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

PRINTED: 04/29/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: OLD YUMA MINE

ALTERNATE NAMES:
YUMA MINE

PIMA COUNTY MILS NUMBER: 21

LOCATION: TOWNSHIP 13 S RANGE 12 E SECTION 9 QUARTER SW
LATITUDE: N 32DEG 18MIN 52SEC LONGITUDE: W 111DEG 07MIN 17SEC
TOPO MAP NAME: JAYNES - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
LEAD
COPPER
ZINC
MOLYBDENUM
SILVER
GOLD LODE
VANADIUM

BIBLIOGRAPHY:
AZBM BULL. 189, P. 102, 1974
ADMMR OLD YUMA MINE FILE
AZ. MINING JOURNAL JUNE 1919, P. 77
AZBM BULL. 106, P. 6, 16-17, PLATE 1

T

OLD YUMA MINE REFERENCES PIMA COUNTY

Arizona Mining Journal June 1919, p. 77

ABM Bul. 189, p. 102

ABM Bul. 106, p. 6, 16-17, plate 1

MILS Sheet sequence number 0040190345

Mineralogical Record, Arizona-IV, Volume 14, #2, Pg. 95 - 107

OLD YUMA MINE

Mo, V, Pb, Au

Pima 10 - 1

Yuma Mining Co., Gen. Del, Tucson '40
Lessee: Grady Wilson, 102 W. Lincoln St., Tucson

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

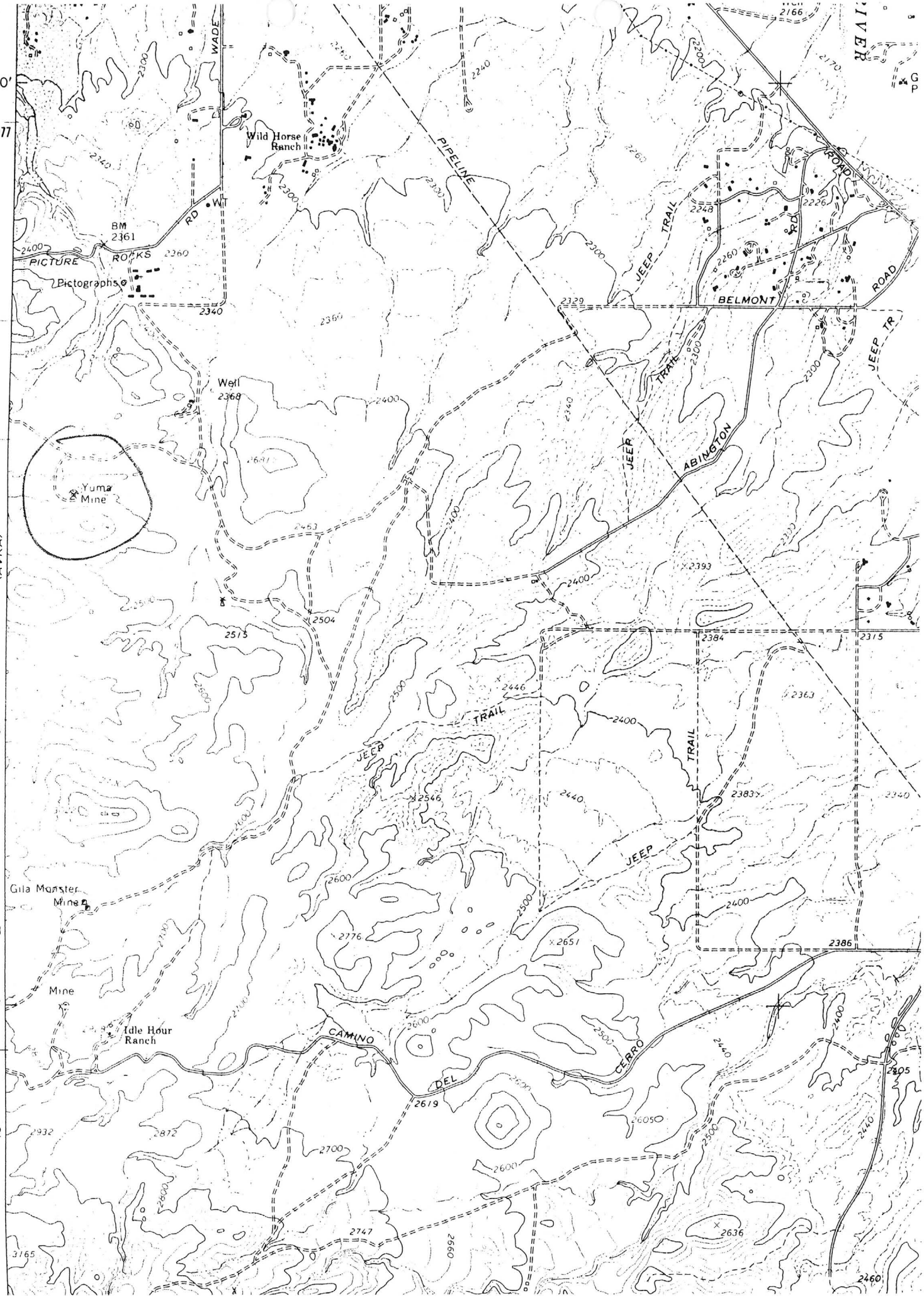
PIMA COUNTY

OLD YUMA MINE

MM-7486	Vanadinite
MM M 221	Gold
M 222	"
M 223	"
M 224	"
M 120	Wulfenite
M 126	Wulfenite

MI-S 521
1-AKA
Old Yuma Mine (Gold)

LOCATION OF OLD YUMA MINE, PIMA COUNTY
4-3-80



NAME OF MINE: OLD YUMA
OWNER:

COUNTY: Pima
DISTRICT: Amole
METALS: Pb,Mo,Vd

OPERATOR AND ADDRESS		MINE STATUS	
Date:		Date:	
11/44	Grady Wilson, 102 W. Lincoln, Tucson	11/44	Developing

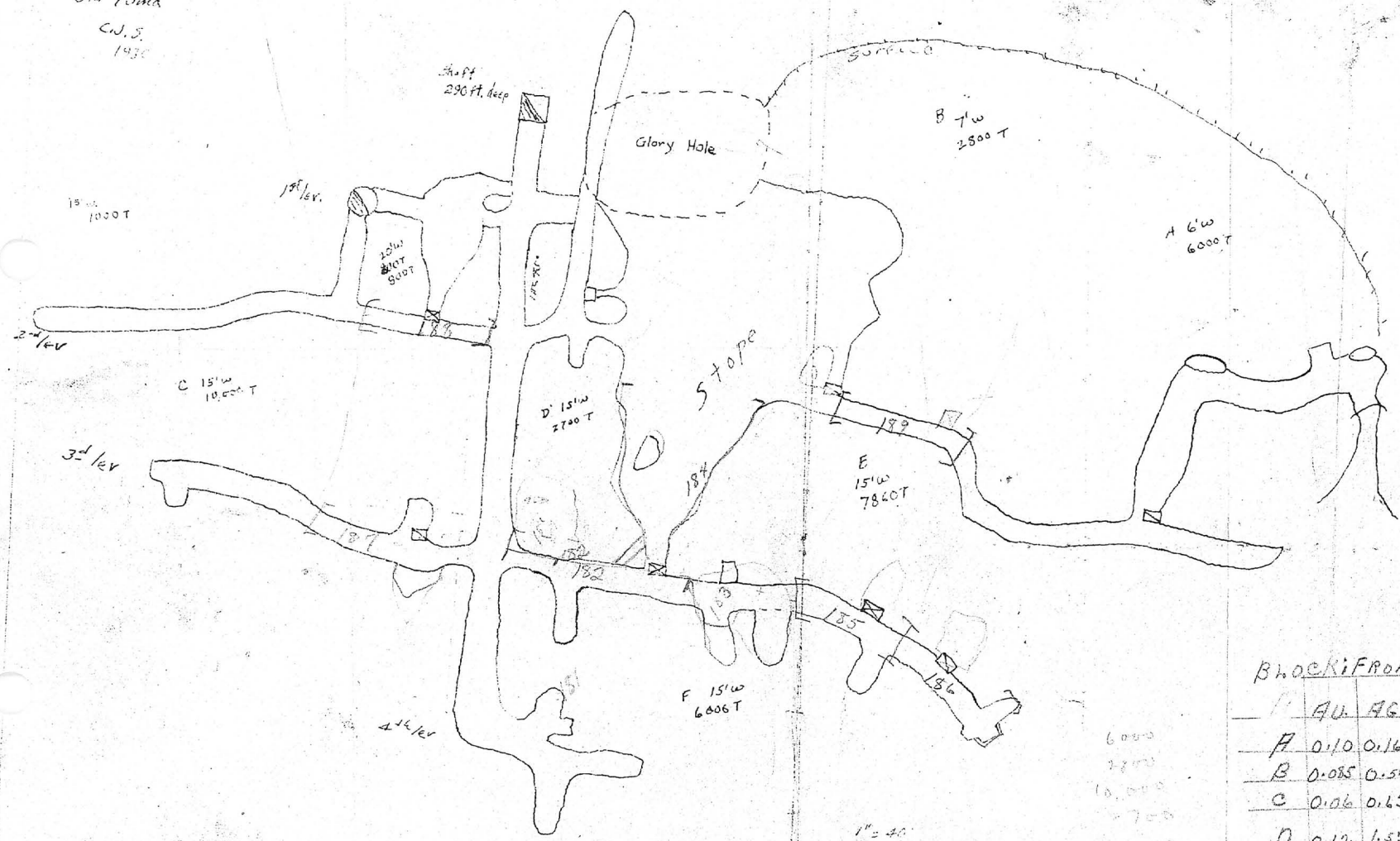
Copy in book

Old Yuma Mine, Amole District, Pima County

Visited sometime in April 1944 - Lead Gold property.
No study of the property was made at this time due to the fact that it could give no immediate production and under present conditions required too much exploration. Under right conditions it justifies a detailed study with view to further exploration to determine if commercial sulphide orebodies may occur. (Messers. Stone and Hernon).

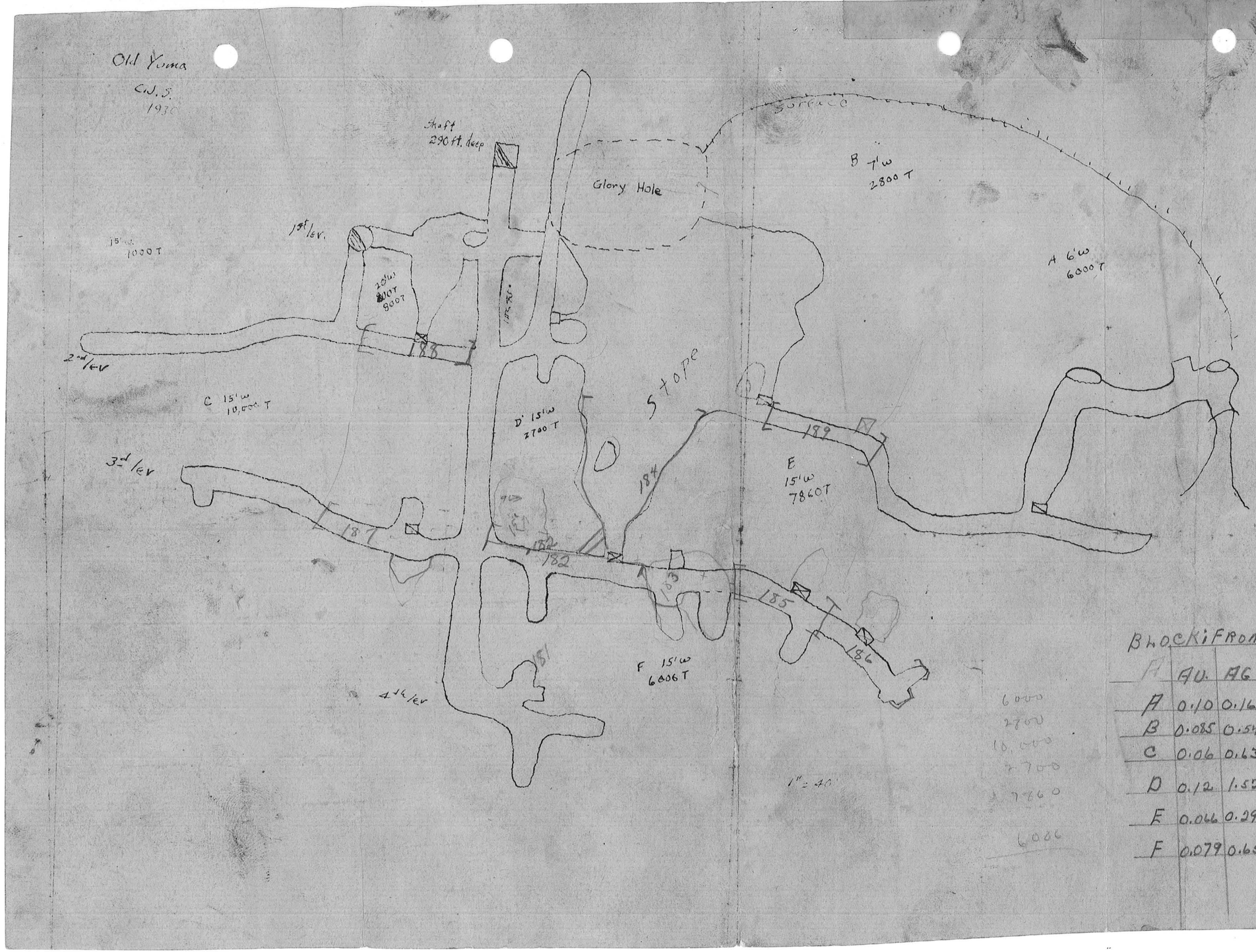
LOCATION OF OLD YUMA MINE, PIMA COUNTY

4-3-80



Block from C. J. Searle 1930

	Au	Ag	Pb	MoS2	V2O5
A	0.10	0.16	2.7	0.53	0.38
B	0.085	0.54	2.4	0.31	0.54
C	0.06	0.63	2.9	0.34	0.53
D	0.12	1.52	7.61	1.22	0.36
E	0.066	0.29	2.3	0.41	0.41
F	0.079	0.65	4.05	0.80	0.47



Block from C. J. Searle 1930

	AU.	AG	PB	MO S2	V205
A	0.10	0.16	2.7	0.53	0.38
B	0.085	0.54	2.4	0.31	0.54
C	0.06	0.63	2.9	0.34	0.58
D	0.12	1.52	7.61	1.22	0.36
E	0.066	0.29	2.3	0.41	0.41
F	0.079	0.65	4.05	0.80	0.47

6000
2700
10,000
2700
7860
6006

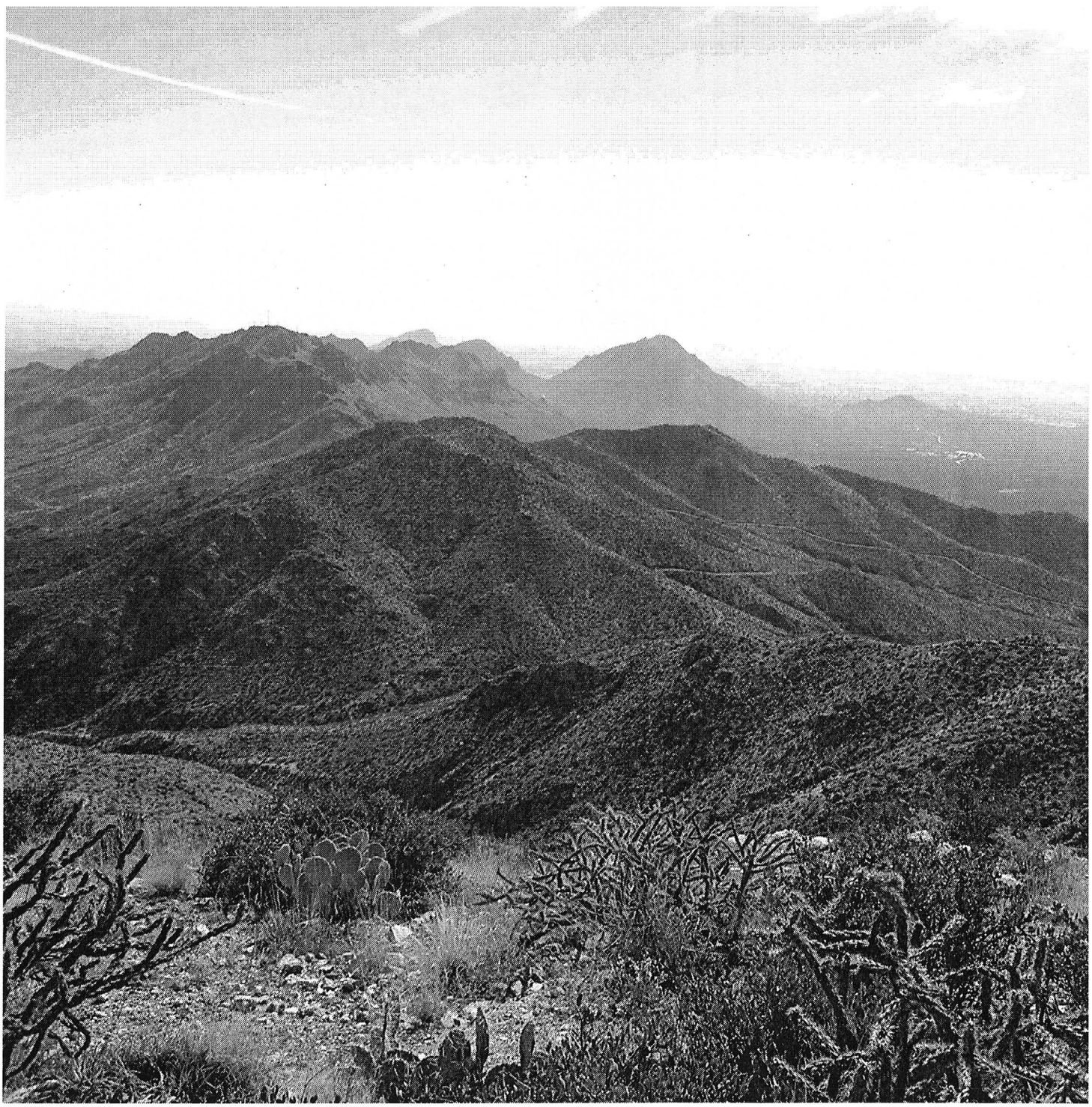
National Park Service
U.S. Department of the Interior

Natural Resource Program Center

Saguaro National Park

Geologic Resources Inventory Report

Natural Resource Report NPS/NRPC/GRD/NRR—2010/233



Although relatively recent observations at sampling stations within the park are scarce, the limited water quality data suggest that water quality for Saguaro National Park has not been impacted by human activities. West of the Rincon Mountain District, however, principally along the Santa Cruz River, human activities have impacted water quality (National Park Service 1997). Potential anthropogenic sources of contamination include municipal and industrial wastewater discharges, urban development atmospheric deposition, storm water runoff, mining and quarrying operations, livestock grazing activities, recreational use, and military operations. Surface water quality and groundwater quality are not impacted by Saguaro's septic system. All drain fields have been replaced since 1990.

