TRANSMITTED
JUN 14 1955

DMEA
Date Rec'd
JUN 10 1955
BUREAU OF MINES
Denver, Colorado

RECEIVED
JUN 20 1955
5

June 8, 1955

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Region III

From: Superintendent, Southwest Experiment Station, Tucson, Arizona

Subject: Field Examination Report, Docket DMEA-3586, Maricopa Minerals Co.'s Good Earth Columbium-Tantalum Placers, Maricopa County, Arizona

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by W. R. Hardwick of the Bureau of Mines and Leonid Bryner of the Geological Survey, and the section on Engineering by Hardwick for the above report. A section on Geology will be submitted by the Geological Survey.

On their first visit to the property, Hardwick and Bryner took 12 large samples to check the results of the applicant's samples. These 12 samples were large so were quartered in the field, then run over a table to obtain a concentrate of black sands. The concentrate then was assayed in the laboratory of the Southwest Experiment Station in Tucson. As no columbium or tantalum was found in the first assays, the samples were analyzed again and also checked with a spectroscope. Some of the samples also were sent to the Intermountain Experiment Station at Salt Lake City for a check. No columbium or tantlaum was found.

In order to check these samples, the DMEA examining team returned to the placer deposit and took a 800-pound sample from one of the pits where the applicant had obtained a good columbium-tantalum assay. This large sample was carefully concentrated and the concentrate assayed, but only a trace of columbium-tantalum was found.

Because they could find no appreciable amounts of columbium or tantalum in the placer deposit, the DMEA examiners recommended that Government exploration assistance be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

cc - Traver (orig. & 8)
J. H. Faick
DMEA-3586
BF
WRStorms/ts

6-24-55

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS MCKAY, SECRETARY

RECEIVED
JUN 29 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA-3586, Maricopa Minerals Co.

Good Earth Columbium-Tantalum Placers

Maricopa County, Arizona

William R. Hardwick, Mining Engineer
U. S. Bureau of Mines

Leonid Bryner, Geologist
U. S. Geological Survey

June 1955

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(date)

TRANSMITTED
JUN 14 1955
RECEIVED
JUN 20 1955

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By William R. Hardwick[1] and Leonid Bryner[2]

Sewell Thomas, a consulting mining engineer acting for Maricopa Minerals Co., an Oklahoma corporation, presented an application to the Defense Minerals Exploration Administration for Government assistance to explore the Good Earth placer claims in Maricopa County, Arizona, for columbium and tantalum. The application requested assistance in the amount of 75 per cent of the costs of a proposed drilling program estimated to cost $33,000.00. This application, presented under the provisions of the Defense Production Act of 1950, as amended, was docketed DMEA—3586 (Columbium) and was referred to the field for an examination and report.

The Good Earth placer claims are situated in T. 2 S., R. 4 W., Maricopa County, Ariz. The gravels form an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash. This wash drains in a southwesterly direction and is situated one to two miles from the Hills. These gravels are unsorted to poorly sorted, and consist of angular to sub-angular fragments generally less than six inches in diameter in a caliche cement.

The Good Earth placer claims were visited and examined on February 14 and 15, 1955 by William R. Hardwick and Leonid

---

1/ Mining engineer, U. S. Bureau of Mines.

2/ Geologist, U. S. Geological Survey

Bryner. The DMEA examining team was assisted by Sewell Thomas and John L. Holt, the locator of the claims. The examining team cut 12 samples to check the results reported by the applicant. The metallurgical section of the U.S. Bureau of Mines at Tucson reported no columbium or tantalum in these check samples. The claims again were visited on April 12, 1955 and a large 600-pound sample was taken at the test pit where one of the highest grade samples reported by Thomas was taken. This sample was assayed, but no significant amount of columbium or tantalum was found.

There has been no production from this deposit, and as the assays show noocolumbium or tantalum, there are no ore reserves. It is the conslusion of the examining team that the sample values reported by the applicant do not represent the true value of the ground sampled and that a significant amount of columbium and tantalum will not be discovered by the project.

It is recommended that the application (DMEA-3586) of Maricopa Minerals Co. to explore the Good Earth placer claims for columbium and tantalum be denied.

DMEA-3586, MARICOPA MINERALS CO.
GOOD EARTH COLUMBIUM-TANTALUM PLACERS
MARICOPA COUNTY, ARIZONA

RECEIVED
JUN 20 1955

Engineering Report

By William R. Hardwick, Mining Engineer
U. S. Bureau of Mines

June 1955

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(date)

DMEA-3586, MARICOPA MINERALS CO.
GOOD EARTH COLUMBIUM-TANTALUM PLACERS
MARICOPA COUNTY, ARIZONA

RECEIVED
JUN 20 1955

CONTENTS

Page

Engineering report

Introduction---------- 1
Acknowledgments---------- 2
Location, topography and climate---------- 2
History and production---------- 3
Ownership and extent---------- 4
Description of the deposit---------- 4
Ore reserves---------- 6
Present status---------- 7
Proposed exploration---------- 9
Estimated costs---------- 9
Proposed financing----------12
Conclusions----------12
Recommendations----------13
Appendix----------14

ILLUSTRATIONS

Figure — Following page

1 Location map---------- 1
2 Claim map and location of proposed drill holes (with Geological Section)
3 Map of test pits and assays---------- 6

INTRODUCTION

The Maricopa Minerals Co., an Oklahoma corporation, applied for Government assistance to explore the Good Earth placer claims, Maricopa County, Ariz., for columbium and tantalum (figure 1). The application (DMEA-3586) was received by the Defense Minerals Exploration Administration Field Team, Region III, Denver, Colo., on November 17, 1954, and was forwarded to the Southwest Experiment Station, Tucson, Ariz., on November 29, 1954 for a field examination. The applicant proposed to explore alluvial gravels for columbium and tantalum by churn-drill sample holes. The total estimated cost of the project was $33,000.00.

The Good Earth claims were examined on February 14 and 15, 1955 by Leonid Bryner, geologist, U. S. Geological Survey, and William R. Hardwick, mining engineer, U. S. Bureau of Mines. The examining team was assisted by Sewell Thomas, Consulting Engineer for the applicant, and John L. Holt, owner and original locator of the claims.

Based on a review of the sampling procedure used by Sewell Thomas and the assay results reported by Charles O. Parker & Co., Denver, Colo., an exploration project appeared feasible. However, after the field examination, some changes in the initial application seemed desirable to the examining team. These changes were discussed with Sewell Thomas at a conference in Buckeye, Ariz. on February 16, 1955. Mr. Thomas concurred fully with these changes and requested in a letter dated February 24, 1955, that these changes be incorporated in the proposed project.

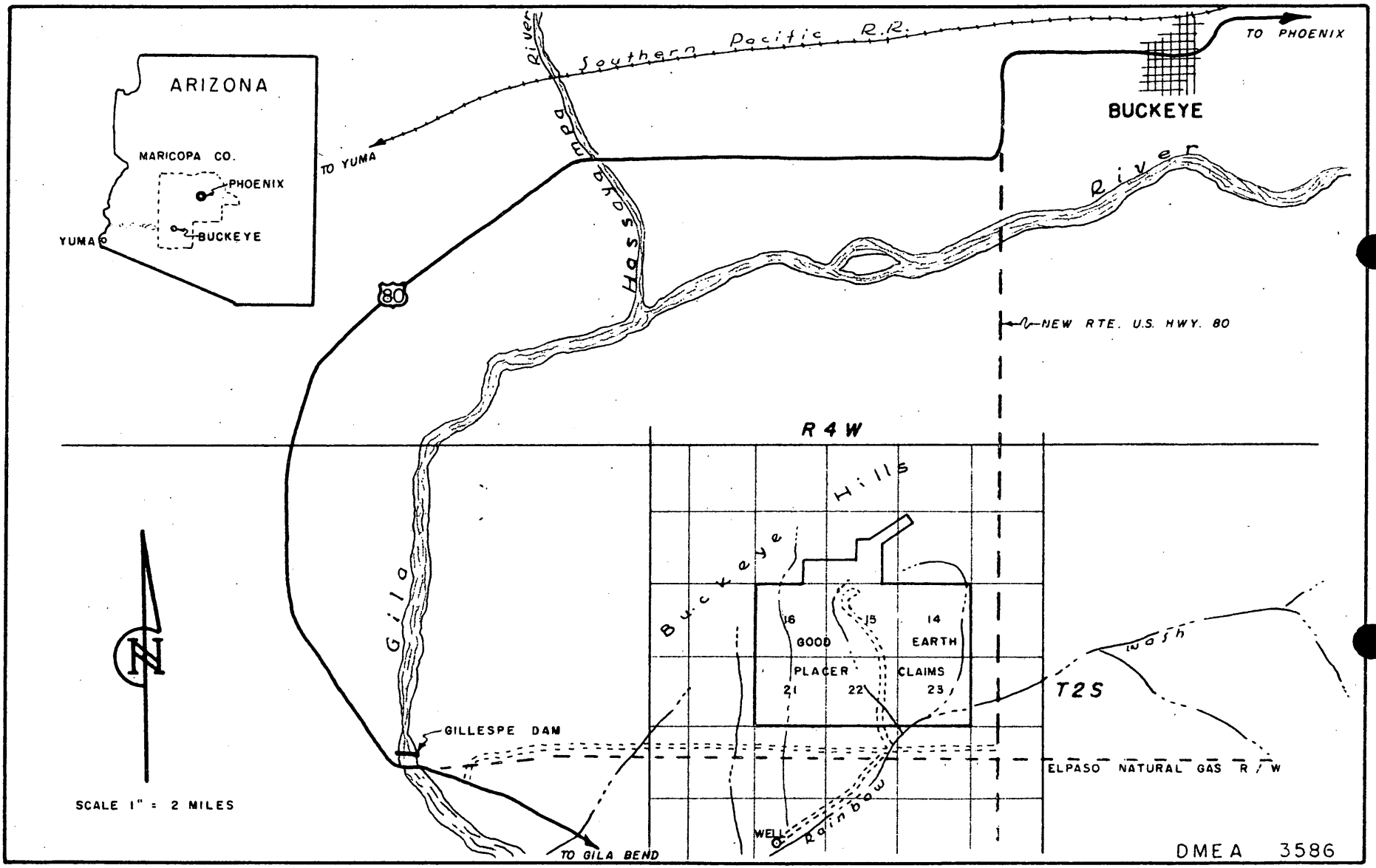


FIGURE - 1 - LOCATION MAP - GOOD EARTH PLACERS
MARICOPA COUNTY, ARIZ.

During the field examination, 12 samples were taken at favorable places on the property. The metallurgical section of the Southwest Experiment Station, U. S. Bureau of Mines, Tucson, Ariz., was unable to detect any columbium or tantalum in these samples, so on April 12, 1955, the Good Earth placer claims again were visited by the examining team. A 600-pound sample was taken at the most favorable location that had been reported by Sewell Thomas. This sample also showed no significant amounts of columbium or tantalum.

ACKNOWLEDGMENTS

Acknowledgment is due the efforts of Sewell Thomas, Consulting Mining Engineer, in showing the examining team over the property, and to John L. Holt, owner of the Good Earth placer claims, who supplied information and assistance during the field examination.

LOCATION, TOPOGRAPHY AND CLIMATE

The Good Earth placer claims are situated in Secs. 14, 15, 16, 21, 22 and 23, T. 2 S., R. 4 W., Maricopa County, Ariz. The claims are on the south side of the Buckeye Hills and on the north edge of Rainbow Valley. They may be reached by driving south from the town of Buckeye, Ariz. along the new route of U. S. Highway 80 (now under construction) for a distance of 12 miles to the point where El Paso Natural Gas Co.'s pipe line crosses the highway. Turn west along the pipe line right-of-way and travel 1.5 miles to the center of the southern part of the group of claims.

The Rare Earth lode claims are located along the south side of a rugged ridge. The Good Earth placer claims are located

on the alluvial fans formed by small arroyos that flow south into Rainbow Wash. The ground slopes southward at the rate of from 100 to 200 feet per mile and is cut by washes and low alluvial ridges. The difference in elevation from top of ridge to bottom of wash may be as much as 50 feet in some places, but probably averages about 30 feet. The elevation above sea level is 900 feet at the south end of the claim group and 1,100 to 1,200 feet at the north end.

The vegetation is typical of the southwestern desert. The ridges are sparsely covered with brush and cacti, while palo verde and mesquite grow along the washes. The rainfall may vary from 5 to 10 inches per year, and probably averages about 7 inches, most of which comes in July and August as torrential thunder storms.

The climate is mild in the winter and hot in the summer. Temperatures as high as 120° F. are not unusual in the summertime.

The Southern Pacific railway has a station at Buckeye, a distance of 12 miles from the claims. The main pipe line of El Paso Natural Gas Co. crosses the southern edge of the claims, and the new route of U. S. Highway 80 will cross the eastern edge. Electric power is available from a transmission line in the center of Rainbow Valley, approximately 4 miles from the center of the group. Water can be developed on the southern claims.

HISTORY AND PRODUCTION

There has been no production from the Good Earth placer claims. Small lots of high-grade "heavy minerals" have been mined from the pegmatite dikes on the Rare Earth lode claims. No sale

of this specimen material for its mineral content has been reported.

OWNERSHIP AND EXTENT

The Rare Earth lode claims 1 to 5, and the Good Earth placer claims 1 to 12 were located by John L. and Viola W. Holt. These claims now are held by the Maricopa Minerals Co. under a "lease and option to purchase" agreement. This option provides for a purchase price of $100,000.00. The lease provides for payment of a minimum sum of $400.00 per month, or royalty on production at the rate of 5 per cent, whichever is the larger sum. All payments are to be applied to reduce the purchase price.

Since the execution of the lease and option with the Holts, the Maricopa Minerals Co. has located additional placer claims surrounding the initial group.

DESCRIPTION OF THE DEPOSIT

The general geology of the deposit is described in a separate report by Leonid Bryner, examining geologist.

The Good Earth placer gravels are deposited along the south side of the Buckeye Hills. The valuable minerals, columbium and tantalum, are reported to come from a system of pegmatite dikes that have been partly eroded. The gravels vary in depth from zero at the south edge of the Buckeye Hills to an undetermined depth at the south edge of secs. 21,22 and 23, some 2 miles from the edge of the hills. A well has been drilled to a depth of 309 feet in sec. 33, just south of the claims. This well did not penetrate bedrock.

Sewell Thomas estimated in the initial application that

the average depth to bedrock would be 15 feet. He also assumed that the gravels were underlain by a relatively smooth pediment. However, it has been the experience of the examining engineer that in this desert country where shallow gravels are underlain by a pediment, numerous outcrops occur. Where no outcrops occur, the bedrock usually drops rapidly away from the hills. At a distance of a mile from the hills, the depth to bedrock may be from 200 to 500 feet. This feature was pointed out during the examination and Sewell Thomas has modified the proposed program to incorporate the possibility of deep gravel at the starting location.

The gravels represent a series of coalescing alluvial fans that were formed by washes draining southward from Buckeye Hills to Rainbow Wash. In the vicinity of the shaded area shown on figure 2, the gravel consists of rounded to sub-angular boulders and fine sand. The size of the boulders increases toward the edge of the hills, and they become more plentiful.

The gravels were estimated to consist of from one-fourth to one-third quartz and feldspar fragments. The remainder was weathered dark-colored granite. Except for the loose material in the recent wash beds, the gravels were cemented with caliche.

In the samples taken, most of them in or near the shaded area of figure 2, all of the heavy mineral was less than 10 mesh in size. Large pieces (one inch in diameter) were reported to have been found at the edge of the hills by John L. Holt. None were observed by the examining team.

ORE RESERVES

With a hoe-type power shovel, 30 test holes were dug to a depth of from 6 to 8 feet by Maricopa Minerals Co. A sample was cut from each hole with the bucket of the shovel. These samples ranged in size from 500 to 2,000 pounds. They were trucked to water, screened wet, and processed in a mechanical pan which made a concentrate that ranged in size from 140pounds 10 ounces to 49 pounds. This concentrate was assayed for columbium and tantalum by Charles O. Parker & Co., Denver, Colo. The results of the Parker assays ranged from 0.12 to 3.07 percent combined columbium-tantalum pentoxide. Based on the assay results of Parker, Sewell Thomas has inferred 625,000 cubic yards of gravel that contains 0.052[1/] percent combined columbium-tantalum pentoxide, or approximately one pound per ton.

Twelve samples were taken by the DMEA examining team during the field examination and later a 600 pound sample was taken from the most favorable location. None of these samples contained more than a trace of columbium-tantalum pentoxide. Therefore, no ore is inferred by the examining team.

The 30 samples takenby the applicant are shown on figures 2 and 3. The locations of the 12 samples taken at the time of the DMEA field examination also are shown on figures 2 and 3. The results of the applicant and the DMEA examining team are compared in Table I.

When all 12 of the check samples failed to show any

1/ Due to a typographical error this figure was reported as 0.52 percent by Sewell Thomas in the statement attached to the original application.

columbium, the analyses were repeated in Tucson, and portions of the pulps also were sent to the Bureau's Salt Lake City laboratory to be checked by the metallurgical section at that station. These checks confirmed the original analyses.

The sampling procedure followed by the applicant had been duplicated as nearly as practical by the DMEA examining team. The 12 samples were cut by hand from the sides of the same pits, and therefore were smaller than the samples which were cut by the applicant with a power shovel.

In order to check the sampling procedure, the examining team returned to the Good Earth placer claims on April 12, 1955 and cut a 600-pound sample from pit No. 2. One of the applicant's highest grade samples came from this location. The results of this sample showed only a trace of columbium and tantalum. The results of the metallurgical work on this project are covered in the attached report, TMR-379-1, "Concentration of Placer Gravel from the Good Earth Claims, Maricopa County", by F. N. Bender and R. R. Cruse.

PRESENT STATUS

During the summer of 1954, after control of the property was acquired by Maricopa Minerals Co., 30 test holes were dug with a back-hoe. The location of these holes is shown by the shaded area on figure 2 and in more detail on figure 3. Other than location pits and the test pits mentioned above, no work has been done on the Good Earth placer claims.

TABLE I. Comparison of Applicant's Samples and Samples by DMEA Examining Team.

Samples by Sewell Thomas. Analyses by Charles O. Parker & Co., Denver, Colo.					Samples by DMEA Examining Team. Analyses by Metallurgical Section of Bureau of Mines.			
Sample No.	Sample Weight, Pounds	Weight of Concentrate, lbs.	Oz.	Percent $(Cb\text{-}Ta)_2O_5$	Sample No.	Sample Weight, Pounds*	Weight of Concentrate, Pounds	Percent $(Cb\text{-}Ta)_2O_5$
15	727	21	7.0	0.32	13151	62.25	0.533	Nil
14	1,337	66	7.0	0.35	13153	51.50	2.485	Nil
19	1,000	36	15.0	1.41	13154	39.25	1.990	Nil
22	1,000	26	12.0	0.53	13155	57.00	1.616	Nil
1	1,580	14	12.0	2.44	13158	37.50	1.287	Nil
2	1,420	40	13.5	2.53	13159	83.50	4.458	Nil
3	590	35		3.07	13161	49.50	2.180	Nil
27	1,000	38	1.0	0.48	13162	35.50	2.092	Nil
					13152	35.50	0.962	Nil
					13156	32.00	1.153	Nil
					13157	32.25	0.935	Nil
					13160	34.25	1.107	Nil

* Larger samples were taken in the field and quartered to the reported weight.

PROPOSED EXPLORATION

The initial application proposed sample holes drilled to bedrock and spaced 200 feet apart. A gridwork in four different areas wasproposed. The selection of these different areas was based on the results of sampling shallow test pits.

During the field examination it was pointed out to Thomas that his estimate of the depth of bedrock might be in error, and that concentrations of heavy minerals might be more variable vertically than horizontally. Therefore, Thomas revised his original proposal and in the revision, proposed to drill two rows of sample holes across the drainage pattern. These holes would be 2,000 to 3,000 feet from each other. Based on the results of these widely spaced holes, Thomas expected to select an area that would be drilled on 200-foot squares.

ESTIMATED COSTS

The backers of Maricopa Minerals Co. are connected with oil exploration work in Oklahoma. They proposed to furnish their own drilling equipment and to do all of the proposed exploration on their own account. Sewell Thomas, an experienced mining engineer, would supervise the project.

Labor and supplies are available in Buckeye, 12 miles from the claims, or in Phoenix, 40 miles distant. The wage rates proposed by the applicant are somewhat higher than those at the nearby mines, but are about the same as those paid by construction projects in the area. Power is available at the well in sec. 33,

The applicant proposes to use this well for a water supply source.

The drilling costs proposed by the applicant are summarized below. They are based on a one-shift operation and an estimated advance of 15 feet per day.

Item	Cost per Day	Cost per Foot
Labor	$	$ 6.07
Supervision and consultant		3.67
Operating materials and supplies		1.77
Operating equipment rental		6.33
Miscellaneous		
Moving equipment in and out		1.00
Rehabilitating well and pump		0.20
Repairs and maintenance	7.50	
Assays, 1 sample per day	30.00	
Accounting	5.00	
Comp. employee liab., Soc. Sec. & payroll tax	12.50	
	$55.00	3.66
Contingencies		1.00
Grand total per foot of hole		$ 23.70

The costs proposed by the applicant seem excessive. In 1946, a series of 9-inch churn-drill sample holes were drilled some 60 miles south of the Good Earth placer claims in similar gravel. These holes were drilled under the supervision of the [redacted] examining engineer. The depths of the holes varied between 400 and 700 feet.

The cost, including labor, supplies, sampling at 5-foot intervals, and hauling water from 2 to 7 miles (but not including depreciation on equipment and casing) was slightly less than $6.00 per foot. The rate of advance was approximately 30 feet per shift. The holes were cased.

Assuming an advance of 25 feet per day and using the wage rates, supply costs, and equipment values proposed by the applicant, the following costs are estimated. They seem reasonable.

Labor	Per Day	Per Foot
2 Drillers @ $2.50 per hour	$ 40.00	
1 Panner @ $2.75 per hour	22.00	
1 Truck driver @ $2.00 per hour	16.00	
1 Roustabout @ $1.50 per hour	12.00	
1 Supervisor	25.00	
Total labor	$115.00	$ 4.60
Comp. Employee Liab., Soc. Sec. & Payroll tax (15%)		0.69
Operating materials and supplies		1.06
Depreciation of equipment		0.69
Miscellaneous		
Moving equipment in and out		1.00
Installation of water pump		0.20
Road preparation		0.50
Equpment repairs		0.50
Contingencies		0.50
Cost of drilling hole		$ 9.24

Assaying at 10-foot intervals ----------	$4.00
Grand total, drilling and sampling ----------	$ 13.24

In comparing the two estimates, the largest single difference is in the item, "Estimated rental or depreciation". The applicant has used a rental or use-allowance figure of $95.00 per day for equipment, which it values at $25,750.00. The examining engineer (using the same values for equipment) has used a 60-month depreciation rate and 25 working days per month to arrive at a figure of $17.17 per day.

The price for a columbium-tantalum assay is $60.00 for a single sample, or $40.00 per sample in quantities of 20 or more.[2/] This is equal to a cost of $2.00 per foot of drill hole for a 20-foot sample interval, or $4.00 per foot if samples are taken for each 10 feet.

PROPOSED FINANCING

Maricopa Minerals Co. proposes to furnish 25 percent of the cost of the proposed exploration. It has requested in the application for assistance, that the Defense Minerals Exploration Administration furnish 75 percent of the costs under the provisions of the Defense Production Act of 1950, as amended.

