2012

Copper King Mine, Silver Crown District, Wyoming (Preliminary Report)

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COPPER KING MINE, SILVER CROWN DISTRICT

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Introduction

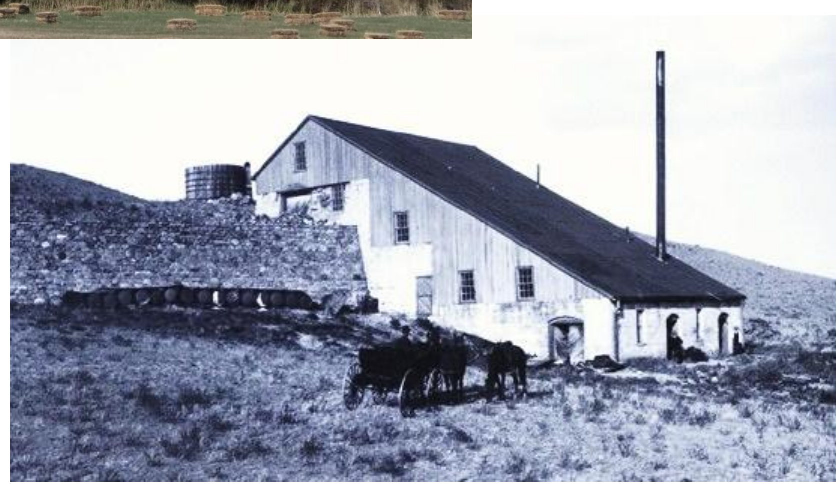
The Silver Crown district (*also known as Hecla*) lies 20 miles west of Cheyenne and immediately east of Curt Gowdy State Park along the eastern flank of the Laramie Range. The district is visible on *Google Earth* (search for *'Hecla, Cheyenne, WY'*) and lies within the boundaries of the Laramie 1:100,000 sheet. This area was initially investigated by Klein (1974) as a thesis project, and also by the Wyoming Geological Survey as a potential target for low-grade, large-tonnage, bulk minable gold and copper (Hausel and Jones, 1982).

Nearly all mining and exploration activity in the district centered on the Copper King mine and the Hecla ghost-town with its mill constructed to support mining operations in the area (Figure 1). However, the mill was so poorly designed that rejected tailings often assayed higher than the mill concentrates (Figure 2) (Ferguson, 1965). This has been a common problem with many mines in the West – poorly designed mills. For example, four mills constructed nearby in the Colorado-Wyoming State Line district to extract diamonds, rather than copper and gold from 1979 to 1995, also had recovery problems. The last mill built at the Kelsey Lake mine (*40°59'38"N; 105°30'05"W*) was not only constructed on a portion of the ore body, but also lost many diamonds. After several months of processing, tailings were checked and the first test sample yielded several diamonds including a 6.2 carat stone.

Figure 1– Foundation of the Copper King mill viewed from Laramie County 210 looking north.

Below - Historical photo of the Hecla mill (J.E. Stimson Collection, University of Wyoming Archives).

A tiny smelter was located on the south side of County Road 210 a short distance from the mill.



Mineralization in the Silver Crown district is primarily gold-copper. These are mostly fracture fillings in shear zones and veins associated with the shears.

The flagship deposit of the district is a large-tonnage, low-grade gold-copper porphyry root zone and shear structure associated with the Copper King Quartz Monzonite and Hecla Granodiorite that is known as the Copper King mine.

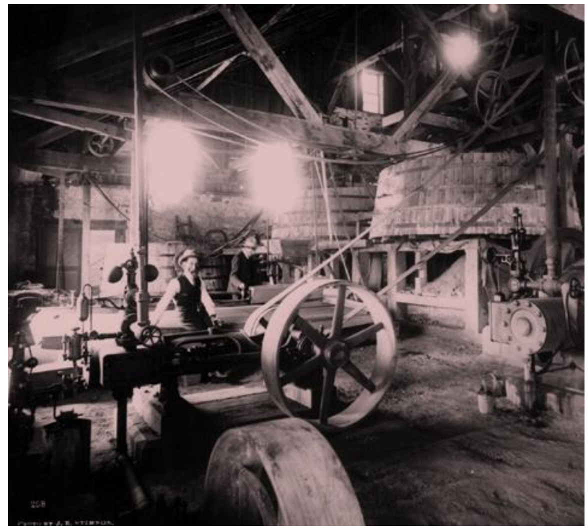


Figure 2 – Inside the historical Hecla Mill – J.E. Stimson photo collection, University of Wyoming archives.

Land Status & Investigation

This Silver Crown district was initially investigated by the author in 1981 and 1982. The current investigation was undertaken: (1) to determine if there is an offset of the Copper King ore deposit; (2) to determine if similar deposits occur nearby that could add to the value of the project, and (3) to determine if any nearby vein and shear zones could also provide value to the project.

The author was contacted by Strathmore Resources to conduct a cursory investigation of the region due to previous experience in the district, and due to a reputation of finding mineral deposits [i.e., (1) http://wygmstn.blogspot.com, (2) http://gemhunter.webs.com/mineraldiscoveries.htm, (3) http://2009pdac.blogspot.com. Because of other obligations, the author was unable to begin field investigations until October 5th to October 15th, 2012. This cursory field investigation was not enough time to complete detailed studies of the area. Another problem was an overall lack of land access to much of the district.

The author was able to determine the location of the Copper King fault along the eastern edge of the ore body and the relative throw of the fault. The fault likely offsets a portion of the ore body that *should be investigated by drilling* under alluvium, further east of the fault. The author was also able to verify the presence of free gold in core samples (VG was identified in one core sample at three different spots) (Figure 3).

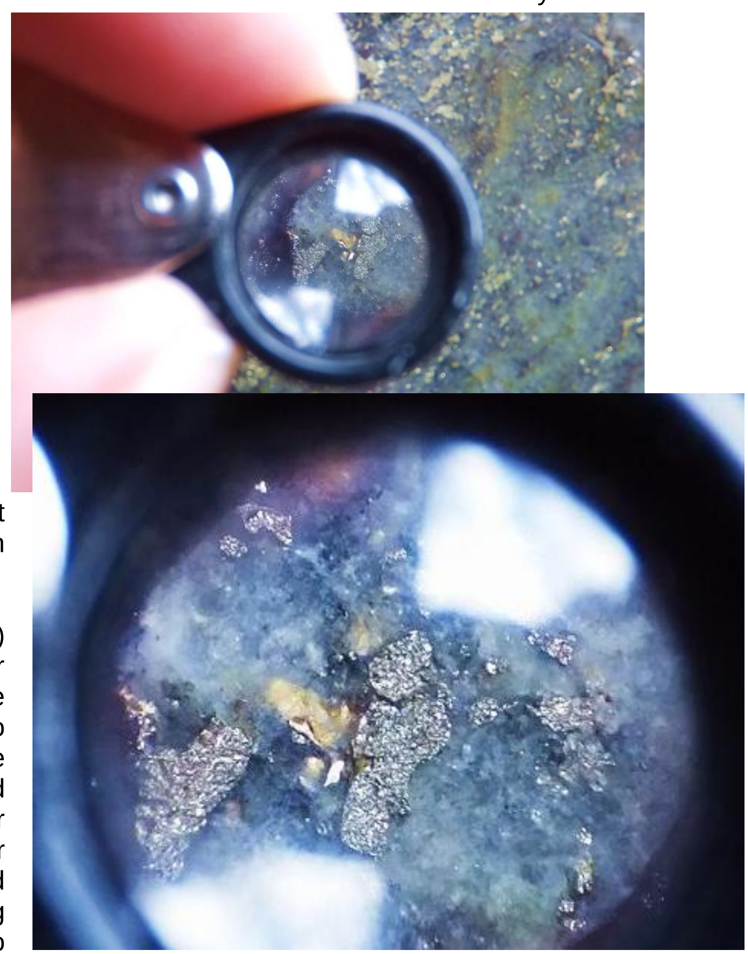


Figure 3 – Photos of visible gold surrounded by pyrite in Hecla Granodiorite from the Copper King mine. Note the distinct yellow color and rounded characteristic of the native gold compared to the adjacent metallic bronze to silver colored pyrite.

