MAPPING PROGRAM: MORGAN PEAK CU PORPHYRY, GILA COUNTY, ARIZONA

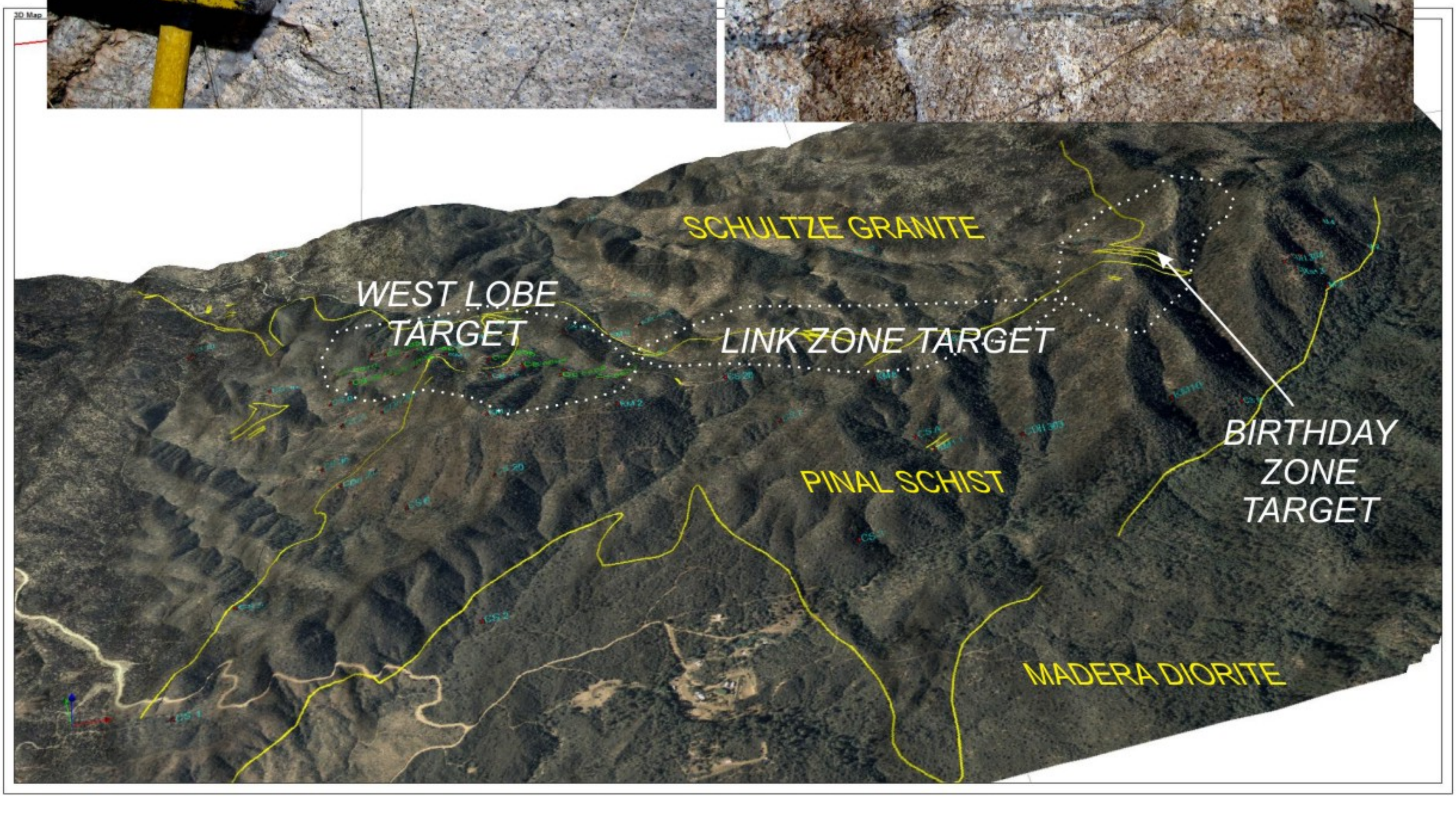
For: Toro Resources
Revised February 2011

_By_: Warren Pratt (PhD CGeol)
Specialized Geological Mapping Ltd

www.geologicalmapping.com
info@geologicalmapping.com
Tel: ++ 44 (0) 1343 842813

Quartz vein with k-feldspar halo in porphyritic granite.

Quartz vein xenoliths in porphyritic granite cut by D veins.



MapInfo/Discover 3D screenshot of Morgan Peak, from south.

CONTENTS

FIGURES

APPENDICES

1 EXECUTIVE SUMMARY

Geological mapping was undertaken at the Morgan Peak copper (Cu) porphyry (Toro Resources), near Miami, Arizona between the 17th and 27th of July 2010. Bernie Stannus commissioned the work. The main objectives were to undertake mapping, give an opinion on the economic potential of the property, and generate new drill targets. A further visit was carried out in January 2011. New mapping was undertaken. Mapping by Shelby Cave and Gerry Puente de la Vega has been incorporated into a revised map (Appendix 1). Modifications to the Herb Duerr 2011 drill plan were suggested.

Cu mineralization occurs for about 3 km along the northwest-striking contact of the Schultze Granite. Overlying Precambrian schist was reactive to hydrothermal fluids and developed fracture-controlled alteration and veining. There were various stages of veining. Prominent greisen veins, with wide halos of coarse muscovite, seem to have introduced much of the Cu, mostly as chalcopyrite. There are also earlier, higher temperature quartz veins with k-feldspar, green mica and chalcopyrite + bornite.

Local breccias along the contact of the Schultze Granite began life as tectonic, but ended up as hydrothermal. These breccia bodies, though small, can carry high supergene Cu grades (1%) and merit more mapping and drill testing.

The new reconnaissance mapping highlights 3 areas for future work: 1) *West Lobe*, 2) *Link Zone* and 3) *Birthday Zone.* All 3 areas merit drilling.

Most previous drilling was on the *West Lobe*. This needs infill drilling, probably on 100 m centres, to help define a NI 43-101-compliant Inferred Resource. This is merited because the supergene enrichment blanket, which has 0.3-0.4% Cu, is potentially economic if treated by SX-EW. Project economics are helped by the low stripping ratio, very low clay content, and the exceptional infrastructure of the Globe-Miami district. This infrastructure allows for off-site processing of pregnant solutions. I am also optimistic that infill drilling will cut higher grades along faults and breccias, for example along the Santa Anna Fault and at Breccia Hill. These have the potential to raise the overall grade of the West Lobe resource.

Birthday Zone, in the East Lobe, displays the most intense hydrothermal alteration and veining on the property. However, it is virtually untested by drilling. It is a priority drill target. It lies in the apex of the Schultze Granite. Such apices are normally a favourable site for higher Cu grades since hydrothermal fluids tend to pool there. Other favourable factors include interfingering of granite and schist, and a nearby north-striking fault (Ellis Fault) that may intersect the mineralized zone. There is every indication that Birthday Zone should give higher Cu grades than in already drilled areas.

The Link Zone is an inferred target that effectively links the West Lobe and Birthday Zone. Following the contact of the Schultze Granite closely, it may have a sinuous, narrow chalcocite blanket that will improve the overall economics of the project.

Recommendations for further work are made. However, the property is virtually drill-ready. A 3000 m program is justified by the targets identified in the new mapping.

2 INTRODUCTION

2.1 Objectives

Warren Pratt (Specialized Geological Mapping Ltd, UK), visited Morgan Peak, close to Miami, Arizona, from the 17th to 27th of July 2010. This followed a request from Bernie Stannus in May 2010 for mapping and evaluation. Further objectives were identified during the field visit, in discussions with Bernie Stannus and Bill Galine (President Toro Resources). Warren Pratt visited again in January 2011, with Gerry Puente de la Vega. Detailed aerial photography was acquired between my two visits and is of excellent quality. One metre topography has also been generated, ideal for a resource calculation and a scoping study (strip ratios etc). Shelby Cave also carried out mapping between July 2010 and January 2011.

This report should be read together with the reconnaissance geological map (Appendix 1). This report is not intended to be NI 43-101-compliant. Neither is it meant as a comprehensive review of previous work. A NI 43-101 report by Paul Noland (filed December 9th, 2010) has a complete history of exploration that I do not intend to repeat here. Some of his historic resource figures and diagrams by American Copper Corporation are reproduced here.

Some drill core from the 2008 campaign was examined in Miami. Quick logs are presented in Appendix 2.

2.2 Notes

The igneous classification of Streckeisen (1976, 1978) is used throughout. Structural data were plotted on stereograms and maps using Spheristat software (Pangaea Scientific, Vancouver). A geological interpretation was made in Mapinfo/Discover 3D, then exported as dxf files to Autocad, for final map preparation.

This report should be read in conjunction with the reconnaissance geological map (Appendix 1). This is based only on surface mapping. Not all surface exposures were visited and the map makes <u>no attempt to integrate drill data</u>. It will therefore require modification in the future. Viewing in 3D, with the orthophotograph draped over the digital elevation model (DEM), was especially useful in identifying faults and lithological contacts.

The NAD 83 (Zone 12) projection was used successfully on a hand-held Garmin GPS. Compass directions are abbreviated in the text, for example, 'WSW' instead of 'west southwest'. Localities are marked in the field by flagging with 'WP 1', 'WP 2' etc. I recommend that Toro geologists collect field data in a similarly consistent fashion. The DVD at the back of this report (Appendix 3) includes a file called 'Morgan Peak structural data.xls'. This contains field data, with coordinates and elevation (from GPS), for my field localities.

The DVD (Appendix 3) contains numerous field photographs. These include photographs from the field, labelled according to WP locality, and drill core photographs, in appropriate folders labelled with depth.

The cross sections (Appendix 4) are non-interpreted sections showing Cu values in previous drill programs. A map shows the location of each section and, in red, the location of drill holes planned for 2011. (Note that this program is under discussion and some drill holes have been dropped and others relocated.)

2.3 Acknowledgements

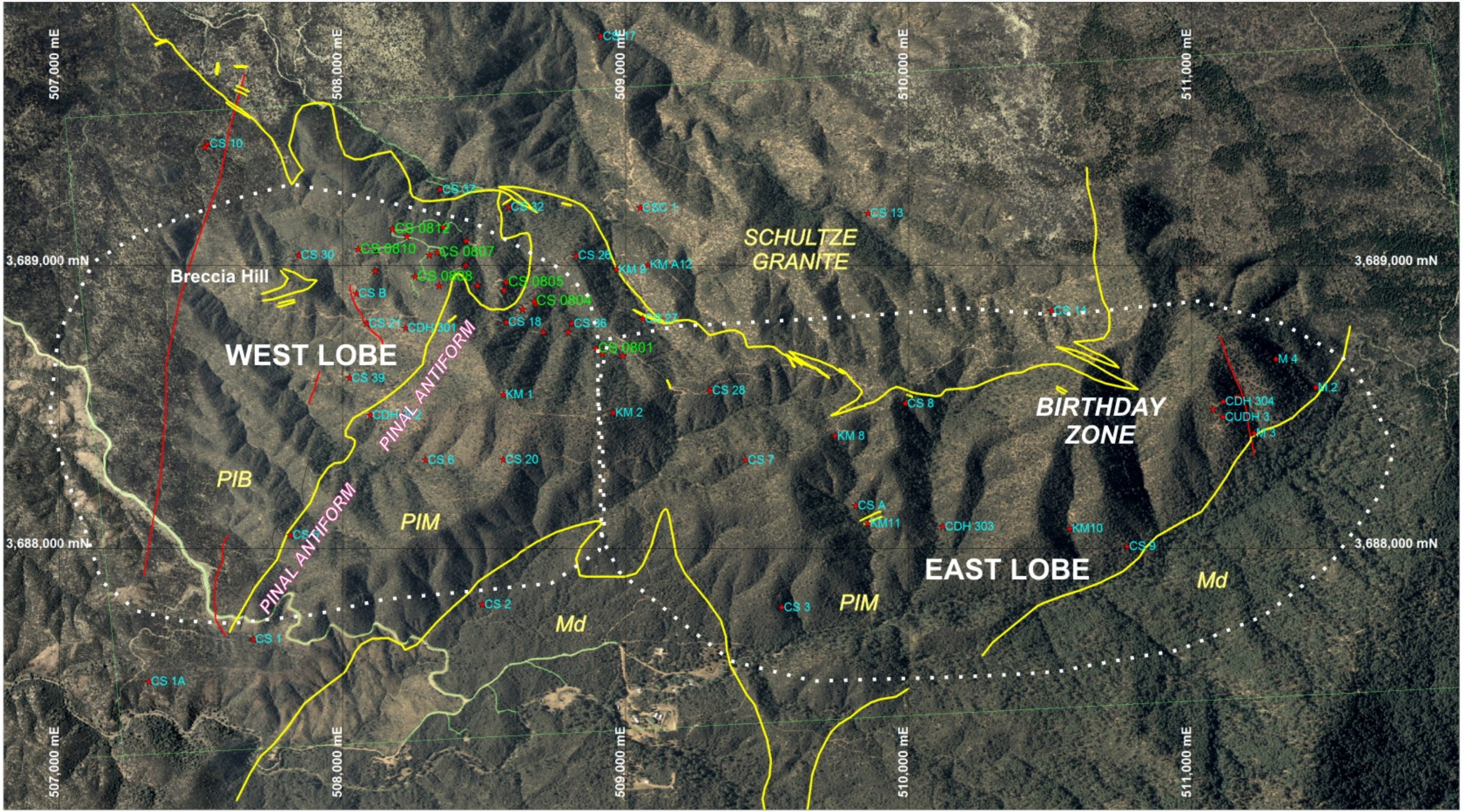
Many thanks to Shelby Cave (2010-11) and Gerry Puente de la Vega for their infill mapping. Bernie Stannus and Bill Galine kindly ensured everything ran smoothly. Mark Bolsover was field assistant in July 2010 and did much of the detailed map preparation in 2010 and 2011 (Appendix 1). Herb Duerr is thanked for background information regarding Morgan Peak.

3 GEOLOGICAL INTRODUCTION

Morgan Peak, which has gone under various names during the last 50 years, is a mature exploration prospect which has had several major drill programs by companies including Kerr-McGee. It is a copper (Cu) porphyry deposit in the Gila County of the Globe-Miami district of Arizona. This district includes major historical Cu mines (Miami-Inspiration, Pinto Valley, Copper Cities) and recent major discoveries (Resolution).

The Morgan Peak mineralization occurs at the southern contact of the Laramide (Early Tertiary) Schultze Granite pluton. It is mostly hosted by Precambrian schist (the Pinal Schist), whilst the granite is only weakly mineralized.

The property is generally divided into East and West lobes (Figure 1). Drilling has been concentrated in the West Lobe. Drilling to date has demonstrated a potentially economic supergene Cu blanket with grades of 0.3-0.4% Cu in the West Lobe. This report identifies other potential targets, including the distinctly under-drilled 'Birthday Zone' target in the East Lobe (Figures 1 & 20) and the Link Zone (Figure 20). Other areas of interest are identified and described.



Specialized Geological Mapping

Figure 1 Morgan Peak project with previous drill holes (pale blue). 2008 drill holes are shown in green. Geological contacts in yellow. See Appendix 1 for legend.

4 LITHOSTRATIGRAPHY

Most of the area is underlain by Precambrian schists, known as the Pinal Schist. As previous reports describe (e.g. Burton, 1969; Lluría, 1969), there are several varieties. Some may have been more reactive to hydrothermal solutions, so it is important to map the differences. Previous maps have not attempted it. Figure 1 and Appendix 1 show two distinct types; in the W, distinctive grey compositionally banded schist, almost certainly derived from mudstones; in the E, a more massive light green schist, possibly derived from igneous or volcanic rocks.

4.1 Pinal Schist. Banded. ('PIB' on geological map, Appendix 1)

Typical banded schist is shown in Figure 2 (WP 138) and Figure 5 (WP 109). In deeply weathered exposures it is very soft, bleached and fissile. When fresh, it comprises centimetre bands of very fine grained dark and light grey schist. Excellent exposures occur in an un-named creek in the West Lobe (e.g. WP 146 [507643 3688773]). The bands were probably originally bedding, since the metamorphic grade is low (low greenschist), insufficient to cause wholesale remobilization/recrystallization. The schistosity is very planar and flaggy; the rocks commonly resemble slate. The principal minerals are muscovite + quartz, with minor biotite. There is also 1-2% coarse disseminated hematite. This is probably a surface oxidation product of magnetite.

The schists have local lenticular quartz porphyroblasts ('eyes') up to a few mm long. There are also common metamorphic porphyroblasts of andalusite (?) up to 15 mm long (see Figure 2, WP 142). It is not clear if the andalusite is a product of thermal metamorphism from the Schultze Granite or a semi-regional metamorphic mineral.

The schist is typified by swarms of lenticular quartz veins that lie parallel to the schistosity (see Figure 2 for examples). These are easily distinguished from porphyry-related quartz veins since they contain no sulfide (limonite). They also display massive white or pinkish grey 'bull' quartz, rather than crystalline quartz and crustiform textures of the porphyry veins. They commonly have fringes and pockets of coarse muscovite or biotite, again of metamorphic origin and also without sulfides. Other veins show strong ptygmatic folding and boudinage.

The banded flaggy schist occurs mostly on the W limb of a major antiform, which I refer to as the Pinal Antiform (Figure 1; Appendix 1). It also coincides with the area of relatively well developed Cu enrichment in the West Lobe, in the vicinity of CS–11, CS-12 and the 2008 drill program (see Figure 1). This area lies in the hinge of the S-plunging antiform.

