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

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UNITED STATES
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BUREAU OF LAND MANAGEMENT

Serial Number

MINERAL REPORT

VALIDITY EXAMINATION OF THE
DOROTHY B AND DOROTHY B #12
PLACER MINING CLAIMS

ALSO SEE
ORDER 9-15-99
FROM OFFICE OF
HEARINGS AND APPEALS

(Title)

LANDS INVOLVED

E½SE¼ Section 21; SW¼SW¼ Section 22;
NW¼NW¼ Section 27; and NE¼NE¼ Section 28
T6S R28E
Gila and Salt River Base Meridian
Graham County, Arizona
Containing 200 Acres, More or Less

BUREAU OF LAND MANAGEMENT CERTIFIED Matthew W. Shumaker REVIEW 028 MINERAL EXAMINER U.S. DEPARTMENT OF THE INTERIOR

Prepared By: Larry Thrasher, Matthew Shumaker, and David Taylor

Larry J Thrasher
(Signature)
Geologist
(Title)
7/15/96
(Date)

BUREAU OF LAND MANAGEMENT CERTIFIED Lawrence C. Thrasher 0087 MINERAL EXAMINER U.S. DEPARTMENT OF THE INTERIOR

Matthew W. Shumaker
(Signature)
Locatable Minerals Coordinator
(Title)
7/25/96
(Date)

David Taylor
(Signature)
Geologist
(Title)
7/18/96
(Date)

BUREAU OF LAND MANAGEMENT CERTIFIED Burren W. Clay REVIEW 001 MINERAL EXAMINER U.S. DEPARTMENT OF THE INTERIOR

Technical Approval:

(Signature)
Division Chief, NTC
(Title)
11/21/96
(Date)

Management Acknowledgement:

Margaret L Jensen
(Signature)
Gila Resource Area Manager
(Title)
December 20, 1996
(Date)

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SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A validity examination was conducted on two association placer mining claims, the Dorothy B #12 and the Dorothy B. These two claims cover approximately 200 acres within the Gila Box Riparian National Conservation Area, and are part of a block of 64 contiguous placer mining claims that cover a total of about 2,700 acres.

The subject claims were mapped and nine samples were taken for analysis; all exposures made by past exploration programs conducted by the private sector were sampled. Assay techniques for precious metal content included amalgamation, cyanidation, fire assay, and atomic absorption.

Assay results show an in-place value of no more than 12 cents per cubic yard. This is far below capitalization and operating costs. It is therefore concluded that these claims do not support any discoveries of valuable mineral deposits, meaning that a person of ordinary prudence would not be justified in the further expenditure of his labor and means, with a reasonable prospect of success, in developing a valuable mine. We, the geologists involved with this examination, therefore recommend that a contest for lack of discovery be brought against the two claims.

INTRODUCTION

Purpose

The purpose of this report is to document the validity examination of two contiguous association placer mining claims located at and near the confluence of Bonita Creek and the Gila River in Graham County, Arizona. One claim, called the Dorothy B #12, is approximately 40 acres in size and is in the southeast quarter of Section 21, T. 6 S., R. 28 E. The other claim, simply called the Dorothy B, is approximately 160 acres in size and is in portions of Sections 21, 22, 27, and 28, T. 6 S., R. 28 E. These claims are part of one contiguous claim block consisting of ~~64~~ 65 placer claims; most of the other ~~62~~ 63 claims are each approximately 40 acres in size, with a few being 20 acres. The location of the claim block, which covers nearly 2700 acres, is shown on Figure 1. The claim block was located in the mid 1960's and, as shown in Figure 1, straddles the boundary of the recently designated Gila Box Riparian National Conservation Area (RNCA), with the two subject claims being within the RNCA. This area was formally designated as an RNCA by the U.S. Congress as a part of the Arizona Desert Wilderness Act of November 28, 1990 (Public Law 101-628). This designation withdrew the area from mineral entry subject to valid existing rights. The purpose of this examination is to determine if such rights exist for the two subject mining claims.

The conclusions of this report are limited to the action prompting the report and should not be used for any purposes other than that for which they were originally intended.

Brief History of the Case

The area of the Dorothy B claims has been mined for placer gold since around the turn of the century. The target is generally very fine flakes of gold ("flour gold", or "gold dust") in the riparian alluvium and especially in older gravel terraces near the Gila River. Various prospecting and mining activities have occurred by lessors of the Dorothy B claims since their location in the mid 1960's. These activities range from simple gold panning and sampling operations to the construction of buildings for minerals processing in conjunction with the use of bulldozers, loaders, trucks, and a large trommel that has been sitting idle south of the 160 acre claim for about 15 years now. Historically, the general pattern of each operator's activities is to start mining aggressively, taper off dramatically, and then leave the site with or without equipment, and generally without reclamation or recovering any significant amount of gold. There has been no recorded production of gold or other precious metals from these placer claims in the 30 years that they have been in existence.

The lack of reclamation has resulted in two Notices of Noncompliance issued by the Safford office of the BLM to the claimant, Dorothy S. Braatelien of Safford, Arizona. Both of these notices are still in effect, and require that an approved plan of operations be in effect and a reclamation bond posted with the Safford BLM before any further activity involving mechanized equipment is conducted on any of the Dorothy B claims.

The designation of the area as an RNCA by congress requires that the Safford BLM develop a comprehensive management plan with the goal of conserving, protecting, and enhancing the resources and values of the area. A draft Interdisciplinary Activity Plan/Environmental Assessment (EA) for the RNCA has been prepared and distributed to the public for comment by the Safford BLM. Over 200 comments were received, and a final planning document is currently being prepared.

The Dorothy B claims in general, and the two subject claims in particular, are located by the main entrance to the RNCA. Mining activities in this area of high scenic, wildlife, and riparian values would thus be highly visible to the public. The EA noted that the area of the subject two claims is an ideal spot for picnic tables and associated facilities for the general public. The BLM feels that it can work with the claimant and operators to mitigate mining activities if mineral resources are present, but the BLM needs to establish the presence or absence of such minerals as part of its planning process.

A certified letter dated October 6, 1994 was sent to the claimant, Ms. Dorothy S. Braatelien, at the address recorded with the mining claims (P.O. Box 584 in Safford, Arizona) notifying her that a validity examination will be conducted on the 160 acre Dorothy B claim and the Dorothy B No. 12. The letter said the field work would begin the week of November 7, and provided her or an agent of her choice the opportunity to be present for the examination to point out discovery points, sampling sites, and any other pertinent features of the claims.

Ms. Braatelien responded by calling Mineral Examiner Larry Thrasher, BLM Geologist in Safford, to say that she is experiencing medical problems that preclude her from going outside and that she has no agent to represent her. Thrasher and Mineral Examiner Matt Shumaker (Senior Geologist at the BLM National Training Center in Phoenix) visited with her at her apartment on November 1, where she gave them unpublished geologic and engineering reports and assays regarding her claims, as well as photos of past operations conducted since 1980. The next day she called Thrasher to say that she has heard that the examination of her claims would constitute a physical trespass and claim jumping on the BLM's part. Thrasher assured her that is not the case and on November 4th he stopped by her apartment and gave her a BLM circular entitled "Discovery Validity

Occupancy Under the General Mining Law of 1872" as well as an excerpt from a mining law book that outlines the BLM's legal rights to conduct such exams. The Safford BLM then notified her in a certified letter dated November 10, 1994 that the exam is postponed until December 12 due to her ongoing medical problems and lack of an agent. On December 5 she telephoned Thrasher to say she still could not go, but could meet us in the field if we waited one more month. After doing some consultation, Mr. Thrasher called her back and said the BLM can wait until the week of January 16, 1995 to do the work, and asked that Ms. Braatelien put her request for this postponement in writing for the sake of documentation in the files. She said she would but what she sent instead was a letter to Thrasher protesting the "intrusion and trespass upon the unpatented mining claims" and that the exam "will end in a lot of law suits, both personal and professional." She also wrote a letter to U.S. Senator John McCain protesting the exam and asking for his help. Thrasher visited with her one more time on December 9 to discuss the letter addressed to him; she said she felt that she was being forced to send the Safford BLM a letter requesting the postponement until January or else it would not be postponed and that is why she sent a threatening letter instead. The only other correspondence with her before the field work was a call to Thrasher on December 29 saying she has new medical problems and will be recovering for a long time.

The field work was initiated on Monday, January 16, when Shumaker towed the BLM National Training Center's portable placer concentrator from Phoenix and met Thrasher at the claim site. A full description of the field work, sampling, and analytical work is given in the section under that heading. Thrasher and Shumaker were assisted throughout this study by David Taylor, BLM geologist based in Lake Havusu City, Arizona.

LANDS INVOLVED

Land Status

The two subject mining claims are located on public lands within the Gila Box RNCA, in Graham County, about 14 miles northeast of Safford, Arizona. Their locations are shown on Figures 3 through 6. The legal descriptions of the subject claims are as follows:

Gila and Salt River Base Meridian

Dorothy B claim:

T. 6 S., R. 28 E.
sec. 21, SE/SE
sec. 22, SW/SW
sec. 27, NW/NW
sec. 28, NE/NE
Containing 160 acres, more or less

Dorothy B #12 claim:

T. 6 S., R. 28 E.

sec. 21, NE/SE

Containing 40 acres, more or less

As indicated on Figure 3, there is an aqueduct owned by the City of Safford that runs through the western ~~eastern~~ edges of the subject claims. The north-central portion of the #12 claim has five acres patented to Safford for a water pumping station. There is also a Special Land Use Permit issued to Graham County for an indefinite period for an historical marker located in the northwest quarter of the 160 acre claim. Additionally, there is a range improvement (fence) in the easternmost portion of the two claims, as well as several dirt roads on the claims.

BLM computer records show no other encumbrances, such as mineral leases or mineral material disposal sites on the subject claims.

As noted, the land was segregated from mineral entry on November 28, 1990 by the passage of the Arizona Desert Wilderness Act.

Claim Data

The Dorothy B claim (AMC No. 42716) and the Dorothy B #12 claim (AMC No. 42728) are unpatented association placer claims. BLM records show that there were six claimants of record for the 160 acre Dorothy B claim when this study began. They were Dorothy, Edwin Sr., Edwin Jr., James, and Susan Braatelien, and Dorothy Carden; on September 15, 1995, Edwin Sr., Edwin Jr., and James Braatelien ended their association with the claim. According to Graham County records, the eight original claimants of the DB claim were 6 members of the Braatelien family (Edwin H. Sr., Edwin H. Jr., Dorothy, James, Harriet, and Susan) plus Emzie L. Carden and Dorothy E. Carden. According to BLM records, the ex-claimants transferred their interest out, in favor of the current claimants.

The 40-acre #12 claim, like the rest of the Dorothy B claims, had Dorothy and Edwin Braatelien Sr. listed as the original claimants, with a mailing address of P.O. Box 584 in Safford. Edwin Sr. dropped his interest in all these claims however, with some being dropped by him in 1980 and the rest, including the subject #12 claim, on September 15, 1995. The Dorothy B claim was located on August 14, 1965, and the Dorothy B #12 claim was located on March 2, 1966. Through the years, the Safford BLM has conducted all correspondence regarding the Dorothy B claims through Dorothy Braatelien.

Land Use

The RNCA is used mainly for recreation. Public use is low to moderate. River floating, tubing, picnicking, car camping, rockhounding, backpacking, mountain biking, ATV use, pleasure driving, bird watching, photography, fishing, and hunting are the most common activities. Some of these activities occur within the vicinity of the subject claims because they are located near the main entrance to the RNCA. The subject claims are also readily accessible by dirt roads, and are in direct contact with the Gila River and Bonita Creek. In particular, fishing access, hunting, and car camping as well as tubing and float boating occur in the area of the subject claims.

The Gila River within the RNCA was determined by the BLM to be eligible for addition to the Wild and Scenic River System. The reach that flows by the subject claims was classified as "scenic" - the intermediate classification between wild and recreational. Such a classification can allow for the development of a mine, subject to the BLM's approval of a formal mining plan of operations. An analysis of the suitability of the river for such a designation is currently in progress.

Also, the Gila River within the RNCA and Bonita Creek were designated in 1993 by the U.S. Fish and Wildlife Service as critical habitat for the endangered razorback sucker.

PHYSIOGRAPHIC DATA

Location and Access

The claims are located about 14 miles northeast of Safford, Arizona, by the western boundary of the Gila Box. As indicated on Figure 1, the Gila Box consists of the segment of the Gila River and its major tributaries such as Bonita and Eagle Creeks that flows through the area south of the Gila Mountains and north of the Peloncillo Mountains. This is one of the most significant riparian areas in the Southwest and is characterized by scenic, steep-walled desert canyons surrounding perennial rivers and creeks. The area around the Gila Box is largely unpopulated.

Figures 2 and 3 shows the access from Safford to the claim site. Access to the claims from Safford is from either the airport road or from Solomon to Sanchez Road, to Bonita Creek Road, and then taking a spur road to the claims. The access is paved about half the way; the pavement ends about four miles before reaching the Bonita Creek Road.

As indicated on the topographic map (Figure 3) and air photo (Figure 6), there are no roads or other means of access to the portion of the subject claims on the east side of the river. This area consists of rugged, mountainous terrain, and the nearest bridge is about 15 miles downstream. There has been no history of any mining-related activities on this side of the river.

Climate, Vegetation, and Wildlife

Climatic conditions in the claim area are similar to those throughout the region. Summer highs are typically between 90 and 100 degrees Fahrenheit with nighttime lows of about 65 degrees. Daytime winter temperatures typically range from 55 to 63 degrees, with nighttime lows around 25 to 35 degrees. Annual precipitation averages about 12 inches, with most coming in the form of thunderstorms in the late summer and relatively low intensity, long lasting storms in the winter. Drought is most common from April to June and less severe in the fall. The earliest killing frosts generally occur during late October or early November.

The claim area grades from an uplands desert scrub association to a riparian vegetation habitat. The desert scrub association is dominated by creosote bush, ocotillo, and prickly-pear cactus with subdominants of mesquite, blue palo verde, and devils cholla. Avian species include black-throated sparrow, rock wren, verdin, cactus wren, roadrunner, and house finch. Mammals include cactus mouse, Merriam's kangaroo rat, white-throated wood rat, and black-tailed jackrabbit. Common reptiles include the Gila monster, collared lizard, western whiptail lizard, gopher snake, and western diamondback rattlesnake. The riparian vegetation consists mostly of mesquite bosque, mixed broad-leaf forest, cottonwood trees, and willows. Animals using this habitat include mule deer, javelina, western gray squirrel, beaver, and waterfowl and other migratory birds.

The aquatic habitat, i.e., the Gila River and Bonita Creek, supports five native fishes, the re-introduced endangered razorback sucker, eight non-native fishes, and leopard frogs.

Cultural Resources

The Gila Box RNCA contains about 50 known cultural resource properties, representing a diverse array of cultural groups, time periods, and site types. Three sites occur on the subject claims. One, located in the southwestern portion of the #12 claim, is called the Bonita Creek Stone Cabin and has recently been renovated by the BLM. This cabin, built around the turn of the century, is eligible for listing on the National Register of Historic Places. Another site, located near the northwest corner of the 160 acre claim, is the Kearny Monument, which commemorates the camp site and trail of the Kearny expedition during the Mexican-American War. This site is listed on the National Register of Historic Places. This is the historical marker that Graham County has a Special Land Use Permit for. The other cultural site is a prehistoric artifact scatter, consisting mostly of pottery sherds, on the 160 acre claim. This site was fenced off by the BLM in 1980 and covers nearly one acre. The locations of these three cultural sites are shown on Figure 3. No other cultural sites are known in the immediate vicinity of the subject claims.

General Topography

The RNCA as a whole is characterized by rugged, mountainous topography with deep, steep-sided, twisting canyons. The Gila River canyon is up to 1,000 feet deep. The river canyons form the dividing line between the Gila Mountains to the northwest and the Black Hills of the Peloncillo Mountains to the southeast. Elevations in the RNCA range from 4,976 feet above sea level along upper Bonita Creek to a low of 3,100 feet along the Gila River. A significant feature of the subject claims is an alluvial flat within the Gila River flood plain that occurs on the 160 acre claim. This alluvial flat, which consists mostly of unconsolidated, poorly sorted river sediments, rises to an elevation of about 100 feet above the river during normal flow. Much of the flat is covered by flood waters about every 10 years or so; it was most recently flooded in January, 1993, and in the fall of 1983 before that.

GEOLOGIC SETTING

The RNCA is in mountainous terrain situated between the Gila and Peloncillo Mountains, with the canyons of the Gila River and its tributaries forming the boundary between the two ranges. These mountains form a more or less continuous northwest trending range typical of the Southern Basin and Range Province of Arizona and New Mexico. The mountains are uplifted fault blocks, caused by high angle, normal faulting along the mountain fronts. This faulting probably began during the late Tertiary period, some 20 to 25 million years ago, and continued intermittently, probably until the end of the Tertiary, about two million years ago (Richter and Lawrence, 1981).

The geology of these mountain ranges, like all the ranges in the Southern Basin and Range Province, is generally complex and variable. The intervening basins of the province generally contain thick deposits (up to several thousand feet) of alluvial fill washed in from the mountains. Because of this fill material, the basement geology of the basins is typically poorly known or unknown.

The RNCA is at the northern edge of the Basin and Range Province, abutting the southern edge of the Mogollon Rim. The Mogollon Rim forms the transition zone between the generally flat-lying sedimentary rocks of the Colorado Plateau to the north, and the

Basin and Range Province to the south.

As discussed by Richter, et al. (1982), the rocks of the RNCA are mostly derived from volcanic activity that occurred in the area approximately 20 to 30 million years ago. The volcanics, consisting mostly of lava flows, were erupted from many largely unknown volcanic centers or rifts. Lesser amounts of air-fall tuffs and ash flows are interlayered with the lavas. Basins flanking the volcanic highlands were filled with thick deposits of coarse rock fragments eroded from the highlands. These deposits of rock fragments were originally designated as the Gila Conglomerate. The older conglomeritic deposits are interlayered with volcanic flows, showing that volcanism was continuing while the rock fragments were being deposited. The final volcanic event in the RNCA resulted in a small cinder cone of Miocene age, located on the north side of the Gila River, between Bonita and Eagle Creeks. The youngest sedimentary deposits in the RNCA are unconsolidated alluvium (sand and gravel) of Quaternary age associated with the Gila and San Francisco river systems.

SITE GEOLOGY

The subject claims are covered with recent alluvium, terraces of unconsolidated, poorly sorted gravels, and lesser amounts of cliff-forming, well-consolidated conglomerates and andesitic lava flows. The deposits are of late Tertiary through Quaternary age

(Richter, et al., 1982).

A geologic map that covers the subject claims published by the U.S. Geological Survey (Richter, et al., 1983) is shown as Figure 4. This map shows the unconsolidated terraces of gravel as "older alluvium", and identifies three other deposits of gravel on the two subject claims (Gravel of Rail End Canyon, Conglomerate of Midnight Canyon, and Conglomerate of Bonita Creek). The authors said these three other gravel deposits were originally considered as parts of the Gila Conglomerate. This term eventually became too ill-defined and all-encompassing to have a significant meaning however, and the term Gila Conglomerate is today used mostly in an informal sense. This map by the U.S. Geological Survey was done on a much more regional scale than the study at hand calls for, and was used as the basis for the geologic map prepared and used in this study (Figure 5).

For the purposes of this study, it was found that the older unconsolidated gravels form three terraces on the alluvial flat plus a loosely defined fourth terrace overlying a lava flow in the northeast corner of the #12 claim, which is at the highest point on the two subject claims.

The areal extent of the three terraces on the alluvial flat are shown on the geologic map prepared for this study (Figure 5), and on the aerial photograph (Figure 6). A cross section of these terraces is shown as Figure 7. Figure 8 is a panoramic view of the claim area, featuring the terraces. Terrace 1 rises about 30 feet from the recent alluvium. The top of terrace 2 comprises most of the surface of the alluvial flat on the 160 acre claim. Terrace 2 is about 35 feet thick. Terrace 3 is about 30 feet thick at its southern end on the subject claims, rises about an additional 10 feet toward the north, and, at the northern end of the 160 acre subject claim, is capped by about 25 feet of an andesitic lava flow. Terrace 4, on top of the #12 claim, is about 15 feet thick.

The geology of these four terraces are nearly identical to one another. They each consist of subrounded to rounded, poorly sorted sediments ranging from very fine clays to large boulders over two feet in maximum dimension. Generally, the material contains about 10 percent clay; about 60 percent of particles from silt to pebble in size; and the remainder being cobbles and boulders. The material is mostly massive, although some bedding based on sorting was seen in terraces 1 and 2 (mostly beds of sands less than a foot thick), plus the boulders were, in places, imbricated, indicated the direction of past channel currents. Very little hardpan, or caliche, was observed. The lithologies of the individual rocks that comprise these sediments are quite varied, representing the many different rock types in the watershed from which these sediments were derived. The sands are fairly rich in dark grains ("black sands"), composed largely of magnetite.

Based on the extent and thickness of the terraces on the alluvial flat, terrace 1 has about 2.4 million cubic yards (cys) of material, terrace 2 about 2.3 million cys, terrace 3 about 730,000 cys, and terrace 4 about 24,000 cys. In relation to placer mining, about 15 percent can be added to these amounts due to swelling when the material is removed, based on observed swell in samples we collected. About 30 percent as boulder factor can be subtracted from that amount to account for the cobbles and boulders.

The geology of the rest of the claims consists mostly of andesitic lavas and the cliff forming conglomerates, neither of which is amenable to placer mining like the unconsolidated terraces are. There are some unconsolidated gravels resting on the cliffs on the east side of the Gila River, but, as previously discussed, this area is inaccessible. The recent alluvium in the river bed is not a known source of significant amounts of placer gold; it is not mentioned as a resource in any of the publications on gold placers in Arizona, such as Johnson (1972) and Wilson (1961), and has not been a target of mining activities associated with the Dorothy B claims.

MINING HISTORY

According to the U.S. Geological Survey and U.S. Bureau of Mines (Richter, et al., 1982), the area of the Gila Box contains no organized mining districts, and historically has only contained a small number of mining claims. They stated (p. 3), "Mining activity has been limited to small, intermittent, gold placer operations along the Gila and San Francisco Rivers [and] small prospect pits . . . The presence of placer gold in the older alluvial terraces of the Gila and San Francisco Rivers has been known since before 1900 . . . The deposits have been occasionally worked but total production has been low . . .". They noted that in 1980, "Universal Mining Company completed construction of a million-dollar mining and milling facility at the Dorothy B placer deposit". This facility is apparently the source of the two "mine" sites shown on topographic and geologic maps of the area (shown herein on Figures 3 and 5), which are located just to the south and southwest of the subject 160 acre claim. According to the claimant Dorothy Braatelien (pers. com., 1991), this operation was shut down in 1981 with no gold production. Figure 9 is a newspaper article reporting on this operation; and Figure 10 is a copy of a photograph of the operation, supplied by Ms. Braatelien. It was this operation that resulted in the trommel as well as other mining debris, including a 30,000 gallon fuel container, being left on the property; evidently no reclamation was done. Figure 11 shows two photographs supplied by Ms.

