600

FEB 28 1955

J. Willis Grider Fluorspar Co.

Marion, Kentucky

Re: Docket No. DMEA-3558 - Fluorspar
J. Willis Grider Fluorspar Co.
J. Willis Grider Farm
Caldwell County, Kentucky

Dear Mr. Grider:

Your application for aid for an exploration project and other data available to us in Washington relating to the above-named property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of all our information indicates to us that the probability of disclosing significant reserves of fluorspar by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

SIGNED

Administrator

JHopkins:ad 2/23/55
Copy to: Admr. R. File
Docket
Operating Committee
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk

February 21, 1955

Memorandum

To: Administrator

From: Nonmetallic Minerals Division

Subject: A denial of exploration assistance and summary report

By: James Hopkins

1. Docket No. DMEA-3558 - Fluorspar
Property: J. Willis Crider Farm
Caldwell County, Kentucky

Applicant: J. Willis Crider Fluorspar Co.
Mexico, Kentucky

Application: MF-103 dated April 23, 1954.

Work proposed:

1800 feet diamond drill holes @ $3.45/ft. (rounded to)	$6,222.85
Breakdown of costs:	
Labor and supervision	$2,720.00
Operating material & supplies	570.00
Operating equipment	2,290.00
Analytical work, accounting, payroll taxes and compensation insurance	392.00
Contingencies	250.00
Total proposed cost	$6,222.85

No contract: Application denied.

2. Comments:

The applicant proposed exploration of a large fault structure on his property with diamond drill holes. The fault is known as the Tabb fault system. It is about 20 miles long, and consist of four definite sub-parallel faults on the applicant's property. It has been one of the most productive structures in Kentucky.

Fluorspar ore has been produced from one of the components of the system known as the South Tabb fault from about a mile west of the Crider property and for three miles farther west. A smaller but substantial tonnage of ore has been mined also to the east and southeast along the Tabb system. This productive fault touches the Crider property at two points, neither of which could be utilized as exploration sites because of their proximity to another property that would be greatly benefitted by an exploration project.

Drilling, therefore, is proposed for the Main Tabb fault of the system which has been non-productive in other areas and has been tested immediately to the west and found to have very slight mineralization - principally sphalerite.

The most favorable horizon for ore deposition along the Main Tabb fault lies at a depth of 400 feet, which may be beyond the limit of an economical mining operation if ore should be found.

Surface work and shallow pits and shafts along the fault on this property has shown very scant mineralization - being insufficient to encourage deeper exploration.

The geologist of the examining team concludes that all available data on the area indicates a slight chance of finding ore of sufficient grade to be mined from a depth of 400 feet and therefore recommends that the application be denied.

The mining engineer concludes that the structure is well defined and may be mineralized and thus appears a worthwhile site for an exploration diamond drill program. He therefore recommends acceptance of the application for drilling the Main Tabb structure.

The commodity division of the Geological Survey concurs in the recommendation of denial by the examining geologist. The commodity division of the Bureau of Mines concurs in the recommendation of the examining engineer that a limited project be approved.

The Nonmetallic Minerals Division concurs in the denial.

JHopkins:ad 2/23/55
Copy to: Admr. R. File
Mr. Houk

Feb 17, 1955

Memorandum

To: Files

From: James Hopkins

Subject: Evaluation of application for exploration assistance and Reports of Geologist and Engineer of Field Team

Docket No. DMEA 3538 - Floorspar

J. Willis Crider Floorspar Co. Caldwell County, Kentucky.

Field Team Report by G. S. Newman, U.S.B.M recommends 1800 feet on main Tabb fault.

Report by R. D. Jones recommends denial.

Newman recommends drilling for following reasons:

1. The Tabb fault system that crosses property has been very productive in mines one mile east and one mile west of property

2. Neither the North Tabb nor the main Tabb has ever been explored to any appreciable extent, probably because the potential ore horizon is deep

3. The most favorable horizon in this territory is probably Fredonia formation ~300' vertically below surface. and could be tested with 400-foot holes inclined at 45°

4. Belief that the Main Tabb fault has good possibilities although not too much surface exists to substantiate this view other than an exploration project of the proposed magnitude would settle disputes and doubts regarding its potentialities

Conclusion:

I am inclined to agree with the geological interpretation of Mr. R. D. Trace Geologist, U.S.G.S. that exploration of either of the fault structures of the Tabb system would be a terribly "long shot" project. I, therefore, recommend denial of the application

Geological Section on Cutler Property

Tar Spring formation at surface	100 ft thick
Glen Dean	40 "
Hardinsburg	130 " "
Golconda	130 " "
Cypress	75 " "
Point Creek	20 " "
Bethel	50 " "
Renault	70 " "
Total to Top Ste Genevieve	610 feet
Levia's	10
Rosiclaire	10
Total to top of Fredonia the best "host" formation	630
Fredonia	200
Total to top of St. Louis 2nd most productive horizon	830 feet

5. Belief that the South Tabb fault, which, with a few cross faults, has been the only productive zone in mines to the west, offers the best possibilities. This is ruled out because exploration on this member would benefit adjoining properties more than the Cutler property.

