Memorandum

January 20, 1958

To: E. W. Ellis, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of application, DMEA 4919 (uranium), United Western Minerals Company, State and Fee Lands, Teller, Park, and Fremont Counties, Colorado.

The applicant proposes a very large scale, ambitious project to explore for uranium ore deposits. The properties involved comprise about 120 square miles located between Parkdale and Hartsel, Colorado, about 35 miles north of Canon City.

The proposed project would consist of about 325,450 feet of core and non-core drilling, 500 feet of drifting, and 100 feet of raising. The estimated cost of such a project would be over $900,000.

Much of the proposed drilling is on half-mile centers, which is very wide and might be construed by some as prospecting. Some of the other drilling, on the other hand, is more closely spaced about areas where the applicant claims to have found radiometric anomalies. The latter drilling might be more appropriate for DMEA participation.

The applicant's maps indicate that many radiometric anomalies are present on the property; but if he has sampled the radioactive areas he does not so state nor has he submitted assays of samples he may have taken.

It appears that final evaluation of the property will only be arrived at through field examination. Under those conditions I recommend that the application be referred to the Field Team for further processing.

Copy to: DMEA (3)
C. I. Gamber
James Paone, 3643
Docket file
Chron. file
Director's reading
Branch reading

W. P. Williams

WPWilliams:pbb
G-MD: 1/20/58

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

MAR 2 1959

Mr. Alva A. Simpson, Jr., President
United Western Minerals Company
136 West Palace Avenue
Santa Fe, New Mexico

Re: Docket No. DMEA-4919 (Uranium)
Chumsky Park and Tallahassee
Creek lands
Park and Fremont Counties, Colorado

Dear Mr. Simpson:

Reference is made to our letter of January 29, 1959, regarding action required to make your DMEA application eligible for consideration under the OME regulations.

We wish to cooperate with you in allowing ample time to complete such action; but, if we do not hear from you within 30 days from the date of this letter, we will assume that you are no longer interested in proceeding with your application, and we will consider it as having been withdrawn.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Director

MChing/gla
3-2-59
cc to: Director's Reading File
THKillsgaard, 5224
Mr. Ching
OME Field Team, Region III (2)

June 10, 1958

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of field examination report, DMEA 4919 (Uranium) United Western Minerals Company, Fremont, Park, and Teller Counties, Colorado

The examining team recommend approval of a DMEA contract that would provide for a total of 32,250 feet of drilling, at a total estimated cost of $44,223. The project recommended by the examiners is much reduced and modified from the applicant's proposal.

Large portions of the applicant's property do not warrant exploration on geologic grounds. Three areas have been chosen by the examining team as worthy of additional work. The modified project would explore favorable lithologic units along known and inferred northwest structural trends in one area and would explore a known mineralized zone in another area.

I agree with the recommendations of the Field Team on the grounds that economically significant uranium deposits are likely to be discovered by the proposed drill holes.

The Field Team points out that the applicant may not have sufficient interest in the lands for DMEA purposes.

W. P. Williams

cc: DMEA (3)
James Paone
C.I. Gardner
Director's reading
Branch reading
Chron. file
Docket file

WPWilliams/mm
G-MD-6-10-58

4919

SEP 1958

DMEA

25th Fev Customhouse
Denver 2, Colorado
June 3, 1958

Memorandum

To: Secretary to the Operating Committee

From: Field Team, Region III

Subject: Docket No. DMEA 4919 (Uranium) United Western Minerals Company, Fremont, Park and Teller Counties, Colorado - Joint Report of Examination

Enclosed are the original and two copies of a Joint Engineering and Geologic Report of Examination by Donald E. Richter, USGS, and W. V. Vinal, DMEA.

The field examiners conclude that exploration in three localities in two of the Applicant's areas appears to be warranted. They recommend a highly modified version of the Applicant's exploration proposal, in which the Field Team concurs.

The Applicant's representative has been uncooperative throughout the period of processing this application. Failure to keep firm appointments, failure to seek our Ranger with the various claim groups to assist the examiners, and failure to assist in reconciling apparent claim conflicts and discrepancies in property rights seriously delayed completion of the examination and report.

We seriously doubt that the Applicant has a sufficient interest in the claims on which exploration is proposed to satisfy the Government and we suggest that your legal section review the documents by which the Applicant purports to hold the property. We suggest you notify the Applicant of any additional documents needed and prepare the Consent to Lease forms for signature.

Also enclosed are eight extra copies each of Figures 2 and 3 for use in the contract.

Original signed by
E. N. HARSHMAN

E. N. Harshman

Original signed by
J. W. TOWNSEND

J. W. Townsend

Reviewed by
DMEA OPERATING COMMITTEE

(date)

EHC:dp

cc: Harshman
DMEA/RFC 2
Baker
Docket
Chron.

FOR GOVERNMENT USE ONLY

JUN 6 1958
COLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

JOINT REPORT OF EXAMINATION BY EXAMINING TEAM
KEOTON III

DMEA
DEPARTMENT OF THE INTERIOR
JUN 2 - 1958
REGION III
DENVER, COLORADO

DMEA 6919

United Western Minerals Company

Fremont, Park, and Teller Counties, Colorado

TRANSMITTED
JUN 4 1958

Uranium

Joint Engineering and Geologic Report

by

Donald H. Richter, Geologist
Geological Survey

W. W. Winkel, Mining Engineer
Carl Belser, Mining Engineer
Bureau of Mines

May 29, 1958

Reviewed by
DMEA OPERATING COMMITTEE

(date)

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DMEA 4919

UNITED WESTERN MINERALS COMPANY
TELLER, FREMONT, AND PARK COUNTIES, COLORADO

INTRODUCTION AND SUMMARY

On January 16, 1958, the United Western Minerals Company, 136 W. Palace Avenue, Santa Fe, New Mexico, applied for Government assistance to explore a large group of claims and leases in Park, Teller, and Fremont Counties, Colorado, for uranium. Estimated cost of the exploration program, which consisted principally of non-core drilling, with some underground work, is approximately $800,000. A preliminary examination of the applicant's claims and leases, and surrounding properties was made during the period March 3-6, 1958, by D. H. Richter, U. S. Geological Survey, and Carl Belser U. S. Bureau of Mines. A second examination was tentatively scheduled for the week of March 10-14, but due to inclement weather was necessarily postponed. On March 31, 1958, the field examiners were informed that United Western Minerals Company had entered into an exploration agreement with Newmont Mining Corporation, a company whose policy has been against Government aid in mineral exploration, and wished to postpone their request for aid. After drilling only five holes, however, Newmont Mining Corporation cancelled the exploration agreement and on April 16, 1958, the applicant rescinded their postponement request. During April 28-30, 1958, the second and final field examination of the properties was conducted.

The applicant's properties are in and around the Thirty-nine Mile volcanic field, a Tertiary volcanic province in central Colorado. Significant uranium deposits, with a probable present potential of about 100,000 tons containing 0.28 percent U_3O_8, are apparently restricted to the Tallahassee Creek area, a small 36 square mile area in the southeast part of the field. The uranium occurs as uraninite and autunite in carbonaceous tuffs, arkose, and volcanic agglomerate in the volcanic sequence. The ore deposits also show a spatial relation to known faults and surface lineations.

At the present time only two of the applicant's areas, namely, the Tallahassee Creek and Chumway Park areas, appear to warrant Government assistance in exploration. The remaining areas are generally deficient in promising geologic features and/or lack initial prospecting; therefore the exploration proposed on them by the applicant cannot be justified. A modified and systematic two-stage exploration program consisting of a maximum of 32,250 feet of non-core drilling at a total cost of $44,222.50 in the two areas mentioned above is recommended. This exploration is designed to test extensions of mineralized trends and radioactivity anomalies in areas of favorable lithology and structure which may result in the discovery of additional significant uranium deposits.

ACKNOWLEDGMENTS

Mr. Richard Hamburger of the Atomic Energy Commission was consulted several times regarding the geology and exploration potential of the area.

Memorandums from George C. Selfridge, W. P. Williams, and James Paone were noted.

LOCATION, TOPOGRAPHY, AND CLIMATE

The United Western Minerals Company's holdings consist of claims, leases, options to purchase on 2,669 unpatented mining claims, mineral rights on fee land, and 17 State Land Board mineral leases comprising a total of 66,903 acres, scattered over an area 48 miles long by 30 miles wide in Fremont, Park, and Teller Counties, Colorado (figs. 1 and 1A). Of these scattered areas two were selected as worthy of DMEA aid. They are the Tallahassee Creek area in Fremont County and the Chumway Park area in Park County.

The terrain of the areas of interest is one of moderate relief. Elevations range from about 8,500 feet at Chumway Park, to 8,800 feet in the Tallahassee Creek area. The Chumway Park area is in sec. 19, T. 15 S., R. 73 W., 6th P. M., and sec. 24, T. 15 S., R. 74 W., 6th P. M., Park County, Colorado. The Tallahassee Creek area is subdivided into two locales--the North Tallahassee Creek locale in secs. 9 and 10, T. 17 S., R. 73 W., 6th P. M., Fremont County, Colorado, and the Middle Tallahassee Creek locale in secs. 21 and 22, T. 17 S., R. 73 W., 6th P. M., Fremont County, Colorado.

