



CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
602-771-1601
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

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1883

1883

SURVEY NO 525 PLAT

OF THE *Linhum*

MINING CLAIM,

Wallaqui Mining District,

Mohave County,

ARIZONA.

Claimed by *Henry C. Wilson*

Surveyed by *O. F. Kuencer* U. S. D. S.

June 22 1883

Containing an Area of 20.66 Acres.

Scale 200 feet to the inch.

Variation 14° 25' East.

The original Field Notes of the Survey of the

Linhum Mining Claim from

which this plat has been made, have been examined and approved and are on file in this office; and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises; and that such reference is made therein to natural objects and permanent monuments, as will perpetuate and fix the locus thereof.

I further certify that the value of the labor and improvements placed thereon by the applicant or his grantor is not less than Five Hundred Dollars, and that said improvements consist of

A Shaft 74 ft deep

Cross Cut 7' long

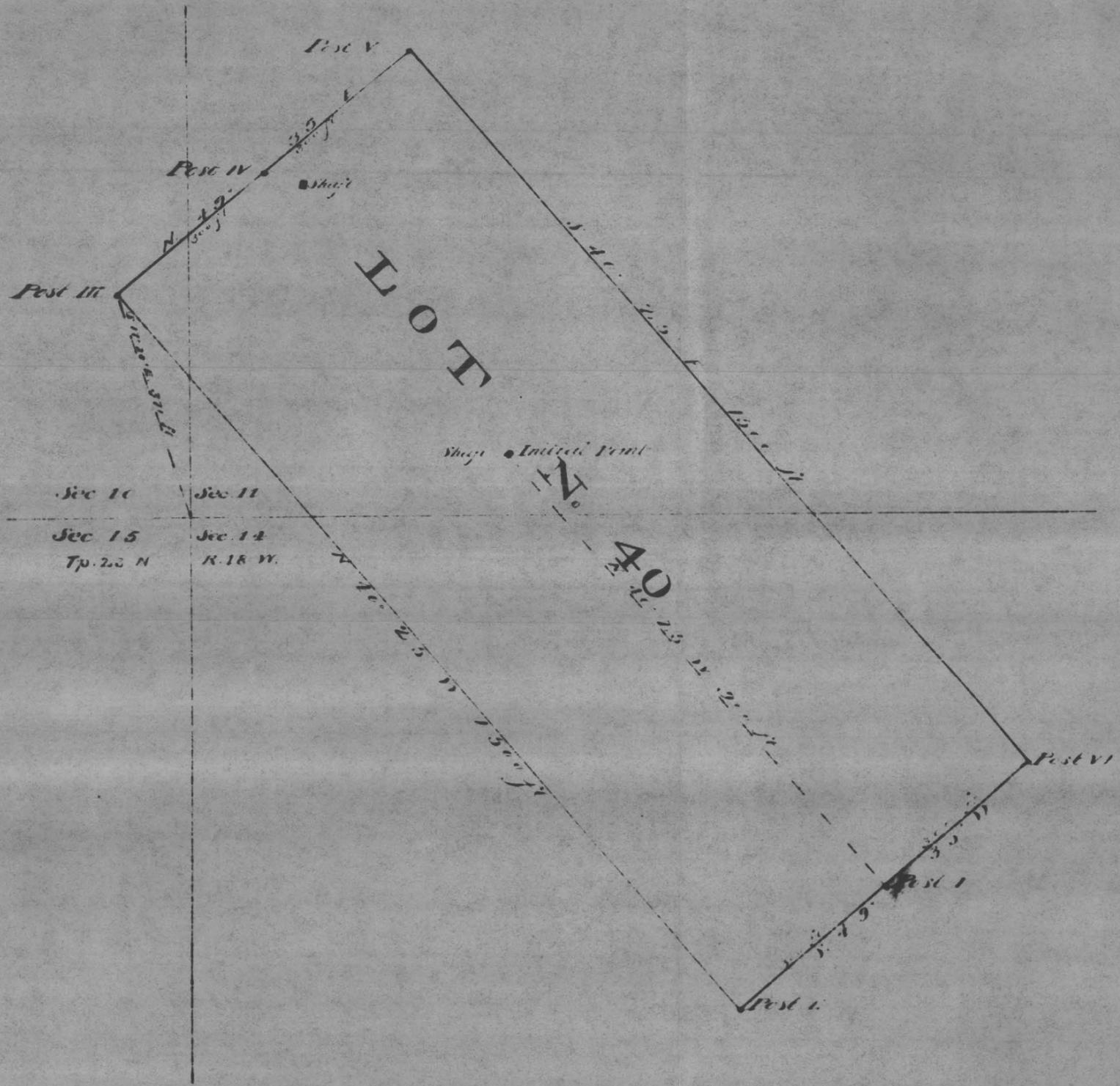
as appears by the report of the Deputy Surveyor and the testimony of two disinterested witnesses.

