CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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Arizona Department of Mines and Mineral Resources Mining Collection

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PRINTED: 11/21/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: BAGDAD

ALTERNATE NAMES:
CYPRUS BAGDAD COPPER

YAVAPAI COUNTY MILS NUMBER: 119B

LOCATION: TOWNSHIP 14 N RANGE 9 W SECTION 4 QUARTER C
LATITUDE: N 34DEG 35MIN 01SEC LONGITUDE: W 113DEG 12MIN 23SEC
TOPO MAP NAME: BAGDAD - 15 MIN

CURRENT STATUS: PRODUCER

COMMODITY:
COPPER SULFIDE
MOLYBDENUM SULFIDE
COPPER OXIDE
LEAD
ZINC
SILVER
URANIUM
GOLD
BERYLLIUM

BIBLIOGRAPHY:
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BLM STATE OFF. AQUARIUS PLAN UNIT STEP 3
BLM AMC FILES 38688, 19355, 22771, 31840
BUR. MINES INFO
PAY DIRT MAG. MAR. 1978, P 1, 4-9
PAY DIRT MAG. APRIL 24 1972 P 1, 4-5
PAY DIRT MAG. APRIL 16 1976 P 6-7
BONNIS, R.J. & J.E. NELSON, MINING ENGR. APRIL 1978, P 351-354

BAGDAD YAVAPAI COUNTY MILS119B FILE 1 OF 8
GENERAL INFORMATION tmm 12/05/2002

34°30′ 113°15′ 100 000 FEET 295 R 9 W. (Thorn Peak 1:24 000) 3352 I NW 302 304

Mapped by the Geological Survey
1945

Bagdad 15′

3352 IV NE

STATE MINE INSPECTOR
1616 West Adams Suite 411
Phoenix, AZ 85007-2627

STATE MINE INSPECTOR
NOV - 6 1989

START-UP NUMBER 94363254
STATE NUMBER 41539A
MSHA NUMBER K48

~~TEMP~~ BAGDAD (P) HAMM

NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with the Arizona Revised Statute Section 27-303, we are submitting this written notice to the Arizona State Mine Inspector of our intent to start X (Construction) stop ____ move ____ (Please check one) a mining operation.

If this is a move, please show last location: ____
If you have not operated a mine previously in Arizona, please check here: ____ If you want the Education and Training Division to assist with your mine safety training, please check here: ____
If this operation will use Cyanide for leaching, please check here: ____

COMPANY NAME: The Industrial Company of Steamboat Springs, Inc.

DIVISION: ____

MINE OR PLANT NAME: Cyprus Bagdad Mill Exparsion TELEPHONE: (602) 633-4373

CHIEF OFFICER: Robert Dusbabek

COMPANY ADDRESS: P.O. Box 426

CITY: Bagdad STATE: Arizona ZIP CODE: 86321

MINE OR PLANT LOCATION: (include county and nearest town, as well as directions for locating property by vehicle: 4 miles North of Highway 97 Bagdad, Arizona Highway 97 ends at the Cyprus Bagdad Copper Corp. guard shack. A map can be obtained at guard shack to our location at Mill

TYPE OF OPERATION: Mill Exparsion PRINCIPAL PRODUCT: Copper

STARTING DATE: 11-6-89 CLOSING DATE: 7-6-90 DURATION: approx. 8 months

PERSON COMPLETING NOTICE: Robert L Dusbabek TITLE: Const Mgr

DATE NOTICE MAILED TO STATE MINE INSPECTOR: 11/1/89

FORM 101-106 REV. 08/86

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

YAVAPAI COUNTY

CYPRUS

BAGDAD COPPER MINE

30 mi. NW Hillside
Eureka Dist.

MILS # 119 B

O - AKA's

BAGdad (full)

MM 1173	Conichalcite
1393	Molybdenite
1325	Chrysocolla & Malachite
4230	Montmorillonite
4231	Montmorillonite
4424	Molybdate w/ Ferromolybdate
4492	Apatite spar
5003	Calcite, dog tooth, iceland
6061	Molybdenite on Quartz
6081	Cathode Starter Sheet, Copper
7130	Chrysocolla
7236	Copper (Cathode starter sheet)
8040	Chrysocolla, malachite
K073	Copper Ore
L146	Native Copper
L147	Copper from mill
L148	Native Copper
L149	Native Copper
L170	Copper from smelter

ARIZONA

YAVAPAI COUNTY

CYPRUS BAGDAD MINE

BAGDAD, Arizona

MILS #119B

MM-9515	Chrysocolla
MM-9516	Pyrite
MM M 056	Antlerite
M 057	"

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA
YAVAPAI COUNTY
CYPRESS BAGDAD COPPER MINE
2900' level

MILS #119B

MM-L109 Malachite and Tenorite
MM-L110 Malachite and Tenorite
MM-L111 Chrysocolla and Malachite

USA Arizona
Yavapai Co
72 Eureka Dist.
Bagdad landmark
Cyprus Bagdad mine

MILS #119B

MM M 705 Chalcopyrite

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1992 Yavapai County

Cyprus Bagdad Copper Corp.
Bagdad T14N R9W Sec. 4

P.O. Box 245, Bagdad, AZ 86321 - Phone 633-2241 - Employees: 728 - Open pit copper-molybdenum mine - 71,000 TPD concentrator - Dump leach-solvent extraction-electrowinning plant.

Vice President & General Manager Harry W. Cosner
Manager, Administration R. J. Cunningham
Manager, Mining Kent Watson
Manager, Plant Operations G. G. Granger
Manager, Community Services D. L. Mead
Manager, Human Resources J. S. Bush
Manager, Safety Joe Mortimer

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1991

CYPRUS COPPER COMPANY
(A subsidiary of Cyprus Minerals Company)

P. O. Box 1126, Green Valley, AZ 85622 - Phone 628-4000.
Executive Vice President ..... James C. Compton
Vice President Technical Services .....Ron Kellner
Cyprus Bagdad Copper Corp.
Bagdad T14N R9W Sec. 4
P.O. Box 245, Bagdad, AZ 86321 - Phone 633-2241 - Employees: 680 - Open pit copper-molybdenum mine - 71,000 TPD concentrator - Dump leach-solvent extraction-electrowinning plant.
Vice President & General Manager ..... Harry W. Cosner
Manager, Administration ..... R.J. Cunningham
Manager, Mining ..... Kent Watson
Manager, Plant Operations ..... G. G. Granger
Manager, Community Services ..... D.L. Mead
Manager, Human Resources ..... J.S. Bush
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Manager, Mining ..... Kent Watson
Manager, Plant Operations ..... G. G. Granger
Manager, Community Services ..... D.L. Mead
Manager, Human Resources ..... J.S. Bush
Manager, Safety ..... Joe Mortimer
Cyprus Casa Grande Corp.
Casa Grande T10S R4E Sec. 25
P.O. Box C-9, Casa Grande, AZ 85222 - Phone 623-1539 - Employees: 179 - In- situ leach copper mine - Roast Leach - Solvent extraction-electrowinning plant - Acid plant - Located 32 miles south of Casa Grande.
Manager ..... Ravi Medhi
Administrative Manager ..... Robert Moon Plant
Superintendent ..... John Kline
Mine Superintendent ..... Kermit Behnke
Metallurgical Control Superintendent..... Sam Yang
Administrative Supervisor ..... Joe Smith
Quality Assurance Supervisor..... Troy Pool
Quality Assurance Supervisor ..... Dave Hamby
Human Resources Supervisor ..... Jim Lewis
RLA Superintendent ..... Dave Shade
SX-EW Superintendent ..... Jim Garvey

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1989

CYPRUS MINES CORPORATION
(A subsidiary of Cyprus Minerals Company)

Cyprus Bagdad Copper Corp.

Bagdad T14N R9W Sec. 4, 5, 6
T15N R9W Sec 28,

P.O. Box 245, Bagdad 86321 - Phone 633-2241 - Employees 600 - Open pit copper-molybdenum mine - 54,000 TPD concentrator - Dump leach-solvent extraction-electrowinning plant.

Vice President & General Manager ..... Harry W. Cosner
Manager, Administration ..... R.J. Cunningham
Manager, Mining ..... T.H. McNamara
Manager, Plant Operations ..... G. G. Granger
Manager, Community Services ..... D.L. Mead
Manager, Human Resources ..... J.S. Bush

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1988

CYPRUS COPPER COMPANY

9100 E. Mineral Circle, P.O. Box 3299, Englewood, CO 80112 - Phone (303) 643-5000.

Executive Vice President ..... F. Steve Mooney
Vice President & Controller ..... Daniel Zang

Bagdad T14N R9W Sec. 4

P.O. Box 245, Bagdad 86321 - Phone 633-2241 - Employees 600 - Open pit copper-molybdenum mine - 54,000 TPD concentrator - Dump leach-solvent extraction-electrowinning plant.

Vice President & General Manager ..... Harry W. Cosner
Manager, Administration ..... R.J. Cunningham
Manager, Mining ..... T.H. McNamara
Manager, Plant Operations ..... D.K. Mortensen
Manager, Community Services ..... D.L. Mead
Manager, Human Resources ..... J.S. Bush

BAGDAD COPPER CORPORATION
BAGDAD, ARIZONA 86321

1967

David C. Lincoln,	President
George W. Colville,	Exec. V.P. & TREAS
Robert C. Bogart,	Vice Pres.
William T. Garland	Vice Pres.
Frank L. Snell,	Vice Pres.
Brooks Wilder,	Secretary
Jerry C. Ryan	Asst. Sec'y.

BAGDAD COPPER CORPORATION

"Pilot Mill Flotation Work at the Property of the Bagdad Copper Corp., Hillside, Arizona." (With discussion) By G. Gamlen Thomas, Associate. - Excerpt from Trans; of the Institution of Mining & Metallurgy, 43rd Session, 1933-34. (copy in file)

Report on - "Mills - Northern District: - 9/30/47 in Geology file.

IC 7890 - "Block Caving Mining Methods & Costs, Bagdad mine, etc."

IC 7929 Cyprus Mines (file)

IC 8341, p. 7, 10, 12, 14, 18, 32, 40 41, 42

USGS P.P. 278

USGS Bull. 782, p. 7

ABM Bull. 125, p. 75
" " 129, p. 59
" " 180, p. 121

MAPS - Upstairs in the flat storage area - Third Drawer

Mining World, April, 1959, p. 40
" " December, 1960, p. 35
" " May, 1961, p. 47
" " June, 1961, p. 48
" " August, 1961, p. 26-28
" " September, 1962, p. 64
" " May, 1963, p. 37
" " November, 1963, p. 20

Az. Republic 3-6-77--Mine additions ahead of plans.

Paydirt - 3-28-77 - Reduction in mine taxes

MAPS - Upstairs in the ABM rolled files -- Maps include information on geology, drill holes, assays etc, from the Arizona Bagdad Copper Co. days. Also showing Paul and Black Mesa mines.

