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A

GEOLOGICAL REPORT

on the

CHIEF ENGINEER PROPERTY

in the

Wallapai Mining District

Mohave County, Arizona

by

Wm. Vanderwall
Geologist
Scottsdale, Arizona

April 30, 1981

SUMMARY OF GEOLOGICAL REPORT

CHIEF ENGINEER PROPERTY Wallapai Mining District Mohave County, Arizona

The Chief Engineer Property consists of four contiguous, unpatented mining claims located in Section 9, Township 22N, Range 17W, G&SRM, Mohave County, Arizona.

The property is a part of the Stockton Hill Camp. A late 1800's silver bonanza where oxidized ores ran as high as 3000 ounces silver per ton. The Chief Engineer property was worked until the turn of the century but production statistics are unavailable.

The property is located in the central portion of the Cerbat Mountain Range, one of the many north south trending, fault-block ranges of the Southwest desert. Rocks exposed at the surface, on the Chief Engineer property, include pre-Cambrian metamorphic rocks cut by Mesozoic (?) intrusives and by mineralized beins of unknown (Tertiary?) age.

The ore deposits on the property may be of two types: Oxidized, near surface veing deposits often greatly enriched in silver; and deeper, primary, base metal-silver vein depoists which may extend to considerable depth.

The most favorable loci for ore is at the junction of veins with other structures, although it can be found randomly spaced along the veins in lenses or shoots. The main vein on the Chief Engineer property trends northwest and projects to a shallow underground intersection with neighboring dykes.

Results of field reconnaissance indicate the following:

- A) Mineralized structures traverse the property and ore is exposed in prospect pits, trenches, etc., indicating the oxide zone was not mined out by the first miners.
- B) Dykes and veins project to a shallow underground intersection which would provide a sizable locus for ore deposition.
- C) Past mining on the property has produced a considerable amount of dump material which may be amenable to cyanidation.

Wm. Vanderwall, Geologist
April 30, 1981

Geological Report
CHIEF ENGINEER PROPERTY
Wallapai Mining District
Mohave County, Arizona

LOCATION:

The Chief Engineer property consists of four contiguous, unpatented mining claims located approximately eight miles north of Kingman, Arizona, on the eastern slope of the Cerbat Mountains. The claims are situated in Section 9, Township 22N, Range 17W, G&SRM, and are accessible via county and private roads.

SCOPE OF REPORT:

Facts and opinions contained in the report are based on a cursory field examination of the property and on the author's specific knowledge of the area and general familiarity with the published literature concerning the Wallapai District.

HISTORY AND PRODUCTION:

The Chief Engineer property lies centrally in the famous silver bonanza ghost camp of Stockton Hill, where rich silver discoveries brought miners to the area as early as 1863. Oxidized silver ores (up to 3000 ozs. per ton) were mined at Stockton Hill with the bulk of production during the 1870-1880 period. The rapid decline in silver prices between 1885-1895, the recession of 1905 and the added cost of mining the deeper, leaner, sulfide ores caused the suspension of mining operations. The area, for the most part, has been idle ever since.

Schrader, 1909 (USGS Bulletin 397, pp. 112-113) briefly describes the Little Chief Mine (now the Chief Engineer) and estimates its production to be \$25,000 in silver (125,000 ozs. @ 20¢/oz.). Schrader credits the Little Chief with approximately 1000 feet of underground work and gives cerargarite (AgCl), galena (PbS) and native gold as the principal ore minerals. He states ore tenure as 350 ounces of silver per ton, 14% to 30% lead, and up to one half ounce gold. Physical inspection of dump material tends to support Schrader's values.

The value of metals produced in the Wallapai District during the years 1904-1948 (U.S. Bureau of Mines 1948 Annual Report) was about 22.5 million dollars at 1948 prices (nearly a half a billion dollars at today's prices). Values were principally in lead and zinc, but with substantial amounts of copper, silver and gold.

Currently Penzoil-Duval Corporation, approximately 4 miles northwest of the Chief Engineer property, is reportedly producing 18,000 to 20,000 tons per day of open pit ore averaging 0.5% copper and 0.045% molybdenum, plus other metals.

GEOLOGY AND ORE DEPOSITS:

The Cerbat Mountains constitute one of the many north-south trending, fault block ranges of the southwest desert. They consist primarily of metamorphosed pre-Cambrian igneous and sedimentary rocks, cut by later intrusions of Mesozoic (?) granite and monzonite porphyries, known locally as the Ithaca Peak Granite, and by Tertiary volcanic dykes. Centering around the Ithaca Peak intrusive, mineralization is typically copper and molybdenum sulfides, now being mined by Duval. Surrounding the intrusive is a zone several miles wide of copper-lead-zinc-silver bearing veins which gradationally change to veins of intense silver-lead-mineralization. The Chief Engineer property contains veins of the silver-lead type.

The vein type ore deposits occur in clefts or cracks in the country rock in which the mineral material precipitated from aqueous solution (hydrothermal fissure veins). It is probable that these fissures formed from forces accompanying the emplacement of the Ithaca Peak intrusive. With the intrusive acting as a heat engine, a convecting hydrothermal system developed that set up a hypogene enrichment process which deposited ore and gangue minerals near the top of the convecting cell and extracted metals and sulfur from sources at depth. Conceivably, as the solution approached the fissure level, it boiled, thereby distilling the acid forming constituents CO_2 and H_2S . Cooling and a slight pH rise of the residual liquids, due to loss of acid forming constituents, may be regarded as the mechanism of sulfide precipitation. Exposure of the veins to normal weathering processes oxidized the ore and, to a point, enriched it by the downward migration of slightly acidic rainwater carrying metals in solution.

Many veins, occurring in nearly vertical fault fissures, strike northwest and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, or shoots, though not continuous are numerous and tend to have greater vertical rather than horizontal extent. Concentrations of extremely high-grade ore appear to favor vein junctures. These concentrations are attributable to chemical and physical changes which enhanced mineral deposition at the fissure level of the convecting cell.

The main vein on the Chief Engineer property is a prominent linear structure which extends from the Banner Mine southeastward. It cuts all lithologic units in the area, mostly pre-Cambrian granite, to intersect with no less than two dykes on the Chief Engineer property. The vein is composed of quartz and silicified granite breccia with some gouge. The vein trends $\text{N}40^\circ\text{W}$ and is nearly vertical. The vein is from 3 to 9 feet wide and heavily

stained in outcrop by iron and manganese. Evidence of mineralization in the vein is from pronounced gossan caps, in place mineralization underground and the number and extent of workings on the vein.

Dykes on the property include granite porphyry and diabase but are, presumably, less mineralized than the vein. No dyke-vein junction is apparent on the surface but attitude and trend of the dykes as well as mine dump material suggests an underground intersection.

The primary mineralization is one of proustite, galena, sphalerite, chalcopryrite, pyrite and arsenopyrite together with a variety of gangue minerals. The oxidized portion of the veins ranges from 50-300 feet and may be very rich in lead sulfide, silver chloride, native silver and lesser concentrations of native gold.

ORE RESERVES:

The Chief Engineer property contains a known ore body composed of primary base metal-silver values as well as oxidized silver-gold values. Data from past developments, publications and reports are insufficient, or unavailable, to completely delineate the ore body for volumetric analysis. However, there is ore exposed in various underground workings and in many places on the surface; prospect pits, trenches, dumps, etc.

Numerous veins traverse the Chief Engineer property, some of which are known to contain ore shoots rich in silver and gold. The shoots are generally less than three feet wide and tend to have a greater vertical than horizontal extent. The Little Chief Mine, located on the main vein of the Chief Engineer property, is on one such ore shoot but the extent and exact tenure of this shoot cannot be ascertained since the mine is presently caved and inaccessible. However previous developments on the same vein and in the immediate vicinity of the Little Chief Mine have shown considerable ore at depth which indicates commercial quantities of ore may be encountered beneath the present workings.

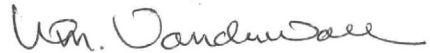
Previous mining operations on the property have produced some sizable mine dumps. The possibility of precious metal extraction from these dumps should not be overlooked.

CONCLUSION:

On the basis of surface observations and in accessible old workings, plus facts provided in the published literature and by local people of reputation it is the author's conclusion the property contains well developed structures with strong to moderate silver-lead mineralization.

It is also the author's conclusion that the results of an adequate exploration program consisting of detailed geological mapping and diamond drilling would justify initiating a mining venture.

Respectfully submitted,

A handwritten signature in cursive script that reads "Wm. Vanderwall".

Wm. Vanderwall, Geologist
April 30, 1981

COST SHEET

FOR

LITTLE CHIEF DEVELOPMENT TUNNEL

Ore car	\$ 500.00
Rails-spikes-ties	5,000.00
Cobra Rock Drill	3,500.00
6 lights-3 charges	400.00
Chain Saw	300.00
28' Extension ladder	200.00
Metal storage shed	250.00
50 pounds 40% Gelatin caps,	
Safety fuse, crimper, safety shoe	400.00
1 Wedge	100.00
Timber sets, caps, posts,	
lagging, braces	1,000.00
Misc. equipment including	
First Aid, Fire extinguisher,	
stretcher, blanket, timber, powder	
magazine, safety shoes, gloves,	
goggles, picks, shovels, sledges	3,000.00
Small trailer	3,500.00
Timber for manway, intermediate	
level	2,000.00
Used compressor	5,000.00
Road building	2,500.00
Labor-3 men & management	10,000.00
Workmans Compensation	<u>1,500.00</u>
	\$ 39,150.00
20% contingency	<u>7,830.00</u>
	\$ <u>46,980.00</u>

Prep/P. Patterson

EXPLORATION PLAN

FOR

LITTLE CHIEF DEVELOPMENT TUNNEL

The Geological Report prepared by S.S. Jones, Registered Mining Engineer #347,1080, who was Superintendent of the Tom Reed Gold Mines Company from May 1907 to July 1916, states that the development tunnel was first driven as a cross-cut to meet a stope and manway which made a connection with a known ore shoot in the intermediate workings above.

The developement tunnel is caved 175' from the portal entrance. In order to re-open the development tunnel the following minimum equipment would be necessary:

To initially muck and tram the development tunnel to the manway will require 450' of 18" track plus ties, spikes. For temporary track 8 pound rail is heavy enough and where the work is heavy 16 and 18 pound rail is used. The best mine car for the development tunnel would be the standard car with rotary dump, 1600 pound capacity. The estimated expense for the end dump is \$250 to \$500 per car. One end-dumping truck will be satisfactory. 450' of 12 pound rail, 3600 pounds in weight, plus ties and spikes. It is difficult to make a cost estimate, however, \$3,000 to \$4,000 would be a reasonable estimate.

For occasional light rock drilling, a Cobra rock drill with 2', 4', and 6' lengths of chisel steel will be necessary. A new unit sells for approximately \$3,200 with \$250 for the chisel steel. Additional items will be required for the actual mining operation (See cost sheet).

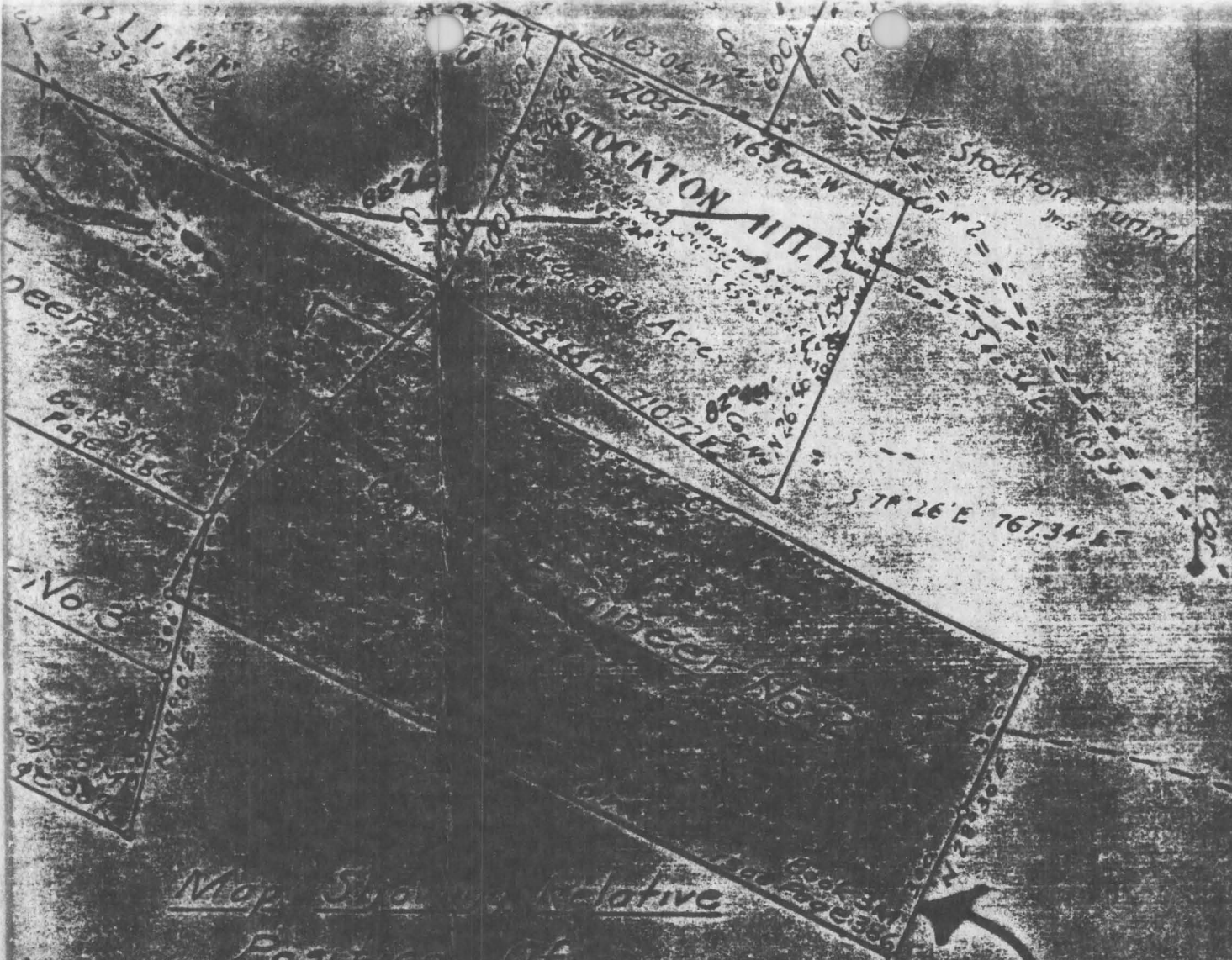
Labor will be the largest expense item as the project will take anywhere from 4 to 8 weeks and use 3 men to properly muck and tram the tunnel, timber the heavy ground and properly lay the track. Additional money will be required for miscellaneous items as listed on cost sheet.

Additional timbering will be necessary if the manway and intermediate level is in poor condition, which will also require additional man-hours of labor. If we hire employees, Workmans Compensation will be required. (Possible to contract work) Cost estimates for an exploration program are difficult due to the inability to determine how much ground is caved, how extensive, and the expertise of the underground workers. Therefore, I have raised some costs plus a 20% contingency figure.

Little Chief To Go To
Stockton Hill Company

1926

Silver was .60¢ oz
Gold was 20.00 oz
AT THIS TIME.



Map Showing Relative
Position of
Lode Claims Comprising

Chief Engineer Group

In Sec. 9, T. 22 N. R. 17 W.
Stockton Hill Section of
Wallopore Mining District

From the dump at the 80 foot shaft about midway between the Treasure Hill or Stockton Hill main shaft, and the Little Chief workings on the upper end of the Windsor group, samples were taken that gave returns of 16.6 to 34 ounces silver and up to 13% lead.

LITTLE CHIEF GEOLOGY

Commenting upon the Little Chief mine in the same government report, the author, F. C. Schrader, wrote, "The country rock is pre-Cambrian complex. To judge from talus debris on the surface at the mine, it seems to be intruded by diabase near by, and portions of a light-colored altered rock, which seems to be the intrusive porphyry, are associated with the vein."

"The vein trends N. 40° E. and dips steeply northeast. It is about 6 feet in width and is supposed to be the Banner vein of the Treasure Hill mine, described later. The gangue is quartz and crushed and altered silicified rock. The ore shoot locally coincides in width with the vein and is stained throughout with copper carbonate. The ore contains principally green horn silver, galena, and gold, in all of shipping grade, and is said to average about as follows: Silver, 350 ounces to the ton; gold \$5 to \$10 a ton; and lead, 8 to 40 per cent."

Since the above government report was written the entrances to the works referred to, have been caved and are now with few exceptions impassable. Samples that have been taken from rather narrow streaks in the vein as now exposed and left by the early

W. B. Ford

KINGMAN ASSAY OFFICE
W. S. EVERETT
REGISTERED ASSAYER AND CHEMIST

CONTROL DETERMINATIONS

LABORATORY WORK A
SPECIALTY

CERTIFICATE OF ASSAY

KINGMAN, ARIZONA. July 2nd 1930
FROM E. C. Ross Householder

THE SAMPLE OF

FROM

AND SUBMITTED TO ME FOR ASSAY CONTAINS:

AB. NO.	OWNER'S MARK	OZS. PER TON 2000 LBS.		VALUE PER TON GOLD & SILVER	LEAD % FIRE	LEAD % WET	COPPER %	ZINC %	%	PER TON TOTAL VAL
		GOLD	SILVER							
1673	Chieftang 1	0.03	62.17							

Gold @ \$20.00 per oz.

Silver @ 60c per oz.

Lead @c per lb.

Zinc @c per lb.

Copper @c per lb.

CERTIFIED BY

W. S. Everett

ASSAYER

CHARGES

Paid

Affidavit of Labor Peformed and Improvements Made

STATE OF ARIZONA, } ss.
County of Mohave }

E. Ross Housholder

being duly sworn, deposes and

says that he is a citizen of the United States and more than twenty-one years of age, and resides at.....Kinman.....in.....Mohave.....

County, State of Arizona, and is personally acquainted with the mining claims known as.....
Chief Engineer(recorded in Book of Mines page) and the
~~Chief Engineer No. 36 " " " " " "~~

mining claims, situate in Stockton Hill section of the Wallapai Mining District, County of Mohave, State of Arizona, the location notice of which is recorded in the office of the County Recorder of said County, in Book 3M of Records of Mines, at page 385 and 387; that between the 15th day of November A. D. 1938, and the 30th day of June A. D. 1939, at least Two hundred and fifty (\$250.00)

.....dollars worth of work and improve-
ments were done and performed upon said claim, not including the location work of said claim.
Such work and improvements were made by and at the expense of E. Ross Housholder
the owner, and others working for the
owner.....of said claim^S for the purpose of complying with the laws of the United States per-
taining to assessment of annual work, and Bill Cunningham, R. L. Miller, C. S. Hall,
Slim Day, E. Ross Housholder, et al

were the men employed by said owner.....and who labored upon said claim, did said work and improvements, the same being as follows, to-wit: retimbering drift and stope in lower level Chief Engineer tunnel; Clearing tunnel of rock caved from top and walls; building entrance to intermediate level from surface; Clearing debris and rock from intermediate level to permit further exploration and extraction of the ores from this level; Repairing 1000 feet road from portal lower tunnel to main Stockton Hill road so that material, tools and supplies could be transported to the portal of the underground workings; repairing, and rebuilding transportation trail from the portal of the Chief Engineer No. 3 tunnel to the mine road, thence to main Stockton Hill road; Clearing drifts and crosscuts in Chief Engineer No. 3 tunnel; extracting ores; sorting ores; tools, supplies, material amounting to \$42.00 and labor amounting to \$208.00, besides other work performed by the owner on and for the benefit of these claims.

Subscribed and sworn to before me this 13th day of July, A. D. 1939.

(My commission expires Nov. 20, 1939.....)

Notary Public

Filed and recorded at request of E. Ross Housholder, 429 Spring St., Kingman,
Arizona, July 1st A. D. 1939, at 9:30 o'clock A. M., Book

Proof of Labor, pages....., Records of Mohave County, Arizona.

By _____ Deputy Recorder

County Recorder

Page.....

Intermediate level and cross cut tunnel were open in 1941 but Mr. Rosa Household returned from the war the workings were caved in.

Affidavit of Labor Peformed and Improvements Made

STATE OF ARIZONA, }
County of Mohave } ss.

L. M. Hall

being duly sworn, deposes and

says that he is a citizen of the United States and more than twenty-one years of age, and resides at Kingman in Mohave

County, State of Arizona, and is personally acquainted with the mining claims known as

Chief Engineer (recorded in Book of Mines 3-M at page 385,
Chief Engineer No 3 (recorded in Book of Mines 3-M at page 387
mining claims, situate in Wallapai

Mining District, County of Mohave, State of Arizona, the location notice of which is recorded in the office of the County Recorder of said County, in Book 3M of Records of Mines, at pages 385 and 387, that between the 2nd day of July A. D.

1939, and the 1st day of July A. D. 1940, at least Two Hundred (\$200.00)

dollars worth of work and improvements were done and performed upon said claims, not including the location work of said claim. Such work and improvements were made by and at the expense of

E. Ross Housholder

owner of said claims for the purpose of complying with the laws of the United States pertaining to assessment of annual work, and L. D. Anderson; John F. Coate

L. C. Edgar; L. M. Hall; D. S. Edgar;
E. Ross Housholder; et al,

were the men employed by said owner and who labored upon said claim, did said work and improvements, the same being as follows, to-wit:

sinking wing in Chief Engineer
middle tunnel six feet; removing debris washed in from
shaft connection; repairing and replacing timbers overhead in
connecting shaft junction with middle tunnel; trenching 3'
vein in underhand stopes; stoping in lower tunnel and
preparing connection into intermediate mine level of
Chief Engineer mine; brushing out and building
transportation trail from road junction to Little Chief
Shaft approximate distance of 800 feet; repairing and
grading road from road junction to portal lower tunnel
approximate distance of 700 feet; constructing ladders,
admirways, from collar Little Chief Shaft into intermediate and
lower levels of Chief Engineer mine.

