

No liberated linnaeite grains were found with the mineral mostly locked in pyrite and to a lesser extent in NSG. The P80 values range between $28\mu\text{m}$ and $53\mu\text{m}$. Images of linnaeite particles have been appended in Appendix 6.

3.5 Grain Size Data

Grain size data including weight percent distribution (cumulative percent passing), and phase specific surface area are presented for significant copper-bearing and gangue minerals.

The MLA grain size data were based on the measurement of the area and boundary of a mineral grain. If two grains of the same mineral were touching in the sample section the MLA will not map the grains separately. Thus, if the grains were relatively fine and disseminated the MLA measurement would reflect the individual grain size closely whilst intimately inter-grown grains of the same mineral phase would report phase sizes larger than the individual grain size.

All weight percent distribution data for ungrouped mineral phases were presented as weight percent passing using the 4SQRT sieve series. The grain size measurement was maximum diameter. Any grouped mineral phase data were presented using equivalent circle as a measure of grain size and using 4SQRT sieve series. The maximum diameters of mineral grains were not recalculated from the images after grouping and thus the grouped mineral grain size data were not accurately represented by the maximum diameter measurements.

The Phase Specific Surface Area (PSSA) data were calculated by dividing the total grain area of each mineral phase of interest by the total grain boundary of the same phase. Relatively coarse-grain phases will have a smaller PSSA value when compared with fine-grain phases. The PSSA values provide a gross comparison of the grain size of mineral phases across samples whilst the weight percent distribution data provides additional detail.

3.5.1 Weight Percent Distribution Data

The weight percent distribution graphs and twenty, fifty and eighty percent passing data for the major copper bearing minerals (Tables 7 - 9 and Figures 5 -12) and weight distribution graphs (Figures 13 - 21) for selected gangue minerals are presented below. Tabulated weight percent passing data minerals are presented in Appendix 4. Grain size data for all minerals can be obtained from the client's data CD.

It should be noted that the maximum diameter calculation for grain-size measurements ignores inclusions where the host mineral is continuous.

Chalcopyrite

Chalcopyrite was a significant occurrence (>0.1 Wt%), in samples 04_145-147, 79_84-86, 79_91-93, 79_107-109 and 100_172-173. Figure 5 displays the grain size distribution data for these samples. The graph indicates the chalcopyrite grains in samples 04_145-147 and 79_91-93 are relatively coarse-grain.

Table 7 displays the percent passing data for all samples however the data would be less reliable for the samples in which chalcopyrite was not a significant occurrence. The percent passing data indicates a coarse grain-size for the samples with significant concentrations of chalcopyrite. Greater than eighty weight percent of chalcopyrite in these samples has a grain size > 140 microns and for samples 04_145-147 and 79_91-93 the twenty percent passing data was >400 microns.

In samples containing minor concentrations of chalcopyrite the percent passing data tended to indicate a relatively fine-grain size, (i.e. samples 07_50-51 and 07_82-83).

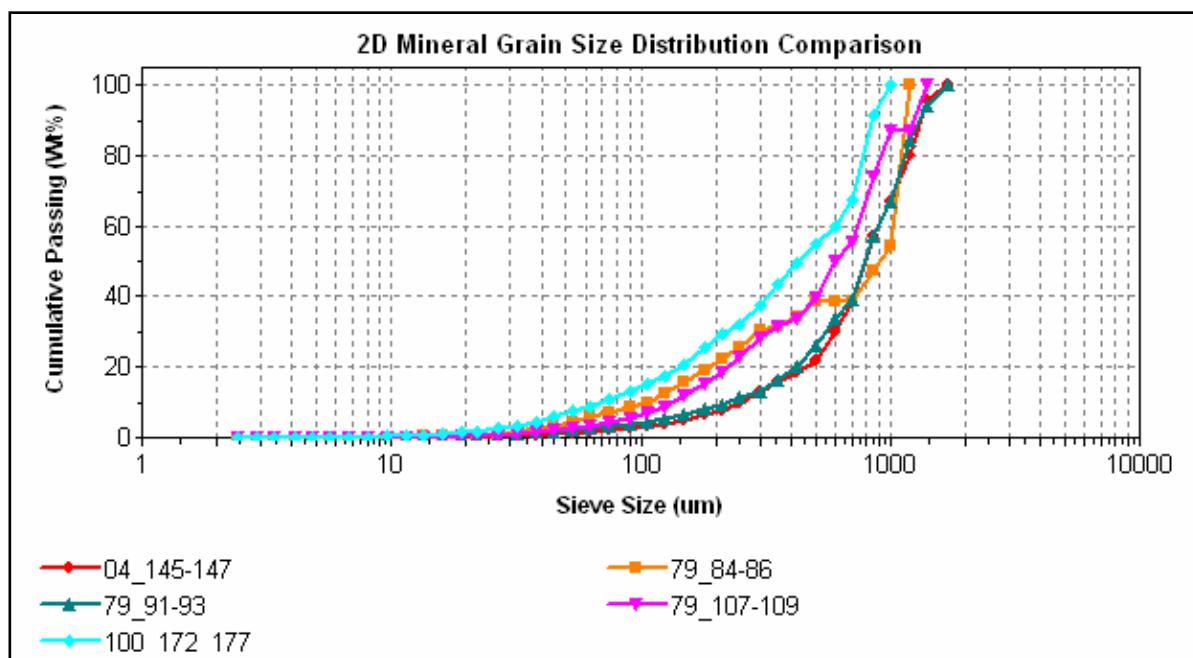


Figure 5 Grain Size Distribution Graph for Chalcopyrite (Cumulative Passing, Maximum Diameter)

Table 7 Twenty, Fifty and Eighty Percent Passing Data for Chalcopyrite (Wt%)

Chalcopyrite	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172-173	111_67-70	111_196-198
P20	457.8	31.2	27.6	189.8	426.0	225.6	143.9	20.8	196.3
P50	797.8	217.9	34.8	904.0	793.9	602.7	433.7	36.8	450.0
P80	1197.7	237.2	75.6	1112.0	1150.4	919.7	784.0	449.9	480.0

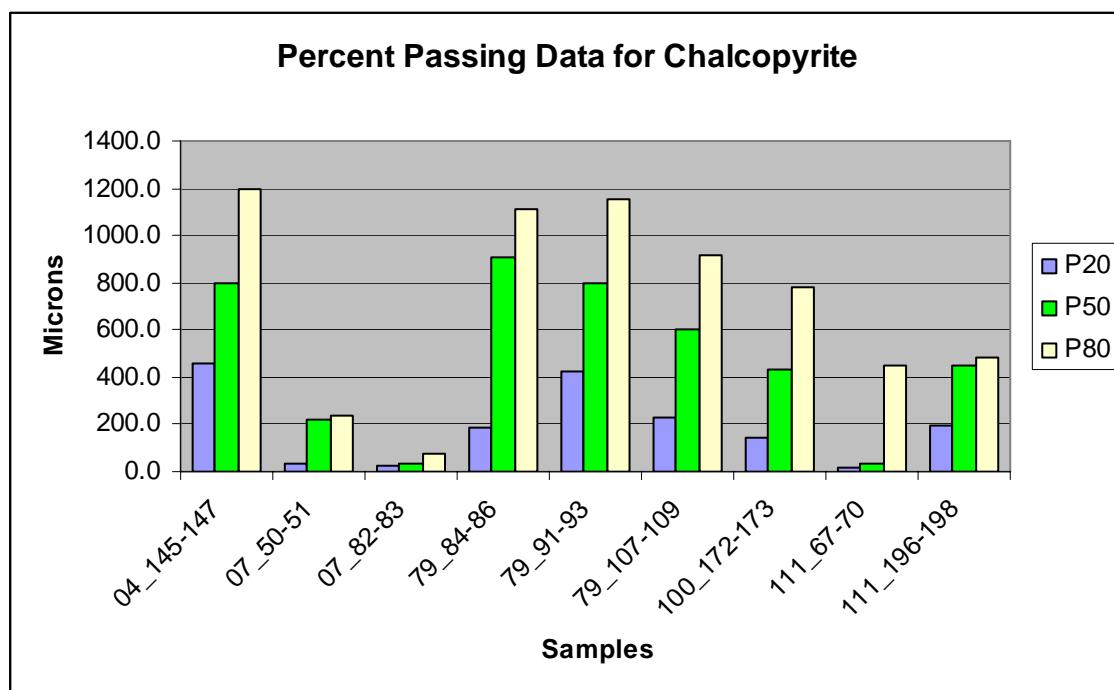


Figure 6 Percent Passing Data for Chalcopyrite

Chalcocite

Chalcocite was a significant occurrence (>0.2 Wt%), in samples 07_50-51 and 07_82-83. Figures 7 and 8 display the grain size distribution data for these samples (different mineral lists for the two samples does not enable display of data on a single graph). The graph and percent passing data (Table 8) indicate the chalcocite in both samples is relatively coarse-grain with >80 Wt% of grains having a maximum diameter of >130 microns. Sample 07_82-83 has a greater weight percent of chalcocite >300 microns.

It should be noted that a small number of coarse, liberated grains can skew the data significantly, and this may explain why >20 Wt% of chalcocite grains are allocated to the 1400-1700 size fraction in sample 07_82-83.

In samples containing minor concentrations of chalcocite, the percent passing data tended to indicate a relatively fine-grain size, (i.e. samples 79_84-86 and 79_91-93). The percent passing data for sample 111_67-70 were very consistent across the twenty, fifty and eighty percent classes, this reflects the very low concentration and thus grain counts of chalcocite in the sample.

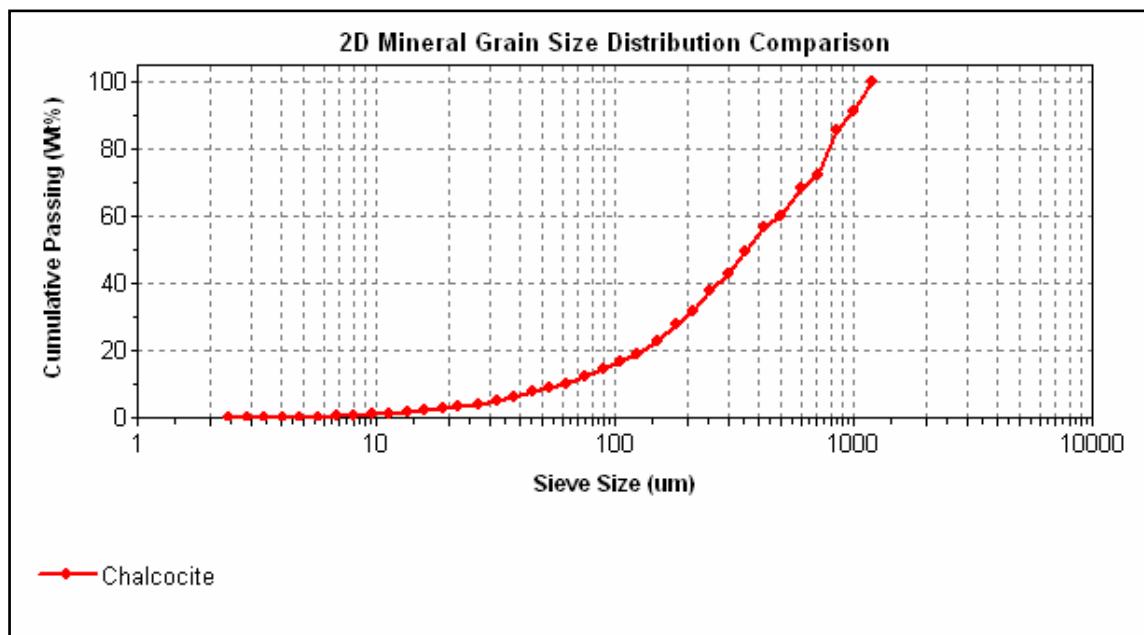


Figure 7 Grain Size Distribution Graph for Chalcocite in Sample 07_50-51 (Cumulative Passing, Maximum Diameter)

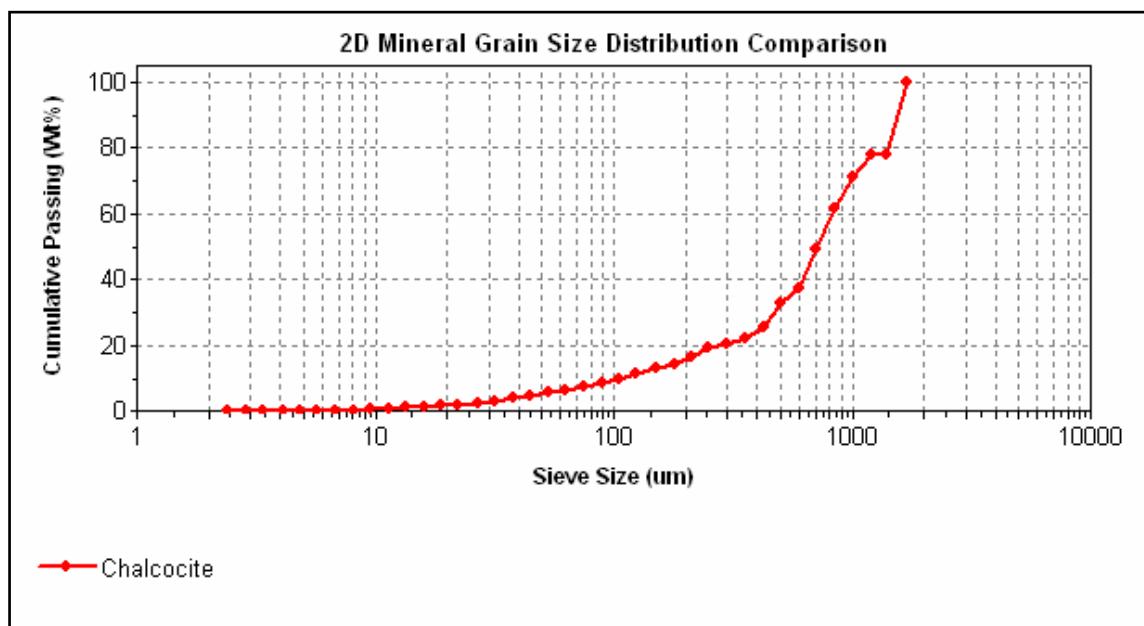


Figure 8 Grain Size Distribution Graph for Chalcocite in Sample 07_82-83 (Cumulative Passing, Maximum Diameter)

Table 8 Twenty, Fifty and Eighty Percent Passing Data for Chalcocite (Wt%)

Chalcocite	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172-173	111_67-70	111_196-198
P20	88.3	131.6	278.0	10.7	19.6	-	-	600.5	-
P50	238.0	362.6	719.2	13.5	55.0	-	-	641.6	-
P80	778.7	788.9	1429.2	19.9	67.7	-	-	682.6	-

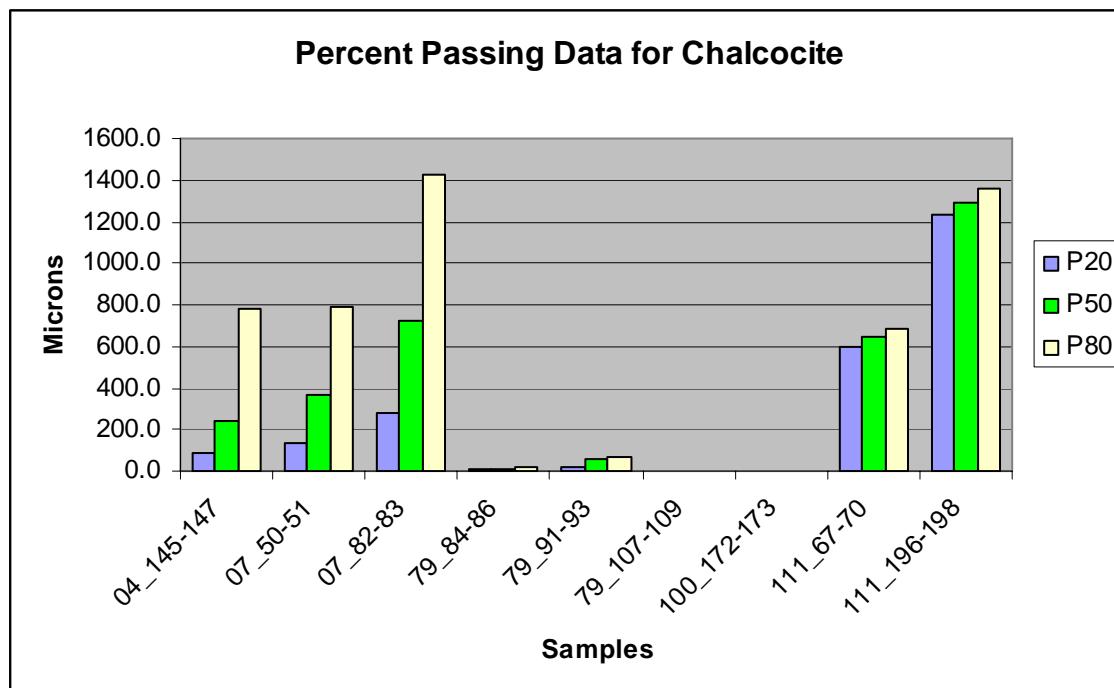


Figure 9 Percent Passing Data for Chalcocite

Native Copper

Native copper was a significant occurrence (>0.6 Wt%), in samples 07_50-51 and 07_82-83. Figures 10 and 11 display the grain size distribution data for these samples (different mineral lists for the two samples does not enable display of data on a single graph). The graph and percent passing data (Table 9) indicate the native-copper in both samples is relatively coarse-grained with >80 Wt% of grains having a maximum diameter of >180 microns. Sample 07_82-83 has a greater weight percent of chalcocite > approximately 280 microns.

In samples containing minor concentrations of native-copper, the percent passing data tended to indicate a finer-grain size, (i.e. samples 04_145-147 and 79_91-93). The percent passing data for sample 111_196-198 were very consistent across the twenty, fifty and eighty percent classes, this reflects the very low concentration and thus grain counts of chalcocite in the sample.

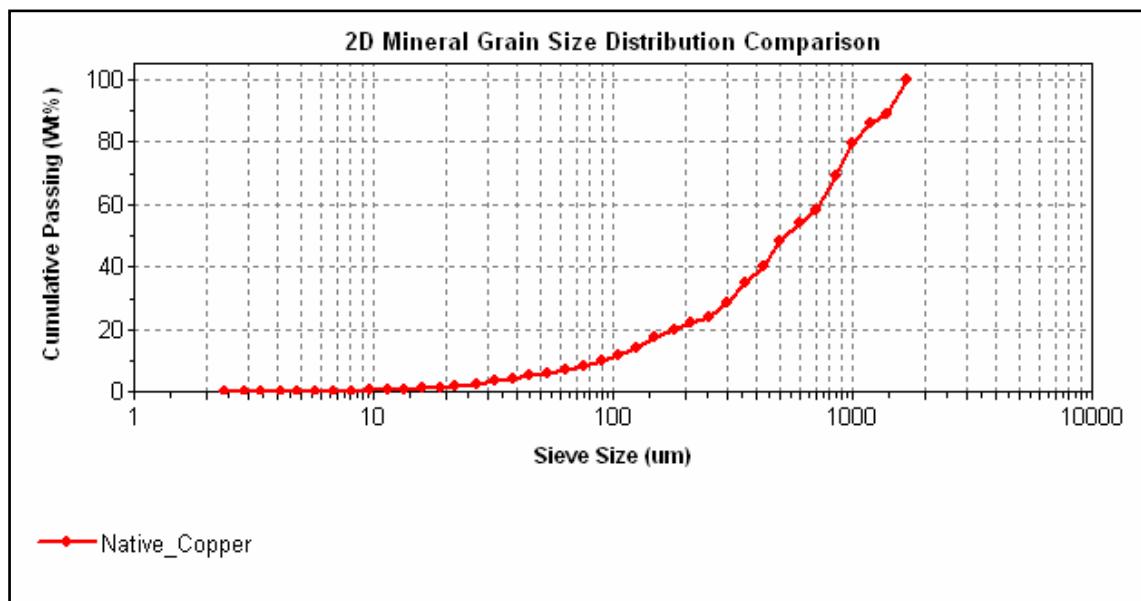


Figure 10 Grain Size Distribution Graph for Native-copper in Sample 07_50-51
(Cumulative Passing, Maximum Diameter)

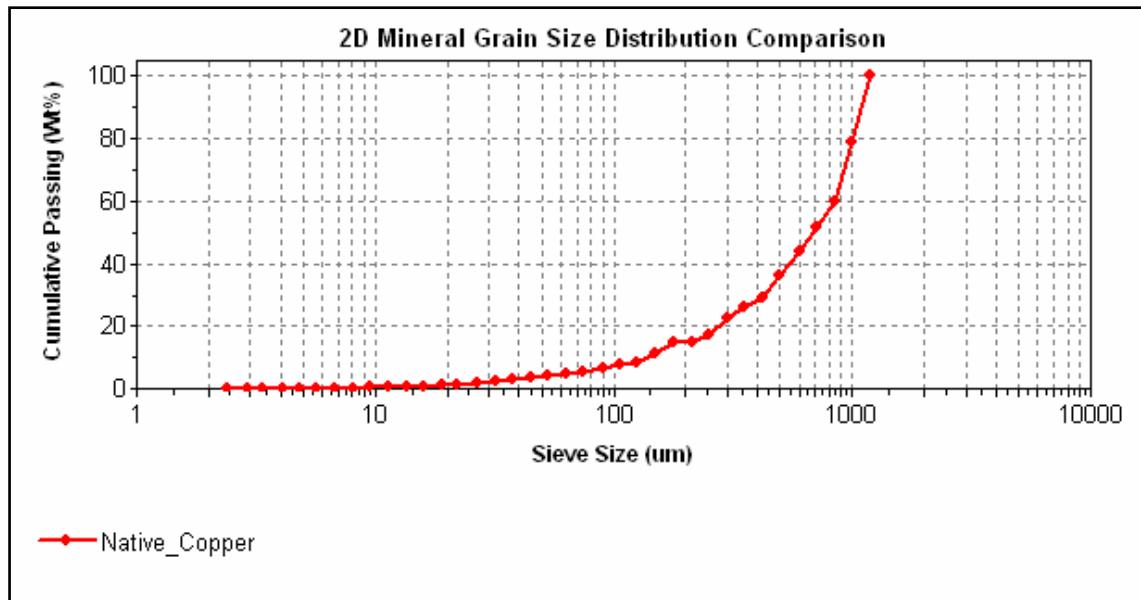


Figure 11 Grain Size Distribution Graph for Native-copper in Sample 07_82-83
(Cumulative Passing, Maximum Diameter)

Table 9 Twenty, Fifty and Eighty Percent Passing Data for Native Copper (Wt%)

Native Cu	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172-173	111_67-70	111_196-198
P20	26.7	180.2	277.7	-	182.8	-	-	216.4	1229.5
P50	93.1	530.1	690.2	-	193.8	-	-	361.4	1293.4
P80	100.9	1014.8	1012.5	--	204.7	-	-	454.0	1357.4

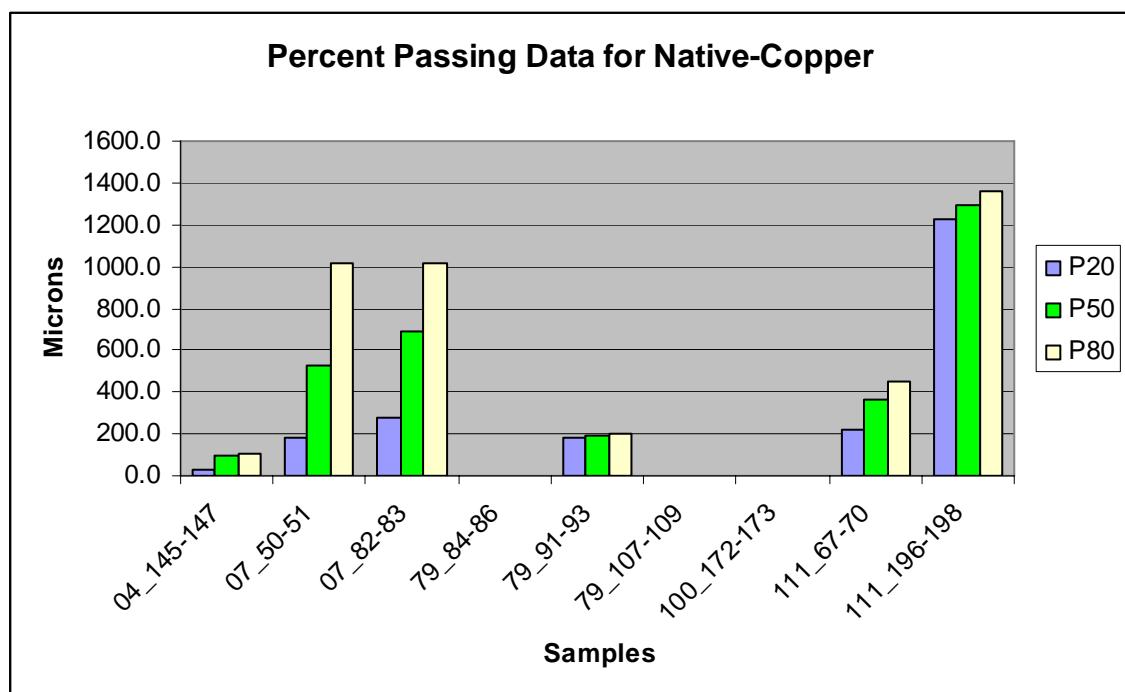


Figure 12 Percent Passing Data for Native Copper

Gangue Minerals

The modal abundances of gangue minerals were highly variable across the nine samples, making comparison difficult. Graphs of the gangue minerals with the greatest weight percent occurrences for all samples are presented in Figures 13 - 21 below. The client can obtain all gangue grain-size data including weight percent distribution tables and percent passing using the data files and software provided on CD.

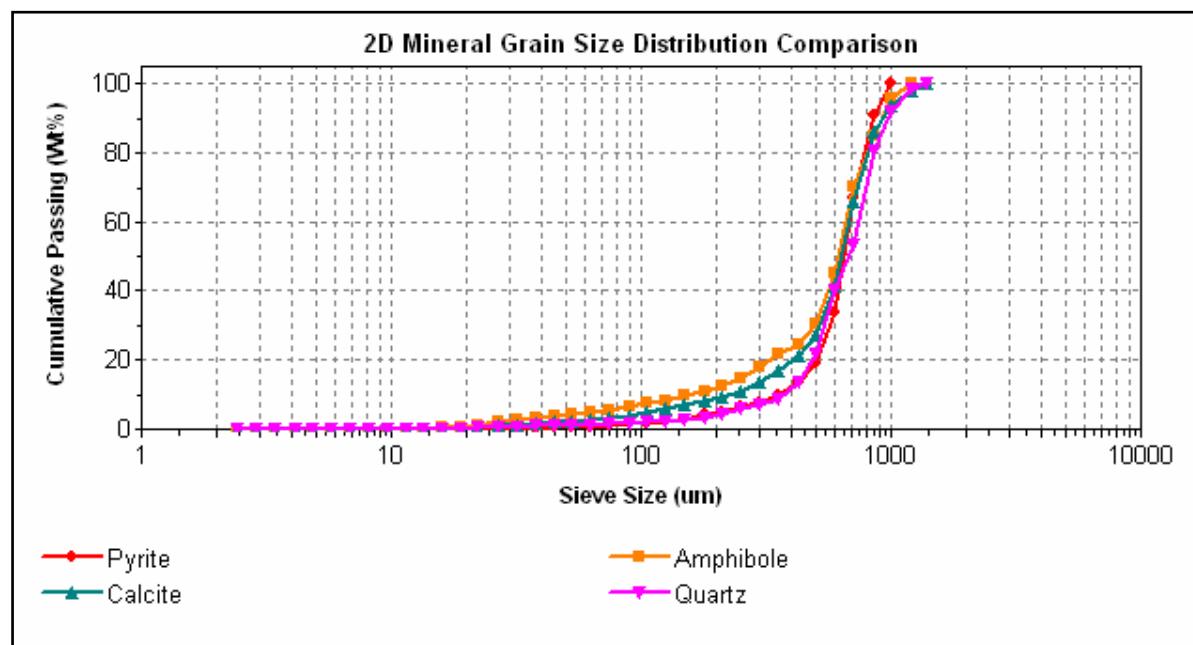


Figure 13 Grain Size Distribution Graph for Grouped Gangue _Sample 04_145-147 (Cumulative Passing, Equivalent Circle)

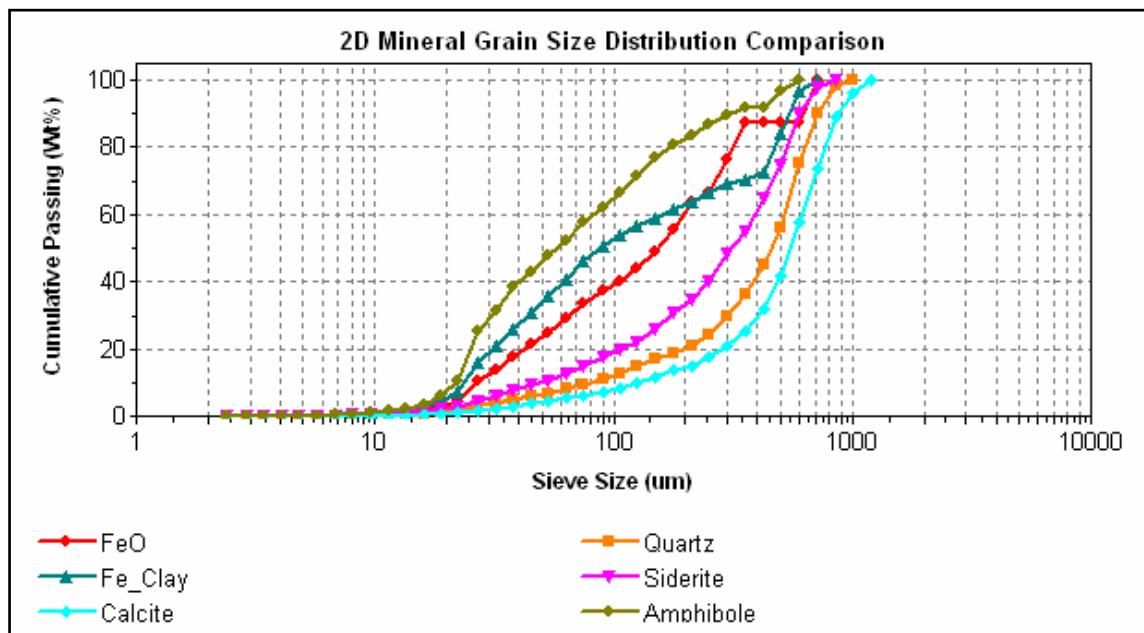


Figure 14 Grain Size Distribution Graph for Grouped Gangue _Sample 07_50-51
(Cumulative Passing, Equivalent Circle)

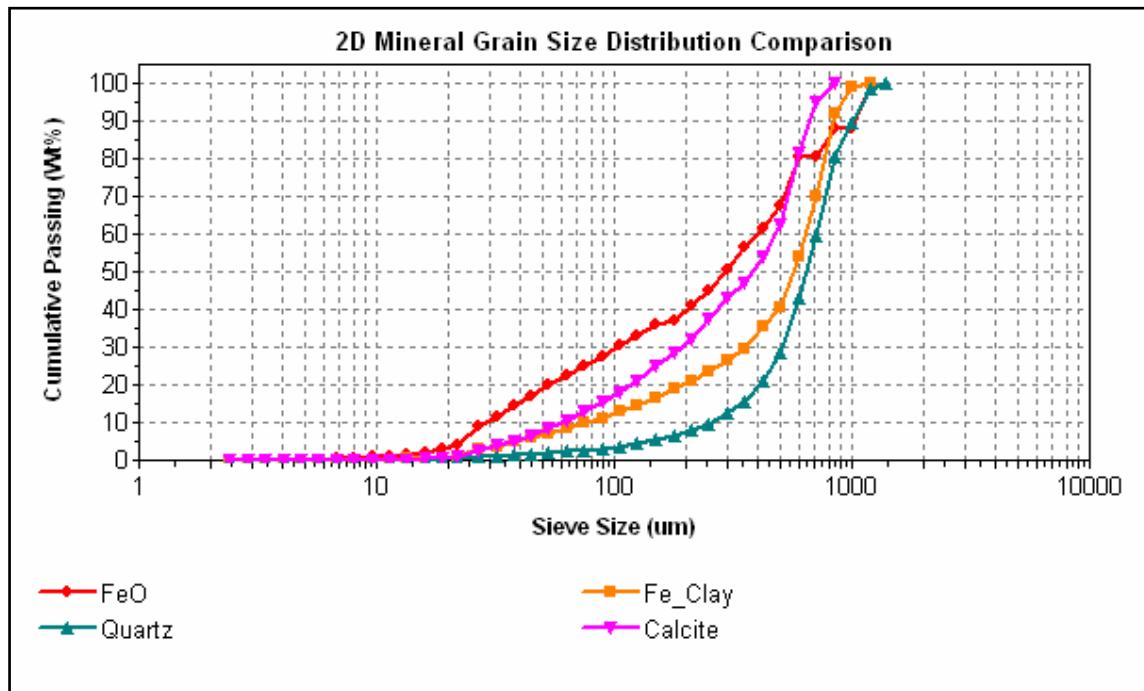


Figure 15 Grain Size Distribution Graph for Grouped Gangue _Sample 07_82-83
(Cumulative Passing, Equivalent Circle)

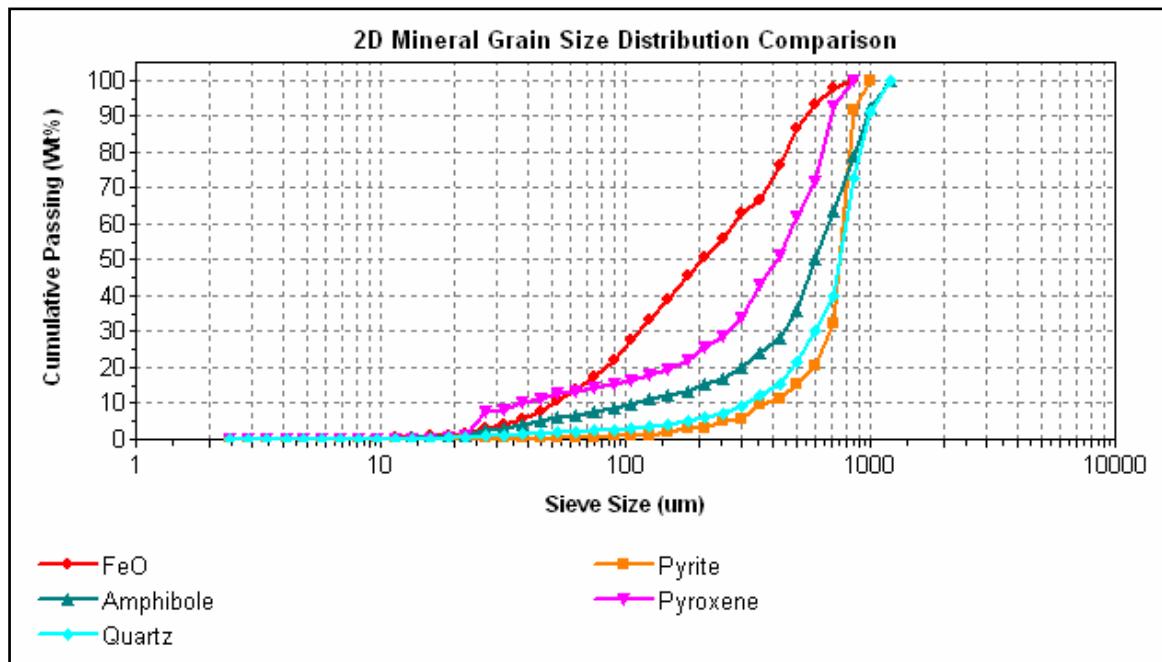


Figure 16 Grain Size Distribution Graph for Grouped Gangue _Sample 79_84-86
(Cumulative Passing, Equivalent Circle)

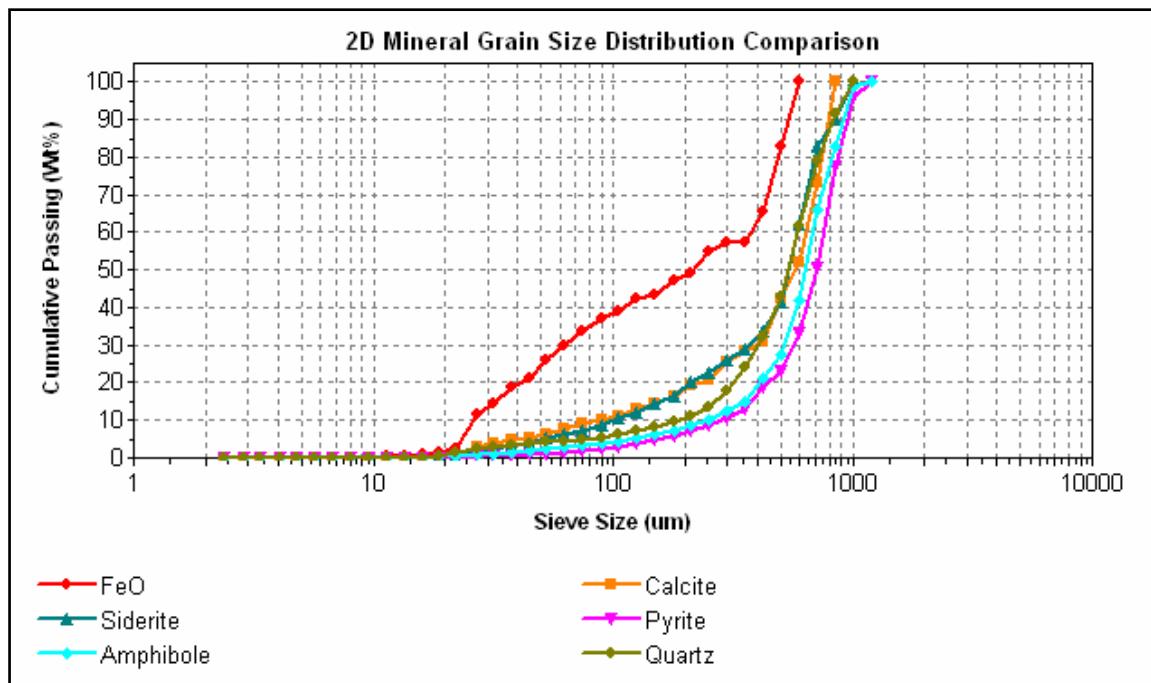


Figure 17 Grain Size Distribution Graph for Grouped Gangue _Sample 79_91-93
(Cumulative Passing, Equivalent Circle)