Samples were collected from nearby vein and shear zone deposits and mailed to ALS for assay. A distinct hydrothermally-altered zone was also investigated northwest of the Copper King mine. This zone, referred to as the Rambler anomaly represents a potential exploration target similar to the Copper King. It is recommended Strathmore investigate this anomaly. A similar deposit may also occur southwest of the Copper King, but the author was unable to gain access.

It is recommended that Strathmore investigate: (1) access to the hydrothermal system at the Rambler anomaly; (2) obtain access to the anomaly west of the Copper King described by Klein (1974); and (3) drill to search for the offset of the Copper King ore-body to the east of the known mineralization. It is recommended Strathmore explore these options prior to any major announcements. As an example, after the author discovered gold in the Seminoe Mountains and Rattlesnake Hills in 1981 and 1982, a claim staking rushed covered much of these districts. This also occurred after announcements of minable gold intersected by deep drilling by Evolving Gold in the Rattlesnake Hills (Fladager, 2011). This could potentially happen in the Silver Crown district.

Regional Geology

The Copper King deposit lies in the Laramie Mountains within the Silver Crown district (Figure 4). The Laramie Mountains form an elongate north-south anticlinal uplift cored by Precambrian rock flanked by up-warped Phanerozoic sedimentary rock. Along the western flank of the range, Phanerozoic rocks unconformably overlie Precambrian basement and dip at low angles into the Laramie and Shirley Basins. On the eastern flank, pre-Tertiary sedimentary rocks generally dip steeply into the Denver Basin and in places are overturned and locally overthrust by Precambrian crystalline rock. Within the Precambrian core, several mining districts and mineralized areas are recognized that include Casper Mountain, Deer Creek district, Elmers Rock greenstone belt, Esterbrook district, Garrett (Sellers Mountain), Iron Mountain, LaPrele, Sellers Mountain, Silver Crown district, State Line district, Strong Mine and the Warbonnet district (Hausel, 1989, 1997, 1998; Hausel and Hausel, 2011).

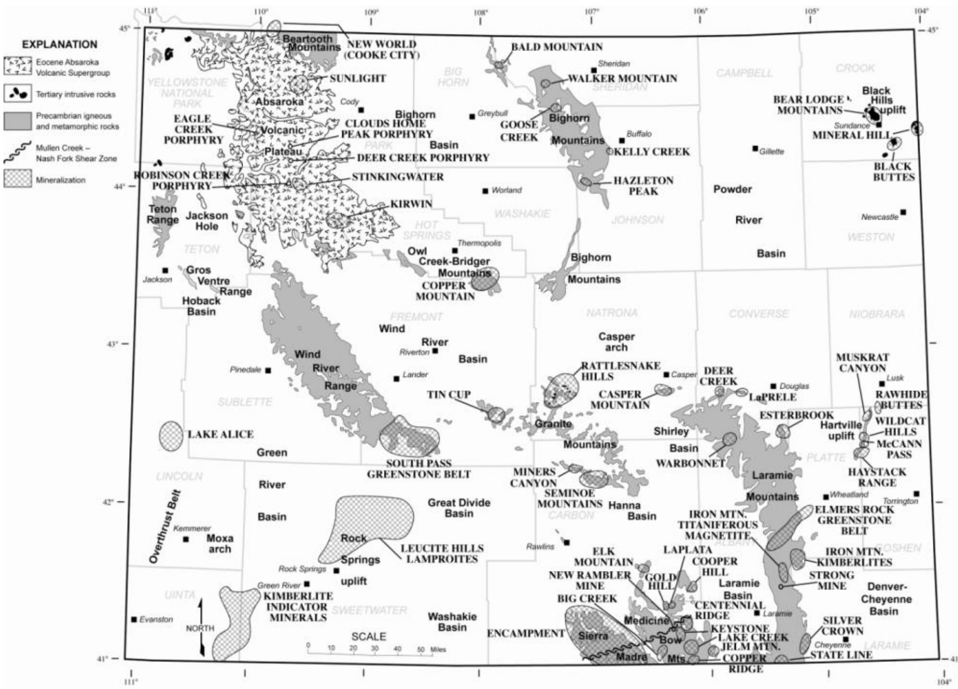


Figure 4. Map of mineralized terrains and mining districts in Wyoming (exclusive of uranium, coal and industrial minerals) (from Hausel, 1997).

Precambrian rocks of the Laramie Mountains are divisible into a southern Proterozoic province (Green Mountain terrain) and a northern Archean Province (Wyoming Craton). These two meet near the center of the Laramie Mountains where the 350-mi^2 anorthosite-syenite batholith intrudes the projected trend of the Mullen Creek-Nash Fork shear zone (Figure 5). The anorthosite is dated at 1.42 Ga (Subbarayudu, 1975) to 1.53 Ga (Smithson and Hodge, 1972).

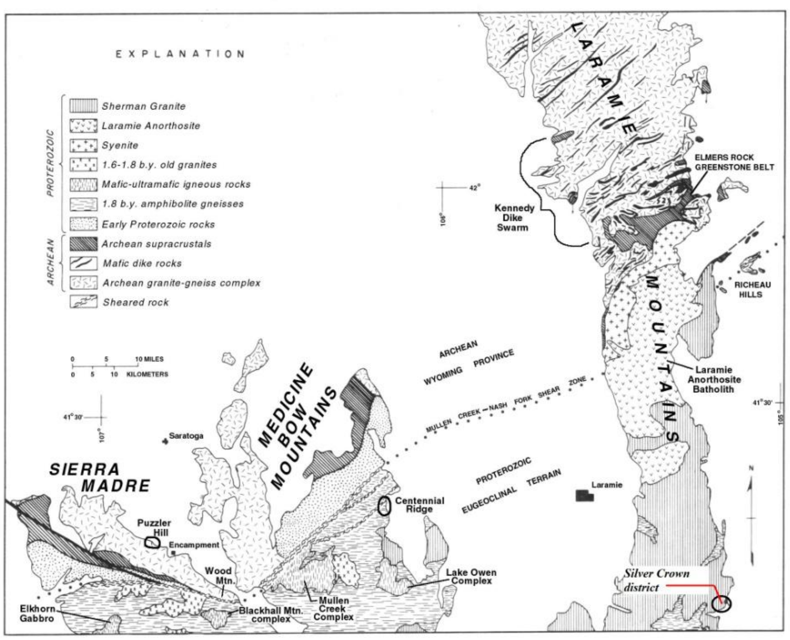


Figure 5. Generalized geological map of Precambrian rocks in southeastern Wyoming showing the edge of the Wyoming Craton (Archon) marked by the Mullen Creek-Nash Fork shear zone. Basement rocks north of this structure provide Archean ages. To the south, the basement yields

Proterozoic ages. The Silver Crown district lies several miles south of the exposed Archon in an area intruded by Sherman Granite (Graff and others, 1982).

The Green Mountain terrain to the south consists of amphibolite-grade mafic to intermediate metavolcanic and associated metasedimentary rocks that are about 1.8 Ga. These were intruded by 1.39 to 1.25 Ga granite, which includes the Sherman Granite and related felsic intrusive rocks (Peterman and others, 1968).

Rocks in the central and northern Laramie Range are part of the Wyoming Province and include Archean gneiss, migmatite, granite and supracrustal successions of metasedimentary and metavolcanic rock. Gneiss and migmatite in this region have been radiometrically dated at 2.9 to 3.0 Ga and granites typically date between 2.54 and 2.65 Ga (Johnson and Hills, 1976). The metavolcanic and metasedimentary supracrustal successions were intruded by granite and interpreted to overlie gneiss. Thus the age of the supracrustal belts are bracketed by the older gneiss and the younger granite (Graff and others, 1982). Granites that fold and dome the supracrustal belts have been dated at 2.54 Ga (Hills and Armstrong, 1974).

Copper and associated metals in the northern Laramie Range are found near Esterbrook on the north flank of Laramie Peak. These include several copper-pyrrhotite deposits and some lead and zinc occurrences. The principal deposits are in pendants of Archean metasediments and metavolcanics.

