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

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Arizona Department of Mines and Mineral Resources Mining Collection

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LEE HAMMONS, GEOLOGIST
6243 West Missouri Avenue Glendale, Arizona YE 7-6008

April 25, 1961

Mr. Melvin H. Jones
Box 807
Congress Junction, Arizona

Dear Mr. Jones:

At your request and with your kind assistance, I have made a preliminary geological valuation study of your Santa Margarita group of placer mining claims located at Congress Junction, Arizona.

My findings and recommendations are contained in the accompanying report. Thank you for this opportunity to be of service.

Very truly yours,

Lee Hammons

REGISTERED GEOLOGIST
CERTIFICATE NO.
LEE HAMMONS
EXP. 31, 19

A PRELIMINARY VALUATION REPORT
ON THE SANTA MARGARITA GROUP

The group of unpatented placer mining claims known as the Santa Margarita group is located at Congress Junction, Yavapai County, Arizona. They cover 42 sections in Townships 8, 9 and 10 North and Ranges 5 and 6 West. The total effective acreage is reduced to approximately 24,900 acres by various patented tracts, rights-of-way, etc.

These claims are owned by Melvin H. Jones, Box 807, Congress, Arizona. Mr. Jones purchased the property from Imperial Iron, Inc. on March 7, 1961.

The purpose of this preliminary study is to determine if a valuable deposit of iron, in the form of magnetite sands, exists on the land comprising the Santa Margarita group.

Geography

The altitude at Congress Junction is 3,000 feet above sea level. The climate is semiarid, vegetation is sparse. The topography is that of a plain dissected by numerous dry washes. Relief varies from approximately 25 feet at the north end of the property to about 80 feet at

deposits of magnetite would occur in the alluvium resulting from the erosion of the mountains.

The area is drained by Martinez Creek which is an intermittent stream tributary to the Hassayampa River. Antelope Creek and Stanton Creek are major tributaries of Martinez Creek, both crossing the property.

Between the larger drainage channels lie numerous smaller washes and gullies. This system of channels forms a north to south, almost parallel pattern. Many of the minor washes are several miles long. The width of the flat stream beds varies from a few feet to more than 1,000 feet. The average width is in excess of 100 feet. The depth has not been determined.

The major constituent of the alluvium is sand of minus ¼ inch. Except in certain local areas (mainly in the southeastern corner of the group) the gravel content is quite low in the visible material. Few pebbles exceed 1½ inches and boulders are rare. A 30 inch diameter, 30 foot depth drill hole located on a ridge between washes showed only an occasional pebble of 1 to 2½ inch size in the cuttings pile.

There are some local layers of caliche-cemented sand, but these are thin and may not be continous. No difficulty is anticipated here.

The alluvium has been reworked by erosion and deposition many times. This action would tend to concentrate

heavier minerals such as magnetite at some depth in the washes.

Sampling

Local concentrations of magnetite show abundantly on the surface of the dry creek bottoms and even on the high flats between creeks. The total visual impression as one walks over the ground is one of considerable richness. As a consequence it was thought that a general surface sampling would indicate a large commercial tonnage.

The first group of samples were taken within a foot of the surface of the ground. Both creek bottoms and intervening ridges and flats were sampled. A special effort was made not to high grade the samples. The approximate locations of these samples are shown on the map, numbered 1 thru 23.

Composite samples were made of all samples and of all creek bottom samples. These were assayed and found to contain over 60% iron and to be reasonably low in impurities. Titanium was especially low. See exhibit 1.

Since the magnetite content, based on a hand magnet separation, was below commercial grade, it was decided to take some additional samples in the creek bottoms. It was thought that this procedure would stand the best chance of indicating commercial grade material. There

are obviously millions of tons of sand in these areas.

This second group of samples, designated A thru F on the map, were taken from the nearly vertical sides of 3 feet deep holes except for sample D. Sample E was taken from a hole which was started in the bottom of a 2 foot deep pit.

These samples were assayed individually. The separation was by hand magnet. It was found that most of the magnetic portion was in the minus 20 mesh fraction. Calculations indicate that about 36% of the creek bottom sand is minus 20 mesh. See exhibits II and III.

Small grains of magnetite are often attached to large grains of quartz, feldspar, apatite or mica. This is undoubtedly the cause of the high assay on the silica and phosphorus content of the composite sample (exhibit I). Screening will reduce these impurities and give a more uniform concentrate. The values contained in the minus 20 mesh fraction are tabulated below.

SAMPLE	DEPTH	MAGNETIC MATERIAL
A	0-3	4.69%
B	0-3	4.87%
C	0-3	6.35%
E	2-5	8.71%
F	0-3	3.94%
		5.71% average

The second group of samples (excluding D) averaged 39.2% iron. This, when averaged with the composite of

the first group of samples, gives 60.25%. The second group creek bottom samples averaged 2.07% magnetite on the gross material.

Sample D was not taken from a creek bottom, but from a highway department borrow pit. It is on high ground and contains very little in the way of concentrated material. For that reason, it is not included in the creek bottom calculations.

Dabngrell W. Brown, a Field Engineer for the Arizona Department of Mineral Resources, made a departmental report in 1943 on a property which included, at that time, Section 6, T. 8 N., R. 5 W. and Sections 35 and 36, T. 9 N., R. 6 W. A portion of that report is quoted below.

"___a metallurgical investigation performed by the Arizona Bureau of Mines shows that it is possible to recover 83.3% of the total iron present in the sands as a magnetic concentrate with one pass through the separator."

"A composite sample was taken from various test pits which averaged 38.1% iron. I believe this to be fairly representative of the deposit."

An Arizona Bureau of Mines assay report which accompanied the above is quoted as follows: 38.1% Fe gross, 66.4% Fe concentrate, and 6.9% tails. This sample was all minus 14 mesh.

An auger drill hole 30 inches in diameter and 30

feet deep (see map) contained an average of 4.5% magnetic material thruout its depth according to the former owners of the property.

The same parties furnished an assay sheet containing a report of analyses on 2 samples. One sample was taken from a drill hole, not located, at a depth of 103 feet. It contained 68% magnetic material which assayed 68.40% iron. The other sample was scooped from the surface of the ground. It ran 19% magnetic and assayed 67.80% iron. Other assay sheets show iron values up to 71%.

Valuation

Not enough data are available to make a precise appraisal of costs and tonnages. The sampling is preliminary in nature, and freight rates have not been established from Congress Junction to West Coast ports. Therefore, approximate figures and general conclusions are employed here.

