To:
Lary Hook
Rm 4453, Int. Bldg.

Attached are maps and letters on Simplot's Chalepa property, which we discussed on Dec. 12.

Tom

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

[redacted]
No. 157 Howard Street
Spokane 4, Washington

Docket 3641

November 6, 1956

Mr. Thor N. Killingsord
Staff Assistant for DMEA
Mineral Deposits Branch
U. S. Geological Survey
Washington 25, D. C.

Dear Thor:

During my last trip to Central Idaho I took most of a day (October 19, 1956) to look at the Chalsper No. 2 fluorspar area, in line with your letter of September 25, 1956.

I did not learn much about the property beyond that which I already knew, but I did get a rough idea of the thickness of the Haybarns dolomite in this particular area and some idea of the displacement along the Chalsper No. 2 vein-fault. These are only estimates as I did not have the time to do much actual mapping but I think I did enough to rule out the possibility of a bedded deposit. I am enclosing a print of the map which accompanied the Simplot application to which I have added dips and strikes of the bedding and a vertical section across the vein; I have also shown what I believe goes on along the longitudinal section. I hope you find the dip and strike symbols that are mixed up in the longitudinal section; they belong with the plan.

The thickness of the dolomite is about 600 feet, which I obtained by projecting the conglomerate on the east side of the vein above the surface and projecting the dolomite-phyllite contact from the portal to the B-B' section (see map attached). This distance also conforms to an observation I made in the field from the phyllite contact. I think that with a minor amount of field work the dolomite section can be measured from the phyllite contact recently exposed in the new access road across the beds to the conglomerate contact.

The displacement of the beds on the vein is estimated to be about 250 to 300 feet with the west block dropped down and the east block thrown up.

Some parallel faulting west of the vein is evident on the top of the hill as I have roughly shown on section B-B'. This may also be a place to look for ore if the property is explored.

I assume Keith actually found the phyllite contact in place in the trench below the proposed portal site. The trench is filled in and there surely isn't much evidence at the present time that the contact is located here. Some pieces of phyllite can be found in the rubble but a small bed of phyllite could exist at the base of the conglomerate, as I noted some beds of phyllite-like rock at the top of the dolomite.

Maybe it would be wise to do a bit of preliminary diamond drilling in the east wall of the vein to determine where and how the phyllite occurs in order to properly locate the portal site for the maximum ore reserves above this level.

I saw no bedded fluorspar at the Chalspar No. 2. However, Al Weissenborn says that Simplot had some trenches a mile or so south of Chalspar No. 2 on the south side of Moriarty Creek. He says that according to Ross's mapping the trenches were in the basal conglomerate member of the Ramshorn slate and that in places the conglomerate was cemented by fluorite. Perhaps this is the deposit that Chambers and Van Alstine visited.

I just returned from a three-week trip to Idaho catching up on field examinations. I guess that any more applications that come in will have to wait until spring as the high country is getting pretty well covered with snow.

I hope I have shed a small amount of light on the Chalspar No. 2 property and if you have any more questions I will be glad to try and answer them.

As ever,

Howard B. Nickelson
Geologist

Enclosure 1 (in quad.)

P. S. I am sending along four copies of the map just in case you need them for anything.

Docket 3661

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

strong dipping replaced bed. Such an attitude is also indicated on Hubbill's plan map on figure 2 that shows a number of fluorspar deposits occurring along the Bay Roses dolomite south of the Challenger No. 2.

At the moment the Challenger No. 2 is a dead issue; however, it is something that could be reconsidered at any time. In view of the debate on the type of the deposit I believe we should get more information on this deposit so as to be able to answer any questions that might arise in the future. Certainly if it is a bedded deposit the entire Gaston Creek area has a far greater fluorspar potential than if it is simply a vein similar to the one we discussed drilled at the Challenger No. 1. I therefore suggest that the next time you go to the Challis area you take with you Hubbill's map of the Challenger No. 2 and that you plan to spend a day or so on the property. On that map you could plot correctly the formations we are concerned with and their proper attitude. I am sure that you could get enough information in the trenches and in the various outcrops to accomplish such a study. In this way we not only would determine whether this is a bedded deposit or not but would also correct the many flaws that are apparent on Hubbill's map.

I have not as yet contacted anyone in the Foreign Geology Branch as I promised you I would but I shall do so as soon as possible.

Sincerely,

[redacted]

[redacted]

Enclosures 2

cc: [redacted]
[redacted]
[redacted]
[redacted]

[redacted]

14

J. R. SIMPLOT COMPANY
GENERAL OFFICES
CONTINENTAL BANK BUILDING
BOISE, IDAHO

RECEIVED
AUG - 5 1955

August 1, 1955

File - Idaho Fluorspar

Mr. C. O. Mittendorf
Administrator
Defense Minerals Exploration Admin.
Washington 25, D. C.

SUBJECT: Docket No. DMEA-3661-Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho
Contract No. Idm-E822

Dear Mr. Mittendorf:

This will acknowledge and thank you for your letter dated July 28 with reference to our letter to the Executive Officer, DMEA Field Team, Region I, dated July 14, with reference to the above captioned subject.

We want you to know that we appreciate your action in this matter, and it is hoped that the subject may be opened again during our 1956 exploration program.

We are marking our files to take this matter up with you again in February of 1956.

Cordially,

George A. McHugh
Manager of Mines

GAM:je
cc: A. E. Weissenborn

J. R. Simplot
L. E. Haight
Keith Madill

Docket Copy
Surname:
Hopkins
J. L. Kearns
E. B. Lucas
Mittendorf

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

J. R. Simplot Company
Continental Bank Building
Boise, Idaho

JUL 28 1955

Re: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho
Contract No. Idm-E822

Gentlemen:

Reference is made to your letter to the Executive Officer, DMEA Field Team, Region I, dated July 14, 1955, returning copies of the unexecuted contract.

The subject application is being closed and placed in our inactive file. We regret your inability to carry on the project work at this time due to prior commitments. We wish to assure you of our willingness to give the matter further consideration if, in the near future, you should find that your technical staff can devote sufficient time to properly supervise the work. We are unable to comply with your request for a copy of the unexecuted contract.

Sincerely yours,

C. O. Mittendorf

Administrator

cor

JHopkins:gad 7/27/55
Copy to: Admr. R. File
Docket
Operating Committee
Field Team, Region I
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk
Mr. Hopkins

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

F Kraus

July 27, 1955

Memorandum

To: R. E. Adams, Chief, Operations Control and Statistics Division

From: Nonmetallic Minerals Division

Subject: Withdrawal of Application - Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho
Contract No. Idm-E822

The subject application is being withdrawn by the applicant because it does not have the personnel to properly direct the work specified.

The application will be considered in inactive status but may be reopened upon request within a reasonable period if the applicant finds that its technical staff can devote sufficient time to properly supervise the work.

James Hopkins
Nonmetallic Minerals Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

RECEIVED
JUL 25 1955

July 21, 1955

Mr. George C. Selfridge, Chairman
DMEA Operating Committee
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3661 (fluorspar)
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

Enclosed are all of the copies of Contract Idm-E822 returned by J. R. Simplot Company unsigned. Also attached are copies of a letter from Mr. George A. McHugh, Manager of Mines, giving the reasons why the company does not feel able to undertake the project at this time.

Please note that the company is in no way dissatisfied with the terms and conditions of the contract; they simply feel that they do not at this time have the personnel to direct properly the work specified.

We regret the return of this contract as we still believe that this is an excellent fluorspar prospect, but we would, of course, prefer to see the company defer the project than attempt to do the work without proper technical supervision. We suggest that Mr. McHugh be informed that the contract can not be held open indefinitely but could be reinstated easily at some future time, provided, of course, that fluorspar is still eligible for DMEA assistance.

By Field Team, Region I, NW District

A. E. Weissenborn
A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Thomas E. Howard
Thomas E. Howard
for Wing G. Agnew, Member
U. S. Bureau of Mines

Enclosures

cc: USBM (2)
Nickelson

July 14, 1955

Idaho Fluorspar

RECEIVED
JUL 25 1955

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region 1, N. W. Dist.
So. 157 Howard Street
Spokane 4, Washington

DMEA

SUBJECT: Docket No. DMEA-3661
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Weissenborn:

With reference to the above captioned subject, and telephonic conversation had with you on July 11, we wish to place before you for your consideration, the following information.

At the time of the initial application for a DMEA loan for development of our Challis fluorspar property, circumstances were such that we hoped to go ahead and develop the property in the immediate future. However, since that time, our position has been altered. These circumstances in no way affect our interest in the Challis fluorspar deposit which we hold by virtue of our mineral claims, but only because of the fact that we do not have the personnel available at this time to do a good job. As you know, we are only a small company and we hesitate to expand beyond our present technical staff.

During this present year, just to cite a few of our operations, we are further developing the

RECEIVED
JUL 18 1955

the Centennial phosphate deposit which was started last year and expect to go into production in July of 1956. This entails a staff of four engineers and probably the building of a railroad, together with the necessary road to connect the mine with the railroad. We are negotiating to export at least 500,000 tons of iron ore from Nevada which will probably go into production during this coming summer, and we are diamond drilling a large gypsum deposit in California. These projects coupled with exploration operations already under way over the past year have left us in a position that we feel we cannot conscientiously do a good job at the Idaho fluorspar property.

Therefore, we would ask that this approved DMEA 3661 fluorspar matter be held in abeyance without prejudice.

For your information, we are doing our 1955-1956 assessment work at this time, and we are going to try to purchase the Buchanan interest from the estate.

We are returning under separate cover, the documents which you sent, and we will be pleased indeed if you could send us a copy for our files.

Trusting that you will give this request your careful consideration, and thanking you in anticipation.

Most cordially yours,

George A. McHugh
Manager of Mines

GAM:je
cc: J. R. Simplot
O. E. Pothier
Keith Madill

Ving G. Agnew
U.S. Bureau of Mines

File - Idaho Fluorspar

RECEIVED
JUL 25 1955

Mr. A. F. Weissenborn
Executive Officer, DMEA
Field Team, Region 1, N. W. Dist.
No. 167 Howard Street
Spokane 4, Washington

SUBJECT: Docket No. DMEA-3661
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Weissenborn:

With reference to the above captioned subject, and telephonic conversation had with you on July 11, we wish to place before you for your consideration, the following information.

At the time of our initial application for a DMEA loan for development of our Challis fluorspar property, circumstances were such that we wanted to at least start develop the property in the immediate future. However, since that time, our position has changed. These circumstances in no way affecting our interest in the Challis fluorspar deposit which we hold by virtue of our mineral claims, but only because of the fact that we do not have the personnel available at this time to do a good job. As you know, we are only a small company and we hesitate to expand beyond our present technical staff.

During the present year, just as soon as [illegible] we are further developing the

the Centennial phosphate deposit which was started last year and expect to go into production in July of 1956. This entails a staff of four engineers and probably the building of a railroad, together with the necessary road to connect the mine with the railroad. We are negotiating to export at least 500,000 tons of iron ore from Nevada which will probably go into production during this coming summer, and we are diamond drilling a large gypsum deposit in California. These projects coupled with exploration operations already under way over the past year have left us in a position that we feel we cannot conscientiously do a good job at the Idaho fluorspar property.

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Trusting that you will give this request your careful consideration, and thanking you in anticipation.

Most cordially yours,

George A. McHugh
Manager of Mines

GAM:je
cc: J. R. Simplot
O. E. Pothier
Keith Madill

Wing G. Agnew
U.S. Bureau of Mines

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMEA-3661

EXHIBIT "A"

Description of the Work

The exploration project is divided into three stages, and is shown, in part, on the attached map entitled "J. R. Simplot Company, Fluorspar Division, Challis Idaho Chalspar Area No. 2." The Operator shall perform Stage I and so much of the work under Stages II and III as is approved in advance by the Government, based upon results of the previous stage. The work is as follows:

Stage I

1. Construct 3 miles of access road with a D-8 or equivalent bulldozer.

2. Prepare a satisfactory portal site on the Chalspar No. 2 vein, with a D-8 or equivalent bulldozer.

3. Construct a rough frame compressor house and shop, approximately 16 feet by 32 feet.

4. Drift on the Chalspar No. 2 vein a distance of approximately 450 feet. Drive crosscuts to the walls of the vein at intervals where the width of the vein exceeds the width of the drift. The aggregate drifting and crosscutting under this stage shall not exceed 500 feet.

Stage II

1. Extend the drift adit approximately an additional 430 feet on the Chalspar vein. Drive crosscuts to the walls of the vein at intervals where the width of the vein exceeds the width of the drift.

The aggregate drifting and crosscutting under this stage shall not exceed 480 feet.

Stage III

1. Drive 120 feet of 2-compartment raises at points approved in advance by the Government.

General Provisions

The location, direction, inclination, and extent of all work and the method of sampling are subject to the approval of the Government.

All workings shall be timbered as necessary.

Drifts, crosscuts, and raises shall have cross-sectional dimensions of approximately 5 feet by 7 feet in the clear of timber. Each sample taken shall be divided into at least two parts one of which shall be furnished to the Government, and each sample shall be analysed for CaF_2 and SiO_2.

Estimated Costs of the Project

Stage I

Category (1) Independent Contracts

Bulldozing 112 hours @ $12.50/hr.	$ 1,400.00

Category (2) Personal Services

(a) Supervision

1 - Supervisor:		
During preparatory work, 1/4 mo. @ $600.00/mo.	$ 150.00	
During underground work, Half time for 5 mos. @ rate of $600.00/mo. for full time ($300.00)	1,500.00	
	1,650.00	

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each

	2 laborers @ $14.50/day each		
	1 truckdriver half time @ $13.00/full day		
		$ 7,045.00	$ 8,695.00
Category (3)	Operating Materials and Supplies		
	Miscellaneous	4,358.00	
	390 feet (Lineal) Square set timbering $5.00/ft.	1,950.00	6,308.00
Category (4)	Operating Equipment		
	(a) Rental		
	1 - Compressor (Road - Portal), 17 days @ $10.00/day	170.00	
	(b) Purchase		
	None		
	(c) Depreciation		

Item	Cost	Depreciation @ 1/60 per mo.
Compressor-315 cfm	$6,500.00	$108.33
1½ ton pickup	3,000.00	50.00
Receiver tank	275.00	4.50
Water tank	60.00	1.00
Drill	480.00	8.00
Jackleg	120.00	2.00
Mucker, 12-B	2,812.00	46.86
Trammer	1,745.00	29.08
Blower	286.00	4.77
Total	$15,278.00 or 254.00 per mo.	

5 months @ $254.00/mo.	1,270.00	1,440.00

Category (5) Initial Rehabilitation and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

1 - Compressor house and shop $ 485.00

Upon completion of the project the Government will have no interest in the building.

Category (7) Miscellaneous

75 sample analyses (CaF_2 and SiO_2) @ $5.00/sample $ 375.00

Social Security and liability insurance 957.00 1,332.00

Estimated Total Cost of Stage I $19,500.00

Stage II

Category (1) Independent Contracts

None

Category (2) Personal Services

(a) Supervision

1 - Supervisor, half time for 4-4/5 mos. @ rate of $600.00/mo. for full time ($300.00) 1,440.00

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each

1 truck driver half time @ $13.00/full day

6,374.00 $ 7,814.00

Category (3) Operating Materials and Supplies

Miscellaneous	$ 3,725.00	
390 feet (Lineal) Square set timbering @ $5.00/ft.	1,950.00	$ 5,675.00

Category (4) Operating Equipment

(a) Rental

None

(b) Purchase

None

(c) Depreciation

Same items and rates as under Stage I for 4-4/5 months @ $254.00/mo. (rounded)	1,219.00

Category (5) Initial Rehabilition and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

None

Category (7) Miscellaneous

75 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	375.00	
Social Security and liability insurance	859.00	1,234.00
Estimated Total Cost of Stage II		$15,982.00

Stage III

Category (1) Independent Contracts

None

Category (2) Personal Services

(a) Supervision

1 - Supervisor, half time for 1-1/3 months @ rate of $600.00/mo. for full time ($300.00)	$ 360.00	

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each		
1 truck driver half time @ $13.00/full day	1,594.00	$ 1,954.00

Category (3) Operating Materials and Supplies

Miscellaneous	886.00	
120 feet (Lineal) raise timbering @ $5.00/ft.	600.00	1,486.00

Category (4) Operating Equipment

(a) Rental

None

(b) Purchase

None

(c) Depreciation

Same items and rates as under Stage I for 1-1/3 months @ $254.00/mo. (rounded)	305.00

Category (5) Initial Rehabilitation and Repairs

None

Category (6)	New Buildings, Fixtures, and Installations		
	None		
Category (7)	Miscellaneous		
	50 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	$ 250.00	
	Social Security and liability insurance	215.00	$ 465.00
	Estimated Total Cost of Stage III		$ 4,210.00

SUMMARY

Estimated Total Cost of Stage I	$19,600.00	
Estimated Total Cost of Stage II	15,942.00	
Estimated Total Cost of Stage III	4,210.00	
Estimated Total cost of Project		$39,752.00
Government Participation @ 50%		$19,876.00

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMEA-3661

ANNEX I

The land referred to in Article 2 of the contract form is as follows:

Claim

Florspar
Florspar No. 2
Florspar No. 4
Florspar No. 6
Florspar No. 11
Florspar No. 12
Florspar No. 13
Florspar Fraction

The above claims are recorded in Book 14 at pages 82, 111, 114, 115, 132, 139, 140, and 133, respectively, official records of Custer County, Idaho.

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMEA-3661

EXHIBIT "A"

Description of the Work

The exploration project is divided into three stages, and is shown, in part, on the attached map entitled "J. R. Simplot Company, Fluorspar Division, Challis Idaho Chalspar Area No. 2." The Operator shall perform Stage I and so much of the work under Stages II and III as is approved in advance by the Government, based upon results of the previous stage. The work is as follows:

Stage I

1. Construct 3 miles of access road with a D-8 or equivalent bulldozer.

2. Prepare a satisfactory portal site on the Chalspar No. 2 vein, with a D-8 or equivalent bulldozer.

3. Construct a rough frame compressor house and shop, approximately 16 feet by 32 feet.

4. Drift on the Chalspar No. 2 vein a distance of approximately 450 feet. Drive crosscuts to the walls of the vein at intervals where the width of the vein exceeds the width of the drift. The aggregate drifting and crosscutting under this stage shall not exceed 500 feet.

Stage II

1. Extend the drift adit approximately an additional 430 feet on the Chalspar vein. Drive crosscuts to the walls of the vein at intervals where the width of the vein exceeds the width of the drift.

The aggregate drifting and crosscutting under this stage shall not exceed 480 feet.

Stage III

2. Drive 120 feet of 2-compartment raises at points approved in advance by the Government.

General Provisions

The location, direction, inclination, and extent of all work and the method of sampling are subject to the approval of the Government.

All workings shall be timbered as necessary.

Drifts, crosscuts, and raises shall have cross-sectional dimensions of approximately 5 feet by 7 feet in the clear of timber. Each sample taken shall be divided into at least two parts one of which shall be furnished to the Government, and each sample shall be analysed for CaF_2 and SiO_2.

Estimated Costs of the Project

Stage I

Category (1) Independent Contracts

Bulldozing 112 hours @ $12.50/hr.	$ 1,400.00

Category (2) Personal Services

(a) Supervision

1 - Supervisor:		
During preparatory work, 1/4 mo. @ $600.00/mo.	$ 150.00	
During underground work, Half time for 5 mos. @ rate of $600.00/mo. for full time ($300.00)	1,500.00	
	1,650.00	

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each

	2 laborers @ $14.50/day each		
	1 truckdriver half time @ $13.00/full day	$ 7,045.00	$ 8,695.00
Category (3)	Operating Materials and Supplies		
	Miscellaneous	4,358.00	
	390 feet (Lineal) Square set timbering $5.00/ft.	1,950.00	6,308.00
Category (4)	Operating Equipment		
	(a) Rental		
	1 - Compressor (Road - Portal), 17 days @ $10.00/day	170.00	
	(b) Purchase		
	None		
	(c) Depreciation		

Item	Cost	Depreciation @ 1/60 per mo.
Compressor-315 cfm	$6,500.00	$108.33
1½ ton pickup	3,000.00	50.00
Receiver tank	275.00	4.50
Water tank	60.00	1.00
Drill	480.00	8.00
Jackleg	120.00	2.00
Mucker, 12-B	2,812.00	46.86
Tramser	1,745.00	29.08
Blower	286.00	4.77
Total	$15,278.00 or 254.00 per mo.	

5 months @ $254.00/mo.	1,270.00	1,440.00

Category (5) Initial Rehabilitation and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

1 - Compressor house and shop		$ 425.00

Upon completion of the project the Government will have no interest in the building.

Category (7) Miscellaneous

75 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	$ 375.00	
Social Security and liability insurance	957.00	1,332.00
Estimated Total Cost of Stage I		$19,600.00

Stage II

Category (1) Independent Contracts

None

Category (2) Personal Services

(a) Supervision

1 - Supervisor, half time for 4-4/5 mos. @ rate of $600.00/mo. for full time ($300.00)	1,440.00	

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each		
1 truck driver half time @ $13.00/full day	6,374.00	$ 7,814.00

Category (3) Operating Materials and Supplies

Miscellaneous	$ 3,725.00	
390 feet (Lineal) Square set timbering @ $5.00/ft.	1,950.00	$ 5,675.00

Category (4) Operating Equipment

(a) Rental

None

(b) Purchase

None

(c) Depreciation

Same items and rates as under Stage I for 4-4/5 months @ $254.00/mo. (rounded)	1,219.00

Category (5) Initial Rehabilition and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

None

Category (7) Miscellaneous

75 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	375.00	
Social Security and liability insurance	859.00	1,234.00
Estimated Total Cost of Stage II		$15,982.00

Stage III

Category (1) Independent Contracts

None

Category (2)	**Personal Services**		
	(a) **Supervision**		
	1 - Supervisor, half time for 1-1/5 months @ rate of $600.00/mo. for full time ($300.00)	$ 360.00	
	(b) **Technical Services**		
	None		
	(c) **Labor**		
	2 miners and 1 helper @ $14.50/day each		
	1 truck driver half time @ $13.00/full day	1,594.00	$ 1,954.00
Category (3)	**Operating Materials and Supplies**		
	Miscellaneous	886.00	
	120 feet (Linseal) raise timbering @ $5.00/ft.	600.00	1,486.00
Category (4)	**Operating Equipment**		
	(a) **Rental**		
	None		
	(b) **Purchase**		
	None		
	(c) **Depreciation**		
	Same items and rates as under Stage I for 1-1/5 months @ $254.00/mo. (rounded)		305.00
Category (5)	**Initial Rehabilitation and Repairs**		
	None		

Category (6) New Buildings, Fixtures, and Installations

None

Category (7) Miscellaneous

50 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	$ 250.00	
Social Security and liability insurance	215.00	$ 465.00
Estimated Total Cost of Stage III		$ 4,210.00

SUMMARY

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Estimated Total Cost of Stage III	4,210.00	
Estimated Total cost of Project		$39,752.00
Government Participation @ 50%		$19,876.00

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMSA-9661

ANNEX I

The land referred to in Article 2 of the contract form is as follows:

Claim

Florspar (Leased)
Florspar No. 2 - Owned
Florspar No. 4 - "
Florspar No. 6 - "
Florspar No. 11 - "
Florspar No. 12 - "
Florspar No. 13 - "
Florspar Fraction "

The above claims are recorded in Book 14 at pages 82, 111, 114, 115, 132, 139, 140, and 133, respectively, official records of Custer County, Idaho.

A Consent to Lien for 1/2 interest in the Florspar Claim (Leased) executed by Richard C. and Sheila West is attached hereto. A Consent to Lien for the 1/2 interest of the Buchanan estate is waived.

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. SMRA-3661

ARTICLE I

The land referred to in Article 2 of the contract form is as follows:

Claim

Flowspar (Leased)
Flowspar No. 2 - Owned
Flowspar No. 4 - "
Flowspar No. 6 - "
Flowspar No. 11 - "
Flowspar No. 12 - "
Flowspar No. 13 - "
Flowspar Fraction "

The above claims are recorded in Book 14 at pages 82, 111, 114, 115, 132, 139, 140, and 133, respectively, official records of Custer County, Idaho.

A Consent to Lien for 1/2 interest in the Flowspar Claim (Leased) executed by Richard C. and Shalda West is attached hereto. A Consent to Lien for the 1/2 interest of the Buchanan estate is waived.

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMSA-3661

ANNEX I

The land referred to in Article 2 of the contract form is as follows:

Claim

Florspar (Leased)
Florspar No. 2 - Owned
Florspar No. 4 - "
Florspar No. 6 - "
Florspar No. 11 - "
Florspar No. 12 - "
Florspar No. 13 - "
Florspar Fraction "

The above claims are recorded in Book 14 at pages 82, 111, 114, 115, 132, 139, 140, and 133, respectively, official records of Custer County, Idaho.

A Consent to Lien for 1/2 interest in the Florspar Claim (Leased) executed by Richard C. and Sheldn West is attached hereto. A Consent to Lien for the 1/2 interest of the Bushman estate is waived.

Government's copy

MF-200
(Revised June 1954)

Docket No. DMEA - 3661

Commodity Fluorspar

Contract No. Idm-E 822

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this 21st day of June, 1955 between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] J. R. Simplot Company, an Idaho corporation,

whose mailing address is Continental Bank Building
Boise, Idaho,
hereinafter called the "Operator," as follows:

ARTICLE 1. *This contract* is entered into under the authority of the Defense Production Act of 1950, as amended. It consists of this form (MF-200), the attached Exhibit "A," Annex I, and map.

The Operator shall not transfer or assign this contract or any right thereunder without the written consent of the Government.

ARTICLE 2. *Operator's property rights.*—(a) The land which is the subject of this contract (hereinafter called "the land") is in the State of Idaho, County of Custer, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] See Annex I of [5] See Annex I in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] --, [7] unrecorded in Book --, page --, official records of said County; and

(2) The Operator's right, title, or interest (whether as owner, lessee, or otherwise) is subject only to the following claims, liens, or encumbrances: See Annex I

(c) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above, and (if the Operator does not hold the legal title) the Consent to Lien of any holder of the legal title

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] Insert name, and if an organization, its nature (corporation and place of incorporation, partnership with names of partners, etc.).
[3] State on a separate sheet marked "Annex I" the legal description or enough to identify the property, particularly excluding any areas from which the production is not to be subject to the Government's percentage royalty.
[4] Insert "owner," "lessee," "contract purchaser," "locator," etc.
[5] Insert "the entire interest," "the mineral rights," "an undivided one-third," etc.
[6] Insert "deed," "lease," "contract," "location notice," "patent," etc.
[7] If not recorded, so indicate by inserting "un."

of the land (lessor, seller, optionor, etc.), are attached, as follows: See Annex I

(d) The Operator shall preserve and maintain his right, title, and interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. Until the lapse of the time within which the Government may make a certification of discovery or development without any such certification having been made, and after any such certification has been made, the Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof. If the Government makes no certification of discovery or development within the time limited in Article 8, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 8(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of fluorspar. The work to be performed is described in Exhibit "A." The Operator on or before ..... shall commence the work, and on or before May 31, 1956 (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall either have completed the work or shall have incurred allowable costs (see Article 6) in a sum not less than the estimated total allowable cost set forth in Exhibit "A."

ARTICLE 4. *Performance of the work.*—(a) *Operator's responsibility.*—The work shall be performed with reasonable diligence, efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for liability insurance covering employment; and with suitable and adequate equipment, facilities, materials, supplies, and labor, to bring it to completion within the time fixed.

(b) *Independent contracts.*—To the extent that the allowable costs are estimated in Exhibit "A" with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed; but if the reference in Exhibit "A" to any such independent contract requires the Government's approval thereof, payments under such contract will not be allowable costs unless the Government gives its written approval of the contract. Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract and regardless of the Government's approval thereof, the Government will participate in payments to the independent contractor only on account of work performed in accordance with the provisions of this exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) *Government may inspect.*—The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract, and also after a certification of discovery or development to inspect production operations and underground workings. The operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 5. *Contribution by the Government.*—The estimated total allowable cost of the project, set forth in Exhibit "A," is the sum of $ 39,752.00 The Government shall contribute 50 percent of the allowable costs as they are incurred in a total sum not in excess of $19,876.00 : *Provided,* That until the Operator has rendered to the Government his final report, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last

voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(b), but all payments by the Government are provisional only, subject to audit, until the account between the Operator and the Government is finally audited and settled. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; but except for any such necessary excesses in categories, subcategories, or items thereunder the Operator is not obligated to incur more than his agreed percentage of the estimated, total allowable cost of the work.

To the extent specified in this article or in Exhibit "A" the following categories, subcategories, and elements thereof are maximums; but if not so specified either here or in Exhibit "A" they are not maximums, and may be exceeded within the limit of the estimated total allowable cost of the work:

CATEGORY (1)—INDEPENDENT CONTRACTS.—Work to be performed under independent contracts (see Article 4(b)). The estimated total amount of this category and the estimated cost of each unit of work for performance under an independent contract are maximums.

CATEGORY (2)—PERSONAL SERVICES.

Subcategory (a)—Supervision.—All elements of this subcategory (number of supervisors, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)—Technical services.—All elements of this subcategory (number of technicians, periods of employment, rates of pay, and total) are maximums.

Subcategory (c)—Labor.

CATEGORY (3)—OPERATING MATERIALS AND SUPPLIES.—Includes such items as drill bits and steel, explosives, fuel, pipe, power, small tools costing less than $50 each, timber, track.

CATEGORY (4)—OPERATING EQUIPMENT.

Subcategory (a)—Rental.—The number of each object to be rented [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)—Purchases.—The estimated total of this subcategory is a maximum.

Subcategory (c)—Depreciation.—All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)—INITIAL REHABILITATION AND REPAIRS.—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

Subcategory (a)—Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).—The estimated total of this subcategory is a maximum.

Subcategory (b)—Initial rehabilitation and repairs of operating equipment.—The estimated total of this subcategory is a maximum.

CATEGORY (6)—NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

CATEGORY (7)—MISCELLANEOUS.—Repairs and maintenance (other than initial) of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, communications, and any other items of requirement or cost that do not fall within any of the first 6 categories.

THE ESTIMATED TOTAL ALLOWABLE COST of the work is a maximum.

(b) *Nonallowable costs.*—The following costs are not allowable for contribution by the Government:

(1) *Costs of the land,* such as rental, depreciation, depletion, or other cost of acquiring, owning, or holding possession;

(2) *Indirect costs,* such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) *Previous work* performed or costs incurred before the date of this contract; and

(4) *Deferred payments.*—Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods; unless the purchase agreement is approved by the Government in writing.

(c) *Reductions in costs.*—The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article 9.

ARTICLE 7. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. If the Government elects to audit said records and accounts relating to the exploration work by certified public accountant, it may do so as a cost of the work to which the Operator shall contribute. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine any pertinent books, documents, papers, and records of the Operator. All of the Operator's vouchers and records and accounts relating thereto and the Government's payments thereof remain subject to adjustment until final audit by the Government. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

(b) *Progress reports and vouchers.*—The Operator shall provide the Government with five copies of monthly progress reports in three sections as follows: (1) Operator's Monthly Report and Voucher showing detailed costs incurred during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and costs incurred for each type of work; and (3) a Narrative Report of the work performed during the reporting period including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground. (Forms for reporting under (1) and (2) above will be provided by the Government.)

(c) *Final report.*—Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with five copies of a final report (in addition to the final progress report and voucher). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and related costs incurred.

(d) *Report of sales.*—The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's percentage royalty relates, such as copies of smelter or concentrator settlement sheets, and certified accounts of production and sale or other disposition of production.

(e) *Compliance with requirements.*—If in the opinion of the Government any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the making or completion of such with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 8. *Repayment by Operator.*—(a) *Certification.*—If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after a sufficient final report and final account (see Article 7) has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

(b) *Royalty on production.*—The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, within a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f. o. b. point); *except,* that charges of *the buyer* arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

(d) *Unsold production.*—If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value therof in the form in which and at the time when it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination, or the market value, whichever is greater.

(e) *Percentages of royalty.*—The percentages of the Government's royalty shall be as follows:

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½)

percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

(For instance: the royalty on an amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on an amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(f) *Time for computation and payment.*—The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be, as above provided in this article.