Braatelien of what the operation looked like after a major flood swept through the area in the fall of 1983. There has been no significant mining activity on or near the subject claims since then. Except for the trommel, all these workings were reclaimed by the City of Safford in June, 1995; the claimant gave permission for these workings to be reclaimed and said to leave the trommel in hopes of future operations. (The trommel is located at the "mine" site depicted on Figures 3 and 5 as being due south of the 160 acre claim.)

An unpublished letter to the Safford BLM from the Arizona Geological Survey, dated March 9, 1982, noted that placer gold was mined along the Gila River in the Gila Box area starting in the early 1880's "until the early 1900's when mining claim areas became exhausted." The letter stated too that "Free-milling operations exhausted the known concentrations of placer gold by 1905." This early mining was apparently located mostly along the Gila River in Greenlee County near Clifton, about 10 miles upstream of the subject claims, in an area known as the Smuggler's Mine. The March 9 letter stated that the first claims in the area of the subject claims were located in the early 1900's and worked intermittently by companies such as Mammoth, Schwimmer Mining Co., Rio Gila Gold Mining Co., and the Neel Placer Company.

Figure 12 is a newspaper article on perhaps the most significant mining operation in the area of the subject claims prior to the Dorothy B claims being located; this was a hydraulicking operation for placer gold in the mid 1930's. Before being called the Dorothy B deposit, these river gravels were generally known as the Neel (or Neal) placer deposit, or the Gila gold placer deposit. According to Ms. Braatelien, this hydraulicking operation was conducted in the area where the trommel is located.

Wilson (1961) said of placer gold production in Graham County,

> During 1907-49, Graham County was credited with a production of placer gold valued at $1,633. The yield for 1907-31, amounting to $1,481, probably came largely from the area of Greenlee County which was organized out of Graham County in 1910. According to the U.S. Minerals Yearbooks, the output for 1932-49 was $152; it included $14 from the Gila River placers . . . .

The values quoted were at historic gold prices much lower than current prices. The U.S. price of gold was $20.67 per troy ounce from 1900 to 1934, and $35 per troy ounce from 1934 to 1968, when the price was no longer regulated by the U.S. Treasury (Wells, 1969). Gold has been averaging about $350 per troy ounce for the last several years.

The entire production from Graham County from 1907 through 1949 would be just under $28,000 using gold at $350 per troy ounce. The Gila River Placers, encompassing the vicinity of the subject claims, produced $14 in gold from 1932 through 1949, according to

Wilson (1961). Updating the values using current gold prices is difficult, because gold went from $20.67 per troy ounce to $35 per troy ounce in 1935, midway through the 1932 through 1949 reporting period. Assuming that the majority of the production was at $20.67 gold, values at $350 gold only amount to $237, which is not a significant amount.

MINERAL DEPOSITS

Wilson (1961) said of placer gold deposits in Graham County,

> Placer gold occurs in eastern Graham county along the Gila River, chiefly upstream [east] from the mouth of Bonita Creek . . . These placers have been known and occasionally worked for about 40 years but have produced very little.
>
> Here, the curved course of the Gila River is deeply entrenched between terraced bluffs of Gila conglomerate. Within the arcs of certain curves, these terraces are mantled with ancient river gravels which carry placer gold. The gravels, in general, contain a large proportion of boulders which range from several inches up to 3 ft. in diameter. Ferruginous chert pebbles are fairly common, and black sand is very abundant. The gold, which is flaky to wiry in form, ranges in size from that of fluor up to wiry particles one-quarter inch long. Partial tests indicate that the ground locally contains from 15 to 50 cents per cubic yard.
>
> At the Neel property, which is on the north side of the river between Bonita and Spring creeks, test-runs were made with a washing plant for which water was pumped from the river. In June, 1933, this ground was held by the Rio Gila Gold Mining Company. Sampling was conducted farther upstream, on the Smith-Boyls, Hammond-Serna, and Colvin properties.

The unpublished letter of March 9, 1982 from the Arizona Geological Survey described the geology and minerals of the

Dorothy B claims by stating,

> Gold placer found in Quaternary-late Tertiary river gravels that mantle terraced bluffs of Gila Conglomerate along Gila River and cover large alluvial flat at confluence of Bonita Creek and Gila River. Gold ranges in size from flakes to wiry particles about one-quarter inch long. Associated with ferruginous chert pebbles and black sand. Gravel deposits average 23-30 ft. thick.

This letter also noted that the gold is derived from small gold-bearing veins in the highly mineralized Clifton-Morenci area, which is a major copper producing area. In terms of development and production, this 1982 letter regarded the Dorothy B claims as an exploration prospect.

Ms. Braatelien, in response to the BLM notifying her that a validity exam will be conducted on two of her claims, has provided the BLM Safford office with copies of several unpublished privately-prepared reports that discuss the mineral deposits on the claims and the viability of mining them.

Before discussing their descriptions of the mineral deposits, these reports from the claimant as a whole contain an underlying flaw that needs to be addressed. The basic problem is that the geologic framework that is described in these reports for the claim area is incorrect. On page 4 of the oldest report, Vandrenkamp (1930) (also variously spelled in later reports as Vandenkamp, Vanderkamp, Vahrenkamp, and Vahrenkaap) begins his description of the geology of the area by stating, "The geology of this region is fully described in Professional Paper No. 43, 'Morenci and Clifton Quadrangle', by Waldemar Lindgren. It being so thorough and painstaking that it seems of little use to revamp any of its contents. I therefore shall quote excerpts from his report." He then gave about four pages of quotes to describe the geology of the claim area (which, as he noted, the claims at the time in the area of the subject parcel were the Gold Spot Nos. 1-13, the Banner, Bonny, Red Bird, and Gold Nugget claims).

The geology of the claim area, however, is not discussed by Lindgren; the claim area, which is in the Guthrie quadrangle, is about 15 miles southwest of the Clifton-Morenci area, and about seven miles from the nearest portion of the Clifton Quadrangle. (The area of the Clifton Quadrangle is shown on Figure 1 of the Lindgren report, and corresponds exactly with the 15-minute quadrangle map published by the U.S. Geological Survey in 1962.) Further, the actual title of Professional Paper No. 43 (published by the U.S. Geological Survey) is "The Copper Deposits of the Clifton-Morenci District, Arizona" (emphasis added). As such, this publication, which was written in 1905 (a fact not mentioned in any of the unpublished reports), provides over 300 pages of detailed descriptions of hardrock geology and individual copper mines in the Clifton-Morenci area, and less than about four pages on stream deposits. All stream deposits described therein by Lindgren are in the Clifton Quadrangle, and ***not*** the Guthrie Quadrangle, site of the subject claims. Vandrenkamp (1930) quoted almost all four of those pages (mostly pages 74 through 78 of Lindgren's publication), nearly word for word, but changed some of the text to make it *appear* that the report is discussing the Dorothy B claim area.

This misrepresentation is best shown on page 6 where Vandrenkamp alleged the Lindgren (1905) report states, "Along the Gila River from the mouth of Bonita Creek to the mouth of Spring creek, the erosion has in many places produced steep or nearly perpendicular bluffs of Gila Conglomerate usually pitted by reason of the gradual weathering out of the larger pebbles." In fact, what Lindgren (1905) wrote (on page 76) is, "<u>Along San Francisco River and Chase Creek</u> the erosion has in many places produced steep or nearly perpendicular bluffs of Gila conglomerate, usually pitted by reason of the gradual weathering out of the larger pebbles." (emphasis added)

The Vandrenkamp report becomes more misleading on pages 7 and 8 where, after several pages of quotes attributed to Lindgren (1905), the following statement is made, "Between Bonito [<u>sic</u>] and Spring Creeks (See photo and Map No. 1), on the northwest side of the Gila river from 50 to 200 feet above the stream in its lower coarse, we find a large acreage of auriferous gravel, deposited in four distinct terraces." This statement is so sandwiched between a direct quote and a paraphrase of Lindgren that it is difficult for a reader to distinguish between the two authors. In fact, all Lindgren (1905) said about "auriferous gravels" is, after stating on page 211 that "Gold and silver are practically absent in the Morenci ores.", he addresses gold-bearing gravels on page 212 by stating,

> The gravels lying in front of the hills of older rocks at Morenci and Clifton are auriferous in places. Placers of some value were worked in Gold Gulch, but are now exhausted. An unsuccessful attempt was made some years ago to mine, by the hydraulic method, the bench gravels of San Francisco River, which doubtless derived their gold from the veins northeast of Copper Mountain. The Gila conglomerate south of Morenci contains a little fine gold, which is concentrated in shallow gullies. <u>Payable placers have not been found.</u> (emphasis added)

Vandrenkamp, however, continued his discussion of "auriferous gravels" while making it unclear that these are his own words and not those of Lindgren (1905). Vandrenkamp ended his discussion of "auriferous gravels" with statements like (p. 9), "It is not materially significant where the gold comes from found so abundantly in the gravel, or how it was deposited - but, it is important, and very essential, to fix the value of the gravel . . .".

This misapplication of Lindgren's (1905) work is compounded in an unpublished 1981 report by a Max Van Dine, entitled "Investigative Report of 'Dorothy B' Auriferous Gravel and Black Sand Located in Graham County, Arizona". Van Dine (1981, p. 4) began his section on geology word for word <u>exactly</u> like Vandrenkamp did by stating,

> The geology of this region is fully described in

> proffessional [sic] paper no. 43 'Morenci and Clifton Quadrangle', by Waldermar [sic] Lindgren. It being so through [sic] and painstaking that it seems of little use to revamp any of its contents. I therefore shall quote excerpts from his report.

However, instead of using the Lindgren (1905) report, Van Dine (1981, pp. 4-7) actually quoted the Vandrenkamp report and, in so doing, he fully blurred what little distinction there was between Lindgren's words and those of Vandrenkamp. Thus, Van Dine left the impression that all the statements made by Vandrenkamp regarding "auriferous gravels" in the area of the Dorothy B claims were actually made by Lindgren (1905) of the U.S. Geological Survey. Van Dine (1981) therefore gave every indication that it was Lindgren who discussed the "auriferous gravels" in the area between Spring and Bonita Creeks. In fact, based on Van Dine's report alone, it would be difficult for a reader to reach any other conclusion.

Further misapplication of Lindgren's (1905) work is found in an undated, unpublished private report by an organization called Safford International Resources, Ltd. No names of any persons or authors are given, although it is noted on page 8 that a Helen Charbonneau "is not only on the Board of Directors but is also Vice-President of Research and Development for S.I.R., LTD." (The BLM was only given pages 7 through 15 of this report, although the Introduction begins on page 7, and the total costs for a placer mining operation are given on page 15.) This report was apparently written after the Van Dine report, as it refers to his conclusions on page 12. In the geology section (pages 8 - 10) this report quoted Van Dine word for word, including the "auriferous gravels", and attributed the entire quote to Lindgren as well as to a 1978 publication by a Peter Dunn entitled "Geologic Structure of the Safford District." The Dunn report, however, deals entirely with the structural geology of porphyry copper deposits in the Safford area (in the Gila Mountains) and, has nothing to do with gravels or rivers. Although the S.I.~~D~~R. report stated on page 8 that some of the geology section is excerpted from Dunn, in fact, none is. It could be considered that the author(s) of the S.I.D. report were duped by the Vandrenkamp and Van Dine reports, except on page 10, after all of the quotes, the statement is made, "Copies of the reports from which the above excerpts were taken [which would include the Lindgren (1905) report] are available upon request for more detailed information on the area."

This misapplication is so thorough and pervasive in these three unpublished reports that pertinent parts of them, as well as parts of the Lindgren report, are included as Appendix 1 to demonstrate this fact.

Vandrenkamp (1930) recommended that the four terraces he reported to occur in the area of the subject claims be mined by using a hydraulicking operation, stating that the results of his sampling led him to believe that up to over 45 million dollars of free gold can be mined from the deposit. This is based on an availability of nearly 76 million cubic yards of material worth $.60 per yard in free gold. He stated, "In addition to free gold, many of the ancient river beds carry 'black sand' and concentrates containing considerable quantities of Platinum, Iridium, Osmium, Monasite [sic], and other metals and metallic oxides." He then stated (p. 19) that preliminary results indicate that there are about 200 pounds of black sands per cubic yard, having assay values of $12 to $48 per ton in gold. He said (p. 19) that using the $12 figure increases the value of the deposit from over 45 million dollars to over 91 million. After deducting capital and operating expenses, he concluded (p. 31) that the net value of the property was over 30 million dollars.

Van Dine (1981) agreed fully with the amount of material calculated by Vandrenkamp, and said another 620 acres of material should also be included. Van Dine (1981, pp. 9-10) wrote,

> We have found that the Gold has assayed at 81 percent purity, there is silver and platinum in with the Gold . . . In addition to the above 'Free Gold' I have found that the Black Sands carry approximately fourteen (14) troy ounces of Gold per ton of black sand that must be extracted by a method or methods other than the normal Amalgamation process. . . In addition to the above Free gold and the fourteen ounces of gold that cannot be seen, they also contain other high values in the following. Platinum, Iridium, Osmium, Zircon, Monasite [sic], Titanium, Silicon, Silver, Magnesium, and other metals or metal oxide."

He then concluded (p. 10) that, using the then current price of gold at $480 per ounce, the property (i.e., the Dorothy B claims) is worth over 49 billion dollars in gold alone, "Plus the values of the other metals and/or metal oxides in the black sands. These figures are based upon the F.H. Vahrenkamp report, and the research work done by myself in the month of April, 1981." He recommended (p. 16) that a trommel be used in conjunction with amalgamators and concentrating tables rather than the hydraulicking method recommended by Vandrenkamp.

The S.I.~~D~~R!. report (undated) simply re-affirmed Van Dine's estimate of over 49 billion dollars worth of gold and stated that properties immediately adjacent to the Dorothy B claims "should equal or surpass" the values determined by Van Dine. On page 13 it is stated that these adjacent properties have deposits that, when screened to one-quarter inch or less, will average at least three ounces of gold per ton. The S.I.~~D~~R. report noted on page 11 that one ton of black sand is concentrated out of 10 tons of bank run material on the Dorothy B claims.

Charbonneau wrote an unpublished Research Report of the Dorothy B claims in 1983. On the first page she noted, "I am an electronic engineer, having been around mining all my life. I do not hold a certificate, and not registered as an assayer in the state of Arizona, however, in March and April, 1981 I assisted, and worked with Max Van Dine, and have personal knowledge of and kept the records of test made by us at that time." Charbonneau also wrote two unpublished papers in 1986 on sampling and assaying these deposits.

Charbonneau's 1983 report indicated that the material was even richer than what Van Dine reported, stating the typical assays do not give a true indication of all the values present. On page 2, for example, she stated, "Below is the standard assay used by Mr. Van Dine you will note the difference on later research as some of these assays, properly done could increase by 70%." On page 5 she said, "The black sand concentrates have averaged not less than 70 ounces of gold per ton on an overall average, some of the Gila Conglomerate has tested at over 200 ounces per ton and upward." On page 8 she reported, "Some of the blacks [sic] sands are known as complex ore, or as locked in gold, where fine gold particles are sandwiched between two grains of black sand. We refer to it as being locked in a bond. In order to break this bond and recover from the black sands, ore must be ground to 400 fine, and the results would surprise you."

On page 10 Charbonneau (1983) stated, that on the Dorothy B claims, "In some areas the free gold will run upward to 2 and one-half ounces per ton, while in others it will run micron to invisable [sic]. The gold is found in flake and flour in most cases, there are a few of what is known as nugget size. The fact that no visible gold is showing does not mean that the values are not there."

Charbonneau (1983) also reported significant values for silver as well as platinum and the platinum group. She stated (p. 7) that the 40-acre Dorothy B No. 24 claim, which is immediately north of the subject No. 12 claim, is very rich in silver and gold. She said (p. 8) that a cut in the conglomerate on this claim "contained 37 ounces of Gold and 26 ounces of Silver, done by fire assay."; and that "rocks in the conglomerate" at another site on this claim "show silver at 150 ounces per ton, more or less." She also said (p. 8) that samples taken on level ground on top of a bluff on this claim two feet below the surface "shows gold at 60 ounces per ton and Silver at 78 ounces per ton." (This level ground on top of the bluff extends into the subject Dorothy B No. 12 claim, comprising the loosely-defined "terrace 4" in the northeast quarter of this claim.)

Charbonneau (1983) did not quantify the values for platinum and the platinum group. Her main statement on these metals is found on page 11 where she wrote,

> Most assays show a good amount of Platinum, also there is pure platinum in the raw ore, a lot is wire size to larger solid pieces. The gold itself is known to carry about 6% platinum, also both high and low groups show, as palladium, osmium, iridium, all these are present.

By way of contrast, the joint publication of the U.S. Geological Survey and U.S. Bureau of Mines (Richter, et al., 1982) noted that less than $30,000 of gold has been reported to be mined from the Gila Box vicinity (including the Smugglers Mine area), and rated the potential for current gold recovery in the Gila Box area as "low to very low". This report discussed the potential for any kind of mineral development but yet does not mention silver or the platinum group. The report acknowledged the presence of Universal's placer operations with the trommel, noting the operators "anticipate significant gold recovery." However, as previously stated, no gold was ever recovered from that operation, and there have been no significant operations since. The Richter et al. (1982) report stated, after mentioning the Smuggler Mine, "Lithologically similar, old gravels are present in the study area between the confluence of Bonita Creek with the Gila River, but to our knowledge no reliable data concerning gold content are available. Although fire-assay analyses of three representative gravel samples collected by us in this area indicated less than 0.01 ounces of gold per ton, values comparable to that at the Smuggler Mine could still be present." The purpose of this joint publication was to provide land management agencies an assessment of the mineral potential of the area to enhance the quality of land management decisions.

A 1972 publication by the U.S. Geological Survey on placer gold deposits in Arizona (Johnson, 1972) stated (p. 19),

> Gold is found in ancient river gravels that mantle terraced bluffs of Gila Conglomerate along the Gila River downstream from the mouth of Eagle Creek to Bonita Creek (Graham County); . . . About 10-12 miles downstream from Eagle Creek, the Gila River makes a wide bend between Bonita and Spring Creeks. At this location (approximately sec. 20 and 21, T. 6 S., R. 28

> E.) an alluvial flat was tested for placer gold at the property known as the Neel placer. . . . Placer production from the Gila River has been very minor compared with production from the San Francisco River. . . . Tests of the Neel placer made in 1933 and 1938 indicate that the gravels averaged 60 cents per cubic yard. Actual production from the property was small. . . . The origin of the gold in the gravels is unknown, but it was probably derived from gold eroded from the Clifton-Morenci district and transported by the San Francisco River to the Gila River. Small gold veins in the Gila Mountains may have contributed some gold to these minor placers.

The only other article found that addresses gold on the subject claims is an unpublished geologic report by a mining consultant named Richard E. Mieritz, who conducted a private study in 1971 for a Frank Wallis "to check the gold-silver value merit of the Dorothy 'B' placer claims". This report was found by Thrasher and Shumaker while looking through a file on the "Neel Placers" at the Arizona Department of Mines and Mineral Resources in Phoenix in December, 1995.

Mieritz (1971) stated, "[S]ix representative, wide spaced samples were taken in an area designated by Mr. F. H. Vahrenkaap, Consulting Engineer, as containing precious metal values as so indicated in his report on the property dated January 6, 1930." The conclusions Mieritz reached were:

> (1) - The two most obvious, accessible and minable "benches" were tested by six samples. This area does not contain sufficient gold-silver values to be of economical importance, in fact, the samples show very negative results, and,
> (2) - You should have no further interest in the property.

The six samples Mieritz obtained came from the portion of the subject 160 acre claim located in section 28, which is where the terraces are most fully developed; this is the same area where the bulk of the samples gathered for this current study were taken. Mieritz's samples came from existing pits and trenches on the property, but it is difficult to correlate the sites with where the samples for the present study came from. This is because Mieritz's map showing his sample locations are tied to a water well that apparently no longer exists, and to a dirt road system that has apparently been obliterated by floods since his work in 1971.

No other reports, published or otherwise, could be found that addressed the presence of silver in the claim area.

Other than the unpublished reports provided by the claimant, only one document could be found that mentions platinum or the platinum group in the claim area. This is the unpublished letter from the Arizona Geological Survey dated March 9, 1982. This letter states that platinum, iridium, and osmium (as well as zircon and monasite) are contained in the sand and gravels on the Dorothy B claims. However, one of the sources this letter cites for this statement is the "Neel Placers File" of the Arizona Department of Mines and Mineral Resources, which also has on file the Vandrenkamp report. This fact, plus the fact that the letter mentions several specifics of Vandrenkamp's report (such as the same list of metals as given above and the former names of closed mining claims in the area, such as the Gold Spot, Banner, Bonny, Red Bird, and Gold Nugget) led us to the conclusion that this letter probably used Vandrenkamp's report for this information. Thrasher contacted Steve Richard, a geologist for the Arizona Geological Survey, regarding this and was told that, although he did not have the references to prove it, we are more than likely correct in our conclusion.

The Arizona Department of Mines and Mineral Resources has published two circulars addressing the presence of platinum (and the platinum group elements such as palladium, osmium, and iridium) in Arizona. One, Circular No. 3, entitled Platinum in Arizona (Phillips, 1980) stated, "To our knowledge there has never been production of platinum ore from Arizona . . . The recovery of trace amounts of platinum group metals from other ores in the final stages of refining, does not make the rock platinum ore." (Emphasis in original.) The circular said platinum group elements (including platinum) in Arizona have been recovered as a byproduct of copper smelting, but only when in concentrations nearly 200,000 times over background values. The circular noted that assaying the platinum elements is difficult, stating (p. 3), "Even reliable and experienced assayers have been deceived into reporting nonexistent platinum. On the other hand, it is not likely to be missed if present and looked for." The circular stated in its summary that platinum and the platinum group occur in Arizona but "are not known to occur in sufficient concentration to justify their mining."

Circular 11, entitled Mining Scams (Greeley, 1986), stated bluntly (p. 3),

> The platinum-group metals including platinum, palladium, rhodium, ruthenium, iridium, and osmium, are the darling of the swindler. Considering their high unit-value, even minute amounts of these metals appear to be a reasonably good bet to the innocent investor. . . . As a primary ore, platinum has never been mined in Arizona; its only production has come from trace amounts recovered in the final stage of refining copper ores. The geologic environment of Arizona, diverse as it is, does not encourage the search for platinum-group metals . . . .