CONCLUSIONS

Columbium and tantalum have become increasingly important

2/ Personal communication, Ledoux & Co., 359 Alfred Ave., Teaneck, N. J.

in the last five years as a constituant of certain alloys designed for use at high temperatures. As the volume of gravel on the Good Earth placer claims is large and low cost recovery methods could be used, even very low-grade material indicated by the Parker analyses might provide a substantial amount of these important products.

However, sampling by the DMEA examining team and test work by the metallurgical section of the Southwest Experiment Station, Bureau of Mines, indicate that the amount of columbium and tantalum in the gravel is not significant, and that the sampling results presented by the applicant do not represent the true columbium and tantalum content of the gravel.

RECOMMENDATIONS

It seems probable that a significant amount of columbium and tantalum will not be found by the proposed exploration. Therefore, it is recommended that the application (DMEA-3586) of Maricopa Minerals Co. for Government assistance to explore the Good Earth placer claims be denied.

OFFICIAL USE ONLY

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

DIVISION OF MINERAL TECHNOLOGY, REGION III

J. Bruce Clemmer, Chief

TMR-379-1

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS, MARICOPA COUNTY, ARIZONA

DMEA Project - 3586

By: F.N. Bender and R.R. Cruse

May 9 - 1955

SOUTHWEST EXPERIMENT STATION
Carl Rampacek, Supervising Metallurgist
Tucson, Arizona

OFFICIAL USE ONLY

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(Date)

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS MARICOPA COUNTY, ARIZONA - DMEA Project - 3586

By: F.N. Bender and R.R. Cruse

Introduction and Summary

On March 21, 1955, W.R. Hardwick, examining mining engineer for DMEA project 3586, submitted twelve samples of placer gravel from the Good Earth Placer Claims, Maricopa County, Arizona, for gravity concentration tests to determine if they contained any recoverable columbium or tantalum. The samples were concentrated by a simple scalping and tabling treatment outlined by Mr. Hardwick which reportedly had proved successful for recovering tantalum and columbium-enriched concentrates from the material. However, chemical analyses, qualitative spectroscopic analyses and microscopic examination of the concentrates recovered by this procedure failed to detect either columbium or tantalum or their minerals. On April 13, 1955, approximately 600 pounds of the gravel were submitted by Mr. Hardwick for more comprehensive metallurgical testing to ascertain if the simplified procedure had been in error. The material was obtained from a pit in the deposit which reportedly had shown a high columbium-tantalum content. Concentrates and reject products recovered by washing, screening, desliming, classification and tabling were analyzed for the rare metals but they also proved negative.

Description of the Samples

The twelve original samples, numbers 13151 to 13162, inclusive, varied in weight between 32 and 85 pounds, and consisted principally of quartz and feldspar gravel loosely consolidated with substantial quantities of clay and caliche. When soaked in water for a short time and agitated slowly, the caliche and clays disintegrated and liberated the gravel which ranged in size from slime to pebbles, 2-1/2 inches in diameter. The large lot of material was similar mineralogically and chemically to the smaller samples and was obtained from the same prospect pit as sample 13159.

Procedure and Results

A simple washing, screening, desliming and tabling treatment was applied to the original twelve samples in order to recover a heavy mineral product in which the columbium and tantalum minerals would be concentrated if they were present. The procedure consisted of first soaking each individual sample in water and then mildly attritioning the pulp by moving it about with the aid of a hoe in order to slake

the clays and disintegrate the loosely consolidated gravel. The pulp was then screened at 10 mesh and the screen oversize was washed with water to remove any adhering slimes and fines. The screen undersize product was deslimed at about 100 mesh in order to obtain a 100 to 10-mesh feed for tabling; slimes and the screen oversize gravel were combined and rejected. No attempt was made to produce high-grade heavy mineral concentrates by tabling as a maximum recovery of the heavy minerals was the primary objective. A concentrate, middling and tabling product first was recovered in each test. The middling fraction then was examined for heavy minerals and if some were present it was combined with the concentrates, otherwise it was rejected to the tailing. The table concentrates were individually analyzed for combined columbium and tantalum oxides while the screen oversize, table rejects and slimes were weighed and discarded. Results of the washing, screening and tabling tests on the twelve samples are summarized in Table 1.

Table 1. Results of Washing, Screening and Tabling Tests on Twelve Original Samples of Placer Gravel

Sample No.	Sample Weight, lb.	Table Concentrate		
		Weight lb.	Weight, percent	Assay, percent (Cb_2O_5 - Ta_2O_5)
13151	62.25	0.533	0.86	Nil
13152	35.50	0.962	2.71	"
13153	51.50	2.485	4.83	"
13154	39.25	1.990	5.07	"
13155	57.00	1.616	2.84	"
13156	32.00	1.153	3.60	"
13157	32.25	0.935	2.90	"
13158	37.50	1.287	3.43	"
13159	83.50	4.458	5.34	"
13160	34.25	1.107	3.23	"
13161	49.50	2.180	4.40	"
13162	35.50	2.092	5.89	"

The concentrates recovered in the tabling runs consisted principally of magnetite, ilmenite, hematite and sphene with minor quantities of garnet, zircon and other accessory minerals. Qualitative spectroscopic analyses of the concentrates as well as on chemical precipitates from the concentrates failed to detect any tantalum or columbium. In addition, the concentrates were examined under the microscope for tantalum or columbium but none was found.

A more thorough metallurgical investigation was made on the 600-pound sample to ascertain if the simplified procedure had been in error. The gravel first was attritioned, screened on 10-mesh and washed according to the same procedure used for the smaller samples after which the minus 10-mesh pulp was hydraulically classified into 3 spigot products and a minus 200-mesh slime overflow. Each of the spigot products was tabled separately to obtain a concentrate, middling and tailing. The table middling then was retabled to recover an additional small quantity of free and interlocked heavy mineral which was combined with the concentrate. The retabled reject was set aside as a true middling. The table concentrates, middlings and tailings recovered from the different spigot products were ultimately combined for weighing and assaying. Chemical analyses also were made on the classifier overflow slimes and the 10-mesh screen oversize. Results of washing, screening, classification and tabling tests on this sample are summarized in Table 2. The chemical analyses of the feed and different products failed to detect more than a trace of combined tantalum and columbium oxides. Microscopic examination of the gravel and table products for columbium and tantalum content as well as qualitative spectroscopic analyses of the products and chemical precipitates derived from the table concentrates also proved unfruitful.

Table 2. Results of Classification and Tabling Tests on 600-pound Sample of Good Earth Placer Gravel.

Product	Weight, Percent	Assay, Percent (Cb_2O_5 - Ta_2O_5)
plus 10-mesh gravel reject	35.3	<0.01
minus 10 plus 200-mesh table concentrate	3.8	<0.05
minus 10 plus 200-mesh table middling	1.1	<0.05
minus 10 plus 200-mesh table tailing	30.2	<0.01
Composite table feed	35.1	—
minus 200-mesh slime	29.6	<0.02
Composite head	100.0	<0.02
Determined head		<0.01

Conclusions

Gravity concentration tests and complementary chemical analyses on twelve small prospect samples and a 600-pound pit sample from the Good Earth placer deposit have failed to establish the presence of either columbium or tantalum. Traces of the two elements were detected in the large sample but the quantity found was insignificant.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

RECEIVED
JUN 20 1955 DMEA
Date Rec'd
JUN 10 1955
BUREAU OF MINES
Denver, Colorado

June 10, 1955

TRANSMITTED
JUN 14 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3586 (Columbium, tantalum, thorium, uranium, rare earths), Maricopa Minerals, Inc., Good Earth Placer claims, Maricopa County, Arizona

Enclosed are the original and 8 copies of a geologic report by Leonid Bryner, U. S. Geological Survey, covering his examination of the Good Earth Placer claims.

The concentrates from 12 samples of representative material processed and analyzed in the U. S. Bureau of Mines laboratories are reported to contain no columbium or tantalum. Concentrates from a 600-pound check sample similarly processed and analyzed are reported to contain less than 0.05 percent combined columbium and tantalum. The applicant's samples contained less than 0.02 percent U_3O_8 and he presented no evidence of the presence of thorium or rare earth in the deposits.

I concur in Bryner's recommendation that the application for exploration assistance be denied.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (9)

ENHarshman:arh

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(date)

GEOLOGICAL SURVEY
DENVER, COLORADO

Box 4126 University Station
Tucson, Arizona

June 6, 1955

TRANSMITTED
JUN 14 1955

[redacted]

To: Mr. E. H. Kerschman

From: J. H. Faick

Subject: [redacted] Docket 3586 (Columbite-Tantalum)
[redacted] Earth Pleasant, Maricopa Minerals Company;
Maricopa County, Arizona.

Enclosed are the original and 8 copies of a geological report by Leonid Bryner on the field examination of the above property. Columbium and tantalum were not found in the placer deposits; therefore, it is recommended that the application be denied. That report has my approval.

One copy of the brochure is enclosed.

John H. Faick

John H. Faick

JHF:ms

cc: Kerschman - 8
Thorson

Reviewed by
DMEA OFFICER TITLE
6-24-55
(date)

MINERAL DEPOSITS
DMEA
RECEIVED
JUN 9 1955
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

U. S. DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
JUN 20 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REGION III

GEOLOGY

EXAMINATION REPORT

DMEA 3586

MARICOPA MINERALS, INC.
GOOD EARTH PLACER CLAIMS
MARICOPA COUNTY, ARIZONA

(Columbium-Tantalum)

By
Leonid Bryner
Geologist
U. S. Geological Survey

June 6, 1955

DMEA
6-24-55

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
FIELD TEAM III

EXAMINATION REPORT

DMEA 3586
MARICOPA MINERALS, INC.
GOOD EARTH PLACER CLAIMS
MARICOPA COUNTY, ARIZONA
(Columbium-Tantalum)

CONTENTS

	Page
INTRODUCTION	1
LOCATION AND ACCESSIBILITY	2
GEOLOGY	2
GRADE	3
CONCLUSIONS AND RECOMMENDATIONS	4

ILLUSTRATIONS

Fig. 1	Location Map	See Engineering Report
Fig. 2	Map of the project area	Following page 2
Fig. 3	Assay Map	See Engineering Report

INTRODUCTION

In an application to the Defense Minerals Exploration Administration, dated November 16, 1954, Sewell Thomas, consulting engineer and official representative for the Maricopa Minerals Company, requested government participation in a program estimated to cost $33,300, to explore for Columbium, Tantalum, Uranium, Thorium and Rare Earths at the Good Earth Placers, Maricopa County, Arizona.

The property was examined on February 14 and 15, 1955, by Leonid Bryner of the U. S. Geological Survey and W. R. Hardwick of the U. S. Bureau of Mines. The examiners were assisted by Sewell Thomas and John L. Holt. Holt and his wife, Viola W. Holt, are the owners of the property. They have leased the ground to Maricopa Minerals Company.

The examination consisted mainly of taking 12 check samples from numerous test pits, as the main question to be decided was the grade of the gravels. None of these samples contained columbium or tantalum. The deposit is practically devoid of these metals and therefore denial of the application is recommended.

The geology of the area is described by H. M. Babcock and K. K. Kendall in "Geology and ground-water resources of the Gila Bend Basin, Maricopa County, Arizona", and by H. N. Wolcott in "Memorandum on Ground-Water Resources and Geology of Rainbow Valley - Waterman Wash Area, Maricopa County, Arizona." These both are open file reports of the Geological Survey, dated respectively February 18, 1948 and February, 1953.

LOCATION AND ACCESSIBILITY

The property consists of sections 14, 15, 21, 22, and 23, T. 2 S., R. 4 W., Maricopa County, Arizona (fig. 2). It is on the north side of Rainbow Valley, which drains southwest to the Gila River.

The area is reached by driving south from Buckeye on the new highway about 7 miles, and then west about 3 miles along the road that follows the El Paso Natural Gas Company pipeline.

GEOLOGY

The Buckeye Hills, trending approximately west and situated immediately north of the property are the bedrock from which the gravels of the Good Earth Placers were eroded. The Hills are composed mainly of granite which Babcock and Kendall classify as "Mesozoic (?)". This granite, in the part of the hills overlooking the property, contains literally dozens of pegmatite dikes which dip moderately to the north, so that the north flank of the hills present the dikes on a dip slope, while the south flank of the hills present the dikes in cross section. From the south the hills show a striking, horizontal banding due to these dikes.

Some of the dikes on lode claim "Rare Earth 15" (fig. 2) were examined. They consist mainly of orthoclase and quartz. They also contain minor amounts of biotite, magnetite and garnet. Epidote is a comparatively rare constituent. A few crystals of euxenite or samarskite 1/8 to 3/4 of an inch in diameter were seen in one place. These crystals were imbedded in coarsely crystalline, pink orthoclase.

The gravels form an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash which drains in a southwesterly direction and is situated one to

two miles from the hills (fig. 2). The drainage between the hills and Rainbow Wash is south to southeasterly as shown in fig. 2. This drainage is not integrated but consists of numerous independent more or less parallel washes. The gravels laid down by these washes are poorly sorted to unsorted and consist of angular to sub-angular fragments generally less than 6 inches in diameter. Much of the gravel has a pale caliche cement. In places the gravel stands in vertical or steep cliffs as much as 15 or 20 feet above the bottoms of the washes. In the bottom of the washes and also in the low divides between them this well-cemented gravel is overlain in most places by a poorly cemented gravel having a darker shade matrix.

GRADE

There has been no production from this property, but a sampling program was undertaken by the applicant in the summer of 1954. This work consisted of digging 46 trenches 6 to 9½ feet deep from which gravel samples weighing 500 to 2000 pounds were taken. Figure 2 shows the location of trenches dug for location purposes. Trenches not shown in figure 2 are those in the shaded area of figure 2, where the testing was done approximately on a 200-foot grid pattern. According to the applicant the sampling showed from 12 to 30 pounds of heavy mineral per cubic yard. His assays of the heavy mineral showed 0.12 to 3.07 percent combined columbium and tantalum.

Twelve check samples (U. S. B. M. Nos. 13151 to 13162) weighing 32 to 85 pounds were taken by the examiners. The location of Nos. 13156 and 13157 is shown in figure 2 and the location of the others is in the shaded area in figure 2, shown in detail in figure 3. The proportion of heavy mineral weight to sample weight checked quite well

with this proportion in the applicant's sample. Assays of the heavy concentrates from these twelve samples, however, indicated in every case that their combined Cb_2O_5 - Ta_2O_5 content was nil. In order to be sure of this fact the examiners returned to the property on April 12 and obtained a 600 pound sample from Pit No. 2 where the applicant had reported an assay of 2.53 percent Cb_2O_5 - Ta_2O_5 from 40 pounds 13.5 ounces of heavy mineral obtained from a 1,420 pound sample. U. S. Bureau of Mines table concentrates and middlings from the 600-pound sample weighed 29.4 pounds and assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. The concentrates alone weighed 22.8 pounds and also assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. All the other material in the 600 pound sample, that is, rejects, and slime, assayed less than 0.02 percent. Most of the applicant's samples were assayed by the Chas. O. Parker Co. of Denver. Uranium assays of the concentrates submitted by the applicant ranged from nil to 0.017 percent, and no evidence was offered of the presence of thorium and rare earths, mentioned together with uranium in the application. In view of the applicant's lack of evidence for uranium, thorium, and rare earths in this deposit, the examiners did not investigate further for these minerals.

CONCLUSIONS AND RECOMMENDATIONS

The Good Earth Placers were found to contain less than trace amounts of Columbium and Tantalum. Though the ground tested by the applicant and the examiners included only a near-surface portion of the gravels, values are not likely to be much, if any, better at depth as these gravels are not of the type favorable to concentrations of heavy minerals. It is recommended, therefore, that government participation in this project be denied.

TRANSMITTED

JUN 14 1955

DMEA
Date Rec'd, RECEIVED
JUN 10 1955 JUN 20 1955
BUREAU OF MINES
Denver, Colorado

June 8, 1955

Memorandum

To: W. N. Trever, Executive Officer, DMEA Field Team, Region III

From: Superintendent, Southwest Experiment Station, Tucson, Arizona

Subject: Field Examination Report, Docket DMEA-3588, Maricopa Minerals Co.'s Good Earth Columbium-Tantalum Placers, Maricopa County, Arizona

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by W. H. Hardwick of the Bureau of Mines and Leonid Bryner of the Geological Survey, and the section on Engineering by Hardwick for the above report. A section on Geology will be submitted by the Geological Survey.

On their first visit to the property, Hardwick and Bryner took 12 large samples to check the results of the applicant's samples. These 12 samples were large so were quartered in the field, then run over a table to obtain a concentrate of black sands. The concentrate then was assayed in the laboratory of the Southwest Experiment Station in Tucson. As no columbium or tantalum was found in the first assays, the samples were analyzed again and also checked with a spectroscope. Some of the samples also were sent to the Intermountain Experiment Station at Salt Lake City for a check. No columbium or tantalum was found.

In order to check these samples, the DMEA examining team returned to the placer deposit and took a 600-pound sample from one of the pits where the applicant had obtained a good columbium-tantalum assay. This large sample was carefully concentrated and the concentrate assayed, but only a trace of columbium-tantalum was found.

Because they could find no appreciable amounts of columbium or tantalum in the placer deposit, the DMEA examiners recommended that Government exploration assistance be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

cc - Trever (orig. & 8)
J. H. Polak
DMEA-DEBC
RF
WRStorms/ts

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

RECEIVED
JUN 20 1955

REPORT OF EXAMINATION BY FIELD TEAM
REGION XIX

DMEA-3586, Maricopa Minerals Co.

Good Earth Columbium-Tantalum Placers

Maricopa County, Arizona

William R. Hardwick, Mining Engineer
U. S. Bureau of Mines

Leonid Bryner, Geologist
U. S. Geological Survey

June 1955

TRANSMITTED
JUN 14 1955
RECEIVED
JUN 20 1955

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By William R. Hardwick [1] and Leonid Bryner [2]

Sewell Thomas, a consulting mining engineer acting for Maricopa Minerals Co., an Oklahoma corporation, presented an application to the Defense Minerals Exploration Administration for Government assistance to explore the Good Earth placer claims in Maricopa County, Arizona, for columbium and tantalum. The application requested assistance in the amount of 75 per cent of the costs of a proposed drilling program estimated to cost $33,000.00. This application, presented under the provisions of the Defense Production Act of 1950, as amended, was docketed DMEA--3586 (Columbium) and was referred to the field for an examination and report.

The Good Earth placer claims are situated in T. 2 S., R. 4 W., Maricopa County, Ariz. The gravels form an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash. This wash drains in a southwesterly direction and is situated one to two miles from the Hills. These gravels are unsorted to poorly sorted, and consist of angular to sub-angular fragments generally less than six inches in diameter in a caliche cement.

The Good Earth placer claims were visited and examined on February 14 and 15, 1955 by William R. Hardwick and Leonid

---

1/ Mining engineer, U. S. Bureau of Mines.

2/ Geologist, U. S. Geological Survey

Brymer. The BMEA examining team was assisted by Sewell Thomas and John L. Smit, the locator of the claims. The examining team cut 12 samples to check the results reported by the applicant. The metallurgical section of the U.S. Bureau of Mines at Tucson reported no columbium or tantalum in these check samples. The claims again were visited on April 12, 1955 and a large 600-pound sample was taken at the test pit where one of the highest grade samples reported by Thomas was taken. This sample was assayed, but no significant amount of columbium or tantalum was found.

There has been no production from this deposit, and as the assays show no columbium or tantalum, there are no ore reserves. It is the conclusion of the examining team that the sample values reported by the applicant do not represent the true value of the ground sampled and that a significant amount of columbium and tantalum will not be discovered by the project.

It is recommended that the application (BMEA-3586) of Maricopa Minerals Co. to explore the Good Earth placer claims for columbium and tantalum be denied.

RECEIVED
JUN 2 0 1955

[illegible], MARICOPA MINERALS CO.
GOLD MINE [illegible]
MARICOPA COUNTY, ARIZONA

Engineering Report

By William H. [illegible], Mining Engineer
U. S. Bureau of Mines

June [illegible]

BMSA-3586, MARICOPA MINERALS CO.
GOOD EARTH COLUMBIUM-TANTALUM PLACERS
MARICOPA COUNTY, ARIZONA

CONTENTS

Page

Engineering report

Introduction ——— 1
Acknowledgments ——— 2
Location, topography and climate ——— 2
History and production ——— 3
Ownership and extent ——— 4
Description of the deposits ——— 4
Ore reserves ——— 6
Present status ——— 7
Proposed exploration ——— 9
Estimated costs ——— 9
Proposed financing ——— 12
Conclusions ——— 12
Recommendations ——— 13
Appendix ——— 14

ILLUSTRATIONS

Figure — Following page

1 Location map ——— 1
2 Claim map and location of proposed drill holes (with Geological Section) ——— 1
3 Map of test pits and assays ——— 6

INTRODUCTION

The Maricopa Minerals Co., an Oklahoma corporation, applied for Government assistance to explore the Good Earth placer claims, Maricopa County, Ariz., for columbium and tantalum (figure 1). The application (DMEA-1586) was received by the Defense Minerals Exploration Administration Field Team, Region III, Denver, Colo., on November 17, 1954, and was forwarded to the Southwest Experiment Station, Tucson, Ariz., on November 29, 1954 for a field examination. The applicant proposed to explore alluvial gravels for columbium and tantalum by churn-drill sample holes. The total estimated cost of the project was $33,000.00.

The Good Earth claims were examined on February 14 and 15, 1955 by Leonid Reymer, geologist, U. S. Geological Survey, and William M. Hardwick, mining engineer, U. S. Bureau of Mines. The examining team was assisted by Sewall Thomas, Consulting Engineer for the applicant, and John L. Holt, owner and original locator of the claims.

Based on a review of the sampling procedure used by Sewall Thomas and the assay results reported by Charles O. Parker & Co., Denver, Colo., an exploration project appeared feasible. However, after the field examination, some changes in the initial application seemed desirable in the sampling plan. These changes were discussed with Sewall Thomas at a conference in Buckeye, Ariz. on February 16, 1955. Mr. Thomas concurred fully with these changes and requested in a letter dated February 24, 1955, that these changes be incorporated in the proposed project.

