

The State of Wyoming.
Office of State Geologist,
Cheyenne.

MR-1907-82

A
REPORT
ON

THE KOPPER KROWN GROUP.

at
HEOLA. LARAMIE COUNTY. WYOMING.

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SITUATION.

THE KOPPER KROWN GROUP is situated about two miles south-west of Heola P.O., twenty-two miles west of Cheyenne, in western Laramie County, Wyoming. This group is located as follows;

Partly in South-west quarter, Section 36, T.14 N., R.70 W..

"	"	South-east	"	"	35,	"	"
"	"	North-west	"	"	1,	T.13 N., R.70 W..	
"	"	North-east	"	"	2,	"	"

The general situation of the KOPPER KROWN GROUP is very favorable, as the Union Pacific Railroad runs within two and one-half miles ^{south} of the property, the nearest station being Granite Canon Station, three and one-half miles distant by wagon road and Osone Station about four miles away.

The Colorado and Southern Railroad runs within about ten miles of the group, the station of Silver Crown being about ten miles east and the nearest on that road. There is a hard gravel road practically all the way to each of these stations, the longer haul to Silver Crown being

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a downhill pull nearly all the way and the roads to the other Union Pacific Stations, are mountain roads that can be put in first class shape with a small expense and be permanent roads.

EXTENT.

The KOPPER KROWN GROUP consists of eight claims, all lying as shown on the maps of the Company, as follows;

The LOUISE Lode Claim.

"	Mabel	"	"
"	BESSIE	"	"
"	JENNIE	"	"
"	RUTH	"	"
"	ALICE	"	"
"	IDA	"	"
"	VICTOR	"	"

The group covers an area of about one hundred and fifty-four acres, (154) and additional ground here may be secured as may be desirable or necessary.

TITLE.

The KOPPER KROWN GROUP is held by location and discovery under the laws of the United States and the State of Wyoming, and all requirements under these laws have been complied with.

TOPOGRAPHY.

The LOUISE Claim covers the highest portion of the group, being located on the north-easterly slope of one of the mountain spurs of the Laramie Hills Range and the balance of the group covering the adjacent hills and included small mountain valleys to Little Crow Creek on the south,

as shown by the maps of the Company, above noted, and provides sites for all necessary dumps, buildings, reduction plant and working ground.

The general hill surface is very rugged and rocky and the valleys are smooth and grass covered.

ALTITUDES.

For general convenience and information the following altitudes are given at various main points noted in this report:

At Granite Canon Station, U.P.R.R.	7234 feet.
At Ozone Station, "	7685 "
At Silver Crown Station, C. & S.R.R.	6404 "
At Hecla P.O.	6756 "
At Main Shaft, Louise Claim,	7390 "
At foot of hill, below main shaft,	7125 "
At nearest point of Middle Crow Creek,	6900 "
At Cheyenne Reservoir, Middle Crow Creek,	7200 "
At nearest point, Little Crow Creek,	7100 "

These altitudes show the general relation of these points and are compiled from the United States Geological Survey maps of this locality, being considered important in considering equipment, etc., for the mine and proposed treatment or reduction works.

HISTORY.

For the past thirty years the old mining camps of Hecla or Silver Crown have been known and prospected, and occasionally ore was produced on a small scale but no deep mining has ever been done in this locality and it is only recently that the work has been confined to the actual ore showings. Years ago the LOUISE Mine produced considerable ore that was smelted at a small furnace at Hecla, the copper made in 1895 being given

to this office by the then owner, at 6872 pounds of metallic copper but the property has never been worked systematically. Numerous attempts have been made to work ~~these~~ prospects in this vicinity but it is an established fact that the only successful workings have been those where the work has been done ON THE ORE, as in the recent works of the LOUISE Mine, and it is further shown by the works in the LOUISE, Fairview and Strong Mines of this district, that wherever the workings have been driven on the ore, the ore has been found to be greater than at first indicated and in these properties has improved with depth and shows no evidence of the ore quitting as the shafts go deeper but on the contrary, all the evidence points to the existence of large ore bodies with depth in connection with the present ores.

ORGANIZATION.

The KOPPER KROWN GROUP is held by the KOPPER KROWN MINING COMPANY, a corporation organized under the laws of the State of Wyoming November 7th, 1906, capitalised at \$1,500,000.00, divided into 3,000,000 shares, par value, 50 cents each, as shown by the records of the Secretary of State of Wyoming.

GENERAL GEOLOGY.

The KOPPER KROWN GROUP lies on the eastern slope of ~~of~~ the range of low mountains that extends northerly and southerly along the Albany-Laramie County line, from the Wyoming-Colorado State line on the south to the high point of the range known as Laramie Peak on the north, a distance of about 150 miles, and which are generally known as the Laramie Hills.

The general formation of this range consists of a core of granites flanked on either side by the succeeding sedimentary formations, such as shales, limestones, sandstones, etc.. The granite shown is usually of a

reddish feldspathic variety but gray granite is frequently noted throughout the range and both these granites are found to contain numerous dykes, ledges and bands of gneiss, schist, diorite, gabbro and allied dyke rocks.