A publication by the U.S. Geological Survey on platinum-group elements in sedimentary environments (Peterson, 1994) corroborates the conclusion that the potential for these metals is low in the area where the subject claims are.

MINERAL EXPLORATION AND DEVELOPMENT WORK

According to Vandrenkamp (1930), he drilled three holes in the Gila river bed; he said (p. 9), "The depth to bedrock in each hole was twenty (20) feet where the drill entered the Gila conglomerate, and at a depth of thirty-two (32) feet encountered hot water." On page 13 he said, "The best location for my sampling was to start on the different pits, shafts, old and new, [and] open cuts" for use in a rocker, a sluice, and a gold pan. He said (p. 13) that on a Plate 1 "will be found the plan of shafts, pits and cuts" but Plate 1 was not included in our package from the claimant, nor is it on file with his report at the Arizona Department of Mines and Mineral Resources. Further, there does not appear to be any modern records of shafts on the claims in general, or on the two subject claims in particular. No shafts were seen on the subject claims during the course of this study.

Van Dine (1981, p. 11) used Vandrenkamp's narrative on testing and sampling virtually word for word, suggesting he did exactly what Vandrenkamp did. He too said, "The best locations for my sampling was to start on the different pits, shafts, old and new, [and] open cuts" for use in a rocker, a sluice, and a gold pan. Van Dine did not refer to a Plate 1, or to any other map to show where these features are. There is however a map attached to his report showing where his samples came from; of his 39 samples, six (nos. 20 through 25) are from the subject #12 claim, two (nos. 16 and 17) are from the subject 160 acre claim, eight are from the unconsolidated terraces south of the 160 acre claim, and the rest are from near the mouths of Baker and Spring canyons. Van Dine's report does not explain his sampling method.

Charbonneau (1983, p. 2), however, said that Van Dine used a 2-

inch galvanized pipe 4 and one-half feet long, that he drove into the ground to collect a "core" of the material. She indicated that he took all 39 of his samples in this manner, suggesting that Van Dine never probed deeper than 4 and one-half feet in his exploration and sampling of the Dorothy B claims.

The hydralicking operation in the 1930's is one of only two operations we can document prior to the establishment in 1981 ~~1980~~ of reporting requirements to the BLM for working these claims. The other operation comes from one of the unpublished documents received by the BLM from the claimant. This is a report written in 1984 by a William Savory, who gave his first-hand account of activities in the area of the subject claims during an operation in 1938. He said (p. 1) that the area was then called the Neal Placer property, and (p. 3) that this operation involved the use of a trommel with a power shovel, grizzly, small bulldozer, four centrifugal cones (Ainley cones, which, he said on "page 2 equipment" are similar to Knudsen bowls), and a generator. He stated (p. 3) that, "Contrary to popular belief we found the deposits of gold to be in the conglomerate". It is difficult to determine exactly which "conglomerate" he refers to since 1) a power shovel or bulldozer could not by themselves dig into the very hard cliff-forming conglomerates of the area; 2) a crusher would be needed to break the material up, and 3) he said (p. 3) that the mining was done along the banks of the river from Bonita Creek to where the trommel shown in Figures 9, 10, and 11 is now located. This area consists almost entirely of the unconsolidated terrace deposits, which are amenable to being scooped with a power shovel and do not need a crusher to be processed through the bowls. Perhaps he referred to these deposits as the conglomerate as opposed to the recent alluvium in the river bed. On page 1 he stated, "When my turn came to clean the cones that we used, I did recover from the cones for a one day operation, at least 2 inches of pure, clean gold in a quart fruit jar." He never said what became of this 1938 operation.

Ms. Braatelien, on November 1, 1994, showed Thrasher and Shumaker a phial, about the size of an index finger, filled with rice-sized nuggets of gold that she said came from her claims.

The Safford BLM office received its first notice of mine activity on the subject claims in January, 1980. (Such notification requirements were established for this area in about 1978, when this area was first being considered for wilderness designation; mining notification for BLM lands in general did not become required until January, 1981.) This activity was the operation conducted by Universal Mining that involved setting up the large trommel; this operation also entailed blading a large area and constructing a "plant and assay office", which consisted of two buildings 100 feet long and 30 feet wide, on the subject 160 acre claim. BLM fenced off the artifact scatter archaeological site in response to this mining proposal. As discussed, Figure 9 is a newspaper article that describes this operation. The basic operation was to use a series of sizers and cones to mechanically separate gold from the sands and gravels. The operation was shut down in February, 1981 due to bills not being paid; there was apparently no production of gold and essentially no reclamation by the operators or claimants. Two concrete pads 100 feet long by 30 feet wide are still in existence; these are visible herein on Figures 6 and 8.

The subject claims were then leased by Gila 1 Mining Company in March, 1981 for a pilot project in the area of the trommel. (By this time the regulations were in effect that required any mining operation on federal lands that involved the use of mechanized equipment or explosives to file either a notice of intent or plan of operations with the local BLM office; all disturbances greater than five acres required that a plan be filed rather than a notice.) The lease for Gila 1 was terminated in July, 1984 again with no reported production.

During Gila 1's tenure, the BLM received three mining notices from them in the spring of 1981 for making test holes and trenches in the area immediately north and south of the two subject claims, and in the area near the mouth of Spring Creek.

Another organization, called Gila Placers, submitted a plan of operations to the BLM in March, 1983, mostly for working the claims to the immediate south of the 160 acre subject claim, and for using the existing buildings on the 160 acre claim ("plant and assay office") as an office, repair shop, and living quarters.

The BLM also received a notice of intent in March, 1983 from a Flying J Mines for testing the 160 acre claim and claims to the immediate south; this activity was to be done with a D-9 bulldozer, backhoe, front end loader, and a "testing unit". They had subleased the area from Gila 1 Mining.

This activity from 1981 through 1983 apparently resulted in no production of gold or any other commodities. All that was left after the flood of 1983 in the area of the subject claims was the trommel (Figure 11) and pieces of other mining equipment, foundations (concrete pads) of the two buildings, numerous spoil piles, and several trenches, all of which existed into June, 1995 when the City of Safford cleaned most of it up. The lease for Gila Placers expired in March, 1983.

Activity on the Dorothy B claims since the expiration of leases for Gila 1 and Gila Placers has entailed one notice of intent in 1987 and one in 1988 for test holes in the area of the 160 acre claim and around Spring Creek; and two notices of intent in 1991 for test excavations around Spring Creek and on the Dorothy B # 24 claim, just north of the subject #12 claim.

The March 9, 1982 letter from the Arizona Geological Survey stated that development of the Dorothy B claims "included 14 bulldozer trenches of varying depths and with lengths of 400 to 500 ft." There were two well developed trenches and one open cut on a hillside on the 160 acre subject claim observed during the course of this validity examination; these may relate to this development work. As discussed, it is not possible to pinpoint the workings (pits and trenches) that Mieretz (1971) mapped; those workings may also, however, relate to this development work.

A plan of operations for mining the subject 160 acre claim and the Dorothy B #24 claim was received by the Safford BLM in 1992. The plan called for mining gold on both these claims by sieving off material greater than two inches, truck everything else to Safford for refining, and truck the material with no values back to the site for reclamation. However, once the BLM approved the plan, the operator apparently left the vicinity with no activities conducted on the claims and no further word to the BLM. Figure 13 is a newspaper article reporting on this proposal.

SAMPLING PROCEDURES AND ANALYTICAL WORK

Field Work

Field work for this validity examination consisted of geologic mapping using pace and Brunton compass methods, and sampling. Claim corners were either too old to be recognizable or nonexistent. Because these placer claims conform to aliquot parts, it was clear where the borders of the claims were by plotting the claims on the 7.5 minute topographic quadrangle map (Gila Box, Arizona map) that is shown herein as Figure 3; there are sufficient physiographic features, such as the Gila River and Bonita Creek, and manmade features, such as the road system, to keep one well oriented on the ground. An aerial photograph of the claim area (Figure 6) provided an excellent supplement to the topographic map. A portion of the topographic map was enlarged to a scale of 1:6000 for use as a base in constructing the geologic map (Figure 5).

Samples were taken from exposures made by past exploration activities on the subject claims. Because Ms. Braatelein declined to accompany us or send a representative, we selected all sample sites. These consisted of the previously mentioned two deep bulldozer trenches and one cross cut hill on the 160 acre claim. As indicated on Figure 7, these three exposures cover nearly all of the stratigraphic section that comprises the three terraces on the alluvial flat. Because there were no manmade exposures on the #12 claim, two samples were taken in the alluvium at the mouth of Bonita Creek, which provides the drainage route for the sediments of the claim, plus a sample (DB-6) about two feet deep was taken on top of the #12 claim. The idea with sampling the top of the #12 claim was to examine the top few feet like Van Dine did, but the abundance of boulders prevented deeper penetration with a shovel. Also, three individual nodules of chert were taken for assay. This was done because Wilson (1961) and the unpublished letter from the Arizona Geological Survey mentioned their presence plus, in 1991, an agent working with potential lessees of the mining claims (Marion "Bill" Tucker, now deceased) informed Thrasher that such nodules have great potential for precious metals. Mr. Tucker said that the grade quality of the nodules varies wildly; he said some nodules have no value whereas others can assay up to hundreds of ounces of precious metals per ton of material. Two of the nodules came from the surface of the 160 acre claim, within 100 feet of the trench used for our DB Number ~~3~~ 4 sample, and the third was given to Thrasher by Mr. Tucker. This makes a total of nine samples that were taken and analyzed for this examination. Sample locations are shown on the geologic map (Figure 5) and the air photo (Figure 6). Five of the samples (DB-1 through DB-5) were large channel samples collected by Thrasher, Shumaker, and Taylor, one (DB-6) was a small bulk sample collected by Thrasher, two (DB-7 and DB-8) were individual nodules of chert collected by

Thrasher, and one (DB-9) is the chert nodule given to Thrasher by Mr. Tucker; it is not certain where on the claims this last sample came from.

Vehicular access was possible to all the sites except for the two samples taken at the confluence of Bonita Creek and the Gila River. These two samples (DB-1 and DB-2), plus one taken on top of the #12 claim (DB-6) were taken by hand using shovels with the remaining samples (except for the chert nodules) collected by rubber tired backhoe. Appendix 2 consists of photographs of the sample-taking and processing procedures used for the bulk samples.

Samples DB-1 through DB-5 were channel samples collected in the following manner. The surface to be sampled was first scaled and cleaned to expose a fresh surface. Plastic five gallon buckets were then placed on a clean polyethylene tarp at the base of the site to catch the material. Whether by shovel or backhoe, the channel samples were started at the bottom, and cut in as uniform a rectangle as possible; the numerous boulders in some samples made this difficult. The quantity of oversized material (cobbles and boulders) was duly noted. The buckets were then capped and transported in the bed of a pick up truck for processing.

SAMPLE DB-1 was collected along Bonita Creek on the Dorothy B #12 placer mining claim. This sample was a channel sample hand collected with a shovel. The sample was collected from an active stream bank above the creek channel. The channel was approximately 10 feet high, 12 inches wide, and 12 inches deep. The material sampled was predominately unconsolidated sand and silt with intermixed pebbles and a minor amount of clay. The lower six feet of the sample was predominately silt and contained more clay. Bedrock was not exposed in any of the exploration cuts on the subject or in the vicinity. Depth to bedrock is probably considerable. We did not encounter bedrock in any of the samples that we collected.

SAMPLE DB-2 was also a channel sample hand collected by shovel along Bonita Creek on the Dorothy B #12 placer mining claim. The sample was collected from an active stream bank immediately adjacent to the active stream channel. The channel was approximately 4 feet high, 12 inches wide, and 12 inches deep. The material sampled was predominately sand and gravel intermixed with cobbles and boulders. Approximately five percent of the sample consisted of rounded cobbles averaging six to eight inches in diameter. Bedrock was not encountered. Water infiltrated the bottom of the channel sample.

SAMPLE DB-3 AND DB-3A are from an outcrop on a hillside exposed by previous exploration work, located in terrace 3 on the 160 acre Dorothy B placer mining claim. The samples, collected with the assistance of a backhoe, comprise a single channel sample that covers the entire stratigraphic section exposed. It was necessary to sample the face of the hillside in two different areas due to equipment limitations and safety concerns. Sample DB-3 represents the lower 20 foot of the exposed material. Sample DB-3A, located about 50 feet east of DB-3, represents the upper 10 foot of the exposed material. The channel sample for DB-3 is approximately 24 inches wide and six inches deep.

The material sampled had abundant cobbles and boulders intermixed in a silty sand with minor clay. Approximately 10 percent of the sample consisted of boulders averaging 18 inches in diameter. Cobbles made up another 20 percent of the sample. The DB-3A sample was approximately 18 inches in width and 6 inches deep. The material sampled had numerous boulders intermixed with sand and gravel, with minor silt and clay. Approximately 40 percent of the sample consisted of subrounded boulders averaging 18 inches in diameter. Bedrock was not encountered.

SAMPLE DB-4 was collected on the Dorothy B placer mining claim. The sample was a channel sample collected with the assistance of a backhoe. The sample was collected from terrace 2 in an exposure created previously by an exploration trench about 10 feet wide and 15 feet deep. The sample was approximately 15 feet high, 24 inches wide, and six inches deep.

The material sampled had abundant cobbles and boulders intermixed with sand, gravel and silt with minor clay and some caliche. A dark sandy lens 10 inches thick was noticed approximately 6 foot from the top of the sample. Approximately 30 percent of the sample consisted of subrounded boulders averaging about 20 inches in diameter.

SAMPLE DB-5 AND DB-5A were collected from a bulldozer trench located on the Dorothy B placer mining claim. The sample was a channel sample collected with the assistance of a backhoe. The samples were collected at different horizons within terrace 1. As with DB-3 and DB-3A, it was necessary to sample the face of the trench in two separate places so as to sample the entire stratigraphic interval exposed without overextending the backhoe and creating safety concerns. Sample DB-5 sampled the lower 15 foot of the exposed material. Sample DB-5A, located about 100 feet north of DB-5, sampled the upper 15 foot of the exposed material. The DB-5 channel sample was approximately 24 inches in width and six inches deep.

The lower eight feet of the sample was predominantly subangular to subrounded stratified sand, with approximately five percent of the sample consisting of boulders averaging 12 inches in diameter. Cobbles and gravel one to six inches in diameter made up another 15 percent of the sample. The upper 7 feet or the sample had numerous boulders intermixed with sand and silt. Approximately 50 percent of the sample consisted of subrounded boulders averaging 12 inches in diameter. The DB-5A sample was approximately 18 inches wide and 6 inches deep. The lower 1 foot of the sample was sandy silt with approximately 30 percent boulders averaging 18 inches in diameter. The next six feet of the sample consisted of silt and sand with minor clay and approximately 50 percent boulders averaging 24 inches in diameter. The top 8 feet of the sample consisted of sand and silt with minor clay and approximately 25 percent boulders averaging 18 inches in diameter.

DB-6 is a bulk sample consisting of massive, reddish brown sandy silt with about 10% clay, 10% pebbles, and 20% cobbles; poorly sorted, subrounded.

Sample Processing and Custody

Samples were concentrated using equipment from the BLM National Training Center in Phoenix. The equipment used in this examination consists of a Denver Goldsaver trommel and sluice assembly feeding a 24 inch diameter Knudsen bowl through a six foot tail sluice. Photographs of the apparatus are given in Appendix 2. When used in series, the Goldsaver and Knudsen bowl are capable of recovering gold in very fine fractions, including sizes which usually cannot be commercially recovered. Samples DB-1 through DB-4 were concentrated at a location on Bonita Creek about a mile from the sample locations. Sample DB-5, collected several months after samples DB-1 through DB-4, was transported from Safford to a location near Mayer, Arizona and concentrated there using the same equipment.

The Goldsaver uses a trommel rotating at approximately 30 RPM with a pressurized water spray bar to clean sample material introduced through the hopper and classify it to dimensional particles under 1/4 inch. Oversize material is rejected from the end of the trommel into an oversize chute. The material in the oversize chute is continuously inspected for nuggets, and to assure thorough cleaning of undersize particles, then directed into plastic buckets.

Undersize material (smaller than 1/4 inch) is washed over the Goldsaver's sloped oscillating riffles. When present, most gold is collected in the first five riffles near the top of the riffle board. Undersize material not caught in the Goldsaver's riffles is washed through the connecting tail sluice into the 24 inch Knudsen bowl. The Knudsen bowl uses moving water and centrifugal force to concentrate heavy minerals in the lower concentric riffles. Lighter weight material is flushed out through the Knudsen bowl's reject pipe. Material from the reject pipe was panned at regular intervals to assure that gold did not escape the circuit.

Individual buckets of sample were weighed and the results recorded. A small amount of detergent was added to each bucket to reduce the surface tension of the process water and to prevent any fine gold particles that might be present from floating over the riffles. A pump was arranged to provide water from Bonita Creek for samples DB-1 through DB-4, and from a settling pond for DB-5.

At both sites (Bonita Creek and near Mayer), the equipment was leveled, cleaned, prepared, started, and flow tested. Water flows were approximately 20 gallons per minute (gpm) to the Goldsaver with approximately 15 gpm of make-up water added to the Knudsen bowl. This water volume rate effectively reduces the sample slurry density and reduces the tendency of the riffles to pack with lighter weight material. The result is that any gold, which is very dense, that might be present in the sample becomes even heavier in relation to the sample slurry. This increases the gold's propensity to fall to the bottom of the slurry stream through the forces of gravity and be captured by the riffles.

The contents of individual buckets of sample were carefully poured into the feed hopper. The samples were introduced at a slow, steady rate to prevent overloading the riffles. As each bucket was emptied, it was cleaned with water from a hose to assure the processing of all contained particles.

An examiner was stationed at the end of the trommel to watch for nuggets rejected as oversize by the trommel screen (none were observed) and to assure complete cleaning of the material. The position of the spray bar was adjusted to assure maximum pressure cleaning of the sample. Where clay was found in the trommel, the sample feed rate was reduced and a trommel chain installed through the hopper. The trommel chain is about three feet long, and consists of heavy 3/8 inch chain links connected with swivels. A hook on the upper end of the trommel chain anchors it to the hopper. The pounding action of the chain inside the trommel increases the clay cleaning action of the tumbling sample. Heavy, clean scrap steel was added and recycled through the trommel to further aid cleaning when necessary.

Once all buckets of sample were completed for each sample, the equipment was turned off and the water flow stopped. The concentrates from the Goldsaver and tail sluice riffles were carefully washed into separate gold pans. The concentrates from the Knudsen bowl were washed into a separate gold pan. Each was reduced by hand panning to a concentrate of mostly black sand. Each concentrate was labeled and double bagged, and placed inside a sealed plastic bucket. These buckets was stored inside a locked government vehicle.

All concentrates, except DB-6, were transported to the BLM National Training Center in Phoenix and stored in a locked laboratory. There, they were further reduced by hand panning by Taylor, Shumaker, and a BLM visiting geologist, Robert Lewis. Shumaker performed finish panning to a final volume. The final volume was larger than normal to permit large volume mercury amalgamation and cyanide testing due to a potential for exceptionally fine gold. Concentrates from the Goldsaver and tail sluices and the Knudsen bowl were combined for each sample. Each concentrate was examined under a binocular microscope. Relatively large particles of gold are normally removed and weighed. However, no large particles were observed; in fact, only one small flake of gold was observed, which was in the DB-4 sample.

Sample DB-6 was collected by Thrasher by digging a hole with a shovel. This was a qualitative sample, intended for analysis of megascopic gold particles. Once oversized particles (greater than about six inches in maximum dimension) were removed, the sample fit into one five gallon bucket weighing about 70 pounds. This was hand panned by Thrasher at the BLM office in Safford. About 42 grams of black sands were recovered, with no visible signs of gold or any other precious metals. This was a qualitative sample collected to determine the presence or absence of visible gold, and was not further processes.

Analytical Work

Black sand concentrates from the five channel samples (DB-1 through DB-5) were double bagged, securely packed, and sent via certified mail, return receipt requested, to Jacobs Assay Labs in Tucson, Arizona. Jacobs is registered by the Arizona State Board of Technical Registration. Jacobs was requested to perform a mercury amalgamation and fineness test for each concentrate. Jacobs was also requested to perform a cyanide bottle roll test to determine if additional gold could be recovered by that method. Additionally, each of the three chert nodules were split into two pieces, with one piece from each nodule being sent to Jacobs for fire assay and atomic absorption analysis; these analytical methods were used to check the nodules for gold, silver, platinum, and palladium.

The sample taken with a shovel by Thrasher on top of the #12 claim (BD-6), which, when the oversized material was removed, nearly filled a five gallon bucket, was processed by Thrasher by using a gold pan. About 43 grams of black sands were recovered, but no colors of gold, or signs of any other precious metals were seen.

Results of the microscopic evaluation and laboratory analysis for the five channel samples are shown in Tables 1, 2 and 3.

TABLE 1			
Sample Number	Gravel Weight (pounds)	Loose Volume (cubic yards)	pounds per lcy
DB-1	761	.3161	2407
DB-2	561	.1398	4013
DB-3/3A	4205	1.1292	3724
DB-4	845	.2478	3410
DB-5/5A	1435	.3650	3932

Table 1. Statistics for channel samples. Loose volume was calculated by converting gallons to cubic yards; loose cubic yards (lcy) were calculated by measuring the height of the material in each individual five gallon bucket, converting the height to cubic inches by using the conversion factor of one gallon equals 231 cubic inches, and then converting that figure to cubic yards.

The results of the mercury amalgamation and cyanidation are shown in Table 2. A full copy of the assay reports is given in Appendix 3.

TABLE 2					
Sample No.	Conc. Weight (grams)	Mercury Amalgamati on Au (mg)	Cyanidati on Au (mg)	Cyanidati on Ag (mg)	Total Au (mg)
DB-1	533	0.117	0.612	4.385	0.729
DB-2	713	0.191	0.2888	ND	0.4798
DB-3/3A	2504	3.488	0.859	ND	4.347
DB-4	2179	1.090	ND	2.82	1.090
DB-5/5A	534	3.222	ND	3.085	3.222

Table 2. Gold and silver analysis of channel samples. ND is not detected; and mg is milligrams.

TABLE 3					
Sample No.	Gold Conc. (Troz/lcy)	Gold Value ($/lcy) @ $400/oz	Silver Conc. (Troz/lcy)	Silver Value ($/lcy) @ $6/oz	Total Value ($/lcy)
DB-1	.000074	0.0297	.000446	0.0027	0.0324
DB-2	.00011	0.0441	0	0	0.0441
DB-3/3A	.000124	0.0495	0	0	0.0495
DB-4	.000141	0.0566	.00037	0.0022	0.0588
DB-5/5A	.000284	0.1135	.000272	0.0016	0.1151

Table 3. Gold and silver values of the channel samples. Troz is Troy ounces; lcy is loose cubic yards.