4.2 Pinal Schist. Massive. ('PIM' on geological map, Appendix 1)

In contrast to the PIB, the bulk of the East Lobe, and part of the West Lobe, on the E side of the Pinal Antiform, comprises much more massive schist (Figure 1; Appendix 1). This is typically greenish grey and has a cruder, anastomosing schistosity. It comprises quartz + muscovite + feldspar + chlorite + hematite (after magnetite) and can be relatively coarse grained (up to several mm grain size). In some places, particularly on the S side of the West Lobe, it resembles foliated diorite, suggesting that it may be transitional to the Madera Diorite (Section 5.1). Good exposures occur along the access road beside the Santa Anna Fault (e.g. WP 163 [509123 3688624]). I interpret these schists as meta-igneous or meta-volcanic rocks, probably of intermediate composition.

LEFT. WP 46 [508956 3689148] Schultze Granite. Porphyritic granite with large quartz phenocrysts.

RIGHT. WP 120 [507518 3689860] Schultze Granite. Porphyritic granite with parallel D veins with grey muscovite halos (dip steeply to right).

LEFT. WP 138 [507579 3689477] Grey schist with compositional banding. Probable sedimentary origin. Note parallel (metamorphic) quartz veins.

RIGHT. WP 292 [509862 3687939] Quartz rich schist with common folds.

LEFT. WP 142 [507508 3689139] Schistosity surface with porphyroblasts. Grey banded schist.

RIGHT. WP 139 [507509 3689450] Metamorphic quartz vein swarm in grey banded schist.

Specialized Geological Mapping

Figure 2 Examples of lithologies.

4.3 Other schists

Distinctly quartz-rich schist crops out in the vicinity of the Ellis Adit, immediately S of Birthday Zone e.g. WP 278 [510401 3688306]. I have done only a few traverses in the area, so it is difficult to separate and map the unit as a discrete unit. However, it should be attempted in the future. For the time being I include it as the PIM (Appendix 1).

The rock comprises very tough, light grey to buff quartz-rich schist with compositional banding and local 'granitic' clots of k-feldspar + quartz (Figure 3). There is also minor muscovite and biotite. The rock displays irregular metamorphic quartz veins and sweats, commonly with boudinage and folds. I interpret it as a metamorphosed quartz-rich sandstone or quartzite.

Figure 3 Quartz rich schist/metaquartztite. Note folds at top. WP 278 [510401 3688306]. Close to Birthday Zone.

5 INTRUSIVE IGNEOUS ROCKS

5.1 Madera Diorite ('Md' in Appendix 1). Precambrian.

This green medium- to coarse grained equigranular rock is massive and non-foliated. It generally comprises fresh plagioclase + hornblende + biotite + quartz + 1-2% magnetite. The composition is probably quartz diorite to possible granodiorite. It is commonly weakly chlorite and epidote altered, particularly on the E side, close to Madera Peak (e.g. WP 64 [511857 3688580]). The N contact of the intrusion was seen in the main access road to the project WP 409 [508200 3687690]. This exposure is continuous and seems to show a gradual transition from equigranular intrusive into chloritic greenschist (Pinal Schist; Section 4.2) with no sharp boundary. The schist shows profound changes in grain size, locally resembling the intrusion. The intensity of porphyry-related D veins declines into the intrusion. These observations suggest that the Pinal Schist includes metamorphosed and deformed parts of the Madera Diorite.

5.2 Schultze Granite ('PGr' in Appendix 1) . Paleocene.

Previous authors, in particular Burton (1969) and Lluria (1969), recognize sub-types of the Schultze Granite. Traverses into the Morgan Peak project from the NW, along Copper Springs Canyon, do show a subtle change in texture. In the NW, mostly outside the project area, the granite has a coarser grained groundmass with common quartz phenocrysts (see below).

WP 348 [507029 3690590] Schultze Granite.

Upstream from about WP 361 [507713 3689872], there is a subtle change. Large k-feldspar phenocrysts join the quartz phenocrysts and the groundmass is finer grained (see below). The phenocrysts appear more isolated and the texture less crowded. Rare biotite phenocrysts also occur. The rock has a distinctive green tinge along Copper Canyon Creek, because of propylitic (chlorite + epidote) hydrothermal alteration. This porphyritic variety of the Schultze Granite occupies the remainder of the mapping area. References below to 'Schultze Granite' refer to the porphyritic variety.


WP 362 [507854 3689635] Porphyritic Schultze Granite.

The Schultze Granite contact strikes mostly WNW, but there are local NE-striking fingers that penetrate the country rock, in particular one dike in the East Lobe at KM 11 (see Figure 1; Appendix 1). The dip of the granite contact is uncertain. I did not directly observe the contact and I have not reviewed drill logs carefully or plotted geological cross sections. However, it seems to be steep- to moderate S-dipping. A major swing in the contact occurs at Birthday Zone (Figure 1; Appendix 1). Veining evidence suggests that this swing, or apex, is an original intrusive feature and not the result of subsequent fault offset. Apical regions of porphyries can have the best Cu grades, another reason why I identify the Birthday Zone target (see Section 10).

There is an isolated occurrence of Schultze Granite well S of the main body. A 20 m-wide dike occurs at KM 11 in the East Lobe (Figure 1), about 470 m S of the main Schultze Granite contact. This shows strong hydrothermal alteration (muscovite). This isolated occurrence is very important because it raises the possibility of concealed mineralization well S of the 'main' Schultze Granite contact. Concealed cupolas are particularly good places for porphyry-style mineralization.

In a few places the Schultze Granite contains large tabular chunks of quartz, up to 50 mm long. I interpret these as ingested fragments of former quartz vein stockworks (see Figure 16). Identical textures occur in many porphyries, for example the El Galeno and Haquira porphyry Cu deposits in Perú.

Large exposures of the granite are typified by parallel swarms of grey 'D' veinlets, discussed further in Section 6.2 (see Figure 2, WP 120).

5.3 Basic igneous rocks (not separated on map, Appendix 1). Precambrian.

Rare thin schistose basic igneous rocks were seen in the Pinal Schist (e.g. WP 78 [509760 3688633] in the East Lobe). They have also been encountered in drill holes. They probably represent metamorphosed basic dikes.

6 STRUCTURE

6.1 Pre-Laramide structure (Precambrian)

Prior to the intrusion of the Schultze Granite in the Early Tertiary, a thick sedimentary and volcanic/igneous sequence was uplifted and deformed to form the Pinal Schist. The deformation is thought to have occurred between 2.5 and 1.6 Ga. The Madera Diorite is dated at about 1.6-1.4 Ga and is seemingly non-deformed (but see comments in Section 4.2).

The main metamorphic event produced a mostly upright schistosity (S_1) in the district. This is mostly parallel to bedding, forming the distinct compositional banding in the schists derived from sedimentary rocks.

Figure 4 shows stereograms for S_1. The data are divided into two domains, W and E. The division more or less coincides with the Pinal Antiform, a broadly anticlinal structure that includes SE-dipping faults and thrusts. On the W side of the antiform, the schistosity is very consistent; it strikes NE and dips steeply NW. On the E side it is more variable, but generally dips moderately SE or E (Figure 4). Other folds clearly exist in the East Lobe; some tentative antiform and synform axial traces have been added to the map (Appendix 1).

The main schistosity (S_1) is folded by major, km-scale folds within the district. The most obvious, recognized in several previous reports (Burton, 1969; Lluría, 1969), is the Pinal Antiform, in the West Lobe (Figure 1). Since it folds S_1, this is clearly an F_2 structure, product of younger deformation. Axial planar crenulation cleavage/schistosity (S_2), which is sub-vertical and strikes NE, is developed in the hinge of the antiform. An example of S_2 is shown in Figure 5 (WP 315).

Lluría (1969) suggested that the hinge of the Pinal Antiform was important since 'greater fracturing' in the fold hinge more or less coincides with the thickest development of supergene Cu in the West Lobe. This occurs in the vicinity of CS-11, CS-12 (see Figure 1), and was the focus of the 2008 drilling by American Copper Corporation (ACCO). The presence of S_2, basically an 'extra' fracture direction, may have increased the number of fractures available for Cu-charged water to flow through, so this may be true. The thickness of the supergene blanket apparently drops off rapidly towards the S (though old drill data are unreliable), coinciding with the change from banded- to massive Pinal Schist (Section 4.2). In other words, instead of fracture intensity, the lithology, and reactivity of the different schist types, may have played a major role in controlling hypogene, and therefore, supergene, Cu grades.

6.2 Laramide (Paleocene)

The mineralization at Morgan Peak shows plenty of evidence of being strongly structurally controlled. Despite previous maps of hydrothermal alteration which resemble bulls-eyes, it cannot be interpreted as a typical Cu porphyry, with concentric rings of alteration and veining around a vertical cylindrical igneous stock (*cf* Lowell and Guilbert, 1970). Instead, mineralization was strongly elongated along the WNW-striking Schultze Granite/Pinal Schist contact (Figure 1).

Veins The first clue to the tectonic setting of the porphyry comes from the distribution of porphyry-related veins. These include 'D' veins and quartz veins, the characteristics of which

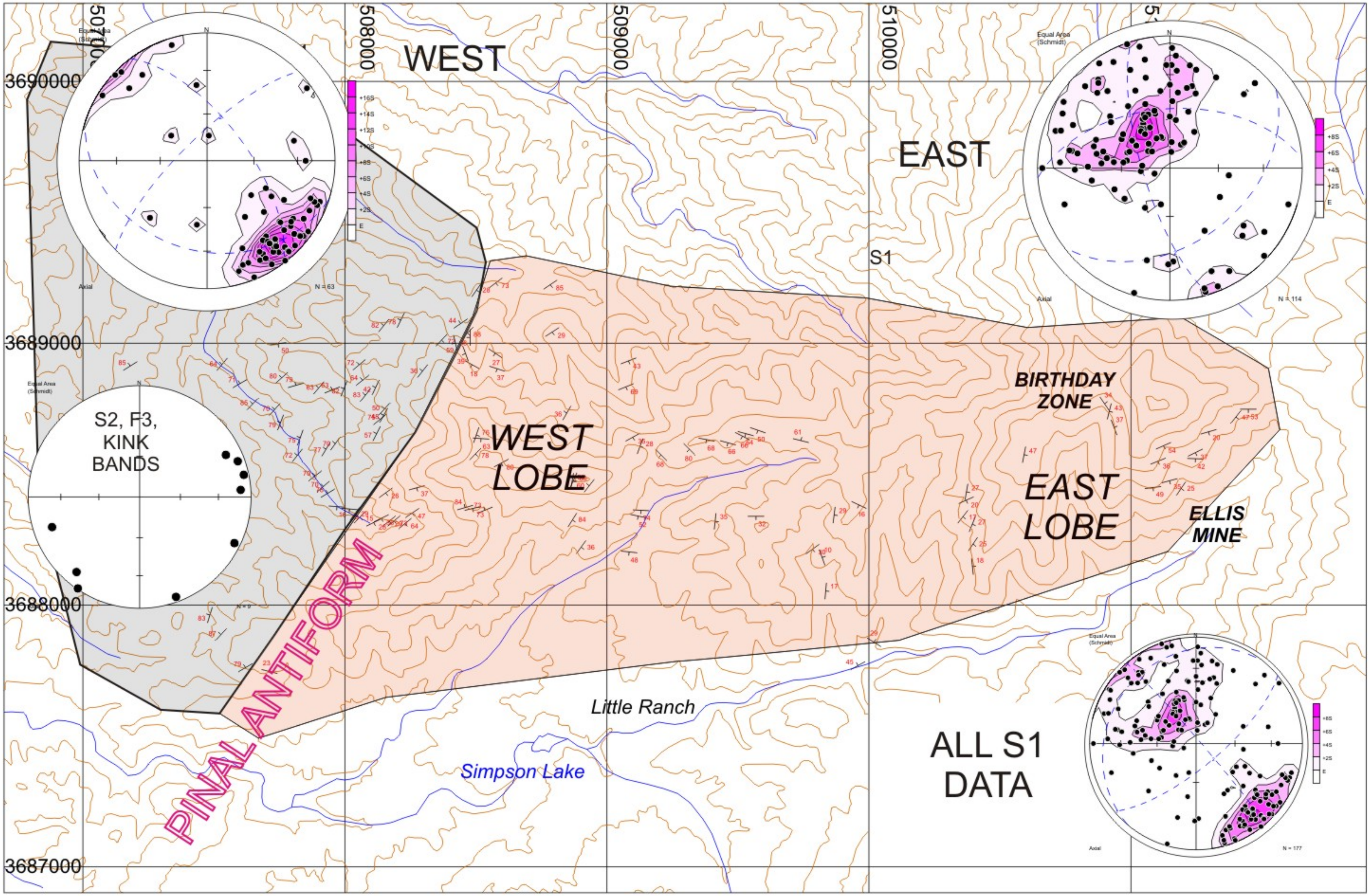
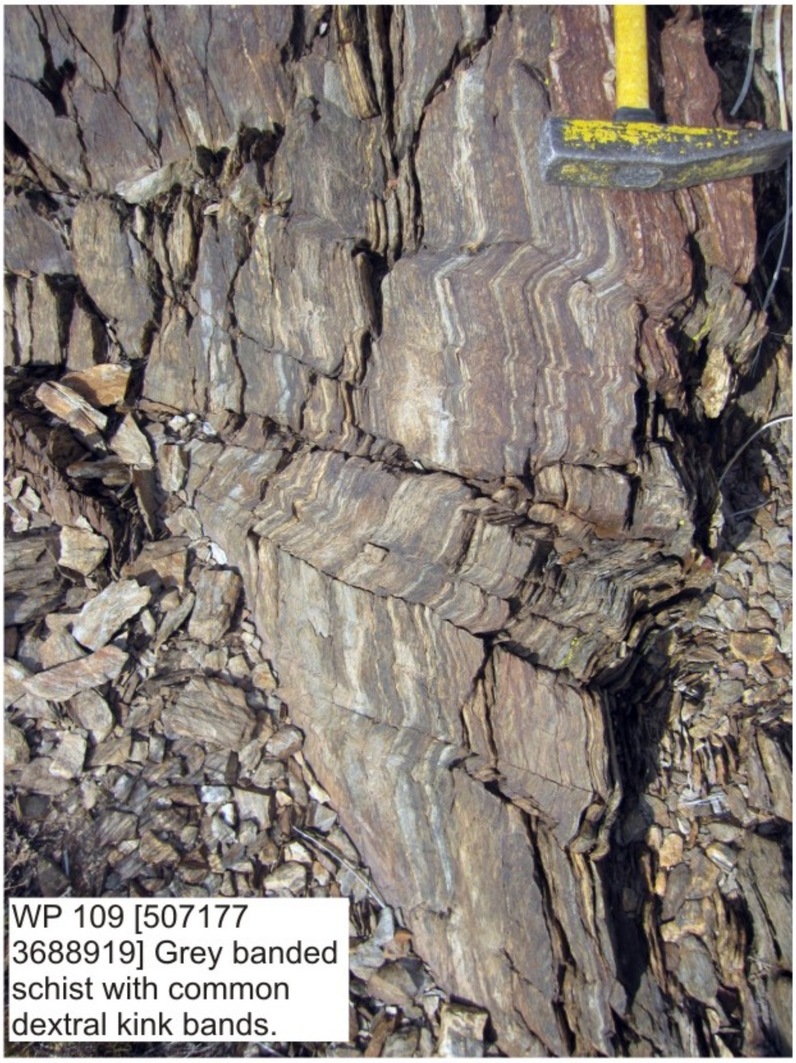
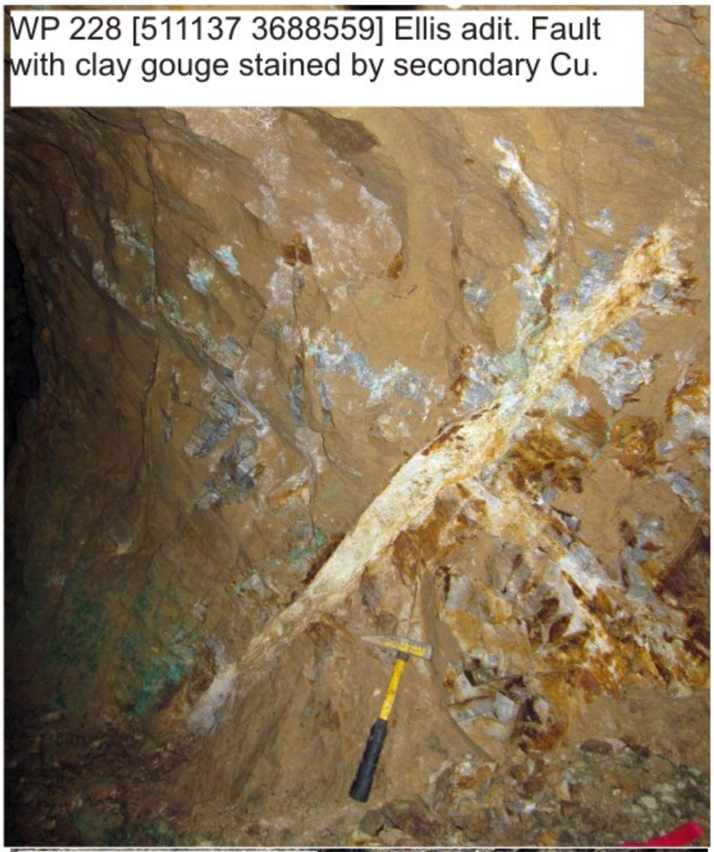


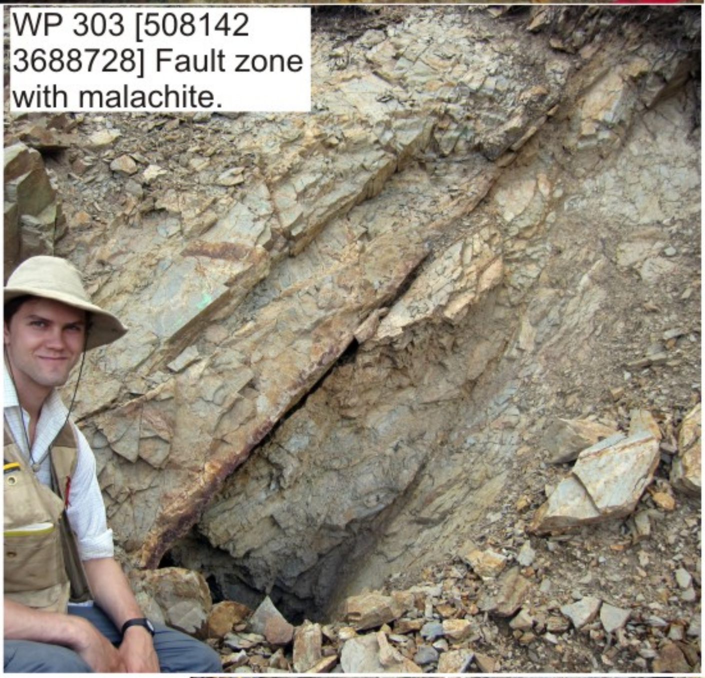
Figure 4 Stereogram and map of S_1 (schistosity). S_2, F_3 axial planes and kink bands are also shown (bottom left).



