xxxxxxxxxxxxxxxxxx
Box 431
Joplin, Missouri

July 26, 1956

Mr. Arthur H. Werner
2211 Thornwood Avenue
Wilmette, Illinois

Re: Pocahontas Zinc-Lead mine
Sec. 16, T. 28, R. 33
Jasper County, Missouri

Dear Mr. Werner:

This is to acknowledge receiving the copy of the pertinent information you assembled on the above-cited property following your visit here with me on June 28.

Presumably you have furnished this data to me for possible eventual use in connection with the Defense Minerals Exploration Program on which I am engaged in Region IV. Therefore, a copy of DMEA Order-1 Amended, and a booklet further explaining that program are enclosed herewith for your information.

After reading the enclosed information, if you decide that this program of financial participation by the Government on qualified exploration projects could be made to assist you, I would be pleased to furnish the necessary set of application forms, and any further information and suggestions you might need for their preparation.

Anyhow, I assure you that your thoughtfulness in furnishing this data for the Field Team file is greatly appreciated.

Sincerely yours,

CCK/emm

Clinton C. Knox
Executive Officer
DMEA Field Team, Region IV

encl.(2)
cc: W file

X-

Arthur H. Werner
2211 Thornwood Avenue
Wilmette, Illinois
TELEPHONE-WILMETTE 1280

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THE POCAHONTUS MINE

on

The South Half of the Southeast Quarter of
The Southeast Quarter of Section 16, Township
28, Range 33, Jasper County, Missouri.

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The information contained herein about the
Pocahontus Mine is assembled from charts,
maps, Bureau of Mines records and statements
by persons who operated or worked at the mine
during its active periods.

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Prepared by

ARTHUR H. WERNER

*****

Revised August, 1956

In 1910 Mr. Jess Short opened the Sitting Bull Mine, which according to Mineral Resources of the United States,

> "was one of the remarkable discoveries of the year"

The drifts ran to the North and Mr. Short leased 10 acres of the 19 acre tract to the north and drilled the land. Cuttings were satisfactory and a shaft was sunk on the lands and the mine was named the Pocahontus. Quality and quantity of ore far exceeded the potential indicated by the cuttings from the drill holes.

Page 489 of Mineral Resources of the United States declares:

> "Large as the production of the Sitting Bull was in 1912, it was very little in quantity and was of less value than the output of the Pocahontus Mine on the Murphy land. The ore taken from the 196 level of the Pocahontus averaged 9% in concentrates...

Production was stepped up in 1913 and Mineral Resources, referring to the output of the District reported (page 138):

> "..and more than half of the sphalerite concentrates were produced from the POCAHONTUS and the Powhattan mines. The POCAHONTUS mine on the Murphy land was one of the largest producers of Sphalerite in the Central States in 1913 ... The average recovery of concentrates from dirt ran over 10%, being practically all sphalerite with a small quantity of Galena".

Mining Engineer, Otto Ruhl, in a report dated April 1, 1935 said:

> "It is also to be noted that the actual milling upon the Pocahontus Tract showed recoveries of eight to fifteen percent..."

Production was stopped in 1914 because of a fire which Mineral Resources, Page 91, records as follows:

> "and the fire in the drifts of the Pocahontus forced the owners to flood the workings.."

The situation was described as follows by Mr. Short in the Prospectus of the Red Cloud Lead and Zinc Company (1938)

> "However operators of the Pocahontus and Sitting Bull properties were forced to close down their properties because of a disastrous fire underground in the Pocahontus, and to put this out the ground was allowed to fill up with water. At the same time the Picher Camp boom came and the trend was toward that camp. With the general move to the Picher field this area was abandoned for a number of years".

In the fall of 1915 the mine was re-opened under the name of Olive Cherokee. Mineral Resources had this to say:

> "About one-half of the total yield of Spaherite was the product of the Pocatella mine ... and the OLIVE CHEROKEE mine on the Murphy Lands".

This relatively large volume of ore came from sinking a new shaft in the S. W. Corner of the lands, clean up operations in old drifts and from cutting new drifts UNDER the pillars for the purpose of dropping them for reclamation, and the fact that ore came from a lower level supports Mr. Short's statements that there is several feet of ore in the floors of the drifts and probably more at lower levels.

The new lower level drifts for the purpose of "dropping" the pillars are shown by dotted lines on Map A 71 J. The new drifts were cut from both shafts A on the South Side and B on the North Side and were within 76 feet of joining when very low ore prices caused Mr. Short to abandon operations.

In 1926 Mr. Short again leased the land and carried on an extensive drilling program. Drill records on some of the holes are missing but the land owner has possession of 11 logs. Five of these show good ore was located but with the prices down to $36.00 per ton, no mining was conducted.

In 1938 Mr. Jess Short and Mr. J.C. Matt organized the Red Cloud Lead and Zinc Company and released the land. A drilling program was launched, but the records are lost. Mr. T.H. Leggitt states that "he drilled several holes North and West of the old House and that 2 of the holes showed very rich lead. Mr. Matt confirmed this. The owner has records on 4 shale holes but the locations are not established. He also has records on two other holes, both showing ore but the locations are uncertain.

The working plans of this company were to:

A. Cut out pillars and floors of drifts.
B. Extend drifts in SW Corner to capture ore shown by Holes No. 1, No. 5, and No. 7.
C. Extend drifts eastward thru holes No. 6, No. 23 and one other not shown on map.
D. To sink a shaft over drill hole on dividing line between E & W halves of land.
E. To sink a shaft in the SE Corner of the West half of the land.
F. To sink a shaft in the NE Corner of the East half of the 19a acre tract.
Holes 1, 5, 7, 6, and 23 are shown on Map No. J71 A.

The original Pocahontus Lease covers only the west half of the 19 acre tract and only about half of that part was mined. The 1938 lease covered all of the 19 acres and Mr. Short stated that there was several times more ore blocked out in the tract than had been removed. He had confidence that the east half would equal or exceed the west half in production, his thoughts being supported by 5 drill holes on the line between the two parts, one of which showed a 17 foot face of ore bearing dirt. The average ore face mined in the old diggings was according to the Bureau of Mines, 14 feet. Add to this the ore shown to be in the floors of the old drifts and there is indication that the average actual ore face was and would continue to be around 17 feet. See Map J 241.

Mr. Short had drilled a hole on the east edge of the 19 acre tract just over the line on the Busy Bee and it was a rich hole. He felt it to be a continuation of ore from the 19 acre tract. The log on this hole is shown later.

A well dug just North of the old House on the North half of the east part of the tract showed lead at 36 feet.

Holes No. 17 and 18, for which records are available, shown later are believed to have been drilled on the east half of the land but their exact location was not indicated on the logs. We know only that they were drilled about 1938 on the land. Both show ore.

Mr. T.H. Leggitt stated that his drilling in 1938 brought in 2 good lead holes some where North and West of the place where the old house stood on the east half of the tract.

The three shafts had been cleaned out, the water pumped and some of the drifts cleaned out and actual production of ore was about to take place when Mr. Short suffered a heart attack and died. Operations were abandoned, and the land has not been mined since. A government expeditor recommended seizure and operation by the Government during World War 2, the end of the war interrupting the recommendation.

Here is a summary of the known and estimated resources left in the mine:

PILLARS-Map 241 J shows in Mr. Short's hand, the dollar estimate of the ore left in the pillars based on $46.00 per ton. As previously stated drifts had almost been completed to "drop" the pillars. Shanklin or the Mining Engineers of Ruhl and Shanklin made the following report in part:

> "Complying with your request we herewith supply you with the tonnage of ore remaining in the pillars left in the Pocahontus Mine. There is approximately 25,000 tons of Ore in the pillars and legs, and, figuring a CONSERVATIVE recovery of ONLY 10% for this ore there is 2500 tons of concentrate, which at the present price for 60% zinc would be $125,000 ($50.00 per ton price)."
>
> Considering the extension of the ore body in the S.W. corner of the property as proven by drill,and which we have outlined, there is 5,000 tons of ore to be mined (in that corner).....
>
> We have figured this tonnage remaining in pillars and legs from our personal knowledge of the height of drifts, gathered while surveying the mine while it was in operation.
>
> We have outlined the pillars and legs that can be mined."

By cutting under the pillars, Mr. Short had estimated that he could mine out many more of the pillars and legs than they had figured on.