The results of the assays for the three chert nodules is as follows (Table 4):

Table 4					
SAMPLE NO.	Au (OPT)	$/TON (@ $400/oz)	Ag (OPT)	$/TON (@ $6/oz)	TOTAL $ PER TON
DB-7	0.005	2.00	0.15	0.90	$2.90
DB-8	0.022	8.80	0.35	2.10	$10.90
DB-9	0.001	0.40	0.15	0.90	$1.30

TABLE 4. Assay results of three chert samples. OPT is ounces per ton. Assay values for platinum and palladium in the three samples were nil, each being recorded as less than .001 ounces per ton (see Appendix 3). Sample DB-9 is from Bill Tucker, and samples DB-7 and DB-8 were picked up from the surface of the 160 acre claim by Thrasher.

ECONOMIC EVALUATION

Various models were considered for mining unconsolidated bank deposits such as those found on the terraces on the claims. Resource values were calculated at $400 per troy ounce gold, and $6.00 per troy ounce silver.

Floating bucket line dredges operating in valleys near Sacramento, California were able to operate profitably on alluvium worth five to ten cents per yard as late as the 1950's. Such alluvium would be worth over 50 cents to over a dollar per cubic yard today due to increased gold prices. These dredges were working in broad alluvial valleys with small maximum sediment size. They enjoyed massive economics of scale due to the massive amount of gold-bearing sediment, inexpensive land, and low operating costs. None of these conditions describe the subject mining claims. Probably the most unfavorable factors in mining the subject claims are the low value of the deposit (less than 12 cents per loose cubic yard) combined with the large amount of boulders; boulders are always an important factor in dredging operations (Wells, 1969).

Stebbins (1987) shows a model placer mining operation suitable for mining unconsolidated bank deposits similar to those on the subject mining claims. In this example, 150,000 loose cubic yards are mined and processed annually. This example assumes an ideal situation where the season permits 250 work days per year. This method involves mining the deposit using front end loaders and backhoes. Processing is accomplished using conveyors, feed hoppers, trommels, jig concentrators, and sluices. Tailings are removed from the concentrators with bulldozers. The model includes costs for employee housing, which would not be necessary on the subject mining claims because of their proximity to Safford. Operating costs alone for the Stebbins model amount to $5.30 per loose cubic yard however, and as mentioned, the best values we obtained were about 12 cents per loose cubic yard. Capital costs for equipment acquisition (including a power source), construction of settling ponds, and reclamation would be additional.

The Stebbins model can be modified somewhat to potentially reduce some costs. Excellent management and equipment maintenance can reduce down time, although there will still be significant costs. General service requirements would still be necessary, but could be kept to a minimum. The model allows $262,575 for these items. Reducing this figure by 95 percent would reduce this part of the annual operating cost to $13,000. With these reductions, plus a general reduction in all costs for good management and low labor costs brings the operating cost (1985 costs) to $2.37 per cubic yard. However, this amount is still well above the best bank grade of about twelve cents ($0.1151) per loose cubic yard available on the subject claims; it is also highly doubtful that an annual operating cost of only five percent of the Stebbins model could indeed be sufficient to keep the equipment in good enough running order to minimize down time. Even with a modified Stebbins model and using our best bank grade, gold would have to be worth more than $8,352 per ounce for such an operation on the subject claims to break even. Although economies of scale are possible, any resultant reduction in cost would still be inadequate to successfully mine the very low grades encountered on the claims.

The occasional nodule of chert on the claims that has high precious metal values might potentially supplement the income of an otherwise viable operation. Unfortunately, chert alone or in combination with the meager placer deposits does not have enough value to render an operation profitable. The chert nodules are rare on the claims, and are difficult to distinguish from the dark volcanic rocks that are so abundant on the claims. The chert nodules would have to be hand picked. Even at the maximum values seen in this study (in sample DB-8), it would require gathering a ton of these fist-sized nodules to obtain $10.90 worth of metals. In a large, disseminated gold operation, $10.90 per ton could be a very good value. However, here the chert nodules are rare and irregularly distributed. Hand gathering of the chert nodules would be slow and labor-intensive. It would require walking the claims to identify and place each piece in a bag or bucket. The collection rate would be agonizingly slow. Not enough nodules could be collected in an hour to pay even minimum wage labor costs. Adding processing and transportation costs would make only add to the loss.

REFERENCES

Arizona Geological Survey, March 9, 1982, unpublished letter to Safford Bureau of Land Management regarding known mineral occurrences in the Turtle Mountain-Gila Box Wilderness Study Areas: Tucson, 30 pp.

Braatelien, D.S., 1991, 1994, personal communication.

Charbonneau, Helene, 1983, Research report of "Dorothy B" placer claims located in Graham County, Arizona: unpublished private sales report, 15 pp.

Dunn, P.G., 1978, Regional structure of the Safford district: Arizona Geological Society Digest, v. XI, Tucson, pp. 9-16.

Greeley, M.N., 1986, Mining Scams: Arizona Department of Mines and Mineral Resources Circular No. 11, Phoenix, 8 pp.

Johnson, M.G., 1972, Placer gold deposits of Arizona: U.S. Geological Survey Bulletin 1355, Washington, D.C., 103 pp.

Lindgren, Waldemar, 1905, The copper deposits of the Clifton-Morenci district, Arizona: U.S. Geological Survey Professional Paper 43, Washington, D.C., 375 pp.

Mieritz, Richard E., 1971, A report on the sampling program and procedure at the Dorothy "B" placer property, Graham County, Arizona: unpublished report, 13 pp.

Peterson, J.A., 1994, Platinum-group elements in sedimentary environments in the conterminous United States: U.S. Geological Survey Bulletin 2049-A, Washington, D.C., 38 pp., 1 plate.

Phillips, K.A., 1980, Platinum in Arizona: Arizona Department of Mines and Mineral Resources Circular No. 3, Phoenix, 3 pp.

Richter, D.H., Klein, D.P., Lawrence, V.A., and Lane, M.E., 1982, Mineral resource potential of the Gila-San Francisco Wilderness Study Area, Graham and Greenlee Counties, Arizona: U.S. Geological Survey, Miscellaneous Field Studies, Map MF-1315-B, Denver, Colorado. One map with pamphlet.

Richter, D.H., Houser, B.B., and Damon, P.E., 1983, Geologic map of the Guthrie Quadrangle, Graham and Greenlee Counties, Arizona: U.S. Geological Survey, Miscellaneous Investigations Series, Map I-1455, Denver, Colorado. One map with text.

Richter, D.H., and Lawrence, V.A., 1981, Geologic map of the Gila-San Francisco Wilderness Study Area, Graham and Greenlee Counties, Arizona: U.S. Geological Survey, Miscellaneous Field Studies, Map MF-1315-A, Denver, Colorado. One map with text.

Safford International Resources, Ltd., undated, untitled, unpublished, pp. 7-15.

Savory, William, 1984, Report of the Neal placer property and the 1938 operation: unpublished, 11 pp.

Stebbins, Scott A., 1987, Cost Estimation Handbook for Small Placer Mines, U.S. Bureau of Mines, Information Circular 9170.

Van Dine, Max, 1981, Investigative report of "Dorothy B" auriferous gravel and black sand located in Graham County, Arizona: unpublished, 17 pp.

Vandrenkamp, F.H., 1930, Investigation and report on "Neel Gila River" auriferous gravel deposits located in Graham County, Arizona: unpublished, 31 pp.

Wells, J.H., 1969 (reprinted 1989), Placer examination; principles and practice: U.S. Bureau of Land Management, Technical Bulletin 4, Phoenix, Arizona, 209 pp.

Wilson, E.D., 1961 (reprinted 1981), Gold placers and placering in Arizona: Arizona Geological Survey Bulletin 168, Tucson, 124 pp.

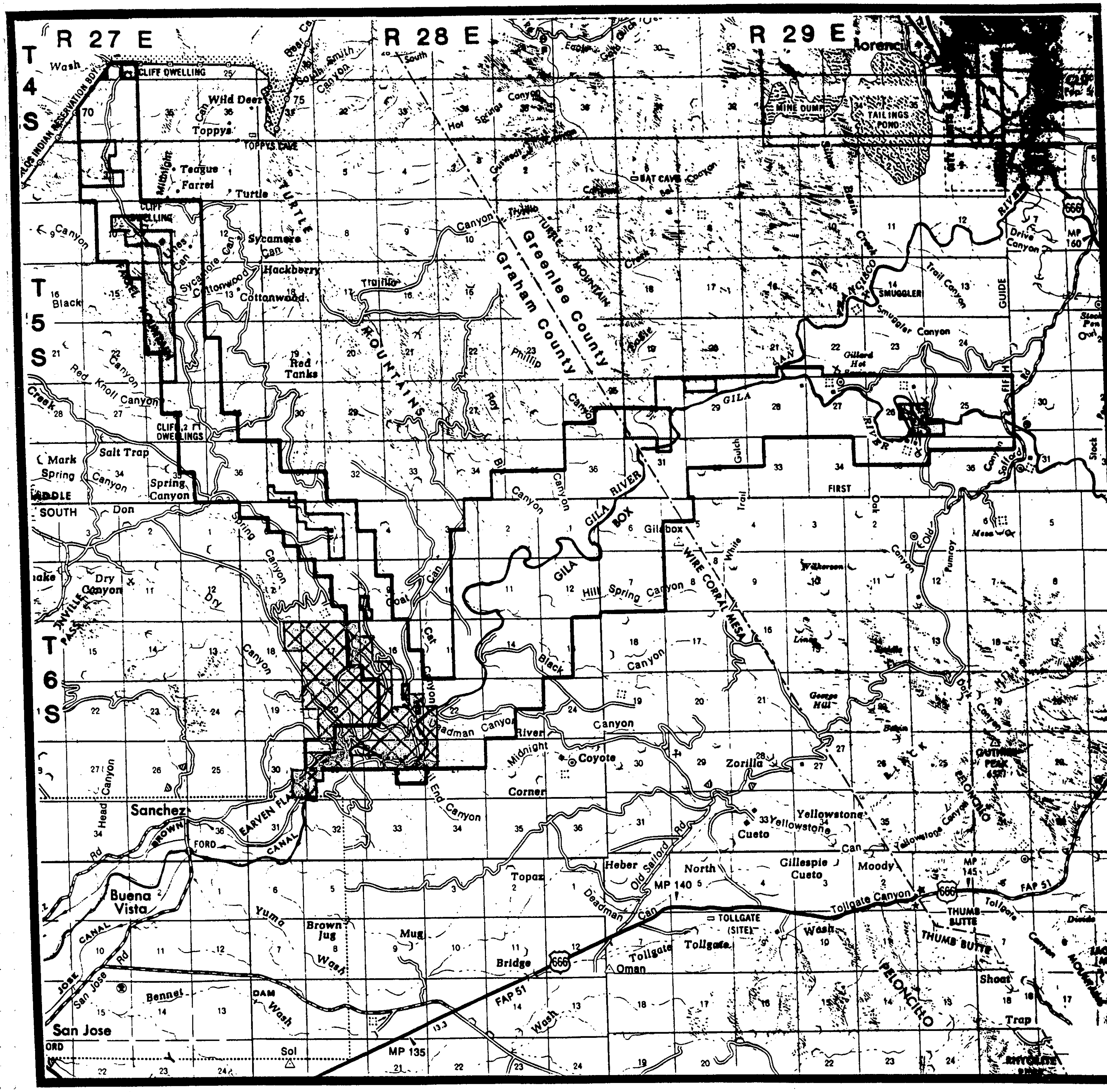

FIGURE 1

RNCA BOUNDARY

DOROTHY B CLAIMS

U.S. Department of the Interior
Bureau of Land Management
Safford District

GILA BOX-RIPARIAN NATIONAL CONSERVATION AREA

Basemap © ADOT

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SCALE

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Miles

LOCATION MAP

1990

FIGURE 2. ACCESS ROUTES

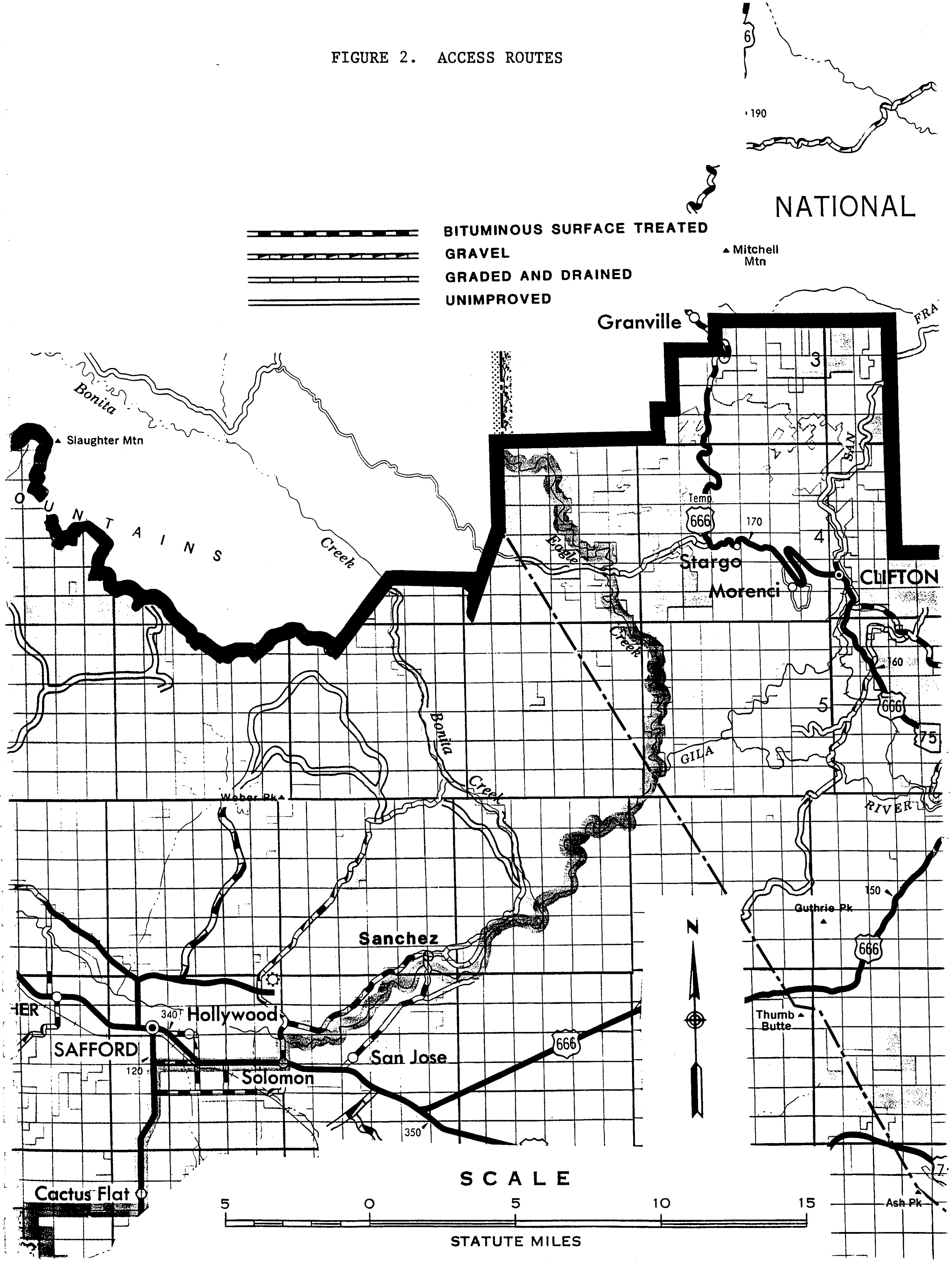
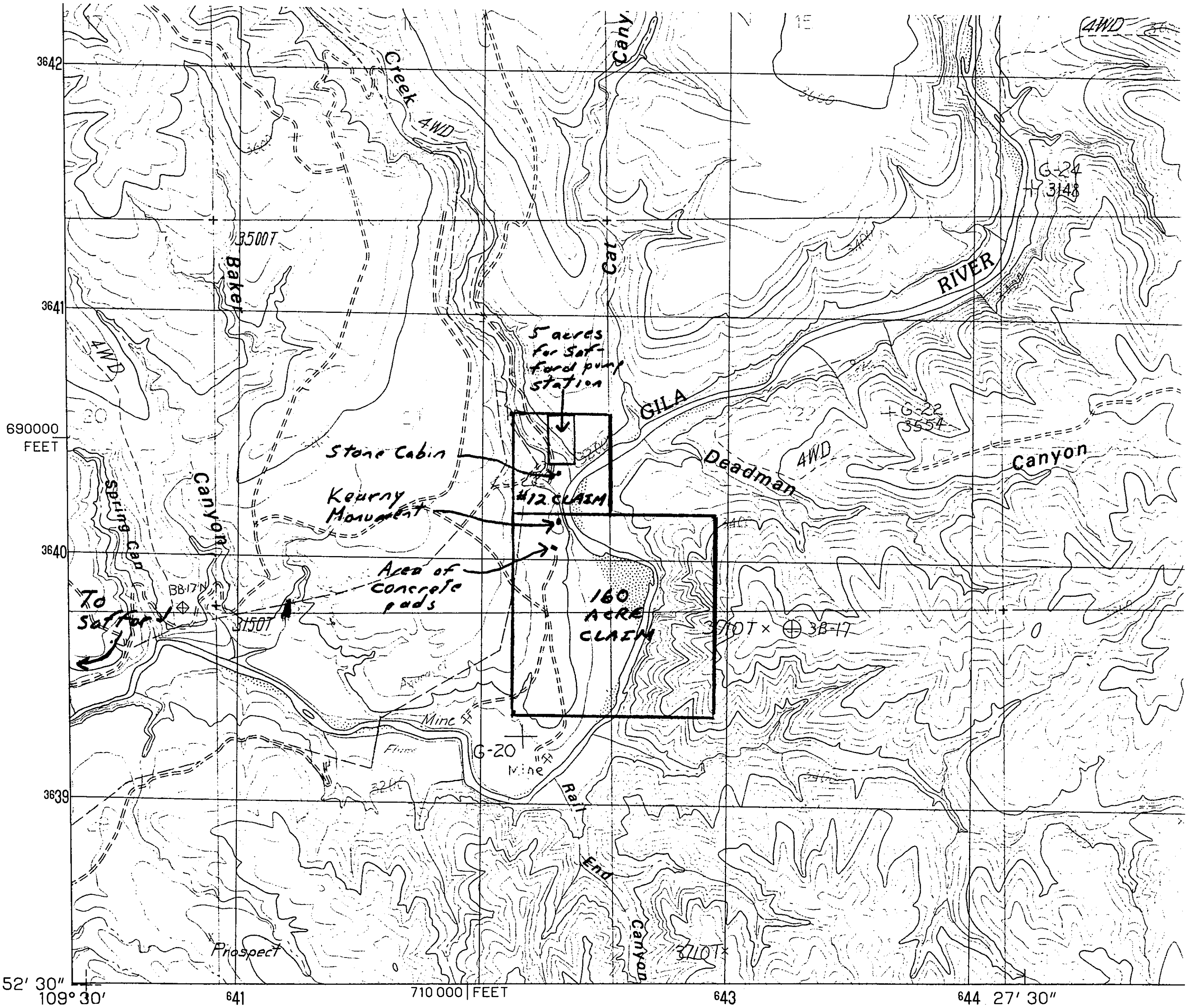


Figure 3. Topographic Map



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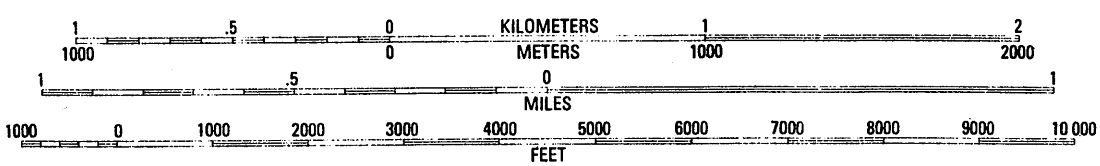


CONTOUR INTERVAL 40 FEET

ROAD LEGEND

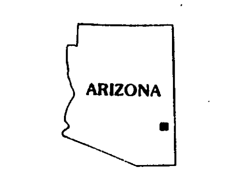
Improved Road ....
Unimproved Road ....
Trail ....

Interstate Route   U.S. Route   State Route

GILA BOX, ARIZONA

PROVISIONAL EDITION 1985

32109-H4-TF-024



QUADRANGLE LOCATION

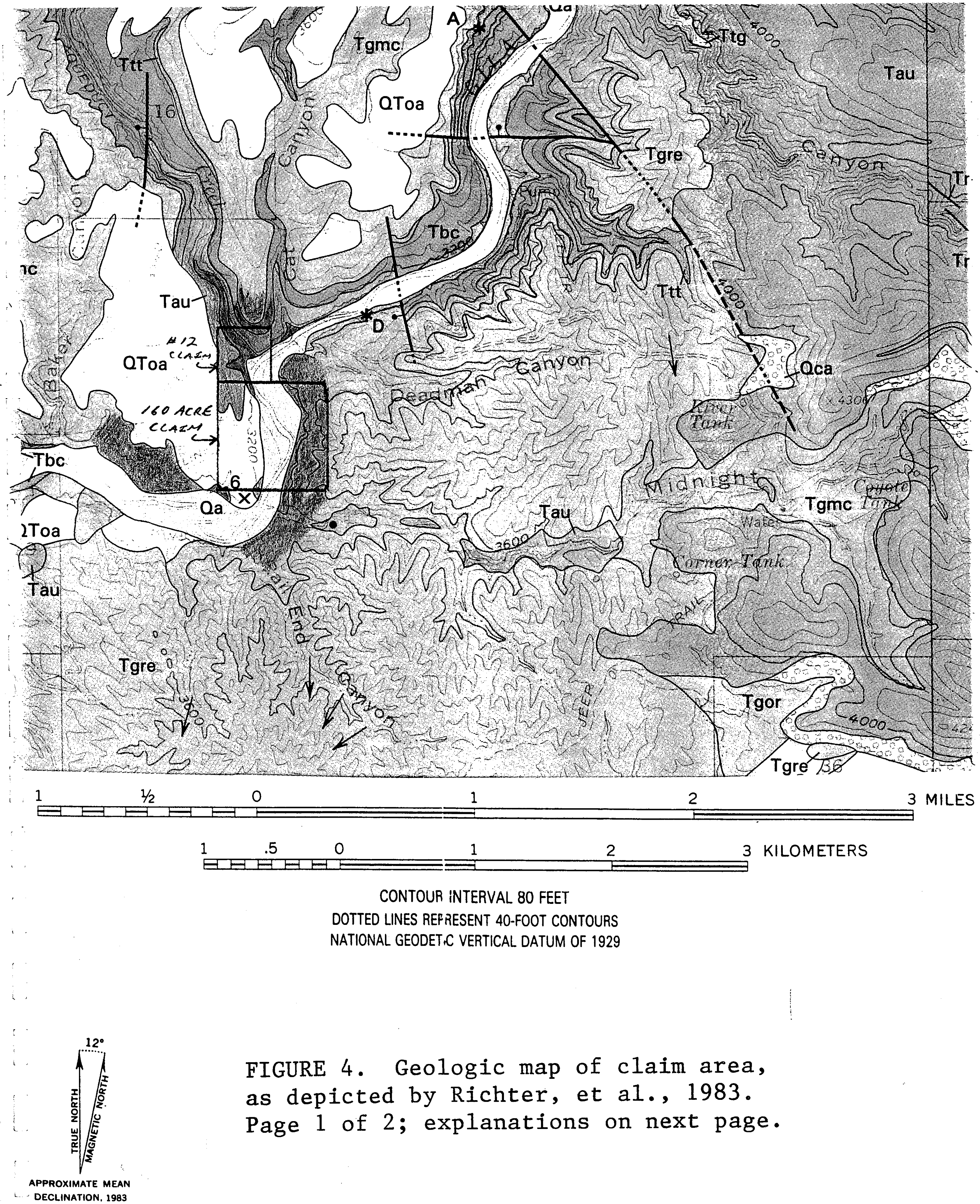


FIGURE 4. Geologic map of claim area, as depicted by Richter, et al., 1983. Page 1 of 2; explanations on next page.

