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MINING ENGINEER

7M. 11/11/71
- 3 copies pls.
R. I. Kirchman, E.M.

Box 327

Lordsburg, N. M. 88045

November 8, 1971

PHONE
505-542-3403

RECEIVED BY
E. C. SKINNER

NOV 11 1971

Mr. E. C. Skinner, Vice-President
Minerals Development
International Minerals & Chemical Corporation
Old Orchard Road
Skokie, Illinois 60076

RECEIVED BY
E. C. SKINNER
NOV 11 1971

Dear Mr. Skinner:

I take the opportunity of presenting an expansion of facts and contributing factors favorable for the development and exploitation of the fluorspar deposit in Cochise County, Arizona which was visited by your two Representatives, Mr. H. A. Stewart and Mr. J. Bruce Inswiler. These two Geologists were on the property on Wednesday, November 3, 1971. They examined and took samples of the lower part of the carboniferous outcrop for a distance of about one and one-half miles. They did not have time to sample the thickness (normal to dip of bedding) of the limestone. It is the opinion that this altered carboniferous limestone is the Escabrosa Limestone of Middle Mississippian Age and could possibly have a thickness of about 1200 feet.

A white crystalline granite occurs along the base of this Escabrosa Ls. which dips NE 27°, Strike S. 30° E. This granite is apparently intrusive underneath the bedding plane of the Escabrosa Ls. and above a lower formation not exposed here, possibly the Martin Limestone of late Devonian Age. The granite outcrop contains numerous veinlets of high grade crystals of white transparent fluorspar at various places along the west side of the contact between the granite and the Escabrosa Ls. The white Escabrosa Ls. is conspicuous from State Highway 666 from the floor of the Sulphur Springs Valley seven miles to the west of the mountains. This white outcrop represents a halo of metamorphism confined by the overlying Cretaceous shale to create a visible tabular form of the altered "lime-fluorine" deposit.

R. I. Kirchman, E.M.

Box 327

Lordsburg, N. M. 88045

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FLUORSPAR SHORTAGE

A forecast has been made that the world consumption of fluorspar will increase from 3.5 million metric tons (2204.6# per MT) to 6 million metric tons by 1975. The availability of fluorspar and other fluorine sources in sufficient quantities to keep up with forecast demand is in some doubt. The increase in price for fluorspar has become a function of beneficiation by floatation, heavy media separation, peletizing and/or other means. The important significance of beneficiation is emphasized by the present practice of extracting fluorine from the concentrated mineral fluorapatite. At least two companies are producing cryolite and aluminum fluoride from this fluorine source. It is of interest to note that the fluorine element in fluorapatite varies from 4.1% F to 4.7% F., depending upon the formula taken for the mineral compound. The above percentages would indicate the equivalent of 8% to 9.4% of calcium fluoride. Your attention is directed to the fact that spar deposit under consideration would from indicated assays present a raw product in great quantities, having an assay content of 15% calcium fluoride to be beneficiated by mechanical means to 85% and above that by more refined methods of treatment to produce acid spar.

The indication is that we have here a very large low-grade deposit capable of supporting an output of many thousands of tons per day over a long period of time. It is conceivable that by blending the minable product that an optimum grade of material could be produced. Also, there is great certainty that high-grade ore (85% CaF_2 contained) will be encountered in the course of mining exploitation because there is present outcrop of such material.

FAVORABLE ASPECTS.

The Phelps Dodge Corporation (Copper) contemplates the expenditure of millions of dollars in the installation of equipment for the recovery of the sulphuric acid from

R. I. Kirchman, E.M.

Box 327

Lordsburg, N. M. 88045

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the smelter smoke at their Clifton, Ajo and Douglas Arizona smelter. This latter plant is about twenty-five miles from the spar deposit. Now, there is a limited demand for sulphuric acid. The transportation and storing of this acid is another factor to be contended with in the future. This Company should be very much interested in any project which would afford an outlet for this acid. It is my belief that they would be receptive to an invitation to participate in such a venture as we have under consideration.

It should be noted that we are close to the border of Old Mexico. The town of Naco about forty miles from the spar property is located in Old Mexico and is connected by railway with Nogales (in Old Mexico) to the west some fifty miles. The town of Nogales is the railhead and Port of Entry; this railway gives access to both Atlantic and Pacific seaports. A branch terminal of the Southern Pacific Railway is at an Airport about ten miles to the south of the spar deposit. A very favorable freight differential could be worked out with either the SP Ry. or the Mexican Ry. both being possible competitors for a lucrative freight business.