(g) *Lien for payment.*—To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(h) *Notice to purchasers.*—The Operator shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

(i) *No obligation to produce.*—Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(j) *Government not obligated to buy.*—Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals mined or produced from the land.

ARTICLE 9. *Interests in purchased property.*—(a) *Title and ownership.*—All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions, although title thereto shall be taken in the name of the Operator.

(b) *Preservation of property.*—Until the final disposal of any property in which the Government has an interest the Operator shall preserve and protect same for the best interest of the Government, any reasonable and necessary costs thereof to be treated as an allowable cost of the project. After the completion of the work or termination of the Government's obligation to contribute, or when such property is not in use for or needed for the work, the Operator shall neither use it without the written consent of the Government nor without paying a reasonable rental to be fixed by the Government for its interest.

(c) *Disposal of property.*—Upon the completion of the work or termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator or the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government the Operator shall not sell at any price any item of property the cost of which was more than $500, and shall not sell at less than 25 percent of the purchase price any item of property which cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or himself cares to give. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, or explosives, or pipe, or rails), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the project.

(d) *Default of the Operator re disposal.*—If within 90 days after the completion of the work or termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, or after such further time as the Government may in writing allow, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may pursue one of the following two courses: (1) the Government, by written notice to the Operator, may place upon such property what in its opinion is a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By O. Mittendorf
Administrator, Defense Minerals
Exploration Administration

J. R. SIMPLOT COMPANY
(Operator)

By .....

.....

I, ..., certify that I am the ..... secretary of the corporation named as Operator herein; that ..... who signed this contract on behalf of the Operator, was then ..... of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

.....

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70617-1

date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; or (2) the Government may enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 10. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are not justified, the Government may give the Operator written notice thereof, and thereupon: (1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon: (1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 10 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 11. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 12. *Officials not to benefit.*—No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. *Changes and added provisions.*—

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMEA-3661

ANNEX I

The land referred to in Article 2 of the contract form is as follows:

Claim

Florspar (Leased)
Florspar No. 2 - Owned
Florspar No. 4 - "
Florspar No. 6 - "
Florspar No. 11 - "
Florspar No. 12 - "
Florspar No. 13 - "
Florspar Fraction "

The above claims are recorded in Book 14 at pages 82, 111, 114, 115, 132, 139, 140, and 133, respectively, official records of Custer County, Idaho.

A Consent to Lien for 1/2 interest in the Florspar Claim (Leased) executed by Richard C. and Shelda West is attached hereto. A Consent to Lien for the 1/2 interest of the Buchanan estate is waived.

RECEIVED
JUL 5 1955
U. S. G. S.
SPOKANE, WASH.

MF-203
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator _____
Docket No. DMEA- _____
Contract No. Idm-E _____
Contract Date _____

Simplest

CONSENT TO LIEN

To the United States of America:

Referring to that certain land in the County of Custer, State of Idaho, described ~~as follows:~~ 1/

in a lease and option agreement, dated June 23, 1953 and recorded in Book 4 Page 478 official records of Custer County, more particularly described as Florspar Mining Claim,

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby—

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of a percentage royalty on production as may be provided for by the contract;2/ and represents and undertakes that there are no claims, liens, or encumbrances upon the undersigned's right, title, or interest in the land prior to that hereby granted to the Government other than the following:3/

None

3. Undertakes and agrees neither to commit any act nor assert any claim in conflict with the provisions of this Consent to Lien; and to give advance notice of the Government's rights under this Consent to Lien to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, or interest in the land; and

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: _____

_____

_____

_____

_____

_____

_____

_____

Dated this 18th day of June, 1955.

Richard C. West [Seal]

Shelda West [Seal]

_____ [Seal]

I, _____ certify that I am the _____ (Secretary, etc.) of the corporation named herein; that _____ who signed this agreement was then _____ (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

_____

[Corporate Seal]

EXPLORATION PROJECT CONTRACT
J. R. SIMPLOT COMPANY
DOCKET NO. DMEA-3661

EXHIBIT "A"

Description of the Work

The exploration project is divided into three stages, and is shown, in part, on the attached map entitled "J. R. Simplot Company, Fluorspar Division, Challis Idaho Chalspar Area No. 2." The Operator shall perform Stage I and so much of the work under Stages II and III as is approved in advance by the Government, based upon results of the previous stage. The work is as follows:

Stage I

1. Construct 3 miles of access road with a D-8 or equivalent bulldozer.

2. Prepare a satisfactory portal site on the Chalspar No. 2 vein, with a D-8 or equivalent bulldozer.

3. Construct a rough frame compressor house and shop, approximately 16 feet by 32 feet.

4. Drift on the Chalspar No. 2 vein a distance of approximately 450 feet. Drive crosscuts to the walls of the vein at intervals where the width of the vein exceeds the width of the drift. The aggregate drifting and crosscutting under this stage shall not exceed 500 feet.

Stage II

1. Extend the drift adit approximately an additional 430 feet on the Chalspar vein. Drive crosscuts to the walls of the vein at intervals where the width of the vein exceeds the width of the drift.

The aggregate drifting and crosscutting under this stage shall not exceed 480 feet.

Stage III

1. Drive 120 feet of 2-compartment raises at points approved in advance by the Government.

General Provisions

The location, direction, inclination, and extent of all work and the method of sampling are subject to the approval of the Government.

All workings shall be timbered as necessary.

Drifts, crosscuts, and raises shall have cross-sectional dimensions of approximately 5 feet by 7 feet in the clear of timber. Each sample taken shall be divided into at least two parts one of which shall be furnished to the Government, and each sample shall be analyzed for CaF_2 and SiO_2.

Estimated Costs of the Project

Stage I

Category (1) Independent Contracts

Bulldozing 112 hours @ $12.50/hr.		$ 1,400.00

Category (2) Personal Services

(a) Supervision

1 - Supervisor: During preparatory work, 1/4 mo. @ $600.00/mo.	$ 150.00	
During underground work, Half time for 5 mos. @ rate of $600.00/mo. for full time ($300.00)	1,500.00	
	1,650.00	

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each

	2 laborers @ $14.50/day each		
	1 truckdriver half time @ $13.00/full day	$ 7,045.00	$ 8,695.00
Category (3)	Operating Materials and Supplies		
	Miscellaneous	4,358.00	
	390 feet (Lineal) Square set timbering $5.00/ft.	1,950.00	6,308.00
Category (4)	Operating Equipment		
	(a) Rental		
	1 - Compressor (Road - Portal), 17 days @ $10.00/day	170.00	
	(b) Purchase		
	None		
	(c) Depreciation		

Item	Cost	Depreciation @ 1/60 per mo.
Compressor-315 cfm	$6,500.00	$108.33
1½ ton pickup	3,000.00	50.00
Receiver tank	275.00	4.50
Water tank	60.00	1.00
Drill	480.00	8.00
Jackleg	120.00	2.00
Mucker, 12-B	2,812.00	46.86
Trammer	1,745.00	29.08
Blower	286.00	4.77
Total	$15,278.00	or 254.00 per mo.

5 months @ $254.00/mo.	1,270.00	1,440.00

Category (5) Initial Rehabilitation and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

1 - Compressor house and shop		$ 425.00

Upon completion of the project the Government will have no interest in the building.

Category (7) Miscellaneous

75 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	$ 375.00	
Social Security and liability insurance	957.00	1,332.00
Estimated Total Cost of Stage I		$19,600.00

Stage II

Category (1) Independent Contracts

None

Category (2) Personal Services

(a) Supervision

1 - Supervisor, half time for 4-4/5 mos. @ rate of $600.00/mo. for full time ($300.00)	1,440.00	

(b) Technical Services

None

(c) Labor

2 miners and 1 helper @ $14.50/day each		
1 truck driver half time @ $13.00/full day	6,374.00	$ 7,814.00

Category (3)	Operating Materials and Supplies		
	Miscellaneous	$ 3,725.00	
	390 feet (Lineal) Square set timbering @ $5.00/ft.	1,950.00	$ 5,675.00
Category (4)	Operating Equipment		
	(a) Rental		
	None		
	(b) Purchase		
	None		
	(c) Depreciation		
	Same items and rates as under Stage I for 4-4/5 months @ $254.00/mo. (rounded)		1,219.00
Category (5)	Initial Rehabilition and Repairs		
	None		
Category (6)	New Buildings, Fixtures, and Installations		
	None		
Category (7)	Miscellaneous		
	75 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	375.00	
	Social Security and liability insurance	859.00	1,234.00
	Estimated Total Cost of Stage II		$15,942.00

Stage III

Category (1) Independent Contracts

None

Category (2)	Personal Services		
	(a) Supervision		
	1 - Supervisor, half time for 1-1/5 months @ rate of $600.00/mo. for full time ($300.00)	$ 360.00	
	(b) Technical Services		
	None		
	(c) Labor		
	2 miners and 1 helper @ $14.50/day each		
	1 truck driver half time @ $13.00/full day	1,594.00	$ 1,954.00
Category (3)	Operating Materials and Supplies		
	Miscellaneous	886.00	
	120 feet (Lineal) raise timbering @ $5.00/ft.	600.00	1,486.00
Category (4)	Operating Equipment		
	(a) Rental		
	None		
	(b) Purchase		
	None		
	(c) Depreciation		
	Same items and rates as under Stage I for 1-1/5 months @ $254.00/mo. (rounded)		305.00
Category (5)	Initial Rehabilitation and Repairs		
	None		

Category (6)	New Buildings, Fixtures, and Installations		
	None		
Category (7)	Miscellaneous		
	50 sample analyses (CaF_2 and SiO_2) @ $5.00/sample	$ 250.00	
	Social Security and liability insurance	215.00	$ 465.00
	Estimated Total Cost of Stage III		$ 4,210.00

S U M M A R Y

Estimated Total Cost of Stage I	$19,600.00	
Estimated Total Cost of Stage II	15,942.00	
Estimated Total Cost of Stage III	4,210.00	
Estimated Total cost of Project		$39,752.00
Government Participation @ 50%		$19,876.00

Docket Copy
Surname:
Houk
Burin
Chamberlin
Selfridge
Hopkins
Mattendorf

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

600

JUN 30 1955

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Subject: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho
Contract No. Idm-2822

Dear Mr. Weissenborn:

Reference is made to your teletype of June 27, 1955, stating that Bert G. Buchanan, owner of one-half interest in the Florspar Claim has died intestate.

The Administrator waives the Owner's Consent to Lien on the one-half portion covered by the Buchanan estate.

You will find enclosed the original and five copies of Annex I, rewritten for attachment to the contract. Please have new Consent to Lien executed by Richard C. West and Shelda West on the March 24, 1955, form and attached to each copy of the contract.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Approved:

J. H. Hedges (JHH)
Member, Bureau of Mines

Thor H. Kiilsgaard (THK)
Member, Geological Survey

Enclosures 6

LGHouk:gad 6/28/55
Copy to: Admr. R. File
Docket
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk

R.C.S.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

June 28, 1955

Memorandum

To: Mr. C. O. Mittendorf

From: Lawrence G. Houk

Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho
Contract No. Idm-E822

Subject: Waiving Owner's Consent to Lien on the subject contract.

The J. R. Simplot Company has been unable to obtain a Consent to Lien on one-half interest on the Florspar Claim on which all the DMEA work will be performed with the exception of the access road. The owner who refused to sign the Consent to Lien forms, Bert G. Buchanan, died intestate and it appears it will be some time before the estate is settled. The project appears a most promising one and the altitude in this area makes time of the essence. There are three courses of action open:

1. Waive the Owner's Consent to Lien on the one-half portion.

2. Require a bond which does take time and will delay the starting date.

3. Endeavor to obtain a Consent to Lien from the executor of the Buchanan estate.

Inasmuch as the J. R. Simplot Company is an established mining company and we have an Owner's Consent to Lien executed on the July 1, 1954, form for one-half interest, I recommend we waive the Consent to Lien on the Buchanan estate interest. I suggest that the attached letter together with a new Annex I be sent to Mr. Weissenborn for execution.

OK

Docket Copy
Surname:

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

600

June 28, 1955

Memorandum

To: Mr. C. O. Mittendorf

From: Lawrence G. Houk

Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho
Contract No. Idm-E822

Subject: Waiving Owner's Consent to Lien on the subject contract.

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1. Waive the Owner's Consent to Lien on the one-half portion.

2. Require a bond which does take time and will delay the starting date.

3. Endeavor to obtain a Consent to Lien from the executor of the Buchanan estate.

Inasmuch as the J. R. Simplot Company is an established mining company and we have an Owner's Consent to Lien executed on the July 1, 1954, form for one-half interest, I recommend we waive the Consent to Lien on the Buchanan estate interest. I suggest that the attached letter together with a new Annex I be sent to Mr. Weissenborn for execution.

LGHouk:gad 6/28/55
Copy to: Admr. R. File
Docket
Mr. Houk

DI-17

SPECIAL

AXXXXXXX-039K

AXXXXXXX-040K

AXXXXXXX-041K

XDXXXXXX-042K

YWA060 WAF SP 9 I-GS-G

SPOKANE WASH 6-27-55 920A

GEORGE C. SELFRIDGE

CHAIRMAN, OPERATING COMMITTEE,

DMEA DEPARTMENT OF INTERIOR WA DC

RE J. R. SIMPLOT APPLICATION DOCKET NO. DMEA 3661.

BERT G. BUCHANAN, OWNER OF PART INTEREST IN FLORSPAR CLAIM HAS DIED INTESTATE AND IT WILL BE SOMETIME BEFORE ESTATE SETTLED. SIMPLOT HAD EXPECTED TO PURCHASE HIS PART OWNERSHIP OF CLAIM OR GET HIS CONSENT TO LIEN. WE ARE REQUESTING SIMPLOT TO OBTAIN BOND OR STANDARD FORM 25, BUT BONDING COMPANIES IN GENERAL HAVE BEEN UNWILLING BECAUSE OF TEN YEAR PROVISION. IF SIMPLOT CAN NOT GET BOND, MAY WE HAVE AUTHORIZATION TO ACCEPT COMPANY'S GUARANTY IN ITS PLACE.

JOHN S. VHAY

FOR: A. E. WEISSENBORN, EXECUTIVE OFFICER, USGS, SP

3661 25

VA 920A

Field Team:

Attention is called to the memorandum from the Acting Assistant Solicitor requiring a statement to be added to Annex I of the contract concerning Operator's interest in the mining claim.

C. O. Mittendorf
Administrator

Docket File
Surname:

Hopkins
Houk
Selfridge
Talbert
H. Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

JUN 21 1955

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Subject: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Weissenborn:

Please find herewith the original and five copies of a contract covering the subject exploration project which have been signed by the Government with register number and effective date as shown.

If the contract meets with your approval present it to the Operator for its approval and signature. If any part of this contract does not have either your approval or that of the Operator and cannot be amended within your delegated authority, then the original and all copies of the contract are to be returned to this office, together with the proposed changes for consideration.

Please bring to the attention of the Operator that this is an actual cost contract and it must keep copies of its payrolls and vouchers of purchases and get receipts for all cash payments not made by check. The original of the monthly Forms MF-104 must be supported by appropriate documentary evidence of the costs claimed.

This contract automatically makes maximums of the totals shown in all categories except sub-category 2 (c) and categories 3 and 7.

After execution of the contract, the copies are to be distributed in the usual manner. Copies of a memorandum from the Acting Assistant Solicitor to the Administrator, dated June 14, 1955, are enclosed for your information and guidance. Copies of a memorandum from T. H. Kiilsgaard of the Geological Survey, dated May 31, 1955, are also enclosed.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (JB)

Approved:

J. H. Hedges (JB)
Member, Bureau of Mines

Thor H. Kiilsgaard (JB)
Member, Geological Survey

Enclosures 10

JHopkins:gad 6/20/55

Copy to: Admr. R. File
Docket
Operating Committee
Mr. Arundale, 3516
Mr. Kiilsgaard, 5222
Mr. Houk

R. C.

Docket File
Surname:
Hopkins
Houk
Amendola

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D.C. 600

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Re: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Laurence:

Please find herewith the original and five copies of a contract covering the subject exploration project which have been signed by the Government with register number and effective date as shown.

If the contract meets with your approval present it to the Operator for its approval and signature. If any part of this contract does not have either your approval or that of the Operator and cannot be amended within your delegated authority, then the original and all copies of the contract are to be returned to this office, together with the proposed changes for consideration.

Please bring to the attention of the Operator that this is an actual cost contract and it must keep copies of its payrolls and vouchers of purchases and get receipts for all cash payments not made by check. The original of the monthly Forms MF-104 must be supported by appropriate documentary evidence of the costs claimed.

This contract automatically makes maximums of the totals shown in all categories except sub-category 2 (c) and category 7. No other maximums are indicated.

After execution of the contract, the copies are to be distributed in the usual manner. Copies of a memorandum from the Acting Assistant Solicitor to the Administrator, dated June 14, 1955, are enclosed for your information and guidance. Copies of a memorandum from T. H. Kiilsgaard of the Geological Survey, dated May 31, 1955 are also enclosed.

Approved:

Sincerely yours,

Member, Bureau of Mines

Chairman, Operating Committee

Member, Geological Survey

Enclosures 10

JHopkins:pk 6/17/55
Copy to: Admr. R. File
Docket
Operating Committee
Mr. Dietrich, 3061
Mr. Kiilsgaard, 5222
Mr. Houk

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

JUN 1955

Memorandum

To: The Administrator, DMEA
Attention: Mr. L. G. Houk

From: Acting Assistant Solicitor, Defense Minerals

Subject: Docket No. DMEA-3661, J. R. Simplot Company
Fluorspar

As requested in reference slip dated June 7 from Mr. Houk, we have prepared the attached contract.

1. In Annex I, 8 claims are listed. The Operator owns all but the Florspar claim, which at present is leased, and a Consent to Lien covering a one-half interest has been submitted. We are informed that the Operator is negotiating to purchase the Florspar claim. Therefore, room has been left in Annex I to add thereto a statement concerning the claims. Thus, if at the time the contract is executed the Operator has completed purchase of the claim, a simple recital may be made at the end of Annex I to the effect that "All claims listed above are owned by the Operator." If the claim has not been purchased, Annex I should recite that the 7 claims are owned, that the one claim (Florspar) is leased, and also the situation existing with respect to the Consent to Lien should be recited. In either event, the recitals in Article 2 of the contract form need not be changed.

2. The map referred to in the contract should be attached prior to execution.

/S/ Henry C. Rubin
For J. L. Hofflund
Acting Assistant Solicitor
Defense Minerals

Attachments
H. C. Rubin/emd
Copy to: DMEA Docket
Solicitor's docket
L. G. Houk (2)
J. L. Hofflund H. C. Rubin chron.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

JUN 14 1955

Memorandum

To: The Administrator, DMEA
Attention: Mr. L. G. Houk

From: Acting Assistant Solicitor, Defense Minerals

Subject: Docket No. DMEA-3661, J. R. Simplot Company
Fluorspar

As requested in reference slip dated June 7 from Mr. Houk, we have prepared the attached contract.

1. In Annex I, 8 claims are listed. The Operator owns all but the Florspar claim, which at present is leased, and a Consent to Lien covering a one-half interest has been submitted. We are informed that the Operator is negotiating to purchase the Florspar claim. Therefore, room has been left in Annex I to add thereto a statement concerning the claims. Thus, if at the time the contract is executed the Operator has completed purchase of the claim, a simple recital may be made at the end of Annex I to the effect that "All claims listed above are owned by the Operator." If the claim has not been purchased, Annex I should recite that the 7 claims are owned, that the one claim (Florspar) is leased, and also the situation existing with respect to the Consent to Lien should be recited. In either event, the recitals in Article 2 of the contract form need not be changed.

2. The map referred to in the contract should be attached prior to execution.

Henry C. Rubin
For J. L. Hofflund
Acting Assistant Solicitor
Defense Minerals

Attachments

Docket Copy
Surname:
Houk
Selfridge
K Johnson
Mittenwof

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

JUN - 9 1955

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Subject: Docket No. DMEA-3661
Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Weissenborn:

Reference is made to your letter of May 17, 1955, restating your opinion as to the best method of exploring the subject property.

We too regret the delay and expense in processing this application. Since the property has not been accessible for a formal field team examination, the delay has been unavoidable. We are in agreement that the potentialities here are most promising, and the property should be explored. The Nonmetallic Minerals Division is not in complete agreement with the exploration approach and has questioned the need for raising if the ore is encountered on the adit level. However, because of your strong recommendations and the short working season they are writing a contract. You should, therefore, watch the project closely so that recommendations can be made for changing the work program if the results are not encouraging.

A blank copy of the performance bond is enclosed for your guidance. The Operator was sent a performance bond on May 27, 1955.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (JHB)

Approved:

J. H. Hedges (JHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (JHB)
Member, Geological Survey

Enclosure

LGHouk:gad 6/1/55
Copy to: Admr. R. File
Docket
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Brundale, 3516
Mr. Houk

R.C.S.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

RECEIVED
JUN 10 1955

June 3, 1955

Air Mail

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3661 (fluorspar)
J. R. Simplot Co.
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

Mr. Nickelson has just returned from a trip to central Idaho during which he was able to visit the Chalspar No. 2 locality although with some difficulty. The last 1½ miles he had to traverse the talus on the south slope of the valley as the valley floor itself was filled with snow and the jeep road was inaccessible.

He found that the north slope of the hill on the Chalspar No. 2 locality was still deeply covered with snow and therefore no observations could be taken; however, on the south slope of the hill he was able to take two strikes and dips on dolomite outcrops. One of these was on the ridge N. 75° E. from the top of the hill about 300 feet from the vein. Here the beds are striking about N. 45° W. and are dipping 43° to the northeast. The second outcrop about 215 feet N. 65° W. of the proposed portal site and just above the west end of the first trench strikes N. 10° E. and dips 30° to the northwest. Outcrops, where recognizable dips could be measured, are very scarce but the observations would seem to indicate that the Chalspar No. 2 vein is pretty near the crestline of the anticline and there is not much danger of intersecting the phyllite in the proposed exploration. No information on the thickness of the Bayhorse dolomite could be obtained.

Nickelson reports that the lowest trench just below the proposed portal site is completely filled with slough material rolled down from the trench above, and the next trench above this is also nearly filled with slough material and also partly covered with

a snow bank. A sample of fluorspar picked up from the caved material in this trench has been sent for assay and the results will be forwarded to you as soon as available; however, no sample could be taken from the vein nor could the vein be seen.

If a bulldozer were available on the property, the two lower trenches could be cleaned out with very little effort and we are sure that the company would be willing to do this; however, cleaning the trench now would mean that a bulldozer would have to be brought in, probably walking it in from the Chalspar No. 1, a distance of 3 miles; it would then have to be removed as it would be impractical to leave it on the property until a decision was made regarding the contract.

We suggest therefore that the contract be negotiated without requiring the cleaning of these two trenches but that the first stage of the work be the performance of sufficient bulldozing to locate a satisfactory portal site and that drifting be started on the fluorspar vein. If this suggestion is not satisfactory, please let us know at once and we will contact the applicant to find out if he is willing to undertake the expense of bringing in a bulldozer for the purpose of opening up the two lower trenches. If he is not, then our recommendation will have to be to drop the contract.

Incidentally, we have been informed that the J. R. Simplot Company is negotiating to buy out the interest of the partner who did not sign the Owner's Consent to Lien.

By Field Team, Region I, NW District

A. E. Weissenborn / O.L.F.

A. E. Weissenborn, Exec. Officer
(U. S. Geological Survey)

Thomas E Howard

for: Wing G. Agnew, Member
(U. S. Bureau of Mines)

cc: USBM(2)

IN REPLY REFER TO:

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

RECEIVED
JUN - 1 1955

May 31, 1955

Memorandum

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

From: T. H. Kiilsgaard, U. S. Geological Survey

Subject: Comments on Simplot fluorspar application, DMEA Docket 3661, Custer County, Idaho

In my letter of May 19, to Dr. A. L. Anderson, copy transmitted to you, I raised certain questions regarding proposed exploration at the cited property. Dr. Anderson has now answered my letter and I am attaching a copy of his reply for your information.

You will note that Anderson concurs in the drifting program requested by the applicant and recommended by the Field Team. He believes the window of Garden Creek phyllite exposed on the nose of the anticline to be an erosional feature, and that drifting on the Chalspar No. 2 vein from elevation 8310 will not encounter the underlying phyllite.

For my own information I have plotted a longitudinal section of the Chalspar No. 2 vein in an attempt to see if the window of phyllite could have been exposed by erosion as suggested by Anderson. To do this I have transposed data from the applicant's map to the topographic and geologic map in U.S.G.S. Bull. 877. The scale of this map is too small to be absolutely accurate; however, plotting the phyllite from the outcrop on the south side of the ridge to the north side window shows the north side outcrop to be about 200 feet lower in elevation, or that the phyllite contact plunges about 5 degrees to the north. If such is the case, the phyllite window could be a topographic feature. Topography would not, however, account for the outcrop of the conglomerate and Ramshorn slate about a quarter of a mile north of the window. The outcrop of these younger rocks can be explained only by a sudden steepening of plunge of the anticline or else by faulting. These outcrops are, of course, beyond the area concerned by the proposed work.

The south side of the window of phyllite is about 2300 feet north of the adit portal site and about 200 feet lower in elevation. Allowing for a constant plunge to the north, this would mean the phyllite contact would be approximately 100 feet below the northern face of the proposed adit. Assuming fluorspar does not occur in the phyllite, this would mean that in addition to the reserve data shown

on the applicant's long section there would also be a triangular block below the adit level, which, using the applicant's vein width and tonnage factor, should contain 35,000 tons of ore -- calculated to the end of the proposed adit. This tonnage, added to that shown by the applicant, indicates the deposit could have a potential of 120,000 tons. Personally, I believe the applicant's tonnage figures are overly optimistic; probably a tonnage estimate about one half the applicants' would be more realistic.

We will not have enough data to evaluate this deposit until it is further explored; however, using those available, an optimistic 120,000 tons of 50% CaF_2, a concentration ratio of 2.3 to 1 -- believed to be the 1953 ratio of Simplot's Meyers Cove milling operations on ore comparable to that in question --, and an overall market value of $40 per ton of concentrate, I calculate a potential gross value of about $2,000,000. If the Government were to be repaid at 5% of the net returns, this evaluation would repay more than 4 times the exploration amount proposed by the Field Team. This seems to me to be a sufficient safety factor to justify Government participation in the proposed exploration project.

Additional field examinations by the Field Team will undoubtedly turn up new information that can be used in evaluating the proposed work; however, from a geological standpoint there seems to me to be ample information on hand to further process this application. Certainly, there is more known about the geologic characteristics and environment of this deposit than about the majority of properties receiving DMEA contracts.

On the basis of information on hand, I recommend approval of the program recommended by the Field Team.

T. H. Kiilsgaard

T. H. Kiilsgaard

COLLEGE OF ARTS AND SCIENCES
CORNELL UNIVERSITY
ITHACA, NEW YORK

DEPARTMENT OF GEOLOGY
McGRAW HALL

RECEIVED
JUN - 1 1955

May 23, 1955

Mr. Thor H. Kilsgaard
Staff Assistant for DMEA
U. S. Geological Survey
Washington 25, D. C.

Dear Thor:

Had James Humphreville written up his thesis problem, we would have more information on the Chalspar No. 2 than we now have, but he has had writing difficulties and I doubt that he will ever complete the writing and get his degree. I had planned to make use of his data and hence did no detailed work myself on or near the Chalspar No. 2. But I couldn't wait for his report, and hence had to use what general information I had. I know he claims a number of faults across the top of the ridge and the local intense silicification of the dolomite along these zones supports his contention of faulting. My map of the area (Fig. 2) and cross section are quite generalized.

The window of phyllite north of the ridge is, I believe, largely the result of erosion. The exposure is in the floor of a somewhat amphitheater like basin. Faulting may have played some part in the origin of this exposure, but I doubt that crossfolding has had any role. I place most of the blame on the topography.

Faults across the ridge may have been a factor on the high level phyllite at the 8300 contour, near the proposed adit portal.

In answer to your specific questions:

(1) The possibility of a northeast-trending fault across the nose of the anticline can't be discounted, but any fault or faults would be of rather minor magnitude. The window of phyllite is probably largely erosional.

(2) I doubt very much that an adit drift started at elevation 8310 would ever encounter phyllite.

(3) The exact thickness of the Bayshore dolomite at the Chalspar No. 2 is not known. There may be some duplication or elimination of beds by faulting. Humphreville had some ideas on that. I feel confident that the dolomite extends below the proposed adit level.

(4) I have no additional data on rock attitudes at the Chalspar No. 2. Humphreville recorded such data, but his notes are not available. I don't think his data will give any data on transverse folding.

(5) I have no information on the amount or type of displacement in the Chalspar No. 2 fault. Faulting produced a lot of open breccia, subsequently cemented by fluorite.

My feeling is that the only logical way to explore the Chalspar No. 2 lode is by adit drift. Diamond drilling would leave too much to be desired. My main concern is the distance of the phyllite below the proposed exploratory drift. I wouldn't expect any phyllite along the drift itself.

It had been my intention last year to continue detailed study and mapping of the Bayphorn anticline, but because of the hostility of Art Chambers, who felt that I was infringing on his thesis area, I transferred my activities to the Salmon quadrangle. This summer I plan to map and study the Baker quadrangle, which adjoins the Salmon quadrangle on the east. Perhaps some day I can resume study of the Bayphorn anticline.

I hope what information I have will be of some use to you. When the anticline is finally mapped in detail, I think we shall find a lot of faulting in and along the dolomitic beds.

Sincerely yours,

Andy

Alfred L. Anderson

ALA:mb

Docket Copy
Surname:

Hopkins
Houk
Matthewson

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

600

MAY 27 1955

J. R. Simplot Company
Continental Bank Building
Boise, Idaho

Re: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Gentlemen:

Reference is made to your application, dated January 6, 1955, for exploration assistance on the Chalspar No. 2 Mine, Custer County, Idaho.

We are enclosing six copies of Consent to Lien forms to be executed by Richard C. West and Shelda West owners of one-half interest in the fluorspar mining claim and returned to this office. Since you are unable to obtain consent to lien on the other one-half interest in the claim we will require a third party guaranty or surety bond to secure the Government's percentage royalty. A copy of Standard Form 25, Performance Bond, is enclosed for execution by your guarantor.

Upon receipt of these documents we will continue processing your application.

Sincerely yours,

SIGNED
Lawrence G. Houk, Chief
Nonmetallic Minerals Division

Enclosures 7

JHopkins:gad 5/27/55
Copy to: Admr. R. File
Docket
Field Team, Region I, NW District
Mr. Kiilsgaard, 5222
Mr. Arundale 3516
Mr. Houk

R.C.h.

Mr. Houk

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

MAY 23 1955

DATE _____

REFERRED TO:

1. _____ 600
2. _____
3. _____
4. _____

FOR:

- _____ Action
- _____ Approval
- _____ Comment
- _____ Conference
- _____ Consideration
- _____ Filing
- _____ Instructions
- _____ Investigation
- _____ Initials
- _____ Mailing
- _____ Previous correspondence
- _____ Recommendation
- _____ Record of _____
- _____ Referring to _____
- _____ Reply for signature of _____
- _____ Rewriting
- _____ Signature
- _____ Suggestions
- _____ Your information

REMARKS: Write actual contract with units as maximum tonnage categories

Check (X) before the items needing attention.

ROBERT E. ADAMS

Initials of sender.

GPO 16—63815-1

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

May 17, 1955

Air Mail

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3661 (fluorspar)
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

This is in reply to Mr. Martin's letter of May 3, 1955, which crossed our letter of May 4, 1955, in the mail.

Our letter of May 4, we believe, answered some of the questions which were raised, but it has not answered all of them; we are sorry but we do not have the answers to all of the questions. The deposit was examined by Nickelson and Johnson last fall because they were in the vicinity and because they had reason to believe that there would be a DMEA application forthcoming. They took a few samples and made some pertinent notes but did not have the opportunity at the time to do more than this. They did see enough, however, to convince them thoroughly that this is indeed a likely prospect. The application itself was received in January 1955 and since then the property has been inaccessible, thus providing no opportunity for a further visit to the property to get the additional information that is requested. Some of this information can be obtained fairly easily as soon as the property is opened, but to obtain the answers to some of the questions may require detailed geologic mapping which is far beyond the scope of the mapping that is normally done in a DMEA examination. Some of the answers perhaps may not be forthcoming until the planned exploration itself is performed.