For more information regarding surface water and groundwater resources in Saguaro National Park, please contact the Water Resources Division of the National Park Service in Fort Collins, Colorado (http://www.nature.nps.gov/water/).

Abandoned Mineral Lands

Mining and mine speculation is an important part of Tuscon-area history, particularly in the late 19th and early 20th centuries (Clemensen 1987). Saguaro National Park contains evidence of this mining history—the NPS Abandoned Mineral Lands (AML) database lists 288 mining-associated features at 146 sites within the park (John Burghardt, NPS Geologic Resources Division, personal communication, August 30, 2010). Most of the mine workings have been fenced off with barbed wire and posted with warning signs. A number of the vertical shafts that are close to public access have been backfilled to eliminate safety hazards. The park tries to have staff visit each site at least annually to determine the sites' status.

Although some mining activity has occurred in both of the park's districts, mining was never widespread or intensive in the Rincon Mountain District (Clemensen 1987). Spanish miners maintained small-scale lime kiln operations between the 1880s and 1910s. In 1902, the Loma Verde Mine reached a depth of 107 m (350 ft), but the mine was not included on a list of mines just five years later. The mine has since been back-filled. The Civilian Conservation Corps filled in 30 prospect holes in the mid-1930s.

Mining activity was more prevalent in the Tucson Mountain District where 150 abandoned mine workings and associated waste rock piles exist, mostly in designated wilderness areas (National Park Service 2005). Quite large waste rock piles are associated with the Gould and Mile Wide mines, the two largest operations (Higgins 1996). Some yellow and red staining, from acid mine drainage, exists in stream channels up to 0.4 km (0.25 mi) below the piles. The streams are ephemeral, however, and the piles have stabilized through time, so the potential of impacting aquatic communities with runoff from the area around the mines now is minimal.

An Environmental Assessment of several Arizona NPS units was conducted with funds from the 2009 American Recovery and Reinvestment Act (ARRA). For Saguaro, the report focused primarily on nine mine openings that are to be closed under ARRA, but sufficient background and field data were collected on all sites and features in the park so that this Environmental Assessment document will be applicable for closure of additional features as funding becomes available. Contact Linda Dansby, National Park Service Intermountain Region Minerals Coordinator and ARRA Program Lead for additional information.

Old Yuma Mine, Tucson Mountain District

When the boundaries of the Tucson Mountain District expanded under the Saguaro National Park Establishment and Expansion Act of 1994, the entire Old Yuma mining claim block (about 67 ha [165 ac]) became part of the park. These were "probably the most famous of the Tucson Mountain claims" (Clemensen 1987). The claimant received a patent on the valid claims from the Bureau of Land Management just before the lands transferred from BLM to NPS management (Comet 1 Lode, Old Yuma #1 Lode, and Old Yuma Placer Mining Claims, which were top-staked on one another and occupied a total of about 9 ha [22 ac]). The claimant never submitted a plan of operations to the National Park Service, and has since passed away. The park has stated that their biggest concern regarding this mine is potential injury due to onsite hazards. (Meg Weesner, NPS Saguaro National Park, personal communication, August 25, 2006). This mine is under a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or "Superfund") investigation, however.

World-renown mineral specimens (particularly wulfenite) have been collected from the Old Yuma Mine (fig. 8), which operated from 1885 to about 1954. Located on a fault that trends east-northeast and dips to the southeast, the Old Yuma Mine contains a broad surface-mined area and a 91-m (300-ft) inclined shaft that dips at an angle of 43°, providing the main access to underground workings (Covington 1996). Horizontal underground workings occur at the 20-, 30-, 61-, and 91-m (65-, 100-, 200-, and 300-ft) levels off the main. An inspection in 2002 revealed caved-in rubble in the lower 30 m (100 ft) of the mine, which blocks access to the 91-m level. Numerous stopes (stepwise, broad excavations) occur along the inclined ore body on either side of the main incline, breaking through into the surface mine workings in what is loosely termed, "the glory hole." The mine is dry at least to the 61-m (200-ft) depth (Baker Jr. 2005).

The Old Yuma Mine produced copper, lead, zinc, silver, gold, and steel hardening agents from wulfenite, molybdenite, and vanadinite (fig. 9) (Covington 1996; Baker Jr. 2005). Molybdenum was produced in 1917 when World War I pushed the price of the metal unusually high (Covington 1996).

In addition to waste rock stashed around the property, approximately 5,400 cu m (7,000 cu yds) of tailings remains stockpiled at the Old Yuma Mill site, although this is only part of the original tailings pile. The other part of the pile was used for road base in the surrounding area (Baker Jr. 2005). The mine site includes a large excavation open to the surface (a "glory hole"), shafts (inclined and vertical), adits (horizontal), a headframe that was used to hoist from the main inclined access shaft, a concrete mill foundation, a solid waste dumping area and a small leach pad. The leach pad was constructed in 1984 for the purpose of reducing gold ore from the remnant mine tailings, but it was never put into operation (Baker Jr. 2005).

Potential Contamination at the Old Yuma Mine

Heavy metal contamination and acid-mine drainage present potential hazards to many parks in the western United States, including Saguaro National Park. A July 2005 Preliminary Assessment/Site Inspection (PA/SI) conducted at the Old Yuma Mine analyzed 17 subsurface soil samples for metals, including a sample from the identified cyanide-leach pad and a composite sample from a private residence located north of the Old Yuma Mine on property adjacent to Saguaro National Park (Baker Jr. 2005). Mine tailings were used as for roadbase and landscaping at the residence.

Criteria and standards used to compare the analytical results included: Preliminary Remediation Goals (PRGs); Soil Remediation Levels (SRLs); and Toxicity Characteristic Leaching Procedure (TCLP) concentrations. PRGs provide an initial screening-level tool for evaluating contaminated sites; they are EPA guidelines, but not legally enforceable standards. SRLs are soil cleanup standards enacted by the State of Arizona for the protection of human health and the environment. TCLP concentrations are maximum concentrations for toxicity characteristics in soil established by the EPA and presented in the Code of Federal Regulations (CFR) 40 CFR 261.

Of the 23 Target Analyte List metals, all but antimony and thallium were detected in the samples. Metals that exceeded SRL and PRG criteria and standards are listed in table 1. The sample from the residence contained metal concentrations exceeding SRL and/or PRG criteria similar to the samples collected from the mine tailings and waste rock (Baker Jr. 2005).

Table 1. Metals exceeding SRL standards and/or PRG criteria in 17 samples.

Metal	SRL	PRG
Lead	All 17 samples	All 17 samples
Arsenic	All 17 samples	All 17 samples
Cadmium	1 sample	1 sample
Iron		All 17 samples
Manganese	16 samples	All 17 samples
Vanadium	1 sample	14 samples
Zinc	9 samples	9 samples

The presence of heavy metals, however, does not necessarily signify a potential hazard to park visitors. As part of the PA/SI, the Old Yuma Mine received a Hazard Ranking System score of 3.15 based on CERCLA 42 United States Code 9601 (Baker Jr. 2005). Only sites that score over 28 are placed on the National Priorities List. The overall Hazard Ranking System score was calculated from scores determined for the following potential contaminant pathways:

- groundwater migration
- surface water migration
- soil exposure
- air migration

Scores for groundwater migration and soil exposure pathways were insignificant. Groundwater is 107 m (350 ft) below ground surface at the residence outside the park, which is a lower elevation than at the mine. Because no residences, daycare facilities, or workplaces exist within 61 m (200 ft) of the site, there was no threat to residential populations through the soil exposure pathway. However, human contact with the soil could occur as a result of hiking on trails through the mine areas and vandalism in fenced areas.

Threats to drinking water, the human food chain, and the environment were used to determine the surface water migration pathway score. A lack of population resulted in a low score for this pathway, also. However, an increase in population served by drinking water, the size of the stream, and an increase in surface water intakes identified within the sampling distance of the Old Yuma Mine site could potentially increase the score (Baker Jr. 2005).

The PA/SI concluded that both surface water runoff and airborne dust are likely migration pathways for contaminants from the Old Yuma Mine (Baker Jr. 2005). The tailings and waste rock piles are bare and loose, and the terrain is relatively steep. Erosion swales at the site suggest that infrequent but heavy rains could transport the loose soil and chemically dissolve metals, although most of the minerals that contain these metals do not dissolve easily in water. In this arid environment, wind also could transport dust.

In general, groundwater contamination by leaching from the tailings and waste rock piles is unlikely because annual precipitation is low and evaporation is high, and recharge provides little input to the underlying aquifers (Mott 1997; Kring 2002; National Park Service 2005). In a 1979 study, the Upper Santa Cruz Basin Mine Task Force concluded that groundwater contamination from mining activities could not be detected in either the Tucson or Avra Valley basins, even from large active mines.

An ephemeral stream is mapped approximately 120 to 150 m (400 to 500 ft) north-northwest of Old Yuma Mine, but no other streams, creeks, rivers, lakes, or other surface water bodies exist within a 0.8 km (0.5 mi) radius of the mine. Even if contaminant migration were to occur during periods of intense thunderstorms when surface runoff could be generated from the tailings piles, dilution during these events would be high, and metals or other contaminants would be carried from the park down to

the adjoining Avra Valley or Tucson Basin before significant infiltration could occur.

Because arsenic and lead tend to bioaccumulate through the food web, a biotic pathway is possible. The studies did not address this potential pathway. In its closing section, the PA/SI recommends further study of site contamination.

As part of the ongoing CERCLA investigation, $418,000 in ARRA funding was appropriated for an Engineering Evaluation/Cost Analysis (EE/CA) and removal action to mitigate metals-contaminated soil. That amount will most likely cover the cost of the EE/CA and the drilling of one water well to test whether Old Yuma is affecting groundwater in the area. An additional $135,000 in ARRA funding will be spent on closures (wildlife-compatible where appropriate) of all of the mine entrances at Old Yuma Mine (John Burghardt, NPS Geologic Resources Division, personal communication, August 31, 2010).

Silver Lily Dikes

The Silver Lily Dikes, a swarm of magmatic intrusions that were injected through the floor of the Tucson Mountains Caldera and the overlying sequence of volcanic ashes and breccias, caused local alteration and mineralization at about the same time the ores of the Old Yuma Mine were being deposited. The dikes are only a few meters wide, but cut across the Tucson Mountains for distances up to 6 km (3.7 mi) (Kring 2002). A series of mines were sunk along the contacts between the dikes and adjacent sedimentary rocks.

Safety Measures

A fence now surrounds the Old Yuma Mine. The abandoned Gould Mine is next to a trail, and a grate has been placed over the shaft. A bat gate has been installed at the Wild Horse Mine on the east side of the Tucson Mountain District. The Mile Wide Mine is not on a trail, and the mine is not easily accessible; its deep shaft is fenced. Mile Wide and Gould mines were the subject of a Geologic Resources Division site visit and trip report in 1996 (Higgins 1996). The shafts and adits in the park's database of old mines for the Tucson Mountain District have been mapped, photographed, and measured. The park has begun to develop a comprehensive mine management plan.

A number of mine safety and closure projects within the park were submitted as part of the American Recovery and Reinvestment Act of 2009. Proposals have been submitted to initiate work on a number of the projects (Meg Weesner, NPS Saguaro National Park, personal communication, May 2010). In preparation for ARRA closures, an Environmental Assessment was conducted on all of the park's mines. Certain key mines will be closed, and fences at all of the remaining mine entrances will be reinforced or reconstructed as needed (John Burghardt, NPS Geologic Resources Division, personal communication, August 30, 2010).

Interpretive Trail to the Santa Catalina Fault

One of the most accessible and well-exposed outcrops of the Santa Catalina Fault is located adjacent to Cactus Forest Drive in the Rincon Mountain District of Saguaro National Park (fig. 11). At the scoping meeting in 2006, participants expressed an interest in developing an interpretive trail to the Santa Catalina Fault.

On July 31, 2009, the National Park Service approved Saguaro National Park's Comprehensive Trails Management Plan. As part of the plan, the Lime Falls Trail will be extended eastward from the Cactus Forest Trail to the eastern portion of Cactus Forest Drive, providing access the Santa Catalina Fault. The trail will include new interpretive signs (National Park Service 2009).

Another exposure of the Santa Catalina Fault exists about 1.6 km (1 mi) north of the Loma Alta trailhead in Rincon Valley. Although also within the park's boundaries, this outcrop does not expose the fault as well as the one along the proposed Lime Falls Trail (Jon Spencer, Arizona Geological Survey, written communication, April 15, 2008). Appendix A displays faults mapped within the park as part of the digital geologic data.

Additional Mapping in the Rincon Mountain District

More details are now available for the rock units that Drewes mapped west and south of the Santa Catalina Fault (Drewes 1977). Additional geologic mapping from the Fire Building to the park's headquarters and along Cactus Forest Drive could provide greater resolution of the exposed units. On the other hand, the contacts between granites, gneisses, and other metamorphic rock units exposed east of the Santa Catalina Fault remain difficult to map, so that re-mapping east of the fault may not prove worthwhile.

Other Issues

Sedimentation and Tinajas

Tinajas are ephemeral pools that are important water sources for wildlife, especially the leopard frog, in the Rincon Mountain District (Parker 2006). Tinajas range from 1 to 9 m (3 to 30 ft) in diameter and form in both bedrock and unconsolidated material. Most of the tinajas in Saguaro National Park have been inventoried. If these pools fill with sediment, their use as wildlife habitat is greatly restricted.

Under normal conditions, channels in the Rincon Mountains contain very little sediment in storage, especially channels cut into steep bedrock slopes. Typically, sheetwash and rill erosion are not significant in transporting sediment to stream channels. Large hot wildfires, however, alter watershed conditions such that the amount of sediment delivered to channels can be greatly increased. Fires destroy the vegetation and the layer of decaying leaves and conifer needles that comprise the forest litter. Fires expose the ground surface to the direct effects of precipitation and storm runoff, and they can burn into root systems that

OLD YUMA MINE PIMA COUNTY

MG WR 8/9/85: Visited the Old Yuma mine (Pima County). Gate on road through Saguaro National Monument was closed, "effective May 11, 1984." From my vantage point I could see no activity at the mine.

CJH WR 9/27/85: Visitor: Rick Barnard, Pres., Consolidated Mining and Milling Ltd., (c). He reported that they have placed 400 tons of Old Yuma dump material on their leach pad and have constructed a film lined plywood framed pregnant solution tank of 15,000 gal. capacity. Consolidated is not operating the Old Yuma but they are prepared to sit on it indefinitely.

MG WR 6/6/86: Provided general information on the Old Yuma (Pima County) to Mr. Dick Bideau (c). Mr. Bideau reports that litigation to secure unlimited or less restricted, access to the mine has not been successful so far. Legal costs have been more than originally anticipated. Some partners in the development of the mine have left the venture. Attempts to purchase or rent a roadway across property to the east of the mine have also failed, principally because of adverse publicity.

NJN WR 1/^2/88: Arden Miller (card) one of the owners of the Old Yuma (file) Pima County visited and reported that a conservative underground estimate would be 50,000 tons of .17 oz/ton Au.

NJN WR 6/10/88: Arden Miller (card) reported he is going to buy access across private property for the Old Yuma (file) Pima County.

