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PRINTED: 08/16/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: STRONG AND HARRIS

ALTERNATE NAMES:
SURPEISE AND NORTE CLAIMS

COCHISE COUNTY MILS NUMBER: 803

LOCATION: TOWNSHIP 15 S RANGE 22 E SECTION 13 QUARTER W2
LATITUDE: N 32DEG 07MIN 40SEC LONGITUDE: W 110DEG 03MIN 30SEC
TOPO MAP NAME: STEELE HILLS - 7.5 MIN

CURRENT STATUS: DEVEL DEPOSIT

COMMODITY:
COPPER SULFIDE
COPPER OXIDE
ZINC
SILVER

BIBLIOGRAPHY:
ADMMR STRONG AND HARRIS FILE

10/18/88

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

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File copy

REPORT
ON
MAGNETOMETER SURVEY
STRONG-HARRIS PROPERTY
OF
NEW BEGINNINGS RESOURCES LTD.
COCHISE CO., ARIZONA

by

PROSPECTING GEOPHYSICS LTD.

Toronto, Ont. . Sept. 1, 1981.

REPORT ON MAGNETOMETER SURVEY STRONG-HARRIS PROPERTY OF NEW BEGINNINGS RESOURCES LTD. COCHISE CO. ARIZONA

INTRODUCTION

An induced polarization survey was recently carried out on the Strong-Harris property held by New Beginnings Resources in Cochise County, Arizona. A magnetometer survey was carried out in conjunction with the I. P. survey in an effort to obtain the maximum information for a diamond drilling program.

The results of the I. P. Survey are discussed in a separate report by Phoenix Geophysics Inc. The following report and accompanying map describe the results of the magnetometer survey and correlate the results with the I. P. survey.

PROPERTY

The property is referred to as both the Strong-Harris property and the Dragoon copper-zinc-silver property which was recently acquired by New Beginnings Resources Ltd. It is situated in Sections 13, 14, 23 and 24, T 15 S, R 22 E in Cochise County, Arizona.

GEOLOGY

The property is underlain by calcareous sediments which generally strike about N 45 W and dip at 30 to 60 degrees to the northeast. Outcrops are largely limited to the south-

western side of the property with the balance of the property largely covered with fairly deep alluvium.

Previous drilling has defined a mineralized body containing 53 million tons averaging 0.63% copper, 0.77% zinc and 0.22 ounce/ton silver. This body has a northwest trend conforming with the regional strike and within this low grade body there are several separate zones of high grade mineralization. These latter zones contain 1.2 million tons of oxide mineralization averaging 4.43% copper, 7.47% zinc and 0.35 - 0.50 ounce per ton silver.

Approximately 1,000 feet southwest of the deposit mentioned above there is another zone of significant mineralization referred to as the Peabody sill. This has a similar strike and is reported to contain 450,000 tons averaging 1.81% copper, 1.36% zinc and 0.78 ounce silver per ton. The ore zones are shown on a map accompanying this report on a scale of 200 feet to the inch.

The depth of oxidation within the sediments is variable and generally is covered with several hundred feet of alluvium.

SURVEY METHOD AND INSTRUMENT DATA

The magnetometer survey was carried out over picketed lines at 200 foot intervals in a northeast direction. The instrument used was a Geometrics G-816 Proton magnetometer. This instrument measures the earth's total magnetic field in

gammas. These are plotted on the accompanying map after correction for diurnal variation and have been contoured.

The magnetic survey was confined largely to the area outside of the known mineralized zone with the exception of a few test lines (lines 16 N, 22 N and 24 N). This covers the area within which the I. P. survey was conducted.

RESULTS OF THE GEOPHYSICAL SURVEYS

The results of the induced polarization survey are discussed in a separate report by Phoenix Geophysics Ltd. with attached maps. Accompanying this report is Map No. 1 showing the results of the magnetic survey and Map No. 2 showing the topographic features with the outline of the known mineralized zones.

The magnetic results have been contoured and coloured to aid in the interpretation. The readings generally are fairly uniform which is to be expected in a uniform sedimentary formation. It should be pointed out that the actual total field readings are 49,750 gammas but for drafting simplicity the readings have been plotted as 750, etc.

There are a few isolated anomalies with readings of over 2,000 as compared to a background just under 800 gammas. These may well represent the presence of magnetite in skarn zones and since skarn zones are not known to be associated with the copper-zinc mineralization, it is questionable if they are significant. One such magnetic anomaly more or less coincides

with a well defined, moderately anomalous zone on line 10 S between zero and 8 E. This zone is interpreted as being shallow and is thought to be due to magnetite. However, some other type of mineralization associated with magnetite cannot be ruled out.

Another similar magnetic anomaly shows on line 42 N from 28 W to 36 W but the I. P. did not show anything on lines 40 N and 44 N but unfortunately the I. P. was not conducted on line 42 N.

Magnetic readings taken on lines 16 N, 22 N and 24 N over the mineralized zone show slightly higher values about 100 gammas above the background of about 750 gammas. The 800 and 850 contours appear to follow the zone of higher mineralization and it is possible that this zone is slightly magnetic. On the other hand, the higher readings may be due to variations in the depth of alluvium. There is no evidence of these higher readings extending to the northwest and the area immediately to the southeast was not surveyed. No magnetic readings were taken over the Peabody Sill.

There are areas of magnetic values above 800 gammas in the area surveyed, the two most significant being

(1) West end of lines 16 N to 36 N.

(2) East end of lines 30 S to 38 S.

In the case of (1) no I. P. anomalies were indicated and I. P. readings were not taken over (2).

The moderately anomalous zone shown in the I. P. survey

from line 28 N to 44 N does not have any anomalous magnetic readings associated with it.

CONCLUSIONS AND RECOMMENDATIONS

The magnetic survey showed fairly uniform readings throughout with the exception of some small isolated magnetic highs that possibly represent magnetite in skarn zones. A shallow I. P. anomaly is associated with one of these magnetic anomalies and it has been interpreted as being due to magnetite.

Some slightly higher magnetic readings were found over that portion of the higher grade mineralization surveyed but the coverage is limited and thus it cannot be definitely concluded that there is a direct association. There are two other irregular areas of similar readings, one of which was tested in the I. P. survey with negative results.

There does not appear to be any correlation between the magnetic and I. P. results but the possible magnetic correlation with the high grade section of the main ore zone warrants some further investigation. If convenient, some additional magnetic readings should be taken over the main zone and the Peabody Sill to determine if there is a

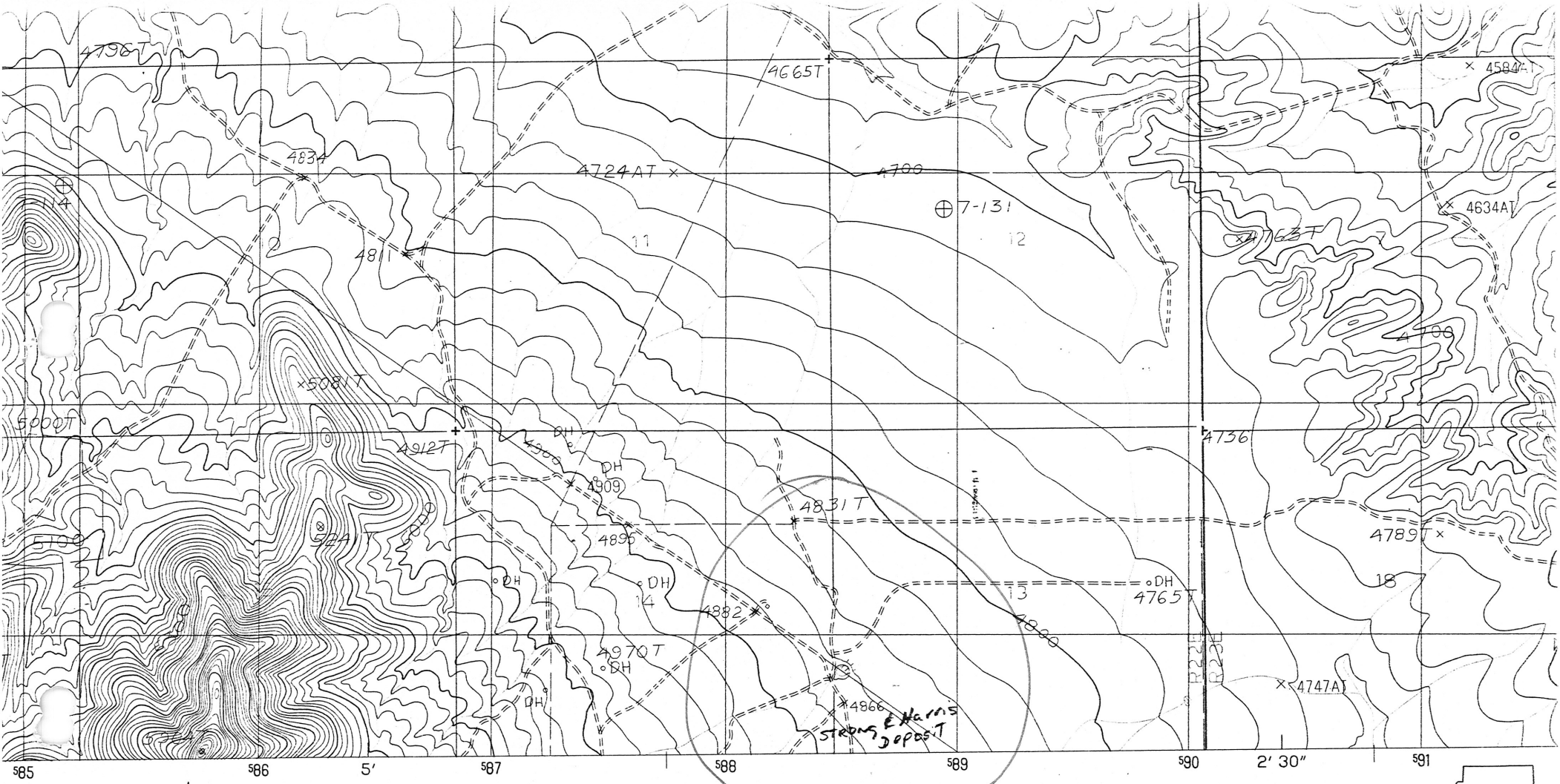
definite association or if these readings are due to variations in the depth of overburden.