Geology File - Nash, J. Thomas - Fluid-Inclusion studies of the Porphyry Copper Deposit at Bagdad, Arizona

BAGDAD COPPER CORPORATION

World Mining Catalog, Survey Direct. Number, 1964, p. 163
" " " , June, 1965, p. 147
" " November, 1965, p. 82
" " May, 1966, p. 34
" " December, 1966, p. 32
" " June, 1967, p. 38

Skillings Mining Review, April 23, 1966, p. 16
" " " May 28, 1966, p. 17
" " " July 30, 1966, p. 21
" " " August 20, 1966, p. 10
" " " November 5, 1966, p. 19
" " " December 17, 1966, p. 10
" " " April,1, 1967
" " " July 19, 1967, p. 22
" " " December 2, 1967, p. 8
" " " November 23, 1968, p. 5
" " " December 19, 1970
" " " May 19, 1973, p. 23, 14
" " " December 15, 1973, p. 19, 14
" " " December 22, 1973, p. 19
" " " January 26, 1974, p. 20
" " " March 9, 1974, p. 27
" " " April 27, 1974, p. 1
" " " May 11, 1974, p. 5
" " " April 13, 1974, p. 23
" " " Aug. 24, 1974, p. 17 (personnel)
" " " November 9, 1974, p.9 (expansion of facilities; Fluor Utah Inc. & Holmes & Naver Inc.=engineering, procurement & construction)
p. 17 (personnel)

Metals Week, June 4, 1973, p. 3, 6
" " June 24, 1974, p. 2
" " August 6, 1973, p. 6
" " Jan. 13, 1975, p. 1 (postponement of building new cu smelter)
" " February 3, 1975, p. 2 (reduce cu prod.)
" " March 3, 1975, p. 3 (re: money lent to PD by Cyprus to exp. Hidalgo smelter to treat concs. from Bagdad)
" " February 17, 1975, p. 9 (decision to custom smelt new output)

BAGDAD COPPER CORPORATION

E/MJ, October, 1958, p. 112
" June, 1961, p. 86-88
" October, 1963, p. 146
" January, 1965, p. 89
" November, 1965, p. 127-130
" December, 1965, (in file)
" January, 1966, p. 76
" December, 1966, p. 126
" January, 1967, p. 72, 97-100
" June, 1967, p. 242
" July, 1967, p. 127
" July, 1968, p. 94
" March, 1969, p. 198
" April, 1971, p. 108
" June, 1972, p. 296
" March, 1973, p. 194, 196
" June, 1973, p. 200, 259
" February, 1974, p. 123
" July, 1974, p. 25, 27
" June, 1974, p. 205 (expansion)
" September, 1974, p. 223, (pipe)
" December, 1974, p. 122 (expansion)

E/MJ, January, 1975, p. 78 (mine & plant exp.)
" March, 1975, p. 252 (cancelled plans to build a smelter)

Mining Congress Journal, May, 1963, p. 85
" " " December, 1965, p. 12
" " " December, 1966, p. 6
" " " June, 1968, p. 38
" " " February, 1973, p. 8, 50
" " " June, 1973, p. 11
" " " May, 1974, p. 13, 16
" " " October, 1974, p. 13 (personnel)p.84 (Holmes & Narver designs)
" " " November, 1974, p. 12 (expand cu conc. facilities)

Fortune Magazine, June, 1964, p. 117

Metal Mining & Processing, June, 1964, p. 24
" " " May, 1964, p. 61
" " " April, 1965, p. 21, 42

BAGDAD COPPER CORPORATION

Mining Engineering, February, 1973, p. 51
" " April, 1973, p. 6, 37
" " June, 1973, p. 14
" " June, 1974, p. 22
" " Dec., 1974, p.48 (personnel)
" " February, 1975, p. 26 (exp. - Fluor Utah & Holmes & Narver are contractors)

Mining Journal, June 8, 1973, p. 473
" " November 2, 1973, p. 365
" " March 22, 1974, p. 220, 221
" " April 26, 1974, p. 335
" " April 13, 1973, p. 302
" " April 19, 1974, p. 305
" " Sept. 6, 1974, p. 210 (personnel)
" " March 7, 1975, p. 171 (concs. to go to PD Hidalgo smelter)
" " January 24, 1975, p. 69 (postpone plans for new cu smelter)

Contractor & Engineer, June, 1973, p. 37
" " November, 1973, p. 34

Mining Annual Review 1974, p. 297, 299 (gen. info.)

Skillings Mining Review, February 15, 1975, p. (2/16/35 info.)
" " " March 15, 1975 (Hidalgo smelter of PD will smelt concs. from Bagdad

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Bagdad **Date** August 31, 1960

District Eureka, Yavapai County **Engineer** Travis P. Lane

Subject: Mine Visit

I visited the Bagdad camp on August 26, 1960 and discussed the status of operations with Geo. Coleville, Mgr., Bob Bogert, Asst. Mgr., and Eddie Howe, pilot plant metallurgist. Mill tonnage is at the normal rate but grade of the feed is slightly lower than the average for the year to date, because of a greater proportion of primary ore, as compared with secondary ore in the current mill feed. The bulk of the mill feed is coming from the low saddle between the big main pit and a smaller pit area a short distance from it down Copper Creek. A new series of benches has been started from the rim of the big pit. Some 4 or 5 benches will be waste strip then about the same thickness will be oxidized ore and finally the secondary ore, underlain by primary ore, will be exposed for mining. Employment totals 350 men.

Construction of the new leach plant has been started by Fisher Construction Co. A Mr. Heinke is the job Supt. for Fisher. The contract crew averages 24 men and eventually is expected to reach a maximum of 70 to 75 before completion of the plant in March or April of next year. Forms were being placed for the precipitation tanks (11) and some cement was being poured in the completed forms. Also, foundations for the 2 acid converter tanks were poured, and other foundations were being set.

Bagdad counts on leaching in place the 30,000,000 tons in its main strip pile (the dam in Mineral Canyon) assaying .40 to .45% Cu; and nearly 3,000,000 tons in a pile being built up in Alum Canyon with assay of .50 to .60% Cu. The better strip material now coming from the pits is going to the smaller pile and this pile will be leached first.

See: MINING WORLD, Sept. 1960, p 61 - re: Leaching Plant. **(Copy in file)**

BAGDAD COPPER COMPANY

Taken from MINING WORLD, Oct, 1959 Issue

BAGDAD HOPES TO CUT WATER USE WITH ION EXCHANGE

Re-opening of the Bagdad Copper Corporation's electrolytic pilot plant at its mine at Bagdad, Arizona, is scheduled shortly, according to George Colville, general manager. The $250,000 plant, built in 1956 as an experimental and research center for production of finished copper sheets from copper concentrate and low grade leached copper deposits, was operated on a full production basis until July 1957, with satisfactory results, At that time, production was discontinued in order that the plant's facilities could be utilized for further research.

At the time production was discontinued, the company was using the standard industry method of precipitating the copper from leach solutions by passing it thru a stockpile of de-tinned cans, the contact resulting in metallic copper being formed. This method, which is still widely used in other copper mines, proved successful. However, there were drawbacks, principally the high cost of the cans, which could be used only once, and the high water loss, an important factor in a location where water was scarce and expensive. Hence, it was decided to search for an improved method.

After two years of intensive research by a team of Bagdad Copper Corporation chemists and metallurgists, comprised of R. C. Bogart, assistant general manager; E. S. Howell, chief metallurgist, and F. H. Wheadon, chemist, a potential process was devised through the adaptation of an ion exchange unit coupled with a resinous flow. In effect, the copper-bearing solution from the leached ore is piped through a circuit where it contacts the resin, which replaces the de-tinned cans formerly used. During the contact, a chemical reaction causes the copper particles to attach to the resin particles in a highly concentrated mass form.

In the former process, 30 gallons of water were required to salvage 114 grams copper. In the new process, the same amount of copper can be claimed in one gallon water. Thru an additional process, the water and resin can be reclaimed and used repeatedly.

According to Mr. Colville, it is planned to operate the pilot plant on a round-the-clock basis for several months to further test the process.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine	Bagdad	Date	March 30, 1959
District	Eureka, Yavapai County	Engineer	Travis P. Lane
Subject:	Visit of Mar. 13, 1959		

Milling operations were normal with the rate at 4700 TPD. Jan. heads assay was 1.03% Cu and present heads are running about the same. Waste stripping is now at the rate of 450,000 tons per mo. or approximately 3:1. The molybdenum content of the ore has dropped to the point where it is no longer economical to recover it.

The new secondary and tertiary crusher installation was practically completed and was expected to be in operation with the next several days. It is counted upon to boost tonnage at least several hundred tons per month.

The pilot plant which has successfully treated 5 TPD of concentrates by fluo-solid roasting followed by electrolytic precipitation is considered a success and will eventually be expanded to plant scale i.e. 150 TPD provided satisfactory results are obtained in percolation leaching of the waste dumps with the acid solution from the precipitating cells. Construction of a pilot leach plant to test the procedure is to begin soon.

The current labor force number 324.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Bagdad Date Dec. 22, 1958

District Eureka, Yavapai Co. Engineer Travis P. Lane

Subject: Visit

The writer, in the company of Frank P. Knight, visited the mine on the morning of Dec. 18th.

The mine and mill were operating normally. Mr. Colville advised that the milling rate is at 4700 TPD with grade of feed close to 1% copper. He estimated that copper production for the year (1958) will be about 24,000,000 lbs. and the average grade of the ore just under 1.00%.

The company is about ready to begin the installation of additional crushing capacity consisting of another secondary and tertiary crusher. The installation will be fed a part of the ore delivered by belt from the primary crusher in the pit. It will be operated separately from the present reduction crushers and will deliver its product (3/8") directly to the fine ore mill bins. The purpose is to relieve the presently overloaded crusher circuit and thus assure a maximum feed rate to the ball mills and possibly augment the plant capacity somewhat by producing more fines in the ball mill feed.

Mr. Colville reported that recently reduction in plant personnel had reduced the number to 316 which is about "bottom."

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Bagdad Mine

Date March 23, 1957

District Eureka Yavapai

Engineer Mark Gemmill

Subject: Present Operations

The operations of the Bagdad Copper Corp. George Colville, Genl. Mgr. continue about as usual, 100,000 tons plus per month being the regular production rate.

The expansion program of several years ago to double the output has not been started as yet. However there is talk of the installation of one more unit to the mill which would increase the capacity about 1000 tons per day.

During the past years a pilot Dorr-Oliver Fluo-solids plant has been installed and put into operation. This plant treats about ten tons of mill concentrates per day and it is understood that the process has proven very successful. Electrolytic copper is produced.

THE BAGDAD MINE STORY

It was in 1944 that J. C. Lincoln, president of the Lincoln Electric Company, acquired control of Bagdad Copper Corporation and appointed E. R. Dickie as general manager. In the twelve years that have passed since then, the Corporation has expended over twelve million dollars in developing the property including over seven million dollars for removing waste. In 1954, the Corporation was able to pay its first dividend to its stockholders, amounting to $135,239.40, and in 1955, a dividend of $279,180.50 was paid. However, with the higher stripping expense of 2¼ million dollars, and lower grade of ore mined in 1956, the directors did not feel justified in paying a dividend for that year.

During this twelve-year period, Bagdad has mined about 14 million tons of ore from which approximately 205,500,000 pounds of copper have been recovered. In other words, only a little over 14 pounds of copper (together with small amounts of silver and molybdenum) were recovered per ton of ore treated. Despite this profitless operation, Bagdad has paid the state a production tax on its output throughout its producing history. It has enriched the state with the production of over 205 million pounds of indestructible copper, and in so doing has furnished remunerative employment to hundreds of Arizona's citizens.

Location and History

Articles in the Mining World for September, 1951 and March, 1952 have been the source of the information on Bagdad's history. The Bagdad Mine is in the Eureka district, western Yavapai County, 27 miles by road from Hillside, a station on the Santa Fe Railway. Bagdad camp is on Copper Creek, a few miles upstream from its junction with Burro Creek, at an altitude of about 3,200 feet.

The Bagdad claims were discovered in 1886, but it was 1906 before they

were worked with small success by the Giroux Syndicate. Then, a new company, The Bagdad Copper Company, took a whirl at it.

In 1919, the Arizona-Bagdad Copper Company took over the claims, churn-drilled them, proved a section of the orebody, much as it is known today, and did underground work which resulted in small production. In 1925 and 1926, Arizona Bagdad conducted an interesting experiment in which the ore was leached in place. Workmen dug a trench around a square block, 300 feet on each side. After six months of water feed to the trench at a rate of 15,000 gallons daily, a "leaching solution" was fed at a rate of 15,000 gallons daily. Lack of money and water, and the excess of lime in the ore-body defeated the project. Also, the uncertain destination of the "leaching solution" made the effort too much like "pouring money down a rat-hole".

In 1927, Bagdad Copper Corporation succeeded the Arizona-Bagdad Copper Company, and, in a 50-ton pilot plant, tested a system of recovering copper by selective flotation, roasting, leaching and electrolysis. In 1929, just prior to Wall Street's Black Friday, after sinking 130 churn-drill holes and closely proving a larger part of the ore body, the company made plans to spend $7,000,000 to block-cave and mill 3,000 tons of ore per day.

Greatly scaling down its plans after the stock-market crash, the company completed a 200 ton mill in 1930 and brought mine production up to 150 tons daily.

In 1935, with the depression still raging, the operation was concentrated first on selective mining of high-grade molybdenite, then on a high-grade copper ore. In 1936, a block-caving project was planned and started; in 1940, it made an operational profit of $1,054, which, of course, was still not enough.

From 1941 to 1944, with the help of a $2,500,000 R.F.C. loan, the company installed a 2,500-ton flotation mill, renovated the mine for large block-caving production, built a 70-mile, 69,000 volt transmission line to bring in power from Parker Dam, and built a housing project, a tailing-disposal line, and a road from Bagdad nearly to Hillside.

In 1944, J. C. Lincoln, President of Lincoln Electric Company, acquired stock control of Bagdad Copper Corporation, and appointed E. R. Dickie as general manager

By early 1945, block caving had proved only partly successful. Labor was in short supply. The ore-body was relatively thin for block-caving and so required a high ratio of development work per ton of ore. Then it was that Manager Dickie made the decision which made Bagdad a mine. On April 29, 1945, miners blasted 150,000 tons of surface ore into the open glory-hole of a caving block. Next, a contractor did minor stripping, trucked away waste, and trucked clean ore to the caving glory-hole.