It should be remembered that A. L. Anderson visited the area in 1951, 1952, and in the early summer of 1953. In August of 1953 he spent three weeks mapping the area. In this time Anderson did not come up with the answers to all the questions asked in your letter of May 3. Anderson's map is certainly not above criticism, but the fact that he had so few strikes and dips on it, except the north part of the map area of figure 2, is significant. Much of the mapped area is heavily timbered, exposures are not too good, and even where there are

exposures, dips are not always readily determinable. This is particularly true of the Bayhorse, which is a massive dolomite without very distinct bedding. Careful search very likely would add more strikes and dips to the map, but to find them in the immediate vicinity of the deposit may not be as simple as it seems.

To get these strikes and dips and to take additional samples will mean we must delay until the property becomes accessible, and it may mean bringing in a bulldozer to clean out the trenches. Inasmuch as we are already convinced that the property merits exploration and that the plan for exploring it is sound, we regret the loss of time and the expense. The loss of time is particularly serious due to the abnormally late spring and the shortness of the working season even under normal conditions.

Regarding the thickness of the Bayhorse dolomite the available information is confusing, if not conflicting. The thickness apparently varies from about 1,000 feet on the east flank of the anticline near Garden Creek to as little as 200 feet on the west flank near the Westspar prospect. If we are to believe Anderson's section A-A of plate 2 which passes right through the Chalspar No. 2 property the Bayhorse has a thickness of about 200 feet in this immediate area. There is no readily available exposure where the section could be measured directly and we do not believe that even with more detailed surface mapping we are likely to come out with a better answer than this, although the exploration itself may give additional information.

Concerning whether or not there are any unmapped faults between the Chalspar No. 2 locality and the small patch of Garden Creek phyllite a little to the north, if Anderson had seen any evidence of such faults he would no doubt have drawn them in. Past experience with Anderson's work in other areas suggests that he has a great tendency to put in faults even on extremely slender evidence; he has in fact been much criticized for this. Exposures on the north slope of the hill are poor or absent so we cannot say categorically that there is no fault in this area. We do know, however, that from the portal of the proposed adit just above the phyllite contact to 200 feet north of the top of the hill we have seen no evidence of a fault offsetting the fluorspar vein. The unexpected can always happen, but we can say definitely that throughout most of the length of the proposed adit there is no surface evidence of any fault large enough to interfere with the exploration, regardless of what there may be farther north.

We cannot agree that the exploration we have recommended is development rather than exploration. We would regard anyone as extremely ill-advised to go in and construct a surface plant and mill on the basis of the information now available on the property, and consequently the property clearly needs exploration. If it were necessary to drive a long crosscut to reach the vein, we might agree that some preliminary diamond drilling might be desirable but with the favorable setup that exists on the property for drifting we believe that the best, cheapest, and quickest method of getting the necessary information on the grade and continuity of the ore is to drive an adit on the vein in the manner we have recommended, and we see nothing improper in Government participation in this adit merely because it will be useful later on for mining should the exploration be successful. We do not believe that it would be preferable to come in on the north side of the hill, even though this is easier to reach by road. We know that the vein can be followed up the south slope of the hill to the top and some 200 feet down the north slope where it runs into cover too deep to bulldoze. We do not know the exact position of the vein on the lower north slope of the hill; in fact, we do not even know with certainty that it continues this far. Underground exploration from the north side would require the drilling of a number of diamond drill holes to locate the vein, and if it should prove that the vein should stringer out before it reaches the north flank of the hill, it would require a long drift in barren ground to reach the ore zone. The cost might well exceed the amount that could be saved in road construction from the north side as compared to the south side. Furthermore, we are sure the operator will not consider doing the work from the north side, and cannot argue with him with conviction. We think it far more prudent to stick close to the known ore and start the drift on the south side on the actual outcrop of the vein. We have taken care of the road problem by putting a maximum on the amount that is allowed for road construction.

//best mining practice

Regarding the matter of a guarantee for a half of one claim, we have in other DMEA contracts accepted the guarantee of this very company in lieu of Owner's Consent to Lien and, consequently, we believed that this would be adequate in the present case. The J. R. Simplot Company is a well-known and highly respected company with an excellent credit rating and should have no difficulty in securing a bond guaranteeing the payment of royalty, if this is required. We discussed this matter with Mr. Hedges while he was here and asked him exactly what type of bond was required. Mr. Hedges was not sure and therefore we would like you to send us, as early as possible, a sample bond for our guidance in obtaining the proper form of bond. We shall then proceed to request the company to secure a proper bond.

In our judgment this is a very attractive property and is the type of exploration in which the DMEA should participate. We do not have all the geologic details which could perhaps be obtained in the area, but we have more information than is usually available on many exploration projects, both DMEA and non-DMEA, and we would have no misgivings whatsoever in entering into the project as recommended. Since you insist, we will visit the property as soon as it becomes accessible and will obtain as much of the information you request as we can, but we sincerely regret the expense and delay that will result and the diversion of our men from other work.

By Field Team, Region I, NW District

A. E. Weissenborn

A. E. Weissenborn, Executive Officer
U. S. Geological Survey

Wing G. Agnew

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: USBM (2)
Nickelson

Monthly Report
Region I - Northwest District
Reporting period: Mar. 15 - Apr. 15, 1955

Idaho

DMEA-3661 (fluorspar) - J. R. Simplot Company, Chalspar No. 2
Custer County, Idaho

The application was submitted to Washington, D. C. on January 29 and the Field Team report recommending a project was forwarded on March 18. The Operating Committee has suggested an alternate exploration program to be presented to the applicant for his reaction.

AIR MAIL

SIMPLOT SILICA PRODUCTS, INC.

OVERTON, NEVADA

May 6th, 1955.

Re: Docket #DMEA-3661-Fluorspar
J.R.Simplot Co.
Chalspar No.2
Custer County, Idaho.

Mr.Lawrence G. Houk, Chief,
Nonmetalic Minerals Division,
U.S.Department of the Interior,
Defense Minerals Exploration Administration,
Washington 25, D.C.

Dear Mr. Houk:

Your letter No.600 of April 29th has been referred to the writer for reply.

All exposures on the south slope above the proposed portal site show ore estimated to contain 50%-65% CaF_2. The trench immediately below the proposed portal exposed large boulders of 40%-50% CaF_2. Due to the lack of a compressor, bed rock was not reached. It was for this reason that the proposed portal is shown North of the trench.

The vein was stripped for the entire distance between the upper North and South slope trenches. The middle North slope trench exposed boulders containing approximately 40% CaF_2, but bed rock was not reached. The lower North slope trench encountered a volcanic remnant. The fluorspar encountered may have been float, as the trench was not at bed rock at a depth of 25 feet. Mr. Nickelson of your Spokane office sampled the property during the writers absence last summer, and should be able to confirm the above.

In that there is no exposure of the dolomite-phyllite contact on the South side of Daugherty Creek, no section could be measured. It is inferred that the thickness of the dolomite is in the order of 250 feet. The 150 foot section(roughly measured) is on the Florspar No.5 claim, which is referred to as "Chalspar No.5" by Dr. Anderson.

We hope that the above will clarify our report, and that the application will be expedited so that we shall be able to take full advantage of the short summer season.

Very truly yours,

Keith Madill

Keith Madill

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

May 4, 1955

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3661 (fluorspar)
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

With reference to Mr. Houk's letter of April 29, 1955, to J. R. Simplot Company we are attaching a brief memorandum from Mr. Nickelson regarding the occurrence of fluorspar in the lower trenches of the south slope of the hill. Mr. Nickelson was absent in the field when the Field Team letter of April 22 was prepared; consequently, we hesitated to state too precisely regarding how much fluorspar he had seen in the lower trenches on the south side of the hill, although we were certain he was convinced that fluorspar could be traced clear down to the trench at elevation 8300 feet. We believe that Mr. Nickelson's statement should relieve any doubt that there are considerable amounts of fluorite clear down to the lower trench at the contact with the Garden Creek phyllite.

With regard to the thickness of the Bayhorse dolomite, the J. R. Simplot Company's map shows a difference of elevation of approximately 250 feet between the Garden Creek phyllite and the basal Ramshorn conglomerate which indicates a thickness much less than the 1,000 feet estimated by Ross in Bulletin 877. Ross thinks that there are about 1,000 feet of Bayhorse dolomite on the east flank of the anticline near Garden Creek; however, he very specifically states that local contortion has rendered accurate measurement impossible and therefore it is very possible that the thickness may not be as great as he thinks.

Also, as Ross points out, the conglomerate at the base of the Ramshorn slate is evidence of an erosional unconformity and therefore at any given place part of the Bayhorse dolomite may be missing. Therefore, aside from structural complications which may further compound the problem, we neither know with certainty how thick the Bayhorse was in the first place nor how much may have been stripped off before the Ramshorn was deposited.

We trust that Mr. Nickelson's memorandum will give sufficient evidence to show that the fluorspar vein does continue down the south slope to approximate elevation 8300.

On his recent trip to the Salmon area he attempted to reach the deposit so that he could map and sample it in greater detail but was unable to reach it because of snow.

By Field Team, Region I, NW District

A. E. Weissenborn

A. E. Weissenborn, Executive Officer
U. S. Geological Survey

Wing G. Agnew

Wing G. Agnew, Member
U. S. Bureau of Mines

Enclosure

cc: USBM (2)
Nickelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

May 3, 1955

Memorandum

To: DMEA Field Team, Region I, Northwest District

From: Howard B. Nickelson, Geologist, U. S. Geological Survey

Subject: Docket No. DMEA-3661 (fluorspar), J. R. Simplot Company, Chalspar No. 2, Custer County, Idaho. Lawrence G. Houk's letter of April 29, 1955, to the applicant.

In regard to Mr. Lawrence G. Houk's letter to J. R. Simplot Company of April 29, 1955, the writer may be able to clear up several of the questions asked.

Regarding samples from the lower trenches on the north and south side of the hill, during the field examination in October 1954 evidence of the vein was observed high on the bank of the trench on the south slope of the hill just below the proposed portal site, even though the trench itself was covered with sloughed material so that the trench could not readily be sampled. Considerable fluorspar was observed in the rubble that had sloughed from the overburden and the near-surface exposure of the vein. High-grade pieces of fluorite were observed up to 1 foot in diameter in the rubble. Fluorite could be observed in the dolomite just above the phyllite contact.

The vein in the next trench above the proposed portal site was covered by the bulldozed material from upper trenches but considerable high-grade fluorspar was evident in the dump. It is difficult to determine just where this material originated but there is no question in my mind that the vein is present here and contains fluorspar.

The other trenches to the top of the hill have been sampled by the Operator and check-sampled at the time of the examination, the results of which have been reported.

The surface had been dozed from the top of the hill to the north for approximately 200 feet and the vein was exposed throughout this length. The last exposure of the vein near the end of the trench was approximately 4 feet wide, and several narrow stringers were also evident on each side of the main vein. As stated by the applicant none of the trenches beyond this point reached bedrock,

although fluorspar float was dug up during the excavation and was evident on the dumps. The Field Team has not proposed any exploration under these two northern trenches.

The principal reason for the examination was to determine if the Operator had represented the property as described in the application and if the proposed work would start on the vein in ore as stated in the application. There is no doubt in my mind that the vein contains fluorspar at the proposed portal site.

Distribution:
DMEA (orig. & 3)
USBM (2)
USBM(AD)
Docket
Nickelson

Docket Copy
Surname:
Houk
Crumbole
Van Alstine
Martin
Holman
Weissenborn

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

MAY - 3 1955

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Subject: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Weissenborn:

Reference is made to your air mail letter of April 22, 1955, on the subject application.

The portion of our letter of April 5, 1955, which you misconstrued, contains no inconsistencies, although your omission "50 feet of shaft" would make it appear so. We cannot reconcile your statement on the top of Page 3 with respect to the thickness of the Bayhorse. The Chalspar No. 2 is on the west flank of the anticline. Anderson states on Page 3 only a few hundred feet of dolomite are exposed on the west flank of the anticline in the vicinity of Daugherty's Gulch. The Operator states in its application "locally the dolomite is thin to as little as 150 feet". The plunge of the anticline and the dip of the contact between the Garden Creek phyllite and the bottom of the Bayhorse in the area of the Chalspar No. 2 would provide us with a better picture of the geology.

You apparently did not understand Van Alstine's fourth question. He was trying to account for the presence of the small island of phyllite north and a little west of the Chalspar No. 2. Please comment on and give costs for rehabilitation or use of the present road to the north end, and on the possibilities and a plan of initiating work on the north end of the mineralization. The potential in depth appears more encouraging than on the south end.

It is true that diamond drilling at the Chalspar No. 1 was inconclusive but deepening of the shaft gave conclusive results on character of the ore shoot. Mr. Van Alstine pointed out the error in Anderson's Section A-A' on Figure 2 in the area west of the Chalspar No. 1 (DMEA-2950) in his memorandum of February 28, 1955, a copy of which you, no doubt, received with the closing letter of April 11, 1955. An additional copy is enclosed.

R.C.S.

The Operator's offer to sign a guarantee in lieu of an Owner's Consent to Lien covering one-half interest in one claim cannot be accepted inasmuch as the Operator makes this guarantee when the contract is executed. (See lien for payment on contract form). It will be necessary that the Operator obtain a performance bond from an established bonding company or provide a guarantee by a financially responsible third party. (See Circular 20 (Revised) March 24, 1955, Section 3).

We do not feel justified in writing a contract without information on the sampling of the lower trenches and replies to our other questions mentioned above.

Copies of a memorandum from R. E. Van Alstine of the Geological Survey, dated April 28, 1955, are enclosed for your information.

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (2/B)

Approved:

M. E. Volin (2/B)
Member, Bureau of Mines

/s/ R. D. Trace (2/B)
Member, Geological Survey

Enclosures

LGHouk:gad 5/2/55
Copy to: Admr. R. File
Docket
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk

IN REPLY REFER TO:

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

April 28, 1955

Memorandum

REVIEW OF FIELD TEAM LETTER OF APRIL 22, 1955 ON APPLICATION DMEA-3661 (fluorspar)

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

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

Applicant: J. R. Simplot Company

Name of property: Chalspar No. 2

Location of property: Custer County, Idaho

Date of Field Team letter: April 22, 1955

Authorship of Field Team letter: A. E. Weissenborn, U.S.G.S., and W. G. Agnew, U.S.B.M.

Field Team's recommendation: Approve applicant's proposal for 1100 feet of drifting, crosscutting, raising, access road construction, portal preparation, and construction of compressor house and shop.

Comments: The proposed underground work still seems to be development and not exploration. The ore reserves are of the indicated and inferred classes, as defined and used by the Bureau of Mines and Geological Survey. The Field Team report of March 1, 1955, states (p. 3) that trenches on both sides of the crest of a hill "expose fluorspar mineralization for a strike length of 900 feet over a vertical distance of about 260 feet. Vein widths range from 6 feet to more than 16 feet. The applicant's samples are reported to average 51.3 percent CaF_2." Continuity of the vein is indicated again by the applicant's map and by Idaho Bureau Mines and Geology Pamphlet 101, figure 6.

Drilling seems appropriate to investigate the continuity of the ore to the proposed adit level and possibly deeper. Similarly the depth at which the unfavorable Garden Creek phyllite underlies the Bayhorse dolomite might be determined by drilling.

If underground work still seems justifiable, however, consideration should be given to starting the adit at the north end of the area, possibly in the cut at an altitude of 8320 feet, and driving southward in the structure to a point below the exposures on the crest of the hill. Such an adit might qualify more as exploration because evidently less is known about this end of the vein. An adit from this end might have the additional advantage of indicating more ore at depth than an adit at the south end, because the one proposed at the south end would start practically on the dolomite-phyllite contact. Furthermore, access to the north end of the property might be easier and less costly than to the south end.

In any event some geologic factors mentioned in my memorandum of March 16, 1955, are still not known. These unknowns, itemized below, are of more than academic interest as they may have an important bearing on the continuity of the ore in depth and along strike and hence upon the location and method of exploration. Possibly Nickelson of the Field Team was able to obtain this information on his attempt to visit the property this month.

1) What are the dips of the Bayhorse dolomite (and the contact with the Garden Creek phyllite) in the immediate vicinity of the proposed exploration? According to Figure 2 of Idaho Bur. Pamphlet 101, Chalspar No. 2 is located near the west flank, axis, and nose of the anticline. The dips might be anything between 20°, the recorded plunge of the fold, and the 75° to 80° dips on the flanks.

2) What is the thickness of the Bayhorse dolomite at the prospect? The thickness of this formation within a distance of 2 miles of the prospect evidently ranges from about 1,000 feet (east flank near Garden Creek, U.S.G.S. Bull. 877, p. 13) to as little as 200 feet (west flank, Westpar prospect, Idaho Bur. Pamphlet 101, p. 12).

3) Is there an unmapped fault or a synclinal fold across the nose of the Bayhorse anticline, between Chalspar No. 2 and the small patch of phyllite to the north (see fig. 2 of Pamphlet 101)? Examination of this map and of the topography on plate 1 in Bull. 877 suggests that there is a synclinal structure or a fault athwart the nose of the anticline in the north part of the Chalspar No. 2 area. Figure 2 shows three such east-trending faults farther north. The Field Team's letter of April 22, in attempting to answer this query, unfortunately talks about a structure some 6,000 feet to the east.

ACTION RECOMMENDED: Explore the deposit, taking whatever action seems appropriate in view of the above comments.

R. E. Van Alstine

R. E. Van Alstine

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

April 22, 1955

Air Mail

Mr. George C. Selfridge
Chairman, Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

WSay

Re: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

Acknowledgement is made of your letter of April 5, 1955, with accompanying memoranda by R. E. Van Alstine and John E. Holtzinger. The Field Team cannot agree that the suggested exploration by means of a 50-foot shaft and five diamond drill holes would be as effective as the plan proposed by the Operator and recommended by the Field Team, nor do we agree, as contended by Van Alstine, that the proposed drifting on the vein would be development rather than exploration. In fact, the proposal to diamond drill rather than drift on the ore seems to be diametrically opposed to the admonition in the Operating Committee's letter that "exploratory workings, in prospects of this type, should be confined primarily to ascertain tonnages by exposing the ore in the mine workings." We are in complete agreement with this and this is exactly what we recommend doing.

The vein has been exposed in a series of bulldozer trenches over a length of 700 feet (without finding its limits to the north), and over a vertical range of 245 feet. What is now required is to open up the vein to determine whether the grade and widths indicated by the trenching are continuous enough to form exploitable ore shoots. We believe that the simplest and cheapest method of doing this would be to drift on the ore. Fortunately, the vein which strikes nearly straight up the slope of a steep hillside is ideally situated for exploration by means of an adit, which would start on the ore; no crosscutting to reach the vein would be required. We do not see the logic of sinking a 50-foot shaft from near the top of the hill as an alternate to this plan because, for the same cost, a much greater amount of vein could be exposed by drifting. Furthermore, should the shaft happen to be located in a lean (or a rich) segment of the vein, the results would be misleading. We believe that at this stage exploration along the strike of the vein would give more

information on the general tenor of the vein and the distribution of lean or rich segments of the vein. We do not believe that this information can be obtained from any practicable amount of diamond drilling, and certainly not from five drill holes, although diamond drilling would have some value in determining the depth to which the vein extends. We would like to point out that in the exploration of the Chalspar No. 1 property with the same company in the same area, diamond drilling gave inconclusive results and more drilling would have been required before the results could have been interpreted with confidence.

We are somewhat puzzled because Van Alstine states that the vein is already so well exposed that the proposed work is development rather than exploration, whereas Holtzinger believes that the estimate of grade and tonnage is based on such scant data that the proposed expenditure cannot be justified. Curiously enough, although these views are completely opposed, both recommend diamond drilling.

We are more or less in accord with the Operating Committee in regarding the Operator's estimate of 88,000 tons of indicated and inferred ore as optimistic; we believe that this figure should not be regarded as an ore reserve but rather as a reasonable "guesstimate" of the amount of ore that might be found above adit level should the exploration be successful. indicated

We believe that the evidence from the bulldozer trenches is conclusive that the vein persists to the 8400 level, and is strong that it persists to the Garden Creek phyllite-Bayhorse dolomite contact near elevation 8300. We do not expect much, if any, ore in the Garden Creek phyllite. It is our intention that drifting would start on the vein in the Bayhorse dolomite; the allowance for portal site preparation presupposes that enough bulldozing will be done to be certain that the adit is in the Bayhorse dolomite. We think this is clear to the Operator, but if there is any doubt, the contract should state that the portal site <u>must</u> be approved by the Field Team and should start in Bayhorse dolomite. Available evidence also indicates that the anticline plunges to the north so that to the north the Garden Creek phyllite-Bayhorse dolomite contact should progressively be at greater depth. The alignment of the vein outcrop as exposed in the applicant's bulldozer trenches does not indicate any fault of sufficient magnitude to have raised this contact very much, nor is any Garden Creek phyllite found on the north slope of the hill down to elevation 8300. The unexpected can always occur but if the adit is started above the Garden Creek phyllite-Bayhorse dolomite contact, we do not believe there is much danger of running into very much phyllite on the adit level. If a single short diamond drill hole could be drilled to test the contact, this might be worthwhile as insurance, but this is not practicable as it is virtually impossible to contract for less than 1,000 feet of drilling at a reasonable cost.

With respect to Van Alstine's question (3) concerning the thickness of the Bayhorse dolomite in the Chalspar No. 2 area, the best answer is given by C. P. Ross (Geology and Ore Deposits of the Bayhorse Region, Custer County, Idaho, USGS Bull. 877, p. 13, 1937), who states "In the cliffs immediately north of the town of Bayhorse, about 1,000 feet of the Bayhorse dolomite is exposed, with Garden Creek phyllite below and Ramshorn slate above. Local contortion, here and elsewhere, has rendered accurate measurement impossible. On the east flank of the anticline near Garden Creek the thickness cannot be much less than 1,000 feet, although there the overlying conglomerate indicates that the dolomite has been eroded." This last is the area of the Chalspar No. 2 property. We are looking at the beds near the crest of the anticline where they are relatively flat; Ross shows dips of 75° to 80° on both flanks of the anticline.

Chalspar #2 is on west flank, easier slope 150

With respect to Van Alstine's fourth question, Anderson obviously pulled a "butch" on his section A-A of figure 2. If the Ramshorn-Bayhorse contact is correctly plotted, there is no need for the fault Anderson shows on the east side of the anticline, and in place of the fault there appears to be a minor anticlinal wrinkle on the flank of the syncline to the east of the Garden Creek anticline. Ross's structure section A'-A' (pl. 1 of Bull. 877) which is a little to the north of the Chalspar No. 2 locality, shows this relationship. It is for this reason that Nickelson's memorandum report (p. 2) reads, with commendable restraint, "The geology in the immediate vicinity of the property has been mapped more recently and on a larger scale by A. L. Anderson." Because we recognized Anderson's error, Nickelson did not state that the area was mapped in greater detail by Anderson. However, this discrepancy affects the structure some 6,000 feet east of the Chalspar No. 2 vein, and hence does not have any direct bearing on the structure in the project area.

This is not an accurate statement as Anderson

Nickelson's report was written on the basis of a visit made to the property last fall in company with V. Z. Johnson. The lower trenches had slumped, preventing sampling or close inspection of the vein in these trenches. There is strong evidence from the slumped material that the vein does extend down the south slope of the hill, but there has been no opportunity to re-examine the property since the date of formal submission of the application (January 6, 1955). Nickelson is in the area at the present time and will map and sample the vein in greater detail if he can, but it is doubtful if he can even reach the property yet. Nickelson's samples taken in the upper trenches check the applicant's and indicate a good width of acceptable grade fluorspar. This, with the other data at hand, in our opinion is sufficient evidence to justify the proposed exploration. We do not think that the additional information to be obtained will be worth the delay that will be required to get it, particularly in view of the short working season in this part of the country, and therefore, we strongly urge that the contract not be held up on this account.

In brief, we believe that preliminary work indicates that this is a very desirable project, that the work is exploration as defined by the DMEA, and we strongly urge that a contract be written in accordance with the plan recommended by the Field Team. We believe there is sufficient information to justify this, and we urge that the contract be written without waiting for further information so that the project may be started as soon as the weather permits.

By Field Team Region I, NW District

A. E. Weissenborn

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: USBM (2)
Nickelson

Docket Copy
Surname:
Houk
Hutchinson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

APR 29 1955

J. R. Simplot Company
Continental Bank Building
Boise, Idaho

Re: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Gentlemen:

Reference is made to your application for exploration assistance on the Chalspar No. 2, Bayhorse Mining District, Custer County, Idaho.

The map submitted with your application fails to show assay data on the lower trenches on the north and south slopes. We would appreciate it if you would send any assay data you may have at these locations. If you have not cut samples visual estimates would be appreciated. It is noted in your application under 4 (c) that the dolomite (Bayhorse) is thin to as little as 150 feet in the area around the Chalspar No. 2. We presume this is a measured section.

Sincerely yours,

SIGNED

Lawrence G. Houk, Chief
Nonmetallic Minerals Division

LGHouk:gad 4/29/55
Copy to: Admr. R. File
Docket
Field Team, Region I, Northwest District
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk

R.L.H.

FILE COPY
Surname:
Houk
Selfridge
Kilsgaard
Mottendorf

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

APR - 5 1955

Mr. A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Subject: Docket No. DMEA-3661 - Fluorspar
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Weissenborn:

Reference is made to the subject application for exploration assistance in Custer County, Idaho, and the cost analysis by A. L. Service of the Bureau of Mines and the geologic report by Howard B. Nickelson of the Geological Survey.

The Operator's estimate of 88,000 tons of indicated and inferred reserves seems optimistic, in light of the geologic knowledge of this particular area. However, the assumption that the strong mineralization which occurs at the crest of the hill persists downward without additional supporting evidence is not, in our opinion, justified. Exploratory workings, in prospects of this type, should be confined primarily to ascertain tonnages by exposing the ore in the mine workings. In this case it appears that the Operator has given too much weight to the future usefulness of the exploratory workings before demonstrating that the deposit is of economic importance. It is generally more advisable to subordinate the future usefulness of exploratory workings and obtain the maximum information at the minimum cost even though the exploratory openings may later prove to be poorly planned from the operating viewpoint.

Copies of memoranda by R. E. Van Alstine of the Geological Survey, dated March 16, 1955, and John E. Holtzinger of the Bureau of Mines, dated March 18, 1955, are enclosed for your information. Mr. Van Alstine's comments, particularly under Section 2, 3, and 4, are especially pertinent.

Please secure the applicant's reaction to a 50 foot shaft to be followed by about five diamond drill holes and incorporate the bids and cost data in the Field Team Report. May we suggest that you sample the remaining trenches either visually or by channelling. The exposed vein geology should be mapped in detail.

Approved:

J. H. Hedges (216)
Member, Bureau of Mines

Thor H. Kiilsgaard (216)
Member, Geological Survey

Sincerely yours,

George C. Selfridge (216)
Chairman, Operating Committee

R.C.S.

LGHouk:ad 4/1/55
Copy to: Admr. R. File
Docket
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Arundale, 3516
Mr. Houk

IN REPLY REFER TO:

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

Defense Minerals Administration
RECEIVED
APR 1 1955

March 31, 1955

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-3661 (Fluorspar)

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

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

Applicant: J. R. Simplot Co., Boise, Idaho

Name of property: Chalspar No. 2

Location of property: T. 13 N., R. 18 E., Bayhorse district, Custer County, Idaho.

Date of Field Team report: March 18, 1955

Authorship of Field Team report: H. B. Nickelson (U.S.G.S.) and A. L. Service (U.S.B.M.)

Field Team's recommendation: Approve 1100 feet of drifting, cross-cutting, and raising, access road construction, portal preparation, and construction of compressor house and shop. Service recommends that the 120 feet of raising be made Stage II, contingent upon results of drifting and cross-cutting.

Comments: The deposit warrants further exploration. The reasons for underground work rather than drilling are not presented. There is nothing to show that the Field Team has considered drilling (see my memo of March 16, 1955, to you).

Bulldozing already has indicated a continuous ore body of good grade along a steep fault for a strike length of 900 feet and a vertical range of about 260 feet. The applicant has estimated 67,000 tons of indicated ore and 21,000 tons of inferred ore in this body.

The continuity of the ore to the proposed adit level and even deeper could be investigated by drilling instead of underground work. Similarly the depth at which the unfavorable Garden Creek phyllite underlies the Bayhorse dolomite might be determined by drilling.

ACTION RECOMMENDED: Consider a drilling program rather than underground work.

R.E. Van Alstine

R. E. Van Alstine

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

So. 157 Howard Street
Spokane 4, Washington

March 18, 1955

Air Mail

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3661 (fluorspar)
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

Attached are memoranda from Howard B. Nickelson, Geological Survey, and A. L. Service, Bureau of Mines, recommending a DMEA contract for the exploration of the Chalspar No. 2 deposit.

Preliminary work by the J. R. Simplot Company has exposed, in a series of bulldozer trenches, what appears to be an unusual deposit of fluorspar. Further attraction is given the deposit because of the geologically favorable position in brecciated Bayhorse dolomite on the flank of an anticline not far under a former cover of Ramshorn slate now largely removed by erosion from the crest of the anticline. The applicant estimates a potential reserve of 88,000 tons above the level of a proposed exploration adit; this might be less should the argillite core of the anticline through faulting or other structural complications occur above adit level. It could be greatly increased if the core of the anticline plunges northerly as expected. Exploration is needed to determine this as well as to establish the continuity of high-grade ore found in bulldozer trenches. Should the exploration be successful there would be a good possibility of bringing other deposits in the immediate vicinity into production.

The applicant's proposal, with some modifications suggested in the attached memoranda, is well designed to explore the deposit to adit level and is strongly endorsed by the Field Team. The only complicating factor is the request for an access road. The existing road appears inadequate for the exploration program proposed, and the Field Team believes that Government participation in road improvement to the extent recommended in the attached memorandum by Service is justifiable under the circumstances.

The applicant has been unable to obtain an Owner's Consent to Lien covering a half interest in one claim but has offered to sign a guarantee in lieu of a Consent to Lien. As the J. R. Simplot Company

Reviewed by
DMEA OPERATING COMMITTEE
3-30-55
(date)

is a well-known, established company it is believed that this guarantee should protect the Government's interest as well as the Consent to Lien.

By Field Team, Region I, NW District

A. E. Weissenborn, Executive Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

Enclosures

cc: USBM (2)
Nickelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~

1201 N. Division St.
Spokane 2, Washington
March 17, 1955

MEMORANDUM

To: DMEA Field Team, Region I, NW District

From: A. L. Service, Mining Engineer, Bureau of Mines

Subject: Cost Analysis, Docket No. DMEA 3661 (fluorspar), J. R. Simplot Company, Chalspar No. 2, Custer County, Idaho

The applicant's proposal of 1100 feet of drifting and raising is considered reasonable but the proposed cost of $58,700.00 is believed to be excessive.

The following cost analysis is based on data compiled by V. Z. Johnson, former Bureau of Mines Engineer, after an examination of the property on October 5 and 6, 1954. These costs are for 1100 feet of drift, crosscut, and raise and about 3 miles of access road. It is recommended that the work be divided into two stages, as follows.

Stage I will consist of preliminary work, 880 feet of drifting, and 100 feet of short crosscuts to explore the vein. Stage II will consist of 120 feet of raising, if warranted.

Should this application be approved for Government participation the following units costs are recommended.

Preliminary Work

Access Road Construction

The proposed 3 miles of access road will connect the project site to the nearest county road. Much of this distance is in ledge rock and coarse boulders that will have to be blasted. The last half mile will have at least three switchbacks in order to traverse the steep slope. The Operator has suggested a maximum grade of 10%, which is acceptable.

There is an alternate route along Big Hill Gulch, but the physical conditions are much the same. The northern exposure and deeper snow conditions make this route the less desirable of the two.

The following cost estimate for two weeks of access road construction is recommended:

Reviewed by
DMEA OPERATING COMMITTEE
3-30-55
(date)

with operator	
D-8 bulldozer/- 12 days or 96 hours @ $12.50/hr.	$1,200.00
1/4 supervising engineer @ $600/mo.	150.00
Labor - 2 men - 96 hours or 12 shifts each @ $14.50/shift	348.00
FICA, etc. - 11%	54.78
Powder - 700 lbs. @ $21/cwt.	147.00
Fuse and caps	25.00
Compressor - 315 cfm - 1/2 mo. @ $300.00	150.00
Miscellaneous	250.00
Total	$2,324.78
SAY	$2,330.00

Portal Preparation

The proposed portal site, as located on the Operator's map, is in an area of large boulders with 15 to 20 feet of overburden. It is estimated that two shifts or 16 hours should be sufficient to prepare the portal site.