WP 109 [507177 3688919] Grey banded schist with common dextral kink bands.

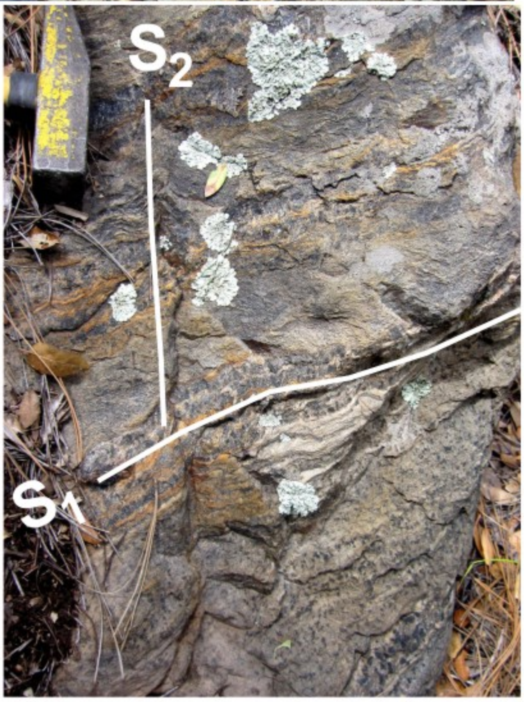


WP 228 [511137 3688559] Ellis adit. Fault with clay gouge stained by secondary Cu.



WP 303 [508142 3688728] Fault zone with malachite.

WP 231 [511163 3688495] Ellis adit, copper stained fault plane.



RIGHT. WP 315 [507969 3688369] Vertical crenulations of S1.

Specialized Geological Mapping

Figure 5 Examples of structures.

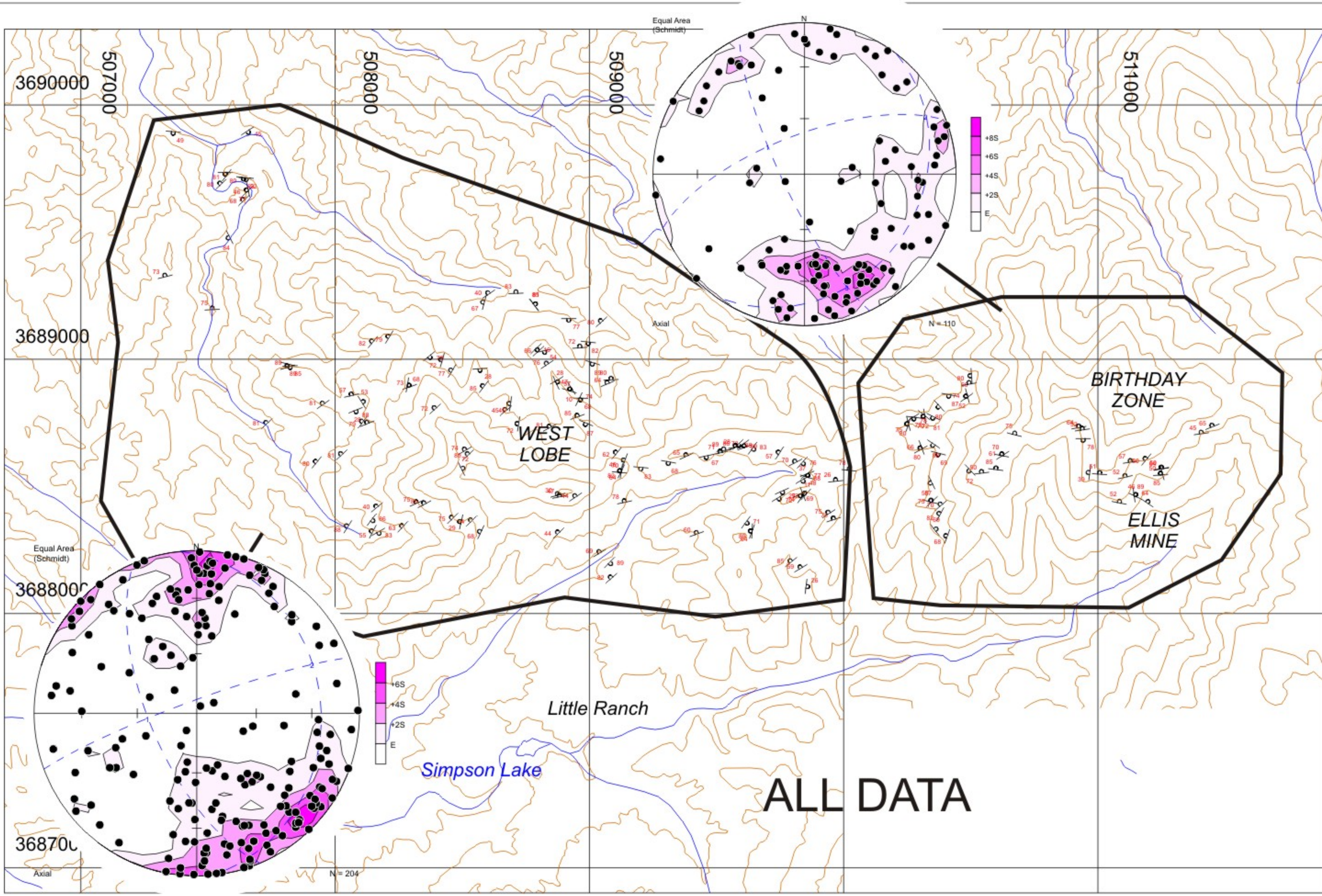


Figure 6 Stereograms and map of quartz-dominated veins.

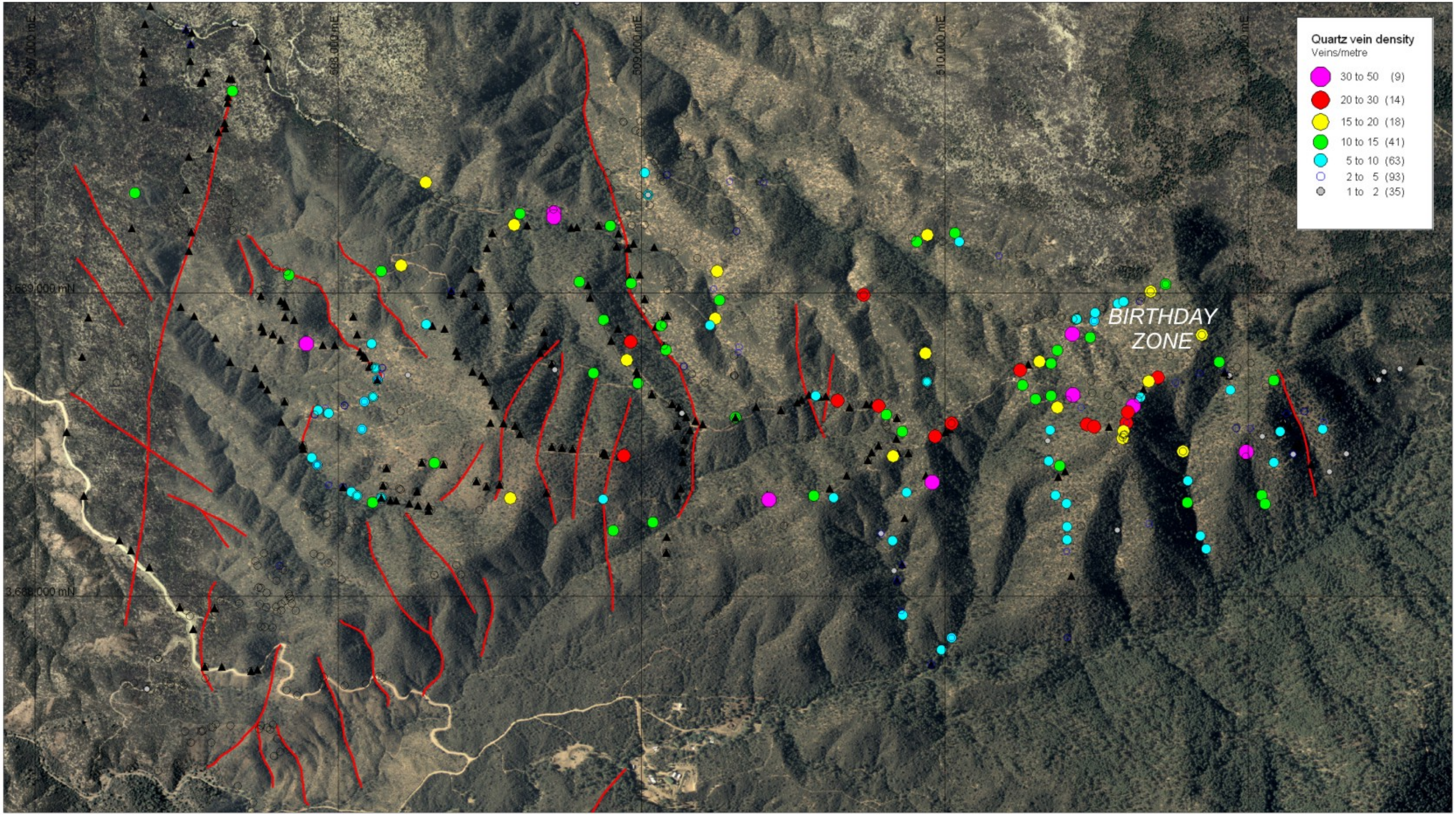


Figure 7 Plot of density of quartz-dominated veins.

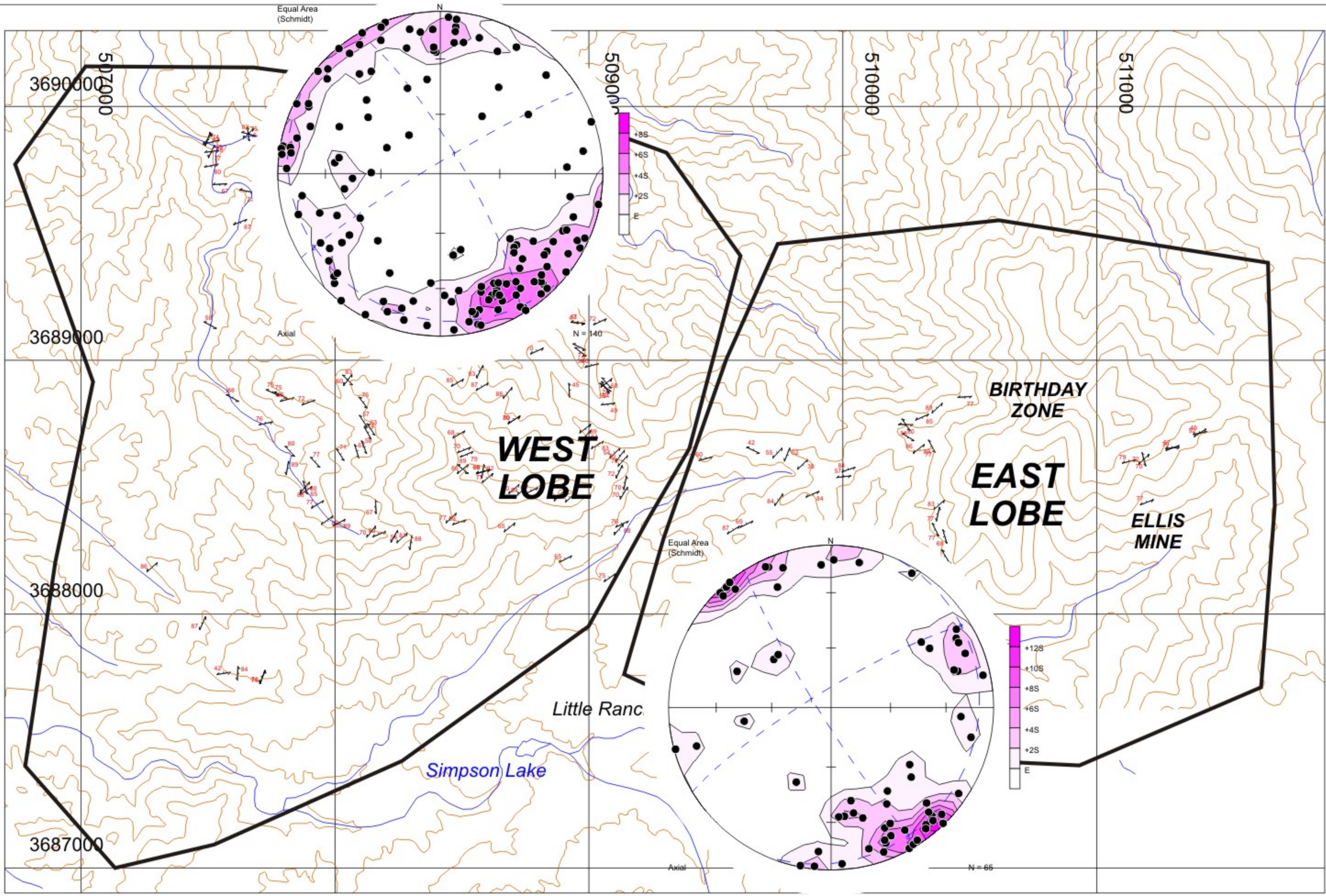


Figure 8 Stereogram and map for D veins, greisen veins and limonitic veins.

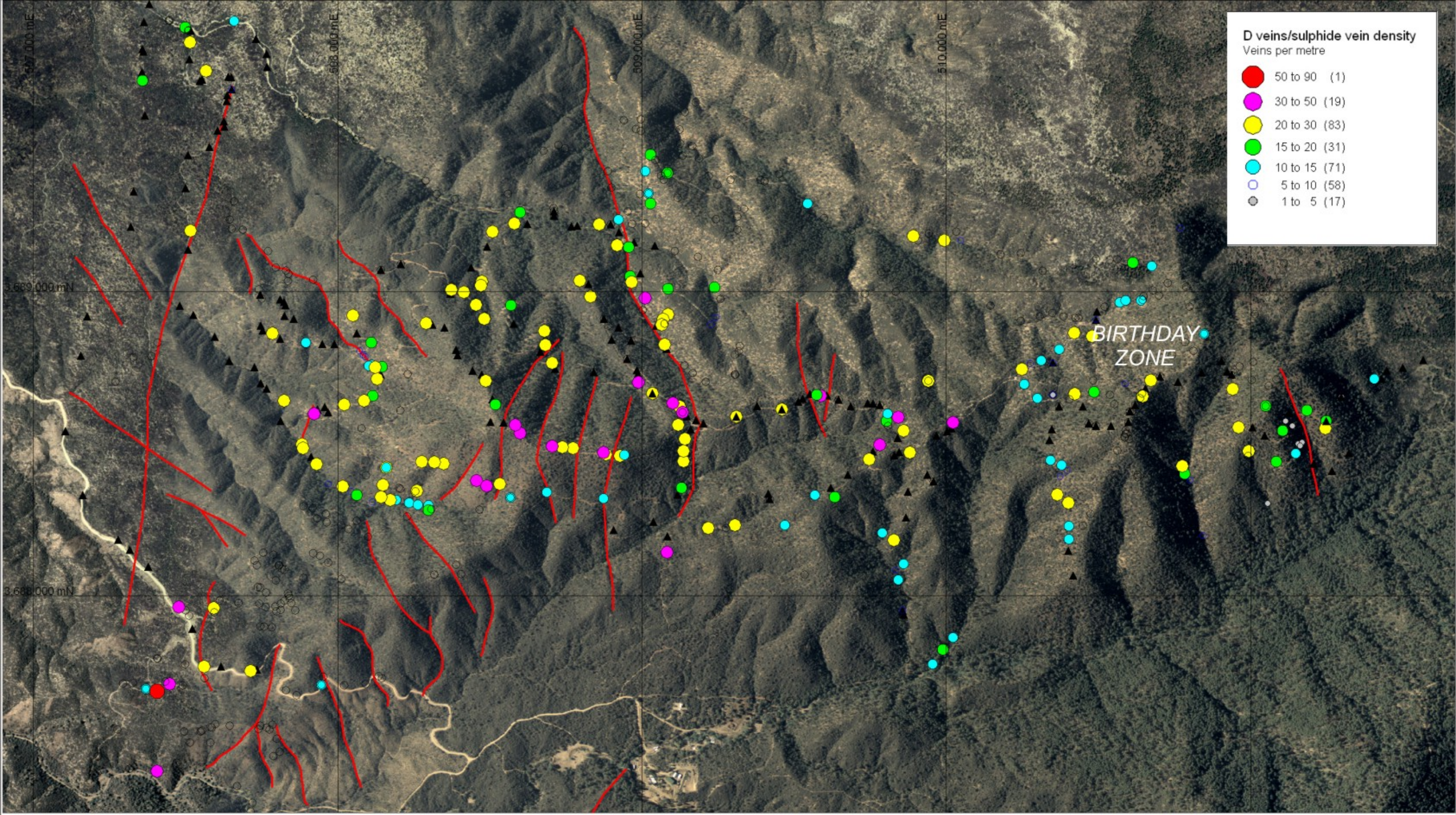


Figure 9 Plot of density of D veins, greisen veins and limonitic veins.