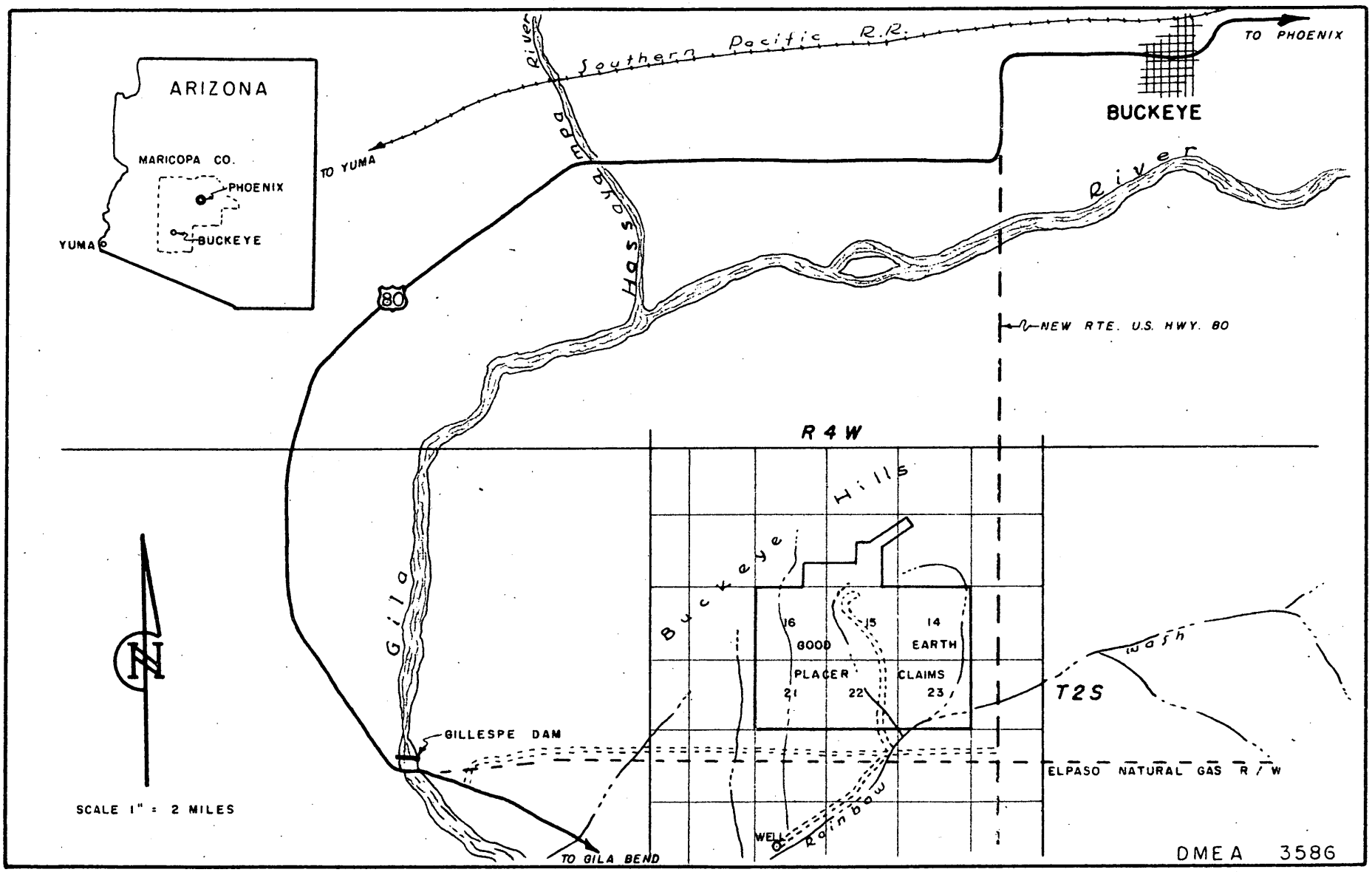


FIGURE - 1 - LOCATION MAP - GOOD EARTH PLACERS
MARICOPA COUNTY. ARIZ.

During the field examination, 12 samples were taken at favorable places on the property. The metallurgical section of the Southwest Experiment Station, U. S. Bureau of Mines, Tucson, Ariz., was unable to detect any columbium or tantalum in these samples, so on April 12, 1955, the Good Earth placer claims again were visited by the examining team. A 600-pound sample was taken at the most favorable location that had been reported by Sewell Thomas. This sample also showed no significant amounts of columbium or tantalum.

ACKNOWLEDGMENTS

Acknowledgment is due the efforts of Sewell Thomas, Consulting Mining Engineer, in showing the examining team over the property, and to John R. Malt, owner of the Good Earth placer claims, who supplied information and assistance during the field examination.

LOCATION, TOPOGRAPHY AND CLIMATE

The Good Earth placer claims are situated in Secs. 14, 15, 16, 21, 22 and 23, T. 2 S., R. 4 W., Maricopa County, Ariz. The claims are on the south side of the Buckeye Hills and on the north edge of Rainbow Valley. They may be reached by driving south from the town of Buckeye, Ariz. along the new route of U. S. Highway 80 (now under construction) for a distance of 12 miles to the point where El Paso Natural Gas Co.'s pipe line crosses the highway. Turn west along the pipe line right-of-way and travel 1.5 miles to the center of the southern part of the group of claims.

The Rare Earth lode claims are located along the south side of a rugged ridge. The Good Earth placer claims are located

on the alluvial fans formed by small arroyos that flow south into Rainbow Wash. The ground slopes southward at the rate of from 100 to 200 feet per mile and is cut by washes and low alluvial ridges. The difference in elevation from top of ridge to bottom of wash may be as much as 30 feet in some places, but probably averages about 20 feet. The elevation above sea level is 900 feet at the south end of the claim group and 1,100 to 1,200 feet at the north end.

The vegetation is typical of the southwestern desert. The ridges are sparsely covered with brush and cacti, while palo verde and mesquite grow along the washes. The rainfall may vary from 5 to 10 inches per year, and probably averages about 7 inches, most of which comes in July and August as torrential thunder storms.

The climate is mild in the winter and hot in the summer. Temperatures as high as 130° F. are not unusual in the summertime.

The Southern Pacific railway has a station at Buckeye, a distance of 12 miles from the claims. The main pipe line of El Paso Natural Gas Co. crosses the southern edge of the claims, and the new route of U. S. Highway 80 will cross the eastern edge. Electric power is available from a transmission line in the center of Rainbow Valley, approximately 4 miles from the center of the group. Water can be developed on the southern claims.

HISTORY AND PRODUCTION

There has been no production from the Good Earth placer claims. Small lots of high-grade "heavy minerals" have been mined from the pegmatite dikes on the Rare Earth lode claims. No sale

of this specimen material for its mineral content has been reported.

OWNERSHIP AND EXTENT

The Rare Earth lode claims 1 to 5, and the Gold Earth placer claims 1 to 12 were located by John L. and Viola M. Holt. These claims now are held by the Marionga Minerals Co. under a "lease and option to purchase" agreement. This option provides for a purchase price of $100,000.00. The lease provides for payment of a minimum sum of $400.00 per month, or royalty on production at the rate of 5 per cent, whichever is the larger sum. All payments are to be applied to reduce the purchase price.

Since the execution of the lease and option with the Holts, the Marionga Minerals Co. has located additional placer claims surrounding the initial group.

DESCRIPTION OF THE DEPOSIT

The general geology of the deposit is described in a separate report by Leonid Beyer, consulting geologist.

The Gold Earth placer gravels are deposited along the south side of the Rushoya Hills. The valuable minerals, columbium and tantalum, are reported to come from a system of pegmatite dikes that have been partly eroded. The gravels vary in depth from zero at the south edge of the Rushoya Hills to an undetermined depth at the south edge of secs. 31,32 and 33, some 2 miles from the edge of the hills. A well has been drilled to a depth of 300 feet in sec. 32, just south of the claims. This well did not penetrate bedrock.

Sewell Thomas estimated in the initial application that

the average depth to bedrock would be 15 feet. He also assumed that the gravels were underlain by a relatively smooth pediment. However, it has been the experience of the examining engineer that in this desert country where shallow gravels are underlain by a pediment, numerous outcrops occur. Where no outcrops occur, the bedrock usually drops rapidly away from the hills. At a distance of a mile from the hills, the depth to bedrock may be from 300 to 500 feet. This feature was pointed out during the examination and herein therefore has modified the proposed program to incorporate the possibility of deep gravel at the starting location.

The gravels represent a series of coalescing alluvial fans that were formed by washes draining southward from Dunlap Hills to Antelope Wash. In the vicinity of the shaded area shown on figure 2, the gravel consists of rounded to sub-angular boulders and fine sand. The size of the boulders increases toward the edge of the hills, and they become more plentiful.

The gravels were estimated to consist of from one-fourth to one-third quartz and feldspar fragments. The remainder was weathered dark-colored granite. Except for the loose material in the recent wash beds, the gravels were cemented with caliche.

In two samples taken, most of them in or near the shaded area of figure 2, all of the sandy material was less than 10 mesh in size. Large pieces (one inch in diameter) were reported to have been found at the edge of the hills by John L. Smith. None were observed by the examining team.

ORE RESERVES

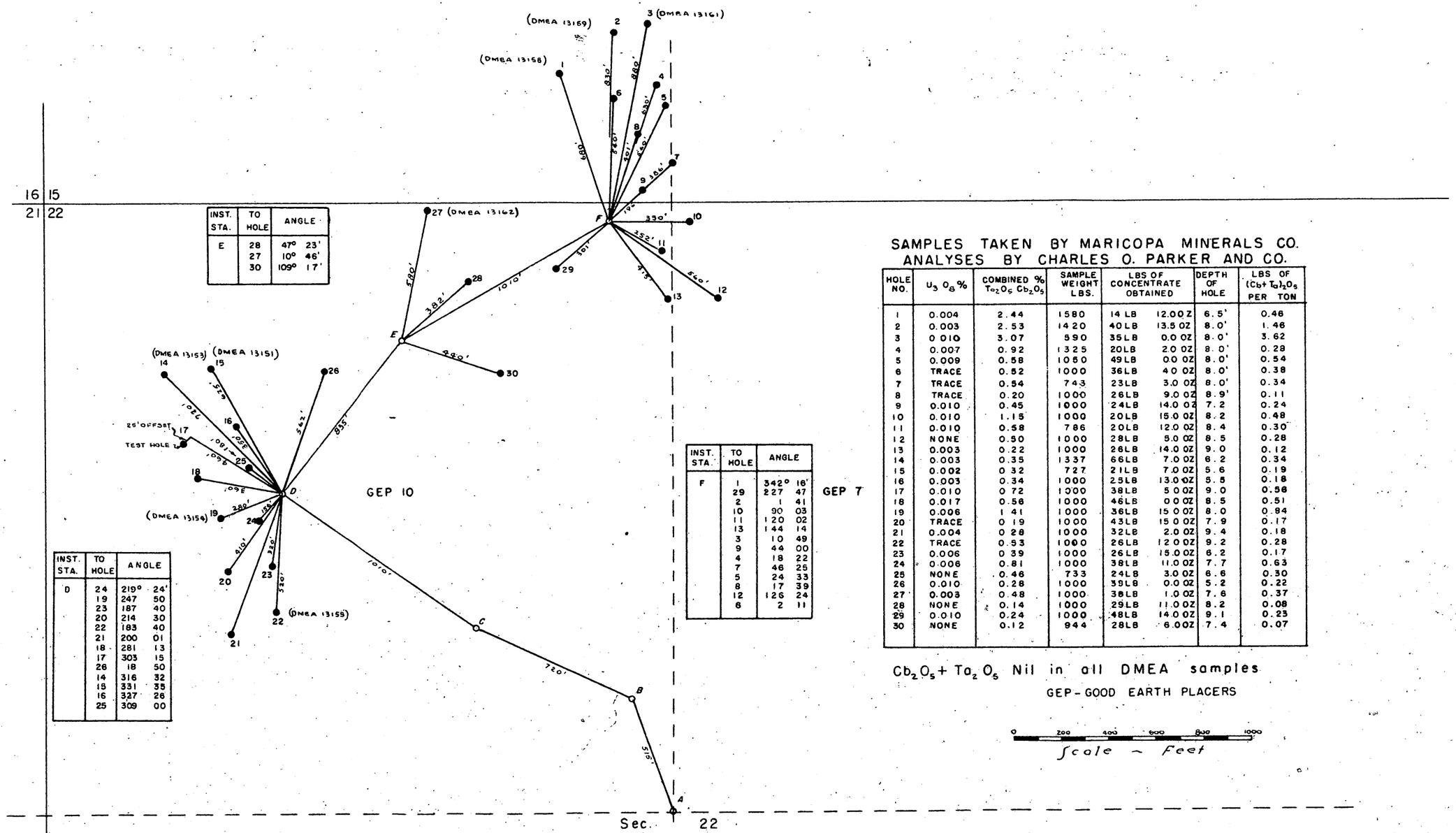
With a hoe-type power shovel, 30 test holes were dug to a depth of from 6 to 8 feet by Maricopa Minerals Co. A sample was cut from each hole with the bucket of the shovel. These samples ranged in size from 500 to 2,000 pounds. They were trucked to water, screened wet, and processed in a mechanical pan which made a concentrate that ranged in size from 14 pounds 10 ounces to 49 pounds. This concentrate was assayed for columbium and tantalum by Charles O. Parker & Co., Denver, Colo. The results of the Parker assays ranged from 0.12 to 1.07 percent combined columbium-tantalum pentoxide. Based on the assay results of Parker, Sewell Thomas has inferred 625,000 cubic yards of gravel that contains 0.052[1/] percent combined columbium-tantalum pentoxide, or approximately one pound per ton.

Twelve samples were taken by the DMEA examining team during the field examination and later a 600 pound sample was taken from the most favorable location. None of these samples contained more than a trace of columbium-tantalum pentoxide. Therefore, no ore is inferred by the examining team.

The 30 samples taken by the applicant are shown on figures 2 and 3. The locations of the 12 samples taken at the time of the DMEA field examination also are shown on figures 2 and 3. The results of the applicant and the DMEA examining team are compared in Table I.

When all 12 of the check samples failed to show any

1/ Due to a typographical error this figure was reported as 0.53 percent by Sewell Thomas in the statement attached to the original application.



INST. STA.	TO HOLE	ANGLE
E	28	47° 23'
	27	10° 46'
	30	109° 17'

INST. STA.	TO HOLE	ANGLE
D	24	219° 24'
	19	247 50
	23	187 40
	20	214 30
	22	183 40
	21	200 01
	18	281 13
	17	303 15
	26	18 50
	14	316 32
	15	331 35
	16	327 26
	25	309 00

INST. STA.	TO HOLE	ANGLE
F	1	342° 16'
	29	227 47
	2	1 41
	10	90 03
	11	120 02
	13	144 14
	3	10 49
	9	44 00
	4	18 22
	7	46 25
	5	24 33
	8	17 39
	12	126 24
	6	2 11

SAMPLES TAKEN BY MARICOPA MINERALS CO.
ANALYSES BY CHARLES O. PARKER AND CO.

HOLE NO.	U_3O_8 %	COMBINED % Ta_2O_5 Cb_2O_5	SAMPLE WEIGHT LBS.	LBS OF CONCENTRATE OBTAINED		DEPTH OF HOLE	LBS OF $(Cb+Ta)_2O_5$ PER TON
1	0.004	2.44	1580	14 LB	12.00 Z	6.5'	0.46
2	0.003	2.53	1420	40 LB	13.5 OZ	8.0'	1.46
3	0 010	3.07	590	35 LB	0.0 OZ	8.0'	3.62
4	0.007	0.92	1325	20 LB	2.0 OZ	8.0'	0.28
5	0.009	0.58	1050	49 LB	0.0 OZ	8.0'	0.54
6	TRACE	0.52	1000	36 LB	4 0 OZ	8.0'	0.38
7	TRACE	0.54	743	23 LB	3.0 OZ	8.0'	0.34
8	TRACE	0.20	1000	26 LB	9.0 OZ	8.9'	0.11
9	0.010	0.45	1000	24 LB	14.0 OZ	7.2	0.24
10	0.010	1.15	1000	20 LB	15.0 OZ	8.2	0.48
11	0.010	0.58	786	20 LB	12.0 OZ	8.4	0.30
12	NONE	0.50	1000	28 LB	5.0 OZ	8.5	0.28
13	0.003	0.22	1000	26 LB	14.0 OZ	9.0	0.12
14	0.003	0.35	1337	66 LB	7.0 OZ	6.2	0.34
15	0.002	0 32	727	21 LB	7.0 OZ	5.6	0.19
16	0.003	0.34	1000	25 LB	13.0 OZ	5.5	0.18
17	0.010	0 72	1000	38 LB	5 0 OZ	9.0	0.56
18	0.017	0.56	1000	46 LB	0 0 OZ	8.5	0.51
19	0.006	1 41	1000	36 LB	15 0 OZ	8.0	0.84
20	TRACE	0 19	1000	43 LB	15 0 OZ	7.9	0.17
21	0.004	0 28	1000	32 LB	2.0 OZ	9.4	0.18
22	TRACE	0.53	1000	26 LB	12 0 OZ	9.2	0.28
23	0.006	0 39	1000	26 LB	15.0 OZ	6.2	0.17
24	0.006	0.81	1000	38 LB	11.0 OZ	7.7	0.63
25	NONE	0.46	733	24 LB	3.0 OZ	6.6	0.30
26	0.010	0.28	1000	39 LB	0.0 OZ	5.2	0.22
27	0.003	0.48	1000	38 LB	1.0 OZ	7.6	0.37
28	NONE	0.14	1000	29 LB	11.0 OZ	8.2	0.08
29	0.010	0.24	1000	48 LB	14.0 OZ	9.1	0.23
30	NONE	0.12	944	28 LB	6.0 OZ	7.4	0.07

$Cb_2O_5 + Ta_2O_5$ Nil in all DMEA samples

GEP - GOOD EARTH PLACERS

FIGURE 3
MARICOPA MINERALS INC.
MAP OF SAMPLE PITS & ASSAYS OF CONCENTRATE
WORK DONE JULY 1954
DMEA 3586

columbium, the analyses were repeated in Tucson, and portions of the pulps also were sent to the Bureau's Salt Lake City laboratory to be checked by the metallurgical section at that station. These checks confirmed the original analyses.

The sampling procedure followed by the applicant had been duplicated as nearly as practical by the BMEA examining team. The 12 samples were cut by hand from the sides of the same pits, and therefore were smaller than the samples which were cut by the applicant with a power shovel.

In order to check the sampling procedure, the examining team returned to the Good Earth placer claims on April 12, 1955 and cut a 600-pound sample from pit No. 2. One of the applicant's highest grade samples came from this location. The results of this sample showed only a trace of columbium and tantalum. The results of the metallurgical work on this project are covered in the attached report, RI-379-1, "Concentration of Placer Gravel from the Good Earth Claims, Maricopa County", by F. N. Bender and N. R. Crume.

PRESENT STATUS

During the summer of 1954, after control of the property was acquired by Maricopa Mineral[illegible]als Co., 30 test holes were dug with a back-hoe. The location of these holes is shown by the shaded area on figure 2 and in more detail on figure 3. Other than location pits and the test pits mentioned above, no work has been done on the Good Earth placer claims.

Table 1. Comparison of Applicant's Samples and Samples by DMEA Examining Team.

Samples by Sewell Thomas. Analyses by Charles O. Parker & Co., Denver, Colo.					Samples by DMEA Examining Team. Analyses by Metallurgical Section of Bureau of Mines.			
Sample No.	Sample Weight, Pounds	Weight of Concentrate, lbs.	oz.	Percent $(Cb-Ta)_2O_5$	Sample No.	Sample Weight, Pounds*	Weight of Concentrate, Pounds	Percent $(Cb-Ta)_2O_5$
15	727	21	7.0	0.32	13151	62.25	0.533	Nil
14	1,337	66	7.0	0.35	13153	51.50	2.485	Nil
19	1,000	85	15.0	1.41	13154	39.25	1.990	Nil
22	1,000	26	12.0	0.53	13155	57.00	1.616	Nil
1	1,590	14	12.0	2.44	13158	37.50	1.287	Nil
2	1,420	40	13.5	2.53	13159	83.50	4.458	Nil
3	590	35		3.07	13161	49.50	2.180	Nil
27	1,000	38	1.0	0.48	13162	35.50	2.092	Nil
					13152	35.50	0.962	Nil
					13156	32.00	1.153	Nil
					13157	32.25	0.935	Nil
					13160	34.25	1.107	Nil

* Larger samples were taken in the field and quartered to the reported weight.

PROPOSED EXPLORATION

The initial application proposed sample holes drilled to bedrock and spaced 200 feet apart. A gridwork in four different areas was proposed. The selection of these different areas was based on the results of sampling shallow test pits.

During the field examination it was pointed out to Thomas that his estimate of the depth of bedrock might be in error, and that concentrations of heavy minerals might be more variable vertically than horizontally. Therefore, Thomas revised his original proposal and in the revision, proposed to drill two rows of sample holes across the drainage pattern. These holes would be 2,000 to 3,000 feet from each other. Based on the results of these widely spaced holes, Thomas expected to select an area that would be drilled on 200-foot squares.

EXPERIENCE CORES

The backers of Saratoga Minerals Co. are connected with oil exploration work in Oklahoma. They proposed to furnish their own drilling equipment and to do all of the proposed exploration on their own account. Donald Thomas, an experienced mining engineer, would supervise the project.

Labor and supplies are available in Buckeye, 12 miles from the claims, or in Phoenix, 40 miles distant. The wage rates proposed by the applicant are somewhat higher than those at the nearby mines, but are about the same as those paid by construction projects in the area. Power is available at the mill in sec. 33,

The applicant proposes to use this well for a water supply source.

The drilling costs proposed by the applicant are summarized below. They are based on a one-shift operation and an estimated advance of 18 feet per day.

Item	Cost per Day	Cost per Foot
Labor	$	$ 6.07
Supervision and consultants		3.67
Operating materials and supplies		1.77
Operating equipment rental		4.33
Miscellaneous		
Moving equipment in and out		1.00
Rehabilitating well and pump		0.20
Repairs and maintenance	7.50	
Assays, 1 sample per day	30.00	
Accounting	5.00	
Comp. employee liab., Ret., Soc. & payroll tax	12.50	
	$54.00	3.66
Contingencies		1.00
Grand total per foot of hole		$ 21.70

The costs proposed by the applicant seem excessive. In 1966, a series of 9-inch churn-drill sample holes were drilled some 60 miles south of the Good Earth placer claims in similar gravel. These holes were drilled under the supervision of the [illegible] consulting engineer. The depths of the holes varied between 400 and 700 feet.

The cost, including labor, supplies, sampling at 5-foot intervals, and hauling water from 2 to 7 miles (but not including depreciation on equipment and casing) was slightly less than $6.00 per foot. The rate of advance was approximately 30 feet per shift. The holes were cased.

Assuming an advance of 25 feet per day and using the wage rates, supply costs, and equipment values proposed by the applicant, the following costs are estimated. They seem reasonable.

Labor	Per Day	Per Foot
2 Drillers @ $2.50 per hour	$ 40.00	
1 Runner @ $2.75 per hour	22.00	
1 Truck driver @ $2.00 per hour	16.00	
1 Roustabout @ $1.50 per hour	12.00	
1 Supervisor	25.00	
Total labor	$115.00	$ 4.60
Comp. Employee Liab., Soc. Sec. & Payroll tax (15%)		0.69
Operating materials and supplies		1.05
Depreciation of equipment		0.50
Miscellaneous		
Moving equipment in and out		1.00
Installation of water pump		0.20
Road preparation		0.50
Equipment repairs		0.50
Contingencies		0.50
Cost of drilling hole		$ 9.24

Assaying at 10-foot intervals ————————	$4.00
Grand total, drilling and sampling ————————	$ 13.34

In comparing the two estimates, the largest single difference is in the item, "Estimated rental or depreciation". The applicant has used a rental or use-allowance figure of $85.00 per day for equipment, which it values at $25,780.00. The examining engineer (using the same values for equipment) has used a 60-month depreciation rate and 25 working days per month to arrive at a figure of $17.17 per day.

The price for a columbium-tantalum assay is $60.00 for a single sample, or $40.00 per sample in quantities of 20 or more. 2/ This is equal to a cost of $2.00 per foot of drill hole for a 20-foot sample interval, or $4.00 per foot if samples are taken for each 10 feet.

PROPOSED FINANCING

Marlboro Minerals Co. proposes to furnish 25 percent of the cost of the proposed exploration. It has requested in the application for assistance, that the Defense Minerals Exploration Administration furnish 75 percent of the costs under the provisions of the Defense Production Act of 1950, as amended.

CONCLUSIONS

Columbium and tantalum have become increasingly important

2/ Personal communication, Ledoux & Co., 359 Alfred Ave., Teaneck, N. J.

in the last five years as a constituent of certain alloys designed for use at high temperatures. As the volume of gravel on the Good Earth placer claims is large and low cost recovery methods could be used, even very low-grade material indicated by the Parker analyses might provide a substantial amount of these important products.