Subscribed and sworn to before me this 28th day of September, A. D. 1940

Witness:

L. B. Edgar

(My commission expires 7/20/1943)

Mary L. Anderson
Notary Public

Filed and recorded at request of E. Ross Housholder

Sept. 28 A. D. 1940, at _____ o'clock _____ M., Book _____

Proof of Labor, pages _____, Records of Mohave County, Arizona.

By _____
Deputy Recorder

County Recorder

Affidavit of Labor Performed and Improvements Made.

STATE OF ARIZONA,

County of Mohave

ss.

E. Ross Housholder

being duly sworn, deposes and

says that he is a citizen of the United States and more than twenty-one years of age, and resides at Kingman in Mohave County, State of Arizona, and is personally acquainted with the mining claim known as Chief Engineer (recorded in Book 3-M of Mines at page 385).

mining claim, situate in Stockton Hill section of the Wallapai Mining District, County of Mohave, State of Arizona, the location notice of which is recorded in the office of the County Recorder of said County, in Book 3-M of Records of Mines, at page 385; that between the 1st day of July A. D. 1940, and the 1st day of July (noon) A. D. 1941, at least One hundred and fifteen (\$115.00)

dollars worth of work and improvements were done and performed upon said claim, not including the location work of said claim. Such work and improvements were made by and at the expense of E. Ross Housholder

owner of said claim for the purpose of complying with the laws of the United States pertaining to assessment of annual work, and Tom Ruston, Lester Edgar, Ellie Barnes, E. Ross Housholder, et al

were the men employed by said owner and who labored upon said claim, did said work and improvements, the same being as follows, to-wit: Sinking winze in upper Lead tunnel; Cutting out to level earth around new collar of shaft ladder-way from surface to Intermediate level; Installing new ladder-way and timbering manway from surface to upper Intermediate level; Advancing upper Intermediate level to the northwest, and extracting and transporting ores from this level to the surface storage dumps; Widening and rebuilding transportation trail from the portal of the upper Lead tunnel, with new trail connection to the collar of the shaft leading to the Intermediate levels, to the mine road junction, approximately 750 feet in total length; Clearing camp site and erecting permanent frame for camp tent houses; sorting ores; powder; fuse; caps; tools, supplies, including \$115.00 in labor besides the cost of supplies and other necessary items to prosecute the mining work, and besides other work performed by the owner on and for the benefit of this claim.

E. Ross Housholder

Subscribed and sworn to before me this 11 day of Sept. A. D. 1941

(My commission expires 7/20/1943)

Notary Public.

Filed and recorded at request of E. Ross Housholder

Sept. 11, A. D. 1941, at o'clock M., Book Proof of Labor, pages, Records of Mohave County, Arizona.

By Deputy Recorder.

County Recorder.

Affidavit of Labor Preformed and Improvements Made

STATE OF ARIZONA,

SS.

County of Mohave.

2. Noss Householder being duly sworn, deposes and says that he is a citizen of the United States and more than twenty-one years of age, and resides at Kingman, Arizona Mohave County, State of Arizona, and is personally acquainted with the mining claim known as Chief Engineer No. 3; Chief Engineer; and Chief Engineer No. 2 claim (Recorded in Book 3M at pages 387, 385, and 386 respectively).
mining claim situate in Wallapai

Mining District, County of Mohave, State of Arizona, the location notice of which is
 recorded in the office of the County Recorder of said County, in Book 3M
 of Records of Mines, at page 385 1/2 387; that between the 2nd day of
July A. D. 1949, and the 26 day of June
 A. D. 1950, at least Two Hundred (\$200.00) Dollars

_____ dollars worth of work and improvements were done and performed upon said claim, not including the location work of said claim. Such work and improvements were made by and at the expense of _____

owners— of said claim for the purpose of complying with the laws of the United States pertaining to assessment of annual work, and Willie Walker,
S. S. Jones, E. Ross Householder, Ted Falton
and William Roush

were the men employed by said owner— and who labored upon said claim, did said work and improvements, the same being as follows, to-wit: *cross cutting in lower tunnel of Chief Engineer Claim and cross cutting and reclaiming tunnel on Chief Engineer No. 3 claim; and extending road on the Chief Engineer claim, besides misc. surface trenching etc., on Chief Engineer claim*

Edross Housholder

Subscribed and sworn to before me this 28 day of June, A. D. 1950,

Notary Public.

(My commission expires Jan 2, 1953)

Affidavit of Labor Performed and Improvements Made

STATE OF ARIZONA, }
County of Mohave } ss.

E. Ross Housholder

being duly sworn, deposes and says that he is a citizen of the United States and more than twenty-one years of age, and resides at 431 E. Spring St., in Kingman, Mohave

County, State of Arizona, and is personally acquainted with the mining claim known as.....

Chief Engineer Recorded in Book 3M, Page 385

Chief Engineer No. 1 " " " 3M, " 386

Chief Engineer No. 2 " " " 3M, " 387

mining claim, situate in Wallapai

Mining District, County of Mohave, State of Arizona, the location notice of which is recorded in the office of the County Recorder of said County, in Book 3M of Records of Mines,

at pages 385, 386, 387, that between the 2nd day of July A. D.

1955, and the 22 day of June A. D. 1956, at least

Three Hundred and Twenty Five (\$325.00)

dollars worth of work and improvements were done and performed upon said claim, not including the location work of said claim. such work and improvements were made by and at the expense of

E. Ross Housholder, 431 E. Spring St., Kingman
owner of said claim for the purpose of complying with the laws of the United States pertaining to assessment of annual work, and E. Ross Housholder; R. Franklin Housholder; Andrew L. Housholder; R. J. Maddux; N. B. Dahan, et al

were the men employed by said owner and who labored upon said claim, did said work and improvements, the same being as follows, to-wit:

Clean out portal of lower tunnel on Chief Engineer; Build new road from campsite on Chief Engineer toward Chief Engineer No. 2 tunnel; Rebuilt, re-graded, and repaired road from County road across Chief Engineer to Campsite; and rebuilt, regraded and repaired road from lower tunnel on Chief Engineer to the upper junction with County road; also leveled off building site for contemplated building improvements across said road from portal of this lower tunnel. Graded and repaired road from Chief Engineer lower tunnel southeast to connect trail to shaft on Chief Engineer No. 3. Heavy earth moving equipment was also used in this road work. Clean out misfitting lugs done in upper LEAD tunnel of the Chief Engineer.

E. Ross Housholder
Subscribed and sworn to before me this 22 day of June, A. D. 1956

(My commission expires or 21 1959)

Notary Public

Filed and recorded at request of E. Ross Housholder, 431 E. Spring St., Kingman, Ariz. A. D. 1956, at 11:55 o'clock 7 M., Book 9

Proof of Labor, pages 130, Records of Mohave County, Arizona.

By Annie J. House

Deputy Recorder

Reggie B. Smith
County Recorder

Page.....

PHOTO COPIED

INDEXED

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Affidavit of Labor Performed and Improvements Made

STATE OF ARIZONA, } ss.
County of Mohave

E. Ross Housholder

being duly sworn, deposes and says that he is a citizen of the United States and more than twenty-one years of age, and resides at 431 E. Spring St., in Kingman, Mohave County, State of Arizona, and is personally acquainted with the mining claim known as

Chief Engineer Book M, Page 385

Chief Engineer No. 2 Book M, Page 386

Chief Engineer No. 3 Book M, Page 387

(Claims in Sec. 9, T. 22 N., R. 17 W.,
G. & S. R. M., Mohave Co., Arizona)

mining claim, situate in Wallapi Mining District, County of Mohave, State of Arizona; that between the 2nd day of September A. D. 1963, and the 31st day of July A. D. 1964, at least

Three Hundred (\$300.00) dollars worth of work and improvements were done and performed upon said claim, not including the location work of said claim. Such work and improvements were made by and at the expense of

E. Ross Housholder, the

owner — of said claim for the purpose of complying with the laws of the United States pertaining to assessment of annual work and Manuel Padilla, Andrew L. Housholder, Duwain Housholder, E. Ross Housholder, and others

were the men employed by said owner — and who labored upon said claim, did said work and improvements, the same being as follows, to-wit: Opened up caved in portal on Chief Engineer No. 2 claim and reclaimed 720 feet of tunnel drift by removing caved in material; Also connecting tunnel portal with a transport trail 82 feet, constructed from said portal to the road built in the latter part of 1962 and first part of 1963; Also cleaning caved in portal of lower tunnel on Chief Engineer claims, including portal of said tunnel, together with 52 feet underground of same tunnel. Also clearing trail and approach road, to upper workings from the west end, etc., etc. (and other impr. work.) E. Ross Housholder

Subscribed and sworn to before me this 31 day of August, A. D. 1964

(My commission expires Dec 26, 1964)

Filed and recorded at request of

August 31, A. D. 1964, at 12:10 o'clock A. M., Book X

Proof of Labor, pages 96, Records of Mohave County, Arizona.

By _____ Deputy Recorder

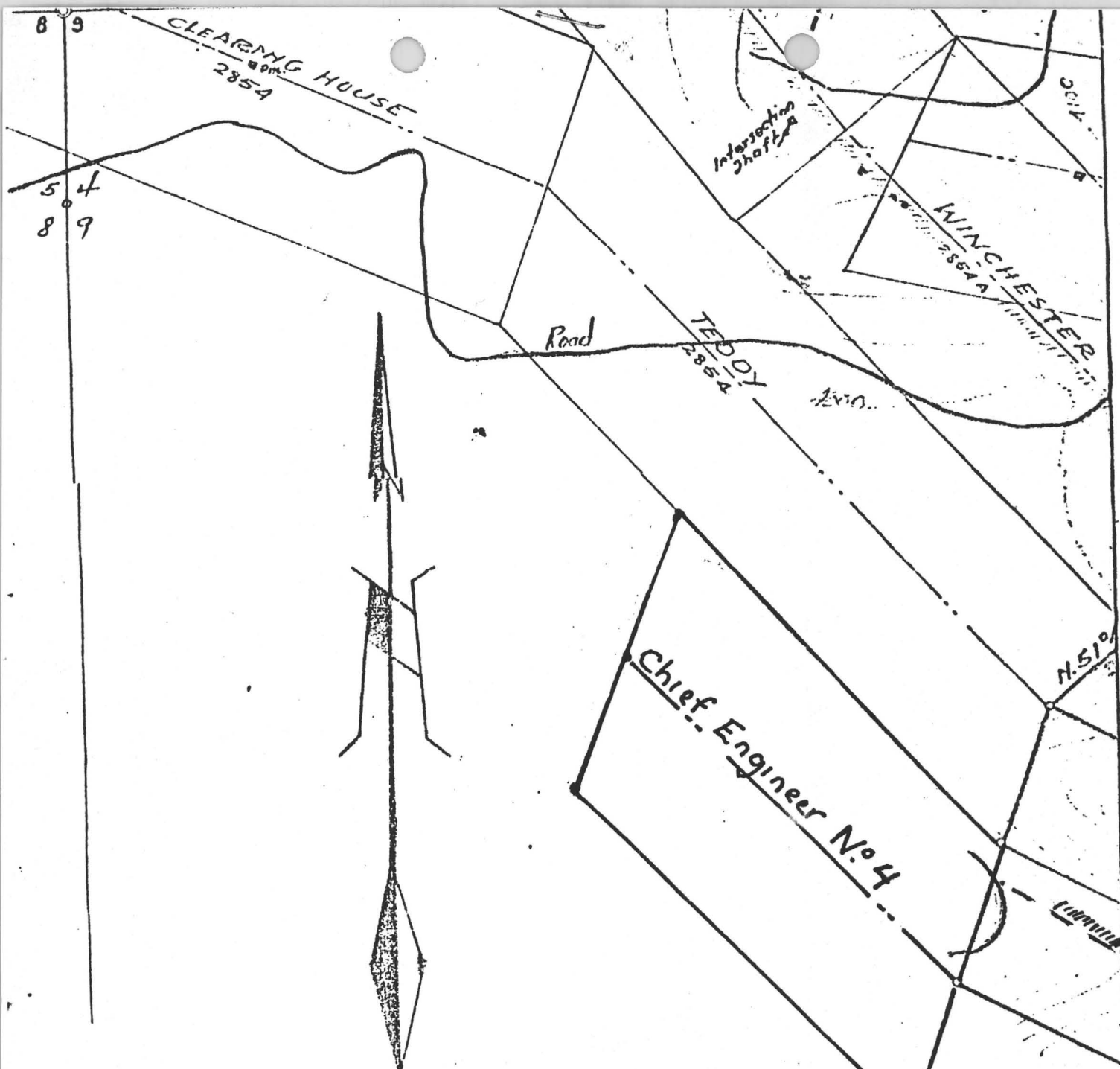
County Recorder

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P.O. Box 1107
Kingman Ariz

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INDEXED
PHOTO COPIED



Contour & Claim Map Of The

Chief Engineer Gro

In The Stockton Hill Section Of The Walapai M
Section 9, Township 22 North, Range 17 West, Gila S
Mohave County, Arizona

Surveyed June 1922

By: E. Ross Housholder

Mapped By: E. R. P.

Reduced June 1950

By: Willie Walker

Especially To Accompany

Report On Property By: (1950)

S. S. Jones, Reg. Mining Engr. #347

By

E. Ross Housholder E.M.

Registered Mining Engineer #25

Kingman,

Arizona

Scale 1" = 300'

BOOK

653

PAGE 555

ARIZONA STATE OFFICE
 BU. LAND MANAGEMENT

SEP 15 1980

7:45 A.M.
 PHOENIX, ARIZONA

A MC 111276

et joins the Cerbat dis-
site slope of the moun-
is about 4 miles in di-
elevation. It is gener-
by wagon roads, in the
eastward into Hualpai
situated in the eastern
strike northwestward.
the principal are the
Cupel, Prince George,

is situated near the
than 2,000 feet of
drift, which extends
to the northeast. It
is 24 feet thick and
consists of pure
iron, and copper, the
amount of
The produe-
gold, silver, and lead,
The ore is

located in the foot-
developed by in-
of good water.
They average
downward. They
of the aplitic
The ore favors
00 feet in extent, with
It runs about 100
and 7 to 10 per cent of
0,000.

Stockton Hill camp.
ton mill and plant of
developed to a depth
stopes, and is said to
It is located on three
re in general contains
hide of silver, but in
ries about \$5 per ton

in gold. About 2,000 tons of ore said to run from \$6 to \$7 per ton lie on the dump. The production to date is reported to be about \$500,000.

Prince George mine.—The Prince George mine, located about one-fourth mile southeast of the Cupel mine, is developed by a 180-foot shaft and drifts, and is said to yield about 2,000 gallons of water a day. The vein dips steeply to the north and is about 12 feet thick. The total production is about \$100,000.

De la Fontaine mine.—The De la Fontaine mine, located at the west side of the district, on the crest of the range, is 400 feet deep, and comprises about 1,400 feet of drift. The vein is 7 to 10 feet in width, and dips steeply to the north. The ore runs about 35 per cent in lead and zinc, and contains some gold. Good ore bodies, 2 to 4 feet thick and of considerable extent, are blocked out in the lower 300 feet of the mine.

'63 mine.—The '63 mine, located in the southern part of the district, is 200 feet deep and is stated to have produced a total of \$500,000, mostly in rich silver ore.

Little Chief mine.—The Little Chief mine, located one-fourth mile west of Stockton Hill camp, is about 100 feet deep and contains about 1,000 feet of underground work. The vein, supposed to be one of the veins of the Treasure Hill mine already described, dips steeply to the northeast. The production, amounting to many thousand dollars, is all shipping ore, averaging in silver about 350 ounces and in gold 5 to 10 ounces per ton, with 8 to 40 per cent of lead.

C. O. D. mine.—The C. O. D. mine, located 2½ miles north of Stockton Hill camp, in the upper part of C. O. D. Gulch, is developed by a shaft 400 feet deep, drifts, and stopes, on and between two main and subordinate levels, aggregating in all about 2,500 feet of underground work. The principal surface equipments consist of a 50-ton concentrating mill and engines. The vein dips steeply northward, and is about 7 feet thick. The ore, whose principal value is in silver, is about as follows: Silver, 160 ounces per ton; gold, 2 ounces per ton; lead, 12 per cent; with some zinc and a little copper. Except the low-grade ore, it is mostly worked out for a distance of about 400 feet on either side of the main shaft, beyond which good ore is reported. The mine closed down late in 1904 and is now full of water. The total production is reported and in part verified by smelter return amounts to be \$1,300,000, that of silver alone amounting to about \$1,000,000.

GOLD BASIN DISTRICT.

The Gold Basin district is situated in the eastern part of the White Hills, in the Gold Basin mining district. It extends over a hilly area about 6 miles in diameter, sloping and draining to Hualpai Wash on the east, and ranges from 2,900 to 5,000 feet in elevation. The water

A

GEOLOGICAL REPORT

on the

CHIEF ENGINEER PROPERTY

in the

Wallapai Mining District

Mohave County, Arizona

by

Wm. Vanderwall
Geologist
Scottsdale, Arizona

April 30, 1981

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CHIEF ENGINEER PROPERTY Wallapai Mining District Mohave County, Arizona

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The property is a part of the Stockton Hill Camp. A late 1800's silver bonanza where oxidized ores ran as high as 3000 ounces silver per ton. The Chief Engineer property was worked until the turn of the century but production statistics are unavailable.

The property is located in the central portion of the Cerbat Mountain Range, one of the many north south trending, fault-block ranges of the southwest desert. Rocks exposed at the surface, on the Chief Engineer property, include pre-Cambrian metamorphic rocks cut by Mesozoic (?) intrusives and by mineralized veins of unknown (Tertiary?) age.

The ore deposits on the property may be of two types: Oxidized, near surface vein deposits often greatly enriched in silver; and deeper, primary, base metal-silver vein deposits which may extend to considerable depth.

The most favorable loci for ore is at the junction of veins with other structures, although it can be found randomly spaced along the veins in lenses or shoots. The main vein on the Chief Engineer property trends northwest and projects to a shallow underground intersection with neighboring dykes.

Results of field reconnaissance indicate the following:

- A) Mineralized structures traverse the property and ore is exposed in prospect pits, trenches, etc., indicating the oxide zone was not mined out by the first miners.
- B) Dykes and veins project to a shallow underground intersection which would provide a sizable locus for ore deposition.
- C) Past mining on the property has produced a considerable amount of dump material which may be amenable to cyanidation.

Wm. Vanderwall, Geologist
April 30, 1981

Geological Report
CHIEF ENGINEER PROPERTY
Wallapai Mining District
Mohave County, Arizona

LOCATION:

The Chief Engineer property consists of four contiguous, unpatented mining claims located approximately eight miles north of Kingman, Arizona, on the eastern slope of the Cerbat Mountains. The claims are situated in Section 9, Township 22N, Range 17W, G&SRM, and are accessible via county and private roads.

SCOPE OF REPORT:

Facts and opinions contained in the report are based on a cursory field examination of the property and on the author's specific knowledge of the area and general familiarity with the published literature concerning the Wallapai District.

HISTORY AND PRODUCTION:

The Chief Engineer property lies centrally in the famous silver bonanza ghost camp of Stockton Hill, where rich silver discoveries brought miners to the area as early as 1863. Oxidized silver ores (up to 3000 ozs. per ton) were mined at Stockton Hill with the bulk of production during the 1870-1880 period. The rapid decline in silver prices between 1885-1895, the recession of 1905 and the added cost of mining the deeper, leaner, sulfide ores caused the suspension of mining operations. The area, for the most part, has been idle ever since.

Schrader, 1909 (USGS Bulletin 397, pp. 112-113) briefly describes the Little Chief Mine (now the Chief Engineer) and estimates its production to be \$25,000 in silver (125,000 ozs. @ 20¢/oz.). Schrader credits the Little Chief with approximately 1000 feet of underground work and gives cerargarite (AgCl), galena (PbS) and native gold as the principal ore minerals. He states ore tenure as 350 ounces of silver per ton, 14% to 30% lead, and up to one half ounce gold. Physical inspection of dump material tends to support Schrader's values.

The value of metals produced in the Wallapai District during the years 1904-1948 (U.S. Bureau of Mines 1948 Annual Report) was about 22.5 million dollars at 1948 prices (nearly a half a billion dollars at today's prices). Values were principally in lead and zinc, but with substantial amounts of copper, silver and gold.

Currently Penzoil-Duval Corporation, approximately 4 miles northwest of the Chief Engineer property, is reportedly producing 18,000 to 20,000 tons per day of open pit ore averaging 0.5% copper and 0.045% molybdenum, plus other metals.

GEOLOGY AND ORE DEPOSITS:

The Cerbat Mountains constitute one of the many north-south trending, fault block ranges of the southwest desert. They consist primarily of metamorphosed pre-Cambrian igneous and sedimentary rocks, cut by later intrusions of Mesozoic (?) granite and monzonite porphyries, known locally as the Ithaca Peak Granite, and by Tertiary volcanic dykes. Centering around the Ithaca Peak intrusive, mineralization is typically copper and molybdenum sulfides, now being mined by Duval. Surrounding the intrusive is a zone several miles wide of copper-lead-zinc-silver bearing veins which gradationally change to veins of intense silver-lead-mineralization. The Chief Engineer property contains veins of the silver-lead type.