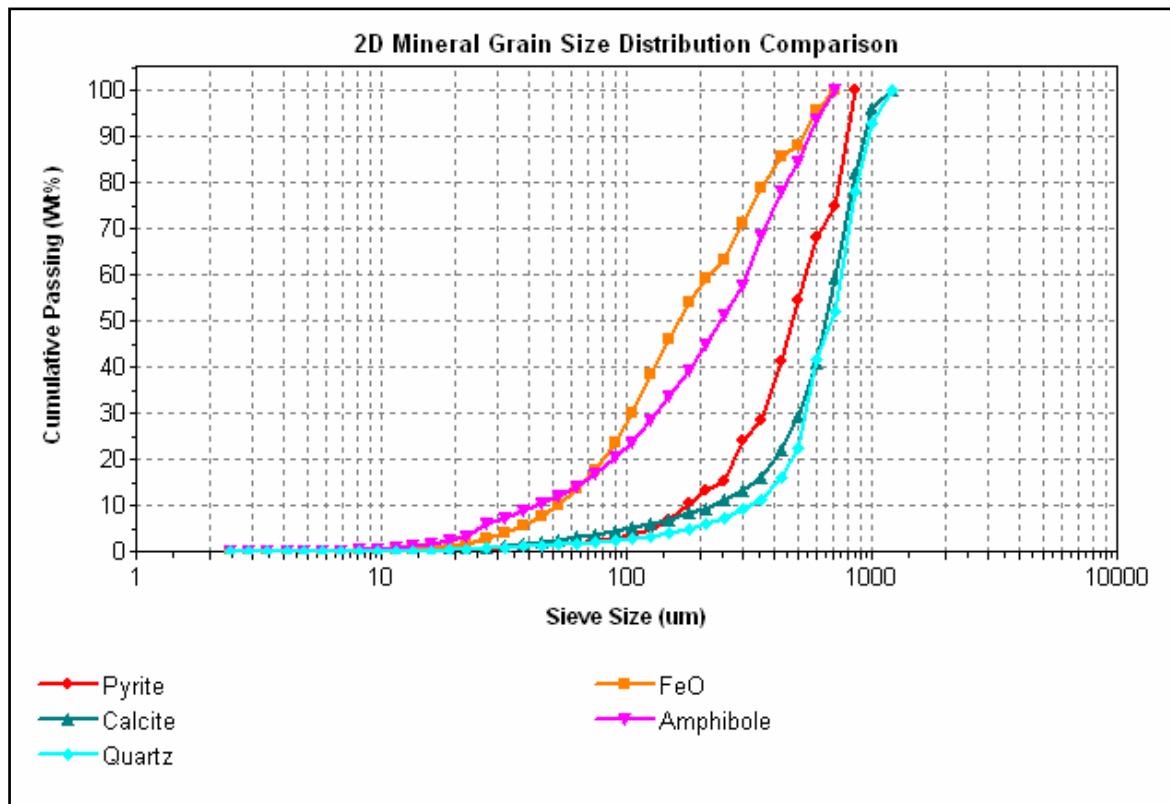


Figure 18 Grain Size Distribution Graph for Grouped Gangue _Sample 79_107-109
(Cumulative Passing, Equivalent Circle)

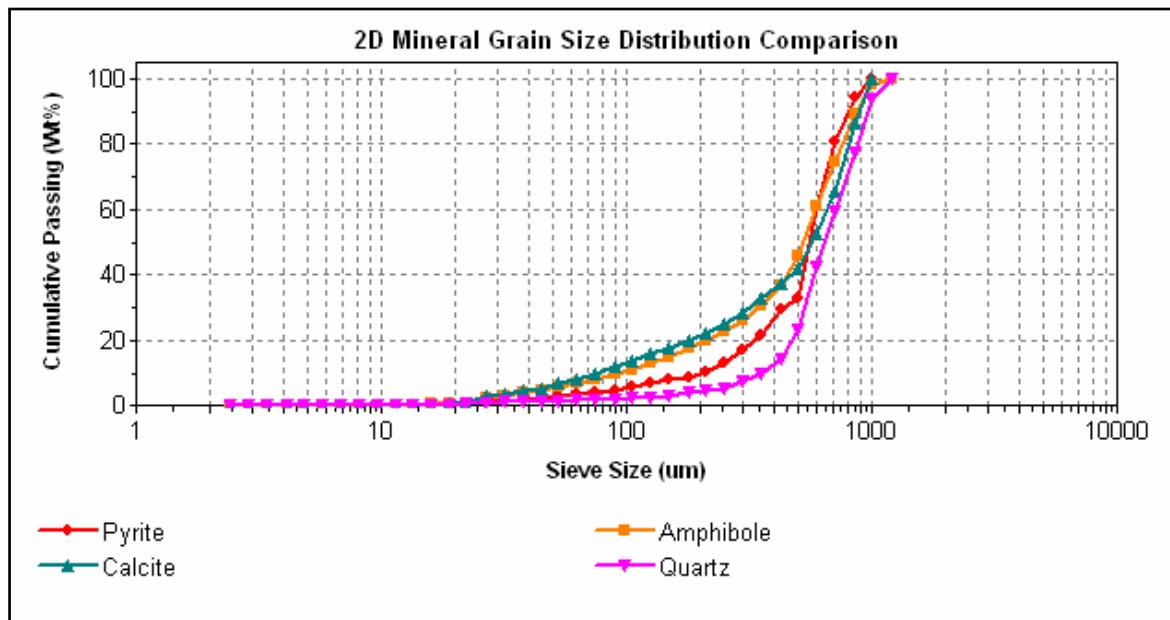


Figure 19 Grain Size Distribution Graph for Grouped Gangue _Sample 100_172-177
(Cumulative Passing, Equivalent Circle)

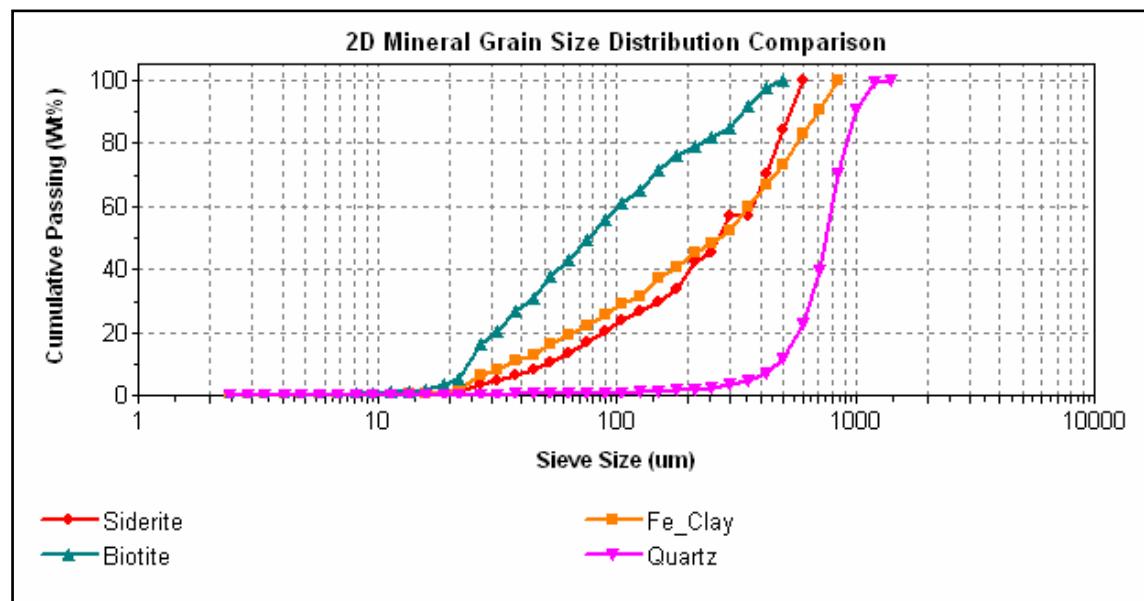


Figure 20 Grain Size Distribution Graph for Grouped Gangue _Sample 111_67-70
(Cumulative Passing, Equivalent Circle)

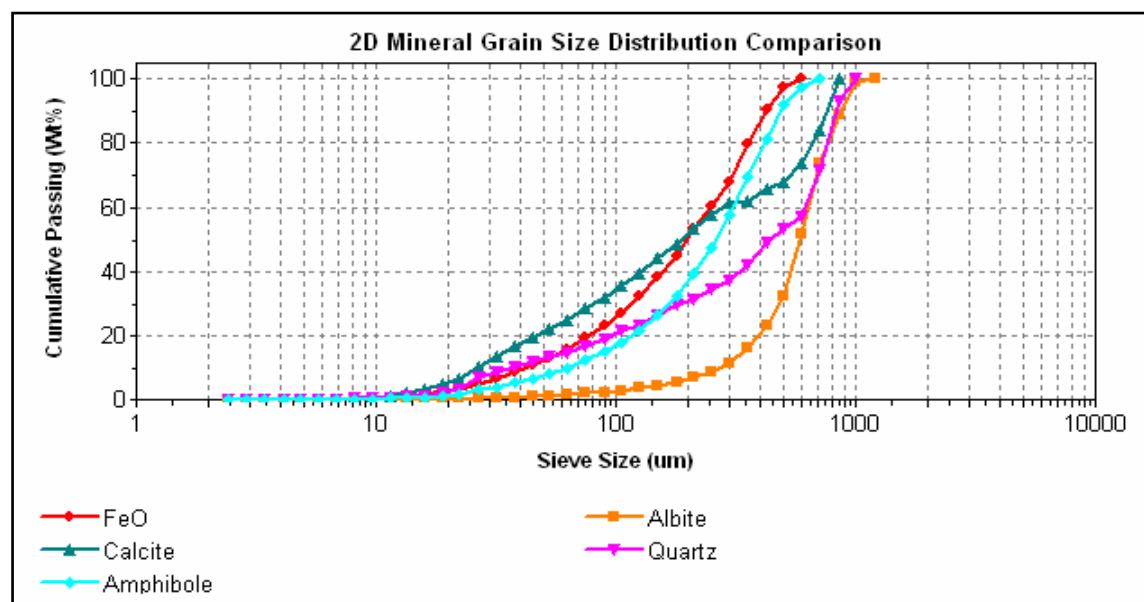


Figure 21 Grain Size Distribution Graph for Grouped Gangue _Sample 111_196-198
(Cumulative Passing, Equivalent Circle)

3.5.2 PSSA Data

The Phase Specific Surface Area (PSSA) data are presented for copper sulphide minerals and selected gangue minerals in Table 10 and a comparison of the PSSA data for significant copper bearing minerals is presented in Figure 22. Relatively coarse-grain phases will have a smaller PSSA value when compared with fine-grain phases. The PSSA value is only valuable as a comparison between samples.

The PSSA values for chalcopyrite were similar for the majority of samples with low values of 0.03 and 0.08 indicating the coarse-grain nature of the mineral. Samples

07_50-51 and 07_82-83 were distinguished by the relatively large PSSA value for chalcopyrite reflecting the fine-grain size of the minor occurrence in these two samples.

The PSSA values for chalcocite were variable with samples 07_82-83 and 111_67-70 having low values that supported a relatively coarse grain size when compared with the chalcocite in other samples (i.e. 0.73 for sample 79_84-86).

PSSA values for native-copper were relatively low for samples 07_50-51, 07_82-83 and 111_67-70 and 111_196-198. This supported the very coarse-grain nature of the native-copper in these samples. In contrast, PSSA values for samples 04_145-147 and 79_91-93 were much larger and supported a relatively fine-grain size for the minor occurrences of native-copper in these samples.

Table 10 PSSA Data for Copper and Grouped Gangue Minerals

Mineral	04_145-147	07_50-51	07_82-83	79_84-86	79_91-93	79_107-109	100_172_177	111_67-70	111_196-198
Chalcocite	0.11	0.1	0.06	0.73	0.3			0.06	
Chalcopyrite	0.03	0.29	0.28	0.04	0.03	0.04	0.07	0.14	0.08
Native_Copper	0.22	0.07	0.06		0.13			0.06	0.01
Pyrite	0.02	0.08	0.47	0.01	0.02	0.03	0.03	0.32	0.06
FeO	0.05	0.11	0.09	0.08	0.1	0.07	0.11	0.15	0.09
Apatite	0.06	0.18	0.08	0.06	0.08	0.05	0.04	0.21	0.16
Calcite	0.02	0.05	0.07	0.04	0.03	0.02	0.04	0.04	0.1
Dolomite	0.25	0.19	0.2	0.22	0.21	0.2	0.14	0.25	0.25
Siderite	0.05	0.09	0.1	0.27	0.04	0.12	0.09	0.08	0.14
Albite	0.06	0.24	0.28	0.06	0.08	0.07	0.07	0.24	0.04
Amphibole	0.04	0.16	0.16	0.05	0.03	0.08	0.05	0.24	0.07
Biotite	0.15	0.26	0.18	0.2	0.14	0.19	0.25	0.13	0.26
Chlorite	0.12	0.2	0.18	0.15	0.08	0.15	0.12	0.17	0.21
Fe_Clay	0.18	0.14	0.05	0.26	0.16	0.2	0.2	0.09	0.15
Orthoclase	0.07	0.29	0.14	0.07	0.14	0.19	0.07	0.16	0.21
Prehnite	0.26	0.25	0.23	0.1	0.21	0.23	0.2	0.26	0.27
Pyrophyllite	0.2	0.25	0.23	0.2	0.14	0.28	0.24	0.22	0.2
Pyroxene	0.22	0.24	0.27	0.06	0.2	0.23	0.19	0.25	0.26
Quartz	0.02	0.07	0.03	0.02	0.04	0.02	0.02	0.01	0.06

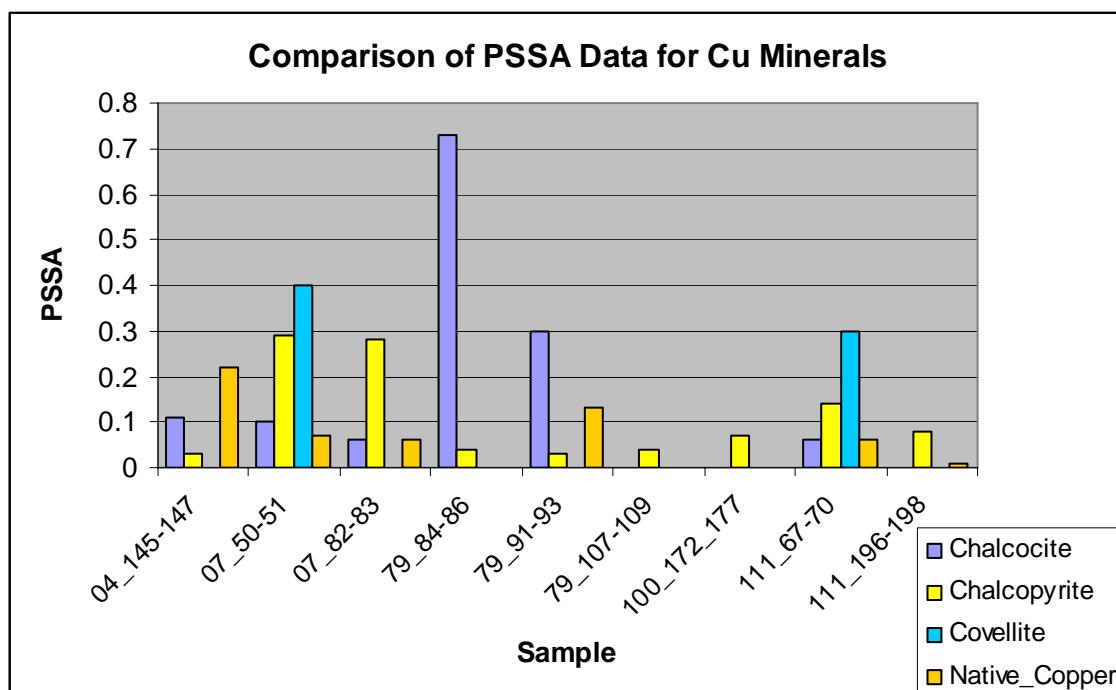


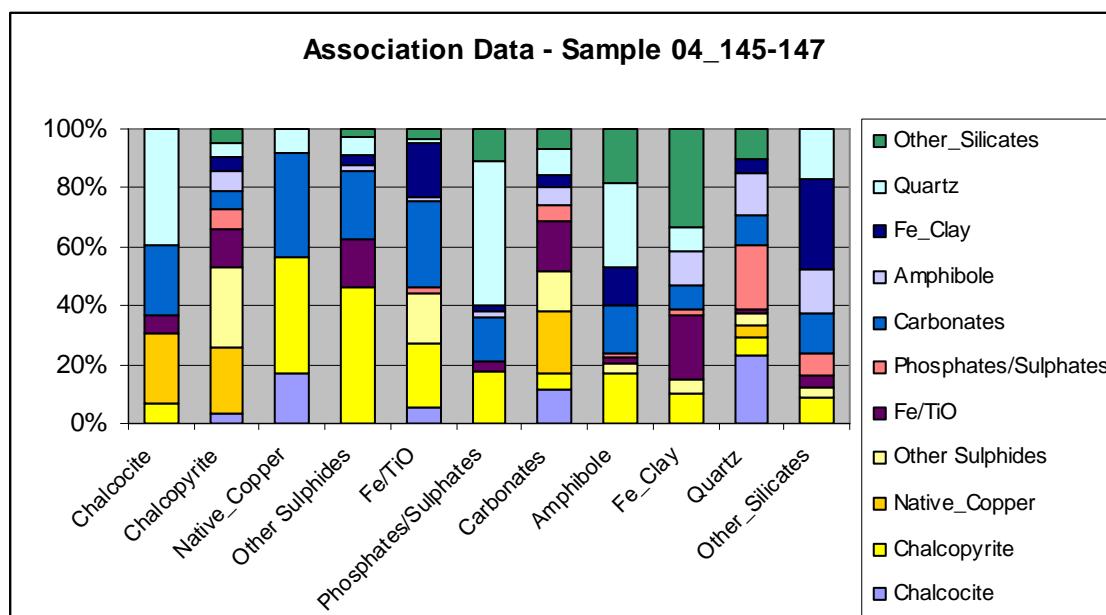
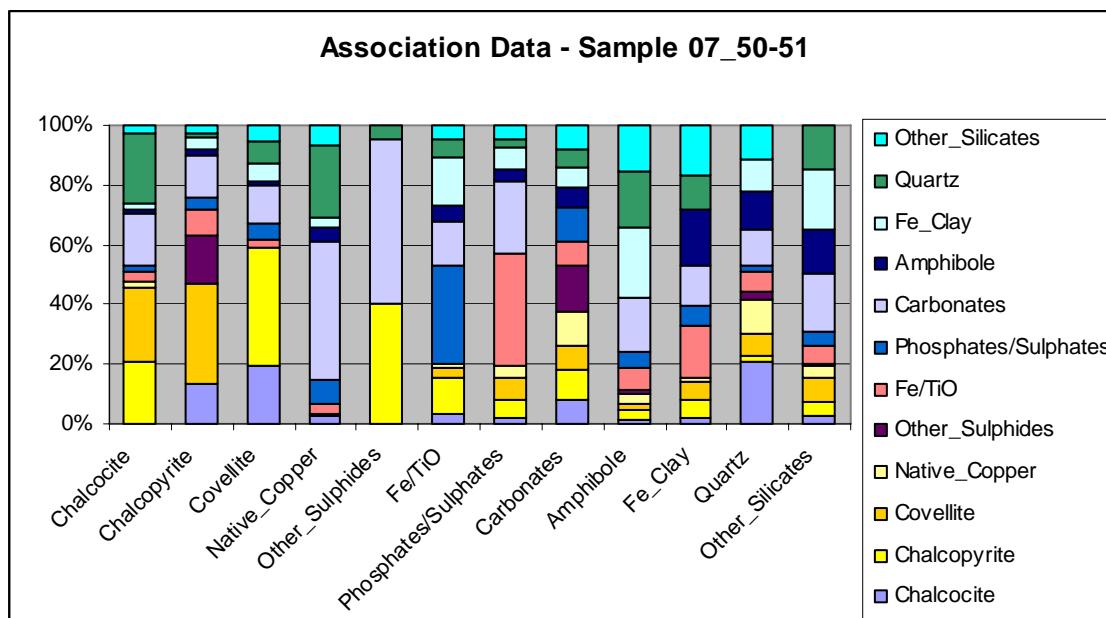
Figure 22 Comparison of PSSA Data for Copper Minerals

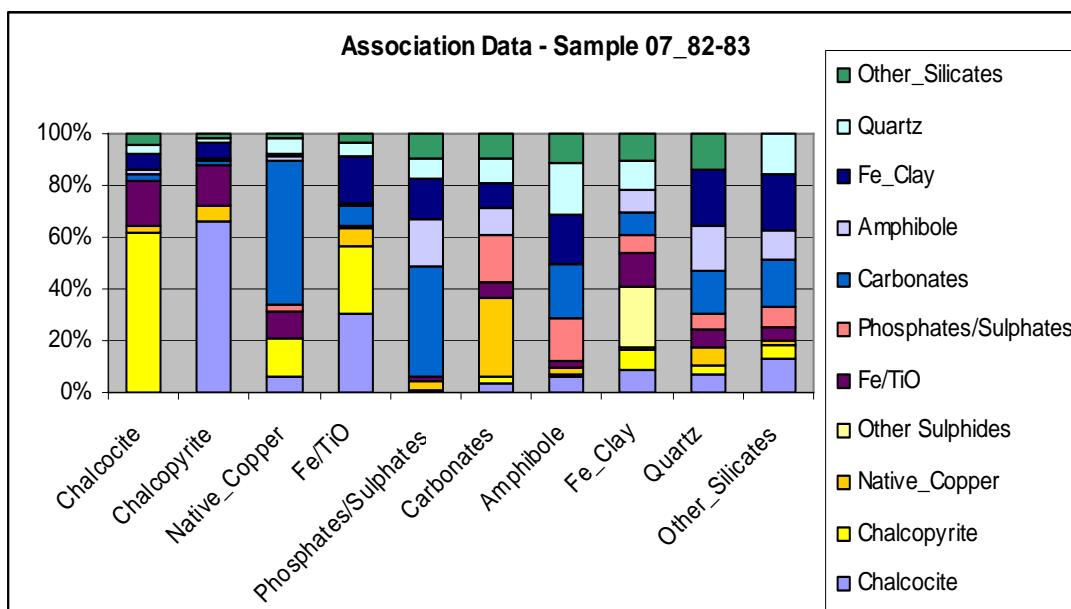
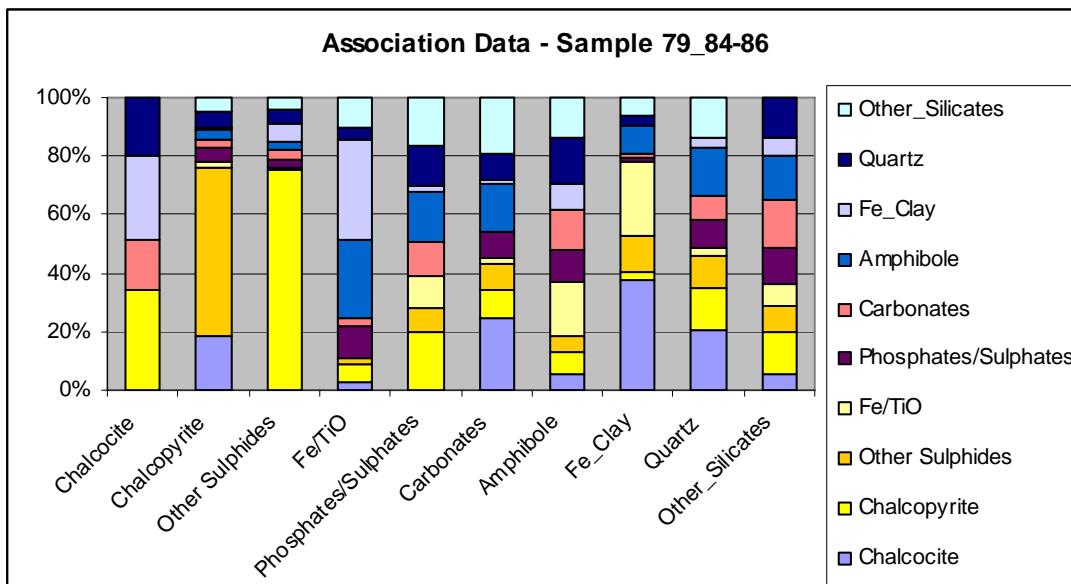
3.6 Mineral Association Data

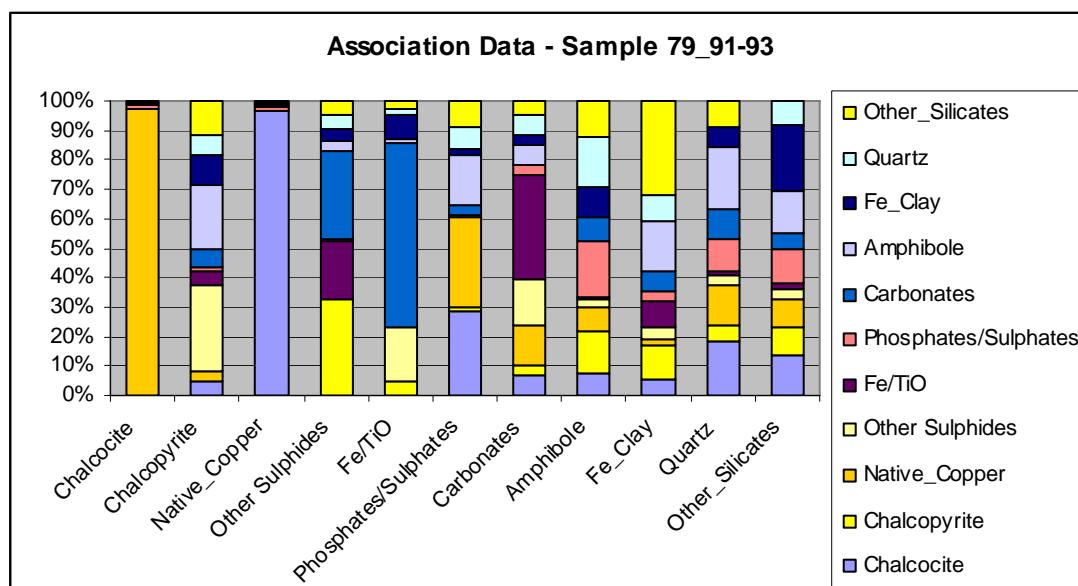
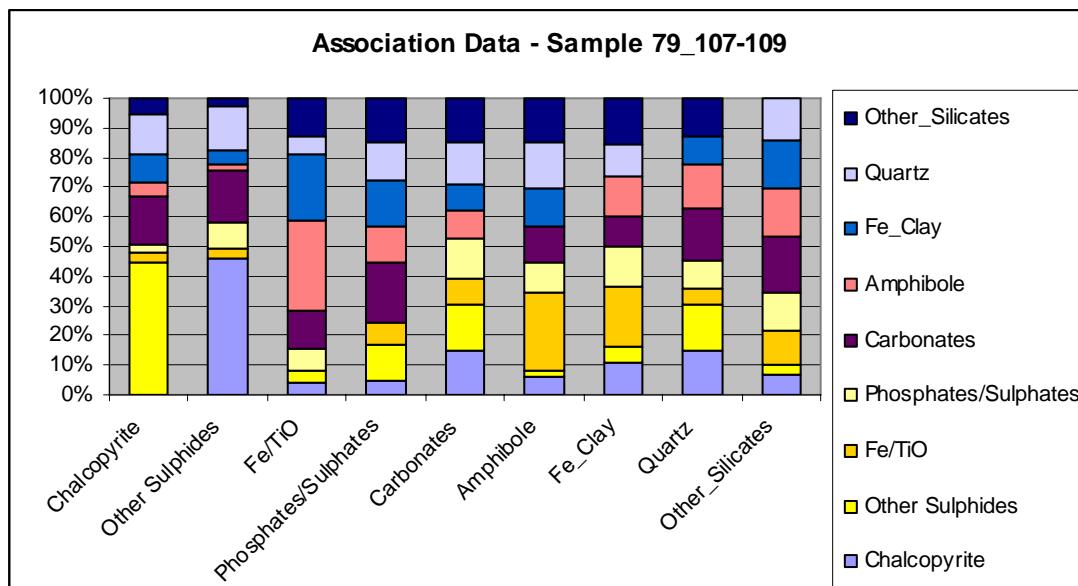
Mineral association calculates the percentage of the total phase boundary of the mineral of interest in contact with other mineral phases in the sample. The data does not account for the concentration of the phases within each sample (i.e. if the samples are 50 Wt% quartz then most other phases will show a strong association with quartz). The modal mineralogy data should be considered when interpreting any association data.

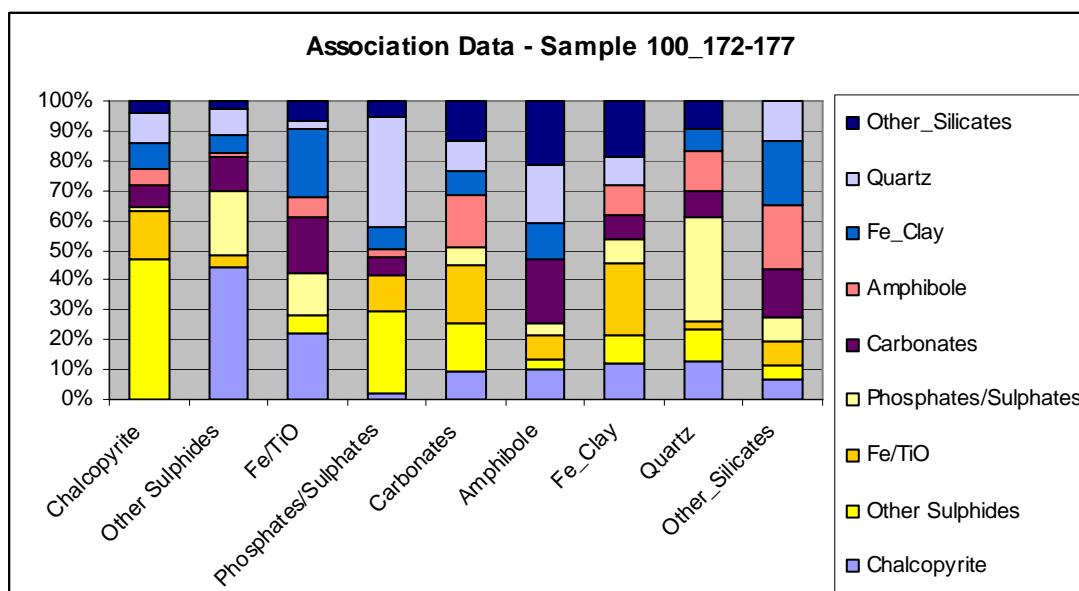
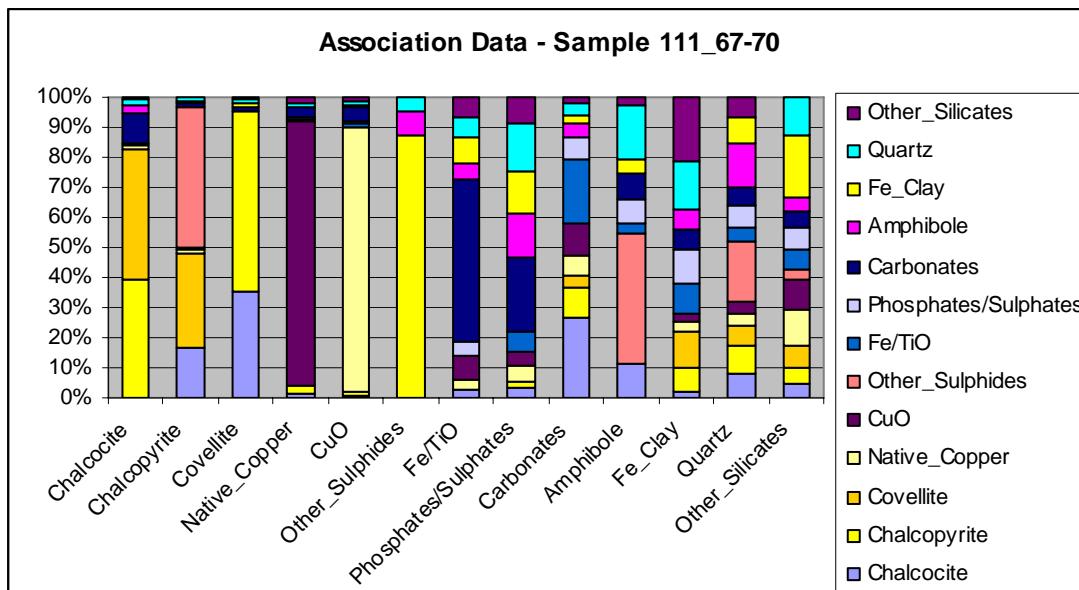
The gangue mineralogy has been grouped (Table 3) for presentation of tabular association data and is displayed in Appendix 5. Ungrouped association data can be obtained from the data bases on the client's CD. The free surface data has been removed and the remaining association percentages normalised to 100% for the graphical representation of the data.

The mineral association data for each sample is graphically presented in Figures 23-31. The data has been further grouped for display.

**Figure 23 Grouped Association Data – Sample 04_145-147****Figure 24 Grouped Association Data – Sample 07_50-51**

**Figure 25 Grouped Association Data – Sample 07_82-83****Figure 26 Grouped Association Data – Sample 79_84-86**

**Figure 27 Grouped Association Data – Sample 79_91-93****Figure 28 Grouped Association Data – Sample 79_107-109**

**Figure 29 Grouped Association Data – Sample 100_172-177****Figure 30 Grouped Association Data – Sample 111_67-70**

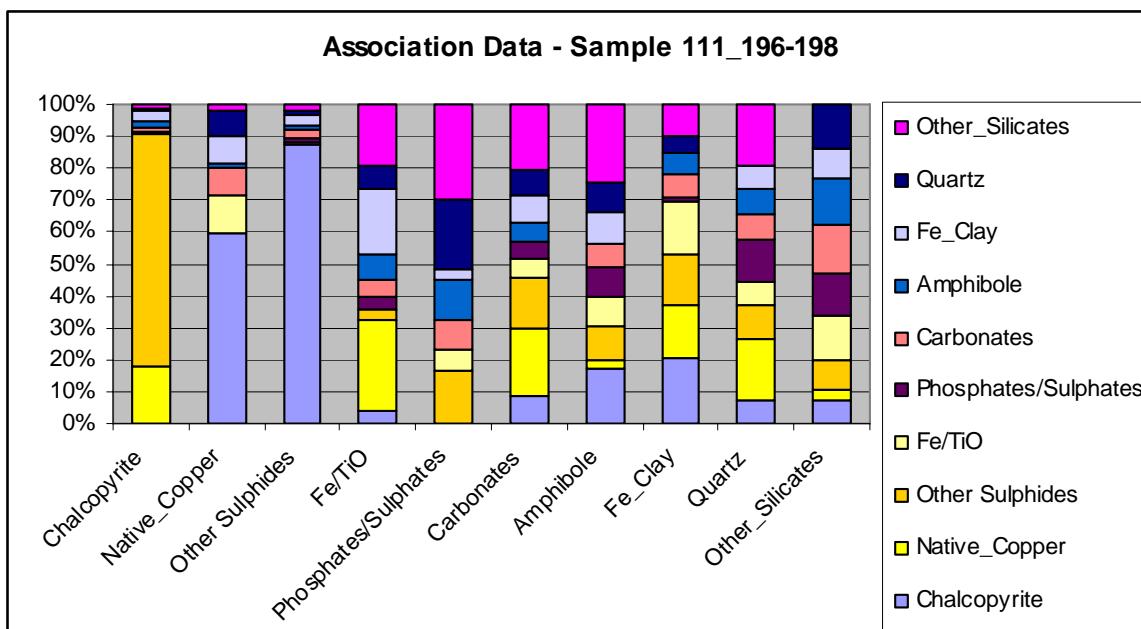


Figure 31 Grouped Association Data – Sample 111_196-198

The association data across the samples, the data for the most significant copper-bearing minerals (chalcopyrite, chalcocite and native copper), have been summarized in Tables 11 - 13 and Figures 32 - 34.

The association data for chalcopyrite (Table 11 and Figure 32), indicates a strong association with chalcocite in samples 07_50-51 and 07_82-83 (19.2 and 25.9 % respectively). The most consistent associations with chalcopyrite across all samples, were with carbonates, amphiboles, quartz and other silicates. The association between chalcopyrite and Fe_clays was strong for samples 07_82-83 and 111_67-70. Chalcopyrite grains also displayed a strong association with Fe/Ti oxides in sample 07_82-83 and with other-sulphides in samples 04_145-147 and 100_172-173.