Later in 1945, the company made a complete switch from block caving to open pit mining with truck haulage. By early 1947, a pit crusher system, glory-hole ore bin, and conveyer system to carry crushed ore from the pit to the mill had been installed. Since early 1948 all ore mined has come from the pit.

In February, 1950, a mill expansion was completed which brought capacity up to 4,000 tons per day. New equipment in the pit, and advancement of pit development and stripping brought ore production up to 90,000 tons per month in 1950 and to approximately 110,000 in 1951.

In December 1955 the Company suffered a loss by the passing of E. R. Dickie, who was instrumental in the change over from underground to open pit.

Geology and Mineralization *

A conspicuous feature around Bagdad is the red and brown iron stain on the rocks, particularly all exposures of the granite porphyry. Much of it is highly colored. This extensive staining indicates a rather widespread mineralization.

Prospecting in the mineralized granite porphyry has been mainly of two types, first, of the more prominent fissures, and, second, of disseminated deposits.

Development has been largely in the porphyry northeast of the junction of Copper

---

* Arizona Bureau of Mines Bulletin #145, by Butler and Wilson.

and Marooney Creeks. The quartz monzonite-copper ore-body dips at 10 to 15° toward the northeast, averages about 170 feet in thickness and is capped in most places by 200 ft. or more of barren Gila conglomerate. The copper occurs mainly as copper glance (chalcocite) with smaller amounts of copper pyrites (chalcopyrite); average copper content is 0.9 percent. In some streaks and fissure fillings, the ore is rich enough in copper for selective underground mining. There are also some high-grade streaks and lenses of molybdenite. Molybdenite has not been noted in the copper veins, though it is possibly present.

Lying over the bed of sulphide ore is a 150-foot zone of copper-oxide mineralalized quartz-monzonite not rich enough for conventional mining, milling or smelting but, once exposed by mining of the overlying overburden, this low-grade is rich enough to drill, blast, haul, stockpile and leach. However, because it is high in lime and low in pyrite, the low-grade must be leached with acidified water.

Like most of the copper deposits of the Southwest, the Bagdad deposit can be separated into three zones -- namely, the oxidized zone, the zone of sulphide enrichment, and the primary lean sulphide zone. Generally, the amount of copper in the oxidized zone increases with depth, and in places just above the secondary sulphide zone it may approach the copper content of the sulphide zone. Ordinarily, however, it is distinctly of lower grade than the sulphide zone, and probably no large bodies of it would exceed 0.5 per cent copper. In total, however, a very considerable amount of the copper is in the oxidized zone.

The secondary sulphide zone consists of veinlets of pyrite and chalcopyrite partially replaced by chalcocite. The copper content of the enriched sulphide zone in general is highest just below the oxide zone and decreases gradually toward the primary zone. In the upper, richer portion of the secondary sulphide zone the average copper content is probably three to four times that in the primary zone, indicating a very considerable movement and enrichment of copper.

As in many deposits, the primary sulphide zone beneath the enriched zone has not been extensively prospected or developed. Pyrite and chalcopyrite are the sulphides present, and the copper content in general does not appear to exceed 0.5 percent.

Bagdad's Pit-Mining Method

Benches are established at 45 and 50-foot vertical intervals. Stripping of waste starts at high elevations on the sides of Copper Creek Canyon. Ore, waste and low-grade are broken by 7" churn drills and rotary drills, loaded by electric shovels. Trucks carry sulphide ore to the pit crusher-plant, from where it is carried by a 1000 ft. long belt to the mill proper. Trucks carry low-grade oxide ore to extend the downstream side of the new tailing dam; there it will be acid-leached at some future date. Trucks carry barren waste (mostly Gila conglomerate overburden) to a waste disposal area about 3/4 of a mile northeast of the pit.

Three makes (five models) of rubber-tired haulage units are running an endurance test against one another, with a close cost-accounting record being made on each unit. Since truck pitting began, Bagdad has cut its mining cost by 40 percent, more than doubled production.

Crushing and Concentration

Bagdad's sulphide-copper flotation mill has recently been revitalized in much the same way as the mine. The main feature of the mill improvement was a system of alkalinity (pH) control which boosted recovery of sulphide-copper by 10 percent. This close pH control also involved additional controls of density and initial ore feed. The company's Mill Supt., Gaylen Guest, found that the optimum pH for flotation of Bagdad's ore was 11.5. The ore contained some zones and streaks with a high percentage of copper sulphate which is acidic. Whenever mill feed was from a copper sulphate zone, the pH fell to a much lower figure than the optimum 11.5. Guest found that with a regulated density control in the

classifier circuit, and a frequently measured pH, the operators soon learned how to regulate lime feed to the ball mills in order to adjust the pH to 11.5.

The crushing circuit is designed for production of a minimum of fines with a resulting efficiency of grinding and reagent consumption. The system consists of crushing, screening to produce three products, and the crushing of the coarser two products to a minus 3/8 in. size. The flow is over a 1½" - 45° grizzly to a 16" gyratory set at 1½". Product and undersize over a double deck screen - oversize of top screen to cone crusher set at ½" - oversize of bottom screen to a cone crusher set at 3/8". Product of 1st cone crusher over 3/8" screen with oversize back to grizzly. Product of 2nd cone crusher and undersize of both screens to any of four 1950-ton orebins. Each ore bin feeds a grate discharge ball mill using 3" steel grinding balls; the grate discharge insuring a minimum of grinding. The ore does not require fine grinding as it does not contain a large quantity of barren iron pyrite which forces most porphyry-copper mills to grind their ore much finer. The flotation circuit consists of a rougher circuit of 3 parallel banks of six 66" mechanical cells. In each circuit the rougher tailing passes on to a bank of six 66" mech. cells. Tailings are pumped to the Marooney tailing dam which stores water for reuse. Fresh water is obtained from Burro Creek, nine miles away. It is pumped by two parallel pumps through a 10-inch line to a second tank at Boulder Creek, whence it is pumped to Bagdad through two parallel pumps and another 10-inch line. Any surplus water (over and above daily requirements) is pumped into Marooney dam.

Rougher concentrate is cleaned in three banks of two 56 inch flotation cells. Cleaner concentrate is thickened and filtered and trucked to the railroad siding at Hillside, whence it is shipped to the A. S. & R. Company copper smelter at El Paso. The thickened cleaner concentrate is sometimes treated before filtering, to recover molybdenite, which is found in rich streaks here and there in the mine.

With its mine and mill operating at top efficiency, and with large reserves of ore, Bagdad is making plans to raise production to 10,000 tons daily, and to install a plant for concentrate roasting, acid production, calcine leaching, and electrolytic precipitation. It promises to make Bagdad one of the major copper producers of the United States.

Mr. J. C. Lincoln, the president of the Bagdad Copper Corporation has this to say in his 1956 annual report to the stockholders -

> "The pilot plant for the production of electrolytic copper has been a satisfactory operation for the last half of 1956. It was expected that troubles in the operation of the plant would develop, but these difficulties have been overcome and the plant now regularly produces about 3,000 pounds per day of electrolytic copper. This is the normal capacity of the plant. The sulfuric acid, which is a by-product of the electrolytic copper, has been used to produce several tons of cement copper from one of the dumps of oxide copper ore. To date we have produced twenty-five tons of cement copper from these dumps. When the electrolytic plant is finally completed, it is expected that the production of copper from our oxide dumps will produce about half as much copper as we can expect from the recovery of sulfide copper from the operation of the mill. This is another way of saying that the sulfuric acid produced by the electrolysis of two pounds of copper in the electrolytic plant will enable us to get an extra one pound of copper from our oxide ore dumps which we cannot recover at present.
>
> It is planned to increase the output of the mill from the present capacity of 3,500 to 4,000 tons per day to 10,000 tons per day as soon as possible. It would be done by installing additional ball mills if necessary, but development work on the method of grinding ore with high-speed rollers is being done, as indicated in my letter of December 13, 1956 to Stockholders. To increase the capacity of the mill, it will be necessary to have additional water and a new well has been sunk that is expected to produce 500 gallons per minute."

BAGDAD
E. R. Dickie

1947

DEPARTMENT OF MINERAL RESOURCES

TO ALL PRODUCERS OF COPPER, LEAD and ZINC IN ARIZONA:

This department and others are making strenuous efforts to bring about legislation which will help ameliorate the restrictions and difficulties faced by the producers of copper, lead and zinc, and other strategic minerals.

To assist in these efforts it is advisable that we have an authentic survey of the results of the President's veto of the Allen Bill, and the results that would take place if a new bill, such as the Russell Bill, were passed by Congress. The Russell Bill includes all strategic minerals.

While we have all learned to love questionnaires just as we love stomach ulcers, will you please give the answers in your best judgment to the following questions:

1. What was your approximate production in pounds per month for the period preceding the President's veto of the Allen Bill?

   (Copper 1,000,000 Lbs.) (Lead _____ Lbs.) (Zinc _____ Lbs.)

2. What has been your average production per month since that veto has affected your price?

   (Copper 1200,000 Lbs.) (Lead _____ Lbs.) (Zinc _____ Lbs.)

3. What is your estimate of your production per month for the first few months of 1948 if prices remain as they are now and no premiums are in effect?

   (Copper 1500,000 Lbs.) (Lead _____ Lbs.) (Zinc _____ Lbs.)

4. What is your estimate of production per month if some incentive plan such as the Russell Bill were in effect?

   (Copper X Lbs.) (Lead _____ Lbs.) (Zinc _____ Lbs.)

5. General remarks: X Depends on, what the top price would be, and if we could qualify or be eligible to receive subsidy payments.

An addressed envelope is enclosed for your convenience, but you will have to help with the stamp.

Yours very truly,

Chas. H. Dunning

Chas. H. Dunning
Director

CHD:mh

BAGDAD CHANGES FROM UNDERGROUND TO OPEN PIT MINING

****

Most mining men of this state are somewhat familiar with the ore body at Bagdad therefore, I will not attempt a lengthy discussion on the geophysics of this property. Briefly, the Bagdad ore body is a monzonite porphyry carrying copper values fairly evenly distributed from the surface down through the primary zone.

The ore body is tabular and extends over several hundred acres. The oxidized zone averages about sixty feet in thickness and assays about 0.50% copper and under which is the chalcocite zone, or the zone of secondary enrichment, which averages about one hundred feet in thickness and assays about 1.4% copper. Under this zone lies the primary zone and extends in places to a known depth of about one hundred and fifty feet and averages in grade about 0.60% copper.

The block caving method of extracting the ore from the chalcocite zone was installed several years ago when it was necessary to draw only about 250 to 300 tons per day, which was the capacity of the old milling plant.

Early in 1943 the new 2500 ton daily capacity concentrator was completed and put into production. Drawing ore from the developed stopes in sufficient tonnage to furnish the mill at capacity proved unsuccessful in more ways than one. First, drawing the ore at an accelerated rate caused a large amount of

dilution, thereby lowering the grade, and also caused funneling through the surface. The surface material was very detrimental to milling metallurgy. The development of these stopes was very costly per ton of ore extracted, and did not prove well adapted in our case from an economical standpoint. The grade of ore extracted was decreased, making it impossible to maintain a mill head of over nine-tenths of one percent copper. The cost of development, drawing, tramming and hoisting this ore averaged $1.05 per ton and was only able to furnish the mill an average of 45,000 tons per month of less than one percent ore. It was a losing proposition.

Other methods of extracting this ore were given careful consideration. A careful survey was made of the possibility of mining this ore by the open pit-glory hole method. Several things entered into the picture, such as getting RFC permission to change our method of mining; our ability to secure the necessary equipment - shovels, trucks, bulldozers, etc.; and last, but not least, the finances needed to make the change-over.

* The cheapest way out was to use the glory hole method and the present underground haulage system, then later, when conditions permitted, install a conveyor from the pit to the mill. This plan was finally agreed upon and stripping was begun in May 1945, and two raises, which were to be used as ore passages for the ore mined on the surface after the overburden was removed, were finished from the haulage level to the surface.

By December 1945, the mill was running at full capacity,

seventy-five percent of the ore coming from the open pit and the balance being drawn from the remaining developed stopes.

In July 1946, we completed the fourth raise to the surface, giving us four ore passages from the surface to the haulage level. By August 1st., 1946, ninety-seven percent of all ore furnished to the concentrating plant came from the open pit. Total mining cost was cut considerably. Tonnage was increased to full mill capacity with an average grade of better than one percent copper for the first six months of this year.

