

Good Hope mining district
Elko County, Nevada

R. M. Smith
10-28-71

(60)

Item 11

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INTRODUCTION

Great Basin Exploration Company, Alexander von Hafften, President, 3898 Washington Street, San Francisco, California 94118, applied to the Office of Minerals Exploration, Docket OME-6854, for financial assistance in a \$19,957.00 program to explore by drilling for silver-gold ore at the Bataan-Belleau Wood group of 13 claims in the Good Hope mining district, Elko County, Nevada. A field examination was authorized by OME and was made June 24, 1971, by R. M. Smith, accompanied by the Applicant's consulting geologist, Dr. Edmond F. Lawrence.

Outcrops in the claims area and the Good Hope district were examined and compared with geologic reports and maps of the district which had been prepared by R. D. Knox as a M.S. thesis. No samples were taken because production records, although incomplete, are more informative. One specimen of fossiliferous limestone was collected for age determination.

The proposed work was subsequently discussed with Mr. von Hafften, Dr. Lawrence, R. D. Knox, and with W. E. Davis (geophysicist, U. S. Geological Survey). A revised program was ^{127,100.00 mutually} agreed upon. The Applicant submitted additional maps, a revised cost estimate, and bids from two independent geophysics contractors and from two bulldozer contractors, ~~and~~ ^{and a financial statement,}

^{and a subcontractor agreement from the owner.}
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The silver ore bodies in the Good Hope district are narrow veins along steep north- and northwest-striking faults in volcanic rocks of Tertiary age. The largest ore body mined was about 150 feet long, up to 5 feet wide, and was mined down dip for perhaps 100 feet. The ore was composed of pyrite,

arsenopyrite, stibnite, and pyrargyrite in a quartz gangue. The grade of ore mined is not known but total production may have been \$100,000 in silver from as much as 5,000 tons of ore.

The largest ore body mined was in the Buckeye and Ohio Mine in the south-central part of the district. The Applicant's property, however, is in the north-central part of the district. It covers most of a northwest-trending zone of hydrothermal alteration 2,000 feet wide and 6,000 feet long. Within and on each side of the zone, geophysical and geochemical anomalies suggest the possibility of several deposits of disseminated sulfides.

There are no measured, indicated, or inferred reserves of ore grade on the Applicant's property, or in the district, but it is reasonable to infer several relatively small bodies of disseminated sulfides of unknown silver content in localities indicated by the geophysical and geochemical anomalies.

Induced Polarization (IP) surveys indicate eight anomalous localities, five of them exceeding 7 percent Frequency Effect (PFE). The anomalies are small and are indicated only along single survey lines which are spaced so far apart that the anomalies do not extend from one line to the next. Their lateral position and extent, therefore, are not known, and there is no assurance that any one of them could be hit with a single drill hole. The IP responses are large enough, however, to warrant closer-spaced IP measurements to locate the largest response and to determine the lateral extent of anomalies.

I recommend, therefore, that the Government enter into an OME contract to provide 75 percent of the costs of a ~~two-stage~~ program of supplemental IP surveys to be followed by drilling if warranted.

LOCATION, ACCESS, FACILITIES

The Good Hope Property is in the Good Hope mining district, Elko County, Nevada, at altitudes of 6,000 to 6,400 feet in the northwest foothills of the Tuscarora Mountains. The property includes the area of the Good Hope mine shown on the topographic map (1961) of the Mt. Blitzen 15-minute quadrangle.

The district is accessible by passenger car during dry weather but may be snowbound at times in winter. Driving time from Elko, Nevada, is 2½ hours (100 miles). State Highway 11 is paved 66 miles to Deep Creek. Four miles north of Deep Creek turn left (west) on a graded dirt road 19 miles to the I.L. ranch, then left (west and south) on the Midas road 5 miles, then left (south) on an unimproved road 6 miles to the Good Hope mine.

All necessary equipment, supplies, and services are available in Elko, Nevada, Reno, Nevada, or Salt Lake City, Utah, except independent contractors for geophysical surveys. Bids were received from Heinrichs Geoexploration Company and McPhar Geophysics, Inc., both of Tucson, Arizona.

PROPERTY

History and Production

The Good Hope mining district now includes the earlier Amazon Mine and district, and the Aurora district which included the area of the Good Hope, Buckeye-Ohio, Snyder, and Page and Kelly Mines. Only the Amazon, Good Hope, and the Buckeye and Ohio can now be identified on the ground.