Table 11 Comparison of Association Data for Chalcopyrite

Samples	Covellite	Chalcocite	Native_Copper	Copper Oxide	Other Sulphides	Fe/TiO	Phosphates/Sulphates	Carbonates	Amphibole	Fe_Clay	Quartz	Other_Silicates
04_145-147	-	0.3	0.1	-	22.5	4.3	0.5	16.4	17.2	7.8	15.8	15.2
07_50-51	0.3	19.2	0.0	-	0.1	5.0	1.9	59.2	2.1	5.0	4.1	3.1
07_82-83		25.9	1.5	-	-	22.0	0.0	7.1	0.5	34.5	4.9	3.5
79_84-86	-	0.0	-	-	11.0	8.6	0.6	5.9	29.6	1.1	16.0	27.3
79_91-93	-	0.0	0.0	-	15.9	2.0	0.1	7.1	47.5	7.8	5.2	14.4
79_107-109	-	-		-	9.4	2.3	0.1	37.7	9.2	5.2	25.7	10.3
100_172-173	-	-		-	19.1	5.6	0.0	21.1	20.4	6.3	16.8	10.6
111_67-70	1.4	5.8	0.8	0.4	0.9	0.0	0.1	17.3	0.0	24.8	35.8	12.7
111_196-198	-	-	0.8	-	10.4	5.1	0.0	7.1	23.5	11.0	6.1	36.0

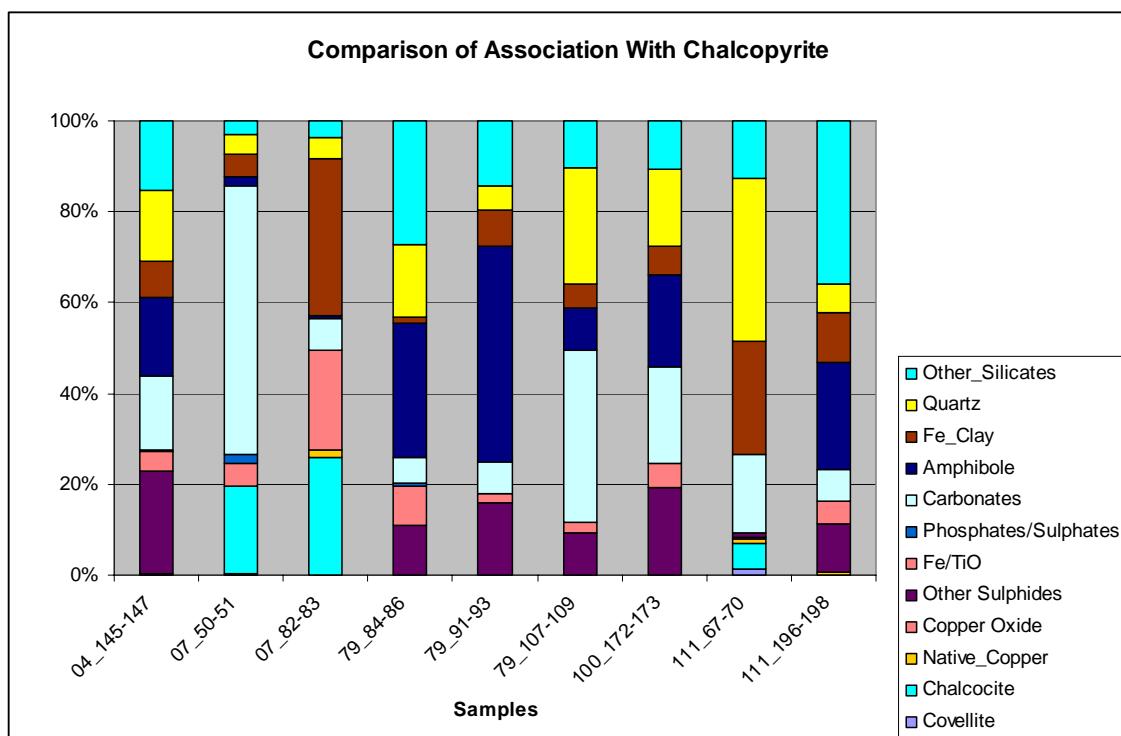
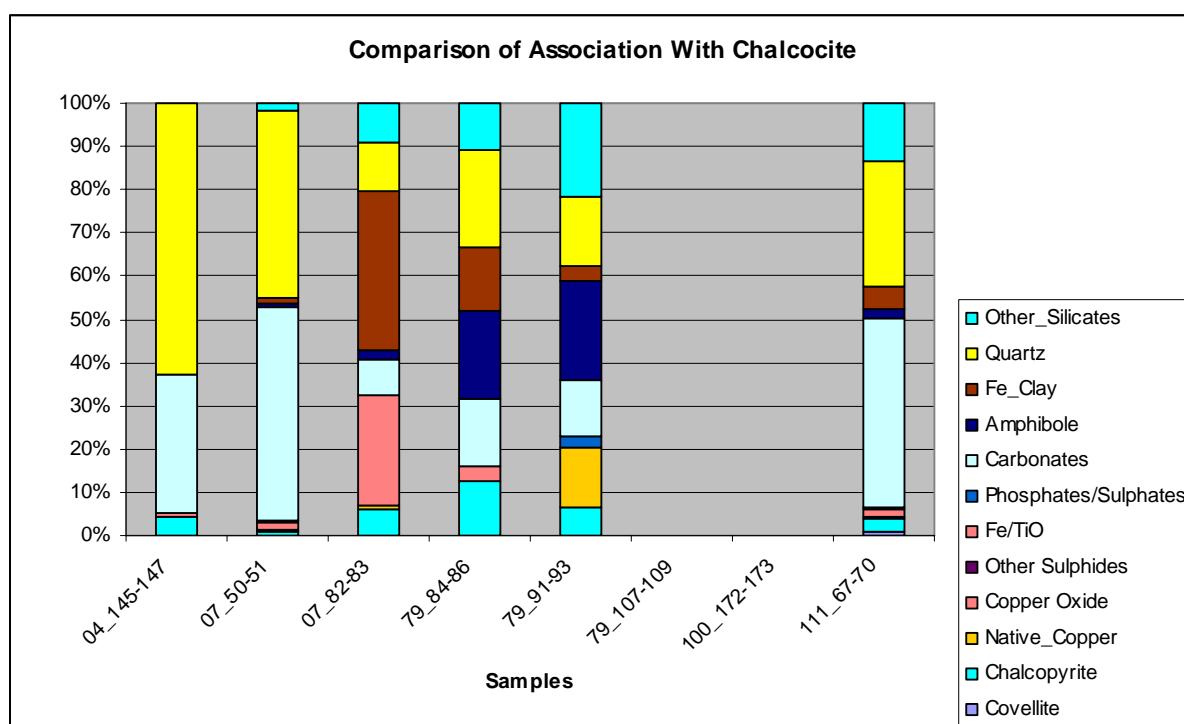


Figure 32 Comparison of Association Data for Chalcopyrite

The association data for chalcocite reveals a consistent, if not particularly strong, association with chalcopyrite across all samples that contained chalcocite (Table 12 and Figure 33). Other consistently strong associations were measured for carbonates and quartz. Chalcocite also displayed a strong association with Fe/Ti oxides in sample 07_82-83, amphiboles in samples 79_84-86 and 79_91-93 and Fe-clays in sample 07_82-83.

Table 12 Comparison of Association Data for Chalcocite

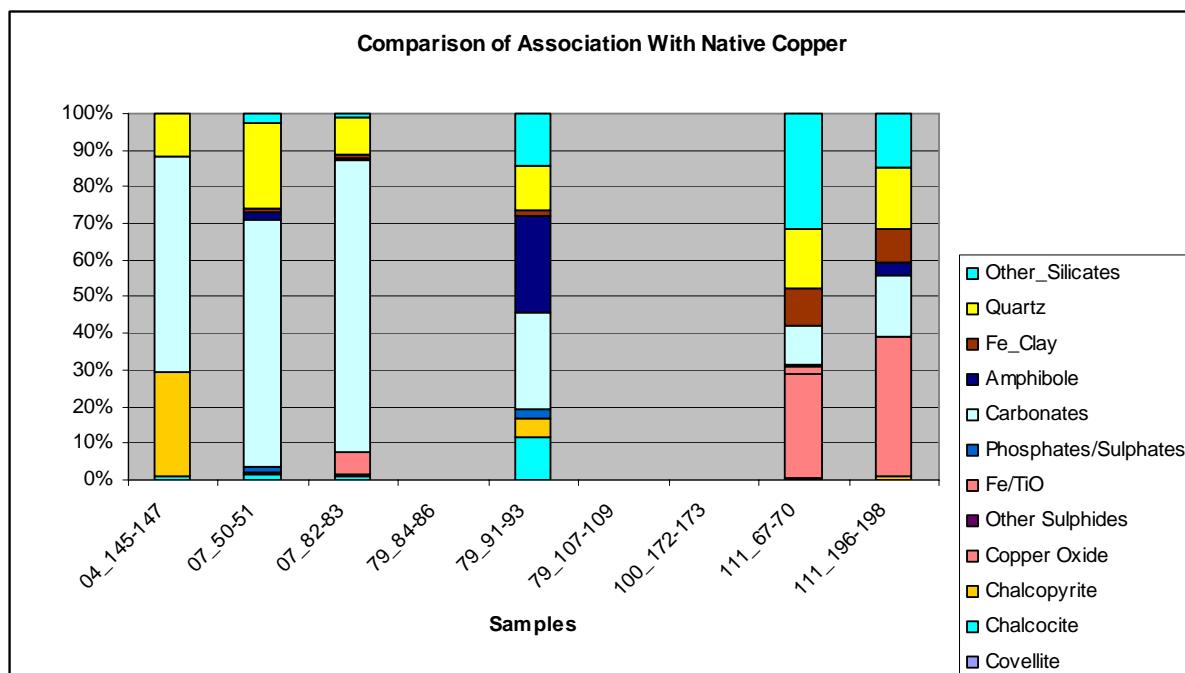
Samples	Covellite	Chalcopyrite	Native_Copper	Copper Oxide	Other Sulphides	Fe/TiO	Phosphates/Sulphates	Carbonates	Amphibole	Fe_Clay	Quartz	Other_Silicates
04_145-147	-	4.1	0.0	-	0.0	1.1	0.0	31.8	0.0	0.0	62.8	0.1
07_50-51	0.2	0.7	0.6	-	0.0	1.4	0.6	49.3	1.0	1.4	43.0	1.8
07_82-83	-	6.1	0.7	-	-	25.5	0.0	8.1	2.3	37.1	11.1	9.1
79_84-86	-	12.5		-	0.0	3.6	0.0	15.4	20.4	15.0	22.4	10.9
79_91-93	-	6.4	14.1	-	0.0	0.0	2.3	13.0	23.0	3.6	16.2	21.4
79_107-109	-	-	-	-	-	-	-	-	-	-	-	-
100_172-173	-	-	-	-	-	-	-	-	-	-	-	-
111_67-70	0.8	3.1	0.3	0.2	0.0	1.7	0.2	44.0	1.9	5.5	28.9	13.4
111_196-198	-	-	-	-	-	-	-	-	-	-	-	-

**Figure 33 Comparison of Association Data for Chalcocite**

Native copper displayed a strong association with chalcopyrite in sample 04_145-147 and with chalcocite in sample 07_91-93 (Table 13 and Figure 34). Rimming of native-copper by copper-oxides/carbonates is reflected in the strong association between the two minerals in sample 111_67-70. Consistently strong associations with native-copper were with carbonates and quartz.

Table 13 Comparison of Association Data for Native-Copper

Samples	Covellite	Chalcocite	Chalcopyrite	Copper Oxide	Other Sulphides	Fe/TiO	Phosphates/Sulphates	Carbonates	Amphibole	Fe_Clay	Quartz	Other_Silicates
04_145-147	-	1.0	28.6	-	0.0	0.0	0.0	58.7	0.0	0.0	11.7	0.0
07_50-51	0.0	1.5	0.0	-	0.0	0.7	1.3	67.6	2.1	1.2	23.2	2.5
07_82-83	-	1.0	0.5	-	-	6.1	0.2	79.2	0.9	1.1	10.0	1.0
79_84-86	-	-	-	-	-	-	-	-	-	-	-	-
79_91-93	-	11.6	5.4	-	0.0	0.0	2.5	26.3	26.3	1.5	12.0	14.4
79_107-109	-	-	-	-	-	-	-	-	-	-	-	-
100_172-173	-	-	-	-	-	-	-	-	-	-	-	-
111_67-70	0.0	0.1	0.2	28.4	0.0	2.2	0.4	11.1	0.0	10.2	16.1	31.4
111_196-198			0.9		0.0	38.1	0.0	16.9	3.5	9.0	16.9	14.8

**Figure 34 Comparison of Association Data for Native-Copper**

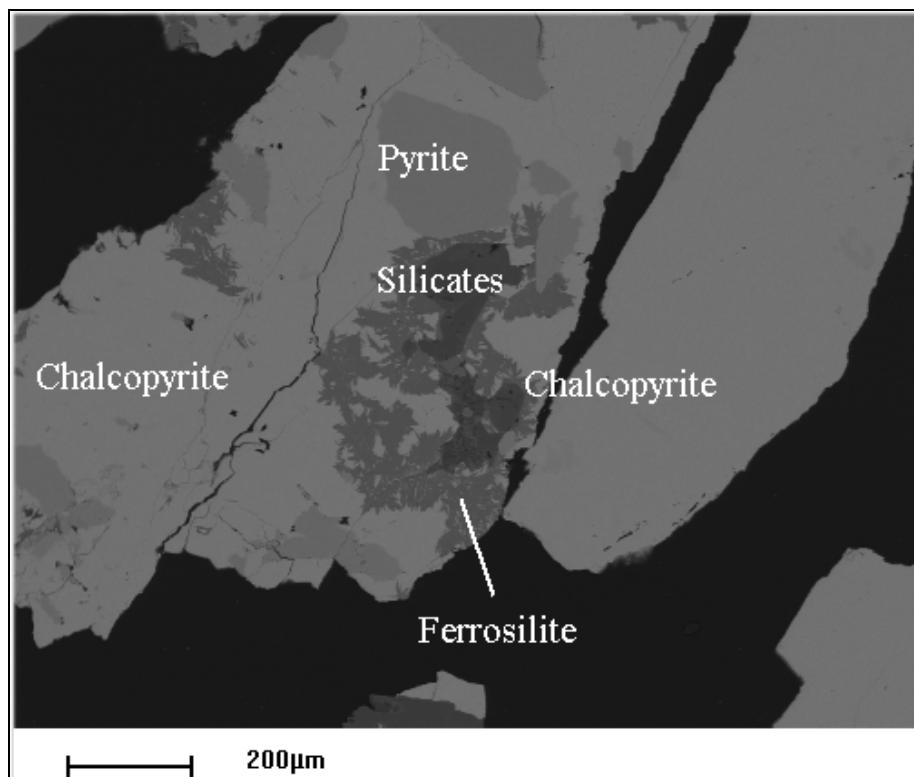


Figure 35 SEM Photomicrograph of coarse-grain chalcopyrite associated with gangue mineralogy – Sample 79_91-93

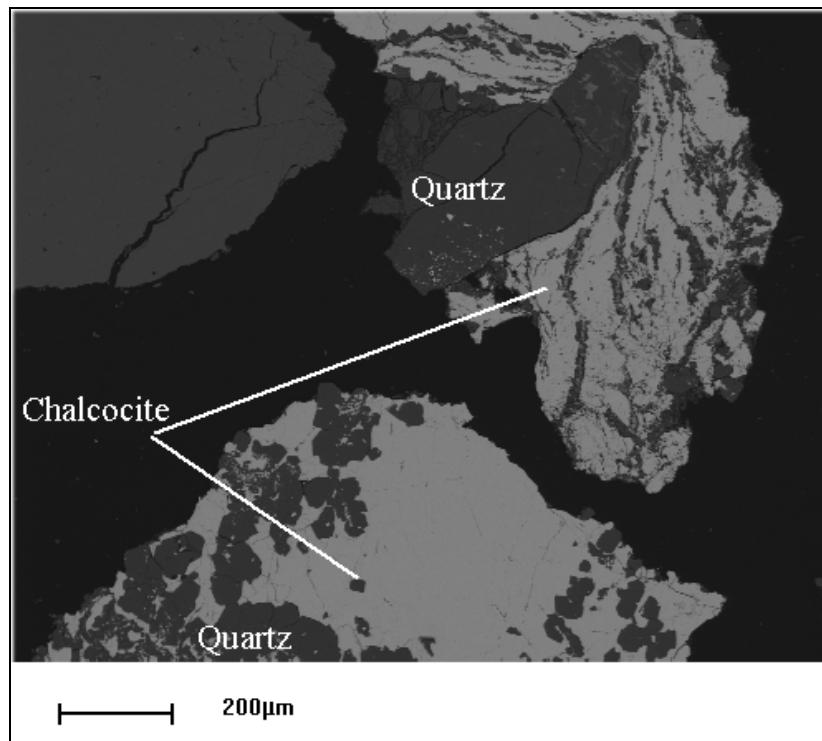


Figure 36 SEM Photomicrograph of different textures observed for chalcocite associated with gangue mineralogy – Sample 07_50-51

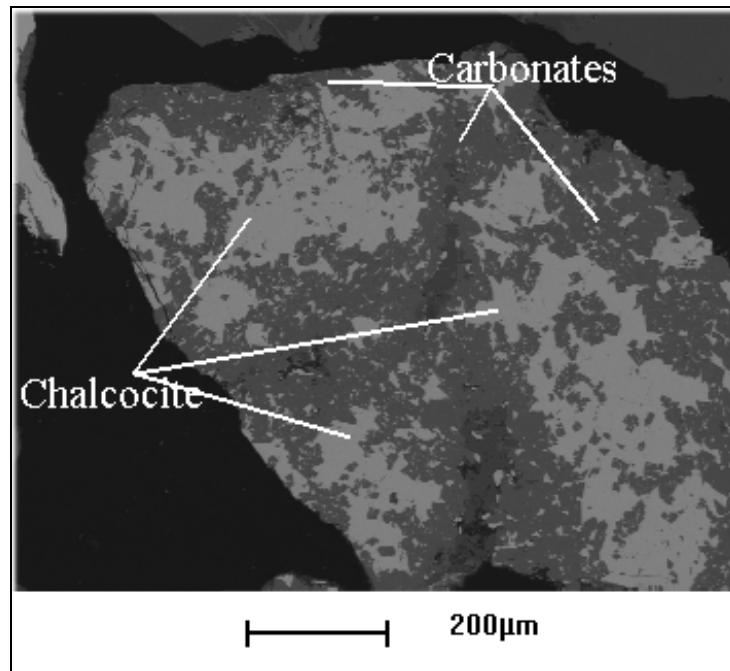


Figure 37 SEM Photomicrograph of a common texture illustrating the strong association of chalcocite with carbonates– Sample 07_50-51

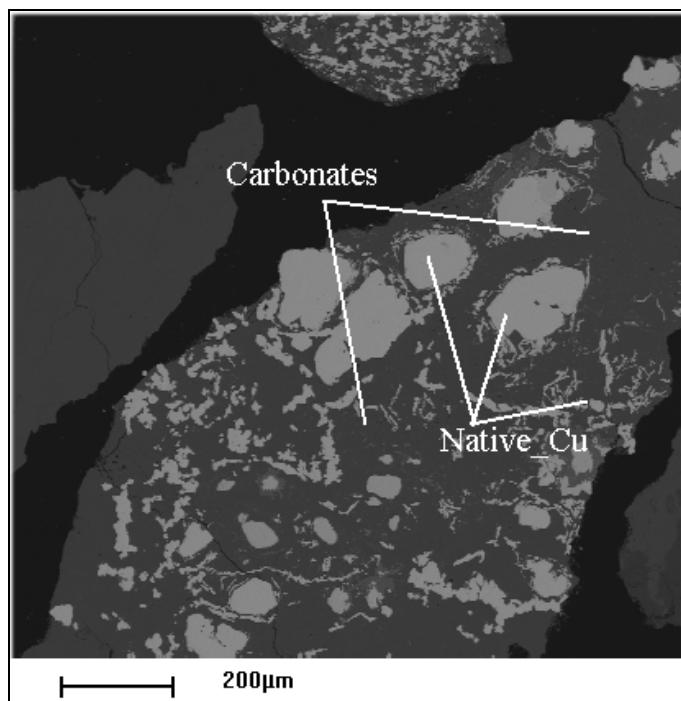


Figure 38 SEM Photomicrograph of native-copper illustrating the strong association with carbonate gangue mineralogy – Sample 07_50-51

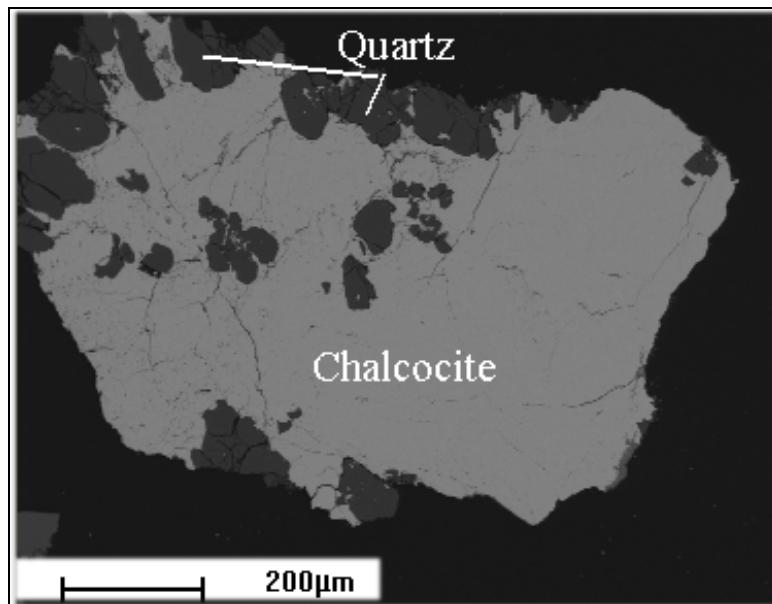


Figure 39 SEM Photomicrograph of coarse-grain chalcocite associated with silicate gangue mineralogy – Sample 07_50-51

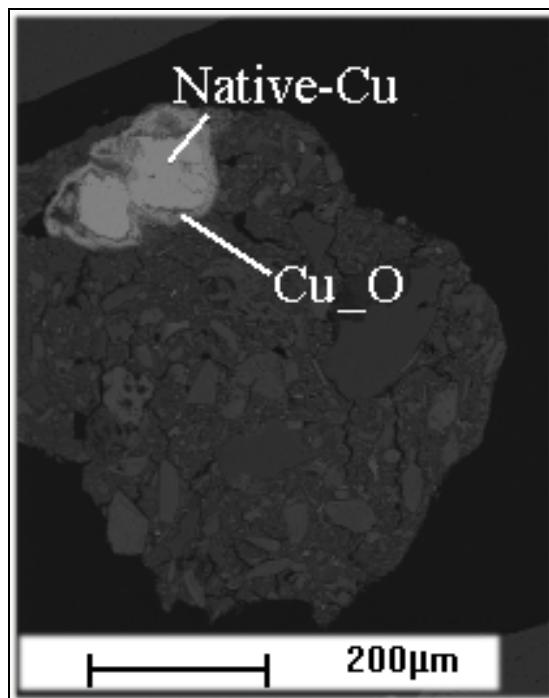


Figure 40 SEM Photomicrograph of native-copper rimmed by copper-oxide/carbonate - 111_67-70

4. PARTICLE IMAGES

Particle images of chalcopyrite, chalcocite and native-copper are displayed below for samples where the modal abundance is >1.0 Wt% (Figures 41 to 50).

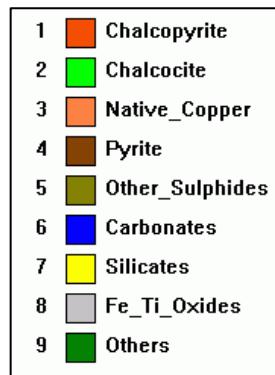


Figure 41 Colour Legend for Particles

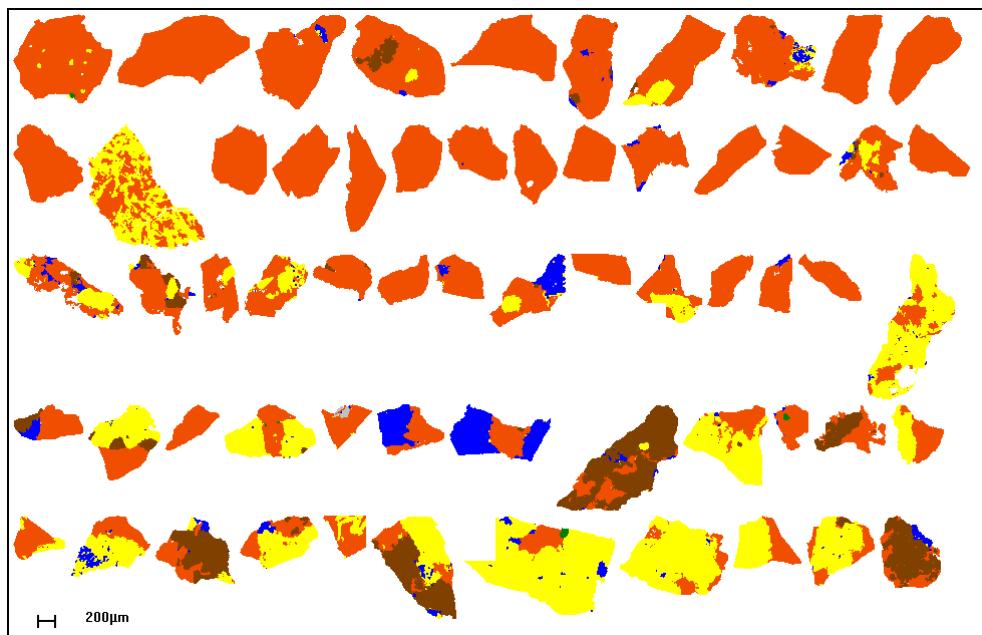


Figure 42 Particle Images of Chalcopyrite for Sample 04_145-147

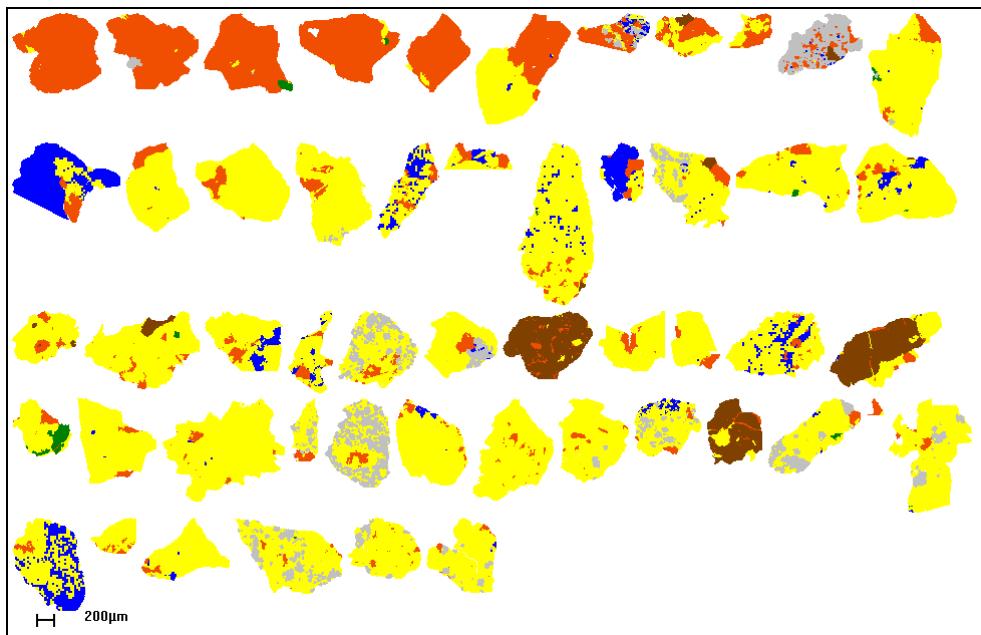


Figure 43 Particle Images of Chalcopyrite for Sample 79_84-8

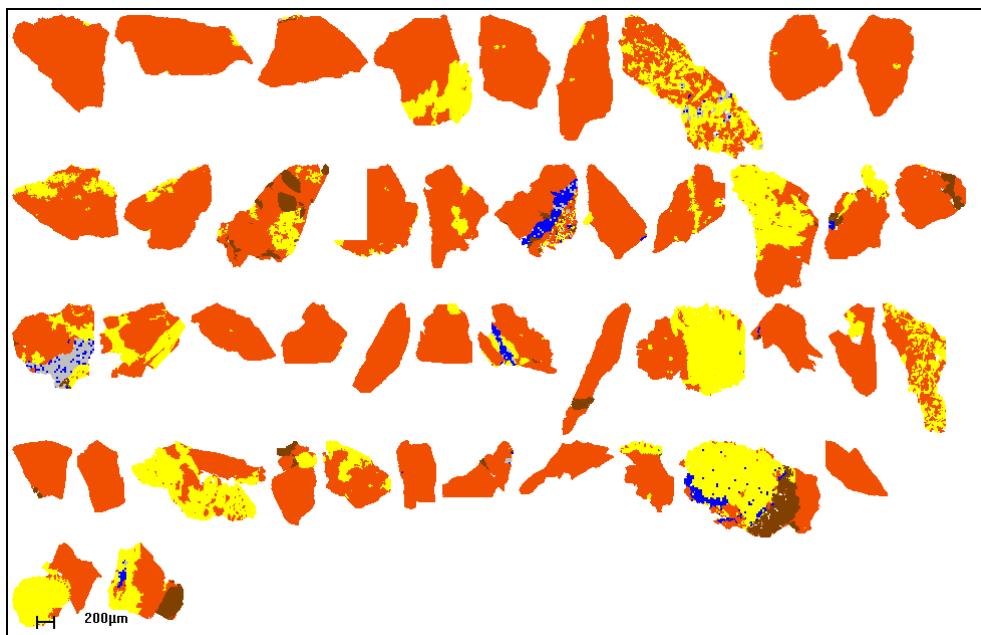


Figure 44 Particle Images of Chalcopyrite for Sample 79_91-93

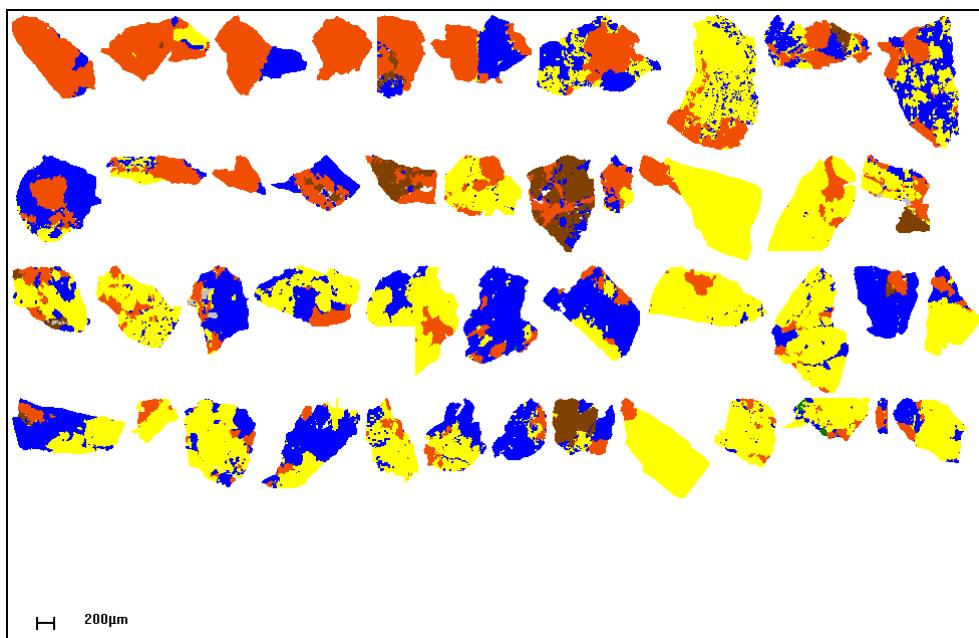


Figure 45 Particle Images of Chalcopyrite for Sample 79_107-109

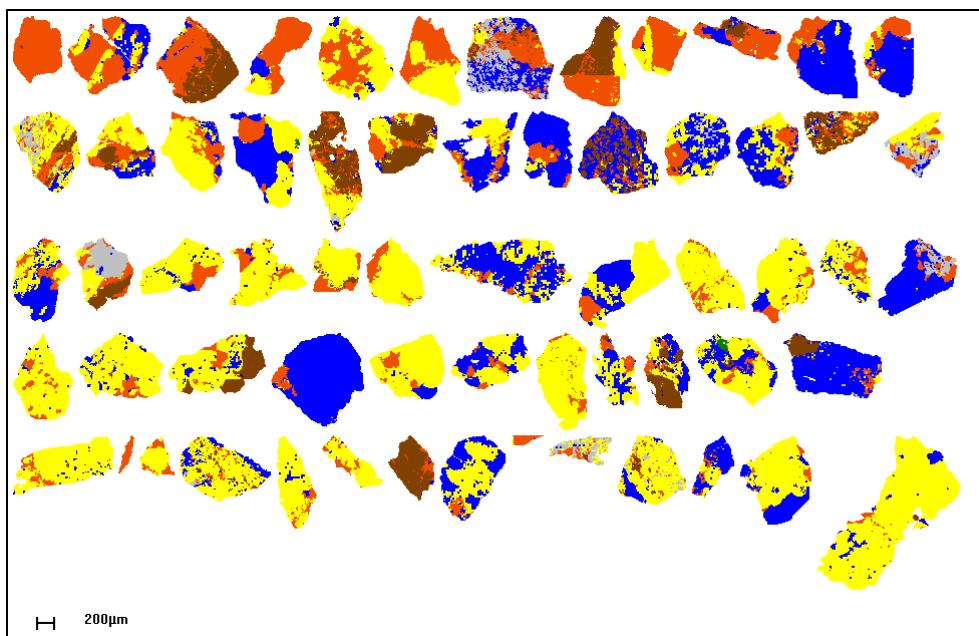


Figure 46 Particle Images of Chalcopyrite for Sample 100_172-173

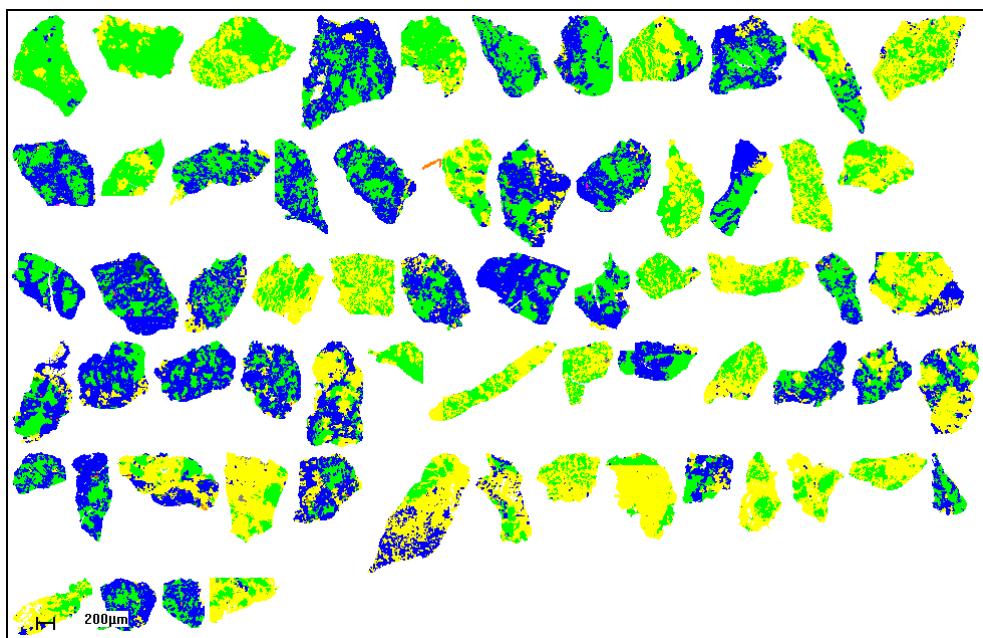


Figure 47 Particle Images of Chalcocite for Sample 07_50-51

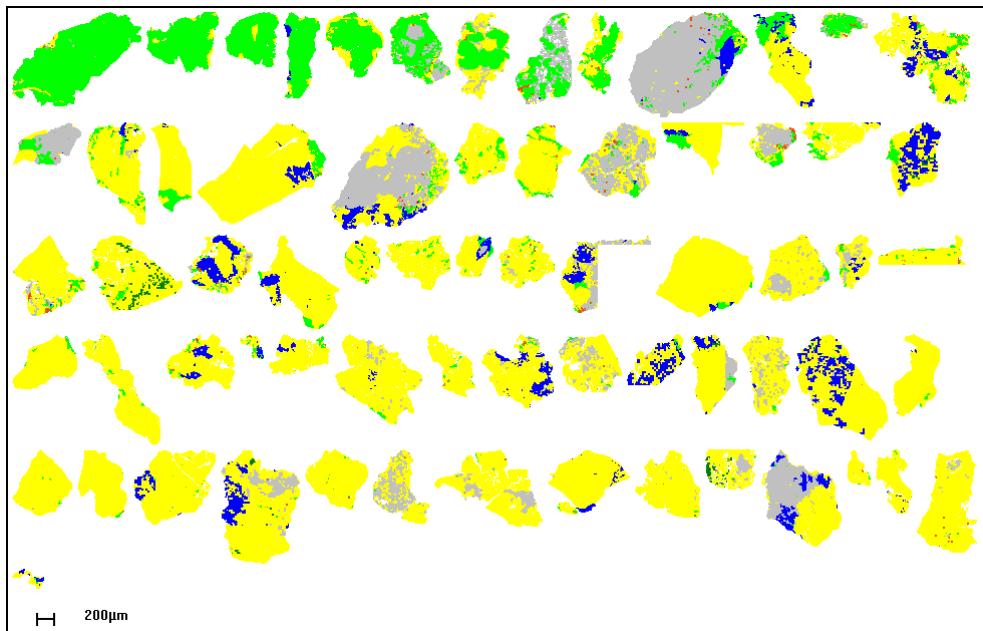


Figure 48 Particle Images of Chalcocite for Sample 07_82-83

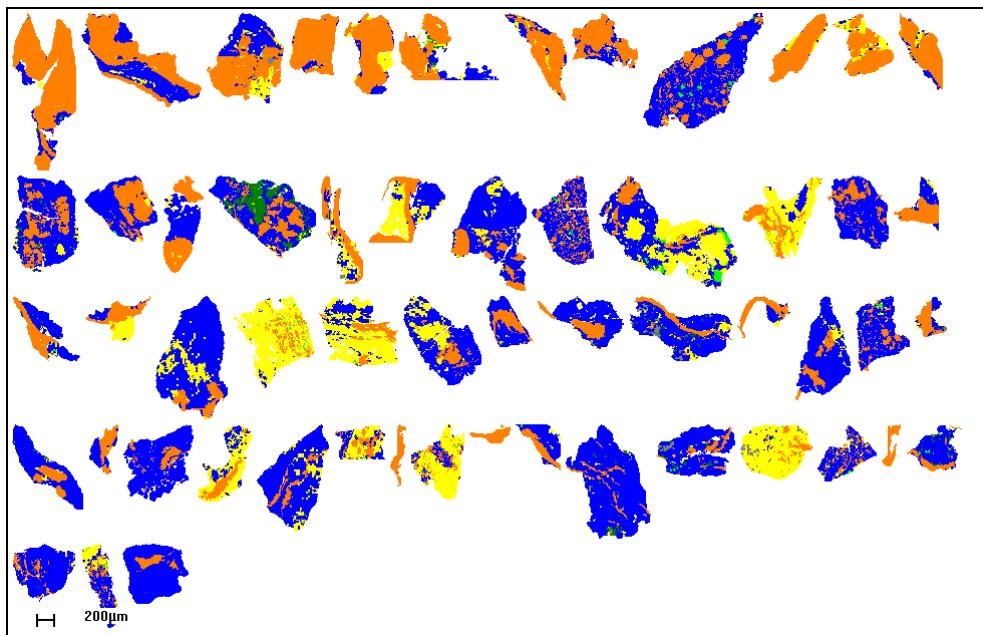


Figure 49 Particle Images of Native Copper for Sample 07_50-51

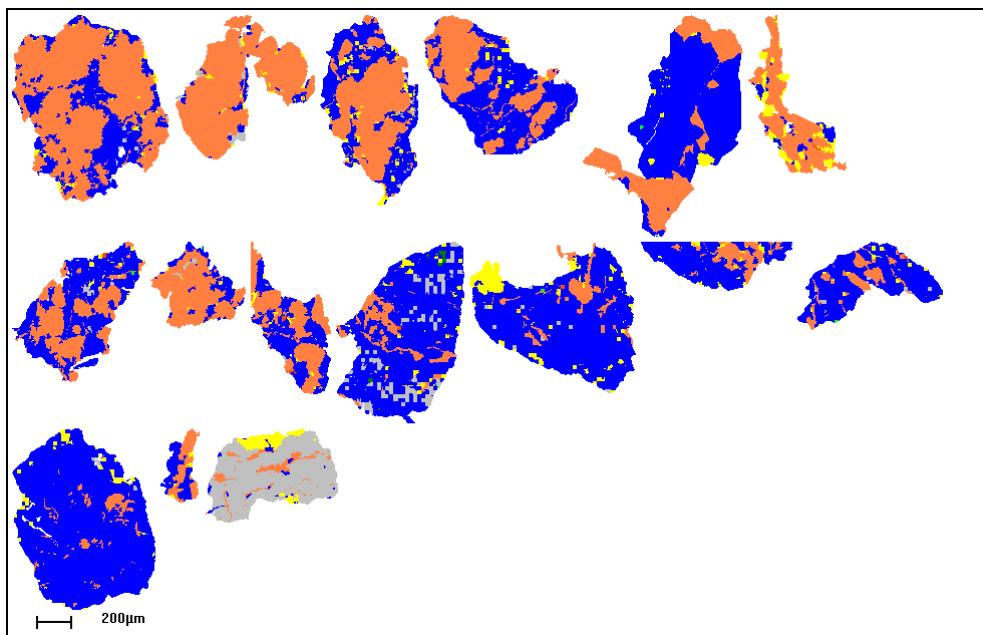


Figure 50 Particle Images of Native Copper for Sample 07_82-83

5. GOLD MINERALOGY

Only one sample (79_91-93) was analysed for gold deportment. The gold search found only seven visible gold particles, all less than 10 μm in size. Of these particles four were locked with chalcopyrite, two with pyrite and one with Fe oxide that is locked in pyrite (Figures 51 to 55).