An Expeditor for the War Production Board, in recommending seizure of the mine and operation of it by the government said in part in his recommendation:

> "The Pocahontus .. a 19 acre tract which may reasonably be expected to yield some 25,000,000 lbs. of zinc and lead metals or more, from ore previously drifted under and nearly ready for extraction at the close of the last war, when workings were allowed to flood..."

Mr. Carpenter, ground boss at the Pocahontus stated that the pillars had been left larger than "normally required" and were rich in ore.

FLOORS OF DRIFTS-LOWER LEVELS- The 3 to 9 feet of ore in the floors of the drifts is shown on map J241 and was verified by Messrs. Carpenter, Mc Corkel, Matts and others who were familiar with the operation. Further evidence that there was greater depth to the ore faces than was mined is contained in a letter written by Mr. R.G.Knickerbocker, Chief, Minerals Technical Division, Region V1 which reports on an intensive study the bureau made on the property and the surrounding lands. He said in part:

> "The ore body that was mined in the main workings was 14 feet thick on the average and was in the M Bed horizon. The floor level was 176 feet below the surface, but along the south line the neighboring Sitting Bull mine drove a wide drift across the line in "sheet ground" or Grand Falls chert, 8 feet below the floor level of the Pocahontus mill shaft. The Powhattan mine on the north also mined the M - Bed horizon and drifted in sheet ground or Grand Falls Chert. There are numerous Winzes in the floor of the M-bed Horizon that show mineralization in the "sheet ground",

It had been Mr. Short's contention that there was another layer or more of ore at lower levels and his contention is born out by the ore production of the Olive Cherokee from cutting the drifts under the pillars.

It has now been definitely established that there may be serveral layers of ore in the district. Mr. Otto Ruhl in Chapter XIX of his book, "The Rationale of Investment in Zinc Mining" states:

> "The work so far done establishes the presumption that there exists large untouched ore reserves below the level hitherto supposed to be the limit of ore deposition."

And Mr. C.E. Siebenthal, writing in United States Mineral Resources said:

> "The recognition of this lower ore run has at length been noted by members of the United States Geological Survey... The blanket deposits or "Sheet Ground" are found in the Grand Chert, member of the Boone formation, at depths varying from 125 feet to 300 feet, depending upon the topography and geologic structure. Below this horizon there are, in the rock of the Kinderhook age, deposits of disseminated ore.... Ore is reported in sheet formation in blue flint (Grand Falls chert member of the Boone Formation) between 180 and 200 feet in depth and between 222 and 290 feet in shally limestone.

It is interesting to contrast the potential here with the Oronogo Circle where ore has been found at many levels after other levels had been mined out and the property abandoned. This potential exists for this area.

DRILL HOLES - Map J71 A shows unmined ore was found by drill holes 1, 5, 6, 7 and 23 all of which were drilled many years ago, about 1913 or 1914 except No. 23 which was drilled about 1927. No logs are available on these holes, but they were located and marked on the map with ore levels indicated. They are also on the Bureau of Mines maps.

It is an interesting characteristic of the ores in this area that the full richness of ore bodies has never been shown by cuttings from holes. In commenting on this Mr. Otto Ruhl, Mining Engineer, said on April 1, 1935:

> "Especial attention is called to the condition of the drilling. The water was up to the 70 foot level during all the drilling operations and hence with the open character of the ground the full richness of the cuttings could not be expected to be obtained. It is also to be noted that the actual milling upon the Pocahontus tract showed recoveries of 8 to 15 % ..."

The owner has possession of 6 drill hole records the locations of which are positive and some others whose locations are uncertain. Three holes drilled approximately 125 feet, 140 feet and 170 feet South of the North line and approximately on the dividing line between the east and west halves of the tract, log as follows:

Driller F.E.	Page - 5-8-26
0 to 2	Soil
2 to 21	Yellow clay and soap
21 to 28	Lime
28 to 40	Blue Mud Boulders
40 to 80	Blue Mud-flint
80 to 110	Blue and Yellow Flint
110 to 165	Blue and White Flint
165 to 180	Blue flint, mundic, zinc
180 to 185	Blue flint, mundic, zinc

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Arthur H. Werner

2211 Thornwood Avenue

Wilmette, Illinois

Driller F. W. Page 5-17-26

0	to	2	Soil
2	to	8	Yellow mud - boulders
8	to	24	Shale
24	to	30	Lime
30	to	40	Shale
40	to	100	Blue and Grey Flint
100	to	170	Yellow Flint
170	to	180	Gray Flint, Zinc

Driller A. S. Baldry 6-7-26

0	to	1	Tailing
1	to	3	Soil
3	to	16	Yellow Mud
16	to	80	Flint yellow
18	to	180	Lime and Flint
180	to	184	Flint

Lost hole

Three other holes drilled for Red Cloud Lead & Zinc Company and marked on the map (A 71 J) show as follows:

Driller-A. S. Baldry

0	- 4	Soil
4	- 20	Yellow Clay and Soap
20	- 28	Yellow Clay - Lime
28	- 42	Blue Mud Boulders
42	- 88	Blue Mud Flint
88	- 110	Blue and Yellow Flint
110	- 165	Blue and White Flint
165	- 178	Blue Flint - Zinc
178	- 195	Zinc - 17 %

-

0	- 6	Soil
6	- 21	Yellow Clay and Mud
21	- 30	Lime
30	- 40	Blue Mud - Boulders
40	- 86	Blue Mud Flint
86	-110	Yellow and Blue Flint
110	-152	Blue and White Flint
152	-188	Zinc - 11%

0	- 4	Soil
4	- 36	Yellow Mud and White Flint Boulders
36	- 42	Gray Flint
42	- 65	Blue Mud-Flint
65	- 85	Red Mud opening
85	- 110	Grey Shelly Flint
110	- 125	Grey Flint, tiff
125	- 155	Blue and White Flint
155	-162	Blue Flint-mud
162	-178	zinc 8%

The owner has possession of a drill record of a hole drilled by Mr. Short on the Busy Bee which he stated to be located just off the East line of the Pocahontus. It records as follows:

0	to	30	Clay & Boulders
30	to	35	Lime and Flint
35	to	80	Lime and Flint
80	to	90	Blue and white Flint
90	to	95	Blue and White Flint, selvage
95	to	100	" " "
100	to	105	" " "
105	to	110	Shelly Broken Ground, 10' opening
110	to	115	Good Jack and lead
115	to	120	" " "
120	to	125	" " "
125	to	135	Good Jack
135	to	140	" "
140	to	145	" "
145	to	150	Zinc Shines

Quit Hole in Zinc Shines, Blue Flint Ground.

The owner also had two other drill records which were drilled on the Pocahontus, but we are unable to spot their location. They read as follows:

Driller - Stark

0	-	30	Yellow Clay
30	-	80	Soap
80	-	90	Mundic Rib
90	-	111	Soap
111	-	140	Blue and White Flint
140	-	150	Blue and White Flint - Shale
150	-	170	Blue and White Flint
170	-	185	Blue & White Flint - Lead and Zinc Shines

Driller - Higginbottom

0	-	30	Clay
30	-	80	Yellow Clay
80	-	90	Mundic rib
90	-	111	Soap Stone
111	-	140	Blue and White Flint
140	-	150	Shale - Blue and White Flint
150	-	170	Blue and White Flint - Lead Shines

Owner also has records on 4 Shale holes, all 30 feet, but exactly where they were put down is not indicated on them.

MAPS AND RECORDS AVAILABLE-Attached to this material is a scale drawing of the west one half of the 19 acre tract. It also includes some of the workings of the Sitting Bull, Hopi and Powhattan mines.

It is quite complete except for the three holes which we have logged on pages P 4 and P 5. Two others logged on P 5 drilled for Mr. Short, all of which indicate good ore are shown on this map as HH - E and DH D. They apparently did not discover the other one in their search. Mr. Matt verified these records and holes.

The William M. Stewart Engineering Company, 216 West Third Street, Joplin, Missouri has a complete tracing of the workings of the Pocahontus. This map shows where the Red Cloud Lead and Zinc Company had indicated the drill holes logged on pages P 4 and P 5 and where they had intended to sink shafts.

It shows the lower level cuttings where they had drifted under the pillars to take them out.

It shows the locations on Holes 1, 5, 6, 7, and 23 with notations regarding the ore possibilities.

This map is No. A 71 J.