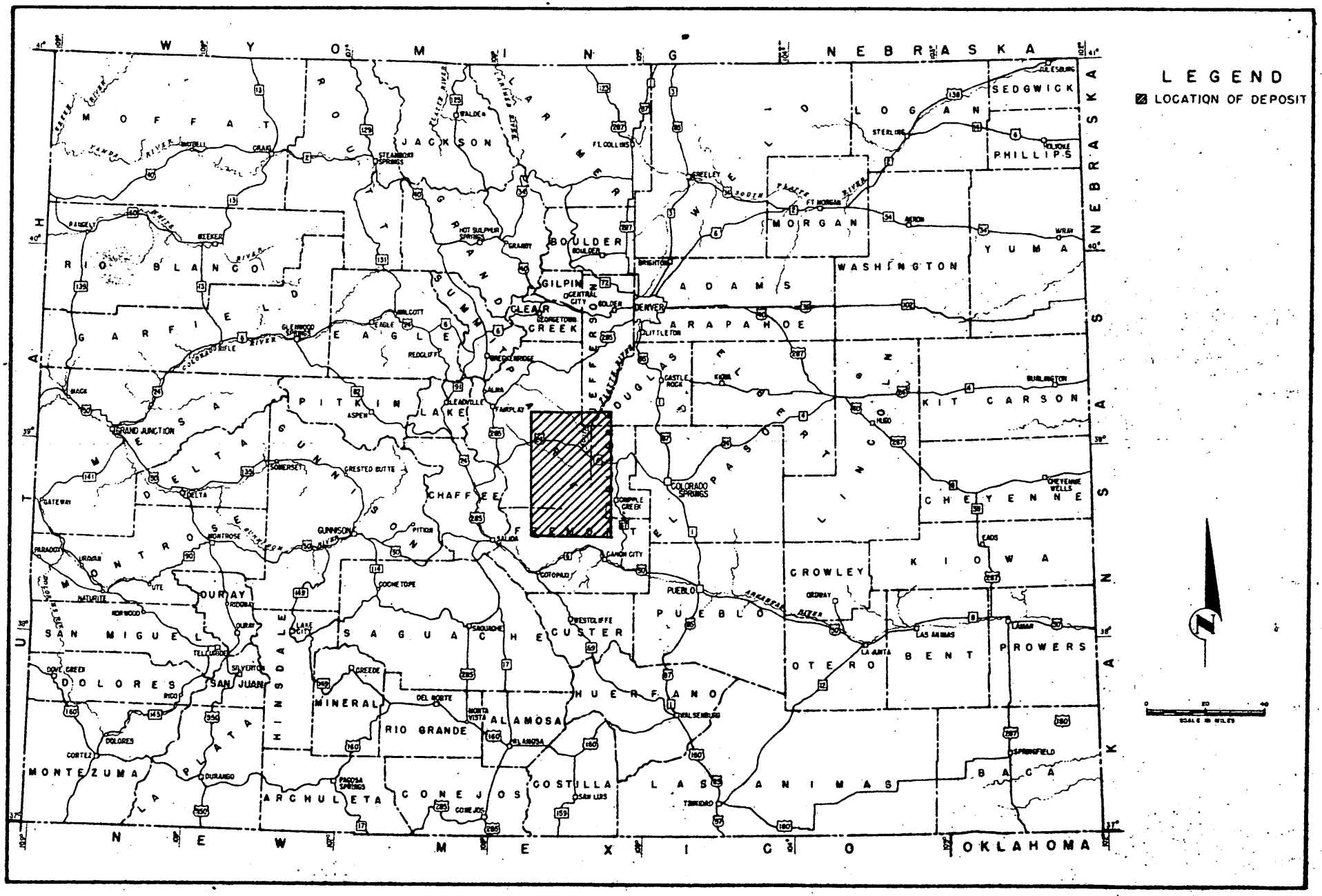

FIGURE 1 - LOCATION MAP, UNITED WESTERN MINERALS COMPANY'S HOLDINGS, FREMONT, PARK, AND TELLER COUNTIES, COLO.
DMEA 4919

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RECEIVED JUN 6 1958

DATE	INITIALS	CODE

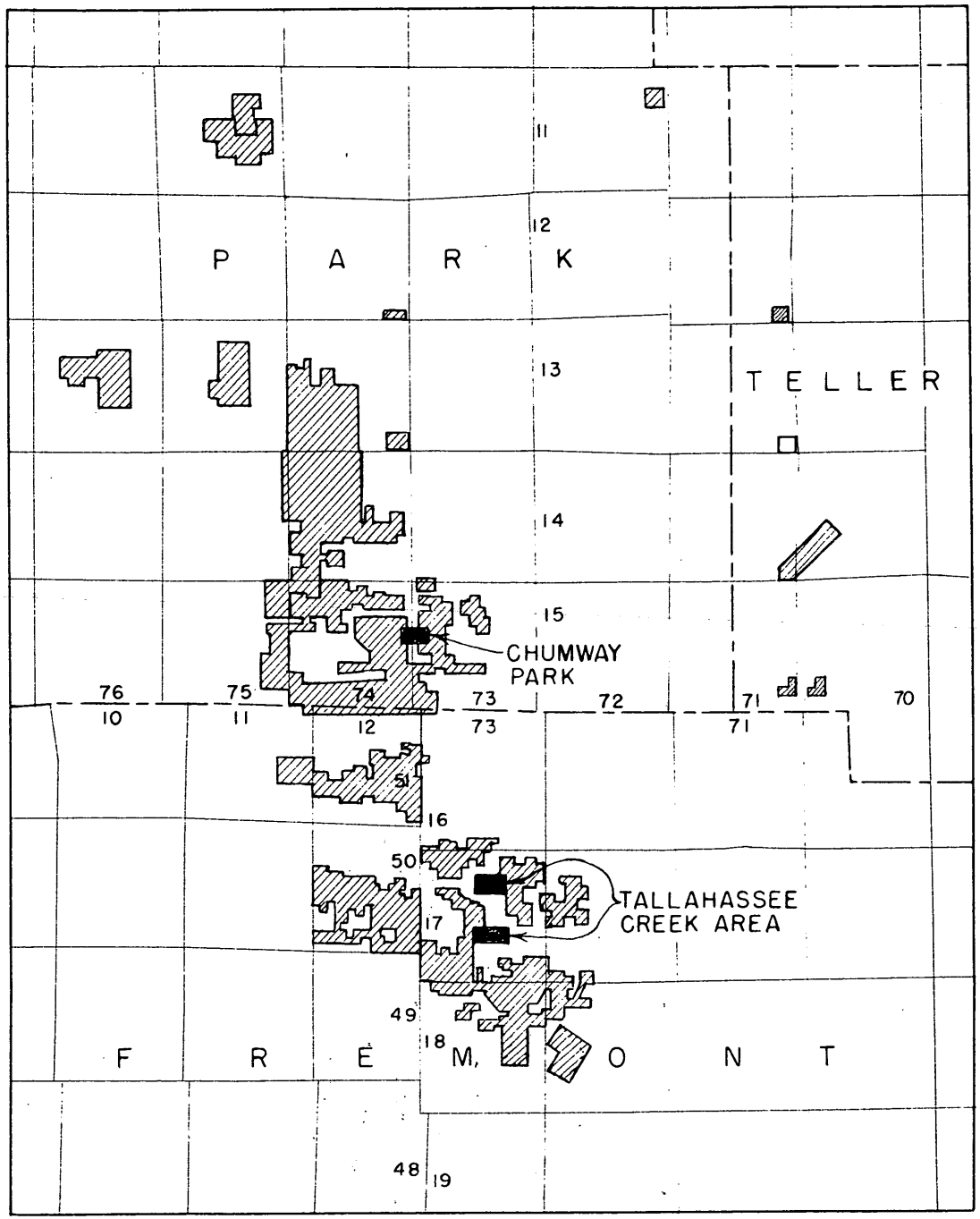

Figure 1A.- Map showing United Western Minerals Company's holdings, Fremont, Park, and Teller Counties, Colo. DMEA 4919

EXTRA COPY
DMEA
RECEIVED JUN 6 1958

DATE	INITIALS	CODE

To reach the properties take U. S. Highway 50 west from Canon City, Colorado, 9 miles to its junction with State Highway 9. From the junction, State Highway 9 is followed northwesterly 12.8 miles to the junction with the Smiths Gulch road; thence 7 miles westerly over the Smiths Gulch road to the North Tallahassee locale and 11 miles to the Middle Tallahassee locale. The Chumway Park area is 3 miles southwest over a fair county road which turns off State Highway 9, 23 miles north of the Smith Gulch road junction.

Some pine and spruce timber grows on the property. Creeks flow close to all three properties; supplies and labor can be obtained at Canon City.

Drilling operations can be carried on throughout the year but will be delayed at times by storms.

HISTORY AND PRODUCTION

The discovery of uranium on Ralston Creek in 1949 by Fred Schwaltzwalder spurred prospecting for uranium ore along the Front Range of Colorado. In the Tallahassee Creek area, extensive prospecting principally by the Juniper Oil and Mining Company led to the discovery of the Dickson-Snooper and Mary L deposits. Shortly thereafter exploration disclosed the other known deposits in the area.

In the year ending November 30, 1956, the Juniper Oil and Mining Company shipped 3,576 tons of uranium ore averaging 0.266 percent U_3O_8

and to date the area has produced about 9,000 tons of uranium ore averaging about 0.30 percent U_3O_8. The applicant estimates a total of 125,000 tons of proven and indicated ore averaging 0.30 percent U_3O_8 remain in the deposits. However the A. E. C. carries only about 60,000 tons of indicated and inferred reserves for the area.

No ore has been shipped from the properties selected by the examining team for exploration.

OWNERSHIP AND EXTENT

The applicant holds claims, leases, and options to purchase on approximately 66,903 acres. Only the land in the two areas selected for possible exploration has been checked. The following claims should be subordinated:

Chumway Park

Claim	County	Book	Page	Date Located	Locator
Doris Nos. 1-7	Park	53	285-298	7/12/57	E.J.Smaller, F.C. Tokarz, J.T. Fontecchio
E. S. Nos. 1-3	"	58	345-350	8/22/57	United Western M. Co.
F. & S. Nos. 1-12	"	54	267-289	7/17/57	E.J. Smaller, F.C. Tokarz, J.T. Fontecchio
G.L.S. Nos. 1-2	"	53	307-310	8/30/57	E.J. Smaller
Ike Nos. 1-9	"	53 54	299-306 51-60	8/30/57	E.J. Smaller, F.C. Tokarz, J.T. Fontecchio

Chumway Park

Claim	County	Book	Page	Date Located	Locator
Loco Nos. 1, 2, 4, 1A	Park	53	277-284	8/30/57	E.J. Smaller, F.C. Tokarz, J.T. Fontecchio
Marie Nos. 1-9		54	61-78	8/30/57	E.J. Smaller, F.C. Tokarz, J.T. Fontecchio
Meadow Nos. 1-4		54	41-48	8/30/57	"

Tallahassee Creek-Middle Tallahassee Creek locale

Dipper Nos. 1-16 Sec. 21, 22	Fremont	352	373-396	4/25/57	H.C. Russell

The Doris Nos. 1-7, F & S Nos. 1-12, and Marie Nos. 1-9, were optioned for purchase for 90 days from E. J. Smaller, F. C. Tokarz, and J. T. Fontecchio to United Western Minerals Company. The option was dated August 30, 1957, and the purchase price was set at $275.00 a claim plus royalty. E. J. Smaller granted a 75-day option to purchase on August 30, 1957, to United Western Minerals Company on G. L. S. claims Nos. 1 and 2. E. J. Smaller, F. C. Tokarz, and J. T. Fontecchio on August 30, 1957, granted the United Western Minerals Co. a 120-day option to purchase the Meadow claims Nos. 1, 2, 3, and 4. Harold C. Russell on October 15, 1957, granted the United Western Minerals Co. a 5-year lease on the Dipper Nos. 1-16 claims. E. J. Smaller, F. C. Tokarz, and J. T. Fontecchio on August 30, 1957, gave a 120-day option

to purchase to the United Western Minerals Company on the Ike Nos. 1-9, and Loco Nos. 1, 1A, 2, and 4 claims.

The above unpatented claim transactions are apparently unrecorded.

The mineral rights on the following Fee land have been partially obtained. This land should be subordinated.