DESCR

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oratory of Isotope Geochemistry,

esponds to number in table 2

ology

ter and Lawrence (1983)]

DESCRIPTION

brecciated, filled with quartz, calcite, pyrite,
ganese minerals, and argentite. Discovered
ined intermittently until 1940. In 1980 under
at old tailings. Production probably more than

uartz and silver minerals. In 1980 under

lings of psilomelane along two fault zones.
y 1918-1955. Production about 1,700 metric
percent Mn.
yrolusite, associated with calcite, in fault zone.
of 40 percent Mn ore produced in 1955.

Francisco River containing clasts of massive
te. Known since 1900; production minor.
River. In 1980 under development for large-

ce in ash-flow tuff (unit Ttt). One quarry

ntinuous tin-bearing quartz-hematite veinlets
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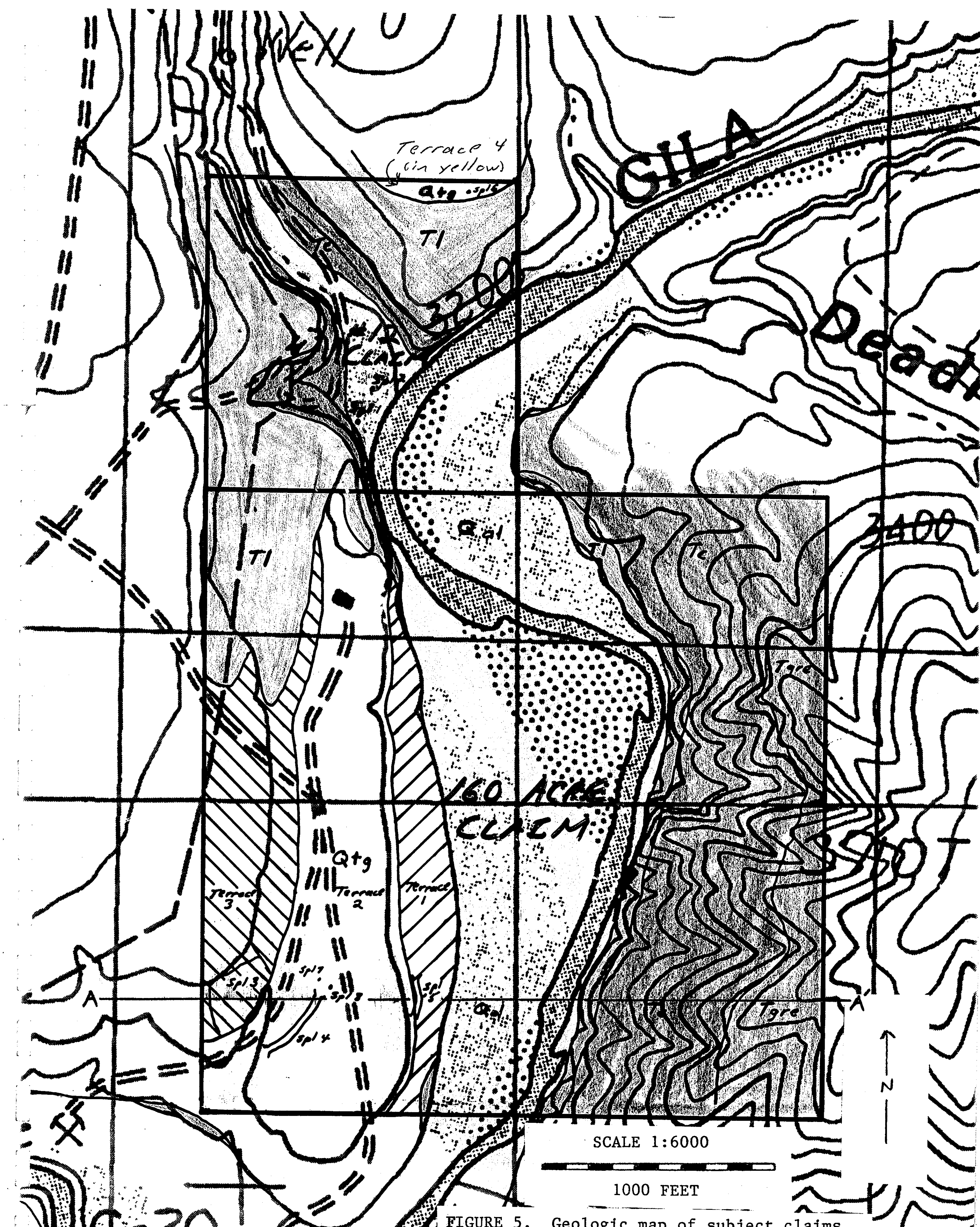


FIGURE 5. Geologic map of subject claims prepared by Thrasher, Shumaker, and Taylor. Page 1 of 2; explanations on next page.

Qal	Recent alluvium in active stream channels
Qtg	Older alluvial gravels
Tc	Cliff-forming conglomerates; generally well consolidated
Tgre	Gravel of Rail End Canyon
Tl	Tertiary lavas; andesitic

A ——— A' Line of cross section for Figure 7 (in southern portion of map)

spl # Sites of samples taken for this study

Figure 5, continued. Explanation of map symbols. Topography taken from U.S. Geological Survey Gila Box quadrangle map, the same as used in Figure 3.

Figure 6. Aerial photograph, taken September 6, 1986, of claim area, showing subject claim boundaries and terraces 1, 2, and 3. Approximate scale is 1" = 1,100'.

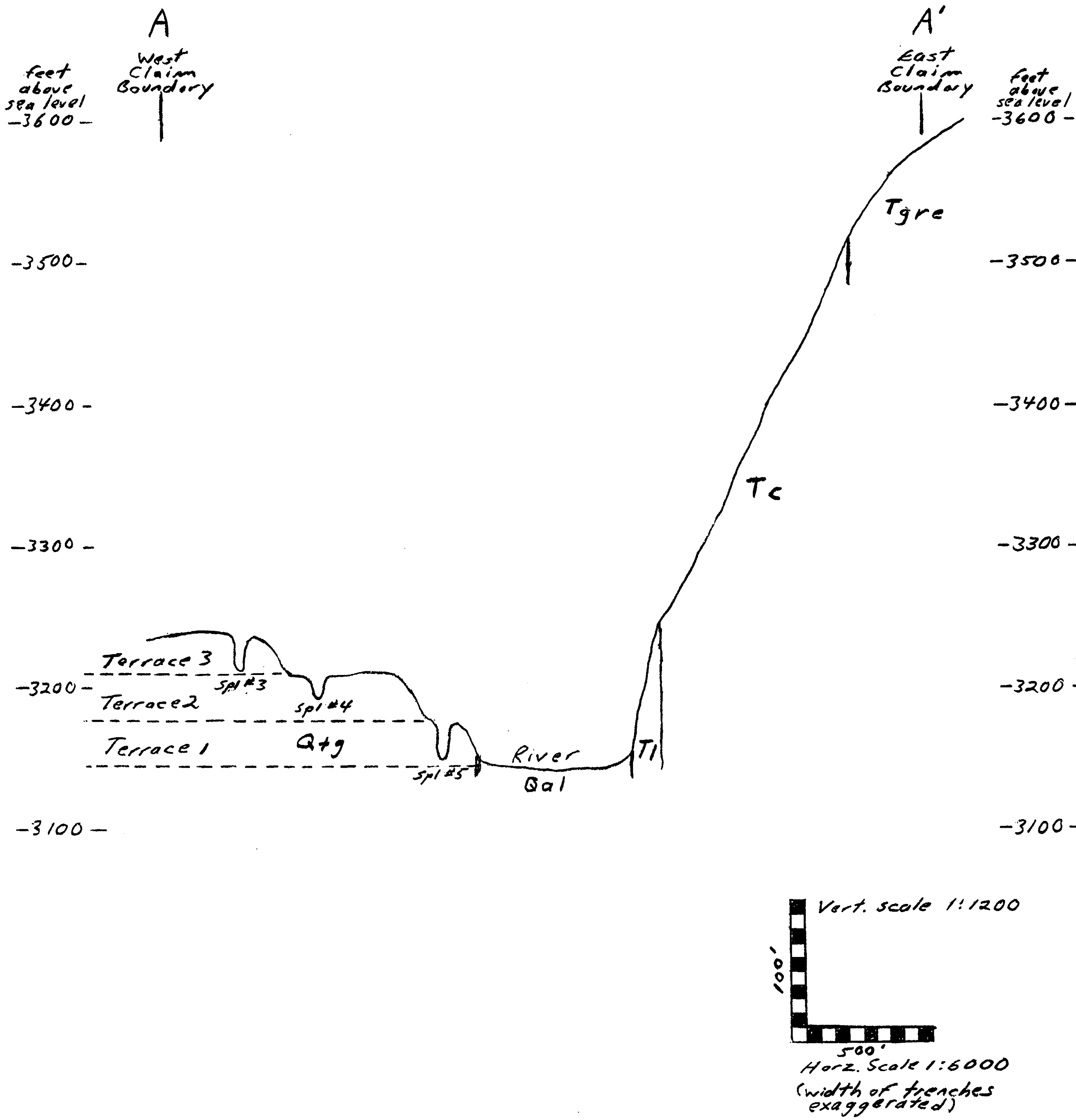
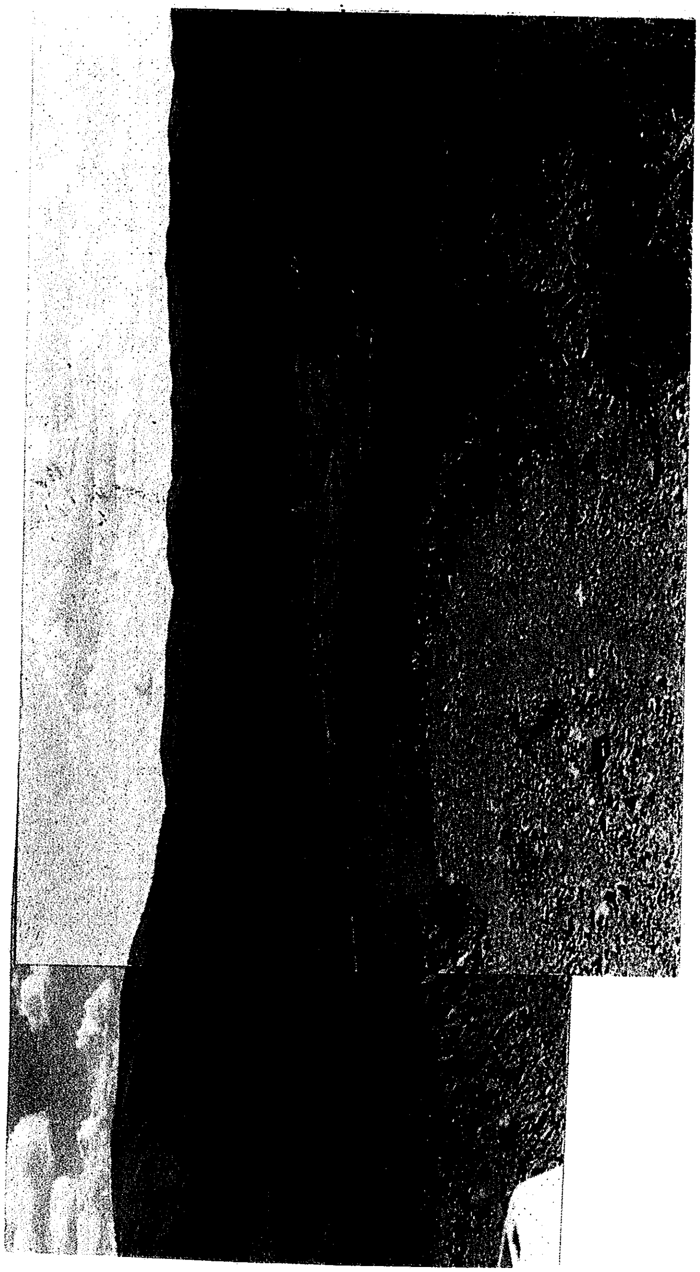


Figure 7. East-west cross section A-A' across 160-acre mining claim. Geologic symbols same as for geologic map (Figure 5).



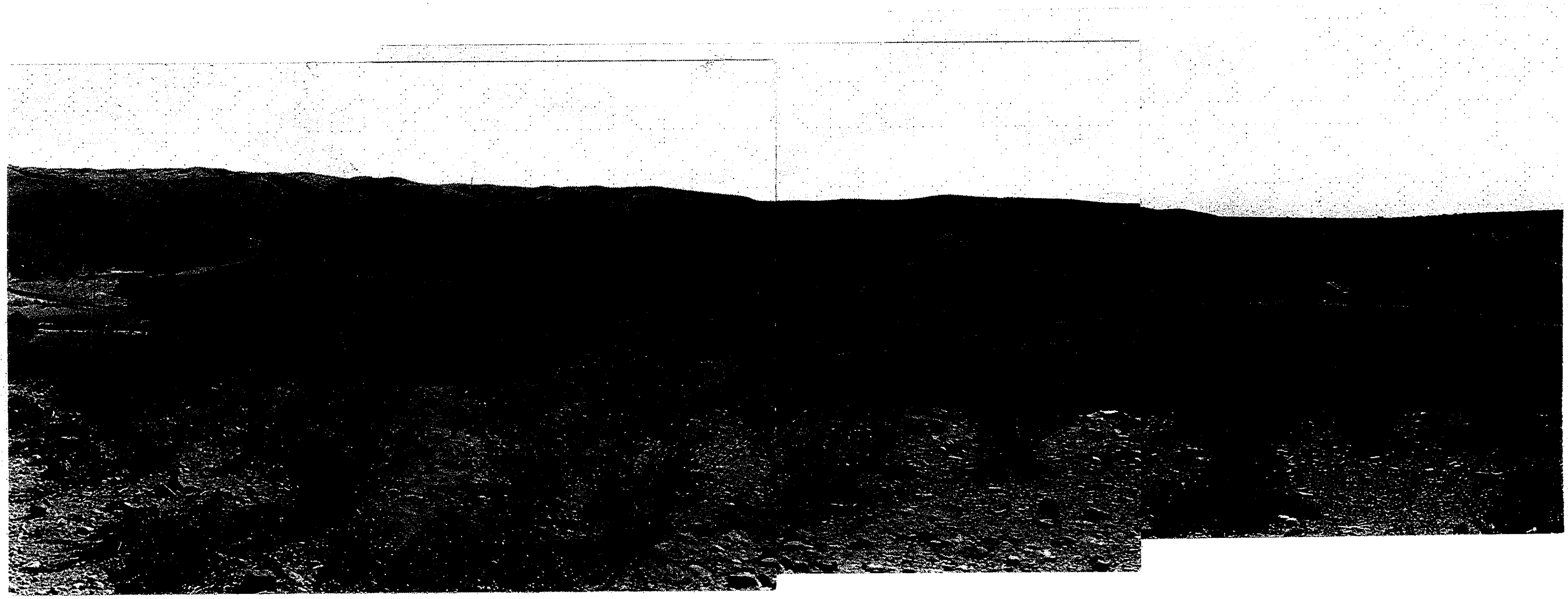


Figure 8. Panoramic view of subject claims, looking south and west from near the northeast corner of the subject #12 claim.

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equipment did not recover

Figure 10. Photograph of the Universal Mining operation.

Flood 1983

after Flood 1983

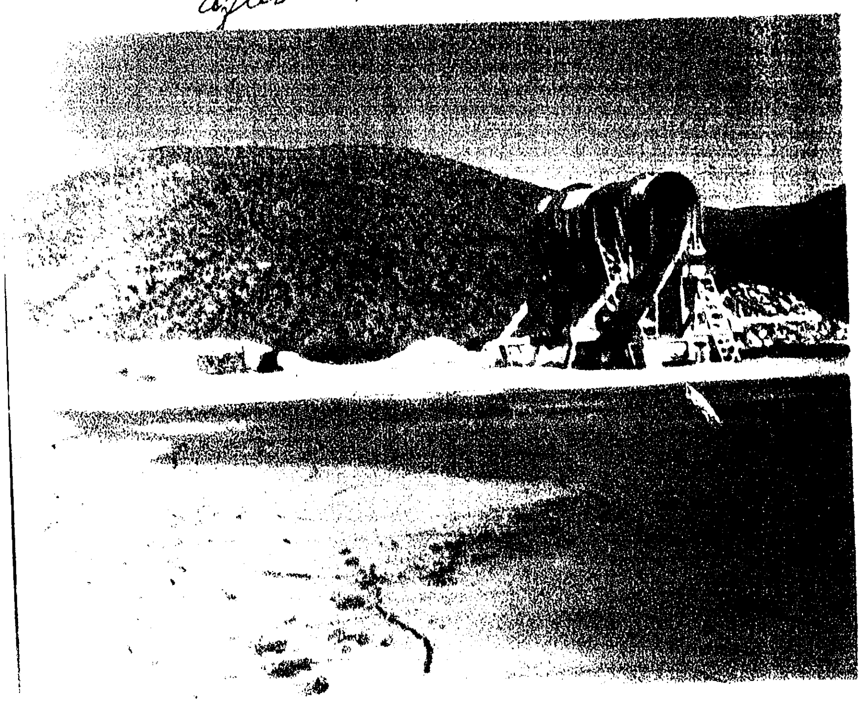

Figure 11. Remains of the Universal Mining operation, after the flood of 1983.

APPENDIX 1

DOCUMENTATION OF MISREPRESENTATION OF GEOLOGIC REFERENCES

EXCERPTS FROM:

The Copper Deposits of the
Clifton-Morenci District,
Arizona

by Waldemar Lindgren

United States Geological Survey
Professional Paper 43
1905

Lindgren

Lindgren

GILA CONGLOMERATE.

General character and distribution.—This name was first applied by Mr. G. K. Gilbert to extensive and deeply eroded valley deposits extending along Gila River from the mouth of the Bonito up into western New Mexico. Mr. Gilbert[a] characterizes the formation as follows:

"The bowlders of the conglomerate are of local origin, and their derivation from particular mountain flanks is often indicated by the slopes of the beds. Its cement is calcareous. Interbedded with it are layers of slightly coherent sand and of trass, and sheets of basalt; the latter, in some cliffs, predominating over the conglomerate. One thousand feet of the beds are frequently exposed, and the maximum exposure on the Prieto is probably 1,500 feet. They have been seen at so many points by Mr. Howell and myself that their distribution can be given in general terms. Beginning at the mouth of the Bonito, below which point their distinctive characters are lost, they follow the Gila for more than 100 miles toward its source, being last seen a little above the mouth of the Gilita. On the San Francisco they extend 80 miles; on the Prieto, 10; and on the Bonito, 15. Where the Gila intersects the troughs of the Basin Range system, as it does north of Ralston, the conglomerate is continuous with the gravels which occupy the troughs and floor the desert plains. Below the Bonito it merges insensibly with the detritus of Pueblo Viejo Desert. It is, indeed, one of the 'Quaternary gravels' of the desert interior, and is distinguished from its family only by the fact that the water-courses which cross it are sinking themselves into it and destroying it instead of adding to its depth."

Beginning of quote by Vandrenkamp

General distribution of Gila Conglomerate; only portion of excerpt not focused on Clifton quadrangle

The Gila conglomerate occupies about 30 square miles in the southeast corner of Clifton quadrangle. It skirts the flanks of the Morenci hills and the southeastern slopes of Copper King Mountain, attaining marginal elevations of about 4,500 feet, the ridges sloping thence southward, at a grade of 100 to 200 feet to the mile, until they abruptly drop off into the canyon of the San Francisco, 400 to 500 feet deep. A long bay of this formation extends northward into the mountain area, following the western side of San Francisco River up to a point 10 miles north of Clifton, where it forms small patches on basalt and rhyolite at elevations of 4,500 feet. The thickness exposed near Clifton is 600 feet, while along the river canyon, due east of Copper King Mountain, it almost reaches 900 feet. Along San Francisco River it does not extend more than 25 miles north of the Gila.

The material of the Gila formation consists almost exclusively of coarse subangular gravels, appearing more or less distinctly stratified by nonpersisting streaks or lenses of sand, and containing fragments of all of the older rocks of the mountains. In most places basalts and rhyolites predominate, as is natural

[a] Gilbert, G. K., Preliminary geological report: U. S. Geog. Surv. W. 100th Mer., vol. 3, Appendix D, 1874, p. 540.

when we consider that at the time when these deposits were being accumulated a much larger part of the quadrangle was covered by volcanic flows than at present. Other rocks may, however, locally preponderate; thus, for instance, below the area of porphyry, a few miles southwest of Morenci, where the gravels consist almost exclusively of coarse diorite-porphyry, often, indeed, difficult to distinguish from the deeply weathered outcrops of the same rock. Along the lower part of Eagle Creek volcanic rocks are extremely abundant in the Gila conglomerate, and the dividing line between this and the underlying basaltic and rhyolitic tuffs in places becomes indistinct.

Along San Francisco River and Chase Creek the erosion has in many places produced steep or nearly perpendicular bluffs of Gila conglomerate, usually pitted by reason of the gradual weathering out of the larger pebbles. Where volcanic rocks predominate the conglomerate is often well cemented, and in many places must even be blasted along railroad cuts and tunnels.

