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JEK

KAISER
EXPLORATION & MINING COMPANY

July 26, 1972

Mr. Howard J. Whitlock
2167 Banyan Drive
Los Angeles, California 90049

Blind Subject: Gold Vein, Oatman District, Mohave County, Arizona

Dear Mr. Whitlock:

This letter is in reply to yours of July 21, inquiring as to our interest in the Waara property at Oatman. I must apologize for not responding sooner, but I had been holding back on a reply in anticipation that I might be in Prescott and would have a chance to discuss the property with Mr. Waara.

However, I believe that at this time I can make a tentative statement as to our interest. I personally reviewed in detail Mr. Waara's description of the veins and his interpretation of offset along the Oatman fault. It is my opinion that the details of geometry do not fully support Mr. Waara's proposal that the Big Jim and Grey Eagle are both down dropped onto his claims. The offset of the Grey Eagle deposit by the Oatman fault is, however, reflected in the various workings on the Tom Reed vein. If the Oatman fault does indeed curve as suggested, it would appear to occupy a position in the hanging wall of the Tom Reed vein. The offset portion of the Grey Eagle (known as the Big Jim) may indeed project onto Mr. Waara's property, but a review of the strike of the Mallery fault suggests that this will truncate the Big Jim at succeedingly deeper elevations, below the point on which commercial ore was found. The above verbal description is perhaps unclear, because the geometry involved is quite complex, but I must restate in summation that I cannot concur with Mr. Waara's analysis of the fault problems. Therefore, this company will probably express no further interest in this property.

It had seemed probable that I would be in Prescott before this date on other business, and I had hoped to discuss this verbally with Mr. Waara, in order to pursue any possible modification of my present opinion. I will still attempt to meet with him when in Prescott, but at this time I do not know when this will be. Therefore, I must decline to take further action at this time, and will resurrect interest only in the event that something should turn up in verbal conversation about the property with Mr. Waara. Let me thank you for presenting this most interesting prospect to our company, and should you have others of equal caliber, I will always avail myself to their consideration.

Very truly yours,

John E. Kinnison
Regional Geologist

JEK/bl
P.S. With this letter I am returning the Waara report and accompanying maps.

OIL EXPLORATION, LANDS, LEASES

AREA CODE 213 476-1496

HOWARD J. WHITLOCK
2167 BANYAN DRIVE
LOS ANGELES, CALIFORNIA 90049

J. E. K.

July 21, 1972

JUL 26 1972

RECEIVED
JUL 2[illegible] 1972
TUCSON
KAISER EXPLORATION & MINING CO.

Kaiser Exploration & Mining Company
5938 North Oracle Road
Tucson, Arizona 85704

Attention: Mr. John E. Kinnison
Regional Geologist

Gentlemen:

In your letter of May 26, 1972 you indicated a potential interest in the Waara Mine located in the Oatman Mining District of Arizona, and expected to contact Mr. Waara relative to his mining report on the subject property.

Mr. Waara two days ago advised me that so far you have not contacted him, which makes me wonder as to whether you are actively considering and evaluating the property.

I would appreciate hearing from you.

Very truly yours,

Howard J. Whitlock

HJW:bw

3-K-141

KAISER
EXPLORATION & MINING
COMPANY

May 26, 1972

Mr. Howard J. Whitlock
2167 Banyan Drive
Los Angeles, California 90049

Dear Mr. Whitlock:

This letter will acknowledge receipt of Mr. Waara's report and your transmittal letter. I have not had a chance to make a detailed study, but I have hastily scanned the report. At this time I think I should express at least a potential interest and will be in touch with you at a later date, after we have had a chance to fully study Mr. Waara's recommendations. It seems likely that I will contact him as you have suggested.

Thank you very much for allowing this company to examined these data, and I hope that further review would find us favorably inclined to the prospect.

Very truly yours,

John E. Kinnison
Regional Geologist

JEK/bl

OIL EXPLORATION, LANDS, LEASES

AREA CODE 213 476-1496

HOWARD J. WHITLOCK
2167 BANYAN DRIVE
LOS ANGELES, CALIFORNIA 90049

May 19, 1972

Kaiser Exploration & Mining Company
5938 North Oracle Road
Tucson, Arizona 84704

Attention: Mr. John E. Kinnison
Regional Geologist

Gentlemen:

Enclosed is Mr. J. William Waara's report covering the gold property near Oatman, Arizona.

I believe this report will answer some of the questions you have raised. As to exploring below the 1,000 foot level, bear in mind that the anticipated mineralized area would be at a greater depth because the subject property is on the downthrown side of the Oatman fault.

I would suggest that after you have reviewed the report you contact Mr. Waara for further detailed information and discussion. He can be reached in Prescott at (602) 445-3920 and by mail at P. O. Box 1017.

Very truly yours,

Howard J. Whitlock

HJW:bw
Encl.

GEOLOGICAL STUDY

of

FUTURE POTENTIAL

OF

WAARA MINE

OATMAN MINING DISTRICT

MOHAVE COUNTY, ARIZONA

GENERAL SUMMARY AND FUTURE POTENTIAL

OF THE

WAARA MINE

This report draws attention to the subject "WAARA MINE," located in the San Francisco Mining District, Mohave County, State of Arizona. This district is generally known as the mining area surrounding the Town of Oatman, Arizona, situated about 26 miles southwest of the County Seat, being Kingman, Arizona.

This Waara Mine has been re-named as such due to the consolidation in ownership of several additional claims to the group of claims operated by the OATMAN UNITED GOLD MINING COMPANY, now a non-existing organization, during the period of the early twenties, and a further desire to present the potentials of the property as a new project with self serving ideas not heretofore advanced in the operation of mines in this area.

There was a limited production record reported on the Oatman United claims in the Bulletin No. 137 published by the Arizona Bureau of Mines in connection with the activities of the University of Arizona in its mining research and technology division concerning gold production operating mines between 1897 and 1931. This record reported a group production in 1922 consisting of "United American, Telluride, Oatman United Mines." In 1923 it reported a group production consisting of the "Oatman United, Gold Dust, Orphan Mines," and lastly, in 1926 a group production consisting of the "Oatman United, Gold Dust, Sheep Trail Mines." No segregation of production was made in the respective company's operation, and it must be assumed to have been rather small. None of these group production properties are now active.

Size, Location and Access

The WAARA MINE property comprises Yankee, Elephant Fraction, Wheeler, Wheeler Fraction Tonopah No. 1, Annie, Merrill, Gratiot, Louise Fraction, Gold Range Fraction, Gold Range, and Emma patented claims of the original Oatman United Gold Mining Company. Also, additional patent claims are the Million Mark, and the Black Hawk Fraction area included in the Dorothy patented claim and the New Years patented claim of the Mohawk Central Mining Company, a total of 170 acres.

The property reaches from about 1000 feet east of the Oatman Post Office to and including the local landmark being the "Elephant's Tooth" peak, and extending northerly and southerly two and one claim lengths respectively.

The Waara Mine shaft is accessible by an ordinary mine road. The western fringe claims are accessible from the Big Jim mine road.

The general description of the area puts the claims in Sections 14 and 23, T. 19 N.R. 20 W.

Early Operations

I have not made a study as to just when the earliest operations on the United Oatman claims were begun, however, a close guess would make it about 1915 when the boom days of the district were very active. A vigorous development program was initiated by sinking a 650 foot shaft, running of drifts and cross-cuts on the 400 and 600 foot levels and a diamond drilling process executed as shown on the map chart of the holes drilled. I find that the mine workings, as surveyed by Foster and Rice, engineers, and shown on their complete map of the claims and underground workings, dated February 1922, consist of the following:

Main shaft	depth	650 feet
Drifts and cross-cuts 400 level		1880 "
Drifts and cross-cuts 600 level		4445 "
Diamond drilling 600 level		5700 "
Ventilation drill hole 6 inch diameter		1000 "

Operations on the New Years claim of the Mohawk Central Mining Co. consists of the following:

Main shaft	425 feet
Drifts and cross-cuts unknown	

Operations on the Million Mark claim:

Drifts, 600 level Big Jim	150 feet
Drifts, 500 level Tom Reed	30 "

Operations on the Black Hawk Fraction:

Drifts, from surface	50 feet

Other workings such as location holes and prospect cuts and shafts are found on all of the property listed above but considered herein as of no great operational importance.

On early operations, I quote from U.S.G. Survey Bulletin No. 743, page 8, "The outstanding events in the early part of the year 1922 were the discovery of ore by diamond drilling from the 600 level of the Oatman United Mine, about a quarter of a mile east of the Town of Oatman, and the success of Stoney & Ferra, lessees, in finding rich ore near the surface in the Tom Reed vein, practically within the town."

This report is made during a period when every mine in the Oatman region of the San Francisco Mining District is closed and not accessible for examination. Since the mineralized zones have not outcropped in virgin areas, one is absolutely dependent on Bulletins of the geological survey, mine operators reports, individual reports by qualified mining engineers, Arizona Bureau of Mines Bulletins by their staffs of engineers and such technical data which has bearing on any individual problem offered by qualified knowledgeable people known to be dependable for accuracy. Private engineers' map, and mining company's maps covering the areas of the United Eastern, Tom Reed, Ben Harrison, Grey Eagle, Big Jim, Oatman United Mohawk Central and Hartman Gold Mines were used in assembling data for my report, in addition to the very informative "Geological Map of the Oatman District, Mohave County, Arizona" together with the geological report made by F. L. Ransome, Both published in U.S. Geological Survey Bulletin No. 743, issued in 1923.

This shaft was started at the top of a hill at an elevation 120 ft. above the collar of No. 1. The location afforded an excellent site for the mill in close proximity to the shaft. The shaft consists of three compartments, each 5 by 5 ft. inside dimensions. Two compartments were used for hoisting purposes and the other for ladderway, pump and air columns, and electric cables.

Ore pockets of 100 tons capacity were cut below each station on the fourth to the eighth levels inclusive. Each ore pocket discharged into two measuring pockets, each of one skip capacity. (Fig. 4.)