These recommends denial of the application for following reasons:

1. There has been no shallow production of note on any of the faults on the Cutler property. No particular evidence of mineralization exists.

2. Fault No 2 or South fault of Tabb system is ruled out for the same reason as given above. This zone would have greater possibilities than Fault No 1 because production is found on it to the east and west.

3. The shallowest zone is at a vertical distance of nearly 400 feet. This depth may be too deep for an economical mining operation

4. Drilling of the area between the Cutler property and productive mines on the west indicate that the ore deposits in those mines are not continuous to the Cutler property

5. The best evidence of the potential possibilities of fault No 1 or Main Tabb fault on the Cutler property is in the half mile length immediately east. Here the most favorable horizon is either within 50 feet or is at the surface within feet well. The shallow pits in this area are known to have found no minable ore. This is also true of fault 2 or South Tabb

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

Defense Minerals Administration
RECEIVED
FEB 23 1955

February 21, 1955

Memorandum

To: Mr. Lawrence G. Houk, Chief, Non-Metallic Minerals Division, DMEA

From: Commodity Specialist, Branch of Construction and Chemical Materials

Subject: Review of field team reports on Docket No. DMEA 3558 - (Fluorspar - Lead - Zinc) J. Willis Crider Property, Caldwell County, Kentucky

The application and field team reports disclose that the proposed project is well-located with respect to transportation, markets, and availability of labor, supplies, equipment, power and water; the applicant has had considerable experience in fluorspar mining in this district; property rights appear firm; the method of exploration is suited to the project; the cost to the Government is moderate. Thus it appears that the sole issue involved relates to the geologic probability of a discovery.

The Bureau of Mines member of the field team has recommended that a limited project of diamond drilling (1800 feet) be approved to test the Main Tabb (fault 1 on the map attached to the field team report). There has been a considerable production from the Tabb fault system as close as one mile to the west of the proposed project, and a smaller but substantial production about a mile east of the site. Although it appears that most production in the vicinity has come from the south Tabb (fault 2 on the map) or cross faults, both members of the team point out that there has been little exploration of fault 1 in favorable horizons.

In recommending that no drilling be authorized, the member of the team from the Geological Survey pointed out that the minimum depth at which an ore body might be discovered was about 400 feet; that the record of the north branch of the fault system in other areas was poor; that prospect pits to the east of the project site - where the most favorable formation is at shallow depth - disclosed no evidence of minable ore; that fault 2 - a large producer both to the east and the west of the project - had produced no ore in the area of the Crider property.

Although these factors might be considered unfavorable indications, it is felt that they are by no means conclusive. The evidence regarding the old prospect pits to the east of the project is sketchy. Both members of the field team agree that the main Tabb (fault 1) has not been adequately tested in the most favorable stratigraphic beds.

The fault to be tested appears to be well defined; is a major part of the Tabb system in this area; and has never been adequately explored. The application meets all other criteria set forth in DMEA Order 1, dated March 28, 1954 (Sec. 6). Therefore it is recommended that a limited project such as that suggested by the Bureau of Mines engineer be approved.

John E. Koltsinger, Jr.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Library
FEB 18 1955

February 15, 1955

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-3558 (Fluorspar-lead-zinc)

To: L. G. Monk, Defense Minerals Exploration Administration

From: R. E. Van Alstine, U. S. Geological Survey

Applicant: J. Willis Crider

Name of property: J. Willis Crider property

Location of property: Tabb fault system, west of Kentucky Highway 91, Caldwell County.

Date of Field Team report: February 2, 1955

Authorship of Field Team report: 2 reports: one by G. L. Neumann, U.S.B.M., and one by R. D. Trace, U.S.G.S.

Field Team's recommendation:

Neumann -- 1000 feet of drilling along the main or central Tabb fault (Fault 1 of Trace); possibly 4 or 5 holes.

Trace -- deny application.

Comments:

1) I agree with Trace that the proposal has but slight chance of finding ore. No evidences of mineralization on the property have been presented. The nearest mines along the Tabb fault are 1 mile east and 1 mile west. If the mere presence of a persistent fault on a property were considered justification for government participation in exploration, several hundred miles of fault lengths similarly would be eligible for DMEA exploration in the Kentucky-Illinois field.

2) The large ore deposits mentioned in mines along the Tabb fault west of the Crider property are not continuous to the applicant's property. No commercial mineralization was reported in Bureau of Mines and private drilling in the eastern part of the Huffer property and in the property adjoining the Crider property on the west.

3) In the immediate vicinity, the proposed project is not the most favorable site, geologically, as Trace points out that Fault 2 is more favorable than Fault 1, a more favorable part of Fault 1 lies just east of the Crider property, and much shallower drilling to the favorable horizon (Fredonia) could be found nearby.

4) The Bureau of Mines engineer has recommended approval of the proposal but seems lukewarm about it. On page 5 of his report he admits that "the applicant's proposed exploration program is not too good", and that "not too much evidence exists to substantiate this view" -- the applicant's belief that the main Tabb has good possibilities. On page 2 the reason for the exploration seems to be to "settle disputes and doubts regarding its (the main Tabb's) potentialities." This proposal appears to me to be in the nature of eliminating dead ground, which seems too much of a negative approach for government participation in exploration.

