



**QuadraFNX**  
MINING LTD

## **Morgan Peak Project**

Globe-Miami District, Gila County, Arizona

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## Location and Setting

Morgan Peak is a copper porphyry property is held by MinQuest and optioned by Toro Resources of Vancouver, B.C. Toro Resources holds 131 unpatented claims in the Tonto National Forest in western Gila County, Arizona.

Morgan Peak is located several miles south of the Carlota Copper Company in the Pinal Mountains of Gila County, Arizona. The property is south of US 60, and access is from the highway at the Pinto Valley Road turn off. The property is accessible on improved gravel roads.

The claim block covers a long ridge that runs east-west and culminates in a taller ridge that runs more to the northeast. Two deep valleys are found on the north and southeast sides of the property. The southeast valley is top of Pinto Creek, which eventually runs through the Cactus Pit at Carlota. The creek in the north valley eventually flows into Pinto Creek. Access on the property is limited to poorly maintained drill roads which are becoming clogged with manzanita and oak trees.

The terrain is fairly steep and is densely vegetated with small trees and manzanita stands making cross country travel difficult. There are no endangered Arizona Hedgehog Cacti on the property.

Three visits were made to the property, and two trips were made to look at core from the 2008 drilling program.

## Geology

Three rock units dominate the geology of the Morgan Peak property.

1. Pinal Schist
2. Madera Diorite
3. Schultze Granite.

Other rock units consist of hydrothermal breccias, breccia pipes, and pebble dikes.

The Pinal Schist is the basement rock for the Globe-Miami District. It consists of poorly metamorphosed sediments and possibly interbedded volcanics. The schist is composed of quartz and muscovite with the occasional band of biotite or chlorite. Quartz porphyroblasts are common. Drill core reveals very low-grade metamorphism with remnant sedimentary bedding and poor development of foliation. These foliation bands are composed of biotite and chlorite. In some cases foliation is not present, although biotite is found as blebs and blotches. On occasion, the schist is more highly metamorphosed, and tightly crenulated foliation and microfaults are seen.

While sandstones and argillites can be identified as the original rock, the more biotite-rich schist may be volcanic in origin. If this is the case, the biotite is a likely a metamorphic product from intermediate compositional rocks such as latites or andesites.

The Madera Diorite is a fine to medium grained mafic rock that exhibits some metamorphic texture and features. It only intrudes the Pinal Schist, and is not involved as a mineralizer. It is considered to be lower Pre-Cambrian in age. The diorite is found along the southern edge of the claim block.

The Schultze Granite is considered to be the mineralizer for the Globe-Miami District. There are two phases of the granite found on the property:

1. Medium-grained quartz-orthoclase granite
2. Schultze Granite Porphyry, which is distinguished by large (>1 inch) orthoclase phenocrysts

The granite is found on the north side of the property. The contact with the schist forms a prominent stream valley. It is possible this contact is a thrust fault with the schist thrust over the granite. In a couple of areas the granite intrudes along faults that cut the schist.

Hydrothermal breccias are found locally, as well as what is thought to be a breccia pipe. This pipe is located on the far west side of the property. A brief visit revealed a large area of schist clasts supported in what looks like a fine grained matrix of possible volcanic origin. However, more work is needed to determine the actual origin of this unit. There are no drill holes that intercept this unit.

There are two major structures of note, the Santa Anna Fault and the Ellis Fault and Vein. These faults trend north-northwest and likely were conduits for mineralizing fluids. The Santa Anna Fault is not well exposed, but the Ellis Fault is because of the presence of the Ellis Vein. These faults should be considered large structures, and ultimately will be seen as important in the ore forming process.

There are several north-northeast trending structures and at least two northeast trending faults that the upper tributaries of Pinto Creek follow. Throughout the district, northeast-trending faults are very important in the mineralization of the process. Where these faults intersect the Santa Anna and Ellis faults it is likely mineralization will be found.