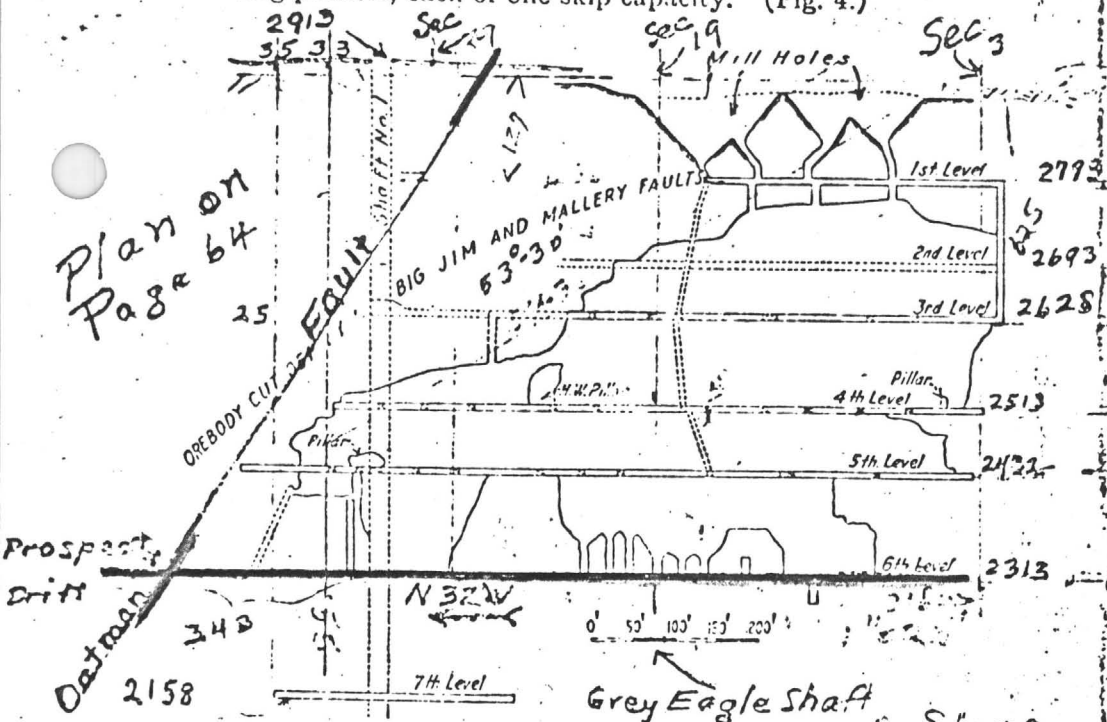
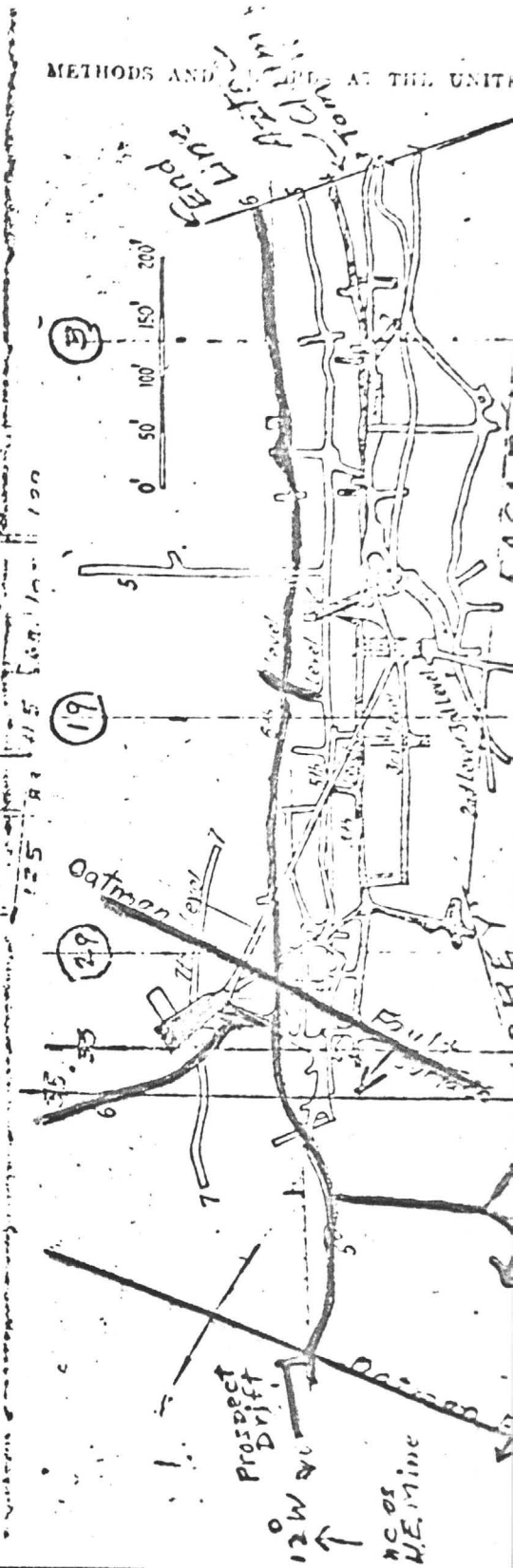
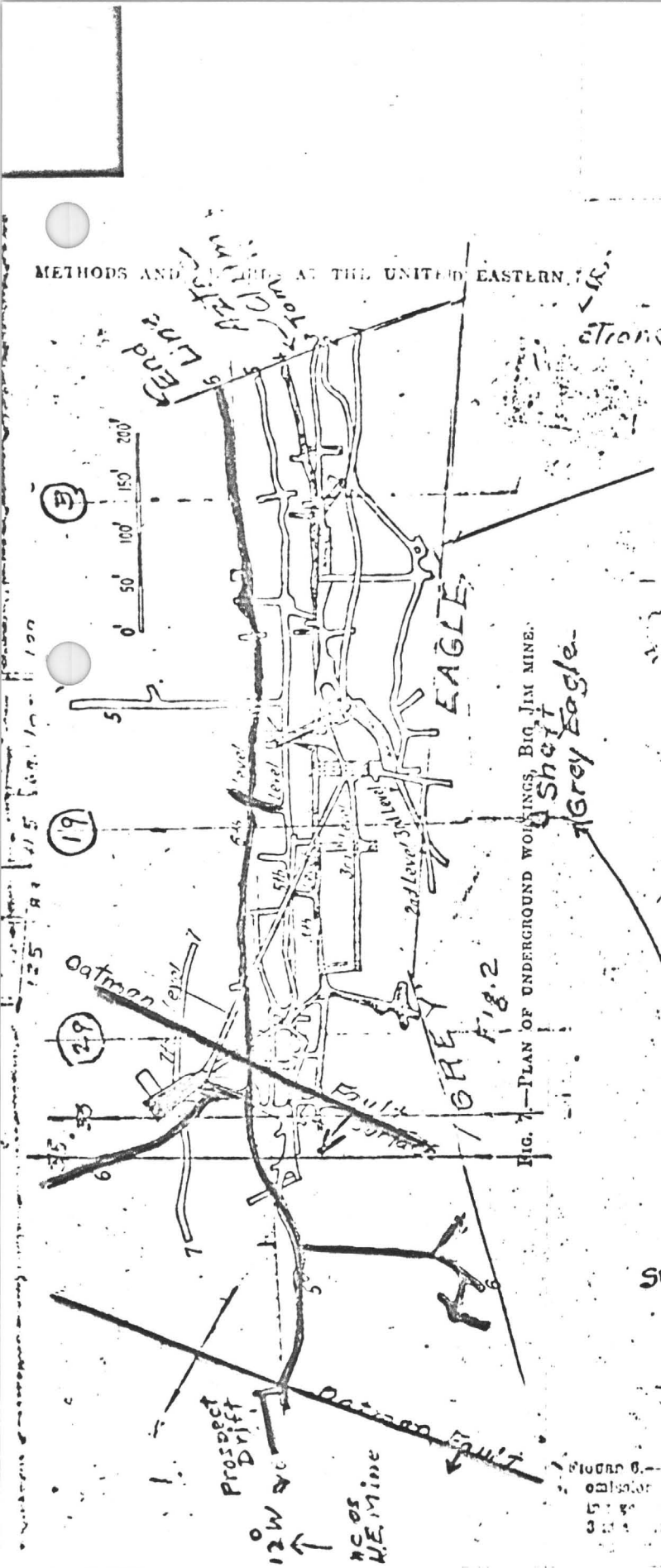


FIG. 2.—LONGITUDINAL SECTION THROUGH BIG JIM STOPE.

Levels were driven at intervals of 100 ft., 150 ft., and 200 ft. between the first level at 585 ft. and the lowest level at 1293 ft. The first level corresponds to the fourth level of shaft No. 1. The distances of the vein from the shaft on the top and bottom levels were respectively 60 and 260 feet.

The collar of the shaft was concreted to a depth of 50 ft. Timbers of merchantable grade were used throughout for shaft sets, the plates being 10 by 10 in. and the dividers 8 by 10 in. Stations were cut to the full length of the shaft, thus affording ample room on both sides of the double tracks leading to the station ore pockets. They were also large enough to permit storage of ore cars temporarily not in use, and were floored with planks 3 by 12 in. and ¼-in. steel sheets, with the exception





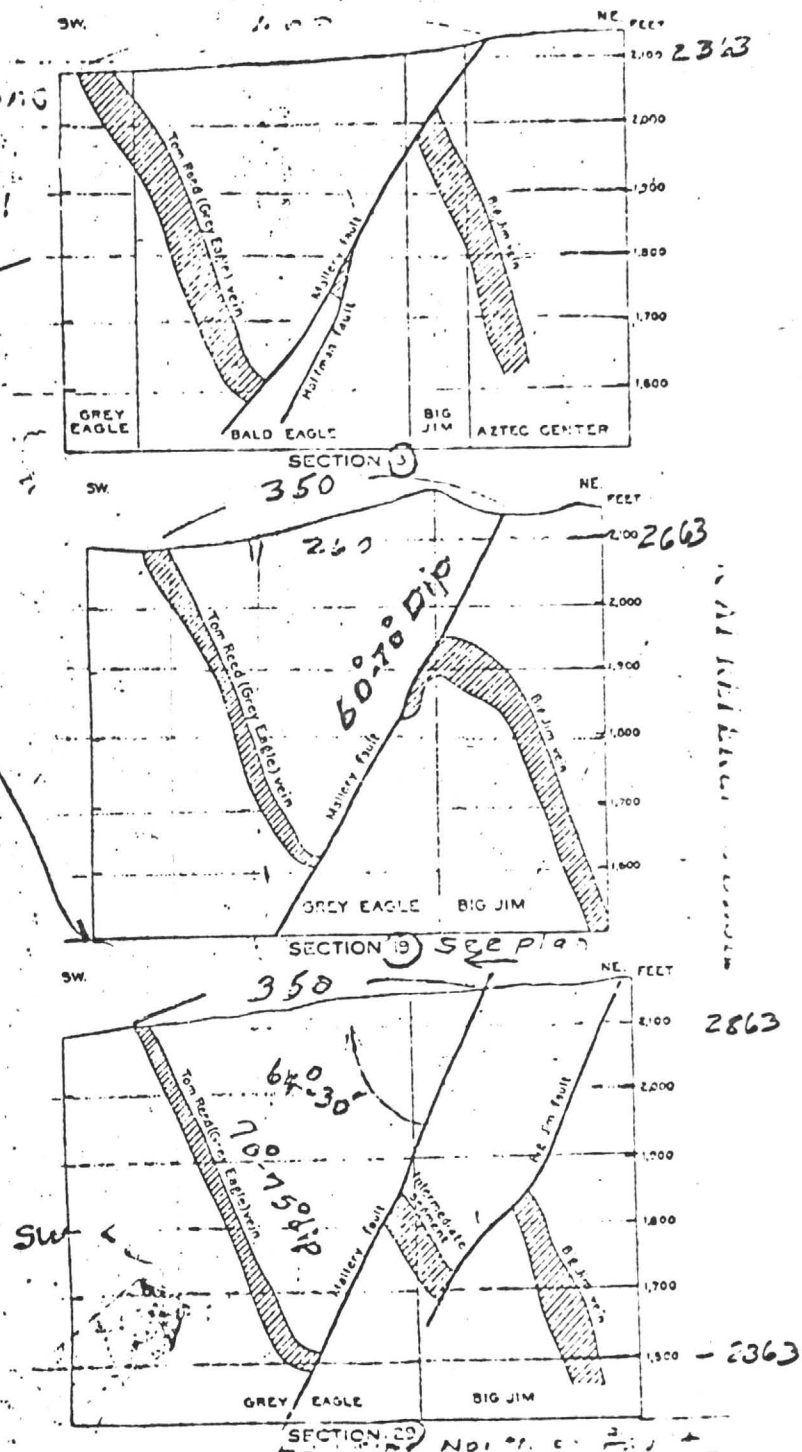


FIGURE 6.—Cross sections of the Tom Reed-Big Jim vein and Mallery fault. Ta
omission of some details, from a series of sections prepared by O. H. Hern
[illegible], and Herman Zuich, and
[illegible]

GEOLOGICAL SEQUENCES

PERIOD
No. 1

Generally speaking, the Oatman area is a region of five different volcanic disturbance or flows through which fissures formed in all directions. During the period of mineralization, various fissures became mineral vein system upon which the mining development of the area depended. To identify the mines, we have the Ben Harrison, Olla Oatman, United Eastern, Grey Eagle, Big Jim and Gold Road and their vein systems. These veins were formed during the same period. It does not matter as to the priority other than what happened later, geologically speaking, as to the next structural changes.