ACTION RECOMMENDED

Follow Field Team recommendation by R. D. Trace and deny application.

R. E. Van Alstine

REVanAlstine:hlm
G-2/15/55

Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. C. Arundale, 3516 Interior

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
FEB - 3 1955

College Park, Maryland

February 2, 1955

Memorandum

To: George C. Selfridge, Chairman, Operating Committee, DMEA

From: Supervising Mining Engineer

Subject: Docket No. DMEA-3558 - (Fluorspar-Lead-Zinc)
J. Willis Crider Property
Caldwell County, Kentucky

Transmitted herewith in quadruplicate are separate reports by the Geologist and the Engineer who made the field examination of the applicant's property.

There is a difference of opinion on the recommendations with justifications for both. Therefore, separate reports are submitted for consideration by the Operating Committee.

W. T. Millar

Enclosures

WTM:rwa

copy for Mr. Selfridge - orig. & 3 ✓
PTAllsman, CP Files
USGS
DMEA Files, CP

FIELD TEAM REPORT ON EXAMINATION OF PROPERTY

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB - 3 1955

DMEA Docket No. 3558 - (Fluorspar-Zinc-Lead)

Applicant: J. Willis Crider Fluorspar Company
Mexico, Kentucky
Property: J. Willis Crider Property
Caldwell County, Kentucky

by
R. D. Trace 1/

TABB FAULT SYSTEM

The Tabb fault system, on which the Crider property is located, is in the southern part of the Kentucky-Illinois fluorspar district. The ore deposits in the Tabb area consist of fluorspar with subordinate quantities of sphalerite and galena; calcite and barite are the principal gangue minerals. The deposits occur as steeply dipping veins along faults that displace relatively flat or shallow dipping shale, sandstone, and limestone beds of Mississippian age.

The Tabb fault system is about 20 miles long; the western part trends east-northeast, the eastern part east-southeast to southeast. The fault system generally consists of two steeply dipping, sub-parallel faults, 100-400 feet apart, and intervening ground complexly broken in places by cross faults. Many of the cross faults can be found only from mining or drilling data.

The Tabb fault system has been one of the most productive in the Kentucky area. From about a mile west of the Crider property, and for about three miles further west, ore has been produced by the Rosiclare Lead and Fluorspar Company from the Pygmy mine, from the Eva Tanguay mine, from the Haffaw mine by Alcoa, from the Blue mine, and by U. S. Steel from several mines. This area has been one of the leading producers in the district.

1/ R. D. Trace, Geologist, U. S. Geological Survey.

Most of the ore has been mined from the southern fault or from cross faults, commonly where the surface outcrop of the footwall of the fault is the Ste. Genevieve or lower formation.

A smaller, but substantial tonnage of ore has been mined also to the east and southeast of the property along the Tabb system. From about a mile east of the Crider property, at the Beavers mine, for about 8 miles, the Brown, Ray Hill, Schmenck, Crowder and other small mines have produced ore, primarily from the southern fault or cross faults of the Tabb system.

CRIDER PROPERTY

The Crider property is on the central part of the Tabb fault system, near where it changes in trend from east-northeast to east-southeast. The exposed formations and the faults on the property and adjoining area to the west are shown on the attached map. The approximate average thicknesses of the formations in the area are as follows:

	(feet)
Mississippian	
Chester series	
Menard limestone	80
Waltersburg sandstone	40
Vienna limestone	30
Tar Springs sandstone	100
Glen Dean limestone	40
Hardinsburg sandstone	130
Golconda formation	120
Cypress sandstone	75
Paint Creek shale	20
Bethel sandstone	50
Renault formation	75
Meramec series	
Ste. Genevieve limestone	
Levias limestone member	10
Rosiclare sandstone member	10
Fredonia limestone member	200
St. Louis limestone	400

Four faults, labelled 1, 2, 3, and 4 on the attached map, are known to be on the Crider property. The applicant proposes to drill only along fault 1.

Fault 2 and 4 are excluded from drilling because of their short extent on the property. The location of fault 3 is poorly known.

Fault 1 probably dips steeply to the north, and displaces the beds at least 150 feet vertically. At the surface, the hanging wall of fault 1 is mostly the Tar Springs sandstone and the footwall is mostly the Hardinsburg sandstone. As would be anticipated with these sandstones at the surface on the walls of the fault, no deposits have been found; however, no exploration has been done, other than a few shallow prospect pits.

As no mining or serious exploration has been done on the Crider property, it can be evaluated only by comparison with other areas along the same fault system. The nearest mines are the Pygmy, about a mile to the west, and the Beavers, about a mile to the east. The mined area to the west was mapped and studied by the Geological Survey in 1942-45 and will be partially described. A brief summary of the area to the east will be given also.