However, sampling by the DMEA examining team and test work by the metallurgical section of the Southwest Experiment Station, Bureau of Mines, indicate that the amount of columbium and tantalum in the gravel is not significant, and that the sampling results presented by the applicant do not represent the true columbium and tantalum content of the gravel.

RECOMMENDATIONS

It seems probable that a significant amount of columbium and tantalum will not be found by the proposed exploration. Therefore, it is recommended that the application (DMEA-1324) of Maricopa Minerals Co. for Government assistance to explore the Good Earth placer claims be denied.

OFFICIAL USE ONLY

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

DIVISION OF MINERAL TECHNOLOGY, REGION III

J. Bruce Clemmer, Chief

TMR-379-1

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS, MARICOPA COUNTY, ARIZONA

BMSA Project - 3506

By: F.N. Bender and R.R. Grace

May 9 - 1955

SOUTHWEST EXPERIMENT STATION
Carl Rampacek, Supervising Metallurgist
Tucson, Arizona

OFFICIAL USE ONLY

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS MARICOPA COUNTY, ARIZONA - BMSA Project - 1886

By: F.N. Sander and R.R. Grace

Introduction and Summary

On March 21, 1945, V.R. Murdoch, consulting mining engineer for BMSA project 1886, submitted twelve samples of placer gravel from the Good Earth Placer Claims, Maricopa County, Arizona, for gravity concentration tests to determine if they contained any recoverable columbium or tantalum. The samples were concentrated by a simple sluicing and tabling treatment outlined by Mr. Murdoch which reportedly had proved successful for recovering tantalum and columbium-enriched concentrates from the material. However, chemical analyses, qualitative spectroscopic analyses and microscopic examination of the concentrates recovered by this procedure failed to detect either columbium or tantalum or their minerals. On April 13, 1945, approximately 500 pounds of the gravel were submitted by Mr. Murdoch for more comprehensive metallurgical testing to ascertain if the simplified procedure had been in error. The material was obtained from a pit in the deposit which reportedly had shown a high columbium-tantalum content. Concentrates and reject products recovered by washing, screening, desliming, classification and tabling were analyzed for the rare metals but they also proved negative.

Description of the Samples

The twelve original samples, numbers 13141 to 13152, inclusive, varied in weight between 22 and 61 pounds, and consisted principally of quartz and feldspar gravel loosely consolidated with substantial quantities of clay and caliche. When soaked in water for a short time and agitated slowly, the caliche and clays disintegrated and liberated the gravel which ranged in size from slime to pebbles, 2-1/2 inches in diameter. The large lot of material was similar mineralogically and chemically to the smaller samples and was obtained from the same prospect pit as sample 13139.

Procedure and Results

A simple washing, screening, desliming and tabling treatment was applied to the original twelve samples in order to recover a heavy mineral product in which the columbium and tantalum minerals would be concentrated if they were present. The procedure consisted of first soaking each individual sample in water and then mildly scrubbing the pulp by moving it about with the aid of a hoe in order to slake

the clays and disintegrate the loosely consolidated gravel. The pulp was then screened at 16 mesh and the screen oversize was washed with water to remove any adhering slimes and fines. The screen undersize product was declimed at about 100 mesh in order to obtain a 100 to 16-mesh feed for tabling; slimes and the screen oversize gravel were combined and rejected. No attempt was made to produce high-grade heavy mineral concentrates by tabling as a maximum recovery of the heavy minerals was the primary objective. A concentrate, middling and tailing product first was recovered in each test. The middling fraction then was examined for heavy minerals and if some were present it was combined with the concentrates, otherwise it was rejected to the tailing. The table concentrates were individually analyzed for contained columbium and tantalum oxides while the screen oversize, table rejects and slimes were weighed and discarded. Results of the washing, screening and tabling tests on the twelve samples are summarized in Table 1.

Table 1. Results of Washing, Screening and Tabling Tests on Twelve Original Samples of Placer Gravel

Sample No.	Sample Weight, lb.	Table Concentrate Weight, lb.	Table Concentrate Weight, percent	Table Concentrate Assay, percent (Cb$_2$O$_5$ + Ta$_2$O$_5$)
1R51	42.25	0.525	0.86	Nil
1R52	35.50	0.965	1.71	"
1R53	51.50	2.485	4.83	"
1R54	38.25	1.990	5.07	"
1R55	57.00	1.615	2.84	"
1R56	32.00	1.153	3.60	"
1R57	35.25	0.935	2.90	"
1R58	37.50	1.287	3.43	"
1R59	53.00	4.488	8.34	"
1R60	34.25	1.187	3.33	"
1R61	40.50	1.186	4.40	"
1R62	25.50	2.002	5.00	"

The concentrates recovered in the tabling runs consisted principally of magnetite, ilmenite, hematite and sphene with minor quantities of garnet, zircon and other accessory minerals. Qualitative spectroscopic analyses of the concentrates as well as on chemical precipitates from the concentrates failed to detect any tantalum or columbium. In addition, the concentrates were examined under the microscope for tantalum or columbium but none was found.

A more thorough metallurgical investigation was made on the 600-pound sample to ascertain if the simplified procedure had been in error. The gravel first was scrutinized, screened on 10-mesh and washed according to the same procedure used for the smaller samples after which the minus 10-mesh pulp was hydraulically classified into 3 spigot products and a minus 200-mesh slime overflow. Each of the spigot products was tabled separately to obtain a concentrate, middling and tailing. The table middling then was remilled to recover an additional small quantity of free and interlocked heavy mineral which was combined with the concentrate. The remilled reject was set aside as a true middling. The table concentrates, middlings and tailings recovered from the different spigot products were ultimately combined for weighing and assaying. Chemical analyses also were made on the classifier overflow slimes and the 10-mesh screen oversize. Results of washing, screening, classification and tabling tests on this sample are summarized in Table 2. The chemical analyses of the feed and different products failed to detect more than a trace of combined tantalum and columbium oxides. Microscopic examination of the gravel and table products for columbium and tantalum content as well as qualitative spectroscopic analyses of the products and chemical precipitates derived from the table concentrates also proved unfruitful.

Table 2. Results of Classification and Tabling Tests on 600-pound Sample of Good Earth Placer Gravel.

Product	Weight, Percent	Assay, Percent (Grade - Tenor)
plus 10-mesh gravel reject	35.3	<0.01
minus 10 plus 200-mesh table concentrate	3.8	<0.06
minus 10 plus 200-mesh table middling	1.1	<0.02
minus 10 plus 200-mesh table tailing	35.3	<0.01
Composite table feed	35.1	—
minus 200-mesh slime	22.4	<0.02
Composite head	100.0	<0.02
Determined head		<0.01

Conclusions

Gravity concentration tests and complementary chemical analyses on twelve small prospect samples and a 600-pound pit sample from the Good Earth placer deposit have failed to establish the presence of either columbium or tantalum. Traces of the two elements were detected in the large sample but the quantity found was insignificant.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RECEIVED JUN 10 1955

DMEA Date Rec'd JUN 10 1955

Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

BUREAU OF MINES
Denver, Colorado

June 10, 1955

TRANSMITTED
JUN 14 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3596 (Columbium, tantalum, thorium, uranium, rare earths), Maricopa Minerals, Inc., Good Earth Placer claims, Maricopa County, Arizona

Enclosed are the original and 8 copies of a geologic report by Leonid Bryner, U. S. Geological Survey, covering his examination of the Good Earth Placer claims.

The concentrates from 12 samples of representative material processed and analyzed in the U. S. Bureau of Mines laboratories are reported to contain no columbium or tantalum. Concentrates from a 600-pound check sample similarly processed and analyzed are reported to contain less than 0.05 percent combined columbium and tantalum. The applicant's samples contained less than 0.02 percent U_3O_8 and he presented no evidence of the presence of thorium or rare earth in the deposits.

I concur in Bryner's recommendation that the application for exploration assistance be denied.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (9)

ENHarshman:arh

MINERAL RESOURCES
RECEIVED
JUN 9 1955
U.S.
GEOLOGICAL SURVEY
DENVER, COLORADO

RECEIVED
JUN 20 1955

Box 4125 University Station
Tucson, Arizona

June 6, 1955

TRANSMITTED
JUN 14 1955

MEMORANDUM

To: Mr. K. E. Burnham

From: J. H. Faick

Subject: [redacted] Project 3566 (Columbium-Tantalum)
[redacted] Placers, Maricopa Minerals Company;
Maricopa County, Arizona.

Enclosed are the original and 8 copies of a geological report by Leonid Beyer on the field examination of the above property. Columbium and tantalum were not found in the placer deposits; therefore, it is recommended that the application be denied. This report has my approval.

One copy of the brochure is enclosed.

John H. Faick

John H. Faick

JHF:mm

cc: Burnham - 8
Stone

MINE
RE
JUN 0
GEOLOGICAL SURVEY
DENVER, COLORADO

U. S. DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEPARTMENTAL MINERALS EXPLORATION AGREEMENT

REGION XXI

[redacted]

EXPLORATION REPORT

DMEA 3056

MARICOPA MINERALS, INC.
[redacted]
MARICOPA COUNTY, ARIZONA

(Columbian-Tantalum)

By
Leonid Enzner
Geologist
U. S. Geological Survey

June 6, 1955

RECEIVED
JUN 20 1955

U. S. DEPARTMENT OF THE INTERIOR
BUREAU MINERALS EXPLORATION ADMINISTRATION
FIELD TEAM XIX

EXAMINATION REPORT

TMEA 1556
MARICOPA MINERALS, INC.
GOOD HOPE FLAGSTAFF CLAIMS
MARICOPA COUNTY, ARIZONA
(Columbium-Tantalum)

CONTENTS

	Page
INTRODUCTION	1
LOCATION AND ACCESSIBILITY	2
GEOLOGY	2
GRADE	3
CONCLUSIONS AND RECOMMENDATIONS	4

ILLUSTRATIONS

Fig. 1	Location Map	See Engineering Report
Fig. 2	Map of the project area	Following page 2
Fig. 3	Assay Map	See Engineering Report

INTRODUCTION

In an application to the Defense Minerals Exploration Administration, dated November 16, 1954, Sewall Thomas, consulting engineer and official representative for the Maricopa Minerals Company, requested government participation in a program estimated to cost $22,500, to explore for Columbium, Tantalum, Uranium, Thorium and Rare Earths at the Great Earth Placers, Maricopa County, Arizona.

The property was examined on February 14 and 15, 1955, by Leonid Beyer of the U. S. Geological Survey and W. R. Hardwick of the U. S. Bureau of Mines. The examiners were assisted by Sewall Thomas and John L. Holt. Holt and his wife, Viola V. Holt, are the owners of the property. They have leased the ground to Maricopa Minerals Company.

The examination consisted mainly of taking 12 check samples from numerous test pits, as the main question to be decided was the grade of the gravels. None of these samples contained columbium or tantalum. The deposit is practically devoid of these metals and therefore denial of the application is recommended.

The geology of the area is described by E. H. Debenek and E. H. Kendall in "Geology and ground-water resources of the Gila Bend Basin, Maricopa County, Arizona", and by E. H. Velasco in "Reconnaissance on Ground-Water Resources and Geology of Rainbow Valley - Waterman Wash Area, Maricopa County, Arizona." These both are open file reports of the Geological Survey, dated respectively February 18, 1948 and February, 1953.

LOCATION AND ACCESSIBILITY

The property consists of sections 14, 15, 21, 22, and 23, T. 2 S., R. 4 W., Maricopa County, Arizona (fig. 2). It is on the north side of Rainbow Valley, which drains southwest to the Gila River.

The area is reached by driving south from Buckeye on the new highway about 7 miles, and then west about 3 miles along the road that follows the El Paso Natural Gas Company pipeline.

GEOLOGY

The Buckeye Hills, trending approximately west and situated immediately north of the property are the bedrock from which the gravels of the Good Earth Fissure were created. The Hills are composed mainly of granite which Babcock and Hendall classify as "Ancosaic (?)". This granite, in the part of the hills overlooking the property, contains literally dozens of pegmatite dikes which dip moderately to the north, so that the north flank of the hills presents the dikes on a dip slope, while the south flank of the hills presents the dikes in cross section. From the south the hills show a striking, horizontal banding due to these dikes.

Some of the dikes on lode claim "Sure Earth 15" (fig. 2) were examined. They consist mainly of orthoclase and quartz. They also contain minor amounts of biotite, magnetite and garnet. Epidote is a comparatively rare constituent. A few crystals of columbite or samarskite 1/8 to 3/4 of an inch in diameter were seen in one place. These crystals were imbedded in coarsely crystalline, pink orthoclase.

The gravels from an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash which drains in a southwesterly direction and is situated one to

two miles from the hills (fig. 2). The drainage between the hills and Rainbow Wash is south to southeasterly as shown in fig. 2. This drainage is not integrated but consists of numerous independent more or less parallel washes. The gravels laid down by these washes are poorly sorted to unsorted and consist of angular to sub-angular fragments generally less than 6 inches in diameter. Much of the gravel has a pale caliche cement. In places the gravel stands in vertical or steep cliffs as much as 15 or 20 feet above the bottoms of the washes. In the bottom of the washes and also in the low divides between them this well-cemented gravel is overlain in most places by a poorly cemented gravel having a darker shade matrix.

GRADE

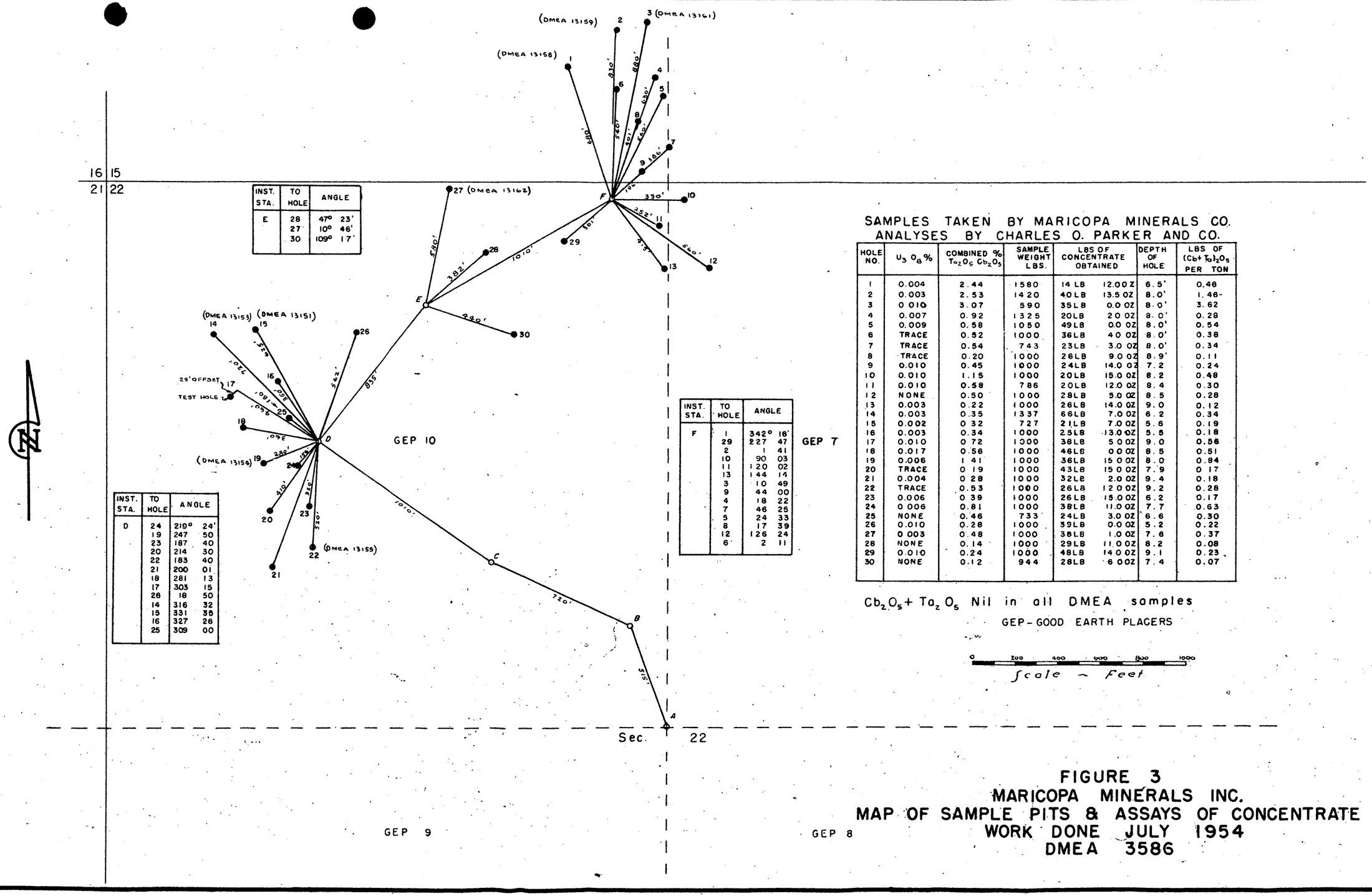
There has been no production from this property, but a sampling program was undertaken by the applicant in the summer of 1954. This work consisted of digging 46 trenches 6 to 8½ feet deep from which gravel samples weighing 300 to 2000 pounds were taken. Figure 2 shows the location of trenches dug for location purposes. Trenches not shown in figure 2 are those in the shaded area of figure 2, where the testing was done approximately on a 200-foot grid pattern. According to the applicant the sampling showed from 12 to 30 pounds of heavy mineral per cubic yard. His assays of the heavy mineral showed 0.12 to 3.07 percent combined columbium and tantalum.

Twelve check samples (U. S. B. M. Nos. 13151 to 13162) weighing 32 to 85 pounds were taken by the examiners. The location of Nos. 13156 and 13157 is shown in figure 2 and the location of the others is in the shaded area in figure 2, shown in detail in figure 3. The proportion of heavy mineral weight to sample weight checked quite well

with this proportion in the applicant's sample. Assays of the heavy concentrates from these twelve samples, however, indicated in every case that their combined Cb_2O_5 - Ta_2O_5 content was nil. In order to be sure of this fact the examiners returned to the property on April 12 and obtained a 600 pound sample from Pit No. 2 where the applicant had reported an assay of 8.53 percent Cb_2O_5 - Ta_2O_5 from 48 pounds 13.5 ounces of heavy mineral obtained from a 1,400 pound sample. U. S. Bureau of Mines table concentrates and middlings from the 600-pound sample weighed 29.4 pounds and assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. The concentrates alone weighed 22.8 pounds and also assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. All the other material in the 600 pound sample, that is, rejects, and slime, assayed less than 0.02 percent. Most of the applicant's samples were assayed by the Chas. A. Pender Co. of Denver. Uranium assays of the concentrates submitted by the applicant ranged from nil to 0.017 percent, and no evidence was offered of the presence of thorium and rare earths, mentioned together with uranium in the application. In view of the applicant's lack of evidence for uranium, thorium, and rare earths in this deposit, the examiners did not investigate further for these minerals.

CONCLUSIONS AND RECOMMENDATIONS

The Red Hawk Placers were found to contain less than trace amounts of Columbium and Tantalum. Though the ground tested by the applicant and the examiners included only a near-surface portion of the gravels, values are not likely to be much, if any, better at depth as these gravels are not of the type favorable to concentrations of heavy minerals. It is recommended, therefore, that government participation in this project be denied.



INST. STA.	TO HOLE	ANGLE
E	28	47° 23'
	27	10° 46'
	30	109° 17'

INST. STA.	TO HOLE	ANGLE
D	24	219° 24'
	19	247 50
	23	187 40
	20	214 30
	22	183 40
	21	200 01
	18	281 13
	17	303 15
	26	18 50
	14	316 32
	15	331 35
	16	327 26
	25	309 00

INST. STA.	TO HOLE	ANGLE
F	1	342° 18'
	29	227 47
	2	1 41
	10	90 03
	11	120 02
	13	144 14
	3	10 49
	9	44 00
	4	18 22
	7	46 25
	5	24 33
	8	17 39
	12	126 24
	6	2 11

SAMPLES TAKEN BY MARICOPA MINERALS CO.
ANALYSES BY CHARLES O. PARKER AND CO.

HOLE NO.	U_3O_8 %	COMBINED % Ta_2O_5 Cb_2O_5	SAMPLE WEIGHT LBS.	LBS OF CONCENTRATE OBTAINED	DEPTH OF HOLE	LBS OF $(Cb+Ta)_2O_5$ PER TON
1	0.004	2.44	1580	14 LB 12.00 Z	6.5'	0.46
2	0.003	2.53	1420	40 LB 13.5 OZ	8.0'	1.46
3	0.010	3.07	590	35 LB 0.0 OZ	8.0'	3.62
4	0.007	0.92	1325	20 LB 2.0 OZ	8.0'	0.28
5	0.009	0.58	1050	49 LB 0.0 OZ	8.0'	0.54
6	TRACE	0.52	1000	36 LB 4.0 OZ	8.0'	0.38
7	TRACE	0.54	743	23 LB 3.0 OZ	8.0'	0.34
8	TRACE	0.20	1000	26 LB 9.0 OZ	8.9'	0.11
9	0.010	0.45	1000	24 LB 14.0 OZ	7.2	0.24
10	0.010	1.15	1000	20 LB 15.0 OZ	8.2	0.48
11	0.010	0.58	786	20 LB 12.0 OZ	8.4	0.30
12	NONE	0.50	1000	28 LB 5.0 OZ	8.5	0.28
13	0.003	0.22	1000	26 LB 14.0 OZ	9.0	0.12
14	0.003	0.35	1337	66 LB 7.0 OZ	6.2	0.34
15	0.002	0.32	727	21 LB 7.0 OZ	5.6	0.19
16	0.003	0.34	1000	25 LB 13.0 OZ	5.5	0.18
17	0.010	0.72	1000	38 LB 5.0 OZ	9.0	0.56
18	0.017	0.56	1000	46 LB 0.0 OZ	8.5	0.51
19	0.006	1.41	1000	36 LB 15.0 OZ	8.0	0.84
20	TRACE	0.19	1000	43 LB 15.0 OZ	7.9	0.17
21	0.004	0.28	1000	32 LB 2.0 OZ	9.4	0.18
22	TRACE	0.53	1000	26 LB 12.0 OZ	9.2	0.28
23	0.006	0.39	1000	26 LB 15.0 OZ	6.2	0.17
24	0.006	0.81	1000	38 LB 11.0 OZ	7.7	0.63
25	NONE	0.46	733	24 LB 3.0 OZ	6.6	0.30
26	0.010	0.28	1000	39 LB 0.0 OZ	5.2	0.22
27	0.003	0.48	1000	38 LB 1.0 OZ	7.8	0.37
28	NONE	0.14	1000	29 LB 11.0 OZ	8.2	0.08
29	0.010	0.24	1000	48 LB 14.0 OZ	9.1	0.23
30	NONE	0.12	944	28 LB 6.0 OZ	7.4	0.07

$Cb_2O_5 + Ta_2O_5$ Nil in all DMEA samples

GEP - GOOD EARTH PLACERS

FIGURE 3
MARICOPA MINERALS INC.
MAP OF SAMPLE PITS & ASSAYS OF CONCENTRATE
WORK DONE JULY 1954
DMEA 3586

RECEIVED
JUN 2 0 1955

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS MCKAY, SECRETARY

RECEIVED
JUN 29 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA-3586, Maricopa Minerals Co.