The district "... is said to have produced over \$100,000 in silver" (Emmons, 1910, p. 65, USGS Bull. 408), most of it from the Buckeye and Ohio during 1882-1884. Little, if any, mining has been done since 1903.

Ownership

The land included in the project area consists of 13 unpatented lode mining claims in secs. 3, 4, 8, 9, and 10, T. 41 N., R. 49 E., MDB&M, owned by the Applicant, and 21 unpatented lode mining claims and 720 acres of fee land in the same township (see Fig. 1) leased to the Applicant by Allied Properties of San Francisco, California. A copy of this lease is included in the application. In the event of an OME contract to extend the IP survey, Lien and Subordination Agreements ^{have been} ~~can be~~ obtained for all of the pertinent area except ^{(part of} the S $\frac{1}{2}$ of ~~SE $\frac{1}{4}$ and~~ the NE $\frac{1}{4}$ of section 9 which ^{drilling} ~~are~~ ^{is} ~~is not~~ necessary to the project and ~~are~~ ^{is} part of the public domain.

Development

There are no surface structures, and all the mines are inaccessible. Access roads have been bulldozed to the proposed sites of holes 3-4 and 5.

GEOLOGY

Geologic Setting

The oldest rock unit exposed in the district is quartzite of the Valmy(?) or Vinini(?) Formation of Ordovician age. It is overlain unconformably by volcanic rocks of Miocene(?) age which are overlain locally by erosion remnants of limestone containing Lymnaea-like fresh-water snails (gastropods) and elsewhere by volcanics of Pliocene(?) age. The older (Miocene) volcanics are locally mineralized.

Ore Deposits

The ore bodies are narrow quartz veins along faults that strike north or ^{east} ~~northwest~~ and dip steeply west or southeast. They are confined to the older volcanics. The largest ore bodies mined were at the Buckeye and Ohio Mine where two intersecting quartz veins as much as 5 feet wide contained pyrite, arsenopyrite, freibergite, stibnite, and dark ruby silver. A sample (Lawrence, 1963, p. 62, Nev. Bur. Mines, Bull. 61) across 36 inches of vein material assayed 7.56 oz. silver, 14.1 percent antimony, and a trace of gold. The depth mined is not known, but probably did not exceed 100 feet.

On the Applicant's property, a mile north of the Buckeye and Ohio, the Good Hope Mine and one other--name unknown--were evidently less than 100 feet deep and produced very little. Fragments of ore contain early barren white quartz cut by irregular stringers of sulfide-bearing bluish quartz and by late barren white crustification quartz.

On the west side of the district, southwest of the Applicant's claims, barite veins as much as 3 feet wide occur in the older volcanics.

A zone of surface alteration of the older volcanics, notably silicification, is roughly coextensive with the Applicant's claims. The zone trends northwest, is about 2,000 feet wide, and more than 6,000 feet long.

Argillization is also prominent in this zone, but it may be supergene and related to the shallow sea or lake in which the fresh-water limestone was deposited.

Sampling

Selected samples of quartz from dumps on the Applicant's claims assayed as high as \$62 per ton in silver, and lower assays were obtained from seven other localities related to veins in ~~Section 9.~~ *the zone of alteration.*

Geochemical sampling of the Applicant's claims indicate anomalous concentrations of silver in three localities, mercury in four localities, and arsenic in five localities. All three metals coincide in one locality at the north end of Bataan 1 claim (Figure 2). Silver and arsenic coincide roughly in one locality near the Good Hope Mine on Belleau Wood 2 claim, and silver coincides with mercury near the north end of the Belleau Wood 3 claim.

Geophysical Surveys

Magnetic, VLF electromagnetic, and Induced Polarization surveys were conducted as a M.S. thesis project (Knox, 1970, 76 p., Univ. of Calif., Riverside), of which only the IP and magnetic surveys gave results directly applicable to exploration for silver. IP anomalies were detected in five localities on the Applicant's claims and in three other areas outside the claim area. Magnetic anomalies do not coincide with the IP anomalies, suggesting that the IP responses are not due to magnetite.