The Blue mine area, about 2 miles east of the Crider property, is not known to have been tested by drilling. Mining has been almost exclusively on the south fault (corresponds roughly to fault 2 on Crider property) or on cross faults. For example, according to the Geological Survey unpublished map of the Blue property made in 1943, 21 shafts were sunk on the south fault where the surface wall rocks are Hardinsburg and St. Louis or Ste. Genevieve. A few of these shafts might have been sunk on cross faults. Three shafts were sunk on the north fault (corresponds roughly to faults 1 and 3 on Crider property), where the surface wall rocks are Hardinsburg and Tar Springs sandstones.

The Haffaw mine area, the next property to the east of the Blue, appears to have produced ore primarily from cross faults in the western part of the property. The mined area is now indicated by caved ground that trends east and is about 500 feet long, 200 feet wide, and 25 feet deep. This caved ground lies between the north and south faults, although it overlaps the south

fault slightly.

In the eastern part of the Haffaw property and on the adjoining Eva Tanguay property, at least 11 holes drilled by the Bureau of Mines and Alcoa in 1943-45 cut both the north and south faults. As the holes were started on the north side and in the hanging wall of the Tabb fault system, 9 of the 11 holes cut the north fault above where either wall was the Ste. Genevieve. No ore or marginal ore was cut in these nine holes in the north fault. The average width of fault zone (breccia, gouge, gangue) was about 5 feet. Of the other two holes one had Fredonia on the footwall of the fault and had 10 feet of fault material; the other hole, had St. Louis on the footwall of the fault and had 20 feet of fault material in the north fault. Neither hole contained minable fluorspar.

The south fault, where cut by drilling, had either Ste. Genevieve or St. Louis on one of the walls, in all 11 drill holes. Three holes cut ore, and three others cut marginal ore in the south fault. The fault zone in the south fault in the 11 holes averaged nearly 40 feet in thickness, and ranged from 10 to 60 feet.

The next adjoining property to the east of the Eva Tanguay is the Pygmy, the eastern part of which is shown on the attached map. In the western part of the property (west of the Illinois Central Railroad), most of the mining was done on a cross fault, where the Ste. Genevieve or St. Louis is the footwall. Within 100 to 300 feet of the highest grade and widest Pygmy ore body on the cross fault, the north fault was tested by three drill holes where the footwall was limestone beds of the Renault or St. Louis formations. The wide fault zones were nearly all breccia and calcite.

East of the I. C. tracks (see attached map) most of the mining was done on the south fault or cross faults where the Ste. Genevieve or St. Louis

was on one wall. North of this mined area five drill holes cut the north fault. None of the holes cut minable fluorspar, although two had considerable zinc. Both walls of the fault cut in these five holes were above the Ste. Genevieve. The above data are of limited value because the core recovery obtained by the operator in drilling particularly the eastern part of the Pygmy mine area and adjoining area to the east was poor.

Only a few tons of ore have been taken from scattered shallow shafts from about 600 feet west of Livingston Creek, east and east-southeast to the Crider property along the Tabb fault system. A few holes were drilled by the Pygmy mine operator on both sides of and near Livingston Creek (see attached map), but no ore was found. In 1953 the Bureau of Mines drilled six holes further to the east of this area (see attached map), but no minable fluorspar, although some zinc along fault 2, was found. No assays are available. BM 1-4 were drilled to explore fault 2, and is the exploration closest to the Crider property on the west.

In summary, the mining record of the area to the west of the Crider property is as follows: Nearly all the ore has been found on the south or cross faults, where one wall of the fault is Ste. Genevieve or St. Louis. The north fault has had little mining done on it, but only in a few scattered places has this fault been tested where its walls are stratigraphically similar to the walls of the ore deposits in the south or cross faults.

The Geological Survey has mapped the Tabb area for about a mile east of the Crider property, up to and including the Beavers property. No drilling is known to have been done in the area between the Crider and Beavers property and only a few shallow shafts or pits had been dug. The Beavers mine, which had not been opened when the area was mapped in 1945, is reported to have produced between 1,000 and 2,000 tons of ore in 1953. From [illegible] [illegible]

The geology of this area, as mapped from surface outcrops, appears to be not too complex or different from the geology of the Crider property, except in one significant respect. Beginning near the southeast corner of the Crider property and extending eastward, the existence of fault 4 has lessened the amount of relative displacement along fault 2 and increased it along fault 1 so that the Renault-Ste. Genevieve formations, rather than the Hardinsburg, crop out at the surface between faults 1 and 2. Slightly less than half a mile to the east, another and similar cross fault is probably present. These two cross faults have created an area between fault 1 and fault 2 where the lower part of the Renault and the upper part of the Ste. Genevieve formations crop out at the surface.

Thus for about half the distance from the Crider to the Beavers property, the surface walls of fault 1 are the Tar Springs or younger beds and the lower Renault or Ste. Genevieve. Along this half mile of fault 1, about 10 shallow shafts or pits had been dug as of 1945. Of these, a shaft about 100 feet northeast of Kentucky Highway 91 (see attached map) is 100 feet deep and is reported to have produced a few tons of ore. Dumps from at least three other shafts along fault 1 contain fault material but there is little suggestion of any mining.