Any diamond drilling program should include a hole on the shallow I. P. anomaly with an associated magnetic anomaly.

Respectfully submitted,
PROSPECTING GEOPHYSICS LTD.

Toronto, Ont.
Sept. 1, 1981.

H. J. Bergmann, P. Eng.



SCALE 1:24 000

NORTH

MILES

FEET

KILOMETERS

METERS

CONTOUR INTERVAL 20 FEET

ARIZONA

QUADRANGLE LOCAT

1	2	3
4		5
6	7	8

1 Hookers H
2 Muskhog
3 Square M
4 Deepwell
5 Red Bird
6 San Pedr
7 Dragoon
8 Cochise

ADJOINING 7.5' QUADRAN

PROVISIONAL MAP
Produced from original manuscript drawings. Information shown as of date of field check. 2

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225
OR RESTON, VIRGINIA 22092

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY (SHORT FORM)
May be Reproduced
May Be Inserted Into Mine File Or Added To "Rumor Page"

1. **Information from:** Richard C. Moores II

   Address: 808 10th St.

   Golden, CO 80401

2. **Phone:** (303) 279-0908

3. **Mine:** Strong & Harris

4. **ADMMR Mine File:** STRONG & HARRIS

5. **County:** Cochise

6. **MILS Number** 803

7. **Operational Status:** Developed deposit

8. **Summary of information received, comments, etc.:**

   The deposit has been optioned by Richard Moores II and John Dryer, principals in the Arizona Copper Company. There are no immediate plans for mining at the Strong & Harris until cash flow from the Sanchez deposit is achieved.

   Joint venture proposals for development of this resource would be amicably received.

Date: January 1989

H. Matson
(signature) ADMMR

STRONG AND HARRIS COCHISE COUNTY

HM WR 7/2/88: Robert Durham, Tucson, Arizona, phone 293-8864, was provided with information on mining companies which might be interested in leasing the Strong & Harris Deposit, Cochise County. A report was donated for the files and additional data was promised to the Department. Mr. Durham inherited a share of the property and also represents the other owners.

THE STRONG & HARRIS PROJECT

SUMMARY

Located in the Johnson Camp Mining District, Cochise County, Arizona, the property adjoins Arimetco's Johnsor Camp mine and SX-EW operation (formerly Cyprus) to the west and south. Over 130 core holes have been drilled to date.

Established geologic resources at the Strong & Harris (S & H) deposit total 50 - 60 million tons of copper/zinc oxide and sulphides containing approximately 750 million pounds of copper, 1 billion pounds of zinc and 12 million ounces of silver (0.62% Cu, 0.78% Zn and 0.20 oz/ton Ag), according to reports by Superior Oil, S & H's former owner. This includes open ended, high-grade zones containing 4.4% copper and 8.6% zinc, plus silver. A more recent calculation by third parties has indicated high-grade zones containing 3.8 million tons of 2.6% copper and 3.6% zinc, plus silver.

The top of the ore-grade mineralization, generally occurs at depths of 100 to 500+ feet, indicating underground mining methods will be required. The methods of recovery and the economics of the project are still to be determined.

LOCATION/INFRASTRUCTURE

The project is accessible from Interstate-10 by a 4-mile, all weather, gravel road. The property is 8 miles north of the Southern Pacific Railroad.

Adequate power should be available from a line extending into the Arimetco mine, about 2 miles from the center of the property. Tests to date indicate that sufficient process water could be readily and cheaply developed on and adjacent to the property. An adequate supply of skilled labor is available locally from Benson, Willcox and the immediate area.

PREVIOUS WORK

The deposit was originally staked by Strong & Harris Mining, who put down a number of drill holes that intersected mineralization. In 1967, an option was granted to Continental Materials Corp., with a reassignment to Superior Oil Co. in 1971. Superior undertook an extensive program of drilling, metallurgical testing, engineering and feasibility analysis. Information on 137 diamond drill holes and some of the metallurgy and engineering is available to AZCO.

Because of complex metallurgy, low metal prices and the relatively small size of the high-grade reserves by Superior's standards, the lease was dropped in the late 1970's. Beard Oil leased the property in 1979/80 but did no additional work.

Preliminary, conceptual mine design and engineering was performed by both Superior and Beard, along with some metallurgical test work. These tests demonstrated the potential for successfully working the deposit and pointed out areas for future research.

A large body of data is available, but much additional metallurgical and engineering work is required to determine the viability of the deposit. If viability is established, engineering, permitting and development will be initiated.

GEOLOGY/ORE RESERVES

The S & H deposit is a skarn/replacement manto type of copper porphyry centered around structural feeder zones in upper Paleozoic sedimentary rocks. Copper/zinc mineralization occurs in silicified and silicated limestones and shales. Pyrite is the most abundant sulphide and is present in hornfels, marbles and skarn. The S & H mineralized zone strikes NNW and is approximately 1 mile long and 1,000 to 1,500 feet wide. Where intersected by drill holes, the ore zone ranges from a few tens of feet to more than 500 feet thick. Grade varies widely. The highest grade mineralization occurs near the top of the central portion of the ore zone and in a lamprophyre intrusion (Peabody Sill) encountered in the southwest portion of the property.

Copper mineralization at S & H can be divided into three zones: an oxide zone, a thick mixed zone, and a sulphide zone. Ore mineralogy of the 100 - 200 feet thick oxide zone consists principally of chrysocolla, copper pitch, tenorite and malachite, chalcocite and several species of zinc oxides (smithsonite, hemimorphite etc). Pyrite, chalcopyrite, sphalerite, chalcocite and bornite are found in the sulphide zone. The mixed zone, 100 to 400 feet thick, occurs at the interface of the oxide and sulphide zones, has minerals from both zones present and exhibits increased quantities of chalcocite. Each zone contains about 1/3 of the ore. Ore associated with the Peabody Sill is almost entirely sulphide. All ore found at the S & H to date has been in the upper Paleozoics. At S & H the lower Paleozoics have not been tested, although this zone is responsible for 75%+ of prior production in the district.

Outstanding Royalites

Advance Minimum Royalties are as follows:

U.S.$	**45,000 to be paid by January 2nd 1993**
	55,000 to be paid by January 2nd 1994
	55,000 to be paid by January 2nd 1995
	55,000 to be paid by January 2nd 1996
	100,000 to be paid by January 2nd 1997 and thereafter.

The above advance royalties to be offset against production royalties and also count toward the $2.5 million cap on royalties. Base royalty is 3.0% on electrowon copper; 3.5% on cement copper and other chemical precipitates which are not an intermediate product; and 4.4% on all other forms of production.

AZCO may terminate the lease by giving 30 days notice to the owners.

AZCO does not intend to commence any further exploration and development work in connection with the Strong and Harris Property at this time, beyond those certain expenditures required under the outstanding royalties formula. Such expenditures are not expected to exceed $80,000 in any one year.

Cochise MILS 803

BEARD MINING COMPANY
Subsidiary of Beard Oil Co.

DON A. MONTGOMERY
President

STRONG & HARRIS PROJECT

SUMMARY PRIOR TO BEARD MINING CO. ENTRY

The Strong and Harris property is located in the Little Dragoon Mountains 65 miles east of Tucson in the Johnson Camp Mining District. It lies adjacent to the north property boundary of Cyprus and is 1 1/2 miles north of their open pit copper mine. Beard Mining Company presently controls 1,500 acres through 90 unpatented leased claims. The lease involves advance royalty payments and a 3.5% production royalty, all of which apply to a purchase price of $2,500,000.

A fairly typical southern Arizona Paleozoic section is preserved. The known mineralization is in Pennsylvanianand Permian aged Horquilla, Earp, and Colina formations which are overlain by 50 to 800+ feet of semiconsolidated gravels. The nearest intrusive is located two miles south; however, the metamorphism of the limestones is strong. The limestones are converted to marbles; silty carbonates to diopside tactites. The lower Earp has been intensely silicified and pyrrhotized. Presently drilled copper-zinc mineralization is confined to tactite units of all three formations.