Ore Reserves

There are no measured, indicated, or inferred ore reserves in the Good Hope district. From the geological, geochemical, and geophysical surveys it is reasonable to infer several small bodies of disseminated sulfides of unknown silver content, but it is not possible to pinpoint their positions close enough to hit them with a drill hole.

EXPLORATION

In its original application, the Applicant proposed to test four localities by drilling five vertical holes to depths of 300 to 600 feet.

<u>Hole</u>	<u>Location</u>	<u>Depth</u>	<u>Target</u>
1	Belleau Wood 3	500	IP
2	Bataan 2	600	IP
3-4	Bataan 1	300 or 600	IP, Ag, Hg, As
5	Bataan 1	400	IP, Ag, Hg, As
6	Belleau Wood 1	<u>600</u>	IP, Ag, As
Total		2,400 or 2,700	

One additional hole (No. 7) to test the Buckeye and Ohio veins at depth is no longer included in the proposed OME project.

The Applicant infers from the following geological relationships that silver minerals in commercial quantities may be disseminated in the wall rocks near the veins at depths of 300 to 700 feet. He considers the area of proposed Hole 1 to be most favorable because of the greater number of quartz veins.

1. Hydrothermal alteration--mainly silicification--of the wall rocks in the altered zone indicates that brecciation and mineralization were extensive.

2. Quartz veins and veinlets in the altered zone containing pyrite, arsenopyrite, stibnite, and small amounts of pyrargyrite and cinnabar indicate that sulfide mineralization occurred. (Silver-antimony ore produced from the Buckeye and Ohio veins was a mile from the zone to be explored, and is not directly relevant.)

3. Induced polarization surveys across the altered zone gave weak to moderate anomalies which indicate possible disseminated sulfide bodies in eight localities at depths of 300 to 700 feet. A survey for comparison across the Buckeye and Ohio veins (line G-G') gave a weak anomaly in the area of the veins.

4. Geochemical anomalies of silver, mercury, and arsenic coincide with each other and also with an IP anomaly in one locality. Silver and arsenic coincide roughly in one locality, and silver and mercury coincide in one locality.

5. Geologic similarity with the Calico silver district in San Bernardino County, California, where an extensive low-grade disseminated silver deposit occurs in volcanic rocks in a zone of alteration that includes silicification and baritization (Calif. Div. Mines and Geol., Mineral Inf. Service, Jan. 1967, v. 20, no. 1, p. 5).

Analysis of Applicant's Proposal

Induced Polarization surveys, which respond preferentially to large disseminated or massive deposits of minerals with metallic luster, are more diagnostic of disseminated sulfides than any other geophysical method. Magnetite, however, cannot be distinguished from sulfides, and some clay minerals may give weak anomalies which normally do not obscure strong anomalies from metallic minerals.

On the Applicant's property the type of deposit is inferred from the weak to moderate IP anomalies to be disseminated rather than massive, probably less than three percent sulfides. The minerals responsible for the IP anomalies are inferred from surface outcrops, from mine reports, and from geochemical surveys, to be mainly pyrite and arsenopyrite accompanied by small amounts of pyrargyrite, stibnite, and cinnabar. Magnetite is fairly abundant (2-4 percent) in andesite flows and intrusives, but the highest magnetic anomalies do not coincide with IP anomalies.

The IP survey of the Applicant's property is an excellent reconnaissance job. Spacing of the survey lines (as much as 1,800 feet) is so great, however, that correlation between lines is unreliable for lack of intermediate control points.

Because the distance on each side of a survey line at which a mineralized body might be detected is 450 feet (1.5 times the electrode spread of 300 feet), and because the better anomalies are indicated by only one or two readings on each of one or two levels, their exact locations and sizes are not known. Two or three holes might be needed just to find each anomaly. Even if found

with the first hole, there is no way to predict where to drill the second. Moreover, the anomalies mapped may not represent the largest IP responses which would mark the centers of the mineral deposits. Additional parallel survey lines 200 feet on each side of the existing lines are desirable "... to locate the largest response and determine the lateral extent of anomalies" (Davis, W. E., 1971, written communication).

If, by a more detailed IP survey, the reconnaissance anomalies are confirmed, their centers located more precisely, and the best ones identified, then one drill hole in the center of each anomaly should answer the question of whether the mineralized bodies are of commercial grade. Additional holes to delineate the size and grade of each mineralized body could then be spotted from the data at hand. I consider the drilling originally proposed to be premature, and according to OME regulations to be prospecting rather than exploration.