Good Earth Columbium-Tantalum Placers

Maricopa County, Arizona

William R. Hardwick, Mining Engineer
U. S. Bureau of Mines

Leonid Bryner, Geologist
U. S. Geological Survey

June 1955

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(date)

TRANSMITTED
JUN 14 1955
RECEIVED
JUN 20 1955

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By William R. Hardwick[1] and Leonid Bryner[2]

Sewell Thomas, a consulting mining engineer acting for Maricopa Minerals Co., an Oklahoma corporation, presented an application to the Defense Minerals Exploration Administration for Government assistance to explore the Good Earth placer claims in Maricopa County, Arizona, for columbium and tantalum. The application requested assistance in the amount of 75 per cent of the costs of a proposed drilling program estimated to cost $33,000.00. This application, presented under the provisions of the Defense Production Act of 1950, as amended, was docketed DMEA—3586 (Columbium) and was referred to the field for an examination and report.

The Good Earth placer claims are situated in T. 2 S., R. 4 W., Maricopa County, Ariz. The gravels form an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash. This wash drains in a southwesterly direction and is situated one to two miles from the Hills. These gravels are unsorted to poorly sorted, and consist of angular to sub-angular fragments generally less than six inches in diameter in a caliche cement.

The Good Earth placer claims were visited and examined on February 14 and 15, 1955 by William R. Hardwick and Leonid

---

1/ Mining engineer, U. S. Bureau of Mines.

2/ Geologist, U. S. Geological Survey

Bryner. The DMEA examining team was assisted by Sewell Thomas and John L. Holt, the locator of the claims. The examining team cut 12 samples to check the results reported by the applicant. The metallurgical section of the U.S. Bureau of Mines at Tucson reported no columbium or tantalum in these check samples. The claims again were visited on April 12, 1955 and a large 600-pound sample was taken at the test pit where one of the highest grade samples reported by Thomas was taken. This sample was assayed, but no significant amount of columbium or tantalum was found.

There has been no production from this deposit, and as the assays show noocolumbium or tantalum, there are no ore reserves. It is the conslusion of the examining team that the sample values reported by the applicant do not represent the true value of the ground sampled and that a significant amount of columbium and tantalum will not be discovered by the project.

It is recommended that the application (DMEA-3586) of Maricopa Minerals Co. to explore the Good Earth placer claims for columbium and tantalum be denied.

DMEA-3586, MARICOPA MINERALS CO.
GOOD EARTH COLUMBIUM-TANTALUM PLACERS
MARICOPA COUNTY, ARIZONA

RECEIVED
JUN 20 1955

Engineering Report

By William R. Hardwick, Mining Engineer
U. S. Bureau of Mines

June 1955

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(date)

DMEA-3586, MARICOPA MINERALS CO.
GOOD EARTH COLUMBIUM-TANTALUM PLACERS
MARICOPA COUNTY, ARIZONA

RECEIVED
JUN 20 1955

CONTENTS

Page

Engineering report

Introduction---------- 1
Acknowledgments---------- 2
Location, topography and climate---------- 2
History and production---------- 3
Ownership and extent---------- 4
Description of the deposit---------- 4
Ore reserves---------- 6
Present status---------- 7
Proposed exploration---------- 9
Estimated costs---------- 9
Proposed financing----------12
Conclusions----------12
Recommendations----------13
Appendix----------14

ILLUSTRATIONS

Figure — Following page

1 Location map---------- 1
2 Claim map and location of proposed drill holes (with Geological Section)
3 Map of test pits and assays---------- 6

INTRODUCTION

The Maricopa Minerals Co., an Oklahoma corporation, applied for Government assistance to explore the Good Earth placer claims, Maricopa County, Ariz., for columbium and tantalum (figure 1). The application (DMEA-3586) was received by the Defense Minerals Exploration Administration Field Team, Region III, Denver, Colo., on November 17, 1954, and was forwarded to the Southwest Experiment Station, Tucson, Ariz., on November 29, 1954 for a field examination. The applicant proposed to explore alluvial gravels for columbium and tantalum by churn-drill sample holes. The total estimated cost of the project was $33,000.00.

The Good Earth claims were examined on February 14 and 15, 1955 by Leonid Bryner, geologist, U. S. Geological Survey, and William R. Hardwick, mining engineer, U. S. Bureau of Mines. The examining team was assisted by Sewell Thomas, Consulting Engineer for the applicant, and John L. Holt, owner and original locator of the claims.

Based on a review of the sampling procedure used by Sewell Thomas and the assay results reported by Charles O. Parker & Co., Denver, Colo., an exploration project appeared feasible. However, after the field examination, some changes in the initial application seemed desirable to the examining team. These changes were discussed with Sewell Thomas at a conference in Buckeye, Ariz. on February 16, 1955. Mr. Thomas concurred fully with these changes and requested in a letter dated February 24, 1955, that these changes be incorporated in the proposed project.

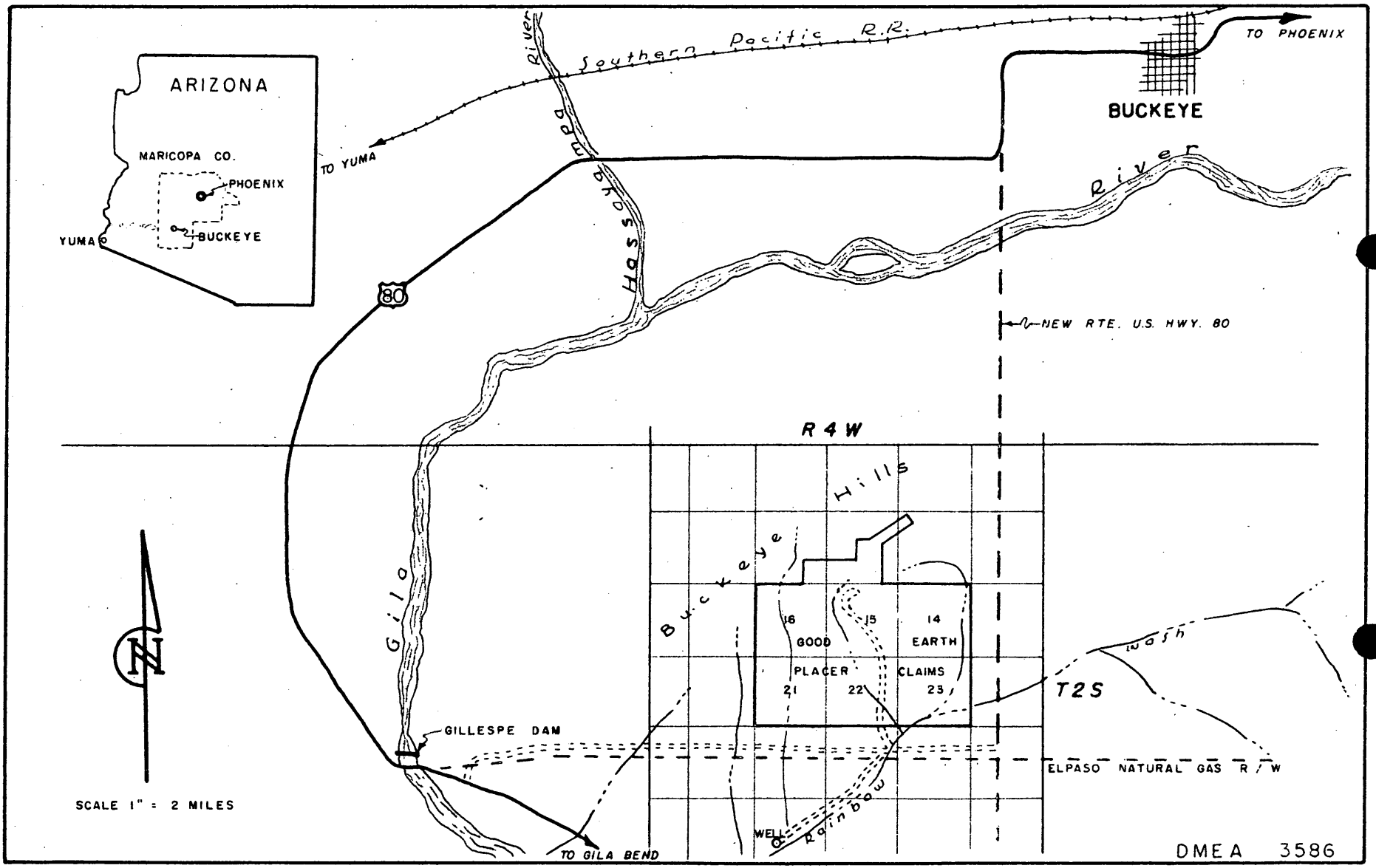


FIGURE - 1 - LOCATION MAP - GOOD EARTH PLACERS
MARICOPA COUNTY, ARIZ.

During the field examination, 12 samples were taken at favorable places on the property. The metallurgical section of the Southwest Experiment Station, U. S. Bureau of Mines, Tucson, Ariz., was unable to detect any columbium or tantalum in these samples, so on April 12, 1955, the Good Earth placer claims again were visited by the examining team. A 600-pound sample was taken at the most favorable location that had been reported by Sewell Thomas. This sample also showed no significant amounts of columbium or tantalum.

ACKNOWLEDGMENTS

Acknowledgment is due the efforts of Sewell Thomas, Consulting Mining Engineer, in showing the examining team over the property, and to John L. Holt, owner of the Good Earth placer claims, who supplied information and assistance during the field examination.

LOCATION, TOPOGRAPHY AND CLIMATE

The Good Earth placer claims are situated in Secs. 14, 15, 16, 21, 22 and 23, T. 2 S., R. 4 W., Maricopa County, Ariz. The claims are on the south side of the Buckeye Hills and on the north edge of Rainbow Valley. They may be reached by driving south from the town of Buckeye, Ariz. along the new route of U. S. Highway 80 (now under construction) for a distance of 12 miles to the point where El Paso Natural Gas Co.'s pipe line crosses the highway. Turn west along the pipe line right-of-way and travel 1.5 miles to the center of the southern part of the group of claims.

The Rare Earth lode claims are located along the south side of a rugged ridge. The Good Earth placer claims are located

on the alluvial fans formed by small arroyos that flow south into Rainbow Wash. The ground slopes southward at the rate of from 100 to 200 feet per mile and is cut by washes and low alluvial ridges. The difference in elevation from top of ridge to bottom of wash may be as much as 50 feet in some places, but probably averages about 30 feet. The elevation above sea level is 900 feet at the south end of the claim group and 1,100 to 1,200 feet at the north end.

The vegetation is typical of the southwestern desert. The ridges are sparsely covered with brush and cacti, while palo verde and mesquite grow along the washes. The rainfall may vary from 5 to 10 inches per year, and probably averages about 7 inches, most of which comes in July and August as torrential thunder storms.

The climate is mild in the winter and hot in the summer. Temperatures as high as 120° F. are not unusual in the summertime.

The Southern Pacific railway has a station at Buckeye, a distance of 12 miles from the claims. The main pipe line of El Paso Natural Gas Co. crosses the southern edge of the claims, and the new route of U. S. Highway 80 will cross the eastern edge. Electric power is available from a transmission line in the center of Rainbow Valley, approximately 4 miles from the center of the group. Water can be developed on the southern claims.

HISTORY AND PRODUCTION

There has been no production from the Good Earth placer claims. Small lots of high-grade "heavy minerals" have been mined from the pegmatite dikes on the Rare Earth lode claims. No sale

of this specimen material for its mineral content has been reported.

OWNERSHIP AND EXTENT

The Rare Earth lode claims 1 to 5, and the Good Earth placer claims 1 to 12 were located by John L. and Viola W. Holt. These claims now are held by the Maricopa Minerals Co. under a "lease and option to purchase" agreement. This option provides for a purchase price of $100,000.00. The lease provides for payment of a minimum sum of $400.00 per month, or royalty on production at the rate of 5 per cent, whichever is the larger sum. All payments are to be applied to reduce the purchase price.

Since the execution of the lease and option with the Holts, the Maricopa Minerals Co. has located additional placer claims surrounding the initial group.

DESCRIPTION OF THE DEPOSIT

The general geology of the deposit is described in a separate report by Leonid Bryner, examining geologist.

The Good Earth placer gravels are deposited along the south side of the Buckeye Hills. The valuable minerals, columbium and tantalum, are reported to come from a system of pegmatite dikes that have been partly eroded. The gravels vary in depth from zero at the south edge of the Buckeye Hills to an undetermined depth at the south edge of secs. 21,22 and 23, some 2 miles from the edge of the hills. A well has been drilled to a depth of 309 feet in sec. 33, just south of the claims. This well did not penetrate bedrock.

Sewell Thomas estimated in the initial application that

the average depth to bedrock would be 15 feet. He also assumed that the gravels were underlain by a relatively smooth pediment. However, it has been the experience of the examining engineer that in this desert country where shallow gravels are underlain by a pediment, numerous outcrops occur. Where no outcrops occur, the bedrock usually drops rapidly away from the hills. At a distance of a mile from the hills, the depth to bedrock may be from 200 to 500 feet. This feature was pointed out during the examination and Sewell Thomas has modified the proposed program to incorporate the possibility of deep gravel at the starting location.

The gravels represent a series of coalescing alluvial fans that were formed by washes draining southward from Buckeye Hills to Rainbow Wash. In the vicinity of the shaded area shown on figure 2, the gravel consists of rounded to sub-angular boulders and fine sand. The size of the boulders increases toward the edge of the hills, and they become more plentiful.

The gravels were estimated to consist of from one-fourth to one-third quartz and feldspar fragments. The remainder was weathered dark-colored granite. Except for the loose material in the recent wash beds, the gravels were cemented with caliche.

In the samples taken, most of them in or near the shaded area of figure 2, all of the heavy mineral was less than 10 mesh in size. Large pieces (one inch in diameter) were reported to have been found at the edge of the hills by John L. Holt. None were observed by the examining team.

ORE RESERVES

With a hoe-type power shovel, 30 test holes were dug to a depth of from 6 to 8 feet by Maricopa Minerals Co. A sample was cut from each hole with the bucket of the shovel. These samples ranged in size from 500 to 2,000 pounds. They were trucked to water, screened wet, and processed in a mechanical pan which made a concentrate that ranged in size from 140pounds 10 ounces to 49 pounds. This concentrate was assayed for columbium and tantalum by Charles O. Parker & Co., Denver, Colo. The results of the Parker assays ranged from 0.12 to 3.07 percent combined columbium-tantalum pentoxide. Based on the assay results of Parker, Sewell Thomas has inferred 625,000 cubic yards of gravel that contains 0.052[1/] percent combined columbium-tantalum pentoxide, or approximately one pound per ton.

Twelve samples were taken by the DMEA examining team during the field examination and later a 600 pound sample was taken from the most favorable location. None of these samples contained more than a trace of columbium-tantalum pentoxide. Therefore, no ore is inferred by the examining team.

The 30 samples takenby the applicant are shown on figures 2 and 3. The locations of the 12 samples taken at the time of the DMEA field examination also are shown on figures 2 and 3. The results of the applicant and the DMEA examining team are compared in Table I.

When all 12 of the check samples failed to show any

1/ Due to a typographical error this figure was reported as 0.52 percent by Sewell Thomas in the statement attached to the original application.

columbium, the analyses were repeated in Tucson, and portions of the pulps also were sent to the Bureau's Salt Lake City laboratory to be checked by the metallurgical section at that station. These checks confirmed the original analyses.

The sampling procedure followed by the applicant had been duplicated as nearly as practical by the DMEA examining team. The 12 samples were cut by hand from the sides of the same pits, and therefore were smaller than the samples which were cut by the applicant with a power shovel.

In order to check the sampling procedure, the examining team returned to the Good Earth placer claims on April 12, 1955 and cut a 600-pound sample from pit No. 2. One of the applicant's highest grade samples came from this location. The results of this sample showed only a trace of columbium and tantalum. The results of the metallurgical work on this project are covered in the attached report, TMR-379-1, "Concentration of Placer Gravel from the Good Earth Claims, Maricopa County", by F. N. Bender and R. R. Cruse.

PRESENT STATUS

During the summer of 1954, after control of the property was acquired by Maricopa Minerals Co., 30 test holes were dug with a back-hoe. The location of these holes is shown by the shaded area on figure 2 and in more detail on figure 3. Other than location pits and the test pits mentioned above, no work has been done on the Good Earth placer claims.

TABLE I. Comparison of Applicant's Samples and Samples by DMEA Examining Team.

Samples by Sewell Thomas. Analyses by Charles O. Parker & Co., Denver, Colo.					Samples by DMEA Examining Team. Analyses by Metallurgical Section of Bureau of Mines.			
Sample No.	Sample Weight, Pounds	Weight of Concentrate, lbs.	Oz.	Percent $(Cb\text{-}Ta)_2O_5$	Sample No.	Sample Weight, Pounds*	Weight of Concentrate, Pounds	Percent $(Cb\text{-}Ta)_2O_5$
15	727	21	7.0	0.32	13151	62.25	0.533	Nil
14	1,337	66	7.0	0.35	13153	51.50	2.485	Nil
19	1,000	36	15.0	1.41	13154	39.25	1.990	Nil
22	1,000	26	12.0	0.53	13155	57.00	1.616	Nil
1	1,580	14	12.0	2.44	13158	37.50	1.287	Nil
2	1,420	40	13.5	2.53	13159	83.50	4.458	Nil
3	590	35		3.07	13161	49.50	2.180	Nil
27	1,000	38	1.0	0.48	13162	35.50	2.092	Nil
					13152	35.50	0.962	Nil
					13156	32.00	1.153	Nil
					13157	32.25	0.935	Nil
					13160	34.25	1.107	Nil

* Larger samples were taken in the field and quartered to the reported weight.

PROPOSED EXPLORATION

The initial application proposed sample holes drilled to bedrock and spaced 200 feet apart. A gridwork in four different areas wasproposed. The selection of these different areas was based on the results of sampling shallow test pits.

During the field examination it was pointed out to Thomas that his estimate of the depth of bedrock might be in error, and that concentrations of heavy minerals might be more variable vertically than horizontally. Therefore, Thomas revised his original proposal and in the revision, proposed to drill two rows of sample holes across the drainage pattern. These holes would be 2,000 to 3,000 feet from each other. Based on the results of these widely spaced holes, Thomas expected to select an area that would be drilled on 200-foot squares.

ESTIMATED COSTS

The backers of Maricopa Minerals Co. are connected with oil exploration work in Oklahoma. They proposed to furnish their own drilling equipment and to do all of the proposed exploration on their own account. Sewell Thomas, an experienced mining engineer, would supervise the project.

Labor and supplies are available in Buckeye, 12 miles from the claims, or in Phoenix, 40 miles distant. The wage rates proposed by the applicant are somewhat higher than those at the nearby mines, but are about the same as those paid by construction projects in the area. Power is available at the well in sec. 33,

The applicant proposes to use this well for a water supply source.

The drilling costs proposed by the applicant are summarized below. They are based on a one-shift operation and an estimated advance of 15 feet per day.

Item	Cost per Day	Cost per Foot
Labor	$	$ 6.07
Supervision and consultant		3.67
Operating materials and supplies		1.77
Operating equipment rental		6.33
Miscellaneous		
Moving equipment in and out		1.00
Rehabilitating well and pump		0.20
Repairs and maintenance	7.50	
Assays, 1 sample per day	30.00	
Accounting	5.00	
Comp. employee liab., Soc. Sec. & payroll tax	12.50	
	$55.00	3.66
Contingencies		1.00
Grand total per foot of hole		$ 23.70

The costs proposed by the applicant seem excessive. In 1946, a series of 9-inch churn-drill sample holes were drilled some 60 miles south of the Good Earth placer claims in similar gravel. These holes were drilled under the supervision of the [redacted] examining engineer. The depths of the holes varied between 400 and 700 feet.

The cost, including labor, supplies, sampling at 5-foot intervals, and hauling water from 2 to 7 miles (but not including depreciation on equipment and casing) was slightly less than $6.00 per foot. The rate of advance was approximately 30 feet per shift. The holes were cased.

Assuming an advance of 25 feet per day and using the wage rates, supply costs, and equipment values proposed by the applicant, the following costs are estimated. They seem reasonable.

Labor	Per Day	Per Foot
2 Drillers @ $2.50 per hour	$ 40.00	
1 Panner @ $2.75 per hour	22.00	
1 Truck driver @ $2.00 per hour	16.00	
1 Roustabout @ $1.50 per hour	12.00	
1 Supervisor	25.00	
Total labor	$115.00	$ 4.60
Comp. Employee Liab., Soc. Sec. & Payroll tax (15%)		0.69
Operating materials and supplies		1.06
Depreciation of equipment		0.69
Miscellaneous		
Moving equipment in and out		1.00
Installation of water pump		0.20
Road preparation		0.50
Equpment repairs		0.50
Contingencies		0.50
Cost of drilling hole		$ 9.24

Assaying at 10-foot intervals ----------	$4.00
Grand total, drilling and sampling ----------	$ 13.24

In comparing the two estimates, the largest single difference is in the item, "Estimated rental or depreciation". The applicant has used a rental or use-allowance figure of $95.00 per day for equipment, which it values at $25,750.00. The examining engineer (using the same values for equipment) has used a 60-month depreciation rate and 25 working days per month to arrive at a figure of $17.17 per day.

The price for a columbium-tantalum assay is $60.00 for a single sample, or $40.00 per sample in quantities of 20 or more.[2/] This is equal to a cost of $2.00 per foot of drill hole for a 20-foot sample interval, or $4.00 per foot if samples are taken for each 10 feet.

PROPOSED FINANCING

Maricopa Minerals Co. proposes to furnish 25 percent of the cost of the proposed exploration. It has requested in the application for assistance, that the Defense Minerals Exploration Administration furnish 75 percent of the costs under the provisions of the Defense Production Act of 1950, as amended.

CONCLUSIONS

Columbium and tantalum have become increasingly important

2/ Personal communication, Ledoux & Co., 359 Alfred Ave., Teaneck, N. J.

in the last five years as a constituant of certain alloys designed for use at high temperatures. As the volume of gravel on the Good Earth placer claims is large and low cost recovery methods could be used, even very low-grade material indicated by the Parker analyses might provide a substantial amount of these important products.

However, sampling by the DMEA examining team and test work by the metallurgical section of the Southwest Experiment Station, Bureau of Mines, indicate that the amount of columbium and tantalum in the gravel is not significant, and that the sampling results presented by the applicant do not represent the true columbium and tantalum content of the gravel.

RECOMMENDATIONS

It seems probable that a significant amount of columbium and tantalum will not be found by the proposed exploration. Therefore, it is recommended that the application (DMEA-3586) of Maricopa Minerals Co. for Government assistance to explore the Good Earth placer claims be denied.

OFFICIAL USE ONLY

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

DIVISION OF MINERAL TECHNOLOGY, REGION III

J. Bruce Clemmer, Chief

TMR-379-1

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS, MARICOPA COUNTY, ARIZONA

DMEA Project - 3586

By: F.N. Bender and R.R. Cruse

May 9 - 1955

SOUTHWEST EXPERIMENT STATION
Carl Rampacek, Supervising Metallurgist
Tucson, Arizona

OFFICIAL USE ONLY

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(Date)

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS MARICOPA COUNTY, ARIZONA - DMEA Project - 3586

By: F.N. Bender and R.R. Cruse

Introduction and Summary

On March 21, 1955, W.R. Hardwick, examining mining engineer for DMEA project 3586, submitted twelve samples of placer gravel from the Good Earth Placer Claims, Maricopa County, Arizona, for gravity concentration tests to determine if they contained any recoverable columbium or tantalum. The samples were concentrated by a simple scalping and tabling treatment outlined by Mr. Hardwick which reportedly had proved successful for recovering tantalum and columbium-enriched concentrates from the material. However, chemical analyses, qualitative spectroscopic analyses and microscopic examination of the concentrates recovered by this procedure failed to detect either columbium or tantalum or their minerals. On April 13, 1955, approximately 600 pounds of the gravel were submitted by Mr. Hardwick for more comprehensive metallurgical testing to ascertain if the simplified procedure had been in error. The material was obtained from a pit in the deposit which reportedly had shown a high columbium-tantalum content. Concentrates and reject products recovered by washing, screening, desliming, classification and tabling were analyzed for the rare metals but they also proved negative.