Cost comparisons of mining by the block caving and the open pit-glory hole methods follow:

For the year 1945	Total Mining Cost $1.054
For the first 8 months, 1946	Total Mining Cost 0.87

By changing from underground to open pit-glory hole method, a saving of $0.184 per ton is effected, and the mill supplied at full capacity with ore averaging one percent copper.

* A greater saving is to be made beginning about January, 1947, as we are now installing a large crusher in the pit and a 36" conveyor, 1000 ft. long, from the bottom of the pit to the present crushing plant. This installation, when completed and in operation, will make a further saving of $0.44 per ton of ore mined as no further underground operation will be required.

The following is an estimated total cost for stripping, mining and conveying ore to the mill after the conveyor is in operation:

Stripping or development	$0.2031
Mining, shoveling & trucking	.1668
Primary crushing & conveying	.0619
Total cost per ton ore	$0.4318

ERNEST R. DICKIE, General Manager
BAGDAD COPPER CORPORATION

October 25, 1946

Bagdad Copper Corporation

Hillside, Arizona

June 14 1941

Mr.Charles F.Willis
Phoenix,Arizona.

Dear Charley:

This will acknowlddge your letter of the 13th-saying that Mr.Morris was on his way to Washington.

In as much as the company has for the past three or four months been working with both the OPM and the RFC in an attempt to finance Bagdad I am sure that both these bureaus have a good deal more dope on Bagdad that the rough figures I sent you.The most recent data was a report by Ira Joralemon made about the middle of May 1941;and which Mr.Joralemon took back to Washington and presented personally. For the above reasons I would prefer that you advise Mr.Morris that I think it would be wise for him to contact Mr.Frank Page at the Mayflower Hotel.Mr.Page.who is a director of Bagdad is familiar with all this recent Bagdad business both with the OPM and the RFC and I imagine it would be much wiser for Mr.Morris to use the more carefully worked out data than the rough picture I gave you. Mr.Millikin,the president of Bagdad is in and out of Washinton quite a bit and I imagine Mr.Morris could contact him by dropping a note to him at 480 the Arcade,Cleveland,ohio.His full name is Severance A.Millikin.

// You might also tell Sam Coupal that he had better polish off his glasses-as he made quite a bull in the letter he wrote me encloding one he had written to a man named Sine in LA.This Sine apparently had some idea of making a quick turn.At any rate Sam in his letter to Sine said "It has 50,000,000 tons of ore in sight that will average 1.3% copper.This is practically proven ore"..... I have gone carefully back over the letters I wrote you and can find nothing anywhere near the above statement.....I did say that from the data here it was my personal opinion that onee mining was started it would not be finally finished until 50,000,000 tons of 1% ore had been mined,or its equivalent copper content.....I further said that on a start off operation that for the first five years it would probably be possible to mine 3000 tons per day and hold the mill heads to 1.3%.....At any rate I would appreciate your jumping Sam out about this-as oen of the troubles with Bagdad is that there has been too much bull thrown about it in the past-and I would like to stick to the facts in the case from now on out..... //

With best regards,as ever,

J. B. Stull

Bagdad Copper Corporation

Hillside, Arizona

May 30 1941

Mr. Charles F. Willis
Phoenix, Arizona.

Dear Charley:

This will acknowledge your letter of the 28th; and the following data is my best guess to answer your questions. It is self evident that there is a large personal element in some of the assumptions that have to be taken.

I would estimate that a 3000 tons per day plant could be put in here for about 1¾ million dollars and that it would take about 11 months to get it rolling. From the way the present orebody is now developed I would say that the first five years operation would produce about 5,250,000 tons of ore at a grade of about 1.3% total copper. With a mill extraction of 85% this would mean 22.1 lbs recovered per ton or a total copper production in the five years of 116,025,000 lbs of Cu. The total investment here at present (mining claims, churn drilling, test plant etc) is in the neighborhood of 2 million dollars.

The estimated costs then would be about as follows:

	Per Lb Cu	Per Ton	Per year
Development, mining & milling	6.3¢	$1.39	$1,459,500
Marketing Conc (Smelt, Ref, etc)	2.7¢	.59	619,500
Total direct	9.0¢	1.98	2,079,000
Taxes & Gen'l Ex	1.5¢	.33	346,500
Amortization of Plant (5 yrs)	1.5¢	.33	346,500
Depletion of orebody & Depreciation of plant	.67¢	.15	157,500
Total	12.67¢	$2.79	$ 2,929,500

Just what could be assumed to be a fair profit is anybody's guess under present political and economic conditions-but I dont think 1½¢ per lb would be excessive. This then means a 14¢ price to come out. The taxes and gen'l ex item above is pure estimate but is probably not too far out. The depletion and depreciation item is based on my assumption that eventually 50,000,000 tons of 1% ore will be mined here (or its equivalent in Cu content). This means a long life with the maintanance of plant over such a period amounting to the cost of the original plant several times over. All in all this kind of figuring is a little over my head-but I feel tha above is not too far out. After the 5 yr period and the plant amortized; there would then

be a n opportunity (with the 1½¢ amortization charge out of the picture) to make the same profit at about 12½¢ copper.

As I said above I am not very familiar with either the theory or the practice of the application of these various book charges.As you know it takes a tax expert to really set them up for once they are setup they constitute a precedent-and for that reason I would not like to have this letter used as any more than my personal opinion;and not in any way as an expression of the company's policy.

I have used in making the above cost picture a breakdown of the Miami annual report figures for 1939 and 1940 as taken f om thier annual report(that is the 9¢ operating cost is an estimate of the local conditions) and the other parts of the cost are taken on a basis similar to Miami:These figures are as follows:

Miami Cost figures:

	1939	1940
Costs: Per Lb of Cu recovered:		
Development,Mining & Treatment	$.0621	$.0696
Freight,smelting,refining,etc	.0235	.0230
Total direct	$.0856	.0926
Taxes,Gen'l Ex	.0107	.0124
Depletion	.00745	.00949
Depreciation	.0038	.0046
Misc Income Credit,etc	.0003 Cr	.0004
Total Cost per Lb of Cu	.10725	.11949

Hope the above will be of some value to you,and with best regards,I am,

Yours very truly,

J.W.Still

P.S. Sorry that the is somewhat delayed— started to write it on the 3rd & did not get it finished before the 3rd.

May 28, 1941

Mr. J. W. Still
Bagdad Copper Corporation
Hillside, Arizona

Dear Jack:

I have your letter of the 24th and, while you give us a lot of information in a short space, you also give us a lot of things that we would have to guess on.

I regard the Bagdad Copper Corporation as being the very best potential producer of copper in Arizona that is not yet producing what it could under the right circumstances. I think that you will agree with that.

What we need, however, is some discussion of what are the right circumstances for Bagdad. There would seem to be no question that a 3,000 ton mill is justified and it would work upon an average of 1% ore and thereby produce close to nine hundred tons of copper a month. You say you believe that it could be done at an operating cost of 9¢ a pound.

However, in order to do this it would require a large capital investment and that capital investment would have to be amortized during the time that the demand for copper was sufficient to keep it working. Included within the costs it would be necessary to make provision for amortization, for no one in the world is going to make the investment under the present uncertain market conditions and knowing that after the defense emergency is over the demand for copper will be such as to force idleness upon many copper plants.

We know that the government is going to require more copper than can be produced in all of the North and South American mines at 12¢ a pound, and, therefore, we have a theory that the government can do in copper mines just the same as it has done in dozens of other industries - build new plants for production or guarantee those who finance them.

Our thought is that the government can deal with certain producers of copper who are not yet producing as much as they could individually, guaranteeing to take their entire output of five years, for instance, at a price which would include amortization of the investment during the period of the contract. Then if the national defense emergency is over before the five year period, the government could cancel the contract by paying damages amounting to the unamortized portion of the capital investment. Such a plan could be applied either to private financing or government loans. The owners of properties would be appealed to to contract with the government on the grounds of national needs.

Bagdad Copper Corporation

Hillside, Arizona

Production last 5 yrs.

May 24 1941

Mr. Charles F. Willis
Phoenix, Arizona.

Dear Charley:

This will acknowledge your letter of the 23rd; and I am sorry that I have delayed sending in the dope on Bagdad.

There have been numerous and sundry estimates run on the Bagdad orebody; and as there have been 123 churn drill holes plus considerable underground work there is plenty of dope to work from. The following is a list of some of these estimates:

Rogers	1911	4,324,000 tons	@ 1.93%
Clark	1912	4,883,600 "	@ 1.934%
Geisendorfer	1916	13,277,200 "	@1.68
Rogers, Mayer & Ball	1918	9,165,400 "	@ 1.62%
Meyers	1918	20,547,500 "	@ 1.44%
Weed	1918	28,502,843 "	@ 1.29%
Geisendorfer	1921	20,384,600 "	@ 1.50%
Geisendorfer	1921	15,921,100 "	@ 1.62%
PC Benedict	1926	16,525,420 "	@ 1.41%
PC Benedict	1926	20,933,530 "	@ 1.25%
CQ Schlereth	1937	6,250,000 "	@ 1.47%
J.W. Still	1930	18,428,160 "	@ 1.215%
J.W. Still	1930	36,767,800 "	@ 0.9857%

The above as you can readily see represents quite a cross section of opinion-running from the optimistic to the conservative. I have always figured that in view of present day mining practice in the low grade operations that its a cinch that regardless of what grade is talked about the operation will never quit until all the avilable 1.0% ore has been mined out. In addition to the above estimates which are based on the drilled area; there is considerable additional ore to the west and northwest that will be picked up with later prospecting. Figuring from this I have always figured that there is available here for eventual mining at least 50,000,000 tons of 1.0% ore or its equivalent copper content.

In the matter of costs: we are now mining about 275 tons per day of ore running from 1.40% to 1.50% Cu. On this basis since the first of the year (since plenty of water has been available) we have been making an operating cost of about 10½¢ per lb of copper. This operating cost includes all Arizona expenses but does not cover the eastern office expense, consulting engineer or the usual charges for

depletion,depreciation or amortization.Using our past costs as a basis of calculation I have always figured that with a modern up to date plant that on any basis from 1000 tons per day on up that we could make copper here for less than 9¢.I have also always figured that about a 3000 tons per day plant would be as big as it would be wise to go to-as the size of the orebody here hardly justifies any larger capital investment.

Thats roughly the picture,Charley,and while there is no question but that there is a potentially valuable copper deposit here-its not worth much and wont be until a plant is built.

In regard to your other question re the Chance Group owned by Frank Morton and Alec Lucy; This adjoins us to the southwest and contains 19 claims.I have never thought this ground was worth anything as the geology was all against it.As you may know the Bagdad deposit is in a huge island of monzonite-all of which is mineralized to some extent and the richest spot is of course the developed orebody.There is a sharp change to the south and southwest the monzonite breaking off into a schist-granite complex crossed by numerous pegmatite dikes.This area contains quite a few isolated monzonite islands-all small;and while several of these spots are mineralized like the Bagdad monzonite they are all small.It naturally follows that this spotty mineralization(not over 1.5% Cu) is entirely too spotty and the single areas too small to by any stretch of the imagination ever to be commercial.I dont mean to knock Morton's show-but the above is my best opinion and personally I would not give 15¢ for the whole 19 claims.

I am sending this letter in in place of the questionnaire as for our property here I think I can give you a better picture this way.I hope some of these days you will be able to make a visit in here;for seeing the thing first hand would I think give you even a * better picture of it.

With best regards,I am,

Yours very truly,

J.W.Still

Production 1936-1940 (Calculate from card

June 17, 1941

Mr. J. S. Coupal
Department of Mineral Resources
Capitol Building
Phoenix, Arizona

Dear Sam:

Following is a paragraph just received in a letter from Jack Still. He evidently resents being misquoted.

> "You might also tell Sam Coupal that he had better polish off his glasses, as he made quite a bull in the letter he wrote me enclosing one he had written to a man named Sine in LA. This Sine apparently had some idea of making a quick turn. At any rate Sam in his letter to Sine said 'It has 50,000,000 tons of ore in sight that will average 1.3% copper. This is practically proven ore'. I have gone carefully back over the letters I wrote you and can find nothing anywhere near the above statement.... I did say that from the data here it was my personal opinion that once mining was started it would not be finally finished until 50,000,000 tons of 1% ore had been mined, or its equivalent copper content. I further said that on a start off operation that for the first five years it would probably be possible to mine 3000 tons per day and hold the mill heads to 1.3%. At any rate I would appreciate your jumping Sam out about this, as one of the troubles with Bagdad is that there has been too much bull thrown about it in the past, and I would like to stick to the facts in the case from now on out..."

With kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

September 14, 1942

Mr. J. W. Sill, Gen. Mgr.,
Bagdad Copper Corporation,
Hillside, Arizona.