Mr. L. Osmer informed me that at the time of the visit of the two Geologists from your Company he personally took samples normal to the strike of the deposit (which would represent the thickness); and he subsequently made a quick qualitative heat test with the result that all of his samples fluoresced, indicating the presence of fluorine. This experiment conformed with our sampling previously in Section 36 about 1 1/2 miles southeast of where Osmer took his samples (Sec. 36, T-20-S; R-27-E).

A perspective of the entire area would indicate the possibility that twelve sections of ground would be involved in the mineralized area. This deposit outcrops on the surface and, as a consequence, surface quarry mining would be instituted with no initial waste stripping. The future stripping involved would be the removal of a

R. I. Kirchman, E.M.

Box 327

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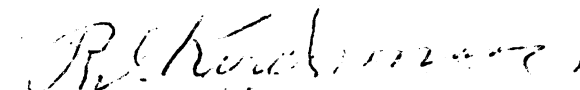
-4-

covering of about three square miles of Cretaceous shale along the eastern border. It is believed that this shale would have been considerably eroded. There has been a period of erosion of this shale indicated by the covering of the white outcrop to the southeast and of the Cretaceous shale to the immediate northwest by extrusive lava. Again it is predicted that a concentration of precious and base metals will be uncovered beneath this shale, concentrated after the abstraction of the fluorine mineralizer containing the accessory minerals (precipitated by the lime solutions) and the metals carried upward by colloid solution involving sulphides. There are various silver mining property locations in the immediate vicinity.

It is our proposal that your firm join us in underwriting the venture with the development expenditures and engineering operations to be controlled by your firm - the expansion of the area to be dictated by the initial portent from the economic discoveries.

In closing, it is permissible to state that the writer has had experience in the development and mining exploitation of a very large open copper operation. This fluorine deposit is from personal experience a most unusual and unsuspected occurrence.

Very truly yours,



R. I. Kirchman, E. M.

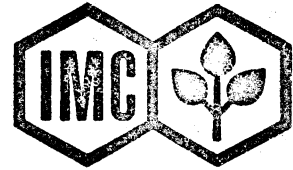
rik;nh

cc: Mr. Lou Osmer
P. O. Box 43
Tyrone, New Mexico

Mr. Brian Bell
P. O. Box 1533
Silver City, New Mexico

COPIES TO:

Dr. D. H. Freas
Dr. D. L. Everhart
J. B. Imswiler- Reno ✓



TO Mr. E. C. Skinner
FROM H. A. Stewart
DATE November 15, 1971
SUBJECT R. I. Kirchman - Fluorspar Prospect - Cochise County, Arizona

As you know, J. B. Imswiler and I inspected the Swisshelm Mountains "fluorspar" deposit on November 3. J. B. Imswiler has written a report of our investigation which is quite complete with the exception of chemical analyses which were done here in Florida, and the mineralogical analyses done at Libertyville.

During discussions with Mr. Kirchman in Arizona, I asked what analytical method was used by Dr. Wilson to determine that calcium fluoride is present in the massive limestone ore body. Kirchman stated that all analyses had been run by atomic absorption and that the CaF_2 ranged from slightly over 20% to a low of about 6%. I did not question Kirchman further on analytical methods, but it seems to be a well known fact that fluorine can not be determined with atomic absorption equipment. Calcium, however, can be analyzed quite accurately by A.A. methods. I am attaching a copy of the analyses done by the Noralyn laboratory which indicate that the high grade vein was indeed high grade, showing 43.2% F. The Number 2 sample which was a contact sample of the conglomerate material showed 11.7 F. The remainder of the samples analyzed less than 1% F which means that there is no possibility that Mr. Kirchman's analyses were correct.

The procedure used at the Noralyn laboratory for fluorine determination involves digestion of the sample and volatilization of fluorine with perchloric acid. This is a standard method and should be relatively fool-proof.

On the basis of these results, it is quite obvious that the massive deposit described by Kirchman is mainly limestone.

H. A. Stewart
H. A. Stewart

HAS:cah

Attachment

FLUORSPAR BENEFICIATION

Date: 11-12-71 Charge #: 75-0080 Location: SURSHENI MTS. ARIZONA Technician: Wheeler