The Deer Creek, LaPrele, and Warbonnet districts occur principally in potassic granites and gneiss intruded by mafic (diabase) dikes. These have small associated metal deposits. The most significant base and precious metal deposit identified in the Laramie Mountains to date are in the Silver Crown district in the southern part of the range.

Figure 6*. Gray, strongly-foliated granodiorite with limonite on fracture surface.*

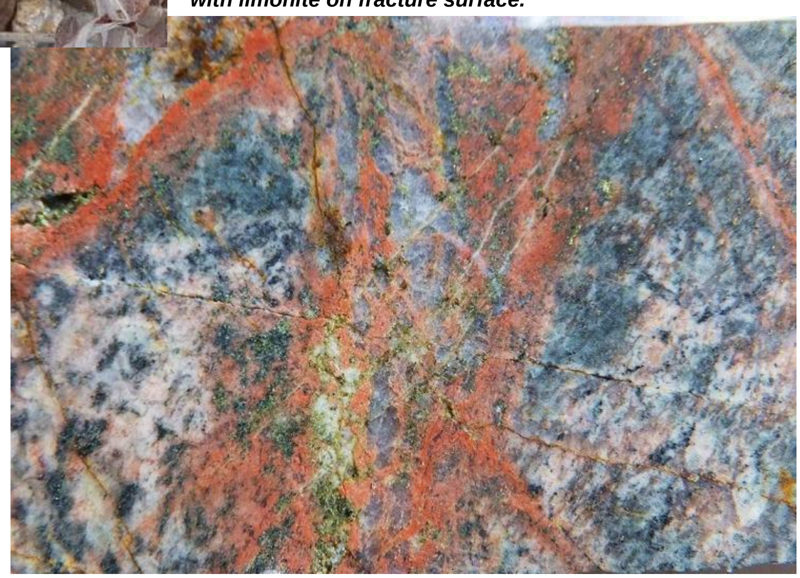
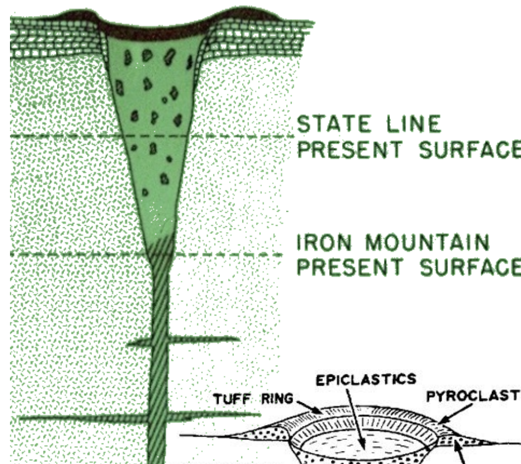


Figure 7*. Hydrothermally altered granodiorite with secondary quartz, hematite and pink K-spar replacing plagioclase. Fractures stained by pink to red secondary feldspar and green epidote.*

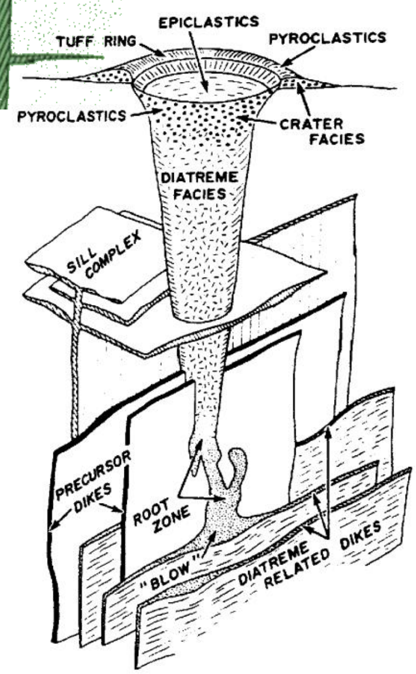
Silver Crown district

The Silver Crown district is underlain by Proterozoic basement rocks of the Colorado Province. These lie along the southern margin of the Wyoming Craton. The edge of the Archon in the Laramie Mountains was obliterated by intrusion of the Laramie anorthosite-syenite complex. Anorthositic rocks crop out at the Strong mine (*41°23'33"N; 105°21'59"W*) less than 20 miles north-northwest of the Copper King mine. The Strong Mine is a polymetallic deposit with anomalous copper, silver, tungsten, gold, lead, molybdenum and nickel that sits near the southern margin of a cordierite deposit near Ragged Top - Sherman Mountain. This cordierite deposit is mostly unexplored for gemstones even though very high-quality iolite was verified in the deposit by the author (2006) and world-class iolite gemstone deposits with considerable kyanite gems and minor ruby and sapphire were discovered further north at Palmer Canyon and Grizzly Creek (Hausel, 1998, 2002a,b, 2003, 2008; Hausel and Sutherland, 2002).



The Silver Crown district (also known as Hecla) lies 20 miles west of Cheyenne and immediately east of the Curt Gowdy State Park along the eastern flank of the Laramie Range. Most of the mining activity in the district centered on the Copper King and Comstock mines.

Several copper-gold-silver deposits in the district occur as permeable fracture fillings and as rehealed silicified fractures. The Copper King, however; is interpreted as a large-tonnage, low-grade gold-copper-gold porphyry root and shear zone.



During the Laramie Orogeny, the Laramie Mountains with the Silver Crown district was uplifted and exposed to erosion. The amount of erosion is unknown but can be estimated based on the morphology of a swarm of kimberlite pipes in the State Line district 16 miles to the west-southwest and in the Iron Mountain district 30 miles to the north (Hausel, 1998; Hausel and others, 2004).

Kimberlite pipes characteristically erupt as distinct circular maar-type volcanoes or pipes (*see cross section sketches to the right*). Such pipes are evident at the Ekati diamond mine in NWT where diamonds are currently mined by open pit. These are visible on *Google Earth* (*64°43'16"N; 110°35'40"W*).

Kimberlites erupt from linear fissures or dikes. At a depth of approximately 5,000 feet, the feeder dike gradually swells upward into elongate 'blows' that continue expanding upward to circular volcanoes. Petrographically, kimberlite is tuffaceous at the surface crater facies and grades downward into breccia (diatreme facies) and further downward into hypabyssal facies kimberlite near the feeder dike complex (Erlich and Hausel, 2002). Based on morphology and petrography of the Colorado-Wyoming State Line kimberlites, McCallum and Mabarak (1976) estimated that about half of the kimberlite pipes' upper columns (2,000 to 2,500 feet) had been removed by erosion. In the Iron Mountain district, nearly all of the diamond pipes had been removed by erosion leaving a deeply eroded complex of feeder dikes and blows emplaced in Sherman Granite. In is estimated nearly 5,000 feet of erosion likely occurred in Iron Mountain based on these kimberlites. Kimberlites in this region have yielded Late Precambrian-Early Cambrian and Early Devonian ages.

It is logical that similar amounts of erosion occurred in the Silver Crown district located between these two diamondiferous kimberlite districts. This would imply that two to five thousand feet of erosion has occurred at the Copper King since uplift, suggesting a sizable gold resource could have been removed and transported downstream during the geological past. The implications may suggest that the eastern portion of the Copper King ore body, where down-dropped along the Copper King fault, could have a much thicker column of ore preserved at depth than the exposed (eroded) western portion of the ore body.

Figure 8. Massive epidote accompanied by quartz in quartz monzonite at the Copper King.

The Colorado Province, which underlies the Silver Crown district as well as the southern half of the Medicine Bow and Sierra Madre Mountains consist of Proterozoic island arc metavolcanic and metasedimentary rocks that date between 1.6 to 1.9 Ga (Hausel, 1997). Much of the Proterozoic basement has been intruded by 1.4 Ga Sherman Granite. Ore at the Copper King is hosted by calc-alkalic granodiorite and quartz monzonite. The Copper King stock (quartz monzonite and granodiorite) may have been emplaced immediately following emplacement of the Sherman Granite. Mineralization is generally low grade, although supergene ore mined in the past contained masses of chalcocite (Ferguson, 1965) that were selectively mined.