PERIOD
No. 2

The structure of the now mineralized area had been weakened by the excessive fissuring. Additional earth movement caused fissuring and faulting action. Noticeably, all of the above mentioned vein systems were intersected, in one form or another, by the faulting.

The dip of the above mentioned fissuring and faulting actions caused different reactions. Apparently all faults along the Ben Harrison, Olla Oatman and United Eastern veins had fault planes parallel to the dip of the veins. Where the fault plane diverted from its course and crossed the vein parallel to it, there was a probability that their dips, displaced the vein laterally and also downward, all segments, however, remaining generally parallel. This probably happened on the south end of Tom Reed vein on the Ben Harrison claim at the latter's south end, which fault action cut off the Tom Reed vein. Mine operators called this the Oatman Fault.

The dip of the fault paralleling the Big Jim vein, known as the Mallery Fault, was in the opposite direction from the dip of the vein. At the time of action on the Mallery Fault, the ground mass containing the vein was hundreds of feet, possibly more than a thousand feet higher than the present surface. The present surface and fault analysis tells us now that the vertical drop in ancient times was at least 600 feet. Erosion of the surface of the faulted ground mass was at least 500 feet, thus accounting for the point of separation being one hundred feet below the present surface, thusly indicating no apex of the root segment of the Big Jim vein itself. The cross-section drawings of the vein appears as a "saw tooth arrangement," indicating that the apex before faulting was at elevation 3400 or higher.

From the above information, we may draw the conclusion that once a vein and fault appear associated, their continuity will remain the same.

PERIOD
No. 3

The continuing earth movements created a new non-conforming fault pattern approaching a right angle, with the vein system and their containing fault structure. This action named the Oatman Fault, strikes nearly east and west, appears on the surface about 100 feet south of the Big Jim shaft. The fault plane of this Oatman Fault at this point cuts off the "saw tooth" vein systems of the Grey Eagle mine and the Big Jim mine in its dip northward along the strike of the Mallery Fault. The Grey Eagle and Big Jim veins thus far have not been found north of their operating zones.

MY OBJECTIVE

I have set forth in the foregoing original and transcribed writings, the basis for my attempt to determine the present position of the faulted segments of the lost northerly continuation of the Grey Eagle and Big Jim ore bodies.

I decided to make an accurate series of maps, being, plan, longitudinal section, cross sections both general and ideal sections, drawn to scale of 100 feet to the inch. By using the original and very informative map of the property of the Oatman United Gold Mines, made by Messrs. Foster and Rice in 1922, and adding claims belonging to the Hartman Gold Mines, Big Jim, Grey Eagle, Ben Harrison, Tip Top, United Eastern, and Mohawk Central Mining Co., I developed a very informative group of maps to accompany this report.

All of the claims owned by the various companies had been patented, mineral surveys of which provided accurate consolidated data to produce a dependable map of the extended area. All available data as to underground workings were platted, also any informative geological data. Various underground maps, concerning ground movements and thoughts or interpretations of the engineers, appearing on these maps, were accurately transcribed.

SOURCES OF INFORMATION

This report cannot go on without telling the true story and background for the information used in developing my version of the geology, and geological movements in the Oatman area.

My interest in this area began in 1953, when I first visited the area in my capacity as an engineer. My interest lead to reading about the past history of the mines. Nothing was visible on the surface to inform me. I bought the property of the Oatman United Gold Mines under tax sale. My interest now became basic and I started gathering information from available sources.

Access to Oatman mining district data was available at the Los Angeles city library where I found the very informative Bulletin No. 743 by Mr. F. L. Ransome, issued by the U.S. Geological Survey in 1923. From this library I obtained a copy of the Mining Methods and Records at the United Eastern Mining Co.

From this library I obtained a report by Mr. Roy W. Moore, General Manager of the United Eastern Mining Co., owner of the Big Jim Mine. This report is authentic and is my basis for representing the Big Jim and Grey Eagle mined mineralization values, shown in the production reports. It was published in the Engineering and Mining Journal in February 1928.

The bulletin reports issued by the Arizona Bureau of Mines, Nos. 131-137 and 139, clearly tell us about the mineral values and general expectancy of what an engineer likes to know about a mining district and the occurence of mineralized deposit in this district. Circular 6824 by Mr. C. H. Thompson, M.E., U.S. Bureau of Mines, dwelling on "Mining and Milling Methods at the Big Jim Mine" year 1935, undoubtedly contained the most helpful outstanding remark, casually expressed, in describing the condition of a cave-in section at the 200 foot level of the Big Jim shaft, when he said, "At the latter point two faults converged, one dipping steeply toward the end and the other toward the side of the shaft." This remark was my only real clue as to the convergence and position of the Mallery and Oatman fault planes, and the confirming key information to my objective.

A small sketch map of the mine workings, showing the Tip Top, Ben Harrison, Grey Eagle and Big Jim relative position of the ir workings was found in the records of Mr. E. Ross Householder, owner of the well known engineering office in Kingman, Arizona. He also gave me a copy of the report by Mr. Edward O. Brooks, M.E. dated January 23, 1932, both rewarding valuable data.

I needed further confirmation on my efforts. Last June I went to Oatman, Arizona, and called on Mr. Joe Brandenburg, local manager and custodian of the old Tom Reed Gold Mining Company's holdings. The vault doors were opened to me, and he graciously permitted access to all records therein. Some records of adjoining mines were also made available. I owe great gratitude to Mr. Joe Brandenburg and his associates and feel that he has performed a great service to me, to his friends and to his community.

Notes and identification of certain geology in the workings of the Tom Reed's four mines, Olla Oatman, Tip Top, Ben Harrison, and Grey Eagle by Mr. Oscar H. Hershey, Consulting Geologist for the Tom Reed Gold Mines Co., made available to me on the maps of the company, although very sketchy, were of great importance in confirming my version of the geological happenings in the dim. past. I knew what information I needed and I was able to identify the sketchy data in various maps of isolated areas of the mines.

Plate I from Bulletin No. 743 issued by the U.S. Geological Survey depicting the work of Mr. F. L. Ransome was exceedingly rewarding to me in identifying underground workings, not heretofore identified with accuracy.

It is clear that the last great earth movement during Period No. 3 as heretofore mentioned, was the reaction resulting in the formation of the Oatman Fault as it is today, and further the slicing of the northerly ends of the Grey Eagle and Big Jim ore zones. This Oatman fault apparently got its name originally when first encountered in the Olla Oatman mine workings. It parallels the vein, continuing later along the newer workings of the Tip Top and Ben Harrison mines to the south half of the Ben Harrison claim. All identified by Hershey's sketch points, to area south of the Ben Harrison shaft. The vein and fault structure disappeared about the south end line of the Ben Harrison claim.

Mr. Hershey again identifies the Oatman Fault at the most northerly corner of the Grey Eagle claim. On his sketch maps he marks the Oatman Fault as a curve southeastward across a long southwest to northeast cross-cut, and north end of 500 foot level of the Grey Eagle Mine, at the south end of the Rising Star claim. By extending both identified ends, I have the Oatman fault located lengthwise southeastward through the Rising Star claim, and curving easterly to the common corner of the Grey Eagle and Big Jim claims at an underground elevation of 2364 feet. In the Big Jim's northwest exploration drift a fault was intercepted (on the 2313 elevation) at the offset point 320 feet northwest of the Big Jim Shaft, there being no workings northwest of the Big Jim's vein cut-off line, no further identification was available as to the upward position of the Oatman fault plane. The fault plane's intersections was shown by Hershey on various isolated positions of his saw-tooth cross-sections but not sufficiently clear and extensive enough to base a conclusion.

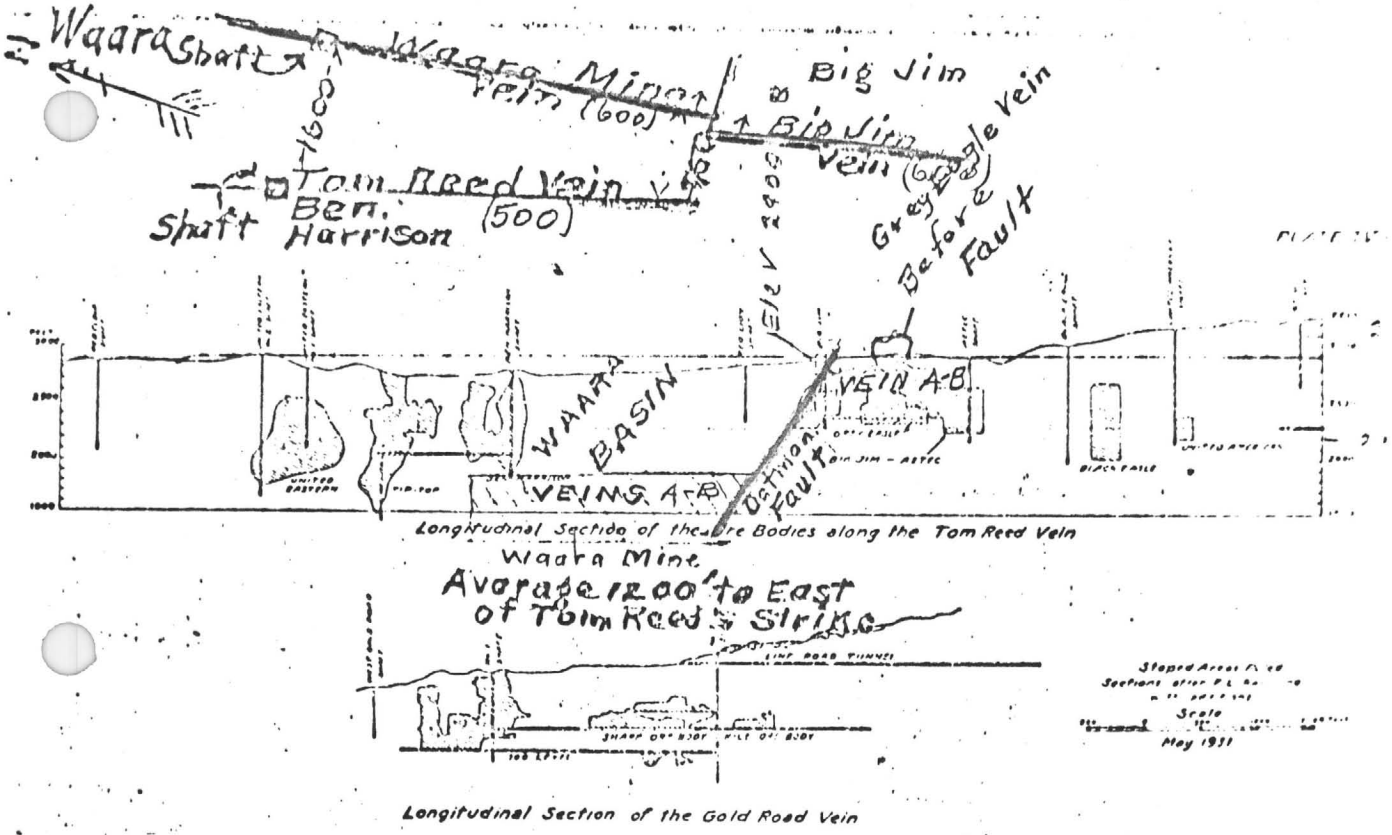
The Circular information No. I C 6824 statement by Mr. C. H. Johnson became the clue as heretofore mentioned. The two fault plane intersection on the 200 level of the Big Jim shaft matched by dip and strike with the offset in the exploration drift. By extending the Oatman fault from Hershey's Grey Eagle most northerly corner point to the offset in the exploration cross-cut, I obtained the strike of the Oatman fault on the Big Jim's 600 level. By extending the fault plane dip upward from the 600 level in the Big Jim drift, through the shaft fault intersection, I found the surface position of the Oatman fault and confirmation of somebody's isolated identification notes of the Oatman fault on the northeast side line of the Big Jim claim. Returning to the job of locating the surface strike of the Oatman fault, we have an identification of it at the south end of the Ben Harrison claim and another identification by Hershey at the north center point on the end line of the Grey Eagle claim. Connecting the three last identifications we obtain a tangent

line, corresponding with the previous underground position of the Oatman fault. Back to the surface again, there is a marker for the fault on the west side line of the Grey Eagle claim. By connecting the last two points at the Grey Eagle center and on the eastside line, with the point of the surface position of the Oatman fault plane through the Big Jim shaft, we obtain a nearly tangent line all the way to the eastside line of the Big Jim claim. Thusly we have obtained our surface position of the Oatman fault line from the point on the eastside line as set by me which appears to be identical with Mr. Ransome's point, to about 90 feet westerly of the angle corner of the common Grey Eagle and Big Jim claims, which point is 250 feet southeasterly from the angle point of the offset on the westside of Mr. Ransome's position for the Mallery fault, practically identical with my 100 foot inch enlargement position of the Mallery fault as shown on Plate I of the U.S. Geological Survey maps. Up to now we have partially cleared up the complicated mess of thoughts and opinions, and the confirmed position of the Mallery and Oatman faults in the area of the cut-off section of both the Big Jim and Grey Eagle veins.