A total of 137 diamond drill holes have been completed by previous operators: Superior Oil Company, Cyprus, and Continental Materials. Interest began in 1964 and the property was continually leased until recently. More than 100,000 feet of rotary drilling in alluvium and core drilling in bedrock has been completed.

The drilling has outlined a significant zone of copper-zinc mineralization which is continous for 5,000 feet along strike and 800 feet downdip. The mineralization ranges from 70 to 500 feet thick and has an overall dip of 45°. Mineralization occurs both as oxides and sulfides. Oxide mineralization is disseminated and fracture filling. Sulfide mineralization is strata-bound, but locally modified by oxidation.

Diamond drilling indicates geologic reserves of 53,000,000 tons of .62% copper, .72% zinc, and .20 ounce silver per ton. Included within this main mineralized zone are six separate zones of high grade material. Three high grade oxide deposits contain 1,200,000 tons of 4.43% copper, 7.47% zinc, and .35-.50 ounce silver per ton. Three high-grade sulfide deposits contain 500,000 tons of 4.43% copper, 11.2% zinc, and .35-.50 ounce silver per ton. The average thickness of these zones is 14.3 feet. The high grade deposits have not been fully delineated by drilling and are open on both ends along strike. Superior drilled 6 additional holes, 132-137 which were completed after the above tonnage estimates. Several of these additional holes intercepted high grade mineralization such as D.H. 134 459-464, 8.04% Cu and 11.30% Zn. These additional holes add substantially to the tonnage and no doubt additional mineralization exists.

A separate copper-zinc deposit occurs in a lamprophyre sill near the southern boundary of the property. It has been drilled and contains at least 750,000 tons of 1.81% copper, 1.36% zinc and .78 ounces silver per ton.

Significant problems were encountered with metallurgy as this is a complex sulfide-oxide ore and flotation testing has not resulted in a clean separation of copper and zinc minerals. This is primarily due to activation of zinc by copper salts in the ore. Not all selective flotation methods have been tried. Most of the testing has been initiated on the bulk low-grade deposit. It has been possible to achieve copper recoveries of 75% and zinc recoveries of 60% in a bulk concentrate.

Superior considered the possibility of additional research to improve the recoveries in a bulk concentrate; and then roasting and leaching to recover the metals from solution. An alternative is to produce a marketable bulk concentrate. Some leach tests were conducted on the oxide ore with good recoveries; however, it was found that up to 600 pounds/ton of H_2SO_4 could be consumed.

A considerable amount of the testing was done by Mountain States Engineers. They report that the testing to date is only preliminary and has, by no means, been optimized. The past objectives were to develop the property as a bulk low-grade tonnage deposit and the high-grade zones have not been singled out separately for metallurgical testing.

A preliminary feasibility study was conducted by the Ralph M. Parsons Company for Superior Oil Company.

Cyprus apparently dropped the property because of insufficient exploration and nonconclusive results. Continental Materials drilled several holes and gave Superior Oil Company an option to purchase their lease. Superior drilled several holes and delineated several deposits. They were apparently interested in a large bulk tonnage deposit and the Strong and Harris property didn't appear to fulfill that potential.

SUMMARY AFTER BEARD'S ENTRY

Beard Mining optioned the S & H property due to the dual potential which exists. The high grade deposits (gross revenue of + $200,000,000) look attractive for the near term and the low grade deposit (gross revenue of $1,220,000,000) has long term potential.

Hopefully the high grade could be brought into production and the property would be purchased out of royalty; the low grade deposit can be held indefinitely for the future at little or no cost.

Prior to Beard's entry, the property had not been drilled below 2,400 feet. The lower Paleozoic carbonates, such as the lower Pennsylvanian Horquilla or Mississippi Escabrosa may be favorable hosts. This would be particulary true if the S & H mineralization represents a separate locus of ore deposition from depth rather than a lateral migrating copper-zinc deposit which is peripheral to and related to the Texas Canyon intrusive (located 2 miles south-southwest).

INFRASTRUCTURE

The deposits are well located with respect to access. It is located 2½ miles north of Interstate 10 near Dragoon, Arizona. The Southern Pacific Railroad passes through Dragoon which is 6 miles south of the property. A reasonable water supply should be available as Cyprus Johnson Mining Co. presently pumps water from wells located as close as 100 feet to the S & H property. A new high-voltage transmission power line has been constructed which passes through the center of the property.

Should the property look attractive for production, a possibility exists that a mine and mill complex could be partially or completely financed through low interest community industrial revenue bonds.

EXPLORATION

Beard Mining initated several types of activity in June, 1980. An exhaustive petrographic study was begun of selected mineralization in various drill holes. The mineral zonation, metamorphic assemblages, and retrograde effects indicated that metal-bearing fluids probably were generated from the Texas Canyon stock and migrated N-NE along favorable contacts and fracture zones. The mineralization does not appear to be related to a separate source beneath the property.

Beard Mining selected D.H. 83, which was previously core drilled to a depth of 2334 ft., as a site for testing lower stratigraphic units. It was considered favorable as it is located between 2 premineral (?) faults and was one of the deepest stratigraphic holes.

Beard Mining completed the core hole in Sept., 1980 at a total depth of 3835. The work was applied as assessment work for both 1980 and 1981. The hole tested most of the lower Horquilla; however, it did not penetrate the Black Prince or The Escabrosa due to increasing dip with depth. Minor intercepts of low-grade copper-zinc-silver were encountered.

Superior Oil Co. dumped all of the previous drilled core (50,000-60,000 feet) at a locality on the property. The core and boxes were left outside in the weather for five years and were in terrible condition. Beard Mining purchased 2 used trailer vans and moved them to the vicinity. Steel

racks were installed and most of the core was salvaged, re-boxed, sorted and placed in the vans for permanent weather-proof storage.

DR. SHANTZ AMMONIA PLANT FEASIBILITY AND CASH FLOW.

Dr. Robert Shantz, a consulting metallurgist, was retained to complete a report on the viability, capital costs, operating costs and cash flow of an ammonia leach plant (high grade oxide deposit only).

Mr. Shantz assumed a ore grade of 4.0% oxide copper, .:% sulfide copper and 7.0% zinc. The reserve used was Superior Oil's computer estimates of 1,200,000 tons. Recoveries were assumed to be 80% of oxide copper, 80% of sulfide copper, and 60% of the oxide zinc.

The plant scheme calls for crushing and grinding to 65 mesh, followed by ammonia-ammonia carbonate leach. Following leach, filtrate is sent to solvent extraction and copper is stripped and sent to an electrowin plant. Zinc carbonate is recovered prior to copper electrowinning. The filter cake after leaching is conditioned and floated to recover copper sulfides (the grade and composition of the concentrate is unknown).

Capital mill costs are estimated at $15,634,000. This amount covers the complete cost of crushing, grinding, leaching, floating, tailing disposal, solvent extraction, electrowin, and $2,000,000 for working capital. Mine development and equipment were assumed at $2,500,000. The total capital required for mine and mill is $19,000,000.

Mining costs are assumed to be $25.00/ton and milling costs were estimated at $36.29/ton. A careful analysis of these and other costs are indicated in the following cash flow data. (3.0% royalty was not used, nor were investment tax credits, nor declining property taxes over operation life)

Copper price	1.00	1.10	1.20	1.30
Zinc price	.30	.35	.35	.35
Gross/Ton	92.80	104.12	111.23	118.35
Cash Flow/Ton	25.59	35.89	41.07	46.18
Total Return (1,000's)	33,107	43,038	49,284	55,414
Payout Years	4.92	3.78	3.30	2.94
Payout Ratio	1.74	2.27	2.59	2.92
Return (Non-discounted)	17.4	22.7	25.9	29.2

The mine development and equipment costs are probably low. Zinc demand was not projected to increase significantly in the future.

The above costs are rough; recoveries are assumed; no metallurgical testing has been completed; however, the over-all study indicated that further exploration and metallurgical testing are certainly warranted.

ADDITIONAL FAVORABLE INDICATIONS THAT INCREASE RETURNS.

1. The price of zinc has increased to 39.5¢/lb. at the time of this writing. The return, non discounted, at $1.00/lb. copper and 39.5¢/lb. zinc would approximate 21%.

2. Recoveries could probably be improved through research.

3. The above plant design did not take into account the 500,000 tons of high grade sulfide deposits at 4.47% copper and 11.2% zinc. The oxide and sulfide deposits occur separately and could be mined separately. By adding to the flotation circuit, this material could easily be concentrated. If the concentrates are not salable, a small roaster could convert the sulfides to oxides and then back to the leach circuit. These reserves would add almost 4 years life to the operation and raise the overall average grade.

4. Superior Oil's drill holes 132-137 were drilled after computer estimates were made. One of the additional drill holes alone suggests an additional 150,000 tons of high grade oxide ore.

5. The high grade deposits are open ended both to the north and south. No doubt additional tonnage will be found.

6. The ammonia leach circuit could be followed by cyanidization at low capital cost. 600,000 ounces of silver in the high grade oxide at 80% recovery would generate $9,600,000 of additional revenue.($20.00 Silver) Additional operating costs would be minimal.

7. Possibly copper-zinc-silver could be recovered through fine crushing and the grinding eliminated. The minor sulfide portion of the oxide deposit would not be recovered; however, capital costs would be substantially lowered due to no grinding, no floatation circuit, and a cheaper tailings disposal system.