The vein type ore deposits occur in clefts or cracks in the country rock in which the mineral material precipitated from aqueous solution (hydrothermal fissure veins). It is probable that these fissures formed from forces accompanying the emplacement of the Ithaca Peak intrusive. With the intrusive acting as a heat engine, a convecting hydrothermal system developed that set up a hypogene enrichment process which deposited ore and gangue minerals near the top of the convecting cell and extracted metals and sulfur from sources at depth. Conceivably, as the solution approached the fissure level, it boiled, thereby distilling the acid forming constituents CO_2 and H_2S . Cooling and a slight pH rise of the residual liquids, due to loss of acid forming constituents, may be regarded as the mechanism of sulfide precipitation. Exposure of the veins to normal weathering processes oxidized the ore and, to a point, enriched it by the downward migration of slightly acidic rainwater carrying metals in solution.

Many veins, occurring in nearly vertical fault fissures, strike northwest and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, or shoots, though not continuous are numerous and tend to have greater vertical rather than horizontal extent. Concentrations of extremely high-grade ore appear to favor vein junctures. These concentrations are attributable to chemical and physical changes which enhanced mineral deposition at the fissure level of the convecting cell.

The main vein on the Chief Engineer property is a prominent linear structure which extends from the Banner Mine southeastward. It cuts all lithologic units in the area, mostly pre-Cambrian granite, to intersect with no less than two dykes on the Chief Engineer property. The vein is composed of quartz and silicified granite breccia with some gouge. The vein trends $\text{N}40^\circ\text{W}$ and is nearly vertical. The vein is from 3 to 9 feet wide and heavily

stained in outcrop by iron and manganese. Evidence of mineralization in the vein is from pronounced gossan caps, in place mineralization underground and the number and extent of workings on the vein.

Dykes on the property include granite porphyry and diabase but are, presumably, less mineralized than the vein. No dyke-vein junction is apparent on the surface but attitude and trend of the dykes as well as mine dump material suggests an underground intersection.

The primary mineralization is one of proustite, galena, sphalerite, chalcopyrite, pyrite and arsenopyrite together with a variety of gangue minerals. The oxidized portion of the veins ranges from 50-300 feet and may be very rich in lead sulfide, silver chloride, native silver and lesser concentrations of native gold.

ORE RESERVES:

The Chief Engineer property contains a known ore body composed of primary base metal-silver values as well as oxidized silver-gold values. Data from past developments, publications and reports are insufficient, or unavailable, to completely delineate the ore body for volumetric analysis. However, there is ore exposed in various underground workings and in many places on the surface; prospect pits, trenches, dumps, etc.

Numerous veins traverse the Chief Engineer property, some of which are known to contain ore shoots rich in silver and gold. The shoots are generally less than three feet wide and tend to have a greater vertical than horizontal extent. The Little Chief Mine, located on the main vein of the Chief Engineer property, is on one such ore shoot but the extent and exact tenure of this shoot cannot be ascertained since the mine is presently caved and inaccessible. However previous developments on the same vein and in the immediate vicinity of the Little Chief Mine have shown considerable ore at depth which indicates commercial quantities of ore may be encountered beneath the present workings.

Previous mining operations on the property have produced some sizable mine dumps. The possibility of precious metal extraction from these dumps should not be overlooked.

CONCLUSION:

On the basis of surface observations and in accessible old workings, plus facts provided in the published literature and by local people of reputation it is the author's conclusion the property contains well developed structures with strong to moderate silver-lead mineralization.

It is also the author's conclusion that the results of an adequate exploration program consisting of detailed geological mapping and diamond drilling would justify initiating a mining venture.

Respectfully submitted,

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Includes general features of area, detailed descriptions of major mines with petrographic examination results of surface and subsurface ores. Concludes proustite (Ag_3AsS_3), galena (PbS), sphalerite (ZnS), chalcopyrite (CuFeS_2), are primary (hypogene) ore minerals in the Chloride (pp. 24-33) and Stockton Hill (pp. 33-35) areas. Thus silver, copper, lead and zinc values should persist throughout the primary ore zone. Oxidation products giving rich silver values near the surface are cerargyrite (AgCl) and native metal, which were caused by secondary enrichment. Concludes primary silver ores warrant further explorations and development.

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Brief and sketchy description of geology and mines in the district. Mentions Pinkham Mine on page 142.

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Detailed description of geology, structures, ore deposits, mines and prospects. Production records from selected mines. Pinkham production given as over 14,000 ounces of silver, 27.5 tons of copper plus lesser quantities of gold and lead. Concludes future economic importance of district lies chiefly in base-metal sulfides. Author states that discovery of large orebodies of massive sulfide veins and/or disseminated porphyry type deposits by proper exploration very probable.

ELSING, M.J. and HEINEMAN, E.S., 1936. Arizona Metal Production: ABM Bulletin 140, pp. 73.

Establishes Wallapai District production from 1908-1933 as just over half a million tons producing \$1,037,468 in gold; 1,913,345 ozs. AG; 966,235 lbs. Cu: 35,990,504 lbs. Pb: 95,587,344 lbs. Zn.

Revised United States Bureau of Mines figures 1908-1948 give totals as just over one and a quarter million tons producing 124,491 ozs. Au: 4,813,757 ozs. Ag: 5,712,992 lbs. Cu: 71,473,292 lbs. Pb: 169,520,515 lbs. Zn.

NOTE: Neither of these reports take into account early production from the rich oxidized veins before the turn of the century. That production estimated to be greater than 1,000,000 ounces of silver came, for the most part, from the mines of the Stockton Hill area. Nor do these reports consider the production of copper and molybdenum from the Penzoil-Duval open pit mine at Mineral Park (1962-present). Mineral Park is located midway between the Pinkham and Chief Engineer properties.

HAURY, P.S., 1947. Examination of lead-zinc mines in the Wallapai Mining District, Mohave County, Arizona: United States Bureau of Mines (USBM) Report On Investigation, Number 4101, 43p.

Brief description of geology, history and ore deposits. Detailed description of selected mine workings. Notable among these are the Lone Jack, page 18-19 (near the Pinkham property and comparable) and the Jim Kane and DeLa Fontaine mines pages 32-35 (near the Chief Engineer property and comparable). Mine descriptions include above and below ground geology, USBM ore and wall rock assay results, mine history, ownership and development. Maps of mine workings with sample locations included in the report. Concludes Wallapai District has substantial primary silver-lead-zinc-copper reserves with considerable enrichment of silver, copper and gold in the shallow, oxidized zone.

HERNON, R.M., 1938. Cerbat Mountains: In Some Arizona Ore Deposits, ABM Bulletin 145, pp. 110-117.

Brief description of topology, geology, history, etc., followed by adequate description of Tennessee Mine developed to a depth of 1600 feet and still in ore. The Tennessee produced silver lead zinc ore from veins in the chloride area until the close of World War II. The author elaborates on ore character, alteration and secondary enrichment in the chloride area.

MC KNIGHT, E.T.. Mesothermal Silver-Lead-Zinc Deposits; In Ore Deposits of the Western States (Lingren Volume), pp.592-93, American Institute of Mining and Metallurgical Engineering.

Brief geological overview; character and genesis of ore deposits, total production, regional geology and history.

High silver values in shallow oxidized zone noted throughout district especially in the Stockton Hill area and ascribed to secondary enrichment processes. Concludes primary sulfide deposits in veins are mesothermal base metal-silver deposits which may widen with depth.

SCHRADER, F.C., 1909. Mineral Deposits of the Cerbat Range, Black Mountains and Grand Wash Cliffs, Mohave County, Arizona: USGS Bulletin 397, 220p.

Considered the textbook for much of the geology, production and history of the Wallapai District. Detailed descriptions of selected mines both above and below ground. Shows Pinkham Mine as being developed to the 240 foot level, describes ore as oxidized in upper workings to 85 foot level then primary ore to total depth. Notes copper secondary enrichment products, chalcocite and bornite in upper two levels. Notes primary ore encountered in 140 foot level averaged 9% Cu and 60 ozs: Ag per ton. Map (pp.75) shows total depth 400 foot, 5 levels, totaling 1200 feet of progress and approximately one third of the inferred orebody mined out. Author suggest orebody located at junction of Pinkham and Midnight vein, suggests veins may horsetail at this junction and implies a continuation of Pinkham orebody both north and south from the present workings (Diagram pp. 76). See also Midnight Mine description pp. 76-77.

Schrader describes the Stockton Hill area, pp. 107-115, equally as well. The Little Chief Mine, pp. 112-113 (now the Chief Engineer property) is described as being developed to the 200 foot level with some 1000 feet of total progress. The Author likens the Little Chief Mine with the Banner Mine and the Treasure Hill Mine, observing that all are on the same (Banner) vein, all had the same surface expression and all produced the same type of ore. The Little Chief produced ore averaging 350 ozs. Ag and 14% to 30% Pb per ton.

SCHRADER, F.C., 1917. Geology and Ore Deposits of Mohave County, Arizona: AIME Trans., Vol. 56, pp. 197-236.

Similar to USGS Bulletin 397. Describes history, topology, geology and ore deposits. Describes selected mines both above and below ground.

THOMAS, B.E., 1949. Ore Deposits of the Wallapai District,
Arizona: Economic Geology, Vol. 44, pp. 663-705.

Describes general geology and characteristic fissure veins with associated wall rock alteration and secondary enrichment. Emphasis on ore shoots; mineralogy, age, texture and genesis. Concludes mineralizing fluids followed pre-existing conduits and are subsequent to majority of dykes and veins. Suggests that veins may widen with depth and increase in lead-zinc relative to copper-silver-gold. Considers district has good potential for future base-metal production.

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Wm. Vanderwall, Geologist
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Detailed description of geology, structures, ore deposits, mines and prospects. Production records from selected mines. Pinkham production given as over 14,000 ounces of silver, 27.5 tons of copper plus lesser quantities of gold and lead. Concludes future economic importance of district lies chiefly in base-metal sulfides. Author states that discovery of large orebodies of massive sulfide veins and/or disseminated porphyry type deposits by proper exploration very probable.

ELSING, M.J. and HEINEMAN, E.S., 1936. Arizona Metal Production: ABM Bulletin 140, pp. 73.

Establishes Wallapai District production from 1908-1933 as just over half a million tons producing \$1,037,468 in gold; 1,913,345 ozs. AG; 966,235 lbs. Cu: 35,990,504 lbs. Pb: 95,587,344 lbs. Zn.

Revised United States Bureau of Mines figures 1908-1948 give totals as just over one and a quarter million tons producing 124,491 ozs. Au: 4,813,757 ozs. Ag: 5,712,992 lbs. Cu: 71,473,292 lbs. Pb: 169,520,515 lbs. Zn.

NOTE: Neither of these reports take into account early production from the rich oxidized veins before the turn of the century. That production estimated to be greater than 1,000,000 ounces of silver came, for the most part, from the mines of the Stockton Hill area. Nor do these reports consider the production of copper and molybdenum from the Penzoil-Duval open pit mine at Mineral Park 1962-present). Mineral Park is located midway between the Pinkham and Chief Engineer properties.

HAURY, P.S., 1947. Examination of lead-zinc mines in the Wallapai Mining District, Mohave County, Arizona: United States Bureau of Mines (USBM) Report On Investigation, Number 4101, 43p.

Brief description of geology, history and ore deposits. Detailed description of selected mine workings. Notable among these are the Lone Jack, page 18-19 (near the Pinkham property and comparable) and the Jim Kane and DeLa Fontaine mines pages 32-35 (near the Chief Engineer property and comparable). Mine descriptions include above and below ground geology, USBM ore and wall rock assay results, mine history, ownership and development. Maps of mine workings with sample locations included in the report. Concludes Wallapai District has substantial primary silver-lead-zinc-copper reserves with considerable enrichment of silver, copper and gold in the shallow, oxidized zone.

HERNON, R.M., 1938. Cerbat Mountains: In Some Arizona Ore Deposits, ABM Bulletin 145, pp. 110-117.

Brief description of topology, geology, history, etc., followed by adequate description of Tennessee Mine developed to a depth of 1600 feet and still in ore. The Tennessee produced silver lead zinc ore from veins in the chloride area until the close of World War II. The author elaborates on ore character, alteration and secondary enrichment in the chloride area.

MC KNIGHT, E.T.. Mesothermal Silver-Lead-Zinc Deposits; In Ore Deposits of the Western States (Lingren Volume), pp.592-93, American Institute of Mining and Metallurgical Engineering.

Brief geological overview; character and genesis of ore deposits, total production, regional geology and history.

High silver values in shallow oxidized zone noted throughout district especially in the Stockton Hill area and ascribed to secondary enrichment processes. Concludes primary sulfide deposits in veins are mesothermal base metal-silver deposits which may widen with depth.

SCHRADER, F.C., 1909. Mineral Deposits of the Cerbat Range, Black Mountains and Grand Wash Cliffs, Mohave County, Arizona: USGS Bulletin 397, 220p.

Considered the textbook for much of the geology, production and history of the Wallapai District. Detailed descriptions of selected mines both above and below ground. Shows Pinkham Mine as being developed to the 240 foot level, describes ore as oxidized in upper workings to 85 foot level then primary ore to total depth. Notes copper secondary enrichment products, chalcocite and bornite in upper two levels. Notes primary ore encountered in 140 foot level averaged 9% Cu and 60 ozs: Ag per ton. Map (pp.75) shows total depth 400 foot, 5 levels, totaling 1200 feet of progress and approximately one third of the inferred orebody mined out. Author suggest orebody located at junction of Pinkham and Midnight vein, suggests veins may horsetail at this junction and implies a continuation of Pinkham orebody both north and south from the present workings (Diagram pp. 76). See also Midnight Mine description pp. 76-77.

Schrader describes the Stockton Hill area, pp. 107-115, equally as well. The Little Chief Mine, pp. 112-113 (now the Chief Engineer property) is described as being developed to the 200 foot level with some 1000 feet of total progress. The Author likens the Little Chief Mine with the Banner Mine and the Treasure Hill Mine, observing that all are on the same (Banner) vein, all had the same surface expression and all produced the same type of ore. The Little Chief produced ore averaging 350 ozs. Ag and 14% to 30% Pb per ton.

SCHRADER, F.C., 1917. Geology and Ore Deposits of Mohave County, Arizona: AIME Trans., Vol. 56, pp. 197-236.

Similar to USGS Bulletin 397. Describes history, topology, geology and ore deposits. Describes selected mines both above and below ground.

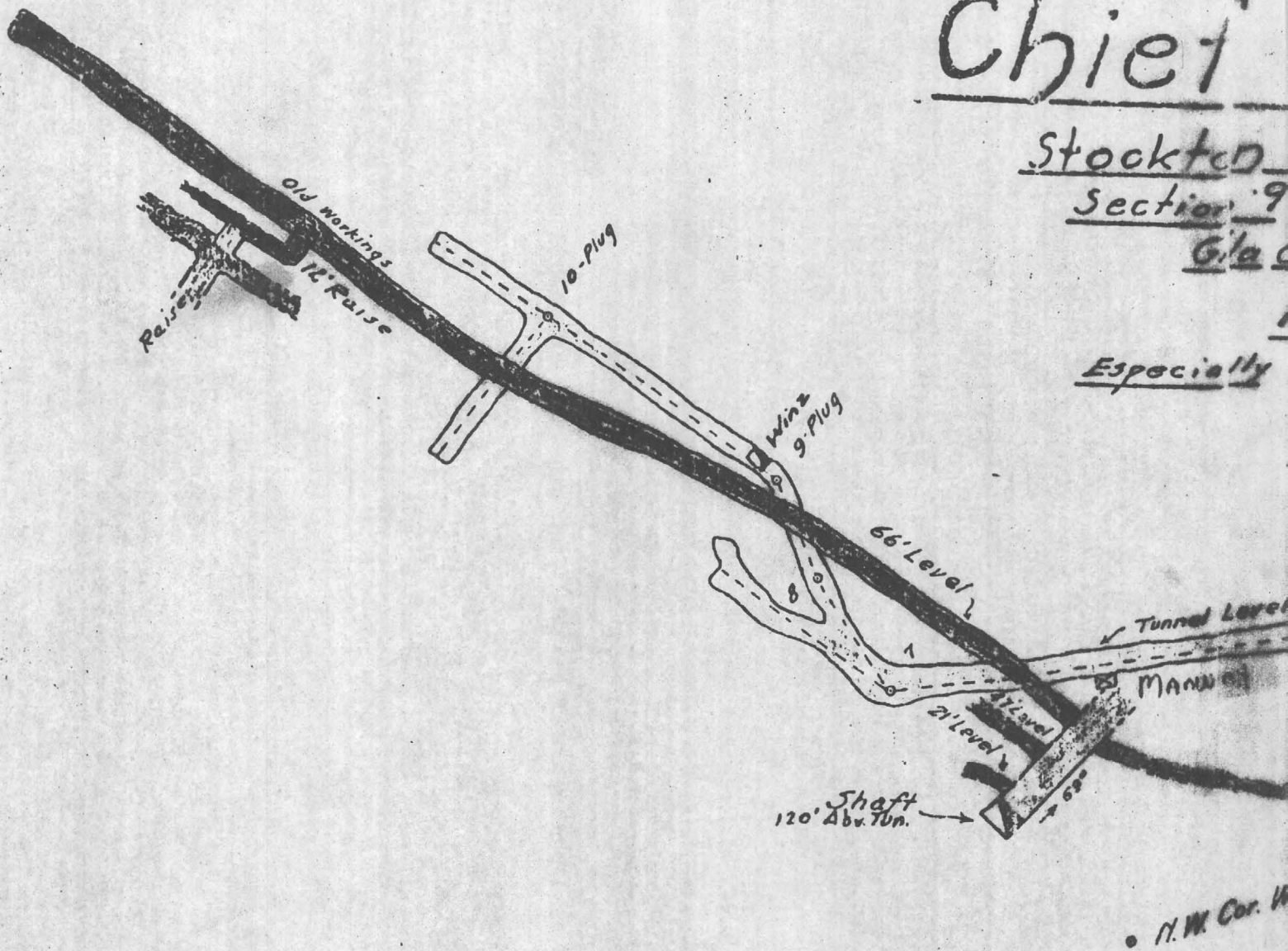
THOMAS, B.E., 1949. Ore Deposits of the Wallapai District,
Arizona: Economic Geology, Vol. 44, pp. 663-705.

Describes general geology and characteristic fissure veins with associated wall rock alteration and secondary enrichment. Emphasis on ore shoots; mineralogy, age, texture and genesis. Concludes mineralizing fluids followed pre-existing conduits and are subsequent to majority of dykes and veins. Suggests that veins may widen with depth and increase in lead-zinc relative to copper-silver-gold. Considers district has good potential for future base-metal production.