Now to clear up the Mallery fault's position to the north of the Oatman fault offset. The writings of Ransome and Brooks mentioned the 600 level drift in the United Oatman mine. This 600 level drift was described by Ransome as very clearly resembling the Mallery fault structure and its contents. He had access to the drift and of course it must be accurate and reliable information regarding its identity. Brooks undoubtedly quotes Ransome since the Oatman United was closed during his visit to the area at the time of his report. Brooks appears to have stressed on the advisability of the extension of the prospect drift from a point 300 feet southeast of the northerly end of the Big Jim claim, northerly. Apparently following one of the numerous fault fissures, which led to a well defined fault, crossed a fault dipping northeasterly on a 45° fault plane. Continuing further the drift encountered another fault, striking slightly northwestward and dipping eastward. This fault was followed 200 feet with no information of values discovered except to identify the faulting to be the Mallery fault.

By transcribing these additional workings from a sketch map obtained from Mr. Househoulder, I obtained the true position of the Mallery fault on the northwest end of the North Aztec claim, now patented as the Oneida claim. The strike of the 600 level drift of the Oatman United Mine, now called the Waara Mine, when extended southward, intersected the strike of the Big Jim prospect drift extended northward, "HEAD ON." This "Dead center" intersection formed a tangent line for the Mallery fault southeast of the Waara Mine drifts end for 1000 feet. (Waara Mine was formerly known as the Oatman United Gold Mines Co. property.)

Continuing on the Mallery fault problem to co-ordinate my findings 600 feet underground, I platted the faults position on Plate I with its scale of 1 inch equals 1000 feet to my large map



Pate IV.—Location of ore shoots on the Tom Reed vein and the Gold Road vein.

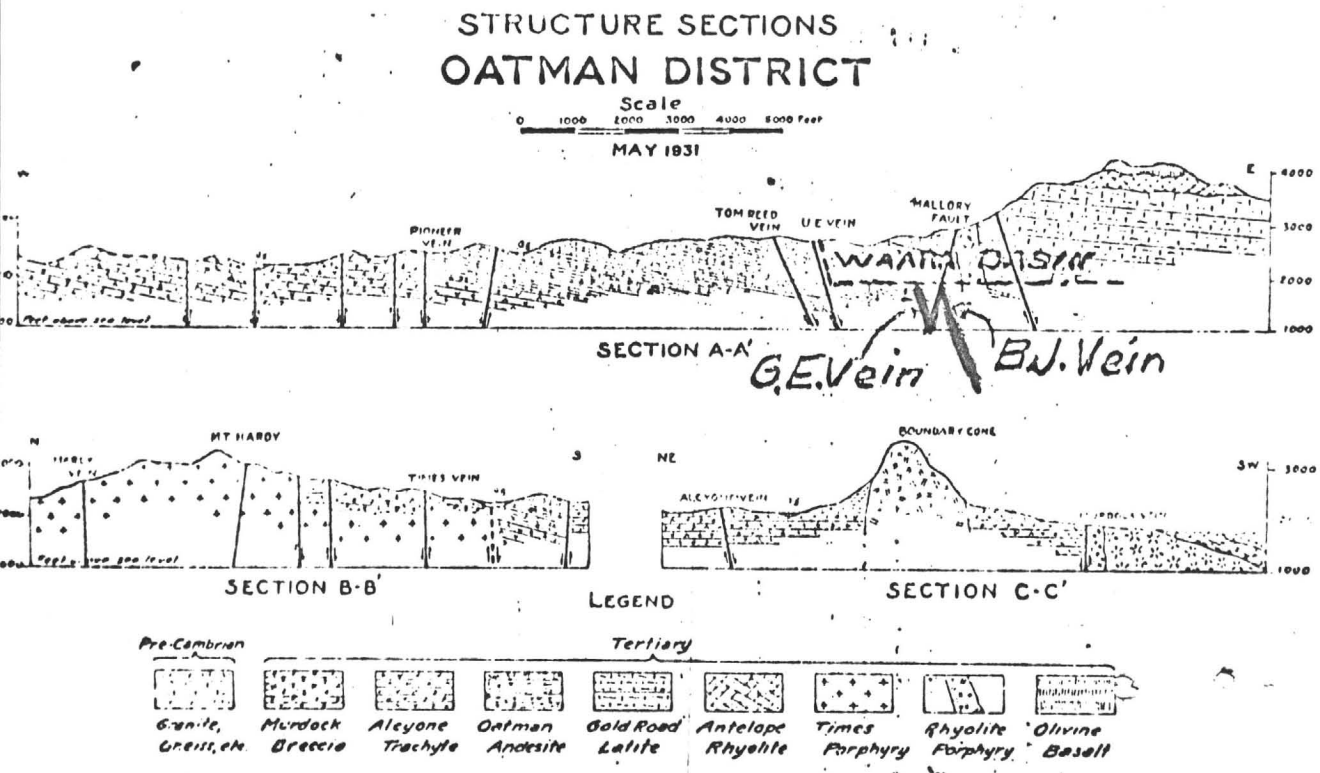


Plate III.—Structure sections of the Oatman District.

of 100 feet to the inch. This platting placed the fault parallel and in proper dip position just developed east of the underground workings. The Mallery faults surface exposure extends, as transcribed, southward through the area of surface cuts on the Merrill claim and also was identified in surface cuts on the original North Aztec claim now patented as the Onieda claim. The Mallery fault, up to this date, had not been identified south of the northwest corner of the Big Jim Claim. By extending upward, the fault plane from the intersection of faults on the 200 level of the Big Jim shaft, on the usual dip, I established the Mallery fault on the surface east of the Big Jim shaft. The latter position conformed with the surface continuation of the Mallery fault from the above described positions, and continuing southerly, I established an intersection with the fault plane of the Oatman fault. Thusly for the first time we have established the fault plane of the Mallery fault above the fault plane of the intersecting Oatman fault. The dip of the Mallery fault plane intersects the Oatman fault plane just east of the prospect drift, where it had not been seen to this date. We will now approach the crucial problem, under a new identification name. Hereafter the Oatman United name will be dropped and the new name WAARA MINE will be used to more clearly carry factual data forward.

WAARA MINE BASIN THEORY

The basic data to find the lost ore zones of the Grey Eagle and Big Jim mines has now been established, to wit:

That the Mallery fault has not caused the disappearance of the ore zone.

That the Oatman fault existed and had a dip northward and downward; a fixed position relative to the area structure, on an east to west strike.

That the Oatman fault caused the displacement by cutting off the continuation of the ore zone, since no other cause has been found.

That the Mallery fault definitely identified and its fixed position determined, at the surface and on the 2313 foot elevations. (600 level.)

That the Grey Eagle and Big Jim ore bodies had a fixed position with the Mallery fault, which could not separate when faulting occurred. This fixed position will hereafter be called "VEIN MASS."

We have established that the vein mass could not have gone anywhere but downward, into a basin-like area, leaving no clue as to its throw and heave. Lack of clues establishes the fact the ground movement extended from the Ben Harrison, Tip Top mine area to the top of the mountains to the east.

The diamond drill hole chart on the Waara Mine map

indicates that from station No. 1 located just south of the Elephant Tooth peak, a drill hole was driven westerly to the center of the "Black Hawk Fraction" area. This drill hole had a length of 1100 feet and a dip of 14° - 17' downward. By calculations we find that its bottom or end on the Black Hawk Fraction is at elevation 2070 feet or 245 feet below the 600 level of Big Jim and Waara mines. There is not available a log of the hole. No publicity has ever been given that any ore zone was encountered in this drill hole, so it is extremely positive that no indication of mineral zones were found in the course of the drill hole.

The Mallery fault, by my analysis, was crossed by this drill hole at its 1000 foot depth. Had the vein mass been in the path of the drill hole, the hole would have entered the vein mass at its 700 foot depth. The vein mass not having been identified in drill core samples for 400 feet of vein mass, we must conclude that drill hole passed over the vein mass which must rest at an elevation lower than 2070 feet.

There is no way of determining how far below elevation 2070 is the vein mass. Since 600 feet was the displacement on the Mallery fault between the two mines, another estimate of 400 feet additional drop would be a guess of similar other earth movements.

Using 400 feet of throw for the Oatman fault's movement below the Big Jim's 600 level, we get an elevation of 2313-4000 + 1913 or 157 feet below the bottom of the drill hole. Let us slide the graphic section of the vein mass down on the Oatman fault plane until the original surface elevation point of 2913 feet reaches elevation 1913 feet. Now we have the position of the vein mass on the Oatman fault plane as graphically illustrated by my LONGITUDINAL SECTION MAP with old surface diagram at 1913 foot elevation or 1000 feet below our present surface.

Now we come to the other big question and my answer to it. Hershey, Ransome and Brooks dwelt on the strike faulting of the Ben Harrison vein with a throw of 400 feet or so. This throw corresponds with my version of displacement on the Oatman fault in the above paragraphs. As shown on my plan main map, the Oatman fault traverses a route along the United Eastern, Tip Top, Ben Harrison workings and veins to a point south of the Ben Harrison shaft, where it crosses the Tom Reed vein. At this point, the strike faulting crossed the Tom Reed vein and created a displacement downward in the hanging wall of the vein, thus cutting off the extension southward of the Tom Reed vein.

My contention is that the Oatman faults last mass movement was downward all of the way along its course from its position in the United Eastern ore zones southward past the Ben Harrison ore zone to the curvature at the southend of the Rising Star claim

and thence on course eastward. This downward movement on its dip was like a mass sliding in an open sided bowl or basin and continuously rotating eastward, northeastward and northward causing the ground mass to slide eastward in the area of the Mallery fault, which left the root of the Mallery fault to the west and thus creating the offset of 380 feet between two ends of the Mallery fault, on opposite sides of the strike of the Oatman fault. The movement offseting of the Mallery fault carried the containing vein mass of the Grey Eagle and Big Jim ore zones with it. The 400 foot throw mentioned by Brooks agrees with my contention that the throw, on the Oatman fault, of the vein mass is 400 feet below the 600 level as shown in my diagrams, at elevation 1913.