And I further certify that this is a correct Plat of said Mining Claim, made in conformity with said original Field Notes of the survey thereof.

O. F. Kuencer
U. S. Surveyor General for Arizona.

U. S. Surveyor General's Office,
Tucson, Arizona,

August 10 1883



Patent No. 11-3-86
Patent No. 11192
Serial No. ME 126 Pa.

A

GEOLOGICAL REPORT

on the

PINKHAM PROPERTY

in the

Wallapai Mining District

Mohave County, Arizona

by

Wm. Vanderwall
Geologist
Scottsdale, Arizona

April 30, 1981

SUMMARY OF GEOLOGICAL REPORT

PINKHAM PROPERTY Wallapai Mining District Mohave County, Arizona

The Pinkham Property consists of two contiguous mining claims, one patented, located in Sections 11, 12, and 14, of Township 23 North, Range 18 West, G&SRB&M, Mohave County, Arizona.

Rich silver discoveries brought miners to the area in the early 1860's and in the early days the Pinkham Mine was known largely for copper and silver production. Production statistics indicate approximately 1000 tons of ore was removed containing between 8 and 60 ounces of silver per ton and 3% to 9% copper.

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 Pinkham Property include pre-Cambrian metamorphic rocks cut by Mesozoic(?) intrusives and mineralized veins of an unknown (Tertiary?) age.

A known ore-body exists on the Property and if underground maps supplied to the Author are accurate, approximately 2000 tons of ore, carrying 8 to 60 ounces of silver per ton and 3% to 9% copper has been blocked out.

The most favorable loci for ore is at the junction of veins although it can be found randomly spaced along the veins in lenses, or shoots. The main vein on the Pinkham Property intersects with at least three smaller veins in a zone of highly altered and fractured country rock.

Results from field reconnaissance indicate the following:

- A) Mineralized structures traverse the Property and ore is exposed on the surface; prospect pits, trenches, dumps, etc..
- B) A major vein junction exists on the Property providing a favorable locus for prolonged ore deposition.
- C) Past mining activity on the Property has produced considerable dump material. The possibility of milling and concentrating this material should not be overlooked.

Wm. Vanderwall, Geologist
April 30, 1981

Geological Report
PINKHAM PROPERTY
Wallapai Mining District
Mohave County, Arizona

LOCATION:

The Pinkham Property consists of two mining claims (one patented) located approximately 20 miles northwest of Kingman, Arizona, and 2 miles southeast of Chloride, Arizona, on the western slope of the Cerbat Mountains. The property is situated in Sections 10, 11 and 14, Township 23 North, Range 18 West of the G. & SRM, Mohave County, Arizona and is accessible via county and private roads.

SCOPE OF REPORT:

Time was the limiting factor of this very interesting investigation. Facts and opinions in this report are based on a cursory field examination of the property and on the authors specific knowledge of the area and general familiarity with the published literature concerning the Wallapai District.

HISTORY AND PRODUCTION:

The Pinkham Property lies in an area rich and colorful in Arizona Mining History. Bonanza type silver lode discoveries brought miners to the District in the early 1860's. Oxidized ores were mined extensively during the 1880-1890 period principally for silver and gold. The rapid decline in silver prices between 1885-1895, the recession of 1905 and the deeper leaner, sulfide ores caused the suspension of mining operations in the area.

Dings, 1951, (pp147) lists the early production from the Pinkham Mine as approximately 14,000 ounces of silver and 27.5 tons of copper with minor amounts of gold and lead.

Schrader, 1909, (pp 74-76) credits the Pinkham Mine as the most important copper mine in the region. Schrader's ore description tells of oxidized ore containing 18 ounces of silver per ton and 3% copper which indicates less than 1000 tons of ore was mined from the property.