Map J 241 also in their possession shows the pillars with their estimated dollar valuations as inserted by Mr. Short.

He also has available maps on the workings of the Sitting Bull, Powhattan and Hopi, all adjacent to the Pocahontus Mine.

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MINERALS TECHNOLOGY
DIVISION
JUL 23 1956
BUREAU OF MINES
JOPLIN, MO.

DATA RELATING TO MINING ON

THE SW 1/4 OF THE SE 1/4 (39 ACRES)

THE SW 1/4 OF THE NW 1/4 OF THE SE 1/4 (10 ACRES).

THE NE 1/4 OF THE SOUTHWEST 1/4 (40 ACRES)

THE NORTH 1/2 OF THE SE 1/4 OF THE SW 1/4 (20 ACRES)

SECTION 13, TWP 27, RANGE 32

JASPER COUNTY, MO.

****

The information contained herein about the above lands is assembled from charts, maps, drill logs, interviews, research and information gathered from persons believed to be reliable and properly informed.

****

OWNER OF PROPERTY

ARTHUR H. WERNER

****

COMPILED 1956

MINING ACTIVITIES

There are several abandoned shafts on the land indicating that from time to time some mining activity was carried on.

The first actual record of any potential activity is evidence by sale of the lands executed April 23, 1883 to the Thurman Mining Company. Thurman Mining Company sold the lands on July 20, 1886. There is no record of whether or not any mining activity of any kind was conducted.

On July 1, 1906 the lands were leased by W.E. Gaddie, A.T. Womack and J.R. Womack. The lease covered the SW 1/4 of the SE 1/4 "Except a strip 300 feet wide along the west line and a section 400 ft. square in the North East Quarter."

Mr. A. T. Womak visited the lands in 1947 and told the following story about the lease and operations. Drill hole(NR 4) on map was put down and good lead was struck so a shaft was sunk over it. He states that lead was hit at 90 feet and that good drifts were made S. & W. Because of illness of one of the partners operations were suspended and the shaft caved to the 50 foot level where others mined good lead. He panned out some of the dump pile and it showed good lead traces.

He stated that he backed the rig off hole NR 4, some 50 to 60 feet or more South and struck excellent zinc at 85 feet but it was not mined because of the low market value.

It was his impression that holes NR 2 and NR 5 might be Bob Mc Gee Holes.

He also stated he drilled NR 2 and hit lime bar.

Further North and close to the fence line there are two more smaller shafts.

Mr. George Wells is reported to have removed rich shallow lead from Shaft B on map.

Mr. Robinson stated that rich lead came out of Shaft C on map at what he recalled as about 30 feet.

Shaft B is about 20 feet East of a rich drill hole put down by Tom Phelps which is logged.

It is also just west of the Old Annabelle Mine on the property to the east which Mr. Edw. Cunningham stated was a rich lead strike. He stated that they hit a 6" vein wider than the shaft at 17'. The drifts ran east and west.

Mr. Robinson stated that the drift ran toward the west and was very rich and was mined off and on for many years.

Just South of the 20 acre tract (N 1/2 of SE 1/4/ SW 1/4) about 50 feet south of the line, Mr. Wilkins sunk a shaft in 1955 over a drill hole logging exactly like hole # 2 A and hit rich premium lead at between 30 and 40 feet. The log had indicated ore at 65 feet. Veins veer toward the North.

There is a substantial dump pile in the approximate NW corner of the 39 acre tract but no history or information is available about it. It is marked D on map.

No data is available on Dump marked E.

There are some smaller gougings on the N half of the 39 acre tract which have no records available.

Mr. Robinson stated that a shaft had been sunk "in the middle of the field" on the NO 1/2 of SE 1/4/SW 1/4 which hit a bonanza and that partners fell out over it and one of them blasted it. He stated it is in the clump of bushes in the field.

DRILL HOLES

There are many old drill holes on the land and a great deal of effort has been made to locate the drillers and to secure data on them.

Several people insist that Bob Mc Gee drilled "somewhere back of the church" and hit a bonanza mine. Mr. Grenninger of Carterville who worked with McGee before his death stated that Mc Gee told him he had hit a 16 foot vein of lead and was going to try to get a lease and mine it.

Mc Gee's brother and nephew both stated that they worked on the drill rig and that he drilled 3 holes lined North and South "some where not too far north of the church" and that the center one hit a 16 foot vein of lead. The other two were blanks. They stated Mc Gee filled the holes when he was unable to secure a mining lease. Neither could remember how far apart the holes were "about 50 feet they thought" and neither was quite sure how far back of the church the rig had stood.

Driller Minshall provided two drill logs which he said were given to him as being Mc Gee holes. They are identified on the map as NR 2 and NR 5. They show good ore. It is to be noted that 400 square feet were withheld from the Womack lease in the NE corner. It may be because of NR 5 or it may be because it was in line with the Annabelle to the east.

The Bureau of Mines has some drill records for this Section but we have made no effort to locate or verify them.

The logs on the holes NR 2 and NR 5 above referred to are as follows:

NR 2

0	to	26	CLAY
26	to	36	MED. HARD FLINT, LEAD
36	to	52	LIME BOULDERS AND RED MUD
52	to	69	STRONG LEAD
69	to	77	HARD GREY LIME

NR 5

0	to	14	RED MUD & FLINT
14	to	38	Soft BLUE AND WHITE FLINT - MUD
38	to	52	YELLOW & WHITE FLINT - HEAVY LEAD-SOAP STONE
52	to	68	SHINES - FLINT - LIME

NR 8 was drilled by the brother of the former owner. There is no actual log but he stated that they hit silicate, lead and zinc at 60 to 65 feet.

HOLE NO. 8

0	to	30	CLAY & FLINT GRAVEL
30	to	34	SAND BOULDERS, FLINT
34	to	40	TALLOW CLAY, FLINT-LEAD
40	to	61	YELLOW MUD - WHITE GRAVEL
61	to	74	FLINT - STRONG LEAD
74	to	80	BLUE AND WHITE FLINT - LEAD TRACES
80	to	94	TRACES, FLINT, LIME ROCK

The Following Logs are in Possession of the Owner of the Property:

HOLE NO. 1

0	to	3	Clay
3	to	30	Medium Hard Yellow Flint
30	to	45	Softer Flint
45	to	63	Lime Boulders and Red Mud
63	to	77	Hard Grey Lime

HOLE NO. 2

0	to	10	Clay, Flint, Some Buck Skin Clay
10	to	30	Lime Boulders, White Soap Stone, Crevices
30	to	55	Lime and Flint
35	to	76	Lime

HOLE NO. 3

0	to	10	Clay and Flint
10	to	30	Light Shale
30	to	60	Light Mud and Gravel
60	to	80	Light Mud with Flint Gravels - Lead traces
80	to	85	Soft Flint with LEAD SHINES
85	to	90	Soft Mud, Flint Boulders - Lead Traces
90	to	99	Light Mud and Gravel

HOLE NO. 4

0	to	12	Red Mud and Flint
12	to	68	Soft White and Blue Flint
68	to	79	Mud - Flint - LEAD
79	to	104	Soft Lime Boulders Red Mud
			Soft White Flint

HOLE NO. 5

0	to	28	Red Clay & Flint Gravels
28	to	40	Lead, lime, flint
40	to	75	Lime - hard
75	to	84	Blue and White Flint - Lead

HOLE NO. 6

0	to	28	Clay and Flint Gravel
28	to	30	Sand Boulders
30	to	50	Tallow Clay Blue Mud Flint
50	to	80	Yellow Mud White Gravel
80	to	88	Yellow and White Flint-strong lead traces
88	to	90	Traces - Lime Rock

HOLE NO. 7

0	to	27	Clay & Flint
27	to	40	Tallow Clay & Blue Flint
40	to	50	Flint - Some Clay
50	to	58	Lime

There is some indication that shallow ores may have been overlooked in these drillings for when the cuttings were panned later, traces showed up in various parts of the cuttings which would indicate that there may be ore at various other levels.

The drillers had been cautioned to pan frequently but were not starting to do so until they reached the 50 foot level.

In 1949 and 1950 Holes 1 A thru 9 A were drilled on the N 3/4ths. of the E 1/2 of the SW 1/4.

The operation was designed to discover zinc and little attention was given to indications of lead.

It is interesting to note that Mr. Wilkins opened up 2 shafts just south of this property over drill holes logging out like Hole A 2.