| Assay # | Field # | Total CaO | Acid CaO | CaF ₂ Calculation | CaCO ₃ Calculation | SiO ₂ | Al ₂ O ₃ | Fe ₂ O ₃ | MgO | K | SO ₃ | CO ₂ |
|---------|---------|--------------|-------------|---------------------------------|----------------------------------|------------------|--------------------------------|--------------------------------|-------|-------|-----------------|-----------------|
| 24 | 10-3-1 | 27.20 | 0.54 | 32.12 | 0.96 | 6.13 | 1.98 | 0.47 | 43.20 | 11.70 | | |
| 25 | 11-3-2 | 18.20 | 0.43 | 24.74 | 0.72 | 58.67 | — | — | | | | |
| 26 | 11-3-3 | 50.80 | 4.77 | 5.61 | 93.47 | 5.70 | 0.58 | 0.30 | 0.63 | | | |
| 27 | 11-3-4 | 49.40 | 4.02 | 13.06 | 71.43 | 8.33 | 0.37 | 0.07 | 0.29 | | | |
| 28 | 11-3-5 | 53.00 | 43.64 | 13.07 | 72.84 | 2.81 | 0.30 | 0.12 | 0.46 | | | |
| 29 | 11-3-6 | 46.60 | 38.52 | 11.25 | 68.75 | 2.41 | 0.87 | 0.10 | 0.25 | | | |
| 30 | 11-6-6 | 31.40 | 22.44 | 5.97 | 48.39 | 23.55 | 4.40 | 0.63 | 0.80 | | | |
| 26 | | | 29.79 | | | | | | | | | |
| 27 | | | 47.25 | | | | | | | | | |
| 28 | | | 51.12 | | | | | | | | | |
| 29 | | | 45.43 | | | | | | | | | |
| 30 | | | 21.70 | | | | | | | | | |

REGUM ACID CaO

D. H. Freas

J. B. Inswiler

November 5, 1971

Trip to Tucson, Arizona

J. B. Inswiler met H. A. Stewart in Tucson on November 2, 1971 for the purpose of examining the R. I. Kirchman fluorite property in Cochise County, Arizona. This examination was conducted by Stewart and Inswiler on November 3, 1971 and is covered in a separate memorandum.

On November 4, 1971 Inswiler met with George Stathis of ASARCO for the purpose of discussing a possible joint venture at Morey. Stathis seems to be cool toward the project at the present time but has not ruled it out. It is probable that ASARCO will send several people to Morey at sometime in the future to sample and verify IMC's results in the stockwork area north of the summit of Red Mountain.

Inswiler was given the opportunity to go over ASARCO's data on their Venus project at Yerington and to discuss this data with Stathis. On the basis of their data, chances appear to be slim to locate an ore body on the Venus claims.

A meeting was held in Douglas, Arizona with Sidney A. Williams, petrographic consultant, and the whole Blue Jay project was discussed in detail. Williams is in total agreement with the alteration model and the proposed target which have been conceived for this area, but he is adamantly insistent that the intrusive responsible for the alteration is not the type required to produce a porphyry copper. A full report on this project will be submitted as soon as an analysis of the I. P. work has been received.

J. B. Inswiler

D. H. Freas

J. B. Imswiler

November 5, 1971

Examination and Evaluation of the R. I. Kirchman Fluorspar prospect, Cochise County, Arizona

SUMMARY AND CONCLUSIONS

The R. I. Kirchman fluorite prospect is located on the west flank of the Swisshelm Mountains in Cochise County, Arizona. This prospect consists of a small occurrence of crystalline fluorspar confined to two small veins in bedding plane slips within a sequence of coarsely crystalline cherty marble, recrystallized carbonaceous limestone, and silicious argillite. The property was examined by H. A. Stewart and J. B. Imswiler in response to a written report submitted by R. I. Kirchman in which vast tonnages of low grade fluorite were indicated.

The low grade, the occurrence of appreciable silica and the high cost of a required selective mining process make this property appear to be economically unfeasible in the foreseeable future. It is recommended that no further work be done on this property at this time.

DISCUSSION

The R. I. Kirchman fluorspar prospect is located in Section 23, T. 20 S., R. 27 E., Cochise County, Arizona. This property is situated on the west slope of the Swisshelm Mountains at an elevation of approximately 5,400 feet. Access by 4-wheel drive vehicle is possible via a series of unimproved gravel roads leading east from U. S. Route 666 at a point about one mile south of the town of Elfrida, Arizona.

The property consists of an unknown number of unrecorded, unpatented mining claims which show no evidence of having had corners erected or location work performed. The validity of the claims is in serious doubt. An examination was conducted on November 3, 1971 by H. A. Stewart and J. B. Imswiler in the company of R. I. Kirchman, owner, Louis Osmer and Joe Casebolt, Lessees, and Bill and Clifford Kennedy, associates of Mr. Kirchman.

In the report, "Presentation of Fluorspar Deposits in Cochise County, Arizona by R. I. Kirchman - September 17, 1971"

.../...