This
Un
Chief

Stockton
Section 9
Gla

Especially



MAP OF
LITTLE CHIEF WORKINGS
Stockton Hill, Mohave County, Arizona.
Scale; 1"=30'

This Map Shows Part Of
Underground Workings

et Engineer Mine

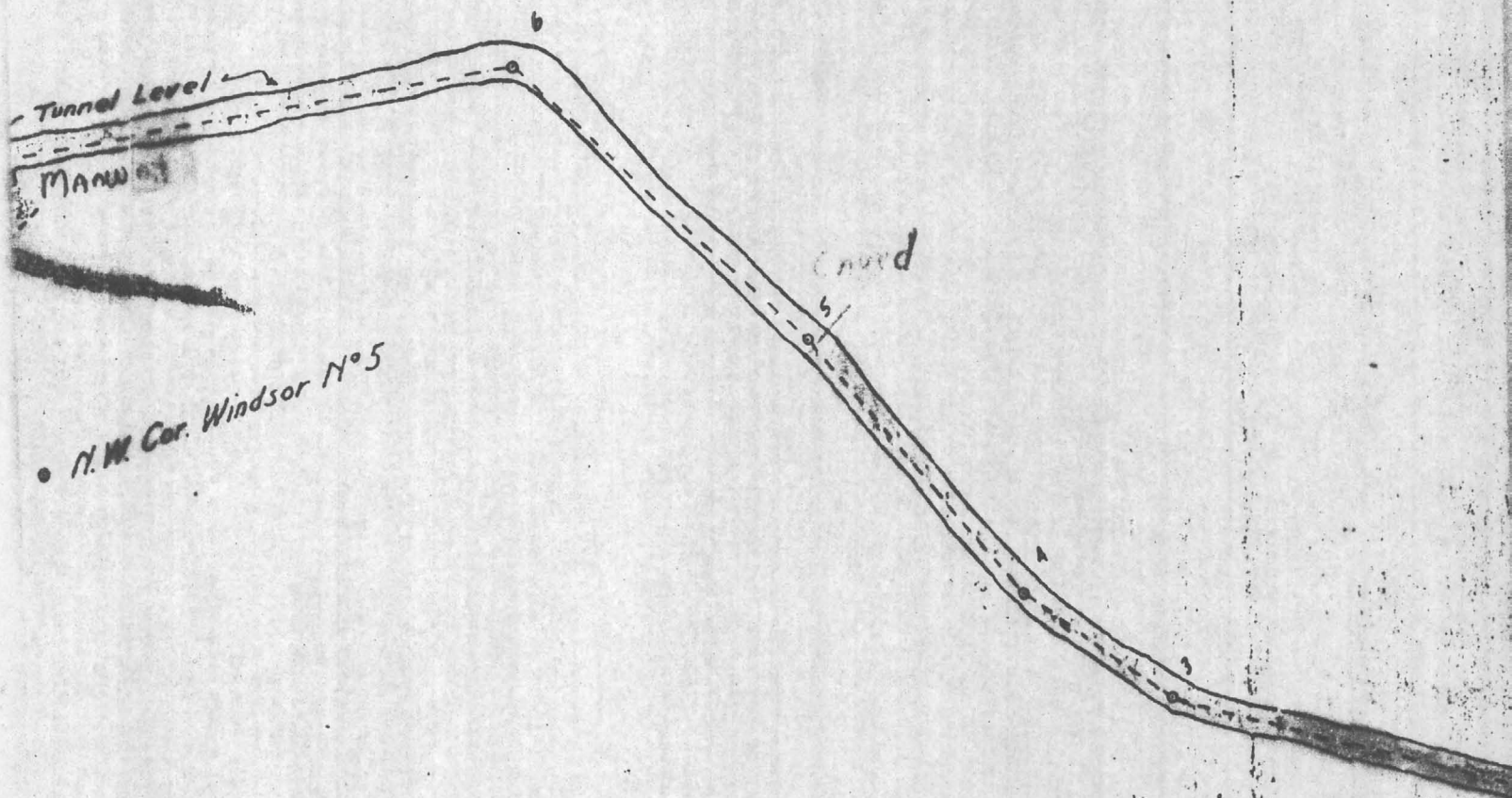
okto Hill Section, Wallapai Mining Dist.
ection 9, Township 22 North, Range 17 West,
Gila & Salt River Base & Meridian,

Mohave County, Arizona

specially Prepared To Accompany Report On The Property For

S. S. Jones, Registered Mining Engineer #34

July 1950



of

95

Mine

001 Mining Dist.

9e 17 West

idian,

izona

ort On The Property for

d Mining Engineer #347

50

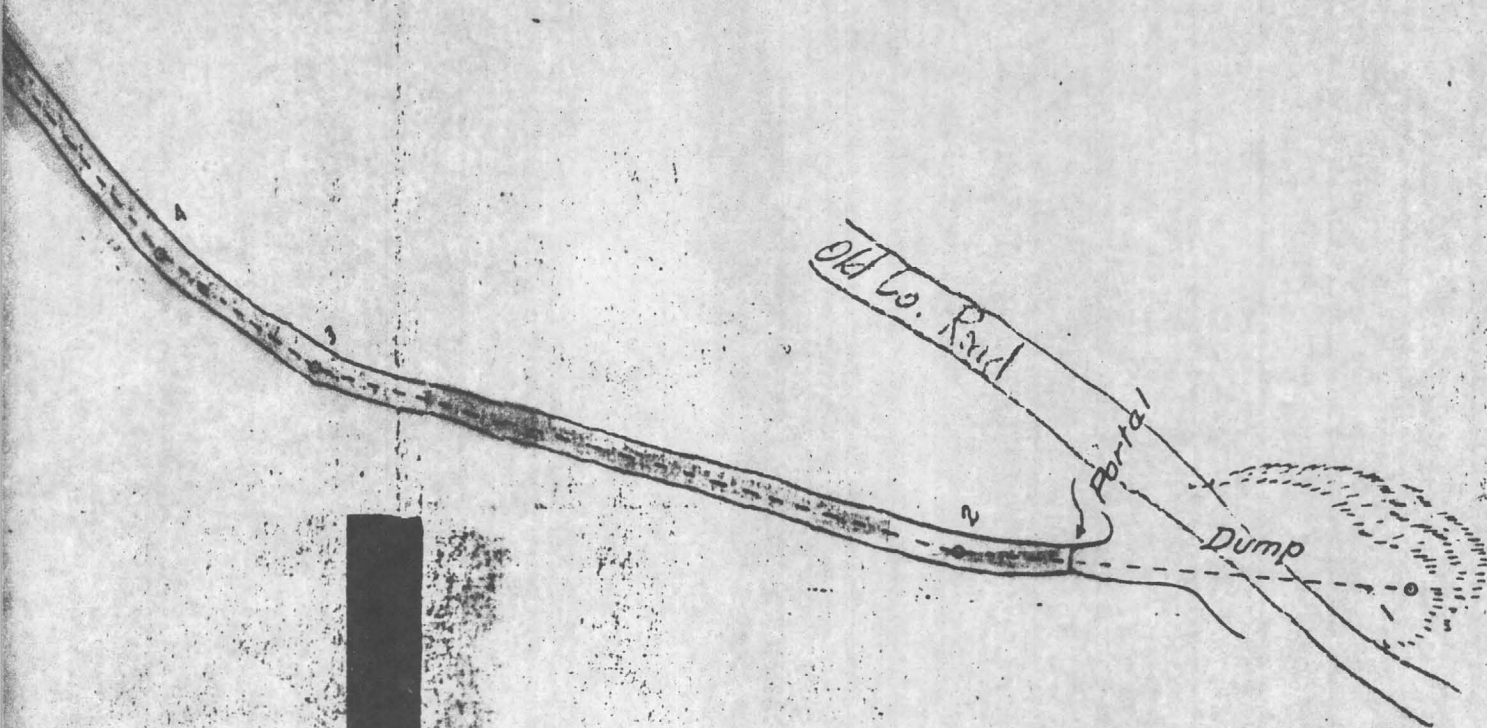
Base Survey By

L. H. FOSTER,

U. S. MINERAL SURVEYOR

AUG. 20, 1926

d



KINGMAN ASSAY OFFICE

W. S. EVERETT

CONTROL DETERMINATIONS

REGISTERED ASSAYER AND CHEMIST

LABORATORY WORK A

SPECIALTY

CERTIFICATE OF ASSAY

KINGMAN, ARIZONA.

THE SAMPLE OF

FROM

AND SUBMITTED TO ME FOR ASSAY CONTAINS:

LAB. NO.	OWNER'S MARK	OZS. PER TON 2000 LBS.		VALUE PER TON GOLD & SILVER	LEAD % FIRE	LEAD % WET	COPPER %	ZINC %	%	PER TON TOTAL VAL
		GOLD	SILVER							
4673	Chifton 1	0.03	62.17							

Gold @ \$20.00 per oz.

Silver @ 60c per oz.

Lead @c per lb.

Zinc @c per lb.

Copper @c per lb.

CERTIFIED BY

W. S. Everett

ASSAYER

CHARGES

Paid

S.S. Jones was engineer & superintendent of Tom Reed Gold mine and him & Hausholder did the work on the Little Chief

pay John's expenses for gas & food and buy him some track & an ore car for \$250 and send him up to Little Chief to do the work
Dec 13, 1980 —

He wants to go down from the top about 30' to 40' to hit the Banner Vein —

The old workings start at about 400'

John said there's about 300' of track and that he dug 100 tons out which took him back 174' in the tunnel which is 7' tall & 4' wide

Highlights

Copper Chief (Darling Mine)

300,000 5 Patented 10 unpatented lode claims

101 acres Copper Chief No. 1 has open cut showing
decided Scheelite ore

+ 200 acres Copper Chief 3 has Chlorite Schist showing

mineral Copper Carbonate and Silver mineralization.

Rights Copper and silver showings on east side of
claim group

Contains large reserve of limestone and
epidote-actinolite rock

Mining engineer report available on examination
of west area of claim group - Tungsten.

Last Production was in 1951 for Tungsten

Prospect for land exchange with U.S. Government

\$100,000

Bee

P 112

The Little Chief mine is located about one-fourth mile southeast of Stockton Hill camp and about 80 feet above it, close to the main road. The mine has been worked on a small scale since the middle seventies, and has produced only high-grade shipping ore from the surface down. It is owned by the C.O.D. Mining Company. The production is reported to be more than \$25,000.

The mine is developed to a depth of about 100 feet and contains about 1,000 feet of underground work, which includes a 400-foot crosscut tunnel, two 80-foot shafts, and 300 feet of drifting, the drift extending about 75 feet on either side of the two main shafts.

The country rock is the pre-Cambrian complex. To judge from talus debris on the surface

of the mine, it seems to be
framed by diabase near by,
and portions of a light-colored
rock, which seems to be the
intrusive granite porphyry, are
associated with the vein.

The vein trends N. 40° W. and
dips steeply northeast. It is
about 6 feet in width and is
supposed to be the Banner vein of
Treasure Hill mine, described

later. The gangue is quartz
crushed and altered silicified

rock. The ore shoot locally
coincides in width with the vein
and is stained throughout with
copper carbonate. The ore contains
principally green horn silver, galena,
and gold, is all of shipping grade
and is said to average about as follows:
350 ounces to the ton; gold, $\$5 \frac{1}{2}$ to $\$1 \frac{1}{2}$ a ton;
silver to 20 per cent.

The practical application of the results lies in the determination of the extent to which the several silver minerals of the ore are secondary or primary and hence to what extent they are likely to play out at moderate depths or to persist below the reach of surface processes of alteration.

= pg 39 1st TP. - orig Ag ores +

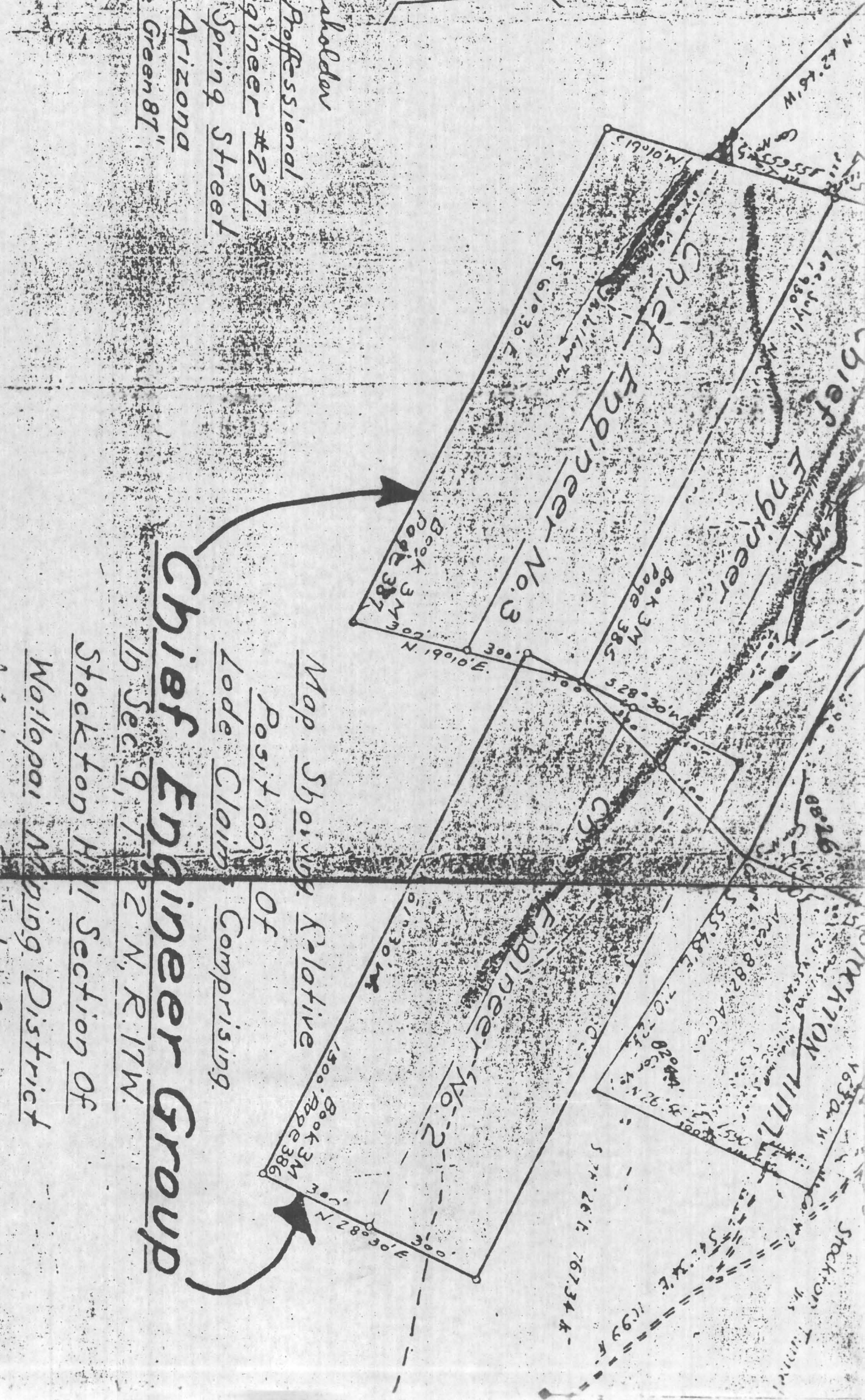
214.

geol.

The country rock is principally dark-blueish granite gneiss of pre-Cambrian age. The schistosity dips about 80° NW. The rock is intruded by a small stock of the granite porphyry. It constitutes the principal mass and upper part of the rough knob situated back of the mine and locally known as the Bronco, and it is in places associated with the Veins in the mine. A schistosity is superimposed and is older than the Veins.

Slackening in the mine indicates a nearly vertical movement.

Compiled by
E. Ross Howaldson
Registered Professional
Mining Engineer #257
431 East Spring Street
Kingman, Arizona
"Phone Green 87"



Chief Engineer Group

Map Showing Relative
Position of
Lode Claim
Comprising
1/2 Sec. 9, T. 2 N., R. 17 W.
Stockton Hill Section of
Mollopai Mining District
County, Arizona

Scale 1" = 300'

June 1956

And 300 feet of drifting and a 550 cross
tunnel.

The shafts have been caved and the tunnel
is open only for the first two hundred feet.

From the original reports and examination
of the old workings and oral information
from the locals the Little Chief contains
a known ore shoot as evidenced by the
lease operations and working shafts covering
a horizontal area of 700 feet.

The Little Chief is sidelined on the north by
the Banner Mine of U.S. Smelting And Refining
Company of Salt Lake City, Utah.

Chief Engineer 3 has a tunnel with several
hundred feet of drifting and has entered a dike
veinflow grade gold-silver milling ore. This tunnel
is still open.

The Chief Engineer 2 has a 90 shaft on the
Banner Vein showing good silver-gold values
in a quartz gangue.

Contains 3,000 feet of Banner vein, very productive.

10,000 acres
needed
Arizona / Montana $\frac{1}{2}$ interest

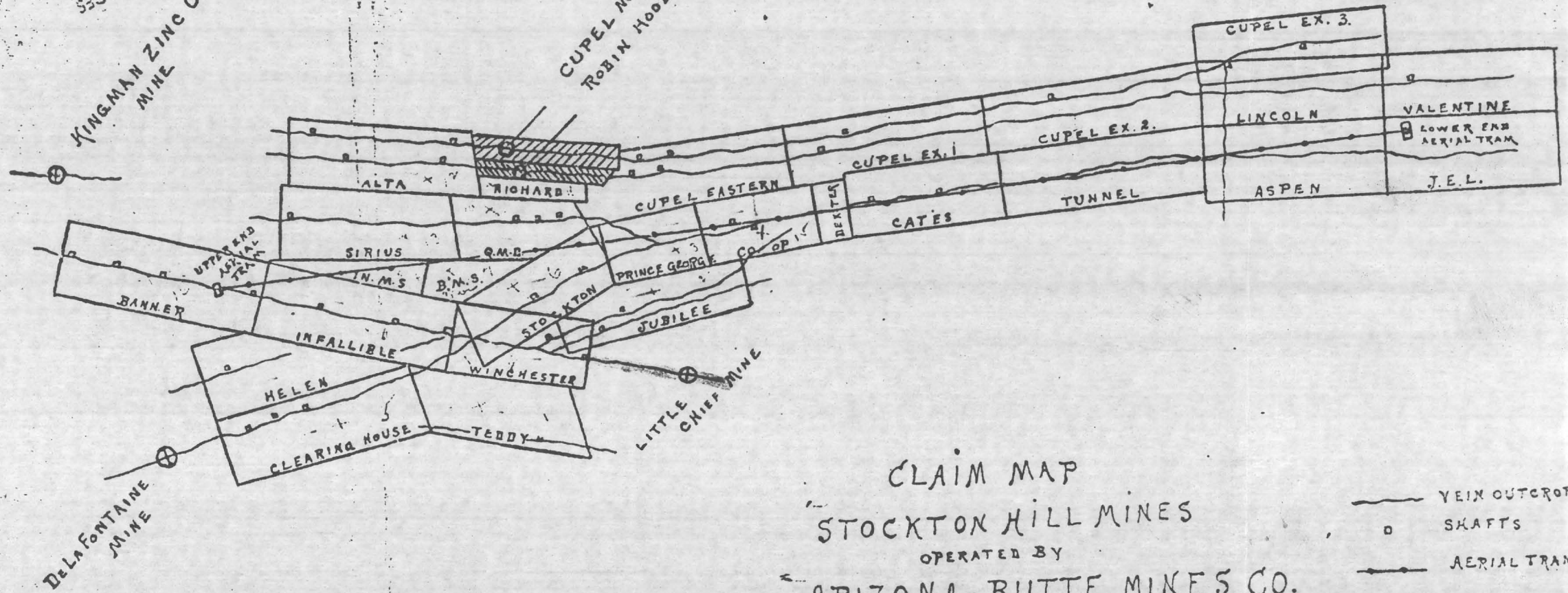
Contains a quartz vein about 3 feet in width
-striking east to west. Bordered on the north
by mill site of Great Lead of the Tennessee
property. Montana vein intersects Molly Gibson
vein on its property. The Arizona shaft with drift
is now completely caved.

Very little development
2 Patented.

THE ARIZONA DEPARTMENT OF MINERAL RESOURCES
MAKES NO REPRESENTATION AS TO THE ACCURACY
OF THE CONTENTS OF THESE DOCUMENTS.

KINGMAN ZINC Co.
MINE

CUPEL MINE
ROBIN HOOD MINE.



CLAIM MAP
STOCKTON HILL MINES
OPERATED BY
ARIZONA-BUTTE MINES CO.
(EXCEPT SHADED PORTION.)

SHOWING VEIN SYSTEM. LENGTH ABOUT 2 MILES.

APPROXIMATE SCALE 1000 FEET = INCH

— VEIN OUTCROPS
□ SHAFTS
—•— AERIAL TRAM

A BIT OF HISTORY

Almost in the center of one of the richest mining districts in the world and ideally situated on a gentle slope at the base of the Cerbat Range is the picturesque mining camp of Chloride,—so named because of the character of its rich silver ore. It possesses an interesting history, details of which we have neither the time nor space to consider now; moreover, history is being made so rapidly in Chloride and the Chloride Mining District these days that what is new today will be out of date next week. Hence, we will jot down briefly only such features as will the better enable our readers to understand and appreciate what follows.

Away back in the early sixties when the Indians were still hostile, scouting parties of soldiers reconnoitering in this region discovered rich silver ore exposed on surface of the ground, and, when not engaged in exchanging target practice with the "redskins," staked off several mining claims. News of these rich finds spread among pioneer prospectors of other camps and soon a camp was established here that assumed the proportions of a town in the earliest seventies. Hostile Indians menaced the settlers frequently and several lives were lost before the Indians became convinced that the whites were here to stay.

The silver ores so easily mined,—or more correctly, "chlorided,"—were found to be amazingly rich, but the ore and trouble with the Indians were about the only things that could be gotten easily. There were no railroads in Arizona in those days and all supplies had to be hauled by ox and mule teams 400 miles overland from Western California, making the delivered cost of such supplies excessively high. Ore had to be hauled to the Colorado River on burros, thence by boat to Port Isabel, down the Gulf of California and then up the coast to San Francisco to be shipped to Swansea, Wales for treatment. Such was the richness and purity of the ores shipped that handsome returns were netted by these hardy prospectors in spite of the enormous costs incident to mining and marketing.

These rugged pioneers suffered hardships and endured privations of every kind as only real men do to whom falls the lot of blazing trails for civilization to follow. There were the long journeys of 400 miles over alkali and sandy deserts, through the domain of hostile Indian tribes, across a country that then had neither roads nor bridges, and always there lurked danger on every side from man, beast or reptile; even Nature seemed antagonistic. In these days of civilization when we enjoy peaceful security, conveniences in traveling, and all the personal comforts our generation affords, we cannot realize fully the great contrast between conditions that prevailed here a half century ago and those we find today. Suffice to say that in the intervening years railroads and mills have been constructed, towns have been built up, great mines have been and are being opened up until the total wealth wrested from this one district alone exceeds fifty million dollars.

35¢

CHLORIDE MINING DISTRICT

1916
\$8,000,000

Mohave
County
Arizona

1917
\$20,000,000

GOLD

SILVER

LEAD

ZINC

COPPER

BARIIUM

TURQUOIS

Placer Mines and Free Gold

ISSUED BY

MINERAL HILLS ENTERPRISES

Chloride, Arizona

NAME OF CLAIM

BOOK

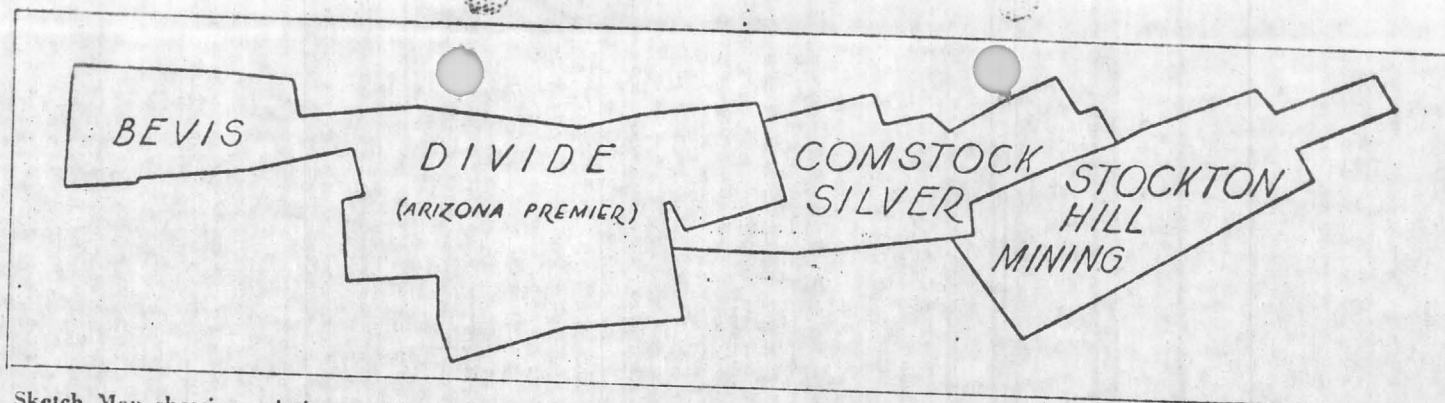
PAGE

Chief Engineer
Chief Engineer No. 2
Chief Engineer No. 3
Chief Engineer Fraction

3M 385
3M 386
3M 387
278 963

Located in Section 9, Township 22 North, Range 17 West,
G. & S. R. M.