The drill records showed ore at 65 feet yet they struck rich ore between 30 and 40 feet with long drifts NE and NW. Either the drill missed these ore bodies or the cuttings may not have been panned because the ore was assumed to be lower.

Log on A2 shows only zinc yet Mr. Wilkins panned out cuttings found by A2 and A8 and found lead in them.

HOLE NO. 9A showed lead 145 to 150 feet.

HOLE NO. 2 A showed Zinc at 85 to 90 feet and again at 130 to 135 feet.

HOLE NO. 7 A showed shale at 110 to 120 feet.

Cuttings from NR 6 also show traces even though this hole was undoubtedly drilled many years ago.

HOLE NO. 2 was drilled after an M Scope (ore finding machine) indicated reactions but no ore was found.

THE FOLLOWING PAGE INDICATES THE APPROXIMATE LOCATION OF ALL DRILL HOLES, NOTATIONS ABOUT EACH AND THE LOCATIONS OF SHAFTS AND DUMPS.

THE MAP SHOWS APPROXIMATE LOCATIONS OF THE VARIOUS HOLES AND SHAFTS, BUT IS NOT DRAWN TO EXACT SCALE AND IS INTENDED ONLY AS A GUIDE.

DRILL HOLES ON SW 1/4 OF SE 1/4 (39 ACRES)

NO. 1. 1947 194 FT. W. OF E. LINE 106 FT. NO. OF CHURCH FENCE
NO. 2. 1947 555 FT. W. OF E. LINE 390 FT. NO. OF SOUTH LINE
NO. 3. 1947 76 FT. W. OF E. LINE 610 FT. NO. OF SOUTH LINE
NO. 4. 1947 105 FT. W. OF E. LINE 103 FT. SO. OF NO. 3 HOLE
NO. 5. 1947 ABOVE SAND ROCK
NO. 6. 1947 640 FT. N. OF S. LINE 35 FT. W. OF E. LINE
NO. 7. 1947 35 FT. W. OF E. LINE 20 FT. SOUTH OF CHURCH
NO. 8. 1912 20 FT. W. OF SHAFT - DUMP "B".

DRILL HOLES ON NO. 3/4 THS. OF E 1/2 OF SW 1/4

1A 2A 3A DRILLED IN 1949

4A W5A 6A 7A 8A 9A DRILLED IN 1950

DRILL HOLES VERIFIED BUT NO ACTUAL DRILL RECORDS(MARKED N.R.)

NR. 1. WOMACK SAID IT WAS DRILLED IN 1907 - 70 FT. TO LIME BAR
NR. 2. WOMACK AND MINSHALL SAID IT PROBABLY A BOB MC GEE HOLE
NR. 3. WOMACK SAID HE DRILLED IT IN 1906 ZINC 80 to 95 FT.
NR. 4. WOMACK SAID HIT LEAD AT 50 FT. AND 90 FT.
NR. 5. WOMACK AND MINSHALL SAID IT WAS A BOB MC GEE HOLE
NR. 6. ROBINSON SAID LEAD AT 37 FEET AND 80 FT.
NR. 7. ROBINSON SAID LEAD AT 32 FT.
NR. 8. J.MURPHY SAID ZINC AND DRY BONE 60 to 65 FT.

NUMEROUS OTHER DRILL HOLES HAVE BEEN LOCATED BUT NO INFORMATION IS PRESENTLY AVAILABLE ON THEM.

SHAFTS AND DUMP PILES

NO. A. WOMACK AND GADDIE SUNK IN 1906 - LEAD AT 50 FT. AND 90 FT.
NO. B. WELLS TOOK OUT LEAD AT 20 FT.
NO. C. ROBINSON SAID SHALLOW LEAD
NO. D. NO INFORMATION
NO. E. NO INFORMATION

A B C DUMP PILES ALL SHOW ORE IN DUMPS.

AIR MAIL

January 19, 1951

Hon. Paul H. Douglas
United States Senate
Washington 25, D. C.

My dear Senator Douglas:

This will acknowledge your letter of January 9, 1951 concerning release by the Bureau of Mines of information on the Pennsylvania Mine, Thom's Station area, Joplin, Missouri, as requested by Mr. Arthur H. Werner, Wilmette, Illinois.

The Pennsylvania Mine was examined by a Bureau of Mines engineer in October 1949 under its continuing, long range program for investigation and development of domestic strategic and critical minerals. The reports on such examinations are intended to provide administrative guidance to the Bureau of Mines in selecting development projects conducted by the Bureau. Such reports are preliminary in nature and are made available only to other government agencies.

If Mr. Werner is interested in making an application for Government assistance to reopen the Pennsylvania Mine and feels that he does not have enough background information to complete an application it is suggested that he contact Mr. David Gallagher, Executive Officer, Defense Minerals Administration Field Team, Box 431, Joplin, Missouri. Bureau of Mines reports are available to the Defense Minerals Administration.

Sincerely yours,

THOS. H. MILLER

Acting Director

JEHill:bal

Copy to: David Gallagher, Executive Off., Defense Minerals Administration Field Team, Box 431, Joplin, Missouri
L. T. McElvenny, Chief, Mining Branch, Mineral Technology Division, Region VI, Rolla Missouri
C. H. Johnson
Minerals Division
F i l e s

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

January 19, 1951

Mr. Arthur H. Werner
2211 Thornwood Avenue
Wilmette, Illinois

My dear Mr. Werner:

Reference is made to your letter of January 2 concerning the Pocahontus Mine, Thom's Station, Joplin, Missouri.

The Bureau of Mines report referred to in your letter is a preliminary examination report for the guidance of that agency in selecting projects for investigation and development under its long range program. These reports are of a preliminary nature and are available only to government agencies. They are not published for public release.

It is suggested that you contact Mr. David Gallager, Executive Officer, Defense Minerals Field Team, Box 431, Joplin, Missouri if you wish to submit an application for Government assistance to operate the Pocahontus Mine and feel that you require additional information collected by the Bureau of Mines to properly present an application. Bureau of Mines reports are available to the Defense Minerals Administration and may be used to supplement the information you may submit.

Although a general circular, such as you mention in the postscript, cannot include specific problems of individual mining districts, the water problem in the Tri State zinc district is well known. As in many other mining districts the pumping problem in the Tri State seriously affects continued mine production and poses a question of the economic feasibility of reopening flooded areas. The problem in each district will have to be considered when presented on its merits as related to the overall program to increase mineral production.

Sincerely yours,

JAMES BOYD

Administrator

JEHill:bsl
Copy to: Director's Reading File
David Gallagher (Air Mail)
R. G. Knickerbocker
C. H. Johnson
Minerals Division
F i l e s

Block	Tons	% Zns	Tons Zns
I	1,169,845	4.36	48,389
II	673,896	3.38	22,777
III	33,464	7.35	2,460
IV	1,920,702	5.70	109,480
V	1,736,752	4.16	72,249
	5,474,659		255,355

4.66 Zns

Total

Blocks I - V :

5,474,659 Tons

4.66 % Zns.

20%

1,094,932 Tons

4.66 % Zns

Block	Tons	% Zns	Tons Zns
I	1,109,845	4.36	48,389
II	673,896	3.38	22,777
III	33,464	7.35	2,460
IV	1,920,702	5.70	109,480
V	1,736,752	4.16	72,249
VI	976,480	1.48	14,452
VII	969,666	2.06	19,975

Block I

Entry	Hole No	Feet of Min.	% Zns wt. Av.	Ft. % Zns
1	39	25	3.24	81.00
2	46	105	8.36	877.80
3	1	115	2.80	322.00
4	47	70	3.61	252.70
5	2	105	2.65	278.25
6	42	50	4.92	246.00
7	69	90	13.58	1,222.20
8	71	60	1.00	60.00
9	53	15	3.36	50.40
10	68	110	5.63	619.30
11	72	85	7.40	629.00
12	3	115	2.00	230.00
13	36	100	2.40	240.00
14	58	80	4.44	355.20
15	54	25	3.40	85.00
16	134	15	1.85	27.75
17	96	75	5.27	395.25
18	67	105	4.61	484.05
19	17	30	1.00	30.00
20	66	35	6.54	228.90
21	12	70	1.96	137.20
22	29	85	3.23	274.55
23	31	75	3.95	296.25
24	19	105	1.71	179.55
Total		1745		7,602.35