Chumway Park

Tract	Sec.	T.	R.	Acres	Owner
W½NE¼	19	15 S	73 W	80	T. B. Sigler and W. C. Sigler
SE¼NE¼	19	15 S	73 W	40	T. B. Sigler and W. C. Sigler
N½SE¼	19	15 S	73 W	80	T. B. Sigler and W. C. Sigler
N½SW¼	19	15 S	73 W	80	Mary E. Goermer
E½NW¼	19	15 S	73 W	80	T. B. Sigler and W. C. Sigler
N½SE¼	24	15 S	74W	80	Mary E. Goermer
Tallahassee Creek-North Tallahassee Creek locale					
NE¼SE¼	9	17 S	73 W	40	C. V. and H. Thorne
SE¼NE¼	10	17 S	73 W	40	" " " " "
S½	10	17 S	73 W	320	" " " " "
NE¼NE¼	10	17 S	73 W	40	" " " " "
E½W½	15	17 S	73 W	160	" " " " "
Tallahassee Creek-Middle Tallahassee Creek locale					
SW¼NE¼	21	17 S	73 W	40	H. C. Russell
E½NW¼	21	17 S	73 W	80	H. C. Russell
NW¼NW¼	21	17 S	73 W	40	H. C. Russell
E½SE¼	22	17 S	73 W	80	H. C. Russell
NW¼SW¼	22	17 S	73 W	40	H. C. Russell

On August 30, 1957, Thomas P. Page, Frank C. Tokarz, and Carl A. Nelson gave an option to United Western Minerals Co. for a period of 60 days on certain mining leases which shall terminate October 31, 1970. We have no evidence that the option was exercised. The option agreement contained the following leases:

1. A lease from Mary E. Goerner to Thomas P. Page on the N½ of SW¼, Sec. 19, T. 15 S., R. 73 W., and the N½ of the SE¼ sec. 24, T. 15 S., R. 74 W., and recorded in Park County, B. 152, P. 232.

2 and 3. Leases to T. P. Page, F. C. Tokarz, and Carl A. Nelson from 50% interest J. B. Sigler and W. C. Sigler and 50% interest the Federal Land Bank of Wichita on the E½NW¼, W½NE¼, SE¼NE¼, N½SE¼, all in Sec. 19, T. 15 S., R. 73 W., 6th P. M., and recorded in Park County, B. 157, Page 295 and B. 157, P. 305.

Harold C. Russell on October 15, 1957, granted an option to a 5-year lease to United Western Minerals Co. to the E½SE¼, sec. 22, T. 17 S., R. 73 W., E½NW¼, NW¼NW¼, SW¼NE¼, all of sec. 21, T. 17 S. R. 73 W.

Multi-Minerals, Inc., on December 21, 1957, gave a 180-day option to United Western Minerals Co. on a lease issued by C. V. Thorne and Hazel Thorne, dated May 20, 1955, and recorded in Book 330 Page 272 of the records of Fremont County, Colorado, on the NE¼SE¼, sec. 9; SW¼, W½SE¼, Sec. 10; E½W½, Sec. 15 all in Township 17 S., R. 73 W. of the 6th P. M.

Of the 66,903 acres included in the application only 66 unpatented lode claims comprising approximately 1,320 acres and 1,000 acres with

mineral rights on fee lands or about 4 percent of the total land claimed by the applicant has been selected for exploration.

Many of the options and leases have expired or nearly expired, and it appears that most of the applicant's purported land holdings must be cleared before DMEA participation in the recommended exploration. Consents to lien would then have to be obtained on all areas mentioned under this heading.

PRESENT STATUS

Exploration and development

The Chumway Park area has been explored by 13 drill holes, the North Tallahassee Creek locale by two trenches, and the Middle Tallahassee Creek locale by four drill holes.

Mining and milling equipment and other facilities

The applicant has no mining or milling equipment. Equipment consists solely of a jeep, pick-up truck, and two counters. Fair access roads lead to all three locations.

GEOLOGY

General statement

The applicant's properties cover approximately 105 square miles, in widely separated parcels, in and around the Thirty-nine Mile volcanic field in Park, Teller, and Fremont Counties, Colorado. The Thirty-nine Mile volcanic field is a dissected highland of Tertiary volcanics consisting chiefly of andesite flows and breccias, rhyolite flows and welded tuffs, and interbedded pyroclastics and sediments. Geologic studies of the volcanics have been restricted to the eastern 1/ and far northern 2/ parts of the field and a small area near Tallahassee Creek 3/. The main central portion of the field, which includes the thickest volcanic assemblage and which undoubtedly contains the source area or areas for the entire field, remains to be investigated.

The Thirty-nine Mile volcanics unconformably overlie rocks ranging in age from Precambrian to Cretaceous and possibly early Tertiary in a Laramide structural basin. Around the northern margin of the volcanic

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1/ Cross, W., 1894, Pikes Peak folio, Colorado: U. S. Geological Survey Folio No. 7.

2/ Stark, J. T., et al., 1949, Geology and origin of South Park, Colorado: Geol. Society of America Memoir 33.

3/ MacPherson, B., in prep., Geology and uranium deposits of the Tallahassee Creek District, Fremont County, Colorado: AEC, RME No. 1083.

field, in South Park, the relatively thin volcanics are overlain by intermontane lake beds of Oligocene age. No evidence of pronounced middle Tertiary sedimentation has been observed in the central and southern portions of the field, where the volcanics, which locally attain thicknesses of over 2,000 feet, presumably formed positive topographical highs as early as middle Tertiary time.

The main period of Laramide orogenesis predates the Thirty-nine Mile volcanism and consequently strong structural dislocations, such as the Elkhorn thrust and South Park fault, which are very prominent in the South Park area, cannot be traced southward into the volcanic field. Late Tertiary block and high angle reverse faulting is, however, apparently quite common throughout the Thirty-nine Mile volcanic field. Movement along these later faults is relatively small and the faults themselves are in general not traceable over 1 or 2 miles.

Radioactivity anomalies are relatively abundant throughout the entire Thirty-nine Mile volcanic field and surrounding environs; ore-grade uranium deposits, however, have only been discovered in a limited area in the Tallahassee Creek district and in a few scattered occurrences north of the volcanic area.

The deposits and stronger radioactivity anomalies occur in rocks ranging in age from Permian to Tertiary, with the latter rocks containing by far the majority of the deposits. Specifically the favorite host rocks, in order of decreasing age, are: Permian Maroon formation, Eocene Denver

formation, various tuffaceous sediments ranging in age from Eocene to Oligocene in the Thirty-nine Mile volcanics, and Oligocene-Miocene Antero (and similar) lake beds. The principal uranium minerals, where identified, in the Tallahassee Creek deposits are finely disseminated uraninite in the unoxidized ores and autunite in the surficial zone of oxidation. The deposits, regardless of the age of their host rock, have a number of features in common that are undoubtedly directly related to their genesis and which in turn provide a basis for further exploration. These common features are: (1) localization of uranium in porous and probably permeable rocks containing an abundance of carbonaceous trash and/or carbon, and (2) a close spatial relationship of ore deposits to known and inferred faults and lineations. Although the applicant stresses a hydrothermal origin for the ore-forming fluids--based entirely on the fault-ore deposit relationship--the very limited amount of investigation in the area, does not preclude other ore-deposition hypotheses.

Applicant's properties

With the exception of one entire area and a part of another, all the areas (total of seven) proposed for exploration in the application were examined. Some of these areas, because of their geologic complexity and abundance of uranium deposits, such as in the Tallahassee Creek area, were examined in detail. Others, containing hundreds of claims of the same lithology, with no definite ore-controls or even ore-relations, were given a relatively brief examination.

The two properties not examined--the High Park area consisting of the Pi and Mu claims and the east half of the Antero Lake bed area (Phi claims)--were withdrawn by the applicant during the examination period. The High Park area claims are in conflict with Cotter Corporation property and the Phi claims, considered by the applicant to have the poorest potential of the group, lack any favorable criteria to justify exploration.

Tallahassee Creek area (various claims and leases): the Tallahassee Creek area which includes the major portions of T. 17 S., R. 73 W., contains all the known major uranium deposits in the area under consideration. The Thirty-nine Mile volcanics are relatively thick and complex in the area and consist from top to bottom of the following units:

Age	Rock units	Thickness (feet)	Uranium occurrences
	Rhyolite, pink. Weathers reddish brown. Probably welded tuff.	30-235	
Miocene & Oligocene	Tuff.	0-60	
	Andesite breccia with thin interbedded pyroclastics	200-600	
	Tuff with carbonaceous material.	0-10	One known deposit.
	Volcanic agglomerate or mud flow with local abundant carbonized wood	0-130	Common
Eocene (?)	Augite andesite, dense black weathers rusty brown.	0-135	
	Sanidine rhyolite	60-200	
	Arkose and shale, locally tuffaceous and carbonaceous.	0-165	Common
Precambrian	Granite, pegmatite and metamorphic rocks.		

The ore deposits in the three units mentioned above are generally lenticular in shape, and occur in the darker gray and more highly carbonaceous zones of the sediments and tuffs. Moreover, many of the ore deposits show a striking alignment along known and inferred faults and lineaments. Mineralization is autunite in the oxidized zone and finely disseminated uraninite in the unoxidized zones.

The most conspicuous congregation of ore deposits occurs in the volcanic conglomerate along both sides of Middle Tallahassee Creek (fig. 2). The Snooper-Dickson mine, which has produced to date approximately 6,000 tons of 0.30 percent ore, lies along a poorly exposed northwest-trending fault on the north side of the creek. The other six deposits on the south side of the creek have not been mined, or adequately exposed to allow interpretation of any possible structural control. However, from the geophoto map of the area two strong northwest-trending lineaments project through the general area of these deposits. One mile northeast of this area, on the ridge between Middle and South Tallahassee Creeks is the Glenn Williams deposit. This ore body, which has been stripped ready for mining, occurs in a 4-5 foot thick carbonaceous tuff bed above the top of the volcanic conglomerate. Disseminated autunite and fine-grained uraninite occurs throughout the entire unit. Two miles north of the Middle Tallahassee Creek deposits, on a small tributary of North Tallahassee Creek, are three uranium deposits in the basal Tertiary arkose and shale. Two of these deposits, the Seattle Chief and Mary L. occur in carbonaceous zones along a well-defined

easterly dipping high angle reverse fault. The other deposit (Smaller) occurs a few hundred feet to the southwest in the same horizon and apparently on a similar structure. A number of smaller deposits occur along Middle Tallahassee Creek, in the vicinity of the Williams deposit, and eastward across Tallahassee Creek (Huber oil).

According to the applicant, production from four deposits in the area (Snooper-Dickson, Thorne Cut, Mary L., and Smaller) has amounted to approximately 9,000 tons of 0.30 percent U_3O_8. Indicated reserves, again according to the applicant, for the 12 known major deposits in the area, are approximately 76,000 tons of 0.28 percent U_3O_8 and inferred reserves are probably around 50,000 tons of the same grade.

Two of the applicant's properties in the Tallahassee Creek area appear to be very favorably located with respect to probable ore trends as inferred from the alignment of known ore deposits along faults and surface lineaments, which may be indicative of faults. Exploration, designed to test the favorable lithologic horizons, along projections of these trends, appears to be justified. The largest of these favorable areas is the ground included in the Russell lease and Dipper claims along the north side of Middle Tallahassee Creek, immediately northwest of the area of known deposits. The other favorable area is along the south side of North Tallahassee Creek, where a pronounced radioactivity anomaly (50 X background) between two lineaments occurs in the volcanic conglomerate.