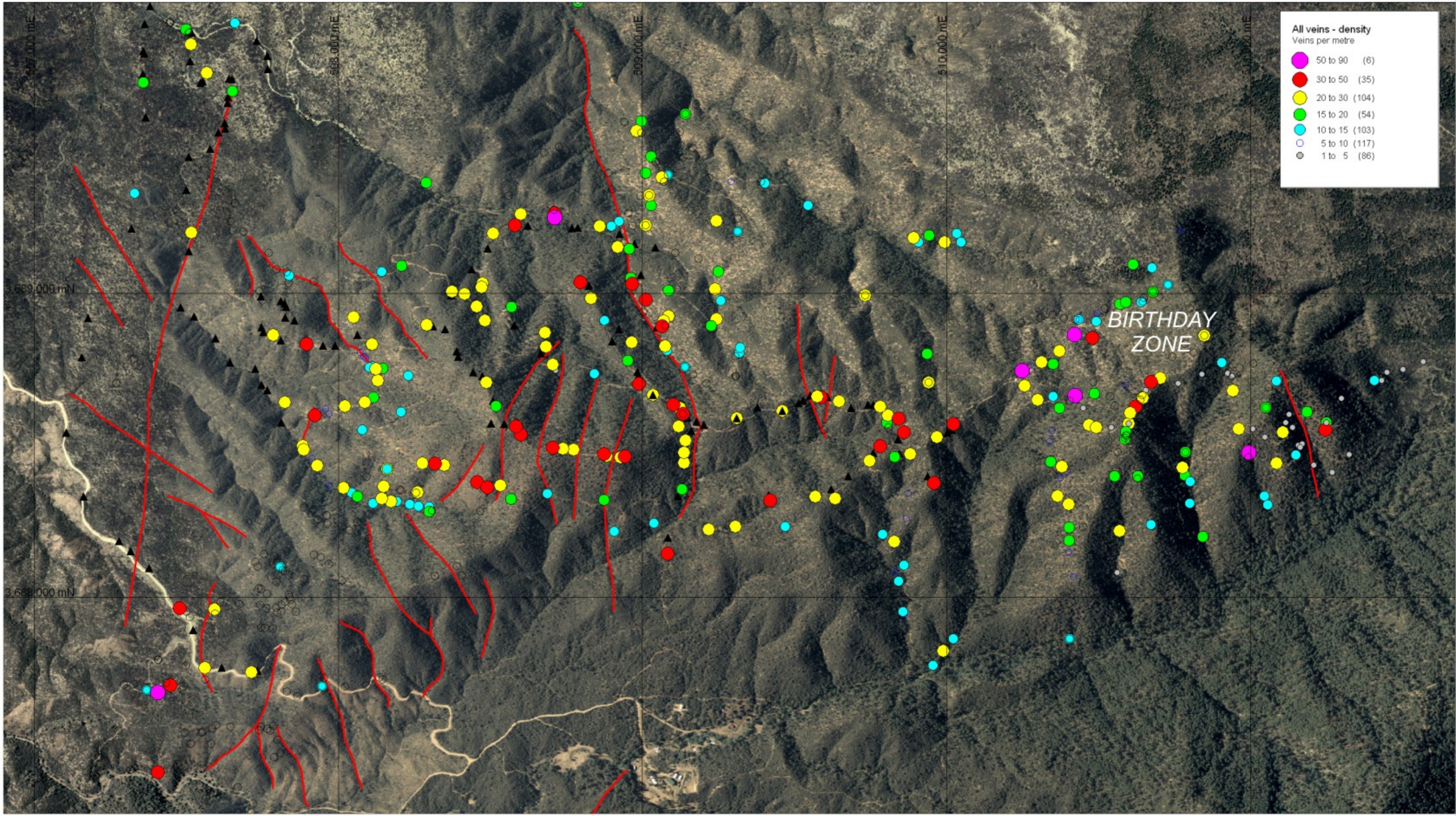


Figure 10 Plot of density of all vein types.

are described in Section 9.1. Stereograms of the quartz veins are shown in Figure 6. The density of veins, measured simply as veins per metre, is shown in Figure 7. (These figures exclude all metamorphic quartz veins.) Porphyry-related quartz veins in the West Lobe are mostly sub-vertical and strike NE. Around Birthday Zone, and the apex of the Schultze Granite intrusion, there are several sets, including E-striking, steeply N-dipping veins.

The D veins (Figures 8 and 9) seem simpler. Like the quartz veins, they are mostly sub-vertical and strike NE. There is also a minor NW-striking sub-vertical set. Figure 10 shows the density of all veinlet types. The sheeted nature of the D veins is shown well in Figure 17 (WP 32).

Faults The principal faults are well-known from previous reports. Many are mineralized with Cu and have been the target of small scale mining. These faults include the *Santa Anna Fault*, which divides the West and East lobes (Appendix 1). Exposed at WP 161 [509161 3688549], it strikes N-S and dips steeply W. The fault is marked by a major gully and local exposures of strongly limonitic breccia of schist and quartz vein fragments. Nearby exposures (WP 2 [509147 3688592]) show breccia dikes up to 0.2 m wide. The rounding of clasts suggests that these may be hydrothermal pebble dikes rather than tectonic breccias. Drilling (Burton, 1969; Lluría, 1969) encountered the fault northwards at least as far as the Schultze Granite contact. It forms a relatively subtle feature on the orthophotograph.

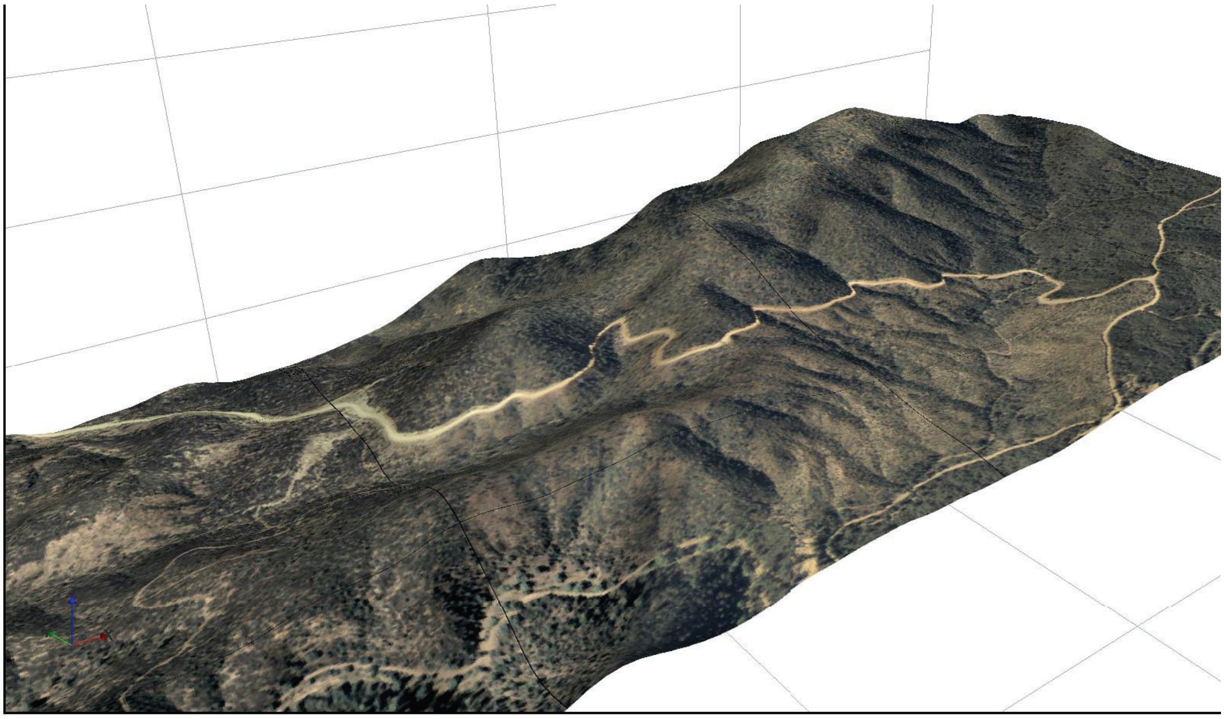
The *Ellis Fault*, seen in the Ellis adit, comprises several parallel green Cu-stained fault strands within a corridor that is at least 25 m wide. The faults strike NNW and dip steeply W (WP 228 in Figure 5). At least one subsidiary major fault is exposed underground (WP 231 in Figure 5). It strikes approximately E-W and dips moderately N. Collapsed workings (stopes?) suggest that it is these E-W faults that are better mineralized with Cu.

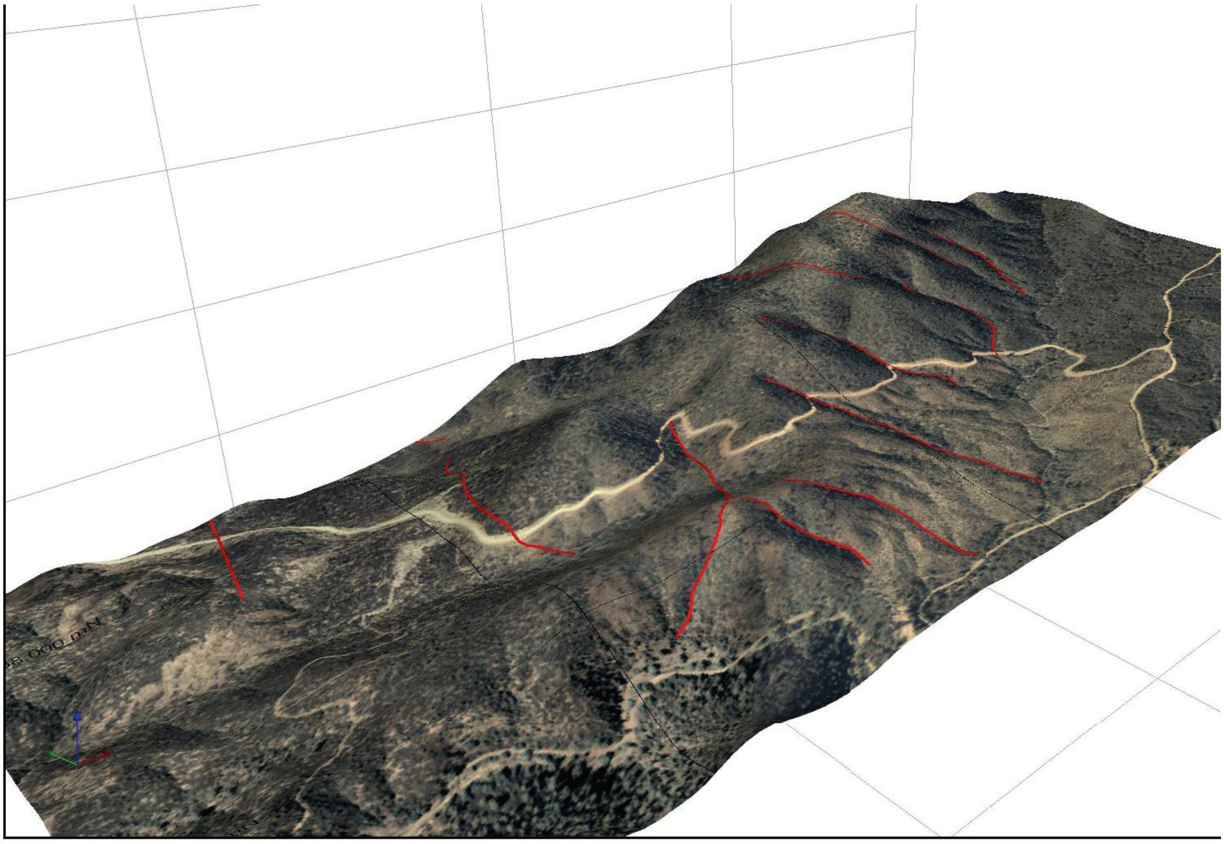
All the fault zones at Ellis adit generally comprise < 0.5 m of kaolinite gouge; the wall rocks between strands are relatively weakly fractured; these are not therefore wide zones of fracturing. The underground workings and faults are shown on the geological map (Appendix 1).

Not all faults at Morgan Peak are steep. A major low angle fault, which I refer to as the Pinal Thrust, is exposed in the forestry road access on the SW side of the West Lobe (WP 35 [507561 3687767]) (Appendix 1). It strikes NNE and dips gently E. There is up to 1.5 m of gouge. The movement sense is unclear and it may be extensional, since extensional faults are common in this part of Arizona (Maher, 2008).

Low angle faults are notoriously difficult to follow on air photographs and satellite images because they contour around hills and valleys. So the northward continuation of the Pinal Thrust is unclear. However, a similar low angle fault, striking NNW and dipping gently E, occurs SE of Breccia Hill; it may be the continuation. In this area the fault is strongly Cu-stained and was targeted for small scale mining (see WP 303 in Figure 5). Major crustiform euhedral quartz + limonite veins, up to 0.2 m thick, occur both parallel to the fault, and as NE-striking sub-vertical veins in the footwall (e.g. WP 298 [508083 3688793]). These veins do not have muscovite. I suggest that they are perhaps very late porphyry-related veins (possibly polymetallic?). Their occurrence along some fault zones establishes that the porphyry was emplaced during faulting.

A series of low angle faults, almost certainly related to the Pinal Thrust, is visible on the image in the SW part of the property. The screenshots below show interpreted (bottom), and non-interpreted (top), views. The image shows the main access road to Simpson Lake and Ellis Ranch. The red arrow (bottom left) points due E, the green N. The faults clearly dip gently E, but there sense of displacement is unknown. Neither is it clear if they are mineralized or not.





Local kink bands and chevron folds (F_3) of the Pinal Schist, seen only in the West Lobe, are probably fault-related. They almost certainly developed as the porphyry was emplaced into an active tectonic environment. They tend to strike NNW and commonly have dextral (clockwise, or right-handed) offsets (see WP 109 in Figure 5; Figure 4). Kinking and folding becomes particularly intense close to the tectonic/hydrothermal breccias in the West Lobe at Breccia Hill (Figure 1). There is commonly a gradation into breccias with more hydrothermal character (see Section 8 for description of the breccias).

Interpretation Many cylindrical, stock-like porphyries, such as the Henderson Mo porphyry, Colorado (see work by Carten), are surrounded by either concentric or radial fracture patterns, in particular D vein networks. I have seen concentric patterns at the Regalito (Chile) and Río Blanco (Perú, Monterrico) Cu porphyries. Similar concentric or radial patterns can occur with igneous and breccia (in particular pebble) dikes. These fracture patterns can provide a clear vector towards the heart of a porphyry system, even though the actual intrusion may not be exposed on surface.

In the case of Morgan Peak, my first observation is that the fracture system is sheeted style (many parallel veinlets) and covers a large area. The swarm of quartz and D veins extends for at least 3 km from NW to SE. If there is a recognizable concentric, or radial, pattern, then it might be on a much larger scale, suggesting a very large porphyry system. However, I strongly suspect that the veins reflect a broad halo of fracturing caused by movement along the Schultze Granite contact. There is no classic concentric or radial distribution. This makes it harder to focus on the heart of the mineralized system.

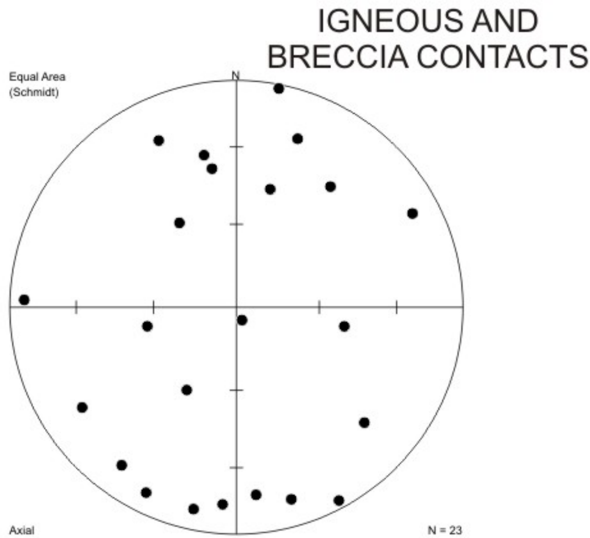
Figure 12 proposes a tectonic model for the emplacement of the porphyry and development of the fracture stockworks. Granite dikes, D veins, and quartz veins developed in a broad swarm during sinistral shear along the flank of the NW-striking Schultze Granite contact. Local tectonic-hydrothermal breccias developed along the contact in a few places, implying faulting. These have the potential to be mineralized with Cu (see Figure 15). However, I don't believe that the entire length of the Schultze Granite contact is a major fault. In some areas, for example in Copper Springs Canyon, there is clear evidence of stoping of granite into schist (see below).