Av

72.71 Ft. 4.36 Zns

Square in - 4.77

Square Ft. - 190,800

Cu. Ft. - 13,873,068

Tons % - 1,109,845 - 4.36 Zns

Tons Zns - 48,389

Block II

Entry	Hole No.	Feet Min	% ZnS wt. Av	Ft. % ZnS	Av.
1	16	25	1.60	40.00	
2	75	20	7.98	159.60	53.18 Ft. - 3.38 % ZnS
3	15	90	9.42	847.80	
4	77	20	8.00	160.00	
5	13	70	5.11	357.70	
6	113	5	2.50	12.50	
7	119	15	3.65	54.75	Sq. in - 3.96
8	136	65	0.00	00.00	Sq. Ft. - 158,400
9	135	65	0.00	00.00	Cu. Ft. 8,423,712
	~~44~~		No log	—	Tons % 673,896 - 3.38 %
10	11	85	2.74	232.90	Tons ZnS 22,777
11	74	30	1.75	52.50	
12	54	25	2.30	57.50	
13	9	85	7.07	600.95	
14	105	50	1.65	82.50	
15	73	65	0.00	00.00	
16	8	50	2.40	120.00	
17	7	90	4.88	439.20	
18	10	100	3.30	330.00	
19	6	60	3.64	218.40	
20	75	35	0.23	8.05	
21	5	95	1.42	134.90	
22	4	25	2.00	50.00	
Total		1170		3959.25	

Block III - Oscar Bennet

Entry	Hole No.	Feet Min	% ZnS wt. Av.	Ft. · % ZnS	Av.
1	3	55	2.88	158.40	58.75 Ft. - 7.35 Zns
2	6	25	1.10	27.50	
3	E	10	0.60	6.00	
4	C	50	6.58	329.00	Sq. in - 1.78
5	B	80	8.88	710.40	Sq. Ft. 71,200
6	1	100	1.55	155.00	Cu. Ft. 418,300
7	A	115	17.33	1,992.95	Tons % 33,464 7.35
8	2	35	2.18	76.30	Tons Zns - 2,460
		470		3455.55	

IV

Entry	Hole No.	Ft. of Min	% Zns wt. Av.	Ft. % Zns	Au
1	19	100	3.20	320.00	
2	21	120	2.13	255.60	76.17 Ft · 5.70 Zns
3	22	110	2.69	295.90	
4	20	120	0.98	117.60	
5	95	46	1.57	70.65	
6	5	95	1.90	180.50	Sq. In 7.88
7	41	30	4.46	133.80	Sq. Ft. - 315,200
8	59	55	1.13	62.15	Cu. Ft. - 24,008,784
9	60	110	16.15	1,776.50	Tons % Zns - 1,920,702 - 5.70
10	181	120	3.89	466.80	Tons Zns - 109,480
11	64	80	2.99	239.20	
12	66	35	4.38	153.30	
13	123	15	0.40	60.00	
14	74	105	15.96	1,675.80	
15	72	85	2.14	181.90	
16	78	30	2.33	69.90	
17	79	55	1.91	105.05	
18	81	85	12.21	1,037.85	
19	90	65	0.00	00.00	
20	83	15	2.00	30.00	
21	86	100	4.22	422.00	
22	85	55	1.33	73.15	
23	113	95	2.07	196.65	
24	69	75	0.93	69.75	
25	67	65	23.27	1,512.55	
26	65	90	12.60	1,134.00	
27	63	90	4.43	398.70	
28	62	70	15.52	1,086.40	
29	61	85	6.12	520.20	
30	47	85	4.34	368.90	
		2285		13,014.80	

V

Item	Hole No	Ft Min	% Zns wt. Au.	Ft. % Zns
1	30	65	2.12	137.80
2	116	35	2.49	87.15
3	33	75	3.85	288.75
4	32	65	7.06	458.90
5	75	85	18.69	1,588.65
6	35	75	2.33	174.75
7	34	100	5.72	572.00
8	111	60	1.40	84.00
9	121	65	1.08	70.20
10	28	80	1.38	110.40
11	17	30	2.58	77.40
12	14	90	1.98	178.20
13	48	70	0.40	28.00
14	11	130	13.34	1,734.20
15	44	25	0.40	10.00
16	15	80	2.15	172.00
17	40	100	9.98	998.00
18	43	15	9.83	147.45
19	16	35	2.64	92.40
20	13	40	2.00	80.00
21	8	105	1.90	285.00
22	77	10	2.00	20.00
23	9	85	2.06	177.16
24	98	70	2.43	170.10
25	12	80	1.72	137.60
26	7	115	2.15	247.25
27	3	115	2.76	317.40
28	76	5	2.00	10.00
29	2	100	2.60	260.00

AU

74.86 ft. - 4.16 % Zns

Sq. ft - 7.25

Sq. ft. 290,000

Cu. ft. 21,709,400

Tons 90 1,736,752 - 4.16 Zns

Tons Zns - 72,249

V (cont'd)

Item	Hole No	Ft. min.	% Zns	Ft. % Zns
30	1	130	1.45	188.50
31	6	70	1.73	121.10
32	38	115	0.83	95.45
33	39	55	1.60	88.00
34	40	95	9.24	877.80
35	42	150	5.40	810.00
		2620		10,895.61

(AU 74.86 Ft. - 4.16 % Zns)

VI

Entry	Hole No	Ft. of Min	% Zns wt. Av.	Ft. % Zns	Aver.
1	154	105	2.60	273.00	
2	152	90	2.70	243.00	85.00 Ft + 1.48 % Zns
3	138	110	1.70	187.00	
4	133	45	0.72	32.40	
5	134	100	0.50	50.00	Sq. in - 3.59
6	135	70	1.28	89.60	Sq. Ft. 143,600
7	126	95	1.64	155.80	Cu. Ft. 12,206,000
8	136	110	0.86	94.60	Tons % 976,480 - 1.48 Zns
9	153	75	1.62	121.50	Tons Zns - 14,452
10	150	30	1.17	35.10	
11	155	95	0.37	35.15	
12	151	95	2.04	193.80	
		1020		1,510.95	

VII

Item	Hole No	Ft. Min.	% Zns wt. Av.	Ft. % Zns
1	127	85	1.92	163.20
2	138	120	1.55	186.00
3	139	75	3.18	238.50
4	104	90	2.53	227.70
5	140	75	2.62	196.50
6	149	105	1.45	152.25
7	102	75	2.00	150.00
8	162	100	1.08	108.00
9	18	150	1.98	297.00
10	99	85	1.68	142.80
11	24	110	2.13	234.30
12	26	120	1.98	237.60
13	23	55	3.14	172.70
14	130	100	1.75	175.00
15	131	120	3.26	391.20
16	25	115	2.57	295.55
17	110	95	2.45	232.75
18	27	135	1.00	135.00
		1810		3736.05

Av.

67.04 Ft. - 2.06 Zns

Sq. in - 4.52

Sq. Ft. - 180,800

Cu. Ft. 12,120,832

Tons % - 969,666 2.06

Tons Zns. 19,975

Section	Cubic yds Brown	Cubic yds Blue	Ore Tons	Ore Grade	Tons X grade	Ore below [illegible]	
A-A'	68,647	15,353	15,000	3.24	48,600		
B-B	90,385	20,604	143,300	5.33	763,789		
C-C	118,290	27,606	147,700	3.13	462,301		
D-D	77,836	48,993	115,900	11.02	1,277,218		
E-E	113,389	47,426	201,620	4.34	875,031	9840	2.00
F-F	118,224	75,865	83,400	4.65	387,810		
G-G	[illegible]	52,295	102,900	4.61	474,369		
H-H	138,911	36,574	114,900	3.33	382,617		
I-I	136,711 ~~138,911~~	52,095 ~~36,574~~	75,600 ~~114,900~~	1.71 ~~3.33~~	12,9276	15,000	3.0
J-J	133,060	78,333	84,560	2.89	244,378	5240	2.12
K-K	150,130	44,859	59,780	8.42	503,348	18,400	4.71
L-L	127,792	89,185	66,200	13.09	866,558		
M-M	155,131	57,862	100,300	2.74	274,822	6960	3.35
N-N	108,588	94,818	104,936	2.28	239,254		
O-O	131,693	56,211	161,500	6.22	1,004,530		
P-P	127,926	66,647	103,240	3.75	387,150	6480	5.52
Q-Q	74,348	122,674	72,720	3.64	264,701		
R-R	140,345	55,194	126,800	1.28	162,304		
S-S	89,118	85,917	108,100	1.77	191,337		
T-T	78,599	111,522	75,760	1.58	119,701		
U-U	94,236	90,751	117,300	10.00	1,173,000	16,000	10.00
V-V	83,950	94,786	136,220	5.75	783,265		
W-W	109,639	64,913	190 [illegible]	—			
X-X'							