Bulldozer with operator - 2 days or 16 hours @ $12.50/hr.	$ 200.00
Labor - 2 men - 12 hours or 2 shifts each @ $14.50/shift	58.00
FICA, etc. - 11%	6.38
Compressor - 315 cfm - 2 days @ $300/mo.	20.00
Powder - 100 lbs. @ $21.00/cwt.	21.00
Miscellaneous	35.00
Total	$ 340.38
SAY	$ 350.00

Compressor house and shop

16'x32' rough frame	850.00

Drift and crosscut

These costs are prepared by assuming that a 4-foot round may be advanced each 8-hour shift.

Labor and Supervision for one shift

1/2 supervising engineer @ $600/mo., 25 shifts/mo.	$ 12.00
2 miners and helper @ $14.50/shift	43.50
1/2 truck driver @ $13.00/shift	6.50
	62.00
FICA, etc. - 11%	6.82
	68.82

$$\frac{68.82}{4} = \$17.205/\text{ft.}$$

Tieg = .179 ¢/foot

Operating Materials and Supplies

Assuming 4 feet of advance for a standard 5'x7' drift, it is reasonable to assume that the Operator will use certain items for further development or exploitation of the mine; therefore, an adjustment of 20 to 40 percent for salvage has been considered.

Item		Initial	Adjusted
Track - 8' of 20# @ $8.20/cwt.	4.26		
3 ties @ .40	1.20		
accessories	.90	$ 6.36	$ 2.54
Pipe - 4' of 1" @ .242	.96		
4' of 2" @ .46	1.84		
hangers & fittings	.25	3.05	1.22
Powder - 50# @ $21/cwt.			10.50 High
Caps - 18 @ 0.02			.36
Fuse - 18 x 8.5' @ .014			2.14
Fuel			4.70
Bits - 700'/$18 bit 70'/round			1.80
Steel			1.40
Ventube - 4'- 12" @ .90	3.60		
wire and hangers	.40	4.00	.80
Repair parts			2.50
Miscellaneous small tools and supplies			1.60
			$ 29.56

$$\frac{29.56}{4} = \$7.39/\text{ft.}$$

Depreciation on Equipment Furnished

Item	Cost	Depr.	Depr/yr.
Compressor - 315 c.f.m.	$6500.00	20%	$1300.00
1-1/2 ton pickup	3000.00	33%	990.00
Receiver tank	275.00	10%	27.50
Water tank	60.00	20%	12.00
Drill	480.00	33%	158.40
Jackleg	120.00	20%	24.00
Mucker 12-B	2812.00	25%	703.00
Trammer	1745.00	25%	436.25
Blower	286.00	25%	71.50
			$3722.65

$$\frac{3722.65}{12} = \$310.22 \text{ per mo.}$$

25 shifts/mo = 100 feet $\frac{310.22}{100} = \$3.10/\text{ft.}$

$2.50

Total cost per foot of drift and crosscut	
Labor and supervision	$ 17.21
Operating materials and supplies	7.39
Depreciation on equipment furnished	3.10
	$ 27.70
Contingencies - 15%	4.16
Total	$ 31.86/ft.

Timber, consisting of standard 5'x7' sets, in the clear, shall be used where necessary.

Timber - 900 feet @ $5/ft.	$4500.00

An allowable maximum of $1500.00 for sampling is suggested.

Samples	$1500.00

Recommended Agreed Unit Costs

Stage I

Access road construction - 3 miles	$ 2,330.00
Portal preparation	350.00
Compressor house and shop	850.00
Drift and crosscut - 980 feet @ $31.86	31,222.80
	$34,752.80

Stage II

Raise - 120 feet @ $31.86	3,823.20

Timbering - 5'x7' in the clear - shall be used where necessary up to an allowable maximum of 900 feet

Timber - 900 feet @ $5.00	4,500.00

An allowable maximum of $1500.00 has been recommended for sampling.

Samples	1,500.00
Total	$44,576.00
Government participation - 50%	$22,288.00

Distribution:
DMEA, Wash. (4)
USGS (2)
DMEA
Engr.

DMEA

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
So. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 23 1955

March 1, 1955

MEMORANDUM

To: DMEA Field Team, Region I, Northwest District

From: Howard B. Nickelson, Geologist, U. S. Geological Survey

Subject: Docket No. DMEA-3661 (fluorspar), application for DMEA assistance, J. R. Simplot Company, Chalspar No. 2, Custer County, Idaho.

Preliminary exploration by the J. R. Simplot Company has been in progress intermittently at this property since the spring of 1953 but was recessed for a time because of the lack of demand for fluorspar. Due to what was regarded as a more favorable outlook for fluorspar, the company requested and prepared a set of MF-103's in the late summer of 1954 but, because of delays in obtaining Owner's Consent to Lien forms, did not officially submit the application until January 1955. Because of these circumstances the property was examined by the writer and V. Z. Johnson, former engineer of the Bureau of Mines, in October 1954 while in the vicinity on other DMEA business; if the examination were delayed until the Consent to Lien forms had been obtained, snow would have prevented the examination of the property until the spring of 1955.

Recommendation

Approval is recommended of the application to explore the Chalspar No. 2 fluorspar vein by drifting and subsequent raising under two stages.

Resume of the investigation

The property is in sec. 5, T. 13 N., R. 18 E., in Custer County, Idaho, Bayhorse mining district, within the drainage area of Daugherty Gulch, a tributary of Garden Creek.

The property is approximately 9 miles west of Challis, Idaho. The first 6 miles are traversed by a fair county and Forest Service dirt road which is accessible the year round but may require some snow removal during the winter and spring months. For the last 3 miles the road is a steep bulldozer trail which, even when dry, is passable only to a 4-wheel drive vehicle. The applicant has requested that the Government share in the cost of constructing a new road for these last 3 miles.

Reviewed by
DMEA OPERATING COMMITTEE

(date)

J. R. Simplot Company is able to provide its share of the costs, and its operating personnel is competent to perform the work. This company has completed four DMEA contracts in Idaho.

The J. R. Simplot Company owns or controls a large number of claims in the vicinity of the project as shown on the claim map accompanying the application. Eight contiguous claims, the Florspar, the Florspar Nos. 2, 4, 6, 11, 12, and 13, and the Florspar Fraction are included in the ground to be explored under the DMEA contract. These claims appear to cover adequately the land that would be benefited by the proposed exploration.

According to the application the claims and their book and page numbers are listed in the official records of Custer County, Challis, Idaho, in Book 14, Quartz Locations, as follows:

Florspar, page 82	Florspar No. 11, page 132
Florspar No. 2, page 111	Florspar No. 12, page 139
Florspar No. 4, page 114	Florspar No. 13, page 140
Florspar No. 6, page 115	Florspar Fraction, page 133

The J. R. Simplot Company states that the above claims are held by the company by right of location except the Florspar claim which is owned by Bert Buchanan and Richard and Shelda West and is leased to the company for 10 years with option to purchase. A copy of the lease agreement is attached. Richard and Shelda West have signed an Owner's Consent to Lien, but Bert Buchanan has refused to subordinate his half interest in the claim. The J. R. Simplot Company is prepared to sign a guarantee with respect to this half interest in the Florspar claim. Since this is an established company, it is recommended that the applicant's guarantee for this part of the property be accepted in lieu of an Owner's Consent to Lien.

Geology

The general geology of this part of Idaho has been described by C. P. Ross 1/, but, although Ross 2/ recognized the presence of fluorite in some of the veins, he does not mention any of the fluorspar deposits, as the fluorspar deposits were discovered after this work was done. The geology in the immediate vicinity of the property has been mapped more recently and on a larger scale by A. L. Anderson 3/.

The Chalspar No. 2 deposit occupies a steep-dipping northwest-trending fault zone in brecciated Bayhorse dolomite on the west flank of the Bayhorse anticline. It is one of several fluorspar veins and fillings of brecciated zone found in the immediate area 4/.

1/ Ross, C. P., Geology and Ore Deposits of the Bayhorse Region, Custer County, Idaho: U. S. Geol. Survey Bull. 877, 1937.

2/ Ross, C. P. op. cit., p. 102.

3/ Anderson, A. L., A preliminary report in the fluorspar mineralization near Challis, Custer County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 101, August 1954.

4/ Anderson, A. L., op. cit., fig. 2.

The deposit has been explored by a series of bulldozer trenches which expose fluorspar mineralization for a strike length of 900 feet over a vertical distance of about 260 feet. Vein widths range from 6 feet to more than 16 feet. The applicant's samples are reported to average 51.3 percent CaF_2. A 17-foot sample across the vein taken during the course of the examination and near the top of Daugherty ridge (see geologic map of Chalspar No. 2 area accompanying application) assayed 57.04 percent CaF_2. This compares with a sample assaying 57.1 percent CaF_2 taken by the applicant at the same locality over a width of 14 feet. A sample in the second trench from the top of the hill assayed 65.08 percent CaF_2 over a width of 14 feet; this compares with an assay of 63.7 percent CaF_2 obtained by the applicant over a width of 12 feet in the same trench. Because the trenches have sloughed badly and had covered the vein, no other samples were taken during the course of the examination.

The Chalspar No. 2 vein is potentially productive anywhere in the Bayhorse dolomite but is not expected to be productive should the vein enter the Garden Creek phyllite which forms the core of the Bayhorse anticline and which crops out just below the site of the portal of the proposed exploration adit. The applicant estimates that it might be possible to discover 88,000 tons of fluorspar ore above the proposed adit. Should the phyllite core of the anticline plunge to the north as expected, or should the vein dip in such a manner as to stay in the dolomite flank of the structure, this tonnage might be greatly increased, but, if through faulting or other structural complications the phyllite should be found above the adit level, the potential tonnage would be much less than expected.

Should the proposed exploration be successful, it is likely that some of the other deposits in the area would be developed.

The proposed program

The applicant proposes to:

1. Construct 3 miles of access road.

2. Prepare a portal site approximately at elevation 8,290 feet on the south slope of the ridge.

3. Drift on the vein a distance of 980 feet.

4. Drive a 120-foot raise on the vein about 460 feet from the portal.

This seems a logical program, although some modification seems desirable. Comments on the above items are given below.

1. Road construction.--The terrain is exceptionally steep, and the present road is trafficable only with a 4-wheel drive vehicle and then only with difficulty. The proposed exploration would be severely handicapped and excessively slow and costly with the existing road and, therefore, Government participation in road improvement seems justified. The road should be the minimum required to carry out the proposed exploration -- it should not be designed primarily for hauling ore.

2. Portal site preparation.--In addition to the construction of a compressor-tool shed and the excavation for the portal itself, this should include bulldozing a site where the ore could be dumped separately from the waste for later recovery.

3. Drifting 980 feet on the vein.--Because the drift will follow a wide vein zone (up to 16 feet wide or more in places), the full width of the ore zone should crosscut at intervals of no greater than 75 feet. Approximately 100 feet of crosscut would be required, leaving about 880 feet for the drifting. The footage specified should be approximate only to allow some interchange between crosscutting and drifting where necessary.

4. Raising 120 feet.--If the vein should be in ore for the entire length of the drift, no raising would be required, but if, as is more likely, the fluorspar should be found in a number of separate ore shoots or if the vein should be in places in argillite at the drift level, a certain amount of raising could be considered as a necessary part of the exploration. The contract should state specifically that raising will be authorized only at those places agreed on in advance by the Field Team.

The applicant has listed 200 samples for assaying. These may not be sufficient in view of the wide vein zone that is being tested. Unless the vein is uniformly mineralized across its entire width, fractional sampling will be required; furthermore, all samples will be assayed for CaF_2; a number should be run for SiO_2; and some possibly should be analyzed for other elements. It is therefore suggested that the allowance for assaying be increased to $1,500.00 with no maximum placed on the number of samples to be analyzed. The assaying charges should be on an actual cost basis up to the maximum of $1,500.00.

Distribution:
DMEA(4)
USBM(2)
USGS(SRO)
Docket
Nickelson

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

March 18, 1955

Memorandum

To: Mr. Lawrence G. Houk, Chief, Non-Metallic Minerals Division, Defense Minerals Exploration Administration

From: Commodity Specialist, Branch of Construction and Chemical Materials

Subject: Review of application; D.M.E.A. Docket No. 3661, Fluorspar, J. R. Simplot Co., Chalspar No. 2, Custer County, Idaho

The applicant proposes to test a fluorspar vein exposed by trenching operations by driving a 980 foot drift on the structure and one 120 foot raise. The exploration target is estimated by the applicant to be 88,000 tons of fluorspar averaging 50% CaF_2, roughly equivalent to about 35,000 tons of finished spar worth from $25 to $40 per ton and would probably justify the estimated cost. However, it is felt that the data presented in the application are insufficient in scope to justify an expenditure of this sum, since the estimate of tonnage and grade appears to have been entirely calculated from surface trenching.

Although the information presented indicates that the deposit may be of significant size it would seem that a limited program of diamond drilling to confirm the size and grade is more appropriate.

It is therefore my recommendation that consideration be given a drilling program and that the application be referred to the Field Team for further evaluation and recommendations.

John E. Holtzinger

John E. Holtzinger

Copy to: Files
Div. of Minerals
Br. of Const. & Chem. Mats.
Mr. Holtzinger

RECEIVED

IN REPLY REFER TO:

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 1955

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

March 16, 1955

Memorandum

REVIEW OF APPLICATION DMEA-3661 (Fluorspar)

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

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

Applicant's name and address: J. R. Simplot Co., Boise, Idaho

Name of property: Chalspar No. 2

Location of property: T. 13 N., R. 18 E., Bayhorse Mining District, Custer County, Idaho

Summary of applicant's proposal: Three miles of access road; 980 feet of drifting; 120 feet of raising; assaying 200 samples.

Sources of information on applicant's property:

Anderson, A. L., 1954, A preliminary report on the fluorspar mineralization near Challis, Custer County, Idaho: Idaho Bur. Mines & Geol.

Ross, C. P., 1937, Geology and ore deposits of the Bayhorse region, Custer County, Idaho: U. S. Geol. Survey, Bull. 877.

DMA-519 and DMEA-2950, exploration for fluorspar in similar structures about 1 mile from Chalspar No. 2 deposit.

Comments: 1) Proposed program of drifting, raising, and road building seems to be development and not exploration. The vein is already exposed in numerous outcrops and bulldozer cuts. The widths and grade of ore have been determined in sufficient detail for the applicant to estimate 67,000 tons of indicated ore (+50 percent CaF_2) and 21,000 tons of inferred ore (see applicant's map of Chalspar area no. 2, section A-A).

2) As the vein seems to be continuous throughout the length mapped, a limited program of diamond drilling probably would determine the continuity in depth to the proposed drift level of 8290 feet. Four or five holes might be drilled from the northeast (downslope) side of the nearby vertical vein. Deeper holes, especially near the south end of the vein, probably would hit Garden Creek phyllite beneath the Bayhorse dolomite, at least on the east side of the mineralized fault. The phyllite is generally regarded as an unfavorable host rock for fluorspar in this district.

3) How thick is the Bayhorse dolomite in the Chalspar No. 2 area, and how steeply is it dipping?

4) Is there an unmapped fault or a synclinal fold across the nose of the Bayhorse anticline, between Chalspar No. 2 and the small patch of phyllite to the north (see fig. 2 of Anderson's report)? Such structures would have an important bearing on the depth of ore in the Chalspar No. 2 vein.

RECOMMENDATION: Refer to Field Team for examination.

R.E. Van Alstine

R. E. Van Alstine

February 4, 1955
Subject: DMEA 3661
Re: Exploration Assistance
Chalspar No. 2

J. R. Simplot Company
Continental Bank Building
Boise, Idaho

Gentlemen:

The receipt of your application dated January 6, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA 3661 and referred to the Nonmetallic Minerals Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

February 4, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region I NW.

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region I Northwest.

DMEA - 3661 J. R. Simplot Company

Robert E. Adams,
Chief, Operation's Control
and Statistics Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

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

January 29, 1955

Mr. George C. Selfridge, Chairman
DMEA Operating Committee
Department of the Interior
Washington 25, D. C.

Re: New application for exploration assistance
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

Dear Mr. Selfridge:

Enclosed are the original and two copies of an application with maps submitted by Mr. Keith Madill for the above-captioned company. Other supporting documents are: (1) three copies of a Lease and Option Agreement between Bert G. Buchanan, a bachelor, and Richard C. West and Shelda West, husband and wife, and J. R. Simplot Company; (2) three copies of an Owner's Consent to Lien executed only by Richard C. and Shelda West. Mr. Madill explains in his letter that Mr. Buchanan refused to sign the Owner's Consent to Lien, but the company is prepared to sign a guaranty in the absence of his consent; (3) three copies of pamphlet No. 101 by the Idaho Bureau of Mines and Geology.

The application is very well prepared, and the property has been briefly examined by a member of our field team. The Bureau and Survey will prepare an appraisal of the application, which we expect to be able to send to you in the next couple of weeks.

Very truly yours,

John S. Vhay

John S. Vhay
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District

Enclosures

cc: USBM (2)
Nickelson

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED

FEB - 3 1955

XXXXXXXXXXXXXXXX
So. 137 Howard Street
Spokane 4, Washington

January 29, 1955

Mr. George C. Selfridge, Chairman
DMEA Operating Committee
Department of the Interior
Washington 25, D. C.

Re: New application for exploration assistance
J. R. Simplot Company
Chalspar No. 2
Custer County, Idaho

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Enclosed are the original and two copies of an application with maps submitted by Mr. Keith Madill for the above-captioned company. Other supporting documents are: (1) three copies of a Lease and Option Agreement between Bert C. Buchanan, a bachelor, and Richard C. West and Shelda West, husband and wife, and J. R. Simplot Company; (2) three copies of an Owner's Consent to Lien executed only by Richard C. and Shelda West. Mr. Madill explains in his letter that Mr. Buchanan refused to sign the Owner's Consent to Lien, but the company is prepared to sign a guaranty in the absence of his consent; (3) three copies of pamphlet No. 101 by the Idaho Bureau of Mines and Geology.

The application is very well prepared, and the property has been briefly examined by a member of our field team. The Bureau and Survey will prepare an appraisal of the application, which we expect to be able to send to you in the next couple of weeks.

Very truly yours,

John S. Vhay
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District

Enclosures

cc: USGS (2)
Nickelson

J. R. SIMPLOT COMPANY
GENERAL OFFICES
CONTINENTAL BANK BUILDING
BOISE, IDAHO

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

JANUARY 6, 1955

MR. A. E. WEISSENBORN
REGIONAL DIRECTOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
SOUTH 157 HOWARD STREET
SPOKANE, WASHINGTON

DEAR MR. WEISSENBORN:

PLEASE ACCEPT THE ATTACHED APPLICATION FOR AID IN EXPLORING OUR CHALSPAR NO. 2 FLUORSPAR DEPOSIT. THIS APPLICATION CONSISTS OF THE FOLLOWING:

FORM MF 103 WITH ADDENDA
LEASE AND OPTION AGREEMENT
CONSENT TO LIEN
PAMPHLET NO. 101 - IDAHO STATE
BUREAU OF MINES AND GEOLOGY
GEOLOGICAL MAP WITH CHALSPAR AREA NO. 2
CLAIM MAP
LOCATION MAP - (PHOTOSTAT)

DUE TO MR. BERT BUCHANAN'S REFUSAL TO SIGN THE CONSENT TO LIEN, ONLY MR. AND MRS. WEST'S SIGNATURES APPEAR THEREON. MR. WEST AND MR. BUCHANAN ARE EQUAL PARTNERS IN THE "FLORSPAR" CLAIM, AND THE J. R. SIMPLOT COMPANY IS PREPARED TO GUARANTEE MR. BUCHANAN'S SHARE OF THE LOAN. THE GUARANTEE WILL BE HANDLED FOR THE J. R. SIMPLOT COMPANY BY MR. JOHN DAHL, TREASURER.

RESPECTFULLY SUBMITTED,

J. R. SIMPLOT COMPANY

BY Keith Madill
KEITH MADILL, MANAGER
FLUORSPAR MINES

RECEIVED
JAN 12 1955

MF-103
(Revised April 1952)

RECEIVED
JAN 12 1955
U. S. G. S.
SPOKANE, WASH.

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

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

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. 3661
Metal or Mineral Fluorspar
Date Received 2-3-55
Estimated Cost $58,700
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: J. R. Simplot Co., an Idaho corporation, Continental Bank Bldg., Boise, Idaho. J. R. Simplot, President; John Dahl, Treasurer; and Loyd E. Haight, Secretary; W. Grant Kilbourne, Vice-President.

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract

See addenda

(*b*) State any mine name by which the property is known. Chalspar No. 2

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise owner and lessee (see 3-a)

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it None

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you will to explore Fluorspar

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within 90 days and be completed within 21 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [X] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated January 6, 1955

J. R. Simplot Company
(Applicant)

By W. Grant Kilbourne
W. Grant Kilbourne, Vice-President

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Addenda to MF-103 Page 1.
J. R. Simplot Co.
Continental Bank Bldg.
Boise, Idaho

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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FEB - 3 1955

3(a).

A contiguous group of eight (8) unpatented lode mining claims, known as Florspar, Florspar No. 2, 4, 6, 11, 12, 13 and Florspar Fraction, situated in the Bayhorse Mining District, Custer County, Idaho, Township 13 North, Range 18 East, Boise Meridian, and more particularly described in Book 14, Quartz Locations, at pages 82, 111, 114, 115, 132, 139, 140 and 133, respectively, Official Records of Custer County, Challis, Idaho. The Florspar claim is held under lease and option agreement from Bert Buchanan, Richard C. and Shelda West, all residents of Challis, Idaho. The remainder of the claims are held by right of location.

4(a).

During the summer of 1953, the following exploration was completed:

Seven bulldozer trenches, with an average length of 175 feet and depth of 15 feet, expose the structure for a strike distance of 900 feet and a difference in elevation of 260 feet. The apparent strike of the vein is N. 30° W. and the dip 70° to 80° southwest. Due to the irregularity of the fault zone a reliable attitude could not be ascertained. Vein widths vary from 4 to 16 feet and weighted assays indicate a 51.3% CaF_2 content.

The vein was stripped for a distance of 200 feet down the north slope from the crest and the structure was located by trenches at elevations of 8,400 and 8,500 feet. The lower trench on the north slope, at 8,300 feet, encountered an erosional remnant of the Challis volcanics. The presence of gouge, hydrothermally altered dolomite and small amounts of Fluorite, indicated structure. Some 25 feet of overburden precluded further trenching on the north slope.

The upper 5 trenches on the south slope all exposed the vein over widths varying from 6 to 16 feet. Unmineralized phyllite was exposed in the bottom of the fifth and in the sixth trenches, indicating that no ore can be expected below 8,290 feet in elevation on this side of the ridge. However, there is no geologic reason that the structure will not continue northward for several hundred feet beyond the lowest trench. Due to the plunge of the anticline, the Bayhorse dolomite should be present near the surface for at least 1,500 feet north of the most northerly trench.

No mine workings or production facilities. All operations conducted by the applicant.

(b).

No production. Inferred reserves, 88,000 tons of 50% CaF_2 ore.

(c).

The deposit is located near what is thought to be the northern exposure of the Bayhorse anticline. The vein occurs on the west limb, near the crest, of the structure. In common with all of the known deposits in the area, the major Fluorspar mineralization lies within the Bayhorse dolomite. The Bayhorse dolomite is a buff to grey, thick bedded, dolomitic limestone, with a maximum thickness of approximately 1,000 feet. Locally, due to faulting and erosion, the dolomite is thinned to as little as 150 feet. This member is thought to be of Cambrian age, and is underlain by the Garden Creek phyllite. Generally, the dolomite is overlain by the Ramshorn slate, but, in the immediate vicinity, the dolomite is overlain by a quartz conglomerate which varies from a few tens of feet to 500 feet in thickness. Immediately below its contact with the conglomerate the dolomite is extremely brecciated and silicified. Frequently, cavities in the silicified zone are lined with massive Fluorite crystals.

Structurally, the Fluorspar occurs as fillings in the steeply dipping north west trending fault zone on the limb of the Bayhorse anticline. Some of the high grade lenses are clearly the result of open cavity filling, but the greater volume of the ore is of the breccia type. After long periods of movement along the fault, Fluorite was introduced and surrounded the breccia within the fault as well as filling the cavities and fractures. Some of the dolomite fragments, cemented with Fluorite, are so rounded as to give the entire mass the appearance of a fine conglomerate.

Preliminary mapping of the area was done during August, 1953, by an Idaho State Bureau of Mines and Geology field team, under the direction of Dr. A. L. Anderson. The report covering this work is enclosed herewith.

(d).

The property is located approximately nine miles west of Challis. The first six miles are traversed by fair County and Forest Service roads, the last three miles are over a "bull dozer" trail, which is possible to travel in a four-wheel drive vehicle when dry.

The railhead is located at Mackay, Idaho; 54 miles from Challis over oiled highway. Challis is the supply and residence point.

(e).

Manpower, materials, supplies and equipment are available upon short notice. Compressed air to be supplied by a deisel engine driven compressor and the ventilating system to be run by a gasoline-electric generator. Drill water to be hauled either from a spring four miles from the property or from Challis.

5(b).

1. Construct approximately three miles of access road, suitable for transporting fuel, water, personnel, equipment and supplies for the project. Construction will entail approximately one-half mile of heavy rock work and two deep fills. Access road to begin at the National Forest boundary, proceed in a southerly direction to the south side of the ridge and traverse the south slope to the portal site (see map).

2. Prepare portal site at an elevation of approximately 8,290 feet on the south slope of the ridge. Portal to be collared in the vein immediately above the phyllite-dolomite contact. Preparation of the site will require an estimated two weeks of drilling and "dozer" work.

3. Drift on the structure for a distance of 980 feet.

4. Drive one raise on the vein 120 feet at a distance of approximately 460 feet from the portal. This raise for the purpose of establishing the continuity of mineralization.

(c).

Depending upon weather conditions, road work can be started from late April to the latter part of May, 1955.

(d).

The operating company has been engaged in mining phosphate, uranium, barite, iron and fluorspar during the past ten years. The manager has had 16 years' engineering and operating experience, and is assisted by a competent staff.

6.

Three miles of access road	$ 7,500.00
Portal Preparation	2,000.00
1,100 feet of drifting & raising @ $37.00 per foot	40,700.00
Total exploration	$50,200.00
Unforeseen timbering - 900 feet @ $7.00	6,300.00
Assaying - 200 sample @ $5.00	1,000.00
Compressor house and shop 42' x 16'	1,200.00
Total	$58,700.00

(a).

None.

(b).

Included in unit costs.

(c).

Included in unit costs.

(d).

Included in unit costs.

(e).

None.

(f).

One compressor house & shop 42' x 16'. Lumber frame with metal covering.

(g).

Assaying $1,000.00, other items included in unit cost.

(h).

900 feet of timbering at $7.00 per foot, total $6,300.00.

7(a).

Yes.

(b).

Money in payment for some items of equipment, supplies and labor.

Use of equipment presently owned.

C O P Y

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

LEASE AND OPTION

THIS LEASE AND OPTION, Made and entered into in quintuple this 23rd day of June, 1953, by and between BERT G. BUCHANAN, a bachelor, and RICHARD C. WEST and SHELDA WEST, husband and wife, all of Custer County, State of Idaho, hereinafter called "Lessors", and J. R. SIMPLOT COMPANY, a corporation organized and existing under and by virtue of laws of the State of Idaho, with its principal place of business at Continental Bank Building, Boise, Idaho, hereinafter called "Lessee", and acting by and through Keith Madill of Challis, County of Custer, State of Idaho, the duly authorized agent of J. R. Simplot Company;

W I T N E S S E T H:

That the Lessors, for and in consideration of the royalties, covenants and agreements hereinafter specified to be paid, kept and performed by the Lessee, have leased, let and demised, and by these presents do lease, let and demise unto the Lessee that certain unpatented lode mining claim situated and located in the Bay Horse Mining District, County of Custer, State of Idaho, described as follows, to-wit:

> FLORSPAR MINING CLAIM which appears more particularly described in Book 14 of Quartz Locations, at page 82, official records of Custer County, Idaho, which by reference thereto is incorporated herein as though herein again fully set forth.

TO HAVE AND TO HOLD the above described unpatented claim for the purpose of mining for a period of ten (10) years commencing at twelve (12) o'clock M. on the 23rd day of June, 1953, and ending at twelve (12) o'clock M. on the 23rd day of June, 1963, unless sooner forfeited or terminated through the violation of any of the covenants and conditions herein contained or by proper notice given by the Lessors as hereinafter provided, with full power on the part of the Lessee to assign this lease or any part thereof or to sublet the full or any part of said leased property at the discretion of the Lessee.

The Lessee, in consideration of the premises, has covenanted, contracted, and agreed and by these presents does covenant, contract and agree to and with the Lessors, their heirs, executors, administrators and assigns as follows:

1. To work and mine said claim with a view toward exploration thereof; it being understood hereby that Lessee shall not be required to meet any minimum labor requirements thereon.

2. To allow the Lessors, their executors, administrators or assigns from time to time to enter upon all parts of said leased premises for the purpose of inspection, survey or taking samples therefrom.

3. To post and keep posted on said premises notices to the effect that said mining claim or premises are leased by J. R. Simplot Company, as Lessee, and to comply with Section 44-501 and Section 44-502 of the Idaho Code relative to mine laborers.

4. That it will not permit any liens of any kind or nature for labor or materials to be filed against said property or any part thereof and agrees to hold and keep the Lessors harmless from any and all liability from such liens by it made or suffered.

5. To comply with all federal and state laws and especially the Workmen's Compensation Law of the State of Idaho.

6. To pay and discharge, when the same become due and payable, all taxes of whatsoever kind or nature levied, assessed or imposed upon and against improvements placed by the Lessee on said premises during the term hereof, and any and all taxes and assessments levied, assessed or imposed upon and against the ores and minerals or other values mined and extracted from said premises or any part thereof.

7. Lessee further agrees to pay to Custer County Bank at Challis, Idaho, on behalf of Lessors, the sum of One and No/100 Dollars ($1.00) per ton of all ores marketed in the crude form and Sixty Cents ($.60) per ton for all ores milled before marketing, said above payments to be paid on all ores mined and removed from the property; and that any and all sums paid by Lessee to Lessors according to the terms hereof, shall be divided equally with one-half by separate check paid to Burt G. Buchanan and one-half by separate check paid to Richard C. West and Shelda West, husband and wife.

Lessee further agrees to pay to Lessors at said Custer County Bank, above mentioned, a minimum royalty payment of Five Hundred and No/100 Dollars ($500.00) per year commencing with the first payment due July 1, 1954.

It is understood and agreed that all minimum royalty payments, not to exceed Five Hundred and No/100 Dollars ($500.00) in any one year of said term shall be inclusive of the production royalty payments above mentioned, and shall not be in addition thereto and all minimum royalty payments shall apply against production royalty payments. All minimum royalty and production

royalty payments shall apply toward the option purchase price hereinafter mentioned.

8. That the Lessee, or its agents, during the term of this lease and option will do all things required and necessary for properly holding said mining claim in the name of the Lessors, including the placing on record of all affidavits of assessment work and labor and will save and keep Lessors harmless and indemnified against all loss or losses resulting from his failure to properly hold said claim in the name of the Lessors for so long as this lease and option is in full force and effect.

The Lessors, in consideration of the premises, have covenanted, contract and agreed to and with the Lessee, its successors and assigns, as follows:

1. That the Lessors will deliver immediately to Lessee quiet and peaceable possession of said demised premises and property and warrants that the Lessors hold good and sufficient mine title to said unpatented claim above described.

2. That the Lessors hereby grant to the Lessee exclusive option any time before the expiration date of the term hereby granted to purchase the mining claim above described for a total sum of Twenty-five Thousand and No/100 Dollars ($25,000.00) it being specifically understood and agreed by Lessors and Lessee, however, that all sums paid by Lessee to Lessors, whether it be for minimum or production royalties, prior to the exercising of said option by Lessee, shall be considered a portion of and apply on the total purchase price to the full extent of any said royalty previously paid; and upon notice in writing given by Lessee to Lessors of Lessee's intention to exercise the option in this paragraph provided, the Lessors, their heirs, executors, adminis-

tors and assigns, shall cause to be prepared immediately a quitclaim deed to said mining claim above described and shall thereafter deliver said deed to Lessee upon payment of said purchase price as herein provided.