OLD YUMA PIMA COUNTY

CJH WR 5/4/84: Jack Henseley, Pima County Health Dept. has had some calls expressing concern over the proximity of a new cyanide leach operation at the Old Yuma mine of the Comet #1-12 claims, Amole District, Sec 9, T13S R12E, Pima County. Contact was made with Eddie Martin, Deputy State Mine Inspector and Andrew M. Rendes, Field Representative, Bureau of Water Quality Control, Az. Dept of Health Servies, State Office Bldg., 402 W. Congress, Rm 214, Tucson, Ar. 85701. Tel - 628-5321. Mr. Martin will set up a visit by John Taylor, State Mine Inspector's Office, Mr. Rendes and myself to the property and a report will be made to Mr. Henseley for public information.

FJD WR 6/8/84: Bill Rutan, newly hired by the Game and Fish Dept. came in and wanted to know how bad the leaching operation at the Old Yuma Mine would affect wild life. He had talked with Mr. Lefler who objects to people using their road for the mine.

RRB WR 5/11/84: Tried to visit the Old Yuma Mine, Pima County but found all roads blocked.

MG WR 6/15/84: Mr. Charlie Lemmon reports that he mined 500 tons of dump material at the Old Yuma Mine (pima Co) in 1933. He believes that the material averaged $5/ton in gold.

NJN WR 11/23/84: Arden Miller reports that their fight at the Old Yuma Mine (f) Pima County is far from over. The last ruling only decided one issue that the park road is not a "public road" not that he can't use it. If he ~~looses~~ loses that fight he may gain access by constructing a new road in from the east.

NJN WR 8/9/85: Mark Hay called and reported that he is planning on leasing the Old Yuma Mine (f) Pima County from Dick Bideaux to collect mineral specimens there on weekends.

OLD YUMA MINE PIMA COUNTY

AWB WR 7/26/80: Wayne A. Thompaon of Southwest Minerals Associates, 1723 E. Winter Drive, Phoenix, Arizona 85020, phone 944-6567, reported Southwest is currently working the Old Yuma Mine.

CJH WR 2/18/83: Visitor: L. Arden Miller, Geologist, Southest Mineral Associates. He reported that the decline of the Old Yuma Mine, Pima County is now open to the 200' level.

MG WR 2/18/83: Mr. L Arden Miller of Southwest Mineral Associates was in to get information on the Amole Mining District, Pima County, and on mill equipment available for purchase. He reports that the 100' level workings in the Old Yuma Mine, Pima County are clear and workable. Seams of wulfenite have been located. If other (base-metal?) ore occurs in sufficient amount, Southwest will consider milling it.

MG WR 7/29/83: Sent list of vanadium ore buyers to Mr. Rick Bernard, Consolidated Mining and Milling Co., Ltd., 5959 N. Yuma MIne Road, Tucson, Arizona 85713; phone 744-2208. This company is operating at the Old Yuma Mine, Pima County although its relationship to Southwest Mineral Associates is unclear to me. Mr. Bernard reports that the 200-level workings are clear and workable.

MG WR 8/5/83: Consolidated Mining and Milling Company is leasing the Old Yuma Mine, Pima County from Southwest Mineral Associates.

MG WR 10/14/83: It is reported that a controlled underground sampling program was done in September of this year at the Old Yuma mine (Pima Co.)

RRB WR 3/23/84: Old Yuma Mine, Pima County. Information related to Art Bloyd by Mr. Miller. They are now down 200 feet and have encountered some nice vanadanite crystals. They intend to produce lead, moly, gold and silver.

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Bureau of Land Management

Mineral Report

Publication Title:

Validity Examination of the Comet 1 - 5 and 8 - 11 and Old Yuma #1 - #5 and #8 - #11 Lode Mining Claims and the Old Yuma Placer Mining Claim

Lands Involved:

Southeast Quarter Section 9, T.13S., R.12E
Gila and Salt River Base Meridian
Pima County, Arizona
Containing 160 Acres, More or Less

This document, prepared by the Bureau of Land Management, 1993, is available here as scanned graphic images in downloadable files in Mircosoft Word 97. Due to the size of the complete document, it was divided into the following eight (8) parts. A summary of file contents is listed below.

Validation Part 1	**Validation Part 2**	**Validation Part 3**	**Validation Part 4**
File size: 3800KB	File size: 1210KB	File size: 738KB	File size: 2159KB
Validation Part 5	**Validation Part 6**	**Validation Part 7**	**Validation Part 8**
File size: 1573KB	File size: 1756KB	File size: 1723KB	File size: 2138KB

Validation Part 1 includes the following:

Summary
Introduction
Lands Involved
Physiographic Data
Geologic Setting
Site Geology
Mining History
Mineral Deposits
Exploration and Development Work
Mining, Milling and Related Operations
Sampling Procedures and Analytical Work
Economic Evaluation
Conclusions
Recommendations
References

THESE FILES ARE AVAILABLE FROM ADMAR'S STAFF, EITHER ON PAPER OR DISK. NJN. 2000

Validation Part 2 includes the following:

Appendix I - Figures
Figure 1: General Location Map

Figure 2: Access and topography ma
Figure 3: Cultural Resources inventory map
Figure 4: Geology of the Northern Tucson Mountains (from Knight)
Figure 5: Map of the Claim Group

Validation Part 3 includes the following:

Figure 6: Underground map of the 65 level Old Yuma mine
Figure 7: Underground map of the 100 level Old Yuma mine
Figure 8: Underground map of the 200 level Old Yuma mine
Figure 9: Stylized cross-section of the Old Yuma lode
Figure 10: Map of the Copper Kettle prospect

Validation Part 4 includes the following:

Appendix II - Attachments
Attachment 1: Photographs of Old Yuma Wulfenite and Vanadinite Specimens
Attachment 2: OYM 1 - 10 Descriptions of Workings
Attachment 3: Arizona State Law, Title 12 Section 12-1202, Right to a private way of necessity

Validation Part 5 includes the following:

Attachment 4: Cost Estimate Detail
Attachment 5: Blue Range Mill Flow Sheet
Attachment 6: Floatation test results

Validation Part 6 and Part 7 includes the following:

Attachment 7: Sample Site Descriptions and Photographs

Validation Part 8 includes the following:

Attachment 8: Ore Reserve Calculations
Attachment 9: Smelter Return Calculations
Attachment 10: World Wulfenite Specimen Market Article
Attachment 11: Assay Reports

Requests for a printed hard copy of the report should be directed to: REQUESTED 7/19/2000

Bradley K Flint
Chief Appraiser, Land Resource Program Center
Intermountain Region
National Park Service
P.O. Box 728
Santa Fe, NM 87505
Email: Bradley_Flint@nps.gov

Updated: June 9, 2000

FROM: 8TH ANN[illegible] ARIZONA MINERAL SYM[illegible]IUM MARCH 25, 2000.

THE OLD YUMA MINE, PIMA COUNTY, ARIZONA
A PREMIER VANADINITE AND WULFENITE LOCALITY

Richard A. Bideaux, 710 West Bangalor Drive., Oro Valley, Arizona, 85737-5006

The Old Yuma mine claim was located in 1885 by C.C. Stephens "south of the Silver Bell Road" in the Tucson Mountains, about 15 miles northwest of Tucson, Arizona. Major development of the property came during World War I when it was owned by John H. Martin and William H. Barnes, Tucson lawyers, and then operated under government subsidy by Colonel Epes Randolph and associates for war-critical molybdenum and vanadium. A gravity jig mill, now but a foundation, was constructed to concentrate wulfenite and vanadinite, with about 30,000 tons of ore produced. The mine was prepared for even greater production, but the subsidy ended with WWI and so did further interest in ore mining. The tailings contain about 1/8 troy oz/ton of gold; about 3/4 of the 30,000 tons was direct shipped to the lead smelter at El Paso, while the remainder is still on site.

Among mineral collectors, the mine is best known for its production of superb examples of crystallized vanadinite, brilliant red to orange, typically skeletal and hoppered, with crystals up to two cm in length. It has also produced probably the finest bright orange wulfenite in the world, with crystals known to about three cm on an edge. The ore genesis and mineralogy bear some resemblance to that of the Mammoth-St. Anthony mine at Tiger, Arizona, about 70 km to the northeast.

The mine was owned for many years by the family of John Martin, and in part by his employee, Joe Brooks Davis, and Roland B. Mulchay, chief geologist of the Anaconda Company. This is the first mine in which I ever collected, at age 13 in 1948, when a large pocket of vanadinite was found on the 200-foot level. My father, George Bideaux, and I leased the mine through the Davis' in 1956, along with the mineral dealer Al Haag, which resulted in production of a number of fine specimens of vanadinite and wulfenite.

In 1979, all mining claims had to be refiled with the BLM; the Martin-Davis group failed to do so, and Dick Jones staked the Comet claim. He sold this claim to Wayne Thompson and me in 1982, shortly before he died. Wayne and I then formed Consolidated Mining & Milling, which kept people on the ground for several years cleaning out the inclined shaft to regain entrance to the vanadinite pocket on the 200-foot level. While this work was successful, the market was flooded with Mibladen, Morocco vanadinite, so Consolidated turned its attention to wulfenite and gold-lead ore. A gold leaching facility to process the tailings was permitted through the BLM; however this was shut down before production in 1984 by government action due to close proximity to the Saguaro National Monument.

This shutdown eventually bankrupted Consolidated and some of its stockholders. The claims, covering a BLM 1/4-section by that time, were taken up by the Arizona Exploring & Mining Company, of which I am now the sole stockholder. Another Mining Plan of Operations (MPO) was submitted in 1990. This was denied a day before approval, by the State Director of the BLM, due to pressure from Arizona Senator DeConcini and Congressmen Pastor and Kolbe, who wished to expand the Monument boundaries.

In 1994, the US Congress passed the Saguaro National Monument Protection Act, which withdrew only the BLM 1/4-section from mining entry. In 1996, the US Congress passed the Saguaro National Monument Expansion Act, taking the Old Yuma and associated claims into the Monument. Shortly thereafter, the Monument was elevated to a National Park, the highest designation of land use in the US short of the Capitol Building, White House, and Washington Monument. During this time, the BLM made a validation survey of the claims, requiring three mineral examiners over a period of several years. Based on content of gold and lead in samples taken from underground and the tailings dump, the Comet claim in which the Old Yuma mine is located was found to be a valid discovery.

Immediately on this determination, I applied for mineral patent of the claim. This patent application was successfully pursued through the Arizona State BLM with issuance of first-half papers. It was then sent to Washington, DC, where it has now languished for over two years in the office of the Solicitor General of the Department of Interior under control of Secretary Bruce Babbitt, former Arizona governor. I believe the mining patent must eventually issue, as the claim has once been validated, with the same tests applying.

At this time, another elaborate MPO is being prepared, with the assistance of Wayne Thompson and Les Presmyk, for submission to the Superintendent of the Saguaro National Park and the National Park Service (NPS). Essentially, this MPO would move the excavator (Ed Over, Jr.) and its associated equipment fleet at the Red Cloud mine in Yuma County, where it has been demonstrated to efficiently operate in mining wulfenite specimens, to the Old Yuma mine. The NPS is however well known for denial of such MPO's, sometimes for many years, while simultaneously claiming that the mine owner's rights have not been taken under the Fifth Amendment to the US Constitution.

Six years after the Old Yuma mine's incorporation into the National Park, the statute of limitations will invalidate a "takings" lawsuit; this will occur in October 2000. In the meantime, I have had my architect design a retirement home for me, sited next to the mine. Surrounding property values continue to rise, with one nearby luxury subdivision advertising "You can't live in a National Park, but this is the next best thing."

References:

Jones, Dick (1983) Famous mineral localities: the Old Yuma mine. *Mineral. Record*, 14(2), 95-107 (Arizona-IV issue).

Jones, Bob (1984) The Old Yuma gold mine: One of Arizona's great mines is being reopened. *Rock & Gem*, January, 28-31.

May 7, 1984

Mining Adjacent to Saguaro National Monument

Issue

Mining operations on public lands adjacent to Saguaro National Monument under a plan of operations approved by BLM.

Background

Mining Operations: Consolidated Mining and Milling Company, a small mining company from Tucson, Arizona, is beginning a cyanide leaching operation at the Old Yuma Mine 12 miles northwest of Tucson. The Old Yuma Mine is an abandoned lead, silver, and molybdenum mine with a history of small production and no operation since 1945. The Company has leveled an area at the mine and is building a 50' x 100' leaching pad with an impervious liner. Old mine tailings will be placed on the pad and sprayed with cyanide solutions that will leach gold out of the tailings. The gold-bearing solutions will be drained and filtered to recover the gold. Mining will also remove ore from underground in the old shaft which will be crushed and leached in the same manner. The leaching system is self-contained. It has protective berm and neutralizing solution safeguards and meets the safety requirements of the Arizona State Mining Inspector.

Mining Claims: Consolidated Mining and Milling Company has 12 unpatented mining claims which completely cover a 160-acre tract of public land, the SE 1/4 of Section 9, T. 13 S., R. 12 E., that adjoins the Monument. Maps 1 and 2. One claim, the Comet #1-Old Yuma on the Old Yuma Mine, was located December 27, 1979. The other 11 claims (Comet 2 through 12) were located in January 1983, apparently to preclude others from filing claims near the mine.

BLM mining claim records show six other claims in the S 1/2 of Section 9, the Copper Kittle 1-4 and the Desert View 1 and 2, located October 8, 1960, and owned and being maintained by Irene Benson and Rhoda Phillips. Several of these claims are in the SW 1/4 of Section 9 which is now inside the Saguaro National Monument. No operations are occurring on these claims and the relationship of these claims to the Comet group is not known.

All of the claims were located at times when the lands were open to mining entry. The claimants have complied with the mining claim recordation requirements of Section 314 of FLPMA.

No other unpatented mining claims are known to exist on the other tracts of public lands adjacent to the Monument.

Relationship to Saguaro National Monument: The 160-acre tract of BLM-administered land adjoins the Saguaro National Monument. The Old Yuma Mine is in the northwest corner of the public land parcel and within 150 feet of the Monument boundary. Map 3. All of the Comet claims and the mining and leaching operations are outside of the Monument. However, the principal access road to the Old Yuma Mine circles through the Monument for a distance of about 700 feet and lies about 150 feet inside the Monument. The claimants state that they have a letter from a previous NPS Monument Superintendent giving them permission to use this access road to the mine. This letter is being searched for at this time.

The Saguaro National Monument (West Unit) was established by Presidential Proclamation 3439 on November 15, 1961. The original Monument boundary lay one-half mile west of the Yuma Mine. On October 21, 1976, Public Law 94-578 expanded the Monument boundary one-half mile eastward to within 150 feet of the Yuma Mine. The expansion area encompassed a number of old mines along the east border of the Monument, including the unpatented mining claims of Benson and Phillips in the SW 1/4 of Section 9 (which are now inside the Monument). The expansion did not include the SE 1/4 of Section 9 which remains BLM-administered land open to the operation of the mining laws.

BLM Approval of Mining Plan of Operations: In April 1983, the Consolidated Mining and Milling Company filed with the BLM Phoenix District Office a notice that they intended to begin operation as required by the Surface Management Regulations in 42 CFR 3809. These regulations are designed to prevent unnecessary and undue surface degradation by mining operations and to provide for surface reclamation. If less than 5 acres are disturbed each year, the claimant is only required by 43 CFR 3809.1-3 to notify BLM that mining operations will begin, but no approval by BLM is required.

The operations at the Yuma Mine will disturb in total only about 2 acres of public land, substantially less than the 5 acres of disturbance per year that would require the claimant to file a plan of operations with BLM and obtain approval before proceeding. However, since the operations involve cyanide, the BLM District Office requested that a plan of operations be filed, and the claimants complied with this request. The operations will be confined to the old mine workings, with little new surface disturbance. The cyanide leaching will be conducted in accordance with standard mining practices and meets with the approval of the Arizona State Mine Inspector. BLM, therefore, approved the plan of operations on May 4, 1983.