These considerations were discussed with the Applicant's representatives who concurred and submitted a revised proposal for a two-^{phase} program. The first ^{phase} ~~stage would~~ consist of six lines of supplemental IP surveys, ~~followed~~ by ~~drill hole tests of~~ the four most favorable localities. The second ^{phase} ~~stage~~ would consist of ~~additional~~ drilling ~~if warranted to delineate the size of the~~ ~~best ore body found during Stage I.~~ Estimated cost of the revised program is \$27,100.00. The applicant

EXPLORATION CONTRACT
GREAT BASIN EXPLORATION COMPANY
OME-6854

ANNEX I

The land, including all rights thereto, referred to in Article 2 of the contract consists of 13 unpatented lode mining claims hereinafter called the Great Basin group, of 21 unpatented lode mining claims hereinafter called the Allied group, and of 720 acres more or less of fee lands, in T. 41 N., R. 49 E., MDB&M, Good Hope mining district, Elko County, Nevada, recorded in the office of the County Recorder, Elko, Nevada.

The unpatented lode mining claims of the Great Basin group are as follows:

<u>Name</u>	<u>Book</u>	<u>Page</u>
Bataan No. 1	56	60
Bataan No. 2	56	61
Bataan No. 3	56	62
Bataan No. 4	56	63
Bataan No. 5	83	552
Bataan No. 6	83	553
Belleau Wood No. 1	56	64
Belleau Wood No. 2	56	65
Belleau Wood No. 3	56	66
Belleau Wood No. 4	56	67
Belleau Wood No. 5	56	68
Yorktown No. 1	56	69
Yorktown No. 2	83	551

The unpatented lode mining claims of the Allied group are as follows:

<u>Name</u>	<u>Book</u>	<u>Page</u>
Gyro No. 1	75	365
Gyro No. 2	75	366
Gyro No. 3	75	367
Gyro No. 4	75	368
Gyro No. 5	75	369
Gyro No. 6	75	370
Gyro No. 7	75	371
Gyro No. 8	75	372
Gyro No. 9	75	373
Gyro No. 10	75	573
Copter No. 1	75	569
Copter No. 2	75	570
Copter No. 3	75	571
Copter No. 4	75	572
Copter No. 5	75	374
*Copter No. 6	73	181
Perry No. 1	75	574
Perry No. 2	75	575
Bill No. 1	77	33
Bill No. 2	77	34
George No. 1	76	225

*Copter No. 6: The book and page for Copter No. 6 refer to the Notice of Location, not the Certificate of Location.

The fee lands, all in T. 41 N., R. 49 E., MDB&M, are as follows:

<u>Section</u>	<u>Legal subdivision</u>
2	$E\frac{1}{2}$ of $E\frac{1}{2}$; $W\frac{1}{2}$ of $NE\frac{1}{4}$, $NE\frac{1}{4}$ of $NW\frac{1}{4}$
3	$SW\frac{1}{4}$ of $SW\frac{1}{4}$
9	$E\frac{1}{2}$ of $W\frac{1}{2}$; $NW\frac{1}{4}$ of $NW\frac{1}{4}$; $NW\frac{1}{4}$ of $SE\frac{1}{4}$
16	$W\frac{1}{2}$ of $NE\frac{1}{4}$; $S\frac{1}{2}$ of $SW\frac{1}{4}$; $NW\frac{1}{4}$ of $SW\frac{1}{4}$

The mining claims and the fee lands are shown outlined in green, within which the Great Basin group is outlined in red, on Figure 1 entitled "Property map, Good Hope mining district, Elko County, Nevada," attached hereto and made a part hereof.

The Operator is the owner of the Great Basin group of unpatented lode mining claims.

The Operator is in possession of the Allied group of unpatented lode mining claims and of the fee lands under the terms of a 5-year Lease Agreement dated August 1, 1969, from Allied Properties (a corporation), the owner.

A Lien and Subordination Agreements executed by Allied Properties on October 21, 1971, is attached and made a part hereof.

EXPLORATION CONTRACT
GREAT BASIN EXPLORATION COMPANY
OME-6854

EXHIBIT A

The purpose of the project is to explore by Induced Polarization (IP) surveys followed by rotary drilling from prepared surface sites for disseminated silver-gold-bearing ore bodies in Tertiary volcanic rocks.