It is recommended that a gold deportment study be done when flotation concentrates are available, as this should be provide more statistically significant data.

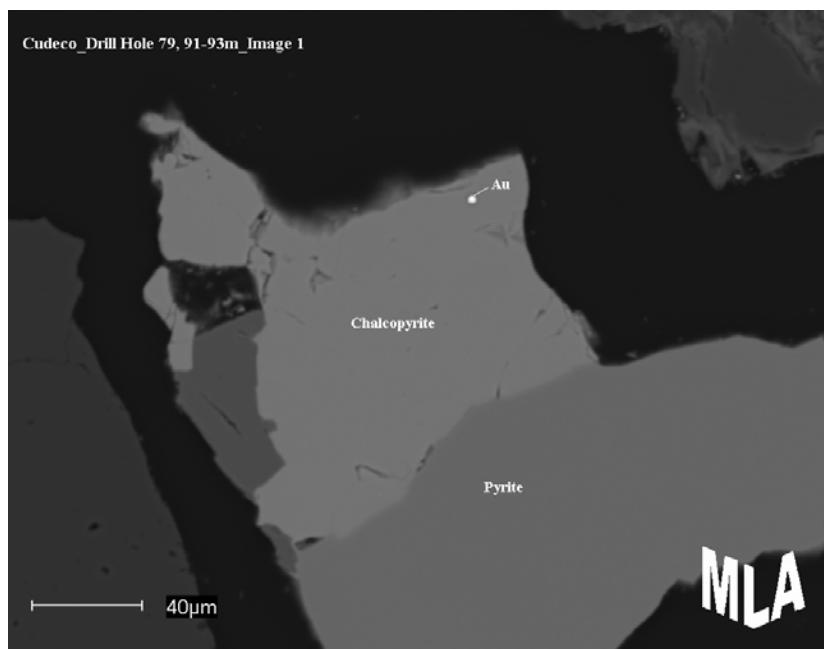


Figure 51 Gold locked in chalcopyrite (Sample 79_91-93)

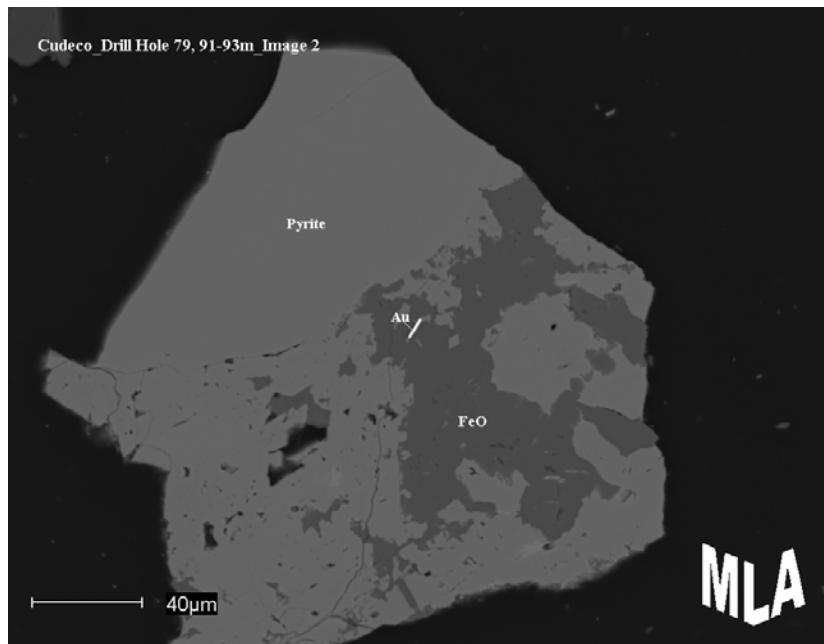


Figure 52 Gold locked in occluded Fe Oxide (Sample 79_91-93)

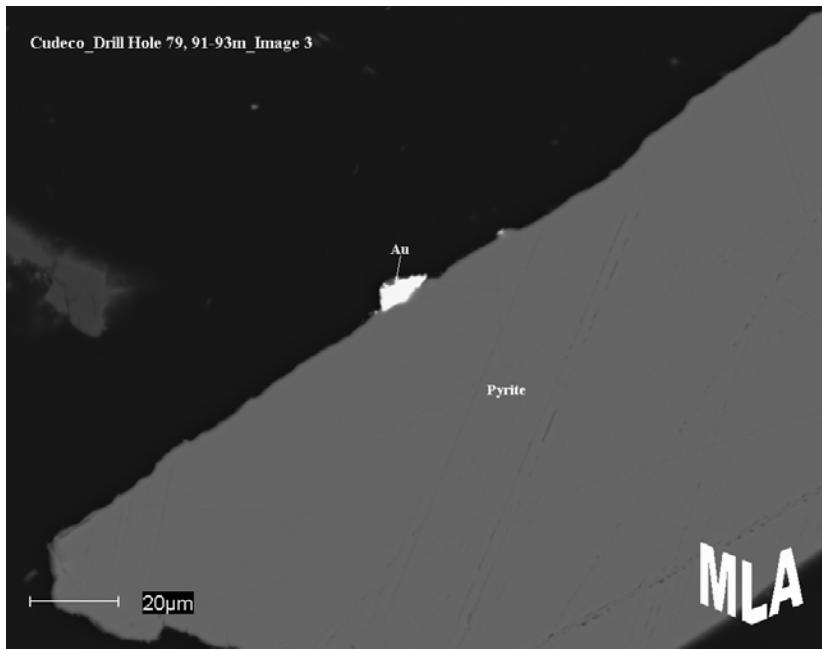


Figure 53 Gold associated with pyrite (Sample 79_91-93)

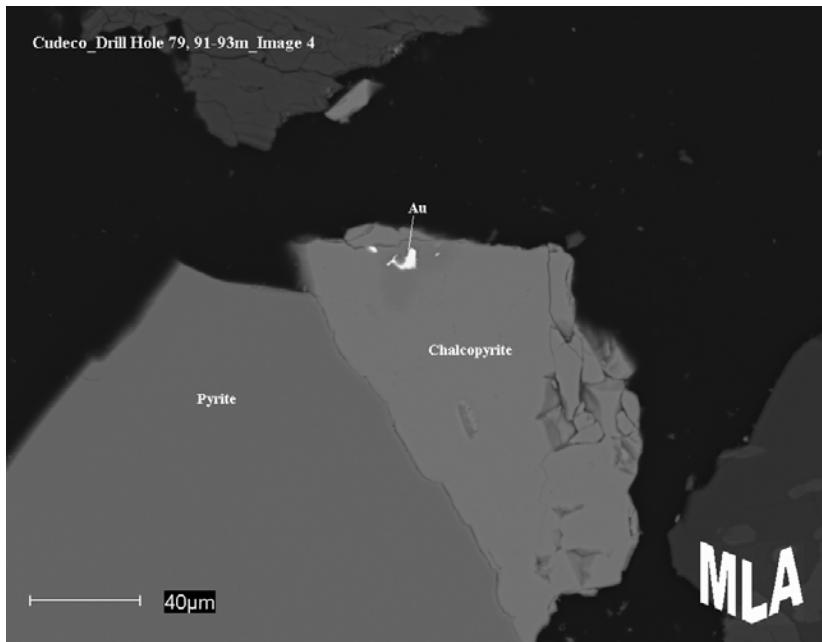


Figure 54 Gold (3 grains) locked in chalcopyrite (Sample 79_91-93)

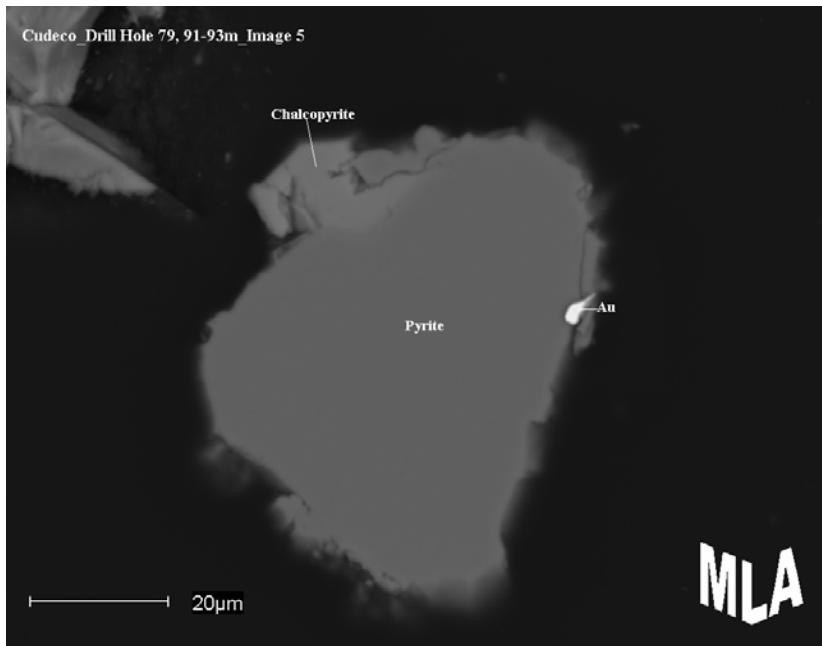


Figure 55 Gold associated with pyrite (Sample 79_91-93)

6. SUMMARY

Nine CuDeco Rocklands Project ore samples were analysed using the MLA to quantify modal mineralogy, elemental deportment, grain size and mineral association.

Significant copper minerals identified are chalcopyrite, chalcocite and native copper. Chalcopyrite is a major source of copper in samples 04_145-147, 79_84-86, 79_91-93 and 79_172-1732. Chalcocite is an important source of copper in samples 07_50-51, 07_82-83, and 111_67_70. Native copper is a significant source of copper for samples 07_50-51, 07_82-83, 111_67-70 and 111_196-198.

Linnaeite was the only Co-bearing mineral found (samples 04_145-147, 79_91-93 and 79_107-109).

Non-silicate gangue minerals included pyrite (samples 04_145-147, 79_84-86, 79_91-93, 79_107-109 and 100_172-173), quartz, amphiboles and carbonates. Sample 79_84-86 had a significant amount of iron oxide while sample 07_83-83 had significant clay content. Carbonate content was high in samples 04_145-147 and 07_50-51.

Relatively coarse-grained chalcopyrite are present in those samples having significant chalcopyrite ($P_{80} > 140\mu\text{m}$ and in some samples a P_{20} of $> 400\mu\text{m}$).

Chalcocite grains have a P_{80} of $> 130\mu\text{m}$ in samples 07_50-51 and 07_82-83.

In the two samples containing significant native copper the P_{80} of the metal is $> 180\mu\text{m}$.

Chalcopyrite was consistently associated with carbonates, amphiboles, quartz and silicates across all samples. There is a strong association between chalcopyrite and clays in samples 07_82-83 and 111_67-70.

Chalcocite has a consistent association with chalcopyrite across all samples. Native copper displayed a strong association with chalcopyrite in sample 04_145-147 and with chalcocite in sample 07_91-93. Rimming of native copper by copper-

oxides/carbonates is reflected in the strong association between the two minerals in sample 111_67-70. Consistently strong associations with native copper were with carbonates and quartz.

The few gold particles found in sample 79_91-93 showed a strong association with sulphides (chalcopyrite and pyrite). The gold grains are <10µm in size.

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Appendix 1 - Elemental Composition

Mineral	Density	Al	Ba	C	Ca	Cl	Co	Cu	F	Fe	H	K	Mg	Mn	Mo	Na	Ni	O	P	S	Si	Ti	Y
Chalcocite	5.8							78.85	1										20.15				
Chalcopyrite	4.19							34.63	30.43										34.93				
Covellite	4.7							67.06	0.73										32.22				
Native_Copper	8.94							100															
CuO	6.42							79.08	0.7									20.21					
Linnæite	4.75							38.96	0.51	1.52							15.6			43.41			
Molybdenite	4.8															59.94				40.06			
Pyrite	4.9									46.55										53.45			
FeO	5.2									72.36								27.64					
FeO_Sil_Int	5	1.22			0.16			1.07	60.8		0.53							32.33			3.89		
Ilmenite	4.67								34.81			1.97						31.64			31.58		
Rutile	4.46																	40.05			59.95		
Apatite	3.75				39.74			3.77										38.07	18.42				
Xenotime	4.66	1.16			1.74				5.53									34.04	11.66	2.86		39.9	
Alunite	2.75	20.23	0.79						6.11	0.5	7.09							47.81		17.45	0.03		
Calcite	2.79			12	40.05													47.95					
Calcite_Mn	2.79			11.86	36.54												4.19			47.41			
Dolomite	2.9			12.33	20.57					7.64			8.31	1.88					49.27				
Siderite	3.8			10.49	3.03					44.56									41.92				
Siderite_2	3.8			10.62	2.92					39.25			0.93	3.86					42.43				
Albite	2.62	10.29																8.77	48.81			32.13	
Albite_2	2.62	10.89			0.92													7.98	48.71			31.5	
Amphibole	3.07	0.25			8.2					7.62	0.2		11.22					0.36	45			27.14	
Amphibole_2	3.07	0.62			7.78					17.26			4.98	0.43				0.34	43.35			25.24	
Amphibole_3	3.07	1.14			8.13					13.25			7.21	0.17				0.4	44.08			25.62	
Biotite	2.99	8.26				0.32				20.95	0.5	3.7	7.99						41.29			16.98	
Biotite_2	2.99	8				0.49		0.87		14.94	0.5	5.31	6.6						42.14			19.54	1.61
Biotite_3	2.99	8.71				0.28		1.45		21.63		2.08	6.49						41.86			16.98	0.53
Chlorite	2.42	11.01								18.35	0.5		12.3						42.62			15.23	
Chlorite_2	2.42	10.24								26.91			6.64	0.32					41.51			14.37	
Chlorite_3	2.42	6.18								28.97			6.6						41.44			16.82	
Chlorite_4	2.42	8.35								32.38			3.75						40.7			14.83	
Chlorite_5	2.42	6.88			0.19					27.62		0.26	6.19						41.72			17.13	
Fe_Clay	2.34	4.08			0.75	0.38				30.66	0.5	0.6	3.58						40.62			18.82	
Fe_Clay_2	2.34	2.87								26.8	0.5	1.53	2.35						42.34			23.61	
Fe_Clay_3	2.34	8.29			0.31					30.47	0.5	0.83	0.93						41			17.66	
Ferrosilite	3.73	0.26								40.65			0.68						39.59			18.82	
Illite	2.83	21.03								1.23	0.5	3.54							48.35			25.35	
Orthoclase	2.57	9.69										14.05							45.99			30.27	
Prehnite	2.92	11.16			15.52					11.68									42.71			18.93	
Pyrophyllite	2.84	14.98									0.56								53.28			31.18	
Pyrophyllite_2	2.84	4.85									0.5								52.19			42.46	
Pyroxene	3.36	0.41			15.56					7.39			7.04				0.47	43.62			25.52		
Titanite	3.5	0.66			20.25													41.41			16.07	21.61	
Quartz	2.65																	53.3			46.7		

Appendix 2 Ungrouped Modal Abundance and Grain Count

CuDeco_04_145-147

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite	0.18	147
Chalcopyrite	12.36	1793
Native_Copper	0.01	11
Linnaeite	0.03	319
Molybdenite		
Pyrite	15.52	443
FeO	1.58	246
FeO_SiL_Int	0.24	549
Ilmenite		
Rutile	0.00	8
Apatite	0.20	86
Xenotime		
Alunite		
Calcite	16.64	3573
Calcite_Mn	5.21	14036
Dolomite	0.20	1238
Siderite	2.26	779
Siderite_2	0.90	1802
Albite	1.09	1606
Albite_2	0.97	1716
Amphibole	8.70	2509
Amphibole_2	0.24	1177
Amphibole_3	1.38	4349
Biotite	0.16	428
Biotite_2	0.33	867
Biotite_3	0.20	1186
Chlorite	0.13	304
Chlorite_2	0.24	567
Chlorite_3	0.02	135
Chlorite_4	0.19	792
Chlorite_5	0.30	1138
Fe_Clay	0.70	2621
Fe_Clay_2	0.06	568
Fe_Clay_3	0.11	896
Ferrosilite	0.08	304
Illite	0.02	51
Orthoclase	0.14	144
Prehnite	0.21	1310
Pyrophyllite	0.00	1
Pyrophyllite_2	0.18	880
Pyroxene	0.38	1877
Titanite	0.03	246
Quartz	28.80	2509
Total	100.00	53211

CuDeco_07_50-51

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite	10.62	10620
Chalcopyrite	0.09	845
Covellite	0.02	172
Native_Copper	10.02	4261
CuO		
Linnaeite		
Molybdenite	0.00	3
Pyrite	0.05	27
FeO	1.06	1851
FeO_Sil_Int	2.41	3330
Ilmenite		
Rutile	0.00	1
Apatite	1.34	4461
Xenotime	0.00	2
Alunite		
Calcite	8.00	26525
Calcite_Mn	25.87	11703
Dolomite	0.83	3883
Siderite	2.98	2467
Siderite_2	14.58	12232
Albite	0.00	23
Albite_2	0.00	18
Amphibole	1.81	4583
Amphibole_2	0.86	5514
Amphibole_3	0.39	1877
Biotite	0.00	31
Biotite_2	0.01	86
Biotite_3	0.09	616
Chlorite	0.00	17
Chlorite_2	0.02	145
Chlorite_3	0.02	161
Chlorite_4	0.06	396
Chlorite_5	0.10	594
Fe_Clay	2.50	7482
Fe_Clay_2	0.43	3201
Fe_Clay_3	0.00	28
Ferrosilite	0.14	860
Illite	0.00	3
Orthoclase	0.00	16
Prehnite	0.47	2942
Pyrophyllite	0.00	4
Pyrophyllite_2	0.11	784
Pyroxene	0.91	5053
Titanite	0.00	5
Quartz	14.20	8051
Total	100.00	124873

CuDeco_07_82-83

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite	3.80	1713
Chalcopyrite	0.12	574
Native_Copper	3.44	873
Linnaeite		
Molybdenite		
Pyrite	0.00	1
FeO	1.01	1487
FeO_Sil_Int	5.40	4747
Ilmenite		
Rutile	0.05	59
Apatite	0.61	597
Xenotime	0.06	112
Alunite		
Calcite	3.48	6127
Calcite_Mn	6.02	5464
Dolomite	0.62	2318
Siderite	0.20	632
Siderite_2	6.53	3696
Albite	0.01	50
Albite_2	0.00	31
Amphibole	0.63	647
Amphibole_2	0.88	4073
Amphibole_3	0.13	553
Biotite	0.01	57
Biotite_2	0.02	97
Biotitte_3	0.31	1056
Chlorite	0.01	62
Chlorite_2	0.05	245
Chlorite_3	0.05	345
Chlorite_4	0.10	588
Chlorite_5	0.44	1847
Fe_Clay	27.30	11270
Fe_Clay_2	0.41	3227
Fe_Clay_3	0.01	50
Ferrosilite	0.08	461
Illite	0.01	33
Orthoclase	0.03	67
Prehnite	0.60	2674
Pyrophyllite	0.00	4
Pyrophyllite_2	0.32	1688
Pyroxene	0.09	452
Titanite	0.06	142
Quartz	37.11	4826
Total	100.00	62945

CuDeco_79_84-86

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite	0.00	6
Chalcopyrite	3.28	1329
Native_Copper		
Linnaeite		
Molybdenite		
Pyrite	6.35	118
FeO	14.34	5451
FeO_Sil_Int	1.51	4951
Ilmenite	0.00	2
Rutile		
Apatite	0.36	129
Xenotime		
Alunite		
Calcite	4.65	2161
Calcite_Mn	1.34	4460
Dolomite	0.07	379
Siderite	0.01	31
Siderite_2	0.01	36
Albite	2.03	2818
Albite_2	1.63	3179
Amphibole	21.70	11879
Amphibole_2	1.05	4103
Amphibole_3	9.83	21022
Biotite	0.02	142
Biotite_2	0.32	1351
Biotite_3	0.10	466
Chlorite	0.03	169
Chlorite_2	0.08	208
Chlorite_3	0.00	6
Chlorite_4	0.02	127
Chlorite_5	0.03	160
Fe_Clay	0.37	3116
Fe_Clay_2	0.04	237
Fe_Clay_3	0.01	85
Ferrosilite	0.02	89
Illite	0.00	20
Orthoclase	1.74	817
Prehnite	0.43	668
Pyrophyllite	0.00	4
Pyrophyllite_2	0.13	641
Pyroxene	7.51	3761
Titanite	0.10	407
Quartz	20.91	2619
Total	100.00	77147

CuDeco_79_91-93

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite	0.01	35
Chalcopyrite	24.68	4739
Native_Copper	0.03	16
Linnaeite	0.04	354
Molybdenite		
Pyrite	17.52	797
FeO	2.52	2621
Ilmenite	0.00	1
Rutile	0.00	4
Apatite	0.24	125
Xenotime		
Alunite	0.00	9
Calcite	4.32	3803
Dolomite	0.07	302
Siderite	8.42	5340
Albite	0.92	1501
Amphibole	30.32	21512
Biotite	0.27	815
Chlorite	1.09	1951
Fe_Clay	1.13	3945
Ferrosilite	0.81	1389
Illite	0.06	55
Orthoclase	0.02	43
Prehnite	0.11	423
Pyrophyllite	0.10	329
Pyroxene	0.40	1336
Titanite	0.02	72
Quartz	6.92	1855
Total	100.00	53372

CuDeco_79_107-109

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite		
Chalcopyrite	5.06	1136
Native_Copper		
Linnaeite	0.02	87
Molybdenite		
Pyrite	4.66	297
FeO	5.62	1716
FeO_Sil_Int	0.43	1238
Ilmenite	0.00	3
Rutile	0.00	2
Apatite	0.19	43
Xenotime		
Alunite		
Calcite	31.28	5816
Calcite_Mn	9.82	24121
Dolomite	0.47	1935
Siderite	0.34	442
Siderite_2	0.21	547
Albite	1.22	1041
Albite_2	0.80	1564
Amphibole	5.82	4799
Amphibole_2	0.28	1443
Amphibole_3	0.91	3078
Biotite	0.04	98
Biotite_2	0.05	233
Biotitite_3	0.12	516
Chlorite	0.05	150
Chlorite_2	0.12	456
Chlorite_3	0.01	72
Chlorite_4	0.30	776
Chlorite_5	0.14	669
Fe_Clay	0.40	2582
Fe_Clay_2	0.23	808
Fe_Clay_3	0.05	173
Ferrosilite	0.02	122
Illite	0.00	12
Orthoclase	0.02	56
Prehnite	0.63	2772
Pyrophyllite	0.00	5
Pyrophyllite_2	0.08	546
Pyroxene	0.97	4236
Titanite	0.11	685
Quartz	29.56	2800
Total	100.00	67075

CuDeco_100_172-177

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite		
Chalcopyrite	3.63	2759
Native_Copper		
Linnaeite	0.00	21
Molybdenite		
Pyrite	8.12	887
FeO	1.27	956
FeO_SiL_Int	0.30	979
Ilmenite	0.00	2
Rutile	0.00	1
Apatite	0.20	49
Xenotime		
Alunite	0.00	1
Calcite	17.08	7295
Calcite_Mn	5.63	17064
Dolomite	0.83	2296
Siderite	0.59	683
Siderite_2	0.39	721
Albite	1.16	1681
Albite_2	1.13	2023
Amphibole	14.75	10442
Amphibole_2	1.54	5524
Amphibole_3	8.33	14747
Biotite	0.01	41
Biotite_2	0.11	703
Biotite_3	0.09	681
Chlorite	0.01	53
Chlorite_2	0.14	355
Chlorite_3	0.01	67
Chlorite_4	0.43	976
Chlorite_5	0.14	683
Fe_Clay	0.72	3294
Fe_Clay_2	0.10	679
Fe_Clay_3	0.06	597
Ferrosilite	0.07	373
Illite	0.00	11
Orthoclase	0.33	225
Prehnite	0.97	3665
Pyrophyllite	0.00	4
Pyrophyllite_2	0.09	624
Pyroxene	2.17	7272
Titanite	0.19	659
Quartz	29.41	3047
Total	100.00	92140

CuDeco_111_67-70

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite	0.18	58
Chalcopyrite	0.03	60
Covellite	0.00	20
Native_Copper	0.54	109
CuO	0.13	239
Linnaeite		
Molybdenite		
Pyrite	0.00	8
FeO	0.29	508
FeO_Sil_Int	0.87	1258
Ilmenite	0.07	147
Rutile	0.25	460
Apatite	0.12	420
Xenotime	0.01	42
Alunite		
Calcite	0.51	418
Calcite_Mn	0.50	446
Dolomite	0.02	77
Siderite	0.24	480
Siderite_2	1.74	775
Albite	0.02	102
Albite_2	0.02	120
Amphibole	0.01	43
Amphibole_2	0.10	428
Amphibole_3	0.01	60
Biotite	0.40	1126
Biotite_2	0.91	1808
Biotitte_3	1.93	4791
Chlorite	0.16	559
Chlorite_2	0.18	623
Chlorite_3	0.02	80
Chlorite_4	0.18	837
Chlorite_5	0.44	1487
Fe_Clay	3.93	6935
Fe_Clay_2	0.22	1236
Fe_Clay_3	3.23	4255
Ferrosilite	0.02	89
Illite	0.00	12
Orthoclase	0.10	219
Prehnite	0.08	379
Pyrophyllite	0.01	25
Pyrophyllite_2	0.59	2617
Pyroxene	0.02	104
Titanite	0.01	36
Quartz	81.91	2361
Total	100.00	35857

CuDeco_111_196-198

Mineral	Mineral Weight (%)	Grain Count
Bornite		
Chalcocite		
Chalcopyrite	0.06	47
Native_Copper	0.61	6
Linnaeite		
Molybdenite	0.00	2
Pyrite	0.26	91
FeO	11.72	6279
FeO_Sil_Int	1.90	5088
Ilmenite	0.26	856
Rutile	0.00	14
Apatite	0.62	1514
Xenotime	0.00	7
Alunite		
Calcite	2.70	3850
Calcite_Mn	1.13	6142
Dolomite	0.08	496
Siderite	0.07	291
Siderite_2	0.16	128
Albite	31.82	14279
Albite_2	18.04	35214
Amphibole	7.37	8071
Amphibole_2	0.42	2065
Amphibole_3	5.36	9684
Biotite	0.04	331
Biotite_2	0.36	3482
Biotite_3	0.35	2654
Chlorite	0.05	345
Chlorite_2	0.14	647
Chlorite_3	0.00	40
Chlorite_4	0.03	222
Chlorite_5	0.06	500
Fe_Clay	0.54	3125
Fe_Clay_2	0.54	945
Fe_Clay_3	0.05	486
Ferrosilite	0.01	74
Illite	0.00	6
Orthoclase	0.80	4723
Prehnite	0.74	5770
Pyrophyllite	0.00	16
Pyrophyllite_2	0.33	1516
Pyroxene	0.25	1398
Titanite	5.76	7465
Quartz	7.37	7352
Total	100.00	135221

Appendix 3 Elemental Depoartment

CuDeco_04_145-147_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Co	Cu	F	Fe	H	K	Mg	Mn	Na	Ni	O	P	S	Si	Ti
Bornite																			
Chalcocite						3.24		0.01								0.29			
Chalcopyrite						96.44		24.62								34.07			
Native_Copper						0.12													
Linnaeite					100	0.00		0.00					100.00			0.10			
Molybdenite																			
Pyrite							47.36									65.54			
FeO							7.50								1.25				
FeO_Sil_Int	0.61		0.00			0.06		0.97		0.10					0.22		0.05		
Ilmenite																			
Rutile															0.00			6.67	
Apatite		0.81				100									0.22	100			
Xenotime																			
Alunite																			
Calcite	67.17	68.40													22.84				
Calcite_Mn	20.81	19.57													83.64	7.08			
Dolomite	0.81	0.41					0.10			1.28	1.41				0.28				
Siderite	7.97	0.70					6.60								2.71				
Siderite_2	3.23	0.27					2.33			0.66	13.36				1.10				
Albite	23.19													45.09	1.53		2.00		
Albite_2	21.76	0.09												36.39	1.35		1.74		
Amphibole	4.48		7.33				4.35	67.29		76.57		14.72		11.21			13.42		
Amphibole_2	0.31		0.19				0.27			0.94	0.40	0.39		0.30			0.35		
Amphibole_3	3.23		1.15				1.20			7.78	0.90	2.59		1.74			2.00		
Biotite	2.74			9.61			0.22	3.12	10.96	1.01					0.19		0.16		
Biotite_2	5.48			30.36		0.07	0.33	6.43	32.45	1.72					0.40		0.37	36.86	
Biotite_3	3.59			10.45		0.07	0.28		7.65	1.02					0.24		0.19	7.31	
Chlorite	2.97						0.16	2.53		1.26					0.16			0.11	
Chlorite_2	5.11						0.43			1.26	0.30				0.29			0.20	
Chlorite_3	0.28						0.04			0.11					0.03			0.02	
Chlorite_4	3.33						0.41			0.57					0.23			0.16	
Chlorite_5	4.20	0.01					0.54		1.41	1.44					0.35			0.29	
Fe_Clay	5.89		0.05	49.58			1.41	13.54	7.72	1.97					0.81			0.75	
Fe_Clay_2	0.36						0.11	1.17	1.70	0.11					0.07			0.08	
Fe_Clay_3	1.91		0.00				0.22	2.17	1.71	0.08					0.13			0.11	
Ferrosilite	0.04						0.20			0.04					0.09			0.08	
Illite	0.78						0.00	0.35	1.17						0.02			0.03	
Orthoclase	2.73								35.24						0.18			0.23	
Prehnite	4.87		0.34				0.16								0.26			0.23	
Pyrophyllite	0.01							0.01							0.00			0.00	
Pyrophyllite_2	1.76							3.41							0.26			0.43	
Pyroxene	0.32		0.60				0.18			2.07		0.83			0.47			0.54	
Titanite	0.04		0.07												0.04		0.03	49.16	
Quartz															43.95		76.43		
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_07_50-51_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Cu	F	Fe	H	K	Mg	Mn	Mo	Na	O	P	S	Si	Ti	Y	Yb
Bornite																				
Chalcocite					45.35		0.97											97.03		
Chalcopyrite						0.17	0.26											1.46		
Covellite						0.05	0.00											0.22		
Native_Copper						54.27														
CuO																				
Linnaeite																				
Molybdenite													100				0.01			
Pyrite							0.22										1.28			
FeO							6.98								0.80					
FeO_SiO ₂ _Int	11.99		0.03		0.14		13.34			1.90				2.13			1.10			
Ilmenite																				
Rutile														0.00				5.58		
Apatite		3.71			100.00									1.40	100.00					
Xenotime	0.00		0.00				0.00							0.00	0.00		0.00	100	100	
Alunite																				
Calcite		16.02	22.31												10.51					
Calcite_Mn		51.20	65.82										65.03		33.61					
Dolomite		1.71	1.19			0.58				10.26	0.94			1.12						
Siderite		5.21	0.63			12.09									3.42					
Siderite_2		25.85	2.97			52.12				20.13	33.77			16.96						
Albite	0.13													1.69	0.00		0.01			
Albite_2	0.16		0.00											1.80	0.00		0.01			
Amphibole	1.84		1.03			1.25	19.12			30.10				41.11	2.23		5.74			
Amphibole_2	2.18		0.47			1.36				6.38	0.22			18.54	1.02		2.55			
Amphibole_3	1.81		0.22			0.47				4.16	0.04			9.82	0.47		1.16			
Biotite	0.13			0.12			0.01	0.10	0.57	0.05					0.00		0.01			
Biotite_2	0.40			0.61	0.00		0.02	0.32	2.65	0.12					0.01		0.03	20.66		
Biotite_3	3.05			2.45	0.01		0.17		7.26	0.83					0.10		0.17	47.61		
Chlorite	0.08						0.00	0.05		0.03					0.00			0.00		
Chlorite_2	0.95						0.06			0.22	0.00				0.03			0.04		
Chlorite_3	0.45						0.05			0.17					0.02			0.03		
Chlorite_4	2.04						0.18			0.33					0.07			0.10		
Chlorite_5	2.76		0.00			0.25			1.04	0.90					0.11			0.20		
Fe_Clay	41.53		0.13	96.81		6.97	66.01	60.96	13.26						2.78		5.49			
Fe_Clay_2	5.00					1.04	11.29	26.59	1.49						0.50		1.18			
Fe_Clay_3	0.09		0.00			0.01	0.07	0.09	0.00						0.00		0.01			
Ferrosilite	0.15					0.51				0.14					0.15		0.30			
Illite	0.02					0.00	0.01	0.03							0.00			0.00		
Orthoclase	0.06							0.80							0.00			0.00		
Prehnite	21.39		0.51			0.50									0.55		1.04			
Pyrophyllite	0.03						0.01								0.00		0.00			
Pyrophyllite_2	2.26							3.02							0.16		0.57			
Pyroxene	1.52		0.99			0.61			9.51				27.03	1.09		2.72				
Titanite	0.00		0.00												0.00		0.00	26.15		
Quartz															20.73		77.53			
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_07_82-83_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Cu	F	Fe	H	K	Mg	Mn	Na	O	P	S	Si	Ti	Y	Yb
Bornite																			
Chalcocite					45.80		0.24								95.00				
Chalcopyrite						0.61		0.22							5.00				
Native_Copper						52.63													
Linnaeite																			
Molybdenite																			
Pyrite							0.00								0.00				
FeO							4.61								0.65				
FeO_SiL_Int	4.81		0.19		0.88		20.71			2.17					4.09		0.89		
Ilmenite																			
Rutile															0.05			69.17	
Apatite			5.20			100									0.54	93.72			
Xenotime	0.05		0.02				0.02								0.05	6.28	0.01	100	
Alunite																		100	
Calcite		21.74	30.17												3.91				
Calcite_Mn		37.14	47.59												48.51		6.68		
Dolomite		3.94	2.74				0.30			3.87					2.22	0.71			
Siderite		1.11	0.13				0.57								0.20				
Siderite_2		36.06	4.12				16.16			4.60					48.46	6.49			
Albite	0.04														7.29	0.01		0.01	
Albite_2	0.03		0.00												4.65	0.00		0.01	
Amphibole	0.12		1.12				0.30	0.89		5.35					32.15	0.66		0.72	
Amphibole_2	0.40		1.49				0.96			3.33					42.61	0.90		0.94	
Amphibole_3	0.11		0.23				0.11			0.72					0.04	7.50	0.14		
Biotite	0.06			0.03			0.01	0.04	0.20	0.06					0.01			0.01	
Biotite_2	0.10			0.08	0.00		0.02	0.06	0.48	0.08					0.02		0.01	0.59	
Biotite_3	1.97			0.83	0.07		0.42		3.52	1.53					0.30		0.22	3.66	
Chlorite	0.12						0.02	0.05		0.14					0.01			0.01	
Chlorite_2	0.39						0.09			0.26					0.03				
Chlorite_3	0.23						0.09			0.26					0.05			0.04	
Chlorite_4	0.58						0.19			0.27					0.09			0.06	
Chlorite_5	2.22		0.02				0.77		0.63	2.07					0.43			0.32	
Fe_Clay	81.36		4.43	99.06			52.78	96.32	89.29	74.04					25.97			21.70	
Fe_Clay_2	0.86						0.69	1.44	3.41	0.73					0.41			0.41	
Fe_Clay_3	0.04		0.00				0.01	0.02	0.03	0.00					0.01			0.00	
Ferrosilite	0.02						0.21			0.04					0.08			0.06	
Illite	0.15						0.00	0.04	0.19						0.01			0.01	
Orthoclase	0.21								2.25						0.03			0.04	
Prehnite	4.91		2.02				0.44								0.60			0.48	
Pyrophyllite	0.01							0.00							0.00			0.00	
Pyrophyllite_2	1.14							1.14							0.39			0.58	
Pyroxene	0.03		0.29				0.04			0.46					5.80	0.09		0.09	
Titanite	0.03		0.24												0.05		0.04	26.58	
Quartz															46.31		73.17		
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_79_84-86_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Cu	F	Fe	H	K	Mg	Mn	Na	O	P	S	Si	Ti
Bornite																	
Chalcocite					0.03		0.00								0.00		
Chalcopyrite					98.21		5.18								25.20		
Native_Copper																	
Linnæite																	
Molybdenite																	
Pyrite						15.36									74.80		
FeO							53.90							9.96			
FeO_SiL_Int	2.04		0.04		1.40		4.77			0.21				1.23		0.26	
Ilmenite							0.00				0.00			0.00			0.18
Rutile																	
Apatite		2.23				100								0.35	100		
Xenotime																	
Alunite																	
Calcite	76.81	28.89												5.61			
Calcite_Mn	21.80	7.57									70.82			1.59			
Dolomite	1.20	0.23				0.03				0.16	1.68			0.09			
Siderite	0.09	0.00				0.01								0.01			
Siderite_2	0.09	0.00				0.01				0.00	0.30			0.01			
Albite	23.20												38.37	2.49			2.91
Albite_2	19.67		0.23										27.96	1.99			2.28
Amphibole	6.02		27.61			8.59	90.41			64.18			16.83	24.55			26.24
Amphibole_2	0.72		1.27			0.94				1.38	5.72	0.77	1.14				1.18
Amphibole_3	12.44		12.40			6.77				18.68	21.15	8.47	10.90				11.22
Biotite	0.22			2.28		0.03	0.25	0.33	0.05				0.02			0.02	
Biotite_2	2.86			47.44	0.24	0.25	3.35	6.38	0.56				0.34		0.28	19.05	
Biotite_3	0.93			8.15	0.12	0.11		0.75	0.17				0.10		0.07	1.88	
Chlorite	0.35					0.03	0.30		0.09				0.03		0.02		
Chlorite_2	0.89					0.11			0.14	0.32			0.08			0.05	
Chlorite_3	0.01					0.00			0.00				0.00			0.00	
Chlorite_4	0.18					0.03			0.02				0.02			0.01	
Chlorite_5	0.26		0.00			0.05			0.03	0.05			0.04			0.03	
Fe_Clay	1.67		0.04	42.13		0.59	3.84	0.82	0.35				0.38			0.31	
Fe_Clay_2	0.13					0.06	0.43	0.24	0.03				0.04			0.04	
Fe_Clay_3	0.07		0.00			0.01	0.08	0.02	0.00				0.01			0.01	
Ferrosilite	0.00					0.03			0.00				0.02			0.01	
Illite	0.07					0.00	0.03	0.04					0.00			0.00	
Orthoclase	18.74							91.39						2.01			2.35
Prehnite	5.35		1.04			0.26							0.46			0.36	
Pyrophyllite	0.01						0.01						0.00			0.00	
Pyrophyllite_2	0.68						1.31						0.17			0.24	
Pyroxene	3.42		18.13			2.88				13.94		7.60	8.24			8.54	
Titanite	0.07		0.31										0.10			0.07	78.89
Quartz													28.02			43.50	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_79_91-93_Final - Ungrouped