3. That Lessors further covenant and agree that the title to said mining claim shall in all respects satisfy the maximum requirements for a merchantable mine title, as that term is known and used in the mining industry.

It is further mutually understood and agreed by and between Lessors and Lessee that Lessee may relinquish and terminate the lease and option herein contained at any time after the proper written notice is directed to Lessors through the usual mail channels.

It is further specifically understood and agreed by and between the Lessors and Lessee that time is of the essence of this lease and option and in the event the Lessee fails to make any of the covenants herein contained, then and in that event, Lessors shall have the right to declare this agreement forfeited by giving a written notice to Lessee by registered mail, specifying the particulars wherein this agreement is not being carried out, and providing that unless the delinquent payment is made, or the failure to perform, corrected within Ninety (90) days from the mailing of said notice, this lease and option shall be immediately forfeited and terminated and upon such forfeiture and termination the said Lessee shall be without right, title or interest in and to said mining claim and personal property and the whole thereof, except such machinery and equipment placed upon said premises by the Lessee which may be removed by it within sixty (60) days therefrom. The

service of said notice on said Lessee may be made by sending the same by registered mail to J. R. Simplot Company, Continental Bank Building, Boise, Idaho, and no further notice shall be required. An act of God and failure on the part of the Lessee to perform the terms and conditions hereof by reason thereof shall not be considered as a default of the terms, conditions and covenants of this lease.

This lease and option shall extend to and be binding upon the heirs, executors, administrators and assigns of the Lessors and shall extend to and be binding upon the successors and assigns of the Lessee.

IN WITNESS WHEREOF, the Lessors have hereunto subscribed their names and the Lessee has caused its corporate name to be hereunto subscribed by its agent, Keith Madill.

/s/ Richard C. West

/s/ Shelda West

/s/ Bert G. Buchanan
LESSORS

J. R. SIMPLOT COMPANY

By /s/ Keith Madill
Agent

STATE OF IDAHO)
) ss.
County of Custer)

On this 23rd day of June, in the year 1953, before me, the undersigned, a Notary Public in and for said State, personally appeared Bert G. Buchanan and Richard C. West and Shelda West, husband and wife, known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

/s/ Jack B. Furey
Notary Public for Idaho
Residing at Challis, therein.
My commission expires: 4-4-57

STATE OF IDAHO)
) ss.
County of Custer)

On this 23rd day of June, in the year 1953, before me, the undersigned, a Notary Public in and for said State, personally appeared Keith Madill, known to me to be the duly authorized agent of J. R. Simplot Company, the company that executed the within instrument, and acknowledged to me that he executed the same as agent for J. R. Simplot Company.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

/s/ Jack B. Furey
Notary Public for Idaho
Residing at Challis, therein.
My commission expires: 4-4-57

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

MF-203
(Revised July 1, 1954)

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Idaho, County of Custer, described ~~as~~ ~~follows~~: 1/

in a lease and option agreement, dated June 23, 1953 and recorded in Book 4 Page 478 official records of Custer County.

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ J. R. Simplot Company, an Idaho Corporation

hereinafter called the "Operator"; and

WHEREAS, under the provisions of said contract the Government is entitled to a percentage royalty on production and to other rights and equities which do or may conflict with or be adverse to the rights of the undersigned:

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract or any amendment thereof shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production 3/ provided for under the terms of said exploration project contract or any amendment thereof there is hereby granted to the Government a lien upon the land above referred to and upon any production of minerals therefrom until said royalty is fully paid or ten years have elapsed from the date of the contract, whichever occurs first.

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

(OVER)

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

4. Changes and added provisions _____

_____

_____

_____

Dated this third day of January, 1955.

Richard C. West [Seal]

Shelda West [Seal]

_____ [Seal]

prepared a detailed topographic-geologic map of the Chalspar No. 2 area and two topographic-geologic maps of the Chalspar No. 1 area. These maps were based on stadia-plane table traverses. Mr. Humphreville was a graduate student at Cornell University at Ithaca, New York, and Mr. Reynolds a student at the University of Idaho.

PREVIOUS GEOLOGIC WORK

The only published work covering the area of fluorspar mineralization is that by J. B. Umpleby[1] and C. P. Ross[2]. Neither report, however, makes any mention of fluorspar mineralization, but that by Umpleby has considerable data on the base-metal deposits from the old town of Bayhorse to Daugherty Gulch and the one by Ross has much information on the local stratigraphy and structure with additional facts on the base-metal mineralization.

More recent studies of the area have been made by Mr. Arthur Chambers with particular attention to the fluorspar deposits on Keystone Mountain. These studies began in the late forties and cover the area from Bayhorse to Daugherty Gulch. Mr. Chambers prepared his own aerial photographs as a base for detailed geologic mapping. His studies include both the base-metal and fluorspar mineralization, but unfortunately this work has not been published.

GEOGRAPHY

LOCATION AND ACCESSIBILITY

The fluorspar deposits are in the northern part of the Bayhorse district with the fluorspar mineralization known to extend at present from the Pacific mine near the old town of Bayhorse to Mill Creek some 7½ miles to the north-northwest (Fig. 1). The mapped area (Fig. 2) covers the northern end of the zone of fluorspar mineralization from Garden Creek to Mill Creek, its eastern edge about 4 miles southwest of Challis (Fig. 1). This area is at about 44° 30′ N. latitude and 114° 20′ W. longitude. It lies mostly within the Challis National Forest, much of it in unsurveyed T. 13 N., R. 18 E., Boise meridian.

The area of fluorspar mineralization is fairly accessible. A gravelled, well-graded and maintained road extends from Challis into the mapped area (Fig. 2), with one fork continuing up Garden Creek and the other across a relatively low divide to Mill Creek and thence over to Bonanza on Yankee Fork. The fluorspar deposits below the mouth of Daugherty Gulch (Chalspar No. 1 and Holterman) are reached by a short branch road accessible by car but the deposits in Daugherty Gulch and on the ridges bordering the Gulch are accessible only on foot or by jeep. The Pacific mine has road connection with Bayhorse and is within easy reach by car. The deposits on Keystone Mountain are approached from Garden Creek over a steep road with many switchbacks (road not shown in Figure 2).

Challis, the county seat of Custer County, is on U.S. Highway 93 and is about 60 miles from Mackay, the nearest railhead and terminus of a branch line of the Union Pacific Railroad. The highway to Mackay (U. S. 93-A) is hard surfaced, but the highway up the Salmon River (U.S. 93) to Clayton and Stanley has only a gravel surface.

SURFACE FEATURES

The area of fluorspar mineralization is near the southeastern edge of the Salmon River Mountains, a complex of deeply dissected uplands, incised locally by Garden, Mill, and Bayhorse Creeks, all tributaries of the Salmon River. Each of these streams in turn has its system of tributaries, some of which occupy valleys or gulches of pertinent geographic interest, among them Daugherty and Whetstone Gulches (tributaries to Garden Creek), Big Hill Gulch (tributary to Mill Creek), and Beardsley Gulch (tributary to Bayhorse Creek). These gulches are shown in Figures 1 and 2.

The mountains are relatively high and possess considerable local relief. The highest ridges rise to nearly 10,000 feet above sea level or nearly 3,000 feet above the lower valley bottoms. Keystone Mountain reaches 9,464 feet; Ramshorn Mountain, 9,905 feet; and the peak at the head of Daugherty Gulch, 9,840 feet. Cirques nestle against some of the higher peaks and a double cirque occurs at the head of Daugherty Gulch (Pl. 1A). From this compound cirque the glacial ice drained to the mouth of Daugherty Gulch and reshaped the stream-carved valley into a relatively broad-bottomed glacial trough. Except in Big Hill, slopes are steep, in places even precipitous.

CLIMATE AND VEGETATION

Because of the high altitude, much of the area has a rigorous climate, with short cool summers and long cold winters with much snow on upper slopes. The snow constitutes somewhat of a handicap to wintertime operation of deposits on the higher ridges. In places the snow may linger well into June and even into July.

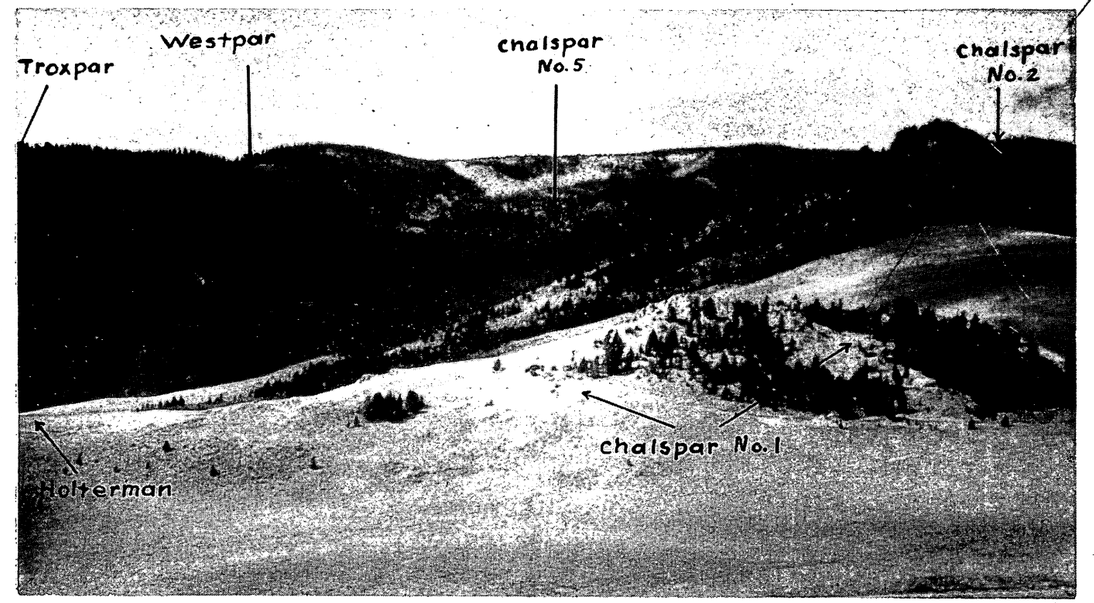
Except on the lower slopes, the area is fairly heavily timbered, especially on the north sides of the ridges (Pl. 1A). Much of the timber is second growth and consists largely of fir and spruce, suitable for mine timbers. Open country and lower slopes are covered by sage brush and various grasses.

GEOLOGY

GENERAL FEATURES

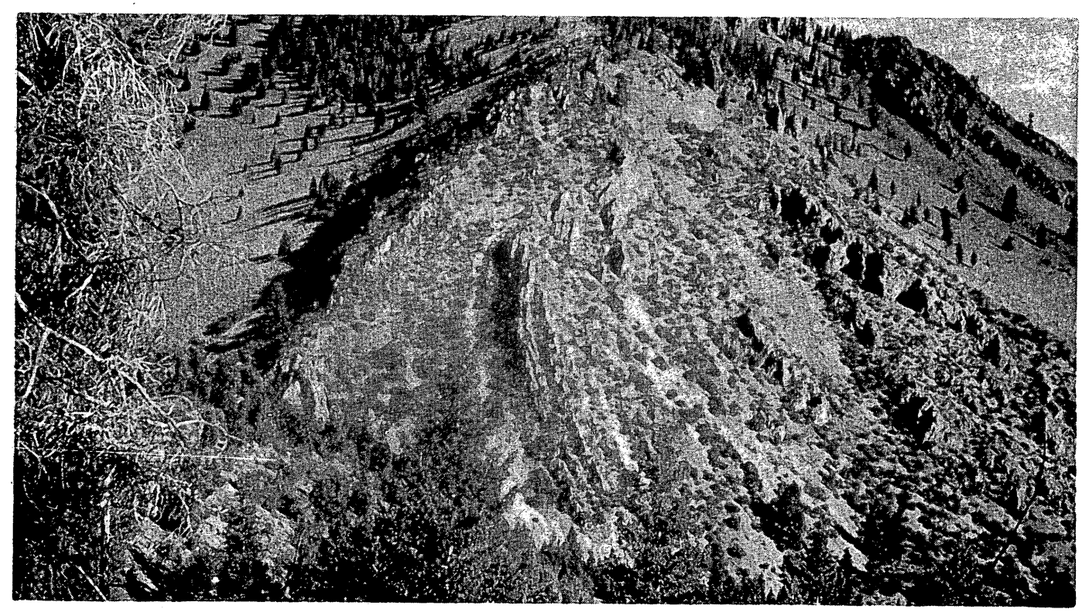
Except for local overlays of Challis volcanic (Tertiary) and Quaternary slope wash and alluvium, the area of fluorspar mineralization is underlain throughout by sedimentary rocks of lower Paleozoic age; namely, the Garden Creek phyllite and Bayhorse dolomite of Cambrian (?) and the Ramshorn slate and conglomerate and the Kinnikinic quartzite of Ordovician age. These sedimentary strata have been rather strongly folded and faulted and locally form the complexly faulted Bayhorse anticline, the dominant structural feature of the region.

[1] Umpleby, J. B., Some ore deposits in Northwestern Custer County Idaho; U.S. Geol. Survey Bull. 539, pp. 55-76, 1913.
[2] Ross, C. P., Geology and ore deposits of the Bayhorse Region, Custer County, Idaho; U.S. Geol. Survey Bull. 877, pp. 157, 1937.



A. DAUGHERTY GULCH

Shows the cirques at the head and the high ridges bordering Daugherty Gulch and the location of the Westpar on the south ridge, the Chalspar No. 5 on the end of the ridge between the cirques, and the Chalspar No. 2 on the north ridge. The picture also shows the area of Bayhorse dolomite (foreground) faulted against the flank of the Bayhorse anticline and the location of the Holterman and the Chalspar No. 1 properties. The prominent ridges at the end of the north ridge are composed of silicified dolomite. Photograph by James Humphreville.



B. BAYHORSE DOLOMITE

Exposure of the Bayhorse dolomite on the locally overturned east limb of the Bayhorse anticline north of Garden Creek. The smooth slope on the left is underlain by the Garden Creek phyllite and the prominent ledges in the extreme upper right are composed of Ramshorn conglomerate.

A Preliminary Report on the Fluorspar Mineralization Near Challis, Custer County, Idaho

by

Alfred L. Anderson

ABSTRACT

The fluorspar deposits near Challis, Custer County, Idaho, are in the northern part of the Bayhorse district, mostly on Keystone mountain, in and near Daugherty Gulch, and in several of the mines near the old town of Bayhorse. The presence of fluorspar at these places became known only recently and exploration so far has not extended much below the surface.

The deposits occur as fissure and breccia fillings in the fractured and faulted Bayhorse dolomite along the crest and flanks and in faulted offsets of the Bayhorse anticline. The deposits are fairly numerous and many of them are relatively large. The surface exposures show exceptional promise and suggest that the district may contain one of the most important concentrations, if not the most important concentration of fluorspar within the State. More exact evaluation of the district and appraisal of its deposits must await more extensive underground exploration, for the downward extent of the fluorspar deposits is still largely unknown. However, the outlook for a substantial reserve of fluorspar is bright.

INTRODUCTION

PURPOSE AND SCOPE

The purpose of this preliminary report is to direct attention to the recent fluorspar discoveries in the region near Challis in Custer County, Idaho, and to encourage more active exploration and development in what appears to be one of the most promising centers of fluorspar mineralization within the State. Because of the potential importance of these discoveries, it was decided to issue a preliminary report before completion of the field study in order that the present available information on the fluorspar mineralization might be made to serve an immediate need. This is in accordance with the policy of the Idaho Bureau of Mines and Geology to lend support to the development and utilization of the State's mineral resources for the benefit of the State and its people.

The present report deals largely with the geologic occurrence and geographic and geologic distribution of the fluorspar deposits and delineates the area in which the fluorspar may be expected. So far most of the deposits have received a rather cursory examination, with detailed mapping and study confined to a small area readily accessible from Challis. Some of the deposits had just been discovered and were being explored by the bulldozer while the writer was in the district. Very few of the deposits are exposed underground. Although the general region had long been known for its base-metal deposits, the presence of fluorspar was not generally known and apparently attracted little, if any attention until the late forties.

FIELDWORK

Several hours were spent at the fluorspar deposits on Keystone Mountain in the summer of 1951 and several brief visits were made to the deposits bordering Daugherty Gulch in 1952 and in the early summer of 1953, but actual fieldwork did not get underway until August 4, 1953. This work continued for little more than three weeks. During this time the writer prepared a fairly detailed geologic map of a part of the area and examined some of the deposits in as much detail as the surface exposures would permit, giving other deposits a most cursory examination. The more detailed study and mapping of some of the deposits was left to Mr. James A. Humphreville for use as a thesis problem. Except for a one-day visit to the Bayhorse area and another to Keystone Mountain, the entire time was spent in or near Daugherty Gulch from Garden Creek north to Mill Creek.

ACKNOWLEDGEMENTS

The writer wishes to acknowledge his deep gratitude to Messrs. Keith Madill, Don Ferguson, and Arthur Chambers for their helpful assistance in the field. Mr. Madill personally escorted the writer to many of the deposits in the Daugherty Gulch area and accompanied him on his one-day trip to the fluorspar deposits near Bayhorse. Mr. Ferguson also drove the writer to some of the deposits in and bordering Daugherty Gulch accessible only by jeep and accompanied him on several of his all-day traverses on the high ridges. Both Messrs. Madill and Ferguson also provided jeep transportation for Messrs. James Humphreville and Clayton Reynolds to the Chalspar No. 2 area on the high ridge north of Daugherty Gulch and otherwise assisted them with the mapping and study of the deposits reserved for the thesis project. Mr. Chambers in 1951 and again in 1953 drove the writer to the top of Keystone Mountain, accessible only by jeep, and escourted him personally to the various fluorspar deposits on the mountain, giving freely of his knowledge of the occurrence of the fluorspar and of the general features of the geology.

The writer also wishes to express his appreciation to Mr. James A. Humphreville for the use of his maps and the data collected for his thesis study. Mr.Humphreville assisted by Mr. Clayton Reynolds (the writers personal field assistant loaned to Mr. Humphreville)

throw on the southwest side. Its throw must be at least 1,000 feet.

Other longitudinal faults extend into the map-area from the south (Fig. 2). One of these lies along Whetstone Gulch on the east side of the anticline and several occur on the west side, but only one of the latter has been mapped. The one in Whetstone Gulch strikes about N.30°W. and apparently dips northeast. The ones to the west have more northerly trends and apparently dip west. These several faults appear to terminate against transverse faults.

Longitudinal faults also interrupted by transverse faults are present farther north, one near the west edge of the map-area, two others in Big Hill Gulch. The two in Big Hill Gulch form the northeast and southwest boundaries of a small block of Bayhorse dolomite.

Transverse Faults

The transverse faults are roughly paralled and extend across the anticlinal structure in east-northeasterly directions. Those in the northern part of the area are outlined by prominent gulches and saddles. Of the three shown on the map (Fig. 2), two dip south and the third north. The more southerly of these faults has caused a local extension of the Ramshorn conglomerate. The position of the faulted conglomerate north of the fault suggests that the fault had considerable rotational movement.

The transverse faults in the southern part of the area have caused some minor offsets of the limbs of the anticline. The course of Garden Creek is apparently controlled by one of the faults which on crossing the anticline from west to east swings from an east-northeasterly to a more northeasterly direction. Its downthrow is to the south. The second fault closely parallels to one along the creek, but its throw appears to be to the north. This fault loses its identity on approaching Whetstone Gulch.

Other Faults

There are many other faults worthy of mapping and would have been mapped had time permitted. Some of these faults have caused local thickening or repetition of beds, particularly of the dolomite along the east flank of the anticline near Garden Creek. Chambers[15] reports several rotational faults south of Garden Creek which have been responsible for the broad expanse of dolomite on the north side of Keystone Mountain. The faulting is especially complex along or near lower Whetstone Gulch and may not be exactly as represented (Fig. 2).

Mineralized Faults

Because of the relatively small size of the mineralized faults, they are not shown in Figure 2, but some of them are shown on the larger scale maps of the Chalspar No. 1 and 2 areas. These minor faults, actually the most important economically, do not seem to have the structural relations of the longitudinal and transverse faults. At least one of those at the Chalspar No. 1 has a prominent strike-slip relationship and locally has placed volcanic rocks against the Paleozoics. The relations of the mineralized faults elsewhere are less clearly defined, but they appear to differ in kind and age. These various faults will be described in some detail in the part of the report dealing with the structural relations of the fluorspar deposits.

The faults have produced fissures as well as zones of brecciated rock. Some of the zones of brecciated rock seem related to the folding and may have been formed as a result of differential movement or shearing between the beds during the folding, especially along or near the dolomite-slate contact. Other breccias seem to be related to tectonic faults.

[15] Chambers, A. E., Personal communication.

FLUORSPAR DEPOSITS

HISTORY AND PRODUCTION

The history of the Bayhorse district dates back to 1877 to the discovery of the base-metal lodes, but the fluorspar did not become associated with the history until about 70 years later. During the intervening years the presence of fluorspar must have been known to the prospectors who combed the area and to the miners who worked some of the silver and base-metal lodes in which the fluorspar is now known to occur. But they may not have recognized the fluorspar for what it is and, even if they had, they perhaps realized its then lack of economic value. That the presence of the fluorspar was not generally known is indicated by the fact that no mention is made of it in any of the reports on the area.

It was not until the days of World War 2 when fluorspar was added to the critical list of strategic minerals that the local deposits received any recognition. The mineral was then reported at some of the old silver-bearing veins on Keystone Mountain and at the Pacific mine above Bayhorse. Near the end of the War or shortly thereafter the fluorspar on Keystone Mountain attracted the attention of Arthur Chambers, who in the next year or so began an intensive investigation of the fluorspar mineralization. This investigation carried through from 1947 into 1949 during which time Mr. Chambers studied and mapped the geology of the area from Bayhorse north to Daugherty Gulch and by bond and lease and location acquired possession of the fluorspar deposits on Keystone Mountain. He noted but did not locate or acquire any of the deposits since prospected in and near Daugherty Gulch.

The history since has been largely one of discovery and exploration. During the early fifties some development was carried on at the Holterman property below the mouth of Daughtry Gulch. The nearby Past Up vein on the Chalspar No. 1 was actively developed during 1952 and 1953 both on and below the surface, the final work by the diamond drill in August and September of 1953. During the summer of 1953 active search for fluorspar was carried on in other parts of the Daugherty Gulch area with important discoveries made in and on the ridges bordering the gulch. Except for the Holterman, all the deposits in the Daugherty Gulch area were located or acquired and prospected or developed by the J. R. Simplot Company.

To date the only production of fluorspar has come from the Past Up vein on the Chalspar No. 1. From this vein were shipped 475 tons of metallurgical spar containing 88 percent CaF_2 and 245 tons of milling sparl with 55 percent CaF_2.

CHARACTER OF THE DEPOSITS

The fluorspar deposits may be classed as fissure and breccia deposits. Some of them are simple fissure veins, but most of the veins also contain some breccia material either within or alongside the fissure filling and show transition into deposits more aptly described as breccia veins and lodes. There are also breccia deposits which lack the thin tabular characteristics of the fissure veins and lodes and occur instead as relatively thick blunt bodies. In many of these thicker and shorter bodies the fluorspar shows a striking "boxwork" structure and this feature has prompted the use of the term "boxwork" in referring to the deposits. The boxwork deposits are particularly well developed on Keystone Mountain.

The fluorspar is everywhere a filling of open spaces and shows little, if any evidence of replacement of the rock in which it occurs. The filling is generally somewhat incomplete and for that reason the deposits, except for a few of the filled fissures, abound in openings lined with small fluorite crystals.

The fluorspar mineralization is younger than and apparently entirely independent of the base-metal mineralization. In general the fluorspar forms separate bodies remote from the base-metal deposits, but some do occur along side the base-metal lodes and some have incorporated small amounts of the base-metal ores.

GEOLOGIC AND GEOGRAPHIC DISTRIBUTION

The fluorspar deposits that have been found so far have been entirely within the Bayhorse dolomite. It is doubtful that significant amounts will be found in any of the other formations, for unlke the dolomite, the Garden Creek phyllite and Ramshorn slate are not prone to develop much breccia or open space and hence are not hospitable hosts for the open-space seeking fluorite[16]. Seach for fluorspar is, therefore, most likely to be rewarded if confined to the Bayhorse dolomite. Not all parts of the dolomite, however, appear to be equally favorable for the occurrence of the fluorspar. Whereas the fissure veins may appear in any part of the formation, the boxwork breccia deposits show a marked preference for the upper beds of dolomite, more particularly for the beds just below the Ramshorn slate or just above a parting slate in the dolomite about 120 feet below the Ramshorn contact. No fluorspar has yet been found entirely within the volcanic rocks, but does occur in a fissure with a footwall of dolomite and hanging wall of altered volcanic rock.

The fluorspar is widely distributed in the dolomitic rocks along the Bayhorse anticline and in the areas of dolomite adjacent to the anticline, with concentrations appearing sporadically all the way from the old town of Bayhorse to the last exposure of dolomite on Mill Creek nearly 8 miles to the north. The most notable concentration of fluorspar deposits appears to be on Keystone Mountain with the deposits there larger and more numerous than elsewhere; but other important concentrations also occur in and on the ridges bordering Daugherty Gulch, in the dolomite faulted against the Bayhorse anticline just north of the mouth of Daugherty Gulch, and at the Pacific and some of the adjoining mines near the town of Bayhorse. Weak fluorspar mineralization is also expressed in the dolomitic rocks elsewhere along the anticline, in the small block of faulted dolomite in Big Hill Gulch, and in the dolomitic rocks at and near Mill Creek. The fluorspar appears to occur sparingly in almost every exposure of dolomite, but is present in substantial amounts only where the dolomite has been appreciably brecciated or fissured.

[16] A little fluorite is reported in the phyllite at the Hoosier mine near Bayhorse.

STRUCTURAL RELATIONS

The fluorspar deposits have varied structural relations and are in part fault controlled and in part controlled by zones of brecciation which may in part have formed concomitantly with the folding. The fissure veins and breccia lodes are all fault controlled and are localized along faults and fault zones of relatively minor magnitude, contained wholly within the dolomite and bearing in general northerly directions. These mineralized faults and fault zones are too few as yet to establish a definite pattern, but most of them trend N.15°-20°W. and N.10°E, with some trending N.30°-40°E. Except for some relatively flat bedding faults, they all dip steeply, most of them 70°-80°E., some steeply west. Except for the Past Up vein at the Chalspar No. 1, the direction and amount of displacement on the faults still remains to be determined. The fault that controls the Past Up vein shows considerable curvature with the strike changing from N.30°W. to N.15°W. and the dip from steeply southwest to steeply northeast. Slickensided surfaces along the walls show essentially horizontal grooves and afford evidence of marked horizontal displacement, but no clue has yet been found as to the amount of movement. The displacement may be considerable, for volcanic rocks have locally been brought against the Bayhorse dolomite and the dolomite against a slice of Ramshorn slate. Along some of the faults just simple fissures were produced, but along others the dolomitic walls were also considerably brecciated, forming in places very porous breccias. Such breccias all were highly favorable to fluorspar deposition.

The boxwork deposits appear to be controlled by zones of brecciation which may in part represent structural adjustments to folding. These deposits tend to keep close to the contact of the Ramshorn, generally within a hundred feet or so of the top of the dolomite or in close proximity of a thin slate member (parting slate) some 100 to 200 feet below the contact. These mineralized breccias tend to parallel the contact and their localization appears to be more or less definitely controlled by the contact. The individual breccia zones may be several tens of feet wide and up to several hundred feet long, but the depth to which they extend can be learned only from underground exploration. The breccias show evidence of no great movement, but do show much crackling of the rock and an apparent independence of major fissuring. Probably the greater competency of the dolomite as compared with the slate was instrumental in causing the brecciation with the contact between the two formations tending to localize the structural deformaion and failure. In any event the dolomite brecciated when subjected to deformation, whatever may have been the nature of the deforming stresses.

MINERALOGY

General Features

The fluorspar deposits contain few minerals other than fluorite and these few are represented in places by only trivial amounts of quartz and calcite. Some of the deposits do contain some grains and small masses of sulfides and quartz as fragmental inclusions incorporated from earlier base-metal or quartz fillings, but these inclusions are foreign to the fluorspar mineralization. The chief gangue of the fluorspar deposits is the fragmented dolomite contained as breccia fragments in the fluorspar fillings.

Although quartz is conspicuous in the vicinity of some of the fluorspar deposits, in places forming huge ledges of silicified dolomite, it appears to be more closely associated with the base-metal rather than with the fluorspar mineralization and composes the chief gangue of some of the base-metal lodes. Such quartz is milky white and occurs as a replacement of the fractured dolomite, and locally the bordering phyllite or slate. The fluorspar may occur in the fractured dolomite along side the bodies of quartz but never in the quartz itself. Such quartz forms an enormous body on Keystone Mountain adjacent to the area of fluorspar mineralization and also some very prominent ledges on the east end of the high ridge north of Daugherty Gulch (Pl. 1-A).

Minerals Associated With The Fluorspar

Quartz

The quartz deposited with the fluorspar is very sporadic in its distribution and in most deposits is present very sparingly. It was rarely observed along the fissure and breccia veins and lodes, although in places it forms a thin inconspicuous layer beneath the fluorite. Its presence is more evident in the boxwork breccias where it forms very thing partitions between boxwork cells, always with a coating of small fluorite crystals.

Fluorite

The fluorite seems to occur wherever the dolomite has been fractured and is to be found more or less sparingly through almost every outcrop, but the important concentrations are in the structurally favorable areas of more extensively fissured and brecciated rock.

The fluorite shows some variation in its textural and structural characteristics, depending largely on the completeness of the fissure and breccia filling. In the filled fissures and breccias the fluorite is quite massive and rather coarsely grained. Any unfilled openings, however, are generally lined with small cubic crystals. The fluorite filling may show inconspicuous banding and in some of the smaller fissures crustification parallel to the walls. It may also form poorly defined concentric bands about breccia fragments. Some of the fluorite has itself been brecciated and cemented by more fluorite. As filling is generally incomplete, the fluorite shows a marked tendency to develop crystal form and much of the filling, especially of the open breccias, consists of crystals and crystal aggregates coating the surface of the breccia fragments and the fracture walls (Pl. 2-A). In the boxwork deposits the small crystals occur as coatings on the walls of the paper-thin partitions of silica which in general are joined in such a way as to affect a striking cell-like structure (Pl. 2-B).

The fluorite has some fairly distinctive characteristics. Its crystals are invariably small with none more than 0.8 inch square and with few more than 0.4 inch. On the boxwork partitions the crystals rarely exceed 0.1 inch. In most of the breccias the range is between 0.1 and 0.4 inch. The crystals are always cubic with no modifications and are invariably white or colorless. Some of the crystals are actually transparent. Even the massive fluorite is dominantly white or colorless, but it does in places show rather inconspicuous tints of gray, rose, purple, and green.

Calcite

Calcite was noted only at the West vein on the Chalspar No. 1 where it formed small flat crystal rhombs on the surface of some of the fluorite crystals. It was not observed elsewhere, but because of the ease with which it disappears in the zone of weathering, it could be present in other deposits and could be more abundant than the present exposed outcrops seem to indicate.

Paragenesis

The paragenesis of the fluorspar deposits is quite simple. Disregarding the minerals inherited from the earlier base-metal fillings, the mineral succession appears to be quartz, fluorite, and calcite. In many of the deposits, however, the quartz and calcite seem to be lacking and the succession consists of fluorite alone.

DISTRIBUTION OF THE FLUORSPAR

From what little is known of the fluorspar mineralization, the fluorspar may be expected to have a rather erratic and sporadic distribution along the fissure and breccia zones. This bunchy distribution has been partly verified underground at the Past Up vein, where the filling swells and pinches quite abruptly on strike and dip with the mineable shoots confined to lengths of a few tens of feet. On the other hand, the vein at the Chalspar No. 2 appears to be persistently and quite uniformly mineralized for some hundreds of feet. The breccia deposits show some irregularity in the distribution of the fluorspar, but this irregularity should not greatly affect the overall tenor of the deposits. Such irregularity as may appear along the outcrop may also be expected to characterize the deposits with depth. The distribution of the fluorite is dependent largely, if not entirely on favorable structural openings, the extent of which is as yet unpredictable.