Several shallow shafts or pits also have been dug along fault 2 between the Crider property and Beavers mine, but there was no evidence in 1945 of any mining operations.

According to the operator, Mr. Crider, the record of this area along faults 1 and 2 between the Crider property and Beavers mine (except for the latter mine) has not changed since 1945.

SUMMARY AND CONCLUSIONS

Although no ore has been produced from the Crider property, the Tabb fault system, beginning about a mile west of the Crider property and continuing westward for about 3 miles, has probably produced as much if not more fluorspar than any other area in the Kentucky part of the district. Ore also has been produced east of the Crider property, the nearest mine being about a mile away.

The operator proposes to drill fault 1 where the surface formations are Tar Springs and Hardinsburg sandstone. No ore has been mined from this (or any other) fault on the property, nor, from general experience in the district, would ore be expected to occur where these two sandstones constitute the walls of the fault. The shallowest zone that has a reasonable chance of containing ore is at a vertical depth of nearly 400 feet. At this depth, the footwall of the fault probably would be the Ste. Genevieve and the hanging wall Cypress or Bethel. In order to cut the fault at this zone, a drill hole must be 400 to 600 feet in length.

Despite the excellent mining record of the Tabb system as a whole, the available data on the area to be drilled suggest that the proposed drilling program has but slight chance of finding ore sufficiently wide and high in grade to be mined from a depth of 400 feet; therefore, no drilling is recommended.

Three items, which overlap somewhat, suggest this conclusion. They are: 1) the record of the northernmost fault of the Tabb system is poor, although admittedly the most favorable stratigraphic beds have not been well tested along it. 2) In the area of the Crider property, even fault 2, from which much ore has been mined in areas to the west and east, has produced no ore. 3) Perhaps the best evidence of the potential possibilities of fault 1

on the Crider property is in the half mile length of fault 1 immediately east of the Crider property. Here, the most favorable formation is either within 50 feet of the surface or is at the surface on the footwall of fault 1. The 4 or 5 pits or shallow shafts that have explored the fault in this favorable area are not known to have found any minable ore. Nor is any ore known in the same area along fault 2.

FIELD TEAM REPORT ON EXAMINATION OF PROPERTY

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB - 3 1955

DMEA Docket No. 3558 - (Fluorspar-Zinc-Lead)

Applicant: J. Willis Crider Fluorspar Company
Mexico, Kentucky
Property: J. Willis Crider Property
Caldwell County, Kentucky

by
G. L. Neumann 1/

Summary:

The purpose of the exploration proposed in this application is to increase the known reserves of the three strategic minerals: fluorspar, sphalerite and galena, occurring on land owned by the Applicant. This property is so located that according to the geologic map of the Western Kentucky Fluorspar District, published in 1951 by Stuart Weller and A. H. Sutton, it lies along the Tabb Fault system in a territory where there are three sections, locally called the main Tabb, or central Tabb, the south Tabb and the north Tabb. The Tabb Fault system has been the best producing structure in this district: to the west of the J. Willis Crider Tract at such mines as U. S. Steel, Mary Helen, Tabb No. 1, Blue Haffaw and Pigmy, and to the east of this tract at the Beavers, Brown, McNeally and Marble (see sketch map accompanying application).

Most of the production from the Tabb fault system in this immediate vicinity has come from the south Tabb or from spur faults off the south Tabb, chiefly because with its stratigraphic position the potential ore horizon is shallow.

The north Tabb is a swing or arc off the main Tabb and is localized to this immediate area. Neither the north Tabb nor the main Tabb has ever

1/ G. L. Neumann, Mining Engineer, Bureau of Mines.

been explored to any appreciable extent, probably because the potential ore horizon is deep.

The south Tabb crosses two tips of the J. Willis Crider property for about 500 feet in two nearly equally separated sections. The main Tabb runs across the length of the property, as may the north Tabb. The applicant has asked for approximately 1800 feet of diamond core drilling. The most favorable horizon in this territory is probably the Fredonia limestone formation and in this area the Fredonia is 300 feet or more below the surface, so that holes inclined at 45° would be at least 400 feet long to reach this horizon.

Conclusions:

The proposed program is set up for approximately 1800 feet of diamond core drilling, thus four or possibly five holes could be drilled, to explore 600 to 800 feet along the trend of the main Tabb fault structure. This structure is well defined and may be mineralized, and thus appears a worthwhile site for the explorational diamond core drilling as proposed. J. Willis Crider, the Applicant, has had 30 years in the successful exploration and production of fluorspar in this territory. He has stated a preference of the main Tabb as the target for his proposed drilling program. There is no better time to explore this fault structure and thus settle disputes and doubts regarding its potentialities.

Recommendations:

The Bureau of Mines representative of the Field Team recommends acceptance of this application with the proviso that the drilling be concentrated on the main Tabb or central Tabb Fault structure.

Time Spent on Property:

G. L. Neumann, Bureau of Mines Field Team engineer, spent the morning of November 18, 1954 on the property with J. Willis Crider, the Applicant.

Robert D. Trace, Geological Survey Field Team geologist, spent the afternoon of December 1, 1954 on the property with the applicant.