TO FIND THE ORE ZONE

There are two ways in which to seek the ore zone; "1st way" -- to drill with diamond drill equipment, prepared to go at least 1200 feet from the lowest surface point above the ore zone to penetrate 100 to 200 feet into the root section or apex section of the veins. Grey Eagle being the apex section. The "2nd way" is to utilize the Big Jim shaft and the drifts on the 600 level to reach the end of the prospect drift. The last 500 feet of this prospect drift is directly over the vein mass resting on the Oatman Fault plane. It would be advisable to drill vertical holes from this prospect drift, starting at its very end. The vein could be fissured and shattered close to the fault plane, giving questionable results for the diamond drilling.

Since the Big Jim shaft was completely repaired on December 15, 1932, we have every reason to believe that its weak section was held up and that the whole shaft could be rehabilitated with less costs than say two drill holes prospecting from the surface. 600 feet of costs of each drill hole would be saved and still have a working shaft and 950 feet of prospect drift opened up. Apparently the earlier portion of the prospect drift had held up well as no comment was made of caving troubles therein by Johnson. (See I C 6824 by C. H. Johnson) Mr. Johnson's information circular just referred to is very informative and should by all means be consulted as to important details.

After finding the ore zone from the 600 level of the Big Jim workings, I consider the prospecting stage to have been completed, and further drilling to learn of the values in the Grey Eagle and Big Jim segments of the saw tooth vein structure would be development work. This development work would guide the new operators. For example, winze to the ore zone from the 600 level of the Big Jim workings, and development there from along the vein southerly and northerly along the Mallery Fault's strike. Another way to prospect and develop the ore zone would be to rehabilitate the now Waara Mine shaft, sink it deeper directly

into the ore zone which is 400 feet below the Waara Mine's 600 level and go from there. By this time the new operators will have learned enough to build a mill. By selecting a site for a mill advantageously accessible from the two shafts or selecting a new shaft site and building a mill conveniently located for low production costs, could be considered.

Surface drilling sites are no problem. The gulch flowing southwest from the center area of the Merrill claim would provide the shallowest hole site. This would be directly above the drill hole from Station No. 1 of the Waara Mine or at the intersection of drill hole with the Mallery Fault, at elevation about 2850 feet. The drill hole from here will reach the vein mass at elevation 1913, about 1000 feet northerly from the Oatman Fault plane on 600 level.

PHYSICAL CONDITIONS AND IMPROVEMENTS AT THE WAARA MINE

The main shaft is the only surface improvement on the property. There are no buildings or such thereon. A mine road extends from the Town of Oatman to the property on a fairly good grade to the shaft. An easier approach is practical when necessity requires it.

I expect the shaft will be found in reasonably fair condition as there are no known great fissure or fault conditions affecting it. The collar of the shaft has caved in, a condition usually occurring with closed shafts and mines. The Mallery fault located east of the shaft is not threatening, it being 180 feet east at the surface, 40 feet east on the 600 level, and will not intersect the shaft until the shaft reaches the 1200 foot level. No trouble is expected in sinking the shaft through the Mallery Fault on its way to the 1000 and lower depths. Apparently no trouble was involved by the Big Jim shaft sinkers when that shaft was sunk through the same fault.

MILLING AND CYANIDE TREATMENT

Three mills operated at the same time in the early mining days. There was no trouble so far as water is concerned. The same sources are available for the present use of water.

VALUES IN ORE ZONES

Financial statements and reports must be relied upon for authentic determination of expectant values to be found in the lost ore zones. The report of Mr. Roy W. Moore, General Manager of the United Eastern Mining Co. at its New York meeting in February 1928 is one of my references in the effort to determine expectant values in the lost ore zone of the Big Jim and Grey Eagle mines, both of which are of the same vein and character.

The financial statement involving the Big Jim (B.J.) as related in Table 1 hereto attached should be examined as to details.

Similarly to the Moore report, I am relying on the report of Mr. Edward O. Brooks, consulting Mining Engineer and Geologist, for an outsider's view and valuation of the Big Jim and its operations. I consider his report, where it disagrees with my version, as very much confused due to lack of authentic background data, poorly assembled. Otherwise the report should be read carefully and with good interest to learn of the Big Jim's operations, since the Big Jim lost ore zone is our objective in advancing interest into its rediscovery, which I assure you is imminent.

It should be remembered that while we are discussing Big Jim's ore zone, that we include the Grey Eagle ore zone and maintain that they are alike and have the same difficulties. However, the two ore zones are now under one ownership and operational conditions for the future. I now refer you to Page 78 of Arizona Bureau of Mines Bulletin No. 131, illustrating a diagram of the Big Jim and Grey Eagle ore zones with notations of values in both zones during the $20.00 per ounce gold price era. Heretofore I nicknamed this diagram as a "sawtooth" section. Roughly speaking we have 600 feet of Grey Eagle and 600 feet of Big Jim vein ready to mine, located about 300 feet apart. One can easily see how the costs of operations to mine both ore zones may be substantially reduced, all of the way from management overhead to surface delivery of the mined ores.

The potential valuation of the two segments is very interesting:

The Big Jim vein was 750 feet long. The production report shows a valuation of $3,642,683.00. By plain arithmetic we have:

$$\frac{\$3,642,683}{750} = \$4,857.00 \text{ per lineal foot.}$$

The Grey Eagle mine was about 10% richer in values and volume than the Big Jim mine, to wit:

$$\$4,857 + 485.00 = \$5,342 \text{ per lineal foot.}$$

Totaling the two mines we have $10,199.00 per lineal foot. The length of the ore zone on the Waara Mine property, being 2600 feet, we have,

$$2600 \times \$10,199 = \$26,517,400.$$

The production totals of $26,517,400 were on the basis of gold being valued at $20.00 per ounce. With the 1933 value of $35.00 per ounce the next potential value will be $46,405,604.00. The cash value of gold on January 20, 1972 was $45.10 per ounce increases the potential value to $59,664,358,00. The silver

content of the mined ore was significant, however, I have no figures on the silver content of the ore. The value of the silver per ounce is doubled at least comparing 1928 prices and that of 1972, with the latter price going higher. The silver price per ounce reached close to $2.25 per ounce just over a year ago. Ore zone values below original 600 level of Big Jim not estimated.

The values of ore mined are from the official records of the United Eastern Mining Co., and are authentic. The estimate for the Grey Eagle mine are considered just as authentic even though records are not available individually of the several units. The Grey Eagle mine was a part of the Tom Reed Mines Co. operation and there were several units included in the production figures to wit; Grey Eagle, Aztec Center, Black Eagle, Telluride, Ben Harrison Tip Top, and Olla Oatman mines.

No promotion was involved in connection with the reports of Mr. Moore and Mr. Brooks. In fact, the mines were practically closed down relatively speaking. Reports were to the company and its stockholders.

OPERATIONS PLANT

A full scale start of a mine operation is at stake.

The Big Jim shaft may be leased.

The Waara Mine shaft can be rehabilitated and sunk deeper.

Diamond drilling from the surface, or opening of either shaft and diamond drilling from the 600 levels will be necessary.

A full scale development plan and blocking out of ore for milling operations is due.

A mill must be constructed, of a capacity to be determined by the new management. Pipe lines and electric power lines from the nearby sources must be installed.

All of these must be done in sequence as management, operating, and designing engineers may determine.

The potential is unlimited for successfully developing a paying mining operation. The climate is ideal for all year round operations, although the summer heat may result in some discomfort, however, nothing compared with the early days in Oatman. The ore zones were richer in the northern areas of the Tip Top and United Eastern workings, and since this property should be considered as being in the northern area, we can anticipate richer ore bodies, in the Waara Mine than in the mines further south.

CONCLUSION

My version of developing new mining sources in the foregoing report is the result of months of keen study and production of authentic maps. These maps are accurate to measurements within ten feet for important work where one may desire to take on formation from the map to use underground or in the field. The elevations shown thereon are accurate to 10 feet in all of the mine workings, based on sea level datum of the Big Jim and Waara Mines. The earlier incorrect sea level datum used in the Tom Reed mine have been adjusted to my datum. All informative data was double checked from different viewpoints to develope greatest accuracy possible.

The future will confirm my efforts. A NEW PRODUCER IN OATMAN.