8. The Cyprus Johnson mine-mill complex is located 1½ miles south of the S & H mineralization. Their solvent extraction and electrowin plant is approximately the same capacity as that which would be required by an S & H high grade oxide operation of 400 T/D.

The Cyprus plant is presently scheduled to close in mid-1984 as a result of high over-burden/ore ratios. They are presently exploring for additional reserves at other locations to extend the life. Cyprus management, in talks to Beard Mining, indicate that should they not be able to extend reserves, the plant would either be sold or put on standby. They would probably be willing to lease the plant to Beard Mining or operate it as a custom plant. This possibility would decrease the capital costs for S & H by at least some $6,000,000 - 7,000,000.

The Cyprus plant could easily be used with ammonia leach systems. An intermediate facility for the precipitation of zinc carbonate would have to be constructed.

9. The Peabody Sill area with more than 750,000 tons of reserve which contain in excess of 3% copper equivalant may appear economic after the high grade deposits are exhausted. A significant area of somewhat smaller dimensions within the 750,000 tons may average 4% copper equivalant.

A rising silver price will add to the attractiveness of this deposit as it contains .78 ounce silver/ton.

All of the above factors enhance the possible feasibility and cash flows for the S & H high grade deposits.

PROJECTED COPPER AND ZINC PRICES.

The demand for zinc is not expected to increase for several years. The present price of copper is not expected to increase substantially until 1982-1983 as the price is dominated by free world demand and many of these countries are just beginning to enter a recession. By 1984, the demand and price for copper should be strong. The large U.S. producers report that copper will have to be near $1.40/lb. (1980 base) to justify bringing new deposits into production.

Since copper demand and price is traditionally cyclic, the most favorable time to acquire and explore a property is during a recession. Should the property warrant production, hopefully, beginning production would coincide with a coming cyclic high. This cyclic revenue will somewhat be balanced by silver prices as precious metals tend to be higher in recessionary periods.

JOINT VENTURING.

Several short cuts exist on types of extraction. It may be possible to leach the ore and produce cement copper and also recover most of the zinc. Solvent extraction and electrowinning circuits would be eliminated which reduces the capital cost considerably. Beard Mining believes that the property contains enough long term potential to try to work out a metallurgical plan to recover as much copper, zinc, and silver as is economically possible and not necessarily sacrifice recoveries for a lower capital cost.

From this type of viewpoint, the property at this time appears to be too capital intensive for Beard Mining and the management wishes to decrease the risk and requirements for capital by joint venturing the property.

STRONG & HARRIS

UNTESTED POTENTIAL FOR INCREASING TONNAGE

1. HIGH GRADE DEPOSIT. Open ended on both ends. Every drill hole which penetrated the Earp-Colina contact encountered high grade ore. Approximately 4,000 feet of strike along this contact is untested.

2. LOW GRADE DEPOSIT. Open ended on one and possibly two sides. All sides are poorly defined at present.

3. PEABODY SILL. Open ended on three sides.

4. MISSISSIPPI ESCABROSA. Not tested anywhere on property. This formation was the major host of high grade copper-moly mineralization at the I-10 prospect located three miles to the south. (see report on I-10 prospect) This formation underlies the entire property.

5. CAMBRIAN ABRIGO. Not tested anywhere on property, and is probably fairly deep. This is the only host at the Cyprus mine which is producing. It is heavily mineralized 1/2 mile southwest of our property boundry and dips underneath the property.

6. I.P. ANOMALIES. Several anomalies remain untested. I.P. anomalies exist around the Peabody sill area; along possible extensions of the low grade deposit to the south-east; a large anomaly which is parallel to and extends from the last high grade holes to the south-east. This could very easily represent an extension of the High Grade South deposit.

7. MAGNETIC ANOMALIES. Aeromagnetics indicate that the Cyprus mine is probably related to the margin of a magnetic low. The map indicates a large north-west trending magnetic low of which the Strong and Harris deposit is located on the south-east margin. This low may indicate a separate untested buried source for the Strong and Harris mineralization. (see map).

8. ADJACENT PROPERTIES OF MERIT. Other properties can possibly be acquired.

BEARD MINING COMPANY

STRONG & HARRIS PROJECT

Preliminary Ammonia Leaching Plant

Rough Costs

Sept. 2, 1980

Robert Shantz
Metallurgist Consultant

Table of Contents

P.O. Box 113
San Antonio, NM 87832
August 30, 1980

Mr. Don Montgomery, President
Beard Mining Company
1725 Juniper Avenue
Silver City, New Mexico 88061

Dear Don:

I've attached some comments on the preliminary ammonia leaching plant for the Strong & Harris high-grade oxide deposit, together with xerox copies of articles on leaching with ammonia for your files. In analyzing these articles, you need to remember that when these plants were running labor was relatively cheap while ammonia and other supplies were relatively expensive.

I've written the Cochise County Assessor's Office to see if I can get a better estimate of the property tax. I'll send the information along when it comes in.

After I get some better information on a few of the major items, I'll run a better financial analysis. If you need something sooner, give me a call.

Sincerely,

Robert Shantz

GENERAL PROCESS DESCRIPTION

The process described in this preliminary evaluation consists of crushing and grinding the high grade ore to a 65 mesh nominal size, followed by an agitated ammonia—ammonium carbonate leach. Since little information is available on the time required for recovery of zinc minerals, a mean retention time of 24 hours was allowed for leaching. Metallurgical tests are definitely required to better define both the retention time and the fineness of grind that will be required to achieve an economic recovery.

Following the leach, the pulp is filtered and the filtrate sent to the solvent extraction circuit. The copper in the filtrate, but not the zinc, should be readily and completely extracted. The loaded organic is then stripped, and the pregnant electrolyte sent to the electrowinning section. The recovery of copper from an ammoniacal leach stream by SX-EW has been demonstrated several times, including Anaconda's Arbiter plant in Butte.

The raffinate, or tails stream from the copper solvent extraction section, is then treated with zinc dust to precipitate any remaining copper and all metals more noble than zinc, which would include most impurities. The solution is filtered to recover these metals, and then sent to crystallizers. Here steam is used to strip ammonia and carbon dioxide from the solution. Condensers on the off gas stream will recover essentially all the stripped ammonia. The carbonates in the raw ore could be expected to provide sufficient make-up carbonate.

Once the ammonia is stripped, the zinc will precipitate as the zinc carbonate which can then be filtered, dried and shipped. If a suitable price cannot be obtained for zinc carbonate, it can be calcined to produce zinc oxide. Zinc oxide should be readily marketable, and should yield a price equal to about the current market price for the contained zinc.

The filter cake from the leach filters is then repulped and conditioned with flotation reagents, and treated in the flotation plant to recover the copper sulfides that did not leach. It is assummed at this point that an acceptable copper sulfide concentrate can be produced, but that zinc sulfide concentrate cannot be recovered economically. Some silver may report with the chalcopyrite in the copper concentrate. The economic value of the concentrate is somewhat debatable at this point. More information on the leachability and flotation characteristics of the ore are required before proper decision can be made. Also, since only a limited additional profit is expected, it might be desirable to eleminate the flotation section to reduce the initial costs of the plant. The copper concentrates are filtered, and shipped to a custom smelter while the tailings are thickened and sent to the tailings pond.

The use of filtration rather than counter-current decantation in thickeners for separating the leach solution from the pulp is open to question. For the fairly short life projected for this operation, used filters of adequate size can probably be obtained for considerably less than the cost of field erecting a series of thickeners. Wash water streams on the drum filter will be required to minimize soluble losses in the filter cake.

Allowance was made for a cleaner flotation section. Another alternative that should be considered is pulling the final concentrate from the first of the rougher cells and returning the middlings from the later cells to this first cell. Doing this would somewhat simplify the circuit, and reduce the cost of the section slightly.

If the ore proved extremely easy to leach, the possibility of using vats rather than a fine grind—agitation leach becomes possible. A longer leach retention time would be required so the savings in the agitation section would be limited. However, eliminating the fine grinding (ball mill) would result in a considerable reduction in capital costs both for the circuit itself and for its supporting electrical facilities. When an adequate amount of representative ore becomes available for metallurgical testing, a comparison of the two methods should be made.

Another possible leach scheme would be a fairly coarse grind followed by leaching the coarse fraction in sand tanks and the fines in agitators. Leaching a coarse sand in tanks was used by Kennecott in Alaska with considerable success. However, this approach will probably be more labor intensive than the other methods.

COMMENTS ON CAPITAL COSTS:

The capital cost of the plant was estimated by pricing the major process equipment for the plant with the exception of the solvent extraction--electrowinning sections. This process equipment cost was then adjusted with standard prodedures for the total capital investment. For the solvent extraction--electrowinning sections, cost data from General Mills (now Henkel) was averaged and adjusted for inflation. The process equipment costs and the installation costs are detailed in the appendix. This total, direct plant cost exclusive of SX-EW, was then added to the estimated cost of the SX-EW plant, and the contractor's fee, contingency and spare parts added in. From this total, an additional allowance of 15% was made for working capital.

Several comments are in order on the process equipment and support facilities.