Name, Location and Accessibility of Property:

The J. Willis Crider Farm is located in the Western Kentucky Fluorspar Mining District, in Caldwell County, Kentucky. To get to the site of the proposed project take Kentucky State Highway 91 from Fredonia towards Marion, a good all-weather black-top road. At the western edge of the town of Fredonia, where 91 takes a bend to the right, go straight ahead onto a dirt road for about 3/4 of a mile to a fork, take the right-hand road to the Crider property. This dirt road is in fair condition, although quite narrow in places.

Competency of Applicant and Operating Personnel:

The applicant has had considerable experience, about 30 years, as a successful operator in the exploration, mining, milling and marketing of fluorspar. His crew has worked under him on numerous explorations entailing diamond core drilling. They have also worked at times on drilling jobs with several of the contract drillers operating in this territory. They are thoroughly competent to handle the proposed job. The equipment is in good operating condition and is adequate for the proposed exploration.

Applicant's Property Rights:

The applicant owns the mineral and surface rights on this tract in fee simple. Deeds are recorded in the Caldwell County Recorder's Office in book 80, page 54; book 91, pages 397 and 398. There are no mortgages or liens on the property.

Description of Property:

The J. Willis Crider property is rolling farm land with a residence, pond, barns, fences and such equipment accessory to raising Herford cattle.

Most of the farm is grazing land. There are no mining and milling facilities now on the place. There was once a prospect shaft, reportedly 20 feet deep, but now caved and filled. The applicant is now operating a fluorspar mine through two shafts about one mile to the east of the farm. This property is on the Tabb Fault system. The applicant also operates a fluorspar mill at Mexico, Kentucky.

Geology:

The geology of the Western Kentucky Fluorspar District is composed of a very complicated series of fault fissures, for the most part normal, which have been filled with calcite, fluorite, barite, sphalerite and galena in varying proportions. The fault widths run from 2 to 20 feet. The displacement varies from a few feet up to several hundred. Generally the faults are steep-dipping. The most favorable host rock for mineralization appears to be the Fredonia limestone formation.

In the vicinity of the Crider farm, the Fredonia formation lies at a vertical depth of approximately 300 feet. The displacement on the Tabb Fault in this vicinity appears to be around 600 feet. The various members of the Tabb system in this locality are all steeply dipping or nearly vertical and all appear to dip to the north. The trend is east-west.

Past Operations:

The only mine workings ever known on the Crider farm consist of an exploration shaft about 20 feet deep, now caved and filled. No record of any production exists. Because in a landscaping project the shaft was filled in and the dump dispersed, none of the material taken from the shaft is available for examination.

Availability of Manpower, Materials, Supplies, etc.:

Manpower, common or skilled, is locally available for any size or type of mining operation, common labor at $1.00 per hour, skilled at $1.50 an hour.

Materials, supplies and equipment are available at Marion, Kentucky, 12 miles distant. Large manufacturers have district offices and warehouses at Paducah, Kentucky, and give very prompt delivery service. Water is available at Livingston Creek about 2000 feet distant from the proposed work. Power is available from a Kentucky utilities line within one-half mile of the property.

Statement of Applicant's Proposal:

The applicant's proposed exploration program is not too good. Since only 1800 feet of drilling is planned, it is the feeling of the Bureau of Mines Field Team engineer, agreed to by the applicant, that the drilling should be concentrated on one structure. The south Tabb appears to be the most promising structure, evidenced by the production at the Pygmy mine and the diamond core drilling by the Bureau of Mines in 1953 on the east side of the Pygmy property, just west of the Crider property, but the south Tabb cuts across two tips of the Crider property for a total distance of about 500 feet, so any exploration there would develop the adjoining properties more than it would the Crider Farm mainly because this fault has not been explored at a favorable horizon.

The applicant believes that the main Tabb has good possibilities, although not too much evidence exists to substantiate this view. With the Fredonia formation at a depth of over 300 feet, holes inclined at 45° would be more than 400 feet long to reach this objective, and four possibly five holes could be drilled along the trend with 1800 feet of drilling. The Bureau engineer feels justified in recommending the drilling of the main Tabb. Thus, at a 200-foot spacing, 600 to 800 feet along the trend could be explored. This seems an adequate target for a project.

Operator's Property Rights:

The applicant owns both surface and mineral rights on this property. All of the tract is included in the exploration program and is subject to

royalty repayment for the Government's share invested in the project, if certified as a discovery and mined within the time limitation.

Exploration Project:

The work on the project will start within 30 days after approval of the contract. The work should be completed easily within four months after commencement, as scheduled.

