

STATE OF NEVADA

JAY A. CARPENTER, DIRECTOR

Bureau of Mines



Box C, UNIVERSITY STATION

MACKAY SCHOOL OF MINES  
RENO, NEVADA

08300001

Item 1

A RECONNAISSANCE OF THE GOLDACRES DISTRICT, LANDER COUNTY, NEVADA (1945)

INTRODUCTION

The Goldacres district is situated in Lander County 30 miles southwest of Beowawe on the east edge of the Shoshone Range and the western edge of the Crescent Valley. It is about six miles southwest of Tenabo and 10 miles northwest of Cortez, and lies in both Sec. 36, T. 28 N., R. 46 E., and Sec. 31, T. 28 N., R. 47 E.

The reconnaissance of the district was made in June, 1945 at the request of Jay A. Carpenter, director of the Nevada State Bureau of Mines.

Harry Treweek, superintendent for the Goldacres mine, Harry C. Bishop, main owner of the Consolidated Goldacres mine, and Louis Fitzgerald and Frank Hartnert, general superintendent and engineer respectively for Willow Creek Company and operators of the Consolidated Goldacres mine, along with Lee Lakin, original locator of both mines, were all very helpful in giving available information on the mines and workings at the two properties.

GEOLOGY

The relief in the district is slight varying between 5,000 feet in Crescent Valley and 6,000 feet 5 or 6 miles to the west. Squaw Butte one and one-half miles south of the Consolidated Goldacres rises to 6,300 feet, or about 700 feet above the elevation of the mine, but this



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isolated butte with steep slopes is the exception rather than the rule in the district. The general topography is that of low rolling hills with a gradual rise to the west of Crescent Valley for about six miles, where a depression separates this ridge from the main axis of the Shoshone Range.

The surface exposures in the district are poor due to the low relief and the consequent covering of rock debris. Limestone, shale, and quartzite sediments are present in the area, apparently deposited in the order named, although formation contacts and bedding attitudes are obscure. Capping Squaw Butte, one mile south of the Consolidated Goldacres mine, about 100 feet of quartzite overlies the shale, but again the actual contact is covered by quartzite talus. The relationship between the shale and limestone is not so distinct as the limestone appears to be everywhere in fault contact with the shale.

No index fossils were found, but the formations may possibly be referred to the sequence, as described by Emmons, (U.S.G.S. Bull. 408, page 17) of Nevada limestone (Devonian), White Pine shale, and Diamond Peak quartzite (Carboniferous).

Locally the bedding attitudes are very irregular as a result of both faulting and folding but viewed over an area 5 or 6 miles square the regional dip is probably to the west at a fairly low angle. Folding in areas of flat lying beds and slight relief results in very



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irregular contacts between beds or formations. An anticline may result in the exposure of an island of underlying rock completely surrounded by younger rocks, or a syncline may result in the exposure of an island of overlying rock completely surrounded by older rocks. This seems to be the situation along the north-south contact between the shale and quartzite west of the mines of the district.

The limestone is limited in extent to a half-moon shaped area about two miles in length along the east edge of the range. It is bounded on the north, west, and south by silicious shale and on the east by the alluvium of Crescent Valley. The gold mineralization is found disseminated along a highly brecciated fault contact between the limestone and shale. Bordering the brecciated limestone on the east is a zone of black (sooty) carbonaceous limestone, from 50 to 600 feet in width. This rock has undergone some metamorphism with the growth of innumerable small acicular crystals of tremolite. Small cubes of pyrite pseudomorphs are commonly present in the adjoining dark gray massive limestone, and are particularly plentiful on the water-tank hill to the northeast of the Consolidated Goldacres mill.

The shale extends for an average width of two to three miles to the west of the limestone where it is in contact with the overlying quartzite. It has been almost all silicified into a dense, cherty or



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flintlike rock, with the original bedding only discernable, in some places, by varicolored banding. Later alteration along shear zones in the shale has caused the formation in scattered areas of deposits of turquoise and variscite some of which work is proceeding at the present time. The shale and quartzite contact is very irregular, as mentioned above, because of the folding, and in addition there apparently are both quartzite and thin, buff colored limestone ribs interbedded with the shale near the top of the formation. There are several gold and silver prospects in the shale area. One of these from which Lee Lakin made a shipment is a replacement along a north-south fissure in calcareous shale with a honey-comb porous silica remaining after the final leaching of the rock.

The outcrop of quartzite to the west of the shale averages about three miles in width and forms the top of a gentle east-sloping ridge, similar in shape to a cuesta. The steep west slope is the result of faulting, and both silicified shale and buff limestone are exposed to the west of the fault. The quartzite is both medium and fine grained usually a dull gray in color. In some areas it is extremely fine grained resembling the silicified shale in texture. Buff colored limestone float and dense fine-grained oval limestone concretions were noted in a few places near the quartzite and shale contact.