D.H.Freas
J.B.Imswiler
Report - R.I.Kirchman
November 5, 1971

this prospect is described as follows: ".....It has a thickness normal to the dip of anywhere between fifty and one hundred and fifty feet. It definitely runs for one mile and can be seen for an additional two more miles, i.e. three miles in extent. The fluorspar occurs immediately in and above the white rock and can be traced for about 500 feet to the southwest of its initial outcrop, Claim Spar #1. In various other spots in small seams, the fluorspar can be observed by its crystalline structure, (isometric), this continues for about 2,600 feet to the Southeast of large fluorspar exposure. Spar #1 claim (sic).The chemical analysis varies from 10%, 18% to 22% CaF_2 - made from different rock specimens."

This "deposit" as observed by Stewart and Imswiler consists of one prospect pit dug on two small veins of fluorite. The veins are about four and eight inches thick, respectively, and appear to be controlled by bedding plane slips in a coarsely crystalline marble and recrystallized carbonaceous limestone. This single occurrence contains the only identifiable fluorite observed.

The vast resources of low grade fluorite referred to by Mr. Kirchman appear to be contained in a section of coarsely crystalline chert-bearing marble and interbedded siliceous, sometimes carbonaceous, argillite. This sequence perhaps 200 - 400 feet thick, strikes north 25° west and dips 28° to the northeast, and is underlain and intruded by a fresh, unaltered granite. The only observed evidence of metasomatism was the one insignificant occurrence of crystalline fluorite and the silicification of the argillites. Metamorphism of the limestone appears to be wholly in the form of recrystallization.

Six samples were taken for the purpose of verification of Mr. Kirchman's data, and a descriptive list of these samples is attached to this report. Four of the six samples taken are samples of marble from locations where Mr. Kirchman reports assays of 8 - 20% CaF_2 . No fluorite was observed in any of these samples. Unless some rather astounding surprises are forthcoming, it appears that Mr. Kirchman's analyst is totally lacking in competence and/or integrity. It should be stated parenthetically that this same analyst has done the assay work on

.../...

D.H.Freas
J.B.Imswiler
Report - R.I.Kirchman
November 5, 1971

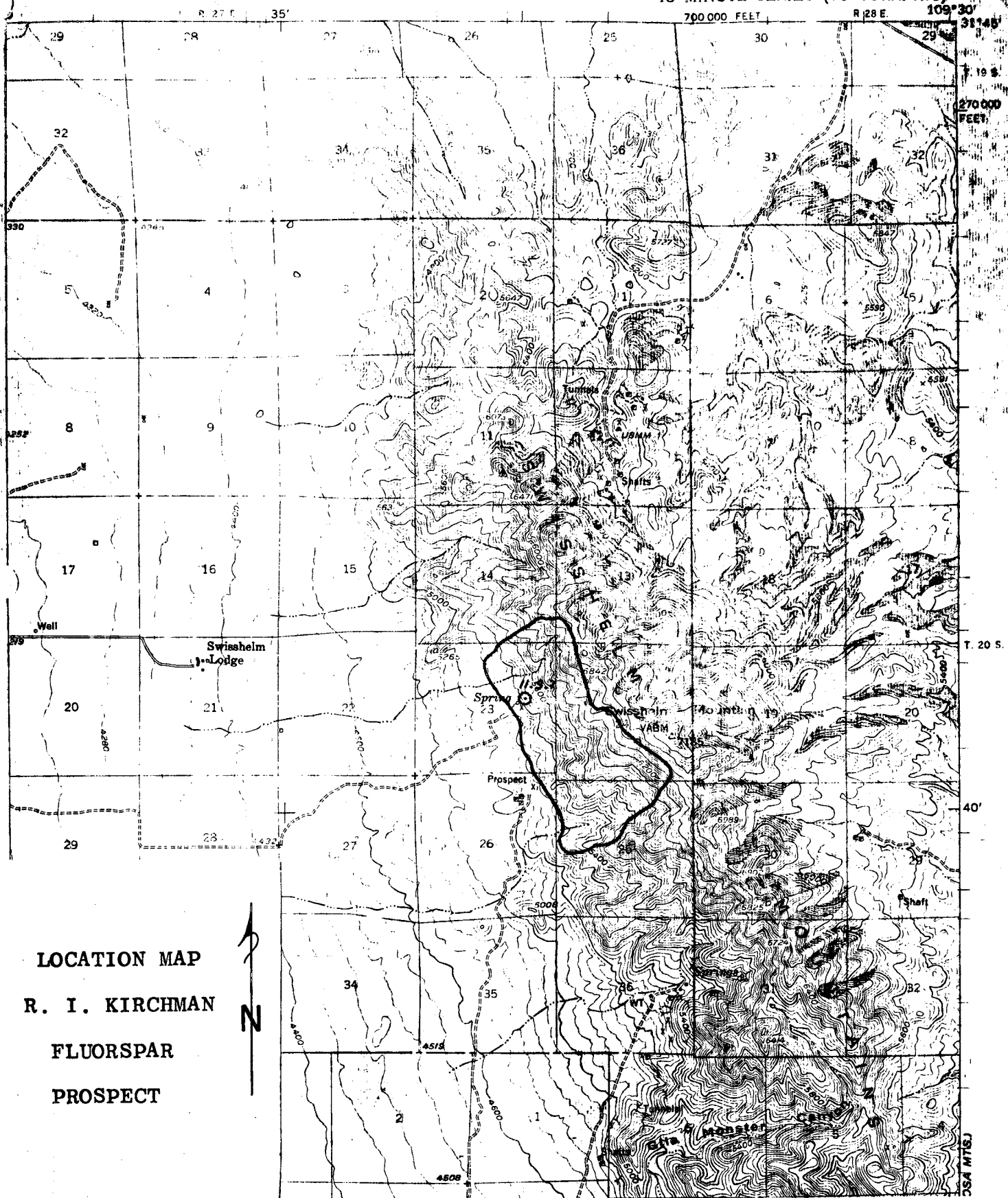
Mr. Kirchman's Silver City platinum property in which IMC has currently expressed an interest.