Description of Project:

This project is planned as a diamond core drilling exploration on the main Tabb fault fissure. In the locality of the J. Willis Crider farm, the Tabb fault system has been mapped as three major structures: the north Tabb, the main or central Tabb, and the south Tabb. At the Pigmy mine, the closest producer to this property, most of the production came from the south Tabb and spur faults off the south Tabb. The main Tabb showed some mineralization of fluorspar, zinc and lead but was not found in minable widths. This fault was not explored very extensively, especially at a favorable horizon, also much of the early core drilling in this area was very unsatisfactory, core recoveries were poor to nil. Very little exploration has been done on the north Tabb. In 1953 the Bureau of Mines drilled six holes on the Hyatt property, the easternmost plat of ground controlled by the Pygmy mine and adjoining the J. Willis Crider farm. Holes 1, 2, 3 and 4 were drilled on the south Tabb and all cut the fault structure. Holes 1, 2, and 4 showed fair mineralization chiefly sphalerite with minor fluorite. Holes Nos. 5 and 6 drilled to test intersections of cross- or spur-faults with the main Tabb, cut fault zones but showed no mineralization. "The Tabb vein system, the most important in Kentucky, embodies the Tabb, Wheatcroft, Haffaw, Pogue, Blue and Marble, Pygmy and other mines." 2/

2/ Bull. 59, Ill. State Geol. Survey, 1938, p. 25

Several years ago there was a series of sinkholes on the Crider farm. Sinkholes are often associated with fault structures in this district. These holes were filled in recently by J. Willis Crider as part of the landscaping operations for the farm. The applicant is now operating a good fluorspar mine about one mile east of the farm along the Tabb fault.

Cost of the Project:

The contract price for AX diamond core drilling in this district is $2.50 to $3.50 a foot. The applicant, using his own equipment, is justified in his costs as follows:

Allowable costs of Project -		
Independent contracts	None	
Consultants - 80 hrs. @ $3.00/hr.	$240.00	
Supervision - 160 hrs. @ $2.00/hr.	320.00	
Labor - skilled - 640 hrs. @ $1.50/hr.	960.00	
- common - 640 hrs. @ $1.00/hr.	640.00	$2,160.00
Operating Materials and Supplies -		
Gasoline - 80 shifts - 10 gal/shift or 80 gal. @ $0.30	$240.00	
Oil and grease	40.00	
Cement - 16 bags @ $1.25	20.00	
Core boxes - 1800 feet @ $0.10/ft.	180.00	$ 480.00
Use Allowance -		
Diamond core drill equipment $7,000.00 7% use allowance - 4 mos.	$490.00	$ 490.00

Rehabilitation and building -	None	
Maintenance on drill equipment - $0.10/ft (1800 ft.)	$180.00	
Diamond bit repairs - $1.00/ft - 1800 ft.	$1,800.00	
Contingencies	$ 80.00	
Unemployment - taxes - compensation - 7% of payroll	$ 150.00	
Accounting - clerical work - 40 hrs. @ $1.50/hr.	$ 60.00	$2,270.00
Total -		$5,400.00

1800 ft. drilling cost - $5,400.00 - Unit cost drilling $3.00/ft.

Analytical work (sampling & assaying) - 24 samples @ $5.00 ea.	$ 120.00
Total cost of Project -	$5,520.00
Government Participation - 50%	$2,760.00

DEC - 2 1954 600

Mr. W. T. Millar
Executive Officer, DMEA
Field Team, Region VIII
Bureau of Mines
Eastern Experiment Station
College Park, Maryland

Subject: Docket No. DMEA-3558 - Fluorspar
J. Willis Crider Fluorspar Co.
J. Willis Crider Farm
Caldwell County, Kentucky

Dear Mr. Millar:

Please review the subject application and arrange for a field examination if you deem it necessary.

Copies of memoranda from the Geological Survey, dated November 23, 1954, and from the Bureau of Mines, dated November 5, 1954, are enclosed for your information.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

Approved:

J. H. Hedges

Member, Bureau of Mines

Thor H. Kiilsgaard

Member, Geological Survey

Enclosures 4

JHopkins:ag 11/29/54
Copy to: Admr. R. File
Docket
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk

600

DEC - 2 1954

J. Willis Crider Fluorspar Co.

Mexico, Kentucky

Re: Docket No. DMEA-3558 - Fluorspar
J. Willis Crider Farm
Caldwell County, Kentucky

Dear Mr. Crider:

Your application for assistance in exploring the subject property has been reviewed by the Nonmetallic Minerals Division of the Defense Minerals Exploration Administration and has been referred to Mr. W. T. Millar, Executive Officer, DMEA Field Team, Region VIII, Bureau of Mines, Eastern Experiment Station, College Park, Maryland, for further consideration and possibly a field examination.

The Regional Office will contact you at an early date if an examination is to be made. Any assistance that you may give the members of the field team during the examination will be appreciated.

Sincerely yours,

C. O. Mittendorf

Administrator

Jhopkins:sd 11/29/54
Copy to: Admr. R. File
Docket
Operating Committee
Field Team, Region VIII
Mr. Killagaard, 5222
Mr. Arundale, 3516
Mr. Houk

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

November 23, 1954

Memorandum

REVIEW OF APPLICATION DMEA-3558 (Fluorspar, Lead & Zinc)

To: L. G. Hook, Defense Minerals Exploration Administration

From: R. D. Trace, U. S. Geological Survey

Applicant's name and address: J. Willis Crider Fluorspar Company, Marion, Kentucky

Name of property: None given

Location of property: Caldwell County, Kentucky

Summary of applicant's proposal:
Drill 3 core holes, average depth 600 feet each, to explore Tabb Fault system for fluorspar, lead, and zinc.