SIZE

The fluorspar deposits show a considerable range in size. The fissure veins and lodes may range from those but a few inches thick and a few tens of feet long to those which are several feet thick and several hundred feet long. The only productive vein to date, the Past Up on the Chalspar No. 1, has been exposed for about 200 feet and has been mined on the surface for about 100 feet. For much of its length the vein is a few inches to several feet thick but, where stoped, is 3 to 4 feet and in places as much as 7 feet thick. The West vein nearby may be traced for about 300 feet and shows a thickness ranging from 1 to 5 feet. The long-

also abundant in the wash that extends from the mouth of Daugherty Gulch, but included also are notable amounts of the Kinnikinic quartzite. The wash at the head of Daugherty Gulch is composed largely, if not entirely of materials derived from the Kinnikinic quarzite. The wash on the slope between lower Daugherty Gulch and Garden Creek is derived largely from the Ramshorn conglomerate, but that on the east side of Garden Creek is composed of volcanic rocks. The deposits everywhere show little sorting and contain notable admixtures of coarse materials, including blocks of rock several feet in diameter. Much of the debris at the mooth of Daugherty Gulch appears to be of morainal origin, but glacial ice apparently has had little to do in forming the deposits elsewhere.

The slope wash has probably been accumulating since early glacial times and apparently still continues to accumulate. Its age, therefore, may range from Pleistocene to Recent.

Alluvium

The alluvium is restricted to the lower valley bottoms and has been mapped along Garden Creek, lower Daugherty Creek, and locally along Mill Creek (Fig. 2). As mapped, it may include also some lower terrace deposits.

The alluvium is composed largely of coarse gravel with a generous admixture of cobbles and boulders. Most of it is made up of the more resistant members of the Paleozoic formations and of flows in the Challis volcanics. Some of it is reworked glacial outwash. Much of it is of Recent age.

STRUCTURE

The most pertinent structural features are those which involve the Paleozoic rocks, for to date all the fluorspar has been found in structural openings in the Bayhorse dolomite and nowhere else. Although the fluorspar mineralization may post-date the extravasion of the Challis volcanics, the fluorspar apparently did not enter the volcanics and, therefore, the structural relations of the volcanics have little present interest. Most of the folding and faulting in the Paleozoic rocks preceded the extrusion of the volcanics and deformation since has merely caused some titlting of the volcanic strata, chiefly as a result of rather minor faulting.

Folds

As mentioned earlier, the dominant structural feature of the area is the Bayhorse anticline, but there is also another fold of local significance, composed of a faulted syncline, which lies against the east flank of the anticline. This second fold is referred to herein as the Chalspar syncline.

Bayhorse Anticline

The Bayhorse anticline is one of the largest and longest in the region. Its total length is unknown. In the map area (Fig. 2) it plunges sharply to the northwest and within a short distance disappears beneath a cover of Challis volcanics, but southward it extends past Bayhorse and Clayton and, after an interruption by thrust faulting near Clayton, appears to continue across the East Fork of the Salmon River and thence southeastward across the Hailey quadrangle[14].

[14] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. pp. 75-78.

The anticline is especially well-developed within the map-area (Fig. 2) and is ideally exposed along Garden Creek and in Daugherty Gulch. This part of the anticline has apparently been lifted higher by the orogenic forces than elsewhere, since the oldest rocks in the region are exposed in it. The anticline is comparatively wide with a nearly flat top, but the immediate flanks are steep and locally even overturned (Pl. 1-B). It apparently reaches its greatest height in Daugherty Gulch and from there plunges rather steeply northwest and less steeply south, thus forming a local, somewhat elongated dome (Fig. 2).

The anticline is asymmetric with the easterly limb as a whole more steeply dipping than the westerly. In places, as along Garden Creek, the resistant Bayhorse dolomite and overlying conglomerate are overturned (Pl. 1-B). The anticline has been complexly faulted, but the faults have not produced any major offsets in the structure.

Chalspar Syncline

The Chalspar syncline lies against the east flank of the Bayhorse anticline, but its exposures are small and restricted chiefly to the area of Bayhorse dolomite on the lower east slope of the mountain, identified locally as the site of the Chalspar No. 1 group of claims, and to the area of dolomite at and near Mill Creek (Fig. 2). In the Chalspar No. 1 area the beds are nearly flat and apparently represent the bottom of the syncline, but near Mill Creek the exposed beds are those of the east flank. The syncline has apparently been brought up to its present position along side the anticline by faulting with the anticline on the downthrow side. The syncline shows some minor undulations, apparently induced by faults of relatively minor magnitude.

Faults

The Bayhorse anticline and bordering Chalspar syncline have been cut by many facults, some of comparatively large size but most of rather small. Some of the larger faults have been mapped (Fig. 2), but mapping of the smaller ones must await detailed studies. These faults may be conveniently classed as longitudinal faults (those that tend to parallel the long dimension of the anticline and syncline), transverse faults (those that extend at about right angles to the trend of the folds), other faults (those which are neither longitudinal or transverse to the folds), and mineralized faults (those faults and fault zones of minor magnitude which have localized fluorspar mineralization).

Longitudinal Faults

The longitudinal faults comprise some of the largest and most impressive faults in the district, among them the fault that has brought the Bayhorse anticline against the Chalspar syncline. The trace of the fault is mostly concealed beneath the cover of Challis volcanics and slope wash, but may be followed through the low saddle of bench just west of the exposure of Bayhorse dolomite of the Chalspar No. 1 area and again across the ridge between Big Hill Gulch and Mill Creek. At both places beds of Ramshorn slate occur on both sides of the fault, but the Bayhorse dolomite immediately underlies the slate east of the fault. The fault strikes about N.30°W. and apparently dips steeply southwest. It is a normal fault with down-

slate, which on fossil evidence is known to be of Lower Ordovician age[7].

Ramshorn Slate

Like the other Paleozoic formations, the Ramshorn slate forms a part of the Bayhorse anticline and in the map-area (Fig. 2) completely envelopes the dolomitic and phyllitic core of the anticline. It is exposed over a greater area than any of the other Paleozoic units and extends far out on the flanks of the anticline, with much of the rock on the east side concealed beneath a cover of slope wash and Tertiary volcanics. It is particularly widespread near Mill Creek at the north end of the anticline and along the south edge of the map across the top of Keystone Mountain (Fig. 2).

Except for the basal conglomerate, the Ramshorn is composed almost entirely of thin-banded argillaceous rock with some beds somewhat more siliceous and others somewhat more calcareous than the average. It possesses a prominent slaty cleavage which invariably cuts the banding at high angles. Most of the slate is dark green to purplish, but some locally has been lightened by calcareous material or darkened by carbonaceous matter. According to Ross[8] most of the slate consists largely of quartz, in grains rarely more than a few hundredths of a millimeter in diameter, and fine aggregates of chlorite, serpentine, biotite, and other micaceous minerals. The slate is generally somewhat contorted, but not as much so as the Garden Creek phyllite.

The Ramshorn slate is the thickest of the Paleozoic formations, locally with at least 2,000 feet and possibly 3,000 feet of beds exposed in or near the area. Absence of easily recognizable horizon markers within the mass of the formations makes it difficult to eliminate the effects of repetition or omission of beds by faulting.

The age of the Ramshorn slate from fossil evidence is known to be Lower Ordovician[9].

Kinnikinic Quartzite

The Kinnikinic quartzite, which flanks and crowns the Bayhorse anticline at intervals along its course, has locally been lost by erosion, except for a cap on the high ridge at the head of Daugherty Gulch. A part of the cap extends into the map-area (Fig. 2).

The Kinnikinic quartzite is conspicuously well-bedded and consists largely of rather pure quartzitic strata with some shaly partings and some minor intercalations of somewhat shaly quartzite. The rock is generally white, but in some exposures it has a distinctive lavender cast. It is composed essentially of detrital grains of quartz 0.1 to 0.5 millimeter in diameter in a siliceous cement containing sericite.

The exposure at the head of Daugherty Gulch is perhaps 500 feet or more thick, but the rock there represents only the lower part of the formation which elsewhere is known to be at least 3,500 feet thick[10].

As the formation lies above the Ramshorn slate (Lower Ordovician) and below the Saturday Mountain formation (Upper Ordovician), its age is definitely Ordovician and probably Lower or Middle Ordovician[11].

[7] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. pp. 16-17.
[8] U.S. Geol. Survey Bull. 877, op. cit. p. 15.
[9] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. pp. 16-17.
[10] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. p. 18.
[11] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. p. 18.

Tertiary Rocks

Challis Volcanics

Most of the cover of Challis volcanics has been stripped from the Bayhorse anticline, but otherwise the cover is continuous for miles to the north and east and forms most of the exposed rock in the eastern and northern part of the map-area (Fig. 2). The stripping of the volcanic blanket from the anticline was not quite complete in the map area and many thin patches or caps remain, some large enough to show on the map (Fig. 2), others much too small.

The volcanics comprise a thick accumulation of flows and tuffs of varied character and composition which Ross[12] has subdivided locally into flows of basalt and calcic andesite, the Germer tuffaceous member, and flows and pyroclastics of mainly intermediate composition, the latite-andesite member. The basalt and calcic andesite occur on both sides of the road that crosses into Big Hill Gulch from Garden Creek, and the light-colored bedded Germer tuffs occur just beyond the basaltic and andesitic flows on both sides of the road as it descends to the mouth of Big Hill Gulch. The latite-andesite member is much more widespread than the others and extends over much of the country along the east and north side of the map-area (Fig 2.). As the volcanic rocks appear to have escaped the fluorspar mineralization, they received little attention in the present study and the several members were not differentiated in mapping.

After consideraiton of all aspects of the problem, Ross[13] has concluded, largely on the basis of fossil evidence, that the Challis volcanics are possibly, if not probably, of Oligocene age and that they can hardly be younger than early Miocene.

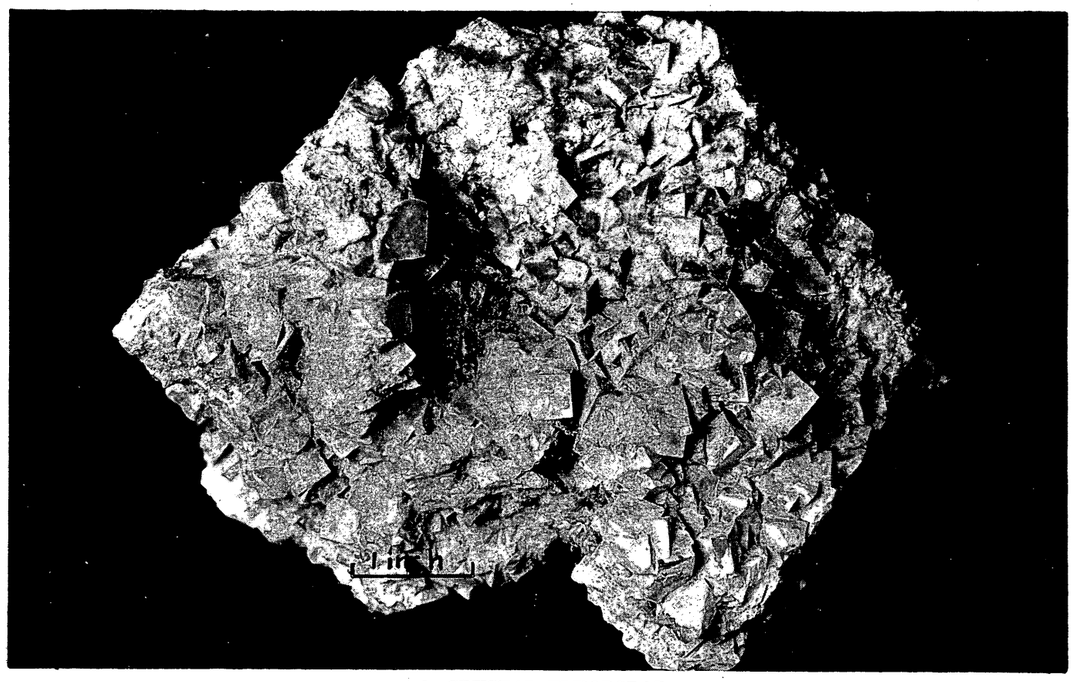
Quarternary Rocks

Slope wash

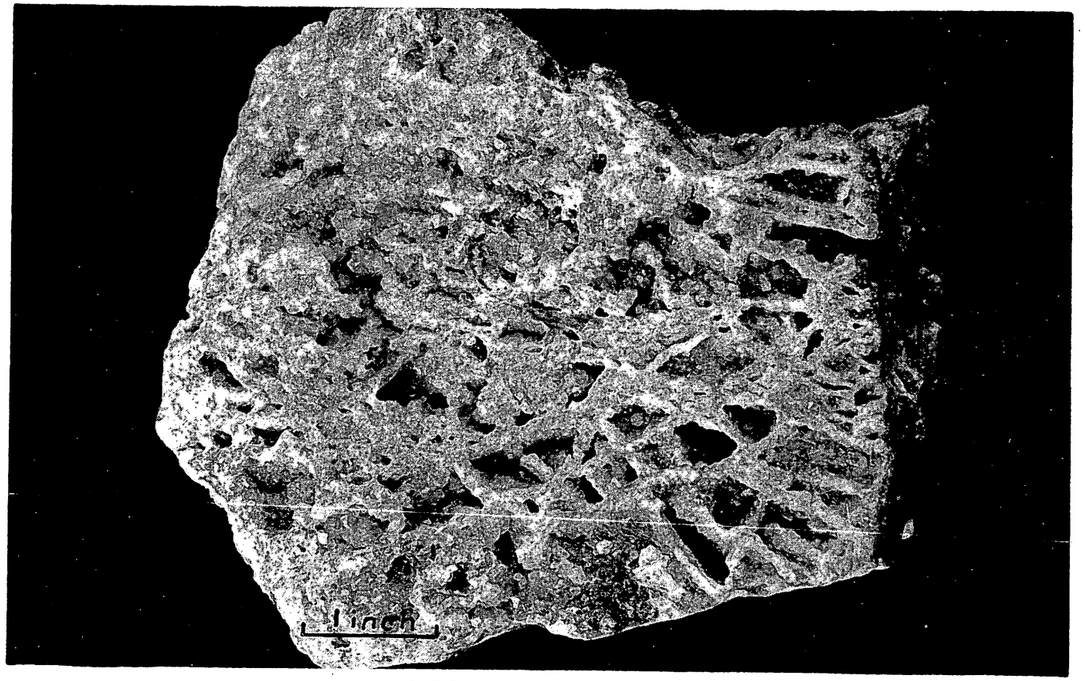
Slope wash is rather widespread and has been mapped wherever there is uncertainty as to the structural and stratigraphic relations of the underlying rock (Fig. 2). The largest area of slope wash is in the Big Hill Gulch drainage basin where it covers the slopes of a somewhat basin-like area and effectively conceals all the underlying bedrock. This wash extends far up the slope on the south and joins with another wash that stretches down the slope in a more easterly direction and around a projecting spur of Paleozoic rocks on which the Chalspar No. I and Holterman properties are located. Another body of slope wash occurs in and below the floor of the cirque at the head of Daugherty Gulch and another larger mass, at the mouth of Daugherty Gulch. Other areas of slope wash lie to the south of Daugherty Gulch on both sides of Garden Creek.

The slope wash consists largely of blocks and boulders of the more resistant members of the Paleozoic formations, carried down the slopes from the higher ridges under gravity. In the Big Hill area the wash contains a notable abundance of material from the Ramshorn conglomerate and from masses of silicified dolomite. Such materials are also abundant in the wash that encircles the outlier of dolomite in which the Chalspar No. 1 is located. The same materials are

[12] U.S. Geol. Survey Bull. 877, op. cit. Pl. 1.
[13] U.S. Geol. Survey Bull. 877, op. cit. pp. 65-68.



A. CRYSTAL FLUORSPAR
Crystal coatings are typical of much of the fluorspar in the breccia deposits and occur as druses in all deposits where filling has been incomplete.



B. BOXWORK FLUORSPAR
Typical "Boxwork" structure found in many of the breccia deposits. After fragments of the brecciated dolomite had received a thin coating of silica, the dolomite was dissolved, leaving the silica partitions which were then coated by small crystals of fluorite.

STRATIGRAPHY

Cambrian (?) Rocks

Garden Creek Phyllite

The Garden Creek phyllite forms the core of the Bayhorse anticline and is exposed in the valley walls on both sides of Garden Creek, reaching well up on Keystone Mountain on the south and over the ridge into Daugherty Gulch on the north (Fig. 2). From Daugherty Gulch the phyllite extends northward through the ridge under a cap of Bayhorse dolomite and appears as a small window on the other side, completely surrounded by dolomite. Its only other occurrence elsewhere is along Bayhorse Creek near the town of Bayhorse.

As pointed out by Ross[3], the formation is composed entirely of dark-gray to black, in part somewhat calcareous phyllite with silvery sericite abundantly displayed on cleavage surfaces. The bedding is obscure but may be recognized on close observance as thin crenulated bands. The phyllite is soft and weathers readily to smooth slopes (Pl. 1-B), breaking up into small fragments or flakes that make masses of mobile talus. The only rock observed in place was along the inner gorge of Garden Creek and in some low cliffs on the slope to the south.

The base of the phyllitic formation has not been exposed and the thickness is indeterminate, but from map interpolation the thickness must aggregate some hundreds of feet. The formation appears to underlie the Bayhorse dolomite with little, if any discordance.

The Garden Creek phyllite has no counterpart anywhere in the region. Because of its apparent conformance with the Bayhorse dolomite and the lack of conformance of the dolomite with the overlying Ramshorn slate of undisputed Ordovician age, the phyllite is regarded tentatively as Cambrian[4]. It bears no resemblance to any of the formations of pre-Cambrian age exposed elsewhere in the region.

Bayhorse Dolomite

The Bayhorse dolomite occurs on the flanks and in places along the crest of the Bayhorse anticline and at several places off the anticlinal structure. The most extensive exposures are in the vicinity of Daugherty Gulch and Garden Creek where it overlies and otherwise completely encircles the Garden Valley phyllite (Fig. 2). Its outcrop pattern is that of an elongated, more or less ellipsoidal-like ring, encircled in turn by Ramshorn slate and conglomerate. Off the anticlinal structure, it is exposed along the relatively low ridge north of the mouth of Daugherty Gulch and again near the mouth of Big Hill Gulch and on Mill Creek. Another small isolated block occurs about midway along the northern edge of Big Hill Gulch (Fig. 2).

The greater part of the formation is composed of thick-bedded dolomite with cliff- or ledge-forming tendencies, very well expressed along Mill Creek and other exposures off and along the anticline (Pl. 1-B). The beds are mostly light gray, but outcrops are usually weathered a rusty buff. A part of the dolomite is cherty and some near the top of the formation contains interbedded lenses of slate. According to Ross[5] some of the dolomite on the west flank of the anticline on Garden Creek is a breccia or poorly rounded conglomerate and some on the east flank has interbedded quartzite containing fragments of dolomite. These quartzite beds measure as much as 100 feet thick. The dolomite generally shows much evidence of local fracturing and brecciation, a feature of considerable economic importance from the standpoint of occurrence and distribution of fluorspar.

Because the dolomite was extensively eroded prior to deposition of the overlying beds of the Ramshorn formation, its original thickness is not known. Only a few hundred feet are exposed along the western flank of the anticline in Daugherty Gulch and in the valley of Garden Creek whereas as much as 1,000 feet and perhaps more remain along the eastern flank of the anticline and in some of the other exposures. The broader areas of the dolomite shown on the geologic map (Fig. 2) reflect duplication of the beds by faulting.

The dolomite appears to be non-fossiliferous, but because of its unconformable relationship to the overlying slate of Lower Ordovician age and its lack of lithologic resemblance to any of the known members of the pre-Cambrian Belt series it is tentatively assigned to the Cambrian[6].

Ordovician Rocks

Ramshorn Conglomerate

The Ramshorn conglomerate is strictly local and is exposed only around the northern end of the Bayhorse anticline. It is a prominent feature in the vicinity of Daugherty Gulch and Garden Creek (Pl. 1-A) and in the upper reaches of Big Hill Gulch where it wraps around the sharply plunging nose of the anticline (Fig. 2). The conglomerate may be traced southward along the west flank of the anticline to, but not beyond, Garden Creek and may also be traced along the east flank for a somewhat greater distance, actually across Garden Creek and for about ¾ of a mile up Whetstone Gulch. It is not known to occur elsewhere along the anticline, except on upper Rattlesnake Creek about 7 miles to the south and does not overlie or occur with any of the isolated exposures of Bayhorse dolomite east of the anticline.

This conglomerate occurs at the base of the Ramshorn slate and is composed almost entirely of fairly well rounded pebbles of vein quartz and quartzite with most of the pebbles less than an inch in diameter but with some as large as 3 inches. These pebbles are generally securely held in a siliceous matrix, locally somewhat sandy. In places the conglomerate contains interbedded quartzite or thin lenses of slate.

The conglomerate shows considerable variation in thickness, from 0 up to 600 feet, reaching its maximum thickness in the upper part of Daugherty Gulch. In most places the conglomerate rests directly on the Bayhorse dolomite, but in some places it is separated from the dolomite by a small thickness of slate. It is conformable with the slate and locally contains thin lenses of interbedded slate. Both slate and conglomerate rest unconformably on the eroded surface of the dolomite. Variation in thickness of the conglomerate may reflect the depth of erosion of the dolomite, for there appears to be less dolomite where the conglomerate is thick than where it is thin.

As the conglomerate forms the basal part of the Ramshorn slate, its age is tied up with that of the

[3] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. p. 12.
[4] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. p. 12.
[5] U.S. Geol. Survey Bull. 877, op. cit. p. 13.
[6] Ross, C. P., U.S. Geol. Survey Bull. 877, op. cit. p. 14.

MINES AND PROSPECTS

CHALSPAR PROPERTY

The Chalspar property comprises holdings of J. R. Simplot Company in and near Daugherty Gulch. These holdings consist of two groups of claims, a lower group of 9 claims on the dolomite below the mouth of Daugherty Gulch and an upper group of 20 claims in and on both sides of Daugherty Gulch. The first holdings were acquired in 1952 and then added to by discovery and location during the late Spring and Summer of 1953. The exploratory and development work to date has been centered on the Chalspar No. 1, Chalspar No. 2, Chalspar No. 5, Westpar, and Troxpar claims (Fig. 2).

Chalspar No. 1

History and Development

The Chalspar No. 1 is in the lower group of claims which covers the dolomite exposure north of the mouth of Daugherty Gulch (Fig. 2). The location was made in the early fifties and acquired by J. R. Simplot Company in 1952. The holdings contain two veins, one known as the Past Up and the other as the West vein (Fig. 3). The first work was on the Past Up and consisted of extensive bulldozer stripping, followed by open cutting, and then underground by shaft and drifts, with most of the surface work in 1952 and the underground work in 1953. Work was also carried on in 1953 with the diamond drill. Exclusive of the surface work, the total development on the Past Up vein consists of a 65-foot shaft with a short drift on the 50-foot level, some stopes to the surface, and 1232 feet of core drilling in six holes, all driven into the hanging wall of the vein from the surface (Figs. 4 and 5). The West vein received some attention in 1952, but most of the work, chiefly stripping with the bulldozer and trenching along the outcrop with a slusher, was done in 1953. The only production to date has been from the Past Up and includes 475 tons of metallurgical-grade spar (88 percent CaF_2), shipped as mined, and 245 tons of milling spar (55 percent CaF_2).

Geologic Features

The Chalspar No. 1 is in the synclinal block of Bayhorse dolomite faulted against the east flank of the Bayhorse anticline (Figs. 2 and 3). The dolomite has barely lost its cover of Challis volcanics and in places still retains thin patches of the volcanic rocks, mainly where infaulted in the dolomite. The patches are mainly covered by wash and have in part been revealed by surface stripping. The volcanics locally apparently accumulated on an uneven surface much like the present with the remnants in part marking the lower spots on the pre-volcanic erosion surface. The beds of dolomite dip gently west and have not been seriously dislocated by a series of northerly trending faults, mainly of rather minor magnitude. A thin cover of Ramshorn slate overlies the uppermost exposure of dolomite and some infaulted slate also occurs in the dolomite lower on the ridge. The Ramshorn conglomerate is missing.

The two veins occupy fault fissures of somewhat dissimilar structural characteristics. The Past Up vein strikes in a northwesterly direction along a course that changes from N.30°W. to N.10°W. and with a dip that changes from steeply southwest to about 80°NE. The Past Up vein apparently occupies a fault fissure of strike-slip origin, for grooves on slickensided surfaces along the south end of the vein dip 20°SE. and along the north end, about 10° SE. This fault was active after as well as before mineralization.

The West vein on the other hand strikes N.30°E. and dips 65°SE. The nature of the faulting that controls the West vein is not clear. There appears to have been little movement along the fault after mineralization.

Past Up vein.—The Past Up vein has been exposed on the surface for about 200 feet and below the surface for a much shorter distance. It shows a range of thickness from a few inches up to a maximum of 7 feet, averaging 3 to 4 feet in the stopes. The vein filling has been considerably shattered by post mineral-faulting and in places has been reduced to a granular sand. As revealed by the underground work, the fault which produces the fissure carried volcanics against dolomite and dolomite against slate, so that the hanging wall is in part altered volcanics and the football in part slate (Fig. 5). Holes Nos. 1, 2, and 3 drilled to intersect the vein at points 30 feet and 180 feet north of the shaft passed through an appreciable thickness of volcanics before entering the dolomite (Fig. 4). South of the shaft the hanging wall is wholly dolomite, but the footwall is slate, apparently an infaulted block of the Ramshorn (Fig. 5). The vein is not so wide against the slate as it is when entirely within the dolomite.

The fluorspar appears to have a rather sporadic distribution along the fault and forms bodies which may pinch and swell quite abruptly. Although the north end of the vein shows considerable promise on the surface, no significant mineralization was uncovered in Hole 1 drilled to intersect the vein 30 feet north of the shaft nor in Holes 2 and 3 drilled at 180 feet. On the other hand, Hole 5 encountered a highly mineralized zone with fluorspar exposed for 40 feet and estimated to contain about 70 percent CaF^2 for a length of 30 feet. But Hole No. 6, drilled from the same station as the No. 5 and at such an angle as to intersect the fluorspar zone 40 feet above the No. 5, penerated only a foot of massive fluorite together with an indeterminate amount of gouge. Apparently Hole No. 5 either penetrated a large bunch or pocket of fluorspar which terminated upward short of the No. 6 hole or was driven along a vein of mineralized zone of about the same dip as the drill hole. Hole No. 4 which lies to the south of Holes 5 and 6, exposes fluorspar only on the projected dip of the vein (Fig. 4). Apparently commercial fluorpar would have to occur within a strike distance of less than 90 feet (the distance between Holes 1 and 5).

The fluorspar in the Past Up vein is mainly coarse, massive, but some does occur as crystals in small scattered druses. A very little of the fluorite occurs in the cryptocrystalline form, but some is interbanded with the more coarsely crystalline variety. Most of the fluorite in the vein is white, but in places it does show a faint coloring, mainly in pale shades of green and purple. The fluorspar filling holds some scattered breccia fragments of the dolomite. Some of the fluorite has itself been brecciated and cemented by more fluorite.

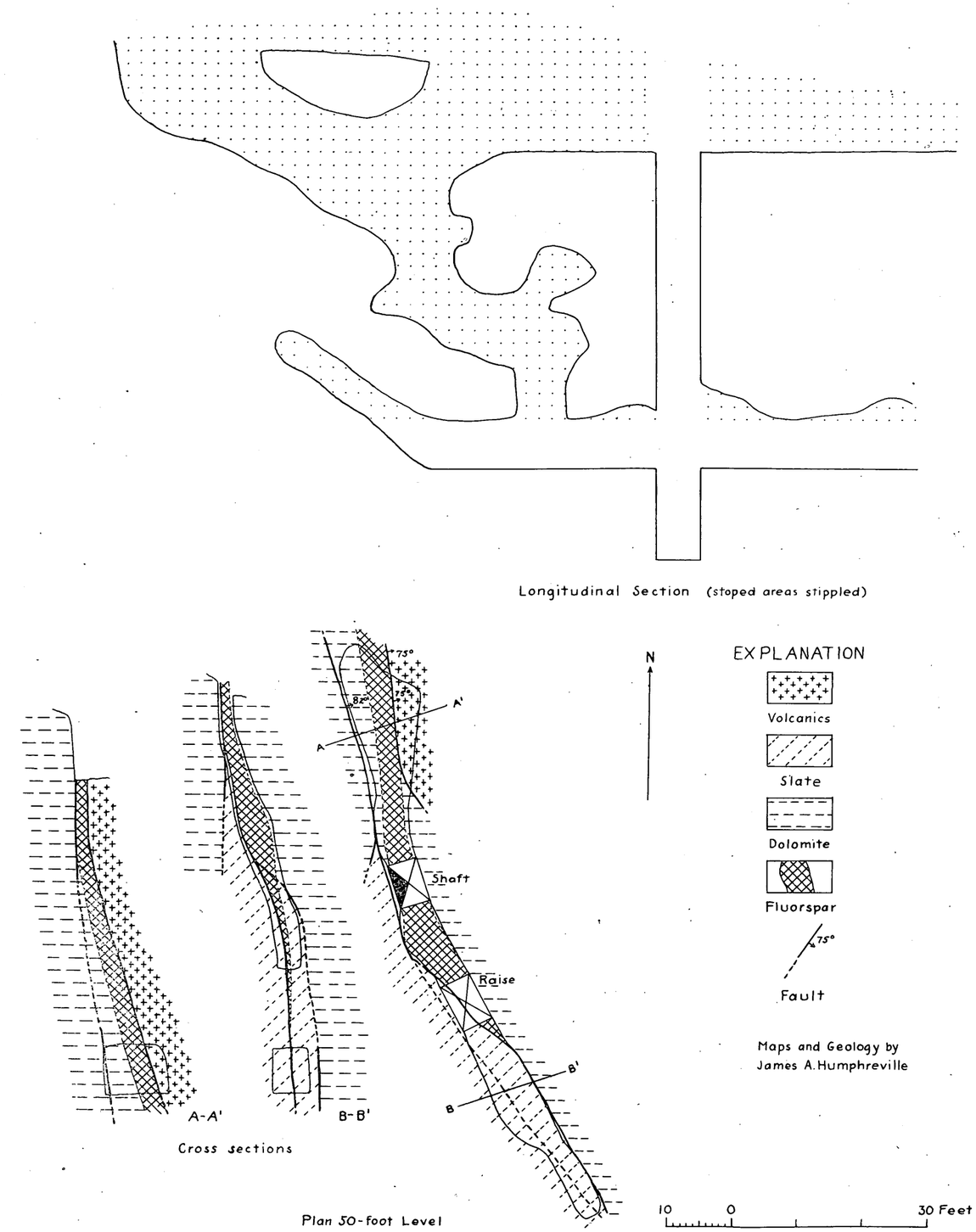


Figure 5. Underground workings on the Past Up vein.

est and most persistently mineralized vein is the one on the Chalspar No. 2 group. This fissure-breccia vein has been exposed by bulldozing for a distance of 900 feet and for much of its length is 12 to 18 feet thick.

The breccia deposits are quite variable as to size. Those on Keystone Mountain measure from a few feet up to 30 feet across with most of them between 20 and 30 feet. Those that outcrop boldly on the surface may be traced for a hundred feet or more. The breccia deposit in Daugherty Gulch has been exposed for about 200 feet. This deposit is about 30 feet across with some 5 feet composed essentially of massive fluorspar. The dolomite above the breccia deposit also contains appreciable quantities of fluorite through a zone at least 100 feet thick. Although surface exposures of many deposits seem adequately large for commercial exploitation, the depth to which the deposits extend will not be known until some work is carried on underground.

TENOR

Data on the tenor of the deposits are scanty. The fluorspar shipped as metallurgical spar from the Past Up vein on the Chalspar No. 1 contained 88 percent CaF_2 and that sent to the mill contained 55 percent CaF_2. Samples across the vein on the Chalspar No. 2 showed 13 feet of 67.1 percent CaF_2 on the crest of the ridge and 14 feet of 57.1 percent CaF_2 in a channel on the hanging wall side. A 12-foot sample in a cut about 200 feet slope distance down the south side of the ridge contained 63.7 percent CaF_2. The high tenor of this outcrop material may reflect in part surface enrichment through solution-weathering of some of the incorporated breccia fragments of dolomite. On the Chalspar No. 5 a 17-foot channel showed 40 percent CaF_2 and an 8-foot channel, 44 percent CaF_2.