Established market prices and ore specifications do not exist. They have to be negotiated. Several companies and brokers have indicated that they will pay certain prices for ores meeting their specifications. No two of these are just alike.

The average base price offered is $10.50 per long ton having a minimum of 57% iron, plus a bonus for each

1% above 57% of $0.25. Since the Santa Margarita magnetic concentrates assay 60% iron, the price to be expected is $11.25 F. O. B. West Coast ports.

It has been said that contract prices of $14.00 and over have been negotiated on the basis of known reserves and an anticipated very high rate of production of high grade concentrate. If a sufficient tonnage of good ore should be developed on the Santa Margarita group, such prices might be bargained for. At the present, however, the $11.25 price is more realistic.

Since freight rates are not established, an estimated $6.00 is used here. That is somewhat higher than rates quoted from Parker, Arizona and Seligman, Arizona. A high rate of production on a long-term contract might command a lower rate.

The cheapest method of excavating and moving large tonnages of unconsolidated sand and gravel is by dragline and conveyor. A total cost of $2.45 per ton of concentrate is estimated for mining, separation and loading on cars at Congress Junction. This is based on raw ore containing 5% of magnetically recoverable material assaying 60% iron. A rate of production of 10,000 tons per month, minimum, is assumed.

$2.45 added to the estimated freight charge of $6.00 and a pelletizing charge of $2.00 brings the total cost to $10.45. This figure, subtracted from the

estimated price, leaves a profit before income taxes of $0.80 per ton of concentrate. These figures indicate that 5% ore is essentially a break-even proposition.

Of course, if a higher price or a lower freight rate could be negotiated, lower grades could be mined. Also, if a closer market should develop, the economics of operating this property would improve dramatically. This is at least a possibility. A company has announced plans to construct a steel plant at Parker, Arizona. This facility, including a pelletizing plant, is scheduled for completion late in 1962.

If a good supply of water can be developed, it would be advisable to consider standard gravity methods of separation. Efficiency would be improved, and any gold values in the ore would be recovered. A possible drawback would be a higher titanium content since ilmenite also has a high gravity. Another byproduct that might be marketed is clean, sized sand and gravel.

It is desirable to find ore bodies having a magnetically recoverable content in excess of 5%. Altho the sampling program did not prove such ore exists, it did furnish strong evidence that there has been abundant magnetite available for concentration. Further support for this conclusion is furnished by Mr. Brown's report quoted earlier.

Sample B had a 3% magnetic content before screening

and 3.71% in the minus 30 mesh portion. It was taken at a slightly lower depth than the other samples. Extensive sampling at significant depths will probably discover commercial concentrations.

Summary and Recommendations

Projecting the results of a geological study and a preliminary surface sampling, it is concluded that there is a very good possibility that one or more bodies of commercial grade magnetite exists on the Santa Margarita group.

An exploration program consisting of pitting and drilling should be carried out. After preliminary test pits have indicated the most favorable ground, auger drills should be employed to discover and block out any existing ore. This program should be planned and supervised by competent technical personnel.

The available ground water supply should be evaluated, either as a part of the exploration program, or as a separate geological study.

Respectfully submitted,

April 25, 1961

the south end.

The Santa Margarita group is traversed by both the Santa Fe Railroad and U. S. Highway 89. A power line crosses the property.

Geology

The Santa Margarita group of placer claims is situated on a bajada, or an alluvial plain formed by a number of alluvial fans which have coalesced at the base of the mountains. The depth to bedrock has not been determined, but wells in the area indicate several hundred feet, at least. A depth of several thousand feet would not be unusual.

The Weaver Mountains, and to a lesser extent the Date Creek Mountains, have supplied the alluvium to the bajada. The Weaver Mountains are composed chiefly of granite, diorite, schist and flow rock. These rocks in turn are made up of the minerals quartz, feldspar, mica, hornblende, pyroxene and magnetite. Minor amounts of ilmenite and apatite also occur.

A few analyses of the major rock types published by the United States Geological Survey show a magnetite content of 4-6% for some types. Since magnetite has a specific gravity of over 5, it is considerably heavier than the bulk of the minerals making up the rocks of the Weaver Mountains. It is to be expected that placer

Shop No. 3186
File No. 1026 HA

VALUES
Latest Quotation

1 oz. Gold
1 oz. Silver
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
Samples submitted for assay contain as follows:

Date 29 APRIL 1961 CHAS. A. DIEHL
(Registered No. 682)

Arizona Assay Office

Phone ALpine 3-4001

815 North First Street
Phoenix, Arizona
P. O. Box 1148

MR. LEE HARMONS
6243 W. MISSOURI AVE
GLENDALE ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	$ PERCENTAGE	REMARKS
A								[illegible]	
B								[illegible]	
C								[illegible]	
D								[illegible]	
E								[illegible]	
F								[illegible]	

Charges $ 26.00

ANDY CHUKA, PRINT

EXHIBIT III

Assayer Chas. A. Diehl
Chas. A. Diehl
Reg. No. 682

C
O
PY

LEE HAMMONS, GEOLOGIST
6243 West Missouri Avenue Glendale, Arizona YE 7-6008

April 25, 1961

Mr. Melvin H. Jones
Box 807
Congress Junction, Arizona

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/s/ Lee Hammons (SEAL)

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The purpose of this preliminary study is to determine if a valuable deposit of iron, in the form of magnetite sands, exists on the land comprising the Santa Margarita group.

Geography

The altitude at Congress Junction is 3,000 feet above sea level. The climate is semiarid, vegetation is sparse. The topography is that of a plain dissected by numerous dry washes. Relief varies from approximately 25 feet at the north end of the property to about 80 feet at the south end.

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A few analyses of the major rock types published by the United States Geological Survey show a magnetite content of 4-6% for some types. Since magnetite has a specific gravity of over 5, it is considerably heavier than the bulk of the minerals making up the rocks of the Weaver Mountains. It is to be expected that placer deposits of magnetite would occur in the alluvium resulting from the erosion of the mountains.

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The major constituent of the alluvium is sand of minus $\frac{1}{4}$ inch. Except in certain local areas (mainly in the southeastern corner of the group) the gravel content is quite low in the visible material. Few pebbles exceed $1\frac{1}{2}$ inches and boulders are rare. A 30 inch diameter, 30 foot depth drill hole located on a ridge between washes showed only an occasional pebble of 1 to $2\frac{1}{2}$ inch size in the cuttings pile.