-misquoted by van drenkrap

From Morenci down to Clifton the gravels are roughly stratified, largely subangular, and the pebbles rarely attain over 1 foot in diameter. Volcanic rocks, granite, limestone, and quartz porphyry are mixed. They are not greatly consolidated, though forming small cliffs in places. The gravels contain a considerable amount of sand, but it is intimately mixed with the coarse material and rarely occurs in isolated streaks. The color of the Gila conglomerate is reddish to grayish white, especially in places where long-continued exposure has had opportunity to oxidize the iron.

In Ward Canyon the gravels lean up against the steep fault plane along which the granite here breaks off. North of the canyon patches of gravel lie on the granite at higher elevations of 4,300 feet. These were probably once connected with the great table of gravel south of the canyon, which has the same elevation, apparently showing that there has been no considerable dislocation of the conglomerate since its deposition.

The gravel bluffs begin almost immediately below Clifton, where they are seen leaning up against granite and basalt (Pl. II, *A*), and continue along the river for many miles. Excellent exposures are seen 1½ miles below the new Shannon smelter, especially on the west side (Pl. III, *B*). The sandy river bottom is here from 300 to 600 feet wide; in several places there are narrow terraces of gravel, at most 100 feet above the creek. The bluffs, which in places are almost perpendicular, rise to a height of about 400 feet; the conglomerate is well cemented (railroad tunnels will stand in it without timbering) and is roughly stratified by small streaks of sand. On the whole, there is little sand and few indications of cross-bedding. The material consists of rhyolite, basalt, granite,

Lindgren

and porphyry, all subangular, the fragments attaining 2 feet in diameter, but averaging about 8 inches. Some of the material on top of the bluff seems better rounded than the rest. South of San Francisco River the same formation continues over the undulating foothills down to the Gila, but the pebbles of the conglomerate become distinctly finer. At the Gila the formation leans against hills of basalt and other lavas.

Mode of deposition.—The Gila conglomerate is unquestionably of fluviatile origin, and was deposited during an epoch in which the lower reaches of the rivers gradually lost their eroding and transporting powers, while disintegration progressed rapidly in the mountains. Especially was it active among the loose masses of lava, which then covered so much of this quadrangle, from which intermittently torrential streams brought down vast masses of the crumbling rocks. The climatic conditions were then probably very similar to what they are at present.

The volcanic outbursts of the Tertiary took place under conditions of active erosion, the different flows being often deeply dissected before the eruption of the next mass. This epoch of erosion doubtless continued for a short time after the close of the igneous activity, for we find the Gila conglomerate deposited on an uneven and in places deeply dissected surface. A deep and narrow canyon was cut corresponding to the present San Francisco River, with a course parallel, but about a mile farther west; this is clearly marked by the bay of gravels now cut across by Chase Creek between Clifton and the Morenci foothills without exposing the bed rock. As far as known, the Gila conglomerate has not been warped or dislocated by faulting in this area, though studies extended over a wider field may very possibly modify this conclusion.

Age.—No fossils have been found in the formation. Mr. Gilbert, followed by Mr. Ransome, assigns an early Quaternary age to it, and no evidence from this region conflicts with this conclusion.

TERRACE GRAVELS.

Small benches of terrace gravels appear at a few places along San Francisco River and Eagle Creek, especially in the lower part of the stream courses. Such gravels are found on Eagle Creek in small bodies 100 to 200 feet above the creek in its lower course, and about 50 feet above the creek near the northern end of the quadrangle. Similar benches are found along the San Francisco. The Shannon smelter is built on one of them, which is exposed 1 mile below Clifton, rising 60 to 100 feet above the water level. These gravels, indicating a temporary check in the erosive power of the stream, are much later than the Gila conglomerate, and are referred to the late Quaternary.

- Used by Vandrenkamp near bottom of p. 7

Lindgren

PRESENT STREAM GRAVELS.

The most recent Quaternary formation is the alluvium contained in San Francisco River and Eagle Creek. Both streams are well graded and occupy a continuous strip of sandy and gravelly bottom land, sometimes, however, narrowing to a width of only 100 or 200 feet. Just below Clifton the sandy alluvium of San Francisco River attains the unusual width of 2,000 feet.

end of discussion on gravels, except for p. 212

INTRUSIVE ROCKS.

GENERAL STATEMENT.

Granting intrusive origin to the basal pre-Cambrian granite, there is a second and much younger series of igneous rocks contained as stocks, dikes, sheets, and laccoliths in all of the lower Cretaceous, Paleozoic, or pre-Cambrian formations. The time of intrusion of these falls between the middle Cretaceous and the middle Tertiary periods, but they far antedate the Tertiary lavas, which are spread out over their eroded surface. Porphyries of granitic, monzonitic, or dioritic affiliations predominate; diabase occurs in subordinate amounts and would appear to be somewhat later than the porphyries. The great dislocations followed these intrusions.

PORPHYRIES.

General character and distribution.—The porphyries form an almost continuous series of light-gray acidic or predominatingly feldspathic rocks, ranging from diorite-porphyry through monzonite-porphyry to granite-porphyry. Between the last two divisions no line can be drawn, but the diorite-porphyry occupies a somewhat more individual position.

The area covered by porphyry on the general map (Pl. I) hardly amounts to 9 square miles. The rock is extensively developed in the Morenci hills between Eagle Creek and Chase Creek, but also reaches up from the canyon of the latter on the north and the east flanks of Copper King Mountain.

The principal area forms a stock extending with jagged contacts for 7 miles in a northeast direction from the Eagle Creek foothills by Morenci to 1 mile northeast of Metcalf, where it splits up in very numerous dikes, all having a northerly or northeasterly trend. The northern half of this stock and its dikes is chiefly contained in granite, while the southern part is surrounded by Cretaceous shales and sandstones, Cambrian quartzites, or Ordovician limestones, and breaks up into a complicated mass of dikes and sheets near the point where the rocks dip below the basalts, which fill the valley of Eagle Creek. A narrow dike, breaking through Cretaceous sediments, connects this area with an oval mass of porphyry containing 1½ square miles, and almost entirely surrounded by slightly

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limestone. Prospects have been opened along this fault both at the horizon of the porphyry and below it. The ore is rusty and decomposed, showing some partly decomposed pyrite.

The Hormeyer mine is the most important of these deposits. It is located in the limestone overlying the quartzite 1 mile east-southeast from the Detroit Copper Company's store at Morenci. It has been worked at intervals during the last few years, and the developments consist chiefly of two levels or tunnels. The total product is believed to have been $30,000, chiefly in gold. The croppings are situated at an elevation of 4,760 feet, the top of the Coronado quartzite appearing 100 feet below, on the Chase Creek slope. The deposit is a fissure vein following a porphyry dike, this dike being an offshoot from the main sill of porphyry which so persistently follows the contact of quartzite and limestone in this vicinity. The strike of the vein is northeasterly. The croppings consist of cellular quartz stained yellow by lead oxide. The ore contains a little copper, a great amount of lead carbonate, and native gold. The lowest tunnel, located at an elevation of 4,500 feet, is run along a porphyry dike 6 feet wide, which probably is a continuation of the one noted at the upper tunnel. No ore has thus far been found in the lower level.

The ores of Copper King mine contain from $1 to $4 per ton in gold. Northeast of Copper Mountain the same vein system continues in granite, usually following porphyry dikes, but here carries less copper and considerably more gold. The croppings yield light gold in the pan, and, in tunnels 50 to 100 feet below, sulphide ore is found in many places, consisting of auriferous pyrite, chalcopyrite, zinc blende, and galena. The value of these veins is as yet problematical.

GOLD-BEARING GRAVELS.

The gravels lying in front of the hills of older rocks at Morenci and Clifton are auriferous in places. Placers of some value were worked in Gold Gulch, but are now exhausted. An unsuccessful attempt was made some years ago to mine, by the hydraulic method, the bench gravels of San Francisco River, which doubtless derived their gold from the veins northeast of Copper Mountain. The Gila conglomerate south of Morenci contains a little fine gold, which is concentrated in shallow gullies. Payable placers have not been found.

CONDITIONS OF GROUND WATER.

Permanent water has not thus far been encountered in any of the mines in the whole district with which this report deals.

Morenci is situated on hills from 800 to 1,500 feet above the principal streams—Chase Creek and Eagle Creek—and the deepest workings in no place

Lindgren

EXCERPTS FROM:

Investigation and Report on
"Neel Gila River" Auriferous
Gravel Deposits Located in
Graham County, Arizona

by F.H. Vandrenkamp

Unpublished

1930

COPY

COPY

INVESTIGATION AND REPORT

on

"NEEL GILA RIVER" AURIFEROUS GRAVEL DEPOSITS

Located in

GRAHAM COUNTY, ARIZONA

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INDEX

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GEOLOGY

The geology of this region is fully described in Professional Paper No. 43, "Morenci and Clifton Quadrangle", by Waldemar Lindgren. It being so thorough and painstaking that it seems of little use to revamp any of its contents. I therefore shall quote excerpts from his report.

beginning of quote

Although not noted, many portions of quote are skipped

General Character and Distribution. "The boulders of the conglomerate are of local origin, and their derivation from particular mountain flanks is often indicated by the slopes of the beds. Its cement is calcareous. Interbedded with it are layers of lightly coherent sand and of trass and sheets of basalt; the latter, in some cliffs, predominating over the conglomerate. . . . Beginning at the mouth of Bonito Creek below which point their distinctive characters are lost, they follow the Gila River for more than one hundred miles toward its source. Below Bonito Creek it merges insensibly with the detritus of Pueblo Viejo Desert. It is, indeed, one of the "Quaternary Gravels" of the desert interior, and is distinguished from its family

Vandrenkamp

only by the fact that the water-courses which cross it are sinking themselves into it and destroying it instead of adding to its depth * * The material of the Gila River formation consists almost exclusively of coarse subangular gravels, appearing more or less distinctly stratified by non-persisting streaks or lenses of sand, and containing fragments of all of the older rocks of the mountains. In most places basalts and rhyolites predominate, as is natural when we consider that at the time when these deposits were being accumulated, a much larger part of the quadrangle was covered by volcanic flows than at present. Other rocks may, however, locally predominate; thus, for instance, below the area of porhyry, a few miles southwest of Morenci, where the gravels consist almost exclusively of coarse diorite - porphyry, often indeed, difficult to distinguish from the deeply weathered outcrops of the same rock. Along the lower part of Eagle Creek volcanic rocks are extremely abundant in the Gila conglomerate, and the dividing line between this and the underlying basaltic and rhyolitic tuffs

bottom, p. 75 of Lindgren

in places becomes indistinct. * * Along the Gila River from the mouth of Bonita Creek to the mouth of Spring creek, the erosion has in many places produced steep or nearly perpendicular bluffs of Gila conglomerate usually pitted by reason of the gradual weathering out of the larger pebbles. Where volcanic rocks predominate, the conglomerate is often well cemented. The color of the Gila conglomerate is reddish to grayish white, especially in places where long-continued exposure has had opportunity to oxidize the iron.

- see first full paragraph on p. 76 of Lindgren

<u>Mode of Deposition</u>. - - The Gila conglomerate is unquestionably of fluviatile origin, and was deposited during an epoch in which the lower reaches of the rivers gradually lost their eroding and transporting powers, while disintegration progressed rapidly in the mountains. Especially was it active among the loose masses of lava, which then covered so much of the quadrangle, from which intermittently torrential streams brought down vast masses of the crumbling rocks. The climatic conditions were then probably very similar to what they are at present. The vol-

canic outbursts of the Tertiary took place under conditions of active erosion, the different flows being often deeply dissected before the eruption of the next mass. This epoch of erosion doubtless continued for a short time after the close of the igneous activity, for we find the Gila conglomerate deposited on an uneven, and in places, deeply dissected surface. As far as known, the Gila conglomerate has not been warped or dislocated by faulting in this area, though studies extended over a wider field may very possibly modify this conclusion." End of quoting Lindrgen

TERRACE GRAVELS

Between Bonito and Spring Creeks (See photo and Map No. 1), on the northwest side of the Gila river from 50 to 200 feet above the stream in its lower course, we find a large acreage of auriferous gravel, deposited in four distinct terraces. The deposition of the gravel in terraces would indicate a temporary check in the erosive power of the stream, much later than the Gila conglomerates.

Not in Lindgren

paraphrase of Lindgren, p. 77

CHARACTER AND SOURCE OF TERRACE GRAVELS

copied by Von Olne, who attributed this to Lindgren

The terrace gravels are of auriferous origin, deposited by erosive agents, and, being a much later flow than the Gila conglomerate, the Gila conglomerate forms the bed-rock or stratas of gold concentration. These gravels no doubt are part of a remnant of an old ancient river channel. The channel may be traced by its exposed edges and rims in several places. All the boulders and stratas of gravel have a slight dip of 10 degrees to the northwest, whereas the Gila conglomerate dips 20 degrees southwest. These gravels indicate a temporary check in their erosive ~~poser~~ power, due no doubt to the erosion gradually declining in intensity, thus forming the many terraces. The gold being of ancient origin, being derived from disintegration of the immeasurable gold-bearing quartz veins in the igneous rocks of post-paleozoic age.

The gravel consists of average size boulders, from the size of a bucket to that occasionally of a large barrel, and sand of a very loose nature, all washed smooth and well rounded. No pipe clay or cemented gravel is to be found of any consequence, except, occasionally now and then I observed a thin layer of about two feet in thickness of gravel cemented by some carbonate of lime with oxide of iron which, when coming in contact with water, disintegrates instantly.

continued copying by Von Dine

The gravels, as shown deposited by an ancient river channel in the form of terraces, never eroded into the bed of the Gila River. The old river channel makes a swing northwest along the north bank of Spring Creek, thence disappearing underneath a heavy wash. The gravels in the Gila river bed are largely composed of detritus material and of rocks found in the Gila conglomerate. The writer drilled three (3) test holes in the bed of the Gila river to determine this factor. The depth to bedrock in each hole was twenty (20) feet where the drill entered the Gila conglomerate, and at a depth of thirty-two (32) feet encountered hot water. A few colors of free gold were found in each hole throughout the twenty feet of gravel, this no doubt having come out of the Gila conglomerate, as the Gila conglomerate contains a little free gold throughout, but not in commercial quantity.

It is not materially significant where the gold comes from found so abundantly in the gravel, or how it was deposited - but, it is important, and very essential, to fix the value of the gravel, the nevertheless I will have to include this acreage as DOUBTFUL. In the event we find this ground to contain pay gravel in its entirety, it will add an additional yardage of approximately 45,760,000 to what we already have. The measurements of the acreage are as follows:

	Feet:
Approximate length between extreme points -	5,280
" width " " "	2,600
" depth of gravel - - - - - - - - -	120

TESTING OF GRAVEL AND SAMPLING

Copied by Van Dine

Having ascertained the approximate yardage, and the character of the gravel, the next important phase is the values in free gold per cubic yard. The only method of testing and sampling a gravel property is by rocker, the pan or sluice. I employed all three methods in my sampling. The best location for my sampling was to start on the different pits, shafts, old and new, open cuts, group them, and find the average.

On Plate No. 1 will be found the plan of shafts, pits and cuts, showing the ensemble of sampling of first terrace. The gravel was taken at different heights, all along the top of the first terrace in open pits and shafts from six (6) to thirty (30) feet in depth, and all along the face of the bank in cuts from six (6) feet in width to thirty (30) feet in height, were cut vertically in the different strata.

Copied by Van Dine

From three (3) to twelve (12) pans were taken in each pit and shaft; and from one-half (½) cubic yard to as many as two (2) cubic yards of gravel were taken from pits, shafts, and cuts, and washed by rocker or sluiced, exclusive of the bed-rock. All samples were taken in a box measuring one cubic yard, or 3'x9'x1'. This box was filled with gravel and boulders, allowance being made for the volume of the boulders; then washed either by rocker or through the sluice box containing riffles. The free gold was then separated by amalgamation from the "black sands", weighed on especial gold scales, and values calculated, using for unit value per milligram the fineness of the gold as per mint receipts. The results thus obtained being sixty cents (60¢) per cubic yard for the entire six hundred forty (640) acres. This acreage has been determined by measurements, spaced by myself, the average of which has been found to be as follows:

Approximate length	- - -	11,220 feet
" width	- - -	1,820 "
" depth	- - -	30 "

According to these figures, the importance of the deposit approximates 17,017,000 cubic yards of POSITIVE gold bearing auriferous gravel, or, in round figures, sixty cents (60¢) per cubic yard, a POSITIVE value of

Copied .
Van Din

According to these figures, we find the deposit on the second terrace contains approximately 58,905,000 cubic yards of gold bearing gravel, having a PARTIALLY assured gross value of $35,343,000.00 in dollars and cents.

On Plate No. 2 , third terrace, not enough work has been done to determine any POSITIVE or PROBABLE value of the ground. The same method should be adopted in prospecting by shafts, pits and cuts; my time being limited, it could not be done. I nevertheless "panned" and "rocked" the many places, as shown marked "PP" on the Plate. The results obtained were the same, as on first and second terrace, and in several places I obtained as many as forty-three (43) colors to the pan, and from the size of the colors the value of sixty (60) cents is conservative for this acreage, although I can not include it as pay gravel, therefore will place it in the DOUBTFUL column until such time when it has been fully prospected. In the event it should be found that the nien hundred sixty (960) acres contains pay gravel throughout, it adds an additional 45,760,000 cubic yards. I have every reason to believe it will.

Amount of Gold. I am confident from all the prospects taken that my figure of sixty (60) cents per cubic yard is very close to the reality, and that I have not overestimated the value in free gold of the deposit, and therefore will adopt it in my calculations. Having the yardage and the value, the amount of free gold in the two terraces is:

First terrace - - - -	$10,210,200.00
Second Terrace - - - -	35,343,000.00
	$45,553,200.00

copied by Van Dine

BLACK SANDS

In addition to free gold, many of the ancient river beds carry "black sand" and concentrates containing considerable quantities of Platinum, Iridium, Osmium, Zircon, Monasite, and other metals or metallic oxides. In former years of hydraulic placer mining and dredge mining, these were thrown away with the tailings; whereas, the "black sand" and sand products would in many cases be of much value.

In order to thoroughly sample a large body of gravel to ascertain the exact amount of "black sand" concentrates to a cubic yard of gravel, is a very difficult problem, due to the great variation of the deposit. Near the surface the metal content usually is exceedingly low, and becomes richer as we near the

Vandrenkamp

copied by
Van Dine

bed-rock; therefore, the metal content has to be gauged by a mechanical separation of a large sample. It must be remembered that, roughly speaking, a drill sample will only represent something like one part in 200,000 to one part in 1,000,000, of the body of material to be worked. (Dredging for Gold in California, by D'Arcy Weatherbe.)

The sampling of tailings is even more difficult. The difference of opinion on the subject is an added proof of the well known difficulties of correct sampling and of the great variation of the personal equation in this work.

I do not consider that sufficient or detailed tests have been made to form a definite conclusion as to the gold value per ton of "black sand" concentrates available per cubic yard of gravel, until a more complete working test on a larger scale has been made. The purpose of my examination is merely to obtain data as to the advisability of saving the "black sand" concentrates; and judging from tests made, and from past experience on similar gravel deposits, the "black sand" concentrates found in this property represent a by-product of considerable value.

copied by Van Dine

The results of the tests are most surprising. The total weight of "black sand" concentrates recovered by sluicing and rocker tests amounts to two hundred (200) pounds to a cubic yard, having an assay value from twelve dollars ($12.00) up to as much as forty-eight dollars ($48.00) per ton in gold.

Accepting, therefore, the lowest assay value per ton, of twelve dollars ($12.00) it would add an additional value of $1.20 to every cubic yard. The total yardage available in the two terraces being 75,922,000 cubic yards. This would amount to $91,106,440.00. These figures appear staggering; nevertheless, they are to a certain extent true. The gold bearing "black sands" in this locality are extremely rare of their kind. I shall not include them as POSITIVE value until further tests on a larger scale have been concluded. I merely mention them as they are of great commercial inportance.

The losses in precious metals in the metallurgical end of placer mining are unknown. In many cases, the gold is so extremely fine that much of it is lost, even under the most favorable conditions possible, under the old gold-saving devices.

EXCERPTS FROM:

Investigative Report of "Dorothy B" Auriferous Gravel and Black Sand Located in Graham County, Arizona

by Max Van Dine

Unpublished

1981

INVESTIGATIVE REPORT

OF

"DOROTHY B" AURIFEROUS GRAVEL AND BLACK SAND

located in

GRAHAM COUNTY, ARIZONA

UPDATED APRIL, 1981

BY

MAX VANDINE

Properties owned by

Edwin H. and Dorothy S Braatelien

REPORT ON THE DOROTHY B MINE

LOCATED IN GRAHAM COUNTY,

ARIZONA

BY MAX VAN DINE

May 14, 1981

OWNERS ARE

DOROTHY S. BRAATELIEN

AND

EDWIN H. BRAATELIEN

REFERENCES:

Investigative report of the Neal Gila River auriferous gravel deposits Dated January 6, 1930, and Signed by F.H. Vahrenkamp Consulting Engineer.

GEOLOGY

"MORENCI AND CLIFTON QUADRANGLE" BY WALDERMAN LINDGREN PROFESSIONAL PAPER #43

GEOLOGY

The geology of this region is fully described in proffessional paper no. 43 "Morenci and Clifton Quadrange", by Waldermar Lindgren. It being so through and painstaking that it seems of little use to revamp any of its contents. I therefore shall quote excerpts from his report.

beginning of quote

GENERAL CHARACTER AND DISTRIBUTION, "The boulders of the conglomerate are of local origin, and their derivation from particular mountain flanks is often indicated by the slopes of the beds. Its cement is calcareous. Interbedded with its layers of lightly coherent sand and of trass and sheets of basalt; The latter, in some cliffs, predominating over the conglomerate. Beginning at the mouth of Bonita Creek below which point their distinctive character are lost, they follow the Gila River for more than one hundred miles toward its source. Below Bonito Creek it merges insensibly with the detritus of Pueblo Viejo Deseet. It is, indeed, one of the "Quaternary Gravels" of the desert interior, and is distinguished from its family

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Note lack of closing of quote, which Van drenkamp showed on p. 7

TERRACE GRAVELS

Between Bonita and Spring Creek (see Map) on the northwest side of the Gila river from 50 to 200 feet above the stream in its lower course, we find a large acreage of auriferous gravel, deposited in four distinct terraces. The deposition of the gravel in terraces would indicate a temporary check in the erosive power of the stream, much later than the Gila Conglomerates.

Taken from Vandrenken (p. 7) but attributed to Lindgren.

Van Dine

CHARACTER AND SOURCE OF TERRACE GRAVELS

still being attributed to Lindgren, but actually taken from Vandrenkamp

The terraces gravels are of auriferous origin, deposited by erosive agents, and, being a much later flow than the Gila conglomerate.. These gravels no doubt are part of a remnant of an old ancient river channel. The channel may be traced by its exposed rim in several palces. All boulders and stratas of gravel have a slight dip of 10 degrees to the northwest, where as the Gila conglomerate dips 20 degrees southwest. These gravels indicate a temporary check in their erosive power, due no doubt to the erosion gradually declining in intensity, thus forming the many terraces. The Gold being of ancient origin, being derived from disintergration of the immeasurable gold-bearing quartz veins in the ingenous rocks of post-paleozoic age.