Current Status:

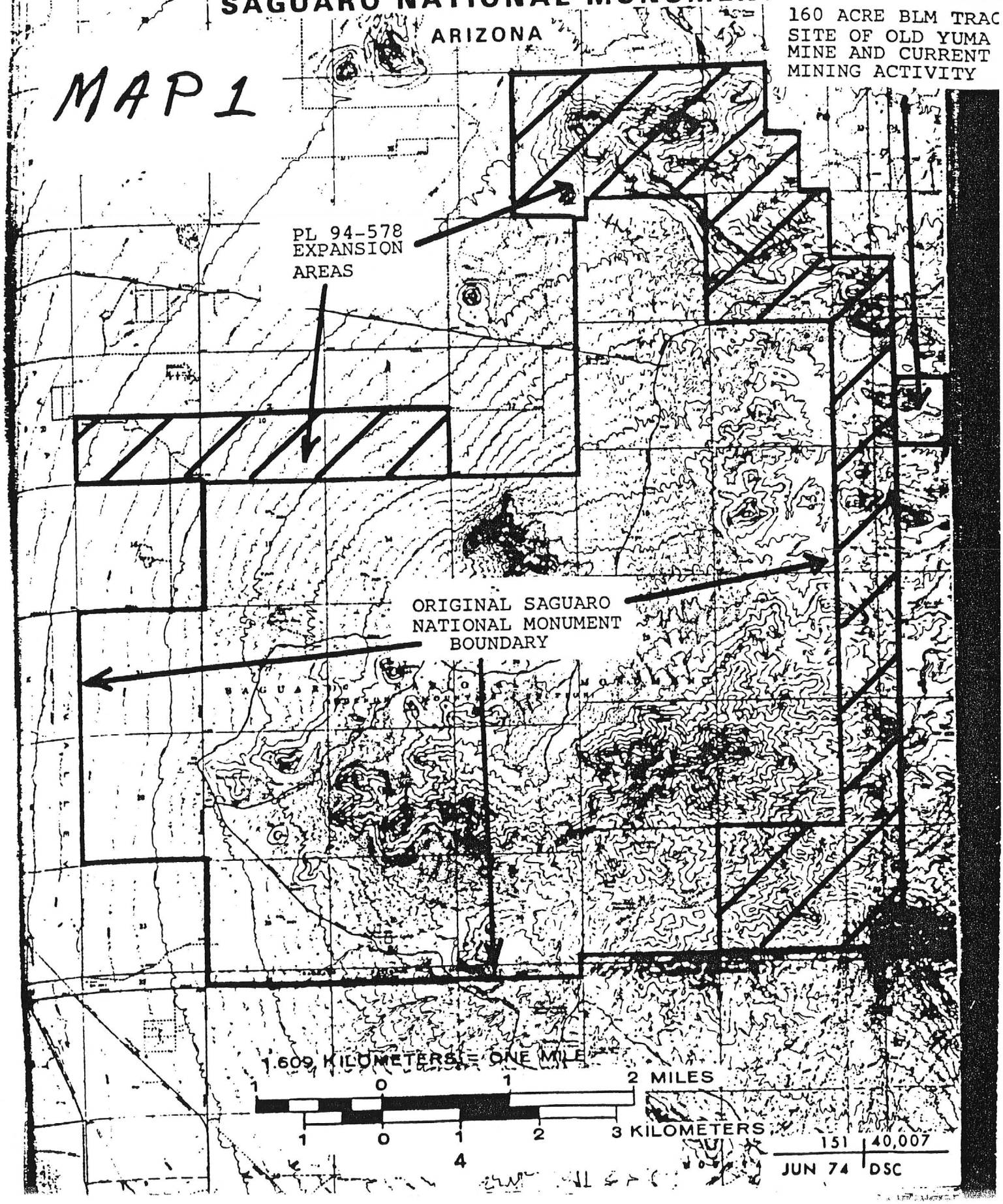
Public Reaction: NPS Saguaro National Monument officials, Pima County officials, environmental groups, and adjoining private land owners have expressed strong objection to the mining operations and to BLM's approval of the mining plan of operations. The issue has received front page and editorial coverage in the Tucson newspapers.

Access: The mining company can use a secondary access road to get to the Yuma Mine without going through the Monument if forced to abandoned the existing road. However, the adjoining private land owners, L.G. and Betty Lefler are attempting to block the mining company from using the long-existing road that comes in from the north across their land in the NE 1/4 of Section 9 to gain access to the Yuma Mine. Reportedly, the Leflers have posted armed guards to block the access road. The Company contends they have a right of access across the Lefler property. The matter may have to be settled in local court.

Mining Operations: The Company has a valid right under the 1872 Mining Law to the land and has complied with recordation and surface management regulations. BLM has only limited authority over mining claim operations, and has probably exceeded that authority in requesting a plan of operations in a situation where only minor surface disturbance will occur. The Company has decided to delay further operations "for a few days" in light of the furor, and until they resolve the access disputes with the private landowners and the NPS.

TUCSON MOUNTAIN UNIT
TOPOGRAPHIC MAP
SAGUARO NATIONAL MONUMENT
ARIZONA

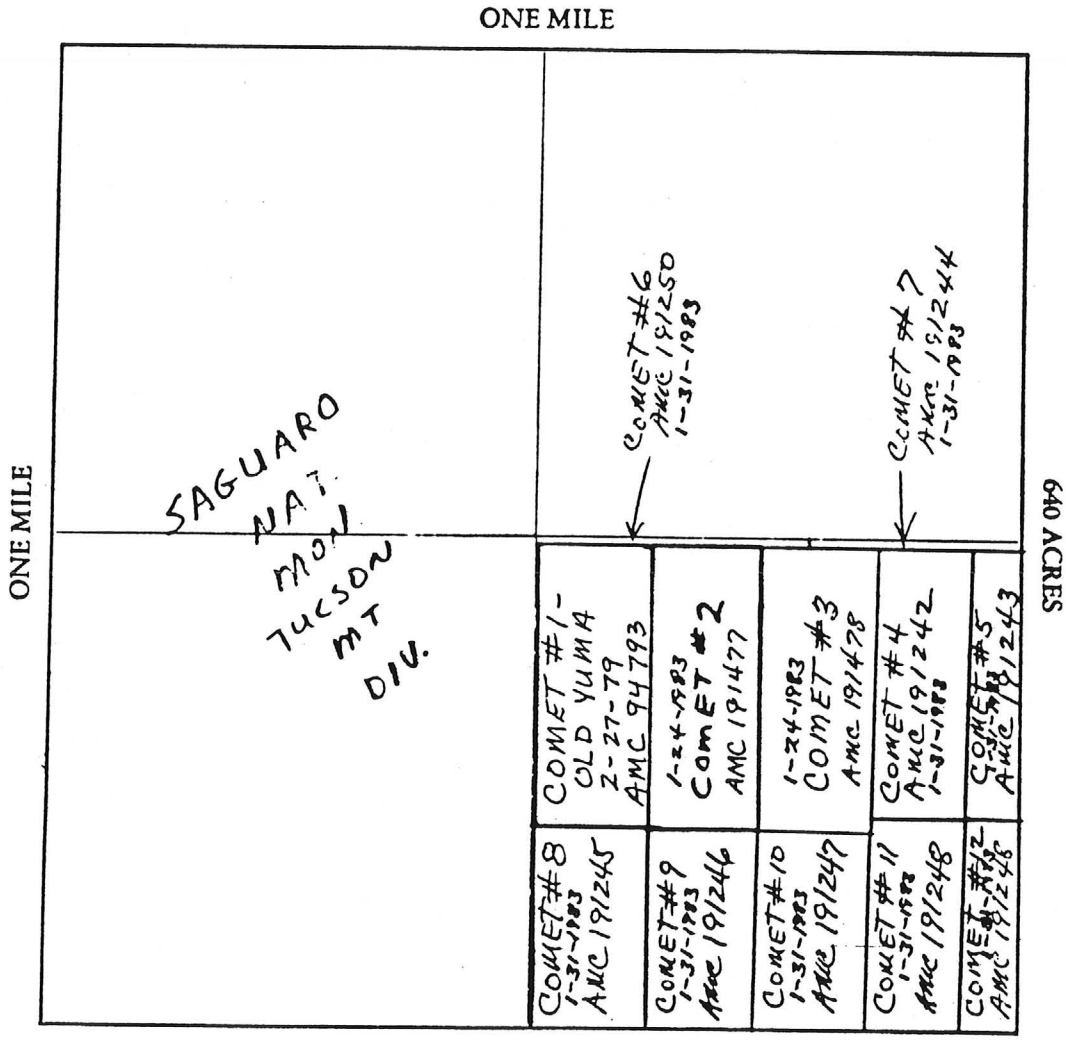
MAP 1



MAP 2

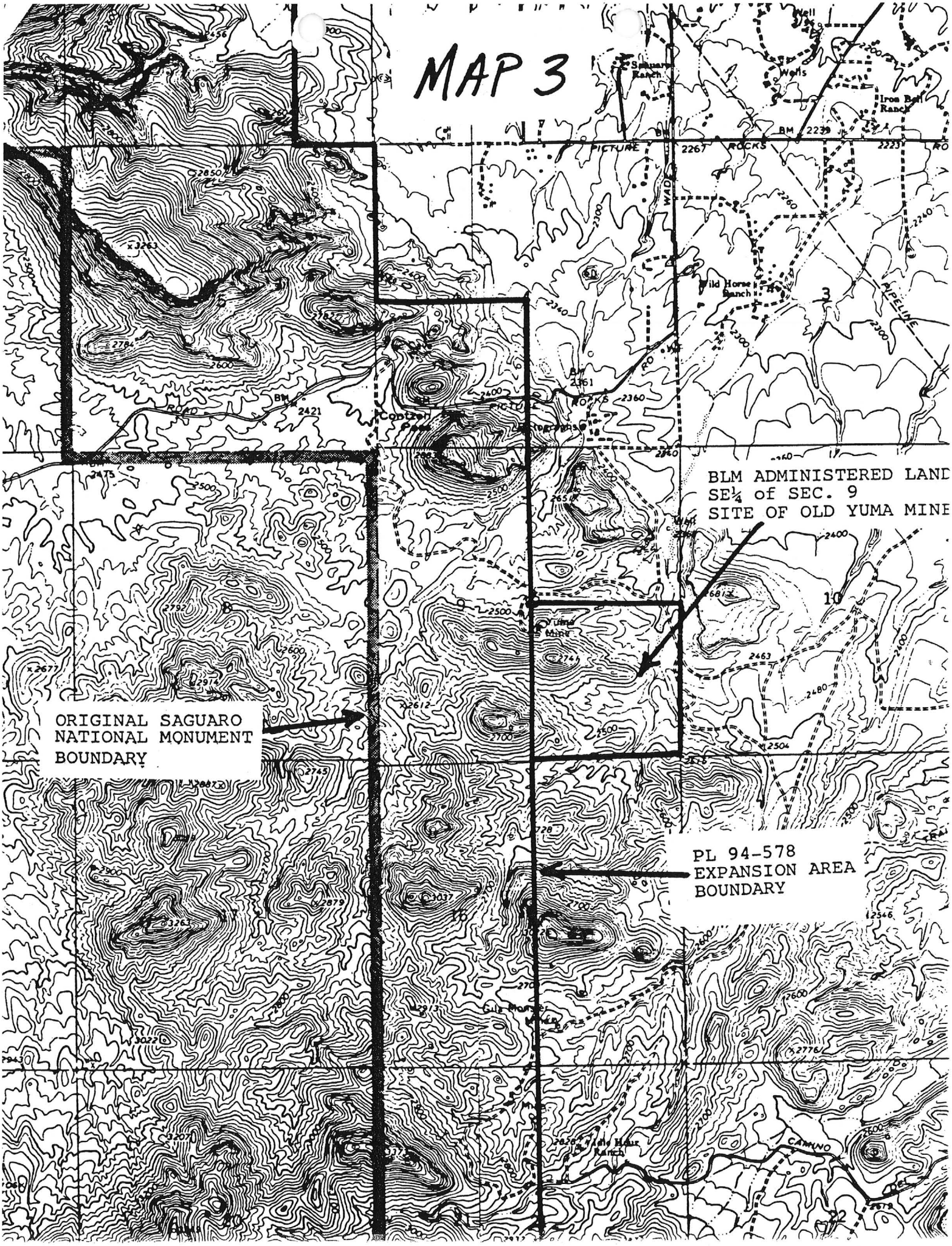
One inch = One thousand feet

North Arrow ↑



AMC 191477

Section 9 Range 12E Township 13S, G&SRB&M


MAP 3
BLM ADMINISTERED LAND
SE¼ of SEC. 9
SITE OF OLD YUMA MINE
ORIGINAL SAGUARO
NATIONAL MONUMENT
BOUNDARY
PL 94-578
EXPANSION AREA
BOUNDARY
Wells
Iron Bell Ranch
Wild Horse Ranch
PICTURE ROCKS
WAD
PIPELINE
Contzen Pass
Yuma Mine
Gila Monster Mine
CAMINO
3
8
9
10
16
22

Tower 5-4-83

MAY 4 1983

CERTIFIED MAIL - Return Receipt Requested

Consolidated Mining & Milling Ltd.
4131 E. Van Buren
Phoenix, AZ, 85008

Mining Plan of Operations
MPO 83-P-003
Proposed Mining Plan
Approved

Decision

On 6 April 1983 the above company submitted a Mining Plan of Operations indicating the work they proposed to do to reopen the Old Yuma Mine. The plan covers work to reopen the mine, site development for a milling/concentrating plant and plans for precious metals cyanide extraction system. After consultation with the PRA Minerals Specialist a modification to the reclamation measures section of the plan was worked and incorporated on 27 April 1983. The Old Yuma Mine and the contiguous claims on this property are in Section 9, T. 13S., R. 12E. There are seven claims on the property named Comet #1 thru #7. The MPO was submitted to the Phoenix Resource Area, Phoenix District, Bureau of Land Management, AZ and is serialized MPO 83-P-003.

Field examination was accomplished on 21 April 1983 of the subject lands. The mine development, milling and processing activity would not constitute undue and unnecessary degradation if the mitigating measures identified in the plan of operations and the following nine stipulations are complied with.

1. The surge pond retention must be adequate to contain system fluids plus run-off from a four inch rainfall in the event of an overload catastrophic failure of the cyanide extraction system.

2. The leach pad/sump/retention pond system must be designed such as to prevent any release of fluids outside the fenced perimeter or into the natural drainage system.

3. Adequate chemical cyanide neutralizers must be stocked on site to insure that a cyanide hazard can be neutralized and controlled in the event of any catastrophic failure or release of caustic fluids or materials.

4. All spent ore or chemical waste must be neutralized and tested prior to utilization in site development or stored in a dump.

5. Prior to reclamation the impervious pads in the cyanide leach system must be neutralized and ripped to prevent subsurface welling of hazardous fluids.

6. The natural drainage pattern must not be encroached upon or altered without BLM evaluation via an MPO amendment.

7. Cut banks greater than 3 ft must be avoided in roads or leach pad platform areas. All standing banks must be beveled to 1 to 2 (rise to run) on reclamation.

8. All construction must be designed to be substantially removable on reclamation. All equipment, constructions and hardware will be removed on reclamation.

9. On termination of operations the BLM must be notified and reclamation procedures commenced within 30 days.

Subject to compliance with the submitted Mining Plan of Operations and these stipulations the proposed MPO is approved. This decision is issued without prejudice.

As specified in 43CFR 3809.17(a) at any time during operations under an approved Mining Plan of Operations the authorized officer or the operator may initiate a modification of the plan detailing any necessary changes that were unforeseen at the time of filing of the plan of operations.

You have the right of appeal to the Arizona State Director, Bureau of Land Management in accordance with 43 CFR 3809.4. If you exercise this right, you appeal accompanied by a statement of reasons and any arguments you wish to present which would justify reversal or modification of the decision must be filed in writing at this office within 30 days after the above date. This decision will remain in effect during appeal unless a written request for a stay is granted.

Sincerely,

WILLIAM K. BARKER

William K. Barker
District Manager

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

1. Information from: Richard Barnard

   Address: 5959 No. Yuma Mine Rd., Tucson, AZ 85743, Ph. 744-2208

2. Mine: OLD YUMA

3. No. of Claims - Patented

   Unpatented 12 - Comet #1-12

4. Location: Ina Rd. west of I-10, south on Wade Rd. approx 0.7 mi, about 2 miles by dirt road.

5. Sec 9 Tp 13S Range 12E

6. Mining District Amole

7. Owner: Consolidated Mining & Milling owns Comet #2-12. Leases Comet #1 from Southwest Mineral Associates.

8. Address: 5959 No. Yuma Mine Rd., Tucson, AZ 85743

9. Operating Co.: Consolidated Mining & Milling, Ltd.

10. Address:

11. President: L. Arden Miller

12. Gen. Mgr.: Richard Barnard

13. Principal Metals: Gold

14. No. Employed: 2-4

15. Mill, Type & Capacity: None

16. Present Operations: (a) Down ☐ (b) Assessment work ☒ (c) Exploration ☒
    (d) Production ☒ (in 30 days) (e) Rate Agglomerate 50 tpd.
    500 tons on pad.

17. New Work Planned: 50' X 50' pad. - liner possible. Membrane type. Merrill-Crowe precipitation. Will work tailings - 3000 tons. Est. 6 mos. supply.

Date: March 28, 1984

(Signature) (Field Engineer)

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

1. Information from: Mr. L. Arden Miller

   Address: c/o Southwest Mineral Associates

2. Mine: OLD YUMA (Pima County) 3. No. of Claims - Patented ____ Unpatented 1 (Comet)

4. Location: Ina Rd. west of I-10, south on Wade Rd approx. 0.7 miles, about 2 miles by dirt road.

5. Sec 9 Tp 13S Range 12E 6. Mining District Amole

7. Owner: Southwest Mineral Associates (Phone: 861-1830)

8. Address: 2929 W. Northern Ave., Phoenix, AZ 85021

9. Operating Co.: Same

10. Address: ____

11. President: Richard Bideaux 12. Gen. Mgr.: L. Arden Miller (geologist)

13. Principal Metals: ____ 14. No. Employed: 2-4

15. Mill, Type & Capacity: ____

16. Present Operations: (a) Down ☐ (b) Assessment work ☐ (c) Exploration ☒
    (d) Production ☐ (e) Rate ____ tpd.

17. New Work Planned: Plan to drift southerly on the first level and north & south on the 2nd (bottom?) level.

18. Miscl. Notes: One 45° decline about 305 feet long is being rehabiliated. Began work summer 1982. Mine equipment and development appears to be in excellent condition. Immediately north of the decline is a glory hole that has caved to the first (100) level.