There are some local layers of caliche-cemented sand, but these are thin and may not be continuous. No difficulty is anticipated here.

The alluvium has been reworked by erosion and deposition many times. This action would tend to concentrate heavier minerals such as magnetite at some depth in the washes.

Sampling

Local concentrations of magnetite show abundantly on the surface of the dry creek bottoms and even on the high flats between creeks. The total visual impression as one walks over the ground is one of considerable richness. As a consequence it was thought that a general surface sampling would indicate a large commercial tonnage.

The first group of samples were taken within a foot of the surface of the ground. Both creek bottoms and intervening ridges and flats were sampled. A

special effort was made not to high grade the samples. The approximate locations of these samples are shown on the map, numbered 1 thru 23.

Composite samples were made of all samples and of all creek bottom samples. These were assayed and found to contain over 60% iron and to be reasonably low in impurities. Titanium was especially low. See exhibit I.

Since the magnetite content, based on a hand magnet separation, was below commercial grade, it was decided to take some additional samples in the creek bottoms. It was thought that this procedure would stand the best chance of indicating commercial grade material. There are obviously millions of tons of sand in these areas.

This second group of samples, designated A thru F on the map, were taken from the nearly vertical sides of 3 foot deep holes except for sample D. Sample B was taken from a hole which was started in the bottom of a 2 foot deep pit.

These samples were assayed individually. The separation was by hand magnet. It was found that most of the magnetic portion was in the minus 20 mesh fraction. Calculations indicate that about 36% of the creek bottom sand is minus 20 mesh. See exhibits II and III.

Small grains of magnetite are often attached to large grains of quartz, feldspar, apatite or mica. This is undoubtedly the cause of the high assay on the silica and phosphorus content of the composite sample (exhibit I). Screening will reduce these impurities and give a more uniform concentrate. The values contained in the minus 20 mesh fraction are tabulated below.

SAMPLE	DEPTH	MAGNETIC MATERIAL
A	0-3	4.69%
B	0-3	4.87%
C	0-3	6.35%
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F	0-3	3.94%
		5.71% average

The second group of samples (excluding D) averaged 59.2% iron. This, when averaged with the composite of the first group of samples, gives 60.25%. The second group creek bottom samples averaged 2.07% magnetite on the gross material.

Sample D was not taken from a creek bottom, but from a highway department borrow pit. It is on high ground and contains very little in the way of concentrated material. For that reason, it is not included in the creek bottom calculations.

Magnetite Iron Group
Deseret Iron

Bahngrell W. Brown, a Field Engineer for the Arizona Department of Mineral Resources, made a departmental report in 1943 on a property which included, at that time, Section 6, T. 8 N., R. 5 W. and Sections 35 and 36, T. 9 N., R. 6 W. A portion of that report is quoted below.

"___a metallurgical investigation performed by the Arizona Bureau of Mines shows that it is possible to recover 83.3% of the total iron present in the sands as a magnetic concentrate with one pass through the separator."

"A composite sample was taken from various test pits which averaged 28.1% iron. I believe this to be fairly representative of the deposit."

An Arizona Bureau of Mines assay report which accompanied the above is quoted as follows: 28.1% Fe gross, 66.4% Fe concentrate, and 6.9% tails. This sample was all minus 14 mesh.

An auger drill hole 30 inches in diameter and 30 feet deep (see map) contained an average of 4.5% magnetic material thruout its depth according to the former owners of the property.

The same parties furnished an assay sheet containing a report of analyses on 2 samples. One sample was taken from a drill hole, not located, at a depth of 103 feet. It contained 68% magnetic material which assayed 68.40% iron. The other sample was scooped from the surface of the ground. It ran 19% magnetic and assayed 67.80% iron. Other assay sheets show iron values up to 71%.

Valuation

Not enough data are available to make a precise appraisal of costs and tonnages. The sampling is preliminary in nature, and freight rates have not been established from Congress Junction to West Coast ports. Therefore, approximate figures and general conclusions are employed here.

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The average base price offered is $10.50 per long ton having a minimum of 57% iron, plus a bonus for each 1% above 57% of $0.25. Since the Santa Margarita magnetic concentrates assay 60% iron, the price to be expected is $11.25 F.O.B. West Coast ports.

It has been said that contract prices of $14.00 and over have been negotiated on the basis of known reserves and an anticipated very high rate of production of high grade concentrate. If a sufficient tonnage of good ore should be developed on the Santa Margarita group, such prices might be bargained for. At the present, however, the $11.25 price is more realistic.

Since freight rates are not established, an estimated $6.00 is used here. That is somewhat higher than rates quoted from Parker, Arizona and Seligman, Arizona. A high rate of production on a long-term contract might command a lower rate.

The cheapest method of excavating and moving large tonnages of unconsolidated sand and gravel is by dragline and conveyor. A total cost of $2.45 per ton of concentrate is estimated for mining, separation and loading on cars at Congress Junction. This is based on raw ore containing 5% of magnetically recoverable material assaying 60% iron. A rate of production of 10,000 tons per month, minimum, is assumed.

$2.45 added to the estimated freight charge of $6.00 and a pelletizing charge of $2.00 brings the total cost to $10.45. This figure, subtracted from the estimated price, leaves a profit before income taxes of $0.80 per ton of concentrate. These figures indicate that 5% ore is essentially a break-even proposition.

Of course, if a higher price or a lower freight rate could be negotiated, lower grades could be mined. Also, if a closer market should develop, the economics of operating this property would improve dramatically. This is at least a possibility. A company has announced plans to construct a steel plant at Parker, Arizona. This facility, including a pelletizing plant, is scheduled for completion late in 1962.

If a good supply of water can be developed, it would be advisable to consider standard gravity methods of separation. Efficiency would be improved, and any gold values in the ore would be recovered. A possible drawback would be a higher titanium content since ilmenite also has a high gravity. Another byproduct that might be marketed is clean, sized sand and gravel.

It is desirable to find ore bodies having a magnetically recoverable content in excess of 5%. Altho the sampling program did not prove such ore exists, it did furnish strong evidence that there has been abundant magnetite available for concentration. Further support of this conclusion is furnished by Mr. Brown's report quoted earlier.