The crushing plant was estimated as the cost of a portable plant from Barber-Green (Telsmith). However, this total was included in the plant process equipment which is then multiplied by a factor of over 4 to arrive at the installed cost. Doing so probably makes the direct plant cost estimate high.

As can be seen from the table, the cost of the ball mill is a significant portion of the process equipment cost. If coarse leaching is possible, this item might be eliminated or reduced considerably. Thus, up to a million dollars might be saved.

The marginal benefit of the sulfide flotation section is limited. About $600,000 in initial capital costs might be eliminated by omitting this section.

The capital costs for utilities are a major item, thus any modification to the process requirements for steam or electricity will result in significant capital cost reductions. As was noted under operating costs, however, power generation on site might allow sufficient cogeneration of steam to more than offset the initial capital costs.

The tailings dam cost was estimated by assuming that a dam would be built to hold the total tailings. In actual proactice, a starter dam would be constructed, and the dam raised as required with tailings. However, no reclamation costs were included, so the overall cost might be realistic.

COMMENTS ON OPERATING COSTS:

Direct Costs:

Operating Labor: This item includes the wages of the operating personnel only. Supervisors, maintenance and support personnel are not included. In addition, fringe benefits including workman's compensation and social security taxes are not included. These are included in payroll overhead, which is estimated at 35% of all salaries and wages.

This estimate is based on the assumption that union scale wages will be paid, and that these will be approximately $9/hr for laborers, $11/hr for helpers, and $13/hr for operators. One operator per shift was included for the plant, to be assisted by two operator's helpers. One helper can probably cover the grinding section, leach and flotation sections; the other the SX-EW plant and zinc precipitation plant. A crusher operator and loader operator will be required on day shift only, five days per week. Four laborers were included. Besides general labor, they would be responsible for stripping and preparing starter sheets in the EW section, which can be quite time consuming.

Since a shift foreman is included on each shift, it might be possible to eliminate either the operator or one of the helpers from each shift. In this small a plant, it is assumed that the shift foremen whill be working foremen.

Supervision: This category includes only those supervisors required to supervise the direct operation of the plant. A mill superintendent and four working shift foremen were estimated, one on each shift. In addition, the superintendent will have the half-time services of a clerk who will be shared with the mine superintendent. The salaries used are comparable to those in union plants. Note that at $13/hr, operators make about $27,000/yr without overtime.

Maintenance: This category includes the salaries, but not fringes, of the maintenance staff together with the repair parts and supplies required for normal maintenance. High wear items, such as grinding balls and mill and crusher liners are included in plant supplies.

Since the mine/mill combination will be reasonably complicated, it is assumed that the entire operation will require a master mechanic, electrical foreman, electrician, machinist, and one mechanic per shift. These personnel will be shared evenly by the mine and mill. In addition, the mill may well require an instrument man, whose salary must be charged entirely to the mill. A 10% allowance for unscheduled overtime was made. Maintenance materials are estimated at 3% of fixed capital per year, in keeping with the recommendations of standard sources.

COMMENTS ON OPERATING COSTS CONTINUED:

Plant Supplies: These are the reagents and other consumable materials used in the normal operation of the plant. The ball and liner usage of 1# and ½#/ton of ore are in line with average conditions. In the oxidized zone, the consumption may be somewhat lower. The ammonia consumption is based on reported data from Kennecott, Alaska and Calumet and Hecla. They made extreme efforts to recover ammonia because of the cost at the time (25-35¢/lb in 1920's). Thus, it may be more economical now to tolerate a higher ammonia loss in order to reduce the steam consumption in the stripping circuit. The cost of flotation reagents and SX reagents are based on published data, adjusted for inflation. The others category is based on recommended percentages.

Utilities: Utilities include process heat, steam, and electricity. This is an extremely large portion of the direct costs, and may well be an area that can be reduced significantly. The power consumption is in line with standard practice and cannot be reduced significantly. However, the 5¢/kwh charge might be reduced significantly if on-site facilities for power generation were built. In addition, the waste heat from power generation could provide a significant portion of the required steam.

The process steam consumption is based on data from the Kennecott and Calumet & Hecla operations. This might be reduced significantly by tolerating a higher ammonia loss or using vacuum equipment. At last report, coal could be bought fob Pittsburg & Midway at Gallup for about $8/ton for 8000 BTU/lb coal. A freight tarriff would have to be obtained from Santa Fe and Southern Pacific to better estimate the shipping cost. Since unit trains are now run from Gallup to the Cochise power plant at Wilcox, a fairly good freight tarriff might be possible.

The butane is required to heat buildings. The 100,000 gallon figure is strictly a rough guess.

Payroll Overhead: This item includes workman's compensation taxes, social security taxes, retirement and medical plans, sick leave and vacation time, etc. Current practice is to use 35% or there about for this item, taken over all wages and salaries.

Laboratory: This is the assay office required to support the mine and mill. Since numerous process streams must be monitored in the plant, it was assumed that an assayer would be required on each shift as well as two sample buckers on day shift to handle solid sample preparation. The assayers were assigned 3/4 time to the mill, the buckers ½ time. Allowance was made for a chief chemist. It is possible that the mill superintendent could also oversee the laboratory since there will be competent assayers on all shifts. Laboratory supplies are estimated at 30% of laboratory salaries and wages.

INSTALLED COSTS

Utilities & Tailings Dam

Steam: Field Erected Boiler, 20,000#/h		$410,500	$ 410,500
Electricity:	Electrowinning, 1200 kva Plant, motors etc. 950 kva		
	Major distribution: (sustations, etc.)	$980,700	
	Power Line: 10 miles	150,000	$1,130,700
Tailings Dam:	1,000,000 sq ft by 30 ft high		
	Lining @ $5/sq yd	$185,000	
	Berms: 240,000 cu yd @$1	240,000	
	Reclaim Pumps, towers, etc.	75,000	500,000
Loader: 4 Cu yd for crusher feed & general cleanup			83,500
	Sub-Total		$2,124,700

Solvent Extraction—Electrowinning Plant:

The cost of this plant, installed, is estimated by taking a mid-range figure from a Henkel Corp. (General Mills) bulletin and adjusting to 1980 prices.

$170/#/da Cu times 25,600 #/da	$4,352,000
Total Installed Costs for Items not included in main Plant estimate:	$6,476,700

INSTALLED COST

(Excluding SX-EW and Utilities)

Process Equipment Cost:	$1,532,400
Field Erection @ 14%	214,000
Foundations & Supports @ 12%	183,900
Piping & Chuting @ 22%	337,100
Electrical Installation @ 19.5%	298,800
Instrumentation @ 10%	152,400
Miscellaneous @ 5%	76,600
Buildings @ 35%	536,300
Service Facilities (exl. steam & major elec) @30%	459,700
Land, 100 acres @ $400	40,000
Physical Cost:	$3,831,200
Engineering & Construction @ 25%	957,800
Direct Plant Cost:	$4,789,000

TOTAL CAPITAL INVESTMENT

Direct Plant Cost from Above	$4,789,000
Utilities & Tailings Dam	2,124,700
Solvent Extraction—Electrowinning	4,352,000
Total Direct Plant Cost:	$11,265,700
Contractor's Fee @ 5%	563,300
Contingency @ 15%	1,689,900
Spare Parts @ 5% of process equipment	76,600
Total Fixed Capital:	$13,595,500
Working Capital @ 15%	2,039,300
Total Capital Investment:	$15,634,800

MAJOR PROCESS EQUIPMENT

(Excluding SX-EW)

Crushing/Grinding:	Installed HP	Estimated Cost,$
1. Portable Crushing Plant, 20"x36" jaw crusher, 36" cone crusher	200	250,000
Electric Motors for plant		7,100
2. 24"x100' conveyor to fine ore bin	7½	29,400
3. Fine Ore Bin, Steel, 1200 ton		64,700
4. Variable Speed Feeder, 18"	7½	20,000
5. 24"x50' Conveyor to Ball Mill	7½	14,700
6. Ball Mill, Marcy Grate, 8½'x6'	250	242,000
electric motor		7,900
7. Cyclones, 10", 2 ea		4,000
8. Cyclone Feed Pump w/motor	25	2,900
9. Head Water Tank, 100,000 gal		66,200
10. Ammonium Carbonate Condensate Tank 50,000 gal		37,100
Crushing/Grinding Sub-Total		$746,000

Leach Plant:		
1. Agitated Tanks, Steel, w/covers and motors, 45,000 gal, 3 ea	90	204,200
2. Drum Filter, 710 ft^2, w/vacuum equipment	20	250,000
Leach Plant Sub-Total		$454,200

Major Process Equipment Cont.