    Southwest Mineral is interested chiefly in mining wulfenite and vanadinite as mineral specimens. Mr. Wayne Thompson is Vice President.

Date: December 30, 1982

M W Greeley
(Signature) (Field Engineer)

Old Yuma Mine file card made

Taylor

Office of State Mine Inspector

705 West Wing, Capitol Building
Phoenix, Arizona 85007
602-255-5971

STATE MINE INSPECTOR
DEC 11 1983

NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with Arizona Revised Statute Section 27-303*, we are submitting this written notice to the Arizona State Mine Inspector (705 West Wing, Capitol Building, Phoenix, Arizona 85007) of our intent to start/stop (please circle one) a mining operation.

COMPANY NAME Bill Hawes Minerals + Fossils

CHIEF OFFICER Bill Hawes Jr.

COMPANY ADDRESS 416 W. McNeil Phnx, Az. 85041

COMPANY TELEPHONE NUMBER 276-4958

MINE OR PLANT NAME Old Yuma Mine

MINE OR PLANT LOCATION (including county and nearest town, as well as directions for locating by vehicle)

Sec 9 R12E T13S Comet Claim #1 Pima Co., Tucson I-10 to Ina Rd. west to Wade Rd. South to intersect. of Yuma Mine Rd + Picture Rocks Rd. (over

TYPE OF OPERATION underground mine PRINCIPAL PRODUCT gold

STARTING DATE 1/84 CLOSING DATE N/A

DURATION OF OPERATION N/A

PERSON SENDING THIS NOTICE Bill Hawes Jr.

TITLE OF PERSON SENDING THIS NOTICE owner

DATE NOTICE SENT TO STATE MINE INSPECTOR 12/8/83

*A.R.S. Section 27-303 NOTIFICATION TO INSPECTOR OF BEGINNING OR SUSPENDING OPERATIONS: When mining operations are commenced in any mine or when operations therein are permanently suspended, the operator shall give written notice to the inspector at his office prior to commencement or suspension of operations.

A MC 94793 (952)

July 1, 1980

Mr. Richard L. Jones
117 W. 10th Street
Casa Grande, Arizona 85222

Dear Mr. Jones:

This letter is to identify the serial number we have assigned to your mining claim location notice filed in this office on February 1, 1980.

Serial Number	Name of Claim
A MC 94793	Comet

Please refer to the claim name and the serial number in any future correspondence.

A photocopy of your recorded Affidavit of Labor Performed or Notice of Intent to Hold for the 1979-1980 assessment year should be filed in this office on or before December 30, 1980. To be acceptable, the affidavit must show the work done during the period noon September 1, 1979 to noon September 1, 1980. No fee is required.

Sincerely,

/s/ Robert L. Peterson

Robert L. Peterson
Chief, Branch of Records
and Data Management

Enclosure:
Regulations 43 CFR 3833

BAhdarn:nlg 7-1-80

A MC 94793

RECEIVED
B.L.M. AZ STATE OFFICE

FEB 1 1980

10:00 A.M.
PHOENIX, ARIZONA

U.S. Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona

Gentlemen,

Please find enclosed $5.00 to record the Comet Mining claim along with a copy of the location notice including a map of the claims location.

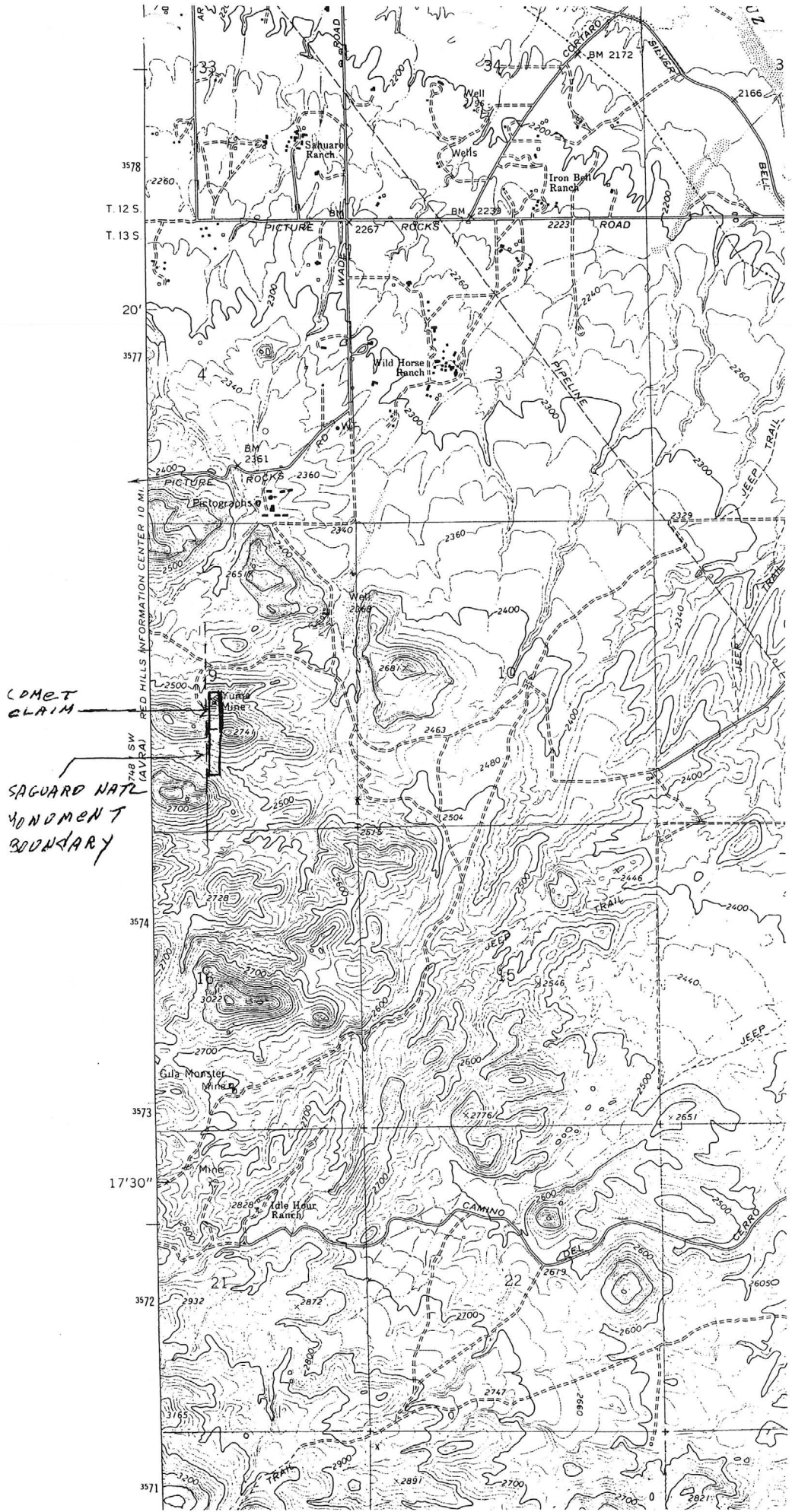
Also enclosed is a copy of affidavit of performance of annual work on the Veta Grande Claim AMC 31724. I have already filed a copy of this with your office on 12/27/79 but the book and page number of the county recorder was not furnished at that time. Book 1138 Page 413 was assigned to this instrument.

filed
the 480
with
31724.
rlg

Yours truly,

Richard L. Jones

Richard L. Jones


COMET CLAIM
SAGUARO NAT'L MONUMENT BOUNDARY
Saguaro Ranch
Wells
Iron Bell Ranch
Wild Horse Ranch
Pictographs
Yuma Mine
Gila Monster Mine
Mine
Idle Hour Ranch
PICTURE ROCKS ROAD
SILVER BELL ROAD
CORTARO
PIPELINE
JEEP TRAIL
CAMINO DEL CERRO
RED HILLS INFORMATION CENTER 10 MI.
T. 12 S.
T. 13 S.
17'30"
20'

B.L.M. AZ STATE OFFICE
FEB 1 1980
10:00 A.M.
PHOENIX, ARIZONA

State of Arizona
County PIMA } ss

I hereby certify that the within instrument was filed and recorded
on DEC 27 1979 - 3 05 PM
in Docket 6183
at Page 959
at the request of Richard L. Jones
In witness whereof I have hereunto set my hand and seal.

COUNTY RECORDER PIMA COUNTY ARIZONA

JOE BEDARD
County Recorder
Deputy County Recorder

Fee No. 153758

Compared
Photostated
Fee 3.00

When recorded mail to:

LOCATION NOTICE

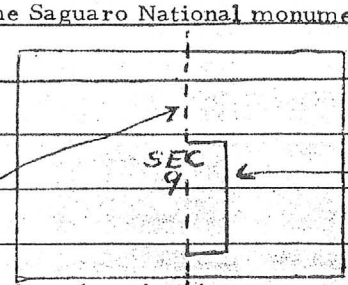
Lode Mining Claim

This mining claim, the name of which is the COMET, FORMERLY YUMA MINE, mining claim, was located by the undersigned Richard L and Helen Jones on the 27th day of December 19 79

This claim is 1500 feet long and 600 feet wide, and the point of discovery is 350 feet from the North end and 1150 feet from the South end of this claim.

The general course of this claim is from North to South

This claim is situated and located in the Amole Mining District, in Pima County, State of Arizona, about ½ one half mile in a southerly direction from Picture rocks retreat in the East center ½ of section 9, Township 13 South, Range 12 East abutting the boundary (east side) of the Saguaro National monument. OLD WORKINGS ON CLAIM



Dated and posted on the ground the day and year first above written.

E. K. Richardson WITNESS

Richard L. Jones
Helen M. Jones
117 W 10th ST
CASA GRANDE, ARIZONA
85222

Ph+ Old Yuma (f) Pima

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

TUCSON RESOURCE AREA OFFICE
675 N. FREEMAN
TUCSON, ARIZONA 85748
(602) 670-5320

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
3809
MP091-P-001

January 13, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DECISION

Mr. Richard A. Bideaux	:	Plan of operations
Arizona Exploring & Mining Company	:	MP091-P-001
710 West Bangalor Drive	:	Not Approved
Oro Valley, Arizona 85737	:	

On November 8, 1990 the Bureau of Land Management (BLM) received from Arizona Exploring & Mining Company (AE&MCo) a plan of operations filed under the authority of the 43 CFR 3809 Surface Management Regulations. Three addenda to AE&MCo's plan were subsequently submitted; the last addendum was received on October 16, 1991.

In accordance with 43 CFR 3809.1-6 your plan of operations (MP091-P-001) is not approved for the following reasons:

1. The construction of new roads and other surface disturbing activities at the Old Yuma Mine as proposed in MP091-P-001 would cause unnecessary or undue degradation because AE&MCo does not have documented legal access to the subject mining claims. Without legal access, there is no assurance that AE&MCo could complete the reclamation phase of the operation as required under 43 CFR 3809.1-5(5).

2. In 1984 Consolidated Mining & Milling, LTD, et al. brought suit against Saguaro National Monument and Mr. & Mrs. L. G. Lefler regarding access to the Old Yuma Mine (Civ 84-315 TUC ACM). The District Court found that legal access was not provided by the road which crossed the Saguaro National Monument and the Lefler's property. Other private property owners with land adjacent to the Old Yuma Mine provided written notice to the BLM on December 20, 1991 that AE&MCo has not secured legal access across their land.

1. Old Yuma Mine
2. Amole District, Yuma County, Arizona
3. T. N. Stevens
4. Messrs. Stone and Hernon
5. Visited sometime in April 1944
6. Lead-gold
7. No study of the property was made at this time due to the fact that it could give no immediate production and under present conditions required too much exploration. Under right conditions it justifies a detailed study with view to further exploration to determine if commercial sulphide orebodies may occur.
8. ———

* * * * *

THE EAGLE-PICHER MINING & SMELTING COMPANY
MIAMI, OKLAHOMA

INTRA-COMPANY CORRESPONDENCE

TO Grover Duff - Tucson Office

DATE April 6, 1951

FROM John W. Chandler - Miami Office

SUBJECT: Exploration Work

Dear Grover:

We are presently compiling a record of all the mines and prospects which we have examined for the Company during the past 10 years.

Starting with 1940, and listing the work done by years, such as 1940, 1941, 1942, etc., we would like to have the following information tabulated:

1. Name of property
2. Location - (State and County)
3. Who it was submitted by
4. Who made the examination
5. Time spent on the examination
6. Metals involved
7. General conclusions drawn from examination
8. Remarks - Under this heading could be shown whether we have done drilling or any other work in addition to the examination. Give brief outline. If the property subsequently became a mine unit and was operated so state.

We do not have a complete file in this office on all properties examined by the Company and we will combine your report with the one being made up from our files to make the final report complete. I would appreciate it if you could put someone on this work until it is completed, sending me three copies of your tabulation.

Best regards,

Jack.

John W. Chandler.

JWC/jm

4-25-51 - Mr. Chandler will send us a list of the properties on which they have reports in their files, and we will then send him the information on the others.

GJD

ARIZONA DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

July 8, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Old Yuma Mine (Pima County) lead, molybdenum, vanadium
(Property) (ore)

PHOENIX, ARIZ. JUL 8 7-PM 1958

RETURNED TO WRITER

Unknown at Address

above property which we would like to have

ine Owner's Report form with as complete detail

of reports, maps, assay returns, shipment returns

ot sent us before and which might interest a

t the property.

Mr. Grady Wilson
~~102 W Lincoln St.~~
Tucson, Arizona

Frank P. Knight

FRANK P. KNIGHT,
Director.

Enc: Mine Owner's Report

USBM "U" File states vanadium Low

see - Book V-VII - A.L. Flag vanadium reports

copy in book

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
518 TITLE AND TRUST BUILDING
PHOENIX, ARIZONA

May 20, 1942

REPLY TO

Copy in book

We have submitted your Mine Owner's Report to Mr. G. Donald Emigh, who is representing the U. S. Vanadium Corporation, with present headquarters at the Pioneer Hotel, Tucson, Arizona as being one of the properties from which vanadium production may be obtained.

The following item will explain our reason for so doing:

> The U. S. Vanadium Corporation has been designated by the Metals Reserve Company to increase the production of lead vanadates and they are working in the southwest.
>
> G. Donald Emigh, Pioneer Hotel, Tucson, is their representative, and Arthur L. Flagg, 29 W. Holly Street, Phoenix, is their field manager.
>
> They are seeking small vanadium properties and are ready to handle them on almost any kind of a deal except actually buying properties. They will put money into development, they will lease, they will build small mills, they will work out processes, they will co-operate with the man to develop his own property. They will pay premium prices for that which they get. They will do almost anything and everything designed to bring out increased vanadium production.
>
> An office is going to be established in Tucson and we will let you know the address as soon as we get it. Any occurrences of lead vanadates should be promptly reported to either Mr. Emigh or Mr. Flagg, or anyone who has vanadium properties should be referred to them.

We would suggest that you contact these parties at once and if you can furnish any information in addition to that which occurs in your Mine Owner's Report on file with us that you do so at once. Please advise us of your action.

With best wishes and hoping you get your property into early production, I am

Yours very truly,

J. S. Coupal

J. S. Coupal,
Director

JSC:LP

ED PASTOR
2ND DISTRICT, ARIZONA

LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-0302
(202) 225-4065

Congress of the United States
House of Representatives
Washington, DC 20515-0302

FOR IMMEDIATE RELEASE:
Tuesday, January 14, 1992

CONTACT: Lori Arguelles
(202) 225-4065

WASHINGTON-- Congressman Ed Pastor (D-AZ) and Senator Dennis DeConcini (D-AZ) expressed their delight with the Bureau of Land Management's rejection of a plan to activate a claim at the Yuma Mine, adjacent to Saguaro National Monument West.

"The Saguaro National Monument West is one of Tucson's crown jewels. We need to do everything we can to protect and preserve this pristine land," said Pastor. "I'm pleased the BLM has responded to our request and recognized the importance of protecting the Monument, especially from the dangers of mining."

"I'm pleased to see the BLM taking a leadership role with this issue by denying the request to reopen the Yuma Mine," said DeConcini. "The decision takes a major step toward preserving this land."

Congressman Pastor and Senator DeConcini had written to the BLM in late December asking the BLM to reject the proposal to reopen the Yuma Mine, located east of the Monument. The move prevents any mining claims from being carried out on the land. A local man's efforts to activate a gold mine claim on the land led to the request by Pastor and DeConcini.

"This is a victory for the environmentally sensitive Saguaro National Monument and the land surrounding it," said Pastor. "It's also a victory for people who live in the area."

"Congress must now make sure this is a long-term victory," said DeConcini, "by fighting to make sure federal legislation is enacted to include the Yuma Mine land in the boundaries of the Monument."

In order to ensure further protections for the Monument, Pastor and DeConcini will be introducing legislation in the House and Senate that will expand its boundaries in order to protect it from external threats such as claims being staked at the Yuma Mine.