Sample E had a 3% magnetic content before screening and 8.71% in the minus 20 mesh portion. It was taken at a slightly lower depth than the other samples. Extensive sampling at significant depths will probably discover commercial concentrations.

Summary and Recommendations

Projecting the results of a geological study and a preliminary surface sampling, it is concluded that there is a very good possibility that one or more bodies of commercial grade magnetite exists on the Santa Margarita group.

An exploration program consisting of pitting and drilling should be carried out. After preliminary test pits have indicated the most favorable

ground, auger drills should be employed to discover and block out any existing ore. This program should be planned andsupervised by competent technical personnel.

The available ground water supply should be evaluated, either as a part of the exploration program, or as a separate geological study.

Respectfully submitted,

/s/ Lee Hammons (SEAL)

April 25, 1961

C
O
P
Y

ARIZONA TESTING LABORATORIES

817 West Madison St.

Phoenix, Arizona

For: Lee Hammonds
6243 West Missouri
Glendale, Arizona

Date: April 5, 1961

Sample: Ore

Lab.Nos.: 152491 and 152492

ASSAY CERTIFICATE

Composite of All Samples: Magnetic Portion	Percent Magnetite = 1.55%
Iron (Fe)	60.48 %
Titanium dioxide (TiO_2)	0.05 %
Silicon dioxide (SiO_2)	11.20 %
Manganese (Mn)	0.50 %
Phosphorus (P)	0.24 %

Composite Creek Bottom Samples: Magnetic Portion	Percent Magnetite = 1.75%
Iron (Fe)	60.70 %

Respectfully submitted,

ARIZONA TESTING LABORATORIES

/s/ Claude E. McLean

(SEAL)

EXHIBIT 1

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

October 29, 1958

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

MAGNETITE IRON GROUP (Property) iron (ore)

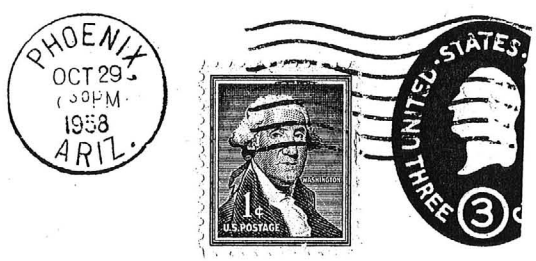
(formerly Deseret Iron)

We have an old listing of the above property which we would like to have brought up to date.

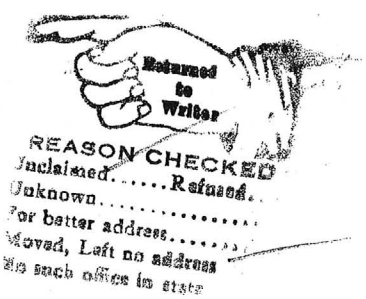
Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.



Mr. C. C. Findly
Wickenburg
Arizona



Denver
Nov-12-48

M. Rae Deming
Arizona Dept. Mineral Resources
Phoenix Arizona-

Dear Sir-

Will you kindly supply me the following reports?

Wickenburg- Magnetite Sand- Report made by B.W. Brown. 9

Yavapai County Hematite- Report by Elgin B. Holt.

This nice be greatly appreciated-

Yours very truly-

F.W. Foster M.E.
1439- Detroit
Denver
Colorado.

Nov. 17, 1948.

R. W. Foster, M. E.
1739 Detroit St,
Denver, Colo.

Dear Sir:-

Complying with your request of Nov. 13th there is enclosed a copy of report by E.W.Brown, made in June 1943, on a property then called "Magnetite Group ", but which appears in our files under the name of Deseret Iron. We presume this is the report you desire; it is, in fact, the only one we have on magnetite sands.

Mr. Elgin Holt is deceased. We fail to find any report under the title "Yavapai County Hematite ", nor yet any such under our Hematite file. Our filing system is based upon names of the mine or property, with cross-indexes under the owner and metal or product. Perhaps you may recall the name of the property or its owner; if so, we should be able to locate any data.

Very truly yours,

Department of Mineral Resources,

by _____
J.E.Busch, Office Engineer.

June 11, 1943

Mr. Jack Crist,
Wickenburg,
Arizona.

Dear Mr. Crist:

I have just received a letter form Dr. T. G. Chapman, Director, Arizona Bureau of Mines, wherein he states as follows:

> "Referring to your second paragraph in which you state that Mr. Crist had made concentrations of the magnetic material by a hand magnet and the material which he concentrated by this method assayed from 67.60 to 69.95 per cent iron, I wish to explain that the test we made for Mr. Crist was made by feeding the material at the rate of 200 lbs. per hour per inch of width of the magnetic concentrator. The difference between the two tests is that the test that Mr. Crist made by the hand magnet was not a commercial test, whereas the test we made was made as nearly as possible under commercial conditions. I believe that this will explain the difference in assay results of the two concentrates."

Very truly yours,

J. S. Coupal, Director

JSC:kk

Dear Tom

June 7, 1943

Dr. T. G. Chapman, Director
Arizona Bureau of Mines
University Station
Tucson, Arizona

Dear Tom:

I am enclosing my check for $10.18 to pay for the metallurgical test made for Mr. Jack Crist of Wickenburg. Mr. Crist handed me the cash for this today.

In regard to these tests Crist has made certain concentrations of the magmatic material by a hand magnet, and from assays on the material he concentrated and shipped to Kaiser Company, Inc., Fontana, California he received results showing 67.60 percent iron and 69.95 percent iron against the test made by Mr. Crabtree which showed a 66.4 recovery.

Crist is sending another sample to the Stearns Magnetic Company and suggests that they make the test on an MD Stearns Magnetic Drum.

Many thanks for the prompt attention to this test.

Very truly yours,

J. S. Coupal, Director

JSC:kk
Encl--Check, $10.18

University of Arizona

TUCSON

COLLEGE OF MINES
ARIZONA BUREAU OF MINES

June 9, 1943.

Mr. J. S. Coupal
Director, Dept. of Mineral Resources
413 Home Builders Bldg.,
Phoenix, Ariz.

Dear Sam:

This will acknowledge receipt of your letter of June 7 attaching a check for $10.18 in payment for the metallurgical tests made for Mr. Jack Crist of Wickenburg.