The apex area of the Schultze Granite, at Birthday Zone, is interesting. The intensity of fracturing dies out towards the Ellis Adit, away from the apex. The vein directions, in particular quartz veins, change compared with the remainder of the area. This supports the idea that this is the apex, or cupola of the porphyry intrusion. Presumably, the shear regime on the NE side of the Schultze Granite pluton may change to one of dextral shear. This possibility is shown in Figure 12.

Despite previous theories of low angle extensional faulting (which is prevalent in the district) I see no convincing evidence that the hypogene or supergene mineralization is significantly offset (dropped down) by faults. There is therefore no discernible, tectonic difference between the West and East Lobes. This is positive for the project because it allows for continuation of the West Lobe mineralization into the East Lobe.


WP 358 [507508 3689860]. Copper Springs Canyon. Granite stoped into schist.

Specialized Geological Mapping



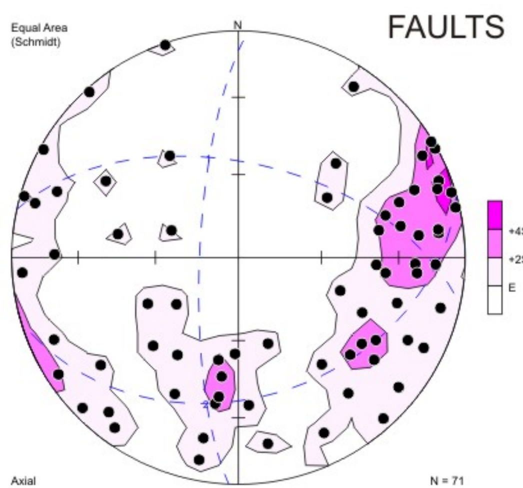


Figure 11 Stereograms of faults and igneous and breccia contacts.

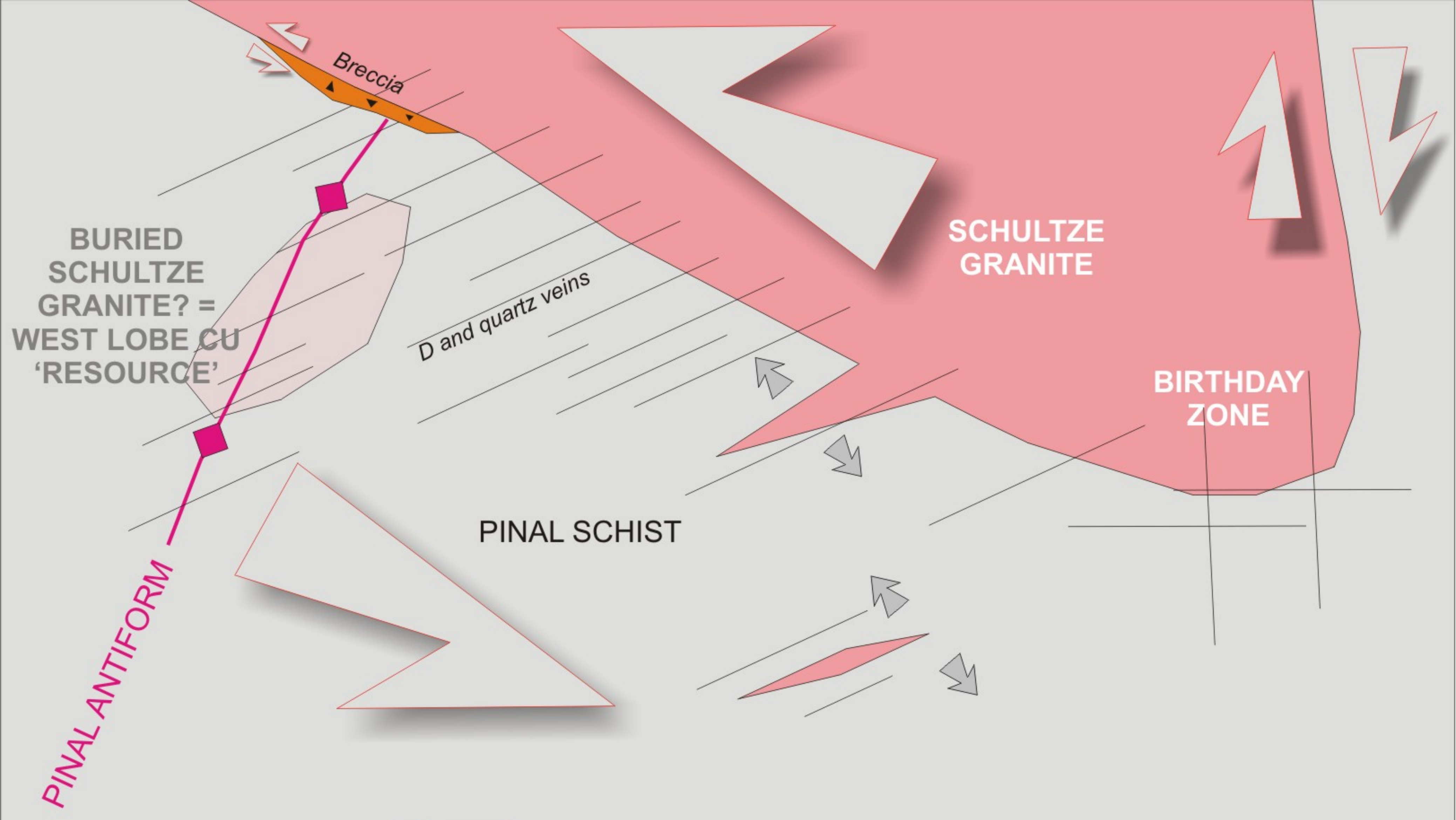
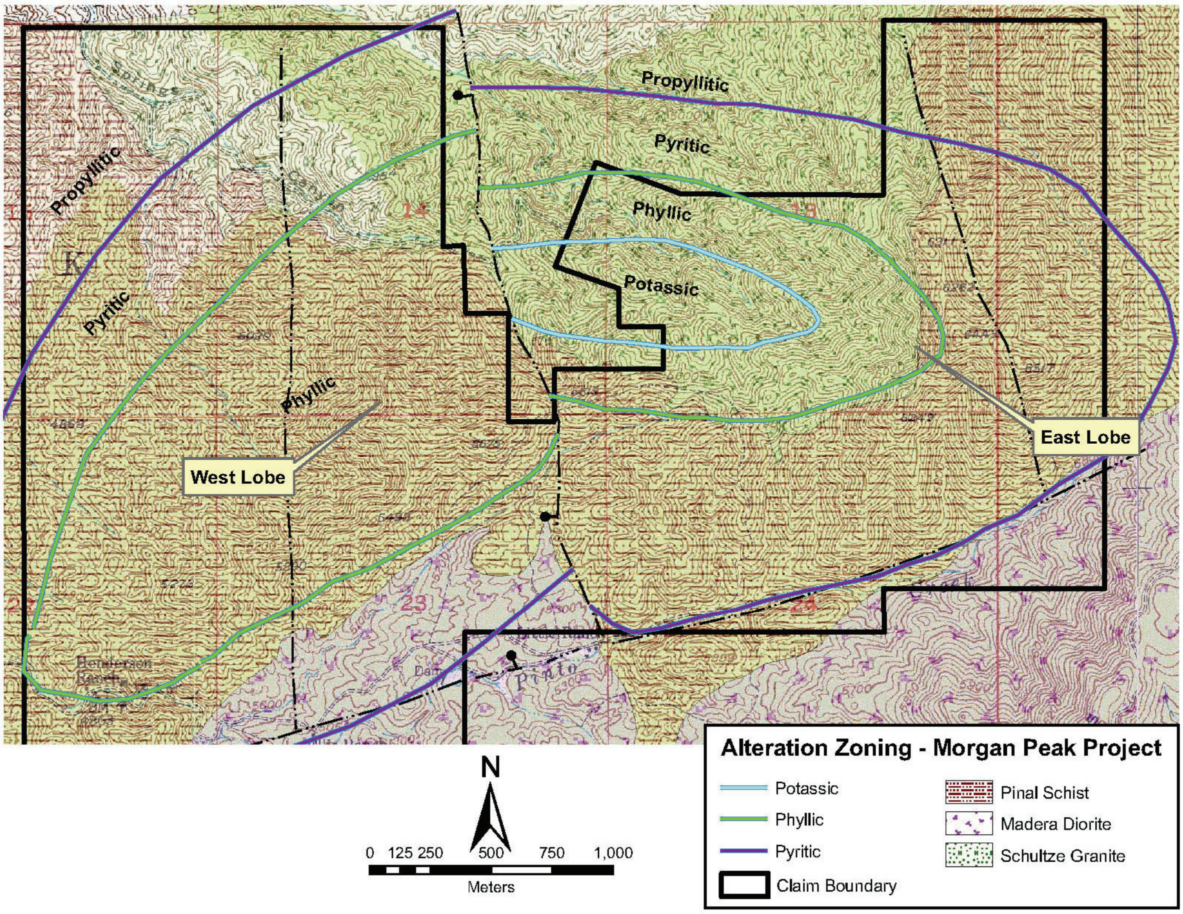


Figure 12 Tectonic model for Morgan Peak Cu porphyry.

7 HYDROTHERMAL ALTERATION

Some previous maps of Morgan Peak depict a bulls-eye arrangement of concentrically zoned potassic, phyllic and propylitic alteration (see map from Noland, 2010 below). This is misleading because the alteration is strongly elongate (parallel to the granite/schist contact) and controlled by fractures/veins. Furthermore, the different phases overlap. Therefore, greisen veins with strong muscovite halos commonly overprint 'potassic' veinlets. Hydrothermal alteration is rarely pervasive at Morgan Peak. However, broadly speaking, hydrothermal alteration becomes more intense towards the granite contact, and declines a short distance into the granite. Section 9 describes the vein types in more detail.



'Potassic' conditions at Morgan Peak are indicated by high temperature quartz veins with k-feldspar or k-feldspar halos (Figure 16); also by thin biotite veinlets. Many of the high temperature quartz veins probably developed under potassic conditions, but direct evidence of secondary k-feldspar or biotite is commonly difficult to see at surface (it becomes easier in drill core). I don't rule out the presence of pervasive secondary biotite, a good indicator of potassic conditions, in some of the Pinal Schist. However, I was unable to map this at surface. Recognition is not helped in the schist by widespread metamorphic biotite.

At Morgan Peak veins with k-feldspar halos (potassic alteration) are widespread along the Schultze Granite contact over several km. Maher (2008) describes these veins as semi-regional, and mostly not associated with Cu mineralization. This is the converse of many porphyries, which tend to have a central potassic zone (as in the map above) with the highest Cu grades.

Specialized Geological Mapping

‘Phyllic’ conditions are indicated by D veins (Gustafson and Hunt, 1975). These D veins seem to be laterally equivalent to higher temperature ‘greisen’ veins, which have quartz + muscovite + sulfide (limonite) (Section 9). There is a clear pattern of greisen veins passing outwards into D veins with sericite. The reappearance of muscovite in sites far from the Schultze Granite contact may therefore indicate buried granite bodies with the potential to host mineralization. Propylitic conditions are represented by rare epidote veinlets E of the Ellis adit. I did not recognize the ‘pyritic’ alteration shell described from many porphyries and it does not manifest itself on the limonite maps; it should appear as strong jarosite staining (Figures 18 & 19).

My approach to mapping hydrothermal alteration is to present point data observations. Figures 13 and 14 show the distribution of observed secondary muscovite and k-feldspar/secondary biotite. (Metamorphic biotite and muscovite are ignored in these maps.) Stronger, more pervasive, muscovite alteration occurs at Birthday Zone and is picked out separately in Figure 14. It particularly affects the granite and broadly follows the contact. It is also particularly strong around a NE-striking dike at WP 83 [509841 3688520], in the East Lobe.

The map of D veinlet density (Figure 9) is slightly misleading. This is because in the vicinity of Birthday Zone the D veinlets, although more widely spaced, show stronger and wider halos of muscovite.

Argillic and advanced argillic alteration are completely absent at Morgan Peak. Leached capping (the product of oxidation of pyrite) is present, but relatively thin. A large part may have been eroded. Kaolinite, and other clay, is only weakly developed in the leached capping. This is potentially good news for heap leaching because it will allow better permeability.

8 HYDROTHERMAL BRECCIA

As well as igneous breccias, caused by stoping of granite into schist (see photograph in Section 6.2), there are also probable hydrothermal breccias. These were mapped in the vicinity of Breccia Hill (see Figure 1; Appendix 1), in the NW part of the West Lobe. They also occur in several places in a southern tributary of Copper Springs Canyon. The breccias are irregular, discontinuous bodies up to nearly 40 m wide. Their geometry was difficult to establish during this short reconnaissance mapping. They need to be mapped in more detail. Contact measurements show a good spread of directions, with mostly steep contacts (see Figure 11).

Many of the breccias comprise well cemented, clast-supported angular schist fragments with a ‘rotational’ fabric. The small amount of matrix seems siliceous. Examples are shown in Figure 15. They clearly evolved from the kinked and chevron-folded Pinal Schist (see Figure 5), implying a tectonic beginning. However, some breccias contain scattered granite clasts and clasts of older breccia (Figure 5). This clearly indicates considerable transport and, given the lack of clay gouge and tectonic foliation, they are best interpreted as hydrothermal breccias. The process began as tectonic, but ended up as hydrothermal.

Brecciation clearly occurred early on. Clasts with vein stockwork are very rare. The breccias are cut by D veins (e.g. WP 54 [507785 3688864] & WP 128 [507554 3689698]) and quartz veins (e.g. WP 56 in Figure 15).

A few granite-dominated breccias were also seen N of Breccia Hill, close to the Schultze Granite contact. Shown in Figure 15, they can be difficult to interpret. The matrix may be