The applicant has also requested considerable drilling elsewhere in the Tallahassee Creek area, but much of this work is essentially prospecting and cannot be justified. Two other localities were considered earlier for exploration, but after the second examination trip into the district these were also deleted. These two localities are along a pronounced fault in sections 11, 12, 13; R. 73 W., T. 17 S. The northernmost locality (sec. 11) is a radioactivity anomaly in granite arkose and the other (sec. 13) is a 40-acre section in an area of favorable volcanic lithology. The former locality, however, is known to be covered by three claim groups, the Joe and Bob, Pike, and Star claim, of which only the Pike group, of questionable priority, is owned by the applicant. The 40-acre section, although shown on MacPherson's AEC map to overlie volcanics, is shown on the later geophoto maps to be entirely in Precambrian. Because of the applicant's representative's inability to find this area, attempts to examine the isolated 40-acre section were futile and consequently the examiners' only recourse was to delete this area from consideration.

Chumway Park area (Sigler lease and Marie Meadow claims).--The applicant's property in the Chumway Park area overlies a small part of an erosional window in the Thirty-nine Mile volcanics that exposes Precambrian granite overlain by a series of red, buff, and gray arkose and red conglomerate that have been tentatively assigned to the Permian Maroon formation.

A radioactivity anomaly in the red beds along Thirty-one Mile Creek has been explored in a very limited area by 8 core drill holes, 2 by earlier owners and 6 by the applicant (fig. 3). One of the two earlier holes reportedly intersected 14 feet of 0.40 percent U_3O_8, and three of the applicant's holes, which were designed to closely offset the discovery holes, intersected significant mineralization. Results of the applicant's drilling are reported to be as follows:

Hole no.	Total depth	Mineralization purported Depth (feet)	Mineralization purported Grade (% eU_3O_8)
1	245	143-154	0.18
2	164		No count
3	160	45-49	0.07-0.10
4	230	48-60	0.03-0.07
5	188		No count
6	188		No count

Delineation and further exploration of the known uranium-bearing zone appears warranted.

Elkhorn thrust area (Gemma claims): The Elkhorn thrust area, which includes the principal portions of secs. 14, 22, 23, and 26, T. 11 S., R. 75 W., lies just west of the large Elkhorn thrust fault in the central part of South Park. Rocks exposed in the area consist chiefly of the Eocene Denver formation and the underlying Cretaceous Fox Hills sandstone, with some of the higher hills capped by remnants of a late Tertiary

trachyte flow. The Elkhorn thrust fault in the area east of the claims brings Precambrian granite in contact, over a wide 30- to 100-foot breccia and shear zone, with shales, siltstones and soft sandstones of the Denver formation.

Anomalous radioactivity is present in a gray, micaceous siltstone containing abundant carbonaceous trash along a short portion of the thrust fault zone near the Gamma claims. This area, known as the Mitchell Prospect, has been extensively explored surficially by trenches and cuts, but there is no evidence to indicate that any ore-grade material was found. Highest radioactivity detected during the examination was only 0.2 Mr/hr, against a background of 0.035 Mr/hr.

On the basis of the meager radioactivity at the Mitchell prospect, the applicant proposed to drill 14 deep holes, on rough half-mile centers, to test the carbonaceous strata in the Denver formation west of the Elkhorn thrust fault. It is clearly evident that the applicant's exploration proposal is premature and cannot be justified on the information presently available.

Antero Lake bed area (Rho and Phi claims).--This area, which includes two widely separated claim groups, covers a small central part (Rho claims) of ancient Lake Antero in secs. 8, 9, 10, 15, 17, and 22, T. 13 S., R. 76 W., and a portion of the east shore of the old lake (Phi claims) in secs. 10, 15, 21, and 22, T. 13 S., R. 75 W. This latter claim group was withdrawn from the application and was not visited during the examination.

The Rho claims are underlain almost entirely by semi-consolidated tuffaceous lake sediments, interbedded with thin lenses of dense reef-like limestone. These lake beds, which post-date most of the Thirty-nine Mile volcanics are apparently up to 500 feet thick in the deeper part of the old Lake Antero on the Rho claims. The lake beds thin to the west and on the far west Rho claims Thirty-nine Mile andesite and andesite breccia is present.

A uranium occurrence on the Nina claims, one mile southwest of the subject property, was visited during the examination. Ore-grade mineralization is reported to have been discovered in the main pit on the property, but a strong ground water flow hampered, and finally forced the operation to cease without production. The mineralization supposedly occurred in an interbedded gray clay-carbonaceous silt-volcanic arkose unit of the lake beds. The applicant also reported a number of strong radioactivity anomalies in the limestone reefs on the Rho claims, but a "typical" anomaly examined had a maximum level of radioactivity of only 0.04 Mr/hr or about 2 times normal background. Three holes, drilled to depths of 295, 294, and 55 feet by the applicant, in sec. 15, failed to intersect any radioactivity.

Optimistically, however, the applicant believes that the bottom of old Lake Antero may have been an ideal trap for uranium-bearing solutions, " ... which by virtue of the deposit on the Nina claims and the anomalous limestone must have permeated the area ...," and has proposed seventeen 500-foot holes to test the approximately 4 square mile area. Here again

is a case of expensive exploration proposed in an area on the basis of a few wild corollaries and without benefit of any prior systematic prospecting or preliminary exploration.

Three Mile Creek area (Iota and Tiny Tim claims).--The Three Mile Creek area includes 24 Iota claims, which are part of a large claim group extending to the east, and 8 Tiny Tim claims in secs. 3 and 10, T. 14 S., R. 74 W. The area is in the northern section of the Thirty-nine Mile volcanic field and is underlain by flat-lying volcanic conglomerate, similar to that found in the Tallahassee Creek area, and andesite breccia. This latter rock unit, a dark brown massive flow rock containing large andesite and other volcanic fragments in an andesitic matrix, overlies the softer conglomerate only on the higher elevations in the area.

Several radioactivity anomalies of 2 to 5 times background have been found in the area by walking the breccia-conglomerate contact. Two of these anomalies, one on Tiny Tim No. 2 and the other on Iota No. 118, were tested with a total of 5 drill holes, by the applicant. On Tiny Tim No. 2, four holes, which ranged in depth from 78 to 275 feet, all encountered some mineralization in the upper part of the volcanic conglomerate, with the highest grade reported to have been 10 feet of 0.17 percent eU_3O_8. The one hole drilled on Iota No. 118 to a depth of 65 feet, did not encounter any anomalous radioactivity. During the period April 4 to 10, 1958, Newmont Mining Corporation drilled five holes in and around the better mineralized holes on Tiny Tim No. 2; two of these holes encountered slight radioactivity and the remaining three were barren.

The 25 holes, averaging 200 feet deep, requested in this area are, according to the applicant, to be drilled only on the higher elevations and not at claim centers as shown on the application map, which would obviously collar many of the holes below the "uranium-bearing zone" of the conglomerate. However, regardless of the method(s) proposed by the applicant, it appears to the examiners that the area has little to justify further work. The topography of the area is such, that if any significant uranium deposits are present, stronger evidence of mineralization, other than the few radioactivity anomalies, would have been found prior to now. Furthermore, in the major portion of the area the favorable upper part of the conglomerate has been eroded away, leaving for potential ground only a few scattered hills, each only a few acres in size.

Black Mountain area (Lava Cap, Chili, et al. claims).--This area in the central part of the Thirty-nine Mile volcanic field (secs. 9, 10, and 15, T. 15 S., R. 74 W.) surrounds a small group of claims containing the Bell and Moore mine, a uranium deposit of questionable economic significance. Exposed rocks in the area again consist of andesite and andesite breccia, on the higher elevations, underlain by the ubiquitous volcanic conglomerate.

The Bell and Moore mine, under lease to Cotter Corporation, consists of two or three bulldozer trenches cut in the volcanic conglomerate and local overlying slope wash or colluvium. The volcanic conglomerate is

poorly consolidated and consists of large altered masses of andesite breccia (?) granite and volcanics in a poorly sorted gray tuffaceous matrix. No structures, other than a few thin limonite-filled fractures, were observed around the mine pits. These fractures, which in places contain autunite and are highly radioactive (up to 1.0 Mr/hr), are visible both in the colluvial material and upper oxidized parts of the volcanic conglomerate. Unoxidized ore-grade material reportedly has been found in one of the pits in a gray carbonaceous trash zone, but no evidence of such was seen during the examination.

The applicant's exploration program in this area is based entirely on the presence of radioactivity at the Bell and Moore mine and essentially the only work undertaken by the applicant is the staking (or leasing) of the subject claims. The radioactivity anomalies shown by the applicant on his claim map, appeared to be either inaccessible or their exact location on the ground was not known. It is apparent therefore that work cannot be recommended on the basis of this limited amount of information available.

ORE RESERVES

There are no known ore reserves on the applicant's claims.

APPLICANT'S PROPOSED EXPLORATION PROGRAM

The applicant proposed a three-stage exploration program in seven different areas, Stage I to consist of 117,950 feet of non-core drilling, 2,500 feet of core drilling, 500 feet of drifting, and 100 feet of raising. Stages II and III each consist of 100,000 feet of drilling. The following table summarizes the Stage I drilling proposed by the applicant in the various areas:

Area	No. of holes	Drilling footage Non-core	Drilling footage Core	Drilling grid, hole spacing, etc.
Tallahassee Creek	208	49,600		Random
Chumway Park	75	18,750	No	Random
Elkhorn Thrust	18	9,000	esti-	Approx. ½ mile centers
Antero Lake bed	29	17,000	mate	Approx. ½ mile center
Three Mile Creek	25	6,200	by	Random and approx. 600-foot centers
Black Mountain	45	9,000	area	Random
High Park	42	8,400		Approx. 500-foot centers
Totals	442	117,950	2,500	

Estimated costs follow:

Stage I

Independent contracts		
117,950 feet non-core drilling	$194,400.00	
117,950 feet gamma ray logging at 10¢/ft.	11,795.00	
2,500 feet core drilling at $3.50/ft.	8,750.00	
900 hours bulldozing at $17.00/hr.	15,300.00	
Total independent contracts		$230,245.00
Labor and Supervision		
Consulting engineer, 4 months at $1,000.00/mo.	4,000.00	
Project engineer, 4 months at $800.00/mo.	3,200.00	
Chief geologist, 4 months at $750.00/mo.	3,000.00	
4 geologists, 4 months at $2,000.00/mo.	8,000.00	
Engineer, 4 months at $650.00/mo.	2,600.00	
2 surveyor helpers, 4 months at $700.00/mo.	2,800.00	
2 draftsmen, 4 months at $800.00/mo.	3,200.00	
Total labor and supervision		$ 26,800.00
Operating Materials and Supplies		
Fuel, oil, maintenance for 6 jeeps, 4 months at $750.00/mo.	3,000.00	
Repairs and batteries for counters, etc., 4 months at $150.00/mo.	600.00	
Supplies, prints, copywork, 4 months at $300.00/mo.	1,200.00	
Total operating materials and supplies		$ 4,800.00

Operating equipment		
Rental		
6 jeep station wagons, 4 months at $1,200.00/mo.	$ 4,800.00	
Transit, etc., 4 months at $75.00/mo.	300.00	
Drafting equipment, 4 months at $75.00/mo.	300.00	
Purchase		
6 scintillators at $275.00 each	1,650.00	
6 Bruntons at $55.00 each	330.00	
Total operating equipment		$ 7,380.00
New Buildings, Fixtures, installations		
Rental		
1 field office, 4 months at $100.00/mo.		400.00
Miscellaneous		
Stenographer, 4 months at $250.00/mo.	1,000.00	
Clerical work, 4 months at $400.00/mo.	1,600.00	
Accounting (Santa Fe) Workmen's Compensation, insurance, payroll taxes, 4 months at $2,000.00/mo.	8,000.00	
Total miscellaneous		$ 10,600.00
Assaying		
1,200 chemical assays at $4.00 each	4,800.00	
400 radiometric assays at $2.00 each	800.00	
Total assaying		$ 5,600.00
Total estimated cost of Drilling Stage I		$285,825.00

Stage I Drifts and Raising

500 feet drifting at $40.00/foot	$ 20,000.00	
100 feet raising at $40.00/foot	4,000.00	
200 feet timbering at $5.00/foot	1,000.00	
75 feet raise timbering at $10.00/ft.	750.00	
16 hours bulldozing at $17.00/hr.	272.00	
Total estimated cost of Stage I drifting and raising		$ 26,022.00
Total estimated cost of Stage I		$311,847.00

No estimate of costs for Stage II and Stage III given.