Section	Cubic yds Brown	Cubic yds. Blue	Ore Tons	Ore Grade	Tons x grade	Ore below 170'
JJ-II	63,796	61,679	94,200	7.65	721,395	
KK-KK	76,215	93,519	67,820	14.13	958,296	
LL-LL	53,878	67,814	89,500	3.26	291,770	
MM-MM	75,432	102,104	31,680	1.91	60,509	
NN-NN	55,528	85,317	97,200	12.48	1,213,056	
OO-OO	65,430	91,152	104,820	11.95	1,252,599	
PP-PP	104,787	106,505	85,400	0.852	72,590	
QQ-QQ	112,689	20,354	172,480	1.76	303,565	
RR-RR	4,321,648	2,973,929	4,336,516		21,230,339 @ 4.90	
SS-SS						
TT-TT			below 170			
UU-UU			112,580 @ 4.43 %			
VV-VV						
WW-WW						
XX-XX						

above 170	4,336,516 tons @ 4.90 %	
below 170	112,580 ton @ 4.43 %	
Total	4,449,096 tons @ 4.88 % Zns	

Stribbing

Center Block

Stripping	133,000 × 40¢ =	53,200
Mining	270,000 × 50¢ =	135,000
Milling	270,000 × 60¢ =	162,000
Overhead	270,000 30¢	81,000
		431,200

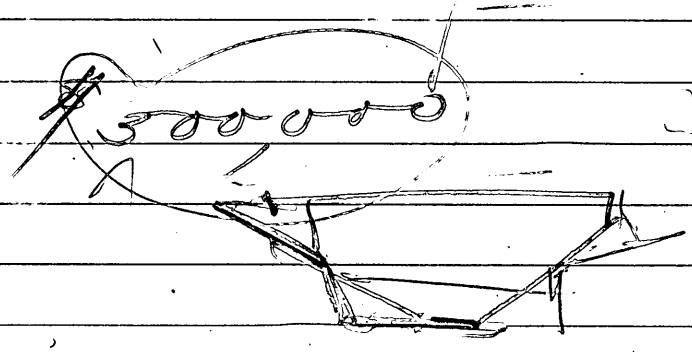
Cost/ton $\frac{431,200}{270000} = 1.597$

1.60

Royalty 2.28 × 7½

6 × 270,000 = 1620,000

$300,000



2.28
1.60
1.18
21
97¢
50¢
47¢

OPEN PIT

Stripping Costs

Shale – 40¢/yd in place
Rock (blasting req'd) 80¢/yd

Mining Costs

Shale 30¢/Ton
Rock 50¢/Ton

Milling Cost 60¢/Ton
(E.P.C. Mill 55¢ incl 9¢ overhead)

Shale slopes 2 to 1

Rock slopes ½ to 1

Leave 15' berm

Road grades not to exceed 10%

OPEN PIT

Stripping Costs

Shale - 40¢ /yd in place
Rock (blasting req'd) 80¢/yd

Mining Costs

Shale 30¢ /Ton
Rock 50¢ /Ton

Milling Cost 60¢ /Ton
(E.P. C. Mill 55¢ incl 9¢ overhead)

Shale slopes 2 to 1

Rock slopes ½ to 1

Leave 15' berm

Road grades not to exceed 10%

Joplin, Missouri
December 28, 1951

Memorandum

To: David Gallagher

From: Edwin T. Perkins

Subject: Waco-Missabe Mining Company, Waco, Jasper County, Missouri
Docket IMA 1880

Analyses of cost estimates for proposed open-pit mining loan. The quantities and grades of the areas as first calculated by U. S. G. S. are shown in Table 1.

Table 1

Area	Measured Tons	20 Percent Remaining Tons	Percent ZnS
I	1,109,845	222,000	4.36
II	673,896	134,800	3.38
III	33,464	6,700	7.35
IV	1,920,702	384,100	5.70
V	1,736,752	347,400	4.16
VI	976,480	excluded	1.48
VII	969,666	"	2.06
		1,095,000	

There has been considerable caving of the ground and settling of the surface, and as a consequence, a certain amount of dilution of the remaining ore at the main working level has taken place.

Estimates of the amount of dilution and the resulting tonnage and grades of the ore which would be milled are given in Table 2. The original drilling showed mineralization in several of the holes to a depth of 330 feet. Other holes showed only this lower run of ore. The ore found in holes below the 170-foot level, however, has not been taken into consideration as it is not suited to open-pit mining. The values have been recalculated in rearranged areas, grouped into four Blocks as shown on the Sketch II.

Table 2

Block	Tons Ore	20 Percent Remaining Tons	Plus Tons Dilution	Ore to be Milled Tons	Ore to be Milled %Zinc
1	1,025,000	205,000	166,000	371,000	2.54
2	1,320,000	440,000	176,000	616,000	2.28
3	2,585,000	969,700	271,300	1,241,000	1.64
4	2,486,000	976,480	301,920	1,278,400	2.16
			Total	3,506,400	

Block 1 is made up of Area I (Sketch I) and the area of "score" included within its limits.

Block 2 is made up of most of Area II, a part of Area V, and the area of "score" included between them.

Block 3 is made up of parts of Areas II, IV, and V and all of Areas III and VII.

Block 4 is made up of parts of IV, and V, and all of Area VI.

Block 3

Because of the possibility of a smaller initial capital outlay and equal ease of access, a Wase-Missaba Mining Co. representative has suggested that mining be planned only for Block 3 and a cheaper mill of smaller capacity be built. Rough estimates of the amount of tons and grades remaining in Block 3 above the 170-foot level are shown in Table 3.

Table 3

Areas	Total Tons	Tons	%ZnS	Added Tons Dilution	Ore to be Milled Tons	Ore to be Milled %ZnS
II	134,800	22,500	3.38	2,800	25,300	2.96
III	6,700	6,700	7.35	800	7,500	6.43
IV	384,100	38,400	5.70	4,800	43,200	5.00
V	307,400	173,600	4.16	21,700	195,300	3.64
VII	969,666	969,700	2.06	-	969,700	2.06
				Total	1,241,000	2.45 ZnS 1.64 Zn

Therefore, from the mining of Block 3, the following production calculations are made:

Estimated Production Value:

1,241,000 tons x 1.64 percent zinc = 20,352 tons zinc

20,352 x .8 (80 percent mill recovery) = 16,282 tons recoverable zinc

16,282 ÷ .6 = 27,136 tons 60 percent zinc sulfide concentrate

27,136 x $135/ton = $3,663,427 - present value on Joplin market

Less 7-1/2 percent royalty = 274,757

Net Value $3,388,670

Estimated Production Costs:

Shale stripping	3,070,500 tons	at $ .20	=	$ 614,100
Removing waste rock	290,200 "	" 1.00	=	290,200
Mining	1,241,000 "	" 1.00	=	1,241,000
Milling	1,241,000 "	" .70	=	868,700
Office & Administration	4,601,700 "	" .30	=	1,380,510
Cost of Mill				150,000
Interest on $150,000, 2 years at 5 percent				15,000
		Operating Cost		$4,559,510
		Net Value of Ore		3,388,670
		Operating Loss		$1,170,840

A break-even operation would require a price of about $170 per ton of concentrate F.O.B. Joplin, Missouri.