	Installed HP	Estimated Cost,$
Flotation Section:		
1. Repulping Agitator/Conditioner	5	10,000
2. Flotation Cells, 5-100 cu ft, for rougher flotation, w/motors	25	38,500
Flotation Cells, cleaners	10	5,000
3. Tailings Thickeners	5	22,000
4. Concentrate Filter w/vacuum equip.	5	31,300
5. 60 ton concentrate storage bin		8,200
6. Misc. pumps and sumps	10	20,000
Flotation Section Sub-Total		$135,000
Zinc Precipitation Plant:		
1. Crystallizers, 30 tpd		111,100
2. Condensers, ammonia		20,000
3. Zinc Dust Precipitation (feed prep)		20,000
4. Filter, zinc carbonate, w/vacuum equip		31,300
5. Dryer/Calciner for zinc oxide		15,000
Zinc Precipitation Plant Sub-Total		$197,400

Note: Solvent Extraction—Electrowinning and Tailings Dam Costs Estimated Separately:

Total Process Equipment Costs:

Crushing/Grinding	$746,000
Leach Plant	454,200
Flotation Section	135,000
Zinc Precipitation Plant	197,400
Total	$1,532,400

MATERIAL BALANCE

(Major Process Streams Only)

Basis: Mill feed = 400 stpd, containing 7.0% oxide zinc, 4.0% oxide copper, and 0.5% sulfide copper. Extractions are assumed to be 60% for oxide zinc, 80% for oxide copper, and 80% for sulfide copper. The mill will run 24 hours per day, 350 days per year. The crushing plant will have full feed for 7 hours per day, 5 days per week.

Stream	tph solids	tph water	comments
Crusher feed	80.00	4.00	5% moisture
Grinding:			
ball mill, new feed	16.67	.83	5% moisture
leach feed	16.67	16.67	50% solids
cyclone feed	66.67	44.45	60% solids
cyclone underflow	50.00	27.78	65% solids
total mill feed	66.67	28.62	70% solids
make-up water		15.83	
Leach Plant:			
leach feed	16.67	16.67	92 gpm slurry
filter feed	14.35	16.67	2.32 tph dissolved
filter cake	14.35	1.44	10% moist
soln. to SX		19.55	2 washes on filter
Flotation Plant:			
filter cake	14.35	1.44	
flotation feed	14.35	33.48	30% solids
make-up water		32.04	
rougher concentrate	.445	1.04	30% solids
final concentrate	.267	.027	10% moisture, 25% Cu
cleaner underflow	.173	.534	25% solids
filter feed	.267	.401	40% solids
Zinc Precipitation:			
raffinate from SX		19.55	71.6# Zn/ton water
zinc precipitate	1.346	.135	10% moisture
stripped solution		19.42	

Note: Individual flows for the solvent extraction—electrowinning plant are not required as a different method was used for its cost estimation.

OPERATING COSTS CONT.

Operating Labor:

This estimate is based on the assumption that the following personnel will be required to handle the fairly complex operation.

Shift Personnel: One operator and two helpers. For the 7 day per week schedule this gives 4 operators and 8 helpers total.

Day Shift, 5 da/week only: A loader operator and crusher operator will be required for the crushing plant. 4 laborers will be required for stripping starter sheets and general mill work.

Hence, the operating labor costs will be as follows (excluding payroll overhead).

Operators: 6 @ $13/hr	$162,240
Helpers: 8 @ $11/hr	183,040
Laborers: 4 @ $9/hr	74,880
Operating Labor:	$420,160 or $3.00/ton of ore

Supervision:

A mill superintendent and one shift foreman per shift will be required. A clerk will be shared with the mine superintendent.

Mill Superintendent:	$ 40,000
Shift Foremen: 4 @ $30,000	120,000
Clerk: ½ time @ $20,000	10,000
Supervision:	$170,000 or $1.21 per ton of ore

Maintenance:

A master mechanic, electrical foreman, electrician, and one mechanic per shift, and a machinist/welder will be shared evenly with the mine. An instrument man will be assigned to the mill.

Master Mechanic: ½ time @ $40,000	$20,000
Electrical Foreman: ½ time @ $40,000	20,000
Mechanics: 4 ea, ½ time @ $13/hr	54,080
Electrician: ½ time @ $30,000	15,000
Machinist/Welder: ½ time @ $13/hr	13,520
Instrument Man:	30,000
Direct Maintenance Labor:	$152,600
Unscheduled Overtime: @ 10%	15,260
Maintenance Materials @ 3% of Fixed Capital:	407,870

OPERATING COSTS CONT.

Plant Supplies:	$/ton ore
Grinding Balls: 1#/ton ore at $1/lb	1.00
Mill/Crusher Liners: ½#/ton @ $2	.50
Ammonia: 2#/ton @ 13¢	.26
Flotation Reagents: 0.2#/ton @ $2	.40
SX Reagents: (Henkle estimate)	.64
Others: @15% of maintenance	.62
Plant Supplies:	$3.42/ton or $478,270 / yr

Utilities:

Electricity: @ 5¢/kwh	
Grinding @ 20 kwh/ton ore	$1.00 / ton ore
Electrowinning @ 1 kwh/lb Cu	3.20 "
General @ 15 kwh/ton ore	.75
Total Electric	$4.95 / ton ore

Process Steam:

Assume that coal is used to generate the steam, and that all costs other than fuel for steam generation are included in operating costs. Coal can be purchased from P&M in Gallup for about $8/ton, and averages about 8000 Btu/lb. Assume that it can be delivered to Johnson for $22/ton, and burned with an 80% efficiency. Fuel costs for steam will then be about $2.50/1000#

Steam: 1200#/ton ore @ $2.50 $3.00 / ton ore

Water: Water losses will amount to about 25% of the tailings weight, or about 55 gal/ton of ore.

Water: 55 gal/ton @ 50¢/1000 gal $0.03/ton ore

Butane: Assume that 100,000 gal will be required per year for heating, etc.

Butane: 100,000 gal/year @ 65¢/gal $65,000 /year

Utilities:	
Electircal	$4.95/ton ore
Steam:	3.00
Water:	.03
Butane:	.46
Total:	$8.44/ton ore or $1,182,200 / year

OPERATING COSTS CONT.

Payroll Overhead:

Operating Labor:	$420,160
Supervision:	170,000
Maintenance Labor:	167,260
Assay Labor:	127,880
Overhead:	78,940
Total Wages & Salaries:	$964,240
Payroll overhead @ 35%	$337,480 or $2.41/ton ore

Laboratory:

Because of the number of streams in the mill, assume that an assayer will be required on each shift, and a chief chemist for supervision. Assign their salaries 75% to mill, 25% to mine. Two sample buckers will be required on a five day week basis, assigned evenly to mine and mill.

Chief Chemist: 3/4 time @ $40,000	$30,000
Assayers: 4 ea, 3/4 time @ $25,000	75,000
Sample Buckers: 2 ea, ½ time @ $11/hr	22,880
Laboratory Labor:	$127,880
Laboratory Supplies: @30%	38,360
Laboratory:	$166,240 or $1.19/ton ore

Plant Overhead:

The plant overhead will include a plant engineer, accountant/purchasing agent, warehouse clerk, and receptionist/typist. A plant manager will also be required. All personnel will be evenly shared by the mine and mill.

Plant Engineer: ½ time @ $40,000	$20,000
Accountant/Purchasing Agent: ½ time @ 30,000	15,000
Warehouse Clerk: ½ time @ $11/hr	11,440
Receptionist/Typist: ½ time @ 15,000	7,500
Plant Manager: ½ time @ $50,000	25,000
Plant Overhead Wages & Salaries:	$78,940
Telephone, Office Supplies, etc.	10,000
Plant Overhead:	$88,940 of $0.64/ton ore

OPERATING COSTS CONT.

Property Taxes:

Arizona uses Hoskold's method to discount projected future earinging to arrive at a net present value for tax purposes. For the present estimate, the total capital investment will be used for the present value. A tax rate of $9/ $100 of assessed value will be used. The assessed value is 60% of the present value. The tax will be assigned to the mill.

Property Tax: $15,634,800 x 60% x 9% $844,280 or $6.03/ton ore

Severence Taxes:

Arizona has a Privilege Sales Tax of 2½% of the value of the minerals produced. An estimated net return of $93/ton will be used.

Severence Tax: $93/ton @ 2½% $2.33/ton ore or $325,000 per year

Insurance: Estimate at 1.5% of depreciable capital cost

Insurance: $13,555,500 @ 1.5% $203,300 or $1.45/ton ore

Administration: Estimate at 6% of direct, indirect, and fixed costs exluding depreciation.