Mineral	Al	Ba	C	Ca	Cl	Co	Cu	F	Fe	H	K	Mg	Mn	Na	Ni	O	P	S	Si	Ti
Bornite																				
Chalcocite							0.06		0.00									0.01		
Chalcopyrite							99.43		30.23									47.85		
Native_Copper							0.33													
Linnaeite						100	0.00		0.00					100				0.11		
Molybdenite																				
Pyrite									32.86									52.03		
FeO									3.73								1.37			
FeO_SiI_Int	3.41			0.04			0.15		3.05			0.20					1.55		0.39	
Ilmenite									0.00			0.00					0.00		0.14	
Rutile																	0.00		9.38	
Apatite			2.07					100								0.35	100			
Xenotime																				
Alunite	0.09	100.00							0.00	0.02	0.56						0.00	0.00	0.00	
Calcite			27.86	28.33													6.08			
Calcite_Mn			8.76	8.22									30.56				1.91			
Dolomite			0.59	0.30					0.02			0.17	0.89				0.13			
Siderite			46.54	4.10					11.24								10.15			
Siderite_2			16.26	1.36					3.42			0.61	58.40				3.55			
Albite	10.22														20.35		0.83		1.14	
Albite_2	11.63			0.09											19.92		0.89		1.20	
Amphibole	12.96			40.76					7.07	85.86		78.87		43.60		40.07			50.15	
Amphibole_2	0.92				1.11					0.46			1.00	1.98	1.18		1.10		1.34	
Amphibole_3	17.05			11.66					3.55			14.62	7.90	13.98		11.32		13.66		
Biotite	0.75				2.52				0.03	0.38	6.13	0.10					0.06		0.06	
Biotite_2	2.96				15.61		0.02		0.10	1.53	35.64	0.33					0.27		0.26	
Biotite_3	1.22					3.38		0.01		0.05		5.30	0.12				0.10		0.08	
Chlorite	0.25								0.01	0.09		0.04					0.02		0.01	
Chlorite_2	2.84								0.13			0.25	0.28				0.20		0.14	
Chlorite_3	0.30								0.03			0.04					0.04		0.03	
Chlorite_4	9.23								0.64			0.56					0.77		0.58	
Chlorite_5	6.89			0.02					0.50		4.73	0.84					0.72		0.61	
Fe_Clay	9.79			0.17	78.49				1.32	9.93	26.11	1.16					1.67		1.61	
Fe_Clay_2	0.33								0.05	0.47	3.17	0.04					0.08		0.10	
Fe_Clay_3	0.35				0.00				0.02	0.18	0.64	0.01					0.03		0.03	
Ferrosilite	0.48								1.33				0.17				1.24		1.23	
Illite	2.65								0.00	0.52	8.10						0.10		0.11	
Orthoclase	0.37										9.63						0.03		0.04	
Prehnite	2.69			0.36					0.05								0.18		0.16	
Pyrophyllite	1.61										0.50						0.10		0.12	
Pyrophyllite_2	0.60										0.51						0.11		0.19	
Pyroxene	0.37				1.33				0.12			0.85		0.98			0.67		0.81	
Titanite	0.03				0.08												0.03		0.02	
Quartz																	14.26		25.93	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_79_107-109_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Co	Cu	F	Fe	H	K	Mg	Mn	Na	Ni	O	P	S	Si	Ti
Bornite																			
Chalcocite																			
Chalcopyrite						99.61		16.21										41.41	
Native_Copper																			
Linnaeite					100	0.01		0.00					100				0.19		
Molybdenite																			
Pyrite							22.85										58.40		
FeO							42.88								3.60				
FeO_Sil_Int	1.23		0.00			0.26		2.73			0.25				0.32			0.10	
Ilmenite								0.00				0.00				0.00		0.19	
Rutile															0.00			1.15	
Apatite		0.44					100								0.17	100			
Xenotime																			
Alunite																			
Calcite	74.55	73.00													34.74				
Calcite_Mn	23.14	20.92										95.32			10.78				
Dolomite	1.16	0.57					0.38				4.31	2.06			0.54				
Siderite	0.71	0.06					1.60								0.33				
Siderite_2	0.45	0.04					0.88				0.22	1.89			0.21				
Albite	29.70												53.20		1.38			2.30	
Albite_2	20.66	0.04											31.83		0.90			1.48	
Amphibole	3.44	2.78					4.67	72.23			71.55		10.43		6.06			9.27	
Amphibole_2	0.41	0.13					0.51				1.52	0.28	0.47		0.28			0.41	
Amphibole_3	2.47	0.43					1.28				7.22	0.36	1.82		0.93			1.37	
Biotite	0.79		5.85				0.09	1.25	9.18	0.35					0.04			0.04	
Biotite_2	0.91		10.68		0.02		0.08	1.48	15.70	0.35					0.05		0.05	3.02	
Biotite_3	2.41		14.91		0.10		0.27		15.03	0.83					0.11		0.12	2.43	
Chlorite	1.24						0.09	1.48			0.64				0.05			0.04	
Chlorite_2	2.89						0.34				0.87	0.09			0.11			0.10	
Chlorite_3	0.17						0.04				0.08				0.01			0.01	
Chlorite_4	5.87						1.01				1.22				0.28			0.26	
Chlorite_5	2.24	0.00					0.40		2.21	0.93					0.13			0.14	
Fe_Clay	3.82	0.02	68.55				1.28	12.29	14.68	1.55					0.37			0.44	
Fe_Clay_2	1.56						0.65	7.11	21.67	0.59					0.22			0.32	
Fe_Clay_3	1.08	0.00					0.18	1.70	2.81	0.06					0.05			0.06	
Ferrosilite	0.01						0.07				0.01				0.02			0.02	
Illite	0.09						0.00	0.05	0.39						0.00			0.00	
Orthoclase	0.48								18.33						0.02			0.04	
Prehnite	16.52	0.57					0.77								0.62			0.69	
Pyrophyllite	0.03							0.03							0.00			0.00	
Pyrophyllite_2	0.88							2.37							0.09			0.19	
Pyroxene	0.94	0.88					0.75				7.45		2.26		0.98			1.45	
Titanite	0.17	0.13													0.11		0.10	93.21	
Quartz															36.49			81.01	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_100_172-177_Final - Ungrouped

Mineral	Al	Ba	C	Ca	Cl	Co	Cu	F	Fe	H	K	Mg	Mn	Na	Ni	O	P	S	Si	Ti
Bornite																				
Chalcocite																				
Chalcopyrite							99.56		11.29									22.62		
Native_Copper																				
Linnaeite						100	0.00		0.00						100		0.01			
Molybdenite																				
Pyrite								38.62									77.37			
FeO								9.37								0.83				
FeO_Sil_Int	0.55			0.00			0.25		1.86			0.06				0.23		0.05		
Ilmenite								0.00				0.00				0.00			0.41	
Rutile																0.00			0.17	
Apatite			0.66				100									0.18	100			
Xenotime																				
Alunite	0.02	100						0.00	0.01	0.07						0.00		0.00	0.00	
Calcite			70.13	58.34													19.32			
Calcite_Mn			22.84	17.54									81.99				6.29			
Dolomite			3.50	1.46				0.65			2.62	5.43				0.97				
Siderite			2.12	0.15				2.69								0.58				
Siderite_2			1.41	0.10				1.55			0.14	5.20				0.39				
Albite	18.13														34.66		1.34		1.68	
Albite_2	18.66			0.09											30.69		1.30		1.60	
Amphibole	5.59			10.32				11.49	84.23		62.74				18.07		15.66		18.00	
Amphibole_2	1.45			1.02				2.71			2.90	2.30	1.78			1.57			1.74	
Amphibole_3	14.40			5.78				11.28			22.76	4.92	11.34			8.66			9.59	
Biotite	0.08			0.59				0.01	0.09	0.40	0.02					0.01		0.01		
Biotite_2	1.37			15.56		0.08		0.17	1.61	9.78	0.28					0.11		0.10	4.20	
Biotite_3	1.25			7.42		0.11		0.21		3.20	0.23					0.09		0.07	1.15	
Chlorite	0.10							0.01	0.09		0.03					0.01		0.00		
Chlorite_2	2.24							0.40			0.36	0.16				0.14		0.09		
Chlorite_3	0.09							0.03			0.03					0.01		0.01		
Chlorite_4	5.38							1.41			0.60					0.41		0.28		
Chlorite_5	1.45			0.00				0.39		0.59	0.33					0.14		0.11		
Fe_Clay	4.43			0.05	76.43			2.24	10.22	7.00	0.97					0.69		0.61		
Fe_Clay_2	0.44							0.28	1.44	2.52	0.09					0.10		0.11		
Fe_Clay_3	0.81			0.00				0.20	0.93	0.88	0.02					0.06		0.05		
Ferrosillite	0.03							0.31			0.02					0.07		0.06		
Illite	0.07							0.00	0.03	0.12						0.00		0.00		
Orthoclase	4.84									75.44						0.36		0.45		
Prehnite	16.37		1.28					1.15								0.97		0.82		
Pyrophyllite	0.01								0.01							0.00		0.00		
Pyrophyllite_2	0.69								1.34							0.12		0.18		
Pyroxene	1.35		2.89					1.64			5.80		3.48			2.24		2.49		
Titanite	0.19		0.33													0.18		0.14	94.06	
Quartz																36.99		61.75		
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		

CuDeco_111_67-70_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Cu	F	Fe	H	K	Mg	Mn	Na	O	P	S	Si	Ti	Y	Yb
Bornite																			
Chalcocite					16.86		0.04								75.54				
Chalcopyrite					1.18		0.18								20.83				
Covellite					0.24		0.00								2.02				
Native_Copper					64.28														
CuO					12.09		0.02						0.05						
Linnaeite																			
Molybdenite																			
Pyrite							0.01								1.61				
FeO							4.45						0.16						
FeO_Sil_Int	1.23		0.24		1.10		11.07			0.93			0.55		0.08				
Ilmenite							0.52				1.54		0.04			11.29			
Rutile													0.20			75.38			
Apatite			8.17			100							0.09	96.07					
Xenotime	0.01		0.02				0.01						0.01	3.93		0.00		100	
Alunite																			
Calcite		18.57	36.46										0.49						
Calcite_Mn		17.83	32.32									23.06		0.47					
Dolomite		0.57	0.56				0.02			0.26	0.32		0.01						
Siderite		7.45	1.27				2.22						0.20						
Siderite_2		55.59	8.99				14.38			3.30	73.96		1.45						
Albite	0.24												44.90	0.02			0.02		
Albite_2	0.25		0.03										41.15	0.02			0.02		
Amphibole	0.00		0.14				0.01	0.04		0.21			0.88	0.01			0.01		
Amphibole_2	0.07		1.36				0.36			1.00	0.47		8.73	0.08			0.06		
Amphibole_3	0.02		0.19				0.04			0.20	0.03		1.40	0.01			0.01		
Biotite	3.86			4.91			1.76	4.23	8.61	6.51				0.33			0.17		
Biotite_2	8.52			17.13	0.94		2.87	9.64	28.15	12.25				0.76			0.44	7.40	
Biotite_3	19.67			20.75	3.32		8.80		23.38	25.54				1.59			0.81	5.17	
Chlorite	2.07						0.62	1.70		4.03				0.14			0.06		
Chlorite_2	2.15						1.02			2.43	0.63			0.15			0.06		
Chlorite_3	0.12						0.10			0.21				0.01			0.01		
Chlorite_4	1.80						1.26			1.41				0.15			0.07		
Chlorite_5	3.55		0.15				2.57		0.67	5.57				0.36			0.19		
Fe_Clay	18.72		5.21	57.21			25.34	41.53	13.70	28.62				3.14			1.81		
Fe_Clay_2	0.73						1.24	2.32	1.95	1.05				0.18			0.13		
Fe_Clay_3	31.28		1.77				20.71	34.16	15.59	6.12				2.61			1.40		
Ferrosilite	0.00						0.13			0.02				0.01			0.01		
Illite	0.09						0.00	0.04	0.07					0.00			0.00		
Orthoclase	1.09								7.88					0.09			0.07		
Prehnite	1.05		2.22				0.20							0.07			0.04		
Pyrophyllite	0.09							0.06						0.01			0.00		
Pyrophyllite_2	3.37								6.28					0.61			0.62		
Pyroxene	0.01		0.66				0.04			0.34		2.94	0.02			0.02			
Titanite	0.01		0.25											0.01			0.00	0.76	
Quartz													85.92			93.91			
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

CuDeco_111_196-198_Final - Ungrouped

Mineral	Al	C	Ca	Cl	Cu	F	Fe	H	K	Mg	Mn	Mo	Na	O	P	S	Si	Ti	Y	Yb	
Bornite																					
Chalcocite																					
Chalcopyrite					3.15			0.15											13.24		
Native_Copper																					
Linnaeite																					
Molybdenite												100						0.08			
Pyrite							0.99											86.68			
FeO							70.94										7.28				
FeO_SiL_Int	0.41		0.07		3.10		9.67			0.73							1.38		0.30		
Ilmenite							0.77					7.25				0.19			6.23		
Rutile																0.00			0.10		
Apatite			5.65			100										0.53	99.89				
Xenotime	0.00		0.00				0.00									0.00	0.11		0.00	100	
Alunite																				100	
Calcite	65.80		25.00														2.91				
Calcite_Mn	27.21		9.55									66.15					1.21				
Dolomite	2.10		0.40				0.05			0.51		2.20					0.09				
Siderite	1.47		0.05				0.26										0.06				
Siderite_2	3.42		0.11				0.52			0.11		8.55					0.15				
Albite	57.54															65.19	34.90			41.18	
Albite_2	34.52		3.83													33.63	19.74			22.88	
Amphibole	0.32		13.95				4.70	60.64		60.24						0.62	7.45			8.05	
Amphibole_2	0.05		0.75				0.60			1.52		2.51				0.03	0.41			0.43	
Amphibole_3	1.07		10.06				5.94			28.14		12.71				0.50	5.31			5.53	
Biotite	0.06			2.85			0.08	0.91	1.07	0.26							0.04			0.03	
Biotite_2	0.51			35.71	0.48		0.45	7.43	12.52	1.74							0.34			0.28	0.43
Biotite_3	0.54			19.77	0.77		0.63		4.75	1.65						0.33			0.24	0.14	
Chlorite	0.09						0.07	0.97		0.42						0.04				0.03	
Chlorite_2	0.25						0.32			0.69	0.63					0.13				0.08	
Chlorite_3	0.01						0.01			0.02						0.00				0.00	
Chlorite_4	0.04						0.07			0.07						0.02				0.02	
Chlorite_5	0.07		0.00				0.14		0.10	0.26						0.05				0.04	
Fe_Clay	0.39		0.09	41.67			1.39	11.17	2.13	1.42						0.50			0.41		
Fe_Clay_2	0.27						1.20	11.01	5.35	0.92						0.51			0.51		
Fe_Clay_3	0.07		0.00				0.12	0.93	0.25	0.03						0.04			0.03		
Ferrosilite	0.00						0.04			0.01						0.01			0.01		
Illite	0.00						0.00	0.02	0.02							0.00				0.00	
Orthoclase	1.37									73.82						0.83				0.98	
Prehnite	1.45		2.65				0.72									0.71			0.56		
Pyrophyllite	0.01							0.06								0.00			0.00		
Pyrophyllite_2	0.28							6.86								0.39			0.57		
Pyroxene	0.02		0.90				0.15			1.28						0.03	0.24			0.26	
Titanite	0.67		26.94													5.36			3.73	93.11	
Quartz																8.82			13.85		
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

Appendix 4 Grain Size Distribution Tables

(Maximum Diameter/Equivalent Circle, Weight Percent Cumulative Passing using 4SQRT 2 Sieve Series)

CuDeco_04_145-147

Chalcocite	04_145-147		
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	39.29	39.29	60.71
600	0	39.29	60.71
500	0	39.29	60.71
425	0	39.29	60.71
355	0	39.29	60.71
300	0	39.29	60.71
250	8.68	47.97	52.03
212	6.44	54.41	45.59
180	2.24	56.65	43.35
150	0	56.65	43.35
125	11.95	68.6	31.4
106	5.96	74.57	25.43
90	4.78	79.34	20.66
75	5.71	85.05	14.95
63	3.47	88.52	11.48
53	2.2	90.72	9.28
45	1.11	91.83	8.17
38	1.16	92.99	7.01
32	2.37	95.36	4.64
27	1.54	96.9	3.1
22	0.88	97.78	2.22
19	0.44	98.22	1.78
16	0.46	98.68	1.32
13.5	0.51	99.19	0.81
11.4	0.3	99.49	0.51
9.6	0.05	99.54	0.46
8.1	0.31	99.85	0.15
6.8	0	99.85	0.15
5.7	0.13	99.98	0.02
4.8	0	99.98	0.02
4.1	0	99.98	0.02
3.4	0	99.98	0.02
2.9	0.02	100	0
2.4	0	100	0
	P20	P50	P80
Size	88.28	238.02	778.73

Chalcopyrite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1700	0	0	100
1400	4.04	4.04	95.96
1200	15.81	19.84	80.16
1000	13.44	33.28	66.72
850	9.85	43.13	56.87
710	18.45	61.57	38.43
600	8.51	70.08	29.92
500	7.94	78.02	21.98
425	3.51	81.54	18.46
355	2.43	83.97	16.03
300	3.22	87.19	12.81
250	2.8	90	10
212	2.23	92.22	7.78
180	1.16	93.39	6.61
150	1.61	95	5
125	1.29	96.29	3.71
106	0.61	96.9	3.1
90	0.53	97.43	2.57
75	0.42	97.85	2.15
63	0.42	98.26	1.74
53	0.4	98.66	1.34
45	0.25	98.91	1.09
38	0.27	99.18	0.82
32	0.22	99.4	0.6
27	0.2	99.6	0.4
22	0.13	99.73	0.27
19	0.07	99.8	0.2
16	0.05	99.85	0.15
13.5	0.05	99.89	0.11
11.4	0.05	99.94	0.06
9.6	0.01	99.95	0.05
8.1	0.04	99.98	0.02
6.8	0	99.98	0.02
5.7	0.02	100	0
4.8	0	100	0
4.1	0	100	0
3.4	0	100	0
2.9	0	100	0
	P20	P50	P80
Size	457.83	797.84	1197.67

Native_Cu			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
106	0	0	100
90	62.13	62.13	37.87
75	0	62.13	37.87
63	0	62.13	37.87
53	0	62.13	37.87
45	11.92	74.06	25.94
38	0	74.06	25.94
32	5.23	79.29	20.71
27	0	79.29	20.71
22	13.18	92.47	7.53
19	3.14	95.61	4.39
16	1.67	97.28	2.72
13.5	0	97.28	2.72
11.4	0	97.28	2.72
9.6	0	97.28	2.72
8.1	1.88	99.16	0.84
6.8	0	99.16	0.84
5.7	0.84	100	0
4.8	0	100	0
	P20	P50	P80
Size	26.73	93.12	100.85

<i>Pyrite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	9.41	9.41	90.59
710	23.48	32.9	67.1
600	33.21	66.1	33.9
500	15.12	81.22	18.78
425	5.03	86.25	13.75
355	4.12	90.37	9.63
300	2.01	92.38	7.62
250	0.86	93.24	6.76
212	1.94	95.18	4.82
180	0.59	95.77	4.23
150	1.36	97.13	2.87
125	0.92	98.05	1.95
106	0.41	98.46	1.54
90	0.13	98.59	1.41
75	0.46	99.05	0.95
63	0.16	99.22	0.78
53	0.24	99.45	0.55
45	0.15	99.61	0.39
38	0.12	99.73	0.27
32	0.05	99.78	0.22
27	0.04	99.82	0.18
22	0.06	99.88	0.12
19	0.04	99.92	0.08
16	0.03	99.95	0.05
13.5	0.02	99.97	0.03

<i>Calcite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1400	0	0	100
1200	2.18	2.18	97.82
1000	4.24	6.42	93.58
850	7.5	13.92	86.08
710	20.49	34.41	65.59
600	24.04	58.45	41.55
500	14.29	72.74	27.26
425	6	78.74	21.26
355	4.41	83.15	16.85
300	3.08	86.22	13.78
250	2.98	89.21	10.79
212	1.78	90.99	9.01
180	1.02	92.01	7.99
150	1.05	93.06	6.94
125	1.05	94.11	5.89
106	1.03	95.14	4.86
90	0.82	95.96	4.04
75	0.71	96.67	3.33
63	0.47	97.13	2.87
53	0.43	97.56	2.44
45	0.4	97.96	2.04
38	0.37	98.33	1.67
32	0.4	98.73	1.27
27	0.3	99.02	0.98
22	0.59	99.61	0.39
19	0.13	99.74	0.26

<i>Amphibole</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	4.03	4.03	95.97
850	11.04	15.07	84.93
710	14.71	29.78	70.22
600	24.96	54.73	45.27
500	14.7	69.44	30.56
425	6.11	75.54	24.46
355	2.64	78.18	21.82
300	3.75	81.93	18.07
250	3.39	85.32	14.68
212	1.93	87.24	12.76
180	1.77	89.01	10.99
150	1.46	90.47	9.53
125	1.23	91.7	8.3
106	0.85	92.54	7.46
90	0.89	93.44	6.56
75	0.9	94.34	5.66
63	0.85	95.19	4.81
53	0.69	95.88	4.12
45	0.58	96.46	3.54
38	0.46	96.92	3.08
32	0.57	97.49	2.51
27	0.56	98.06	1.94
22	0.96	99.01	0.99
19	0.32	99.33	0.67
16	0.26	99.59	0.41

11.4	0.01	99.97	0.03
9.6	0.01	99.99	0.01
8.1	0	99.99	0.01
6.8	0	100	0
5.7	0	100	0
	P20	P50	P80
Size	508.07	653.34	786.89

16	0.12	99.86	0.14
13.5	0.06	99.92	0.08
11.4	0.03	99.95	0.05
9.6	0.03	99.98	0.02
8.1	0.01	99.99	0.01
	P20	P50	P80
Size	404.97	638.67	808.47

13.5	0.14	99.74	0.26
11.4	0.06	99.8	0.2
9.6	0.08	99.88	0.12
8.1	0.04	99.92	0.08
6.8	0.04	99.96	0.04
	P20	P50	P80
Size	328.29	620.86	803.07

Quartz			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1400	0	0	100
1200	1.7	1.7	98.3
1000	6.47	8.17	91.83
850	11.37	19.54	80.46
710	27.22	46.76	53.24
600	12.78	59.54	40.46
500	18.95	78.49	21.51
425	7.66	86.15	13.85
355	5.07	91.22	8.78
300	1.72	92.95	7.05
250	1.23	94.18	5.82
212	1.55	95.72	4.28
180	0.78	96.51	3.49
150	0.66	97.17	2.83
125	0.59	97.76	2.24
106	0.24	98	2
90	0.23	98.24	1.76

75	0.18	98.42	1.58
63	0.23	98.66	1.34
53	0.21	98.87	1.13
45	0.15	99.02	0.98
38	0.12	99.15	0.85
32	0.15	99.3	0.7
27	0.12	99.42	0.58
22	0.27	99.69	0.31
19	0.13	99.82	0.18
16	0.12	99.94	0.06
13.5	0.03	99.96	0.04
11.4	0.01	99.98	0.02
9.6	0.01	99.99	0.01
8.1	0	99.99	0.01
	P20	P50	P80
Size	485.19	682.1	847.64

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Chalcocite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	9.06	9.06	90.94
850	5.12	14.18	85.82
710	13.33	27.51	72.49
600	4.08	31.59	68.41
500	8.15	39.74	60.26
425	3.5	43.23	56.77
355	7.59	50.82	49.18
300	6.26	57.08	42.92
250	5	62.08	37.92
212	6.25	68.33	31.67
180	3.99	72.32	27.68
150	4.95	77.28	22.72
125	3.69	80.97	19.03
106	2.58	83.55	16.45
90	2.1	85.65	14.35
75	2.24	87.89	12.11
63	1.88	89.77	10.23
53	1.51	91.28	8.72
45	1.22	92.5	7.5
38	1.18	93.68	6.32
32	1.27	94.95	5.05
27	1.05	96	4
22	0.92	96.92	3.08
19	0.54	97.46	2.54
16	0.51	97.97	2.03
13.5	0.46	98.43	1.57
11.4	0.57	99	1
9.6	0.13	99.13	0.87
8.1	0.51	99.64	0.36
6.8	0	99.64	0.36
5.7	0.35	99.99	0.01
4.8	0	99.99	0.01
4.1	0	99.99	0.01
3.4	0	99.99	0.01
2.9	0.01	100	0
2.4	0	100	0
	P20	P50	P80
Size	131.57	362.59	788.87

Chalcopyrite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
250	0	0	100
212	59.17	59.17	40.83
180	0	59.17	40.83
150	0	59.17	40.83
125	0	59.17	40.83
106	0	59.17	40.83
90	0	59.17	40.83
75	0	59.17	40.83
63	4.86	64.03	35.97
53	0	64.03	35.97
45	4.22	68.25	31.75
38	4.46	72.71	27.29
32	5.32	78.02	21.98
27	11.7	89.73	10.27
22	2.93	92.66	7.34
19	2	94.66	5.34
16	2.29	96.95	3.05
13.5	0.95	97.9	2.1
11.4	0.45	98.36	1.64
9.6	0	98.36	1.64
8.1	1.12	99.48	0.52
6.8	0	99.48	0.52
5.7	0.48	99.95	0.05
4.8	0	99.95	0.05
4.1	0	99.95	0.05
3.4	0	99.95	0.05
2.9	0.05	100	0
2.4	0	100	0
	P20	P50	P80
Size	31.15	217.89	237.15

Native Cu			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1700	0	0	100
1400	11.39	11.39	88.61
1200	2.53	13.92	86.08
1000	6.57	20.49	79.51
850	10.54	31.03	68.97
710	10.76	41.79	58.21
600	4.15	45.93	54.07
500	5.82	51.75	48.25
425	8.09	59.84	40.16
355	5.42	65.26	34.74
300	6.15	71.41	28.59
250	4.85	76.26	23.74
212	1.93	78.19	21.81
180	1.84	80.03	19.97
150	2.8	82.83	17.17
125	2.96	85.79	14.21
106	2.48	88.27	11.73
90	2.15	90.42	9.58
75	1.35	91.77	8.23
63	1.12	92.89	7.11
53	1.2	94.09	5.91
45	0.91	95	5
38	0.86	95.86	4.14
32	0.94	96.8	3.2
27	0.78	97.58	2.42
22	0.56	98.14	1.86
19	0.44	98.58	1.42
16	0.3	98.88	1.12
13.5	0.28	99.17	0.83
11.4	0.32	99.49	0.51
9.6	0.07	99.56	0.44
8.1	0.25	99.81	0.19
6.8	0	99.81	0.19
5.7	0.18	99.99	0.01
4.8	0	99.99	0.01
4.1	0	99.99	0.01
3.4	0	99.99	0.01
2.9	0.01	100	0
2.4	0	100	0
	P20	P50	P80
Size	180.45	530.13	1014.82

<i>FeO</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
710	0	0	100
600	12.84	12.84	87.16
500	0	12.84	87.16
425	0	12.84	87.16
355	0	12.84	87.16
300	10.72	23.56	76.44
250	10.18	33.73	66.27
212	2.54	36.28	63.72
180	8.1	44.38	55.62
150	6.96	51.34	48.66
125	4.69	56.03	43.97
106	3.88	59.91	40.09
90	2.46	62.37	37.63
75	4.37	66.74	33.26
63	4.38	71.12	28.88
53	4.13	75.25	24.75
45	3.46	78.71	21.29
38	3.64	82.35	17.65
32	3.68	86.04	13.96
27	3.51	89.55	10.45
22	6.18	95.73	4.27
19	1.53	97.25	2.75
16	1.08	98.33	1.67

<i>Calcite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	3.77	3.77	96.23
850	7.24	11.02	88.98
710	15.56	26.57	73.43
600	15.74	42.32	57.68
500	15.76	58.08	41.92
425	9.85	67.93	32.07
355	6.68	74.61	25.39
300	4.3	78.91	21.09
250	3.63	82.54	17.46
212	2.55	85.09	14.91
180	1.38	86.47	13.53
150	2.11	88.59	11.41
125	1.66	90.25	9.75
106	1.27	91.52	8.48
90	1.3	92.82	7.18
75	0.94	93.75	6.25
63	1.02	94.77	5.23
53	0.8	95.57	4.43
45	0.78	96.35	3.65
38	0.74	97.08	2.92
32	0.69	97.77	2.23
27	0.56	98.34	1.66

<i>Siderite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	2.42	2.42	97.58
600	7.66	10.08	89.92
500	15.18	25.26	74.74
425	9.87	35.13	64.87
355	9.88	45.01	54.99
300	6.5	51.51	48.49
250	8.23	59.73	40.27
212	5.9	65.64	34.36
180	3.79	69.43	30.57
150	4.85	74.27	25.73
125	3.53	77.8	22.2
106	2.61	80.41	19.59
90	2.07	82.48	17.52
75	2.73	85.21	14.79
63	2.11	87.32	12.68
53	2.01	89.33	10.67
45	1.57	90.9	9.1
38	1.57	92.47	7.53
32	1.61	94.08	5.92
27	1.35	95.43	4.57
22	1.97	97.39	2.61
19	0.68	98.07	1.93

13.5	0.54	98.87	1.13
11.4	0.33	99.2	0.8
9.6	0.3	99.5	0.5
8.1	0.15	99.65	0.35
6.8	0.18	99.83	0.17
5.7	0.1	99.93	0.07
4.8	0.02	99.95	0.05
4.1	0.03	99.98	0.02
3.4	0	99.98	0.02
	P20	P50	P80
Size	42.52	155.77	318.24

22	0.77	99.1	0.9
19	0.27	99.38	0.62
16	0.24	99.62	0.38
13.5	0.15	99.77	0.23
11.4	0.07	99.84	0.16
9.6	0.06	99.9	0.1
8.1	0.03	99.93	0.07
6.8	0.03	99.97	0.03
5.7	0.02	99.99	0.01
4.8	0	99.99	0.01
4.1	0	100	0
	P20	P50	P80
Size	285.02	551.25	769.16

16	0.63	98.7	1.3
13.5	0.42	99.12	0.88
11.4	0.22	99.34	0.66
9.6	0.25	99.59	0.41
8.1	0.13	99.72	0.28
6.8	0.16	99.88	0.12
5.7	0.09	99.97	0.03
4.8	0.01	99.98	0.02
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
	P20	P50	P80
Size	109.01	312.76	534.65

<i>Amphibole</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
600	0	0	100
500	3.15	3.15	96.85
425	4.86	8.01	91.99
355	0	8.01	91.99
300	2.23	10.24	89.76
250	2.63	12.88	87.12
212	3.63	16.5	83.5
180	2.46	18.96	81.04
150	4.26	23.22	76.78
125	5.43	28.65	71.35

<i>Fe_Clay</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
710	0	0	100
600	3.21	3.21	96.79
500	12.52	15.73	84.27
425	11.44	27.17	72.83
355	2.56	29.74	70.26
300	0.82	30.56	69.44
250	2.71	33.27	66.73
212	2.7	35.97	64.03
180	2.48	38.45	61.55
150	2.58	41.03	58.97

<i>Quartz</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	1.73	1.73	98.27
710	7.99	9.72	90.28
600	15.2	24.92	75.08
500	19.13	44.06	55.94
425	11.02	55.07	44.93
355	8.45	63.52	36.48
300	6.93	70.46	29.54
250	5.34	75.79	24.21
212	3.11	78.9	21.1

106	4.84	33.49	66.51
90	4.12	37.61	62.39
75	4.64	42.25	57.75
63	5.66	47.91	52.09
53	4.06	51.97	48.03
45	4.96	56.93	43.07
38	4.67	61.6	38.4
32	6.98	68.58	31.42
27	6.24	74.82	25.18
22	14.77	89.59	10.41
19	4.2	93.79	6.21
16	2.66	96.45	3.55
13.5	1.25	97.7	2.3
11.4	0.58	98.28	1.72
9.6	0.61	98.88	1.12
8.1	0.36	99.24	0.76
6.8	0.37	99.62	0.38
5.7	0.21	99.83	0.17
4.8	0.06	99.88	0.12
4.1	0.06	99.94	0.06
3.4	0	99.94	0.06
2.9	0.06	100	0
	P20	P50	P80
Size	25.25	57.86	172.67

125	2.18	43.21	56.79
106	3.16	46.37	53.63
90	3.05	49.42	50.58
75	4.66	54.09	45.91
63	5.14	59.23	40.77
53	5.26	64.48	35.52
45	4.92	69.41	30.59
38	4.75	74.16	25.84
32	5.2	79.35	20.65
27	4.64	83.99	16.01
22	8.99	92.98	7.02
19	2.53	95.51	4.49
16	1.77	97.28	2.72
13.5	0.85	98.14	1.86
11.4	0.44	98.58	1.42
9.6	0.46	99.04	0.96
8.1	0.28	99.33	0.67
6.8	0.34	99.67	0.33
5.7	0.21	99.88	0.12
4.8	0.04	99.92	0.08
4.1	0.04	99.96	0.04
3.4	0	99.96	0.04
	P20	P50	P80
Size	31.3	88.14	472.01

180	2.27	81.17	18.83
150	1.91	83.08	16.92
125	2.03	85.11	14.89
106	2.22	87.33	12.67
90	1.55	88.88	11.12
75	1.64	90.51	9.49
63	1.37	91.88	8.12
53	1.3	93.18	6.82
45	1.01	94.19	5.81
38	0.94	95.13	4.87
32	0.94	96.08	3.92
27	0.89	96.96	3.04
22	1.32	98.28	1.72
19	0.61	98.9	1.1
16	0.55	99.45	0.55
13.5	0.23	99.68	0.32
11.4	0.1	99.78	0.22
9.6	0.08	99.85	0.15
8.1	0.03	99.89	0.11
6.8	0.04	99.93	0.07
5.7	0.03	99.97	0.03
4.8	0.01	99.98	0.02
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
	P20	P50	P80
Size	196.5	459.53	635.63

CuDeco_07_82-83

Chalcocite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1700	0	0	100
1400	22.15	22.15	77.85
1200	0	22.15	77.85
1000	6.75	28.9	71.1
850	9.55	38.45	61.55
710	12.37	50.82	49.18
600	12.15	62.96	37.04
500	4.09	67.06	32.94
425	7.27	74.33	25.67
355	3.61	77.94	22.06
300	1.49	79.43	20.57
250	1.28	80.72	19.28
212	3.16	83.88	16.12
180	2.12	86	14
150	1.19	87.19	12.81
125	1.73	88.92	11.08
106	1.51	90.43	9.57
90	1	91.43	8.57
75	1.22	92.65	7.35
63	0.89	93.54	6.46
53	0.99	94.53	5.47
45	0.9	95.43	4.57
38	0.82	96.25	3.75
32	0.65	96.9	3.1
27	0.92	97.82	2.18
22	0.37	98.19	1.81
19	0.29	98.48	1.52
16	0.26	98.74	1.26
13.5	0.22	98.96	1.04
11.4	0.41	99.37	0.63
9.6	0.07	99.44	0.56
8.1	0.32	99.76	0.24
6.8	0	99.76	0.24
5.7	0.23	99.99	0.01
4.8	0	99.99	0.01
4.1	0	99.99	0.01
3.4	0	99.99	0.01
2.9	0.01	100	0
2.4	0	100	0
	P20	P50	P80
Size	277.99	719.24	1429.15

Chalcopyrite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
180	0	0	100
150	2.63	2.63	97.37
125	2.46	5.09	94.91
106	4.7	9.78	90.22
90	2.98	12.76	87.24
75	7.57	20.32	79.68
63	4.28	24.61	75.39
53	5.88	30.48	69.52
45	7.33	37.82	62.18
38	6.15	43.97	56.03
32	11.21	55.18	44.82
27	28.46	83.64	16.36
22	5.87	89.51	10.49
19	1.68	91.19	8.81
16	1.21	92.41	7.59
13.5	2.27	94.68	5.32
11.4	1.69	96.37	3.63
9.6	0.39	96.76	3.24
8.1	1.84	98.6	1.4
6.8	0	98.6	1.4
5.7	1.24	99.84	0.16
4.8	0	99.84	0.16
4.1	0	99.84	0.16
3.4	0	99.84	0.16
2.9	0.16	100	0
2.4	0	100	0
	P20	P50	P80
Size	27.64	34.77	75.64

Native-Cu			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	21.33	21.33	78.67
850	18.66	39.99	60.01
710	8.62	48.61	51.39
600	7.76	56.37	43.63
500	7.72	64.09	35.91
425	6.71	70.79	29.21
355	3.14	73.93	26.07
300	3.79	77.72	22.28
250	5.13	82.84	17.16
212	2.43	85.27	14.73
180	0.18	85.46	14.54
150	3.11	88.56	11.44
125	2.95	91.51	8.49
106	0.87	92.38	7.62
90	0.97	93.35	6.65
75	1.2	94.54	5.46
63	0.76	95.3	4.7
53	0.66	95.96	4.04
45	0.52	96.48	3.52
38	0.54	97.02	2.98
32	0.73	97.74	2.26
27	0.62	98.36	1.64
22	0.32	98.68	1.32
19	0.31	98.99	1.01
16	0.2	99.19	0.81
13.5	0.18	99.37	0.63
11.4	0.23	99.6	0.4
9.6	0.05	99.64	0.36
8.1	0.18	99.82	0.18
6.8	0	99.82	0.18
5.7	0.18	99.99	0.01
4.8	0	99.99	0.01
4.1	0	99.99	0.01
3.4	0	99.99	0.01
2.9	0.01	100	0
2.4	0	100	0
	P20	P50	P80
Size	277.72	690.24	1012.47

FeO			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	12.14	12.14	87.86
850	0	12.14	87.86
710	7.41	19.55	80.45
600	0	19.55	80.45
500	12.91	32.46	67.54
425	5.99	38.45	61.55
355	5.16	43.6	56.4
300	5.78	49.39	50.61
250	5.46	54.85	45.15
212	4.03	58.88	41.12
180	4.08	62.96	37.04
150	1.25	64.21	35.79
125	2.94	67.15	32.85
106	2.57	69.72	30.28
90	2.61	72.33	27.67
75	2.73	75.06	24.94
63	2.54	77.6	22.4
53	2.63	80.23	19.77
45	2.79	83.02	16.98
38	2.43	85.45	14.55
32	2.81	88.27	11.73
27	2.84	91.1	8.9
22	4.74	95.85	4.15
19	1.1	96.95	3.05
16	0.85	97.8	2.2
13.5	0.61	98.41	1.59

Calcite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	4.81	4.81	95.19
600	13.81	18.62	81.38
500	18.98	37.6	62.4
425	8.42	46.02	53.98
355	7.05	53.07	46.93
300	4.1	57.17	42.83
250	5.55	62.73	37.27
212	5.51	68.23	31.77
180	3.08	71.32	28.68
150	3.68	75	25
125	3.82	78.81	21.19
106	2.98	81.79	18.21
90	2.94	84.73	15.27
75	2.41	87.14	12.86
63	2.23	89.36	10.64
53	2.17	91.53	8.47
45	1.74	93.27	6.73
38	1.49	94.76	5.24
32	1.49	96.25	3.75
27	1.04	97.29	2.71
22	1.61	98.9	1.1
19	0.39	99.28	0.72
16	0.32	99.61	0.39
13.5	0.16	99.77	0.23
11.4	0.08	99.85	0.15
9.6	0.06	99.91	0.09