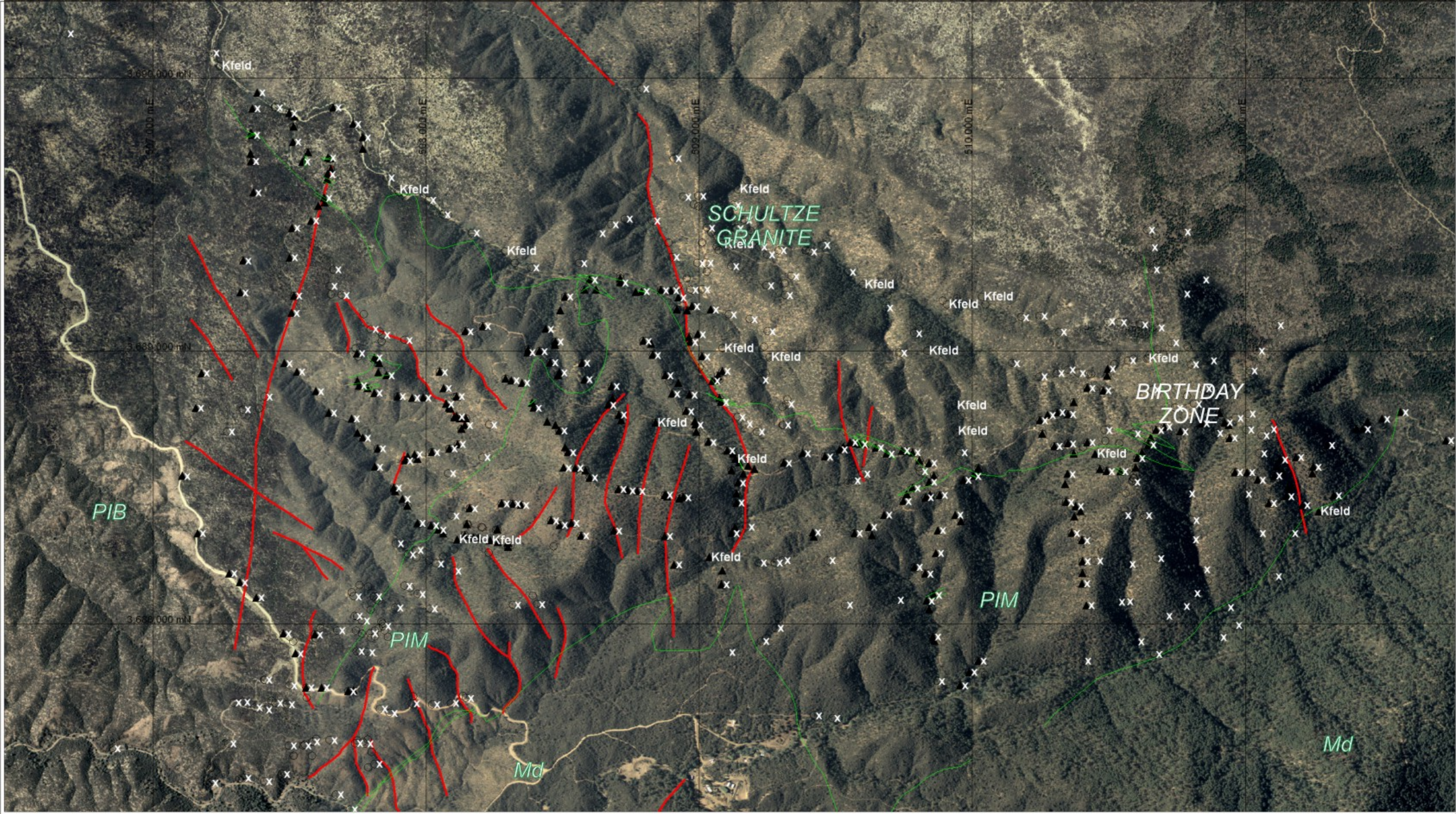
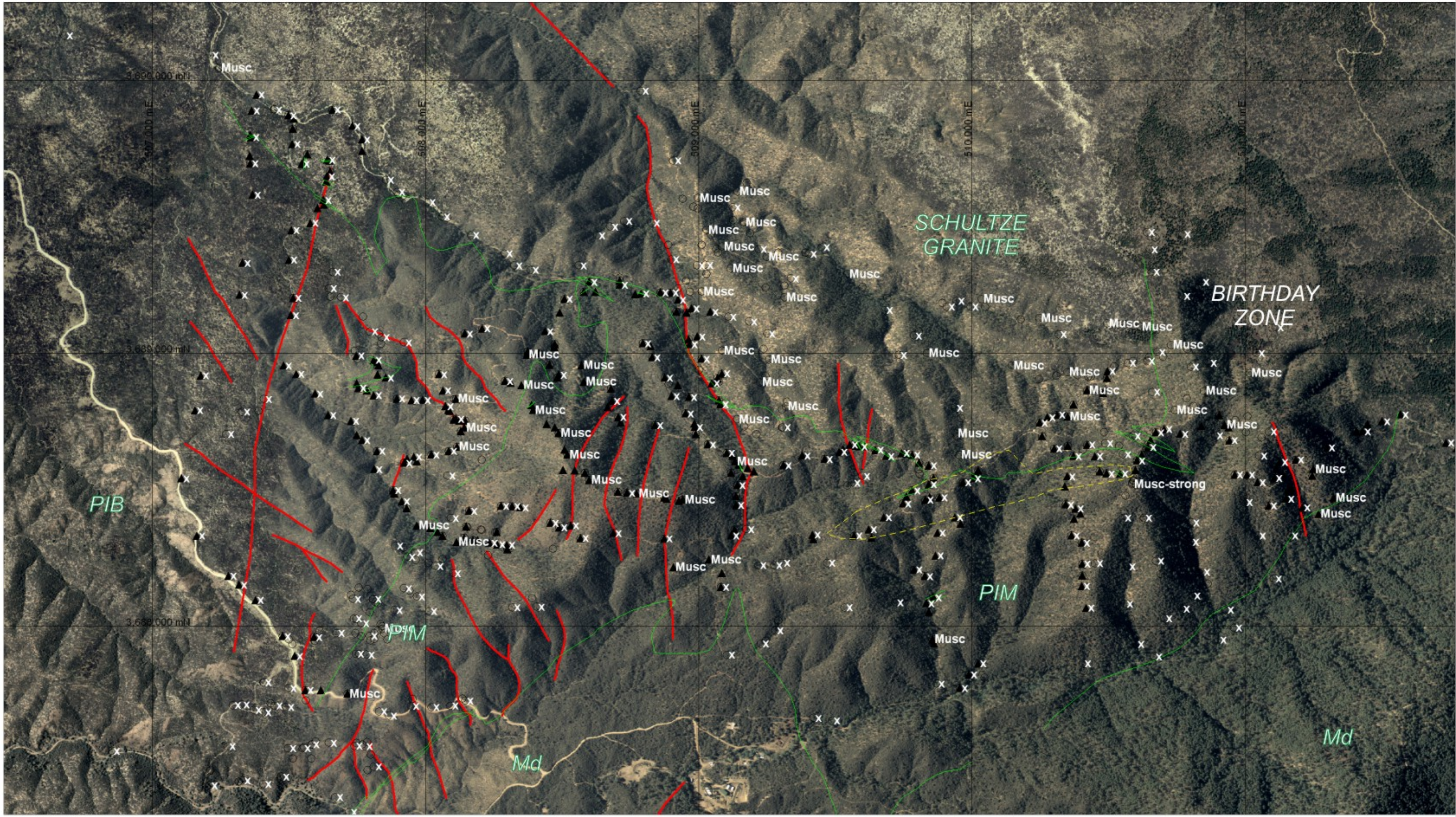


Figure 13 Map showing distribution of secondary k-feldspar biotite, mostly within, and as selvages to, quartz veins. Green lines show principal lithological contacts. See Appendix 1 for key.



Specialized Geological Mapping

Figure 14 Map showing distribution of secondary muscovite, mostly as selvages to quartz veins.. 'Musc strong' indicates pervasive muscovite alteration. The principal area of strong muscovite alteration is shown in a yellow dashed line. Green lines show principal lithological contacts. See Appendix 1 for key.

ABOVE. WP 56 [507748 3688890] Late quartz vein cuts hydrothermal breccia.

ABOVE. WP 128 [507554 3689698] Coarser granite clast within hydrothermal breccia with abundant milled granitic material.

ABOVE. WP 134 [507636 3689629] Hydrothermal or igneous breccia with ill defined granite clasts within granitic matrix.

ABOVE. WP 135 [507626 3689561] Hydrothermal breccia with clasts of older breccia.

ABOVE. WP 135 [507626 3689561] Schist-dominated hydrothermal breccia with scattered granitic porphyry clasts.

ABOVE. CS 08 04 at 158 ft. Coarse chalcocite within hydrothermal breccia.

Specialized Geological Mapping

Figure 15 Examples of hydrothermal breccias.

igneous in the case of WP 134, but in nearby breccia dikes it appears fragmental and milled (WP 128 in Figure 15). WP 134 has vague quartz stockworking in some clasts.

The hydrothermal breccias host some of the highest Cu grades seen on the property yet. For example, a narrow hydrothermal breccia in CS 08 04 at 158 ft (see Appendix 2) contains abundant coarse chalcocite.

9 MINERALIZATION

9.1 Hypogene

Mineralization is strongly controlled by fractures/veinlets at Morgan Peak, with little evidence of significant disseminated chalcopyrite in the drill core that I saw. There does not seem to be a clear 'ore shell', as is traditional in the Lowell and Gulibert (1970) model for Arizonan Cu porphyries. The spacing of veinlets is therefore probably an important vector towards the richest mineralization. As far as I can see in the literature, this approach has not been attempted in a systematic fashion in the past.

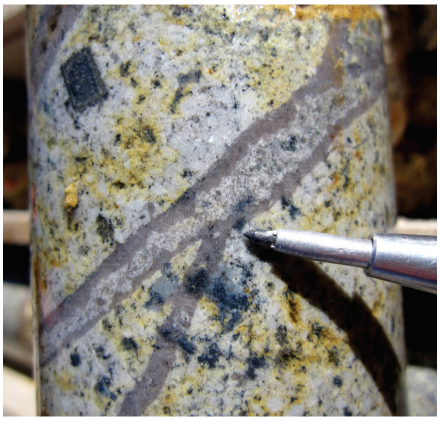
Phyllic alteration is important at many porphyries because it provides the pyrite required to mobilise Cu during supergene weathering. The phyllic alteration at Morgan Peak has relatively low total sulfide content. Likewise, in the areas with potassic veins the chalcopyrite and bornite is largely confined to the veins; its content is low in the intervening rock. This is especially true in the granite, where the muscovite halos contain very low sulfide (limonite). The situation improves in the Pinal Schist.

The density of quartz veins is slightly misleading in Figure 7. I simply measured the number of veins/metre, when a more accurate, but time-consuming, measure is the volume of vein/metre (calculated by adding the combined widths of quartz veins across 1 metre). Although the stockwork appears weaker at Birthday Zone in Figure 7, the veins are consistently much thicker than normal (see photograph below, from WP 248 [510622 3688628]). They attain 0.2 m.

9.1.1 High temperature veins

Various porphyry-related vein types are recognized. High temperature veins developed during the emplacement of the porphyry (a phase of the Schultze Granite) and evolved over time to increasingly lower temperature types. Every porphyry has its own distinct suite of veins, but a few common types occur in most porphyries. These are the A, B and D veins of Gustafson and Hunt (1975), first defined at the El Salvador porphyry in Chile.

The earliest, and highest temperature, veins at Morgan Peak are ‘vein-dikes’. Observed in float blocks in the West Lobe (WP 39 [508711 3689251]), these are the highest temperature veins found in Cu porphyries. They comprise outer rims of coarse euhedral quartz, growing into the centre of the vein, which is filled by aplite (fine grained equigranular feldspar + quartz). The example below is from an Andean Cu porphyry in Argentina, but is typical of those seen at Morgan Peak.



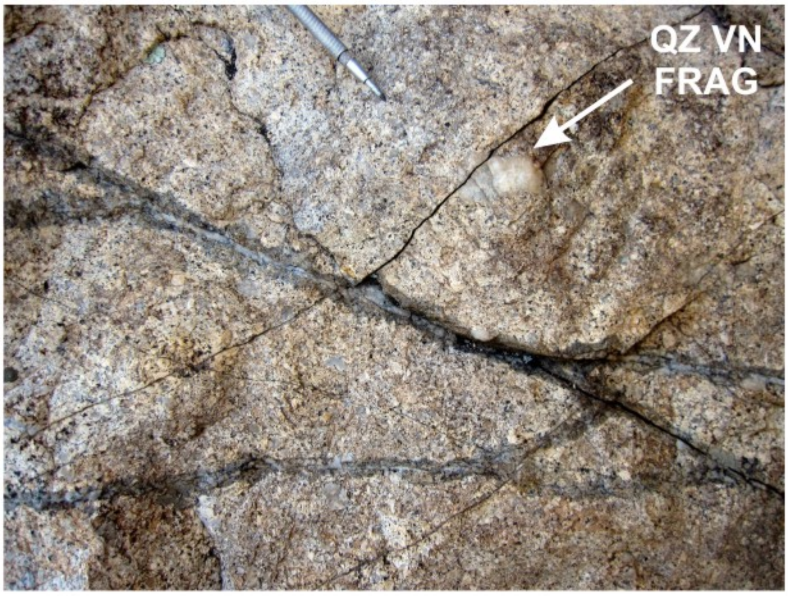
Vein-dikes are important. They are the highest temperature veins that occur in porphyry systems. Developed close to the potassic heart of porphyry systems, they are well described from the Henderson porphyry, Colorado (Carten *et al* 1988). Vein-dikes are known to branch off zones of ‘brain rock’, with Unidirectional Solidification Texture. Such textures indicate a very proximal position to the mineralizing porphyry. This is difficult to reconcile with Morgan Peak, since there is no clearly defined ‘core’ or nucleus to the porphyry system. However, it does imply that this is a deeply eroded porphyry system.

There is a great variety of quartz-dominated vein types, with mostly high temperature characteristics (see Figure 16 for examples). However, true A veins, which are sugary, sinuous veins with no central suture (Gustafson and Hunt, 1975), were not observed.

Most of the veins comprise coarse quartz with minor coarse k-feldspar. There is no central suture and only rare halos of k-feldspar. Chalcopyrite, pyrite and molybdenite occur infrequently. B veins, which are planar, with a central suture and comb-like coarse quartz, are uncommon. In summary, most of the classic ‘potassic’ veins do not seem to have introduced significant Cu at Morgan Peak.

A few complex veins of quartz + k-feldspar + green mica + pyrite + chalcopyrite were observed in drill core (see drill log CS 08 02; Appendix 2). They seem to be relatively rich in chalcopyrite compared with the other high temperature quartz veinlets, so their recognition is important.

ABOVE. WP 127 [507546 3689693] Quartz vein with k-feldspar halo in granitic porphyry.



ABOVE. WP 130 [507640 3689708] Quartz vein fragments in granitic porphyry cut by D veins.

LEFT. WP 257 [510248 3688746] Granitic porphyry with strong quartz vein stockwork.

BELOW. CS 08 03 at 197 ft. Quartz vein with coarse k-feldspar cuts Pinal Schist..

RIGHT. CS 08 03 at 136 ft. Quartz vein with abundant pyrite and moybdenite.

Specialized Geological Mappin[g]

Figure 16
Examples of quartz veins.

In some places there is evidence that late pulses of Schultze Granite magma consumed earlier quartz vein stockworks, creating tabular xenoliths of vein quartz, up to 50 mm long. A typical example is shown in Figure 16. Identical textures occur in many porphyries (e.g. El Galeno and Haquira porphyry Cu deposits in Perú).

Veins of pure biotite and magnetite occur rarely and are also of high temperature origin. Some quartz veins contain abundant molybdenite (see Figure 16).

9.1.2 D veins and greisen veins

These are the most widespread vein type at Morgan Peak. Gustafson and Hunt (1975) defined D veins as narrow, pyrite-dominated planar veinlets with a disproportionately wide halo of grey sericite alteration. They are related to the phyllic (or QSP) phase of hydrothermal alteration; pervasive phyllic alteration occurs when the D veinlets are sufficiently close together that their halos overlap. Although there are conflicting interpretations, phyllic alteration, and D veinlets, are generally interpreted as the cooling phase of the porphyry intrusion, when heated, more acid, meteoric water started to encroach.

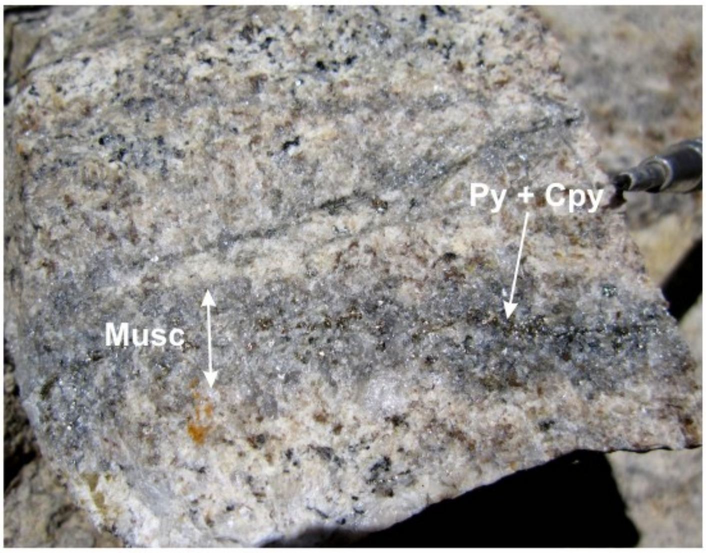
At Morgan Peak, D veinlets are widespread. Examples are shown in Figure 17. They tend to occur in parallel swarms (described in Section 6.2). The veins developed within granite seem to contain much less limonite (sulfide) compared with those in the Pinal Schist.

There are different end-members of the D vein spectrum at Morgan Peak, raising the possibility that there are multiple phases. Some veinlets comprise only limonite (after pyrite + chalcopyrite) with a very thin bleached sericite halo. Others are quartz-rich veins up to several cm thick, with halos of coarse muscovite and, rarely, k-feldspar. These latter veins commonly have euhedral quartz crystals that lie flat (parallel to) the vein (see WP 69 in Figure 17). Coarse muscovite occurs within some veins.

These muscovite-rich veins closely resemble published descriptions of ‘greisen veins’ (Williams and Forrestor, 1995). These are known from other Cu porphyry deposits in the Schultze Granite (Maher, 2008). They are thought to develop in a deeper setting than most D veins and are also described from the Granite Mountain pluton close to Ray (Eric Seedorff, unpublished data). Interestingly, greisen veins are described in the pyrite-poor Highland Valley district Cu porphyries of British Columbia and at Pinto Valley, Globe-Miami (Maher, 2008). Morgan Peak is also pyrite-poor.

(Figure 9, which shows number of D and greisen veins per metre, implies that Birthday Zone has relatively low density. However, the muscovite halos are much wider at Birthday Zone. In places they overlap and the entire rock is strongly muscovite altered. There is no doubt that Birthday Zone was the main focus for greisen alteration.)

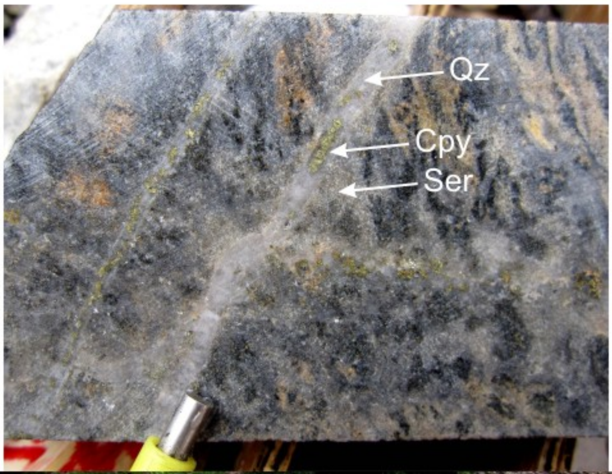
In most Cu porphyries D veins are generally rich in pyrite, but poor in chalcopyrite. Much of the phyllic zone is therefore generally poorly mineralized. However, my inspection of drill core at Morgan Peak shows that they are surprisingly rich in chalcopyrite. They clearly introduced significant Cu, which means that areas with dense D vein stockworks, such as Birthday Zone, and some parts of the West Lobe (Figure 9), potentially have decent hypogene Cu grades. Boxworks and live limonites also indicate the former presence of chalcopyrite in surface exposures. Unusually, some quartz + magnetite veins also have coarse muscovite halos (e.g.



ABOVE. WP 40 [508711 3689266] tYPICAL GREISEN VEIN. Pyrite and chalcopyrite veinlet with abundant coarse muscovite in halo.

RIGHT. WP 243 [510762 3688705] Coarse quartz and limonite vein with coarse muscovite halo.

ABOVE. WP 69 [509514 3688639] Euhedral quartz in quartz, muscovite and limonite vein. Note that the quartz crystals lie within the plane of the vein.