It is noted that that the mineral showings throughout this entire range are all found to be in intimate connection with these dykes or ledges whether with the gabbro-diorite, as at the Strong, the schist as at the LOUISE or the gneiss as at the Fairview mines, before noted.

The copper ores of this range usually have the same surface indications and the ores are similar but the trend or direction of the ledges as well as the dip and extent of the same, vary locally in the different camps along the range.

GEOLOGY AT THE KOPPER KNOB.

The valleys of the upper Crow Creeks, between two branches of which the group is located, show only the granite core with the limestones and other formations showing at the foot of the mountains, north-east of Hecla and east of Granite Canon Station.

The granite is the usual reddish granite of this range, with dykes of schist and diorite and a few veins of quartz outcropping along the sides of the mountains, some of which may be traced for a considerable distance across the country. The dykes usually show a much altered and weathered condition at the surface outcrops and many of the dykes and granite outcrops show a crushed and fissured condition which is the result of a number of movements in the formations, none of which appear to be very extensive but which crushed and fractured the rock mass, both in the dykes proper and the adjacent granite and provided a place for the copper and other minerals to be deposited.

As before noted, the hill surface is rocky and rugged, with huge masses of granite showing and the surface between these masses is usually

covered with disintegrated granite to the depth of a foot or so but does not interfere with surface prospecting.

The outcropping ores usually consist of quartz and oxidised iron, the brown limonite form of iron oxides being the prevailing ore and which stains the adjacent quartz and rocks the rusty color of oxidised iron.

Copper carbonates in both forms also show, the green or malachite form predominating, with more or less of the blue carbonate, azurite, also showing at intervals, as well as an occasional bit of unoxidized sulphides of copper and iron.

The principal showing so far worked is noted on the LOUISE claim at the site of the main shaft and work confined to the showings in this working.

ORES.

The ores noted on the KOPPER KNOX Group are copper-iron sulphide ores, suitable for direct smelting of the high grade ores and for concentration of the low grade ores associated therewith.

At and near the surface the usual oxidised forms of copper and iron are shown, the usual leached condition of the ores being noted but the leached/ portion of the ore is comparatively shallow.

The chief ores of the mine are bornite and chalcopyrite, copper-iron sulphides, and with these is found copper glance or chalcocite, one of the richer forms of copper, in a lesser quantity.

So far none of the detrimental minerals have been noted in the LOUISE ores, such as arsenic, antimony etc. and no zinc has yet been noted, which condition, taken with the clean quartz gangue or waste matter in the smelting ores, indicates a desirable ore for direct smelting.

The low grade ores show as small streaks and fine specks scattered throughout the schist ledge matter and later will form an important part

or the ores of the mine when development has been perfected and ready for a large works.

WORKINGS.

The present development consists of the following;

Main shaft, Inclined,	160 feet.
Drift, at 80 ft. Main shaft,	55 " , West side.
" " 80 " " ,	30 " , East "
" " 160 " " ,	8 " , West "
Old shaft, 100 ft. east of main,	110 "
Drift, at 110 ft, old shaft,	<u>40</u> " , West side.
Total development,	413 "

On the outlying claims of the group, the usual location work has been done but this is not considered important at the present time.

MAIN SHAFT.

This shaft was sunk on the Louise claim as a double compartment shaft, size 5 feet by 9 feet, following the dip of the ore and shows the ore from the top to the bottom. It has been timbered by cribbing for a depth of about one hundred feet and stulls used where necessary below the timbers.

As noted, this shaft followed the dip of the ore, which is slight, dipping to the south at an angle of about 80 degrees, the dip varying at intervals and causing a slight wave or two in the hoisting skids, but this can be readily remedied if rapid hoisting becomes necessary.

The ore in the shaft varied in width and quality as is usual in veins of this sort but was always in evidence and improved with depth. It varied from two to four feet in width and at a point near the present depth (160') widened out and gives every indication that the shaft is at or near the top of a large ore shoot. At this depth the smelting

streak or high grade ore shows a width of from three to four feet, as may be noted in the small drift started on the west side of the shaft at the present depth.

A careful examination of the details of the bottom of the shaft shows that this is only a part of the ore here shown and that it is a part of a mineralized ledge and that other similar streaks may be looked for in either wall and can only be shown by a proper series of crosscuts.

A careful measurement of the mineralized portion shown in the shaft showed a total width of eleven feet (11') and in the north or footwall there are noted a number of streaks of quartz and minerals of copper and iron but at present there is no way of ascertaining the extent or value of the ore thus indicated.

Samples of the ore shown in the bottom of the shaft and here described were taken and returns may be seen at the office of the Company.

At a depth of eighty feet, drifts were run east and west from the shaft, as above noted, and showed ore as in the shaft, the west drift still shows the ore streak at intervals in sides, bottom and roof. The east drift turned off the ore and crosscut the formation; some ore was shown but nothing important was shown in the short distance run.