Dear Sir:

Under separate cover we are mailing you a poster in connection with the mine labor problem which we believe would have an appeal to mine workers in that it expresses their importance to the war effort by remaining on their jobs. We suggest that these be posted in permanent places such as bulletin boards, time offices, stores, and so forth, where the message will reach not only the men themselves, but their families.

These posters are being distributed over the entire state through the courtesy of this Department.

Thanking you for your cooperation and assuring you of our interest in the mine labor problem, I am,

Yours very truly,

Earl F. Hastings, Assistant Direct
and Projects Engineer

EFH:EM

October 28, 1942

Mr. Jack Still
Bagdad Copper Company
Hillside, Arizona

Dear Jack:

We have been asked to try and speed up the development of molybdenum properties by the War Production Board.

There is no custom mill which can handle copper-molybdenum ores and pay both the copper and the molybdenum. Would it be possible for you to consider receiving custom ores in the new plant?

If you would consider this, I would like to meet you sometime and discuss some plan for working it out.

With best wishes and kindest regards, I am

Very truly yours

J. S. Coupal, Director

JSC:BA

[redacted]

Mining Journal 9/15/42

We, of course, could not figure this out for the Bagdad, but I am sure that you who have given it much study could do so. You would know approximately the investment that would be necessary for the plants, water development, transportation and everything else. You could then figure on what the price would have to be to pay operating costs, make a fair profit, and amortize that investment in five years.

Inasmuch as it is generally conceded that this is to be a long war, it might be well to include a statement as to the price that copper could be supplied after the investment is amortized.

I would greatly appreciate some further data from you on the above, particularly the investment that would be required and the price of copper that would have to be assured.

As there is no doubt that we are going to include Bagdad in this report, we want to carry a brief description of each property listed among our potential producers, and to give us the information for this brief description will you kindly let us have the data called for on this second questionnaire.

We believe that we have something on this survey that is of vital importance, not alone to the National Defense Program but to Arizona. We know that copper demands exceed the supply and copper is going to be a bottleneck unless plans are made ahead for the increased production that will be needed. We also know that private capital is not going to do the job without guarantees, and we want Arizona to be ready with its data to show the part that it can play.

Another point that I forgot to mention above is that we would want to know the time necessary to get the property into full production in the event a satisfactory arrangement were made.

I want to thank you for the information you gave me on the Chance Group. From what the Mortons told me about it I had very much the same idea.

Trusting that I will have an early reply and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

SURVEY OF OPERATING MINES

JUNE 13th, 1942

BAGDAD COPPER CORP.
HILLSIDE ARIZ.

PROBLEMS.

This company is setting pretty when it comes to problems to solve. They have the R.F.C ready to help out at any time.

The question of where and how are they going to get labor is now giving them some worries. They ahve a few old standbys but most of the miners are of the two week type now.

Some of them are saying that Mexican miners will have to be brought in, if we keep the mines going.

They have so far got along good on the material line, been able to get what they have needed.

Alla Rebeker

SURVEY OF OPERATING MINES

By A. C. Nebeker

JUNE I3th, I942

BAGDAD COPPER CORP.

BAGDAD COPPER CORP.
Severance A. Millikin , President
480 The Arcade, Cleveland, Ohio.

J. W. Sill Mgr.
Hillside, Arizona.

BAGDAD MINE;

Is located about 35 miles north of Hillside Railroad Station, and Post Office, in the Eureka Mining District, Yavapai Co. Arizona.

The Bagdad Mine is equiped with mining and milling equipment for a production of 250 tons per day. They have their own power plant of Diesel Engines making I200 H.P.

I94I production averaged about 6700 tons per month having average value of I.57% copper. The copper concentrates carry about I.32 Ozs silver showing that the ore carries very little silver, Gold not enough to mention. Copper concentrates from 45% - 50%.

I942 production will be the same as in I94I until the New Mill is operating The old mill is being operated now to full capacity. It is expected by the new plant will be running by the last of December. Mill is flotation type.

The new concentrater is for 2500 tons per day and is being constructed by the Southwestern Engineering CO.

Power for the new plant will be electric, brought in from the Parker Dam.

Water from Burro Creek brought over by a 7 mile, IO½ Ft O.D. pipe line.

There is 20 to 25 new houses now built to serve the new town

While this new construction is going ahead, the mine keeps on mining by the caving system ores for the old plant, and also sinking a new three compartment shaft 480 to 500 feet deep, 8I men employed.

It is claimed there is 40 years ore supply blocked out or proved by the tests made.

Concentrates are shipped to Hayden Ariz, from the mine to Hillside it is hauled by light trucks, and from Hillside to Hayden by heavy trucks.

A. C. Nebeker

Ore occurrence.

Copper mineralization somewhat similar to other low grade coppers. Very little pyrite content and as consequence very little rock alteration. All monzonite area is mineralized with dissemenated chalcocite and chalcopyrite; where mineralization is richest is blocked out orebody. Capping over orebody carries considerable oxide Cu.

Ore reserve (quantities and values).

Present churn drill holes indicate any of following estimates of proven ore:

6,250,000 tons @ 1.47% Cu or
18,250,000 " @ 1.25% Cu or
37,000,000 " @ 0.985% Cu

Possible extensions of above proven ore indicate a total mineable body of about 50,000,000 tons of 1%

Accessory metals of value.

Small amount of silver (about 3¢ per ton recovered at present)
" amount of Moly (MoS_2) about 0.7lb, or 30¢ per ton

Development work done.

400 ft vertical shaft and about 30,000 ft underground workings

Plants (with capacity) already on property.

975HP Diesel plant, Flotation mill and mining, crushing plant etc capable of putting thru 275 tons per 24hrs/

Date 5/30/41 Signed J.W.Still, Gen'l.Mgr.

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Capitol Building, Phoenix, Arizona

Name of property. Bagdad Copper Corporation

Location and accessibility of property.

Located about 26 miles (good dirt road) from Hillside, Arizona; Hillside being a station on AT & SF RR

History of ownership.

Bagdad Copper Corporation present corporate setup.

Original claims consolidated about 1906 by Giroux Syndicate-Arizona Bagdad Co setup about 1912.

Production history.

1906-1928 Prospecting & blocking out orebody by churn drilling and some underground work.

1928-1930 50 ton pilot plant operated to test metallurgy. Pilot plant enlarged to 200 tons late in 1930.

1930-present 200 ton plant operated (with shutdowns 9/15/30 to 10/1/35 and 4/1/38-11/1/39).....total production for this period slighlty under 200,000 tons @ 1.5% copper milled.

Total Copper produced about 4,800,000 lbs.

General geology (brief)

Copper mineralization is dissemenated chalcocite and some chalcopyrite in large island of monzonite.

This island of monzonite about 1 mile E &W by about ¾ mile N & S. Schist area(Hillside Mine) to north; bounded on other three sides by granite-schist complex cut with pegmatite dikes.

Signed _____ Date _____

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Bagdad Date August 31, 1960

District Eureka, Yavapai County Engineer Travis P. Lane

Subject: Mine Visit

I visited the Bagdad camp on August 26, 1960 and discussed the status of operations with Geo. Coleville, Mgr., Bob Bogert, Asst. Mgr., and Eddie Howe, pilot plant metallurgist. Mill tonnage is at the normal rate but grade of the feed is slightly lower than the average for the year to date, because of a greater proportion of primary ore, as compared with secondary ore in the current mill feed. The bulk of the mill feed is coming from the low saddle between the big main pit and a smaller pit area a short distance from it down Copper Creek. A new series of benches has been started from the rim of the big pit. Some 4 or 5 benches will be waste strip then about the same thickness will be oxidized ore and finally the secondary ore, underlain by primary ore, will be exposed for mining. Employment totals 350 men.

Construction of the new leach plant has been started by Fisher Construction Co. A Mr. Heinke is the job Supt. for Fisher. The contract crew averages 24 men and eventually is expected to reach a maximum of 70 to 75 before completion of the plant in March or April of next year. Forms were being placed for the precipitation tanks (11) and some cement was being poured in the completed forms. Also, foundations for the 2 acid converter tanks were poured, and other foundations were being set.

Bagdad counts on leaching in place the 30,000,000 tons in its main strip pile (the dam in Mineral Canyon) assaying .40 to .45% Cu; and nearly 3,000,000 tons in a pile being built up in Alum Canyon with assay of .50 to .60% Cu. The better strip material now coming from the pits is going to the smaller pile and this pile will be leached first.

Bagdad

June 5, 1945

MEMORANDUM

TO: W. C. Broadgate

FROM: Chas. H. Dunning

In regard to the Dickie matters we can offer you very little advice. Certainly we want to do everything possible for any Arizona mine operator but it is an unfortunate fact that we have not been informed in any way of any of Mr. Dickie's difficulties, or of anything in which we could be of assistance to him. I believe Mr. Dickie is the only one of the larger operators in the state whom I have not met personally and who, as far as I know, has never been in this office or had any correspondence with us. No doubt he is fortunate in being so big and in having such important connections of his own that there was no way in which we could help him.

So you will have to use your own judgement, bearing in mind that we want to be of service to all.

CHD:LP

premium?

It is understood, of course, that any of the work specified would be done in such a way as not to interfere with production, possibly by an outside contractor with his own labor and equipment.

As the future of the Bagdad operation means a great deal to the section of Arizona in which the mine is located I feel sure you will give its problems your careful and sympathetic consideration.

Sincerely yours,

Carl Hayden

cc: William C. Broadgate
Donald M. Rait

Confidential

United States Senate

COMMITTEE ON APPROPRIATIONS

May 31, 1945

Honorable Charles B. Henderson, Chairman
Reconstruction Finance Corporation
Washington, D. C.

My dear Senator:

At my request Bill Broadgate has been discussing with various Government agencies two proposals for drilling at the Bagdad Copper Company's mine in Arizona. These are:

(a) A proposed Bureau of Mines diamond drilling program for the conservation of the ore body in the so-called Block B.

(b) A churn drilling development program to ascertain the conditions in Block A prior to shaft sinking and driving levels.

I should appreciate having your position clarified on the following points:

1. If the Bureau of Mines should set up a diamond drilling program as outlined above in (a), would the RFC object to the Bureau having access to the property or to its carrying out the project to completion?

2. If the Company should wish to do the diamond drilling mentioned in (a) above with funds separate from the proceeds of operation, would the RFC give its permission?

3. Regarding proposal (b), would the RFC permit the Bagdad management to proceed with funds it might raise which would be entirely separate from the proceeds of operation?

4. Again regarding proposal (b), would the RFC interpose any objection to the work being done by a special premium allowance made for this particular purpose, should the Quota Committee see fit to provide such a

WASHINGTON, D.C.
June 1, 1945

CONFIDENTIAL

TO: C.H.DUNNING
FROM: W.C.BROADGATE
ABOUT: Bagdad

Regarding the various projects Dickie wishes to get approval for from RFC.

The facts seem to be that the operating revenues of the company, leave no margin above meeting obligations, from which the additional work can be done, and paid for.

The RFC Directors do not feel they can afford an additional capital loan with which to do work which will benefit the property, but not the RFC. I think they would have no objection were the revenues such as to afford the work out of current income.

The stripping and glory-hole operation Dickie now is advocating would cost a great deal to prepare and they have no funds available for it.

The RFC has not officially rejected any of the proposals. If they do (and I think they will) it will not be on the basis that the work would be unsound, or that it would not benefit the mine, but that Bagdad has no money with which to do it.

It seems to me that the churn drilling, which would, together with development work, require about two years to put the next block in shape, should be of sufficient value to the mine that Lincoln and Macklyn should be willing to pay for it.

United States Senate

Special Committee to Study Problems of
American Small Business

May 30, 1945

Mr. Gordon S. Macklin
Executive Vice President
Bagdad Copper Corporation
1260 Union Commerce Building
Cleveland, Ohio

Dear Mr. Macklin:

Mr. Ernest Dickie of the Bagdad Copper Corporation stopped in to see me at Senator Hayden's office for six or seven minutes just before his train time.

He handed me two letters which had been sent to W. H. Gohring, RFC Supervising Engineer, Phoenix, Arizona, and requested assistance. One of these letters requests permission to undertake a stripping and glory-hole operation. The other asks permission to churn drill Block A.

It is my understanding that Dickie saw some people in the War Production Board about this matter and also had interviews with D. M. Rait and Morton Macartney of RFC. The last two, he informed me, rejected both proposals. It is unfortunate that Dickie did not invite me to these conversations as an observer so that I could have noted the arguments pro and con and, perhaps, interposed to some extent.

This was the first I had heard of the proposed glory-hole operation and I am put in the position of having to re-open the matter with Rait and Macartney after they already have given a verbal rejection of the plan.