LEFT. CS 08 03 at 187 ft. Quartz, pyrite and chalcopyrite vein with sericite halos.

BELOW. CS 08 04 at 154 ft. Pyrite, chalcopyrite and chalcocite in quartz vein.

LEFT. WP 32 [507714 3687753] Sheeted D veins dip steeply to the left.

Specialized Geological Mapping

Figure 17 Examples of D veins and greisen veins.

WP 193 [508508 3689199]). Magnetite is generally associated with high temperature quartz (± anhydrite) veins.

9.1.3 Faults

Fault zones such as the Ellis and Santa Anna, may have had high hypogene grades. Furthermore, because they provide extra fracturing for water circulation, they are potential drill targets for supergene Cu.

9.2 Supergene

Traditionally, mapping of limonite type in leached capping has been an important step in searching for weathered supergene blankets (along the lines of Spencer Titley, University of Arizona). Morgan Peak has a thin, eroded leached capping. I attempted to map the limonite type and intensity (see Figures 18 & 19). Most of the limonite is goethite, which in part reflects oxidation and weathering of mafic minerals as well as sulfides. No clear pattern emerges from the mapping, other than very low limonite contents in the granite and only moderate contents in the Pinal Schist.

The optimum total sulfide content of a porphyry should exceed 4% to generate the acid required to produce a healthy chalcocite blanket. The pyrite:chalcopyrite ratio should exceed 3:1. My qualitative observations of some drill core from the 2008 (ACCO) program (see Appendix 2) suggest a very low sulfide content (<1-2%) and a surprisingly low pyrite:chalcopyrite ratio (<3:1). This may also explain the thin leached capping at Morgan Peak. However, perhaps because strong, regular fracturing promoted efficient circulation of acidic groundwater, supergene blankets are present at Morgan Peak. The best-known, in the West Lobe, has been targeted by several drill programs in the West Lobe, most recently by ACCO in 2008. An evaluation of the size and grade of this mineralization is beyond the scope of this report. However, Kerr-McGee calculated 17.5 Mt @ 0.37% Cu and Humble Oil calculated 37 Mt @ 0.26% Cu. It is discussed further in Section 10.

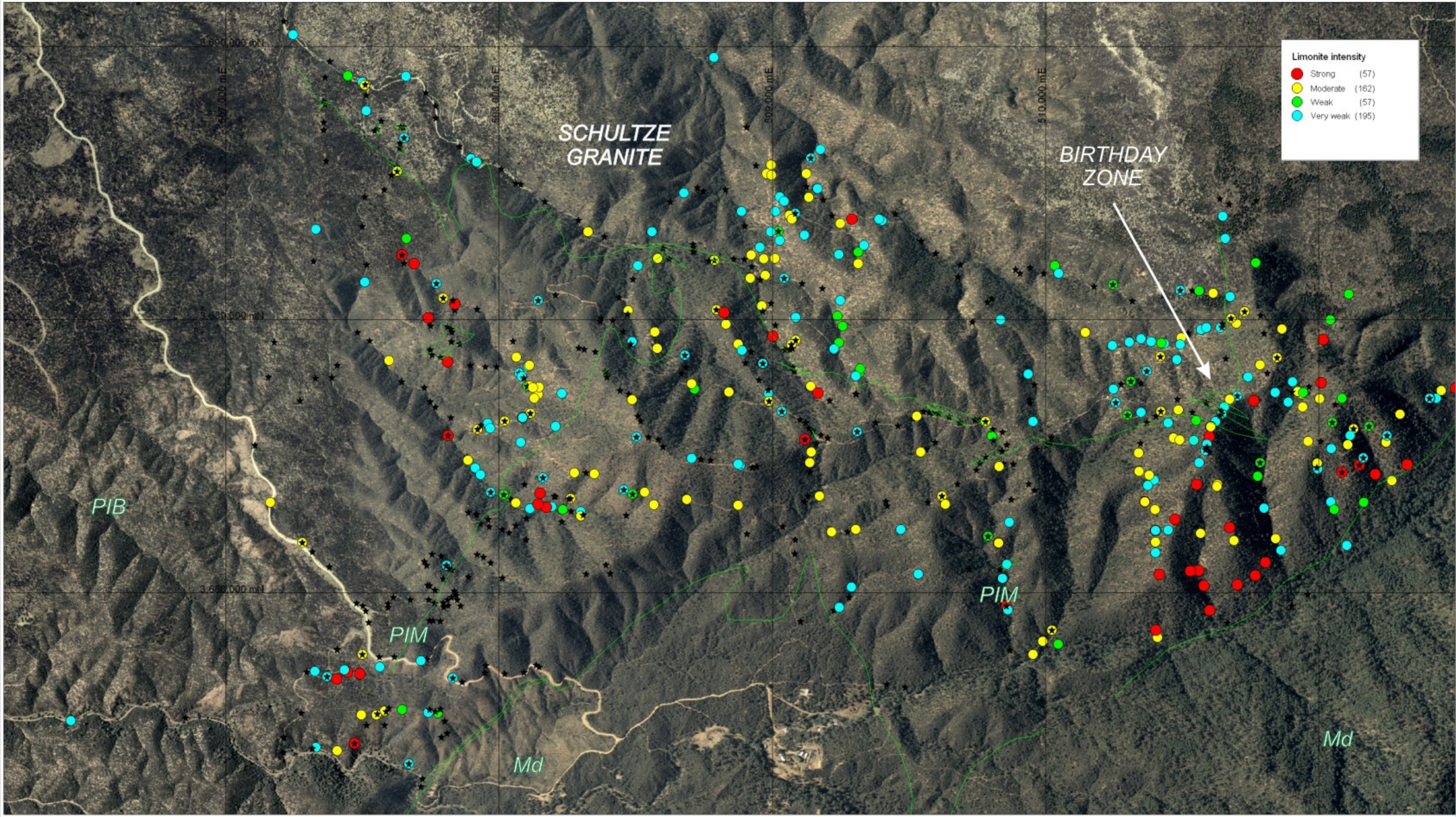
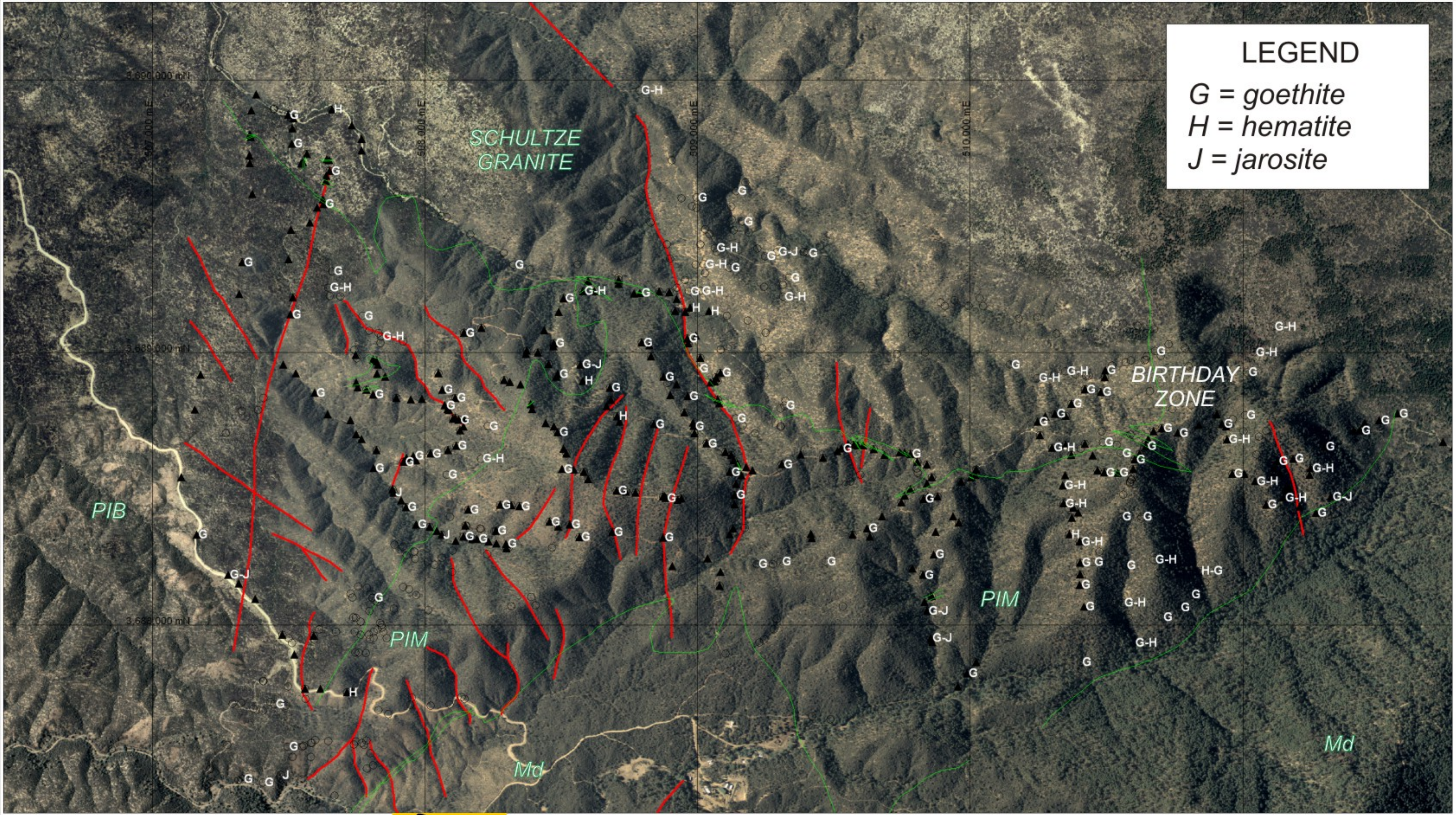


Figure 18 Map of limonite intensity. Green lines show principal lithological contacts. See Appendix 1 for key.



Specialized Geological Mapping

Figure 19 Map showing limonite type. Green lines show principal lithological contacts. See Appendix 1 for key.

10 CONCLUSIONS

Controls on mineralization.

There are several clear controls on mineralization and Cu grade.

1. The ESE-striking contact of the Schultze Granite. Hydrothermal alteration is greater, and stockworks more intense, along this contact. Particularly fertile ground probably occurs where the contact is not sharp, but comprises a series of inter-fingered dikes and schist (e.g. Birthday Zone) (Figure 1; Appendix 1).
2. There is also a strong NE-striking structural control. Veins, granite dikes, and hydrothermal breccia dikes tend to be sub vertical and strike NE. This pattern changes around the nose of the Schultze Granite intrusion, at Birthday Zone.
3. Hydrothermal breccias and fault zones clearly provided increased permeability which allowed increased chalcocite development. This is ably demonstrated by the local high grade chalcocite (> 1% Cu) in hydrothermal breccia in CS 08 04 (see Figure 15). Hydrothermal breccias also seem to have had high hypogene grades (see CS 08 04 at 158 ft in Appendix 2).

The isolated occurrences of Schultze Granite to the S of the main body in the East Lobe highlight the potential for completely buried apophyses of granite and therefore potential mineralization in the Pinal Schist. The dike at KM 11 (East Lobe, see Figure 1) shows strong phyllic alteration and drusy quartz + limonite veining. The surrounding Pinal Schist likewise shows an increased intensity of D and greisen veinlets (with muscovite). The area was tested by a deep drill hole (CS-A), with only low Cu grade, but nonetheless, the principle of buried apophyses of the granite is important. (Incidentally, the presence of these apophyses makes it unlikely that the main Schultze Granite/Pinal Schist contact is a significant regional fault, marking the limit of the granite.)

Potential for Economic mineralization

Morgan Peak must be considered in the context of its location. The presence of superb infrastructure and mining expertise in the Globe-Miami area, taken with the application of SX-EW technology, allows economic mining of much lower grade Cu ores than is possible in other parts of the world.

This is ably demonstrated by the Carlota Mine (QuadraFNX), which has reserves of 77 Mt @ 0.45% Cu (figures from QuadraFNX website). This property, in which rock is mined and dumped directly onto leach pads without any crushing ('run-of-mine' ore), lies only 8 km to the NW of Morgan Peak. An electro-winning plant at Carlota, one of several in the Globe-Miami District, could, in theory, deal with pregnant (Cu-bearing) solutions pumped from a valley-fill leach pad operation at Morgan Peak. Furthermore, milling facilities at nearby Pinto Valley (to be reactivated to deal with Resolution ore?) could deal with any conventional sulphide ore from Morgan Peak. All these factors are tremendous advantages because they reduce the start-up capital required.

Morgan Peak also has very favourable stripping ratios; the chalcocite blankets essentially underlie ridges, meaning that less rock has to be shifted to get at ore. By comparison, Carlota is developed within a 'hole' (see photograph below); the walls also have stability issues.

Recently, problems with clay within the leach pads have been reported. Luckily, clay content at Morgan Peak seems to be very low.

Morgan Peak has been the focus of several drill programs. However, a proper examination of the drill hole data requires a good understanding of the controls on both hypogene and supergene mineralization. From what I see in the literature, most of the previous programs have had a strong element of ‘pot-luck’. Geological criteria may have been applied to target drilling, but there seems to have been no rigorous mapping to provide the essential vectors towards ore. This is particularly important because Morgan Peak does not show a classic ‘bullseye’ pattern of hydrothermal alteration.

This is a mature property and opportunities for economic mineralization have been slowly tested by drilling over a period of over 50 years. However, a large part of this drilling, and the geochemical sampling type, is unreliable, with probable under-reporting of true Cu values and dilution of higher grade intervals. The enormous size of the porphyry mineralization (at least 3 km long) allows for plenty of hidden potential at Morgan Peak.

Hypogene Cu grades seen to date are generally low (0.1-0.2% Cu), but much of the old drilling is unreliable and relied on long composite samples for assay. These may have hidden higher grade intervals. Total sulfide contents seen to date at Morgan Peak are low (<2-3%), meaning that there was little opportunity for a rich supergene enrichment blanket of Cu to develop. The pyrite:chalcopyrite ratio is also relatively low (<3:1?) in the small amount of drill core I saw, again meaning weak mobilisation of Cu during weathering and development of the supergene

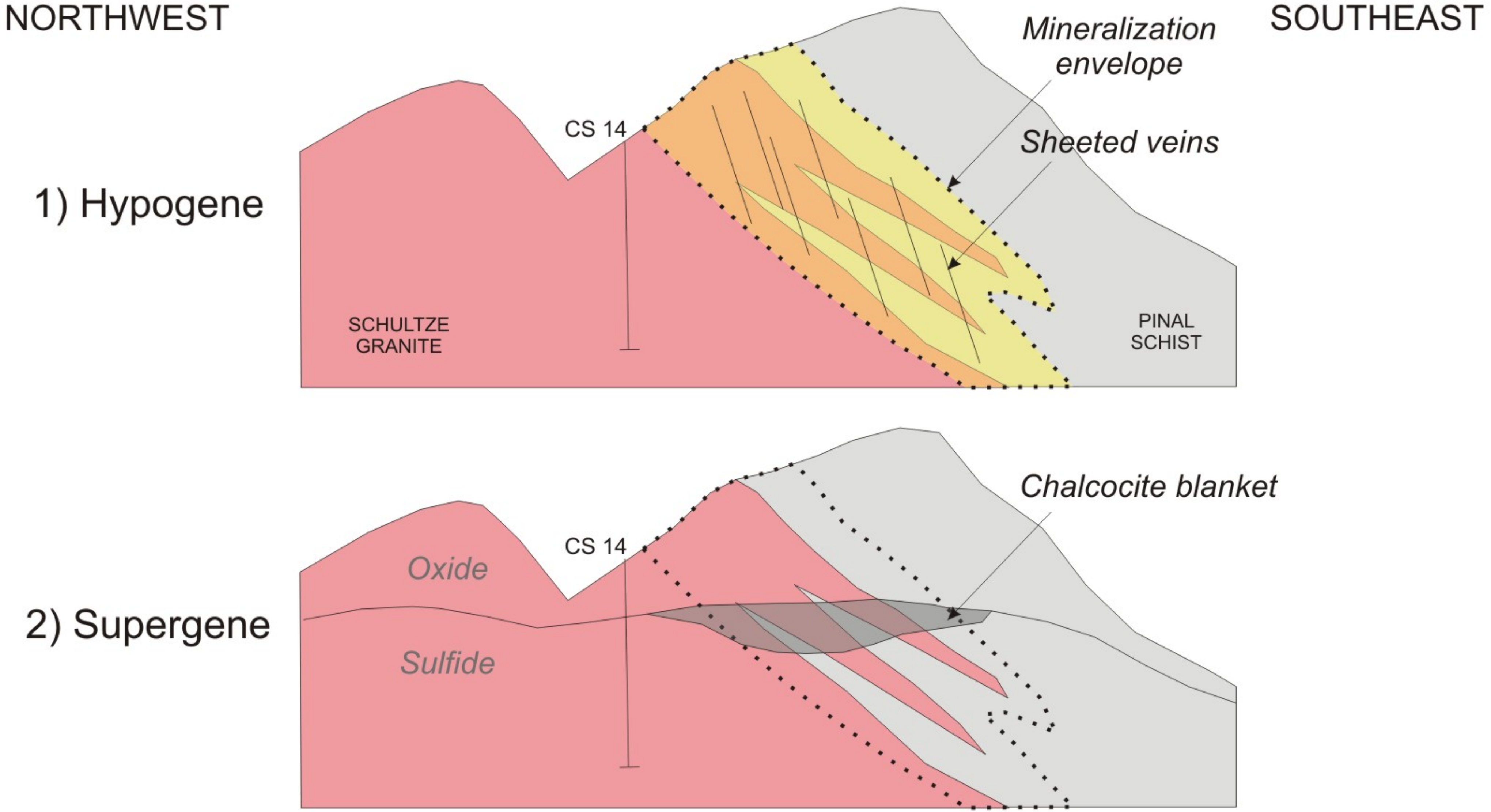


Figure 20 Geological cartoon showing drill target at Birthday Zone.

profile. This is why there is no leached capping at Morgan Peak and no wholesale kaolinite alteration.