Administration: $4,793,320 @ 6% $287,600 or $2.05/ton ore

OPERATING COSTS

	Dollars per year	$/ton
DIRECT COSTS:		
Operating Labor	$420,160	$3.00
Supervision	170,000	1.21
Maintenance	575,130	4.11
Plant Supplies	480,590	3.42
Utilities	1,182,200	8.44
Direct Costs:	$2,828,080	$20.18
INDIRECT COSTS:		
Payroll Overhead	$337,480	$2.41
Laboratory	166,240	1.19
Plant Overhead	88,940	.64
Indirect Costs:	$592,660	$4.24
FIXED COSTS: (excluding depreciation)		
Property Tax:	$844,280	$6.03
Severence Tax:	325,000	2.33
Insurance:	203,300	1.45
Fixed Costs:	$1,372,580	$9.81
ADMINISTRATION:	$287,600	$2.05
TOTAL OPERATING COSTS:	$5,080,920	$36.29

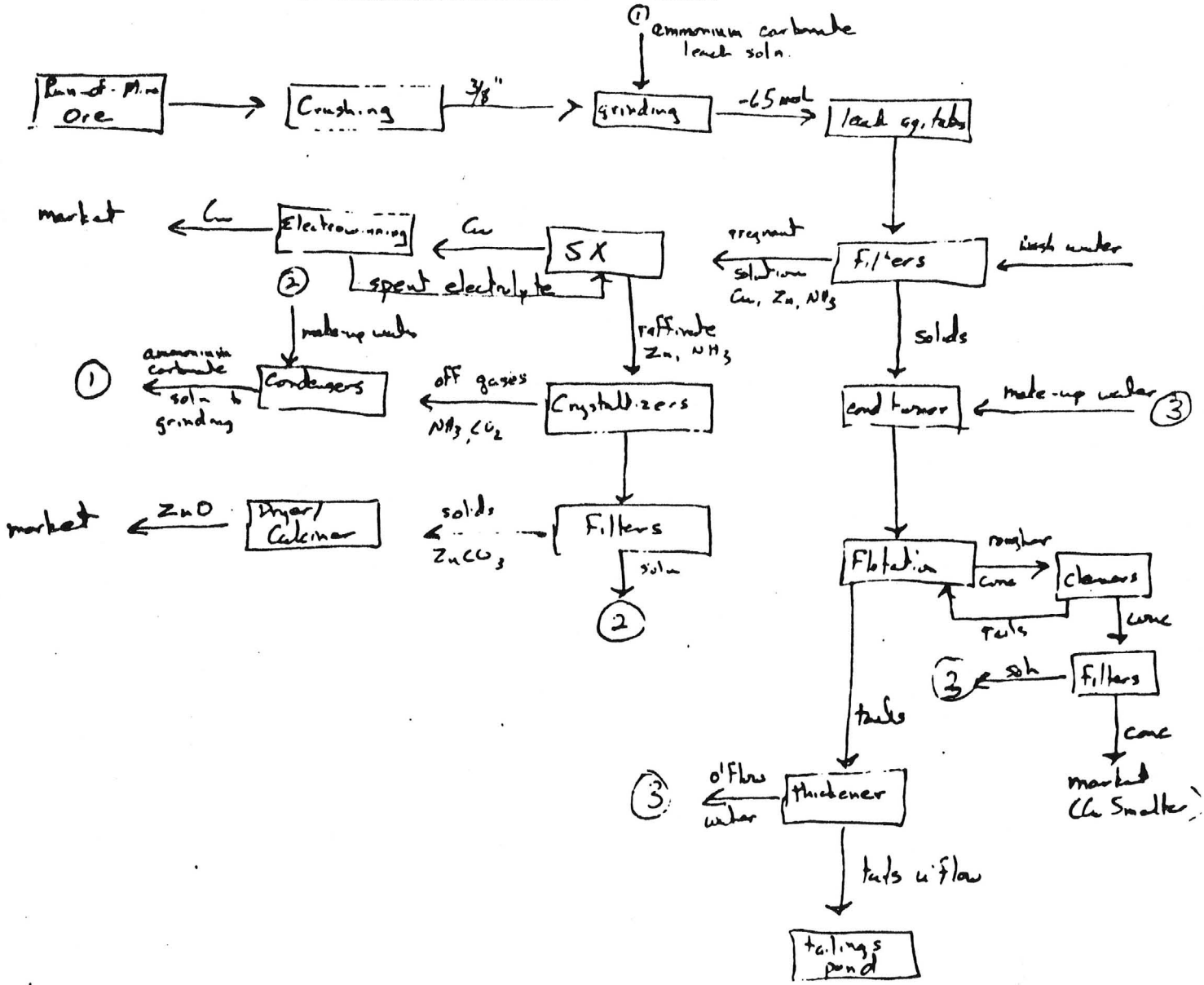
CASH FLOWS

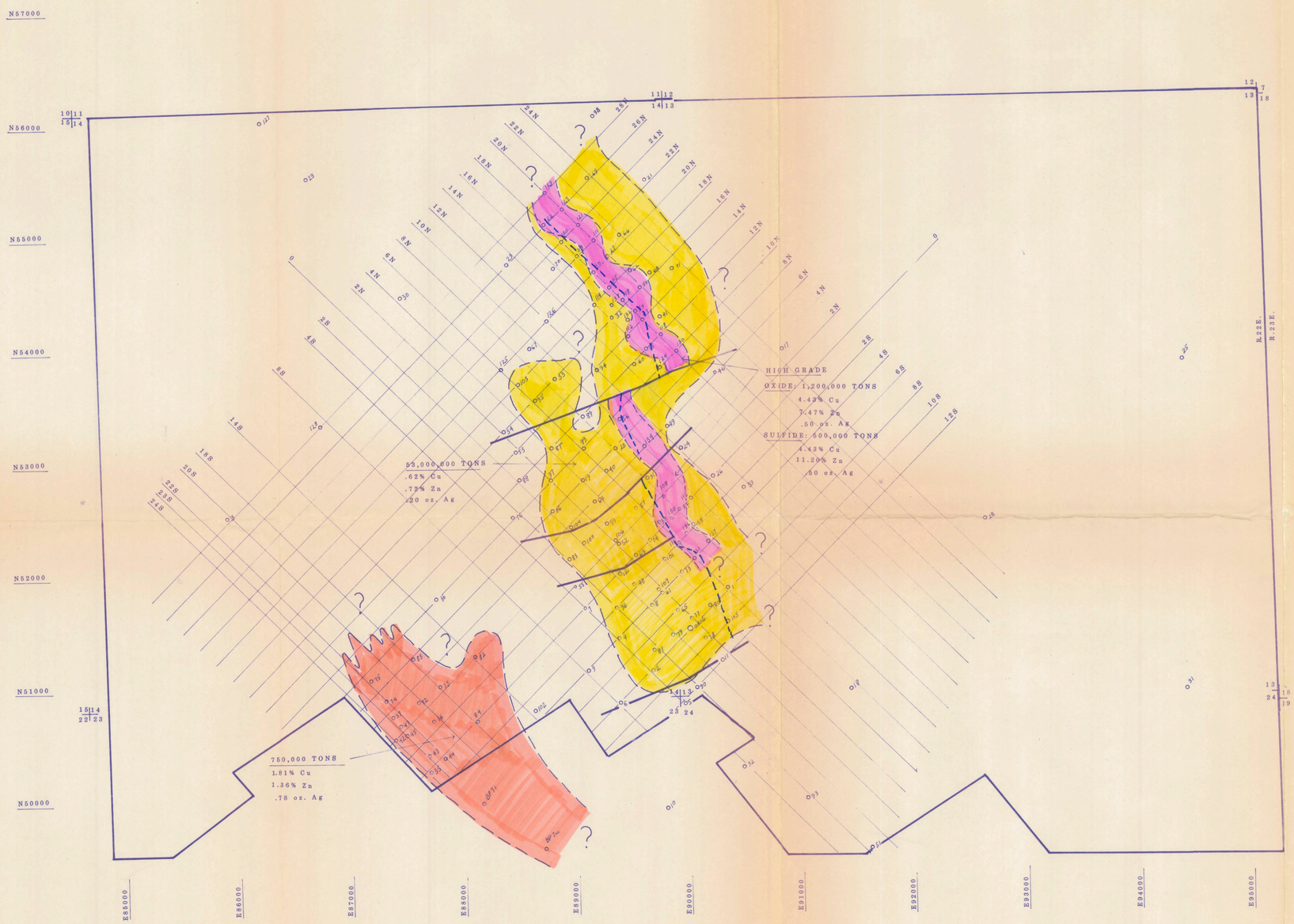
The following cash flow calculations are based on the following; 64 lbs of copper recovered per ton by electrowinning, 8 lbs as a sulfide concentrate assaying 25% Cu, 84 lbs of contained zinc recovered as a zinc carbonate. The copper smelter will deduct 2 units, pay for 97½% of the remainder at the stated price less 28¢, and base charges and freight amount to $98/ton of concentrate.

The total capital capital investment, including mine, is $19,000,000. Depletion is 15% of the copper value and 23% of the zinc value, not to exceed 50% of the net before depletion. Income taxes are assumed to be 50%. Mining cost is assumed to be $25/ton including property taxes on the mine equipment.

fob value, Cu	1.00	1.10	1.20	1.30	1.40	1.50
,Zn	.30	.35	.35	.35	.35	.40
Gross Value	92.80	104.12	111.23	118.35	125.47	136.79
Cost	77.12	77.40	77.58	77.76	77.94	78.22
Net	15.68	26.71	33.65	40.59	47.53	58.57
Depletion	7.84	13.36	16.83	20.10	21.17	23.21
Net	7.84	13.36	16.83	20.49	26.36	35.36
Taxes	3.92	6.68	8.41	10.24	13.18	17.68
Profit	3.92	6.68	8.41	10.24	13.18	17.68
Cash Flow/ton	27.59	35.87	41.07	46.18	50.18	56.72
Total Return (1,000's)	33,107	43,038	49,284	55,414	60,219	68,060
Payout, years	4.92	3.78	3.30	2194	2.70	2.39
Payout Ratio	1.74	2.27	2.59	2.92	3.17	3.58