General Provisions

Induced Polarization surveys shall be performed using a dipole spacing of 300 feet. Interpretation shall include results down to the $n = 4$ separation, and to the $n = 6$ separation if possible.

A bulldozer no smaller than the equivalent of a Caterpillar D-8 shall be used for preparation of access roads and drill sites.

All drill holes shall be cased as necessary and completed not less than $4\frac{1}{2}$ -inch diameter.

All drill cuttings shall be stored in suitable containers identified by hole number and depth.

Stored samples shall be made available for Government inspection and possible use, and may be disposed of with prior Government approval.

All drill cuttings shall be logged and significantly mineralized cuttings shall be split and one split assayed for gold and silver.

True copies of assay certificates, copies of drill logs, and maps or sketches showing the work completed, the location, width, and assay value of all samples assayed, and the geological formations and structures traversed by the drill holes shall be furnished monthly to the Government.

The Operator shall provide such equipment, materials, supervision, labor, and technical services as may be required to perform the work in a satisfactory manner.

The work shall be divided into two consecutive phases. The Operator shall complete all of Phase I and as much of Phase II as is warranted by the results obtained in Phase I.

The location, direction, and extent of each work item shall be subject to Government approval.

The Government will not contribute to the cost of incomplete drill holes, of casing left in a hole at the request of the Operator, or of holes drilled closer than 100 feet to the outer boundary of the project area.

Description of the Work

Phase I

The work shall consist of an IP survey along each of six lines 4,200 feet long located approximately parallel with and approximately 200 feet from existing survey lines A, B, E, and F, and interpretation of the results.

The locations of the existing lines and the tentative locations of the proposed lines are shown on Figure 2 entitled "Claim and composite anomaly map, Good Hope mining district, Elko County, Nevada," attached hereto and made a part hereof.

Phase II

The work shall consist of bulldozing access roads to not more than five drill sites, of leveling the sites, and of rotary drilling not more than five vertical holes aggregating not more than 3,000 feet.

The drill sites and hole depths shall be selected by the Operator to explore the IP anomalies indicated to be most favorable by the results of Phase I and of all previous geological work.

The tentative locations of the holes are shown on Figure 2.

Estimated Costs of the Project

Actual Costs

Category (1) Independent Contracts

IP surveying, 6 lines, 4,200 feet each, including
mobilization, demobilization, labor, equipment,
supplies, final report

1 job \$ 3,430.00

Standby time due to weather

6 days at \$185.00/day 1,110.00

Standby time at Operator's request

2 days at \$175.00/day 350.00

Mobilization, demobilization

1 D-8 or larger bulldozer ~~250.00~~ 200.00

Bulldozing access roads and drill sites

24 hours at \$30.00/hour 720.00

Mobilization, demobilization of drilling equipment 240.00

Drilling, 3,100 feet ~~15,750.00~~ 15,900.00

Price per foot

<u>Depth, feet</u>	<u>Price</u>
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0-300	\$4.50
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300-600	6.00
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Reaming, setting and pulling casing

12 hours at \$25.00/hour 300.00

Casing lost in hole

184 feet at \$2.00/foot 368.00

Reaming bits

~~One~~ bit at 115.00 \$ /bit

\$ 230.00

Cementing, drilling cement

36 hours at \$25.00/hour

900.00

Cement, ~~drill muds~~

105 sacks at 5.00/sack

210.00
200.00

~~Admix~~
30 sacks at \$9.00

270.00

Total Category (1)

\$ 2390.00

Category (2) Personal Services

Subcategory (a) Supervision and technical services

None except:

1 Outside consultant

10 days at \$140.00/day

1,400.00

Total Category (2)

\$ 1,400.00

Category (7) Miscellaneous

~~None except:~~
Travel, outside consultant

325
3,400 miles at \$0.12/mile

398.00
408.00

Per diem, outside consultant

10 days at \$20.00/day

200.00

Sample sacks, cloth

620 sacks at \$0.30/sack

186.00

Assays for gold and silver

185 samples at \$5.00/sample

925.00

Total Category (7)

\$ 2,787.00

Total Estimated Costs of Project

1,710.00

Government Participation at 75 Percent

27,166.00

20,325.00