Despite these normally negative factors, a potentially economic supergene blanket has already been demonstrated at Morgan Peak, in the West Lobe. This may be because of efficient, fracture-controlled percolation of acidic water during weathering. This effectively scavenged Cu. Furthermore, the pyrite content at Birthday Zone was probably much higher and therefore conducive to supergene Cu enrichment. The rocks are also much more fractured, again promoting mobilization of Cu.

I see three principal targets at Morgan Peak (see Figure 21):

1) *The West Lobe chalcocite blanket*.
2) *Birthday Zone*. Inferred chalcocite blanket and improved hypogene grades.
3) *Link Zone* (which joins the West and East lobes), following contact of Schultze Granite. Inferred sinuous chalcocite blanket.

West Lobe chalcocite blanket. The best Cu grades (0.3-0.4% Cu) encountered to date come from this flat-lying chalcocite enrichment blanket. The blanket lies at shallow depth (low stripping) and is predictable. It requires infill drilling (triple tube, on 100 m centres) and step-out drilling to better define Cu grade and thickness; also to allow block modelling and development of a NI 43-101 compliant Inferred Resource.

I fully expect that higher grade supergene Cu will be encountered in fault zones (such as the Santa Anna) and within breccias (Breccia Hill). Inclined drill holes towards the NW and SE (perpendicular to the main vein direction) will help in this process. Higher grade zones will help upgrade the overall resource, maybe considerably, and it may be possible during resource modelling to link them up between drill holes, again improving the overall grade of the resource.

The grade x thickness diagram prepared by ACCO (see below) indicates the known extent of the blanket. Holes on the S side, for example KM 1, seem to cut off the potential to the S. However, these holes have poor, unreliable assay data (the first 400 ft of KM 1 is apparently a single composite sample and gives ‘0% Cu’). Step-out drilling to the S and W is therefore justified (probably after infill drilling).

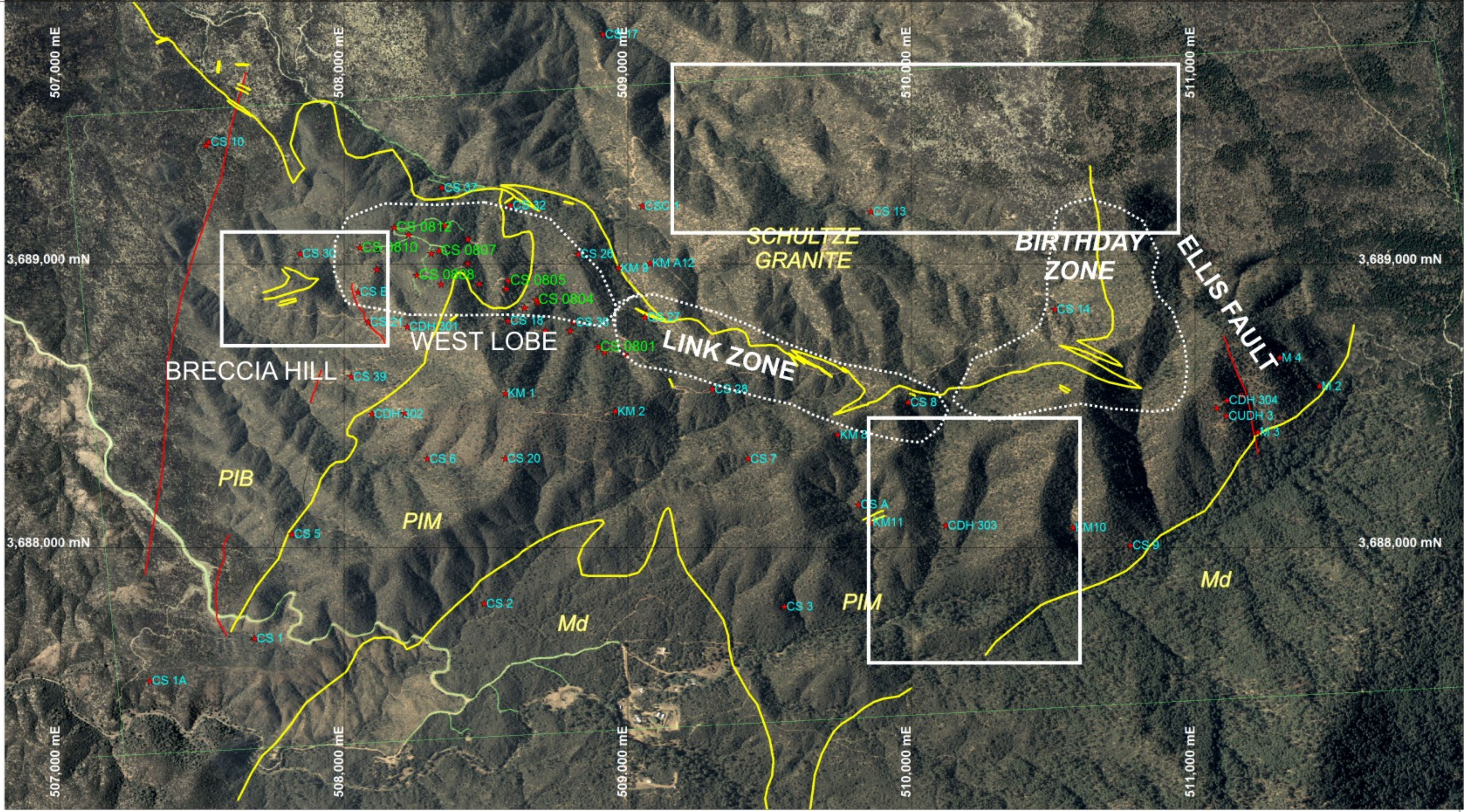
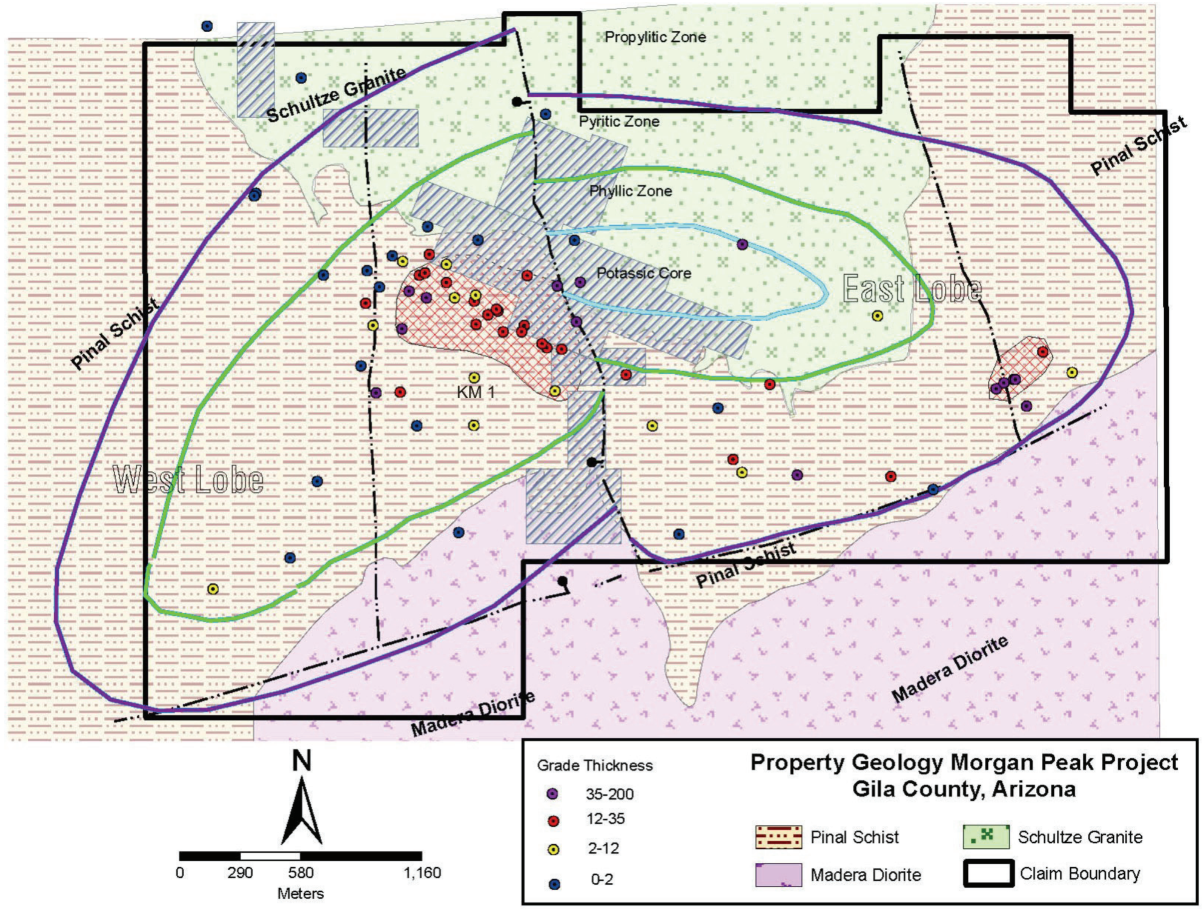


Figure 21 Map showing areas recommended for detailed mapping (1:2000 scale).



The geological controls on the West Lobe enrichment blanket seem to be the granite contact (although Herb Duerr reports that grades actually <u>fall</u> towards the granite contact in drill holes), Pinal Antiform and schist type. The banded Pinal schist seems more reactive and conducive to mineralization, especially in the hinge of the antiform. There may also be a buried lobe of the Schultze Granite beneath (see Figure 12). But, again, the shape of the blanket is partly based on the old, unreliable drilling. There is therefore plenty of room to fit in more patches of supergene blanket, similar to that already known, in the West Lobe. For example, an area of increased jarosite staining at the surface in the vicinity of KM 3 [508160 3688423] should be drill tested.

The tectono-hydrothermal breccias at Breccia Hill have the potential to host >1% Cu supergene grades and may have improved hypogene grades. They need to 'grow' in size so that they can contribute to the overall resource. They may expand considerably at depth and this target should be drill tested.

Birthday Zone. This, in my opinion, is the best 'new' target. It is distinctly under-drilled and certainly merits drill testing. This target is shown in Figures 20 and 21. It shows the most intense stockwork and phyllic alteration. This may mean that the original (hypogene) sulfide content was higher than normal and therefore there is better potential for a sulfide enrichment blanket. This is particularly true if the Ellis Fault zone, which has good drill intersections (e.g. CUHD304, CUHD3), is factored into the equation. An historic resource of about 4-7 Mt at 0.4% Cu has been described at the Ellis Vein, in the vicinity of the adit. This highlights the potential for the northern continuation; it may well intersect the Birthday Zone mineralization and produce higher grades and thicknesses.

An important question to answer at Birthday Zone is the amount of plunge of the apex of granite. A shallower dip would be preferable because it would give a wider supergene Cu blanket (see Figure 20). Encouraging Cu grades are encountered in very widely spaced drill holes in the East Lobe to the S of Birthday Zone. KM 10 (also with long, composite samples) shows Cu grades consistently > 0.1% Cu, despite lying more than 0.5 km S of Birthday Zone.

The Birthday Zone area appears on some previous maps as a 'barren core' (Lluría, 1969). Barren cores do occur in the heart of some porphyry deposits, but as I have outlined above, Morgan Peak does not have classic Lowell and Guilbert (1970) style concentric zoning. It is not a cylindrical igneous stock surrounded by concentric zones of veining and hydrothermal alteration. Furthermore, the veining present at Birthday Zone is of the right type; it comprises D and greisen veins with coarse, wide muscovite halos, as well as a strong stockwork of earlier, higher temperature quartz veins. Examination of drill core indicates that it is precisely the D veins that carry most chalcopyrite and bornite.

Care needs to be taken when targeting the drill at Birthday Zone. Figure 20 shows a cartoon of the anticipated supergene blanket. Note how the original sheet-like distribution of the hypogene Cu controls the subsequent shape and location of the supergene enrichment blanket. I believe that drill hole CS 14 began in a poor location, effectively beneath the fertile zone.

Link Zone. This is a conceptual target, but based on the observation that the Cu mineralization at Morgan Peak is closely linked to the Schultze Granite contact. I infer that there is a sinuous, narrow supergene enrichment blanket that follows the contact between the West Lobe and Birthday Zone (Figure 20). Since it mostly follows a ridge, it is likely to have an excellent stripping ratio and, whilst not wide, the length may produce a sizeable resource.

11 RECOMMENDATIONS

11.1 Detailed mapping (1:2000), following a similar scheme to my mapping (D veinlets/metre etc), has mostly been completed. Only the areas shown in Figure 21 remain.

11.2 Ridge and spur geochemical sampling of the Birthday Zone and the breccias at Breccia Hill is recommended. This should be ICP-MS 34 element, by aqua regia (conventional exploration package). Cu values will be low on surface, but less mobile elements, such as Mo, will give an idea of the potential.

11.3 Approximately 1500 m of infill (triple-tube) drilling at the West Lobe chalcocite blanket to improve the understanding of Cu grade and thickness. Also to allow block modelling and development of a NI 43-101 compliant Inferred Resource. I recommend inclined drill holes (-65^{o}), drilled either towards the NW or SE (perpendicular to the strike of the most veins). This should allow structurally controlled, higher Cu grades to be captured in the resource model.

11.4 The West Lobe drill core should be the largest diameter possible, to allow collection of large metallurgical samples. Metallurgy will be crucial to the project economics and studies should be carried out at an early stage.

11.5 Early drilling of Birthday Zone with a 1000 m program.

11.6 Early drilling of Breccia Hill with a 500 m program.

11.9 Drill core should at no point be washed. This will help avoid loss of the sooty chalcocite that coats pyrite/chalcopyrite.

12 REFERENCES

Blucher, 1970. Geological Report. Morgan Peak prospect. Unpublished report.

Burton, W D 1969. Progress report. Geology of the Copper Springs prospect no 507, Gila County Arizona.

Carten, R B, Geraghty, E P, Walker, B M and Shannon, J R. 1988. Cyclic development of igneous features and their relationship to high-temperature hydrothermal features in the Henderson porphyry molybdenum deposit, Colorado. *Economic Geology*, **83**, 266-296.

Gustafson, L B and Hunt, J P. 1975. The porphyry copper deposit at El Salvador, Chile. *Economic Geology*, **70**, 857-912.

Lluría, M 1969. Drilling report of the Copper Springs Prospect area, Gila County, Arizona. Unpublished report for Humble Oil & Refining Company.

Lowell, J D & Guilbert, J M. 1970. Lateral and Vertical Alteration-Mineralization Zoning in Porphyry Ore deposits. *Economic Geology*, **65**, 373-408.

Maher, D J. 2008. Reconstruction of middle Tertiary extension and Laramide porphyry copper systems, east-central Arizona. Unpublished PhD thesis, University of Arizona.

Noland, P. 2010. NI 43-101 technical report on the Morgan Peak Copper property, Gila County, Arizona. For Toro Resources.

Streckeisen, A. 1976. To each plutonic rock its proper name. *Earth Science Reviews*. **12**, 1-33.

Streckeisen, A. 1978. IUGS Subcomission on the Systematics of Igneous Rocks. Classification and Nomenclature of Volcanic Rocks, Lamprophyres, Carbonatites and Melilitic Rocks. Recommendations and Suggestions. *Nues Jahrbuch für Mineralogie,* **134**, 1-14.

Williams, S A, & Forrester, J D. 1995. Characteristics of porphyry copper deposits. In: Pierce, F W, and Bolm, J G, Eds., Porphyry copper deposits of the American Cordillera, Arizona Geological Society Digest 20, p. 21-34.

13 DATA AND SIGNATURE PAGE

The author, Warren T Pratt (BSc PhD CGeol FGS) is a Director of Specialized Geological Mapping Ltd, a consulting company based in the UK. Also of Sienna Gold Inc, a Junior gold explorer based in Calgary, Canada. Sienna has no connection to Toro Resources or any of its employees. Sienna operates exclusively in Perú.

The author is a graduate of Hull University, UK (BSc Hons Geology, First Class, 1986) and the University College of Wales, Aberystwyth, UK (PhD Structural Geology, 1990). He has practiced his profession continuously for the last 21 years and is experienced in epithermal, porphyry Cu/Au and VHMS deposits. Most of his consulting work is carried out in S America. Dr Pratt is a Competent Person as defined in Chapter 19 of the UKLA Sourcebook, Chartered Geologist (17 years), Fellow of the Geological Society (17 years), and member of the Society of Economic Geologists. He won the President's Award of the Geological Society in 1994 for the preparation of detailed geological maps.

The author has detailed knowledge of the assets held by Toro Resources in Arizona. The author holds no securities, options or other financial interests in Toro Resources or any of its subsidiaries. The only commercial interest in relation to Toro Resources is the right to charge professional fees for this report.

Dated at Urquhart, 09 February 2011

signed

Warren Pratt, PhD, CGeol

Appendix 1 Geological map of the Morgan Peak project.

Appendix 2 Quick logs

Appendix 3 Data DVD

Appendix 4 Cross sections