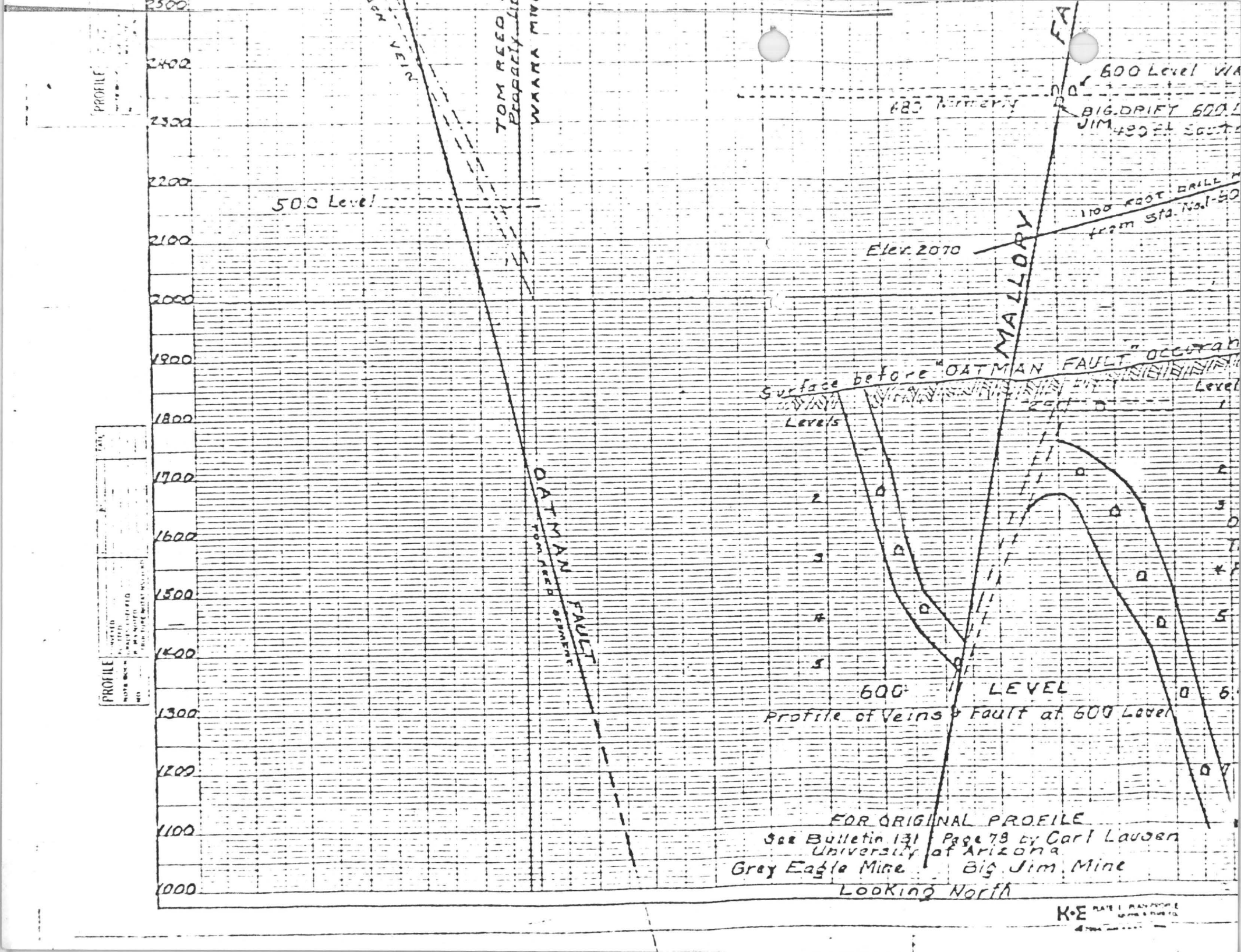
Respectfully submitted,

J. William Waara

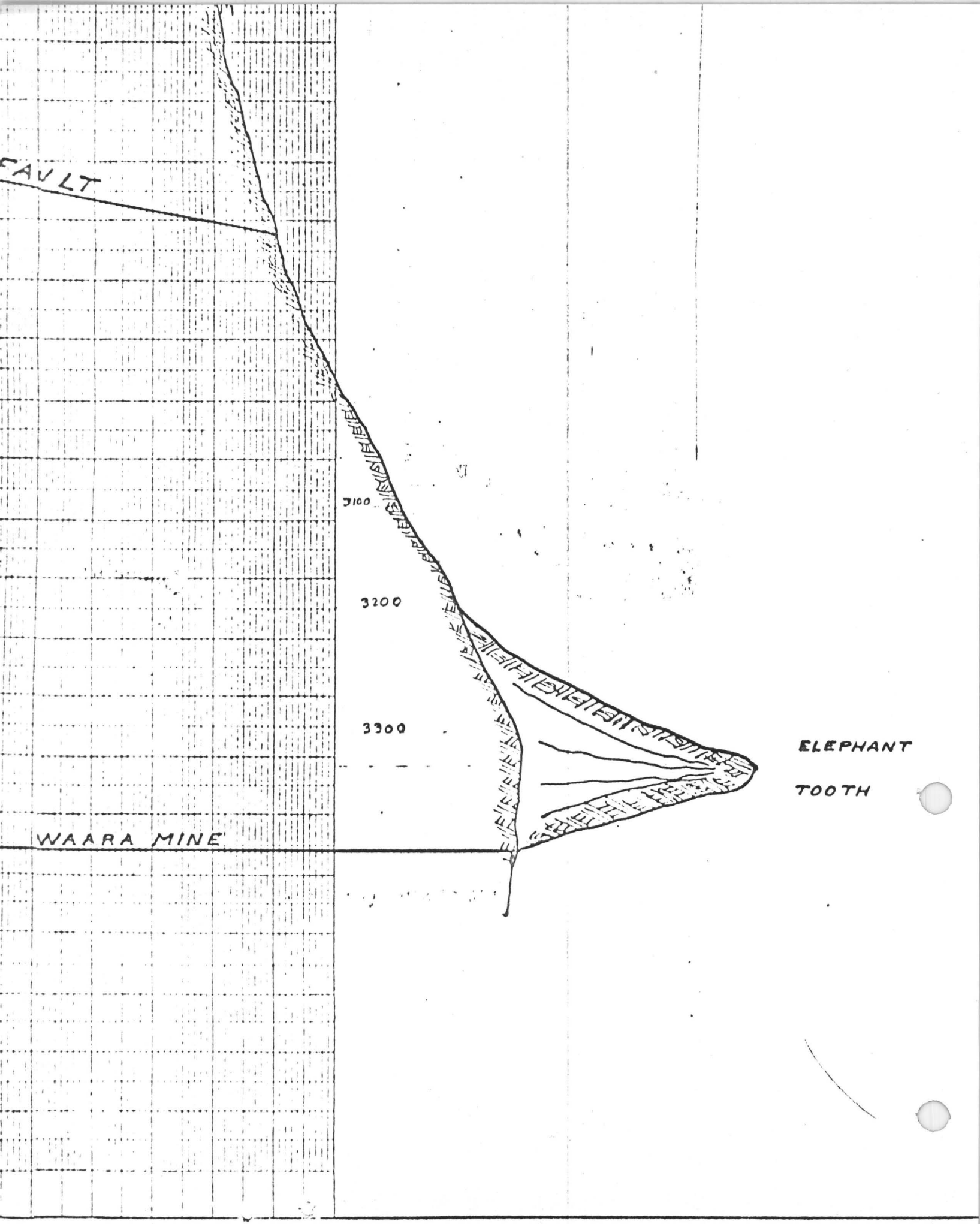
J. William Waara,
Civil and Mining Engineer
Arizona Registration No. 62
Professional Engineer 1922 Registration.

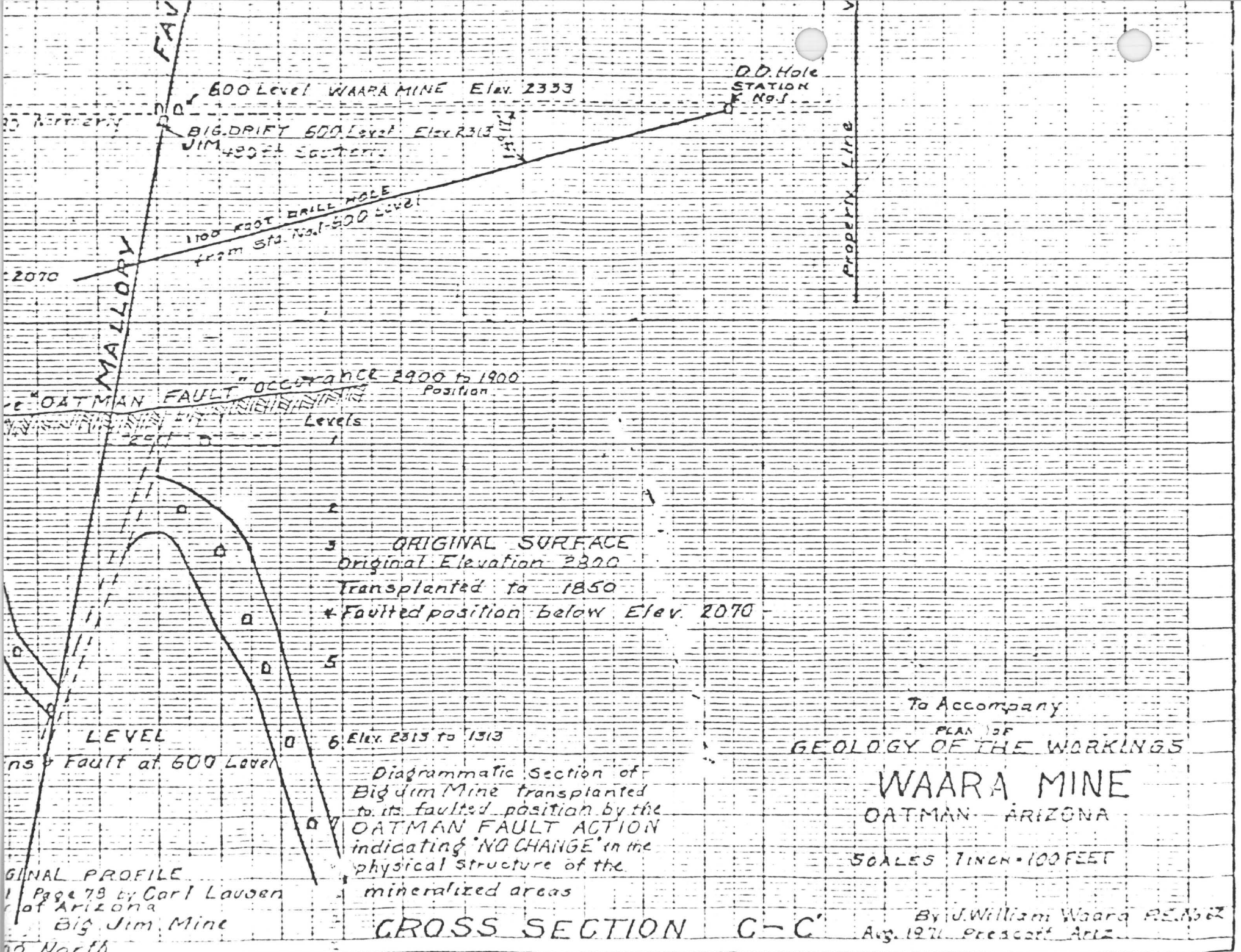
Prescott, Arizona
January 15, 1972

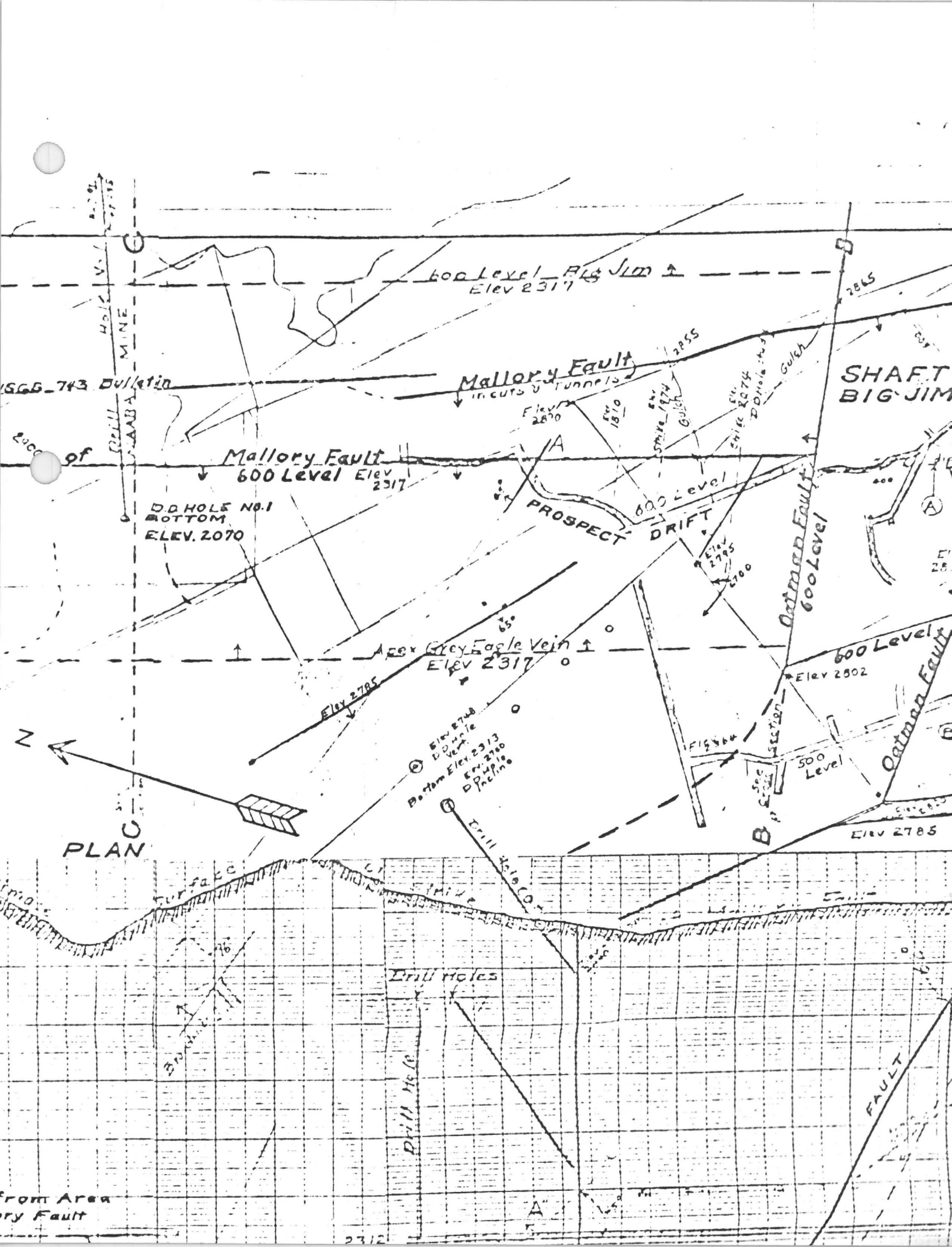
P.S.: For further reference to documents mentioned in this report, their copies will be available, together with larger maps and detail cross-sections, longitudinal sections and profiles to scale of one inch equals one hundred, 1 inch = 100 ft.