-30-

You have the right to appeal to the Arizona State Director, Bureau of Land Management, in accordance with 43 CFR 3809.4. If you exercise this right, your appeal, accompanied by a statement of reasons and any arguments you wish to present, which would justify reversal or modification of the decision, must be filed in writing to the Tucson Resource Area Office, 675 North Freeman Road, Tucson, Arizona 85748, within 30 days after the date of this decision. This decision will remain in effect during appeal unless a written request for a stay is granted.

Donald P. Ducote
Acting Area Manager
Tucson Resource Area

*Old [illegible]ma Mine Summary

The following figures have been compiled after careful study and estimation of this property during the authors association with the leasser now operating the mine. No attempt is made to give a detailed report at this time. The author has sufficient evidence that the claims made for tonnages present and values indicated are there, from past records, his own samples and measurments and smelter returns, are substan-

There are at present 5000 tons of ore on the dumps of the mine and 15,000 tons of ore actually blocked out in the mine. From figures available all of this ore will run at least 5% lead and $2.00 in gold. Actually the average is closer to 7% lead, $3.00 gold, $1.00 silver and $5.00 in combined molybdenum and vanadium. However, the ensuing calculations have been made on the basis of 5% lead and $2.00 gold to assure the minimum operating limit.

It is possible to concentrate this ore by gravity methods. With careful operation it should be possible to effect a recovery of 70% of the values. It is estimated that a concentration ratio of 6 to 1 could be maintained. The concentrate produced would run abut 21% lead and 0.24 oz. gold. The following figures were compiled by the American Smelting and Refining representative and can be taken as what the smelter will pay for concentrates of this nature.

COPY

Lead Concts.

Assay	Au	Pb
Concts	0.24	21.0

Payments			
Gold	0.24 @ $32.31825		7.76
Lead	21.0		
	1.5		
	19.5 --	390 lbs Pb	
Less 10%		39	
Payable lead		351 " " @ $0.0494	17.34
Total			25.10

Deductions;

Base on $15.00------	$3.50	
Additional	1.01	
Total	4.51	4.51
F. O. B. Smelter		20.59

Freight, Tucson ---	3.10	
10% H_2O	0.31	
Switching	0.08	
TotalRR	3.49	3.49
Net before premium		17.10
Premium;		
351 lbs @ 0.0275		9.65
Net return after smelting and frieght/ton conct.		$26.75

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Mar 15, 1942.

The following figures have been compiled for the comparison of royalties received by the owner of the Old Yuma Mine from concentrated ores and from the direct shipment of mine ore. The calculations are made on two types of ore. The high grade ore has been chosen of that value because it is thought that by very carefull and selective mining a limited tonnage of that grade could be produced. The lower grade ore is the minimum that could be mined and milled under the limited necessary capital expenditure warrented by the property. There is a considerable quantity of this type of ore available.

In calculating the head assays the following values were used; gold--$35.00/oz., silver ---$0.71/oz., lead ---$0.0825/lb. (this value includes the recently established premium)

Heads:	Au,oz	Ag,oz	Pb%		
	0.10	1.50	8.5		
Value	$3.50	$1.07	$14.03	Total, $18.60	

Payable values according to A. S. & R.;

Gold -- 100% @ $32.31825	$ 3.25
Silver - 1.5 - 1.0 -- 0.5oz @ $0.69	0.35
Lead -- 8.5-1.5 -- 7.0% less 10% --- 6.3% payable	
6.3%-- 126lbs lead @ $0.0494	6.22
Premium @$0.0275, 126# @ 2.75¢	3.37
Total payable value/ton	12.17

Deductions:

Smelter base rate	$ 3.50	
RR freight	2.20	
Moisture	0.07	
Switching	0.08	
Umpire	0.15	
Total deduction	6.00	6.00
Net smelter return per ton of ore		6.17
Royalty per ton @ 10%		0.62

Head	Au,oz	Ag,oz	Pb,%		
	0.060	--	5.0		
Value	$2.10	--	$8.25	Total head	$10.35

Payable values according to A. S. &R.;

Gold-- 100% @ $32.31825	1.94
Lead -- 5.0-1.5 -- 3.5 less 10% -- 3.15% payable	
3.15 % -- 63 lbs @ $0.0494	3.12
Premium, 63lbs @ 2.75¢	1.73
Total payable value per ton	6.79
Deduction; Same as for high grade ore	6.00
Net smelter return per ton of ore	0.79
Royalty per ton @ 10%	0.08

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Costs

The milling plant should not cost more than $7,500.00 installed. A crushing plant, a sizing unit, tabling unit, and a small storage bin are all that are needed. It is questionable if the plant would have to be housed to start with.

With a 6 to 1 concentration ratio the following costs are reasonable;

Dump ore;	Cost/ton ore	Cost/conct.
Load & haul	$ 0.50	$ 3.00
Milling	1.00	6.00
	1.50	9.00
Transfer cost/ton conct. to RR.car		2.00
Total		11.00
Base royalty @ 15%/ton concts.		3.01
Total cost/ton concts.		14.01
Smelter return		26.75
Cost/ton concts.		14.01
Net return on 6 tons dump ore		12.74
" " / ton dump ore		2.12

With 5,000 tons dump ore available there are $10,600.00 net available. Deducting the plant cost of $7,500.00 this would leave a net of $3,100.00.

The same costs would apply to mined ore, except that an additional $2.00/ton must be added. This would indicate that there was a $0.12 profit per ton mined.

It will cost about $7,500.00 to put the mine in shape to produce 25 tons of ore a day.

The Old Yuma Mine is 15 miles from Tucson. All except the last two miles are good road. The last two miles are poor but quite passable.

A mill site with a drilled well on it is available about three miles from the mine. The mill is about fourteen miles from Tucson.

A. Brodie Campbell

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FORM 3X 20M 1 49 [illegible] PNB

AMERICAN SMELTING AND REFINING COMPANY
EL PASO SMELTING WORKS

ORE SETTLEMENT

EL PASO, TEXAS 4-4-46
SMELTER LOT S-681
SHIPPER'S LOT -
CLASSIFICATION Cts.
NAME OF MINE Old Tuma Dump

BOUGHT OF Tucson Ore Milling Co.
ADDRESS 1187 East Speedway, Tucson, Arizona
SHIPPING POINT Tucson, Arizona

CAR No.	CAR INITIAL	WEIGHT IN AVOIRDUPOIS POUNDS GROSS	SACKS NO	SACKS WEIGHT	NET WEIGHT	MOISTURE %	DRY WEIGHT
34167	SP				55000	12.1	48345

Final Settlement

N. Y. METAL QUOTATIONS

Settlement Date	3-15-46	
B/L Date	3-12-46	
Silver	70.625	Cts. per oz
F'gn Silver	70.75	
Lead	$ 6.50	Per 100 lbs.
E. & M. J. Copper	11.650	Cts. per lb.

PREMIUM METAL CONTENT

Lead 9325 lbs.
Copper lbs.

PAYMENTS FOR METALS										VALUE	
	[illegible]		[illegible]	NET ASSAY	EQUIVALENT IN LBS.	PERCENT PAID FOR	NET PAID FOR		RATE	AMOUNT PER TON	AMOUNT TOTAL
[illegible]	.945	oz.					.945	oz.	32.31825	30.54	
Silver	2.235	oz.	.5	1.735			1.735	oz.	.69125	1.20	
Lead	20.305	%	1.5	18.805	376.1	90	338.49	lbs.	.049	16.59	
Copper	.09	%						lbs.			
Iron	8.6	Ins	39.6	-							
TOTAL PAYMENTS FOR METALS											48.33

DEDUCTIONS		DEBITS	CREDITS
BASE CHARGE: F. O. B. El Paso, for Metal Payments, not exceeding $ 15.00 per ton		3.50	
10 % of $ 33.33 excess over $ 15.00 per ton	Max.	1.50	
Handling Sacks Non dump car		.25	
Copper Deficiency			
Bullion Freight Tax 338.49 @ .0002		.07	

ANALYSIS			DEDUCTION	NET			RATE	
Insoluble	39.6	%	40.0		%	@	Cts.	
Silica	30.4	%			%	@	Cts.	
Iron	8.6	%			%	@	Cts.	
Mn	-	%			%	@	Cts.	
Lime	1.4	%			%	@	Cts.	
Zinc	8.2	%	7.0	1.2	%	@	30 Cts.	.36
Sulphur	4.1	%	2.0	2.1	%	@	25 Cts.	.53
Alumina	.5	%			%	@	Cts.	
As	.25	%			%	@	Cts.	
[illegible]	.18	%			%	@	Cts.	
Bi	-	%			%	@	Cts.	
TOTAL DEDUCTIONS								6.21
NET VALUE PER TON								42.12

				DEBITS	CREDITS
Total Value on	24.1725	Dry Tons @ 42.12	Per Ton		1018.15
Less Freight on	27.500	Wet Tons @ 3.70	Per Ton 111.00 + 3.33	114.33	
		Hauling Charge			
		Switching 2.48 + .07		2.55	
		Umpires		10.16	
		Hawley Lot 190 & 305		22.50	
Amount withheld pending receipt of Silver Affidavit					
Royalty 10%	86.86			86.86	
	86.48	Pd. 3-25-46		778.27	
	.38				
		BALANCE DUE SHIPPER		3.48	
Valuation for freight per wet ton $ 37.02				1018.15	1018.15

Made by _____ Checked _____ Correct _____ Approved _____

FORM 2A 50M 2-47 CAIRNS

AMERICAN SMELTING AND REFINING COMPANY
EL PASO SMELTING WORKS

ORE SETTLEMENT

EL PASO, TEXAS 2-26-47
SMELTER LOT 351
SHIPPER'S LOT
CLASSIFICATION Ore
NAME OF MINE Old Yuma Dump

BOUGHT OF Arthur N. Jacobs, Mgr. Tucson Ore Mg. Co.
ADDRESS P. O. Box 2667, Tucson, Arizona
SHIPPING POINT

CAR No.	CAR INITIAL	WEIGHT IN AVOIRDUPOIS POUNDS: GROSS	SACKS NO.	SACKS WEIGHT	NET WEIGHT	MOISTURE %	DRY WEIGHT
91592	SP				75020	2.9	72844

PROVISIONAL

N. Y. METAL QUOTATIONS

Settlement Date 2-11-47
B/L Date 2-6-47

Silver	90.0	Cts. per oz.
F'gn Silver	70.75	
Lead	$ 15.00	Per 100 lbs.
E. & M. J. Copper		Cts. per lb.

PREMIUM METAL CONTENT

Lead _____ lbs.
Copper _____ lbs.

PAYMENTS FOR METALS

ELEMENTS	ASSAY PER TON 2000 LBS.		DEDUCTED	NET ASSAY	EQUIVALENT IN LBS.	PER CENT PAID FOR	NET PAID FOR		RATE	VALUE: AMOUNT PER TON	VALUE: AMOUNT TOTAL
Gold	.07	oz.					.07	oz.	32.31825	2.26	
Silver	.5	oz.	no	pay				oz.			
Lead	6.5	%	1.5	5.1	102	90	91.8	lbs.	.1129	10.36	
Copper	.05	%	no	pay				lbs.			
TOTAL PAYMENTS FOR METALS											12.62

DEDUCTIONS

	DEBITS	CREDITS
BASE CHARGE: F. O. B. El Paso, for Metal Payments, not exceeding $ 15.00 per ton	4.50	
10 % of $ - excess over $ 15.00 per ton		
Handling Sacks		
Copper Deficiency		
Bullion Freight Tax 91.8 @ .00024	.02	

ANALYSIS			DEDUCTION	NET			RATE		
Insoluble	61.2	%	40.0	21.2	%	@		Cts.	1.06
Silica	55.6	%			%	@		Cts.	
Iron	6.3	%			%	@		Cts.	
Mn		%			%	@		Cts.	
Lime	2.0	%			%	@		Cts.	
Zinc	6.9	%	5.0	1.9	%	@	30	Cts.	.57
Sulphur	.1	%			%	@		Cts.	
Alumina	2.9	%			%	@		Cts.	
As	.17	%			%	@		Cts.	
Sb	.18	%			%	@		Cts.	
Bi		%			%	@		Cts.	
TOTAL DEDUCTIONS									6.15
NET VALUE PER TON									6.47

					DEBITS	CREDITS
Total Value on	56.422	Dry Tons @	6.47	Per Ton		235.65
Less Freight on	37.51	Wet Tons @	2.64	Per Ton 99.03 + 2.97 tax	102.00	
		Hauling Charge				
		Switching		3.10 + .09 tax	3.19	
		Umpires				
		Demurrage 2.20 + .07 tax			2.27	
					12.82	
Amount withheld pending receipt of Silver Affidavit						
Royalty 10%						
BALANCE DUE SHIPPER					116.37	
Valuation for freight per wet ton $ 6.28					235.65	235.65

FORM 24 50M 2-47 CAIRNS

AMERICAN SMELTING AND REFINING COMPANY
EL PASO SMELTING WORKS

ORE SETTLEMENT

EL PASO, TEXAS 2-28-47
SMELTER LOT 351
SHIPPER'S LOT
CLASSIFICATION Ore
NAME OF MINE Old Yuma Dump

BOUGHT OF Authur W. Jacobs, Mar., Tucson Ore Mg. Co.
ADDRESS P. O. Box 2667, Tucson, Arizona
SHIPPING POINT Tucson, Arizona

CAR No.	CAR INITIAL	WEIGHT IN AVOIRDUPOIS POUNDS: GROSS	SACKS No.	SACKS WEIGHT	NET WEIGHT	MOISTURE %	DRY WEIGHT
91592	SP				75020	2.9	72844

FINAL SETTLEMENT

N. Y. METAL QUOTATIONS

Settlement Date	2-11-47	
B/L Date	2-6-47	
Silver	90.0	Cts. per oz.
F'gn Silver	70.75	
Lead	$ 13.00	Per 100 lbs.
E. & M. J. Copper		Cts. per lb.

PREMIUM METAL CONTENT
Lead 5232 lbs.
Copper lbs.

PAYMENTS FOR METALS

ELEMENTS	ASSAY PER TON 2000 LBS.		DEDUCTIONS	NET ASSAY %	EQUIVALENT IN LBS.	PERCENT PAID FOR	NET PAID FOR		RATE	VALUE: AMOUNT PER TON	VALUE: AMOUNT TOTAL
Gold	.09	oz.					.09	oz.	32.31825	2.91	
Silver	.5	oz.	No Pay					oz.			
Lead	7.56	%	1.5	6.06	121.2	90	109.08	lbs.	1129	12.32	
Copper	.05	%	No Pay					lbs.			
TOTAL PAYMENTS FOR METALS											15.23

DEDUCTIONS

	DEBITS	CREDITS	
BASE CHARGE: F. O. B. El Paso, for Metal Payments, not exceeding $ 15.00 per ton	4.50		
10 % of $ .23 excess over $ 15.00 per ton	.02		
Handling Sacks			
Copper Deficiency			
Bullion Freight Tax 109.08 @ .00024	.03		

ANALYSIS			DEDUCTION	NET			RATE		DEBITS	CREDITS	
Insoluble	61.2	%	40.0	21.2	%	@	5	Cts.	1.06		
Silica	55.6	%			%	@		Cts.			
Iron	6.3	%			%	@		Cts.			
Mn		%			%	@		Cts.			
Lime	2.0	%			%	@		Cts.			
Zinc	6.9	%	5.0	1.9	%	@	30	Cts.	.57		
Sulphur	.1	%			%	@		Cts.			
Alumina	2.9	%			%	@		Cts.			
As	.17	%			%	@		Cts.			
Sb	.18	%			%	@		Cts.			
Bi		%			%	@		Cts.			
TOTAL DEDUCTIONS									6.18		6.18
NET VALUE PER TON											9.05

				DEBITS	CREDITS
Total Value on	36.422	Dry Tons @ 9.05	Per Ton		329.62
Less Freight on	37.51	Wet Tons @ 2.64	Per Ton 99.03 + 2.97 Tax	102.00	
		Hauling Charge			
		Switching	3.10 + .09 Tax	3.19	
		Umpires			
			Demurrage 2.20 + .07 Tax	2.27	
Amount withheld pending receipt of Silver Affidavit					
Royalty 10%	22.22			22.22	
	12.82				
	9.40		Pd. 2-26-47	115.37	
			BALANCE DUE SHIPPER	84.57	
				329.62	329.62

Valuation for freight per wet ton $ 8.79

FORM 3A 50M 1-47 BAIRNS

AMERICAN SMELTING AND REFINING COMPANY
EL PASO SMELTING WORKS

ORE SETTLEMENT

EL PASO, TEXAS 3-6-47
SMELTER LOT 351
SHIPPER'S LOT
CLASSIFICATION Ore
NAME OF MINE Old Yuma Dump

BOUGHT OF Arthur W. Jacobs, Mgr., Tucson Ore Mg. Co.
ADDRESS P. O. Box 2667, Tucson, Arizona
SHIPPING POINT " "

CAR No.	CAR INITIAL	WEIGHT IN AVOIRDUPOIS POUNDS: GROSS	SACKS NO	SACKS WEIGHT	NET WEIGHT	MOISTURE %	DRY WEIGHT
91592	SP				75020	2.9	72844

CORRECTION a/c SCHEDULE

N. Y. METAL QUOTATIONS

Settlement Date	2-11-47	
B/L Date	2-6-47	
Silver	90.0	Cts. per oz.
F'gn Silver	70.75	
Lead	$ 13.00	Per 100 lbs.
E. & M. J. Copper		Cts. per lb.