The low grade, the occurrence of appreciable silica, and high cost of a required selective mining process make this property appear to be economically unfeasible in the foreseeable future even if Mr. Kirchman's analyses should be verified. It is recommended that no further work be done on this property other than to analyze these samples taken for the purpose of ascertaining the validity of Mr. Kirchman's data.

J. B. Imswiler

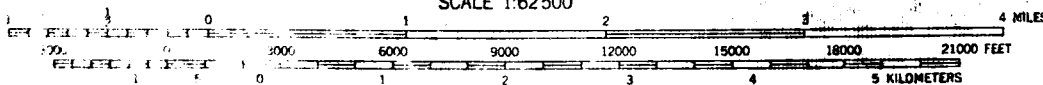
Cc: H. A. Stewart
Peter O. Sandvik

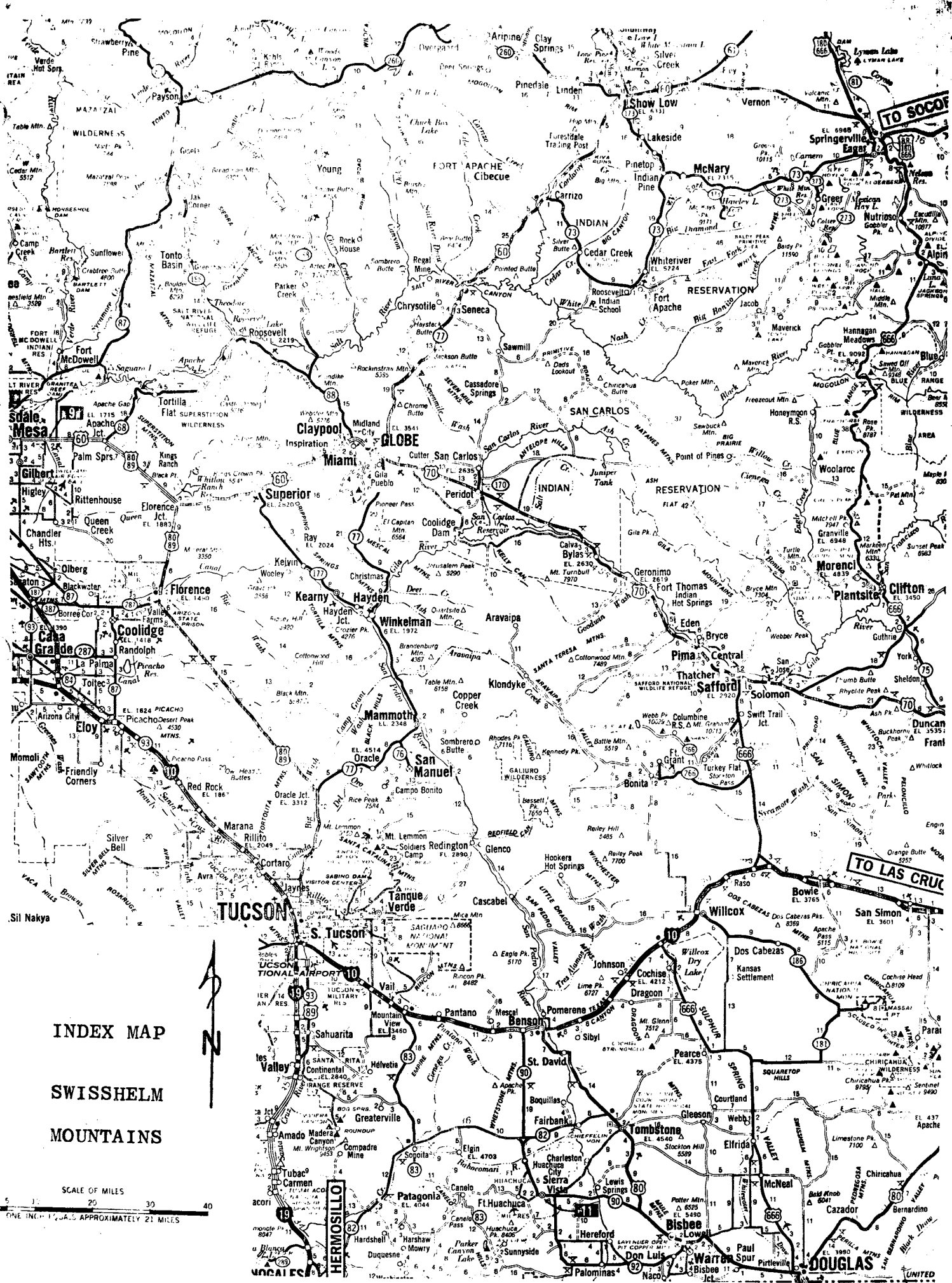
SWISSHELM MTN. QUADRANGLE
ARIZONA-COCHISE CO.
15 MINUTE SERIES (TOPOGRAPHIC)