In 1943, the Tennessee Mine, 2 miles north and mining in the same vein system as the Pinkham, was producing 150 tons of crude ore per day averaging 20 ounces of silver per ton. Total production from the Tennessee Mine is reported to be in excess of 500,000 tons (Dings, 1951, pp147).

The value of metals produced from 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 of 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, located 2 miles south of the Pinkham 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 Mountain constitute one of the many north-south trending, fault-block ranges of the Southwestern 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 in which the Pinkham Property lies.

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 Pinkham Property is a prominent structural feature which extends from the main body of the Ithaca Peak intrusive northwesterly for a distance of over three miles. It cuts all lithologic units in the area and appears to intersect with at least three smaller veins in the vicinity of the Pinkham Mine. The veins are composed of brecciated and altered granite(?) wall rock and quartz. In outcrop they are heavily stained by iron and manganese. The main vein trends $\text{N.}35^\circ\text{-}45^\circ\text{W.}$, and is nearly vertical

with occasional reversal. Country rock is pre-Cambrian granite which has been intruded by later granite and diabase. A gouge zone of sericite and clay accompanies most of the veins.

Bordering the Pinkham Mine is a zone of vein intersection possibly 100 feet across composed of highly altered and fractured rock, impregnated with many short and irregular veinlets. The fractures appear to have no regular strike or dip and are filled with limonite and quartz. Several veins can be traced to an intersection at this zone, a relationship favorable to prolonged ore deposition.

The primary mineralization on the Pinkham Property is one of chalcopryite, pyrite, galena, sphalerite and arsenopyrite, together with a variety of gänge minerals. The oxidized and enriched portion of the veins contain chalcocite, bornite, cerargarite, copper carbonates, native silver and lesser concentrations of native gold.

ORE RESERVES:

The Pinkham Property contains base-metal silver veins, oxidized silver-gold veins and possibly a zone of enrichment in between. Data from past developments, publications and reports are insufficient, or unavailable, to completely delineate the orebody. However, there is ore exposed underground and in many places on the surface; prospect pits, trenches, dumps, etc..

Schrader, 1909, (pp 74-76) describes ore from the Pinkham Mine as carrying 18 ounces of silver per ton and 3% copper in the upper drifts and 60 ounces of silver with 9% copper in the lower drifts. Schrader's map of the workings shows 1200 feet of total progress with a total depth of 400 feet. He shows approximately one-third of the known orebody mined out. Schrader's map is nearly identical to one produced in the 1940's(?) suggesting very little mining has been carried out on the property since Schrader's time.

If the lower drifts could be worked for 180 pounds of copper and 60 ounces of silver per ton and the maps are correct in showing two-thirds of the orebody in place, an estimated recovery in excess of 2000 tons of ore could be expected.

Considering the extent and mineralized nature of the zone of fractured rock around the old workings it may be possible to extend the limits of the known orebody.

Many veins traverse the Pinkham Property and some of these may contain separate orebodies which an adequate exploration program would reveal.

The mine dumps have been shown to carry mill grade values in gold and silver, and this asset should not be overlooked.

CONCLUSION:

On the basis of surface observations plus facts provided in the published literature and by talks with people familiar with

the property it is the Author's conclusion the Pinkham Property contains well developed structures with moderate to strong copper-lead-silver mineralization.

It is also the Author's conclusion a well planned exploration program consisting of detailed geologic mapping and diamond drilling would justify initiating a mining venture.

Respectfully submitted,



Wm. Vanderwall, Geologist

April 29, 1981

BIBLIOGRAPHY OF THE
WALLAPAI MINING DISTRICT
Mohave County, Arizona

BY

William Vanderwall
Geologist

29 April 1981

Compiled and annotated, with special
attention given to the PINKHAM PROPERTY
(Chloride Area), and CHIEF ENGINEER
PROPERTY (Stockton Hill Area).

BASTIN, E.S., 1924. Origin of Certain Rich Silver Ores Near Cloride and Kingman, Arizona: United States Geological Survey (U.S.G.S.) Bulletin 750, pp. 17-39.

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 Cloride (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 exploration and development.

DINGS, M.G., 1950. Wallapai Mining District, Mohave County, Arizona: Arizona Bureau of Mines (ABM) Bulletin 156, pt. 1, pp. 138-142.

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

DINGS, M.G., 1951. The Wallapai Mining District, Cerbat Mountains, Mohave County, Arizona: USGS Bulletin 798, pp. 162.

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, topography, 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.