Chief Engineer AMC 18154
Chief Engineer No. 2 AMC 18155
Chief Engineer No. 3 AMC 18156
Chief Engineer Fraction AMC 18157



Sketch Map showing relative positions of Bevis Divide (Arizona Premier), Comstock Silver and Stockton Hill Mining Properties

Mining Engineer's Report (Continued from Page 1)

Development

"The development work on the Little Chief consists, for the most part, of six shafts, connecting drifts, stopes, raises, crosscuts, etc., between the northwest endline along the vein toward the portal of the present tunnel, a distance of about 1,200 feet. This tunnel has been driven northwest a distance of 500 feet with the main vein exposed in the face. Four hundred twenty-five feet from the portal a winze is being sunk which is producing ore of a good grade from streaks that are coming in across four feet on the hanging wall side. As this tunnel is pushed ahead, it will open up this same vein about 200 feet below the surface and between 100 and 160 feet below the older workings and enter the ore shoots exposed above the depth indicated.

"The main shaft of the Treasure Hill mine is 200 feet deep and is

reported to have about 200 feet of drifting on the lower level. There is 150 feet of water in this shaft. The surface equipment includes a 15-horsepower Weber gasoline engine and hoist, together with a suitable gallows frame and a Meyers bulldozer pump.

"Between the Little Chief tunnel and the 200-foot Treasure Hill shaft, there are a number of other shafts and open cuts ranging between 10 and 90 feet in depth, where ore of varying width and quality is exposed. Over the entire eleven claims on the seven different veins there are a number of shafts and open cuts which, for the most part, make up the assessment work prosecuted during the history of the property. Later a more detailed study will be made of this territory which has much promise in a mining way.

Location and Neighboring Mines

"The eleven lode mining claims comprising the Stockton Hill Mining Company's group are located on the easterly slope of the Stockton Hill section of the Cerbat Mountain range in the Wallapai Mining District, Mohave County, Arizona, at a maximum elevation of 5,000 feet. The northwesterly portion of the group is endlined and sidelined by the Banner-Prince George mining property of the Comstock Silver Mining Company and includes what has been known for years as the Little

Chief mine. The southeasterly portion of the group includes another important producer of high grade ore, located in the early seventies and known as the Treasure Hill. The famous Cupel mine is about 3,000 feet north of the Little Chief workings. The Arizona Premier property of the Bevis Divide lies to the northwest, endlining the Comstock Silver along the same vein system that traverses that property and the Stockton Hill Mining Company acreage.

Conclusion and Summary

"After a careful preliminary examination of the eleven lode mining claims, including the Little Chief and Treasure Hill mines, comprising the estate of the Stockton Hill Mining Company, located in the Stockton Hill section of the Wallapai Mining District, Mohave County, Arizona, it would seem that the indications on the property, its past production record, and the quality of the ore now exposed, warrant further intensive development to open up the main orebodies that have already been so productive near the surface, along the main vein, which can be traced for over 3,000 feet, to the northwest endline where it enters the Comstock Silver group, and which is recognized as the vein from which that company is now producing and shipping carloads of a high grade ore, similar in character to that found in the vein on your holdings.

"There exists at this mine, every apparent geological similarity with the other productive mines of the district, such as the fissure vein and ore characteristics, the same strike and dip of the veins, and the accepted extension of the Banner mine vein from the Winchester claim of that

mine for 3,000 feet through your group. Your property possesses the same general geological formations recognized as the most favorable in which to expect commercial ore deposits in the district. Furthermore, the samples from the workings, old sorting dumps and present exposures gave returns that would indicate that the shipping ore from this property must have been of a high grade and, therefore, following the usual trend of such deposits, it is reasonable to expect that the ore will continue to depth, as is evidenced in the other producing mines of the vicinity.

"The main vein, together with the others on your property, are strong and well defined, and there is no question as regards their permanency and continuity to a very great depth. I am led to believe from my observations and examination that further explorations would result in the uncovering of important orebodies, such as would place the property in rank with other paying mines of the district.

Affidavit of Labor Peformed and Improvements Made

STATE OF ARIZONA, } ss.
County of Mohave }

E. Ross Housholder

being duly sworn, deposes and

says that he is a citizen of the United States and more than twenty-one years of age, and resides at Kingman in Mohave

County, State of Arizona, and is personally acquainted with the mining claim known as.....
Chief Engineer(recorded in Book of Mines page) and the
~~Chief Engineer No. 36~~

mining claims situate in Stockton Hill section of the Wallapai Mining District, County of Mohave, State of Arizona, the location notice of which is recorded in the office of the County Recorder of said County, in Book 3M of Records of Mines, at page 385 and 387; that between the 15th day of November A. D. 1938, and the 30th day of June A. D. 1939, at least Two hundred and fifty (\$250.00)

.....dollars worth of work and improvements were done and performed upon said claim, not including the location work of said claim. Such work and improvements were made by and at the expense of E. Ross Housholder the owner, and others working for the owner.....of said claim^s for the purpose of complying with the laws of the United States pertaining to assessment of annual work, and Bill Cunningham, P. L. Miller, C. S. Hall, Slim Day, E. Ross Housholder, et al

were the men employed by said owner.....and who labored upon said claim, did said work and improvements, the same being as follows, to-wit: retimbering drift and stope in lower level Chief Engineer tunnel; Clearing tunnel of rock caved from top and walls; building entrance to intermediate level from surface; Clearing debris and rock from intermediate level to permit further exploration and extraction of the ore from this level; Repairing 1000 feet road from portal lower tunnel to main Stockton Hill road so that material, tools and supplies could be transported to the portal of the underground workings; repairing, and rebuilding transportation trail from the portal of the Chief Engineer No. 3 tunnel to the mine road, thence to main Stockton Hill road; Clearing drifts and crosscuts in Chief Engineer No. 3 tunnel; extracting ore; sorting ores; tools, supplies, material amounting to \$42.00 and labor amounting to \$208.00, besides other work performed by the owner on and for the benefit of these claims.

Subscribed and sworn to before me this 1st day of July, A. D. 1939

(My commission expires Nov. 20, 1939.....)

Notary Public

Filed and recorded at request of E. Ross Housholder, 429 Spring St., Kingman,
Arizona, July 1st A. D. 19 39 at 9:30 o'clock A. M. Book

Proof of Labor, pages....., Records of Mohave County, Arizona.

By..... Deputy Recorder

County Recorder

Page.....

Intermediate level and cross cut tunnel were open in 1941 but ^{Mr.} Rosa Hausholder returned from the war the workings were caved in.

Indexed	Paged	Blotted

No. 269 Page 66
 Book 75-10348 Fee 85
 Date April 15, 1975
 Request of:

STATE OF ARIZONA
 COUNTY OF MOHAVE ss.

I hereby certify that the within
 instrument was filed for record
 in MOHAVE County, State of Arizona

Witness my hand and Official Seal:

County Recorder

By John B. Rothman Jr.
 Deputy

Request of Mining Claimant for Copy of Notice

Pursuant to the provisions of Section 5 of the Act of July 23, 1955 (69 Stat. 367; 30 USC 611), and to the applicable regulations thereunder (43 CFR 3510.0-3), the undersigned hereby requests a copy of any notice to mining claimants which may be published by the Secretary of the Interior of the United States or his designated representative, as provided in Section 5 of said act, affecting any of the lands hereinafter described:

1. The undersigned, John and Fred Rothman whose address is 3016 W. Mercer Lane, Phoenix, Arizona located the following described claim(s) prior to enactment of the Act of July 23, 1955 and claims rights in the vegetative surface resources or other surface resources as defined in said act.

2. The mining claim(s) is/are situate in MOHAVE County, Arizona, and are identified as follows:

Name of mining claim	Date of location	Locator or Purchaser+	Location notice recorded	
			Docket	Page
Chief Engineer	July 1, 1930	PURCHASER	3M	385
Chief Engineer 2	July 1, 1930	PURCHASER	3M	386
Chief Engineer 3	July 1, 1930	PURCHASER	3M	387

3. The above described mining claim(s) is/are embraced in Section(s) 9 Township 22N Range 17W G. & S.R.M., of the public land surveys.

4. The mining claim(s) will probably be embraced in the following section(s) when the public land surveys are extended to the land covered by said mining claim(s). Section(s) 9 Township 22N Range 17W G. & S.R.M.

5. The undersigned is a locator or purchase of said mining claim(s) as indicated above.

Date April 15, 1975

John B. Rothman Jr.
 Mining Claimant

+Insert in this column opposite the name of each claim the word "locator" or the word "purchase" to show the nature of the mining claimant's interest.

*If the area where the claims are located has not been surveyed, use paragraph 4. In lieu of paragraph 4 the mining claim may be described by a tie by courses and distances to an established United States mineral monument.

81

Proofed Microfilmed

Indexed Miscellaneous

75-10348

FEE \$

APR 16 '75 - 8 30 AM

mailing address:

John and Fred Rothman
3016 W. Mercer Lane
Phoenix, Arizona 85029

Recorded at the Request of

John B. Rothman Jr.

66 of Book 269

Official Records in Mohave County, Arizona.

County Recorder

Deputy

\$2.00

BOOK 269 PAGE 66

District

Cerbat Dist., Mohave Co.

Engineer Lew A. Smith

Subject:

Interviews and Visit to Golden Gem Mine and Mill. (9-6-62) With "Red" Williams.

Location: The Banner Mine lies 2 miles east of the Golden Gem Mine (The Golden Gem is in S-7 T. 22 N., R. 17 W.) (The Banner would then be approximately in S-9.)

Owner: Cerbat M. & M. Co., of Kingman.

Work: The mine is opened by a 1600 foot adit drift which reaches a depth of 250 feet below the surface. A total of 2500 feet of underground working had been completed by 1910. Later a winze, 60 feet deep, was sunk at a point 600 feet from the portal of the 1600-foot adit drift. The Cerbat M. & M. Co. is now sampling the several Banner Dumps and treating the samples in the Golden Gem Mill. These sample lots are reported to run 6 oz. in silver per ton and 2-3 percent of lead.

The Banner Mine geology was described in U.S.G.S. Bull. 397, pp. 109-110, as follows:

The country rock is iron-gray to light gray, fine-grained gneiss, in which the gneissic foliations trend N. 30° E. and dip N-NW toward the vein on the footwall side. The rock is stained red from limonite derived from pyrite. The main fissure vein strikes N. 40 degrees W. and dips 80 degrees NE. The gangue is mainly reddish-brown, stained quartz, at the surface, and it averages 7-8 feet wide, but the ore width ranges from 1-3 feet. The ore band favors the footwall, generally. A foot or more of highly altered gangue follows the hanging wall side. The ore is roughly banded and contains galena with some sphalerite, pyrite and chalcopyrite. Gold sometimes runs up to several ounces and silver is present as sulphides or native silver. Zinc content increases with depth.

*Banner (Digging Quarry)
Note 10-1962 -*

Property to North of Little Chief Mine
Owned By U.S. Smelting & Refining Co.,
Salt Lake City, Utah. It is on the
same vein as Little Chief.

1 of EVERY
PAGE

Little Chief To Go To Stockton Hill Company

1926

MARION L. COOPER, AFTER VERIFYING REPORTS OF RECENT OPERATIONS AT STOCKTON HILL TAKES OVER PROPERTY WHICH ENDLINES COMSTOCK SILVER

Several shoots of ore on main vein that traverses property for over 3000 feet from which important shipments have been made is being tapped at depth by new main exploration tunnel already in good ore.

After having verified reports of recent operations at Stockton Hill, and having investigated the possibilities of this district, which is located 12 miles north of Kingman, Marion L. Cooper of Los Angeles, California, yesterday completed purchase and arranged for development of the Little Chief group of eleven claims in behalf of himself and associates.

This property, which has a length of 3000 feet exactly along the course of the Banner vein system, upon which are in progress the Comstock Silver and Arizona Premier operations, is locally regarded as the most desirable now open in that astonishing region.

The northwest holdings of the Little Chief end lines the Winchester claim of the Comstock Silver. The most important factor of the preliminary development work accomplished to date by former owners and lessees of the property is the indisputable proof that the property contains one, and possibly two shoots of ore containing gold, lead and zinc, together with silver, similar to the shipping ore of Comstock Silver.

The present showing, to be more accurately described in reports ordered by Mr. Cooper, includes a good width of ore containing lead and silver sulphides in a winze 425 feet from the portal of a tunnel now advanced 500 feet. This tunnel, which has now attained a depth of about 200 feet, is to be driven to the northwest, toward the Comstock Silver end line.

At the southeast end of the property is an old shaft 200 feet deep and partially filled with water, that is reported to have yielded shipping ore having a value in excess of \$400 per ton. Former operators, now residing in Kingman, agree that Charles Richardson shipped \$27,000 from this property, that another small operation yielded about \$20,000, and still another \$17,000.

One of the most attractive features of the Little Chief property is the presence of galena, almost on the surface. In prospecting the course of the vein, samples were taken that carried

\$36 in gold and silver with 24% lead; \$41 gold and silver with 27% lead; and one sample from a winze off the main tunnel level carried \$26.46 in gold alone together with some lead; the lowest assay returns from these samples was \$11 in gold and silver besides the lead content.

From a 90 foot shaft a sample of the ore ran \$11.50 gold and silver and 13.1% lead.

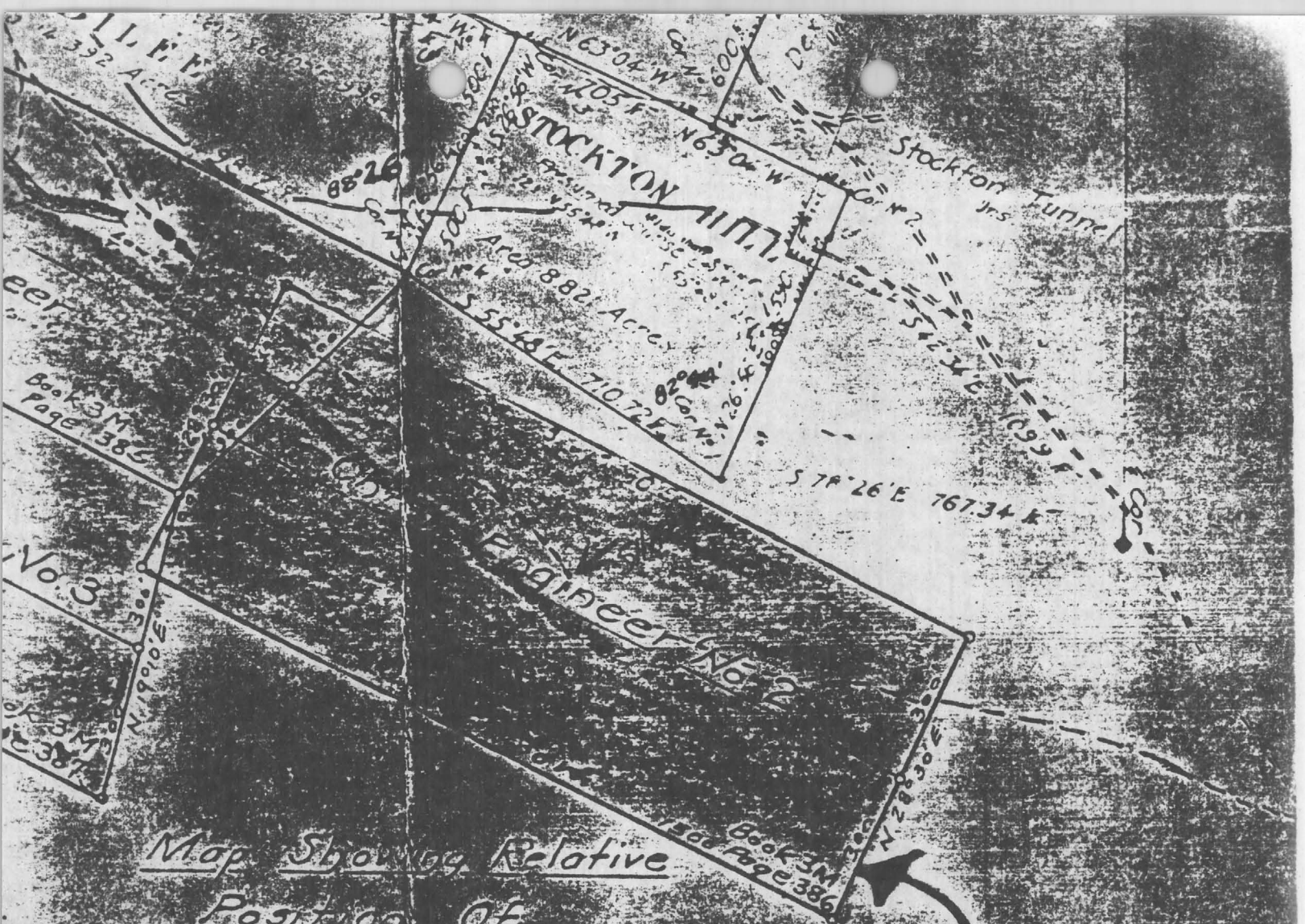
In consultation with his engineer, Mr. Cooper outlined a development program to supplement the work now in progress that will quickly open up the known ore bodies and thereby give an opportunity to begin production on such a scale that will prove profitable to his organization, for the conditions on the property are there to prove the existence of ore bodies of magnitude and remunerative content. This mine will undoubtedly prove to be one of the wealthiest in the entire Stockton Hill section.

Prior to his departure for Los Angeles last night, Mr. Cooper stated that he planned to turn the Little Chief over to a Nevada Corporation, the Stockton Hill Mining Company. He expects to return next week and inaugurate development work on an extensive scale.

power is available. When the veins are struck in the new shaft it is reasonable to believe that the same high-grade ore will be encountered as was shipped from the mine in the early days. Altogether White Hills looks like one of the coming mines of the country.

The head-frame is going up and the force being increased daily. The shaft has attained depth of about 45 feet by hand work. When the air drill starts the shaft should go down at the rate of 3 or 4 feet a day. See Ben Gill and Supt. Wm. Mack have been going over the ground. Mr. Gill having spent two days on the property and left for Goldfield, Nevada, Saturday.

Silver was .60¢ oz
Gold was 20.00 oz
at this time.



Map Showing Relative
Position Of
Lode Claims Comprising
Chief Engineer Group
In Sec. 9, T. 22 N. R. 17 W.
Stockton Hill Section Of
Wallowa Mining District

From the dump at the 80 foot shaft about midway between the Treasure Hill or Stockton Hill main shaft, and the Little Chief workings on the upper end of the Windsor group, samples were taken that gave returns of 16.5 to 34 ounces silver and up to 13% lead.