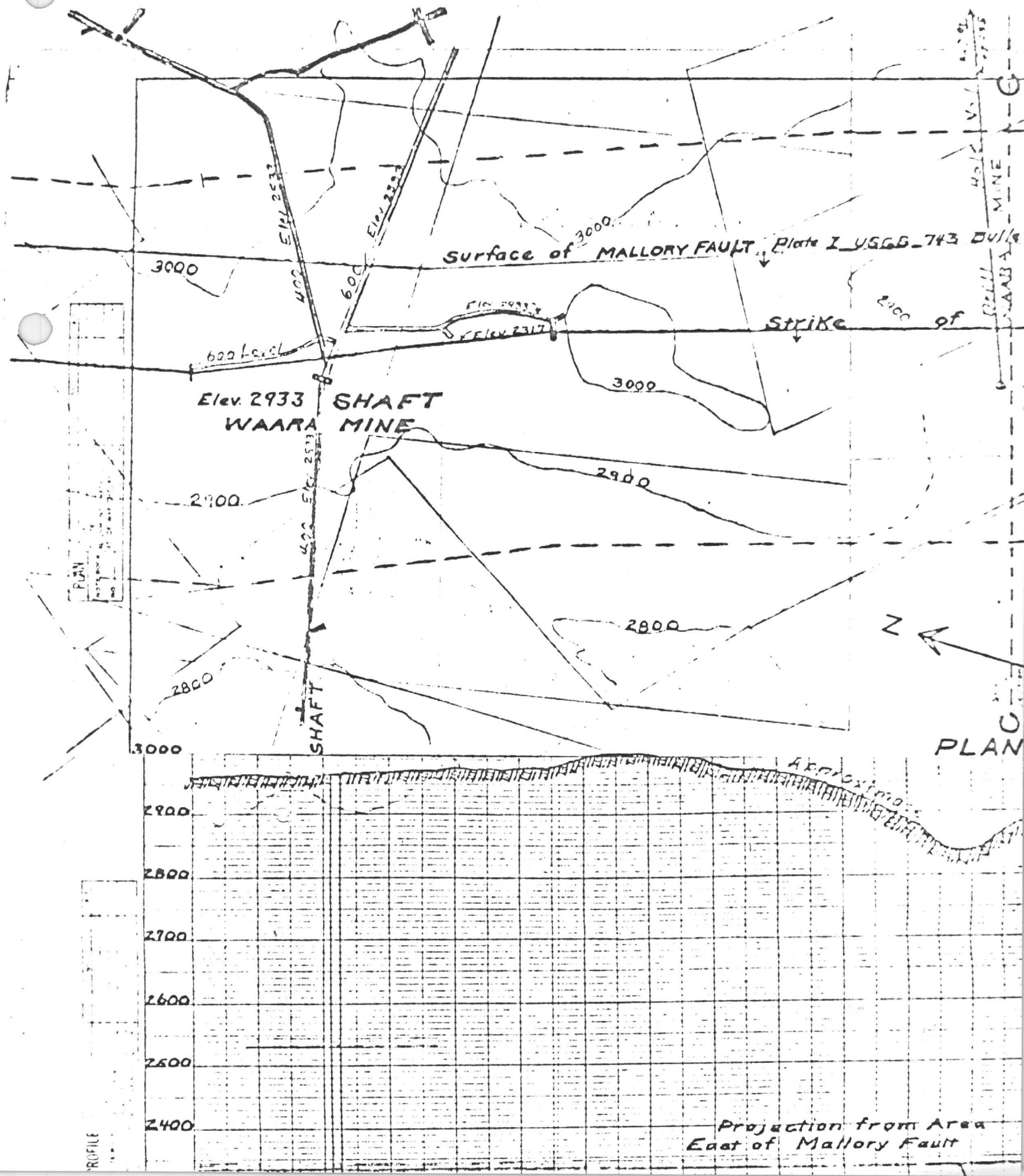

2500
2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
500 Level
TOM REED
WAARA
OATMAN FAULT
TOM REED DEPRESSION
MALLORY FA
600 Level
BIG DRIFT 600
JIM
1100 FOOT DRILL
from Sta. No. 1-50
Elev. 2070
Surface before "OATMAN FAULT" occurr
Levels
600 LEVEL
Profile of Veins & Fault at 600 Level
FOR ORIGINAL PROFILE
See Bulletin 131 Page 78 by Carl Lausen
University of Arizona
Grey Eagle Mine
Big Jim Mine
Looking North
K·E

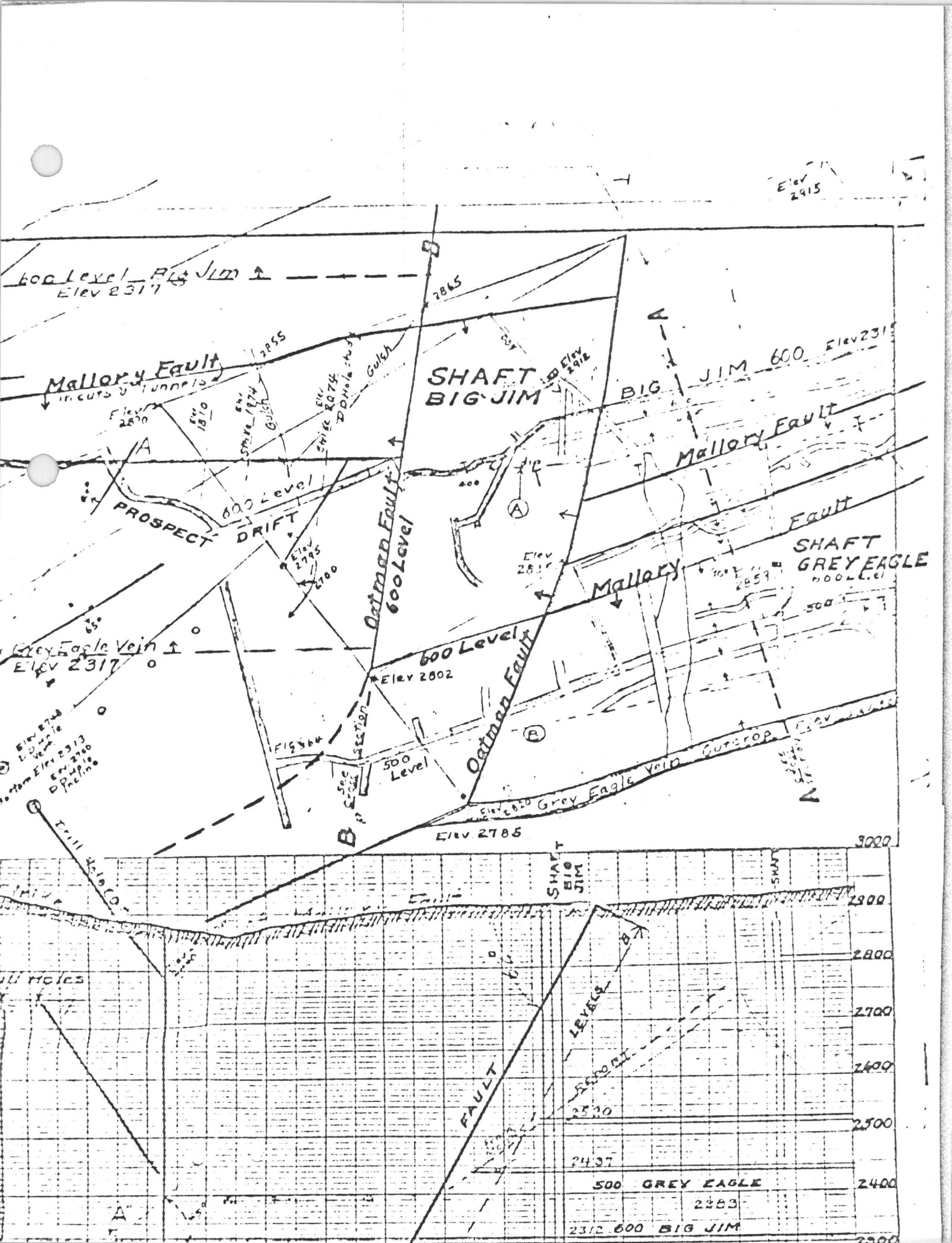

PLAN
3000
2900
2800
2700
2600
2500
SURFACE
→ 2050 Feet
FAULT

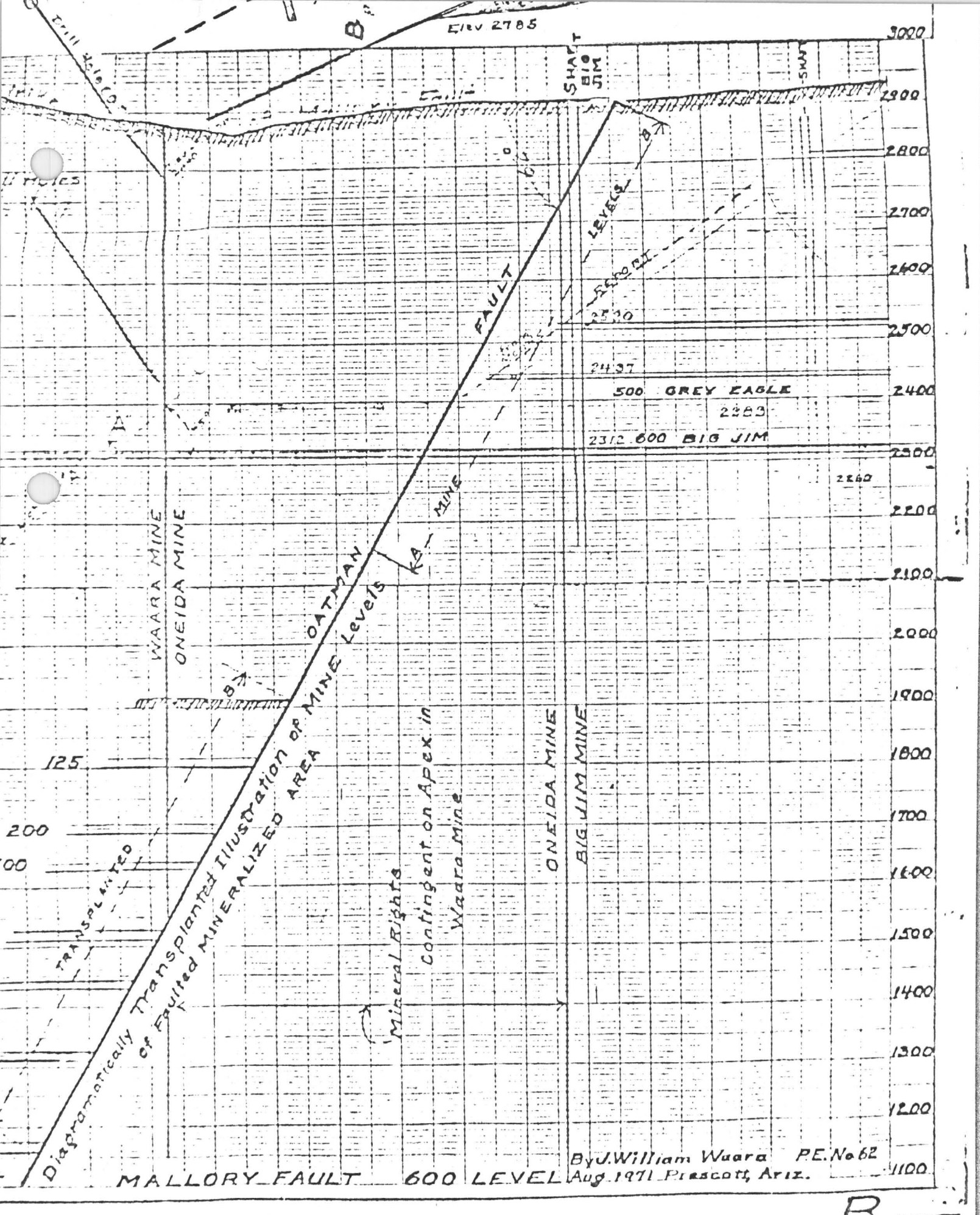

FAULT
3100
3200
3300
ELEPHANT
TOOTH
WAARA MINE


FAU
600 Level WAARA MINE Elev. 2333
O.D. Hole
STATION
F. No. 1
BIG DRIFT 600 Level Elev 2313
JIM 400 ft Southerly
1100 FOOT DRILL HOLE
from Sta. No. 1-600 Level
Property Line
MALLORY
2070
OATMAN FAULT" occurance 2900 to 1900
Position
Levels
1
2
3
ORIGINAL SURFACE
Original Elevation 2800
Transplanted to 1850
* Faulted position below Elev. 2070
5
6 Elev. 2313 to 1313
LEVEL
Fault at 600 Level
Diagrammatic Section of
Big Jim Mine transplanted
to its faulted position by the
OATMAN FAULT ACTION
indicating "NO CHANGE" in the
physical structure of the
mineralized areas
GINAL PROFILE
Page 78 by Carl Lausen
of Arizona
Big Jim Mine
North
CROSS SECTION C-C'
To Accompany
PLAN OF
GEOLOGY OF THE WORKINGS
WAARA MINE
OATMAN ARIZONA
SCALES 1 INCH = 100 FEET
By J. William Waara P.E. No 62
Aug. 1971 Prescott Ariz.
K-E