Referring to your second paragraph in which you state that Mr. Crist had made concentrations of the magnetic material by a hand magnet and the material which he concentrated by this method assayed from 67.60 to 69.95 per cent iron, I wish to explain that the test we made for Mr. Crist was made by feeding the material at the rate of 200 lbs. per hour per inch of width of the magnetic concentrator. The difference between the two tests is that the test that Mr. Crist made by the hand magnet was not a commercial test, whereas the test we made was made as nearly as possible under commercial conditions. I believe that this will explain the difference in assay results of the two concentrates.

Yours sincerely,

T. G. Chapman,
Director, Arizona Bureau of Mines.

P.S. Your letter of June 3 regarding a sack of supposed cassiterite was referred to Mr. Heineman several days ago and I understand that Mr. Heineman has sent you a report on this material.

TGC

May 28, 1943

Desert Iron

Mr. Jack Crist
Box 1
Wickenburg, Arizona

Dear Jack:

I have just received a letter from the Bureau of Mines along with a copy of the metallurgical test on your placer iron.

I am enclosing a copy of the bill which they sent to me and which, I believe, you agreed to take care of. You can either mail a check direct to them or mail it to me and I will forward it.

The tests look very encouraging and it seems possible to make a fine recovery of the iron without any treatment of the tailings which would greatly simplify the process. From an economic viewpoint I believe you could stop with one pass through the D H Stearns Magnetic Separator giving you an 83.3 percent recovery in a concentrate running 66.4 percent iron.

With best wishes and kindest regards, I am

Very truly yours,

J. S. Coupal, Director

JSC:kk
Encl.

May 27, 1943.

Mr. Jack Crist
Box 1
Wickenburg, Arizona

Dear Mr. Crist:

Enclosed is a copy of the results of the magnetic concentration test made on the sample of iron placer sand which Mr. Sam Coupal submitted to us.

We are requesting the Stearns Magnetic Mfg. Company of Milwaukee, Wis., to send you information relative to the machines required for a commercial operation.

Very truly yours,

E. H. Crabtree, Jr.,
Metallurgist.

University of Arizona
TUCSON

COLLEGE OF MINES
ARIZONA BUREAU OF MINES

May 27, 1943.

Mr. Sam Coupal
Dept. of Mineral Resources
Phoenix, Arizona

Dear Mr. Coupal:

Enclosed is a copy of the report on the magnetic test on the sample of iron placer sand which you submitted for Mr. Jack Crist of Wickenburg. Also enclosed is a copy of our letter to him covering this test.

In accordance with your instructions we are enclosing our statement to you covering the costs of this test.

Very truly yours,

E. H. Crabtree, Jr.,
Metallurgist.

University of Arizona
TUCSON

COLLEGE OF MINES
ARIZONA BUREAU OF MINES

May 27, 1943.

To: Mr. Sam Coupal
Dept. of Mineral Resources
Phoenix, Arizona

For: Metallurgical Test - Ore No. 912 -
Jack Crist Iron Placer Sand

Assays	$ 7.00
Express on samples	3.18
	$ 10.18

Arizona Bureau of Mines

Paid by Cash from Crist & check by J.E.

February 8, 1943

Mr. John Crist
P. O. Box 1
Wickenburg, Arizona

Dear Mr. Crist:

I am enclosing a copy of the report by Nebeker on your Desert Iron property.

It would seem as though on the type of production you can make it would be possible to get a contract for a larger tonnage than the 5000 tons you mentioned from the Henry J. Kaiser Company, Inc. for use at their Fontana, California plant.

I have discussed the question of the amount of contracts on manganese ores with one of the Kaiser Company's engineers and know they are opposed to giving large contracts on properties that have not been fully developed so as to absolutely justify a large tonnage contract.

I believe it would pay you to make another try with Mr. George D. Ramsey of the Kaiser Company at Fontant so as to get a large enough contract to justify your spending enough money on the property to properly equip it for a large production.

If we can be of any further assistance, we will gladly do so.

With best wishes and kindest regards, I am

Very truly yours,

J. S. Coupal, Director

JSC:kk

June 13, 1943

MEMORANDUM

To: J. C. Coupal

From: B. W. Brown-FIELD

Subject: Mine examination for J. R. Crist, superseding report made by A. C. Nebekker.

Following the wishes of Mr. J. R. Crist, I made a departmental examination and report on the property formerly owned by Mr. Crist then known as the Deseret Iron. A report had been made on this property by Mr. A. C. Nebbeker which I found to be entirely out of order in that it repeatedly referred to the mineral present as Hematite. A mineralogical examination reveals little or no Hematite present but considerable Magnetite and some Illmenite.

My report on the property, now called the Magnetite Iron, is herewith enclosed.

Bahngrell W. Brown - FIELD

DESERET MINE

Magnetite Iron

Yavapai 13 - 7 T 8 N, R 5 W & T 9 N, R 6 W

C. C. Finley, Box Q, Wickenburg '43

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Magnetite Iron Date June 10, 1943

District Wickenburg Engineer Bahngrell W. Brown

Subject: Examination Magnetite Iron Group; owner, C. C. Findly, Wickenburg, Ariz.

Copy to C. C. Findly 6-15-43 pp

I did this date visit the Magnetite group of unpatented claims which is owned by Mr. C. C. Findly of Wickenburg, Arizona. The Magnetite Iron consists of twelve placer claims each of 160 acres. It is located about five miles north of Wickenburg and is situate within one of the gulches which empties into Martinez Creek. The twelve claims range over a distance of six miles up and down the gulch and traverse sections 14, 23, 25, and 36 of T9N-R6W and sections 6, 8, and 17 of T8N-R5W.

The property was formerly known as the Deseret Iron and was located by Mr. J. R. Crist, also of Wickenburg, Arizona. Considerable sampling and metallurgical investigation was done on the property by Mr. Crist.

The deposit occurs as sands originally from decomposed granites and pegmatites lying in what is normally a dry river bed. The chief mineral involved is a magnetic ore of iron known as magnetite - $FeO.Fe_2O_3$. Although there are traces of other iron minerals present, most of the iron appears as magnetite, and a metallurgical investigation performed by the Arizona Bureau of Mines shows that it is possible to recover 83.3% of the total iron present in the sands as a magnetic concentrate with one pass through the separator. There is some Illmenite in the sands and that is also picked up by the magnet, yielding an assay from the concentrate of .75% $TiO2$. There is also a trace of Manganese in the concentrates.