Regional retrogressive greenschist facies metamorphism produced widespread alteration throughout the district that overprinted earlier amphibolite grade regional metamorphism. Retrograde metamorphism of metamorphic and granitic rocks resulted in widespread, greenschist-facies alteration that produced secondary chlorite and epidote (Figure 8). In mineralized areas of the Silver Crown district host rocks often exhibit moderated to intense propylitically altered rock near mineralization. Mafic minerals in quartz monzonite and granodiorite are often pervasively altered to epidote, chlorite and calcite and accompanied by sulfides. Such strong intense alteration was recognized at the Copper King and Rambler anomaly.

At some prospects, regional metamorphic minerals are overprinted by hydrothermal alteration mineral assemblages that include sulfides with distinct propylitic hydrothermal alteration assemblages (Figure 9). Potassic alteration is very restricted and enclosed by propylitic zones and presents itself as secondary pink K-spar that may be accompanied by secondary quartz, biotite, sericite, pyrite and chalcopyrite (Figure 7). A small zone of potassic alteration occurs at the Copper King mine (*41°08'41.3"; 105°11'11"*) surrounded by the propylitic zone.

Large areas in the district are covered by Tertiary gravels which could hide some mineralization. The eastern margin of the Silver Crown district is marked by steeply dipping Phanerozoic sedimentary rocks that are unconformably overlain by the Tertiary Chadron Formation. The western portion of the district is bounded by Precambrian Granite. Drainages are dry much of the year and a possibility for placer gold has not been tested. South Crow Creek, Middle Crow Creek, North Crow Creek and tributaries could have minor placer gold (and diamonds). These flow easterly towards Cheyenne.

Figure 9. Pervasive propylitic altered Sherman Granite (?) at the Rambler anomaly. The original rock was replaced by epidote, chlorite, calcite, hematite and primary sulfides including chalcopyrite, pyrite, sphalerite and minor specularite.

Several cryptovolcanic structures were discovered by the author adjacent to the district to the south, north and west. More than 300 cryptovolcanic structures were discovered in this region along with more than 300 kimberlitic indicator mineral anomalies. The cryptovolcanic anomalies include structurally-controlled depressions with carbonate-rich soil. Any of these could be similar to the diamondiferous kimberlites in the State Line district.

Mines and Prospects

A number of prospects were visited and sampled and others were inaccessible. Those with WP (way point) numbers were visited.

Prospect WP006 (*41°10.237'N; 105°10.479'W; 7081 ft*). A sample collected from a vein (Figure 10) exposed in a prospect pit near Red Canyon road included silicified amphibolite with disseminated pyrite and limonite coatings, amphibolite with limonite pits after pyrite and quartz stringers, and quartz vein material with considerable limonite after pyrite. The structure trends parallel to the road at N40°E.

Figure 10. Quartz vein in prospect pit at WP006.

Prospect WP008 (*41°10.006'N; 105°13.081'W; 7081 ft*). Altered granite with secondary quartz was found in a prospect pit in Curt Gowdy State Park. A sample was collected for assay.

Prospect WP010 (*41°09.671'N; 105°10.765'W; 6,917 ft*). Sample collected on US Minerals of amphibolite with minor pyrite cubes and secondary quartz with trace copper carbonate from mine dump in a drainage. Based on mine dump size, the adit was only about 200 to 300 feet long. Very little mineralized rock on dump. Dug sample from right side of dump (facing dump). Tunnel was driven it at N55°E to intersect structure.

Figure 11. Steeply easterly dipping shear zone exposed in prospect at WP011.

Prospect WP011 (*41°09.576'N; 105°10.940'W; 7,130 ft*). Samples were collected from an N80°E-trending, 68°N-dipping shear exposed in a 10-foot deep shaft (*see Figure 11*). The shear is stained by limonite with minor copper carbonate.

This prospect is on a vein-shear structure that projects south to the Copper King. The mineralized structure is about 3-feet-wide. Wallrock is amphibolite gneiss and the host rock exhibits minor K-spar and epidote replacement minerals. Copper minerals include cuprite, tenorite, malachite and chrysocolla with some secondary quartz.

Prospect WP012 (*41°09.622'N; 105°10.936'W; 7,130 ft*). This is likely the same shear structure as WP011. At this location, the shear is 4 feet wide, stained by limonite and hosted by amphibolite gneiss (Figure 12). The structure trends at N5°W and dips 83°E.

Secondary quartz veins about 1 to 2 includes wide occur in the shear and intersect at an 80° angle with one parallel to the dip and the other nearly perpendicular to the dip (*Figure 12*).

Figure 12, Shear zone exposed in prospect.

Two samples were collected from the prospect. *WP-12* was a select sample of quartz from the dump that had minor chrysocolla, tenorite, limonite, malachite and chalcopyrite. *WP12-C* was a composite chip sample collected across the four foot width of the primary shear zone.

WP013 is located (*41°09.622'N; 105°10.935'W; 7,146 ft*) north of WP012 and is a prospect pit dug into yellow, sulfur-stained quartz. The shear contains abundant quartz with pyrite vugs stained by limonite and sulfur. The primary shear has some tenorite and malachite stains and is 4 to 5 feet wide. A grab sample was collected of limonite-stained quartz and limonite-stained amphibolite. This shear follows the same trend as WP012.

WP014 (*41°09.676'N; 105°10.886'W; 7,058 ft*) is located on a N65°E, 48°SE-dipping shear in amphibolite gneiss (foliated granodiorite). A prospect pit was dug into yellow, sulfide stained quartz in a shear zone. The shear contains abundant quartz with vugs stained by limonite and sulfur. The primary shear is 4 to 5 feet wide and stained with minor tenorite and malachite. A grab sample was collected of limonite-stained quartz and limonite-stained amphibolite. This shear follows the same trend as WP012.

Carbonate Belle (*NE section 24, T14N, R70W*). This is the site of the infamous salting incident which involved the Wyoming Territorial Geologist - Samuel Aughey. Historic reports indicate Aughey and associates obtained bonds on a number of claims on the Carbonate Belle and attempted to promote the property by salting samples with gold. The salting was exposed by W.C. Knight (see Hausel, 1993, 1994).

Comstock (King David) mine (*SW section 13, T14N, R70W*). The Comstock and nearby mines and prospects, and alteration zones on the Jawbone Gulch Ranch were inaccessible during this 2012 field investigation due to lack of access. In 1981, the author mapped the mine (see Hausel, 1997).

The Comstock mine was developed at the intersection of fractures in foliated granodiorite. The main N20°E-trending mineralized fissure was traced for 0.75 mile on the surface and has an average width of about 2 feet (Jamison, 1911). A 240-foot-deep shaft was sunk on the fracture intersection and 200 feet of drifts were developed on the 172-foot level with 400 feet of drifts on the 205-foot level (Ferguson, 1965). In 1981 and 1982, Hausel and Roberts (1981) mapped the accessible workings of the Comstock mine which consisted of 500 feet of drifts and was accessed from an adit. At that time, the mine still had some incandescent lights in the mine, with rails and an ore car.

The mine was developed in foliated granodiorite and biotite schist and intersected several mineralized and nonmineralized mylonites. The majority of mineralized faults is permeable and contains localized secondary copper silicates and oxides (Hausel and Jones, 1982b). Available assays indicate the presence of high-grade copper as well as anomalous gold and silver.