According to Chambers[17] some of the exposed boxwork deposits on Keystone Mountain contain from 30 to 60 percent CaF_2 across sample widths of 18 to 30 feet, with the average between 40 and 50 percent CaF_2. On Keystone Mountain and elsewhere is a vast tonnage of fluorspar in deposits which probably carry 20 to 30 percent CaF_2. On Mill Creek there is a huge tonnage of rock that may carry 10 to 20 percent CaF_2.

GENESIS

The fluorite must have been introduced into the fissured and brecciated dolomite by solutions which probably originated in some deep magmatic source, perhaps the source that supplied the materials of the Challis volcanics. This source may have been a fairly basic magma, generated perhaps in the basic subcrust, and the lime-fluorine-bearing fluids may have escaped after prolonged magmatic differentiation had affected their concentration within the magma. The fluids probably escaped at a high temperature; but deposition of fluorite did not take place until the fluids reached the abundant openings high in the crust and not until they had become comparatively cool, reduced perhaps to warm aqueous solutions.

The fluorite-bearing solutions spread widely through the fractured dolomite and in places of exceptional fissuring and brecciation left considerable concentrations of fluorite, deposited largely as a filling of the fissures and partial filling of the breccia openings. Because of general incomplete filling, the deposits show unusual crystal development with abundant crystal crusts and druses. The deposits also show interesting textural and structural features, among them the boxwork structures. These boxwork structures are developed only in the brecciated dolomite and only where the breccia fragments received a thin coating of quartz. Apparently before the fluorite was introduced, the dolomite was removed in solution leaving the quartz behind as a cast of the dolomite fragments. These thin partitions of quartz were then coated by small crystals of fluorite, thus preserving the cellular or boxwork structure produced by leaching of the brecciated dolomite.

The channels for the circulation of the fluorite-bearing solutions were largely independent of those which directed the earlier quartz-sulfide mineralization. Some of the channels were along side the older ones, but many were some distance away. In a few places the fluorite did invade the earlier base-metal fillings. The relations are such as to suggest that structural movements that preceded the introduction of the fluorspar-bearing solutions found the earlier lines and zones of weakness too strongly reinforced by the earlier quartz and could not in general reopen the channels that had accommodated the base-metal mineralization. As the quartz-reinforced rock tended to resist refracturing, the bordering dolomite was forced to take up the deformation and failed by fissuring and brecciation.

As fluorite was introduced into a fissure with Challis volcanics as a part of the hanging wall (Past Up vein), the age of the fluorspar is post-Challis and hence probably the same age as the florspar at Meyers Cove where some of the deposits are entirely within the Challis volcanics. As at Meyers Cove, the fluorspar mineralization is apparently of Miocene age.

OUTLOOK

The district appears to have an exceptional concentration of fluorspar and may indeed have one of the most important, if not the most important concentration of its kind within the State. The surface exposures show unusual promise, but it will take underground exploration to determine whether the deposits will measure up to present expectations. The exploration has been too limited as yet to reveal the behavior of the fluorspar mineralization with depth.

The distribution of the fluorspar appears entirely dependent on the location of structurally favorable fissures and breccia zones within the Bayhorse dolomite. The much fractured and faulted Bayhorse anticline apparently provided an ideal structural setting for the fluorspar deposits, with especially favorable sites on Keystone Mountain and in and near Daugherty Gulch. The mineralization is not restricted to these sites, however, and fluorspar deposits occur elsewhere along the anticline and in faulted segments of dolomite off the anticline. Such deposits are known near Bayhorse and in the faulted dolomite north of the mouth of Daugherty Gulch. The district appears to offer a fruitful field for search and exploration.

[17] Chambers, Personal Communication.

West vein.—The West vein has been uncovered almost continuously for about 300 feet. It is mostly 12 to 18 inches thick near the top of the ridge but thickens down slope and is about 3 feet thick in the face of the cut made along the outcrop (Fig. 4). In places its thickness increases to 5 feet. The vein has been little disturbed by post-mineral movement and the filling, therefore, has not been broken up as it has in the Past Up vein. Both walls are in dolomite. The fluorspar resembles that in the Past Up vein. The filling of the fissure has been nearly complete and few drusy openings remain. The filling has incorporated some fragments of the brecciated dolomite.

The economic merit of the West as well as of the Past Up vein can be determined only by underground exploration. The long cut on the West vein appears to have uncovered a body of fluorspar of commercial size more than 80 feet long, perhaps equal in size to the one in the Past Up.

Chalspar No. 2

The Chalspar No. 2 straddles the high ridge north of Daugherty Gulch far up the west flank of the Bayhorse anticline (Fig. 2). The location was made in the late Spring of 1953 and was subsequently explored by stripping the crest of the ridge and by bulldozer trenching on the slopes below (Fig. 6).

The site of fluorspur mineralization is a hundred feet or so from the dolomite-conglomerate contact and equally as far from some of the heavily silicified ledges of dolomite farther east on the ridge. The fluorspar exposed by the stripping and trenching operations is along a well-defined zone of fissuring and brecciation which has been bared here and there for about 1,000 feet. This zone strikes about N.20°W. and from the relationship to the topography must dip steeply southwest. The zone is fairly broad and for much of the distance measures up to 18 or 20 feet across. The fluorspar seems to be well distributed along the fissure-breccia zone, and, except for a relatively narrow parting of dolomite, makes up a considerable part of the zone. Samples taken across the zone in the stripped and trenched areas commonly show more than 60 percent CaF_2. As pointed out elsewhere, a 13-foot channel on the crest of the ridge actually showed 67.1 percent CaF_2 and a 14-foot channel on the hanging wall side showed 57.1 percent CaF_2. A sample across 12 feet of the vein along a cut 200 feet slope distance on the south side of the ridge contained 63.7 percent CaF_2.

The filling along the fissure-breccia zone seems quite complete and the fluorite shows only minor drusy development. The fluorite surrounds fragments of dolomite, some of which are more than a foot in diameter, and otherwise fills most of the fracture and breccia openings. The fluorite is accompanied by a minor amount of fine-grained quartz, which lies under the florite filling.

The trenching has exposed the fluorspar over a vertical range of about 250 feet. Should the deposit maintain its present steep dip, it should come against the phyllite not far below the present lowest fluorite exposure. Contact with the phyllite would probably mark the bottom of economic mineralization. The deposit appears to be one of the largest in the district and seems to be much more uniformly mineralized than most. It is worthy of exploration by adit drifts from the south slope.

Chalspar No. 5

The Chalspar No. 5 is on the lower end of the ridge that separates the two cirques (Pl. 1-A) at the head of Daugherty Gulch about midway between the Chalspar No. 2 on the bordering ridge to the north and the Westpar on the bordering ridge to the south (Fig. 2). It lies only a short distance from the floor of the gulch and at a considerably lower level than the deposits on the bordering ridges. Like most of the other locations made in 1953, the development work has been done by the bulldozer and consists of two broad and rather long cuts across the lower nose of the ridge, one cut just above the other.

The Chalspar No. 5 is also in the dolomitic rocks on the west flank of the Bayhorse anticline with the most extensive and intensive mineralization well down in the dolomite, apparently not far above the phyllite. The dolomite and the rocks above stand out in bold relief along the end of the ridge, the dolomite particularly so because of some local silicification. Some 200 feet of slate lie between the dolomite and the conglomerate.

The upper part of the dolomite has been more or less extensively fractured and silicified and has had numerous fracture surfaces coated by small crystals of fluorite. Some of these fractures show preferred orientation, the more pronounced ones striking about due north and showing slickensided surfaces with grooves and striations dipping 25°N. These fractures are fairly persistant on the strike and one of them is paralleled by an 8-foot zone of rather abundant fluorspar mineralization with the fluorite as crystals and crystalline crusts on fracture walls. There appears to be some fluorite throughout a hundred feet or more of ledgy matter, but not in commercial concentrations.

The main fluorspar mineralization is in the dolomite below the ledges and has been uncovered by the bulldozer. The fluorite appears to be localized along a broad zone of brecciation and fissuring which has been uncovered along the strike for about 215 feet. This zone trends about N.15°W. and contains fluorite over a width of 30 feet with some lenses of massive fluorite up to 5 feet wide. Samples along a 17-foot channel across the exposure contained 40 percent CaF_2 and a second along an 8-foot channel contained 44 percent CaF_2. The whole zone of mineralization may be mineable selectively, with bodies of high-grade fluorspar occurring at various places. Much of the fluorspar is massive and occurs as a filling of what were very loose breccias of the dolomite. The fluorite is white and in part fairly coarsely crystalline.

The dip of the fluorspar body has not been learned. If steep, the body is limited at depth by the phyllite, which is known to be not far below. But if the dip of the body is no steeper than the contact of the dolomite and phyllite, then the body may persist to considerable depth. The deposit has possibilities and is worthy of some underground exploration.

Westpar

The Westpar is on the high ridge south of Daugherty Gulch on the upper west flank of the Bayhorse anti-

cline (Fig. 2). The location was made during the summer of 1953 and was followed by some bulldozing on and below the outcrop.

On this part of the anticline the Bayhorse dolomite, which dips west at a moderate angle, is only about 200 feet thick. The Garden Valley phyllite immediately below has been extensively silicified and rises boldly above the saddle carved in the unsilicified phyllite. Silicification has also spread from the phyllite into the dolomite and has produced some prominent ledges along the crest of the ridge, especially near the contact of the overlying Ramshorn conglomerate.

The fluorospar is contained in brecciated dolomite near or along side the silicified rock not far under the conglomerate. The fluorspar is in considerable part the boxwork type and is developed along fairly well-defined zones of brecciation. These zones appear to trend N.10°E. and N.40°E., dip steeply northwest, and contain up to 8 feet of high-grade spar, mostly as crustiform crystals (Pl. 2). The boxwork zone may be traced in the outcrop for about 60 feet. Bulldozing on the south side of the ridge just under the fluorspar outcrop has uncovered large blocks or boulders of high-grade fluorspar material weighing perhaps as much as a ton. These boulders are composed largely of crustiform and drusy fluorite (Pl. 2).

The fluorspar has apparently been concentrated into rather short but relatively thick bodies. These bodies contain much high-grade material and are worthy of exploration.

Troxpar

The Troxspar is on the same ridge as the Westpar but at the east end of the ridge and on the east flank of the anticline (Fig. 2). Except for a small amount of bulldozing, very little work has been done to uncover the fluorspar, discovered during the summer of 1953.

The fluorspar mineralization is exposed just over the crest of the anticline. Near the phyllite the beds of dolomite dip 35° NE., but the dip steepens on approaching the conglomerate and near the fluorspar deposits is about 55°NE.

Some quartz-sulfide mineralization is exposed around on the south side of the ridge, apparently entirely independent of any fluorspar mineralization, but some fluorspar float occurs nearby and small seams of fluorspar a few inches thick occur in minor fissures in the dolomite not far away. The main body of fluorspar is apparently on the northeast slope where chunks of fluorspar up to 12 inches thick have been piled below several shallow hand-dug trenches. These chunks consist of float and the source has not been uncovered. The character of the float, however, suggests fissure deposition with crustification parallel to the walls. The fluorite is coarsely crystalline and is rose to purple. It shows greater resemblance to the fluorspar in the Meyers Cove area than does any other of the fluorspar in the district.

HOLTERMAN PROPERTY

The Holterman property on the nose of the ridge of faulted dolomite just below the Chalspar No. 1 (Fig. 2) was located May 4, 1951. The development since has comprised several cuts and a shaft (Fig. 3).

Several small veins are exposed on the property, including a bedded vein in the face of the dolomite cliff and two steeply dipping fissure veins on the ridge just back of the cliffs. The largest vein has been uncovered by cuts and a shaft for a length of 210 feet. This vein strikes N.10°E. and dips 78°-80°SE. It contains up to 12 inches of massive fluorspar at the top of the shaft but the vein pinches with depth and is little more than a narrow stringer in the bottom of the shaft.

The second fissure vein lies a short distance west of the first within and about 65 feet west of the road turn. This vein also strikes N.10°E., but dips 70°W. It measures up to 8 inches thick along its exposed length of 20 feet.

The bedded vein exposed in the face of the cliffs east of the fissure veins is a composite of several thin veins or seams spaced through a zone about 5 feet thick. This zone contains thin seams or lenses of fluorite about an inch thick, exceptionally 4 inches thick, with enlargements at or along cross fractures. This composite vein is about 70 feet long and dips gently with the bedding into the cliff. The fililng shows crustification with some crystals an inch square. The fluorite apparently occurs along a local zone of bedding plane slips and cross fractures. The fluorte seams and thin lenses are too widely separated to have much economic interest at the present time.

KEYSTONE PROPERTY

The Keytone property, held by Arthur Chambers, is on the upper north and east slope of Keytone Mountain at the southern edge of the map-area (Fig. 2). It is in part an old property developed and worked for silver in the eighties and intermittently since. Fluorspar was uncovered during the early operations but received no attention until the late forties, when the property was acquired by Mr. Chambers.

The property now consists of 14 unpatented claims located by Mr. Chambers and 4 patented claims held under lease and bond. The development comprises several short adits and stopes along a silver-bearing vein on the northeast side of the mountain, a short adit in fluorspar on the north side of the mountain, and a number of bulldozed excavations made at various other places, primarily to explore the fluorspar deposits. All the working are well up the mountain slope at altitudes of from 7,500 to nearly 9,500 feet and are reached by a steep road with many sharp switchbacks.

The fluorspar deposits are on the gentle, southerly plunging nose of the Bayhorse anticline south of Garden Creek, entirely within the Bayhorse dolomite Fig. 2). The contact of the dolomite with the overlying Ramshorn slate is arcuate in outline and describes a broad curve across the north slope of the mountain. As the bodies of fluorspar tend to follow the contact, they, too, lie along or describe an arcuate belt.

The fluorspar deposits are distributed along the belt for about 6,000 feet either close to the Ramshorn contact or to a parting slate in the dolomite about 125 feet below the contact. Except along the silver lodes, the fluorspar is contained in breccias and occurs for the most part as breccia lodes. The exposures are scattered but appear to be more or less closely connected by float. Continuity of deposits, however, cannot

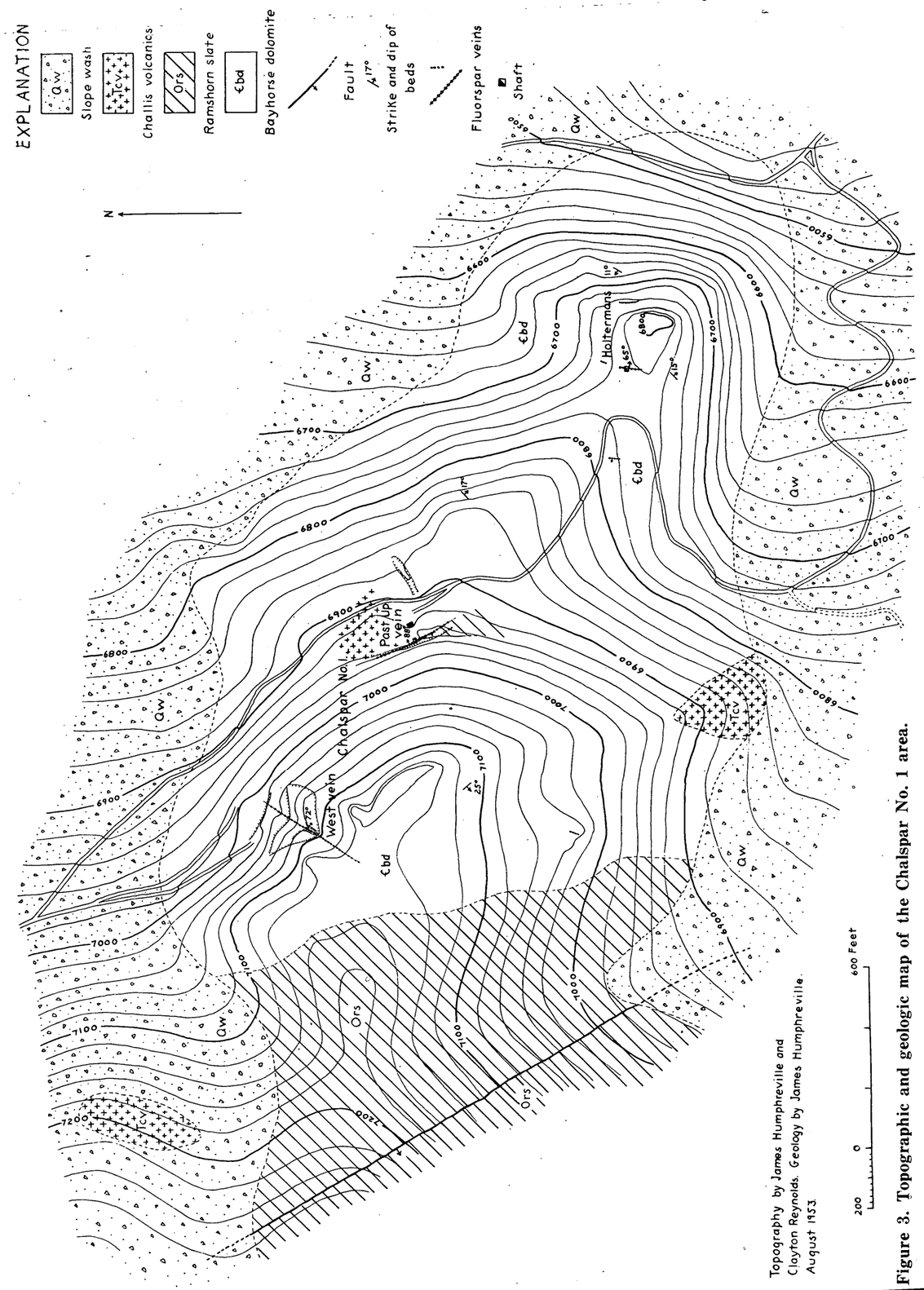


Figure 3. Topographic and geologic map of the Chalspar No. 1 area.

Topography by James Humphreville and
Clayton Reynolds
Geology by James Humphreville

Figure 6. Map of the Chalspar No. 2 vein.

be definitely established without drilling or other underground work. The exposed bodies contain from 18 to 30 feet of crystalline and boxwork fluorite composed of 30 to 60 percent CaF_2, mostly as small crystals averaging about 0.25 inch. At one point the fluorspar is along a north-south fault, which also contains a quartz-silver vein. A huge mass of white quartz outcrops on the upper slope of the mountain near the fluorspar deposits; but, although somewhat fractured in places, it contains no fluorspar.

The deposits along with their geologic setting are described in detail in an unpublished report by Arthur Chambers. Suffice to say that the fluorspar deposits are exceptionally numerous on Keystone Mountain and are among the largest and most promising in the district. As elsewhere, underground exploration must be carried on before the deposits can be properly evaluated and estimates made of reserves. Should the breccias continue to parallel the Ramshorn contact along the flanks of the anticline, the fluorspar should have an impressive vertical range; otherwise, the bottom of fluorspar mineralization may be expected against the underlying Garden Valley phyllite.

PACIFIC MINE

The Pacific mine is near the top of the high ridge between Beardsley Gulch and Bayhorse Creek little less than a mile north of the old town of Bayhorse. The mine is an old silver-lead producer and was probably active in the eighties with considerable production during the first decade of the present century and during the years of World War 2 to the present. Fluorspar was not mentioned in the earlier reports and its presence may not have been known until the late war.

The base-metal ore occurs as a replacement of the Bayhorse dolomite and forms podlike bodies along certain beds of the gently rolling, almost horizontal formation. The replaced material is in part a dolomite breccia recemented by quartz with galena occurring here and there as bunches and stringers in the cemented breccia and in silicified dolomite. The fluorspar mineralization appears to be limited to the walls of the quartz-sulfide bodies and rarely penetrates those bodies.

The fluorspar is known in several parts of the mine with one showing in adit 4A just in from the portal, where the walls are composed of fluorspar material reported to contain about 30 percent CaF_2. The fluorite appears to be along fractures under a quartz-sulfide body. The extent of the fluorspar mineralization is not revealed by the limited work in the adit.

Some fluorspar also appears in Adit 6, but the most impressive body is below the level in the Blaine stope about 25 feet above the Blaine 7 level. This body of fluorspar lies under the sulfide ore and is exposed over a height of more than 8 feet. The dimensions of the fluorspar body are not fully known, but the showing is attractive and contains material reported to carry 60 percent CaF_2. The fluorspar is composed largely of small crystal aggregates and probably occurs largely as a filling of an open breccia. Apparently openings for the fluorite were produced by structural movements which found the dolomite beneath the quartz bodies more favorable to breakage than the overlying quartz-sulfide filling.

The deposits appear to be controlled stratigraphically and perhaps structurally by an intercalated slate member about 120 feet below the top of the dolomite. The fluorspar, as well as the quartz-sulfide ore, occurs 30 to 40 feet above the parting slate.

The fluorspar showing at the Pacific mine is worthy of more thorough investigation than it has received.

OTHER DEPOSITS NEAR BAYHORSE

Fluorspar also occurs along the crest of the ridge some distance west of the Pacific and north of the Forest Rose. This fluorspar is exposed along a shallow adit just under a knoll on the crest of the ridge near the contact of the dolomite with the Ramshorn slate. The rock shows rather extensive brecciation and contains much fluorspar of the boxwork type.

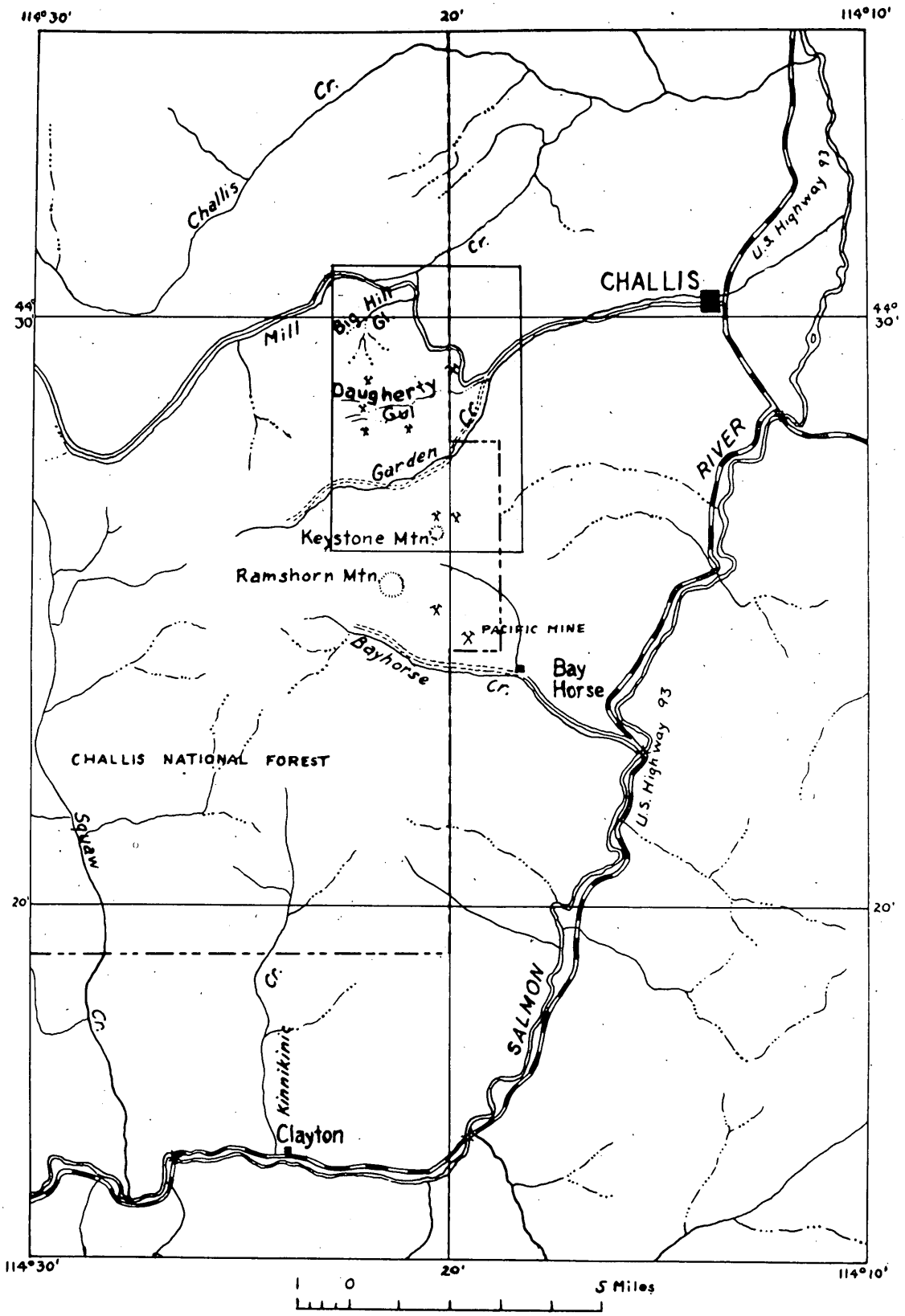


Figure 1. Index map showing location of f luorspar area near Challis, Idaho.

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Pamphlet No. 101 August, 1954

STATE OF IDAHO

Len Jordan, *Governor*

Idaho Bureau of Mines and Geology

A. W. Fahrenwald, *Director*

A Preliminary Report on the Fluorspar Mineralization Near Challis, Custer County, Idaho

By

Alfred L. Anderson

UNIVERSITY OF IDAHO

Moscow, Idaho

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DEPARTMENT OF THE INTERIOR
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Maps + Pamphlet

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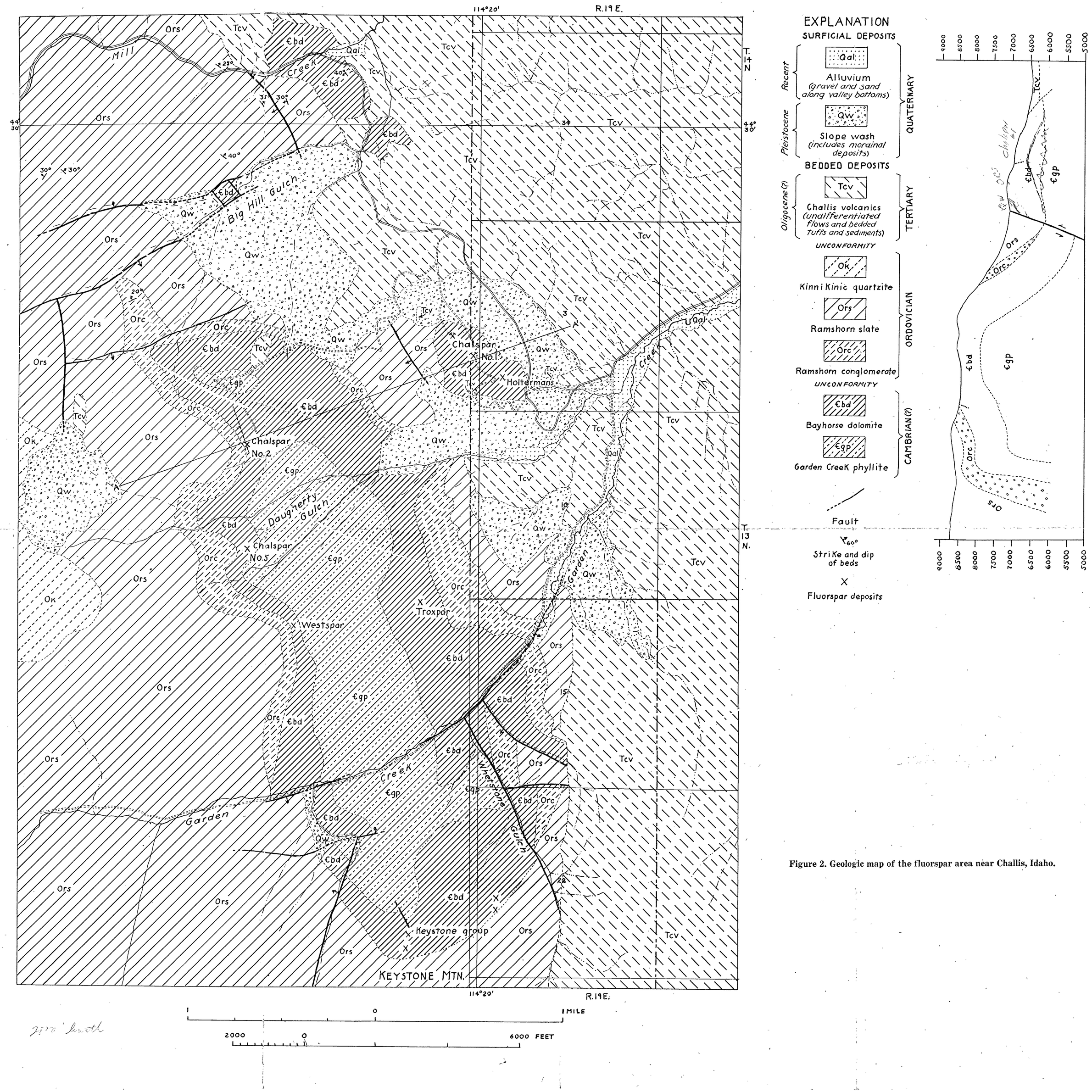
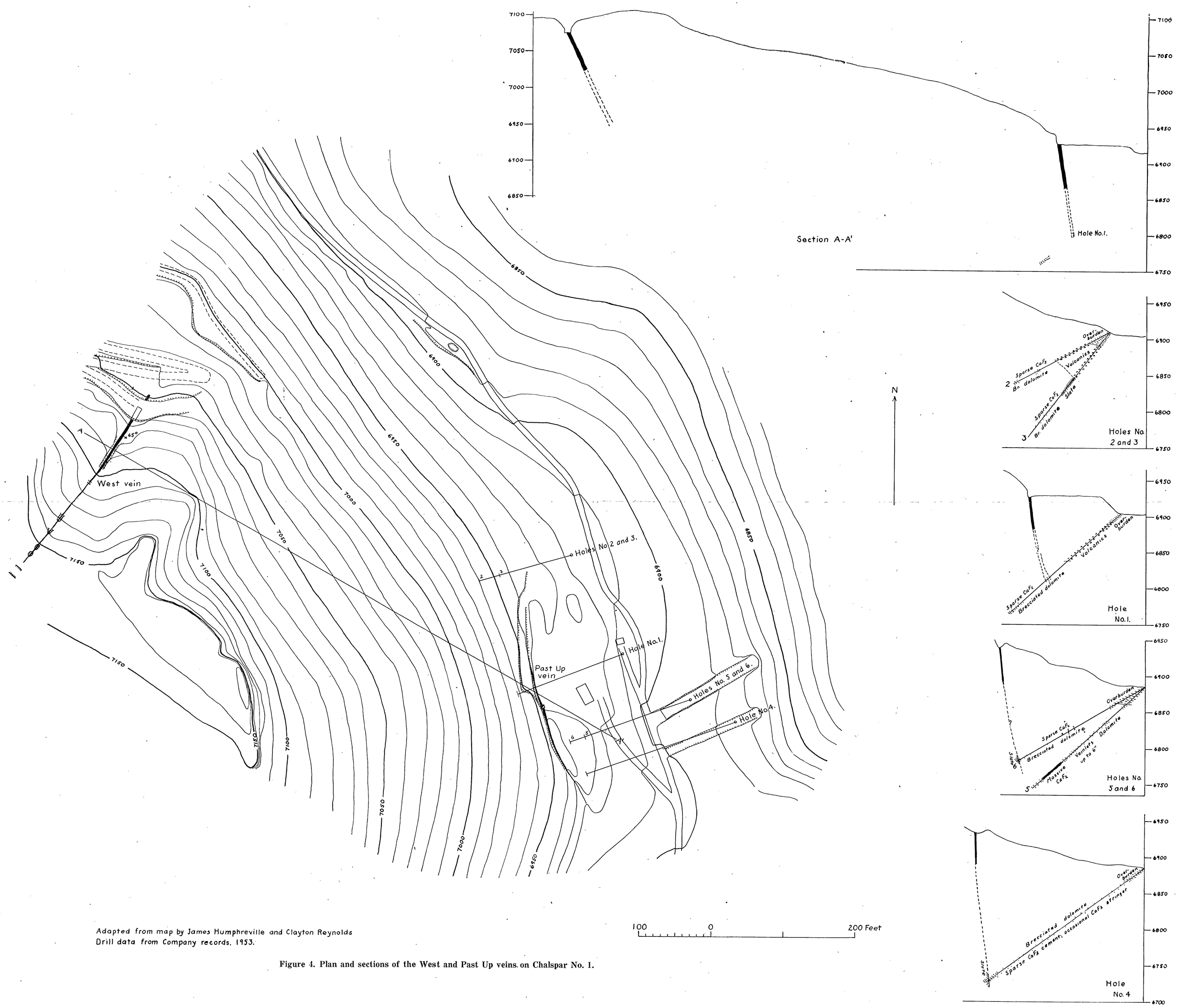
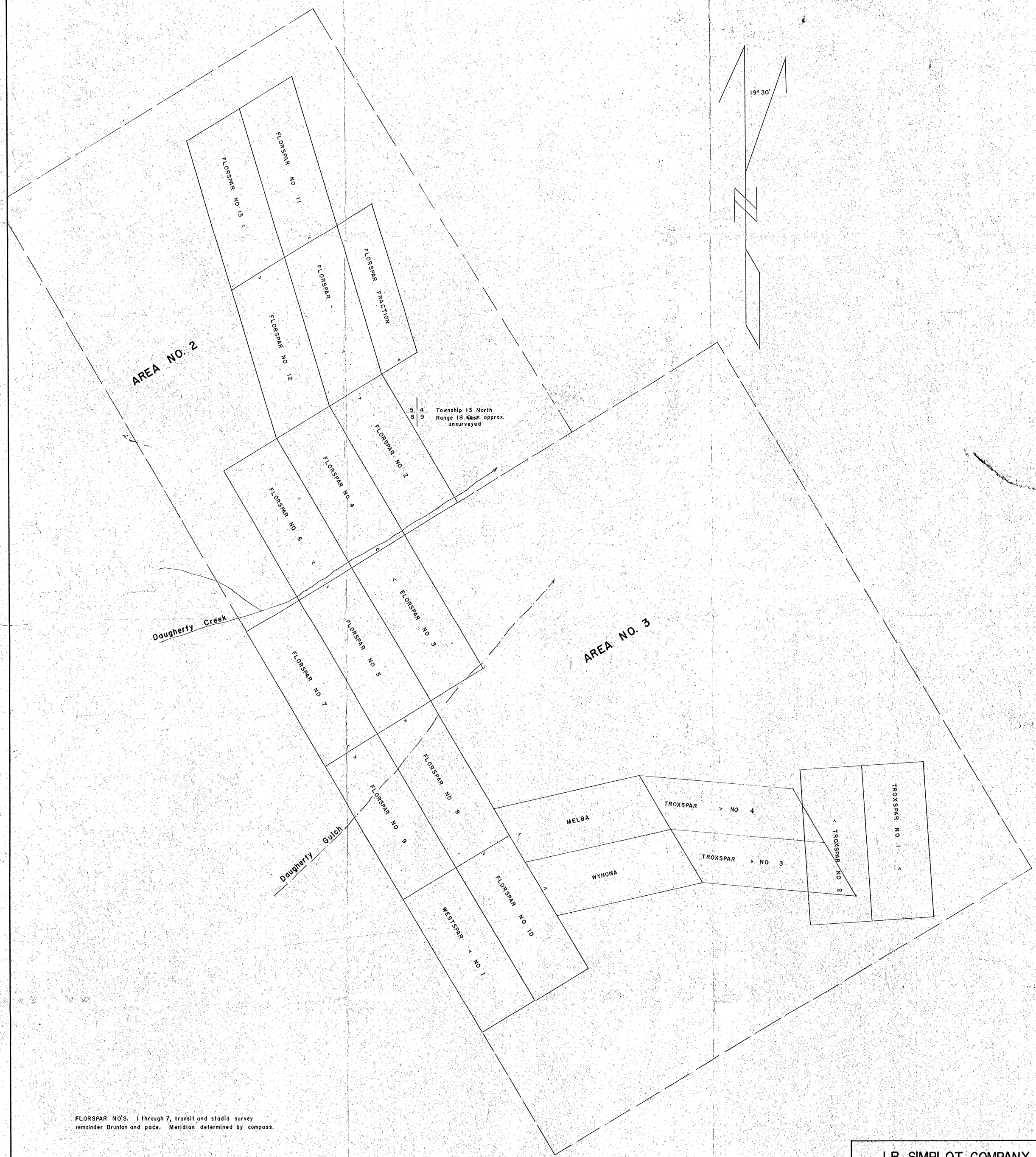


Figure 2. Geologic map of the fluorspar area near Challis, Idaho.