PREMIUM METAL CONTENT

Lead 5232 lbs.
Copper lbs.

PAYMENTS FOR METALS

ELEMENTS	ASSAY PER TON 2000 LBS.		DEDUCT	NET ASSAY	EQUIVALENT IN LBS	PER CENT PAID FOR	NET PAID FOR		RATE	VALUE AMOUNT PER TON	VALUE AMOUNT TOTAL
Gold	.09	oz.					.09	oz.	32.31825	2.91	
Silver	.5	oz.	no	pay				oz.			
Lead	7.56	%	1.5	6.06	121.2	90	109.08	lbs.	.1129	12.32	
Copper	.05	%	no	pay				lbs.			
TOTAL PAYMENTS FOR METALS											15.23

DEDUCTIONS

	DEBITS	CREDITS
BASE CHARGE: F. O. B. El Paso, for Metal Payments, not exceeding $ 15.00 per ton	3.50	
10 % of $ .23 excess over $ 15.00 per ton	.02	
Handling Sacks		
Copper Deficiency		
Bullion Freight Tax 109.08 @ .00024	.03	

ANALYSIS			DEDUCTION	NET		RATE			DEBITS
Insoluble	61.2	%			%	@		Cts.	
Silica	55.6	%			%	@		Cts.	
Iron	6.3	%			%	@		Cts.	
Mn		%			%	@		Cts.	
Lime	2.0	%			%	@		Cts.	
Zinc	6.9	%	5.0	1.9	%	@	30	Cts.	.57
Sulphur	.1	%			%	@		Cts.	
Alumina	2.9	%			%	@		Cts.	
As	.17	%			%	@		Cts.	
Sb	.18	%			%	@		Cts.	
Bi		%			%	@		Cts.	
TOTAL DEDUCTIONS									4.12
NET VALUE PER TON									11.11

				DEBITS	CREDITS
Total Value on	36.422	Dry Tons @ 11.11 Per Ton			404.65
Less Freight on	37.51	Wet Tons @ 2.64 Per Ton	99.03 + 2.97 tax	102.00	
		Hauling Charge			
		Switching	3.10 + .09 tax	3.19	
		Umpires			
		Demurrage	2.20 + .07 tax	2.27	
				29.72	
Amount withheld pending receipt of Silver Affidavit				115.37	
Royalty 10%	29.72	Paid 2-26-47		84.57	
	22.22	Paid 2-28-47			
	7.50			67.53	
		BALANCE DUE SHIPPER			
Valuation for freight per wet ton $ 10.79				404.65	404.65

Made by _____ Checked _____ Correct _____ Approved _____

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
OWNERS MINE REPORT

Date October 16, 1940

1. Mine Old Yuma Mine

2. Mining District & County A mole, Pima Co.

4. Location 17 miles W from Tucson

3. Former name Same

5. Owner Yuma Mining Co.

6. Address (Owner)

Lessee:

7. ~~Operator~~ Grady Wilson

8. Address (Operator) G. D. Tucson, Ariz.

9. President No. Corp.

10. Gen. Mgr.

11. Mine Supt.

12. Mill Supt.

13. Principal Metals Molyb. Van. Pb. Gold

14. Men Employed

15. Production Rate Not established

16. Mill: Type & Cap.

17. Power: Amt. & Type None

18. Operations: Present Property idle, lessee busy.

19. Operations Planned Install concentrating mill.

20. Number Claims, Title, etc. Seven unpatented lode claims on public domain.

21. Description: Topography & Geography On foothills, north slope Tucson Mts. 3 mi W. E. from Amole (Wasson) Peak.

22. Mine Workings: Amt. & Condition 1 shaft (incline) 1½compartment 300 ft depth. Drifting on 100' level 250' E, 200' W. One 200' level 250' E, 200' W, on 300' level 30' E. Many shallow workings 20'-30' on outcrop.

(over)

23. Geology & Mineralization Country rock, andesitic fissure vein, strike NE-SW. Both replacement rich fissure filling. Lead minerals predominate with gold and minor silver.

24. Ore: Positive & Probable, Ore Dumps, Tailings 17,000 Tons on dumps Av. 1% MoO_3
75,000 " showing in mine Av. 0.7% MoO_3
and 0.7% V_2O_5 - $4.00 per ton gold.

24-A Vein Width, Length, Value, etc.

25. Mine, Mill Equipment & Flow Sheet Proposed mill, crusher, rolls, screws, and tables.

26. Road Conditions, Route 5 miles off State h'way 84 at Cortaro. 4 miles graded, 1 mile fair for trucks and automobiles.

27. Water Supply Water on property limited. Abundant in valley of Santa Cruz. Three miles to drilled well 500 g.p.m. 200' vertical below mine.

28. Brief History Located about 1885- operated intermittedly. Produced considerable molybdenum during World War.

29. Special Problems, Reports Filed Will file Engineers Reports.

30. Remarks Values given for ore in mine based on 200 samples and other data. Many carloads shipped to smelter as lead gold ore.

31. If property for sale: Price, terms and address to negotiate. Financed to put in plant. Would consider sale.

32. Signed Grady Wilson.

33. Use additional sheets if necessary.

THE OLD YUMA MINE.

LOCATION:--14 miles northwesterly from Tucson. The route is over the Silverbell, a fine level, graded road for 11 miles, along the west bank of the Santa Cruz river, thence 2 3/4 miles to the mine. This last 3/4 mile is in the sandy bed of the canyon, all the balance is first-class for either heavy teaming or fast auto travel.

There is an abundance of wood for fuel--palo verde and iron wood, between the river and the mine. Water for camp use is now brought from a spring 3/4 mile away but indications are good for the development of a good supply near the mine.

FORMATION:--of this Amole range, as given in goverment reports, is tertiary volcanics. the Old Yuma ore bodies occur inthe contact of the porphyry and lime--the lime being so altered as to be scarcely recognizable. The Old Yuma has been twice visited by Frederick W. Horton, of the U. S. laboratory at Denver, who has made some very interesting and successful tests with the ores--by wet and dry concentration. The mineralization has evidently occured at several periods as the characteristic minerals--wulfenite, vanadinite and galena are often found seperately, filling fracture planes or replacing the lime stone. At one place in the stopes considerable copper appears but the bulk of the ore shows no copper whatever. Some 800 feet to the east of the main incline two shafts on parallel veins show some copper ore assaying over 20 %. West of the incline the cropings exposed by the grading for the road show quite a percent of galena. The vein extends east and west and the chain of hills, of which it forms the backbone, are stained black with the oxides of iron and manganese.

DEVELOPMENT:--The main incline has a depth of over 300 feet, following the ore at a dip of about 45 degrees to the south. There is a good showing of ore to the 200 level, where the grade of the incline was lessened and the ore was probably passed over. A smooth slip, having the appearance of a wall, was left as a roof, but at one place where several feet caved down it is seen to be vein matter carrying the usual minerals. Levels are run on the 100, 200 and the 300, that on the 100 extending for several hundred feet to the east and having raises and stopes connected by a vertical shaft with the surface, furnishing perfect ventilation and an easy outlet for ore. The incline is well timbered with railroad ties and fitted with track, skip and ~~bucket of a gasoline hoist~~. bucket and a gasoline hoist.

The width and character of ore varries--in places it occurs as pure crystals filling seams several inches wide , the entire workings are in vein matter the richer yielding from 5 to 30 percent of the rare mineral concentrates.

There are a number of other shafts, the principal being about 500 feet to the east of the incline, and having a level extending about 100 feet in the direction of the incline and lacking but little of connecting with the stopes. This level shows good ore all the way, increasing in quantity and quality as it approaches the incline. A number of other prospect shafts are sunk on the vein to the east, all showing ore. The last exposure of ore to the east is some 3,000 feet away, the croppings being continuous for that distance, and also to the west to the limits of the three full claims which are taken on the vein.

The property consists of five full claims, three on the vein and two adjoining on the side of the dip. A mill site is located on the spring, 3/4 mile away, of which a half interest is included with the property.

The nearest railroad station is Jaynes, on the main S. P. line, six miles away. but there is a siding two miles nearer. The power wires of the Tucson company extend to near Jaynes, as also the telephone,

P R E L I M I N A R Y T E S T

O L D Y U M A M I N E.

Sampling by Blanchard M. Snyder and A. L. Pellegrin of southern end of ore dump, 125 x 25 x 6 feet, 1,000 tons:

Silver,	1 oz,	$ .50	Molybdenum oxide, 1.86 %,		
Gold,	.33 "	7.20	at 60 cts pound,		$ 22.32
Lead,	5.95 % @2c	2.40	Vanadium oxide, .21 % @50c		2.10
Value in common metals,		$ ~~10.10~~ $ 10.10	Val. in rare metals,		$ 24.42

The above concentrated in the pan yielded 5.355 % in round numbers, 20 into one, these concentrates having a value of:=

Silver,	3.6 ozs,	$ 1.80.	Molybdic oxid,	22.6 % @ 60,	$ 271.20
Gold,	1.98 "	39.60	Vanadic "	3.17 @ 50,	31.70
Lead,	39.9 %,	16.00			
Value common metals,		$ 57.40.	Value rare metals,		$ 302.90

All values, per ton, ~~xxxxxxxx~~ $ 360.30, less freight, $ 15.==$ 345.30
Molybdenum contents alone, $27.10 ~~302.90~~, " " " $ 15. 256.20

Assuming the recoverable values in a ton of concentrates to be $ 300. it would represent $ 15. to the ton of dump ore. Allowing an expense of $ 5. per ton, the net recovery would be $ 10. per ton. The ground ore after concentration retains $ 5.20 per ton in gold, assuming a recovery of $ 4. at an expense of $ ~~1.50~~, or $ 2.50 net, added to the $ 10. from concentrates makes $ 12.50 net recovery per ton. For the 1000 tons . . .$ 12,500.

The northern end of the same dump contains fully as large a tonnage of an apparently equally good grade, which should yield equal returns.

&&&

No sampling of the underground workings have been made but a careful preliminary examination seems to warrant an estimate of

2000 tons from the surface down to the 100level of a grade yielding 10 % o f concentrates.-
1000 tons from the 100 level to the 200 level,
2000 tons between the above workings and the east shaft, to the 200 level
5000 tons, giving ~~800~~ 500 tons of concentrates, @ $ ~~15.00~~ $ 3 00.======$ 150,000

Gold recovery from 5,000 tons @ 2.50,	12,500
Total recovery from 1000 tons dump, sampled,	12,500
Estimated yield of north end of dump,	12,500
Estimated returns from dump and developed ore in mine,	$ 187,500

The purchase price of the mine is $ 150,000, first payment of $ 20,000 in two years. From the shipments 15 % is to be paid, to apply as a credit on purchase price.

No estimate is made of ore below the 200 level. On the 200 level there is a good showing of ore but from that point down the incline was driven at a less grade and has lost the ore body.

Machinery now partly installed at the dump consists of 14" Blake crusher, two 14" rolls, Sutton & Steele dry concentrator, etc, To complete this plant, having a capacity of about 20 tons per 24 hours, including a second-hand Wilfley for recleaning the concentrates, would require $1,000 in cash--one third being paid on engines--and the labor and other expense of operation for six weeks, ample to produce one carload of concentrates$ 500.

2 payments on interest in lease, $ 300. surplus, $ 200. Total, $ 2,000.

Operation 60 days. —

Fuel oil, 1 gal per hour = 500 gals @ 7½ & haul	37.50 27.50	65.00
Hauling water, engine cooling		15.00
Lubricants, ~~Tools~~ Miscellaneous	5. 15.	20.00
Labor 1 mechanic 4.00 2 labor 6.00 60 d @ 10.00		600.00
		700.00
Trips to town		50.
		750.
Building supplies		500
Payment on engine (800)		250
		$ 1500.
Wet concentrator plant		400.
		$ 2000.
10 Ton Cyanide plant		500
		$ 2500.

Returns: —

20 tons Concentrates, MoO_3	20 % = 400 lbs @ 60¢	=	240.
V_2O_5	3 % = 60 " @ 35		21.
Pb	1000 " @ 2¢		20.
Ag	5 oz @ 50		2.50
Au	.5 " @ 20.		10.
			$ 293.50
Less Handling 6.50 freight 20. Sacks, 7.10			43.50
			$ 250.00
20 tons	@		$ 5000.00

15 % Royalty = 750.00
Operation 750.00
Cost of Run — — 1500.

5000/1500 = 3/1

Upper roll should be moved; or the bin moved so a self feeder could supply the 1st Roll. The 2d roll should be moved as close under the 1st as practicable.

Below 2d roll a shaking or revolving screen should make 2 sizes — through 20 or 24, and 20 or 24 to 10 — oversize (+10) being elevated to roll No 2. The 2 sizes of pulp should fall into separate bins and below should be two dry tables — the one handling coarse should have elevator to a bin above 2d roll (for regrinding by itself or with the regular ore.

Dry tables floor should be ample for storing quantity

Below dry floor, two agitators over 2 Wilfleys, from which tailings could flow to cyanide tanks (over amalgamated plates if desired). Amalgamation would also be practicable in the agitator.

Copy 5 Sect

Plan of Operation

There is a quantity of ore on the dump from the rich streaks in the stopes, of which it requires but 4 tons to make 1 of concentrates. The rest of the dump of several thousand tons — all from the vein — grades down to waste rock. At least one carload of 20 tons of concentrates can be made from the high grade ore on the dumps, when the richer parts would be selected as long as it was more profitable than to mine and raise new ore from the stopes — where one or two good miners should be kept stoping ore as a test of value and costs.

The first carload can be produced with the present dry machine alone by repassing product until up to grade. For future operations it would lessen costs to install an additional dry machine either below this one or alongside, with a belt elevator, to give ore a double treatment, continuously. This can be done at present by using a bin over the table, with an elevator, and repassing the pulp when desired — but a second table will double capacity of plant.

To produce the highest grade of product at least expense a wet table should be used — its location depending on water — in conjunction with it a cyanide plant to leach, if it is found profitable after amalgamation plate over the wet table.

Assays —

	Gold	Silver	Lead	MoO_3	V_2O_5	
Screenings (J)	.45	2.	17.			
Stope, shipping (J)	.51	1.1				
Vein matter (J)	.03	.8				
Vein " -P-	Tr	.5				
Copper Shaft P	.02	.8				Copper 2.35
Over slip in incline 200' P	tr	1.2		some	some	
Mill Test, 500 lbs. Heads	.75	.4	18.1	Fe 8.8 S.O. 50 11.2	1.7	
(3-4 = 1) Concentrate	.96	.6	46.5	24.9	3.54	
Amalgamated over plate — Heads	.15	.4				
Tests: — Ore Sent Dump	.04	1.6				Per cent of Concentra 8.5
Waste " "	.03	.4				2.
Loft & Drift to East (Grab dump)	.04	3.6				3.5
Lump	.06	.8				

TEST ON OLD YUMA MINE ORE.

Sampling by Blanchard M. Snyder & A. L. Pellegrin of southern end of ore dump--1000 tons--

Silver,	1. oz,	.50	Molyb. Ox,	1.36%	
Gold,	.36 "	7.20		@ 50 ct lb,	$18.60
Lead, 5.95 %	at	2. 2.40	Vanad. O,	.21%	2.10
Value in comon metals.	.	$10.10	Rare metals .		$ 20.70

The above by pan concentration gave 5.355 percent of product-in round numbers 20 into 1, these concentrates having a value of:---

Silver,	3.6 ozs	1.80	Molybdic oxide	22.6 % 50 c	$226.00
Gold,	1.98 "	39.60	Vanadic "	3.17 "	31.70
Lead, 39.9 %		16.00			
Value common metals		$ 57.40	Rare metals, ...		$ 257.70

Total market value per ton, $ 315.10
less freight, 15.
Net value $ 300.

1 ton concentrates, $ 300.
from 20 tons, per ton, $ 15.
1000 tons, $ 15,000. from concentrates.
Expense 5. per ton, $ 5,000, Net $ 10,000

Ground ore after concentration retains .26 oz gold, value $ 5.20
Recovery by cyanide, $ 4. at expense of $ 1.50, net, $ 2.50

Recovery from 1,000 tons in concentrates,	$ 10,000
" " " in cyaniding,	2,500
	$ 12,500

The northern end of the same ore dump contains as large tonnage of apparently as good a grade, and should produce as large returns.