A composite sample was taken from various test pits which averaged 28.1% iron. I believe this to be fairly representative of the deposit. Although there is considerable magnetite shown throughout the whole area of the claims, I believe that a deposit of the grade here indicated would be bounded by the river benches for an average width of fifty feet throughout the six mile length of the claims. Estimates along this basis with a conservative evaluation of the depth of the iron bearing sands would indicate a considerable body of magnetic iron ore amenable to beneficiation by magnetic separation.

The logical market for the product of this mine if put into operation would be the Kaiser Company plant at Fontana, California. The current freight rate of $3.00 per ton and the sintering charge

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Magnetite Iron

Date

District

Engineer

Subject:

of $1.00 per ton would preclude operation on a profitable basis for any quotation for iron below $.07 per unit Fontana delivered.

The property is ideally situated as a mine and is located on the Santa Fe Railroad and can be reached directly by a national highway. There is no water developed on the property but water is not needed for this type of operation and such water as might be needed from time to time may be conveniently hauled from Wickenburg.

I would recommend that before any operation is contemplated upon this property further determination of extent be made by auger drilling in the river bed itself and in the surrounding benches.

Bahngrell W. Brown - FIELD

C
O
P
Y

ARIZONA ASSAY OFFICE

815 North First Street

P.O. Box 1148

Phoenix, Arizona

20 April 1961

MR. LEE HAMMONS
Lot #3186

SAMPLE A

5 Pounds.
800 Grams -20 mesh
37.5 grams magnetic material
Fe 46.80 % Iron

SAMPLE B

6 Pounds.
1458 -20 mesh
71 Grams magnetic material.
Fe. 61.20 % Iron

SAMPLE C

5½ Pounds.
897 Grams magnetic material. -20 mesh.
57 Grams magnetic material
Fe . 65.40 % IRON

SAMPLE D

5 pounds.
718 Grams -20 mesh
19. Grams magnetic material.
Fe. 58.40 % IRON

SAMPLE E

5 Pounds.
815 Grams -20 mesh
71 Grams magnetic material.
Fe. 55.00 % Iron

SAMPLE F

5 ¼ Pounds.
533 Grams -20 Mesh.
21 Grams magnetic material
Fe. 58.60 % IRON

/s/ Chas. A Diehl
Reg. No. 682

EXHIBIT II

C
O
P
Y

ARIZONA ASSAY OFFICE

815 North First Street

P.O. Box 1148

Phoenix, Arizona

MR. LEE HAMMONS
6243 W. MISSOURI AVE
GLENDALE ARIZONA

	% IRON
A	46.30
B	61.20
C	65.40
D	58.40
E	55.00
F	58.60

Charges $ 25.00

Assayer /s/ Chas. A. Diehl

Reg. No. 682

EXHIBIT III

C
O
P
Y

LEE HAMMONS, GEOLOGIST
6243 West Missouri Avenue Glendale, Arizona YE 7-6008

SUPPLEMENTAL REPORT ON THE SANTA MARGARITA GROUP

This report will add to the information contained in a report entitled A PRELIMINARY VALUATION REPORT ON THE SANTA MARGARITA GROUP dated April 25, 1961. It is based on some additional sampling done in Sections 21, Township 9 North, Range 5 West and 6, Township 8 North, Range 5 West.

No detailed mapping has been done, therefore these figures are still to be considered preliminary. Every effort has been made to stay on the conservative side when making estimates. This additional work is a portion of that recommended in the original report. It has born out the prediction that the grade would improve with depth.

Sampling

This sampling was accomplished by trenching with a tractor and backhoe for the most part; 2 holes were dug with a hand auger. The trenches were sampled from top to bottom by cutting a channel in the straight side walls. The auger holes were sampled by mixing the pile of cuttings and taking a shovelful from each quarter of the pile.

Composite samples were made from each Section and a magnetic separation was made with a hand magnet. Since these holes were deeper than those employed in the first samplings, the results are more representative. The holes averaged 7 feet in depth and varied from 3 to 9 feet. This still leaves much to be desired as far as depth is concerned.

All of the 14 holes located in Section 21 were placed in the bottoms of dry washes on approximately 1000 foot centers. The washes vary from 100 feet to over 1000 feet in width. Antelope Creek and several tributaries cross the Section; as a consequence, roughly half of the surface area is made up of bottom material.

The composite sample from Section 21 contained 4.5% magnetic material in the gross sample. The minus 20 mesh material ran 12.2% magnetic material.

In section 6, the trenches were dug along the more prominent washes and in the adjoining banks. There are 11 trenches and 2 hand auger holes. More than one quarter of the Section can be said to have been sampled; intervals varied from 200 feet to about 2000 feet.

The bank samples showed an average of 1.2% magnetic material in the gross sample. A composite sample from the creek bottoms assayed 7.0% magnetic material in the gross sample, and 12.9% in the minus 20 mesh material.

The low assays on the bank material indicate that it should be stripped as waste. This material is approximately 10 feet thick and consists of loose dirt and sand. However, a composite sample made from portions of all samples ran 3.7%. In a working face, there is a good chance that the higher values below this lean material would carry the full face.

Tonnage

It is estimated that Section 21 contains 13,900,000 square feet of creek bottom area. This material was trenched and sampled to an average depth of 7 feet. Allowing a conservative 24 cubic feet per long ton, calculations show 4,054,167 long tons of ore averaging 4.5% magnetic material. This is proven tonnage where no stripping is required.

In Section 6, approximately one fourth of the Section, or 6,050,000 square feet, was sampled. Most of this area may need to be stripped of its top 10 feet, which is far below commercial grade. The top 4 feet of the creek bottom areas average 7.0% magnetic material. It is logical to assume, because of the geological nature of this deposit, that this grade and thickness will persist beneath the intervening bank areas.

These figures give a calculated reserve of 1,158,333 long tons. This tonnage can be called probable ore.

In both Sections it is obvious that the bottom of the enriched sand had not been reached by the trenches. It is entirely logical to believe that the above tonnages are only a part of the total available in these 2 Sections.

Every subsequent sampling effort has resulted in holes being dug a little deeper and in discovering a significantly higher grade of mineral. It is predicted, therefore, that still greater depths will uncover still greater enrichment.

The work reported on here strongly indicates that a profitable mining operation on the Santa Margarita group is possible.