Chief Engineer No. 2 Shaft

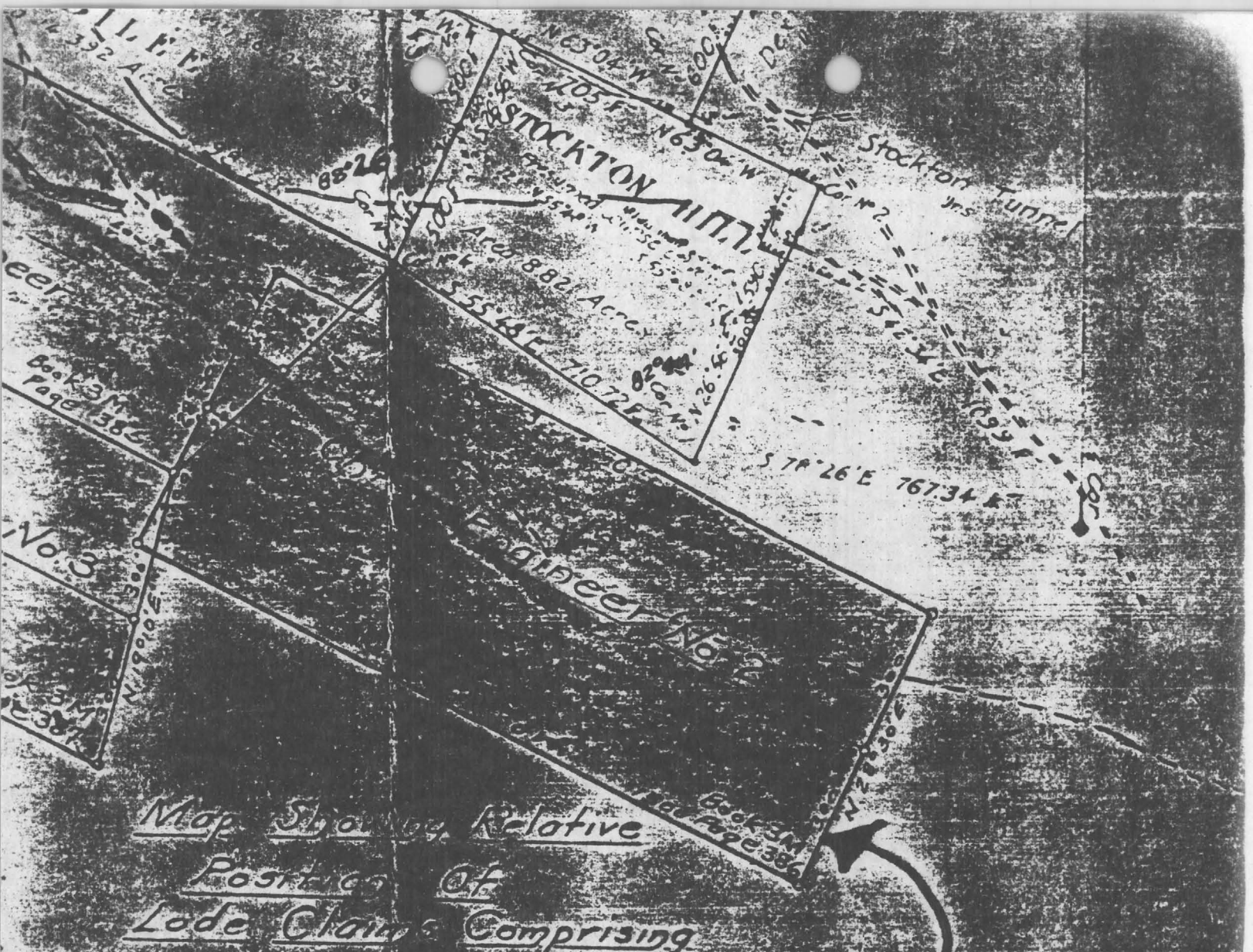
LITTLE CHIEF GEOLOGY

Commenting upon the Little Chief mine in the same government report, the author, F.C. Schrader, wrote, "The country rock is pre-Cambrian complex. To judge from talus debris on the surface at the mine, it seems to be intruded by diabase near by, and portions of a light-colored altered rock, which seems to be the intrusive porphyry, are associated with the vein."

"The vein trends N. 40° W. and dips steeply northeast. It is about 6 feet in width and is supposed to be the Banner vein of the Treasure Hill mine, described later. The gangue is quartz and crushed and altered silicified rock. The ore shoot locally coincides in width with the vein and is stained throughout with copper carbonate. The ore contains principally green horn silver, galena, and gold, is all of shipping grade, and is said to average about as follows: Silver, 350 ounces to the ton; gold \$5 to \$10 a ton; and lead, 8 to 40 per cent."

Since the above government report was written the entrances to the works referred to, have been caved and are now with few exceptions impassable. Samples that have been taken from rather narrow streaks in the vein as now exposed and left by the early

F. C. Schrader



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In Sec. 9, T. 22 N., R. 17 W.
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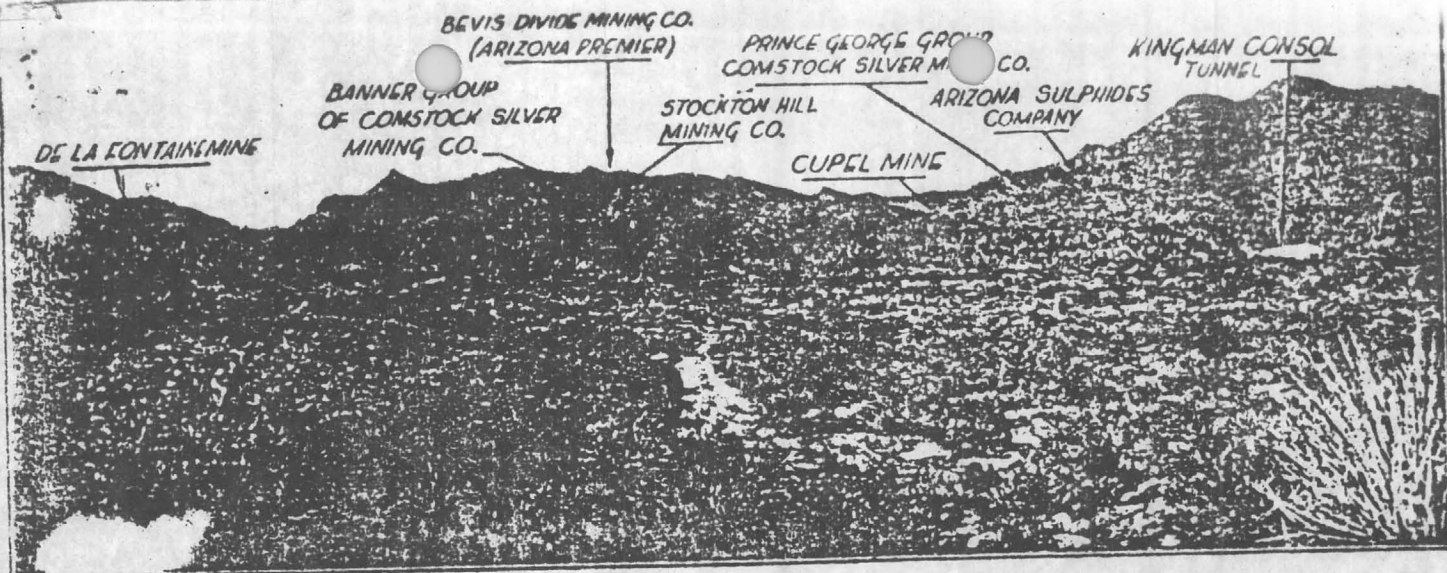
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2. Ross Stockton



Above is a view from the southeast of Stockton Hill, Mohave County, Arizona, the mines on which are attracting renewed attention through noteworthy production of Lead-Zinc-Copper-Gold-Silver ores of excellent grade.

Stockton Hill Mining Company

Organized Under the Laws of Nevada
Capitalization 1,500,000 Non-Assessable
Shares, Par Value 25c Each

Mining Engineer's Report

E. Ross Housholder, well-known mining engineer of Kingman, Arizona, and a recognized authority on the mines of Mohave County, that state, recently made a preliminary report to Marion L. Cooper, president of the Stockton Hill Mining Company, on the property of that corporation. Excerpts from Engineer Housholder's report, including references bearing upon the Little Chief and Treasure Hill mines (now a part of the holdings of the company), contained in U. S. Geological Bulletin No. 397, follows:

History

"The exact date of the discovery and original location of the Little Chief cannot be definitely determined, but evidently the first substantial ore shipments were made more than 30 years ago, when the operators packed their high grade ores out on animals. In a recent article in the Mohave County Miner, of Kingman, Arizona, its mining editor, who is personally familiar with the property, stated:

"In the early days the Little Chief was a shipper of high grade silver ore, many carloads of ore averaging 1,100 ounces going out to the smelters. At that time it was owned by John Kennedy, known to the Indians as 'Little Sealway,' (meaning man with tooth out in front). With the money from the ore sales Kennedy purchased a good-sized cattle ranch. After the mine had passed into other hands, lessors shipped largely from the property, the ore being from the oxidized zone."

"Regarding the southeastern portion of the Stockton Hill Mining Company estate, which includes the Treasure Hill mine, F. C. Schrader, U. S. Geologist, in his report (1909), Bulletin No. 397 (page 114) wrote:

"The Treasure Hill mine is situated in the southeastern part of the district, in southward-sloping foothills at about 4,200 feet elevation. It was discovered late in the seventies and was worked on a small scale. From 1890 to 1900 it was owned by Lehotean Moore, who sunk five or six shafts to water level, about 65 feet from the surface, and is said to have stopped out very rich ore, some of which contained 15,000 ounces of silver to the ton. The production is reported to be \$100,000."

"On page 113 of the same report, the author, in discussing the Little Chief mine, says:

"The ore contains principally green horn silver, galena, and gold, is all of shipping grade, and is said to average about as follows: Silver, 350 ounces to the ton; gold, \$5 to \$10 a ton; and lead, 8 to 40 per cent."

"Again on page 115 of the same report, Schrader, in referring to the Treasure Hill mine, says:

"The ore, so far as the experience of the (then) present management goes, is said to average about 100 ounces of silver and \$3 to \$16 in gold to the ton, and from 7 to 10 per cent of lead, in both the oxidized and unoxidized zones."

"Since the earlier operation of both these mines, now included in the present group of the Stockton Hill Mining Company, this area has been operated on a small scale intermittently to the present time. In the earlier operations only the oxidized ores were extracted because it has only been recently that sulphide ores could be mined at a profit. The rate of progress in the last three years in the development of differential flotation, and the construction of suitable mills at the smelters, have been rapid beyond the realization of most people. Therefore, today sulphide ores, such as are being shipped from the Stockton Hill section, can be mined at a profit, and have stimulated mining there, with the result that such mines as the Stockton Hill Mining Company property can find a ready market for the ores they are uncovering."



Sketch Map showing relative positions of Bevis Divide (Arizona Premier), Comstock Silver and Stockton Hill Mining Property

Mining Engineer's Report (Continued from Page 1)

Development

"The development work on the Little Chief consists, for the most part, of six shafts, connecting drifts, stopes, raises, crosscuts, etc., between the northwest endline along the vein toward the portal of the present tunnel, a distance of about 1,200 feet. This tunnel has been driven northwest a distance of 500 feet with the main vein exposed in the face. Four hundred twenty-five feet from the portal a winze is being sunk which is producing ore of a good grade from streaks that are coming in across four feet on the hanging wall side. As this tunnel is pushed ahead, it will open up this same vein about 200 feet below the surface and between 100 and 160 feet below the older workings and enter the ore shoots exposed above the depth indicated.

"The main shaft of the Treasure Hill mine is 200 feet deep and is

reported to have about 200 feet of drifting on the lower level. There is 150 feet of water in this shaft. The surface equipment includes a 15-horsepower Weber gasoline engine and hoist, together with a suitable gallows frame and a Meyers bulldozer pump.

"Between the Little Chief tunnel and the 200-foot Treasure Hill shaft, there are a number of other shafts and open cuts ranging between 10 and 90 feet in depth, where ore of varying width and quality is exposed. Over the entire eleven claims on the seven different veins there are a number of shafts and open cuts which, for the most part, make up the assessment work prosecuted during the history of the property. Later a more detailed study will be made of this territory which has much promise in a mining way.

Location and Neighboring Mines

"The eleven lode mining claims comprising the Stockton Hill Mining Company's group are located on the easterly slope of the Stockton Hill section of the Cerbat Mountain range in the Wallapai Mining District, Mohave County, Arizona, at a maximum elevation of 5,000 feet. The northwesterly portion of the group is endlined and sidelined by the Banner-Prince George mining property of the Comstock Silver Mining Company and includes what has been known for years as the Little

Chief mine. The southeasterly portion of the group includes another important producer of high grade ore, located in the early seventies and known as the Treasure Hill. The famous Cupel mine is about 3,000 feet north of the Little Chief workings. The Arizona Premier property of the Bevis Divide lies to the northwest, endlining the Comstock Silver along the same vein system that traverses that property and the Stockton Hill Mining Company acreage.

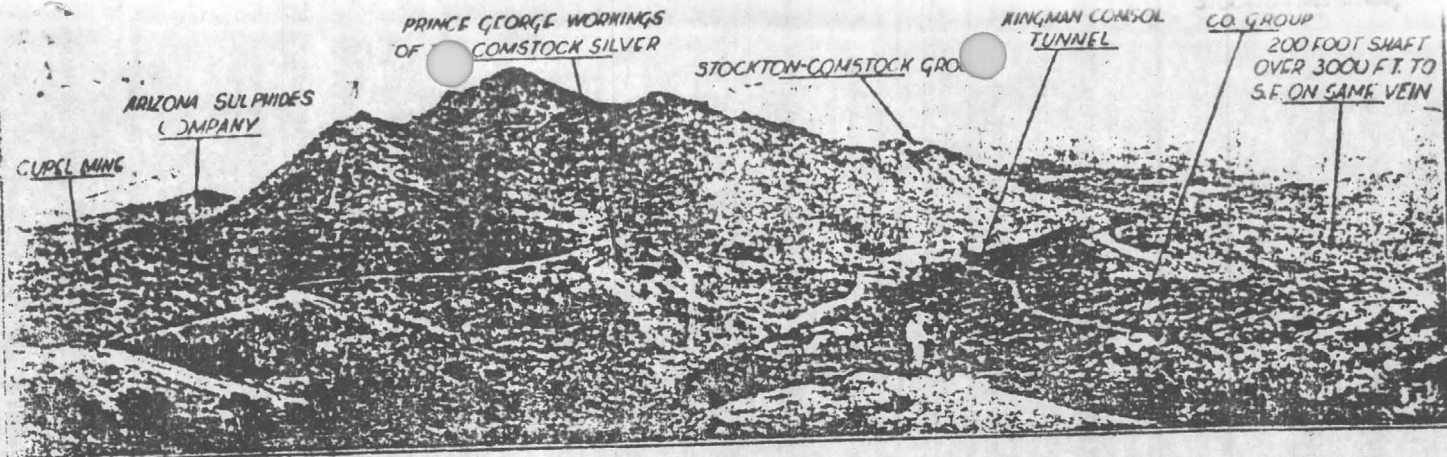
Conclusion and Summary

"After a careful preliminary examination of the eleven lode mining claims comprising the Little Chief and Treasure Hill mines, comprising the Stockton Hill Mining Company, located in the Stockton Hill section of the Wallapai Mining District, Mohave County, Arizona, it is concluded that the indications on the property, its past production and the quality of the ore now exposed, warrant further intensive work to open up the main orebodies that have already been so near the surface, along the main vein, which can be traced about 500 feet, to the northwest endline where it enters the Comstock Silver group, and which is recognized as the vein from which that group is now producing and shipping carloads of a high grade ore, of a character to that found in the vein on your holdings.

"There exists at this mine every apparent geological similarity with the productive mines of the district, such as the fissure vein and the Banner mine vein from the Winchester claim of that

mine for 3,000 feet through your group. Your property possesses the same general geological formations recognized as the most favorable in which to expect commercial ore deposits in the district. Furthermore, the samples from the workings, old sorting dumps and present exposures gave returns that would indicate that the shipping ore from this property must have been of a high grade and, therefore, following the usual trend of such deposits, it is reasonable to expect that the ore will continue to depth, as is evidenced in the other producing mines of the vicinity.

"The main vein, together with the others on your property, are strong and well defined, and there is no question as regards their permanency and continuity to a very great depth. I am led to believe from my observations and examination that further explorations would result in the uncovering of important orebodies, such as would place the property in rank with other paying mines of the district.



Panorama View of Stockton Hill, showing Marion L. Cooper, president of Stockton Hill Mining Company, and his mine foreman, examining ore samples on one of the shaft dumps on property of that corporation.

Mining Engineer's Report

(Continued from Page 2)

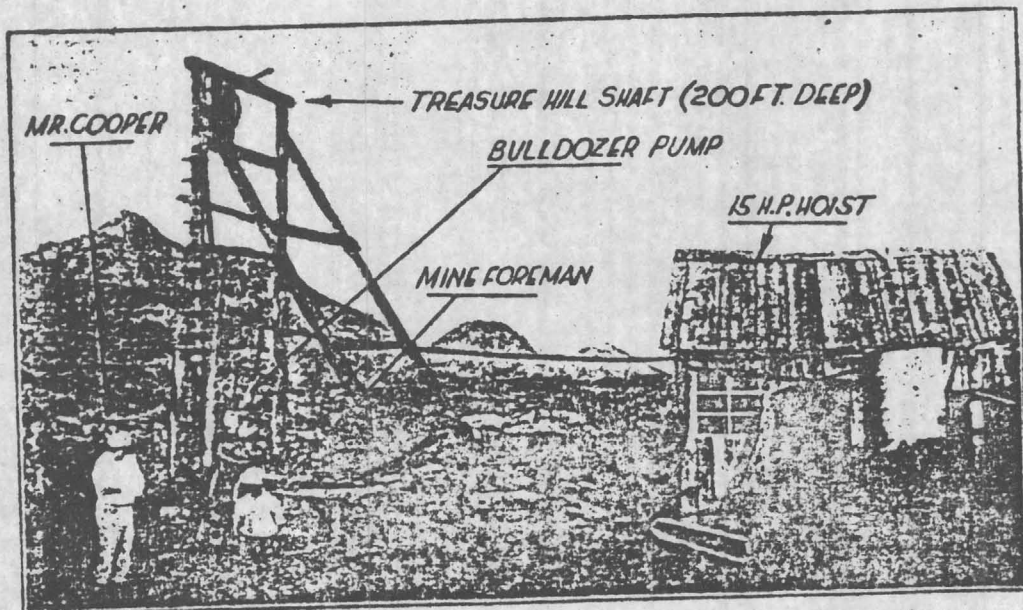
Recommendations

"It would be advisable to continue drifting in your present main tunnel, (that is now 500 feet northwestwardly from the portal), along the main vein of the Little Chief mine toward the northwest endline that joins the Winchester claim of the Comstock Silver. This will give you a depth of about 200 feet below the surface, and will explore the orebodies above from which earlier shipments have been made.

"It is possible, by granting the continuance of the high grade ore and assuming that it will maintain its value per ton, that this work of drifting could be made to almost pay for itself from ore shipments after the shoot was entered. To do this economically it would be advisable to install an engine and air compressor of suitable design and capacity that will handle two heavy duty machine drills at the altitude of the workings, together with the other suitable air pipes and up-to-date equipment that will facilitate the work. The present winze should be continued for at least another 50 feet to better ascertain the character of the vein and ore deposit at this point. In addition, the 200-foot shaft should be unwatered. The 15-horsepower hoist installed there, together with the 'bulldozer' pump, should be overhauled for that purpose. I

would suggest driving a crosscut from the 200-foot level station of this shaft to the intersection of the crossvein with the main Banner-Little Chief vein for the exploration of a possible orebody of importance that I believe exists at the junction of these veins, judging from the surface exposures along the latter vein across the wash to the north of the 200-foot shaft.

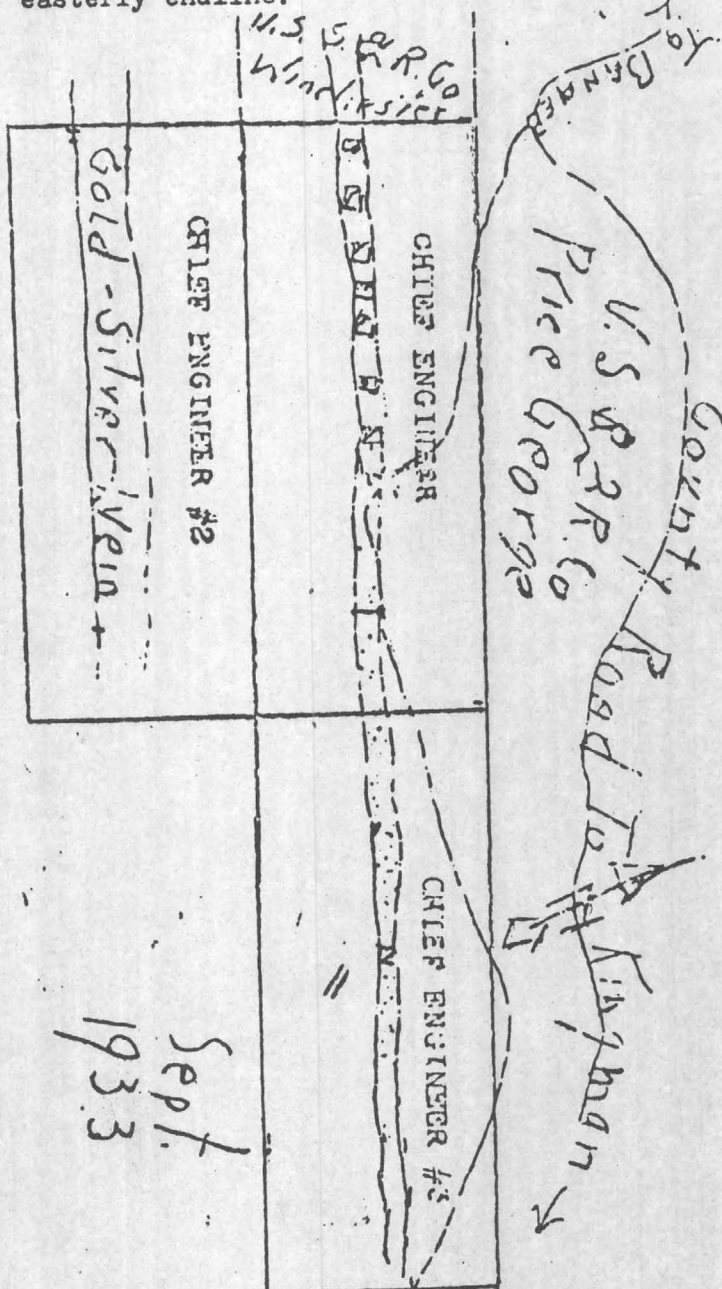
"In carrying on this development program I would further suggest that three shifts be put to work to make the best use of such equipment, as I have recommended, and to quickly open up the known orebodies and thereby give you an opportunity to begin production on such a scale that will, I believe, prove profitable to you and your associates, for conditions are present to prove the existence of orebodies of magnitude and remunerative content. I expect the result of such development of this property will prove it to be one of the wealthiest ever opened up in the Stockton Hill section, where the claim can be made conservatively that this immediate region will have, following a comparatively short development period, more great producing mines than any other camp in Arizona."



View of Callows-Frame and Hoist House on 200-foot Treasure Hill shaft of Stockton Hill Mining Company.