Description of the Samples

The twelve original samples, numbers 13151 to 13162, inclusive, varied in weight between 32 and 85 pounds, and consisted principally of quartz and feldspar gravel loosely consolidated with substantial quantities of clay and caliche. When soaked in water for a short time and agitated slowly, the caliche and clays disintegrated and liberated the gravel which ranged in size from slime to pebbles, 2-1/2 inches in diameter. The large lot of material was similar mineralogically and chemically to the smaller samples and was obtained from the same prospect pit as sample 13159.

Procedure and Results

A simple washing, screening, desliming and tabling treatment was applied to the original twelve samples in order to recover a heavy mineral product in which the columbium and tantalum minerals would be concentrated if they were present. The procedure consisted of first soaking each individual sample in water and then mildly attritioning the pulp by moving it about with the aid of a hoe in order to slake

the clays and disintegrate the loosely consolidated gravel. The pulp was then screened at 10 mesh and the screen oversize was washed with water to remove any adhering slimes and fines. The screen undersize product was deslimed at about 100 mesh in order to obtain a 100 to 10-mesh feed for tabling; slimes and the screen oversize gravel were combined and rejected. No attempt was made to produce high-grade heavy mineral concentrates by tabling as a maximum recovery of the heavy minerals was the primary objective. A concentrate, middling and tabling product first was recovered in each test. The middling fraction then was examined for heavy minerals and if some were present it was combined with the concentrates, otherwise it was rejected to the tailing. The table concentrates were individually analyzed for combined columbium and tantalum oxides while the screen oversize, table rejects and slimes were weighed and discarded. Results of the washing, screening and tabling tests on the twelve samples are summarized in Table 1.

Table 1. Results of Washing, Screening and Tabling Tests on Twelve Original Samples of Placer Gravel

Sample No.	Sample Weight, lb.	Table Concentrate		
		Weight lb.	Weight, percent	Assay, percent (Cb_2O_5 - Ta_2O_5)
13151	62.25	0.533	0.86	Nil
13152	35.50	0.962	2.71	"
13153	51.50	2.485	4.83	"
13154	39.25	1.990	5.07	"
13155	57.00	1.616	2.84	"
13156	32.00	1.153	3.60	"
13157	32.25	0.935	2.90	"
13158	37.50	1.287	3.43	"
13159	83.50	4.458	5.34	"
13160	34.25	1.107	3.23	"
13161	49.50	2.180	4.40	"
13162	35.50	2.092	5.89	"

The concentrates recovered in the tabling runs consisted principally of magnetite, ilmenite, hematite and sphene with minor quantities of garnet, zircon and other accessory minerals. Qualitative spectroscopic analyses of the concentrates as well as on chemical precipitates from the concentrates failed to detect any tantalum or columbium. In addition, the concentrates were examined under the microscope for tantalum or columbium but none was found.

A more thorough metallurgical investigation was made on the 600-pound sample to ascertain if the simplified procedure had been in error. The gravel first was attritioned, screened on 10-mesh and washed according to the same procedure used for the smaller samples after which the minus 10-mesh pulp was hydraulically classified into 3 spigot products and a minus 200-mesh slime overflow. Each of the spigot products was tabled separately to obtain a concentrate, middling and tailing. The table middling then was retabled to recover an additional small quantity of free and interlocked heavy mineral which was combined with the concentrate. The retabled reject was set aside as a true middling. The table concentrates, middlings and tailings recovered from the different spigot products were ultimately combined for weighing and assaying. Chemical analyses also were made on the classifier overflow slimes and the 10-mesh screen oversize. Results of washing, screening, classification and tabling tests on this sample are summarized in Table 2. The chemical analyses of the feed and different products failed to detect more than a trace of combined tantalum and columbium oxides. Microscopic examination of the gravel and table products for columbium and tantalum content as well as qualitative spectroscopic analyses of the products and chemical precipitates derived from the table concentrates also proved unfruitful.

Table 2. Results of Classification and Tabling Tests on 600-pound Sample of Good Earth Placer Gravel.

Product	Weight, Percent	Assay, Percent (Cb_2O_5 - Ta_2O_5)
plus 10-mesh gravel reject	35.3	<0.01
minus 10 plus 200-mesh table concentrate	3.8	<0.05
minus 10 plus 200-mesh table middling	1.1	<0.05
minus 10 plus 200-mesh table tailing	30.2	<0.01
Composite table feed	35.1	—
minus 200-mesh slime	29.6	<0.02
Composite head	100.0	<0.02
Determined head		<0.01

Conclusions

Gravity concentration tests and complementary chemical analyses on twelve small prospect samples and a 600-pound pit sample from the Good Earth placer deposit have failed to establish the presence of either columbium or tantalum. Traces of the two elements were detected in the large sample but the quantity found was insignificant.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

RECEIVED
JUN 20 1955 DMEA
Date Rec'd
JUN 10 1955
BUREAU OF MINES
Denver, Colorado

June 10, 1955

TRANSMITTED
JUN 14 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3586 (Columbium, tantalum, thorium, uranium, rare earths), Maricopa Minerals, Inc., Good Earth Placer claims, Maricopa County, Arizona

Enclosed are the original and 8 copies of a geologic report by Leonid Bryner, U. S. Geological Survey, covering his examination of the Good Earth Placer claims.

The concentrates from 12 samples of representative material processed and analyzed in the U. S. Bureau of Mines laboratories are reported to contain no columbium or tantalum. Concentrates from a 600-pound check sample similarly processed and analyzed are reported to contain less than 0.05 percent combined columbium and tantalum. The applicant's samples contained less than 0.02 percent U_3O_8 and he presented no evidence of the presence of thorium or rare earth in the deposits.

I concur in Bryner's recommendation that the application for exploration assistance be denied.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (9)

ENHarshman:arh

Reviewed by
DMEA OPERATING COMMITTEE
6-24-55
(date)

GEOLOGICAL SURVEY
DENVER, COLORADO

Box 4126 University Station
Tucson, Arizona

June 6, 1955

TRANSMITTED
JUN 14 1955

[redacted]

To: Mr. E. H. Kerschman

From: J. H. Faick

Subject: [redacted] Docket 3586 (Columbite-Tantalum)
[redacted] Earth Pleasant, Maricopa Minerals Company;
Maricopa County, Arizona.

Enclosed are the original and 8 copies of a geological report by Leonid Bryner on the field examination of the above property. Columbium and tantalum were not found in the placer deposits; therefore, it is recommended that the application be denied. That report has my approval.

One copy of the brochure is enclosed.

John H. Faick

John H. Faick

JHF:ms

cc: Kerschman - 8
Thorson

Reviewed by
DMEA OFFICER TITLE
6-24-55
(date)

MINERAL DEPOSITS
DMEA
RECEIVED
JUN 9 1955
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

U. S. DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
JUN 20 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REGION III

GEOLOGY

EXAMINATION REPORT

DMEA 3586

MARICOPA MINERALS, INC.
GOOD EARTH PLACER CLAIMS
MARICOPA COUNTY, ARIZONA

(Columbium-Tantalum)

By
Leonid Bryner
Geologist
U. S. Geological Survey

June 6, 1955

DMEA
6-24-55

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
FIELD TEAM III

EXAMINATION REPORT

DMEA 3586
MARICOPA MINERALS, INC.
GOOD EARTH PLACER CLAIMS
MARICOPA COUNTY, ARIZONA
(Columbium-Tantalum)

CONTENTS

	Page
INTRODUCTION	1
LOCATION AND ACCESSIBILITY	2
GEOLOGY	2
GRADE	3
CONCLUSIONS AND RECOMMENDATIONS	4

ILLUSTRATIONS

Fig. 1	Location Map	See Engineering Report
Fig. 2	Map of the project area	Following page 2
Fig. 3	Assay Map	See Engineering Report

INTRODUCTION

In an application to the Defense Minerals Exploration Administration, dated November 16, 1954, Sewell Thomas, consulting engineer and official representative for the Maricopa Minerals Company, requested government participation in a program estimated to cost $33,300, to explore for Columbium, Tantalum, Uranium, Thorium and Rare Earths at the Good Earth Placers, Maricopa County, Arizona.

The property was examined on February 14 and 15, 1955, by Leonid Bryner of the U. S. Geological Survey and W. R. Hardwick of the U. S. Bureau of Mines. The examiners were assisted by Sewell Thomas and John L. Holt. Holt and his wife, Viola W. Holt, are the owners of the property. They have leased the ground to Maricopa Minerals Company.

The examination consisted mainly of taking 12 check samples from numerous test pits, as the main question to be decided was the grade of the gravels. None of these samples contained columbium or tantalum. The deposit is practically devoid of these metals and therefore denial of the application is recommended.

The geology of the area is described by H. M. Babcock and K. K. Kendall in "Geology and ground-water resources of the Gila Bend Basin, Maricopa County, Arizona", and by H. N. Wolcott in "Memorandum on Ground-Water Resources and Geology of Rainbow Valley - Waterman Wash Area, Maricopa County, Arizona." These both are open file reports of the Geological Survey, dated respectively February 18, 1948 and February, 1953.

LOCATION AND ACCESSIBILITY

The property consists of sections 14, 15, 21, 22, and 23, T. 2 S., R. 4 W., Maricopa County, Arizona (fig. 2). It is on the north side of Rainbow Valley, which drains southwest to the Gila River.

The area is reached by driving south from Buckeye on the new highway about 7 miles, and then west about 3 miles along the road that follows the El Paso Natural Gas Company pipeline.

GEOLOGY

The Buckeye Hills, trending approximately west and situated immediately north of the property are the bedrock from which the gravels of the Good Earth Placers were eroded. The Hills are composed mainly of granite which Babcock and Kendall classify as "Mesozoic (?)". This granite, in the part of the hills overlooking the property, contains literally dozens of pegmatite dikes which dip moderately to the north, so that the north flank of the hills present the dikes on a dip slope, while the south flank of the hills present the dikes in cross section. From the south the hills show a striking, horizontal banding due to these dikes.

Some of the dikes on lode claim "Rare Earth 15" (fig. 2) were examined. They consist mainly of orthoclase and quartz. They also contain minor amounts of biotite, magnetite and garnet. Epidote is a comparatively rare constituent. A few crystals of euxenite or samarskite 1/8 to 3/4 of an inch in diameter were seen in one place. These crystals were imbedded in coarsely crystalline, pink orthoclase.

The gravels form an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash which drains in a southwesterly direction and is situated one to

two miles from the hills (fig. 2). The drainage between the hills and Rainbow Wash is south to southeasterly as shown in fig. 2. This drainage is not integrated but consists of numerous independent more or less parallel washes. The gravels laid down by these washes are poorly sorted to unsorted and consist of angular to sub-angular fragments generally less than 6 inches in diameter. Much of the gravel has a pale caliche cement. In places the gravel stands in vertical or steep cliffs as much as 15 or 20 feet above the bottoms of the washes. In the bottom of the washes and also in the low divides between them this well-cemented gravel is overlain in most places by a poorly cemented gravel having a darker shade matrix.

GRADE

There has been no production from this property, but a sampling program was undertaken by the applicant in the summer of 1954. This work consisted of digging 46 trenches 6 to 9½ feet deep from which gravel samples weighing 500 to 2000 pounds were taken. Figure 2 shows the location of trenches dug for location purposes. Trenches not shown in figure 2 are those in the shaded area of figure 2, where the testing was done approximately on a 200-foot grid pattern. According to the applicant the sampling showed from 12 to 30 pounds of heavy mineral per cubic yard. His assays of the heavy mineral showed 0.12 to 3.07 percent combined columbium and tantalum.

Twelve check samples (U. S. B. M. Nos. 13151 to 13162) weighing 32 to 85 pounds were taken by the examiners. The location of Nos. 13156 and 13157 is shown in figure 2 and the location of the others is in the shaded area in figure 2, shown in detail in figure 3. The proportion of heavy mineral weight to sample weight checked quite well

with this proportion in the applicant's sample. Assays of the heavy concentrates from these twelve samples, however, indicated in every case that their combined Cb_2O_5 - Ta_2O_5 content was nil. In order to be sure of this fact the examiners returned to the property on April 12 and obtained a 600 pound sample from Pit No. 2 where the applicant had reported an assay of 2.53 percent Cb_2O_5 - Ta_2O_5 from 40 pounds 13.5 ounces of heavy mineral obtained from a 1,420 pound sample. U. S. Bureau of Mines table concentrates and middlings from the 600-pound sample weighed 29.4 pounds and assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. The concentrates alone weighed 22.8 pounds and also assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. All the other material in the 600 pound sample, that is, rejects, and slime, assayed less than 0.02 percent. Most of the applicant's samples were assayed by the Chas. O. Parker Co. of Denver. Uranium assays of the concentrates submitted by the applicant ranged from nil to 0.017 percent, and no evidence was offered of the presence of thorium and rare earths, mentioned together with uranium in the application. In view of the applicant's lack of evidence for uranium, thorium, and rare earths in this deposit, the examiners did not investigate further for these minerals.

CONCLUSIONS AND RECOMMENDATIONS

The Good Earth Placers were found to contain less than trace amounts of Columbium and Tantalum. Though the ground tested by the applicant and the examiners included only a near-surface portion of the gravels, values are not likely to be much, if any, better at depth as these gravels are not of the type favorable to concentrations of heavy minerals. It is recommended, therefore, that government participation in this project be denied.

TRANSMITTED

JUN 14 1955

DMEA
Date Rec'd, RECEIVED
JUN 10 1955 JUN 20 1955
BUREAU OF MINES
Denver, Colorado

June 8, 1955

Memorandum

To: W. N. Trever, Executive Officer, DMEA Field Team, Region III

From: Superintendent, Southwest Experiment Station, Tucson, Arizona

Subject: Field Examination Report, Docket DMEA-3588, Maricopa Minerals Co.'s Good Earth Columbium-Tantalum Placers, Maricopa County, Arizona

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by W. H. Hardwick of the Bureau of Mines and Leonid Bryner of the Geological Survey, and the section on Engineering by Hardwick for the above report. A section on Geology will be submitted by the Geological Survey.

On their first visit to the property, Hardwick and Bryner took 12 large samples to check the results of the applicant's samples. These 12 samples were large so were quartered in the field, then run over a table to obtain a concentrate of black sands. The concentrate then was assayed in the laboratory of the Southwest Experiment Station in Tucson. As no columbium or tantalum was found in the first assays, the samples were analyzed again and also checked with a spectroscope. Some of the samples also were sent to the Intermountain Experiment Station at Salt Lake City for a check. No columbium or tantalum was found.

In order to check these samples, the DMEA examining team returned to the placer deposit and took a 600-pound sample from one of the pits where the applicant had obtained a good columbium-tantalum assay. This large sample was carefully concentrated and the concentrate assayed, but only a trace of columbium-tantalum was found.

Because they could find no appreciable amounts of columbium or tantalum in the placer deposit, the DMEA examiners recommended that Government exploration assistance be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

cc - Trever (orig. & 8)
J. H. Polak
DMEA-DEBC
RF
WRStorms/ts

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

RECEIVED
JUN 20 1955

REPORT OF EXAMINATION BY FIELD TEAM
REGION XIX

DMEA-3586, Maricopa Minerals Co.

Good Earth Columbium-Tantalum Placers

Maricopa County, Arizona

William R. Hardwick, Mining Engineer
U. S. Bureau of Mines

Leonid Bryner, Geologist
U. S. Geological Survey

June 1955

TRANSMITTED
JUN 14 1955
RECEIVED
JUN 20 1955

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By William R. Hardwick [1] and Leonid Bryner [2]

Sewell Thomas, a consulting mining engineer acting for Maricopa Minerals Co., an Oklahoma corporation, presented an application to the Defense Minerals Exploration Administration for Government assistance to explore the Good Earth placer claims in Maricopa County, Arizona, for columbium and tantalum. The application requested assistance in the amount of 75 per cent of the costs of a proposed drilling program estimated to cost $33,000.00. This application, presented under the provisions of the Defense Production Act of 1950, as amended, was docketed DMEA--3586 (Columbium) and was referred to the field for an examination and report.

The Good Earth placer claims are situated in T. 2 S., R. 4 W., Maricopa County, Ariz. The gravels form an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash. This wash drains in a southwesterly direction and is situated one to two miles from the Hills. These gravels are unsorted to poorly sorted, and consist of angular to sub-angular fragments generally less than six inches in diameter in a caliche cement.

The Good Earth placer claims were visited and examined on February 14 and 15, 1955 by William R. Hardwick and Leonid

---

1/ Mining engineer, U. S. Bureau of Mines.

2/ Geologist, U. S. Geological Survey

Brymer. The BMEA examining team was assisted by Sewell Thomas and John L. Smit, the locator of the claims. The examining team cut 12 samples to check the results reported by the applicant. The metallurgical section of the U.S. Bureau of Mines at Tucson reported no columbium or tantalum in these check samples. The claims again were visited on April 12, 1955 and a large 600-pound sample was taken at the test pit where one of the highest grade samples reported by Thomas was taken. This sample was assayed, but no significant amount of columbium or tantalum was found.

There has been no production from this deposit, and as the assays show no columbium or tantalum, there are no ore reserves. It is the conclusion of the examining team that the sample values reported by the applicant do not represent the true value of the ground sampled and that a significant amount of columbium and tantalum will not be discovered by the project.

It is recommended that the application (BMEA-3586) of Maricopa Minerals Co. to explore the Good Earth placer claims for columbium and tantalum be denied.

RECEIVED
JUN 2 0 1955

[illegible], MARICOPA MINERALS CO.
GOLD MINE [illegible]
MARICOPA COUNTY, ARIZONA

Engineering Report

By William H. [illegible], Mining Engineer
U. S. Bureau of Mines

June [illegible]

BMSA-3586, MARICOPA MINERALS CO.
GOOD EARTH COLUMBIUM-TANTALUM PLACERS
MARICOPA COUNTY, ARIZONA

CONTENTS

Page

Engineering report

Introduction ——— 1
Acknowledgments ——— 2
Location, topography and climate ——— 2
History and production ——— 3
Ownership and extent ——— 4
Description of the deposits ——— 4
Ore reserves ——— 6
Present status ——— 7
Proposed exploration ——— 9
Estimated costs ——— 9
Proposed financing ——— 12
Conclusions ——— 12
Recommendations ——— 13
Appendix ——— 14

ILLUSTRATIONS

Figure — Following page

1 Location map ——— 1
2 Claim map and location of proposed drill holes (with Geological Section) ——— 1
3 Map of test pits and assays ——— 6

INTRODUCTION

The Maricopa Minerals Co., an Oklahoma corporation, applied for Government assistance to explore the Good Earth placer claims, Maricopa County, Ariz., for columbium and tantalum (figure 1). The application (DMEA-1586) was received by the Defense Minerals Exploration Administration Field Team, Region III, Denver, Colo., on November 17, 1954, and was forwarded to the Southwest Experiment Station, Tucson, Ariz., on November 29, 1954 for a field examination. The applicant proposed to explore alluvial gravels for columbium and tantalum by churn-drill sample holes. The total estimated cost of the project was $33,000.00.

The Good Earth claims were examined on February 14 and 15, 1955 by Leonid Reymer, geologist, U. S. Geological Survey, and William M. Hardwick, mining engineer, U. S. Bureau of Mines. The examining team was assisted by Sewall Thomas, Consulting Engineer for the applicant, and John L. Holt, owner and original locator of the claims.

Based on a review of the sampling procedure used by Sewall Thomas and the assay results reported by Charles O. Parker & Co., Denver, Colo., an exploration project appeared feasible. However, after the field examination, some changes in the initial application seemed desirable in the sampling plan. These changes were discussed with Sewall Thomas at a conference in Buckeye, Ariz. on February 16, 1955. Mr. Thomas concurred fully with these changes and requested in a letter dated February 24, 1955, that these changes be incorporated in the proposed project.

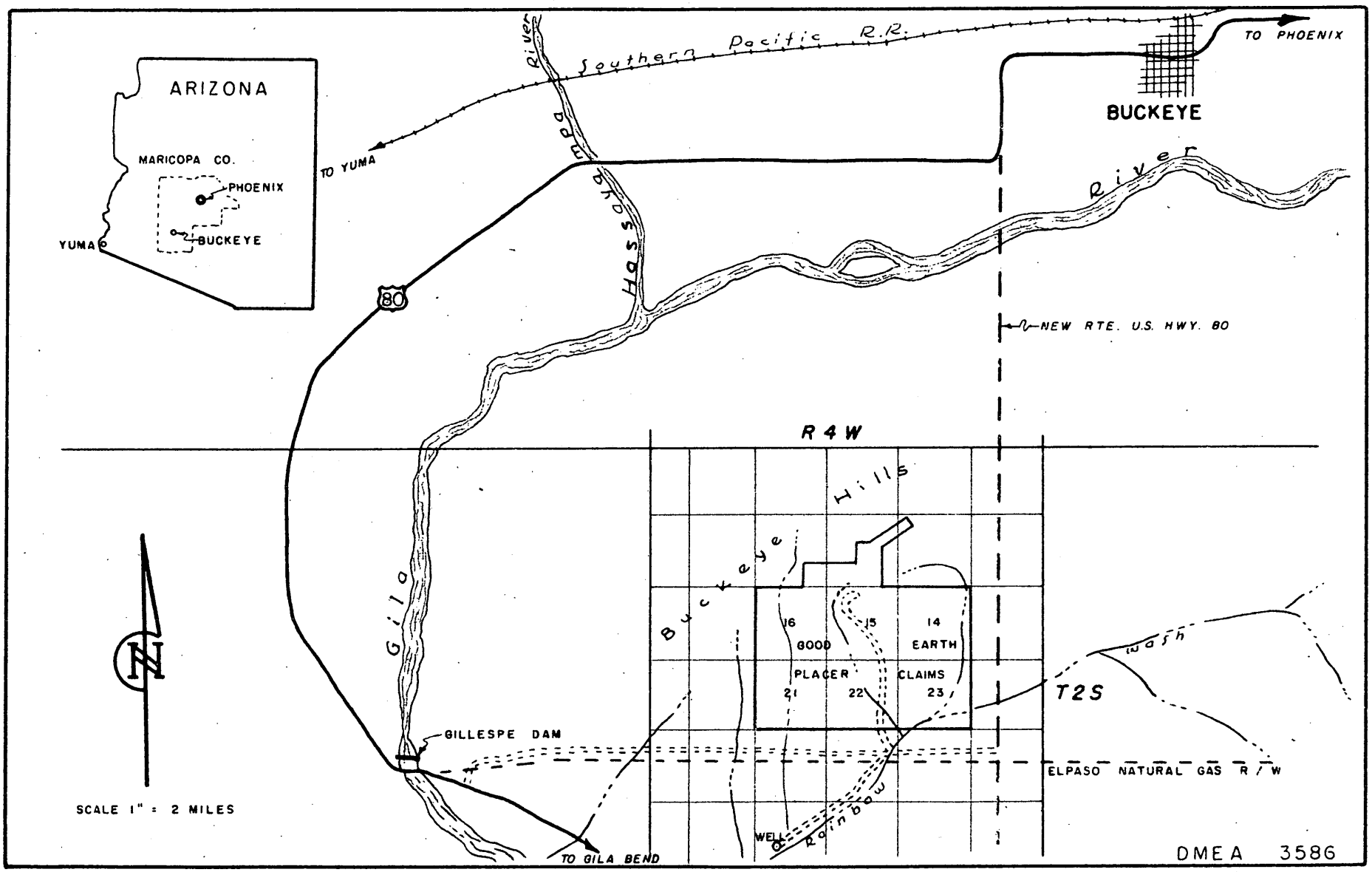


FIGURE - 1 - LOCATION MAP - GOOD EARTH PLACERS
MARICOPA COUNTY. ARIZ.