Respectfully submitted,

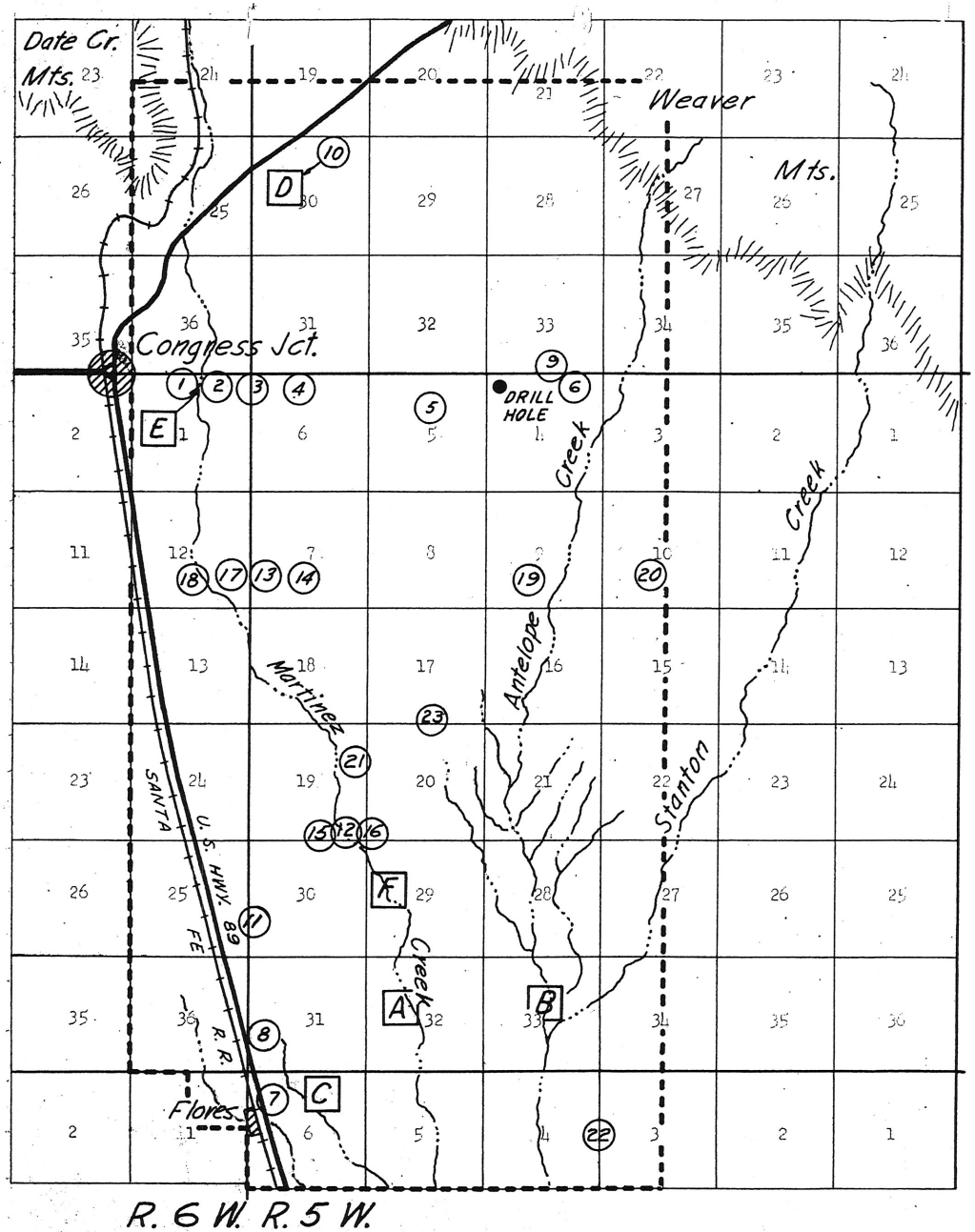
August 1, 1961

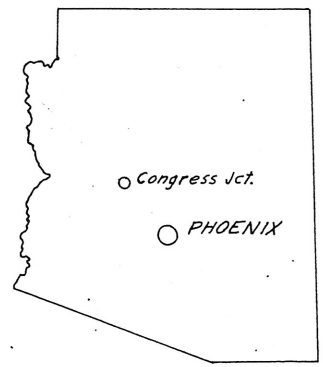
15 April 1961.

Magnetite sand samples from Santa Marguarita placer property, Congress, Arizona.

Sample #1	South creek	Sec 6,	T8N	R5W
Sample #2	Martinez creek	Sec 32	T9N	R5W
Sample #3	Martinez creek	Sec 29,	T9N	R5W
Sample #4	Martinez creek	Sec 1,	T9N	R6W
Sample #5	Antelope creek confluence	Sec 33	T9N	R5W
Sample #6	Open pit	Sec 30	T10N	R5W

MHJ





SANTA MARGARITA GROUP

MELVIN H. JONES

YAVAPAI COUNTY, ARIZ.

1" = 1 MI. 4-7-61 REV. 8-1-61

A (1) SAMPLE NO.

--- GROUP BOUNDARY

UNIVERSITY OF ARIZONA
ARIZONA BUREAU OF MINES
ORE TESTING SERVICE

Ore No. 912

METALLURGICAL TEST

Iron Placer Sand

The sample of this material was submitted by Mr. Jack Crist of Wickenburg, Arizona, with the request that we determine what recovery of iron and what grade of iron concentrate might be obtained by magnetic concentration.

The material as received was all minus approximately 14-mesh in size and contained 28.1 per cent iron. The principal iron bearing mineral was magnetite; minor amounts of other iron oxide minerals were also present.

Summary and Conclusions

Since the laboratory of the Arizona Bureau of Mines was not equipped with a type of magnetic concentrator believed to be best suited for this problem, a portion of the sample was submitted to the Stearns Magnetic Mfg. Company of Milwaukee, Wis. with the request that they make the separation according to their experience with this class of material, and to return the products to us for analysis. The results of their tests indicate that by a simple treatment on a Type "DH" Separator a recovery of 83.3 per cent of the total iron may be obtained in a concentrate assaying 66.4% Fe.

The tailing of this treatment still contained 6.9% Fe and was then passed thru a 3 field "Type K" machine. This operation recovered an additional 13.0 per cent of the iron. Thus the overall recovery of the two machines was 96.3 per cent of the total iron in a combined concentrate assaying 60.4% Fe.

From the results of this test it is possible that only the DH machine would be necessary from an economic standpoint, since the last two K machine products were below grade.

E. H. Crabtree, Jr.,
Metallurgist.

Sample Preparation The sample received was well mixed and a portion cut out by riffling for analysis. Approximately one fourth of the rejects were then riffled out for testing.