RECOMMENDED EXPLORATION PROGRAM AND COST ESTIMATE

The recommended program is a highly modified version of the applicant's proposal. This program is designed to systematically explore selected localities in the Tallahassee Creek and Chumway Park areas that appear to have a very favorable uranium potential. Exploration of the applicant's properties in other areas is not justified and hence not recommended.

In the Tallahassee Creek area two localities have been selected for exploration by a two-stage non-core drilling program (fig. 2). Both localities, one in sections 21 and 22, along Middle Tallahassee Creek and the other in sections 9 and 10 along North Tallahassee Creek, overlie favorable uranium-host rocks along structural trends that are spatially, and probably genetically related to the ore deposits.

Specifically the Stage I drilling is designed to test, on a 400- x 1200-foot grid, the volcanic conglomerate at the base of the andesite breccia, along these pronounced structural trends. The following table summarizes the exploration in the Tallahassee Creek area.

Locality	Number of holes	Drilling pattern	Orientation of drilling pattern	Average depth (feet)	Total footage
		Stage I			
Sec. 21 & 22	55	400- x 1,200- foot diamond grid	N 60° W	250	13,750
Sec. 9 & 10	13	400- x 1,200- foot diamond grid	N 50° W	150	1,950
Totals	68				15,700
		Stage II			
Sec. 21 & 22	44	100- or 200-foot offsets		250	11,000
Sec. 9 & 10	12	100- or 200-foot offsets		150	1,800
Totals	56				12,800
Over-all total	124				28,500

The 250 feet average allowance for the holes in sec. 21 and 22 appears to be a reasonable and adequate figure for the recommended drilling. Some of the holes on the higher elevations will naturally be drilled much deeper--probably up to 400 feet--to penetrate the target unit, and of course others in the lower areas will be much shallower. However, nowhere, either in sections 21 and 22 or sections 9 and 10, should holes be drilled more than 5 feet into the underlying lower rhyolite or Precambrian basement rocks, whichever the case may be.

In the Chumway Park area a modest two-stage program of drilling to test the uranium-bearing carbonaceous arkose unit in the Permian Maroon formation is recommended (fig. 3). The following table summarizes the exploration in the Chumway Park area:

	Number of holes	Drilling pattern	Average depth (feet)	Total footage
		Stage I		
	7	200-foot centers around mineralized zone	150	1,050
	6	200- x 400-foot centers over fault W. of mineralized zone	150	900
Totals	13			1,950
		Stage II		
	12	Offsets on centers not less than 100 ft.	150	1,800
Totals	12			1,800
Over-all total	25			3,750

Total drilling recommended in both areas is 17,650 feet under Stage I and 14,600 feet under Stage II for an over-all total of 32,250 feet.

The following items are included for contract preparation:

(1) Holes should be not less than 3 inches in diameter.

(2) Samples should be taken at 2-foot intervals, checked for radioactivity and sacked. Those samples showing significant anomalous radioactivity or containing visible uranium minerals should be quartered, split, and assayed chemically for U_3O_8.

(3) All holes should be probed immediately after completion and should be paid for on the basis of probed footage.

(4) Geologic logs, as well as radiometric probe logs, should be kept and submitted in each copy of the monthly accounting and fiscal reports.

(5) No hole should be drilled within 100 feet of the property boundary.

(6) Bulldozing should be done by D-7 caterpillar tractor or equivalent unit of other make if available. If that size is not available, work may be performed with a D-6 caterpillar tractor or equivalent unit of another make at the reduced rate as provided for under the estimate of costs.

(7) The program should be supervised by a competent geologist.

On May 8, 1958, the reduced program was discussed with, and approved by, M. Chase, the applicant's representative.

Cost estimates follow:

Tallahassee Creek area

North Tallahassee Creek locale (sec. 9 & 10) 1 rig

Stage I (13 holes average depth 150 feet)

Independent contracts		
1,950 feet non-core drilling at $0.77/ft.	$ 1,501.50	
Gamma-ray logging 1,950 feet at $0.10/ft.	195.00	
16 hours bulldozing with D-7 caterpillar or equivalent at $12.50/hr. or 20 hrs. bulldozing with D-6 caterpillar or equivalent at $10.00/hr.	200.00	
Total independent contracts		$ 1,896.50
Labor and supervision		
Geologist-engineer, 1 month at $650/mo.	$ 650.00	
Engineer's helper, 7 days at $16.00/day	112.00	
Total labor and supervision		$ 762.00
Operating materials and supplies		
Survey stakes	$ 5.00	
1,000 paper bags	10.00	
Total operating materials and supplies		$ 15.00
Operating equipment (rentals)		
Surveying equipment 1/2 month at $75.00/mo.	$ 37.50	
Jeep, gas, oil, rental 1,700 miles at $0.14/mi.	238.00	

Field office 1/3 of 2 months at $100/mo.	$ 66.67	
Scintillator 1 month at $50/mo.	50.00	
Total operating equipment		$ 392.17

Rehabilitation and repairs

None

New buildings, improvements, installations

None

Miscellaneous

Accounting and typing 1 month at $100/mo.	$ 100.00	
Workmen's compensation, liability insurance, and payroll taxes, 7 percent of $862.00	60.34	
Total miscellaneous		$ 160.34

Total estimated cost of 1,950 feet of non-core drilling	$ 3,226.01
Estimated cost per foot $1.65	
20 radiometric assays at $2.00 each	$ 40.00
50 chemical analyses for U_3O_8 at $4.00 each	$ 200.00
Total estimated cost of Stage I	$ 3,466.01

Stage II (12 holes average depth 150 feet) 1 rig

Independent contracts

1,800 feet non-core drilling at $0.77/ft.	$ 1,386.00
1,800 feet gamma-ray logging at $0.10/ft.	180.00

12 hours bulldozing at $12.50/hr.	$ 150.00	
Total independent contracts		$ 1,716.00
Labor and supervision		
Geologist-engineer 1 month at $650/mo.		$ 650.00
Operating equipment and supplies		
1,000 paper bags		10.00
Operating equipment (rentals)		
Jeep, gas, oil, rental, 1,700 miles at $0.14/mile	$ 238.00	
Field office 1/3 of 2 months at $100/mo.	66.67	
Scintillator 1 month at $50.00/mo.	50.00	
Total operating equipment		$ 354.67
Rehabilitation and repairs		
None		
New buildings, improvements, installations		
None		
Miscellaneous		
Accounting and typing, 1 month at $100/mo.	$ 100.00	
Workman's compensation, liability insurance, and payroll taxes, 7 percent of $750.00	52.50	
Total miscellaneous		$ 152.50
Total estimated cost of 1,800 feet of non-core drilling		$ 2,883.17
Estimated cost per foot $1.60		

24 radiometric assays at $2.00 each	$ 48.00
60 chemical analyses for U_3O_8 at $4.00 each	$ 240.00
Total estimated cost of Stage II	$ 3,171.17
Total estimated cost of North Tallahassee Creek locale drilling	$ 6,637.18

Middle Tallahassee Creek locale

Stage I (55 holes average depth 250 feet) 3 rigs

Independent contracts		
11,000 feet non-core drilling at $0.77/ft.	$ 8,470.00	
2,750 feet non-core drilling at $0.88/ft.	2,420.00	
13,750 feet gamma-ray logging at $0.10/ft.	1,375.00	
64 hours bulldozing at $12.50/hr.	800.00	
Total independent contracts		$13,065.00
Labor and supervision		
Geologist-engineer 2 months at $650/mo.	$ 1,300.00	
Engineer's helper 2 months at $400/mo.	800.00	
Total labor and supervision		$ 2,100.00
Operating equipment and supplies		
Survey stakes	$ 10.00	
5,000 paper bags	50.00	
Total operating equipment and supplies		$ 60.00

Operating equipment (rentals)		
Transit, 2 months at $75.00/mo.	$ 150.00	
Jeep, gas, oil, rental 3,600 miles at $0.14/mi.	504.00	
Field office 1-1/3 months at $100/mo.	133.33	
Scintillator 2 months at $50.00/mo.	100.00	
Total operating equipment		$ 887.33
Rehabilitation and repairs		
None		
New buildings, improvements, installations		
None		
Miscellaneous		
Accounting and typing, 2 months at $100/mo.	$ 200.00	
Workman's compensation, liability insurance and payroll taxes, 7 percent on $2,300.00	161.00	
Total miscellaneous		$ 361.00
Total estimated cost of 13,500 feet of non-core drilling		$16,473.33
Estimated cost per foot $1.22		
50 radiometric assays at $2.00 each		$ 100.00
100 chemical analyses for U_3O_8 at $4.00 each		$ 400.00
Total estimated cost of Stage I		$16,973.33

Stage II (44 holes, average depth 250 feet) 3 rigs

Independent contracts		
8,800 feet non-core drilling at $0.77/ft.	$ 6,776.00	
2,200 feet non-core drilling at $0.88/ft.	1,936.00	
11,000 feet gamma-ray logging at $0.10/ft.	1,100.00	
44 hours bulldozing at $12.50/hr.	550.00	
Total independent contracts		$10,362.00
Labor and supervision		
Geologist-engineer 2 months at $650.00/mo	$ 1,300.00	
Engineer's helper 2 months at $400.00/mo.	800.00	
Total labor and supervision		$ 2,100.00
Operating equipment and supplies		
Survey stakes	$ 5.00	
5,000 paper sacks	50.00	
Total operating equipment and supplies		$ 55.00
Operating equipment (rentals)		
Transit 1 month at $75.00/mo.	$ 75.00	
Jeep, gas, oil, rental 3,500 miles at $0.14/mi.	490.00	
Field office 1 and 1/3 months at $100/mo.	133.33	
Scintillator 2 months at $50.00/mo.	100.00	
Total operating equipment		$ 798.33