The churn drilling of Block A is not the same problem we have been discussing, i.e., the Bureau of Mines program for conservation on the south end of Block B by diamond drilling. No application yet had been filed by Bagdad for this project and I advised Dickie to file as, even though we do not yet know if the Budget for Bureau of Mines for the fiscal year 1946 will permit this work, it will cost nothing to initiate an application through the Arizona Bureau of Mines office. Bureau of Mines policy should permit this work if money is available.

United States Senate

Special Committee to Study Problems of
American Small Business

May 30, 1945

Mr. Ernest R. Dickie
General Manager
Bagdad Copper Corporation
Bagdad, Arizona

Dear Mr. Dickie:

As per our conversation, I believe you should file an application with the Bureau of Mines for the diamond drilling conservation program at the south end of Block B. If the budget of the Bureau of Mines provides sufficient funds it may be possible to get this program through.

You understand, I am sure, that the Bureau of Mines probably could not set up a project to do your churn drilling on Block A as this is strictly mine development. Their general policy only permits work where the project presents special technical problems which would advance the nation's mineral program.

I am sorry that I was not present at your conversations with Rait and Macartney so as to have heard the case for drilling and the glory-hole program discussed pro and con. It would have made it much easier to handle your problems.

When I have further information I shall write you.

Sincerely yours,

Bill Broadgate

W. C. Broadgate
Technical Consultant

cc: C. H. Dunning

Washington, D.C.
May 29, 1945

TO: C.H.DUNNING
FROM: W. C. BROADGATE
ABOUT: Bagdad Copper

I am not a little annoyed about the Bagdad deal. Senator Hayden was asked by Lincoln to get him a Bureau of Mines drilling program. In his letter he, by ignorance or otherwise certainly misrepresented the deal. Hayden asked me to look into it. I also had a note from Charlie Willis pointing out how important Bagdad is to the future mining of Arizona and asking that all possible be done.

Gordon Macklyn and another official of the Company came from Cleveland to see the Senator, but could not so saw me and asked help.

I spent a good deal of time looking into the picture and got the USGS to send over the geologist Anderson and went over the picture, getting the reports chenged and brought up to date to fit the bill.

I asked that they file a request with the Bureau for a drilling program.

Incidentally I had not forgotten thah when Dickie was here last year he made an appointment with me and not only did not keep it but did not even phone or write to apologise or explain.

Macklyn called from Clevelend Friday asking for an appointment for Dickie. Dickie also got on the phone and asked to see me. This morning after he has been in town for days, dickie called up and asked for an appointment at Hayden's office for ~~four~~ two o'clock. He turned up at four. two-thirty

He had been everywhere but the Bureau of Mines, without letting me know what he was doing or having me along to hear the conversations. I guess he bungled the deal for when I saw him at four, he told me that he had gotten nowhere, dumped the deal in my lap, handed me two letters he had written to Bill Gohring, and in SEVEN MINUTES was on his way to the train..... no time to stay longer.

I find from the letters (after he had gone) that they did not follow my instructions (given by letter and through Anderson) at all, but have reasked RFC to permit them to churn drill.

We just are not talking about the same thing. He also said they want to mine by gloryhole and RFC refused them.

Says he.."we need your help badly and I'm sure you can fix it up" or words to that effect.

These people that jam everything up and dump the mess in your lap are not worth helping, but I guess I'm stuck with trying to do something, I still don't know what. Dickie should have stuck to the Vulture.

June 13, 1941

Mr. J. W. Still
Bagdad Copper Company
Hillside, Arizona

Dear Jack:

Sam Morris was in the office this morning and he was very much interested in the possibilities of Bagdad as a copper producer. He is leaving tonight for Washington and we are sending on to him the data, as he feels that the case of the Bagdad is one of the most important to present to government authorities.

In checking over the data we did find one thing on which we did not get information that he would like to have and that is the production record up to date both in tons of ore and pounds of copper tabulated by years. I felt sure that you would have this readily available, and I would appreciate getting it so that we can send it airmail to him in Washington.

Trusting that I will have an early reply, and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

June 2, 1941

Mr. J. W. Still
Bagdad Copper Corporation
Hillside, Arizona

Dear Jack:

I have received the second questionnaire on the Bagdad Copper Corporation. Many thanks for so promptly filling it out.

You overlooked one portion of my letter which is very important. You failed to give us the amount of capital investment necessary to put Bagdad on a 3,000 ton basis, and the amount that would be needed to add to the price of copper in order to amortize the investment over a five year period. While you might be able to produce at an operating cost of 9¢ a pound, you would have to figure what it would cost, including amortization, in the event of making a deal with the government.

We know absolutely that a bottleneck is going to be reached in the copper industry within this next year, and that there is going to be frantic searching for sources of copper for defense purposes. We know, of course, that if the price were permitted to go, it would run very high. Therefore, the government is going to have to deal independently with potential copper producers to avoid run away prices.

Thanking you again, and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

June 17, 1941

Mr. J. W. Still
Bagdad Copper Corporation
Hillside, Arizona

Dear Jack:

I have your letter of the 14th which I will transmit to Sam Morris in Washington, and I hope that he will get in touch with Frank Page.

I was anxious to check up with you the recent production from Bagdad. We have some figures from the custom smelters. Our record from the custom smelters shows that Bagdad produced from 1936 to 1940, 4,316.15 tons of concentrates containing 4,658,686 pounds of copper. It does not tell us how many tons of ore, however.

I note your paragraph regarding the misstatement made by Sam Coupal and I will take the matter up with him and see that he gets more nearly down to earth. I do not know where Sam got this information as he has not seen our recent correspondence. I have been handling all of this Copper Tariff work myself.

Thanking you, and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

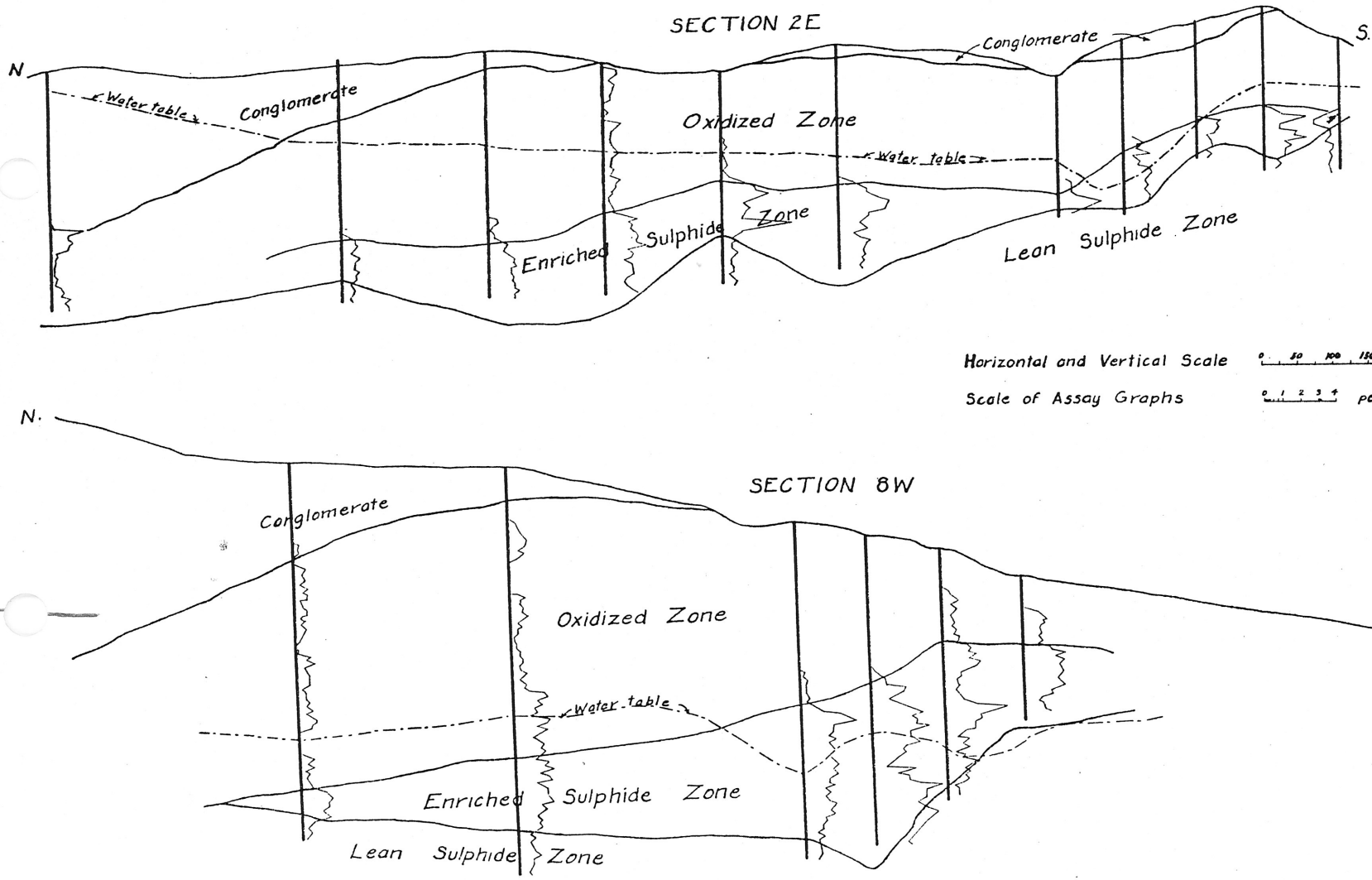


Plate XXVII.—Sections through Bagdad ore body along lines 2 E and 8W of Plate XXV. Drill holes indicated by heavy lines.

Mine **BAGDAD AREA**

Date **Dec. 6, 1952**

District

Engineer **Mark Gemmill**

Subject: **Present operations**

BAGDAD COPPER CORPORATION

Production is about normal or around 100,000 tons per month of ore mined and milled. Preparations are under way to start the proposed expansion program. Mr. Dickie stated that financial arrangements for the program are not complete, but seemed to feel that there is little doubt but that they would be consummated within a short time.

BAGDAD COPPER

Mark Gemmill Report 4-27-55

A new 9 yd. P. & H. electric shovel together with a fleet of large Dart trucks have just been put in operation stripping the hill to the northwest of the present pit. This work will uncover an extensive area of known ore.

BAGDAD COPPER CO.

J. W. Still
Hillside, Ariz.
5/16 - 1st
5/28 - 2nd
6/9 - complete

Severance A. Millikin, Pres
480 Arcade Bldg.
Cleveland, Ohio.

1936			
	45 4R-E.P.	736.00 T.	579,082 lb.
	045 4R	34.60	30,139
1937	45 4R-E.P.	1739.00	1,482,747
1938	45 4R-E.P.	831.00	797,124
1939	45 4R-E.P.	260.00	237,150
1940	045 4R	235.55	1,087,149
	45 4R-E.P.	480.00	435295
		4,316.15	4,658,686

June 9, 1941

Mr. J. W. Still
Bagdad Copper Corporation
Hillside, Arizona

Dear Jack:

I have yours of the 30th and this now gives us the complete information we desire on Bagdad. Outside of a possible increase at Inspiration, Bagdad is the largest potential copper producer and we are very glad to have the complete data on it which you gave. We know very well that the government is going to be looking hard to find out where they are going to get the necessary copper from and Bagdad offers them an opportunity. Incidentally, it may offer you the same opportunity of getting into action in a manner that will assure continuation after the defense program is over.

Thanking you again, and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

DEPARTMENT OF MINERAL RESOURCES

News Items

Date July 24, 39

Mine Bagdad Copper Co

Location 27 miles north

Owner Hillside, Ariz

Address

Operating Co. Not for publication

Address During present shut down continue

Pres. keeping unwatered

Genl. Mgr. A new shaft

Mine Supt. has been started

Mill Supt. now 30' deep of

Principal Metals 3 compartments

Men Employed 2 – 6'x7'

Production Rate 1 – 5x7

Mill, Type & Capacity inside 7'x19' inside

Power, Amt. & Type

Signed Barth

(Over)

Date Jan. 2, 40

Mine Bagdad Copper Corp

Location 29 mi. N. of Hillside.

Owner Same

Address Hillside

Operating Co. Eureka Dist.

Address

Pres.

Genl. Mgr. Jack Still

Mine Supt.

Mill Supt. C. L. Vance

Principal Metals Cu.

Men Employed 42

Production Rate 275 tons

Mill, Type & Capacity Flotation

Power, Amt. & Type Diesel Electric 950 HP.

Signed Barth

(Over)

Date Nov. 1, 1939

Mine Bagdad Copper Corp

Location Hillside, Ariz

Owner

Address

Operating Co. Resume operations

Address Nov. 1.