Adapted from map by James Humphreville and Clayton Reynolds
Drill data from Company records. 1953.

Figure 4. Plan and sections of the West and Past Up veins on Chalspar No. 1.

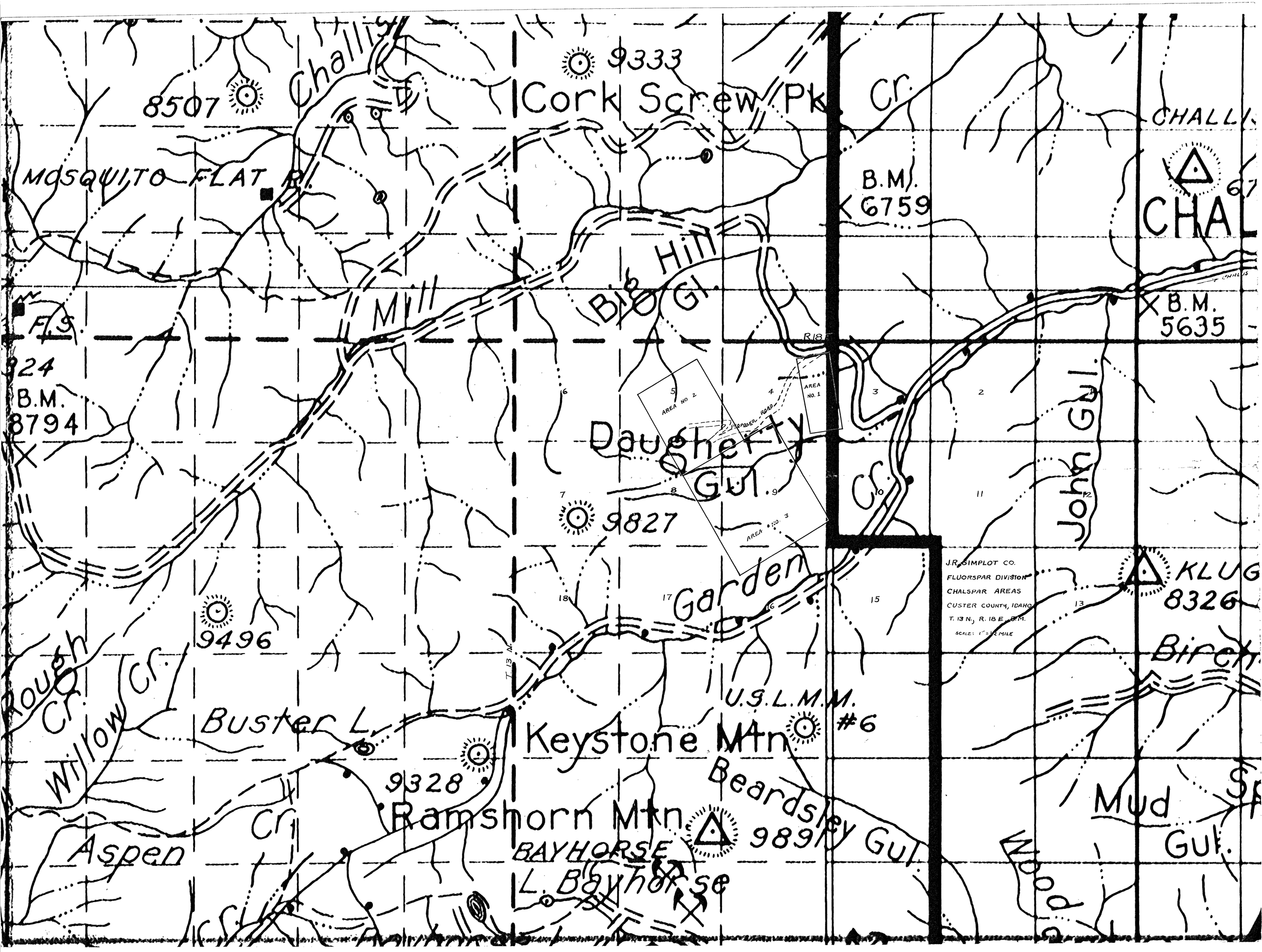


FLORSPAR NO'S. 1 through 7, transit and stadia survey
remainder Brunton and pace. Meridian determined by compass.

J. R. SIMPLOT COMPANY
FLUORSPAR DIVISION
CHALLIS, IDAHO
CHALSPAR AREAS NO. 2 & 3
CLAIM PLAT
Scale: 1 inch = 400 feet

July-August, 1953

Don F. Nov. 30, 1953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CUSTER COUNTY, IDAHO
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Keystone Mtn
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Beardsley Gul.
Mud
Gul.
Ramshorn Mtn
9891
Aspen
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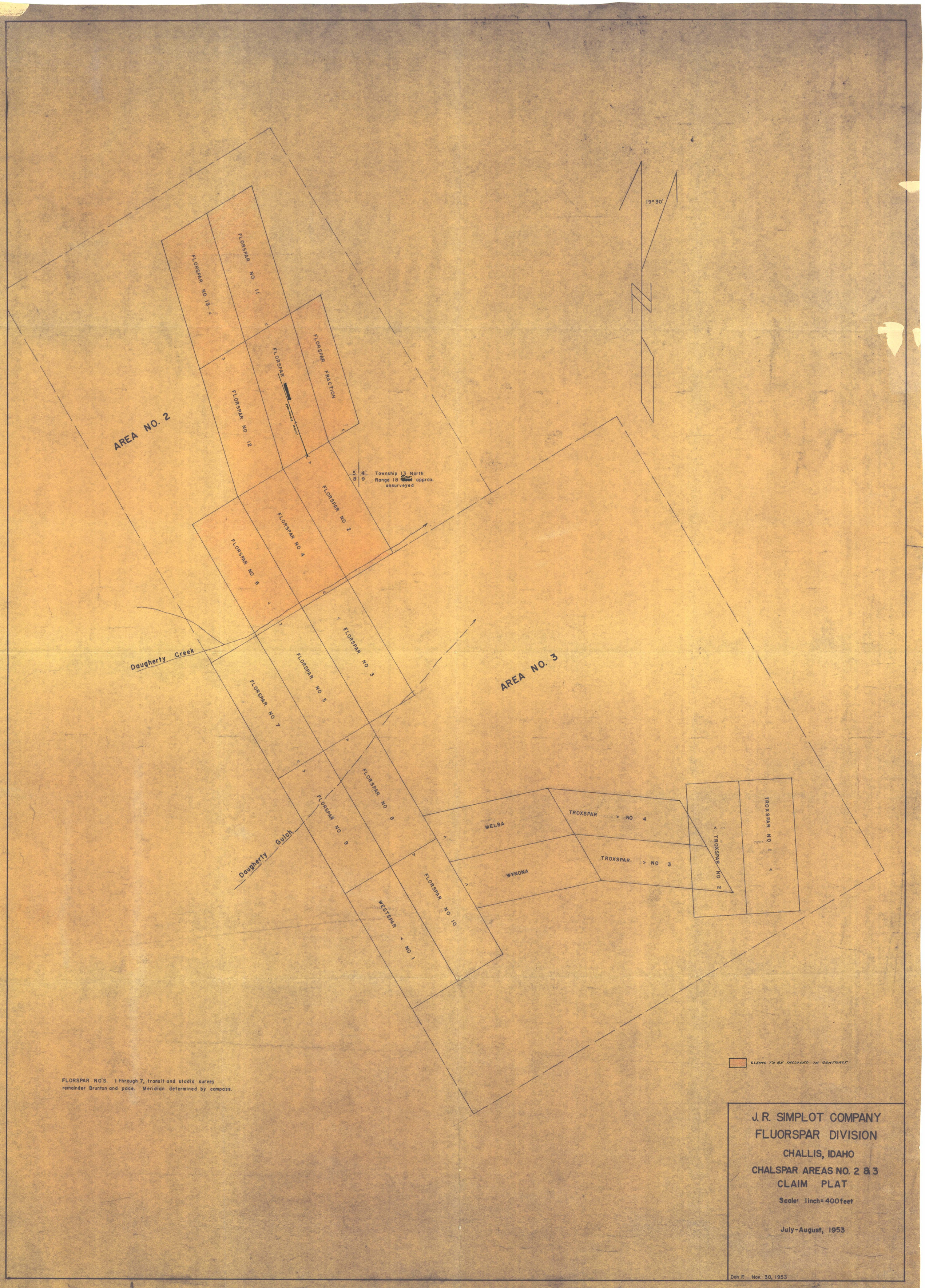
BAYHORSE
L. Bayhorse
Wood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FLORSPAR NO 7
AREA NO. 3
FLORSPAR NO 8
FLORSPAR NO 9
Daugherty Gulch
MELBA
WYNONA
TROXSPAR NO 4
TROXSPAR NO 3
TROXSPAR NO 2
TROXSPAR NO 1
FLORSPAR NO 10
WESTSPAR NO 1
CLAIMS TO BE INCLUDED IN CONTRACT
FLORSPAR NO'S. 1 through 7, transit and stadia survey
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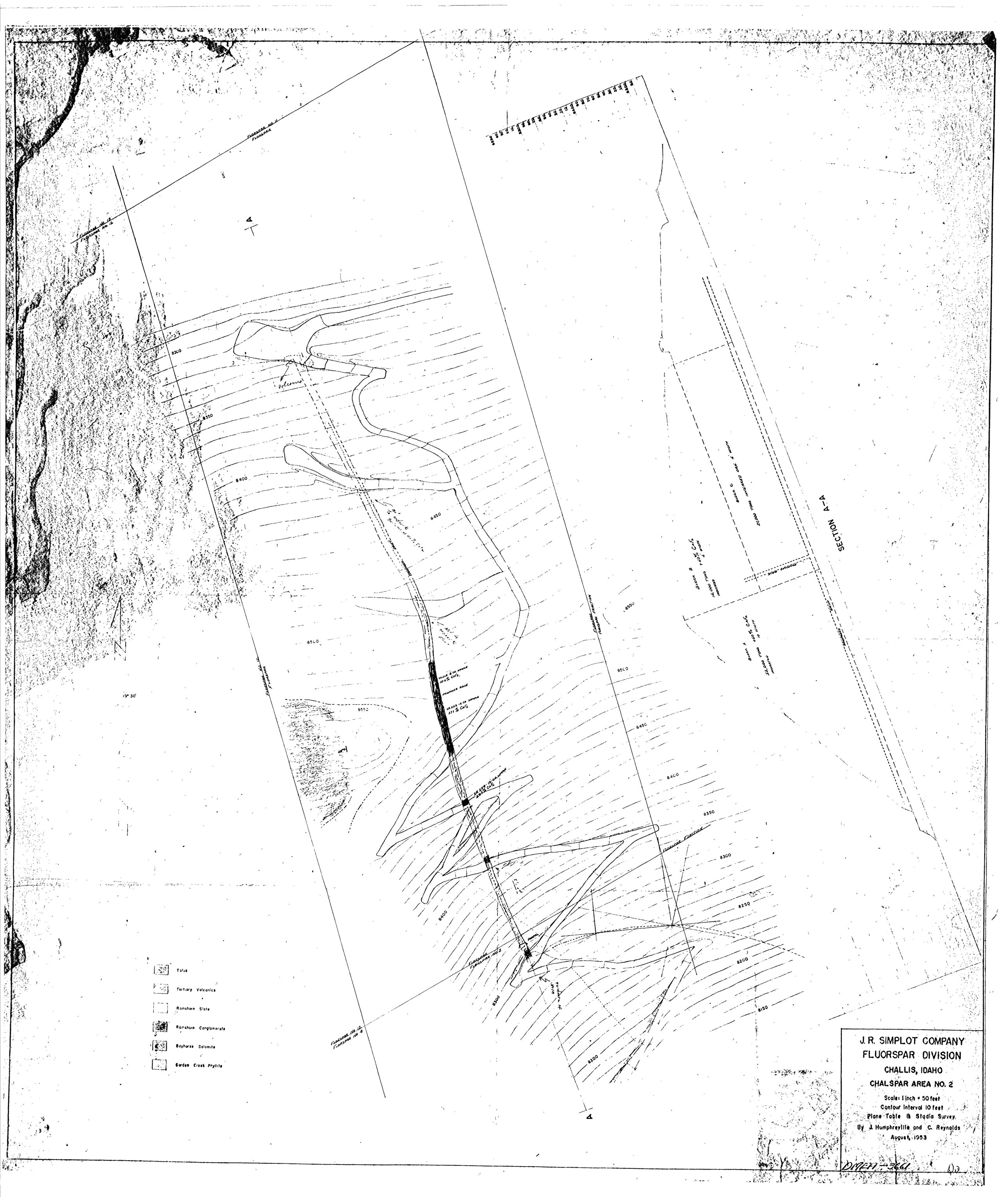
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Volcanics
Proposed Raise
Block C
Proposed Open Pit Mining
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Block B
+20% CaF2
5' Width
15,000 Tons
Inferred
Block A
+20% CaF2
10' Width
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Talus
Tertiary Volcanics
Ramshorn Slate
Ramshorn Conglomerate
Bayhorse Dolomite
Garden Creek Phyllite
J. R. SIMPLOT COMPANY
FLUORSPAR DIVISION
CHALLIS, IDAHO
CHALSPAR AREA NO. 2
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Contour Interval 10 feet
Plane Table & Stadia Survey
By J. Humphreyville and C. Reynolds
August, 1953
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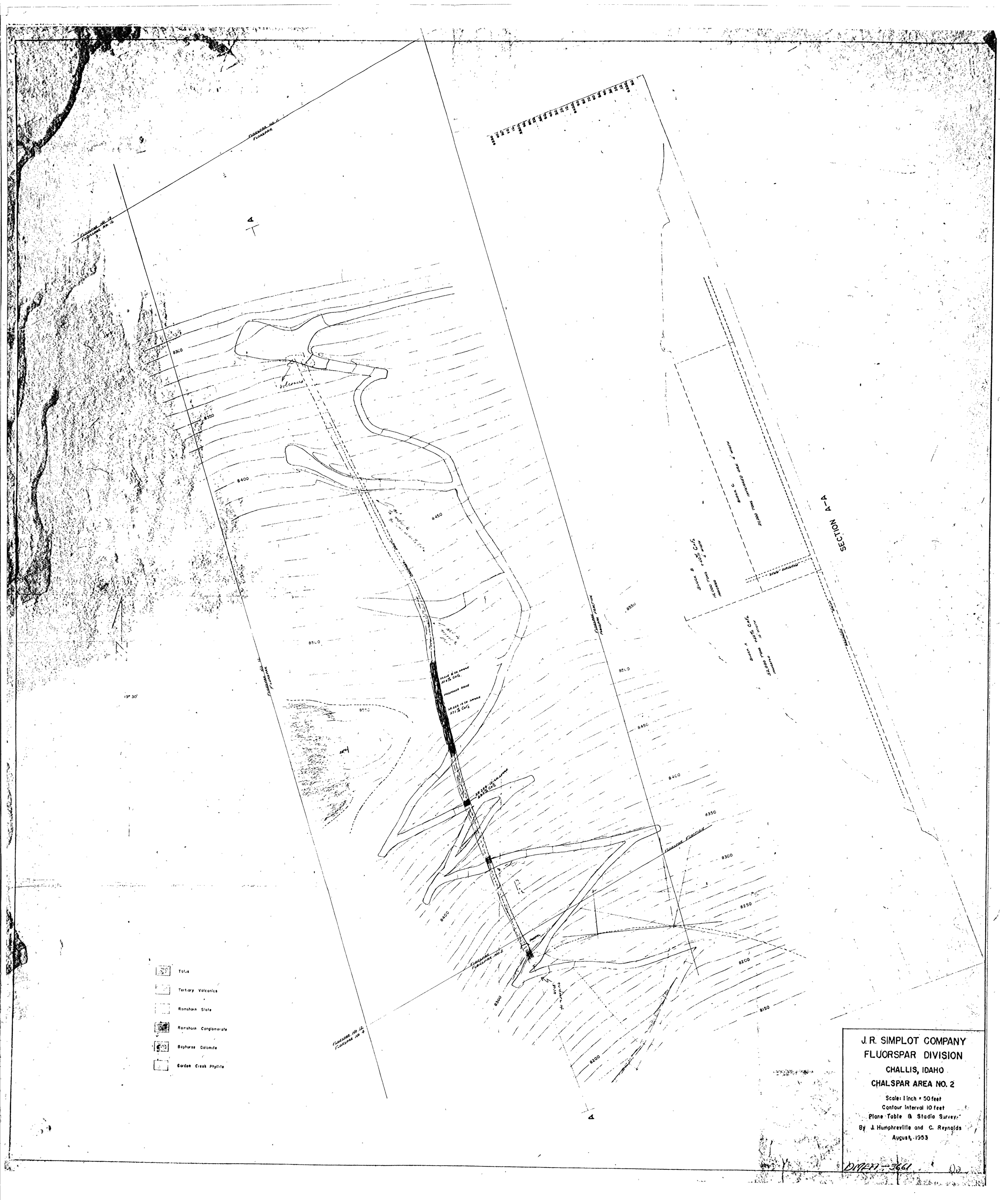
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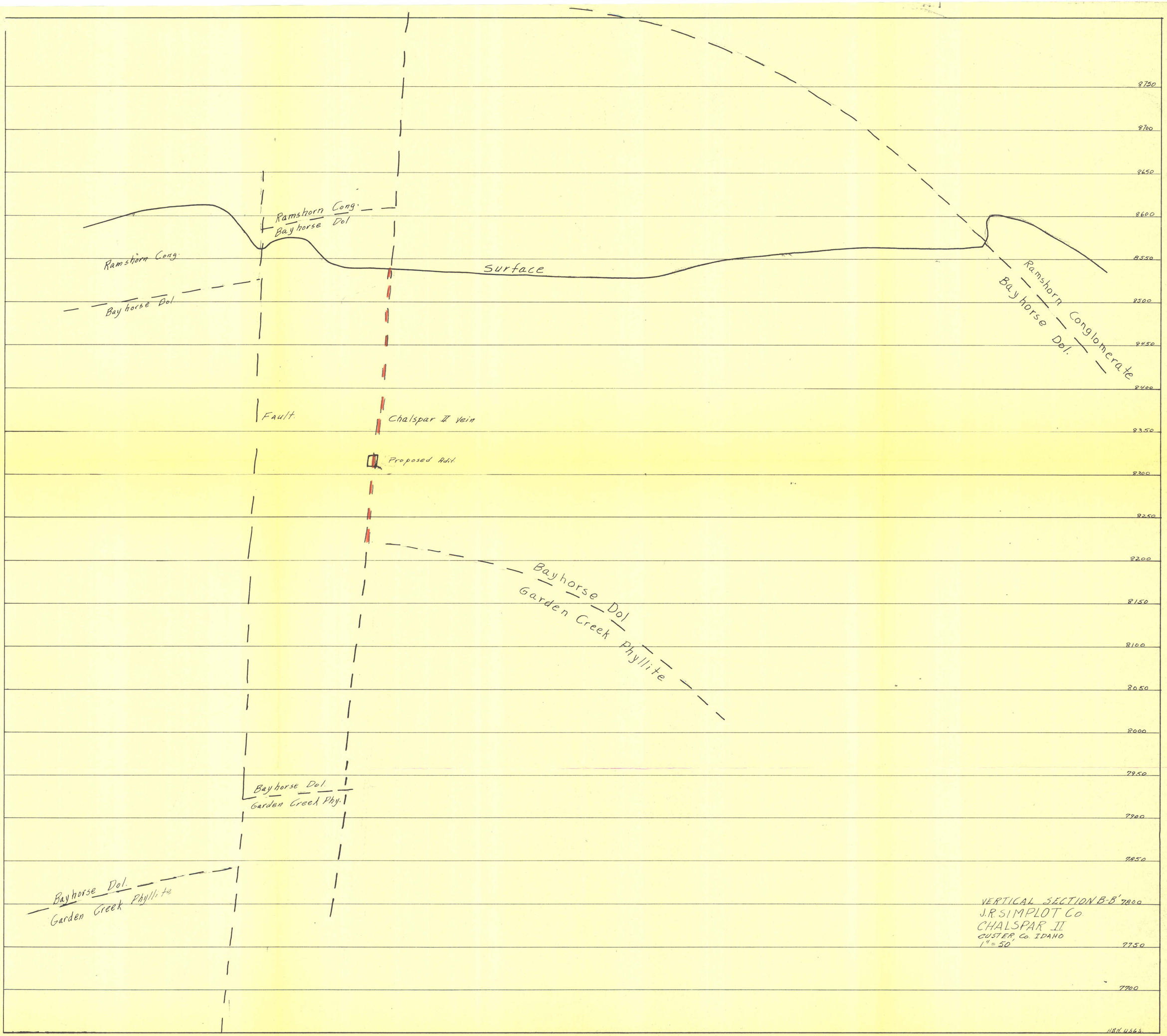
Tertiary Volcanics
Ramshorn Slate
Ramshorn Conglomerate
Bayhorse Dolomite
Garden Creek Phyllite
Volcanics
PROPOSED RAISE
FLUORSPAR NO. 11
FLUORSPAR NO. 12
FLUORSPAR NO. 13
FLUORSPAR NO. 2
FLUORSPAR JUNCTION
8350
8400
8450
8500
8550
8300
8250
8200
8150
19° 30'

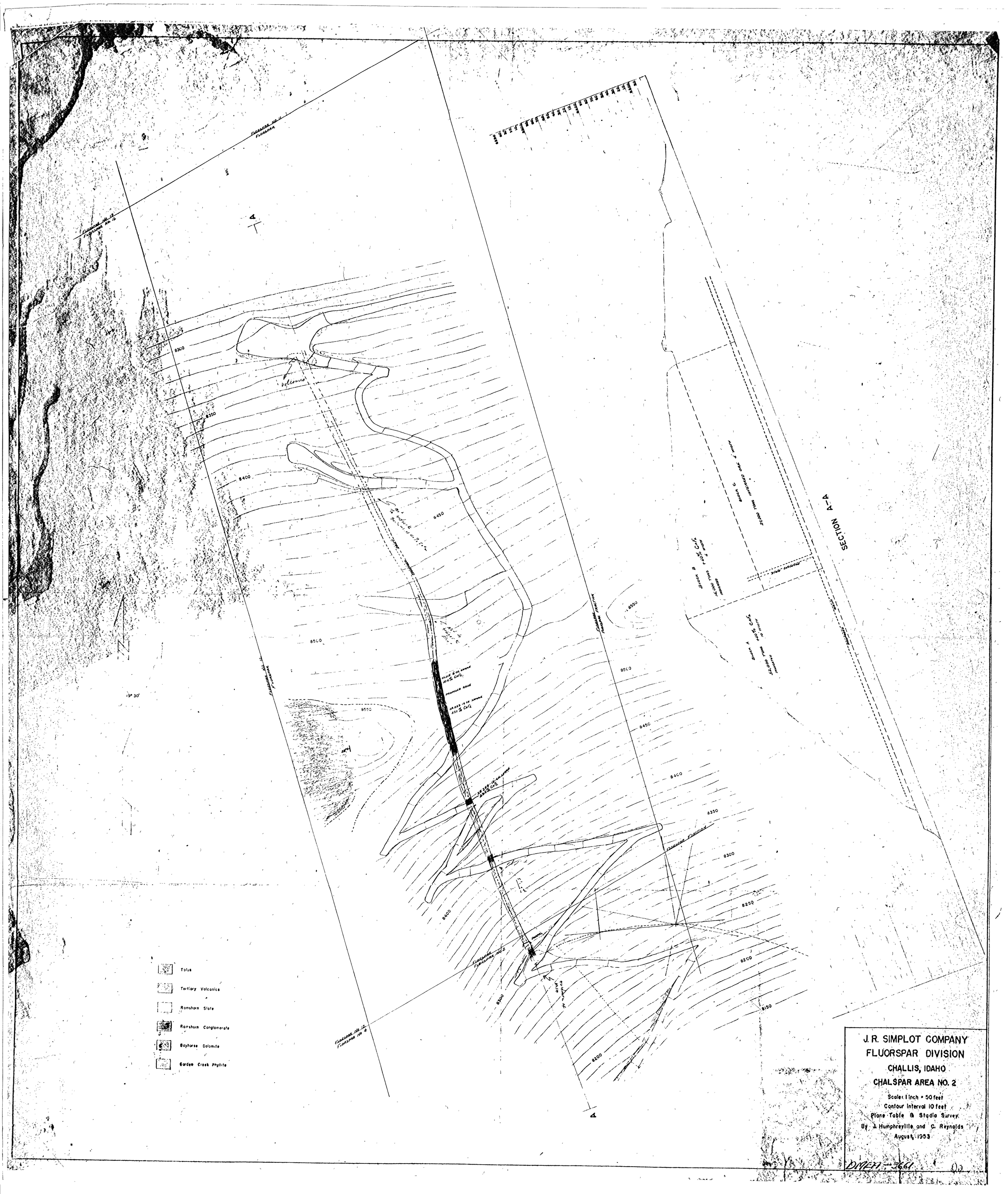
DMEM-3661

FLORSPAR No. 11
FLORSPAR
FLORSPAR No. 13
FLORSPAR No. 12
8300
8350
8400
8450
8500
8550
8500
8450
8400
8350
8300
8250
8200
8150
8200
8400
8500
8550
19° 30'
volcanics
FLORSPAR No. 12
FLORSPAR
FLORSPAR FRACTION
FLORSPAR FRACTION
FLORSPAR No. 2
FLORSPAR No. 12
FLORSPAR No. 4
SR 255 5 Ch. SAMPLE
37.4% CaF2
PROPOSED RAISE
SR 253 14 Ch. SAMPLE
57.1% CaF2
SR 254 12 Ch. SAMPLE
53.2% CaF2
BLOCK C
21,000 TONS
INFERRED ORE 5' WIDTH
BLOCK B
+20% CaF2
15,000 TONS
INFERRED
5' WIDTH
BLOCK A
+20% CaF2
52,000 TONS
INFERRED
10' WIDTH
PROPOSED RAISE
PROPOSED DRIFT
SECTION A—A
A
A
Talus
Tertiary Volcanics
Ramshorn Slate
Ramshorn Conglomerate
Bayhorse Dolomite
Garden Creek Phyllite
J. R. SIMPLOT COMPANY
FLUORSPAR DIVISION
CHALLIS, IDAHO
CHALSPAR AREA NO. 2
Scale: 1 inch = 50 feet
Contour Interval 10 feet
Plane Table & Stadia Survey
By J. Humphreville and C. Reynolds
August, 1953
DMEA—3661


8750
8700
8650
8600
8550
8500
8450
8400
8350
8300
8250
8200
8150
8100
8050
8000
7950
7900
7850
7800
7750
7700
Ramshorn Cong.
Bayhorse Dol
Ramshorn Cong.
Bayhorse Dol
Surface
Ramshorn Conglomerate
Bayhorse Dol.
Fault
Chalspar II Vein
Proposed Adit
Bayhorse Dol
Garden Creek Phyllite
Bayhorse Dol.
Garden Creek Phy.
Bayhorse Dol.
Garden Creek Phyllite
VERTICAL SECTION B-B'
J.R. SIMPLOT Co.
CHALSPAR II
CUSTER, Co. IDAHO
1" = 50
HBK 4563

CHALSPAR II
J.R SIMPLOT Co.
Custer Co, Idaho
Scale 1" = 50'

Base Map by J Humphreville & C Reynolds. Additions by H Nickelson USGS


Talus
Tertiary Volcanics
Ramshorn Slate
Ramshorn Conglomerate
Bayhorse Dolomite
Garden Creek Phyllite
SECTION A-A
J. R. SIMPLOT COMPANY
FLUORSPAR DIVISION
CHALLIS, IDAHO
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