Rehabilitation and repairs

None

New buildings, improvements, installations

None

Miscellaneous

Accounting and typing 2 months at $100/mo.	$ 200.00	
Workman's compensation, liability insurance and payroll taxes, 7 percent of $2,300.00	161.00	
Total miscellaneous		$ 361.00
Total estimated cost of 11,000 feet of non-core drilling		$13,676.33
Estimated cost per foot $1.24		
30 radiometric assays of $2.00 each		$ 60.00
80 chemical assays for U_3O_8 at $4.00 each		$ 320.00
Total estimated cost of Stage II		$14,056.33
Total estimated cost of Middle Tallahassee Creek locale drilling		$31,029.66

Chumway Park

Stage I (13 holes average depth 150 feet) 1 rig

Independent contracts

1,950 feet non-core drilling at $0.77/ft.	$ 1,501.50	
Gamma-ray logging 1,950 feet at $0.10/ft.	195.00	
16 hours bulldozing with D-7 caterpillar or equivalent at $12.50/hr.	200.00	
Total independent contracts		$ 1,896.50

Labor and supervision		
Geologist-engineer 1 month at $650/mo.	$ 650.00	
Engineer's helper 7 days at $16/day	112.00	
Total labor and supervision		$ 762.00
Operating materials and supplies		
Survey stakes	$ 5.00	
1,000 paper bags	10.00	
Total operating materials		$ 15.00
Operating equipment (rentals)		
Surveying equipment 1/2 month at $75/mo.	$ 37.50	
Jeep, gas, oil, rental, 1,900 miles at $0.14/mile	266.00	
Field office 1/3 of 2 months at $100/mo.	66.67	
Scintillator 1 month at $50/mo.	50.00	
Total operating equipment		$ 420.17
Rehabilitation and repairs		
None		
New buildings, improvements, installations		
None		
Miscellaneous		
Accounting and typing, 1 month at $100/mo.	$ 100.00	
Workmen's compensation, liability insurance and payroll taxes, 7 percent of $862.00	60.34	
Total miscellaneous		$ 160.34

Total estimated cost of 1,950 feet of non-core drilling		$ 3,254.01
Estimated cost per foot $1.67		
20 radiometric assays at $2.00 each		$ 40.00
50 chemical analyses for U_3O_8 at $4.00 each		$ 200.00
Total estimated cost of Stage I		$ 3,494.01

Stage II (12 holes average depth 150 feet) 1 rig

Independent contracts		
1,800 feet non-core drilling at $0.77/ft.	$ 1,386.00	
1,800 feet gamma-ray logging at $0.10/ft.	180.00	
10 hours bulldozing at $12.50/hr.	125.00	
Total independent contracts		$ 1,691.00
Labor and supervision		
Geologist-engineer 3/4 month at $650/mo		$ 487.50
Operating materials and supplies		
1,000 paper bags		$ 10.00
Operating equipment (rentals)		
Jeep, gas, oil, rental 1,500 miles at $0.14/mi.	$ 210.00	
Field office 1/3 of 2 months at $100/mo.	66.67	
Scintillator 1 month at $50.00/mo.	50.00	
Total operating equipment		$ 326.67
Rehabilitation and repairs		
None		

New buildings, improvements, installations

None

Miscellaneous

Accounting and typing 1 month at $100/mo.	$ 100.00	
Workmen's compensation, liability insurance and payroll taxes, 7 percent of $587.50	41.13	
Total miscellaneous		$ 141.13
Total estimated cost of 1,800 feet of non-core drilling		$ 2,656.30
Estimated cost per foot $1.48		
20 radiometric assays at $2.00 each		$ 40.00
50 chemical analyses for U_3O_8 at $4.00 each		$ 200.00
Total estimated cost of Stage II		$ 2,896.30
Total estimated cost of Chumway Park drilling		$ 6,390.31

Recapitulation

The three sites are too far apart to permit a quick shifting of supervision and total drilling costs vary from $1.22 a foot to $1.67 a foot.

Chumway Park area

Stage I (13 holes average depth 150 feet)

Independent contracts

1,950 feet non-core drilling at $0.77/ft.	$ 1,501.50	
Gamma-ray logging 1,950 feet at $0.10/ft.	195.00	
16 hours bulldozing access roads and drill sites at $12.50/hr.	200.00	
Total independent contracts		$ 1,896.50
1,950 feet incidental allowance at $0.67/ft.		1,306.50
Total		$ 3,203.00
20 radiometric assays at $2.00 each		$ 40.00
50 chemical analyses for U_3O_8 at $4.00 each		$ 200.00
Total estimated cost of Stage I		$ 3,443.00

Stage II (12 holes average depth 150 feet)

Independent contracts

1,800 feet non-core drilling at $0.77/ft.	$ 1,386.00	
1,800 feet gamma-ray logging at $0.10/ft.	180.00	
10 hours bulldozing roads and drill sites at $12.50/hr.	125.00	
Total independent contracts		$ 1,691.00
1,800 feet incidental expense at $0.67/ft.		1,206.00
Total		$ 2,897.00

20 radiometric assays for U_3O_8 at $2.00 each	$ 40.00
50 chemical analyses for U_3O_8 at $4.00 each	$ 200.00
Total estimated cost for Stage II	$ 3,137.00
Total estimated cost of Chumway Park drilling	$ 6,580.00

North Tallahassee Creek locale

Stage I (13 holes average depth 150 feet)

Independent contracts

1,950 feet non-core drilling at $0.77/ft.	$ 1,501.50	
Gamma-ray logging 1,950 feet at $0.10/ft.	195.00	
16 hours bulldozing with D-7 caterpillar or equivalent $12.50/hr.	200.00	
Total independent contracts		$ 1,896.50
1,950 feet incidental allowance at $0.67/ft.		$ 1,306.50
Total		$ 3,203.00
20 radiometric assays for U_3O_8 at $2.00 each		$ 40.00
50 chemical analyses for U_3O_8 at $4.00 each		$ 200.00
Total estimated cost of Stage I		$ 3,443.00

Stage II (12 holes, average depth 150 feet)

Independent contracts

1,800 feet non-core drilling at $0.77/ft.	$ 1,386.00	
1,800 feet gamma-ray logging at $0.10/ft.	180.00	
12 hours bulldozing at $12.50/hr.	150.00	
Total independent contracts		$ 1,716.00
1,800 feet incidental allowance at $0.67/ft.		$ 1,206.00
Total		$ 2,922.00
24 radiometric assays for U_3O_8 at $2.00 each		$ 48.00
60 chemical analyses for U_3O_8 at $4.00 each		$ 240.00
Total estimated cost of Stage II		$ 3,210.00
Total estimated cost of North Tallahassee Creek area drilling		$ 6,653.00

Middle Tallahassee Creek locale

Stage I (55 holes, average depth 250 feet)

Independent contracts

11,000 feet non-core drilling at $0.77/ft.	$ 8,470.00	
2,750 feet non-core drilling at $0.88/ft.	2,420.00	
13,750 feet gamma-ray logging at $0.10/ft.	1,375.00	
64 hours bulldozing at $12.50/hr.	800.00	
Total independent contracts		$13,065.00

13,750 feet incidental expense at $0.27/ft.		$ 3,712.50
Total		$16,777.50
50 radiometric assays for U_3O_8 at $2.00 each		$ 100.00
100 chemical analyses for U_3O_8 at $4.00 each		$ 400.00
Total estimated cost of Stage I		$17,277.50

Stage II (44 holes, average depth 250 feet)

Independent contracts

8,800 feet non-core drilling at $0.77/ft.	$ 6,776.00	
2,200 feet non-core drilling at $0.88/ft.	1,936.00	
11,000 feet gamma-ray logging at $0.10/ft.	1,100.00	
44 hours bulldozing at $12.50/hr.	550.00	
Total independent contracts		$10,362.00
11,000 feet incidental expense at $0.27/ft.		$ 2,970.00
Total		$13,332.00
30 radiometric assays for U_3O_8 at $2.00 each		$ 60.00
80 chemical analyses for U_3O_8 at $4.00 each		$ 320.00
Total estimated cost of Stage II		$13,712.00
Total estimated cost of Middle Tallahassee Creek drilling		$30,989.50
Total estimated cost of North Tallahassee Creek drilling		$ 6,653.00
Total estimated cost of Chumney Park drilling		$ 6,580.00
Total estimated cost of project		$44,222.50
Government participation 50 percent, or		$22,111.25

CONCLUSIONS AND RECOMMENDATIONS

Exploration in three localities in two of the applicant's areas, the Tallahassee Creek and Chumway Park areas, appears warranted. In the Tallahassee Creek area carbonaceous tuffs and volcanic conglomerate in the Tertiary Thirty-Nine Mile volcanic series, contain a number of economically significant uranium deposits. These deposits are spatially, and possibly genetically, related to northwest-trending faults. In the Chumway Park area drilling has disclosed significant uranium mineralization in carbonaceous arkosic strata in the Permian Maroon formation. A modified non-core drilling program to: (1) explore favorable lithologic units along known and inferred northwest structural trends in the Tallahassee Creek area, and (2) explore the mineralized zone in the Chumway Park area, is recommended for Government participation. Total estimated cost of the program is $44,222.50; Government participation at 50 percent $22,111.25.

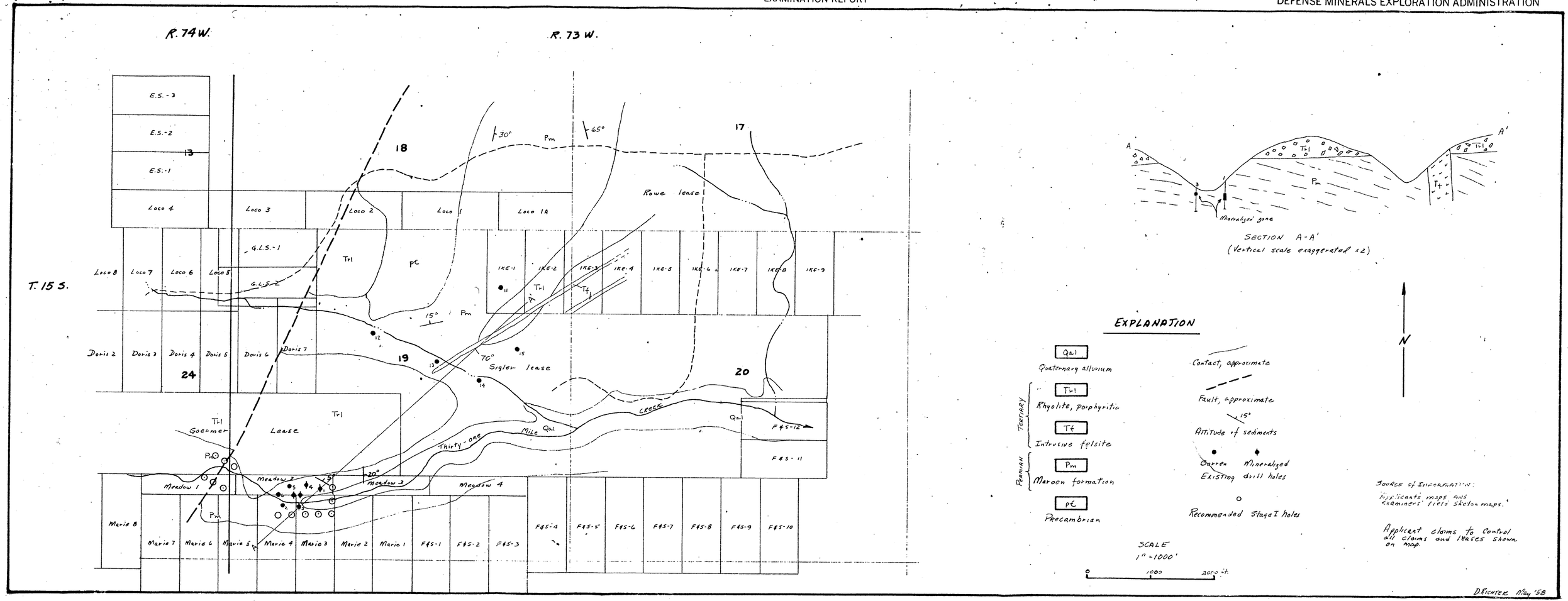

FIGURE 3 - GEOLOGIC MAP AND SECTION OF THE CHUMWAY PARK AREA, SHOWING RECOMMENDED EXPLORATION, UNITED WESTERN MINERALS COMPANY, PARK CO., COLO.