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Intrusive rocks are exposed in several places 5 to 8 miles farther north in the range in the vicinity of Tenabo, and 4 miles to the south volcanic rocks cover the sediments, but in the Goldacres area around the mines igneous rocks are almost completely absent. The only occurrences are a small amount of so-called "porphyry" just south of No. 4 pit at the Consolidated Goldacres mine, and a sericitized felsitic rock in the face of the bottom level of the Goldacres mine. The "porphyry" has very few phenocrysts and is almost completely altered to sericite or an allied mineral. So far as has been determined the "porphyry" carries little or no gold values, however the felsitic rock in the bottom level of the Goldacres mine contains sufficient gold values to be ore.

While igneous rocks appear to be absent here, the occurrence of pyrometamorphic replacement in the limestone southeast of the main adit of the Goldacres mine certainly denotes proximity to an igneous mass below the surface. Extending for about 2,000 feet between the dark limestone and the brecciated area is a narrow belt of limestone almost wholly replaced by garnet and pyroxenes. The rock carries a small amount of scheelite particularly near quartz veins. These veins strike about normal to the trend of the metamorphosed zone, dipping steeply to the east or southeast, and usually do not extend beyond the limits of the metamorphics.



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## GOLDACRES MINE

The Goldacres mine, includes the southern half of the mineralized zone as shown on the accompanying plan map. An adit has been driven for 1,000 feet in the ore zone northwest from the portal, with cross-cuts into the footwall to block out ore. A 190 foot incline winze has been sunk from the main adit level with drifts run from the 90-foot and the 190-foot levels.

The ore is in a wide brecciated zone between the limestone to the east and the silicified shale to the west. The breccia in the main ore zone is dominantly limestone with some silicified shale. The zone is highly oxidized and recemented with iron oxide so that the rock all looks the same and it is difficult or impossible to always determine the original rock makeup. If the material does not effervesce with acid it is probably brecciated shale such as the area on the Iron Blossom No. 1 and the Harry C. claims shown as brecciated shale on the plan map. However, in some cases this test may indicate instead an igneous rock or a replaced carbonate rock which cannot now be recognized.

A flat fault striking about north 30° west and dipping from 5 to 30 degrees to the west forms the hanging wall of the ore zone in the mine working. The low angle of dip and the fact that the fault lies, at least at the surface, between the shale and limestone gives credence



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to the possibility of this being a bedding fault. Further the low angle and the undulating character indicate it as being a thrust fault; however, no estimation of the magnitude of the displacement could be determined.

The ore is almost wholly confined to the footwall of the fault, although the rock in the hangingwall in other respects is very similar. Thus the ore limits are necessarily determined by assay value, and the gold distribution has no apparent structural control other than that of being confined to the footwall of the fault. There are many minor slips and fractures throughout the brecciated zone but they have no continuity. In some places the ore (over 0.1 ounces per ton) is 30 to 50 feet in width, but commonly not over 10 feet; however, due to the flat dip of the fault the crosscuts appear to cut a much wider zone.

An incline winze has been sunk to a depth of 190 feet below the main adit at an average dip of 20 degrees, having a vertical depth, at the bottom, of 65 feet below the adit level. The winze followed the fault in ore for 110 feet, but here the fault flattens out, and the winze continuing at the same inclination passes into waste below at 125 feet.

On the 90-foot level the ore zone has been opened for 300 feet north of the winze. The ore zone is narrower but of consistently higher



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value than the main adit level, although there is no discernable difference in the appearance of the rock.

In the drive on the 190-foot level, all in the footwall, the limestone and shale are less badly brecciated, although still intensely fractured and faulted, and much less oxidation has taken place. Fine disseminated pyrite is present along with a small amount of chalcopyrite. The last 25 feet of the drive cuts an extremely altered, gray, talcy rock which I take to be a sericitized andesite. My three cut samples in this andesite (?) averaged 0.12 oz. gold per ton, which is ore grade, but due to the war shutdown no further exploration work has been done to determine the extent and attitude of this gold bearing rock. The limestone and shale on this level to the west of the contact with the andesite (?) are not ore although they do carry disseminated pyrite to a limited extent. There are scattered ribs of unaltered thin bedded limestone in the sericitized andesite which are probably inclusions in the intruding rock. This andesite (?) could not be recognized on any of the upper levels, although it may possibly be present and not distinguished because of the intense brecciation and oxidation. There is no record available of the results obtained by two churn drills in the hanging wall area.