Assays of samples from the Comstock mine, Silver Crown district (from Ferguson, 1965)

Sample description	*Cu (%)*	*Au (opt)*	*Ag (opt)*
Assay sample	66.6	0.0	0.0
Assay sample	4.8	0.3	0.66
Assay sample	6.0	0.12	7.08
Assay sample	41.35	0.02	9.7
Assay sample	2.01	0.02	0.5
Assay sample	14.7	0.04	0.7
Assay sample	3.1	0.08	1.6
Assay sample	6.5	0.04	11.56
Assay sample	6.9	trace	2.80
Assay sample	4.0	0.02	1.2
Assay sample	6.0	0.02	1.0
Assay sample	3.5	0.02	1.0
Assay sample	5.85	0.04	1.02
North drift, cross section of vein	9.7	0.05	5.15
South drift, winze	8.7	0.07	1.93
North drift, wallrock	1.7	0.0	0.4
Bottom of shaft, 240 feet	12.9	0.04	2.66
North drift, 20 feet from shaft	18.2	trace	14.0
South drift	0.98	0.0	0.2
Shaft, 210 feet	0.78	0.0	0.5
No sample description	8.8	0.07	1.13
48,217 lbs	0.74	0.83	11.02
25,113 lbs	8.0	0.0	1.35
Car control	5.74	0.04	1.25
Concentrates	31.26	0.2	21.8
Selected ore	21.41	-	-
Selected ore	19.34	-	-
Selected ore	45.0	3.75	-

Pockets of rich chalcocite ore were periodically encountered and selectively mined. One massive piece of chalcocite was described to be as large as a cook stove. The amount of ore produced from the property is unknown; however, Ferguson (1965) reported several hundred tons of ore were mined that yielded credits in copper, gold, and silver.

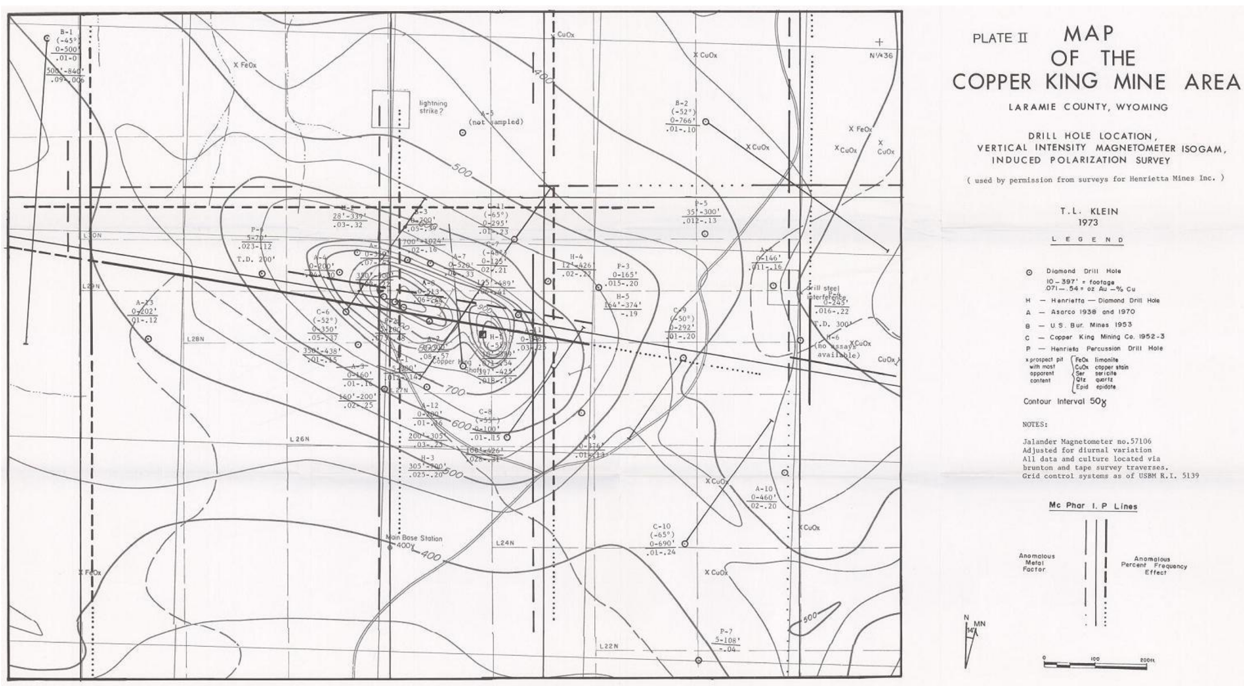
Copper King mine (*NW section 36, T14N, R70W*) (*41°08'41"N; 105°11'08"W*). The Copper King deposit is interpreted as a deeply-dissected, Proterozoic age, copper-gold porphyry (or root-zone) associated with disseminated sulfides, limited stockworks and shearing, surrounded by propylitic and potassic alteration zones. The Copper King (Arizona) claim was located in 1881 and initially developed by the Adams Copper Mining and Reduction Company.

Fourteen samples collected by Jamison (1912b) varied from 0.22% to 2.43% Cu, 0.06 to 0.42 opt Au, and 0.4 to 0.8 opt Ag. Mineralization at the surface occurs primarily as malachite and chrysocolla: at depth as chalcopyrite, pyrite, minor bornite, pyrrhotite and native copper (McGraw, 1954; Soule, 1955).

Primary hypogene mineralization was intersected during drilling to a depth of 150 to 180 feet by the U.S. Bureau of Mines. The primary ore is overlain by an oxidized and leached cap extending from the surface down to depths of 30 to 150 feet (Soule, 1955). Near the Copper King shaft, a zone of intense silicification consists of intersecting quartz veins and veinlets. Extending out from the shaft is a zone of potassium silicate alteration expressed by secondary enrichment of biotite and microcline-quartz intergrowths with some muscovite, sericite, quartz, epidote and sulfides. This potassic zone is enclosed by a propylitic altered zone consisting of secondary quartz, chlorite, epidote with sulfides and lesser calcite (Hausel and Jones, 1982b).

Drilling by the U.S. Bureau of Mines showed mineralization continued to a depth of at least 1,024 feet (Soule, 1955). Sampling suggests the deposit has a minimum strike length of 600 to 700 feet with a 300 foot width that is open at depth (Stockwatch, 1987). Data by Compass Minerals expanded the gold-copper resource. The company reported a gold resource of 23 million tons of ore grading at 0.82 grams (0.026 opt Au) or essentially 770,000 ounces of contained gold, while Paso Rico Resources indicated the deposit to contain a million ounce equivalent gold-copper resource (Hausel, 2008a). Most recently, additional drilling on the property has now outlined a 2 million ounce equivalent ore body (Norm Burmeister, personal communication, 2012).

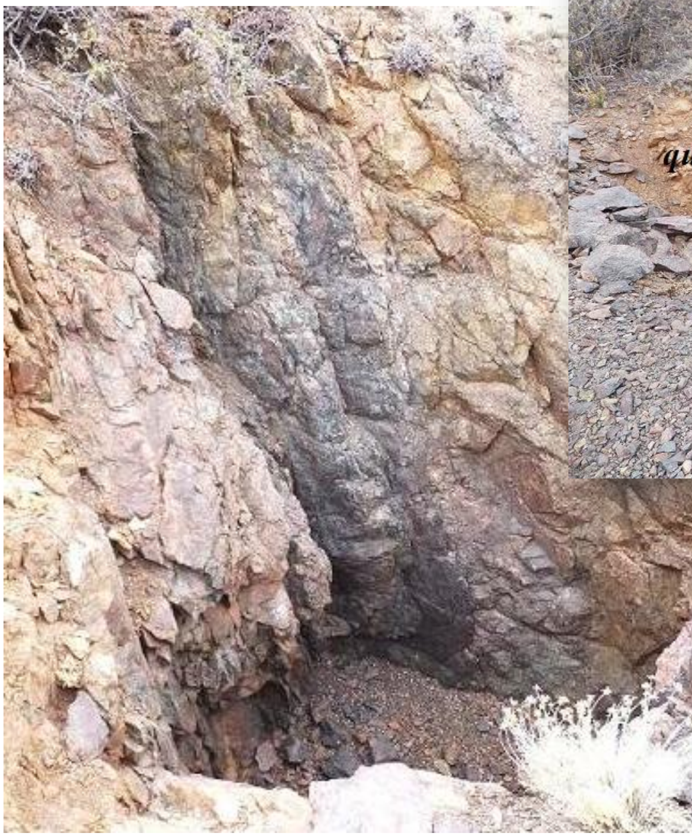
Geochemical and geophysical anomalies suggest the known resource could be increased. For example, a large magnetic anomaly (*1,000 ft wide x 2,000 ft long, 450 gamma magnitude*) almost identical to that