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D M E A
RECEIVED JUN 6 1958

DATE	INITIALS	CODE

Form MF-103
Revised Oct. 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42-R1035.3
Approval expires June 30, 1958

DMEA
DEPARTMENT OF THE INTERIOR
JAN 27 1958
REGION III
DENVER, COLORADO

RECEIVED
JAN 16 1958
DMEA

APPLICATION FOR AID IN AN EXPLORATION PROJECT

PURSUANT TO DMEA ORDER I, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

NAME OF APPLICANT (Full legal name and mailing address as it should appear on contract if one is executed)

United Western Minerals Company
(a Delaware Corporation)
136 W. Palace Avenue
Santa Fe, New Mexico

DMEA
DEPARTMENT OF THE INTERIOR
JAN 14 1958
REGION III
DENVER, COLORADO

APPLICANT NOT TO USE THIS BLOCK

Docket Number: DMEA- 4919
Date Received: 1/16/58
Government Participation %:
Region: III
Division Code: 700

BUSINESS ORGANIZATION (Check one)

- Individual [ ]
- Corporation [X]
- Partnership [ ]
- Other (Specify) [ ]

State in which firm is organized: Delaware

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

Name	Address	Title
Alva A. Simpson, Jr.	Santa Fe, N.M.	President
Norman S. Dike	Santa Fe, N.M.	Vice President
Herbert A. Holt	Santa Fe, N.M.	Secretary and Counsel
Peter Cable	Santa Fe, N.M.	Treasurer
Lillian M. Anderson	Santa Fe, N.M.	Assistant Secretary
Garnett W. Dinan	Santa Fe, N.M.	Assistant Treasurer

Mineral(s) for which you wish to explore: Uranium and associated minerals

Estimated Cost of Project: $ 311,847.00

LOCATION OF PROPERTY

Name	County	State
	Teller, Park, Fremont	Colorado

GENERAL INSTRUCTIONS

Before filling out this application, please read DMEA Order-I, Revised, "Government Aid in Defense Exploration Projects." To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit four copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 1, existing mine workings and geology in item 2, and the proposed exploration project in item 4. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 2(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest DMEA Field Office.*

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.

1/14/58
Dated

UNITED WESTERN MINERALS COMPANY
By Alva A. Simpson Jr.
BY (Signature)

Alva A. Simpson, Jr.
President
Title

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

1. *Applicant's Property Rights:*

(a) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all land adjacent to the proposed project area which you own or control. Describe any part of the project land or workings which should not be subject to Government lien for royalty payments. If the land consists of unpatented claims, state the book and page number for each recorded location notice, including amended locations, and the place where recorded (courthouse, recorder's office, county, and state).

(b) State all the names by which you know the property.

(c) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise. If you are not the owner, submit with this application one exact copy of the lease, contract, or other document (with address of owner) under which you control the property.

(d) Describe all liens, mortgages, or other encumbrances on the property.

2. *Physical Description:*

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the lands, including existing mine workings. Describe all production facilities.

(b) State your interest, if any, in operations stated in 2*(a)*.

(c) State, as far as you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves on the property giving quantities and grades and sampling methods used, supporting your statement with copies of assay certificates and assay maps if available.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations if known, and type of deposit (vein, bedded, etc.).

(f) State your reasons for expecting to find ore, and if you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates.

(g) Send with your application at least *two* copies of all geologic or engineering reports, assay maps, or technologic information which you may have, indicating on each whether you require its return to you.

3. *Accessibility of Project:*

(a) To aid DMEA representatives who may be required to examine the property, state the name and address of the person who will meet the DMEA representative; give directions for reaching the property; and describe accessibility of the property including the mine workings.

(b) Name the shipping and supply points and places where employees reside and state the distances between them and the property.

4. *The Exploration Project:*

(a) Describe fully the proposed exploration project giving individual footages and sizes of openings *for each item of work*. Use narrative, maps, plans, and longitudinal and cross sections as necessary. Show the location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show also the relation of the proposed work to any existing mine workings and to *property boundaries* or to the closest identifiable corner.

(b) If an access road to the project must be built, show the location on the property map and state the length, type, and construction methods proposed.

(c) In the event that an exploration contract with DMEA is executed, how soon will the work start and how many months will be required to complete it? State your anticipated average daily or monthly rate of progress for each type of work.

5. *Experience:*

State your operating experience and background with relation to your ability to carry out this exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of Costs:*

Furnish detailed estimates of the costs *for each item of the work proposed in 4(a)* under the headings listed below with a total for each heading and the estimated total cost of the project. Costs for any work to be performed by an independent contractor should be shown separately under category *(a)* below. Costs for any work that is not to be performed by an independent contractor should be given in detail under categories *(b)* through *(g)*.

(a) Independent contracts. State the cost of any proposed independent contract for the performance of all or any part of the work, expressed in units of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. *(Note* – If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. For necessary supervision, engineering and geological services, and labor, include an itemized schedule of numbers, classes, rates of wages, salaries or fees, and periods of employment. State whether these technicians and employees are available.

(c) Operating materials and supplies. List items of material and supplies with their cost. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of operating equipment to be used giving specifications and indicating how each item is to be acquired – i.e., rented, purchased, or provided by the applicant. If it is rented or purchased, state the estimated rental or purchase price. If it is to be furnished by the applicant, give its present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of necessary *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant, which will be used on the exploration project.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration project stating specifications and cost including labor, materials and supervision.

(g) Miscellaneous. For the operating equipment listed in 6*(d)*, describe the type and estimate the cost of repairs and maintenance expected during project operations. Do not repeat initial repairs listed in 6*(e)*. Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories.

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)* State whether you are prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order–I, Revised.

(b) Explain to what extent you propose to furnish your share of the costs by providing money, by use of equipment owned by you, or otherwise.

* * * * *

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DATE | INITIALS | CODE

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Applicant's Property Rights:

The following property breakdown covers (a), (b), (c), and (d). These properties are owned Mining Claims, Leased Mining Claims and Private Mineral Rights and State Leases, Optioned Mining Claims and Mineral Rights in Teller, Fremont and Park Counties, Colorado.

Date of Location	Name of Claims	Section	Township	Range	Meridian	Place Recorded County	Book No.	Pages	Area	Nature of Title
3/17/57	Pi 1-7, 9 Pi 5,6,7,9(amended)	25	15S	71W	6th	Teller	275 275	225-240 317-324	165	Location
5/15/57	Mu 1-18	30	15S	71W	6th	Teller	275	280-307 360-367	372	Location
8/22/57 8/23/57	Kappa 9-37,39,41,43, 45,47,49,51,53,55,57, 59,61-63,65,67,71	11,12, 13,14	15S	74W	6th	Park	54	175-264	950	Location
9/18,9/20 8/24,9/28/57	Iota 1-61,63,65,67,69, 71,73,75,77-87,89-94 123-137	4,5,10,11 14,15,21 22	14S	74W	6th	Park	54	291-490	2066	Location
8/28,9/3, 9/4,9/5/57	Iota 138-237	4,5,6,7, 8,18	14S	74W	6th	Park	55	1-100	2000	Location
8/28,9/3 9/4,9/5/57	Iota 98-123,238-266, 268-278,280,282,284, 286,287-300,302,304, 306,308-316	3,8,17, 18,19,20, 30,31	14S	74W	6th	Park	55	257-456	2000	Location
9/4,9/6, 9/7,9/8/57	Iota 317-332,334, 336-350,369,371,373, 375,377,381,383, 385-395,397,399,401, 403,417-462	18,19,20, 27,28,29, 30,31	14S	74W	6th	Park	56	1-202	2000	Location

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Date of Location	Name of Claims	Section	Township	Range	Meridian	Place Recorded County	Book No.	Pages	Area	Nature of Title
9/7/57	Iota 463-519	20,21,28, 29,32,33	14S	74W	6th	Park	56	203-316	1140	Location
9/17,9/18 9/24/57	Lamda 342,344,346,348, 350,352,354,356,358, 360,362,364,366,368, 370,372,374,376,378, 380,384,386,388,390, 392,394,396,398,400, 402,404,406,408,412, 420-542,544,546,548, 550,552,554,556,558, 560	1,2,3,4, 5,6	51N	11,12E	N.M.P.M	Fremont	385	83-176	940	Location
8/25,8/26 8/27,8/28/57	Lamda 1-6,8,10-32, 35-102,104,106	3,4,5,6, 9,10	15S	74W	6th	Park	56	373-572	2000	Location
		32,33,34	14S	74W						
8/30,8/31 9/3/57	Lamda 108,110,112, 114-118,145-177,179, 181,183,185-202, 205-222,224,226-244	2,5,6,7, 8,9,10, 11,12	15S	74W	6th	Park	57	1-200	2000	Location
9/3,9/4, 9/7,9/12/57	Lamda 245-282,286,288, 290,292,294-319,321, 323,325,327,329,331, 333,335,339-341,343, 345,347,349,351,353, 355,357,359,361,363, 365,367,369,371,373, 375,377,379,381,383	6,7,8,17, 18,29,30, 31,32,33, 34	15S	74W	6th	Park	57	211-410	2000	Location
9/26,9/27, 10/1,10/2, 10/3,10/4, 10/5/57	Tay 1-72,74,76,78,80-132	1,2,3,4,5 6	18S	73W	6th	Fremont	385(Tay 1) 386	255-256 1-253	2480	Location
		34,35	17S	73W						