Table 4
Combined Blocks 1, 2, 3, and 4

The consideration of mining the entire "zinc" deposit by open-pit method based on the estimated tonnage and grade given in Table 2 gives the following calculated production results:

Estimated Value of Production:

371,000	x	2.54	=	9,423	tons zinc
616,000	x	2.28	=	14,045	" "
1,241,000	x	1.64	=	20,352	" "
1,278,000	x	2.16	=	27,613	" "
3,506,000				71,433	

71,433 x .8 (80 percent recovery) = 57,146 tons zinc recoverable
57,146 ÷ .6 = 95,244 tons 60 percent concentrate
95,244 x $135 = $12,857,940
Less 7½% royalty 964,346
Net Value $11,893,594

Estimated Production Cost:

Stripping	1,538,700 tons		
	1,251,600		
	1,870,500		
	2,288,600		
	6,949,400 tons at $.20 =		$1,629,880
Removing rock	385,000 tons		
	187,200		
	290,200		
	1,122,400		
	1,984,800 tons at $1.00 =		1,984,800
Mining	371,000 tons		
	616,000		
	1,241,000		
	1,278,400		
	3,506,400 tons at $1.00 =		3,506,400
Milling	3,506,400 tons at $ .70 =		2,454,480
Office & Administration	6,949,400 tons		
	1,984,800		
	3,506,400		
	13,440,600 tons at $ .30 =		4,032,180
			$13,607,740
Cost of mill	700,000		
Int. on 700,000(2 yrs. at 5%)	70,000		770,000
		Operating cos	$14,437,740
		Net income	11,893,576
		Loss	$ 2,544,164

A break-even operation would require a price of only $151.50 per ton of concentrate F.O.B. Joplin. Neither operation is profitable with the present price of ore.

Edwin T. Perkins

Edwin T. Perkins

/jd

xxxxxxxxxxxxxx
December 31, 1951
Joplin, Missouri

Memorandum

To: David Gallagher

From: Clinton C. Knox

Subject: Additional comments on the attached memorandum by E. T. Perkins on Waco-Mineabo Mining Company, Docket DMA 1588.

Mass production of zinc and lead by large-scale, open-pit mining methods was proposed in the above-subject application. The oval-shaped, half-mile long "sink" deposit to be mined is near Waco, Missouri, in the Tri-State Mining District. From a study of available old records, the engineers for the applicant made the reasonable assumption that about 20 percent of the original ore reserves remain in that deposit. These reserves are believed to be composed of the supporting pillars and roof arches along with large areas of marginal-grade zinc-bearing materials in the deposit which were left by the previous, underground mining operations. It is also apparent that those remaining reserves have been considerably diluted by the caving of overlying, incompetent strata into the abandoned large open stopes. Some conception of this caving is evident from subsided areas in the present surface topography.

In a concerted effort to make the only possible checks on those remaining ore reserves, Fryklund, Fieldman, and Sebal, U. S. Geological Survey geologists recalculated the original ore reserves by two methods from the numerous churn-drill hole logs and assays. Each of the five favorable, previously-mined areas was discounted by 60 percent. The results showed, in practical round figures, that remaining reserves may be on the order of 1,000,000 tons containing 3 percent zinc but would be diluted by the caving so that a much larger lower-grade quantity must be mined and milled.

In the proposed open-pit mining on that basis a lower-grade, undisturbed "core" would be left in the central area of the "circle sink" deposit. This "core" is roughly estimated to contain 2,000,000 tons of material with a zinc and lead content of about 1 percent.

Maintaining safe pit slopes would be necessary to protect the proposed large, open-pit operations while excavating the various soft formations to be encountered in this "sink" deposit. Therefore, it is

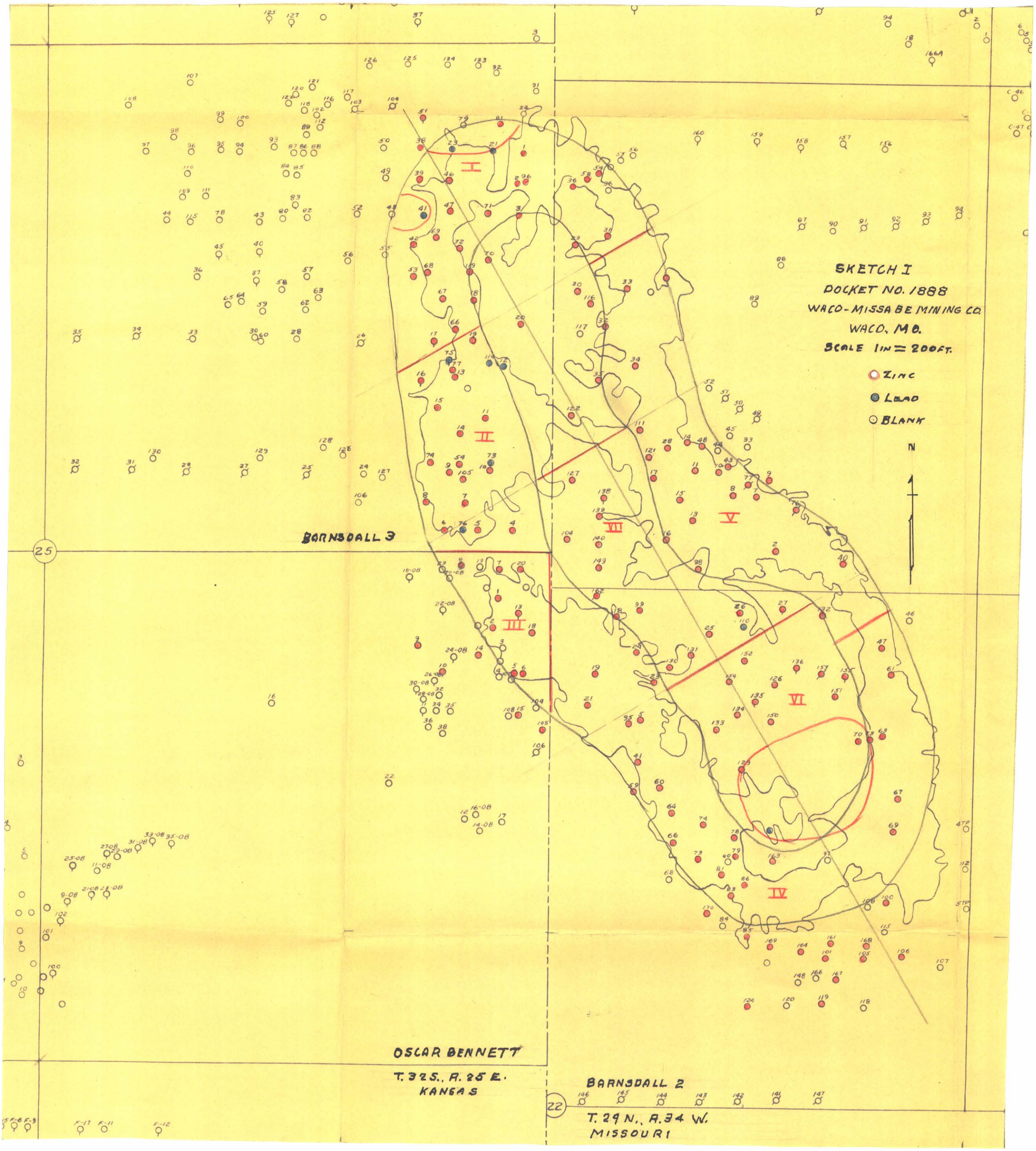
believed impractical to consider leaving much of the soft "core" standing as an island in charting the proposed open-pit mining method. From the relatively few holes which have been drilled in the "core", it appears that large blocks of "core" material in the ore horizon contain enough zinc to be selectively mined and milled. These materials, at least, would better stand the cost of milling in preference to the expense of hauling to the spoil pile because stripping much of the "core" would be required, in either case.