There are other structures of significance. The contact between the schist and Schultze Granite may very well be a thrust fault. A similar situation occurs at Carlota where the schist is thrust up against the Manitou Granite. Even if this thrust exists, it is probably not part of the mineralizing event.

A pre-Laramide structure is found on the far west side of the property and is called the Pinal Anticline, which is mostly like a basement structure that is seen in Pinto Valley Mine area. Oligocene Basin and Range faulting is controlled by this basement feature with faults to the east dipping eastward and faults to the west dipping westward. As has been seen at Eder, these low-angle basin and range faults can move rock a considerable distance. At San Manuel, for instance, the porphyry system was cut in half, moving the Kalamazoo portion down and off to the west at a low angle. The only low-angle fault identified at Morgan Peak is the so called Pinal Thrust found on the west end of the property. How much displacement exists is not known.

## Mineralization and Alteration

A 14-hole drilling program was conducted in 2008 that identified mineralization on the west side of the property. A fairly ambitious drilling program is planned for 2012 that hopefully will extend known mineralization across the central portion of the property.

Core from ten drill holes from 2008 was examined for rock type, mineralization, alteration, and depth of leaching. All of the mineralization seen in core is hosted by the Pinal Schist. Not all of the mineralization is considered to be classic porphyry copper style mineralization.

The depth of leaching varied from hole to hole, but usually extended from 100 feet up to 140 feet below the surface. Leach capping is characterized by fractures filled with hematite. With depth, limonite is seen as mineralization is approached. In some fractures casts and boxworks from sulfides are found. The rock has a weathered look to it, and iron stained clays are found in near surface fractures. The original sulfide content was not very high, and iron oxide usually has a volume percent of less than 2%.

Weak copper oxide mineralization is found in two holes. Malachite and azurite are found in fractures in the leach cap. In one instance, malachite was found in association with sulfide mineralization in biotite bands. At least within the area drilled in 2008, there does not appear to be an extensive oxide zone associated with this deposit.

There is a narrow supergene zone that consists of chalcocite found as rims on pyrite and chalcopyrite or in veins where pyrite has been replaced. Given the wide spacing of drill holes from the 2008 program, it is difficult to characterize the chalcocite mineralization as a blanket. The zone is generally less than 60 feet thick. This material will need to be milled. There is not enough leachable material to make running a heap leach feasible. As at Carlota, the schist has a considerable amount of fine material which would interfere with leaching. Much of the chalcocite occurs in veins, making leaching less effective.

Beneath the chalcocite zone, hypogene mineralization is found as both veinlets and disseminations of pyrite and chalcopyrite. Hypogene mineralization is very similar to that seen behind the Kelly Fault at Carlota. An assemblage of pyrite, chalcopyrite, and magnetite is found in veins. Occasionally

molybdenite and bornite are found in these veins. Magnetite veins and veinlets are commonly seen in core. The depth to hypogene mineralization varies from hole to hole. The extent of this mineralization is not known, since the deepest any of the drill holes from 2008 is less than 400 feet. This material would have to be leached.

A portion of the schist is poorly metamorphosed leaving remnant sedimentary bedding features. Many times these sedimentary features host weakly foliated blebs and thin bands of biotite. It is possible that the biotite blebs are secondary in nature. However, these poorly developed biotite features contain copper mineralization. However, the mineralization is so fine grained, it is very difficult to see. One hole had malachite forming in some of the biotite banding while another hole had very fine-grained disseminated chalcocite. While biotite can contain copper, it is usually at background levels. Therefore, it is thought there is a volcanogenic component to the copper mineralization found at Morgan Peak. It is likely that volcanogenic copper has been remobilized during the formation of porphyry copper style mineralization.

The east end of the property is known as the Birthday Zone which contains the Ellis Vein. The Ellis Vein is a copper oxide deposit found along the Ellis Fault. Adjacent to the vein is disseminated chalcopyrite and chalcocite. Extending west away from the fault, the schist is highly fractured with two or more generations of quartz veins. Sphalerite was found in one vein, and hematite boxworks are found in many veins.