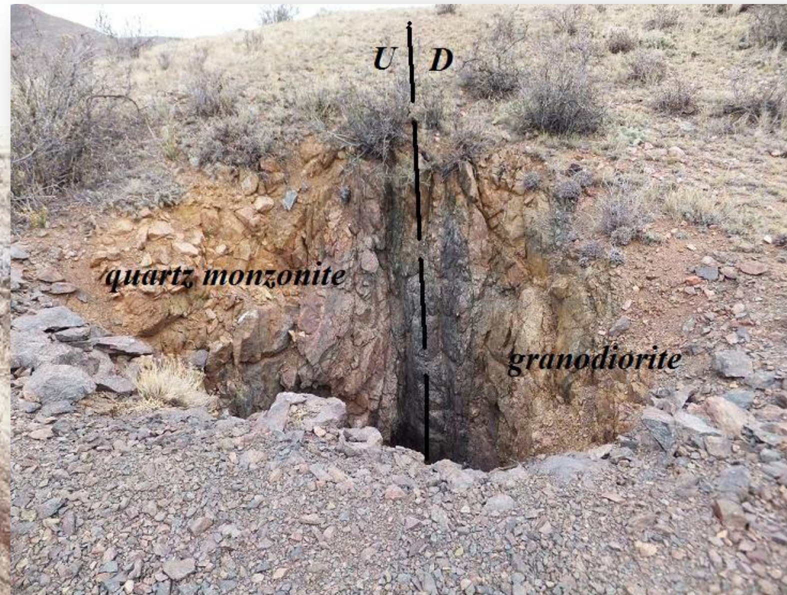


reflected by the Copper King deposit (*800 ft wide x 1,500 ft long, 500 ft gamma magnitude*) **was identified in a gravel covered area 4,500 feet to the southeast**. Soil samples over this anomaly returned anomalous values for the pathfinder elements mercury, zinc, and arsenic supporting the presence of hidden mineralization. Geological and geophysical evidence suggests the presence of sulfides down-plunge to the southwest and to the east of the Copper King. An IP (induced polarization) survey identified a moderate to shallow metal factor anomaly trending east-northeast of the principal mineralized area (Klein, 1974).

Waypoints on the Copper King Fault

WP034. (*N41°08.863'; W105°10.939'*; *7,076 ft*). A shallow shaft was dug on the Copper King fault near the northern





edge of the Strathmore's property in the center of the S/2S/2 Section 25. The shaft exposed an 8-foot vertical section of slickensides that were clearly visible (Figure 13).

Figure 13. Above shows fault exposed in prospect (looking north). The fault polished slickensides can be seen on the fault surface.

The fault separated granodiorite exposed in the east rib from quartz monzonite in the west rib. This was by far the best exposure of the Copper King fault. The shaft was too deep to access these slickensides: there was no way out of this shaft other than by ladder. These would have provided additional data on the throw of the fault (It should be noted that rock units mapped by Klein (1974) show granodiorite on the west and bioitite schist on the east at this point.

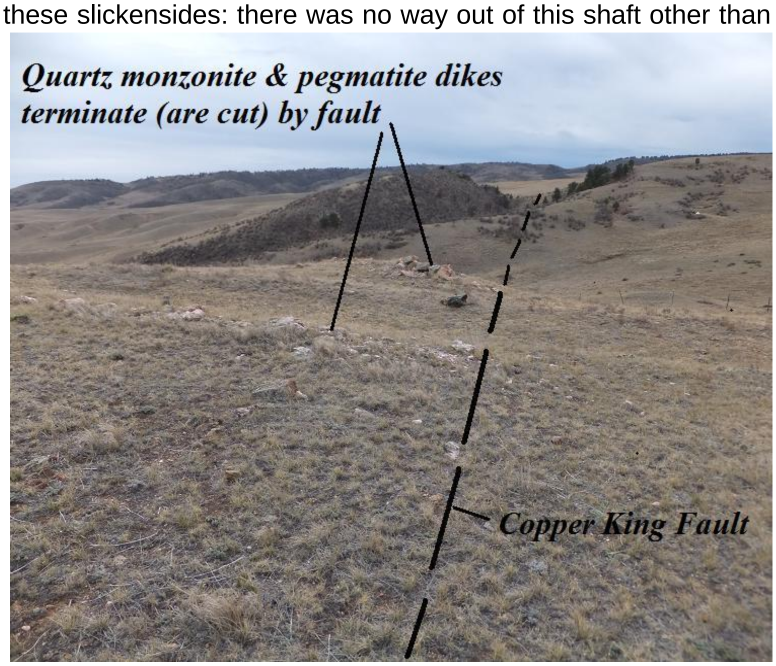


Figure 14. Trend of Copper King fault looking to the south where it cuts felsic dikes in the foreground.

WP033. (*N41°08.830'; W105°10.936'*; *7,085 ft*). At this point along the Copper King fault (just south of WP34), quartz monzonite and pegmatite dikes are cut and terminate at the fault contact (Figure 14 and 15).

Figure 15. Standing on a felsic dike looking to the west where the resistant quartz monzonite abruptly ends against the Copper King fault.

<u>WP022</u> (*N41°08.795'; W105°10.947'*; *7,015 ft*). This way point was measured near the north end of the Copper King fault in a jeep trail, where the fault cuts a couple of granitic dikes. The way point lies just south of WP033.

<u>WP32</u>. (*N41°08.704'; W105°10.929'*; *7,039 ft*). Located about 20 feet from WP 31 where metagreywacke along the Copper King fault exhibits ductile and brittle deformation.

<u>WP31</u> (*N41°07.449'; W105°18.323'; 6,938 ft*). Several exposed slickensides stained by epidote were found along the southern margin of the Copper King fault. Figure 16 shows slickenside with arrow sketched on the surface giving the direction of the last throw on this part of the fault. Based on the slickenside solutions, the west side of the Copper King fault was up-thrown relative to the east block.

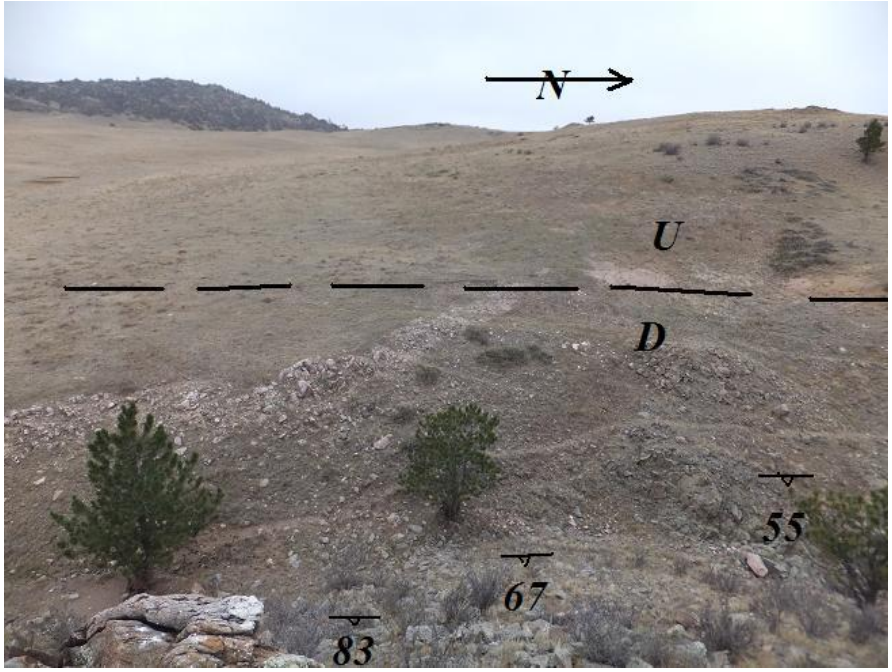
Figure 16. Slickenside dug out near south end of fault. The blue stain on the rock is paint scrapped from a rock chisel used to expose the slickenside.