The gold in the oxidized ore is too fine to be detected by panning,



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and is apparently confined to the innumerable cracks and seams in the breccia that are now cemented with iron oxide. There are no quartz veinlets or stringers showing in the ore. The silver content is negligible.

Because of the nature of the ore breccia it is very easily leached and a good recovery can be obtained by merely crushing, without grinding, and leaching with cyanide solution. According to Superintendent Harry Treweek there was treated from the Goldacres mine to 1941 about 75,000 tons of ore by crushing to minus  $1\frac{1}{2}$  inch and leaching for 3 days in a two pound per ton cyanide solution with an 85% gold recovery. According to the Bureau's bulletin, "Nevada's Metal and Mineral Production" the Goldacres mine reported a production of \$213,014.00 over the period '36-'40, inclusive.

CONSOLIDATED GOLDACRES MINE

The Consolidated Goldacres mine includes the northern portion of the mineralized zone as shown on the accompanying plan. Five adits were driven into the hill transverse to the longitudinal axis of the ore zone to prospect for ore. Adits No. 4 and No. 5 disclosed commercial ore tonnages and open cut excavation was begun late in 1941 to exploit the ore.

Conditions are much the same here as at the Goldacres mine with the ore dipping into the hill to the west. It is apparently controlled by



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the same structure, although it has been more disturbed by post-mineral faulting than the orebody to the south. The rock breccia and ore are also of the same character with no discernable difference between ore breccia and waste breccia. This of course is not surprising as a gold content of 0.10 oz. per ton is considered ore, while that between 0.05 and 0.10 is stockpile ore, and that below 0.04 or 0.05 usually goes as waste. Thus a gradational economic margin is approached which is influenced more by price than by natural geologic phenomena. I am of the opinion that there has been considerable migration and mechanical concentration of the gold during the process of oxidation of the primary pyrite in the breccia. The localized concentration would be affected by numerous minor fractures and faults, and by the relative porosity of various areas during the process of oxidation, as well as by the distribution of the primary gold values which probably were far from uniform. This last fact is apparent from the comparatively barren zone in the northwest corner of the "7 come 11" claim and the west side of the Iron Blossom No. 3 claim situated between two good ore zones. There are gold values in this area but they are very spotty and erratically distributed.

The ore zone is faulted off at its northwest end by a northeast striking post-mineral fault as shown on the plan map. The hanging wall



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of the north dipping fault is silicified shale and carries no values. The shale and limestone contact here follows the general trend of the fault to the northeast for over 1,000 feet and then bears more to the north. If this is a normal fault the extension of the orebody will lie to the northeast a distance depending on the magnitude of the fault. As there are no apparent marker beds in the silicified shale I did not attempt to determine this. Assuming the ore to have an average dip of 20 degrees to the southwest a vertical displacement of 100 feet on the post-mineral fault will displace the ore 250 feet to the northeast, measured on points of equal elevation on opposite walls of the fault after the movement. If the extension of the ore/<sup>zone</sup>should prove to be present where the shale and limestone contact bears back to the north from the northeast striking fault, it would indicate a vertical displacement of about 400 feet on the fault. It seems advisable to do some exploratory drilling along the north side of this fault to determine if the ore does continue northward.

At the present time operations are progressing in the No. 5 pit pushing the face to the south and southwest. The area to the south of No. 5 pit and to the west of No. 4 pit is being stripped by caterpillar and "carry-all", which does not interfere with shovel operations in the pit. The stripping problem becomes increasingly greater as the mining progresses down the dip of the ore to the west. Churn drilling is



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proceeding in this direction with the last churndrill hole west of the No. 5 pit being drilled through 175 feet of waste before encountering the ore.

The ore areas are first outlined by churndrilling and then as work progresses close control is made by assays of face samples and wagon drill blast holes.

The ore is evidently a mixture of brecciated limestone and shale, the latter being the probably cause of the troublesome slime in the mill. The only indication of any volcanic rock in the pits is that at the south shoulder of the No. 4 pit. However, due to the altered condition of the ore breccia it may also contain unrecognized sericitized volcanics.

A 400 ton cyanide plant of combined sand and slime treatment was erected on the property by the Willow Creek Co. and their superintendent Mr. Louis Fitzgerald is in charge of operations until the cost of the mill and its erection is paid off. Mr. Harry C. Bishop, the main owner of the property, holds the contract to mine and transport the ore to the mill. Mr. Bishop states that to date over a quarter million tons of ore has been milled with the result the mill and all improvements will soon be paid off in full.

The two properties combined make up one of the most promising low-grade gold districts in the State, and all indications are that the



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district will be a steady producer for several years to come.

*Fred L. Humphrey*  
Fred L. Humphrey, Mining Engr.

Nevada State Bureau of Mines

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