Fe_Clay			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	1.17	1.17	98.83
850	6.81	7.98	92.02
710	21.88	29.86	70.14
600	16.3	46.16	53.84
500	13.34	59.5	40.5
425	5.19	64.69	35.31
355	5.61	70.3	29.7
300	2.96	73.26	26.74
250	3.33	76.58	23.42
212	2.4	78.99	21.01
180	2.04	81.03	18.97
150	2.26	83.29	16.71
125	2.09	85.38	14.62
106	1.71	87.09	12.91
90	1.67	88.76	11.24
75	1.48	90.25	9.75
63	1.42	91.67	8.33
53	1.28	92.95	7.05
45	1.21	94.16	5.84
38	0.95	95.11	4.89
32	1.17	96.27	3.73
27	0.89	97.17	2.83
22	1.68	98.85	1.15
19	0.45	99.29	0.71
16	0.3	99.59	0.41
13.5	0.13	99.72	0.28

Quartz			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1400	0	0	100
1200	1.66	1.66	98.34
1000	8.88	10.54	89.46
850	8.76	19.3	80.7
710	21.15	40.45	59.55
600	16.33	56.78	43.22
500	14.75	71.53	28.47
425	7.53	79.06	20.94
355	5.66	84.71	15.29
300	2.99	87.7	12.3
250	2.64	90.34	9.66
212	1.55	91.89	8.11
180	1.7	93.59	6.41
150	1.08	94.66	5.34
125	0.88	95.55	4.45
106	0.81	96.36	3.64
90	0.53	96.89	3.11
75	0.47	97.36	2.64
63	0.37	97.73	2.27
53	0.43	98.16	1.84
45	0.26	98.42	1.58
38	0.23	98.66	1.34
32	0.24	98.9	1.1
27	0.26	99.15	0.85
22	0.42	99.58	0.42
19	0.16	99.74	0.26
16	0.14	99.88	0.12

11.4	0.37	98.78	1.22
9.6	0.43	99.21	0.79
8.1	0.24	99.45	0.55
6.8	0.3	99.75	0.25
5.7	0.19	99.93	0.07
4.8	0.02	99.95	0.05
4.1	0.02	99.98	0.02
3.4	0	99.98	0.02
	P20	P50	P80
Size	53.88	294.38	596.5

8.1	0.03	99.94	0.06
6.8	0.03	99.97	0.03
5.7	0.01	99.98	0.02
4.8	0.01	99.99	0.01
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
	P20	P50	P80
Size	117.42	385.48	592.73

11.4	0.07	99.79	0.21
9.6	0.07	99.86	0.14
8.1	0.04	99.9	0.1
6.8	0.05	99.95	0.05
5.7	0.03	99.98	0.02
4.8	0.01	99.99	0.01
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
	P20	P50	P80
Size	196.12	571.21	773.08

13.5	0.04	99.92	0.08
11.4	0.02	99.94	0.06
9.6	0.02	99.96	0.04
8.1	0.01	99.97	0.03
6.8	0.01	99.98	0.02
5.7	0.01	99.99	0.01
4.8	0	99.99	0.01
	P20	P50	P80
Size	413.34	645.65	845.36
2.9	0	100	0

CuDeco_79_84-86

Chalcocite				Chalcopyrite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%	Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
22	0	0	100	1200	0	0	100
19	28.85	28.85	71.15	1000	45.47	45.47	54.53
16	21.15	50	50	850	7.08	52.55	47.45
13.5	0	50	50	710	8.66	61.21	38.79
11.4	19.23	69.23	30.77	600	0	61.21	38.79
9.6	26.92	96.15	3.85	500	0	61.21	38.79
8.1	0	96.15	3.85	425	4.48	65.69	34.31
6.8	0	96.15	3.85	355	2.55	68.24	31.76
5.7	3.85	100	0	300	1.23	69.47	30.53
4.8	0	100	0	250	5.18	74.65	25.35
				212	3.06	77.71	22.29
				180	3.29	81.01	18.99
				150	3.47	84.48	15.52
				125	2.97	87.45	12.55
				106	2.51	89.96	10.04
				90	1.52	91.48	8.52
				75	1.57	93.05	6.95
				63	1.19	94.24	5.76
				53	1.27	95.51	4.49
				45	0.96	96.47	3.53
				38	0.9	97.37	2.63
				32	0.74	98.11	1.89
				27	0.72	98.83	1.17
				22	0.36	99.19	0.81
				19	0.21	99.4	0.6
				16	0.15	99.54	0.46
				13.5	0.14	99.68	0.32
				11.4	0.14	99.82	0.18
				9.6	0.04	99.86	0.14
				8.1	0.08	99.95	0.05
				6.8	0	99.95	0.05
				5.7	0.05	100	0
				4.8	0	100	0
				4.1	0	100	0
				3.4	0	100	0
				2.9	0	100	0
				2.4	0	100	0
					P20	P50	P80
				Size	189.77	903.96	1112.02

<i>Pyrite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	8.22	8.22	91.78
710	59.7	67.91	32.09
600	11.56	79.47	20.53
500	5.28	84.76	15.24
425	4.08	88.84	11.16
355	1.61	90.45	9.55
300	3.66	94.11	5.89
250	0.61	94.72	5.28
212	2.33	97.05	2.95
180	0	97.05	2.95
150	1	98.06	1.94
125	0.7	98.76	1.24
106	0.26	99.02	0.98
90	0.18	99.2	0.8
75	0.23	99.43	0.57
63	0.13	99.56	0.44
53	0.15	99.71	0.29
45	0.06	99.78	0.22
38	0.02	99.79	0.21
32	0.04	99.84	0.16
27	0.02	99.86	0.14
22	0.08	99.94	0.06
19	0.02	99.95	0.05
16	0.01	99.97	0.03
13.5	0.01	99.98	0.02
11.4	0.01	99.99	0.01
9.6	0	99.99	0.01

<i>FeO</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	2.36	2.36	97.64
600	4.47	6.83	93.17
500	6.53	13.36	86.64
425	10.35	23.71	76.29
355	9.91	33.62	66.38
300	3.56	37.18	62.82
250	7.19	44.37	55.63
212	4.9	49.27	50.73
180	5.23	54.49	45.51
150	6.69	61.18	38.82
125	5.73	66.91	33.09
106	5.23	72.14	27.86
90	5.7	77.84	22.16
75	4.63	82.47	17.53
63	3.67	86.14	13.86
53	3.35	89.49	10.51
45	2.68	92.17	7.83
38	2.1	94.27	5.73
32	1.75	96.02	3.98
27	1.15	97.17	2.83
22	1.09	98.26	1.74
19	0.52	98.78	1.22
16	0.42	99.2	0.8
13.5	0.32	99.52	0.48
11.4	0.16	99.69	0.31
9.6	0.16	99.85	0.15
8.1	0.07	99.91	0.09

<i>Calcite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	13.18	13.18	86.82
710	22.49	35.67	64.33
600	11.75	47.42	52.58
500	3.85	51.27	48.73
425	5.84	57.11	42.89
355	3.91	61.02	38.98
300	5.37	66.39	33.61
250	3.33	69.72	30.28
212	4.84	74.56	25.44
180	3.01	77.57	22.43
150	3.12	80.69	19.31
125	2.52	83.21	16.79
106	1.5	84.71	15.29
90	2.04	86.75	13.25
75	1.76	88.51	11.49
63	1.88	90.39	9.61
53	1.46	91.85	8.15
45	2.02	93.87	6.13
38	0.63	94.5	5.5
32	1.57	96.07	3.93
27	0.64	96.7	3.3
22	2.76	99.47	0.53
19	0.2	99.67	0.33
16	0.15	99.82	0.18
13.5	0.07	99.89	0.11
11.4	0.04	99.93	0.07
9.6	0.04	99.97	0.03

8.1	0	100	0
	P20	P50	P80
Size	590.04	752.01	822.37

6.8	0.06	99.97	0.03
5.7	0.02	99.99	0.01
	P20	P50	P80
Size	82.99	207.52	451.89

8.1	0.02	99.98	0.02
6.8	0.01	99.99	0.01
5.7	0.01	100	0
	P20	P50	P80
Size	156.61	532.92	807.56

<i>Amphibole</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
##	0	0	100
##	7.76	7.76	92.24
##	13.34	21.1	78.9
##	15.24	36.34	63.66
##	13.63	49.97	50.03
##	14.22	64.19	35.81
##	7.61	71.8	28.2
##	3.92	75.72	24.28
##	4.3	80.02	19.98
##	3	83.03	16.97
##	1.75	84.78	15.22
##	1.69	86.47	13.53
##	1.37	87.85	12.15
##	1.01	88.86	11.14
##	1.39	90.25	9.75
90	0.92	91.17	8.83
75	0.93	92.1	7.9
63	1	93.1	6.9
53	0.95	94.05	5.95
45	0.98	95.03	4.97

<i>Pyroxene</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	7.32	7.32	92.68
600	20.76	28.09	71.91
500	9.9	37.99	62.01
425	10.85	48.83	51.17
355	8.27	57.1	42.9
300	9.1	66.2	33.8
250	5.19	71.39	28.61
212	2.87	74.26	25.74
180	3.86	78.12	21.88
150	2.33	80.45	19.55
125	1.84	82.29	17.71
106	1.49	83.79	16.21
90	0.98	84.77	15.23
75	0.93	85.7	14.3
63	0.84	86.54	13.46
53	0.73	87.26	12.74
45	1.53	88.79	11.21
38	0.71	89.5	10.5
32	2.09	91.59	8.41

<i>Quartz</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	8.94	8.94	91.06
850	18.35	27.29	72.71
710	32.63	59.92	40.08
600	9.91	69.83	30.17
500	8.72	78.55	21.45
425	5.84	84.4	15.6
355	3.53	87.93	12.07
300	2.83	90.76	9.24
250	1.92	92.68	7.32
212	1.15	93.83	6.17
180	1.01	94.84	5.16
150	0.83	95.67	4.33
125	0.51	96.18	3.82
106	0.55	96.73	3.27
90	0.54	97.26	2.74
75	0.36	97.62	2.38
63	0.31	97.93	2.07
53	0.27	98.2	1.8
45	0.17	98.37	1.63

38	0.79	95.83	4.17
32	0.96	96.79	3.21
27	0.67	97.46	2.54
22	1.52	98.98	1.02
19	0.34	99.32	0.68
16	0.26	99.58	0.42
14	0.15	99.73	0.27
11	0.08	99.82	0.18
10	0.07	99.89	0.11
8	0.04	99.93	0.07
7	0.04	99.97	0.03
6	0.02	99.99	0.01
	P20	P50	P80
Size	300.31	599.8	862.35

27	0.93	92.53	7.47
22	6.44	98.96	1.04
19	0.5	99.46	0.54
16	0.3	99.77	0.23
13.5	0.1	99.87	0.13
11.4	0.04	99.91	0.09
9.6	0.03	99.94	0.06
8.1	0.02	99.95	0.05
6.8	0.02	99.98	0.02
5.7	0.01	99.99	0.01
4.8	0	99.99	0.01
4.1	0.01	100	0
	P20	P50	P80
Size	155.84	415.13	642.84

38	0.21	98.58	1.42
32	0.26	98.84	1.16
27	0.21	99.05	0.95
22	0.5	99.55	0.45
19	0.19	99.74	0.26
16	0.17	99.91	0.09
13.5	0.05	99.96	0.04
11.4	0.02	99.97	0.03
9.6	0.01	99.99	0.01
8.1	0	99.99	0.01
6.8	0.01	99.99	0.01
5.7	0	100	0
	P20	P50	P80
Size	481.45	752.57	909.58

CuDeco_79_91-93***Chalcocite***

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
75	0	0	100
63	32.85	32.85	67.15
53	21.46	54.3	45.7
45	0	54.3	45.7
38	9.67	63.97	36.03
32	0	63.97	36.03
27	4.37	68.34	31.66
22	7.55	75.89	24.11
19	5.03	80.93	19.07
16	1.32	82.25	17.75
13.5	1.72	83.97	16.03
11.4	6.36	90.33	9.67
9.6	1.85	92.19	7.81
8.1	4.5	96.69	3.31
6.8	0	96.69	3.31
5.7	3.31	100	0
4.8	0	100	0
	P20	P50	P80
Size	19.55	55.01	67.69

Chalcopyrite

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1700	0	0	100
1400	5.61	5.61	94.39
1200	10.1	15.71	84.29
1000	17.29	33.01	66.99
850	9.67	42.68	57.32
710	18.28	60.96	39.04
600	5.54	66.5	33.5
500	7.43	73.93	26.07
425	6.16	80.08	19.92
355	3.5	83.58	16.42
300	3.15	86.74	13.26
250	2.04	88.77	11.23
212	1.75	90.52	9.48
180	1.42	91.94	8.06
150	1.44	93.38	6.62
125	1.17	94.55	5.45
106	0.88	95.44	4.56
90	0.6	96.04	3.96
75	0.71	96.75	3.25
63	0.57	97.31	2.69
53	0.49	97.8	2.2
45	0.38	98.18	1.82
38	0.37	98.55	1.45
32	0.42	98.97	1.03
27	0.36	99.33	0.67
22	0.21	99.54	0.46
19	0.13	99.67	0.33
16	0.08	99.76	0.24
13.5	0.07	99.83	0.17
11.4	0.07	99.9	0.1
9.6	0.01	99.92	0.08
8.1	0.05	99.97	0.03
6.8	0	99.97	0.03
5.7	0.03	100	0
4.8	0	100	0
4.1	0	100	0
3.4	0	100	0
2.9	0	100	0
2.4	0	100	0
	P20	P50	P80
Size	425.98	793.92	1150.42

Native Copper

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
212	0	0	100
180	87.74	87.74	12.26
150	0	87.74	12.26
125	0	87.74	12.26
106	0	87.74	12.26
90	0	87.74	12.26
75	0	87.74	12.26
63	0	87.74	12.26
53	0	87.74	12.26
45	3.31	91.04	8.96
38	0	91.04	8.96
32	2.89	93.94	6.06
27	0	93.94	6.06
22	2.76	96.69	3.31
19	0	96.69	3.31
16	0.64	97.34	2.66
13.5	0	97.34	2.66
11.4	1.24	98.58	1.42
9.6	0.37	98.94	1.06
8.1	0.92	99.86	0.14
6.8	0	99.86	0.14
5.7	0.09	99.95	0.05
4.8	0	99.95	0.05
4.1	0	99.95	0.05
3.4	0	99.95	0.05
2.9	0.05	100	0
2.4	0	100	0
	P20	P50	P80
Size	182.82	193.76	204.71

<i>Pyrite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	4.3	4.3	95.7
850	18.18	22.48	77.52
710	26.84	49.32	50.68
600	17.41	66.74	33.26
500	9.97	76.71	23.29
425	4.6	81.3	18.7
355	5.78	87.08	12.92
300	2.31	89.39	10.61
250	1.97	91.36	8.64
212	1.6	92.97	7.03
180	1.16	94.12	5.88
150	0.98	95.1	4.9
125	0.9	96	4
106	0.96	96.96	3.04
90	0.68	97.64	2.36
75	0.37	98.01	1.99
63	0.41	98.41	1.59
53	0.44	98.85	1.15
45	0.27	99.13	0.87
38	0.18	99.31	0.69
32	0.17	99.48	0.52
27	0.16	99.64	0.36

<i>FeO</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
600	0	0	100
500	17.33	17.33	82.67
425	17.19	34.52	65.48
355	8.32	42.84	57.16
300	0	42.84	57.16
250	2.34	45.18	54.82
212	5.6	50.78	49.22
180	2.17	52.95	47.05
150	3.74	56.68	43.32
125	1.09	57.78	42.22
106	3.24	61.01	38.99
90	1.7	62.72	37.28
75	3.61	66.33	33.67
63	3.78	70.11	29.89
53	3.73	73.84	26.16
45	4.74	78.57	21.43
38	2.59	81.17	18.83
32	4.32	85.49	14.51
27	2.73	88.22	11.78
22	9.3	97.52	2.48
19	1.03	98.55	1.45
16	0.72	99.27	0.73
13.5	0.3	99.57	0.43

<i>Calcite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	26.9	26.9	73.1
600	20.97	47.87	52.13
500	9.85	57.72	42.28
425	11.34	69.06	30.94
355	2.6	71.66	28.34
300	2.69	74.35	25.65
250	5.14	79.49	20.51
212	1.44	80.93	19.07
180	2.65	83.58	16.42
150	1.97	85.55	14.45
125	1.58	87.13	12.87
106	1.76	88.89	11.11
90	0.82	89.71	10.29
75	1.15	90.86	9.14
63	1.65	92.51	7.49
53	1	93.51	6.49
45	1.15	94.66	5.34
38	0.48	95.14	4.86
32	1.18	96.32	3.68
27	0.59	96.91	3.09
22	2.7	99.61	0.39
19	0.18	99.79	0.21

22	0.14	99.78	0.22
19	0.05	99.84	0.16
16	0.05	99.89	0.11
13.5	0.04	99.93	0.07
11.4	0.02	99.95	0.05
9.6	0.02	99.97	0.03
8.1	0.01	99.98	0.02
6.8	0.01	99.99	0.01
	P20	P50	P80
Size	446.26	705.73	870.48

11.4	0.11	99.68	0.32
9.6	0.13	99.81	0.19
8.1	0.07	99.88	0.12
6.8	0.06	99.94	0.06
5.7	0.03	99.97	0.03
4.8	0.01	99.98	0.02
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
	P20	P50	P80
Size	41.15	217.27	488.34

16	0.1	99.89	0.11
13.5	0.05	99.94	0.06
11.4	0.02	99.96	0.04
9.6	0.02	99.98	0.02
8.1	0.01	99.98	0.02
6.8	0.01	99.99	0.01
5.7	0	100	0
	P20	P50	P80
Size	236.55	578.39	745.9

Siderite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
#	0	0	100
#	9.94	9.94	90.06
#	7.38	17.32	82.68
#	20.79	38.11	61.89
#	20.56	58.66	41.34
#	7.72	66.38	33.62
#	4.86	71.25	28.75
#	2.68	73.93	26.07
#	3.49	77.41	22.59
#	2.28	79.69	20.31

Amphibole			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	1.37	1.37	98.63
850	15.7	17.07	82.93
710	16.7	33.77	66.23
600	24.11	57.88	42.12
500	14.8	72.69	27.31
425	5.96	78.64	21.36
355	6.25	84.9	15.1
300	2.78	87.68	12.32
250	2.37	90.04	9.96

Quartz			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	8.66	8.66	91.34
710	12.31	20.98	79.02
600	17.36	38.34	61.66
500	18.82	57.16	42.84
425	10.7	67.86	32.14
355	7.84	75.7	24.3
300	6.66	82.36	17.64
250	4.21	86.56	13.44
212	2.28	88.84	11.16

##	3.91	83.6	16.4
##	1.83	85.43	14.57
##	2.63	88.06	11.94
##	1.32	89.38	10.62
90	1.8	91.18	8.82
75	1.51	92.69	7.31
63	1.06	93.75	6.25
53	0.94	94.7	5.3
45	1.3	95.99	4.01
38	0.81	96.8	3.2
32	1.02	97.82	2.18
27	0.53	98.36	1.64
22	1.18	99.54	0.46
19	0.14	99.68	0.32
16	0.16	99.84	0.16
14	0.07	99.91	0.09
11	0.02	99.94	0.06
10	0.03	99.96	0.04
8	0.01	99.98	0.02
7	0.01	99.99	0.01
6	0.01	99.99	0.01
	P20	P50	P80
Size	209.5	542.15	695.8

212	1.37	91.42	8.58
180	1.33	92.75	7.25
150	1.11	93.86	6.14
125	0.96	94.82	5.18
106	0.69	95.52	4.48
90	0.69	96.21	3.79
75	0.65	96.86	3.14
63	0.47	97.33	2.67
53	0.44	97.77	2.23
45	0.44	98.21	1.79
38	0.35	98.56	1.44
32	0.34	98.9	1.1
27	0.28	99.18	0.82
22	0.36	99.54	0.46
19	0.13	99.67	0.33
16	0.12	99.78	0.22
13.5	0.07	99.86	0.14
11.4	0.04	99.9	0.1
9.6	0.04	99.94	0.06
8.1	0.02	99.96	0.04
6.8	0.02	99.98	0.02
5.7	0.01	99.99	0.01
	P20	P50	P80

*CuDeco_79_107-109I**Chalcopyrite*

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1400	0	0	100
1200	13.17	13.17	86.83
1000	0	13.17	86.83
850	12.75	25.92	74.08
710	18.47	44.39	55.61
600	5.75	50.14	49.86
500	10.22	60.36	39.64
425	5.74	66.1	33.9
355	2.42	68.52	31.48
300	3.09	71.61	28.39
250	5.68	77.29	22.71
212	4.22	81.52	18.48
180	3.16	84.68	15.32
150	3.33	88	12
125	3.06	91.07	8.93
106	1.89	92.95	7.05
90	1.55	94.51	5.49
75	1.39	95.89	4.11
63	0.69	96.59	3.41
53	0.84	97.42	2.58
45	0.55	97.97	2.03
38	0.53	98.5	1.5
32	0.37	98.87	1.13
27	0.4	99.28	0.72
22	0.21	99.48	0.52
19	0.15	99.64	0.36
16	0.11	99.74	0.26
13.5	0.08	99.83	0.17
11.4	0.07	99.9	0.1
9.6	0.02	99.92	0.08
8.1	0.05	99.97	0.03
6.8	0	99.97	0.03
5.7	0.02	100	0
4.8	0	100	0
4.1	0	100	0
3.4	0	100	0
2.9	0	100	0
2.4	0	100	0
	P20	P50	P80
Size	225.63	602.68	919.67

Pyrite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	25.42	25.42	74.58
600	6.64	32.06	67.94
500	13.52	45.58	54.42
425	13.27	58.85	41.15
355	12.71	71.56	28.44
300	4.51	76.07	23.93
250	8.57	84.64	15.36
212	2.33	86.96	13.04
180	2.58	89.54	10.46
150	3.71	93.26	6.74
125	2.03	95.29	4.71
106	0.96	96.24	3.76
90	1.15	97.4	2.6
75	0.27	97.67	2.33
63	0.71	98.37	1.63
53	0.13	98.5	1.5
45	0.3	98.8	1.2
38	0.15	98.95	1.05
32	0.26	99.21	0.79
27	0.26	99.47	0.53
22	0.18	99.65	0.35
19	0.11	99.76	0.24

FeO			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
710	0	0	100
600	4.69	4.69	95.31
500	7.67	12.36	87.64
425	2.24	14.6	85.4
355	6.92	21.52	78.48
300	7.25	28.76	71.24
250	7.99	36.76	63.24
212	4.35	41.1	58.9
180	4.8	45.91	54.09
150	8.15	54.06	45.94
125	7.64	61.7	38.3
106	8.29	69.98	30.02
90	6.64	76.63	23.37
75	5.75	82.38	17.62
63	3.88	86.25	13.75
53	3.61	89.86	10.14
45	2.37	92.24	7.76
38	2.02	94.26	5.74
32	1.81	96.06	3.94
27	1.28	97.35	2.65
22	1.02	98.37	1.63
19	0.46	98.82	1.18
16	0.43	99.25	0.75

Calcite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	4.17	4.17	95.83
850	13.8	17.98	82.02
710	22.78	40.75	59.25
600	18.53	59.29	40.71
500	11.53	70.82	29.18
425	7.4	78.22	21.78
355	5.79	84.01	15.99
300	2.87	86.88	13.12
250	2.1	88.98	11.02
212	1.68	90.67	9.33
180	1.06	91.73	8.27
150	1.36	93.09	6.91
125	0.95	94.04	5.96
106	0.9	94.94	5.06
90	0.76	95.7	4.3
75	0.58	96.28	3.72
63	0.69	96.97	3.03
53	0.57	97.53	2.47
45	0.47	98	2
38	0.39	98.39	1.61
32	0.41	98.8	1.2
27	0.3	99.1	0.9

16	0.08	99.84	0.16
13.5	0.05	99.9	0.1
11.4	0.03	99.93	0.07
9.6	0.04	99.96	0.04
8.1	0.01	99.98	0.02
6.8	0.01	99.99	0.01
	P20	P50	P80
Size	277.08	475.02	739.83

13.5	0.31	99.56	0.44
11.4	0.15	99.72	0.28
9.6	0.13	99.85	0.15
8.1	0.05	99.9	0.1
6.8	0.07	99.96	0.04
5.7	0.02	99.99	0.01
4.8	0	99.99	0.01
	P20	P50	P80
Size	81.2	164.93	370.34

22	0.5	99.59	0.41
19	0.13	99.72	0.28
16	0.12	99.84	0.16
13.5	0.07	99.91	0.09
11.4	0.03	99.94	0.06
9.6	0.03	99.97	0.03
8.1	0.01	99.98	0.02
6.8	0.01	99.99	0.01
	P20	P50	P80
Size	403.47	655.12	837.56

Amphibole

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
#	0	0	100
#	6.59	6.59	93.41
#	8.98	15.56	84.44
#	6.39	21.95	78.05
#	9.96	31.91	68.09
#	10.5	42.41	57.59
#	6.63	49.04	50.96
#	6.4	55.44	44.56
#	5.44	60.88	39.12
#	5.49	66.37	33.63

Quartz

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	7.24	7.24	92.76
850	14.86	22.1	77.9
710	26.06	48.16	51.84
600	10.49	58.66	41.34
500	19.08	77.73	22.27
425	6.39	84.12	15.88
355	4.59	88.72	11.28
300	1.91	90.62	9.38
250	2.04	92.66	7.34

##	5.48	71.85	28.15
##	4.7	76.56	23.44
90	3.23	79.79	20.21
75	3.46	83.25	16.75
63	2.78	86.03	13.97
53	1.97	87.99	12.01
45	1.59	89.58	10.42
38	1.53	91.11	8.89
32	1.56	92.67	7.33
27	1.29	93.96	6.04
22	2.78	96.74	3.26
19	0.97	97.71	2.29
16	0.83	98.54	1.46
14	0.43	98.97	1.03
11	0.26	99.23	0.77
10	0.29	99.52	0.48
8	0.16	99.68	0.32
7	0.18	99.86	0.14
6	0.1	99.96	0.04
5	0.02	99.97	0.03
4	0.01	99.99	0.01
	P20	P50	P80
Size	89.07	244.31	447.91

212	1.4	94.06	5.94
180	1.17	95.23	4.77
150	0.78	96.01	3.99
125	0.69	96.7	3.3
106	0.52	97.22	2.78
90	0.41	97.64	2.36
75	0.42	98.06	1.94
63	0.28	98.34	1.66
53	0.25	98.59	1.41
45	0.19	98.78	1.22
38	0.18	98.97	1.03
32	0.16	99.12	0.88
27	0.16	99.29	0.71
22	0.3	99.58	0.42
19	0.17	99.75	0.25
16	0.15	99.9	0.1
13.5	0.05	99.95	0.05
11.4	0.02	99.97	0.03
9.6	0.01	99.98	0.02
8.1	0	99.99	0.01
6.8	0.01	99.99	0.01
5.7	0	100	0
	P20	P50	P80
Size	473.4	690.74	871.2

*CuDeco_79_172-177**Chalcopyrite*

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	8.84	8.84	91.16
710	23.65	32.49	67.51
600	7.85	40.34	59.66
500	4.96	45.3	54.7
425	5.32	50.62	49.38
355	5.84	56.46	43.54
300	6.19	62.65	37.35
250	5.16	67.82	32.18
212	3.01	70.82	29.18
180	3.78	74.61	25.39
150	4.59	79.2	20.8
125	3.27	82.47	17.53
106	2.51	84.98	15.02
90	1.98	86.95	13.05
75	2.11	89.06	10.94
63	2.02	91.08	8.92
53	1.57	92.65	7.35
45	1.53	94.18	5.82
38	1.21	95.39	4.61
32	1.08	96.47	3.53
27	0.94	97.41	2.59
22	0.72	98.13	1.87
19	0.43	98.56	1.44
16	0.39	98.94	1.06
13.5	0.32	99.26	0.74
11.4	0.31	99.57	0.43
9.6	0.06	99.63	0.37
8.1	0.24	99.87	0.13
6.8	0	99.87	0.13
5.7	0.12	99.99	0.01
4.8	0	99.99	0.01
4.1	0	99.99	0.01
3.4	0	99.99	0.01
2.9	0.01	100	0
2.4	0	100	0
	P20	P50	P80
Size	143.87	433.73	783.95

<i>Pyrite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	5.94	5.94	94.06
710	13.27	19.21	80.79
600	20.42	39.63	60.37
500	27.59	67.21	32.79
425	3.51	70.73	29.27
355	8.09	78.81	21.19
300	4.42	83.23	16.77
250	4.03	87.26	12.74
212	2.37	89.63	10.37
180	1.75	91.39	8.61
150	0.52	91.91	8.09
125	1.09	93	7
106	1.35	94.35	5.65
90	1.03	95.37	4.63
75	0.57	95.95	4.05
63	0.87	96.81	3.19
53	0.57	97.38	2.62
45	0.51	97.89	2.11
38	0.59	98.48	1.52
32	0.28	98.76	1.24
27	0.36	99.12	0.88
22	0.29	99.41	0.59

<i>Calcite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	13.57	13.57	86.43
710	20.96	34.54	65.46
600	12.75	47.28	52.72
500	11.06	58.34	41.66
425	4.62	62.96	37.04
355	4.03	66.99	33.01
300	4.93	71.92	28.08
250	3.21	75.13	24.87
212	2.62	77.76	22.24
180	2.35	80.11	19.89
150	2.2	82.3	17.7
125	2.11	84.41	15.59
106	2.13	86.54	13.46
90	1.75	88.3	11.7
75	2.03	90.32	9.68
63	1.49	91.82	8.18
53	1.32	93.14	6.86
45	1.56	94.7	5.3
38	0.76	95.47	4.53
32	1.25	96.71	3.29
27	0.59	97.3	2.7
22	2.06	99.37	0.63

<i>Amphibole</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1200	0	0	100
1000	1.89	1.89	98.11
850	8.65	10.54	89.46
710	14.93	25.47	74.53
600	13.79	39.26	60.74
500	15.2	54.46	45.54
425	8.64	63.1	36.9
355	6.37	69.46	30.54
300	4.32	73.78	26.22
250	3.36	77.14	22.86
212	2.91	80.05	19.95
180	2.55	82.59	17.41
150	2.58	85.18	14.82
125	1.95	87.12	12.88
106	1.95	89.08	10.92
90	1.54	90.62	9.38
75	1.4	92.02	7.98
63	1.29	93.32	6.68
53	1.04	94.36	5.64
45	1.17	95.54	4.46
38	0.7	96.24	3.76
32	0.93	97.17	2.83
27	0.59	97.75	2.25

19	0.14	99.55	0.45
16	0.18	99.73	0.27
13.5	0.11	99.84	0.16
11.4	0.04	99.88	0.12
9.6	0.04	99.92	0.08
8.1	0.03	99.95	0.05
6.8	0.03	99.98	0.02
5.7	0.02	99.99	0.01
4.8	0	100	0
	P20	P50	P80
Size	340.25	562.39	705.74

19	0.22	99.59	0.41
16	0.19	99.78	0.22
13.5	0.09	99.87	0.13
11.4	0.04	99.92	0.08
9.6	0.04	99.95	0.05
8.1	0.02	99.97	0.03
6.8	0.02	99.98	0.02
5.7	0.01	99.99	0.01
4.8	0	99.99	0.01
	P20	P50	P80
Size	181.44	575.44	807.07

22	1.41	99.16	0.84
19	0.26	99.42	0.58
16	0.21	99.63	0.37
13.5	0.12	99.75	0.25
11.4	0.07	99.82	0.18
9.6	0.07	99.89	0.11
8.1	0.03	99.93	0.07
6.8	0.04	99.96	0.04
5.7	0.02	99.99	0.01
	P20	P50	P80
Size	212.62	529.35	761.29

CuDeco_111_67-70***Chalcocite***

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
710	0	0	100
600	80.39	80.39	19.61
500	0	80.39	19.61
425	0	80.39	19.61
355	0	80.39	19.61
300	0	80.39	19.61
250	0	80.39	19.61
212	0	80.39	19.61
180	7.07	87.46	12.54
150	3.96	91.43	8.57
125	0	91.43	8.57
106	0	91.43	8.57
90	0	91.43	8.57
75	1.59	93.02	6.98
63	1.44	94.46	5.54
53	1.01	95.47	4.53
45	0.81	96.28	3.72
38	0.65	96.93	3.07
32	1.55	98.48	1.52
27	0.12	98.6	1.4
22	0	98.6	1.4
19	0.38	98.98	1.02
16	0.14	99.11	0.89
13.5	0.33	99.44	0.56
11.4	0.16	99.61	0.39
9.6	0	99.61	0.39
8.1	0.23	99.83	0.17
6.8	0	99.83	0.17
5.7	0.15	99.98	0.02
4.8	0	99.98	0.02
4.1	0	99.98	0.02
3.4	0	99.98	0.02
2.9	0.02	100	0
2.4	0	100	0
	P20	P50	P80
Size	600.53	641.58	682.63

Chalcopyrite

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
500	0	0	100
425	29.94	29.94	70.06
355	0	29.94	70.06
300	0	29.94	70.06
250	0	29.94	70.06
212	0	29.94	70.06
180	0	29.94	70.06
150	0	29.94	70.06
125	0	29.94	70.06
106	0	29.94	70.06
90	0	29.94	70.06
75	0.74	30.68	69.32
63	2.31	32.99	67.01
53	4.12	37.11	62.89
45	2.92	40.03	59.97
38	7.86	47.89	52.11
32	10.42	58.31	41.69
27	16.34	74.65	25.35
22	3.91	78.56	21.44
19	3.61	82.17	17.83
16	2.73	84.9	15.1
13.5	3.42	88.32	11.68
11.4	4	92.32	7.68
9.6	0.98	93.3	6.7
8.1	4.42	97.72	2.28
6.8	0	97.72	2.28
5.7	2.14	99.86	0.14
4.8	0	99.86	0.14
4.1	0	99.86	0.14
3.4	0	99.86	0.14
2.9	0.14	100	0
2.4	0	100	0
	P20	P50	P80
Size	20.8	36.79	449.9

Native Copper

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
500	0	0	100
425	32.6	32.6	67.4
355	19.16	51.76	48.24
300	5.23	56.99	43.01
250	18	74.99	25.01
212	5.67	80.66	19.34
180	5.63	86.29	13.71
150	2.83	89.12	10.88
125	4.4	93.52	6.48
106	0	93.52	6.48
90	1.43	94.95	5.05
75	0	94.95	5.05
63	0.34	95.29	4.71
53	0	95.29	4.71
45	0.22	95.51	4.49
38	0.98	96.48	3.52
32	0.58	97.06	2.94
27	0.9	97.96	2.04
22	0.49	98.45	1.55
19	0.65	99.1	0.9
16	0.18	99.28	0.72
13.5	0.18	99.46	0.54
11.4	0.2	99.66	0.34
9.6	0.02	99.68	0.32
8.1	0.21	99.89	0.11
6.8	0	99.89	0.11
5.7	0.09	99.98	0.02
4.8	0	99.98	0.02
4.1	0	99.98	0.02
3.4	0	99.98	0.02
2.9	0.02	100	0
2.4	0	100	0
	P20	P50	P80
Size	216.43	361.44	453.99

<i>Siderite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
600	0	0	100
500	15.92	15.92	84.08
425	13.6	29.52	70.48
355	13.65	43.17	56.83
300	0	43.17	56.83
250	11.57	54.74	45.26
212	2.87	57.61	42.39
180	8.54	66.15	33.85
150	4.4	70.56	29.44
125	2.64	73.2	26.8
106	3.19	76.38	23.62
90	3.33	79.71	20.29
75	3.33	83.04	16.96
63	3.58	86.62	13.38
53	2.68	89.3	10.7
45	2.47	91.76	8.24
38	2	93.76	6.24
32	1.86	95.62	4.38
27	0.82	96.45	3.55
22	2.33	98.77	1.23
19	0.49	99.27	0.73
16	0.31	99.57	0.43
13.5	0.14	99.72	0.28

<i>Biotite</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
500	0	0	100
425	2.6	2.6	97.4
355	5.7	8.3	91.7
300	6.93	15.23	84.77
250	3.16	18.39	81.61
212	2.78	21.17	78.83
180	3.09	24.26	75.74
150	4.13	28.39	71.61
125	6.36	34.75	65.25
106	4.46	39.21	60.79
90	5.27	44.47	55.53
75	6.47	50.95	49.05
63	6.18	57.13	42.87
53	4.93	62.06	37.94
45	7.2	69.26	30.74
38	4.12	73.38	26.62
32	6.4	79.78	20.22
27	4.03	83.81	16.19
22	11.12	94.93	5.07
19	1.8	96.74	3.26
16	1.25	97.99	2.01
13.5	0.61	98.6	1.4
11.4	0.37	98.97	1.03

<i>Fe_Clay</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	9.43	9.43	90.57
600	7.52	16.95	83.05
500	10.2	27.15	72.85
425	6.38	33.53	66.47
355	6.93	40.46	59.54
300	7.52	47.98	52.02
250	3.7	51.69	48.31
212	3.31	55	45
180	4.16	59.16	40.84
150	3.93	63.09	36.91
125	5.41	68.49	31.51
106	2.45	70.95	29.05
90	3.64	74.59	25.41
75	3.13	77.73	22.27
63	3.38	81.11	18.89
53	2.89	84	16
45	2.97	86.97	13.03
38	2.03	89	11
32	2.75	91.75	8.25
27	1.75	93.5	6.5
22	4.48	97.98	2.02
19	0.97	98.95	1.05

<i>Quartz</i>			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
##	0	0	100
##	0.82	0.82	99.18
##	8.5	9.31	90.69
##	20.49	29.8	70.2
##	30.61	60.41	39.59
##	17.23	77.64	22.36
##	10.53	88.17	11.83
##	4.71	92.88	7.12
##	2.33	95.21	4.79
##	1.2	96.41	3.59
##	1.19	97.6	2.4
##	0.6	98.2	1.8
##	0.3	98.5	1.5
##	0.33	98.83	1.17
##	0.2	99.03	0.97
##	0.16	99.18	0.82
90	0.1	99.29	0.71
75	0.1	99.39	0.61
63	0.08	99.47	0.53
53	0.09	99.56	0.44
45	0.06	99.62	0.38
38	0.06	99.68	0.32
32	0.07	99.75	0.25

11.4	0.09	99.8	0.2
9.6	0.08	99.88	0.12
8.1	0.03	99.92	0.08
6.8	0.03	99.95	0.05
5.7	0.04	99.98	0.02
4.8	0.01	99.99	0.01
4.1	0.01	99.99	0.01
	P20	P50	P80
Size	88.71	270.5	477.5

9.6	0.39	99.36	0.64
8.1	0.18	99.54	0.46
6.8	0.25	99.79	0.21
5.7	0.14	99.93	0.07
4.8	0.02	99.95	0.05
4.1	0.02	99.98	0.02
3.4	0	99.98	0.02
	P20	P50	P80
Size	31.73	77.19	227.98

16	0.48	99.43	0.57
13.5	0.2	99.63	0.37
11.4	0.1	99.73	0.27
9.6	0.08	99.81	0.19
8.1	0.05	99.86	0.14
6.8	0.06	99.92	0.08
5.7	0.04	99.97	0.03
	P20	P50	P80
Size	66.94	272.77	570.08

27	0.05	99.8	0.2
22	0.14	99.93	0.07
19	0.02	99.96	0.04
16	0.02	99.98	0.02
14	0.01	99.98	0.02
11	0	99.99	0.01
10	0	99.99	0.01
	P20	P50	P80
Size	577.6	757.62	921.76