A small number of slickensides were identified. All but one supported the same direction of relative movement on the fault.

Other structural elements were identified including rhombohedral fractures and a 'Z' fold in schist adjacent to the fault indicating some possible strike slippage during ductile deformation. The ductile folds may be pre-mineralization.

<u>WP20</u> (*N41°08.608'; W105°10.992'; 7,055 ft*). The south end of the Copper King fault is not exposed but marked where it cuts a pegmatite dike. The dike was traced to the fault where it terminated at WP 20. The continuation of this dike was not found in the footwall (west fault block). This would suggest considerable down-drop of the hanging wall, or considerable strike-slip component, or both. The dip of the dike could not be determined without trenching. One nearby ductile shear on the footwall suggested left-lateral movement, but the evidence was not conclusive. Rocks on the hanging wall (east block) yield dips of foliation of 66°SE to 83°SE with trends of N30 to N20°E.

Figure 17. South end of Copper King fault showing termination of granitic dike.



WP021 – (*N41°08.655'; W105°10.974'; 7,076 ft*). An epidote stained slickenside was examined for its throw and attitude (see Figure 18). This slickenside gave a solution that suggests the east block (side with the gloves) was down-dropped relative to the west block (side with the rock hammer). The slickenside exhibits a trend N10°E and 71° E dip.

WP023 – (*N41°08.655'; W105°10.974'; 7,076 ft*). An epidote stained slickenside was examined for its throw and attitude (Figure 18). This slickenside gave a solution that suggests the east block (side with the gloves) was down-dropped relative to the west block (side with the rock hammer). The slickenside exhibits a trend N10°E and 71° E dip.

WP024– (*N41°08.621'; W105°10.964'; 7,109 ft*). Another epidote stained slickenside with an N20°E 78°SE trend. This was examined for its throw and attitude.

Figure 18. Slickenside surface stained with epidote.

Copper King Fault summary

The Copper King Fault trends N30°E (81°SE dip) at its northern exposure to N25°E (71°SE dip) at its southern exposure. Based on the attitude of slickensides near its southern exposure, the fault likely dips 71°SE. At the northern extend, the fault is well exposed in a prospect where it has a near vertical dip of 81°SE.

The last brittle movement on the fault was normal based on the majority of slickensides examined. The size of the Copper King ore body could possibly be increased by additional drilling at nearby geochemical and geophysical anomalies and drilling beneath Tertiary alluvium immediately east of the Copper King (Klein, 1974; Hausel and Jones, 1982a; Hausel, 1989). It is highly recommended that Strathmore consider deep drilling under nearby alluvium to the east of the Copper King mineralization. It is unknown how much (if any) strike slip component occurs on the fault.

Louise Mine - London Mine) Lineament

The Louise-London mine lineament is visible on aerial photography and can be traced for nearly 0.8 mile. If this structure produces any gold anomalies, it would be advisable to explore it in detail. However, based on past sampling, this N20^{o}E structure is relatively unmineralized.

London mine (*E/2 section 35, T14N, R70W*). In 1915, a shaft was sunk on a pyritized gossan in foliated granodiorite to a depth of about 60 feet (Figure 20). The ore was too low grade to ship to a smelter (Ferguson, 1965). Jamison (1911) reported an inclined shaft intersected an 11-foot-wide vein which assayed as high as 11% Cu, 0.05 opt Au, and 1.0% Ni. This nickel assay is interesting as nickel has only been reported at a few localities in Wyoming (i.e., Laramie anorthosite complex, Strong mine, Puzzler Hill). No copper minerals were present on the dump when examined in 1982 and a select sample of quartz with disseminated pyrite collected from the dump assayed 0.02 opt Au (Hausel and Hausel, 2011).

Louise mine (*SE section 35, T14N, R70W*). The Louise mine was part of the Kopper Krown group according to Osterwald and others (1966). The mine consists of two shafts that were sunk to 160 and 110 feet and only included 143 feet of drifts on three levels (80, 110, and 160 feet) (Beeler, 1907c). The shafts were sunk on a one-foot-wide northerly striking cupriferous vein.

Figure 19. Shear zone at the Louise mine.

Stockworks extend 10 to 20 feet outward on either side of the vein (Hausel and Jones, 1982b). According to Ferguson (1965), some copper ore was recovered from the property and milled at the Copper King mill. Two grab samples of dump material were collected that included copper carbonate stained schist that assayed 0.59% Cu and 0.01 opt Au, and pyritized quartz vein that assayed 0.22 opt Ag and <0.01 opt Au (Hausel, 1982c). A chip sample of cupriferous quartz from the south shaft assayed 4.2% Cu and no gold (Gordon Marlatt, personal communication, 1982). Beeler (1907c) reported bornite, chalcopyrite, chalcocite, malachite, azurite and pyrite were found in the mine. The country rock is granodiorite with a small lens of garnet schist to the east.

Figure 20. Standing on the Louise mine dump looking towards London mine across the valley.

WP035 (*N41^{o}08.117'; W105^{o}11.743; 7,351 ft*). Louise Mine. Samples collected from the mine dump. The structure trends N65^{o}W and N20^{o}E. The material is quartz vein material stained by sulfur and trace copper.

(Adams) prospect (*N/2 section 24, T14N, R70W*). Located across the valley (Jaw Bone Gulch) from the Comstock mine, the Dan Joe prospect was reported to have produced $500 in silver (Ferguson, 1965). Jamison (1911) reported the property included three fault-controlled veins. Samples from one of the veins assayed 5% Cu with traces of gold. Copper mineralization included malachite, azurite and tenorite.

Fairview mine (S*W section 13, T14N, R70W*). An 8- to 14-foot-wide fissure with argentiferous chalcocite and other copper minerals was intersected at the bottom of a 20 foot shaft (Aughey, 1886). Drifts were driven N-NE from the shaft on a quartz vein in aplitic quartz monzonite. According to Ferguson (1965) the shaft is 70 feet deep. Some ore was shipped from the property in 1903-1904.

Good Hope-Teddy Roosevelt group (*Section 1, T13N, R70W & Section 35, T14N, R70W*). This group consists of six claims known as the Teddy Roosevelt, Ray Rock #1, Ray Rock #2, Comstock and Mountain Rose located in section 1, and the Good Hope in section 35. The Good Hope abuts against the Louise mine on the north.

The dominant rock type is foliated granodiorite; however, metadiorite and amphibolite are common in section 1 to the southeast. The amphibolites represent metamorphosed mafic flows and contain thin felsites that represent either metamorphosed andesites or rhyolites. A number of prospects in this region expose east-west trending veins with northerly dips stained by copper carbonate and impregnated with chalcopyrite (Beeler, 1906e). Six localized zones of potassic alteration were mapped in section 1 as well as an unexplored gossan in the *E/2 SE section 1* by the author in 1982.

Great Standard group. This group consisted of 17 lode claims including the Jolly Rover, Madeline no. 1, 2, 3, and 4, Virginia Boy, Hustling Dick, Doctor Bill, Boston Boy, Catalina, MollyO, Colonial, Columbian, Florence, Independence, Washington and Charlotte. Beeler (1904e) collected three samples of copper-stained quartz from the Colonial prospect that assayed 0.03 to 0.04 opt Au and 0.12 to 0.14 opt Ag. Samples from the Boston Boy prospect yielded 0.03 opt Au, 0.12 and 0.14 opt Ag and 0.25% Cu. A sample of sulfide-bearing quartz from the Florence prospect assayed 0.1% Cu, 0.02 opt Au with a trace of silver.

Hecla (*section 24, T14N, R70W*). The Hecla property consisted of the Rambler, Coming Day, Big Elephant and Monte Cristo groups. Copper minerals were found with gold and silver in a four-foot-wide vein on one of the claim groups. Twenty tons of ore was shipped 1916. Samples from another group (probably the Rambler) assayed 0.62% Zn, 0.08% Cu, 0.01% Pb, 0.15 opt Au, and $2.40 in silver (price prior to 1927). Other assays were reported to yield 5.2% Zn with lesser amounts of silver, lead and copper (Osterwald and others, 1966).