LOCATION MAP
R. I. KIRCHMAN
FLUORSPAR
PROSPECT

SCALE 1:62500





SAMPLE DESCRIPTIONS - R. J. KIRCHMAN FLUORITE PROSPECT

10-3-1

First stop - 8" vein of high grade at old prospect pit.

11-3-2

Same location as 10-3-1. Pieces of fluorite in recrystallized carbonaceous limestone.

11-3-3

Same location as 11-3-2. Coarsely crystalline marble. Reputed to have 15-20% CaF_2 .

11-3-4

Marble from wash on south end. Reputed to contain 15% CaF_2 .

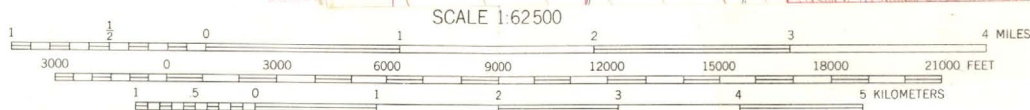
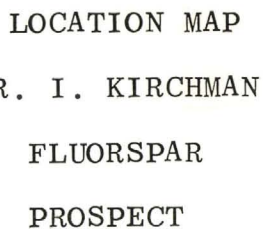
11-3-5

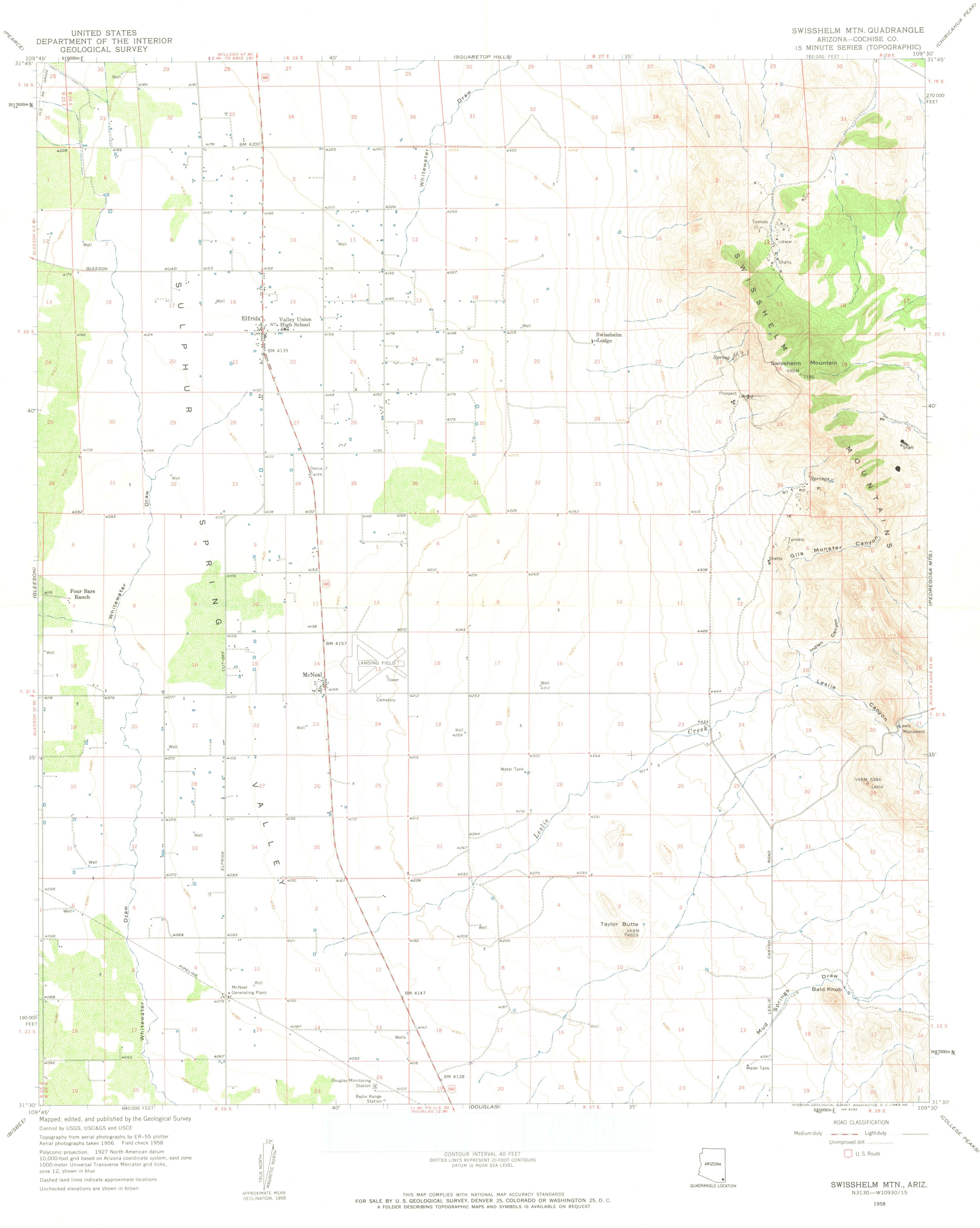
Coarse cherty marble from farthest point south. Reputed to have 8% CaF_2 .