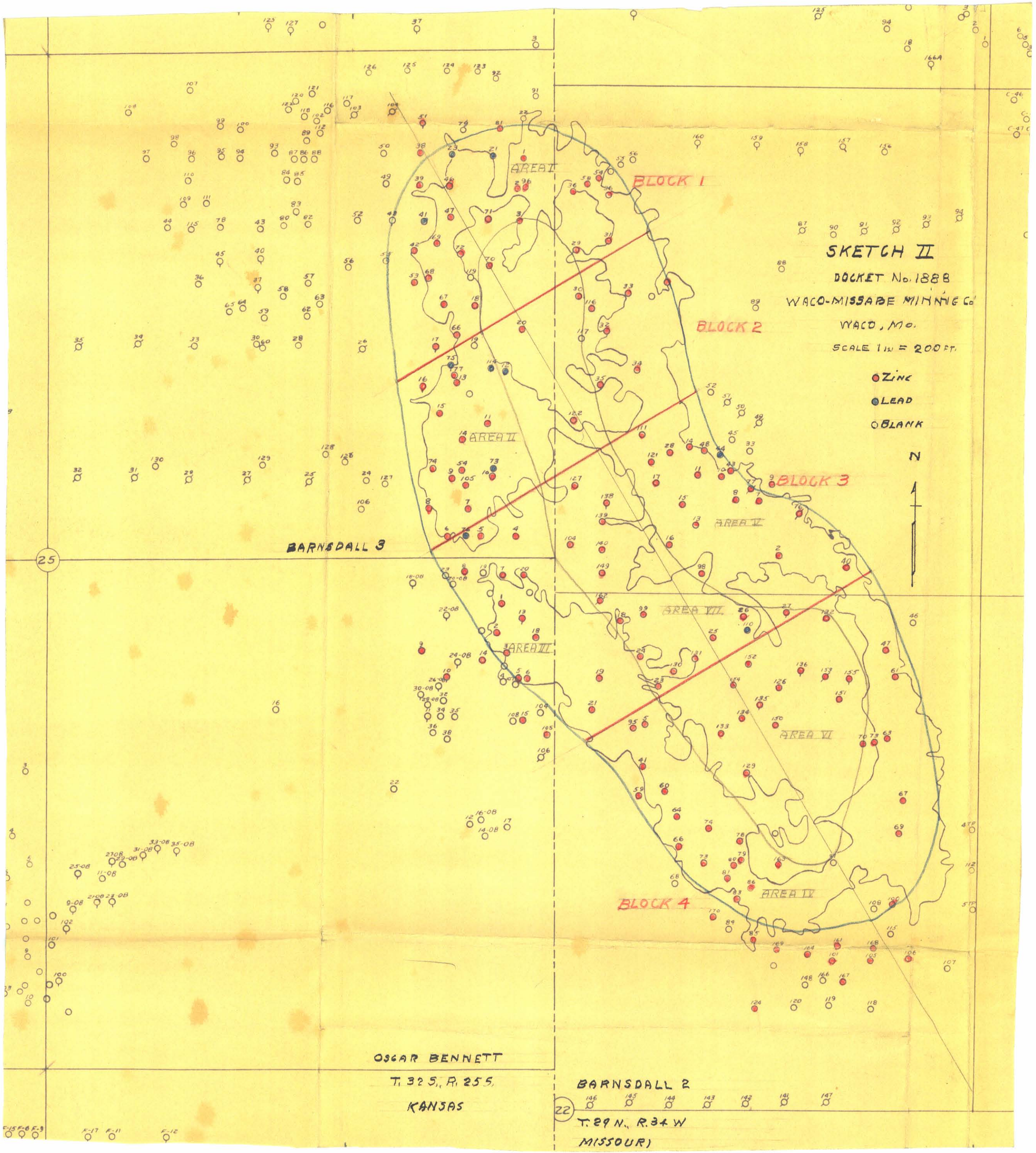
Estimates on the Waco-Missabe Mining Company's open-pit mining as presented in their application (Docket DMA-1888), did not show a profitable operation and are not included in this report.

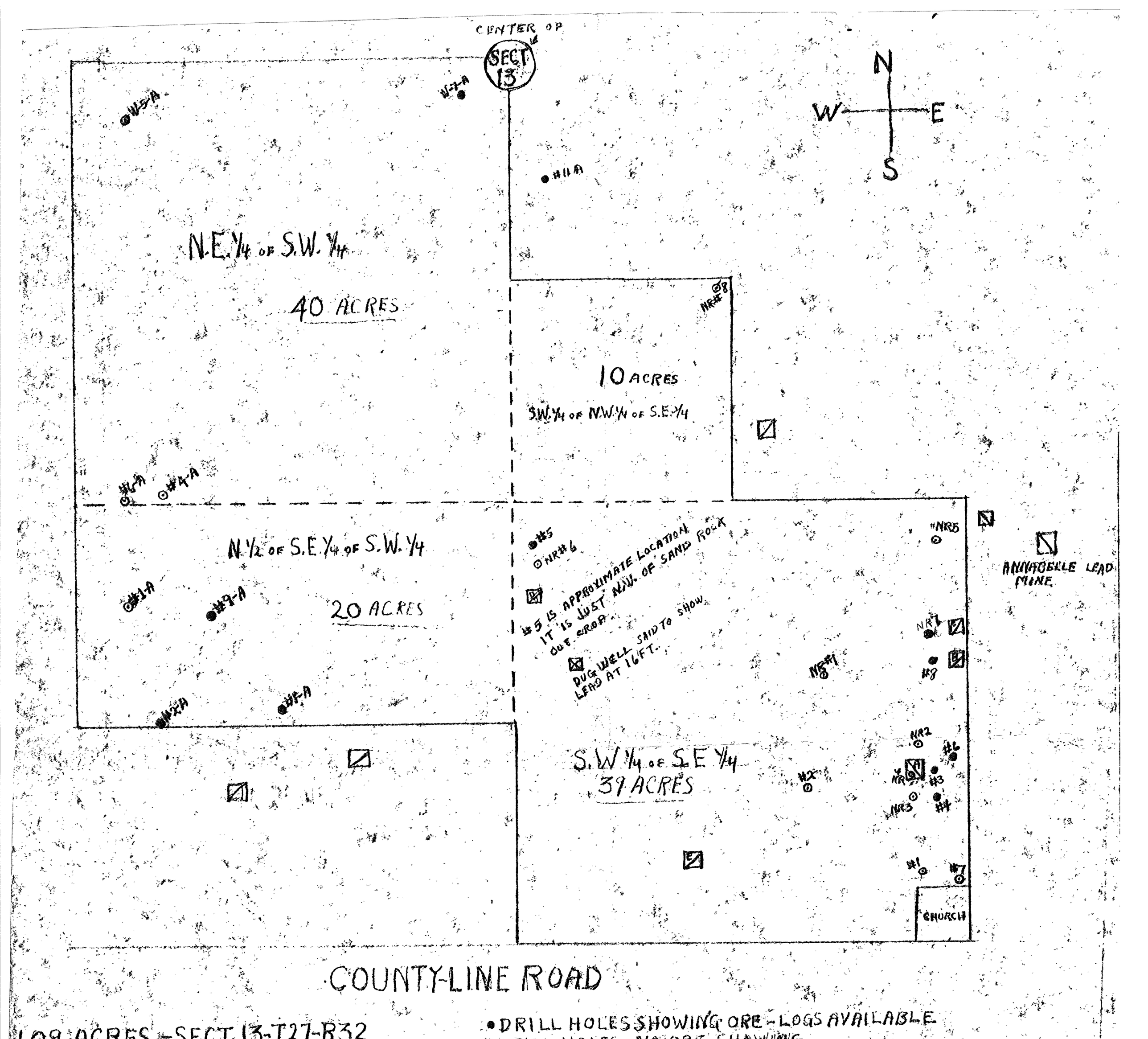
That company then countered with a proposal to mine by open-pitting only a central zone across the deposit which is designated as "Block 3" on the attached Sketch II and estimated results are shown in "Table 3".

"Table 4" which includes Blocks 1, 2, 3 and 4 shown on "Sketch II", gives the estimated result of open-pit mining the entire area.

Edwin P. Pehrus for
Clinton C. Knox


SKETCH I
DOCKET NO. 1888
WACO-MISSABE MINING CO.
WACO, MO.
SCALE 1 IN = 200 FT.
ZINC
LEAD
BLANK
N
BARNSDALL 3
BARNSDALL 2
OSCAR BENNETT
T. 32 S., R. 25 E.
KANSAS
T. 29 N., R. 34 W.
MISSOURI
25
22
I
II
III
IV
V
VI
VII


SKETCH II
DOCKET No. 1888
WACO-MISSABE MINING Co.
WACO, MO.
SCALE 1 IN = 200 FT.
ZINC
LEAD
BLANK
N
BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 4
AREA I
AREA II
AREA III
AREA IV
AREA V
AREA VI
AREA VII
BARNSDALL 3
BARNSDALL 2
OSCAR BENNETT
T. 32 S., R. 25 S.
KANSAS
T. 29 N., R. 34 W
MISSOURI
25
22



109 ACRES - SECT. 13-T27-R32

OWNER

ARTHUR H. WERNER

• DRILL HOLES SHOWING ORE - LOGS AVAILABLE
⊙ DRILL HOLES - NO ORE SHOWING
⊙NR - DRILL HOLES AUTHORITIVELY SAID TO SHOW ORE
ALL LOCATIONS ARE APPROXIMATELY INDICATED