Lenox mine (*Section 24, T14N, R70W*). Located on the west side of Red Canyon Road, the Lenox tunnel was driven 375 feet into Hecla Mountain (Ferguson, 1965). An ore body was intersected which trends N-NW and dips to the northeast. The vein is 6 inches wide at the surface and 2.5 feet wide at 40 feet deep.

Monte Cristo mine (*SE section 8, T14N, R70W*). A 90- to 100-foot deep shaft was sunk in hornblende granite that reportedly contained stringers of molybdenite (Hagner, 1942a). Hagner noted that no molybdenite was found on the mine dump during his examination of the property.

Orenogo mine (*NW NW section 36, T14N, R70W*). A 500-foot adit was driven into granodiorite 1,500 feet west of the Copper King mine in a tributary valley of Middle Crow Creek. The adit exposed a few poorly mineralized fractures with copper carbonates and sulfides and cut two quartz monzonite dikes (Hausel and Jones, 1982b). The mineralization was poor.

Rambler Anomaly (***WP28*** *- N41°10.232'; W105°12.713'; 7,327 ft*); (*E/2 E/2 SENE section 22, T14N, R70W*). This anomaly is located on the northern border of Curt Gowdy State Park between Granite Springs and Crystal Lake reservoirs. The Rambler prospect was developed by an 80-foot shaft (now reclaimed) on an ore shoot formed at the intersection of N60°W and N75°E fractures in Sherman Granite.

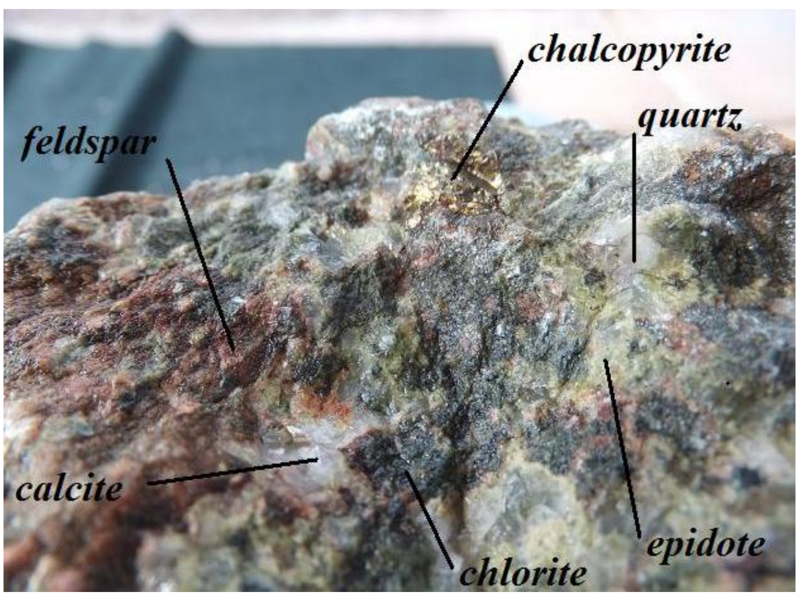
Thirty to 40 feet below the collar of the shaft, the workings were intersected by an adit driven to the west dug on the N60°W fracture. Sulfides occur as disseminated pyrite and chalcopyrite with minor sphalerite and specularite. The sulfides occur principally as replacements of mafic minerals in altered granite. Secondary mineralization includes copper silicates and carbonates. Limonitic boxworks are present. One select sample of sulfide-bearing granite assayed 0.28% Cu and <0.01 opt Au (Hausel, 1981a).

The granite is propylitized (Figure 21). At the Rambler prospect, propylitization is intense. Within a few feet of the mineralized fractures, mafic minerals are completely replaced by chlorite, and epidote and feldspars appear relatively unaffected with a hand lens.

Figure 21. Pervasive propylitically altered Sherman Granite at the Rambler anomaly (see close-up view below).

More intense alteration adjacent to the vein is expressed as pervasive propylitic alteration: mafic minerals and feldspar are altered to chlorite, epidote and calcite (Hausel, 1981a; Hausel and Jones, 1982b).

The Sherman granite in this area shows similar alteration as seen at the Copper King. The altered zone appears to be broad and can be traced north-northeast to the Jawbone Gulch ranch(?). A request for access to this property (and to the Comstock mine) from the landowner at the old Bill Ferguson ranch was denied. It is unknown how broad this altered zone is and the contact of the granite with the granodiorite lies 1,500 feet to the east. The altered zone in the Rambler prospect area appears to be a minimum of 700 feet wide. At **WP29** *(N41°10.224'; W105°12.641'; 7,392ft*) the granite is weakly to strongly propylitized. The matrix consists of secondary epidote, chlorite and milky quartz and orthoclase is bleached (sericitized?). A small prospect pit was dug at **WP30** *(N41°10.193'; W105°12.074'; 7,353 ft*) exposing pervasive propylitization of the granite, but sulfides were not observed. The extend of the altered zone is unknown



Roberts Ranch copper prospect (*S/2 section 23, T13N, R71W*). Northwest-trending cupriferous shears and quartz stringers occur in the Sherman Granite. The mine workings are small and restricted to a shallow shaft and collapsed adit along the Duck Creek drainage.

The mineralized rock consists of secondary chrysocolla and cuprite with disseminated pyrite and chalcopyrite. One sample from the mine dump assayed 2.37% Cu and 0.01 opt Au (Hausel, 1982d; Hausel and Jones, 1982b).

Yellow Bird mine (*No location given*). A shaft was sunk in hornblende granite: some pyrite was visible on the dump. According to Ferguson (1965), the shaft was sunk 200 feet. Traces of gold were reported (Hagner, 1942a).

NE section 12, T13N, R70W. A select sample of silicified, copper-bearing amphibolite collected from a prospect pit on the South Fork of South Crow Creek assayed 0.86% Cu, 0.02 opt Ag and <0.01 opt Au (Hausel, 1983b). The mineralized rock appears to be limited to a narrow mylonitic zone.

S/2 SW section 6, T13N, R69W. A shaft located on U.S. Geological Survey Granite 7.5-minute Quadrangle was sunk to a depth of 10 to 20 feet on a narrow epidote-filled shear in chlorite amphibolite schist. Minor malachite and chrysocolla were found in fractures with minor limonite pseudomorphs after pyrite.

SE section 1, T13N, R70W. A 20-foot shaft was sunk on N80°E-striking, 67°N-dipping copper carbonate stained quartz veins. The largest vein is two-feet-wide at the surface and has limonitic boxworks. A shear in the host amphibolite separates the primary vein from a smaller vein to the south. The small vein (6- to -inches wide) is stained by copper carbonate and limonite. Samples from the mine dump contain quartz vein material with abundant epidote-stained calcite veinlets.

Recommendations

This cursory study of the Copper King fault and nearby anomalies leads to the following recommendations.

(1) Drill east of the Copper King fault under the alluvial cover to search for evidence of offset ore. The dip of the fault appears to be very steep at the surface.

(2) Drill the large magnetic anomaly (*1,000 ft wide x 2,000 ft long, 450 gamma magnitude*) almost identical to that reflected by the Copper King deposit (*800 ft wide x 1,500 ft long, 500 ft gamma magnitude*). This was identified in gravel covered area 4,500 feet to the southeast of the Copper King. Soil samples over this anomaly returned anomalous values for the pathfinder elements mercury, zinc, and arsenic supporting the presence of hidden mineralization.

Geological and geophysical evidence suggests sulfides down plunge to southwest and east of the Copper King. An induced polarization survey identified a moderate to shallow metal factor anomaly trending east-northeast of the principal mineralized area (Klein, 1974). This areas are highly recommended for drilling.

(3) Obtain exploration leases on properties with similar geology and hydrothermal alteration. These include the Rambler anomaly which extends into Curt Gowdy State Park to the south, and north into the Jawbone Gulch Ranch. The second anomaly mentioned by Klein (1974) is in the SW/4 of section 35 and was not investigated during this project due to no land access.

Summary

This report is preliminary and not complete. The final report will be submitted after all of the data is compiled.

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