CHIEF ENGINEER MINE 3 lode mining claims in Stockton Hill

12 miles by road in a northerly direction from Kingman, Arizona, Chief Engineer claim sidelines the Jubilee MS2854A patented claim on the latter's southerly sideline, and also endlines the Winchester #2854A patented claim on the latter's southeasterly endline. Chief Engineer #2 endlines the Chief Engineer claim on the latter's southeasterly endline.



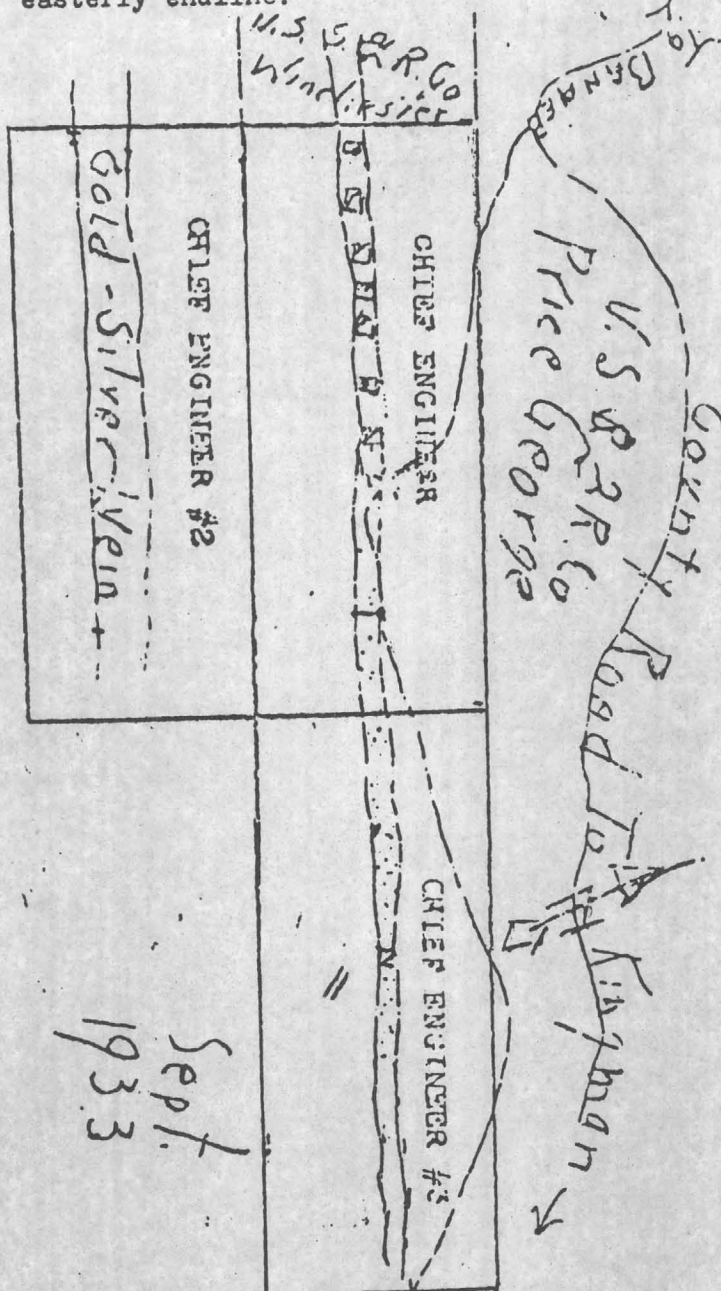
Chief Engineer mining claim #3 also sidelines the Chief Engineer claim on the latter's southwesterly sideline. In 1930 this mine was located as the Chief Engineer group but has been known in the past as the Little Chief and the Windsor group. Early production from the Little Chief is estimated as being over \$100,000.00 in the early 1900's. Chief Engineer was located in 1930.

Chief Engineer Mine was located by E. Ross Householder, mining engineer in Kingman on July 1, 1930 and recorded in September of same year.

CHIEF ENGINEER MINE

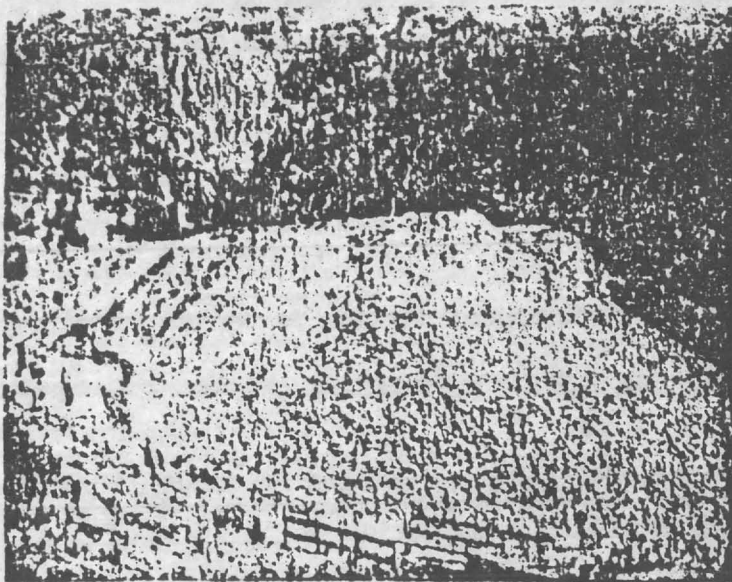
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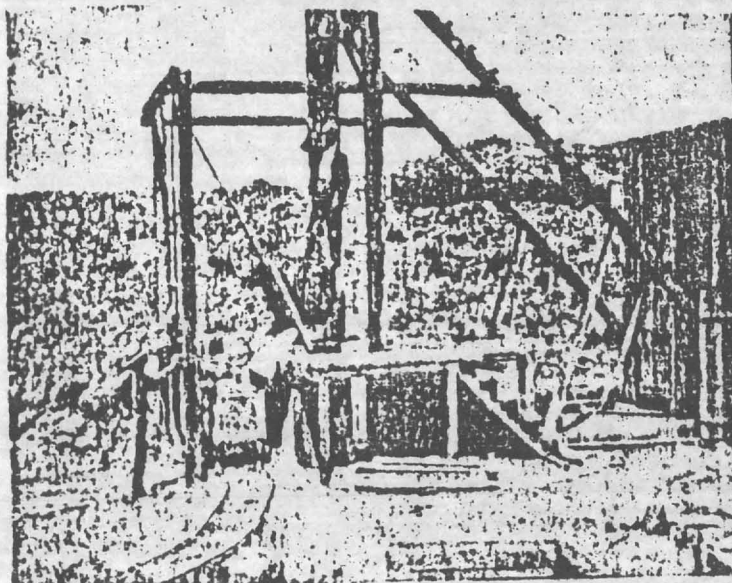


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Dumps of Lucky Boy mine near Chloride.



Hoist at Mother Lode mine near Chloride.

lived paper, "Alta Arizona", which also had its start in Mineral Park.

Stories and news items about Cerbat area were published in almost every issue of the "Miner."

Stockton Hill is not what the name implies, because it was located on the top of the southern end of the Cerbat Mountains. One of its mines was located on the mountain ridge with not much space to operate in. The mines of Stockton Hill were started in the 1860's and some remained in production to the first decades of this century.

From the January 14, 1883 issue of the "Miner": "Standing on Stockton Hill and looking at one's feet, and on every side for a couple of miles, one sees nothing but tunnels, shafts, dumps and other indications of mines, while the piles of ore tell a good story on the mine's depth and extent. On every hillside the eye meets nothing but mines, and one is surprised at the work done in and around Stockton Hill, until he is told the mines of Stockton Hill have been worked for the past fourteen years, and by richness of their ore deposits, have supported many a hard working miner for all this length of time." The same paper in the May 10, 1883 issue mentioned: "The richest ore now being taken in Stockton Hill is from the Little Chief by John Kennedy. A carload of ore assayed from \$700 to \$1,200 per ton."

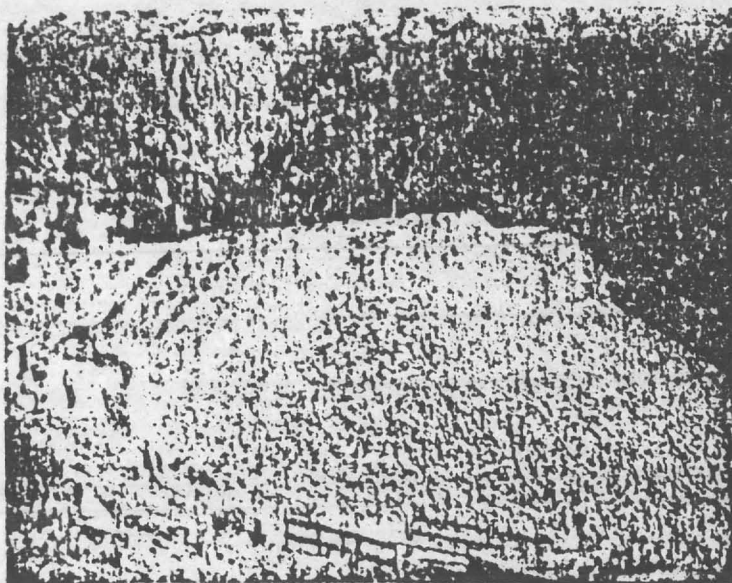
A regular stage coach line served Stockton Hill. Wm. H. Lake, store owner, was postmaster starting March 7, 1885 and was succeeded by William R. Rogers on Dec. 5, 1889.

Short items from the newspaper give glimpses of life in a Stockton Hill mining camp:

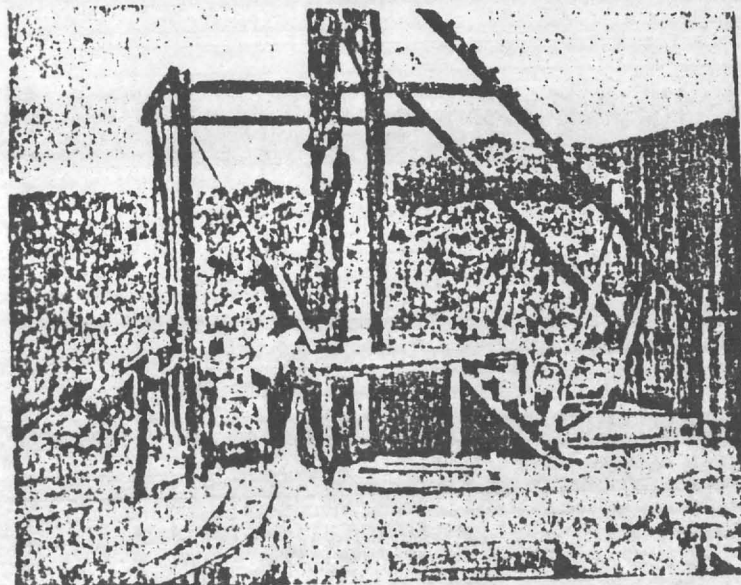
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"The new road to Stockton Hill was finished some time ago at the cost of \$295 from private donations. The road is free to be used by everybody. It is nearly two miles



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"The new road to Stockton Hill was finished some time ago at the cost of \$295 from private donations. The road is free to be used by everybody. It is nearly two miles

SUMMARY

After a careful preliminary examination of the 3 lode mining claims, comprising the CHIEF ENGINEER mine group, located in the Stockton Hill section of the Wallapai Mining District, Mohave County, Arizona, it would seem that the indications on the property, its past production record, and the quality of the ore now exposed, warrants the carrying out of the proposed development and further exploration to open up the ore bodies and veins on the group, that has been outlined in this report. Upon the completion of this exploration program the management could decide intelligently upon any future development program, such as the mining and extraction of any ore bodies thereby opened up, in the primary zone.

The other promising veins having excellent ore exposures can be explored after this main development program is underway. At some future time it might be advisable to continue the drifting from your present Little Chief tunnel of the CHIEF ENGINEER mine, that is now 500 feet northwesterly from its portal, along the main vein of the mine toward the Winchester claim of the Comstock Silver, which will give you a depth of about 200 feet below the surface, and will explore the ore bodies above, from which earlier shipments have been made.

It is possible, by granting the continuance of the ores and assuming it to be of a value similar to like ore bodies in the district under similar conditions, that this work will prove remunerative to the owners. For economical operation in prosecuting this work, suitable mechanical equipment would here be necessary also.

There exists at this mine property every apparent geological similarity with the other productive mines of the section, such as the fissure veins, the same ore characteristics, the same strike and dip of veins as those of the neighboring producing mines, which occur in the geological formations recognized as the most favorable in which to expect commercial ore deposits of importance in the district.

The veins on your property are strong and well defined, and there is no question as regards their permanency and continuity to a very great depth, the future explorations of which will likely result in the uncovering of important ore bodies of remunerative content that will prove profitable to the operators.

Another thing to be considered is the past record of the many neighboring mines in the immediate vicinity, and the present producers, such as the Comstock Silver, "78", Cupel, Prince George, Arizona Premier, De La Fountain, C. O. D., I. X. L., Wrigley, etc. In other words, your property is in a proven production area. Your CHIEF ENGINEER mine has had important production.

1-
148
NO TAILINGS

The ores subsequently found in the CHIEF ENGINEER mines will readily respond to treatment such as is now in practice in this same district with similar ores. There is always a ready and available market for either ores or shipping grade direct from the mine or concentrates from the mill, such as those that have already been produced from these mines.

HISTORY

The exact date of discovery and original location of the Little Chief, now the CHIEF ENGINEER, cannot be definitely determined, but evidently the first substantial ore shipments were made between 50 and 60 years ago, when the operators at that time packed their high grade ores out on animals. In an article published in the Mohave County Miner, the mining editor who was personally familiar with this property, having been a successful operator of the neighboring Cupel mine, stated, "In the early days the Little Chief (now the CHIEF ENGINEER) was a shipper of high grade silver ore, many car-loads of ore averaging 1100 ounces going out to the smelters. At that time it was owned by John Kennedy, known to the Indians as 'Little Scalway' (meaning man with tooth out in front). With the money from the ore sales Kennedy purchased a good-sized cattle ranch. After the mines had passed into other hands lessors shipped largely from the property, the ore being from the oxidized zone."

Since the earlier operation of these mines, now included in the CHIEF ENGINEER group, this area has been owned and operated on a small scale intermittently to the present time, as was the case with the other mines of the Stockton Hill section of the Wallapai Mining District.

In the earlier operations only the oxidized ores were extracted because it has only been comparatively recent that sulphide ores could be mined at a profit. The rate of progress in the last fifteen years in the development of differential flotation, and the construction of suitable mills at the smelters, has been rapid beyond the realization of most people. So today sulphide ores such as are shipped from the Stockton Hill section can be mined at a profit, stimulating mining here, with the result that such mines as the CHIEF ENGINEER can find a ready market for their ores.

FURTHER HISTORY OF CHIEF ENGINEER MINE

Although I have been familiar with the Little Chief, now known as the CHIEF ENGINEER mines, for over 20 years, having been an operator in the immediate area; in order to complete the record at my request the following remarks were furnished me by E. Ross Housholder, E. M., of Kingman, Arizona, a widely known mining engineer, who is the present owner of the property. His remarks as to the early day operations give a good account of those conditions consistent with the obtainable facts as I believe them to be:

HOUSHOLDER'S REMARKS

"Andy Goodwell, an old timer, and owner of the property between the CHIEF ENGINEER and the Cupel, including the Pt. George, as well as the property on which is located the Stockton Hill development tunnel, was familiar with the early operation on the CHIEF ENGINEER mine, in those days known as the Little Chief. He said, several years before he died, that the original locator of the Vigilanty lode claim, between this mine and his Pt. George shaft, had also acquired the Little Chief. The ruins of the old rock cabins can yet be seen from the surface workings of the Little Chief in the wash below.

"Although he made considerable money from the ore shipments from his Vigilanty claim, he later turned the Little Chief (now the CHIEF ENGINEER) property over to the Taggart Mercantile Company, of Kingman, Arizona, to settle his account with them. As often was the case in those early days the mercantile company was also in the mining business. It was their policy to grant 90 to 120 leases to miners for a portion of the vein, having a length of between 50 and 100 feet. The miners would be furnished a grub stake of tools and supplies and they would go to work on the ore. As long as they were in the ore they would keep sinking, with the idea in mind that after they had reached a depth of 75 to 80 feet they could easier mine the ore by stooping.

"But when they attempted to get an extension on their leases the mercantile company owners would not grant such a time extension. So the leaser-miners would stop sinking and endeavor to stoop out all the ores they could in the time that was left. No more timber was used than absolutely necessary. Much of the timber that was used was local cedar or juniper. The owners would be willing to grant other leases on their property, but never in a place that had been opened up.

"This accounts for the seven or eight surface holes that had a depth of from 30 to 60 feet with the ore stooped out on each side of the original shaft.

"Greeley Clack still living in Kingman was the youngest of several brothers who were early day mine operators. He told me that he visited, for several days, his brother William Clack who was extracting ore from one of these Little Chief leases, when he was a young man. He said his brother was mining ore that contained over 60 ounces of silver per ton and some went well over 100 ounces per ton.

"When I first visited these workings about 1925 or 1926, several of these old shaft holes were still open, and some of the reject from the ore sorting operations was still in little piles on the surface.

"Since then the holes have caved in or been filled with the surface soil and debris. It is my knowledge of the ore, that I actually saw there, supplemented by the geological conditions existing on the property, together with the substantiating information from the well informed old timers who personally related their information and knowledge to me that has caused me to hold on to these three lode claims comprising the CHIEF ENGINEER mine group.

"In 1941 and late 1942 I had established a camp at the mine and had several men doing work there. But shortly after the attack on Pearl Harbor I was called back into Military Service and could not return until after the war ended. I had served in World War I also. This I relate here, so you will understand that as an individual I found conditions changed when I returned and could not on my own continue a development program. I have had a road built from the new county road across the CHIEF ENGINEER claim to the mine campsite above the development tunnel and accessible to some of the surface workings, besides other valuable improvements to the mine, within my means to do so.

"It is the one property that I have held, because I have faith in it based on my study and understanding of the situation, made clear to me by my experience as a mining engineer familiar with production mines of this area. That, too, is the reason why I am more interested to take my royalty off the mine production, instead of selling outright. This also helps the operator. In the long run it will be best for me, too."

"E. Ross Housholder."

DEVELOPMENT TUNNEL

The Little Chief development tunnel on the CHIEF ENGINEER lode mining claim, just off the old county road was first run in the mountain as a cross-cut to a place from which a stoop and man-way made a connection with a known ore shoot in the intermediate workings above.

Then the tunnel was driven in further with a view to getting on the main Little Chief vein and it was expected that drifting would be done to the westward to get under the known productive surface openings, and thus penetrate the ore shoots.

However, about two thirds of its present (1950) length, the mineralization lead the operators, at that time, to veer to the right where a mineralized vein was encountered. The showing of sulphides over a width varying from three to four feet was such that a winz was started and sunk about 22 feet. So much water was encountered that the operators could not handle it with the equipment available to them. Then, too, altho the sulphides persisted, the commercial values were not present. Some of the last ore taken from this winz is still on the tunnel dump. Assay returns show very low silver and gold values.

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Now, this work was all done apparently without a proper survey to tie in the surface workings and correlate them with the underground work. It became apparent to the workmen, however, that they had been drifting on a vein parallel to the productive Little Chief vein. This drifting had proceeded about 60 feet beyond the winz, then cross-cutting started to the left, for about 40 feet more, where the work was stopped due to lack of funds.

PROPOSED DEVELOPMENT & EXPLORATION

Although a more precise survey should be completed, enough work was done in late 1942 to show that this last crosscut would not enter the Little Chief vein at right angles. It is proposed to direct this crosscut, after the suggested mapping has been completed, directly to the Little Chief vein, estimated now to be about 35 to 40 feet. Then, when the Little Chief vein has been entered, to drift, possibly easterly and westerly to get under the known productive ore shoots to tap the ore reserves at a depth of about 160 to 200 feet below the surface. Extraction of the ores can then begin, but the drifting should also be continued westerly to the end-line of the CHIEF ENGINEER claim where it adjoins the Winchester claim of the Banner mine owned by the U. S. States Smelting & Refining Co. The production from this same vein which is known as the Banner vein on the Banner mine group has been over a quarter of a million dollars. The ores have similar mineralogic and geologic characteristics as well as a like width in this Banner vein as its easterly extension on the CHIEF ENGINEER mine property where it has been designated as the Little Chief-Banner vein.

Once having tapped the Little Chief-Banner vein ore shoots from this tunnel level, the ores can be transported through the tunnel to the surface portal where it can be placed in suitable bins for loading. Besides mining ores by stooping is much less expensive. Haulage of the ores to the rail head for shipment to a smelter or to a treatment mill presents no problems.

TOPOGRAPHY

The district ranges in elevation from 3,000 feet in the foothills on the northeast to 5200 feet at the crest of the Cerbat mountains on the west. The western end of the CHIEF ENGINEER group is almost 800 feet higher than the eastern end of the property. The average elevation of this group is about 4,600 feet.

The topography of this portion of the district is typical of eroded igneous formations in this region belong to the pre-cambrian, essentially granitic. The accompanying photographs will give one a splendid idea of the topography of the CHIEF ENGINEER mine estate and the surrounding territory.

LOCATION AND TRANSPORTATION

The CHIEF ENGINEER mine group is located on the easterly slope of the Stockton Hill section, of the Wallapai Mining District, in the Cerbat mountains, Mohave County, Arizona, and comprises three lode mining claims, at a maximum elevation of 5000 feet. The north-westerly portion of the group is endlined and sidelined by the

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Banner-Prince George mining property of the Comstock Silver Mining Company and includes what has been known for years as the Little Chief mines. The famous Cupel mine is about 2000 feet north of the Little Chief workings.