#### Assays

2008 drillhole assays are attached to the report. The grade is low for the west lobe, but the drill hole spacing is fairly wide. Out of the 14 holes, a few have grades over 0.5%. One assay exceeds 1%. These high grade samples are primarily from core that has the very fine-grained mineralization that is thought to be volcanogenic in origin.

#### Alteration

Typical of porphyry systems, barren quartz and potassium feldspar veins are seen. These veins cut across the foliation for the most part. In a few cases there is more than one generation of these veins.

The most prominent alteration types are young quartz veins, which crosscut older quartz and feldspar veins, and quartz-sericite alteration. Propylitic and clay alteration is rare, and usually occur as overprints on the quartz and quartz-sericite. Occasionally silicification is found.

Younger quartz veins are quite prevalent. In the area of the Santa Anna Fault and the Birthday Zone weak stockworks are developed. Occasionally three or more different vein sets are seen. Especially in the Birthday Zone, many quartz veins had sulfides, as evidenced by hematite boxworks.

Quartz sericite alteration is widespread. This alteration is closely associated with the Santa Anna Fault, where the density of veins decreases with distance from the fault. This zone extends several hundred feet away from the fault. Sericite is found as selvages along quartz veins or along fractures and joints. Pervasive quartz-sericite alteration is found locally along faults.

Secondary biotite occurs as veins, replacement of primary biotite, and as blotches and blebs that show a weak foliation. Magnetite is associated with all forms of secondary biotite.

## Mineralization Potential

There are two areas that have the potential for substantial tonnage and higher grade mineralization and are yet to be tested.

1. Santa Anna Fault
2. Birthday Zone/Ellis Fault

The Santa Anna Fault is a north-northwest trending fault that traverses the full width of the property. The fault is a likely conduit for mineralization. It has a strong alteration pattern associated with it. Past drilling has been vertical so no drill holes cross the fault zone. Like the Kelly Fault at Carlota, the fault and associated shearing is quite wide. The potential for higher grade mineralization at depth is quite high. Mineralization associated with the quartz-sericite alteration halo could be quite extensive. The proposed 2012 drilling program would help to define this zone, although all of the planned holes are vertical. Deeper drilling is needed to test the intersections of the Santa Anna with northeast- trending structures.

The Birthday Zone is a partial unknown. The area appears to be sheared and strong quartz veining is seen. Some of the veins contain sphalerite and other sulfides typical of mineral zoning in porphyry systems. The Ellis vein is a likely candidate for conducting mineralized fluids, and has the potential of a considerable amount of higher grade tonnage. Surface samples collected across the Birthday Zone are anomalous in copper. The Schultze Granite contact is not well defined in this area, and the area has not been drilled.

The very fine grained mineralization found in the foliation bands of the schist provides a potential high-grade resource that needs to be defined. Some research will be needed to pin down the mineralogy of this mineralization. Even if there is not much tonnage of this material at Morgan Peak, it opens up a potential target in the Pinal Schist in southern Arizona.

Both the Santa Anna Fault and the Birthday Zone hold potential for deep seated mineralization. In 1969 Humble Oil drilled two deep holes in the west lobe area. While not spectacular, mineralization extended below 2,000 feet. Careful drilling of both structural zones could reveal deep higher grade material that could be exploited underground.

## Required Work

Mapping is difficult because of the thick vegetation cover, but is needed to better define the Santa Anna Fault zone, the Birthday Zone, and the eastern contact of the Schultze Granite. The intersections of northeast-trending faults and their intersections with the Santa Anna and Ellis faults need to be better understood.

Surface soil and rock sampling can be accomplished on an irregular grid using GPS. Collecting soil samples is difficult, but with the accuracy of GPS, soil sample locations can be mapped even though they are not on a typical sample grid. Samples would be analyzed for Cu, Mo, and Zn, which will act as a tracer for understanding where we are in the system.