CuDeco_111_196-198

Native Copper				Chalcopyrite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%	Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1400	0	0	100	500	0	0	100
1200	93.81	93.81	6.19	425	74.96	74.96	25.04
1000	0	93.81	6.19	355	0	74.96	25.04
850	0	93.81	6.19	300	0	74.96	25.04
710	0	93.81	6.19	250	0	74.96	25.04
600	0	93.81	6.19	212	0	74.96	25.04
500	0	93.81	6.19	180	10.24	85.2	14.8
425	0	93.81	6.19	150	0	85.2	14.8
355	0	93.81	6.19	125	0	85.2	14.8
300	0	93.81	6.19	106	0	85.2	14.8
250	0	93.81	6.19	90	3.17	88.37	11.63
212	0	93.81	6.19	75	0	88.37	11.63
180	5.2	99.01	0.99	63	2.77	91.14	8.86
150	0	99.01	0.99	53	0.88	92.02	7.98
125	0.89	99.9	0.1	45	1.71	93.73	6.27
106	0	99.9	0.1	38	1.58	95.31	4.69
90	0	99.9	0.1	32	0.49	95.8	4.2
75	0	99.9	0.1	27	1.89	97.69	2.31
63	0	99.9	0.1	22	0.44	98.13	1.87
53	0	99.9	0.1	19	0.17	98.3	1.7
45	0	99.9	0.1	16	0.33	98.63	1.37
38	0	99.9	0.1	13.5	0.22	98.85	1.15
32	0	99.9	0.1	11.4	0.78	99.63	0.37
27	0	99.9	0.1	9.6	0.07	99.7	0.3
22	0.09	99.99	0.01	8.1	0.15	99.85	0.15
19	0	99.99	0.01	6.8	0	99.85	0.15
16	0	99.99	0.01	5.7	0.11	99.95	0.05
13.5	0	99.99	0.01	4.8	0	99.95	0.05
11.4	0	99.99	0.01	4.1	0	99.95	0.05
9.6	0	99.99	0.01	3.4	0	99.95	0.05
8.1	0	99.99	0.01	2.9	0.05	100	0
6.8	0	99.99	0.01	2.4	0	100	0
5.7	0.01	100	0				
4.8	0	100	0				
	P20	P50	P80		P20	P50	P80
Size	1229.45	1293.4	1357.36	Size	196.25	449.97	479.99

FeO			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
600	0	0	100
500	2.47	2.47	97.53
425	6.92	9.39	90.61
355	10.75	20.14	79.86
300	11.75	31.9	68.1
250	7.74	39.64	60.36
212	7.07	46.71	53.29
180	8.64	55.35	44.65
150	6.46	61.8	38.2
125	6.07	67.87	32.13
106	4.94	72.81	27.19
90	3.76	76.58	23.42
75	4.27	80.85	19.15
63	3.51	84.36	15.64
53	2.79	87.15	12.85
45	2.28	89.43	10.57
38	2.16	91.59	8.41
32	1.72	93.32	6.68
27	1.65	94.96	5.04
22	1.7	96.66	3.34
19	0.8	97.46	2.54
16	0.81	98.27	1.73
13.5	0.65	98.91	1.09
11.4	0.35	99.27	0.73
9.6	0.34	99.61	0.39

Calcite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
850	0	0	100
710	15.97	15.97	84.03
600	10.49	26.46	73.54
500	5.78	32.25	67.75
425	1.89	34.14	65.86
355	3.79	37.92	62.08
300	0.82	38.74	61.26
250	3.73	42.47	57.53
212	4.1	46.57	53.43
180	4.77	51.34	48.66
150	4.52	55.86	44.14
125	4.66	60.52	39.48
106	4.1	64.62	35.38
90	3.5	68.12	31.88
75	3.6	71.72	28.28
63	3.41	75.14	24.86
53	2.83	77.97	22.03
45	2.57	80.54	19.46
38	3.01	83.55	16.45
32	3.02	86.56	13.44
27	3.02	89.58	10.42
22	3.75	93.33	6.67
19	1.7	95.02	4.98
16	1.69	96.71	3.29
14	1.32	98.03	1.97

Albite			
Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
###	0	0	100
###	0.71	0.71	99.29
850	10.33	11.04	88.96
710	15.01	26.05	73.95
600	22.05	48.1	51.9
500	19.42	67.52	32.48
425	9.09	76.61	23.39
355	7.09	83.7	16.3
300	4.75	88.45	11.55
250	2.78	91.23	8.77
212	1.79	93.02	6.98
180	1.4	94.42	5.58
150	1.11	95.52	4.48
125	0.89	96.42	3.58
106	0.66	97.07	2.93
90	0.57	97.65	2.35
75	0.42	98.07	1.93
63	0.39	98.46	1.54
53	0.34	98.8	1.2
45	0.24	99.04	0.96
38	0.23	99.27	0.73
32	0.19	99.46	0.54
27	0.15	99.61	0.39
22	0.2	99.81	0.19
19	0.06	99.88	0.12

8.1	0.16	99.76	0.24
6.8	0.15	99.91	0.09
5.7	0.07	99.98	0.02
4.8	0.01	99.98	0.02
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
2.9	0.01	100	0
2.4	0	100	0
	P20	P50	P80
Size	77.98	199.8	355.93

11	0.71	98.74	1.26
9.6	0.63	99.37	0.63
8.1	0.28	99.65	0.35
6.8	0.23	99.89	0.11
5.7	0.08	99.96	0.04
4.8	0.01	99.98	0.02
4.1	0.01	99.99	0.01
3.4	0	99.99	0.01
	P20	P50	P80
Size	46.68	188.99	667.78

16	0.06	99.94	0.06
14	0.03	99.97	0.03
11	0.01	99.98	0.02
9.6	0.01	99.99	0.01
8.1	0	99.99	0.01
6.8	0	99.99	0.01
5.7	0	100	0
4.8	0	100	0
	P20	P50	P80
Size	391.57	590.22	766.44

Amphibole

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
##	0	0	100
##	2.63	2.63	97.37
##	5.54	8.16	91.84
##	10.54	18.71	81.29
##	11.65	30.36	69.64
##	11.76	42.12	57.88
##	10.25	52.37	47.63
##	8.06	60.42	39.58
##	7.29	67.72	32.28
##	5.73	73.45	26.55
##	5.08	78.52	21.48
##	3.64	82.17	17.83

Quartz

Size	Retained Wt%	Cum Retained Wt%	Cum Passing Wt%
1000	0	0	100
850	6.97	6.97	93.03
710	21.63	28.59	71.41
600	14.09	42.68	57.32
500	3.74	46.42	53.58
425	4.46	50.89	49.11
355	6.97	57.85	42.15
300	4.96	62.82	37.18
250	2.93	65.75	34.25
212	2.83	68.58	31.42
180	1.93	70.51	29.49
150	3.24	73.75	26.25

90	2.71	84.88	15.12
75	2.96	87.84	12.16
63	2.21	90.04	9.96
53	1.88	91.93	8.07
45	1.59	93.51	6.49
38	1.31	94.82	5.18
32	1.22	96.04	3.96
27	0.97	97.01	2.99
22	1.28	98.29	1.71
19	0.5	98.8	1.2
16	0.43	99.23	0.77
14	0.27	99.5	0.5
11	0.15	99.65	0.35
10	0.14	99.79	0.21
8	0.07	99.87	0.13
7	0.08	99.94	0.06
6	0.04	99.98	0.02
5	0.01	99.99	0.01
4	0.01	99.99	0.01
3	0	99.99	0.01
3	0.01	100	0
2	P20	P50	P80
Size	117.31	261.55	417.23

125	2.86	76.61	23.39
106	2.1	78.71	21.29
90	2.49	81.2	18.8
75	2.1	83.3	16.7
63	1.92	85.21	14.79
53	1.57	86.78	13.22
45	1.52	88.3	11.7
38	1.45	89.75	10.25
32	1.6	91.35	8.65
27	1.48	92.83	7.17
22	3.93	96.76	3.24
19	1.09	97.84	2.16
16	0.95	98.79	1.21
13.5	0.36	99.15	0.85
11.4	0.23	99.39	0.61
9.6	0.22	99.6	0.4
8.1	0.13	99.73	0.27
6.8	0.15	99.88	0.12
5.7	0.09	99.97	0.03
4.8	0.01	99.98	0.02
4.1	0.01	99.99	0.01
	P20	P50	P80
Size	97.71	439.92	765.63

Appendix 5 Association Data

Mineral Association Data for Sample 04_145-147

Mineral	Chalcocite	Chalcopyrite	Native_Copper	Linn-aelite	Pyrite	FeO	Rutile	Apatite	Calcite	Dolomite	Siderite	Albite	Amphibole	Biotite	Chlorite	Fe_Clay	Ferrosilite	Illite	Orthoclase	Prehnite	Pyrophyllite	Pyroxene	Titanite	Quartz
Chalcocite	0.0	4.1	0.0	0.0	0.0	1.1	0.0	0.0	16.4	0.5	14.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	62.8
Chalcopyrite	0.3	0.0	0.1	0.2	22.3	4.3	0.0	0.5	12.3	0.5	3.6	3.3	17.2	3.2	5.0	7.8	2.5	0.0	0.0	0.6	0.2	0.3	0.0	15.8
Native_Copper	1.0	28.6	0.0	0.0	0.0	0.0	0.0	0.0	57.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7
Linnaeite	0.0	4.1	0.0	0.0	64.1	2.4	0.0	0.0	7.3	0.3	8.9	0.5	1.0	0.2	1.6	3.9	0.4	0.0	0.0	0.1	0.1	0.0	0.0	5.0
Pyrite	0.0	34.6	0.0	4.6	0.0	3.0	0.0	0.0	20.7	0.4	14.7	1.0	3.3	0.9	1.1	3.3	1.4	0.0	0.3	0.4	0.1	0.1	0.0	10.3
FeO	0.3	16.7	0.0	0.4	7.5	0.0	0.0	0.0	15.9	1.3	30.1	0.0	2.2	1.1	1.1	17.4	2.1	0.0	0.0	0.7	0.1	0.1	0.0	3.0
Rutile	0.0	0.0	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0	0.0	0.0	0.0	2.2	11.2	0.0	0.0	17.1	44.0	0.0	0.0	0.0	8.1	4.9
Apatite	0.0	8.5	0.0	0.0	0.0	0.0	0.5	0.0	15.0	0.0	0.4	0.8	1.6	2.0	4.0	1.4	0.0	1.3	1.1	0.9	0.0	2.8	0.2	59.4
Calcite	0.5	5.4	0.1	0.1	5.9	1.8	0.0	0.4	0.0	7.4	17.2	2.2	13.8	1.3	5.3	4.2	0.1	0.0	0.1	4.0	0.2	5.1	0.7	24.2
Dolomite	0.1	1.7	0.0	0.0	0.8	1.1	0.0	0.0	55.1	0.0	7.4	3.4	9.4	1.3	5.3	5.3	0.1	0.0	0.0	4.1	0.1	0.9	0.0	3.9
Siderite	1.3	4.9	0.0	0.6	13.0	10.6	0.0	0.0	53.3	3.1	0.0	0.0	1.9	0.2	1.0	3.7	0.6	0.0	0.0	0.2	0.1	0.1	0.0	5.5
Albite	0.0	3.7	0.0	0.0	0.7	0.0	0.0	0.0	5.7	1.2	0.0	0.0	9.0	18.0	7.8	31.5	0.2	0.1	1.1	6.6	1.8	0.1	0.0	12.4
Amphibole	0.0	9.0	0.0	0.0	1.1	0.3	0.0	0.1	16.3	1.5	0.7	4.1	0.0	2.7	4.3	8.8	0.2	0.0	0.0	2.4	0.4	9.9	0.3	37.8
Biotite	0.0	5.1	0.0	0.0	0.9	0.5	0.0	0.2	4.5	0.7	0.2	25.2	8.3	0.0	17.6	18.4	0.5	0.1	0.7	2.4	1.5	0.4	0.1	13.0
Chlorite	0.0	6.0	0.0	0.1	0.8	0.3	0.0	0.3	14.3	1.9	0.9	8.2	9.9	13.2	0.0	20.3	0.5	0.2	0.5	3.6	1.6	0.6	0.1	16.7
Fe_Clay	0.0	6.2	0.0	0.1	1.7	3.5	0.0	0.1	7.5	1.3	2.2	21.9	13.3	9.2	13.4	0.0	1.5	0.0	0.2	4.0	0.6	0.5	0.0	12.8
Ferrosilite	0.0	28.2	0.0	0.2	9.8	6.0	0.0	0.0	3.1	0.2	4.8	2.3	4.5	3.3	4.2	20.7	0.0	0.0	0.0	0.9	0.1	0.0	0.0	11.6
Illite	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.9	0.2	0.4	0.0	6.3	0.0	2.0	9.1	1.2	0.0	0.0	47.7	2.9	5.1	0.0	0.0	19.4
Orthoclase	0.0	0.2	0.0	0.0	2.7	0.0	1.4	0.9	2.5	0.0	0.0	14.8	0.3	6.6	5.9	3.7	0.0	13.4	0.0	1.1	11.2	0.0	0.0	35.1
Prehnite	0.0	1.8	0.0	0.0	0.7	0.5	0.0	0.1	26.0	3.6	0.5	16.5	13.4	4.3	8.5	14.6	0.2	0.2	0.2	0.0	0.5	1.3	0.1	6.9
Pyrophyllite	0.0	0.9	0.0	0.0	0.3	0.1	0.0	0.0	2.3	0.2	0.4	7.1	3.8	4.4	6.3	3.7	0.1	0.4	3.5	0.9	0.0	0.5	0.1	65.0
Pyroxene	0.0	0.6	0.0	0.0	0.2	0.0	0.0	0.3	24.0	0.5	0.1	0.2	39.8	0.5	1.1	1.4	0.0	0.0	0.0	1.0	0.2	0.0	0.5	29.4
Titanite	0.0	0.2	0.0	0.0	0.1	0.0	0.3	0.2	31.7	0.2	0.0	0.7	9.0	1.3	1.7	1.1	0.0	0.0	0.0	0.4	0.5	5.0	0.0	47.6
Quartz	1.6	6.3	0.0	0.1	2.7	0.3	0.0	1.3	22.0	0.5	1.6	4.4	29.0	3.3	5.6	6.5	0.4	0.1	0.9	1.0	5.7	5.6	1.0	0.0

Mineral Association Data for Sample 07-50-51

Mineral	Chalcocite	Chalcopyrite	Covellite	Native_Copper	Molybdenite	Pyrite	FeO	Rutile	Apatite	Xenotime	Calcite	Dolomite	Siderite	Albite	Amphibole	Biotite	Chlorite	Fe_Clay	Ferro-silite	Illite	Orthoclase	Prehnite	Pyrophyllite	Pyroxene	Titanite	Quartz
Chalcocite	0.0	0.7	0.2	0.6	0.0	0.0	1.4	0.0	0.6	0.0	6.7	0.2	42.4	0.0	1.0	0.5	0.1	1.4	0.2	0.0	0.0	0.4	0.2	0.3	0.0	43.0
Chalcopyrite	19.2	0.0	0.3	0.0	0.0	0.1	5.0	0.0	1.9	0.0	7.9	0.7	50.6	0.1	2.1	1.0	0.3	5.0	0.9	0.0	0.0	0.6	0.1	0.1	0.0	4.1
Covellite	23.1	1.8	0.0	0.0	0.0	0.0	1.2	0.0	2.2	0.0	24.2	0.3	20.1	0.0	1.5	1.8	0.6	5.1	0.0	0.0	0.0	2.0	0.1	0.8	0.0	15.3
Native_Copper	1.5	0.0	0.0	0.0	0.0	0.0	0.7	0.0	1.3	0.0	50.2	0.7	16.7	0.0	2.1	0.4	0.1	1.2	0.0	0.0	0.0	0.4	0.2	1.5	0.0	23.2
Molybdenite	0.0	0.0	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0	24.8	63.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrite	0.0	0.9	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.5	71.9	18.6	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.3
FeO	3.6	0.5	0.0	0.7	0.0	0.0	0.0	0.0	11.4	0.0	16.8	2.1	29.0	0.0	4.9	0.1	0.9	14.0	1.7	0.0	0.0	0.4	0.2	0.6	0.0	13.0
Rutile	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Apatite	1.7	0.2	0.0	1.6	0.0	0.0	13.3	0.0	0.0	0.0	29.9	3.5	32.6	0.0	3.6	0.1	0.6	5.7	0.3	0.0	0.0	1.5	0.1	0.7	0.0	4.5
Xenotime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.9	0.0	0.0	0.0	0.0	0.0	0.0	60.8
Calcite	2.3	0.1	0.1	7.4	0.0	0.0	2.3	0.0	3.5	0.0	0.0	4.8	32.8	0.0	9.0	0.2	0.3	6.4	0.2	0.0	0.0	4.0	0.2	5.7	0.0	20.5
Dolomite	0.6	0.1	0.0	1.0	0.0	1.1	2.8	0.0	3.9	0.0	45.5	0.0	36.3	0.0	2.1	0.1	0.2	2.2	0.1	0.0	0.0	0.9	0.0	0.6	0.0	2.5
Siderite	18.9	0.9	0.1	3.1	0.0	0.0	5.1	0.0	4.9	0.0	41.7	4.9	0.0	0.0	4.5	0.2	0.6	6.2	0.3	0.0	0.0	1.0	0.1	0.8	0.0	6.7
Albite	12.6	0.9	0.0	0.5	0.0	0.0	1.6	0.0	0.5	0.0	13.1	0.0	11.1	0.0	9.8	11.9	0.8	13.6	0.0	0.0	2.7	2.1	8.2	0.0	0.0	10.5
Amphibole	1.2	0.1	0.0	1.0	0.0	0.0	2.2	0.0	1.4	0.0	29.2	0.7	11.6	0.0	0.0	0.4	0.8	15.5	0.6	0.0	0.0	2.1	0.4	5.3	0.0	27.5
Biotite	11.1	0.8	0.3	3.8	0.0	0.0	0.8	0.0	0.9	0.0	11.7	0.4	9.1	0.8	8.5	0.0	5.0	32.0	0.4	0.0	0.2	2.6	0.6	0.5	0.0	10.6
Chlorite	0.8	0.2	0.0	0.3	0.0	0.0	4.3	0.0	2.2	0.0	10.4	0.8	14.5	0.0	8.7	2.7	0.0	47.9	0.4	0.0	0.0	1.6	0.3	0.3	0.1	4.7
Fe_Clay	1.7	0.2	0.0	0.6	0.0	0.0	6.4	0.0	2.2	0.0	21.4	0.8	16.2	0.0	15.8	1.7	4.8	0.0	1.8	0.0	0.0	3.2	0.4	1.1	0.0	21.7
Ferrosilite	3.8	0.6	0.0	0.3	0.0	0.0	10.9	0.0	1.9	0.0	7.9	0.3	12.0	0.0	9.2	0.3	0.6	25.3	0.0	0.0	0.0	0.4	0.2	1.1	0.0	25.3
Illite	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	6.4	0.0	22.1	0.0	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	0.0	0.0	31.4
Orthoclase	9.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	8.8	13.1	11.3	3.8	21.6	0.0	0.0	0.0	2.3	0.0	0.0	0.0	4.2
Prehnite	2.1	0.1	0.1	0.7	0.0	0.0	0.6	0.0	2.4	0.0	53.6	1.3	10.7	0.0	8.7	0.6	0.6	12.7	0.1	0.0	0.0	0.0	0.1	1.0	0.0	4.5
Pyrophyllite	4.1	0.1	0.0	1.6	0.0	0.0	1.8	0.0	0.8	0.0	9.4	0.1	3.3	0.5	7.8	0.6	0.5	7.3	0.2	0.0	0.0	0.6	0.0	3.1	0.0	58.3
Pyroxene	0.7	0.0	0.0	1.6	0.0	0.0	0.6	0.0	0.6	0.0	42.4	0.4	4.4	0.0	12.0	0.1	0.1	2.4	0.2	0.0	0.0	0.6	0.4	0.0	0.0	33.7
Titanite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	7.0	0.0	18.0	0.0	17.2	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6
Quartz	22.0	0.1	0.1	5.0	0.0	0.0	2.6	0.0	0.8	0.0	29.9	0.4	7.7	0.0	12.3	0.3	0.2	9.5	0.8	0.0	0.0	0.5	1.4	6.6	0.0	0.0

Mineral Association Data for Sample 07-82-83

Mineral	Chalco-cite	Chalco-pyrite	Native_Copper	Pyrite	FeO	Rutile	Apatite	Xeno-time	Calcite	Dolomite	Siderite	Albite	Amphi-bole	Biotite	Chlorite	Fe_Clay	Ferro-silite	Illite	Ortho-clase	Prehnite	Pyro-phyllite	Pyroxene	Titanite	Quartz
Chalcocite	0.0	6.1	0.7	0.0	25.5	0.0	0.0	0.0	5.3	0.3	2.4	0.1	2.3	4.9	2.3	37.1	0.5	0.1	0.2	0.5	0.4	0.1	0.0	11.1
Chalcopyrite	25.9	0.0	1.5	0.0	22.0	0.0	0.0	0.0	1.6	0.3	5.2	0.0	0.5	1.9	0.9	34.5	0.3	0.0	0.0	0.3	0.1	0.0	0.0	4.9
Native_Copper	1.0	0.5	0.0	0.0	6.1	0.0	0.1	0.0	30.7	1.8	46.7	0.0	0.9	0.3	0.1	1.1	0.1	0.0	0.0	0.3	0.0	0.0	0.0	10.0
Pyrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FeO	7.2	1.5	1.2	0.0	0.0	0.0	0.1	0.0	4.9	0.6	10.8	0.0	0.9	0.2	1.6	58.1	0.8	0.0	0.0	0.3	0.2	0.0	0.0	11.6
Rutile	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	3.8	0.9	0.7	0.0	3.8	1.2	2.6	44.6	0.0	0.0	0.3	1.0	0.7	0.0	33.5	6.4
Apatite	0.1	0.0	0.2	0.0	0.7	0.0	0.0	0.0	48.0	2.4	7.3	0.0	7.5	0.1	0.4	17.9	0.0	0.0	0.0	4.5	0.1	0.8	0.0	10.0
Xenotime	0.3	0.1	0.5	0.0	2.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	1.5	1.1	88.9	1.0	0.0	0.0	0.3	0.4	0.0	0.0	3.6
Calcite	0.8	0.1	3.2	0.0	2.7	0.0	2.8	0.0	0.0	10.4	20.0	0.0	8.5	0.2	0.6	28.4	0.1	0.0	0.0	11.0	0.2	1.0	0.2	9.9
Dolomite	0.3	0.1	0.9	0.0	1.5	0.0	0.7	0.0	50.5	0.0	9.1	0.0	5.2	0.3	0.4	19.7	0.0	0.0	0.0	6.2	0.1	0.5	0.1	4.4
Siderite	0.5	0.2	6.0	0.0	7.1	0.0	0.5	0.0	24.2	2.3	0.0	0.0	2.1	0.2	1.1	24.7	0.5	0.0	0.0	0.7	0.3	0.2	0.0	29.3
Albite	2.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0	4.0	0.0	1.8	0.0	2.1	1.1	0.7	49.7	0.0	0.0	0.0	0.0	1.3	0.0	0.0	36.6
Amphibole	0.8	0.0	0.2	0.0	1.2	0.1	1.1	0.0	20.5	2.6	4.2	0.0	0.0	0.5	1.0	35.6	0.1	0.0	0.0	3.9	0.7	1.0	0.1	26.4
Biotite	8.8	0.8	0.4	0.0	1.5	0.1	0.1	0.2	1.9	0.6	1.6	0.0	2.2	0.0	11.8	58.1	0.0	0.0	0.1	0.6	0.5	0.0	0.1	10.5
Chlorite	1.6	0.2	0.1	0.0	3.7	0.1	0.1	0.0	2.8	0.3	4.1	0.0	1.8	4.5	0.0	67.0	0.2	0.0	0.0	0.6	0.9	0.0	0.1	12.1
Fe_Clay	2.7	0.6	0.1	0.0	15.0	0.2	0.5	0.4	13.5	1.9	9.7	0.1	7.1	2.4	7.2	0.0	0.5	0.0	0.0	3.0	1.5	0.2	0.3	33.2
Ferrosilite	2.5	0.3	0.3	0.0	13.7	0.0	0.0	0.3	1.7	0.3	14.3	0.0	1.5	0.0	1.2	30.6	0.0	0.0	0.1	0.2	0.0	0.0	0.0	32.9
Illite	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.9	0.0	0.0	0.0	33.6	0.0	14.8	0.0	0.0	44.8
Orthoclase	2.9	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	1.5	0.6	3.1	0.0	13.2	0.0	0.2	14.3	0.0	0.0	63.4
Prehnite	0.4	0.0	0.2	0.0	0.6	0.0	1.2	0.0	48.7	5.7	2.6	0.0	7.3	0.2	0.6	28.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	4.0
Pyrophyllite	0.5	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.3	0.1	2.4	0.0	2.4	0.3	1.7	25.8	0.1	0.4	1.0	0.1	0.0	0.0	0.0	62.7
Pyroxene	0.4	0.1	0.1	0.0	0.6	0.0	1.3	0.0	28.1	3.2	4.4	0.0	11.7	0.0	0.2	11.7	0.0	0.0	0.0	2.4	0.2	0.0	0.5	35.2
Titanite	0.1	0.0	0.2	0.0	1.1	19.3	0.2	0.0	15.4	1.1	2.9	0.0	4.2	0.7	1.1	38.3	0.0	0.0	0.0	1.1	0.1	1.4	0.0	13.0
Quartz	1.2	0.1	0.8	0.0	4.5	0.0	0.4	0.0	7.0	0.6	17.2	0.1	7.8	0.6	1.9	49.5	0.7	0.1	0.4	0.6	5.3	0.9	0.1	0.0

Mineral Association Data for Sample 79_84-86

Mineral	Chalcocite	Chalcopyrite	Pyrite	FeO	Ilmenite	Apatite	Calcite	Dolomite	Siderite	Albite	Amphibole	Biotite	Chlorite	Fe_Clay	Ferrosilite	Illite	Orthoclase	Prehnite	Pyrophyllite	Pyroxene	Titanite	Quartz
Chalcocite	0.0	12.5	0.0	3.6	0.0	0.0	4.4	5.5	5.4	0.0	20.4	5.1	0.0	15.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	22.4
Chalcopyrite	0.0	0.0	11.0	8.6	0.0	0.6	5.6	0.2	0.0	5.6	29.6	1.6	0.9	1.1	0.5	0.0	3.5	0.5	0.2	14.0	0.5	16.0
Pyrite	0.0	38.1	0.0	2.8	0.0	0.3	5.7	0.0	0.0	1.2	19.0	1.4	1.0	5.1	1.0	0.0	1.7	0.5	0.0	9.2	1.3	11.8
FeO	0.0	1.1	0.1	0.0	0.0	0.3	1.1	0.1	0.1	5.0	69.5	1.1	0.5	10.1	0.1	0.0	3.3	0.3	0.0	3.5	0.6	3.1
Ilmenite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	60.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Apatite	0.0	3.3	0.4	14.8	0.0	0.0	5.5	0.0	0.2	9.5	41.9	0.3	0.5	0.6	0.0	0.0	1.8	1.2	0.6	8.2	0.3	10.8
Calcite	0.0	1.9	0.6	2.9	0.0	0.3	0.0	2.5	0.0	3.8	50.8	1.2	1.3	0.2	0.0	0.0	1.4	2.2	0.1	21.1	0.8	8.8
Dolomite	0.1	1.3	0.0	5.0	0.0	0.0	38.3	0.0	0.1	0.4	31.1	3.6	5.9	0.3	0.0	0.0	1.3	1.3	0.0	9.7	0.2	1.6
Siderite	0.3	1.7	0.2	31.1	0.0	1.2	4.6	0.6	0.0	0.7	21.6	0.0	0.8	8.2	1.0	0.0	0.0	1.1	0.0	1.0	0.0	25.9
Albite	0.0	1.9	0.1	13.2	0.0	0.6	3.8	0.0	0.0	0.0	30.2	8.0	0.8	2.2	0.0	0.2	16.7	2.7	2.8	4.2	0.2	12.3
Amphibole	0.0	2.0	0.4	36.5	0.0	0.5	9.8	0.4	0.0	5.9	0.0	1.3	0.4	3.9	0.0	0.0	2.2	1.1	0.1	16.5	0.7	18.0
Biotite	0.0	1.6	0.4	8.0	0.0	0.1	3.3	0.6	0.0	22.5	19.1	0.0	8.0	3.0	0.0	0.0	20.7	3.9	0.2	4.8	0.1	3.4
Chlorite	0.0	2.5	0.8	11.4	0.0	0.2	10.7	3.2	0.1	7.0	15.0	23.7	0.0	3.2	0.0	0.0	11.0	5.7	0.3	3.0	0.1	2.0
Fe_Clay	0.0	0.7	0.9	47.3	0.0	0.1	0.4	0.0	0.2	3.9	34.9	1.9	0.7	0.0	0.2	0.0	2.0	1.0	0.1	2.1	0.1	3.7
Ferrosilite	0.2	11.6	7.4	24.4	0.0	0.0	0.5	0.1	0.8	2.8	16.3	1.2	0.0	8.7	0.0	0.0	0.0	0.9	0.3	2.3	0.0	22.6
Illite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.8	6.3	2.6	0.0	0.0	0.0	0.0	11.0	2.3	0.0	0.0	0.0	0.0
Orthoclase	0.0	2.2	0.3	15.9	0.0	0.2	2.5	0.2	0.0	30.3	20.6	13.3	2.4	2.0	0.0	0.1	0.0	3.6	0.3	1.9	0.1	4.2
Prehnite	0.0	1.1	0.3	4.6	0.0	0.4	12.6	0.5	0.1	15.8	31.8	8.0	4.0	3.3	0.1	0.0	11.6	0.0	0.0	3.1	0.2	2.4
Pyrophyllite	0.0	0.5	0.0	1.1	0.0	0.3	0.9	0.0	0.0	27.0	6.7	0.8	0.3	0.3	0.0	0.0	1.7	0.1	0.0	1.8	0.0	58.3
Pyroxene	0.0	3.2	0.6	6.3	0.0	0.3	13.9	0.4	0.0	2.8	56.4	1.1	0.2	0.8	0.0	0.0	0.7	0.4	0.1	0.0	0.6	11.9
Titanite	0.0	2.0	1.7	19.0	0.0	0.3	9.4	0.2	0.0	2.1	47.2	0.5	0.1	0.8	0.0	0.0	0.4	0.3	0.0	10.7	0.0	5.4
Quartz	0.0	3.4	0.7	5.2	0.0	0.4	5.5	0.1	0.2	7.7	57.3	0.8	0.2	1.3	0.2	0.0	1.5	0.3	3.8	11.2	0.3	0.0

Mineral Association Data for Sample 79_91-93

Mineral	Chalco-cite	Chalco-pyrite	Native_Copper	Pyrite	FeO	Ilmenite	Rutile	Apatite	Alunite	Calcite	Dolo-mite	Siderite	Albite	Amph-ibole	Biotite	Chlorite	Fe_Clay	Ferro-silite	Illite	Ortho-clase	Prehn-ite	Pyro-phyllite	Pyroxene	Titanite	Quartz
Chalcocite	0.0	6.4	14.1	0.0	0.0	0.0	0.0	0.0	2.3	8.2	0.0	4.7	0.0	23.0	0.6	0.0	3.6	0.0	4.6	2.4	6.5	5.8	1.6	0.0	16.2
Chalcopyrite	0.0	0.0	0.0	15.7	2.0	0.0	0.0	0.1	0.0	1.3	0.0	5.7	0.8	47.5	0.6	3.5	7.8	9.2	0.0	0.0	0.1	0.1	0.2	0.0	5.2
Native_Copper	11.6	5.4	0.0	0.0	0.0	0.0	0.0	2.5	0.0	9.0	6.7	10.7	0.0	26.3	4.4	0.0	1.5	0.0	0.0	0.0	2.3	2.3	5.5	0.0	12.0
Linnaeite	0.0	8.0	0.0	68.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.0	2.0	0.0	0.2	0.9	3.5	0.0	0.0	0.0	0.0	0.0	0.0	4.4
Pyrite	0.0	40.7	0.0	0.0	7.8	0.0	0.0	0.0	0.0	1.7	0.1	28.0	0.2	6.8	0.4	0.4	2.8	4.0	0.0	0.0	0.0	0.0	0.0	0.1	2.7
FeO	0.0	6.2	0.0	9.4	0.0	0.0	0.0	0.0	0.0	1.3	0.2	68.6	0.0	3.8	0.1	0.8	5.9	1.9	0.0	0.0	0.1	0.0	0.0	0.0	1.5
Ilmenite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.4
Rutile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.8	0.0	0.0	7.1	0.0	0.0	22.1
Apatite	0.0	2.8	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.9	0.3	5.8	3.9	62.4	0.9	1.6	2.4	0.6	0.0	0.0	1.1	0.0	6.6	0.0	10.0
Alunite	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	30.3	4.2	0.0	57.2	0.0	0.0	0.0
Calcite	0.1	4.4	0.1	2.3	1.4	0.0	0.0	0.1	0.0	0.0	4.6	7.5	0.8	46.6	0.5	1.4	4.1	0.2	0.0	0.0	4.0	0.0	9.3	0.6	12.1
Dolomite	0.0	1.2	0.6	0.9	1.4	0.0	0.0	0.3	0.0	39.6	0.0	7.5	2.8	30.2	1.0	1.9	3.8	0.2	0.0	0.0	3.4	0.0	2.4	0.2	2.7
Siderite	0.0	10.2	0.0	19.2	39.0	0.0	0.0	0.3	0.0	3.9	0.4	0.0	0.0	11.4	0.4	1.3	4.4	1.7	0.0	0.0	0.3	0.0	0.1	0.0	6.5
Albite	0.0	4.0	0.0	0.4	0.0	0.0	0.0	0.7	0.0	1.3	0.5	0.0	0.0	50.3	14.9	6.1	12.9	0.9	0.6	1.1	2.1	1.5	0.0	0.4	2.3
Amphibole	0.0	30.6	0.0	1.7	0.8	0.0	0.0	1.4	0.0	8.8	0.7	4.1	6.1	0.0	1.0	3.0	11.4	3.0	0.0	0.0	1.4	0.2	7.1	0.1	18.7
Biotite	0.0	7.1	0.1	2.0	0.6	0.0	0.0	0.4	0.0	1.7	0.4	2.7	33.4	18.2	0.0	10.4	12.0	0.7	0.1	0.8	0.8	0.2	0.4	0.1	8.0
Chlorite	0.0	13.6	0.0	0.6	0.9	0.0	0.0	0.2	0.0	1.5	0.3	2.9	4.4	18.0	3.4	0.0	40.3	1.6	0.0	0.0	0.6	0.8	0.2	0.1	10.5
Fe_Clay	0.0	14.4	0.0	2.0	3.5	0.0	0.0	0.2	0.0	2.2	0.2	4.6	4.5	32.7	1.9	19.4	0.0	6.7	0.0	0.0	1.0	0.2	0.4	0.2	5.9
Ferrosilite	0.0	41.8	0.0	7.0	2.8	0.0	0.0	0.1	0.0	0.3	0.0	4.4	0.8	20.9	0.3	1.8	16.4	0.0	0.0	0.0	0.1	0.1	0.1	0.0	2.8
Illite	0.7	0.2	0.0	0.0	0.0	0.0	1.8	0.0	1.9	0.0	0.0	0.0	6.4	0.2	0.3	0.0	0.0	0.2	0.0	5.9	0.0	79.1	0.0	0.0	3.3
Orthoclase	0.9	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.7	0.6	0.0	0.6	34.2	6.9	10.4	1.3	4.1	0.0	15.8	0.0	2.7	19.7	0.0	0.0	1.2
Prehnite	0.3	2.1	0.1	0.1	0.3	0.0	0.0	0.7	0.0	21.6	2.1	2.9	7.3	41.3	1.3	3.0	9.5	0.2	0.0	0.3	0.0	0.0	2.9	0.4	3.4
Pyrophyllite	0.4	1.8	0.2	0.1	0.0	0.0	0.1	0.0	1.8	0.0	0.0	0.1	8.5	6.8	0.5	5.8	3.7	0.4	38.2	3.6	0.0	0.0	0.4	0.0	27.6
Pyroxene	0.0	1.1	0.1	0.0	0.1	0.0	0.0	1.4	0.0	17.2	0.5	0.4	0.0	68.9	0.2	0.4	1.3	0.1	0.0	0.0	1.0	0.1	0.0	0.1	7.1
Titanite	0.0	0.0	0.0	4.0	1.2	0.0	0.0	0.0	0.0	21.2	0.7	1.0	8.9	20.3	1.0	2.5	11.3	0.0	0.0	0.0	2.7	0.0	2.4	0.0	22.8
Quartz	0.1	9.7	0.1	1.9	0.9	0.0	0.0	0.6	0.0	6.6	0.2	6.8	0.8	54.1	1.3	5.1	5.9	1.1	0.1	0.0	0.3	1.7	2.1	0.3	0.0