The gravels consists of average size boulders, from the size of a bucket to that occasionally of a large barrel, and sand of a very loose nature, all washed smooth and well rounded. No pipe clay or cemented gravel is to be found of any consequence, except, occasionally now and then I observed a thin layer of about two feet in thickness of gravel cemented by some corbonate of lime with oxide of iron which, when coming in contact with water disintergrates instantly.

The Gravels, as shown deposited by an old ancient river channel in the form of terraces, never eroded into the bed of the Gila river. The old river channel makes a swing northwest along the north bank of spring creek, thence disappearing underneath a heavy wash. The gravels in the Gila river bed are largely composed of detritus materials and of rocks found in the Gila conglomerate.

****

only indication of end of "quote" by Van Dine by Lindgren

I, have refered to the geology and character of the gravels, as reported in the F.H. Vahrenkamp report of 1930, and agree with his findings. in reference to the work done by him, I also agree with him on the work and testing done by him. I do point out that the positive yardage will differ slightly as he is known to be conservative in the extreme.

I, recommend that extensive exploratory work be done before a positive yardage and evaluation of the property in its entirety can be established. Shafts would be the most practical, since the depth should reach up to 200 feet in place , to determine the depth to bedrock, and if or not the "Gravels" do reach to that depth.

When, we accept the yardage determined by F.H. Vanhrenkamp, which are verifiable, we find,and I Quote, " The terrace 50 feet above the water level of the Gila River, covering 640 acres of mining ground, and containing a total of 17,017,000 cu. yards of gravel.

The second terrace 90 feet above the water level containing approximately 480 acres of minning ground, and approximately 58,905,000 cubic yards of gravel. The balance of the 960 acres containing 45,760,000 cubic yards of undetermined values" End Quote..

There is also an additional 620 acres in The Dorothy B properties not taken into or reported on the Vanhrenkamp report that should have research and exploratory work done on them to establish the value and yardage.

TESTING OF GRAVEL AND SAMPLING

copied from Vandeeren-kam (p. 13-14)

Having ascertained the approximate yardage, and the character of the gravel, the next important phase is the values in free gold per cubic yard. The only method of testing and sampling gravel property is by rocker, the pan, or the sluce. I employed all three methods in my sampling. The best locations for my sampling was to start on the different pits, shafts, old and new, open cuts, group them, and find the average.

Van Dine omitted the reference to plate 1

The gravel was taken at different heights, all along the top of the FIRST TERRACE in open pits and shafts from six (6) to thirty (30) feet in depth, and all along the face of banks in cuts from six (6) feet in width to thirty (30) feet in height, were cut vertically in the different strata.

From three (3) to twelve (12) pans were taken in each pit and shaft; and from one half (½) cubic yard to as many as two (2) cubic yards of gravel were taken from pits, shafts, and cuts, and washed by rocker or sluiced, exclusive of bedrock. All samples were taken in a box Measuring one cubic yard or 3'x9' x1'. This box was filled with gravel and boulders; allowance being made for the volume of the boulders; then washed either by rocker or through the sluice box containing riffles. The free gold was then separated by amalgamation from the "black sands" weighed on special gold scales, and values calculated, using for unit value per milligram the fineness of the gold as per mint reciepts. The acreage has been determined by measurements, spaced and the average of which has been found to be as follows.

Approximate length --11,220 feet
" width -- 1,820 feet
" depth--- 30 feet

Van Dine

Copied from Vandrenkamp (p. 16+17)

According to these figures, we find the deposit on the second terrace contains approximately 58,905,000 cubic yards of gold bearing gravel, having a gold value as previously stated.

Omitted plate 2 reference

THIRD TERRACE, not enough work has been done to determine any positive or probable value of this ground. The same methos should be adopted in prospecting by shafts,pits and cuts; my time being limited, it could not be done. I nevertheless "panned" and "rocked" in many places, the results obtained were the same, as on the FIRST and Second terraces, and in several places I obtained as many as forty-three (43) colors to the pan, and from the size of the colors the value of the ground , should be more than the original figure. Although I can not include it as pay gravel, there fore will place it in the Doubtful column untill such time when it has been fully prospected. In the event it should be found that the nine hundred and sixty (960) acres contain pay gravel throughout, it adds an additional 45,760,000 cubic yards. I have every reason to believe it will.

"BLACK SANDS

In addition to free gold, many of the ancient river beds carry "black Sand" concentrates which contains considerable quantities of Platinum, Iridium, Osmium, Zircon, Monasite, and other metals or metalic oxides. In former years of hydraulic placer mining and dredge mining, these were thrown away with the tailings; whereas; the "black sand" and sand products would in many cases be of much value.

In order to thoroughly sample a large body of gravel to asertain the exact amount of "black sand" concentrates to the cubic yard of gravel, is a very

Difficult problem, due to the great variation of the deposit. Near the surface the metal content usually is exceedingly low,and becomes richer as we near the bedrock; therefore, the metal content has to be gauged by mechanical separation of large samples. It must be remembered that, roughly speaking, a drill sample will only represent something like one part in 200,000 to one part in 1,000,000 of the body of material to be worked. (Dredging for Gold in Calif. by D'Arcy weatherbe.)

Copied from Vandrenkamp p. 17-19

The sampling of tailings is even more difficult. The difference of opinion on the subject is an added proof of the well known difficulties of correct sampling and of the great variation of the personal equations in this work.

I do not consider that sufficient or detailed tests have been made to form a definite conclusion as to the Gold values per ton of "Black Sands" concentrates available per cubic yard of gravel, untill a more complete working test on a larger scale has been made. The purpose of my examination is merely to obtain data as to the advisability of saving the "Black Sand concentrates; and judging from test made, and from past experiences on similar gravel deposits, the Black Sand concentrates found in this property represents a by-product of considerable value.

The results of the tests are most surprising. The total weight of "BLACK SAND" concentrates recovered by sluicing and rocker test amount to two hundred (200) pounds of black sand per cubic yard.

end of copying Vandrenkamp

The "Black Sand" in this location are extremely rare of their kind. I mention them as they are of great commercial importance.

Van Dine

EXCERPTS FROM:

Safford International Resources, Ltd.

undated, untitled, unpublished

ALL UNDERLINING IN ORIGINAL

1. INTRODUCTION

The gold mining industry involves several types of mining techniques that employ different technologies, depending upon the physical-chemical structure of the gold bearing material or ore. Traditionally, the basic techniques used are heap leaching, hard rock, and placer. And years ago, a popular but enviromentally devastating method was hydraulic mining which excavated massive amounts of gravel (and every thing else, including top soil) by using high-pressure water shoot from nozzles. This method is no longer used in the United States and Canada. The implimentation of heap leaching and hard rock methods is normally very costly and closely regulated by various State and Federal agencies. Last but not least is placer mining, a relatively inexpensive method to recover substantial amounts of gold.

The recovery of gold and heavy minerals from placer ores for the past century and longer has been based primarily on the fact that gold and heavy minerals have a much higher specific gravity (density) than the host gravel, sand, silt and clay; e.g., the specific gravity of gold is six (6) times heavier than the specific gravity of gravel and sand. Methods such as hand panning, sluicing, jigging, tabling and other gravity methods have been used successfully for recovery of coarse and large gold particles, but somewhat limited to fine particles. All methods basically depend on washing and waste removal of the host materials by hydrodynamic methods causing the inherent specific gravity forces to separate and concentrate the heavy minerals, particularly gold.

As gold particles get finer, other physical forces start working and reduce the dominant role that specific gravity plays in the recovery process. Fine, minute gold particles can and do become physically and dynamically suspended in wash water and are carried through the recovery process along with the tailings and never sparated or concentrate. This frequently occurs when the hydrodynamic water flow rate does not allow the fine gold particles to settle out under the influence of gravity--a function of water velocity and time. Most commercially designed and built placer-gold recovery systems available today do not recover micro-fine free gold particles less than 100 microns in size because of this lack of parity between velocity and time. Consequently. lack of recognition by many in the mining industry of this basic law of physics has prevented the successful recovery of the smaller end of the fine gold values carried in placer ores. S.I.R. LTD. has to the most part resolved this physical problem by having available the technology to build and to operate placer recovery equipment that has superior recovery capabilities than conventional equipment.

S.I.R. LTD. has negotiated an option agreement to purchase certain placer claims from Dr. Walter R. Eicher. As part of this option package, S.I.R. LTD. will have the unlimited rights to manufacture and use a proprietary placer recovery system which Dr. Eicher holds exclusive rights to manufacture and market. The system is the called the "Charbonneau System" and is named after its developer, Helen Charbonneau. Mrs. Charbonneau is not only on the Board of Directors but is also Vice-President of Research and Development for S.I.R. LTD.

The key to the Charbonneau System is the recovery table used to separate the heavy minerals from the placer ore, principally macro- and micro-fine gold particles, from nuggets down to (insert particle size) micron particles; this extremely fine gold is sometimes referred to as "flour gold." The system is fully developed and is being used to prove-up placer properties adjacent to the property S.I.R. LTD. has under option. The equipment has been field tested for approximately (insert number) years not only by Mrs. Charbonneau, but also by (name of user) who is presently using the system in Ontario, Canada, under a lease agreement.

It is the intent of S.I.R. LTD. to build a small production placer mill using the Charbonneau System to prove up the mineral values of the acquired placer claims. Details of this program are given herein under the heading "PROPOSED PLACER OPERATIONS," page .

PROPERTY

The property which the Corporation has under an option agreement is located in Graham County, Arizona, in the Safford Mining District. Three contiguous sections, 27, 34, and 35 in Township 6 South, Range 28 East of the Gila and Salt River Base and Meridian (See Appendix - Location Maps), encompassing approximately 2,000 acres and (insert number) placer mining claims. The average elevation is about 3,300 feet above sea level making for very favorable climatic conditions for year round operations.

Sections 34 and 35 are readily acessible over County maintained gravel roads which follow up and through the Gila River Valley from the town of Solomon which is about 15 miles from the property. Section 27 will require a short distance--less than (insert number) miles of road construction to make it accessible without having to use 4-wheel drive vehicles, as now is the case.

GEOLOGY

Substantial geological documentation of the general area of the property are available, including reports from Federal and State Geological Agencies, University of Arizona, and the private sector. The following are excerpts from "Morenci and Clifton Quadrangle" Professional Paper No. 43, Arizona Geological Society, by Waldemar Lindgren and "Report on the Geologic Structure of the Safford Mining District, Arizona," Arizona

U.S.G.S, actually

Geological Society Digest, Volume XI, October 1978:

Description of the general character of the area and distribution of geological formations..."material of the Gila River formation consists almost exclusively of coarse subanglar gravels, appearing more or less distinctly stratified by non-persisting streaks or lenses of sand, and containing fragments of all of the older rocks of the mountains. In most places basalts and rhyolites prodominate, as is natural when we consider that at the time when these deposits were being accumulated, a much larger part of the quadrangle was covered by volcanic flows than at present. Other rocks may, however, locally predominate; thus, for instance, below the area of porhyry, a few miles southwest of Morenci, [the town of Morenci is about 15 miles Northeast of the porperty] where the gravels consist almost exclusively of coarse dioriteporphyry, often indeed, difficult to distinguish from the deeply weathered outcrops of the same rock. Along the lower part of Eagle Creek volcanic rocks are extremely abundant in the Gila conglomerate, and the dividing line between this and the underlying basaltic and rhyolitic tuffs in places becomes indistinct..." - p. 75 of Lindgren (1905)

..."along the Gila River [adjacent to Western boundary of Section 27, running from the Northeast to Southwest] from the mouth of Bonita Creek to the month of Spring creek, the erosion has in many places produced steep or nearly perpendicular bluffs of Gila conglomerate usually pitted by reason of the gradual weathering out of the larger pebbles. Where volcanic rocks predominate, the conglomerate is often well cemented. The color of the Gila conglomerate is reddish to grayish white, especially in places where long-continued exposure has had opportunity to oxidize the iron."

Further misrepresentation of Lindgren's work

..."Gila conglomerate is unquestionably of fluviatile origin, and was deposited during an epoch in which the lower reaches of the rivers gradually lost their eroding and transporting powers, while disintegration progressed rapidly in the mountains. Especially was it active among the loose masses of lava, which then covered so much of the quadrangle, from which intermittently torrential streams brought down vast masses of the crumbling rocks. The climate conditions were then probably very similar to what they are at present. The volcanic outbursts of the Tertiary took place under conditions of active erosion, the different flows being often deeply dissected before the eruption of the next mass. This epoch of erosion doubtlessly continued for a short time after the close of the igneous activity, for we find the Gila conglomerate deposited on an uneven, and in places, deeply dissected surface. As far as known, the Gila conglomerate has not been warped or dislocated by faulting in this area, though studies extended over a wider field may very possibly modify this conclusion."

Discussing the auriferous gravel in the area..."we find large acreage of auriferous gravel, deposited in four distinct terraces. The deposition of the gravel in terraces would indicate a temporary check in the erosive power of the stream, much later than the Gila conglomerates."

Not in Lindgren or Dunn; only in Van-drenkamp + Van Dine

Discussing the character and source of the terrace gravels...
"The terrace gravels are of auriferous origin, deposited by erosive agents, and, being a much later flow than the Gila conglomerate, the Gila conglomerate froms the bed-rock or strateas of gold concentration. These gravels no doubt are part of a remnant of an old ancient river channel, The channel may be traced by its exposed edges and rims in several places. All the boulders and stratas of gravel have a slight dip of 10 degrees to the northwest, whereas the Gila conglomerate dips 20 degrees southwest. These gravel deposits indicate a temporary check in the rivers' erosive power, due no doubt to the erosion gradually declining in intensity, thus forming the many terraces. The gold, undoubtly, being of ancient origin, being derived from disintegration of the immeasurable gold-bearing quartz viens in the ingneous rocks of post-paleozoic age.

The gravel consists of average size boulders, from the size of a bucket to that occasionally of a large barrel, and sand of a very loose nature, all washed smooth and well rounded. No pipe clay or cemented gravel is to be found of any consequence, except, occasionally now and then in thin layers of about two feet in thickness of gravel cemented by some carbonate of lime with oxide of iron, which coming in contact with water, disintegrates instantly.

The gravels, as shown deposited by an old ancient river channel in the form of terraces, never eroded into the bed of the Gila River. The gravels in the Gila river bed are largely composed of detritus material and of rocks found in the Gila conglomerate.

It is not materially significant where the gold comes from found so abundantly in the gravel, or how it was deposited--but, it is important, and very essential, to fix the value of the gravel, the positive and probable yardage of the deposit, the best working methods, water supply, handling, and other data pertaining to economic and succesful operation..." - End of "quote" by "Lindgren" + "Dunn"

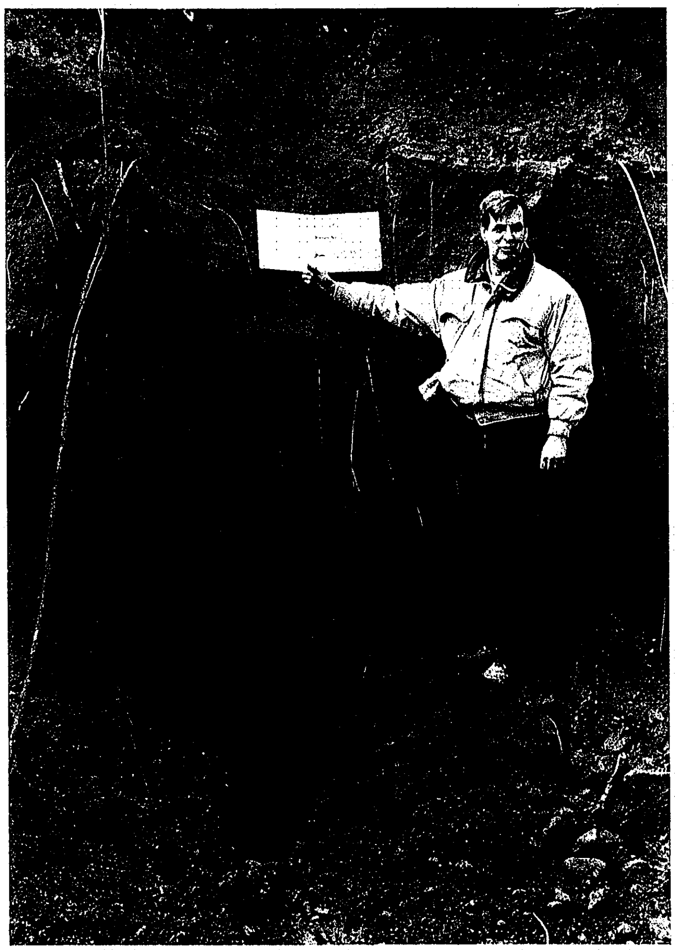
"The writer will say that an immense yardage of gold bearing gravel exists in this property [speaking of the adjacent property, the Dorothy "B"] which is extremely rare of its kind, and contains all natural advantages for econimical operation, and easy of access, that will pay good dividends under competent management over a long period of years." Stated by F. H. Vandemkamp, Consulting Engineer, dated January 6th, 1930. Certified with Seal by J. Stone, Phoenix. (Included in the Appendix is a copy of a Report by Peter G. Dunn, Chief Geologist, Quintana Minerals Corporation, Tucson, Arizona, dated October, 1978, that also relates geological information about the area that encompasses the property.)

Copies of the reports from which the above excerpts were taken are available upon request for more detailed information on the area.

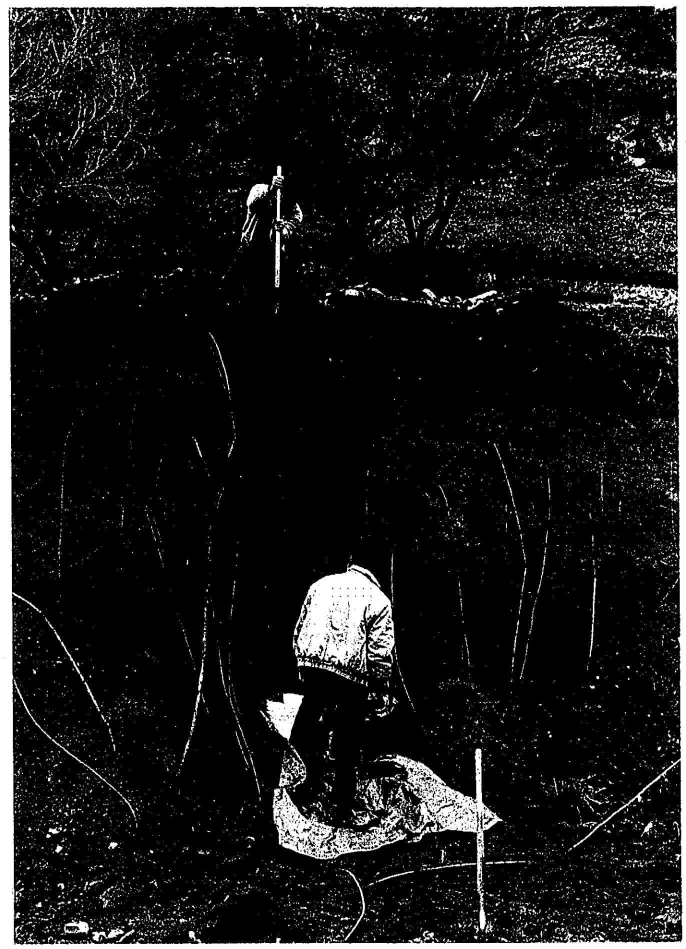
Based on the history of the area, the location of other mining claims in the general area, the prior workings in and near the property, and the existing available geological reports, future geological studies will be limited to specific areas, not en masse.