600 Level Big Jim
Elev 2317
Mallory Fault
in cuts & Tunnels
USGS-743 Bulletin
Mallory Fault
600 Level Elev 2317
DD HOLE NO.1
BOTTOM
ELEV. 2070
PROSPECT DRIFT
600 Level
Ontario Fault
600 Level
Apex Grey Eagle Vein
Elev 2317
Elev 2785
Elev 2802
500 Level
Ontario Fault
Elev 2785
SHAFT
BIG JIM
PLAN
Drill Holes
FAULT
from Area
ory Fault


Surface of MALLORY FAULT, Plate I USGS-743 Quad
Strike of
3000
2900
2800
Elev. 2933
SHAFT
WAARA MINE
600 Level
Elev. 2933
Elev. 2317
SHAFT
PLAN
PROFILE
Approximate
Projection from Area
East of Mallory Fault


600 Level Big Jim
Elev 2317
Mallory Fault
in cuts & tunnels
SHAFT
BIG JIM
BIG JIM 600 Elev 2315
Mallory Fault
PROSPECT DRIFT
600 Level
Ostman Fault
600 Level
Mallory Fault
SHAFT
GREY EAGLE
Grey Eagle Vein
Elev 2317
Elev 2802
Ostman Fault
500 Level
Elev 2785
SHAFT
BIG JIM
LEVELS
FAULT
500 GREY EAGLE
2383
2312 600 BIG JIM
3000
2900
2800
2700
2600
2500
2400
2300



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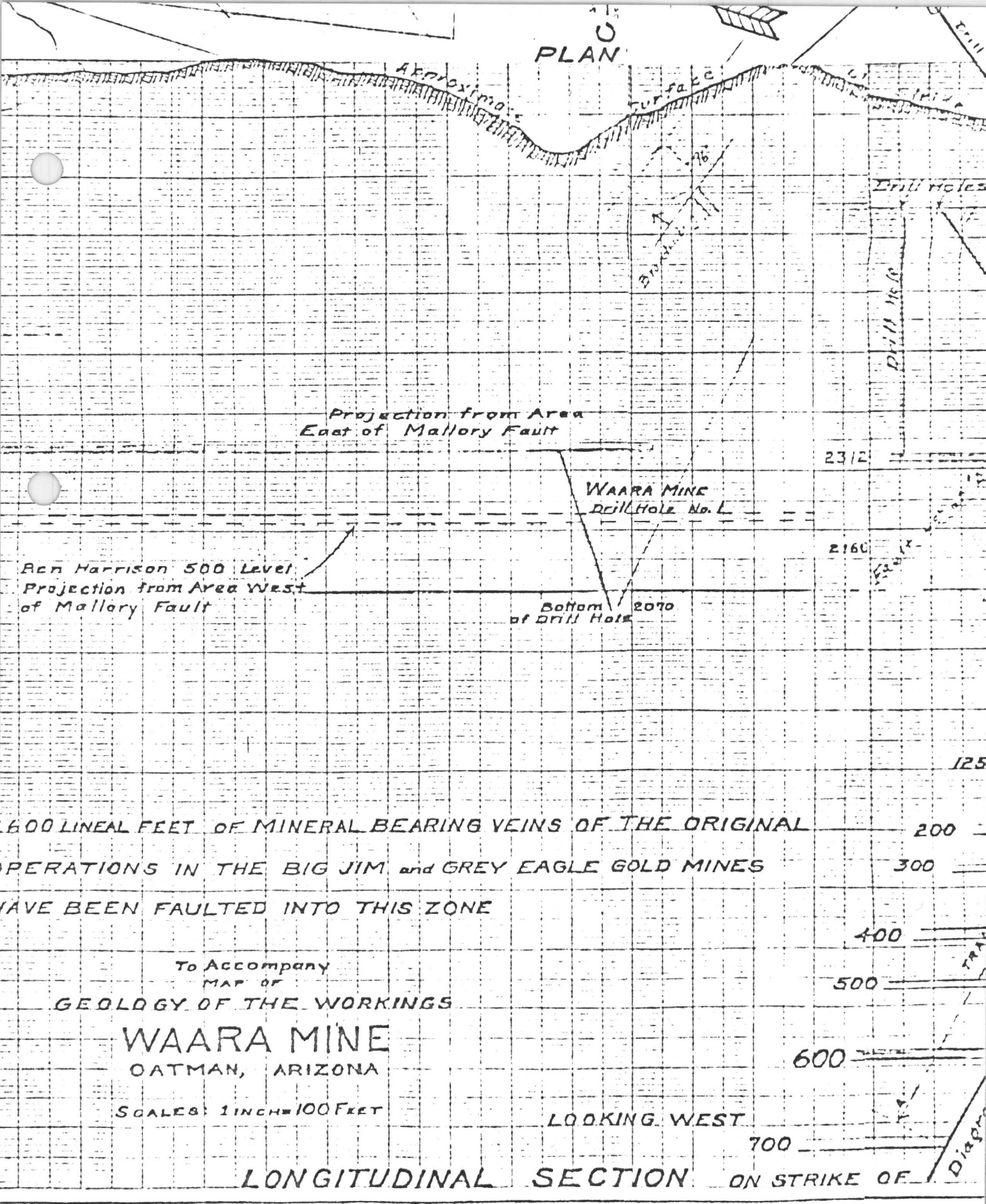
Aug. 1971 Prescott, Ariz.

MALLORY FAULT 600 LEVEL

B



600 LINEAL FEET OF MINERAL BEARING VEINS OF THE ORIGINAL
PERATIONS IN THE BIG JIM and GREY EAGLE GOLD MINES
AVE BEEN FAULTED INTO THIS ZONE

To Accompany
MAP OF
GEOLOGY OF THE WORKINGS

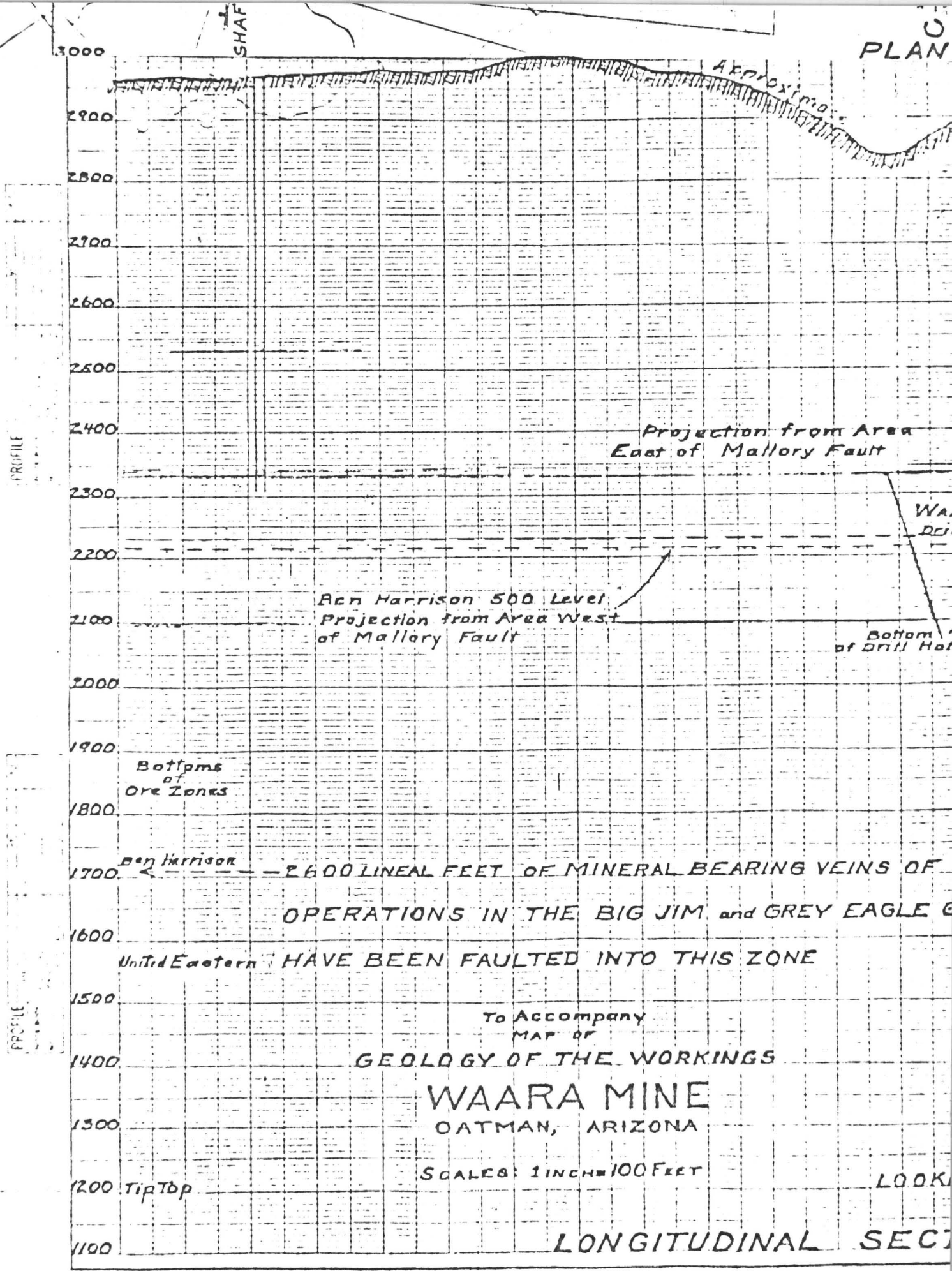
WAARA MINE

OATMAN, ARIZONA

SCALE: 1 INCH = 100 FEET

LOOKING WEST

LONGITUDINAL SECTION ON STRIKE OF


SHAF
PLAN
Approximate
3000
2900
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
PROFILE
PROFILE
Projection from Area
East of Mallory Fault
Ben Harrison 500 Level
Projection from Area West
of Mallory Fault
Bottoms
of
Ore Zones
Ben Harrison
United Eastern
Tip Top
2600 LINEAL FEET OF MINERAL BEARING VEINS OF
OPERATIONS IN THE BIG JIM and GREY EAGLE
HAVE BEEN FAULTED INTO THIS ZONE
To Accompany
MAP OF
GEOLOGY OF THE WORKINGS
WAARA MINE
OATMAN, ARIZONA
SCALES: 1 INCH = 100 FEET
LOOK
LONGITUDINAL SECT