No sampling of the mine workings have yet been made but a careful preliminary examination seems to warrant an estimate of
3,000 tons from surface down to the 100 level, yielding 10 % concentrates
1,000 " " 100 level to the 200, "
3,000 " between above workings and east shaft, down to 200 level
5,000 tons giving returns in concentrates of 500 tons, $ 150,000

Assays —

	Gold	Silver	Lead	MoO_3	V_2O_5	
Screenings (J)	.45	2.	17.			
Stope, shipping (J)	.51	1.1				
Vein matter (J)	.03	.8				
Vein " -P-	Tr	.5				
Copper Shaft P	.02	.8				Copper 2.35
Over slip in incline 200' P	tr	1.2		none	none	
Mill Test, 500 lbs. Heads	.75	.4	18.1	Fe 8.8 Sa 50 11.2	1.7	
(3-4 = 1) Concentrate	.96	.6	46.5	24.9	3.54	
Amalgamated over plate — Heads	.15	.4				
Tests: — Ore Sent Dump	.04	1.6				Per cent of Concentra 8.5
Waste " "	.03	.4				2.
Raft & Drift to East (Grab dump)	.04	3.6				3.5
Dump	.06	.8				

ORES TESTED
IN LABORATORY OR
MILL QUANTITIES

ORES PURCHASED
IN ANY QUANTITY FO.

SOUTHWESTERN ORE WORKS

PLANT, 292-302 S. MAIN ST.
OFFICE, 37 S. STONE AVENUE

TUNGSTEN AND OTHER RARE METALS A SPECIALTY

TUCSON, ARIZONA, _____ 1914.

MARKET CONDITIONS.

Copy

Mr. Horton, of the U. S. Laboratory, at Denver, informed the writer that a ton of choice, hand-sorted molybdenite was recently sold to an eastern chemical works for $ 3,000. Molybdenite contains 60 % of the element molybdenum as against 26 % in wulfenite, but its other component, sulphur, is more difficult to eliminate than the lead in the wulfenite. In the Advance Chapters on the production of metals in 1913, the government bulletin mentions a price of $1586. per long ton as paid in Queensland, and $ 12. per unit for 95 % ore-- $ 1040. per ton for molybdenite by a French firm. For wulfenite an eastern firm states that about $ 1. per pound of contained molybdenum would be paid, with smelters' price for the lead also, this for a 25 % ore. Actual sales of a carload of low grade mixed wulfenite has been made to an eastern firm at about 60 cents per pound for contained molybdic trioxide.

American firms do not usually pay for the vanadium contained in a molybdenum product, but European buyers do, and at the Yuma mine much of the vanadium mineral occurs by itself and can be mined and then milled seperately.

The seperation of the molybdenum and vanadium as salts of ammonium or sodium, or of their oxides in a commercially pure form, or their reduction in an electric furnace into ferro alloys, offers no great difficulty nor expense, and would result in a much more extended market and increased price.

ORE VALUES:--The development of the Old Yuma mine was undertaken with the object of exploiting its godd, silver and lead values, the rarer minerals not having then their present value or importance. While the present holders of the property have secured assays ~~ig~~ high in gold, one sample of the richer ore in the stope giving over an ounce other samples have given low results and while no doubt the gold add silver would pay all mining and working expenses these metals are considered by-products and the main attention devoted to the rare minerals--of vanadium and molybdenum. As but a few small shipments were made to the smelter the main dump contains several thousandtons of material, all from the vein but not all of which would pay to treat. On this dump is a pile of some 50 tonsof screenings from ore from the richer ore in the stopes. A sample consisting of 340 pounds of this was used for a milling test over a Sutton & Steele dry jig. ~~The~~ This sample assayed:--

Gold, .75 oz; Silver, .4 oz; Lead, 18.1 %; Molybdenum trioxide 11.2 %; Vanadium pentoxide 1.7 %

90 pounds of concentrates produced assayed:--and had the following approximate market value:--

gold,	.96 ozs,	value	$ 19.20
silver,	.6 ozs	"	.30
Molybdenum oxide,	24.9 %, at 60 cents per lb,		298.80
Vanadium oxide,	3.54 % at 50 cts	"	35.40
Lead,	46 %, at 2 cents, (2.5)		27.60
	Value per ton,		$ 381.30

While this showed an extraction of but 33 % of the goldand 60 % of the rare minerals a repassing of the pulp over the same dry jig gave 32 lbs of a good middling product and the tails now showed scarcely any free mineral in the pan, showing the adaptability of this ore to dry concentration--- a medium grade ore of say 10 % mineral content would no doubt give clean separation the first time over the jig. It was designed to use the dry process at the mine simply to concentrate the values for transportation to the river where a good wet table would be used to make the highest grade product possible.

A sample of the leads treated in an amalgamated copper pan assayed but .15 oz in gold, showing an extraction by this method of 80 %. Cyanide tests were not made although it would seem that this process would be peculiarly adapted to recovering the gold and silver from the tails from the treatment for the rare metals.

No systematic sampling has been done, but from the large dump a general sample was taken and sorted into two grades. The selected on panning gave 8.5 % of concentrates, and the refuse 2. %. From the dump at the first slaft to the east, a sample gave 3.5 % of concentrates. These tests, incomplete as they are, indicate good values in suffecient quantities and also the practicability ofna good extraction by simple means into a marketable product.

PLANT PARTLY INSTALLED:--consists of a 14 inch Blake crusher, 2 sets of 14 x 24 McCullough disc pulverizers, 1 Sutton & Steele dry jig or concentrator; ore bin below the crusher, shafting, pulleys, etc. Ascreen and an elevator to return the oversize is on hand also a 2 H. P. gas engine and a 4 x 6 Dodge crusher. It was designed to install a 20 or 30 H. P. engine to run the plant. This plant is so placed near the dump that cars can run and discharge on a platform at the crusher.

As before stated the main incline is equipped with track, cable, skip, buckets and a gasoline hoist. There is also a large ~~ca~~ covering blacksmith shop, tools, etc.

A. L. Pellegrin

Tucson, Ariz, Nov. 20, 1914.

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American firms do not usually pay for the vanadium contained in a molybdenum product, but European buyers do, and at the Yuma mine much of the vanadium mineral occurs by itself and can be mined and then milled seperately.

The seperation of the molybdenum and vanadium as salts of ammonium or sodium, or of their oxides in a commercially pure form, or their reduction in an electric furnace into ferro alloys, offers no great difficulty nor expense, and would result in a much more extended market and increased price.

PRELIMINARY TEST

ON OLD YUMA MINE.

Sample taken from ore dump at main incline, southern end, 125 x 25 x 6 feet in average depth, containing about 1,000 tons:----

Silver,	1. oz,	$ .50,	Molibdic oxide,	1.86 %,	
Gold,	.36 "	7.20	@ 60 cts per pound,		$ 22.30
Lead,	5.95 % @ 2¢	2.40	Vanadic oxide, .21% @ 50 ¢		2.10
Value in common metals,		$ 10.10	Value in rare metals,		$ 24.40

A concentration test in the pan of the above yielded 5.355 percent of product----in round numbers 1 ton in 20---containing values of:---

Silver,	3.6 ozs,	$ 1.80,	Molibdic oxide,	22.6 %,	
Gold,	1.98 "	39.60,	@ 60 ¢ per pound,		$ 271.20
Lead,	39.9 %, @ 2,	16.	Vanadic oxid,	3.17 % @ 50,	31.70
Value in common metals,		$ 57.40	Value in rare metals,		$ 302.90

All above values, per ton,		$ 360.30
Less hauling and freight,		20.
		$ 340.30
Molybdenum contents alone,		$ 271.20
Less hauling and freight,		20.
		$ 251.20
Extraction of gold,	$ 32.	
Less expense,	2.	30.00
		$ 281.20

Assuming the net value of a ton of concentrates to be $ 300., and 20 tons of ore to enter into one of concentrates, the recovery would be $ 15. per ton of ore; allowing an expense of $ 5. the net product is $ 10.

The ground ore or tailings still retain $ 5.20 in gold per ton, and assuming a recovery of $ 4. at an expense of $ 1.50, or $ 2. net, this makes a total net recovery of $ 12.50 per ton, for the 1000 tons--$ 12,500

The northern end of the dump apparently contains a larger tonnage of fully as good an average grade, an estimated total net value of ;- $ 25,000

The main incline has a fepth of 300 feet, with levels on the 65, 100. 200 and 300. These levels have a lenght of from 100 to 200 feet, and the 100 both to east and west are connected with the surface by vertical shafts. All these workings down to the 200 are in ore of varrying grades no systematic sampling has been done but a careful examination seems to warrant an estimate of ;----in terms of a grade yielding 10 percent of concentrates:-----

2000 tons, from the surface down to the 100 level,
1000 tons from the 100 level to the 200 level,
2000 tons from the above workings and the east shaft; to the surface.
5000 tons, yielding 500 tons of concentrates, at $ 300. === $ 150.000
Gold recovery from tailings @ 2.50, 12.500
Total recovery from dump, ($25,000 TOTAL) $ 187.500.

Purchase price of mine, $ 50,000; 15 % of product for two years, then a payment of $ 20,000 less royalties;- $ 10,000 each year for 3 years

Comment on Tests on Old Yuma Ore.

There is apparently some error in Table 1, The original ore must have assayed:-----

1A.-+1/2 mesh,	10.29 %	x .15	Mo,	1.5435 units Mo;	x 1.87	Pb,	19.2423
1B. -1/2 "	89.71 %	x .847	"	75.98437 "	"; x 2.92	"	261.9532
	100.	total Mo.		77.52787 "	total Pb.		281.1955

From which the assay of the ore according to the above is:---

Mo. .~~NNT~~ .775 %; Pb. 2.811 %

* * * * * * * * * *

In the series of tests the material thru 3/4 and on 1/2 (1A) was rejected. Why? It assays Mo. .15 %; Pb, 1.87 %, besides gold, and being already mined, crushed thru 3/4 and higher grade than 1D for example, it should be treated with the balance.

If the ore contains large crystals, it should at the start all be crushed thru 1/2, passed over a 20 mesh screen; the coarse jigged and the tailings recrushed thru 20 mesh and added to the first -20. If there are no large crystals in the particular lot being treated, the ore should all be crushed through the coarsest size screen that has been found to yield a considerable proportion of free crystals--say from 12 to 16 mesh. From now on the treatment should be as given in the Engineering Co.'s test: All the material sized into two sizes, (I believe a 40 would prove better than the 60 reccommended), the coarse run over a Wilfley, the tails re-crushed to pass the screen used and combined with the other thru, and this separated into sands and slimes and treated on Wilfleys.

These tailings, all -60, should now be treated with cyanide for the recovery of the gold and silver either by decantation or by filter-pressing;

According to the tests referred to there still remained some 60 % of the lead, although the extraction of the molybdenum was practically perfect--a very strange condition. It should now be possible to recover the larger part of the remaining lead--1.97 % in the low grade sample under treatment--

* * * * * * * * * * *

According to the summary, on Page 2, there was saved 83.08 % of Mo.
add to this that contained in the "reject" 16.92
a complete extraction, proved by tailings being barren,

Of the lead there was saved . . . . 33.03 %
to which add similar proportion in "reject" 2.3
a very poor total saving of . . . . 35.33 %

As in the flotation test the final tails still contained 1.8 % out of the 2.81 % it would indicate no advantage in employing flot. I believe that some modification of the flotation would give result. employing perhaps the gas, H2S, or direct fumes from roasted pyrites some alteration in the mechanical treatment.

* * * * * * *

In the test the concentrates assayed: Mo. 2.03 %
Pb. 24.84
Insol. 29.41

Figuring the Mo to lead molybdate and the balance of the lead t bonate, etc, and we have:---

Lead Molybdate, about	8.
" Carbonate, "	27.
Insol reported,	29.
Balance not reported,	36.7
	100.

The unreported contents are probably mostly iron and manganese oxides.

Should the selective flotation be a success the possible result would in each ton of above concentrates treated:----

Floated: 36 % of iron oxides, 720 lbs per ton,
27 % of lead carb, 540 " " "

and this product would assay about 30 % in metallic lead, (balance mostly iron and marketable. No doubt with good gold values.

The not floated would be: Lead molybdate, 8 % or 160 lbs per ton
Insoluble 29 % " 580 " " "

~~and this recalculated to percentages:~~ L M

and this recalculated to percentages would give:----

Lead Molybdate,	21.6 %
Insoluble,	78.4

This would be marketable, but there should be no difficulty in removing a large part of this insoluble either by careful concentration on tables or by flotation.

Should it not be feasible to make a separation of the lead molybdate from the carbonate, etc, in the finer sizes, by "selective flotation" the old, well-known process of fusion in reverberatory furnaces with an alkali, the lead being reduced to metallic form by proper amount of carbon and carrying down with it the gold and silver, and the molybdenum and vanadium combining with the alkali as a slag, could be followed profitably. For an alkali the "salt cake" sodium sulfate, a refuse of powder works and also of the desert borax refineries would be the cheapest. It would be used in its proper combining proportion or else in excess and reused until saturated. This sodium molybdate would be dissolved in weak acid and precipitated as oxide or else by the addition of an iron oxide in a form suitable for the electric furnace----there are a number of methods for the treatment of the crude sodium molybdate. The silica, unless removed, would interfere with therecovery, but some methods have been devised for overcoming its bad effects.

As the molybdenum sulphide brings so much more in the market, it should be feasible to have the final product in this form at a cost giving a profit.

* * * * * *

Returning to Table 1, the sample is given as containing:--

Mo. .775 % which would require of lead, to form the molybdate, about 2.1 %, and as the contents in lead are given as 2.81 %, of which but 40 % is saved, or 1.12 % the figures do not agree, as all the molybdenum is saved. However calculating the recovery to be 2 % of lead molybdate, 1.5 % of lead, .5 oz in silver and .1 oz gold per ton of average ore treated, the values would be about as follows:------

Lead molybdate,	2 %, or	40 lbs,	@ 50 cts,	$ 20.00
Lead,	1.5 % "	30 "	@ 4 "	1.20
Gold,		.1 oz,		2.00
Silver,		.5 "		.30
			Per ton.	$ 23.50

These figures serve, at least, for comparison; average ore yielding 1 % molybdate and $ 1. in gold, would figure back to $10. per ton, and average ore yielding .6 of one percent molybdate and $0.65 in gold would return about $ 6.60 per ton, or still a small profit above proper working costs.

* * * * * * * *

According to the summary on Page 2, 100 tons of the sample yielded 3.75 tons of concentrates assaying:----

Mo. 2.03 %
Pb 24.84 %

transposing these to minerals we have:----

Mo. 2.03 %, or 8 % molybdate to which add 1.3 % due to useless "reject" and we have 9.3 units of molybdate, or 186 lbs, @ 50 ¢ $ 93.00
Lead, 400 lbs, @ 4 ¢ 16.
$ 109.00 per ton

for the 3.75 tons, $ 411. or pere ton of original ore, $4.11
add recovered gold and silver, 2.00
Total recovery per ton original ore, , , $ 6.11

Such a recovery from the present tailings should yield a profit of at least one-half, and on ore from the mine of one-third, or $2. per ton net. The saving of the values in the form of concentrates requires but capable mill men: the turning of the concentrates into products commanding ready sale is the problem requiring careful working out of proceedure, cost and returns.

Recommendations.

While the Engineering company making the test is in high standing, there are some statements or results in their report that should be verified--as the complete recovery of molybdenum while the other identical (physically) lead minerals show a low recovery.

Another general sample of the tailings dump should be taken, and also one from the higher grade ore in the various workings in the mine of which there is a quantity available. Of each of these the sample should consist of a ton, be crushed to 1/2 mesh and samples of 25 pounds cut out for laboratory tests. These tests should be on lines mentioned in comment on the Salt Lake report--first of all determining if jig treatment of 2, 4, or 8 mesh would not give results, as this coarse product would be best for selective sulphidizing separation. Then besides the ordinary concentration on tables comparative flotation and cyanide tests should be made to determine the best mode of recovery of the gold and silver.

These tests being successful, they should be repeated with the ton lots over carefully adjusted Wilfleys, etc, and if properly conducted should give identical results with the laboratory ones. The cyaniding or flotation should also be conducted---in fact a complete mill run on each sample.

This part of the problem should present no difficulty, the present mill equipment is of the proper kind, lacking a fine re-grinding roll, or Ball mill, or a grinding pan would answer. Tanks for the cyaniding would have to be provided but this would be a separate unit and not necessarily expensive.

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The really difficult part of the problem is the recovery of the values from the concentrates. The mixing of all the ores from the mine has been inexcusible---the vanadium and molybdenum occurs generally separate and can be mined so, and there should be two bins at the top of the mill--a partition in the present bin would answer probably a short picking belt at the top of the bins would pay.

The various concentrating must necessarily make a product containing all of the lead minerals in the feed as the specific gravity is the same; some of the iron and manganese minerals will also be found in the coarser concentrates. It has been found that the molybdenum contents of these concentrates is very low and two methods can be employed. One is the chemical, fusion in reverberatory furnace with sodium or other alkali and carbon, which will reduce the lead to metal, collecting gold and silver in a lead bullion. The rare metals will be in a slag with the soda and are recovered by leaching and precipitation as oxides, and are marketable in that form or in a variety of other products.

The other method is by selective sulphidizing flotation and will probably only be practicable on the coarser sizes of product. This part of the problem requires careful study and experiments:---- different sizing, choice of reagent, strength of solution, time, mechanical means of agitation, etc, then the designing of an apparatus that will carry on the treatment continously--say a belt in a tank, admitting water or air current from below the canvas; with partitions at intervals to catch the different products as they raise, the final vanadium being discharged at lower end of belt.

Probably the best result would be secured by using several flotation machines so that strength of reagent and time could be adjusted in each step of operation, which could still be continous and automatic.