APPENDIX 2

PHOTOGRAPHS OF SAMPLE COLLECTION AND PROCESSING



BEFORE



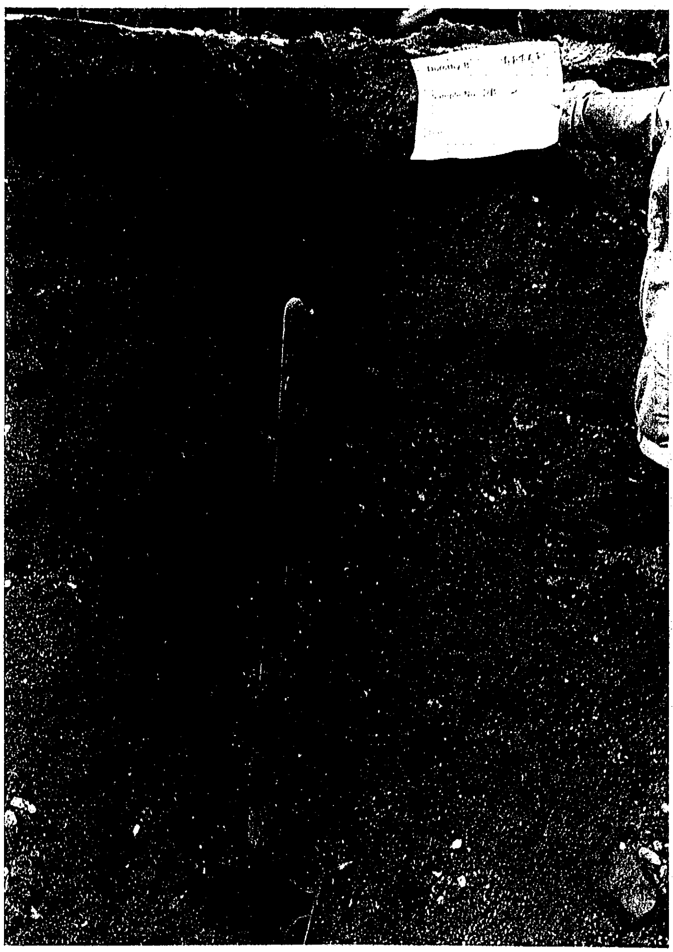
DURING

AFTER

SAMPLE DB-1
DOROTHY B #12

777 POUNDS COLLECTED

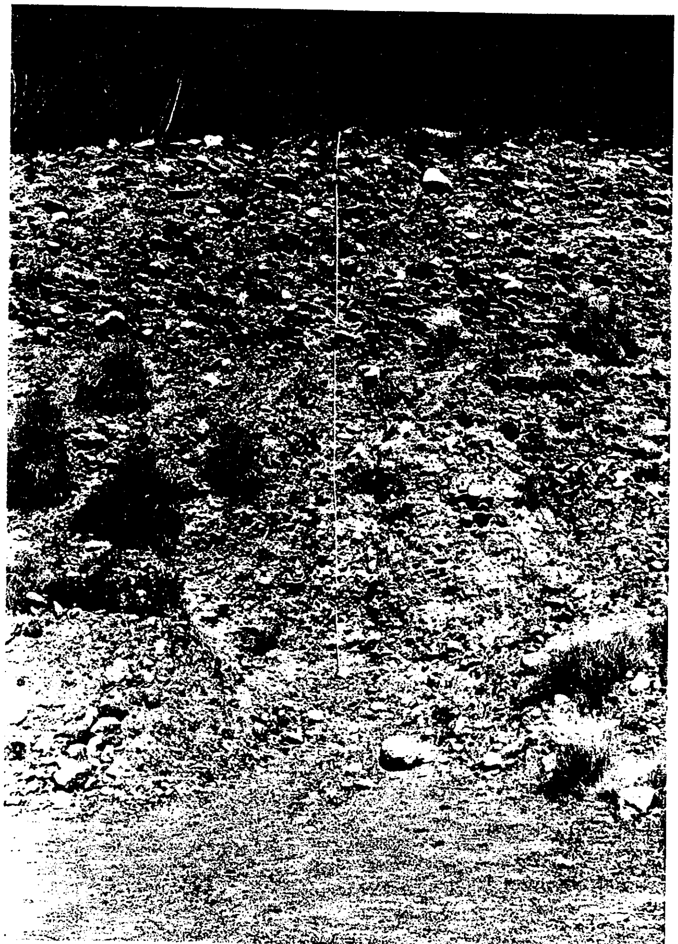
BEFORE

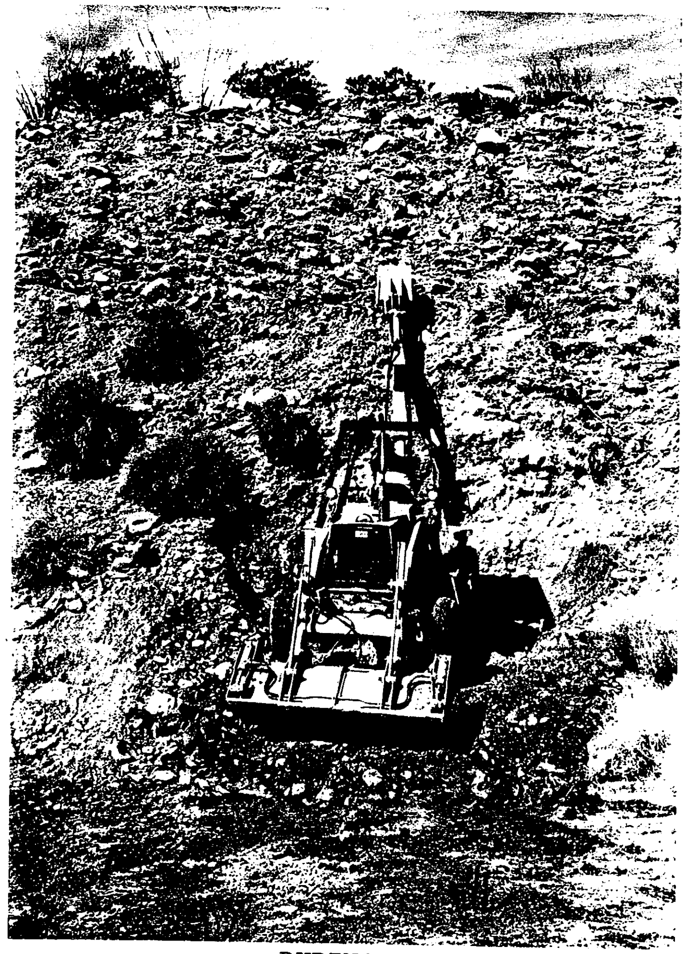


AFTER

SAMPLE DB-2
DOROTHY B #12

570 POUNDS COLLECTED

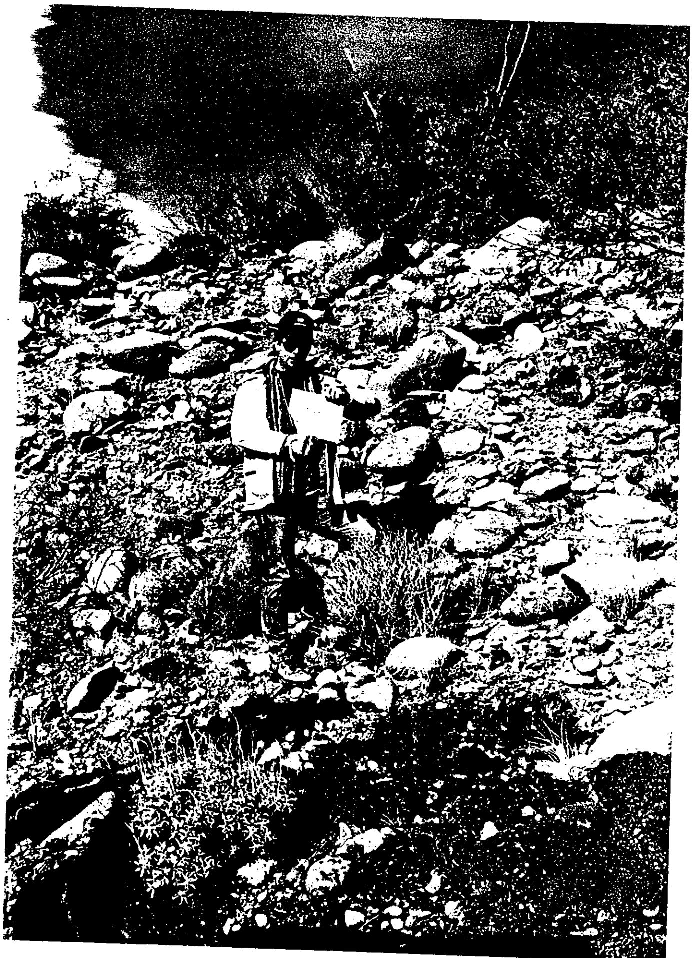

BEFORE (BOTTOM FEW FEET ALREADY CUT)


DURING

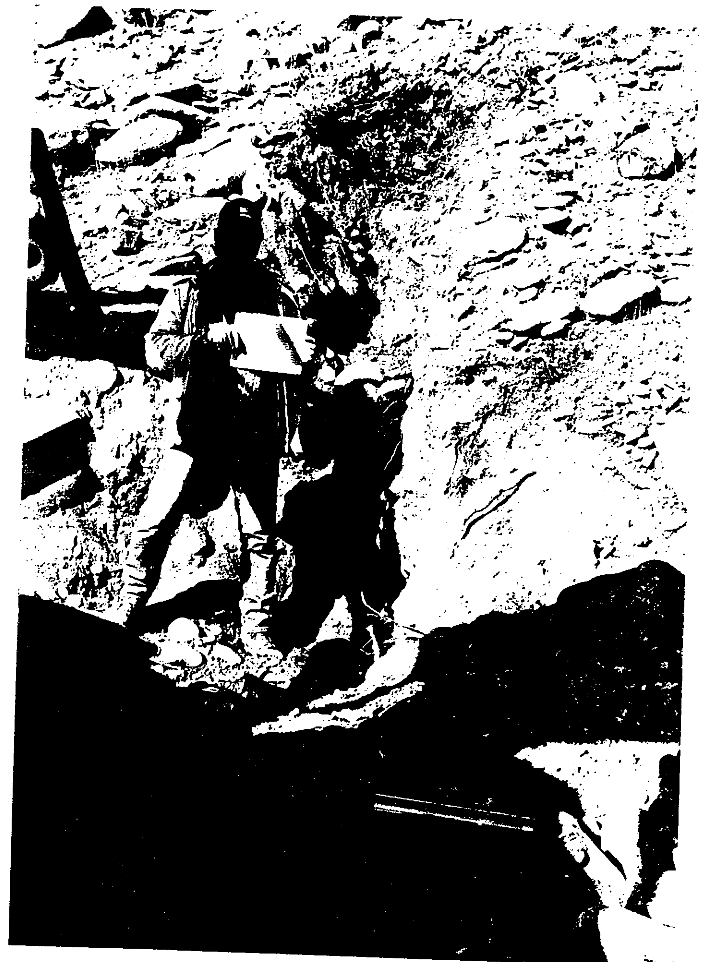

AFTER

SAMPLE DB-3
160 ACRE CLAIM

3,733 POUNDS COLLECTED



BEFORE



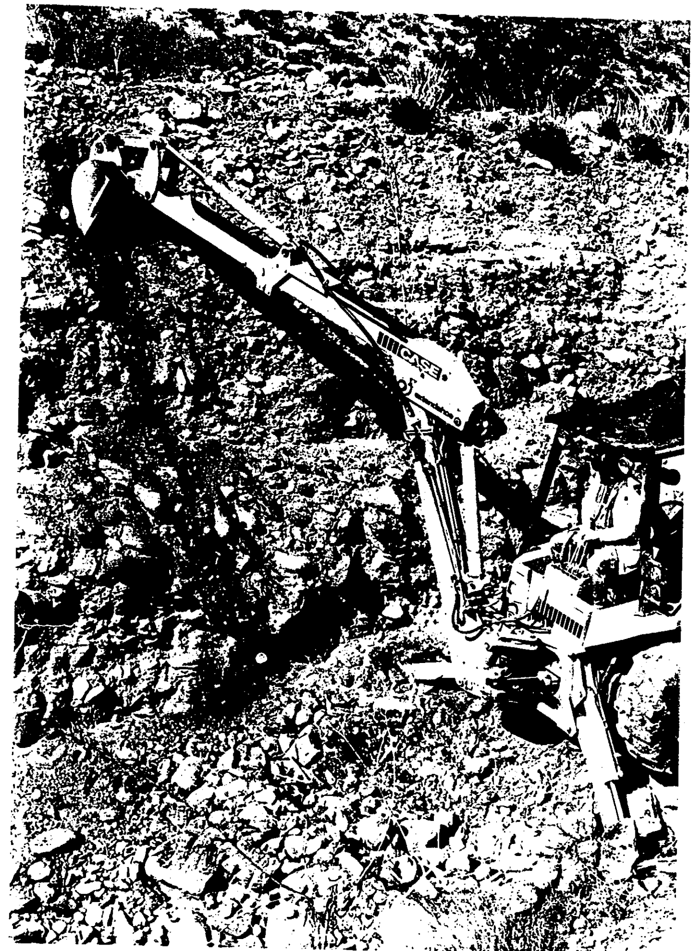
AFTER

DURING

SAMPLE DB-3A
160 ACRE CLAIM

532 POUNDS COLLECTED


BEFORE



DURING


AFTER

SAMPLE DB-4
160 ACRE CLAIM

861 POUNDS COLLECTED

SAMPLE 5, BEFORE
160 ACRE CLAIM

694 POUNDS COLLECTED

SAMPLE 5, AFTER

BEFORE

AFTER

DURING

SAMPLE DB-5A
160 ACRE CLAIM

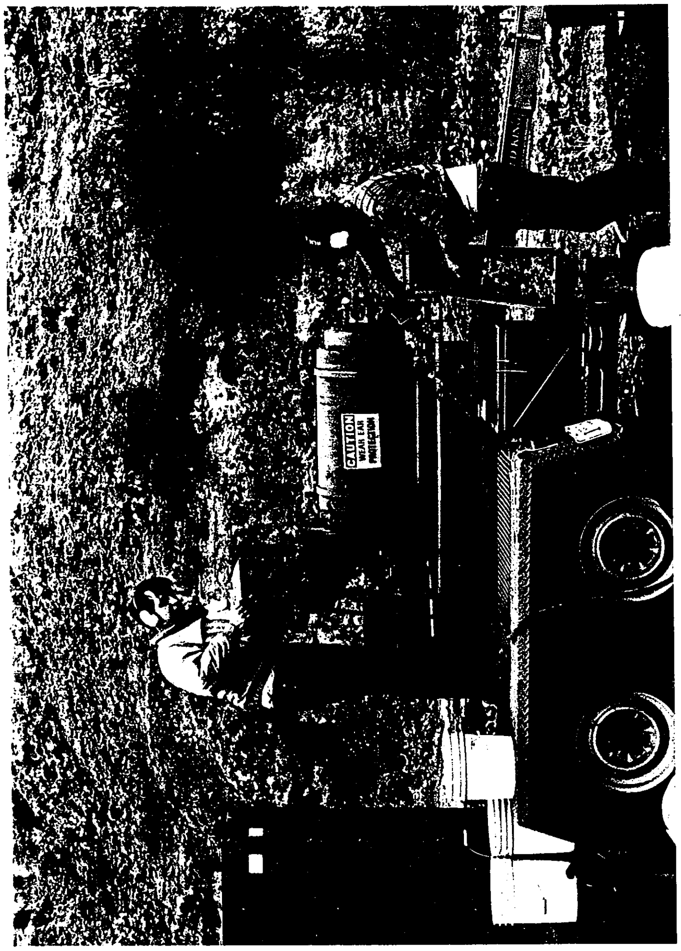
760 POUNDS
COLLECTED

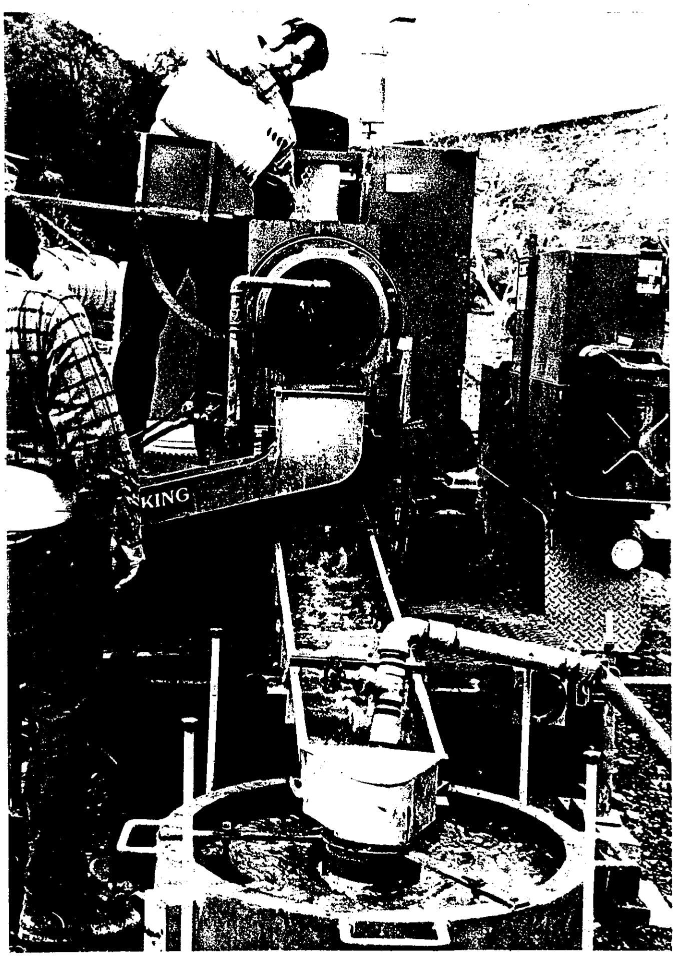
BEFORE

AFTER

SAMPLE DB-6
DOROTHY B #12

ABOUT 75 POUNDS COLLECTED





DENVER GOLDSAVER
IN USE AT BONITA CREEK

APPENDIX 3

ASSAY RESULTS

FAX. (602) 622-0813

Jacobs Assay Office
Registered Assayers, Estab. 1880

1435 S. 10th Ave. Tucson, Az 85713

PH. (602) 622-0813
(602) 622-3845

RECEIVED
BLM SAFFORD DISTRICT
NOV 20 1995
SAFFORD, ARIZONA

Bureau of Land Management
711 14th Avenue
Safford, AZ 85546
c/o Mr. Larry Thrasher

October 17, 1995

ASSAYING & TESTING RESULTS

Dear Mr. Thrasher,

Herein is the final report on the results of Assaying and Testing submitted to this office. The following are the results of the testing. Please note, we will describe in detail the method and process we used in the first sample which also applies to the rest of the samples.

1. DB-1 -20 conc. ← Gold recovered by amalgamation

Amalgamation:

Sample marked DB-1 -20 conc.

Dry wt. = 533.0 grams, agitated (rolled) for 4 hours with dilute Nitric Acid Solution 1:1 pulp ratio. After 4 hours, 10 grams NaOH pellets were added plus 100 grams of mercury. Sample was then agitated for 8 hours. Sample was then separated from the amalgamated mercury by use of a Goldmate wheel. Tails from amalgamation were saved for the cyanidation test. Amalgamation was then dissolved using dilute nitric acid, washed and any residue dried. This residue was then wrapped in lead foil with approx. 25 mg. of pure silver and cupelled. After cupellation, dore bead was parted in the usual manner and the Gold, if any, saved & weighed.

Cyanidation:

533.0 grams agitated 24 hours with 5#/ton Sol NaCN, 3#/ton Lime. After 24 hours, sample was filtered and 870 cc of pregnant solution retained Assaying

Calculations:

Amalgamation	= 0.117 mg Au,	Nil-Ag
Cyanidation Preg.	= 0.447 mg Au,	Nil-Ag
Wash	= 0.165 mg Au,	Nil-Ag
Tails	= Nil mg Au,	4.385 mg-Ag
	0.729 mg Au	4.385 mg Ag

REGISTERED ASSAYER CERTIFICATE NO 11659 MICHAEL G. JACOBS Date Signed Arizona U.S.A.

FAX. (602) 622-0813

PH. (602) 622-0813
(602) 622-3845

Jacobs Assay Office
Registered Assayers, Estab. 1880

1435 S. 10th Ave. Tucson, Az 85713

Bureau of Land Management
c/o Mr. Larry Thrasher

October 17, 1995

ASSAYING & TESTING RESULTS - CONTINUED

2. DB-2 -20 conc. ← recovered gold

Amalgamation:

Dry wt = 713.0 grams Agitated 4 hours, diluted Nitric Acid, 15 grams NaOH + 140 grams mercury agitated 8 hours, yeild from amalgamated mercury = 0.191 mg Gold.

Cyanidation:

713.0 grams agitated 24 hours with 5#/ton Sol NaCN, 3#/ton Lime Filtered and washed

Calculations:

Amalgamation	= 0.191 mg.	Au,	Nil-Ag
Cyanidation Prg.	= 0.1654 mg.	Au,	Nil-Ag
Wash	= 0.1234 mg.	Au,	Nil-Ag
Tails	= Nil	Au,	Nil-Ag
	0.4798 mg.	Au,	Nil-Ag

3. DB-3 -20 conc. ← recovered gold

Amalgamation:

Dry Wt = 2504 grams, Agitated 4 hours with dilute Nitric Acid, 50 grams NaOH + 500 grams mercury, agitated 8 hours, yeild from amalgamated mercury = 3.488 mg. Gold

Cyanidation:

2504 grams agitated 24 hours with 5#/ton Sol NaCN, 3#/ton Sol Lime, Filtered and washed.

Calculations:

Amalgamation	= 3.488 mg	Au,	NiL-Ag
Cyanidation Prg.	= NiL	Au,	NiL-Ag
Wash	= NiL	Au,	NiL-Ag
Tails	= 0.859 mg	Au,	NiL-Ag
	4.347 mg	Au	NiL-Ag

REGISTERED ASSAYER CERTIFICATE NO 11650 MICHAEL G. JACOBS Date Signed Arizona U.S.A.

FAX. (602) 622-0813

PH. (602) 622-0813
(602) 622-3845

Jacobs Assay Office
Registered Assayers, Estab. 1880

1435 S. 10th Ave. Tucson, Az 85713

Bureau of Land Management
c/o Mr. Larry Thrasher

October 17, 1995

ASSAYING & TESTING RESULTS - CONTINUED

4. DB-4 -20 conc. ← recovered gold

Amalgamation:

Dry wt. = 2180 grams, Agitated 4 hours with dilute Nitric Acid, 45 grams NaOH + 440 grams mercury, agitated 8 hours, yeild from Amalgamated Mercury = 1.090 mg Gold.

Cyanidation:

2180 grams agitated 24 hours with 5#/ton Sol NaCN, 3#/ton Sol Lime Filtered and washed

Calculations:

Amalgamation	= 1.090 mg Au	Nil - mg Ag
Cyanidation Prg.	= Nil mg Au	2.820 - mg Ag
Wash	= Nil mg Au	Nil - mg Ag
Tails	= Nil mg Au	Nil - mg Ag
	1.090 mg Au	2.820 - mg Ag

5.DB -20 conc. ← recovered gold

Amalgamation:

Dry wt. = 534.0 grams, agitated 4 hours with dilute Nitric Acid, 11 grams NaOH + 110 grams Mercury, agitated 8 hours, yeild from Amalgamated Mercury = 3.222 mg. Gold

Cyanidations:

534 grams agitated 24 hours with 5#/ton Sol NaCN, 3#/ton Sol Lime. Filtered and washed

REGISTERED ASSAYER
CERTIFICATE NO
11650
MICHAEL C
JACOBS
Date Signed
Arizona U.S.A.

FAX. (602) 622-0813

PH. (602) 622-0813
(602) 622-3845

Jacobs Assay Office
Registered Assayers, Estab. 1880

1435 S. 10th Ave. Tucson, Az 85713

Bureau of Land Management
c/o Mr. Larry Thrasher

October 17, 1995

ASSAYING & TESTING RESULTS - CONTINUED

Calculations:

Amalgamation	=	3.222 mg Au	Nil mg Ag
Cyanidation Prg.	=	Nil mg Au	Nil mg Ag
Wash	=	Nil mg Au	3.085 mg Ag
Tails	=	Nil mg Au	Nil mg Ag
		3.222 mg Au	3.085 mg Ag

This Concludes our Report.

Respectfully,

Mike Jacobs

REGISTERED ASSAYER
CERTIFICATE NO
11659
MICHAEL G.
JACOBS
Date Signed 10-17-95
Arizona U.S.A.

Chert nodules

Fax. (520) 622-3845

Jacobs Assay Office
Registered Assayers, Estab. 1880
1435 S. 10th Ave. Tucson, AZ 85713

Ph. (520) 622-0813

Certificate No ....

SEPTEMBER 5, 19 95

Sample Submitted By LARRY THRASHER / BLM

SAMPLE MARKED	GOLD OZS. PER TON	SILVER OZS. PER TON	~~COPPER %~~	~~LEAD %~~	~~ZINC %~~	Pt O.P.T.	Pd O.P.T.
#1 (DB-9)	0.001	0.15					
#2 (DB-7)	0.005	0.15				<0.001	<0.001
#3 (DB-8)	0.022	0.35				<0.001	<0.001
						<0.001	<0.001

REGISTERED ASSAYER
CERTIFICATE NO
11960
MICHAEL G. JACOBS
Date Signed 10/11/95
Arizona U.S.A.

Very respectfully,

Charges $ ....