No new construction

Pres. work anticipated

Genl. Mgr. Operation of

Mine Supt. present plant

Mill Supt. of 250 tons

Principal Metals capacity

Men Employed Expect 50 men

Production Rate to be put to

Mill, Type & Capacity work.

Jack Still Genl Mgr

PPER CO.

ll Ariz.

Severance A. Millikin, Pres
480 Arcade Bldg.
Cleveland, Ohio.

	736.00 T.	579,082 lb.
	34.60	30,139
P	1739.00	1,483,747
P.	831.00	747,124
P.	260.00	237,150
	235.55	1,097,149
EP	480.00	435,295
	4,316.15	4,658,686

NAME OF MINE: BAGDAD COPPER CORP.

COUNTY: YAVPAI C
DISTRICT:
METALS: CU

OPERATOR AND ADDRESS:

DATE:		MINE STATUS DATE:
6/3/44	Bagdad Copper Corp. ~~S. A. Millikin, Pres.~~ J. C. Lincoln Rt. 1 Box 350 430 The Arcade Cleveland, O. Ernest R. Dickie Scottsdale ~~[illegible]~~, Gen. Mgr. Doren Sutton, Mine Supt. J. C. MacIntosh, Mill Supt. R. R. Bellknap, Ch. Mine Engr. C. C. Anderson, Master Mech. W. D. Deacon, Ch. Electr. E. G. Green, Ch. Chem. R. E. Foudy, Ch. Clerk Hillside, Ariz. C. O. Schlereth, Cons. Engr. Rt. 8, Box 258 B Phoenix, Ariz.	BIG OPERATION Milling & Shipping

United States Senate

MEMORANDUM

March 15, 1945

Dear Chuck,

I am working on trying to get a $50,000 B of M drilling program for the Bagdad Copper Company.

Bill

DEPT. MINERAL RESOURCES
RECEIVED
MAR 17 1945
PHOENIX

United States Senate

MEMORANDUM

The RFC never did prohibit the B of M entering the property to drill.

The answer to the questions posed here is "yes" there will be no objection, as I first ascertained by conference.

However, I want it on paper so there will be no further misunderstanding.

Bill

DEPT. MINERAL RESOURCES
RECEIVED
JUN 4 1945
PHOENIX

C-3

160 10½ x 9 x 5 cm mm K07-

MINE SPECIMEN FOR DEPARTMENT OF LIBRARY AND ARCHIVES

This specimen now in ADMR Museum

(Do not write in this space)

Ore _____

Cabinet _____

No. _____

(Wrap each specimen separately, or place it in a substantial bag, by itself, with a number attached, identical with the number on this card.)

Specimen No. 12, collected by Carl G. Barth, Jr. Field Engineer

Name of ore Copper Ore

Minerals contained Chalcopyrite, Molybdenite

Gangue Granite porphyry

Depth at which taken 300

Approximate mineral content (in terms of average per ton) 1 1/2 percent Copper

Name of mine or claim Bagdad Mine

Group _____

District Eureka

Location (distance and direction by highway from what town 30 mi. NW Hillside

Owner of property Same

Operator Bagdad Copper Corporation

Mine active or inactive Active

If inactive, when operated _____

Specimen presented by Jack Still

Date January 1940

Notes (Any general information regarding the history of the property.)

If more space is desired for notes, use other side.

BAGDAD

7-14-58 We
Report

BAGDAD COPPER CORP. YAVAPAI COUNTY
EUREKA DIST.

Visited Bagdad and Tungstona Mine. Bagdad has recently purchased this property (but not mill) from Hillside Mining Co. The property idle. At the time of visit a Bagdad crew was connecting a pipe line to Bagdad to supply domestic water from a well on the Tungstona property.

Visited Bagdad and discussed current operati with Geo. Colville. The new crusher installati (to augment the old) is completed and expected to be in operation this week. Mining and milli operations are normal.

T P LANE

T. P. LANE
3-13-59(W.Rep.)

MEMO

September 12, 1960

BAGDAD COPPER CORP.

Travis P. Lane

Attended, in Prescott, the regular monthly dinner-meeting of the Yavapai Subsection AIME. The guest speaker was E.S. Howell, Metallurgist for Bagdad Copper Corp. The subject of his talk was the new copper acid leach plant now under construction at Bagdad by Fisher Contracting Co.

Mr. Howell described the laboratory and pilot research work of the past 15 years which culminated in the company's decision to undertake the present project. The plan is to leach in place the oxide copper bearing strip dumps (over 30 million tons). The acid plant and precipitation tanks are situated on Dillon point on the edge of Black Mesa some 700 to 800 feet above Copper Creek, Solution containing .8% H_2SO_4 will flow onto the top of the dumps and the pregnant solution issuing from the base will be pumped up to the plant on the mesa where the dissolved copper will be precipitated on iron as cement copper. The barren tail solution from the precipitation tanks will be brought up to strength and recycled through the dumps, etc. Acid and iron consumption are estimated at about 7 lbs. and 1.6 lbs. respectively per lb. of copper produced. Acid is manufactured from molten sulfur.

Several Bagdad people were in attendance at the meeting, notably David L. Lincoln, President, and Geo. Colville, Gen. Mgr.

BAGDAD MINE - EUREKA DIST. - YAVAPAI COUNTY

Friday: Visited the Bagdad Mine. George Colville and Bob Bogard were away. However, I discussed the operations with Roy Jones, Mine Supt. He reported that the mine and mill were running smoothly. The milling rate is about 5000 TPD. Heads for Sept. averaged .997% Cu. Less than average recovery of about 75% reflected inclusion of considerable oxidized material from an upper part of the old workings. During August 150,000 tons of ore were milled and 500,000 tons of waste stripped.

Because of the strike at the Hayden smelter a considerable tonnage of concentrates has been stockpiled at the mine, and the company is now beginning a stockpile at Hillside station. The plant normally produces around 4,000 tons of concentrates per month.

Employment is as follows:

Pit	90 men
Mill	70 "
Shop,garage, etc.	60 "
Office & Misc.	40 "
Total	**260 men**

TRAVIS P. LANE- Weekly Report 10-3-59

April 27 Visited Bagdad Mine. Geo. Colville, Mr. and Bob Bogard (Asst?) were in conference with representatives of Fischer Contracting Co. concerning design and construction details of the recently announced $2,000,000 copper leach plant. I talked with Roy Jones, Mine Supt. re the current situation. He told me the company had just negotiated a loan from the Valley National Bank to help finance the new plant. The method will be "heap leach" with acid followed by conventional precipitation of copper in shredded detinned cans resulting in a cement copper product. A contact acid plant using ~~native~~ molten sulphur shipped in from outside sources will furnish the necessary leaching acid (H_2SO_4). The heap leach site is located at Dillon point on Alum Creek which leads into Copper Creek about a mile down stream from the main pit workings. Approximately 1,200,000 tons of oxidized ore already has been placed on the leach site and heaping is continuing at a substantial rate. Stripping operations at the mine are at a rate of about 500,000 TPM about 2/3 of which is oxidized material running 0.5% Cu or more. The company anticipates a plant completion date about May 1, 1961. The plant is expected to eventually recover 40,000 lbs. of cement copper per day. It is estimated that 15 additional employees will be required for the plant operation.

Bagdad production is continuing at the normal rate i.e. 5000 TPD. Grade of mill feed at 0.80% Cu for March was somewhat lower than normal. Employees number about 260. Bagdad has for the present shelved its former elaborate plans for electrorefining its copper production.

TRAVIS P. LANE, WR-4-30-60

BAGDAD COPPER CORP' - Yavapai Co. Eureka Dist. June 21, '57

300,000 tons per month. 398 men

J. C. Lincoln Pres, Scottsdale, Ariz. 155 claims
B. H. Jamison, Sec, Cleveland, Ohio
Geo. W. Colville, ~~Supt~~ - Bagdad Gen. Mgr.

L.A.S.

BAGDAD COPPER CORP. YAVAPAI CO.
Bagdad, Ariz.

3,000 t/day copper flotation.

OPERATING

See
(Report- MILLS-NORTHERN DIST.) (In "Geology" file)
SEPT. 30, 1957

B.J.SQUIRE
Field Engineer.

DEPARTMENT OF MINERAL RESOURCES

REPORT TO OPA ON ACTIVE MINING PROJECT

Date 8/10/45

Name of Mine Boyd

Owner or Operator (—) L V Crabb

Address Boyd Ariz (Hillside Ariz)

Filing Information

File System.....

File No.....

This chart to be used for gallons of gasoline required per month.

Mine Location.....

PRESENT OPERATIONS: (check X)

Production.....; Development.....; Financing.....; Sale of mine.....;

Experimental (sampling).....; Owner's occasional trip.....;

Other (specify).....

PRODUCTION: Past and Future.

	Tons
Approx. tons last 3 months	
Approx. present rate per 3 months	
Anticipated rate next 3 months	
If in distant future check (X) here	

EQUIPMENT OPERATED:

Type	Quantity or Horse Power	Miles or Hours Per Month	Gallons Required Per Month
Personal Cars			
Light or Service Trucks	1	200	30 (very rough steep roads)
Ore Hauling Trucks			
Compressors			
Other Mine or Mill Eqpt.			

PRODUCT PRODUCED OR CONTEMPLATED: Name metals or minerals.

.....

REMARKS:

This applicant is an important employee of the Boyd Copper Co. whose duties require considerable mileage in a truck. No doubt he should put his application through our employer but this Department knows enough of the circumstances to say his application is justified

Special notation

ARIZONA DEPARTMENT OF MINERAL RESOURCES

By Grant Bannister

DEPARTMENT OF MINERAL RESOURCES

REPORT TO OPA ON ACTIVE MINING PROJECT

Date: 7/17/45

Name of Mine: Bagdad

Owner or Operator: N E Orr (contractor)

Address: [illegible] W. [illegible] Vista Rd Phoenix

Mine Location: at Bagdad Camp

Filing Information

File System:

File No.:

This chart to be used for gallons of gasoline required per month.

PRESENT OPERATIONS: (check X)

Production.........; Development.........; Financing.........; Sale of mine.........;

Experimental (sampling).........; Owner's occasional trip.........;

Other (specify) ....

PRODUCTION: Past and Future.

	Tons
Approx. tons last 3 months	
Approx. present rate per 3 months	
Anticipated rate next 3 months	
If in distant future check (X) here	

EQUIPMENT OPERATED:

Type	Quantity or Horse Power	Miles or Hours Per Month	Gallons Required Per Month
Personal Cars			
Light or Service Trucks			
Ore Hauling Trucks			
Compressors			
Other Mine or Mill Eqpt.			

PRODUCT PRODUCED OR CONTEMPLATED: Name metals or minerals.

Copper

REMARKS:

This operation is so well known that it requires no comments. The text is too long for this form but is attached herewith.

ARIZONA DEPARTMENT OF MINERAL RESOURCES

By

GEOLOGY DIVISION, ARIZONA SECTION, A.I.M.E.

SPRING FIELD MEETING

BAGDAD, ARIZONA - MAY 16, 1959

Chairman: Edward L. Jones, Mine Superintendent
Bagdad Copper Corporation

PROGRAM

9:30 AM - Registration

10:30 AM - Business Meeting

Geology of the Bagdad Area - C. A. Anderson

12:30 PM - Lunch

2:00 PM - Tour of the Open Pit

Geology Div. AIME
Meeting 5-16-59
Chm. Edward L. Jones, Mine Supt.