11-3-6

"Sugarline" i.e. Coarsely crystalline marble near north end. Reputed to contain 20% CaF_2 .

(CHIRICAHUA PEAK)





UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SWISHELM MTN. QUADRANGLE
ARIZONA-COCHISE CO.
15 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS and USCE
Topography from aerial photographs by ER-55 plotter
Aerial photographs taken 1956. Field check 1958
Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, east zone
1000-meter Universal Transverse Mercator grid ticks,
zone 12, shown in blue
Dashed land lines indicate approximate locations
Unchecked elevations are shown in brown

TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN
DECLINATION, 1958

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

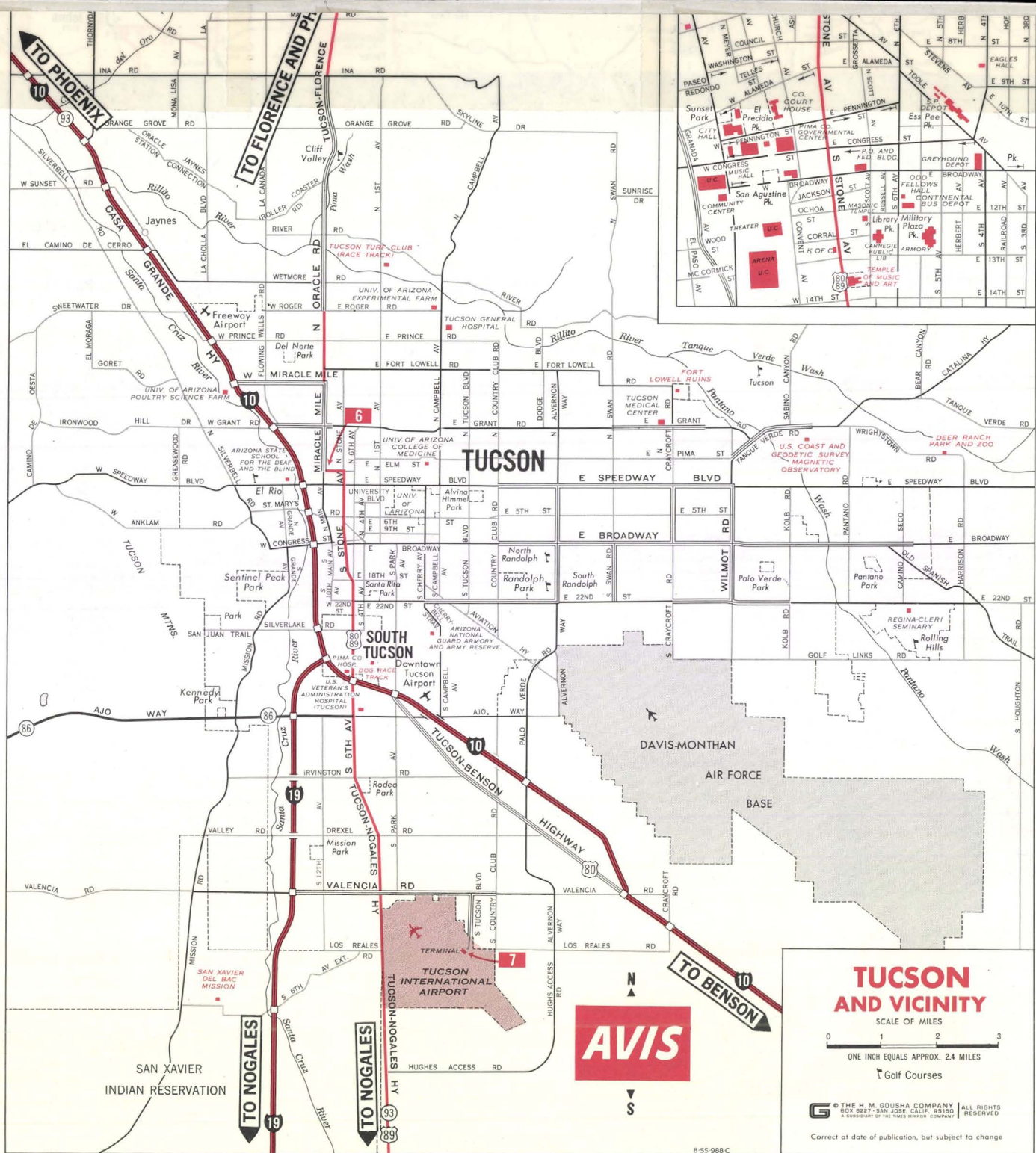
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION
Medium duty ——— Light duty ———
Unimproved dirt ———
U. S. Route