General Flow Sheet

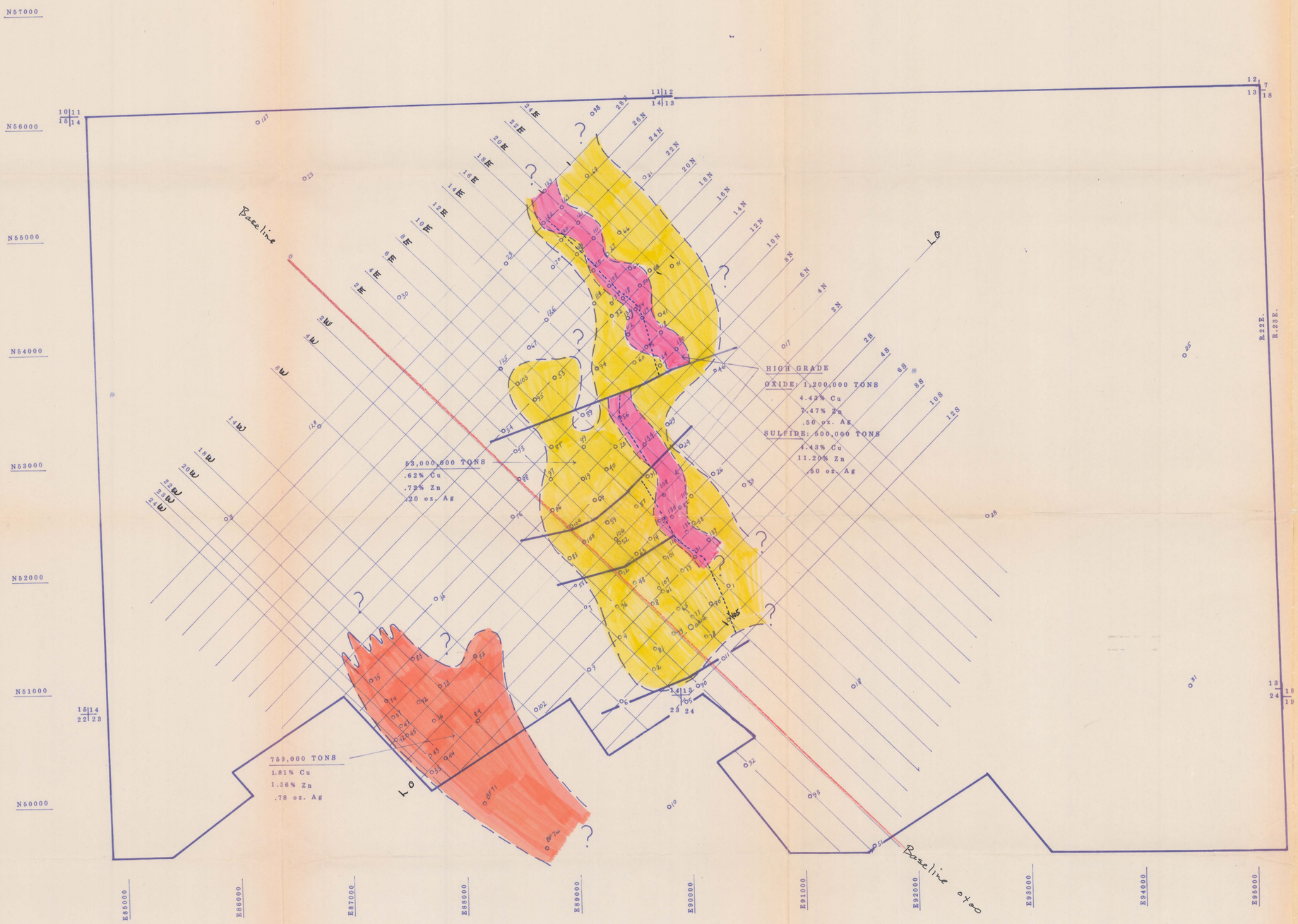




MINERALIZATION

- High Grade
- Bulk Low Grade
- Peabody Sill
- Fault
- Earp Colina Contact
- Strong Harris Property Boundary

BEARD MINING COMPANY	
TITLE: Drill Hole Location Map Showing High and Low Grade Mineralization Limits	
PROJECT AND LOCATION: Strong--Harris, Cochise Co.,Arizona	
GEOLOGY:	SCALE: 1"= 500'
DRAWN BY: C.F. Brink	DATE: 28 October 1980
REVISED BY:	DATE:



MINERALIZATION

- High Grade
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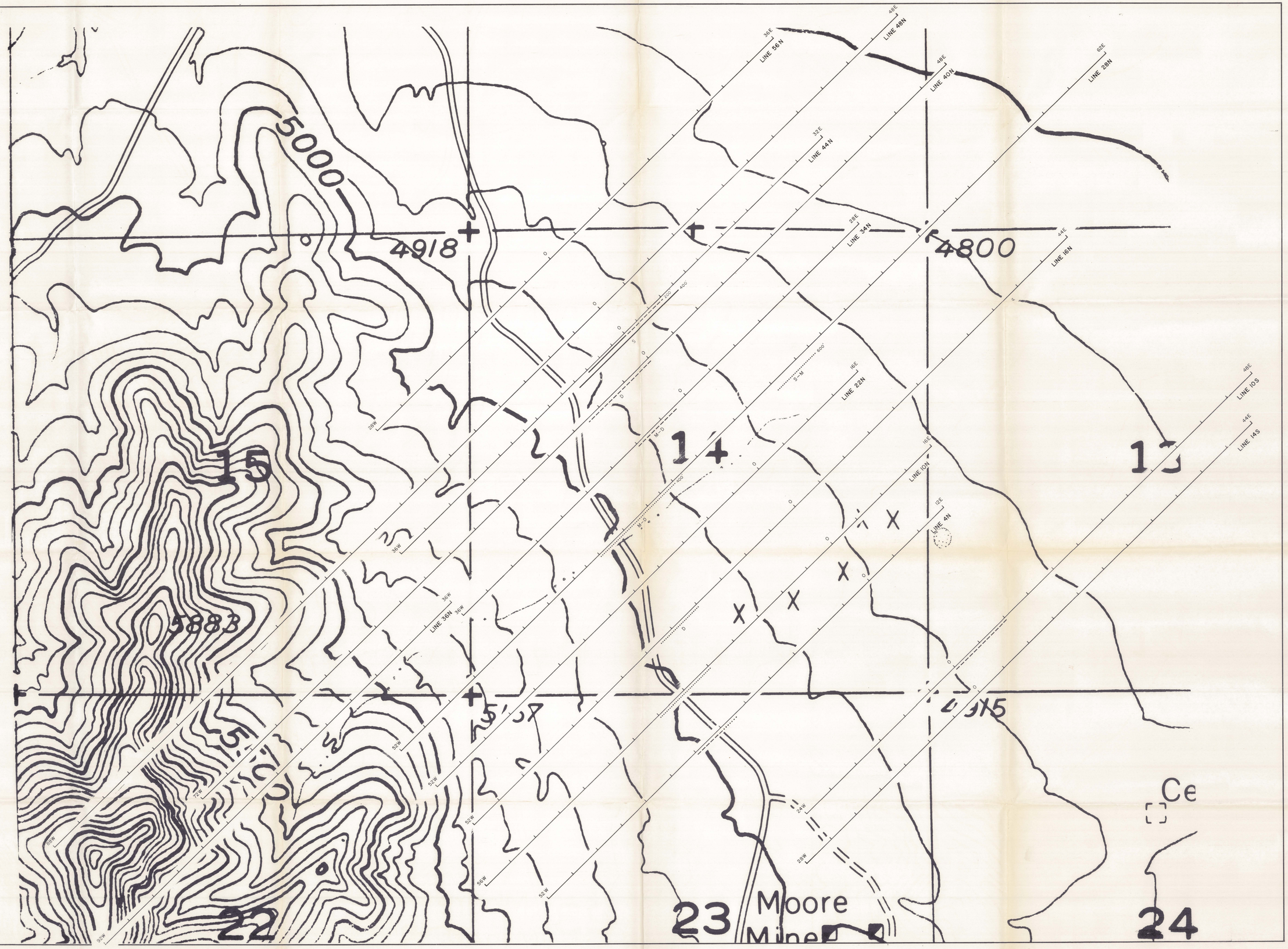
BEARD MINING COMPANY	
TITLE: Drill Hole Location Map Showing High and Low Grade Mineralization Limits	
PROJECT AND LOCATION: Strong--Harris, Cochise Co., Arizona	
GEOLOGY:	SCALE: 1" = 500'
DRAWN BY: C.F. Brink	DATE: 28 October 1980
REVISED BY:	DATE:

PHOENIX GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



SURFACE PROJECTION OF ANOMALOUS ZONES

METAL FACTOR	PERCENT FREQUENCY EFFECT
DEFINITE	VERY STRONG
PROBABLE	STRONG
POSSIBLE	MODERATE
APPARENT DEPTH	WEAK
S = Shallow	VERY WEAK
M = Moderate, D = Deep	
C = Contact, F = Fault	

Number at the end of anomaly indicates spread used.

PROSPECTING GEOPHYSICS INC.

STRONG & HARRIS PROPERTY COCHISE COUNTY,

ARIZONA

SCALE

FEET 400 0 400 800 1200 1600 2000 FEET

1 INCH EQUALS 400 FEET

DRAWN: MLM

DATE: AUGUST 1981

APPROVED:

DATE:

DWG. I.P.P.-U-5125

DWG.I.P.P.-U-5125