During the field examination, 12 samples were taken at favorable places on the property. The metallurgical section of the Southwest Experiment Station, U. S. Bureau of Mines, Tucson, Ariz., was unable to detect any columbium or tantalum in these samples, so on April 12, 1955, the Good Earth placer claims again were visited by the examining team. A 600-pound sample was taken at the most favorable location that had been reported by Sewell Thomas. This sample also showed no significant amounts of columbium or tantalum.

ACKNOWLEDGMENTS

Acknowledgment is due the efforts of Sewell Thomas, Consulting Mining Engineer, in showing the examining team over the property, and to John R. Malt, owner of the Good Earth placer claims, who supplied information and assistance during the field examination.

LOCATION, TOPOGRAPHY AND CLIMATE

The Good Earth placer claims are situated in Secs. 14, 15, 16, 21, 22 and 23, T. 2 S., R. 4 W., Maricopa County, Ariz. The claims are on the south side of the Buckeye Hills and on the north edge of Rainbow Valley. They may be reached by driving south from the town of Buckeye, Ariz. along the new route of U. S. Highway 80 (now under construction) for a distance of 12 miles to the point where El Paso Natural Gas Co.'s pipe line crosses the highway. Turn west along the pipe line right-of-way and travel 1.5 miles to the center of the southern part of the group of claims.

The Rare Earth lode claims are located along the south side of a rugged ridge. The Good Earth placer claims are located

on the alluvial fans formed by small arroyos that flow south into Rainbow Wash. The ground slopes southward at the rate of from 100 to 200 feet per mile and is cut by washes and low alluvial ridges. The difference in elevation from top of ridge to bottom of wash may be as much as 30 feet in some places, but probably averages about 20 feet. The elevation above sea level is 900 feet at the south end of the claim group and 1,100 to 1,200 feet at the north end.

The vegetation is typical of the southwestern desert. The ridges are sparsely covered with brush and cacti, while palo verde and mesquite grow along the washes. The rainfall may vary from 5 to 10 inches per year, and probably averages about 7 inches, most of which comes in July and August as torrential thunder storms.

The climate is mild in the winter and hot in the summer. Temperatures as high as 130° F. are not unusual in the summertime.

The Southern Pacific railway has a station at Buckeye, a distance of 12 miles from the claims. The main pipe line of El Paso Natural Gas Co. crosses the southern edge of the claims, and the new route of U. S. Highway 80 will cross the eastern edge. Electric power is available from a transmission line in the center of Rainbow Valley, approximately 4 miles from the center of the group. Water can be developed on the southern claims.

HISTORY AND PRODUCTION

There has been no production from the Good Earth placer claims. Small lots of high-grade "heavy minerals" have been mined from the pegmatite dikes on the Rare Earth lode claims. No sale

of this specimen material for its mineral content has been reported.

OWNERSHIP AND EXTENT

The Rare Earth lode claims 1 to 5, and the Gold Earth placer claims 1 to 12 were located by John L. and Viola M. Holt. These claims now are held by the Marionga Minerals Co. under a "lease and option to purchase" agreement. This option provides for a purchase price of $100,000.00. The lease provides for payment of a minimum sum of $400.00 per month, or royalty on production at the rate of 5 per cent, whichever is the larger sum. All payments are to be applied to reduce the purchase price.

Since the execution of the lease and option with the Holts, the Marionga Minerals Co. has located additional placer claims surrounding the initial group.

DESCRIPTION OF THE DEPOSIT

The general geology of the deposit is described in a separate report by Leonid Beyer, consulting geologist.

The Gold Earth placer gravels are deposited along the south side of the Rushoya Hills. The valuable minerals, columbium and tantalum, are reported to come from a system of pegmatite dikes that have been partly eroded. The gravels vary in depth from zero at the south edge of the Rushoya Hills to an undetermined depth at the south edge of secs. 31,32 and 33, some 2 miles from the edge of the hills. A well has been drilled to a depth of 300 feet in sec. 32, just south of the claims. This well did not penetrate bedrock.

Sewell Thomas estimated in the initial application that

the average depth to bedrock would be 15 feet. He also assumed that the gravels were underlain by a relatively smooth pediment. However, it has been the experience of the examining engineer that in this desert country where shallow gravels are underlain by a pediment, numerous outcrops occur. Where no outcrops occur, the bedrock usually drops rapidly away from the hills. At a distance of a mile from the hills, the depth to bedrock may be from 300 to 500 feet. This feature was pointed out during the examination and herein therefore has modified the proposed program to incorporate the possibility of deep gravel at the starting location.

The gravels represent a series of coalescing alluvial fans that were formed by washes draining southward from Dunlap Hills to Antelope Wash. In the vicinity of the shaded area shown on figure 2, the gravel consists of rounded to sub-angular boulders and fine sand. The size of the boulders increases toward the edge of the hills, and they become more plentiful.

The gravels were estimated to consist of from one-fourth to one-third quartz and feldspar fragments. The remainder was weathered dark-colored granite. Except for the loose material in the recent wash beds, the gravels were cemented with caliche.

In two samples taken, most of them in or near the shaded area of figure 2, all of the sandy material was less than 10 mesh in size. Large pieces (one inch in diameter) were reported to have been found at the edge of the hills by John L. Smith. None were observed by the examining team.

ORE RESERVES

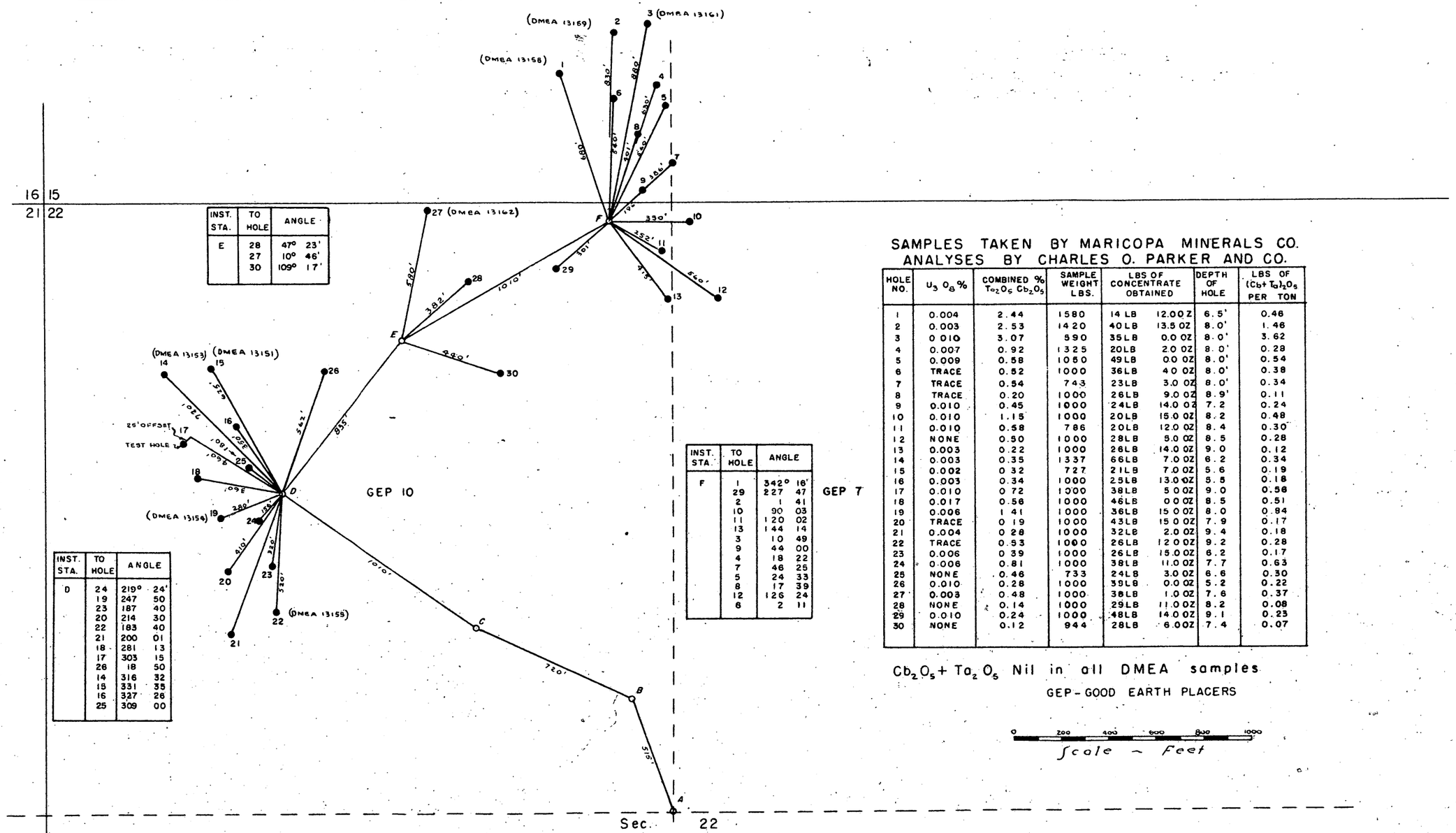
With a hoe-type power shovel, 30 test holes were dug to a depth of from 6 to 8 feet by Maricopa Minerals Co. A sample was cut from each hole with the bucket of the shovel. These samples ranged in size from 500 to 2,000 pounds. They were trucked to water, screened wet, and processed in a mechanical pan which made a concentrate that ranged in size from 14 pounds 10 ounces to 49 pounds. This concentrate was assayed for columbium and tantalum by Charles O. Parker & Co., Denver, Colo. The results of the Parker assays ranged from 0.12 to 1.07 percent combined columbium-tantalum pentoxide. Based on the assay results of Parker, Sewell Thomas has inferred 625,000 cubic yards of gravel that contains 0.052[1/] percent combined columbium-tantalum pentoxide, or approximately one pound per ton.

Twelve samples were taken by the DMEA examining team during the field examination and later a 600 pound sample was taken from the most favorable location. None of these samples contained more than a trace of columbium-tantalum pentoxide. Therefore, no ore is inferred by the examining team.

The 30 samples taken by the applicant are shown on figures 2 and 3. The locations of the 12 samples taken at the time of the DMEA field examination also are shown on figures 2 and 3. The results of the applicant and the DMEA examining team are compared in Table I.

When all 12 of the check samples failed to show any

1/ Due to a typographical error this figure was reported as 0.53 percent by Sewell Thomas in the statement attached to the original application.



INST. STA.	TO HOLE	ANGLE
E	28	47° 23'
	27	10° 46'
	30	109° 17'

INST. STA.	TO HOLE	ANGLE
D	24	219° 24'
	19	247 50
	23	187 40
	20	214 30
	22	183 40
	21	200 01
	18	281 13
	17	303 15
	26	18 50
	14	316 32
	15	331 35
	16	327 26
	25	309 00

INST. STA.	TO HOLE	ANGLE
F	1	342° 16'
	29	227 47
	2	1 41
	10	90 03
	11	120 02
	13	144 14
	3	10 49
	9	44 00
	4	18 22
	7	46 25
	5	24 33
	8	17 39
	12	126 24
	6	2 11

SAMPLES TAKEN BY MARICOPA MINERALS CO.
ANALYSES BY CHARLES O. PARKER AND CO.

HOLE NO.	U_3O_8 %	COMBINED % Ta_2O_5 Cb_2O_5	SAMPLE WEIGHT LBS.	LBS OF CONCENTRATE OBTAINED		DEPTH OF HOLE	LBS OF $(Cb+Ta)_2O_5$ PER TON
1	0.004	2.44	1580	14 LB	12.00 Z	6.5'	0.46
2	0.003	2.53	1420	40 LB	13.5 OZ	8.0'	1.46
3	0 010	3.07	590	35 LB	0.0 OZ	8.0'	3.62
4	0.007	0.92	1325	20 LB	2.0 OZ	8.0'	0.28
5	0.009	0.58	1050	49 LB	0.0 OZ	8.0'	0.54
6	TRACE	0.52	1000	36 LB	4 0 OZ	8.0'	0.38
7	TRACE	0.54	743	23 LB	3.0 OZ	8.0'	0.34
8	TRACE	0.20	1000	26 LB	9.0 OZ	8.9'	0.11
9	0.010	0.45	1000	24 LB	14.0 OZ	7.2	0.24
10	0.010	1.15	1000	20 LB	15.0 OZ	8.2	0.48
11	0.010	0.58	786	20 LB	12.0 OZ	8.4	0.30
12	NONE	0.50	1000	28 LB	5.0 OZ	8.5	0.28
13	0.003	0.22	1000	26 LB	14.0 OZ	9.0	0.12
14	0.003	0.35	1337	66 LB	7.0 OZ	6.2	0.34
15	0.002	0 32	727	21 LB	7.0 OZ	5.6	0.19
16	0.003	0.34	1000	25 LB	13.0 OZ	5.5	0.18
17	0.010	0 72	1000	38 LB	5 0 OZ	9.0	0.56
18	0.017	0.56	1000	46 LB	0 0 OZ	8.5	0.51
19	0.006	1 41	1000	36 LB	15 0 OZ	8.0	0.84
20	TRACE	0 19	1000	43 LB	15 0 OZ	7.9	0.17
21	0.004	0 28	1000	32 LB	2.0 OZ	9.4	0.18
22	TRACE	0.53	1000	26 LB	12 0 OZ	9.2	0.28
23	0.006	0 39	1000	26 LB	15.0 OZ	6.2	0.17
24	0.006	0.81	1000	38 LB	11.0 OZ	7.7	0.63
25	NONE	0.46	733	24 LB	3.0 OZ	6.6	0.30
26	0.010	0.28	1000	39 LB	0.0 OZ	5.2	0.22
27	0.003	0.48	1000	38 LB	1.0 OZ	7.6	0.37
28	NONE	0.14	1000	29 LB	11.0 OZ	8.2	0.08
29	0.010	0.24	1000	48 LB	14.0 OZ	9.1	0.23
30	NONE	0.12	944	28 LB	6.0 OZ	7.4	0.07

$Cb_2O_5 + Ta_2O_5$ Nil in all DMEA samples

GEP - GOOD EARTH PLACERS

FIGURE 3
MARICOPA MINERALS INC.
MAP OF SAMPLE PITS & ASSAYS OF CONCENTRATE
WORK DONE JULY 1954
DMEA 3586

columbium, the analyses were repeated in Tucson, and portions of the pulps also were sent to the Bureau's Salt Lake City laboratory to be checked by the metallurgical section at that station. These checks confirmed the original analyses.

The sampling procedure followed by the applicant had been duplicated as nearly as practical by the BMEA examining team. The 12 samples were cut by hand from the sides of the same pits, and therefore were smaller than the samples which were cut by the applicant with a power shovel.

In order to check the sampling procedure, the examining team returned to the Good Earth placer claims on April 12, 1955 and cut a 600-pound sample from pit No. 2. One of the applicant's highest grade samples came from this location. The results of this sample showed only a trace of columbium and tantalum. The results of the metallurgical work on this project are covered in the attached report, RI-379-1, "Concentration of Placer Gravel from the Good Earth Claims, Maricopa County", by F. N. Bender and N. R. Crume.

PRESENT STATUS

During the summer of 1954, after control of the property was acquired by Maricopa Mineral[illegible]als Co., 30 test holes were dug with a back-hoe. The location of these holes is shown by the shaded area on figure 2 and in more detail on figure 3. Other than location pits and the test pits mentioned above, no work has been done on the Good Earth placer claims.

Table 1. Comparison of Applicant's Samples and Samples by DMEA Examining Team.

Samples by Sewell Thomas. Analyses by Charles O. Parker & Co., Denver, Colo.					Samples by DMEA Examining Team. Analyses by Metallurgical Section of Bureau of Mines.			
Sample No.	Sample Weight, Pounds	Weight of Concentrate, lbs.	oz.	Percent $(Cb-Ta)_2O_5$	Sample No.	Sample Weight, Pounds*	Weight of Concentrate, Pounds	Percent $(Cb-Ta)_2O_5$
15	727	21	7.0	0.32	13151	62.25	0.533	Nil
14	1,337	66	7.0	0.35	13153	51.50	2.485	Nil
19	1,000	85	15.0	1.41	13154	39.25	1.990	Nil
22	1,000	26	12.0	0.53	13155	57.00	1.616	Nil
1	1,590	14	12.0	2.44	13158	37.50	1.287	Nil
2	1,420	40	13.5	2.53	13159	83.50	4.458	Nil
3	590	35		3.07	13161	49.50	2.180	Nil
27	1,000	38	1.0	0.48	13162	35.50	2.092	Nil
					13152	35.50	0.962	Nil
					13156	32.00	1.153	Nil
					13157	32.25	0.935	Nil
					13160	34.25	1.107	Nil

* Larger samples were taken in the field and quartered to the reported weight.

PROPOSED EXPLORATION

The initial application proposed sample holes drilled to bedrock and spaced 200 feet apart. A gridwork in four different areas was proposed. The selection of these different areas was based on the results of sampling shallow test pits.

During the field examination it was pointed out to Thomas that his estimate of the depth of bedrock might be in error, and that concentrations of heavy minerals might be more variable vertically than horizontally. Therefore, Thomas revised his original proposal and in the revision, proposed to drill two rows of sample holes across the drainage pattern. These holes would be 2,000 to 3,000 feet from each other. Based on the results of these widely spaced holes, Thomas expected to select an area that would be drilled on 200-foot squares.

EXPERIENCE CORES

The backers of Saratoga Minerals Co. are connected with oil exploration work in Oklahoma. They proposed to furnish their own drilling equipment and to do all of the proposed exploration on their own account. Donald Thomas, an experienced mining engineer, would supervise the project.

Labor and supplies are available in Buckeye, 12 miles from the claims, or in Phoenix, 40 miles distant. The wage rates proposed by the applicant are somewhat higher than those at the nearby mines, but are about the same as those paid by construction projects in the area. Power is available at the mill in sec. 33,

The applicant proposes to use this well for a water supply source.

The drilling costs proposed by the applicant are summarized below. They are based on a one-shift operation and an estimated advance of 18 feet per day.

Item	Cost per Day	Cost per Foot
Labor	$	$ 6.07
Supervision and consultants		3.67
Operating materials and supplies		1.77
Operating equipment rental		4.33
Miscellaneous		
Moving equipment in and out		1.00
Rehabilitating well and pump		0.20
Repairs and maintenance	7.50	
Assays, 1 sample per day	30.00	
Accounting	5.00	
Comp. employee liab., Ret., Soc. & payroll tax	12.50	
	$54.00	3.66
Contingencies		1.00
Grand total per foot of hole		$ 21.70

The costs proposed by the applicant seem excessive. In 1966, a series of 9-inch churn-drill sample holes were drilled some 60 miles south of the Good Earth placer claims in similar gravel. These holes were drilled under the supervision of the [illegible] consulting engineer. The depths of the holes varied between 400 and 700 feet.

The cost, including labor, supplies, sampling at 5-foot intervals, and hauling water from 2 to 7 miles (but not including depreciation on equipment and casing) was slightly less than $6.00 per foot. The rate of advance was approximately 30 feet per shift. The holes were cased.

Assuming an advance of 25 feet per day and using the wage rates, supply costs, and equipment values proposed by the applicant, the following costs are estimated. They seem reasonable.

Labor	Per Day	Per Foot
2 Drillers @ $2.50 per hour	$ 40.00	
1 Runner @ $2.75 per hour	22.00	
1 Truck driver @ $2.00 per hour	16.00	
1 Roustabout @ $1.50 per hour	12.00	
1 Supervisor	25.00	
Total labor	$115.00	$ 4.60
Comp. Employee Liab., Soc. Sec. & Payroll tax (15%)		0.69
Operating materials and supplies		1.05
Depreciation of equipment		0.50
Miscellaneous		
Moving equipment in and out		1.00
Installation of water pump		0.20
Road preparation		0.50
Equipment repairs		0.50
Contingencies		0.50
Cost of drilling hole		$ 9.24

Assaying at 10-foot intervals ————————	$4.00
Grand total, drilling and sampling ————————	$ 13.34

In comparing the two estimates, the largest single difference is in the item, "Estimated rental or depreciation". The applicant has used a rental or use-allowance figure of $85.00 per day for equipment, which it values at $25,780.00. The examining engineer (using the same values for equipment) has used a 60-month depreciation rate and 25 working days per month to arrive at a figure of $17.17 per day.

The price for a columbium-tantalum assay is $60.00 for a single sample, or $40.00 per sample in quantities of 20 or more. 2/ This is equal to a cost of $2.00 per foot of drill hole for a 20-foot sample interval, or $4.00 per foot if samples are taken for each 10 feet.

PROPOSED FINANCING

Marlboro Minerals Co. proposes to furnish 25 percent of the cost of the proposed exploration. It has requested in the application for assistance, that the Defense Minerals Exploration Administration furnish 75 percent of the costs under the provisions of the Defense Production Act of 1950, as amended.

CONCLUSIONS

Columbium and tantalum have become increasingly important

2/ Personal communication, Ledoux & Co., 359 Alfred Ave., Teaneck, N. J.

in the last five years as a constituent of certain alloys designed for use at high temperatures. As the volume of gravel on the Good Earth placer claims is large and low cost recovery methods could be used, even very low-grade material indicated by the Parker analyses might provide a substantial amount of these important products.

However, sampling by the DMEA examining team and test work by the metallurgical section of the Southwest Experiment Station, Bureau of Mines, indicate that the amount of columbium and tantalum in the gravel is not significant, and that the sampling results presented by the applicant do not represent the true columbium and tantalum content of the gravel.

RECOMMENDATIONS

It seems probable that a significant amount of columbium and tantalum will not be found by the proposed exploration. Therefore, it is recommended that the application (DMEA-1324) of Maricopa Minerals Co. for Government assistance to explore the Good Earth placer claims be denied.

OFFICIAL USE ONLY

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

DIVISION OF MINERAL TECHNOLOGY, REGION III

J. Bruce Clemmer, Chief

TMR-379-1

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS, MARICOPA COUNTY, ARIZONA

BMSA Project - 3506

By: F.N. Bender and R.R. Grace

May 9 - 1955

SOUTHWEST EXPERIMENT STATION
Carl Rampacek, Supervising Metallurgist
Tucson, Arizona

OFFICIAL USE ONLY

CONCENTRATION OF PLACER GRAVEL FROM THE GOOD EARTH CLAIMS MARICOPA COUNTY, ARIZONA - BMSA Project - 1886

By: F.N. Sander and R.R. Grace

Introduction and Summary

On March 21, 1945, V.R. Murdoch, consulting mining engineer for BMSA project 1886, submitted twelve samples of placer gravel from the Good Earth Placer Claims, Maricopa County, Arizona, for gravity concentration tests to determine if they contained any recoverable columbium or tantalum. The samples were concentrated by a simple sluicing and tabling treatment outlined by Mr. Murdoch which reportedly had proved successful for recovering tantalum and columbium-enriched concentrates from the material. However, chemical analyses, qualitative spectroscopic analyses and microscopic examination of the concentrates recovered by this procedure failed to detect either columbium or tantalum or their minerals. On April 13, 1945, approximately 500 pounds of the gravel were submitted by Mr. Murdoch for more comprehensive metallurgical testing to ascertain if the simplified procedure had been in error. The material was obtained from a pit in the deposit which reportedly had shown a high columbium-tantalum content. Concentrates and reject products recovered by washing, screening, desliming, classification and tabling were analyzed for the rare metals but they also proved negative.