SWISHELM MTN., ARIZ.
N3130-W10930/15

1958



AVIS RENT A CAR LOCATIONS

Numbers correspond with numbered locations on Tucson map above and Tucson and Surrounding Area map on other side. Un-numbered locations are beyond the limits of the map.

6 TUCSON
240 West Drachman Street
602 622-3691

7 Tucson International Airport
602 294-1494

AVIS



INDEX MAP
SWISSELM
MOUNTAINS

SCALE OF MILES
0 5 10 20 30 40
ONE INCH EQUALS APPROXIMATELY 21 MILES

November 16, 1971

Mr. R. I. Kirchman
Box 327
Lordsburg, New Mexico 88045

Dear Mr. Kirchman:

This letter is with regard to the examination made of your fluorspar prospect in Cochise County, Arizona on November 3, 1971 by two of our minerals people--Mr. H. A. Stewart and Mr. J. B. Imswiler. They were accompanied by you, Mr. Louis Osmer, Mr. Joe Casebolt, as well as Messrs. Bill and Clifford Kennedy.

I am attaching the analysis of the samples taken at that time by our people. The chemical work was done in IMC's lab in Florida and was 'phoned in to us last Friday. You will note that other than for the material which was in the vein itself, the fluorine content is extremely low and certainly not commercial.

We are sorry that it turned out this way because as I told you personally we are extremely interested in good fluorite deposits, and this, of course, would have been an ideal location, as you mentioned in your letter, because of its proximity to Douglas and Bisbee.

We wish to thank you for bringing the deposit to our attention, and would appreciate your cooperation in the future in working with us if you have an interesting mineral situation. Since we, of course, are associated in the Silver Spot prospect, we should keep in good communication with each other on any occurrences which come to your attention.

With regard to the Silver Spot thing, we are expecting any day now the results of the analysis being run by an expert in the platinum and its associated metals, and we will be in touch with you as soon as we receive the results.

Yours sincerely,

ORIGINAL SIGNED BY
E. C. SKINNER

E. C. Skinner
Vice President

cc: Messrs. Everhart, Imswiler, Osmer, Stewart, S. A. White

Follow

11/18

November 12, 1971

3:15 pm

Mr. Skinner:

Mr. Al Stewart called with following message.

Analysis - Swisshelm Mountain, Arizona, R. J. Kirchman Fluorite prospect

They reran samples in lab on Arizona fluorspar and following is results.

| | |
|--------|--|
| 10-3-1 | 43.20 fluorine (about 88% CaF_2) |
| 11-3-2 | 11.70 fluorine (about 24% CaF_2) |
| 11-3-3 | 0.63 fluorine |
| 11-3-4 | 0.29 fluorine |
| 11-3-5 | 0.46 fluorine |
| 11-3-6 | 0.29 fluorine |

Note: 11-3-3 through 11-3-6 --- No possibility of significant fluorite.
Florida Phosphate contains much more fluorine than this.

10-3-1 and 11-3-12 - First two specimen samples taken from very thin vein.

Millie