Mineral Association Data for Sample 79_107-109

Mineral	Chalco-pyrite	Linn-aelite	Pyrite	FeO	Ilmenite	Rutile	Apatite	Calcite	Dolomite	Siderite	Albite	Amphibole	Biotite	Chlorite	Fe_Clay	Ferrosilite	Illite	Orthoclase	Prehnite	Pyrophyllite	Pyroxene	Titanite	Quartz
Chalcopyrite	0.0	0.1	9.4	2.3	0.0	0.0	0.1	34.1	1.8	1.8	0.8	9.2	1.0	4.1	5.2	1.0	0.0	0.0	1.5	0.4	1.3	0.3	25.7
Linnaeite	2.1	0.0	50.6	0.0	0.0	0.0	0.0	12.7	0.5	13.2	0.0	0.2	0.6	2.5	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	15.7
Pyrite	17.9	2.6	0.0	2.4	0.0	0.0	0.2	25.4	1.4	12.5	1.5	3.4	0.1	0.8	2.3	0.5	0.0	0.0	1.3	0.1	0.5	0.0	27.1
FeO	1.2	0.0	0.7	0.0	0.0	0.0	0.1	18.0	2.4	2.4	8.3	39.7	0.5	1.7	9.5	0.1	0.0	0.0	3.1	0.1	2.8	0.5	9.0
Ilmenite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.8	0.0	0.0	8.4	5.9	0.0	0.0	10.8	0.0	0.0	0.0	16.3	0.0	0.0	0.0	12.8
Rutile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	43.5	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Apatite	1.3	0.0	1.8	4.1	0.0	0.0	0.0	33.2	1.1	0.0	3.5	15.9	0.0	9.3	6.4	0.0	0.0	0.0	3.0	0.0	2.6	0.2	17.5
Calcite	5.7	0.1	2.2	5.7	0.0	0.0	0.3	0.0	6.3	4.1	5.3	16.4	0.5	3.9	4.3	0.1	0.0	0.0	7.2	0.1	7.3	1.1	29.3
Dolomite	2.4	0.0	0.9	5.9	0.0	0.0	0.1	49.4	0.0	2.1	4.7	11.8	0.5	4.9	4.5	0.2	0.0	0.1	6.7	0.1	2.4	0.1	3.4
Siderite	4.2	0.9	15.4	10.6	0.0	0.0	0.0	58.8	3.8	0.0	0.1	2.3	0.0	0.2	1.0	0.2	0.0	0.0	0.4	0.0	0.4	0.0	1.7
Albite	0.6	0.0	0.6	13.0	0.0	0.0	0.2	26.3	3.0	0.0	0.0	22.9	3.3	2.0	4.0	0.0	0.1	0.4	16.4	0.5	1.2	0.4	5.0
Amphibole	2.1	0.0	0.4	17.2	0.0	0.0	0.2	22.5	2.1	0.2	6.3	0.0	0.4	1.4	6.2	0.1	0.0	0.0	3.8	0.2	10.6	0.5	26.0
Biotite	3.2	0.1	0.2	2.8	0.0	0.1	0.0	9.9	1.3	0.1	12.4	5.2	0.0	32.9	6.4	0.2	0.1	4.7	5.4	1.8	0.5	0.2	12.6
Chlorite	4.4	0.1	0.4	3.4	0.0	0.0	0.6	25.5	4.0	0.1	2.6	6.8	11.4	0.0	15.9	0.3	0.0	0.9	8.5	1.9	0.7	0.2	12.2
Fe_Clay	3.7	0.0	0.9	13.0	0.0	0.0	0.3	18.4	2.5	0.3	3.5	19.4	1.5	10.6	0.0	0.3	0.0	0.1	6.0	1.1	1.1	0.2	17.3
Ferrosilite	25.9	0.6	7.1	3.8	0.0	0.0	0.0	13.6	3.3	1.9	0.7	6.7	1.4	7.3	9.6	0.0	0.0	0.0	1.4	0.1	0.2	0.1	16.3
Illite	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	37.7	0.0	6.8	8.7	8.0	0.0	0.0	5.4	9.7	0.0	0.0	0.0	21.1
Orthoclase	0.4	0.0	0.0	0.0	0.0	0.0	0.0	4.1	1.2	0.0	11.8	1.4	40.3	23.5	5.1	0.0	0.6	0.0	5.5	0.2	0.0	0.0	5.9
Prehnite	1.2	0.0	0.6	4.9	0.0	0.0	0.1	36.1	4.3	0.1	16.6	13.8	1.5	6.6	6.9	0.0	0.0	0.2	0.0	0.2	1.9	0.2	4.7
Pyrophyllite	2.3	0.0	0.2	0.7	0.0	0.0	0.0	5.3	0.3	0.0	3.8	4.6	3.5	10.9	9.2	0.0	0.0	0.0	1.7	0.0	0.7	0.2	56.6
Pyroxene	0.8	0.0	0.2	3.3	0.0	0.0	0.1	27.1	1.1	0.1	0.9	28.6	0.1	0.4	0.9	0.0	0.0	0.0	1.4	0.1	0.0	0.9	33.9
Titanite	1.2	0.0	0.0	4.0	0.0	0.0	0.1	30.7	0.4	0.0	2.3	10.0	0.3	0.8	1.0	0.0	0.0	0.0	1.1	0.2	6.8	0.0	41.0
Quartz	5.4	0.1	3.0	3.6	0.0	0.0	0.2	36.9	0.5	0.2	1.3	23.9	0.9	2.4	5.0	0.1	0.0	0.0	1.2	2.0	11.5	1.9	0.0

Mineral Association Data for Sample 100_172-177

Mineral	Chalco-pyrite	Linnaeite	Pyrite	FeO	Ilmenite	Rutile	Apatite	Alunite	Calcite	Dolom-ite	Siderite	Albite	Amphibole	Biotite	Chlorite	Fe_Clay	Ferrosilite	Illite	Ortho-clase	Prehnite	Pyro-phylite	Pyroxene	Titanite	Quartz	
Chalcopyrite	0.0	0.0	19.1	5.6	0.0	0.0	0.0	0.0	17.2	1.5	2.4	1.5	20.4	0.7	1.4	6.3	2.2	0.0	0.2	2.8	0.1	1.6	0.1	16.8	
Linnaeite	10.5	0.0	31.7	7.9	0.0	0.0	0.0	0.0	3.2	0.0	18.4	0.0	1.1	0.0	0.0	5.3	5.2	0.0	0.0	0.0	0.0	0.0	0.0	16.8	
Pyrite	29.0	0.1	0.0	1.5	0.0	0.0	0.4	0.1	31.9	2.0	1.6	0.9	6.5	0.5	0.9	4.8	1.4	0.0	0.6	2.3	0.0	0.7	0.1	14.8	
FeO	10.0	0.0	1.7	0.0	0.0	0.0	0.2	0.0	23.0	3.5	16.0	2.3	16.7	0.2	1.9	12.7	1.0	0.0	0.0	5.0	0.0	0.6	2.1	3.2	
Ilmenite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.1	
Rutile	0.0	0.0	0.0	54.9	0.0	0.0	0.0	0.0	0.0	17.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.3	0.0
Apatite	0.4	0.0	7.9	3.5	0.0	0.0	0.0	0.0	13.6	0.4	0.2	1.3	9.0	0.0	1.2	4.4	0.0	0.0	0.3	2.0	0.0	4.4	3.1	48.2	
Alunite	24.5	0.0	52.3	0.0	0.0	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	
Calcite	3.7	0.0	4.5	2.8	0.0	0.0	0.1	0.0	0.0	5.0	2.5	2.6	41.3	0.3	1.7	3.4	0.2	0.0	0.4	6.1	0.1	11.9	0.9	12.4	
Dolomite	2.3	0.0	2.0	2.9	0.0	0.0	0.0	0.0	35.2	0.0	4.1	4.0	23.0	0.4	3.1	4.9	0.2	0.0	0.2	10.5	0.0	4.0	0.4	2.7	
Siderite	6.3	0.1	2.8	22.9	0.0	0.0	0.0	0.0	30.4	7.0	0.0	0.2	19.1	0.0	0.3	6.4	1.1	0.0	0.0	0.8	0.0	0.3	0.1	2.2	
Albite	1.5	0.0	0.6	1.3	0.0	0.0	0.0	0.0	12.1	2.6	0.1	0.0	24.4	10.6	5.6	11.3	0.1	0.2	1.9	15.7	1.1	0.8	1.1	9.0	
Amphibole	3.6	0.0	0.7	1.6	0.0	0.0	0.0	0.0	33.6	2.6	1.3	4.2	0.0	0.6	2.2	5.3	0.2	0.0	0.4	4.3	0.1	20.3	1.0	17.9	
Biotite	2.4	0.0	1.1	0.3	0.0	0.0	0.0	0.0	4.8	0.9	0.0	34.6	11.8	0.0	13.9	7.6	0.1	0.1	10.2	4.1	0.4	0.9	0.3	6.6	
Chlorite	2.3	0.0	1.0	1.7	0.0	0.0	0.1	0.0	12.7	3.3	0.2	9.1	20.1	6.9	0.0	22.9	0.3	0.0	2.1	7.8	0.7	0.9	0.7	7.3	
Fe_Clay	5.1	0.0	2.5	5.7	0.0	0.0	0.1	0.0	12.8	2.6	2.0	9.0	24.5	1.9	11.3	0.0	1.0	0.0	0.5	8.8	0.3	1.1	0.6	10.1	
Ferrosilite	25.3	0.1	10.4	6.2	0.0	0.0	0.0	0.0	9.2	1.2	4.7	0.8	12.2	0.5	2.4	14.4	0.0	0.0	0.0	2.0	0.1	1.2	0.1	9.2	
Illite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.5	0.9	6.1	0.0	0.0	0.0	0.0	13.1	5.3	0.0	0.0	4.2	3.0	
Orthoclase	1.7	0.0	2.7	0.0	0.0	0.0	0.1	0.0	12.6	0.8	0.0	13.2	17.3	21.4	8.9	4.0	0.0	0.3	0.0	6.0	0.1	2.4	0.7	7.9	
Prehnite	2.5	0.0	1.4	2.5	0.0	0.0	0.1	0.0	26.0	6.3	0.3	14.2	22.6	1.1	4.4	10.0	0.2	0.0	0.8	0.0	0.1	2.3	0.8	4.3	
Pyrophyllite	1.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	2.6	0.2	0.0	9.5	7.0	1.1	3.4	3.5	0.1	0.0	0.2	1.3	0.0	1.3	0.1	68.5	
Pyroxene	0.8	0.0	0.2	0.2	0.0	0.0	0.1	0.0	27.1	1.3	0.1	0.4	56.7	0.1	0.3	0.6	0.1	0.0	0.2	1.2	0.1	0.0	0.6	10.0	
Titanite	0.3	0.0	0.2	6.0	0.0	0.0	0.5	0.0	21.8	1.4	0.2	5.5	28.6	0.4	2.1	3.6	0.0	0.1	0.5	4.4	0.1	6.5	0.0	17.8	
Quartz	6.5	0.0	3.8	0.7	0.0	0.0	0.6	0.0	22.3	0.7	0.3	3.4	39.4	0.8	1.7	4.8	0.3	0.0	0.4	1.8	3.1	7.9	1.3	0.0	

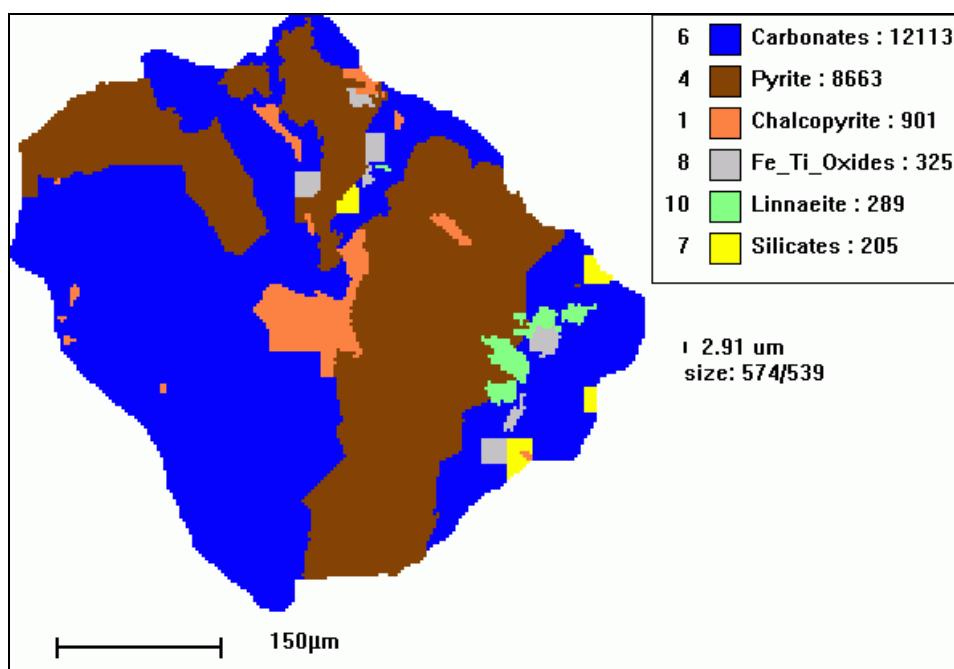
Mineral Association Data for Sample 111_67-70

Mineral	Chalco-cite	Chalco-pyrite	Cove-llite	Native_Copper	CuO	Pyrite	FeO	Ilm-enite	Rutile	Apatite	Xeno-time	Calcite	Dolo-mite	Sider-ite	Albite	Amphibole	Biotite	Chlo-rite	Fe_Clay	Ferro-silite	Illite	Ortho-clase	Prehnite	Pyro-phyllite	Pyro-xene	Tit anite	Quartz
Chalcocite	0.0	3.1	0.8	0.3	0.2	0.0	0.9	0.8	0.0	0.2	0.0	3.1	0.0	40.9	0.0	1.9	9.0	0.8	5.5	0.2	0.0	0.0	2.8	0.6	0.0	0.0	28.9
Chalcopyrite	5.8	0.0	1.4	0.8	0.4	0.9	0.0	0.0	0.0	0.1	0.0	9.8	0.0	7.5	0.0	0.0	8.3	0.8	24.8	0.0	0.0	0.0	2.3	0.9	0.3	0.0	35.8
Covellite	6.4	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	3.0	0.0	0.0	17.9	1.2	38.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	23.0
Native_Copper	0.1	0.2	0.0	0.0	28.4	0.0	2.1	0.0	0.0	0.4	0.0	0.3	0.1	10.6	0.0	0.0	26.0	5.1	10.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	16.1
CuO	0.1	0.1	0.0	26.3	0.0	0.0	4.9	0.2	0.0	0.3	0.0	4.0	0.1	14.1	0.0	0.1	21.3	4.0	8.9	0.0	0.0	0.0	1.3	0.3	0.2	0.0	14.0
Pyrite	0.0	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0	5.5	0.0	3.2	0.0	0.0	75.2	
FeO	0.0	0.0	0.0	0.2	0.6	0.0	0.0	0.4	0.7	0.4	0.0	0.1	0.0	46.0	0.0	0.7	6.1	4.5	22.4	0.4	0.1	0.0	0.1	0.5	0.0	0.0	16.6
Ilmenite	0.4	0.0	0.0	0.0	0.2	0.0	4.6	0.0	6.1	0.0	0.2	0.0	0.0	6.6	0.4	0.0	23.8	3.7	47.3	0.0	0.0	0.2	0.0	0.7	0.0	0.1	5.7
Rutile	0.0	0.0	0.0	0.0	0.0	0.0	2.4	1.9	0.0	0.4	0.0	0.3	0.1	1.2	0.1	0.2	26.3	6.9	45.5	0.0	0.0	2.2	0.4	0.9	0.0	0.3	10.8
Apatite	0.1	0.0	0.0	0.2	0.2	0.0	2.6	0.0	0.6	0.0	0.0	4.3	0.0	9.1	0.0	1.5	5.9	6.3	34.4	0.2	0.0	0.0	4.8	1.1	0.4	0.5	27.8
Xenotime	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.4	0.9	0.0	0.0	0.0	0.0	1.0	0.7	0.0	12.4	1.3	54.6	0.0	0.0	0.0	0.0	1.5	0.0	0.0	25.4
Calcite	0.5	0.8	0.1	0.1	1.6	0.0	0.3	0.0	0.3	2.5	0.0	0.0	6.8	8.6	0.0	2.9	4.6	3.0	18.7	0.1	0.0	0.0	12.9	0.3	3.4	0.4	32.1
Dolomite	0.0	0.0	0.0	0.4	0.2	0.0	0.1	0.0	0.6	0.0	0.0	54.3	0.0	1.8	0.0	0.9	4.3	2.8	18.3	0.0	0.0	0.8	5.6	0.4	1.2	0.0	8.3
Siderite	1.6	0.2	0.0	1.0	1.4	0.0	40.8	0.5	0.3	1.4	0.0	2.2	0.1	0.0	0.0	1.0	5.3	5.3	18.7	0.8	0.0	0.2	0.2	0.4	0.0	0.0	18.7
Albite	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.0	0.1	0.1	0.0	0.3	0.0	0.6	8.1	2.2	22.9	0.1	0.0	0.2	0.2	3.5	0.0	0.0	60.8
Amphibole	0.3	0.0	0.0	0.0	0.0	0.1	2.9	0.0	0.2	1.0	0.0	3.2	0.1	4.7	0.2	0.0	4.4	1.2	22.1	0.4	0.0	0.0	1.1	3.5	0.3	0.0	54.1
Biotite	0.1	0.1	0.0	0.7	0.6	0.0	1.5	0.5	1.9	0.2	0.0	0.3	0.0	1.5	0.2	0.3	0.0	13.0	66.7	0.0	0.0	2.0	0.4	1.1	0.0	0.0	8.7
Chlorite	0.0	0.0	0.0	0.3	0.2	0.0	2.4	0.2	1.0	0.6	0.0	0.4	0.1	3.2	0.1	0.2	27.5	0.0	51.1	0.0	0.0	1.0	0.5	1.0	0.0	0.0	10.2
Fe_Clay	0.0	0.1	0.0	0.2	0.1	0.0	3.2	0.6	1.8	0.8	0.1	0.8	0.1	3.0	0.3	0.8	37.6	13.6	0.0	0.1	0.0	0.4	0.9	3.3	0.0	0.0	32.0
Ferrosilite	0.3	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.9	0.0	1.0	0.0	23.3	0.1	2.7	0.6	0.6	16.8	0.0	0.0	0.0	0.0	0.7	0.0	0.0	41.9
Illite	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5	2.4	18.4	0.0	0.0	0.0	0.0	7.0	0.0	0.0	41.7
Orthoclase	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	3.9	0.0	0.0	0.0	0.2	1.2	0.1	0.0	48.2	11.6	17.5	0.0	0.0	0.0	0.2	0.7	0.0	0.0	16.1
Prehnite	0.7	0.3	0.0	0.1	0.8	0.0	0.4	0.0	0.7	4.6	0.0	20.7	1.1	1.3	0.1	1.6	9.7	5.0	37.7	0.0	0.0	0.2	0.0	0.7	0.4	0.0	13.8
Pyrophyllite	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.2	0.0	0.1	0.0	0.4	0.3	0.8	3.8	1.6	20.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	71.6
Pyroxene	0.0	0.2	0.0	0.0	0.5	0.0	0.3	0.0	0.0	1.3	0.0	19.0	0.9	0.9	0.0	1.4	1.2	0.4	2.5	0.0	0.0	0.0	1.3	1.1	0.0	0.4	68.5
Titanite	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.5	5.9	0.0	8.2	0.0	0.0	0.0	0.0	4.2	2.0	16.1	0.0	0.0	0.0	0.4	1.6	1.5	0.0	53.9	
Quartz	0.3	0.2	0.0	0.4	0.4	0.1	3.7	0.1	0.7	1.0	0.1	2.0	0.1	4.7	1.1	3.0	7.6	4.2	49.8	0.3	0.1	0.6	0.5	18.1	0.8	0.2	0.0

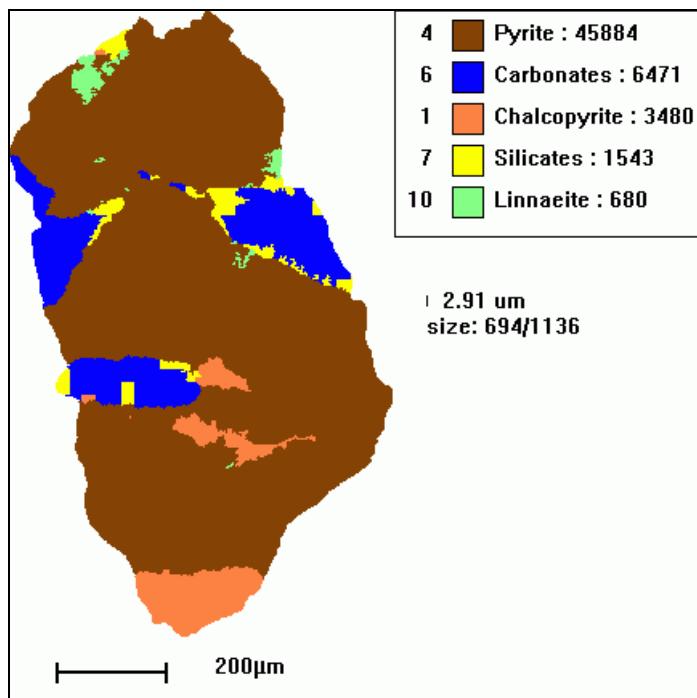
Mineral Association Data for Sample 111_196-198

Mineral	Chalco-pyrite	Native_Copper	Molybdenite	Pyrite	FeO	Ilmenite	Rutile	Apatite	Xeno-time	Calcite	Dolomite	Siderite	Albite	Amphibole	Biotite	Chlorite	Fe_Clay	Ferrosilite	Illite	Orthoclase	Prehnite	Pyrophyllite	Pyroxene	Titanite	Quartz
Chalcopyrite	0.0	0.8	0.0	10.4	5.1	0.0	0.0	0.0	0.0	6.5	0.0	0.5	10.4	23.5	1.0	4.2	11.0	1.1	0.0	2.8	2.2	0.0	0.7	13.5	6.1
Native_Copper	0.9	0.0	0.0	0.0	38.1	0.0	0.0	0.0	0.0	11.5	4.6	0.8	1.9	3.5	3.0	5.4	9.0	0.0	0.0	0.5	2.0	0.0	2.0	0.0	16.9
Molybdenite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.9	71.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrite	3.6	0.0	0.0	0.0	3.8	0.0	0.0	1.6	0.0	12.0	0.8	0.4	26.0	13.6	2.7	2.1	8.7	0.5	0.0	4.4	0.7	1.1	0.2	8.3	9.3
FeO	0.0	0.2	0.0	0.1	0.0	0.4	0.0	0.6	0.0	2.5	0.2	2.1	28.4	12.2	2.0	1.9	9.1	0.1	0.0	0.6	0.7	0.1	0.2	31.9	6.6
Ilmenite	0.0	0.0	0.0	0.0	9.2	0.0	0.8	0.8	0.0	1.6	0.1	0.3	13.7	4.8	0.7	1.1	0.8	0.1	0.0	0.1	0.4	0.0	0.1	62.0	3.5
Rutile	0.0	0.0	0.0	0.0	1.1	39.4	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	3.4	1.5	20.2	0.0	0.0	0.0	0.0	0.0	0.0	15.2	7.0
Apatite	0.0	0.0	0.0	0.2	5.0	0.3	0.0	0.0	0.0	4.4	0.2	0.1	52.8	12.7	0.6	0.2	0.9	0.0	0.0	1.2	2.5	0.6	1.5	5.2	11.7
Xenotime	0.0	0.0	0.0	0.0	19.8	0.0	0.0	3.0	0.0	0.0	0.0	0.0	39.2	8.2	1.8	0.0	2.9	0.0	0.0	2.9	0.0	0.0	0.0	5.9	16.4
Calcite	0.1	0.1	0.0	0.3	4.1	0.1	0.0	0.9	0.0	0.0	1.7	0.3	48.5	9.5	1.6	1.0	3.0	0.0	0.0	3.6	8.2	0.3	2.2	7.9	6.8
Dolomite	0.0	0.6	0.0	0.3	7.1	0.1	0.0	0.6	0.0	30.0	0.0	1.1	12.8	12.6	2.4	1.7	8.9	0.0	0.0	1.2	11.3	0.0	1.5	4.8	2.9
Siderite	0.1	0.1	0.0	0.2	53.1	0.3	0.0	0.2	0.0	4.0	0.9	0.0	2.7	1.4	6.4	4.1	5.7	0.6	0.0	0.5	0.9	0.1	0.0	14.1	4.7
Albite	0.0	0.0	0.0	0.1	10.4	0.2	0.0	2.4	0.0	10.6	0.2	0.0	0.0	24.7	6.9	1.2	2.8	0.0	0.0	8.3	7.1	2.2	0.5	10.9	11.5
Amphibole	0.1	0.0	0.0	0.2	9.8	0.2	0.0	1.3	0.0	4.6	0.3	0.0	54.2	0.0	1.1	0.6	3.6	0.0	0.0	1.0	1.5	0.6	2.8	10.9	7.2
Biotite	0.0	0.0	0.0	0.1	6.4	0.1	0.0	0.3	0.0	3.1	0.3	0.8	60.2	4.5	0.0	5.6	6.1	0.1	0.0	2.8	1.3	0.3	0.1	3.3	4.5
Chlorite	0.2	0.2	0.0	0.3	16.6	0.5	0.0	0.2	0.0	5.1	0.5	1.4	30.2	6.8	15.6	0.0	8.3	0.1	0.0	2.0	1.4	0.5	0.3	4.8	5.0
Fe_Clay	0.2	0.1	0.0	0.4	27.4	0.1	0.1	0.3	0.0	5.4	0.9	0.7	23.2	13.5	5.7	2.8	0.0	0.2	0.0	1.4	3.4	0.3	0.4	7.2	6.3
Ferrosilite	1.3	0.0	0.0	1.6	34.4	0.6	0.0	0.0	0.0	1.6	0.0	5.6	7.5	6.0	3.7	1.3	12.4	0.0	0.0	0.8	0.0	0.8	0.4	4.1	18.0
Illite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.9	5.1	0.0	0.0	0.0	0.0	0.0	37.1	0.0	0.0	0.0	0.0	17.0
Orthoclase	0.0	0.0	0.0	0.2	2.0	0.0	0.0	0.5	0.0	6.8	0.1	0.1	72.3	3.8	2.8	0.7	1.4	0.0	0.1	0.0	3.5	0.3	0.3	2.3	2.7
Prehnite	0.0	0.0	0.0	0.0	2.3	0.1	0.0	0.9	0.0	14.9	1.2	0.1	59.1	5.7	1.2	0.5	3.5	0.0	0.0	3.4	0.0	0.3	0.6	3.3	3.0
Pyrophyllite	0.0	0.0	0.0	0.1	1.3	0.0	0.0	0.7	0.0	1.8	0.0	0.0	52.4	6.4	0.9	0.5	0.8	0.0	0.0	0.7	0.8	0.0	0.5	2.0	30.8
Pyroxene	0.0	0.1	0.0	0.0	2.0	0.0	0.0	2.1	0.0	14.2	0.6	0.0	14.1	37.3	0.4	0.4	1.3	0.0	0.0	1.0	2.0	0.6	0.0	11.5	12.4
Titanite	0.1	0.0	0.0	0.1	32.6	3.0	0.0	0.7	0.0	4.9	0.2	0.6	30.4	13.9	1.1	0.6	2.4	0.0	0.0	0.8	1.1	0.2	1.1	0.0	6.4
Quartz	0.0	0.1	0.0	0.2	9.4	0.2	0.0	2.0	0.0	5.8	0.1	0.3	44.9	12.8	2.0	0.8	3.0	0.1	0.0	1.2	1.4	5.0	1.6	9.0	0.0

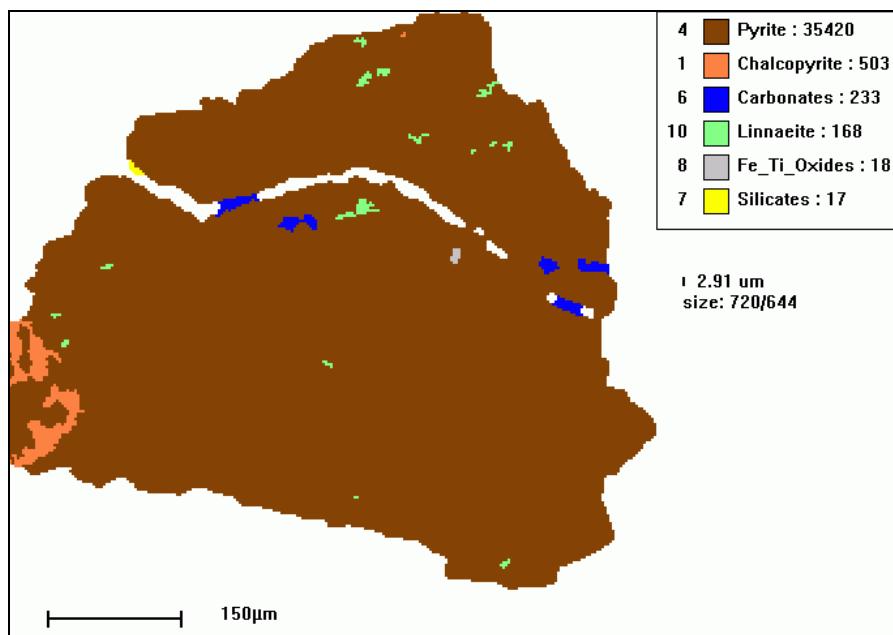
Appendix 6 Linnaeite Particle Images



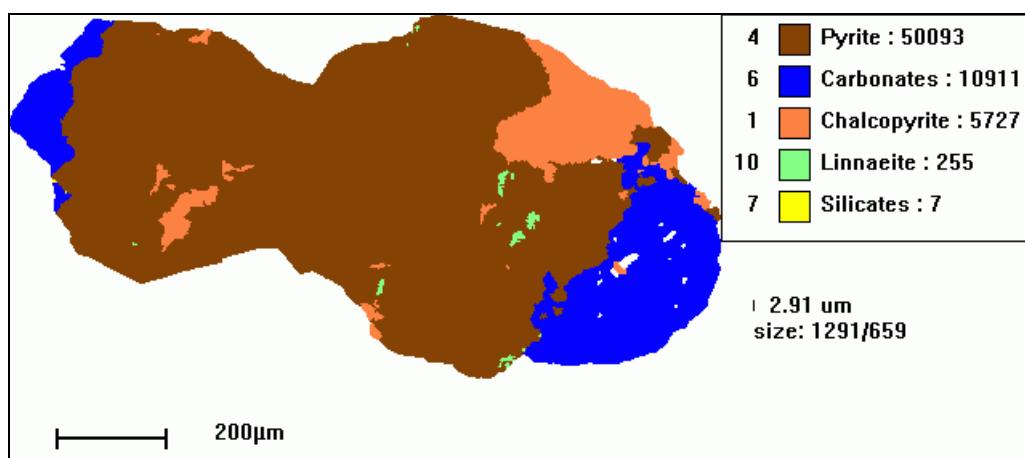
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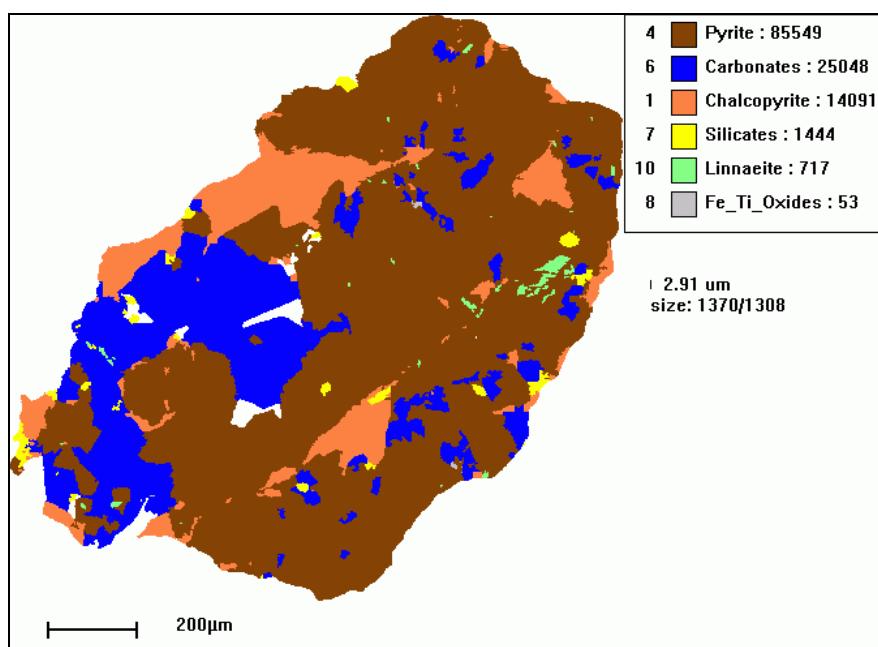
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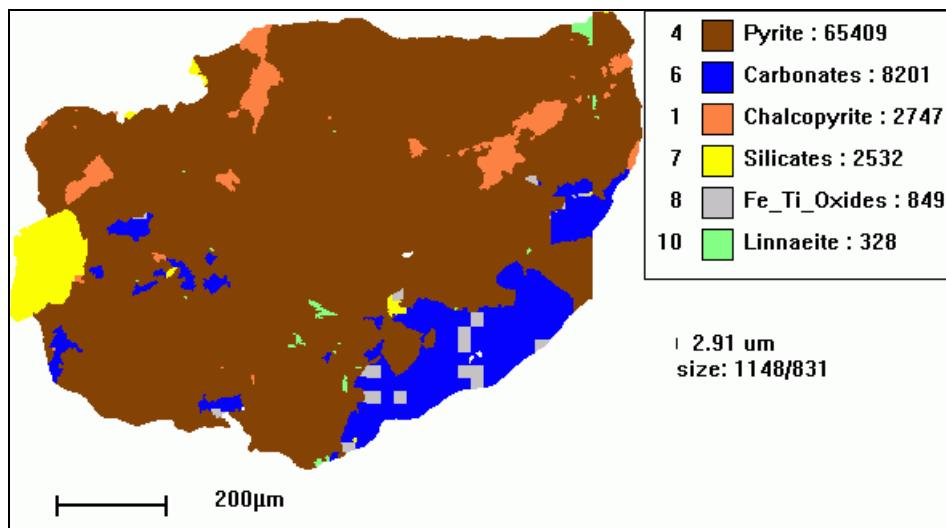
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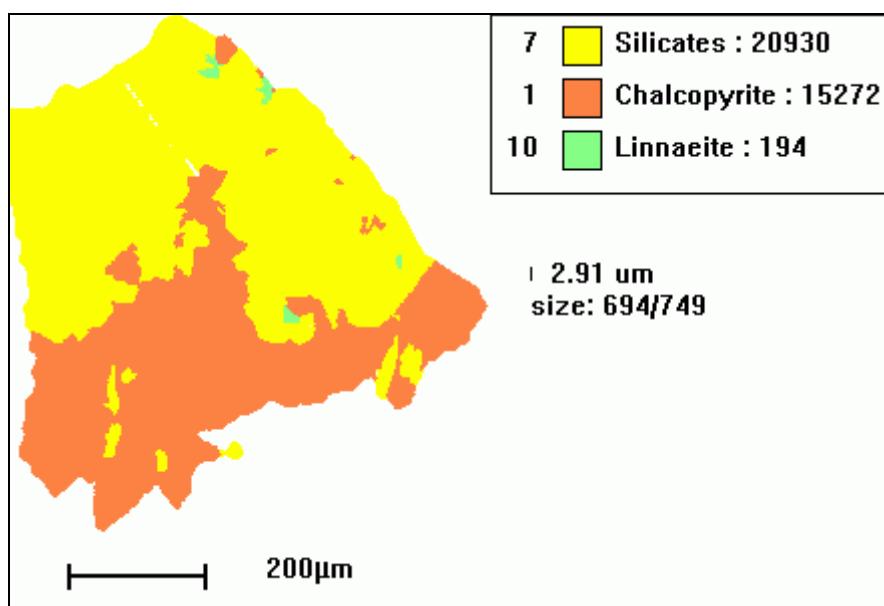
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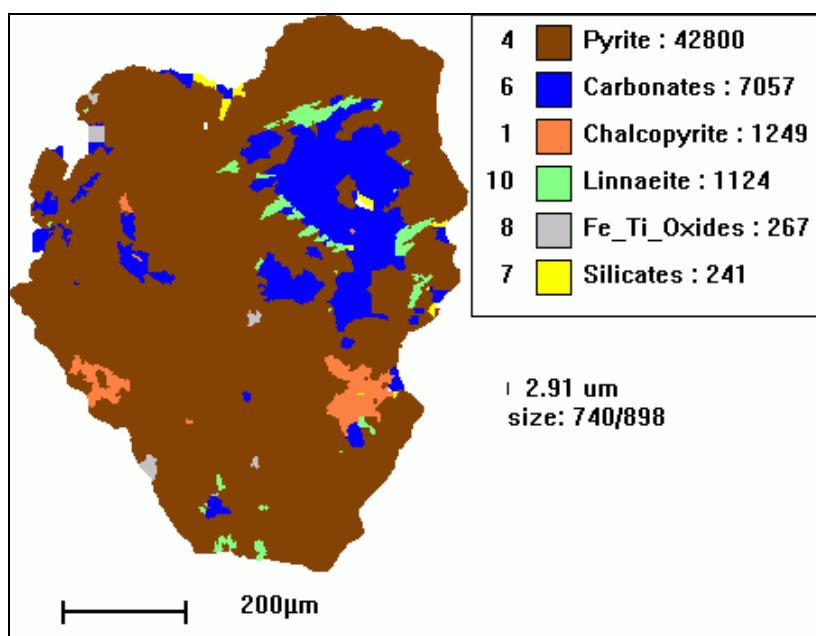
79 91-93



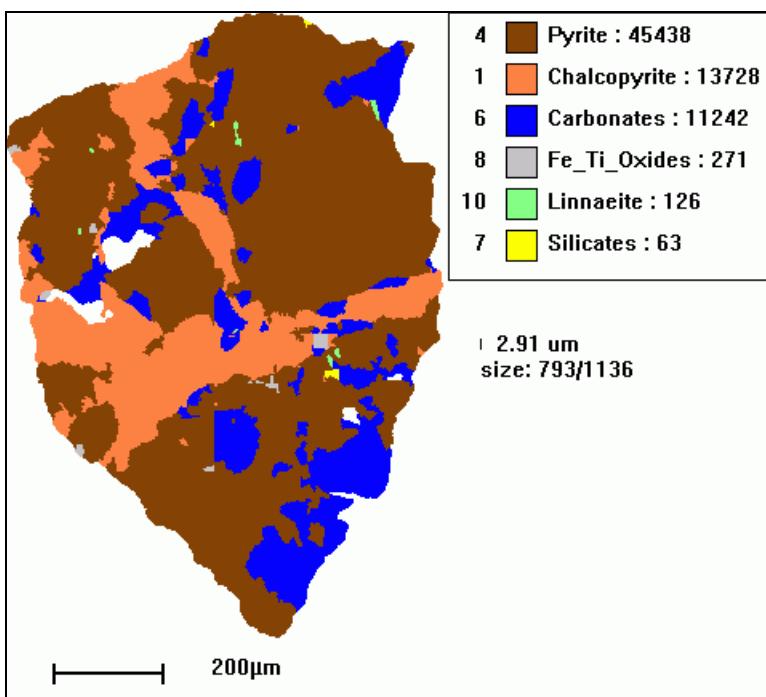
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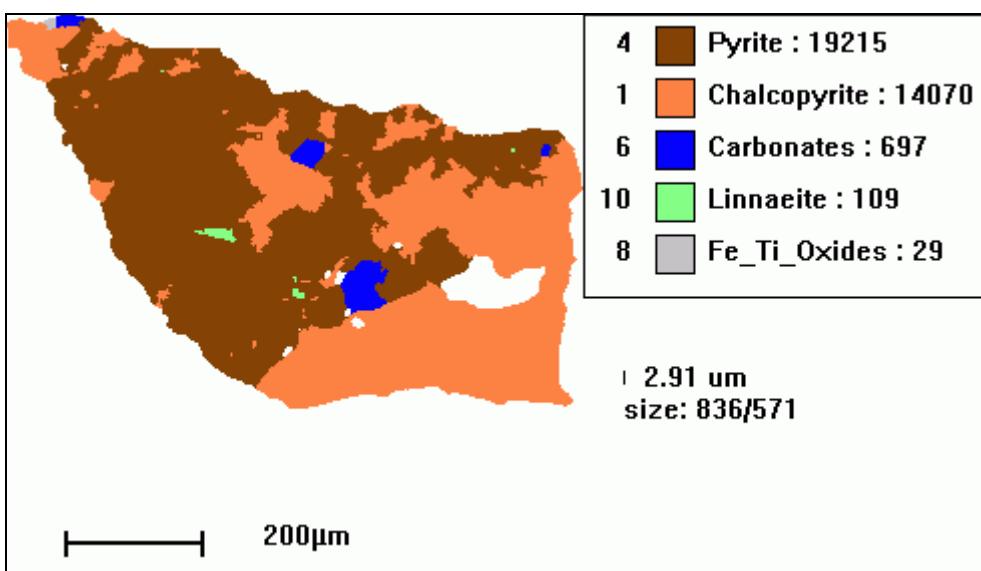
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