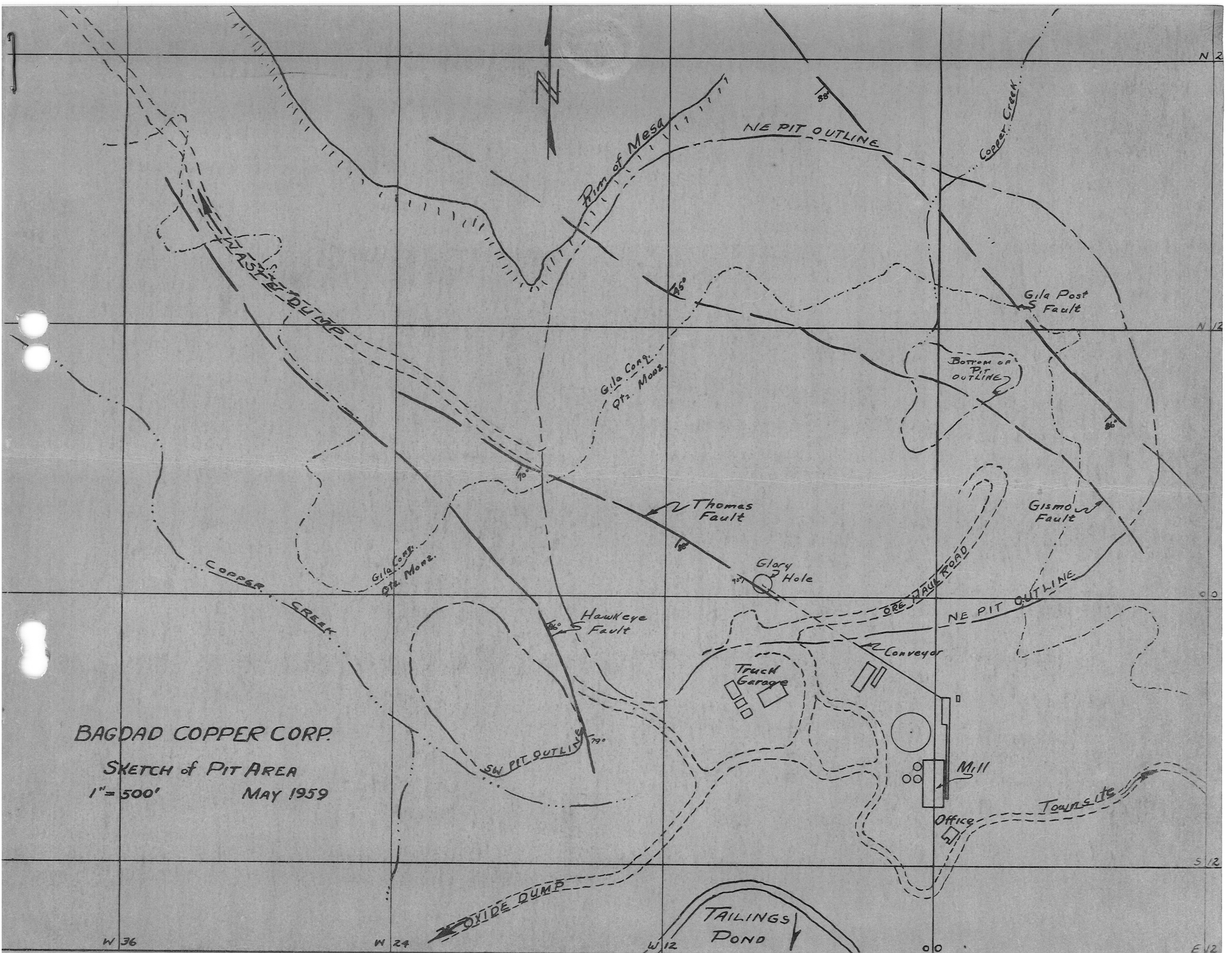
A BRIEF HISTORY OF THE BAGDAD OPERATION

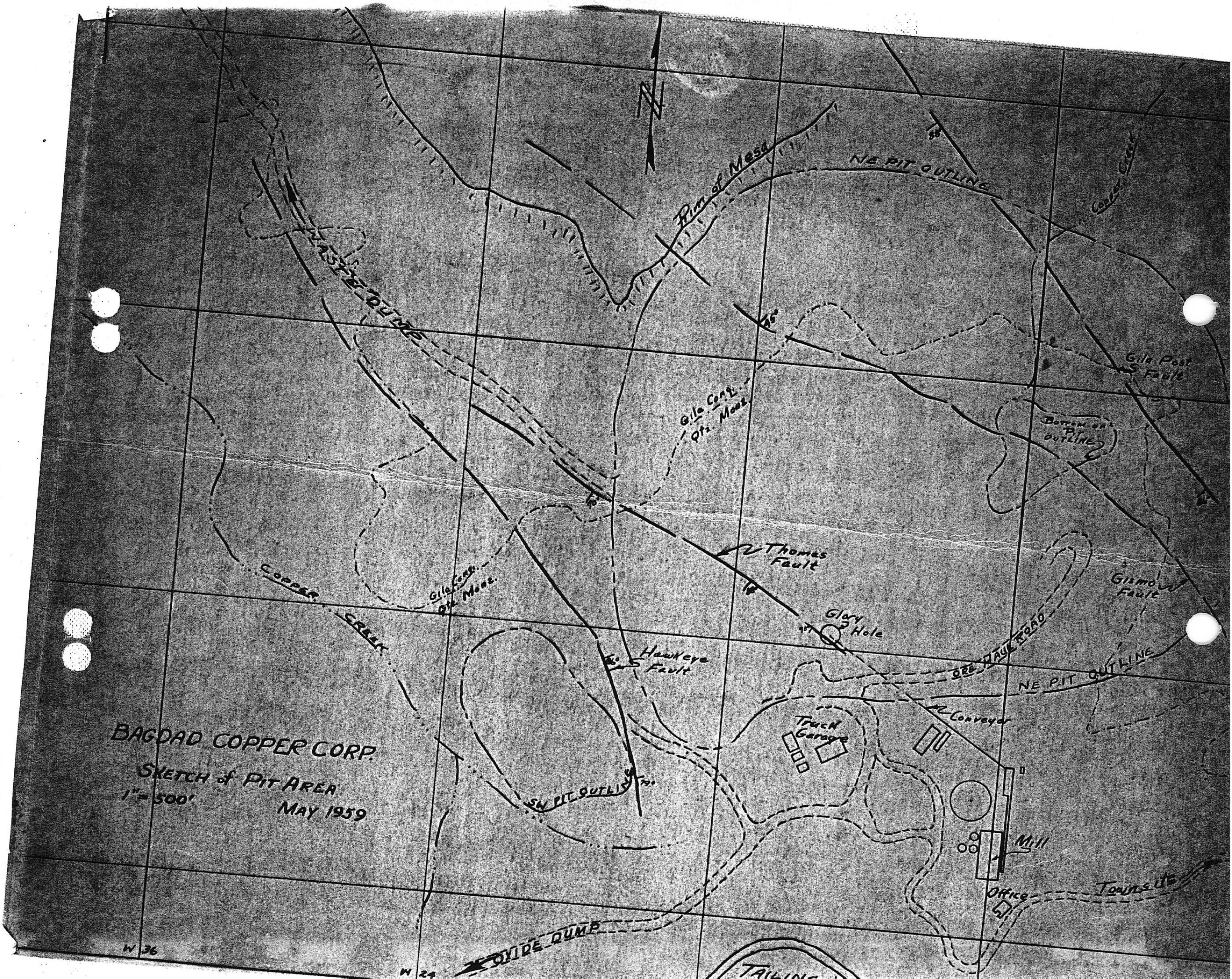
Bagdad Copper Corporation is an independent copper producer. First claims on the ore body were located in 1882. In succeeding years various organizations undertook exploration, but high grade ore findings were small and scattered. In 1927 the organization bearing the present title was formed and rather extensive churn drilling done. Mining started on a small scale in 1929, when a small mill was constructed.

A RFC loan enabled a large scale mill to be constructed, and this 2,500 ton daily capacity mill began operation in 1943. Ore for this mill was obtained by block caving. This did not prove a profitable operation due to the thinness of the secondary ore blanket, the lack of adequate weight over the ore, and to dilution due to overdrawing. In 1945 the mining method changed to open pit with an immediate increase in efficiency. By 1950 another ball mill was added to the concentrator, and in 1957 a fifth mill was added to bring daily capacity up to 5,000 tons.

We are operating on ore running about .90% total copper. MoS_2 runs about .02%/ton of ore and is recovered. Silver in the ore averages about .04 oz./ton.

Exploration continues with two diamond drills doing deep hole work.


N 24
N 12
0 0
S 12
E 12
W 36
W 24
W 12
0 0
Rim of Mesa
NE PIT OUTLINE
Copper Creek
WASTE DUMP
Gila Post Fault
Gila Congl.
Pt2 Monz.
BOTTOM OF PIT OUTLINE
Thomas Fault
Gismo Fault
Glory Hole
Copper Creek
Gila Congl.
Pt2 Monz.
ORE HAUL ROAD
NE PIT OUTLINE
Hawkeye Fault
Conveyor
Truck Garage
SW PIT OUTLINE
Mill
Office
Townsite
OXIDE DUMP
TAILINGS POND
BAGDAD COPPER CORP.
SKETCH of PIT AREA
1"=500'
MAY 1959


BAGDAD COPPER CORP.
SKETCH of PIT AREA
1" = 500'
MAY 1959
NE PIT OUTLINE
Rim of Mesa
Copper Creek
Gila Post Fault
Bottom of Pit Outline
Gila Cong. Qtz. Mons.
Thomas Fault
Gismo Fault
Glory Hole
Hawkeye Fault
ORE HAUL ROAD
NE PIT OUTLINE
Conveyor
Truck Garage
SW PIT OUTLINE
COPPER CREEK
Gila Cong. Qtz. Mons.
WASTE DUMP
Mill
Office
Townsite
OXIDE DUMP
TAILING
W 36
W 24
N

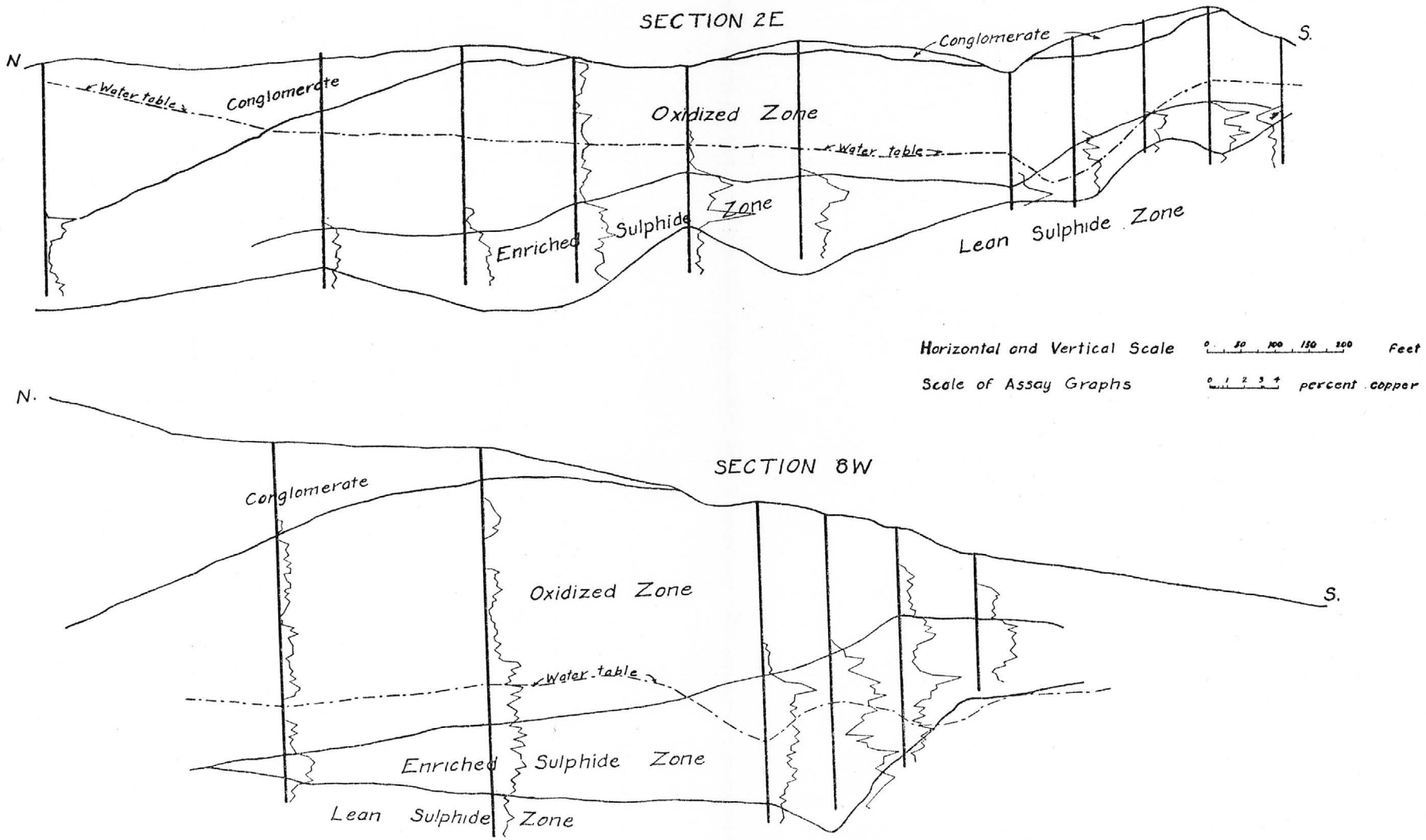


Plate XXVII.—Sections through Bagdad ore body along lines 2 E and 8W of Plate XXV. Drill holes indicated by heavy lines.