The general trend of the vein or ledge is easterly and westerly and the formation shown in the shaft shows a black mica schist much impregnated with quartz and with small stringers of mineralized quartz running through it at various angles, indicating that a great deal of low grade ore runs along with the massive streaks of the smelting ores, and these low grade ores should receive full attention at the proper time.

The old shaft, about 100 feet east of the main shaft, was filled with water at the time of this examination and therefore inaccessible but it is unimportant at this time and may be used for an airway or other

used as soon as a connection is established from the main shaft.

PRESENT EQUIPMENT.

The plant now at the mine is suitable for prospecting purposes only and for active work should be replaced as soon as practicable, it is as follows;

- 1-single cylinder steam hoist. (8" x 10")
- 1-40 H.P. return tuba boiler.
- 1-sinking pump.
- 200 ft wire cable.
- 1-18' wooden tank.
- 1-100 gal. iron bailer.
- 1-700 lbs. shaft bucket.
- 1-Davis Horse Whim.

FUTURE DEVELOPMENT.

The present ore showings and conditions noted all indicate that the ore is of a permanent character and development should therefore be planned with this end in view.

It is recommended that the present shaft be sunk following the dip of the ore to a depth of at least five hundred feet (500') and that drifts be run east and west on the ore at convenient intervals, making the first at the two hundred ft. level or about 40 feet below the present depth.

As soon as practicable, crosscuts should be run north and south from each of these levels and the full extent of this mineralisation determined. Connect these level by suitable upraises on the ore and push the whole development as rapidly as possible.

When this work is completed, the permanent working plant may be located at the most convenient ^{Point} and heavy machinery installed for the deeper mining and the real operation of the mine will begin.

NEW MINE EQUIPMENT.

The present plant being inadequate, a new Hoisting and operating plant should be at once installed and put to work. This should consist of steam hoist of sufficient capacity to operate to a minimum depth of five hundred feet; An air-compressor capable of operating eight or ten air drills and a boiler capacity sufficient to supply all the above plant together with all necessary pumps, dynamos, fans, etc. necessary to the economical operation of a mine, this with the equipment of air-drills, cables, piping, tools and blacksmithing and repair outfits to complete the mine equipment and all to be of approved makes, set up in a first class workmanlike manner.

New buildings will be necessary and should give ample accommodation for all machinery, supplies, help and stock, and be situated at the most convenient point for the whole works.

PROBABLE ORE.

At the present state of the work there is no way to arrive at the amount of ore contained in the ore shoots out by the workings and therefore no estimate of "ore in sight" is here included but enough is shown to show to any reasonable person that a daily production of atleast twenty-five tons of the high grades or smelting ores may be maintained without difficulty and there is every reasonable probability that this could soon be raised to fifty tons per day as the work proceeds.

As above noted, all work should be done on the ore and on the smelting streak as far as possible, leaving the low grades for future treatment and disposition.

The strength and size of the surface outcrops all show that the extent of the ores is considerable and that other shoots are to be opened up is borne out by the facts disclosed by other similar properties in this locality, and that a proper treatment plant is desirable.

PROPOSED SMELTER.

For the treatment of the high grade ores of this mine, a smelter of twenty-five tons daily capacity for the present is proposed. This smelter should be of the type known as the "pyritic smelter" which uses the sulphur contained in the ores smelted for a portion of the fuel and is adapted to the ores of this mine.

This is, of course, a very small plant but properly designed and run will make the property profitable almost from the start and is fully warranted by the showings made in the property.

Experiments should be made on a carload or two of ore before any kind of a reduction works is decided upon and steps taken to install a small converter with the smelter and blister copper produced at the works if possible, thus saving transportation charges on all but the copper.

In designing this plant, the rapid enlargement of the whole plant should be kept constantly in mind and carried out as rapidly as the ore supply warrants its extension.

COSTS.

Only a general estimate of cost may now be made but it is considered that an equipment and development fund of \$100,000.00 should be provided for this work and that it is warranted by the showings now made.

These costs are divided as follows;

Smelter Plant,	\$25,000.00 to \$35,000.00
Mine Plant,	10,000.00 " 15,000.00
Buildings,	5,000.00 " 10,000.00
Mine Development Fund,	55,000.00 " 40,000.00

This may be varied according to extent of plant installed, development carried on and other limiting conditions but is believed to present a working basis for expenditure warranted by the showings.

WATER, TIMBER, ETC..

Water for all purposes may be obtained from either of the branches of Crow Creek, distant from one and one-half to three miles, and water rights may be bought on either of these streams.

There is no timber on the group but the nearness to railroads makes it possible to buy timbers in carload lots at market rates as well as all other supplies and lay them down at the mine at reasonable cost.

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It is considered that the LOUISE presents a first class development proposition which fully warrants the necessary expenditure to make it a producing mine, and further, that the ore bodies now out are permanent, will continue with depth and that there is every reasonable evidence to expect that they will improve with depth.

There is every condition favorable for economical mining here present and in my opinion, there is no reason why it should not become a profitable producing mine when properly managed.

Respectfully Submitted,

Henry C. Beebe

State Geologist.

Date of Examination.

January 28, 29, 30 & 31, 1907.

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