The Western Union mine property adjoins this estate on the southwest. A good grade of lead silver ore is now being extracted from this adjoining mine. South of the Windsor group is the Mountain Queen, and the "78" mine that has been a heavy producer of high grade ores and is today producing 42 ounce silver ore for shipment to the smelters. The De La Fountain mine lies to the west about a quarter of a mile.

The CHIEF ENGINEER mine group is in section 9, Township 22 North, Range 17 West, Gila and Salt River Base Meridian, Arizona.

There is a good county truck road traversing the entire length of the estate, which with connecting mine roads on the property affords easy access to the more important workings of the property. This same road connects with another county road at the northwest corner of the group, a few hundred feet from the Little Chief main tunnel, and again with this same road near the east end of the property in the lower foothills. This latter road section is of easier grade and is being used daily for transportation of supplies to the different mines and ranches and the hauling of the shipping ore to the reduction plants or to the railroad at Kingman, Arizona, on the main line of the Atchison Topeka & Santa Fe R. R., a distance of about 12 miles from the CHIEF ENGINEER mine property. This road is kept up by the county and is in excellent shape.

CLIMATE & WATER SUPPLY

The district has a healthful climate with mild winters which permits good working conditions the year round. The rainfall is about 10 inches a year. The deeper shafts on the property produce enough water to insure an ample supply for mining as outlined in the present development program.

GEOLOGY OF STOCKTON HILL SECTION OF THE WALLAPAI MINING DISTRICT

The country rock is the pre-Cambrian granite, gneiss and schist complex, belonging to the laminated metamorphic series of that age, with a tendency to grade into mica chlorite schists in places. It is intruded by dykes of minette, granite, granite porphyry, diaba-
basalt, and other rocks, that are products of differentiation in the pre-Cambrian series.

The veins for the most part are regular and persistent with well defined walls. They occur chiefly in the pre-Cambrian granitic rocks. Many of the pay chutes coincide with the intersection of fissures. Oxidation has altered the upper part to a depth ranging from 50 to 300 feet, and this oxidized zone changes to the primary ore within a vertical range of 10 to 40 feet. The old time operators were unable to market the sulphide ores at a profit such as can be mined in the district today. Only the oxidized and secondarily enriched ores were they able to treat and ship. Therefore, today there

are mines being developed here which may be capable of great production. The veins have suffered great erosion, and their mode of occurrence leads to the belief that they were deposited at comparatively great depth by hot circulating waters.

LOCATION OF THE STOCKTON HILL SECTION

The Stockton Hill district joins the Cerbat district on the east, and is about parallel and coextensive with it north and south, being situated on the opposite slope of the Cerbat Mountains, in the Wallapai Mining District. It is about four miles in width and but little more in length. It ranges in elevation from 3000 feet at the edge of the Wallapai Valley on the east to 5,800 at the crest of the range.

The principal and oldest camp for many years was Stockton Hill, situated in the foothills in the eastern part of the district, just north of the present CHIEF ENGINEER group of ~~the Stockton Hill Mining Company's estate~~, 10 miles north of Kingman, at an elevation of about 4,800 feet. It dates from early in the sixties, when the principal veins were first discovered and began to produce. In former days much ore was shipped to Swansea, Wales, but later it was treated in the Mineral Park and Cerbat mills and shipped to the smelters in San Francisco and to New Mexico. Then followed a period when the ores were hauled by wagon to the station of Berry on the then new railroad, or to Kingman, whence it was shipped to the mill and smelter at Needles, California, on the Colorado River.

During the past years the shipping ores and concentrates from the milling plants have been trucked over excellent highways to a sampler at Kingman or to the reduction works in the district, where the ores of the district have found a ready market.

ORE DEPOSITS OF THE STOCKTON HILL SECTION

In writing about this section in United States Geological Bulletin #397, F.C.Schrader, the government geologist, stated, "The deposits occur in the pre-Cambrian gneiss or schist, intruded in places by a later aplitic granite or by basic dikes. They are fissure veins, which in general strike northwesterly and are vertical or dip at steep angles to the northeast. The gangue is quartz and the ores contain chiefly silver, with some gold, lead, zinc, and copper. Primary sulphide minerals are galena, zinc, blende, chalcopryite, and pyrite, but the district owes its reputation to the rich silver ores, such as native silver, cerargyrite, argentite, and ruby silver, which were found in large quantities in the upper levels. The water level is about 100 feet below the surface. Galena is often found above it, while rich silver minerals descend to a considerable distance below it. The greatest depth so far attained is 400 feet.

CHIEF ENGINEER GEOLOGY

Commenting upon the Little Chief, now the CHIEF ENGINEER mine in the same government report, the author, F.C.Schrader, wrote "The country rock is pre-Cambrian complex. To judge from talus debris on the surface at the mine, it seems to be intruded by diabase nearby, and portions of a light-colored altered rock, which seems to be the intrusive porphyry, are associated with the vein.

"The vein trends N. 40° W. and dips steeply northeast. It is about 6 feet in width and is supposed to be the Banner vein. The gangue is quartz and crushed and altered silicified rock. The ore shoot locally coincides in width with the vein and is stained throughout with copper carbonate. The ore contains principally green horn silver, galena, and gold, is all of shipping grade, and is said to average about as follows: Silver, 350 ounces to the ton; gold \$5 to \$10 a ton; and lead, 8 to 40 per cent."

Since the above government report was written the entrances to the works referred to, have been caved and are now with few exceptions impassible. Samples that have been taken from rather narrow streaks in the vein as now exposed and left by the early miners gave assay returns between 20 ounces and 80 ounces in silver, besides about \$1 in gold per ton. Samples from the old shaft sorting dumps also carried up to 27% lead. The ore shows a low percentage of copper, but zinc is now present in any appreciable quantity.

Other openings on the CHIEF ENGINEER mine group have exposed veins of varying width and metallic content, which were not extensively investigated, as the two mines of this estate more fully described will warrant the immediate attention of the owners as to the present and near future exploration program.

DEVELOPMENT

The development work on the CHIEF ENGINEER consists for the most part in six or seven shafts, connecting drifts, stopes, raises, crosscuts, etc., between the northwest endline along the vein toward the portal of the present development tunnel a distance of about 1200 feet. This development tunnel has been driven northwest a distance of 500 feet. As this tunnel is pushed ahead it will open up this same vein about 200 feet below the surface and between 100 and 160 feet below the older workings and enter the ore chutes exposed above at the depth indicated.

Taking into consideration all the shallow shafts, tunnels, crosscutting, and drifting, that has been completed in all the workings of the three claims of this CHIEF ENGINEER group, there is in excess of 400 feet of shaft work, with a maximum depth of 120 feet on the Little Chief, now the CHIEF ENGINEER. This has been supplemented by several tunnels having a maximum length of 500 feet on the CHIEF ENGINEER, formerly the Little Chief, together with other tunnels on the remaining parts of the group, where one tunnel has several thousand feet of underground work. The tunnel work crosscutting, drifting, etc., will exceed 1000 feet of work. Considerable ore has been shipped from some of these openings during the history of the property, that is reported to be better than a hundred thousand dollars.

FUTURE EXPLORATION OF THE CHIEF ENGINEER

An accompanying topographical and claim map, on which the general geology of the property has been superimposed will give one an idea about the trend of the more important veins and dykes, together with the general character of the country rock, and the relative position of neighboring mines.

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RECOMMENDATIONS

It would be advisable to continue the drifting from your present ~~main~~ tunnel, that is now 500 feet northwestwardly from the portal to and along the main vein of the CHIEF ENGINEER mine toward the northwest endline that joins the Winchester claim of the Comstock Silver, which will give you a depth of about 200 feet below the surface, and will explore the ore bodies above from which earlier shipments have been made. It is possible, by granting the continuance of the highgrade ore and assuming that it will maintain its present value per ton, this work of drifting could be made to almost pay for itself from ore shipments after the chute was entered.

one of
profitable

In carrying on this development program I would further suggest that you open up the known ore bodies and thereby give you an opportunity to begin production on such a scale that will, I believe, prove profitable to you and your associates, for the conditions here prove the existence of ore bodies of magnitude and remunerative content and I expect the result of such development on this property will prove it ~~to be one of the wealthiest ever opened up~~ in the Stockton Hill section.



Chief Engineer
mine file

THE SUPERIOR OIL COMPANY

MINERALS DIVISION
TUCSON, ARIZONA 85732

MAILING ADDRESS
P. O. BOX 12487

6245 EAST BROADWAY
SUITE 460
TELEPHONE: (602) 747-0770
TELEX: 66-6414

January 27, 1976

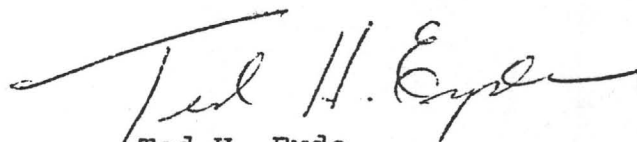
Mr. John Rothermel
Rothco Mines
3016 West Mercer Lane
Phoenix, AZ 85029

Dear Mr. Rothermel:

Many thanks for showing me the Copper Chief property near Quartzite, Arizona. Though the property is of no interest to The Superior Oil Company it does contain a significant reserve of attractive dimension stone and epidote-actinolite which could be of value as a green crushed rock yard cover. I would certainly urge you to continue to hold the property.

Some of the samples I brought back to Tucson contain scheelite, therefore, I would suggest you contact Mr. James E. Morgan, Jr. Regional Geologist, Union Carbide Corporation, Mining & Metals Division, 751 Ryland Street, Reno, Nevada 89503. Union Carbide has a very active tungsten exploration program underway. Please keep us in mind if you should happen to run into any more interesting prospects. Very best of luck to all of you.

Very truly yours,



Ted H. Eyde
Senior Geologist

THE/ym

Patented

Study of Kingman Silver Ores

1924, PART I.

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mineral belt, but

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more probably a

from some un-

Chem. Ind. Kolloide,

ORIGIN OF CERTAIN RICH SILVER ORES NEAR CHLORIDE AND KINGMAN, ARIZONA.

By EDSON S. BASTIN.

INTRODUCTION.

The mineral deposits of the Cerbat Mountains between Kingman and Chloride, in northwestern Arizona, were described by Schrader¹ in 1909. The writer visited some of the silver mines and prospects of the Cerbat Mountains in 1913, in the course of a study of silver enrichment undertaken by the United States Geological Survey in many mining camps of the western United States. The work of preparing the results for publication has been delayed by the war and other causes.

The practical application of the results lies in the determination of the extent to which the several silver minerals of the ore are secondary or primary and hence to what extent they are likely to play out at moderate depths or to persist below the reach of surface processes of alteration. The results are summarized at the end of the report.

The mines described were reached from Kingman, on the main line of the Atchison, Topeka & Santa Fe Railway, and from Chloride, the terminus of a short railroad line from Kingman.

GENERAL FEATURES OF THE AREA.

The area here considered is arid, with hot summers and mild winters. The annual precipitation is about 5 inches, almost never in the form of snow. The area is for the most part treeless, and its vegetation is of desert types.

The Cerbat Mountains constitute one of the numerous desert ranges of nearly north-south trend that form a characteristic feature of the Great Basin topography. In the parts of the range under discussion the altitude ranges between 4,000 and 6,000 feet.

The Cerbat Mountains consist in the main of pre-Cambrian igneous and metamorphic rocks, and these form the wall rocks at all the mines

¹Schrader, F. C., Mineral deposits of the Cerbat Range, Black Mountain, Wash. Cliffs, Mohave County, Ariz., U. S. Geol. Survey Bull. 297, 1909.

Good
Source

Depth of RURAL-BUCKEYE WORKINGS

Rural Shaft
200'

Buckeye
170' shaft

Winge
180' deep

125' from mouth
of tunnel

BOX 14 - PHONE 632-7410
HUMBOLDT, ARIZONA 86329



JOHN B. ROTHERMEL
3016 W. Mercer Ln.
L Phoenix, Ariz. 85029

Feb. 25, 1976

[illegible]

CHARGES \$13.00

ASSAYER

Copper Chief mine Assays

IRON KING ASSAY OFFICE
ASSAY CERTIFICATE

BOX 14 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329



ASSAY
MADE
FOR

FRED ROTHERMEL
3016 W. Mercer Lane
Phoenix, Ariz. 85029

December 10, 1975

[illegible]

CHARGES Carriage 16.25 paid

ASSAYER

BOX 14 -- PHONE 632-7410
HUMBOLDT, ARIZONA 86329



ROTHCO MINES
3016 W. Mercer Lane
Phoenix, Ariz. 85029

[illegible]

CHARGES ~~418.75~~ ~~201.00~~ 201.00

ASSAYER

A circular postmark from Phoenix, Arizona, dated May 1919. The text 'PHOENIX ARIZONA' is curved along the top and right edges. The date 'MAY 1919' is curved along the bottom edge. In the center, the words 'WELLS' and 'STALEY' are printed vertically. The postmark is heavily inked and shows signs of wear.

FORICO MINES
3016 W. Mercer Lane
Phoenix, Ariz. 85029

ASSAY
MADE
FOR

~~October 31, 1975~~

[illegible]

CHARGES 16.50 1.50

ASCA 11-12

LOCATION NOTICE
(Lode)

NOTICE IS HEREBY GIVEN that the Chief Engineer No. 4 lode mining claim has been located by John B. Rothermel Jr., whose address is 6012 North 47 Drive, Glendale, Arizona 85301. The general course of this claim is Northwesterly and it is situated in the Wallapai Mining District, Mohave County, Arizona.

This claim is 1000 feet in length and 600 feet in width. The claim runs from the location monument on which this notice is posted 1001 feet in a northwesterly direction to the end line and with 300 feet on each side of center line ~~direction to the~~

~~end line.~~ The claim boundaries are marked by six monuments, one at each corner and one at the center of each end line of the claim. The location monument on which this notice is posted is situated within Section 9, T. 22, R. 17, G&SRH, Arizona, and this claim encompasses portions of the following quarter section(s).

Section(s), Township(s), and Range(s):

NW 1/4, Section 9, T 22, R 17

G&SRH, Arizona.

The locality of this claim with reference to some natural object or permanent monument and additional information (if any) concerning its locality are as follows:

Chief Engineer No. 4 sidelines the Teddy MS 2854 on the southerly
sideline, it also endlines the Chief Engineer No. 3 and
Chief Engineer Fraction

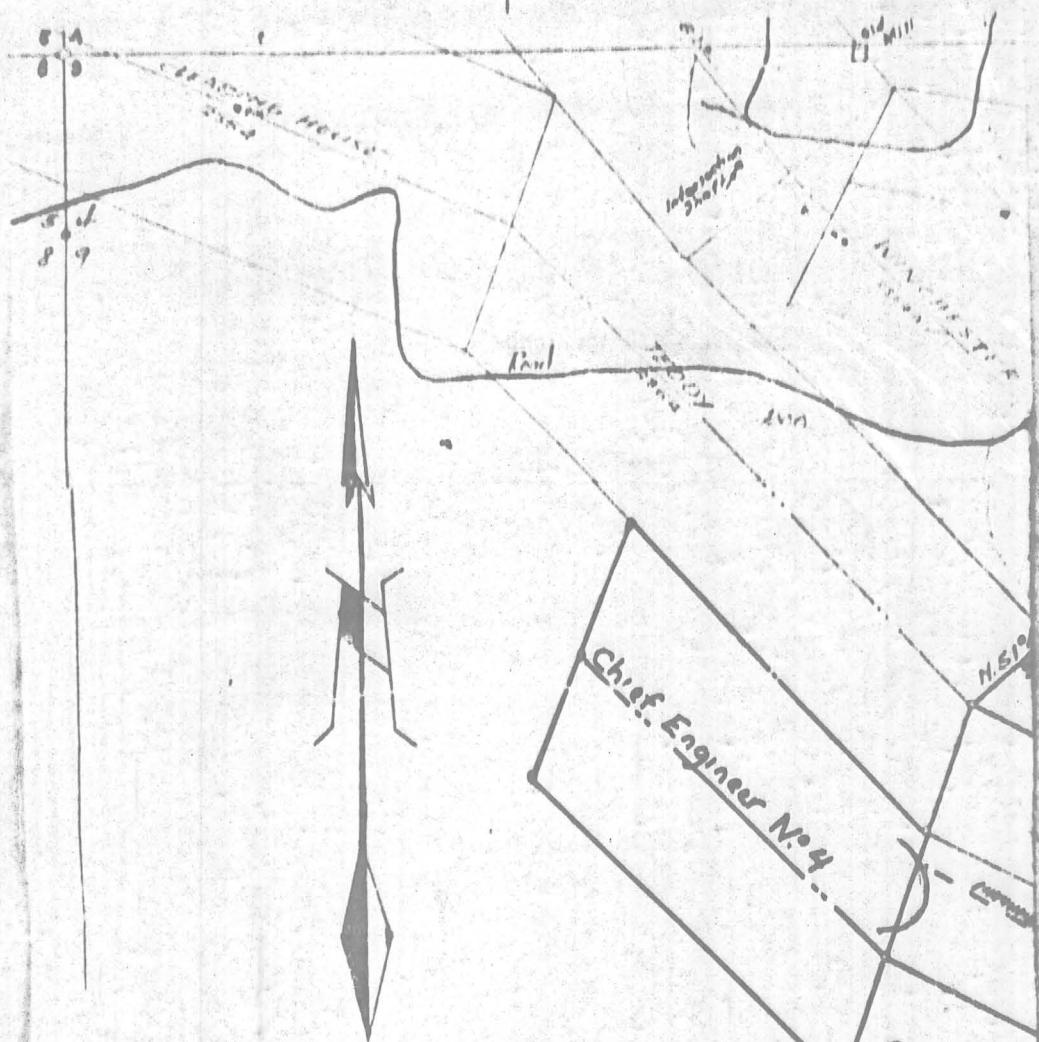
DATED AND POSTED on the ground this 21 day of July,
19 80.

LOCATOR:

John B. Rothermel Jr.

A claim map must be recorded.

BOOK 653 p. 534



Contour & Claim Map of The

Chief Engineer Gro

In The Stockton Hill Section Of The Wallowa M
Section 9, Township 22 North, Range 17 West, Gila Co
Mohave County, Arizona

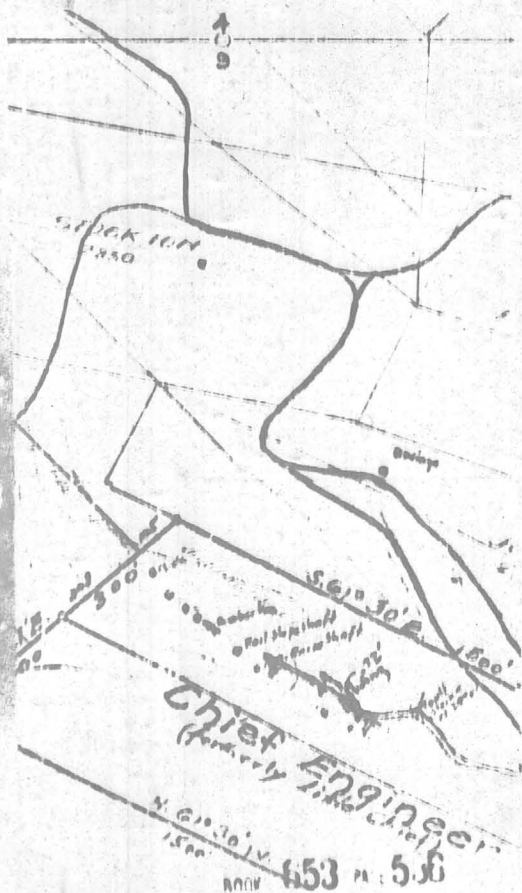
Surveyed June 1928
By E. M. Household
Approved By: E. M.
Recorded June 19 28
By: W. H. Walters

By Household, E. M.
Registered Mining Engineer #25
Kingman, Ariz.

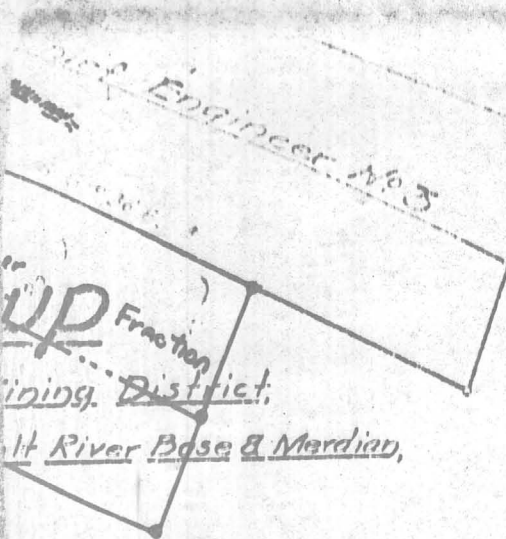
Specified In Arizona
Report On Exposed By: (1928)
J. S. Jones, Sr. Mining Eng. #347

Scale 1" = 300'

BOOK 653 p. 53



THIS PART WILL NOT
BE REPRODUCED SATISFACTORILY



Chief Engineer No. 2
not shown
to reduce size of map.

FEE NO. 80-27980 INDEXED INDEXED MINES
PROOFED
RECORDED AT REQUEST OF John B. Rathbarn Jr.
DATE AUG 25 '80 - 8:00 AM IN BOOK 653 of OFFICIAL RECORDS,
PAGE (S) 534-537 RECORDS OF COCHISE COUNTY, ARIZONA.

RETURN: 6012 N 47th Dr
Glendale, Az 85301
BOOK 653 PAGE 537

JOAN McALB, RECORDER
by Louise L. Lame
S 310