Testing The test sample was sent to the Stearns Magnetic Mfg. Company of Milwaukee for separation into the various magnetic products. A Type "DH" machine was used for the removal of the more magnetic portion. A "Type K" machine was then used for the removal of the less magnetic iron bearing minerals. The results of these tests are presented on the following page.

TEST NO. 912A

Material passed thru a Stearns "Type DH" Magnetic Separator:

Products	% Wt	% Fe	Per Cent of Total Fe
Assayed Heads		28.1	
Calculated Heads	100.0	27.2	100.0
D. H. Concentrate	34.2	66.4	83.3
D. H. Tailing	65.8	6.9	16.7

D. H. tailing passed thru a 3-field "Type K" machine for further recovery of iron bearing material.

Products		% Wt.	% Fe	Per Cent of Total Fe
D. H. Tailing	(Assayed)		6.90	
D. H. "	(Calculated)	100.0	6.97	100.0
K Conc. No. 1		3.8	56.6	30.8
" " No. 2		8.2	36.4	42.8
" " No. 3		2.2	13.1	4.2
K Tails		85.8	1.8	22.2

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Des eret Iron

Date Jan 10th, 1943.

District Vulture(North Wickenburg)

Engineer A. C. Nebeker

Subject: Hematite (Iron)

The property known as Deseret Iron consists of 12 placer claim locations of 160 acres each, and covers 6 miles in distance up one of the gulches leading off the Hassayampa river from 4 miles to 6 miles north of Wickenburg, Ariz.

The property is owned by Mr John Crist, P.O.Box NO 1 Wickenburg, Ariz.

The Hematite iron is a free sand, usually called black sand by the Placer Miners. It seem to be well distributed through river sand and gravel for one to four feet thick, and the river bed on which this sand and gravel is deposited is from 25 feet to over 300 feet wide.
Mr Crist has dug several test pits over quite a distance and finds the sands will produce from 200 lbs to 1000 lbs of hematite sands per cubit yard. Assays made on samples taken by Mr Crist runs 68% and 69% iron. This carried some little sand and all the sand is removed a 70% product is possible.

This hematite is highly magnetic so it is easily separated from the sands and gravels. The sands and gravels will be left as a clean product and there is a possibility of getting a market for a limited amount of this clean product.

In getting at an estimate of the tonnage of Hematite one can assume the width to average 150 feet for the 6 miles, and the depth of 3 feet, and 200 lbs of hematite per cu. yd. sand we would have 100,000 tons of hematite. If each ton carried 70 units of iron the controling factor is the price one can get per unit of iron. With a 3.5 cents per unit it would probable show a loss while with a 10 cents per unit there could be margin of profit.

The property is close to the highway and right along the side of the railroad, and with exception of the rainy season it would be an ideal place to work.
It appears to me, there should be more data gathered before going toodeeply into the purchase of equipment.

I would suggest more test pits dug and sands measured with assays of the iron, and also investigate market for the iron, and also freight rates. An assured large tonnage will be necessary to make this interesting. More test pits over the property with measurements will probably prove a large tonnage of hematite available.

A. C. Nebeker

UNIVERSITY OF ARIZONA
ARIZONA BUREAU OF MINES
ORE TESTING SERVICE

Ore No. 912

METALLURGICAL TEST

Sample Preparation — Iron Placer Sand

The sample of this material was submitted by Mr. Jack Crist of Wickenburg, Arizona, with the request that we determine what recovery of iron and what grade of iron concentrate might be obtained by magnetic concentration.

The material as received was all minus approximately 14-mesh in size and contained 28.1 per cent iron. The principal iron bearing mineral was magnetite; minor amounts of other iron oxide minerals were also present.

Summary and Conclusions — Since the laboratory of the Arizona Bureau of Mines was not equipped with a type of magnetic concentrator believed to be best suited for this problem, a portion of the sample was submitted to the Stearns Magnetic Mfg. Company of Milwaukee, Wis. with the request that they make the separation according to their experience with this class of material, and to return the products to us for analysis. The results of their tests indicate that by a simple treatment on a Type "DH" Separator a recovery of 83.3 per cent of the total iron may be obtained in a concentrate assaying 66.4% Fe.

The tailing of this treatment still contained 6.9% Fe and was then passed thru a 3 field "Type K" machine. This operation recovered an additional 13.0 per cent of the iron. Thus the overall recovery of the two machines was 96.3 per cent of the total iron in a combined concentrate assaying 60.4% Fe.

From the results of this test it is possible that only the DH machine would be necessary from an economic standpoint, since the last two K machine products were below grade.

E. H. Crabtree, Jr.,
Metallurgist.

Sample Preparation The sample received was well mixed and a portion cut out by riffling for analysis. Approximately one fourth of the rejects were then riffled out for testing.

Testing The test sample was sent to the Stearns Magnetic Mfg. Company of Milwaukee for separation into the various magnetic products. A Type "DH" machine was used for the removal of the more magnetic portion. A "Type K" machine was then used for the removal of the less magnetic iron bearing minerals. The results of these tests are presented on the following page.

TEST NO. 912A

Material passed thru a Stearns "Type DH" Magnetic Separator:

Products	% Wt	% Fe	Per Cent of Total Fe
Assayed Heads		28.1	
Calculated Heads	100.0	27.2	100.0
D. H. Concentrate	34.2	66.4	83.3
D. H. Tailing	65.8	6.9	16.7

D. H. tailing passed thru a 3-field "Type K" machine for further recovery of iron bearing material.

Products	% Wt.	% Fe	Per Cent of Total Fe
D. H. Tailing (Assayed)		6.90	
D. H. " (Calculated)	100.0	6.97	100.0
K Conc. No. 1	3.8	56.6	30.8
" " No. 2	8.2	36.4	42.8
" " No. 3	2.2	13.1	4.2
K Tails	85.8	1.8	22.2

RECAPITULATION OF PRODUCTS

	% Wt	% Fe	% of Total Fe
Assayed Heads		28.1	
Calculated Heads	100.0	27.3	100.0
D. H. Conc.	34.2	66.4	83.3
K Conc. No. 1	2.5	56.6	5.2
K Conc. No. 2	5.4	36.4	7.2
K Conc. No. 3	1.4	13.1	0.6
K Tails	56.5	1.8	3.7
Combined Conc.	43.5	60.4	96.3