Sources of information on applicant's property:
The Survey has an inch to a hundred scale map of the area, made during World War II.

Comments: The operator does not present sufficient data to evaluate the property. Its proximity, however, to important deposits west along the same fault system and also the Brown and Beavers Mines to the east, suggest that the property merits an examination. The Survey has considerable file data about the area to the east of the property, but none on the Brown-Beavers area.

RECOMMENDATION: Refer to Field Team.

R. D. Trace

RDTrace:hlm
G-11/23/54

Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. C. Arundale, 3516

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 8 - 1954

November 5, 1954

Memorandum

To: Mr. Lawrence Houk, Chief, Nonmetallic Minerals Division, D. M. E. A.

From: Commodity Specialist, Construction and Chemical Materials Branch

Subject: DMEA Docket No. 3558, J. Willis Crider Fluorspar Co., J. Willis Crider Farm (Fluorspar-Lead-Zinc), Caldwell County, Kentucky

The subject application appears to warrant further investigation by the Field Team.

Fluorspar has been produced on both sides of the proposed project. The Pigmy mine, to the west, has been a relatively large producer, although currently idle, and the applicant reported production of 1927 tons of ore from the Beavers mine in 1953 and 680 tons of ore from the Beavers and the Brown in the first three quarters of 1954.

In September 1953 the Bureau of Mines completed field work in connection with an examination of the Tabb Fault near Fredonia, Kentucky, which consisted of diamond drilling 6 holes aggregating 2,138 feet. The logs of these holes may be useful to the Field Team.

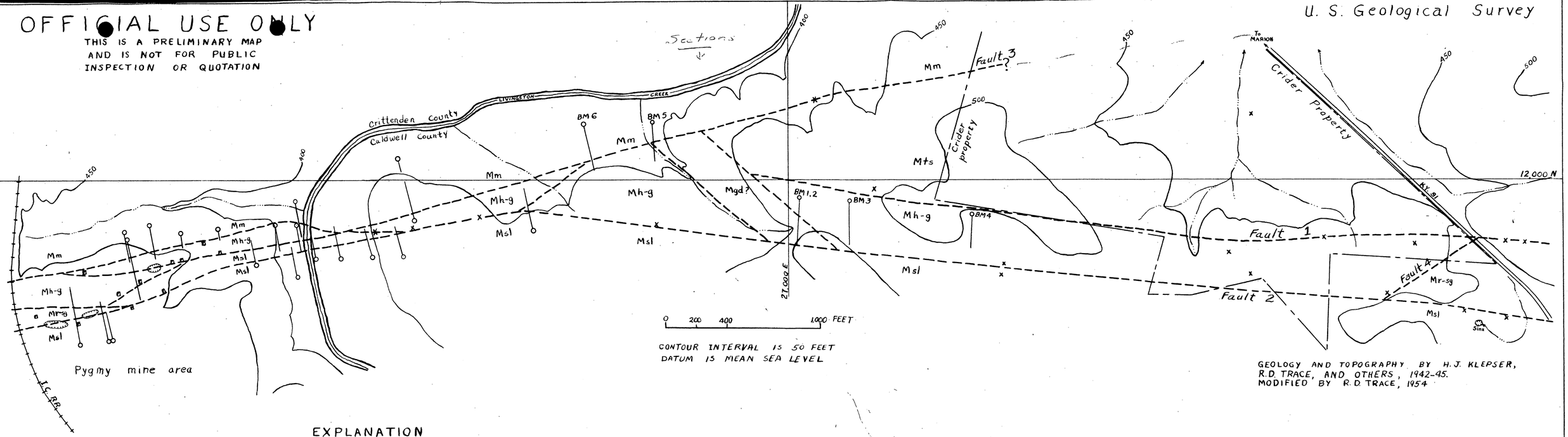
I recommend that the application be referred to the Field Team for evaluation and recommendations.

John E. Holtzinger

OFFICIAL USE ONLY

THIS IS A PRELIMINARY MAP AND IS NOT FOR PUBLIC INSPECTION OR QUOTATION

U. S. Geological Survey



GEOLOGY AND TOPOGRAPHY BY H. J. KLEPSER, R. D. TRACE, AND OTHERS, 1942-45. MODIFIED BY R. D. TRACE, 1954

EXPLANATION

Fault, known or inferred

Prospect pit or shaft

Shaft

BM5 Diamond drill hole (BM holes drilled by Bureau of Mines, 1953; other holes drilled by operator, 1942-45.

Caved area

Crider property line (approximate)

Mississippian:

- Mm — Menard limestone
- Mts — Tar Springs sandstone
- Mgd — Glen Dean limestone
- Mh-g — Hardinsburg ss.-Golconda fm.
- Mr-sg — Renault fm-Ste. Genevieve ls.
- Msl — St. Louis limestone

PRELIMINARY GEOLOGIC MAP OF PART OF THE TABB FAULT SYSTEM, CRITTENDEN AND CALDWELL COUNTIES, KENTUCKY