Description of the Samples

The twelve original samples, numbers 13141 to 13152, inclusive, varied in weight between 22 and 61 pounds, and consisted principally of quartz and feldspar gravel loosely consolidated with substantial quantities of clay and caliche. When soaked in water for a short time and agitated slowly, the caliche and clays disintegrated and liberated the gravel which ranged in size from slime to pebbles, 2-1/2 inches in diameter. The large lot of material was similar mineralogically and chemically to the smaller samples and was obtained from the same prospect pit as sample 13139.

Procedure and Results

A simple washing, screening, desliming and tabling treatment was applied to the original twelve samples in order to recover a heavy mineral product in which the columbium and tantalum minerals would be concentrated if they were present. The procedure consisted of first soaking each individual sample in water and then mildly scrubbing the pulp by moving it about with the aid of a hoe in order to slake

the clays and disintegrate the loosely consolidated gravel. The pulp was then screened at 16 mesh and the screen oversize was washed with water to remove any adhering slimes and fines. The screen undersize product was declimed at about 100 mesh in order to obtain a 100 to 16-mesh feed for tabling; slimes and the screen oversize gravel were combined and rejected. No attempt was made to produce high-grade heavy mineral concentrates by tabling as a maximum recovery of the heavy minerals was the primary objective. A concentrate, middling and tailing product first was recovered in each test. The middling fraction then was examined for heavy minerals and if some were present it was combined with the concentrates, otherwise it was rejected to the tailing. The table concentrates were individually analyzed for contained columbium and tantalum oxides while the screen oversize, table rejects and slimes were weighed and discarded. Results of the washing, screening and tabling tests on the twelve samples are summarized in Table 1.

Table 1. Results of Washing, Screening and Tabling Tests on Twelve Original Samples of Placer Gravel

Sample No.	Sample Weight, lb.	Table Concentrate Weight, lb.	Table Concentrate Weight, percent	Table Concentrate Assay, percent (Cb$_2$O$_5$ + Ta$_2$O$_5$)
1R51	42.25	0.525	0.86	Nil
1R52	35.50	0.965	1.71	"
1R53	51.50	2.485	4.83	"
1R54	38.25	1.990	5.07	"
1R55	57.00	1.615	2.84	"
1R56	32.00	1.153	3.60	"
1R57	35.25	0.935	2.90	"
1R58	37.50	1.287	3.43	"
1R59	53.00	4.488	8.34	"
1R60	34.25	1.187	3.33	"
1R61	40.50	1.186	4.40	"
1R62	25.50	2.002	5.00	"

The concentrates recovered in the tabling runs consisted principally of magnetite, ilmenite, hematite and sphene with minor quantities of garnet, zircon and other accessory minerals. Qualitative spectroscopic analyses of the concentrates as well as on chemical precipitates from the concentrates failed to detect any tantalum or columbium. In addition, the concentrates were examined under the microscope for tantalum or columbium but none was found.

A more thorough metallurgical investigation was made on the 600-pound sample to ascertain if the simplified procedure had been in error. The gravel first was scrutinized, screened on 10-mesh and washed according to the same procedure used for the smaller samples after which the minus 10-mesh pulp was hydraulically classified into 3 spigot products and a minus 200-mesh slime overflow. Each of the spigot products was tabled separately to obtain a concentrate, middling and tailing. The table middling then was remilled to recover an additional small quantity of free and interlocked heavy mineral which was combined with the concentrate. The remilled reject was set aside as a true middling. The table concentrates, middlings and tailings recovered from the different spigot products were ultimately combined for weighing and assaying. Chemical analyses also were made on the classifier overflow slimes and the 10-mesh screen oversize. Results of washing, screening, classification and tabling tests on this sample are summarized in Table 2. The chemical analyses of the feed and different products failed to detect more than a trace of combined tantalum and columbium oxides. Microscopic examination of the gravel and table products for columbium and tantalum content as well as qualitative spectroscopic analyses of the products and chemical precipitates derived from the table concentrates also proved unfruitful.

Table 2. Results of Classification and Tabling Tests on 600-pound Sample of Good Earth Placer Gravel.

Product	Weight, Percent	Assay, Percent (Grade - Tenor)
plus 10-mesh gravel reject	35.3	<0.01
minus 10 plus 200-mesh table concentrate	3.8	<0.06
minus 10 plus 200-mesh table middling	1.1	<0.02
minus 10 plus 200-mesh table tailing	35.3	<0.01
Composite table feed	35.1	—
minus 200-mesh slime	22.4	<0.02
Composite head	100.0	<0.02
Determined head		<0.01

Conclusions

Gravity concentration tests and complementary chemical analyses on twelve small prospect samples and a 600-pound pit sample from the Good Earth placer deposit have failed to establish the presence of either columbium or tantalum. Traces of the two elements were detected in the large sample but the quantity found was insignificant.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RECEIVED JUN 10 1955

DMEA Date Rec'd JUN 10 1955

Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

BUREAU OF MINES
Denver, Colorado

June 10, 1955

TRANSMITTED
JUN 14 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3596 (Columbium, tantalum, thorium, uranium, rare earths), Maricopa Minerals, Inc., Good Earth Placer claims, Maricopa County, Arizona

Enclosed are the original and 8 copies of a geologic report by Leonid Bryner, U. S. Geological Survey, covering his examination of the Good Earth Placer claims.

The concentrates from 12 samples of representative material processed and analyzed in the U. S. Bureau of Mines laboratories are reported to contain no columbium or tantalum. Concentrates from a 600-pound check sample similarly processed and analyzed are reported to contain less than 0.05 percent combined columbium and tantalum. The applicant's samples contained less than 0.02 percent U_3O_8 and he presented no evidence of the presence of thorium or rare earth in the deposits.

I concur in Bryner's recommendation that the application for exploration assistance be denied.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (9)

ENHarshman:arh

MINERAL RESOURCES
RECEIVED
JUN 9 1955
U.S.
GEOLOGICAL SURVEY
DENVER, COLORADO

RECEIVED
JUN 20 1955

Box 4125 University Station
Tucson, Arizona

June 6, 1955

TRANSMITTED
JUN 14 1955

MEMORANDUM

To: Mr. K. E. Burnham

From: J. H. Faick

Subject: [redacted] Project 3566 (Columbium-Tantalum)
[redacted] Placers, Maricopa Minerals Company;
Maricopa County, Arizona.

Enclosed are the original and 8 copies of a geological report by Leonid Beyer on the field examination of the above property. Columbium and tantalum were not found in the placer deposits; therefore, it is recommended that the application be denied. This report has my approval.

One copy of the brochure is enclosed.

John H. Faick

John H. Faick

JHF:mm

cc: Burnham - 8
Stone

MINE
RE
JUN 0
GEOLOGICAL SURVEY
DENVER, COLORADO

U. S. DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEPARTMENTAL MINERALS EXPLORATION AGREEMENT

REGION XXI

[redacted]

EXPLORATION REPORT

DMEA 3056

MARICOPA MINERALS, INC.
[redacted]
MARICOPA COUNTY, ARIZONA

(Columbian-Tantalum)

By
Leonid Enzner
Geologist
U. S. Geological Survey

June 6, 1955

RECEIVED
JUN 20 1955

U. S. DEPARTMENT OF THE INTERIOR
BUREAU MINERALS EXPLORATION ADMINISTRATION
FIELD TEAM XIX

EXAMINATION REPORT

TMEA 1556
MARICOPA MINERALS, INC.
GOOD HOPE FLAGSTAFF CLAIMS
MARICOPA COUNTY, ARIZONA
(Columbium-Tantalum)

CONTENTS

	Page
INTRODUCTION	1
LOCATION AND ACCESSIBILITY	2
GEOLOGY	2
GRADE	3
CONCLUSIONS AND RECOMMENDATIONS	4

ILLUSTRATIONS

Fig. 1	Location Map	See Engineering Report
Fig. 2	Map of the project area	Following page 2
Fig. 3	Assay Map	See Engineering Report

INTRODUCTION

In an application to the Defense Minerals Exploration Administration, dated November 16, 1954, Sewall Thomas, consulting engineer and official representative for the Maricopa Minerals Company, requested government participation in a program estimated to cost $22,500, to explore for Columbium, Tantalum, Uranium, Thorium and Rare Earths at the Great Earth Placers, Maricopa County, Arizona.

The property was examined on February 14 and 15, 1955, by Leonid Beyer of the U. S. Geological Survey and W. R. Hardwick of the U. S. Bureau of Mines. The examiners were assisted by Sewall Thomas and John L. Holt. Holt and his wife, Viola V. Holt, are the owners of the property. They have leased the ground to Maricopa Minerals Company.

The examination consisted mainly of taking 12 check samples from numerous test pits, as the main question to be decided was the grade of the gravels. None of these samples contained columbium or tantalum. The deposit is practically devoid of these metals and therefore denial of the application is recommended.

The geology of the area is described by E. H. Debenek and E. H. Kendall in "Geology and ground-water resources of the Gila Bend Basin, Maricopa County, Arizona", and by E. H. Velasco in "Reconnaissance on Ground-Water Resources and Geology of Rainbow Valley - Waterman Wash Area, Maricopa County, Arizona." These both are open file reports of the Geological Survey, dated respectively February 18, 1948 and February, 1953.

LOCATION AND ACCESSIBILITY

The property consists of sections 14, 15, 21, 22, and 23, T. 2 S., R. 4 W., Maricopa County, Arizona (fig. 2). It is on the north side of Rainbow Valley, which drains southwest to the Gila River.

The area is reached by driving south from Buckeye on the new highway about 7 miles, and then west about 3 miles along the road that follows the El Paso Natural Gas Company pipeline.

GEOLOGY

The Buckeye Hills, trending approximately west and situated immediately north of the property are the bedrock from which the gravels of the Good Earth Fissure were created. The Hills are composed mainly of granite which Babcock and Hendall classify as "Ancosaic (?)". This granite, in the part of the hills overlooking the property, contains literally dozens of pegmatite dikes which dip moderately to the north, so that the north flank of the hills presents the dikes on a dip slope, while the south flank of the hills presents the dikes in cross section. From the south the hills show a striking, horizontal banding due to these dikes.

Some of the dikes on lode claim "Sure Earth 15" (fig. 2) were examined. They consist mainly of orthoclase and quartz. They also contain minor amounts of biotite, magnetite and garnet. Epidote is a comparatively rare constituent. A few crystals of columbite or samarskite 1/8 to 3/4 of an inch in diameter were seen in one place. These crystals were imbedded in coarsely crystalline, pink orthoclase.

The gravels from an extensive apron sloping about 3 degrees in a southerly direction from the foot of the Buckeye Hills to Rainbow Wash which drains in a southwesterly direction and is situated one to

two miles from the hills (fig. 2). The drainage between the hills and Rainbow Wash is south to southeasterly as shown in fig. 2. This drainage is not integrated but consists of numerous independent more or less parallel washes. The gravels laid down by these washes are poorly sorted to unsorted and consist of angular to sub-angular fragments generally less than 6 inches in diameter. Much of the gravel has a pale caliche cement. In places the gravel stands in vertical or steep cliffs as much as 15 or 20 feet above the bottoms of the washes. In the bottom of the washes and also in the low divides between them this well-cemented gravel is overlain in most places by a poorly cemented gravel having a darker shade matrix.

GRADE

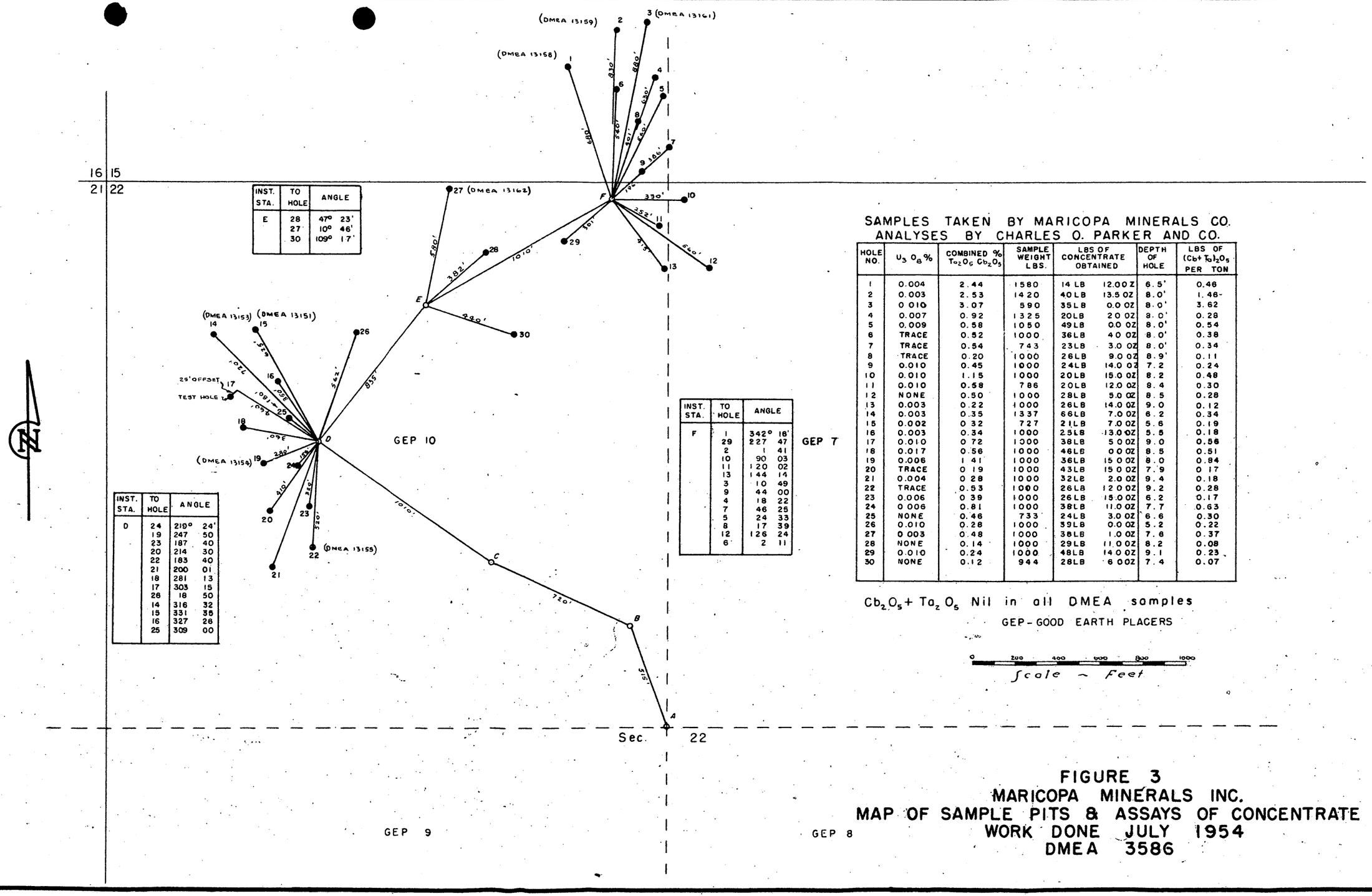
There has been no production from this property, but a sampling program was undertaken by the applicant in the summer of 1954. This work consisted of digging 46 trenches 6 to 8½ feet deep from which gravel samples weighing 300 to 2000 pounds were taken. Figure 2 shows the location of trenches dug for location purposes. Trenches not shown in figure 2 are those in the shaded area of figure 2, where the testing was done approximately on a 200-foot grid pattern. According to the applicant the sampling showed from 12 to 30 pounds of heavy mineral per cubic yard. His assays of the heavy mineral showed 0.12 to 3.07 percent combined columbium and tantalum.

Twelve check samples (U. S. B. M. Nos. 13151 to 13162) weighing 32 to 85 pounds were taken by the examiners. The location of Nos. 13156 and 13157 is shown in figure 2 and the location of the others is in the shaded area in figure 2, shown in detail in figure 3. The proportion of heavy mineral weight to sample weight checked quite well

with this proportion in the applicant's sample. Assays of the heavy concentrates from these twelve samples, however, indicated in every case that their combined Cb_2O_5 - Ta_2O_5 content was nil. In order to be sure of this fact the examiners returned to the property on April 12 and obtained a 600 pound sample from Pit No. 2 where the applicant had reported an assay of 8.53 percent Cb_2O_5 - Ta_2O_5 from 48 pounds 13.5 ounces of heavy mineral obtained from a 1,400 pound sample. U. S. Bureau of Mines table concentrates and middlings from the 600-pound sample weighed 29.4 pounds and assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. The concentrates alone weighed 22.8 pounds and also assayed less than 0.05 percent Cb_2O_5 - Ta_2O_5. All the other material in the 600 pound sample, that is, rejects, and slime, assayed less than 0.02 percent. Most of the applicant's samples were assayed by the Chas. A. Pender Co. of Denver. Uranium assays of the concentrates submitted by the applicant ranged from nil to 0.017 percent, and no evidence was offered of the presence of thorium and rare earths, mentioned together with uranium in the application. In view of the applicant's lack of evidence for uranium, thorium, and rare earths in this deposit, the examiners did not investigate further for these minerals.

CONCLUSIONS AND RECOMMENDATIONS

The Red Hawk Placers were found to contain less than trace amounts of Columbium and Tantalum. Though the ground tested by the applicant and the examiners included only a near-surface portion of the gravels, values are not likely to be much, if any, better at depth as these gravels are not of the type favorable to concentrations of heavy minerals. It is recommended, therefore, that government participation in this project be denied.



INST. STA.	TO HOLE	ANGLE
E	28	47° 23'
	27	10° 46'
	30	109° 17'

INST. STA.	TO HOLE	ANGLE
D	24	219° 24'
	19	247 50
	23	187 40
	20	214 30
	22	183 40
	21	200 01
	18	281 13
	17	303 15
	26	18 50
	14	316 32
	15	331 35
	16	327 26
	25	309 00

INST. STA.	TO HOLE	ANGLE
F	1	342° 18'
	29	227 47
	2	1 41
	10	90 03
	11	120 02
	13	144 14
	3	10 49
	9	44 00
	4	18 22
	7	46 25
	5	24 33
	8	17 39
	12	126 24
	6	2 11

SAMPLES TAKEN BY MARICOPA MINERALS CO.
ANALYSES BY CHARLES O. PARKER AND CO.

HOLE NO.	U_3O_8 %	COMBINED % Ta_2O_5 Cb_2O_5	SAMPLE WEIGHT LBS.	LBS OF CONCENTRATE OBTAINED	DEPTH OF HOLE	LBS OF $(Cb+Ta)_2O_5$ PER TON
1	0.004	2.44	1580	14 LB 12.00 Z	6.5'	0.46
2	0.003	2.53	1420	40 LB 13.5 OZ	8.0'	1.46
3	0.010	3.07	590	35 LB 0.0 OZ	8.0'	3.62
4	0.007	0.92	1325	20 LB 2.0 OZ	8.0'	0.28
5	0.009	0.58	1050	49 LB 0.0 OZ	8.0'	0.54
6	TRACE	0.52	1000	36 LB 4.0 OZ	8.0'	0.38
7	TRACE	0.54	743	23 LB 3.0 OZ	8.0'	0.34
8	TRACE	0.20	1000	26 LB 9.0 OZ	8.9'	0.11
9	0.010	0.45	1000	24 LB 14.0 OZ	7.2	0.24
10	0.010	1.15	1000	20 LB 15.0 OZ	8.2	0.48
11	0.010	0.58	786	20 LB 12.0 OZ	8.4	0.30
12	NONE	0.50	1000	28 LB 5.0 OZ	8.5	0.28
13	0.003	0.22	1000	26 LB 14.0 OZ	9.0	0.12
14	0.003	0.35	1337	66 LB 7.0 OZ	6.2	0.34
15	0.002	0.32	727	21 LB 7.0 OZ	5.6	0.19
16	0.003	0.34	1000	25 LB 13.0 OZ	5.5	0.18
17	0.010	0.72	1000	38 LB 5.0 OZ	9.0	0.56
18	0.017	0.56	1000	46 LB 0.0 OZ	8.5	0.51
19	0.006	1.41	1000	36 LB 15.0 OZ	8.0	0.84
20	TRACE	0.19	1000	43 LB 15.0 OZ	7.9	0.17
21	0.004	0.28	1000	32 LB 2.0 OZ	9.4	0.18
22	TRACE	0.53	1000	26 LB 12.0 OZ	9.2	0.28
23	0.006	0.39	1000	26 LB 15.0 OZ	6.2	0.17
24	0.006	0.81	1000	38 LB 11.0 OZ	7.7	0.63
25	NONE	0.46	733	24 LB 3.0 OZ	6.6	0.30
26	0.010	0.28	1000	39 LB 0.0 OZ	5.2	0.22
27	0.003	0.48	1000	38 LB 1.0 OZ	7.8	0.37
28	NONE	0.14	1000	29 LB 11.0 OZ	8.2	0.08
29	0.010	0.24	1000	48 LB 14.0 OZ	9.1	0.23
30	NONE	0.12	944	28 LB 6.0 OZ	7.4	0.07

$Cb_2O_5 + Ta_2O_5$ Nil in all DMEA samples

GEP - GOOD EARTH PLACERS

FIGURE 3
MARICOPA MINERALS INC.
MAP OF SAMPLE PITS & ASSAYS OF CONCENTRATE
WORK DONE JULY 1954
DMEA 3586

TRANSMITTED
JUN 14 1955

DMEA
Date Rec'd
JUN 10 1955
BUREAU OF MINES
Denver, Colorado

RECEIVED
JUN 20 1955
5

June 8, 1955

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Region III

From: Superintendent, Southwest Experiment Station, Tucson, Arizona

Subject: Field Examination Report, Docket DMEA-3586, Maricopa Minerals Co.'s Good Earth Columbium-Tantalum Placers, Maricopa County, Arizona

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by W. R. Hardwick of the Bureau of Mines and Leonid Bryner of the Geological Survey, and the section on Engineering by Hardwick for the above report. A section on Geology will be submitted by the Geological Survey.

On their first visit to the property, Hardwick and Bryner took 12 large samples to check the results of the applicant's samples. These 12 samples were large so were quartered in the field, then run over a table to obtain a concentrate of black sands. The concentrate then was assayed in the laboratory of the Southwest Experiment Station in Tucson. As no columbium or tantalum was found in the first assays, the samples were analyzed again and also checked with a spectroscope. Some of the samples also were sent to the Intermountain Experiment Station at Salt Lake City for a check. No columbium or tantlaum was found.

In order to check these samples, the DMEA examining team returned to the placer deposit and took a 800-pound sample from one of the pits where the applicant had obtained a good columbium-tantalum assay. This large sample was carefully concentrated and the concentrate assayed, but only a trace of columbium-tantalum was found.

Because they could find no appreciable amounts of columbium or tantalum in the placer deposit, the DMEA examiners recommended that Government exploration assistance be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

cc - Traver (orig. & 8)
J. H. Faick
DMEA-3586
BF
WRStorms/ts

6-24-55