Geophysics would consist of aeromag, gravimetrics and IP. Both Carlota and Morgan Peak need to be flown in order to help define intrusives, structures, contacts, and areas of magnetite alteration. IP would help define hypogene mineralization. Some IP has already been completed in the west lobe area. This work reveals an anomaly in the southwest portion of the property. A weak IP anomaly is associated with the Ellis Vein. Further IP work will help to define targets along the Santa Anna Fault and in the Birthday Zone. Gravimetrics could be done either airborne or on the ground. Either method would help define structures and zones of alteration.

Drilling will be required, but is not necessarily needed right away. Toro Resources does have an obligation to drill three holes by the end of February 2012. A 27-hole pattern has been approved by the Forest Service. All of the holes planned are shallow vertical holes. Some of the holes in the Santa Anna Fault need to be angled across the structure and extend more than 300 feet in depth. A bid was made by National Drilling that would provide the right equipment on the property in a timely manner.

## Environmental Concerns

There are three environmental concerns that will have to be addressed early in the process of the detailed evaluation of the property.

1. The location
2. Protecting the upper Pinto Creek watershed
3. The Forest Service is trying to preserve a semi-roadless character of the area

### Location

The property if developed sits in a very prominent place in the Pinal Mountains of central Arizona. The property is easily seen from Carlota. It will be very visible from quite a distance. The property is visible from parts of Top of the World. Mining would strip down the ridge that dominates the view of that part of the Pinal Mountains.

To the south of the claim block are two parcels of private land that would have to be purchased. The claim block would need to be extended to the south and west to provide enough room for operations.

Access to the property is by improved gravel roads from US 60 across from the turn to Pinto Valley Road. This road would have to be improved to allow access for heavy equipment.

#### Pinto Creek

All of the property is drained by upper Pinto Creek. The headwaters is located on the south side of the Birthday Zone. The creek that follows the contact between the Schultze Granite and the Pinal Schist flows into Pinto Creek. These drainages would be impacted by mining activities in a significant way either by stockpiles, a leach pad, or a tailings dam. Condemnation drilling would need to be done carefully, so that significant mineralization is not covered over. Considerable amount of work will be needed to assure all parties that the operation would be a zero discharge facility. Even to convey ore or PLS to the Carlota site for processing would have a significant impact on upper Pinto Creek. Permitting will be difficult. It took Toro Resources a year to receive a drilling permit on existing roads, but with Carlota's reputation for environmental excellence may have an impact on the permitting process.

#### Roadless Character

The Forest Service has done nothing to maintain old drill roads in the area. A fire that occurred in the summer of 2011 was allowed to burn, but a fire break was built to protect ranches. That fire break is blocked off to vehicular traffic at this time. The road Toro Resources plans to do their 2012 drilling on need to be improved because of trees and brush that block the roads. In order to drill the Birthday Zone, creative navigational drilling will be needed initially to probe that area. There is currently no road access to the Birthday Zone.

### Recommendations

The following recommendations are made for management consideration.

1. The property, despite the environmental challenges, has the potential to produce a significant amount of copper that can be reached by surface mining. It is in the interest of QuadraFNX to partner with Toro Resources to prove up or disprove this potential. The potential for a large tonnage, underground operation is fair despite the lack of deep drilling. The Santa Anna Fault and the Birthday Zone have good potential for higher grade near surface ore and related deep mineralization. Many of the high-grade veins in the Globe-Miami District are the conduits for the disseminated mineralization that is mined open pit. At depth, these veins are related to deep seated high grade disseminated mineralization. Structurally, the schist host rock is well prepared for mineralization.
2. There is required ground work that can be done in conjunction with the drilling program Toro Resources is looking for funding for. There are three drill holes that need to be completed by the end of February 2012. The planned drilling can proceed, but before any further drilling is

proposed, geophysics and surface sampling should be completed especially for the Birthday Zone.

3. Some angle holes should be added to the planned drilling especially in the Santa Anna Fault zone.
4. Oversight for the project can be handled out of Carlota although another geologist will be required especially if exploration at Carlota begins in the second half of 2012.