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Date of Location	Name of Claims	Section	Town-ship	Range	Meridian	Place Recorded County	Book No.	Pages	Area	Nature of Title
9/17,9/20 9/21/57	Lamda 385,387,391,393, 395,399,419,421-451, 453,455,457,459,461, 463,465-485,487,489, 491,493,495-524	28,32,33, 34,35	15S	74W	6th	Park	57	427-627	2000	Location
9/21,9/23/57	Lamda 525-540	28,29,30, 31	15S	74W	6th	Park	58	27-58	320	Location
9/6,9/7, 9/9/57	Xi 1-64,66,68,70,72, 74,76,78,80,82-104, 106,108-111	1,2,12, 13,14,24, 25	15S	75W	6th	Park	58	67-266	2000	Location
9/10/57	Xi 112-144	25,26	15S	75W	6th	Park	58	267-332	660	Location
9/10,9/11, 9/12/57	Nu 1-100	20,21,28, 29,31,32, 33	13S	74W	6th	Park	58	351-550	2000	Location
9/16,9/17, 9/18/57	Nu 101-200	20,21,28, 29,30,33	13S	74W	6th	Park	59	1-200	2000	Location
9/16,9/18, 9/19/57	Nu 201-300	22,27,28, 33,34	13S	74W	6th	Park	59	297-496	2000	Location
9/22, 9/23/57	Nu 301-308,313-318, 323-362,364,366-392	18,19,27, 30,34	13S	74W	6th	Park	59 60	497-600 1-60	1640	Location
9/24,9/25 9/26/57	Omicron 1,3,5,7,9,11,13, 15,17,19,21,23,25,27, 29,31,33,35-52,57-84, 87,89,91,93-117,119, 121,123	28,29,30, 31,32	15S	73W	6th	Park	60	71-258	1880	Location
9/24/57	cron 4,6,8,10,12,14, 18,20,22,24,26,28, ,32,34	5,6 1	16S 51N	73W 12E	6th N.M.P.M.	Fremont Fremont	386	347-377	320	Location

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Date of Location	Name of Claims	Section	Town-ship	Range	Meridian	Place Recorded County	Book No.	Pages	Area	Nature of Title
9/20, 9/21/57	Rho 1-18,20,22,24,26, 28,30,32,34-108	9,10,11, 14,22,23	13S	76W	6th	Park	60	259-458	2000	Location
8/28/57	Iota 88	11	14S	74W	6th	Park	60	61,62	20	Location
8/22/57	E & S 1-3	13	15S	74W	6th	Park	58	345-350	60	Location
9/24,9/25, 10/4,10/14, 10/24/57	Sigma 5-30,35-117, 119-123,125,127-137, 139,141,143,145,147, 149,151,153,155	19,28,29, 30,31,32, 33,34,35, 2,11,14	17S	73W	6th	Fremont	387	260-529	2700	Location
		6	49N 18S	12E 73W	N.M.P.M. 6th					
9/21/57	Rho 109-138	8,9,17, 20	13S	76W	6th	Park	60	484-542	600	Location
10/17, 10/18/57	Lamda 561-572,574,576, 578-602,604,606,608, 610,612,614,616, 618-652,654,656,658, 660-675	22,23, 24,25,26, 27,34,35, 19,30	15S 15S	74W 73W	6th	Park	61	155-354	2000	Location
10/17,10/19, 10/20/57	Lamda 676-730	22,23,24, 25, 19,20	15S 15S	74W 73W	6th	Park	61	355-464	1100	Location
11/19, 11/20/57	Phi 1-64,64A,65-81, 83-100	10,11,14, 15,21,22, 23,26, 27,28	13S 13S	75W 75W	6th 6th	Park Park	61 62	465-600 1-64	2000	Location
11/19, 11/20/57	Phi 101-136	2,3,10, 11,14,15	13S	75W	6th	Park	62	85-157	740	Location
12/4,12/5/57	Gamma 1-16,25-64,65, 67,69,71,73,75-122	14,15,22, 23,24,25, 26,27	11S	75W	6th	Park	Sent for recording		2180	Location

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Date of Acquisition	Name of Properties	Section	Town-ship	Range	Meridian	Place Recorded County	Book No.	Pages	Area	Nature of Title
10/25/57	Tiny Tim 1-8	3,10	14S	74W	6th	Park (Deed recorded Book 151, Page 176)	43	651-658	160	Purchased
7/2/57	Drew 1-4, 6 6 (amended)	1,2	17S	73W	6th	Fremont	361 378	155-161 454	103	Lease 30 years
7/2/57	Sonny 1,2 Sweede 1-5 Sharon K 22-26	2,10,11	17S	73W	6th	Fremont	377 377 350	262-263 264-266 372-376	204	Lease 30 years
7/2/57	B.C. 1-10 Mineral rights on: S½SE¼, NW¼SE¼, N½SW¼, SW¼NW¼ SE¼NE¼, E½SE¼, SW¼, S½NW¼ SE¼NE¼, E½SE¼ NE¼NE¼ W½NW¼	10,11 1 2 3 10 11	17S 17S	73W 73W	6th 6th	Fremont Fremont	377 381	267-276 365	207 840	Lease 30 years Lease 30 years
9/25/57	Treasure 1-22 Florine 1-5	5,6 33	18S 17S	72W 72W	6th	Fremont	376	237-287	540	Lease 30 years
8/30/57	F & S 1-12	19,20,29, 30	15S	73W	6th	Park	54	267-289	240	Purchase
	Marie 1-9	19,24	15S	73,74W	6th	Park	54	61-78	180	Purchase
	Doris 1-12	19,24	15S	73,74W	6th	Park	53	285-298	240	Purchase

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Date of Option	Name of Properties	Section	Town-ship	Range	Meridian	Place Recorded County	Book	Pages	Area	Nature of Title
8/30/57	Chile 1-27	15,16	15S	74W	6th	Park	51(amended) 52	57-98 145-156 135-143	420	Option
4/25/57	Joy 1-27 (Amended)	17,18,19, 20	13S	74W	6th	Park	48	318-334	540	Option
4/25/57	Big Joe 1-12	26,35	16S	73W	6th	Fremont	356	398-420	240	Option
8/26/57	Mineral Rights on:									
	NE¼SE¼	22	15S	74W	6th	Park			800	Option
	N½SW¼, NW¼SE¼	23								
	SW¼NW¼, NW¼SW¼	26								
	S½NE¼, SE¼, SE¼NW¼, NE¼SW¼, S½SW¼	27								
	SW¼	32								
9/3/57	Atomic 1-6	4,9	15S	74W	6th	Park	54	94-99	120	Option
9/3/57	Lava Cap 1-5	4,9	15S	74W	6th	Park	54	88-92	100	Option
6/7/57	Pike 1-7	11,12,14	17S	73W	6th	Fremont	357	297-309	140	Option
6/7/57	Joe and Bob 129-178	12,13,14 23	18S	73W	6th	Fremont	353	159-256	1000	Option
9/13/57	Barbara Dumic 1-8	32	18S	73W	6th	Fremont	339	352-359	1207	Option
	Fulfillment 1,2						342	457-465		
	Prosperity 1-3						342	493		
	Charity 1-3, Brownie 3	31,32					342			
	Bob and Joe 1-3	1,6,7,12,					342	488-490		
	Our Struggle 4-7	32					356	382-388		
	Devil 1-14	9,10,11					380	487-523		
	Satan 1-25	14,15					365	413-451		
8/30/57	Mineral Rights on:									
	SE¼SE¼	2	51N	12E	N.M.P.M.	Fremont			142	Option
	E½NE¼	11								
	Lot 1	12								
	[illegible]W¼	19	15S	73W	6th	Park			80	
	[illegible]E¼	24	15S	74W	6th	Park			80	

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Date of Option	Name of Properties	Section	Town-ship	Range	Meridian	Place Recorded County	Book	Pages	Area	Nature of Title
8/30/57	Loco 1A, 1,2,4	13,18	15S	73W	6th	Park	53	272-284	340	Option to Purchase
	(Loco 1A)						54	49		
	Ike 1-4,	13,18	15S	73W	6th	Park	53	299-306		
	5-9						54	51-60		
	Meadow 1-4	19,24	15S	73,74W	6th	Park	54	41-48		
8/30/57	G.L.S. 1,2	19,24	15S	73,74W	6th	Park	53	307-310	40	Option to Purchase
9/26/57	Mineral Rights on:					Escrow Agreement in Fremont County Bank				
	Sigler & Sigler Fee Land									
	SE¼	11	15S	74W	6th	Park			880	
	SW¼	24								
	NE¼	23	15S	73W						
	E½NE¼	4								
	SE¼SE¼	14								
	N½SE¼	19								
	S½NW¼, N½SW¼, SW¼NE¼	20								
4/25/57	Pinon 1		18S	73W	6th	Fremont	342	17	20	Option
	Dipper 1-16	21,22	17S	73W	6th	Fremont	352	299-309	320	Option
	Mineral Rights on:									
	S½SE¼, NW¼SE¼, N½SW¼, SW¼NW¼	17	17S	73W	6th	Fremont			640	Option
	SE¼NE¼	18								
	NE¼NE¼	20								
	SW¼NE¼, E½NW¼, NW¼NW¼	21								
	E½SE¼, NW¼SW¼	22								
	Mineral rights on:									
	S½SW¼, NW¼SW¼, SW¼NW¼	17	17S	73W	6th	Fremont			2320	Option
	N½SW¼, SE¼SW¼, SW¼SE¼	18								
	NE¼, NE¼NW¼	19								
	NW¼, NE¼SW¼	20								
	S½SW¼, SW¼SE¼, NW¼SW¼, SW¼NW¼	14	17S	74W						
	E½, E½W½	15								
	N½N½, SE¼NE¼	22								
	N½NW¼, S½N½	23								
	SW¼, S½NW¼	24								
	[illegible]NW¼	25								
	[illegible]½	35								

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Lease Number	Date	Description	Section	Town-ship	Range	Date of Expiration	Area	Nature of Title	County
1292-16	9/25/57	E½NE¼, W½, NE¼SE¼, S½SE¼	36	12S	71W	9/25/62	520	Colo. State Lease	Teller
1293-16	9/25/57	Lots 1-30, 32, 33, 35, 37-44, 46-49, 51-55, 57, 59-62	36	13S	71W	9/25/62	550	Colo. State Lease	Teller
1294-16	9/25/57	All	36	14S	71W	9/25/62	640	Colo. State Lease	Teller
1295-16	9/25/57	E½	16	15S	71W	9/25/62	320	Colo. State Lease	Park
1296-16	9/25/57	W½, NW¼SE¼, S½SE¼	36	49N	11E	9/25/62	440	Colo. State Lease	Fremont
1297-16	9/25/57	All	16	13S	74W	9/25/62	640	Colo. State Lease	Park
1298-16	9/25/57	All	36	13S	74W	9/25/62	640	Colo. State Lease	Park
1299-16	9/25/57	All	36	14S	74W	9/25/62	640	Colo. State Lease	Park
1300-16	9/25/57	All	16	15S	74W	9/25/62	640	Colo. State Lease	Park
1301-16	9/25/57	All	36	15S	74W	9/25/62	640	Colo. State Lease	Park
1302-16	9/25/57	W½	15	13S	76W	9/25/62	320	Colo. State Lease	Park
1329-16	11/26/57	Lots 3, 4, S½NW¼, W½SW¼	5	12S	75W	11/26/62	217	Colo. State Lease	Park
1330-16	11/26/57	All	23	51N	11E	11/26/62	640	Colo. State Lease	Fremont
1331-16	11/26/57	All	24	51N	11E	11/26/62	640	Colo. State Lease	Fremont
1332-16	11/26/57	N½	25	51N	11E	11/26/62	320	Colo. State Lease	Fremont
1333-16	11/26/57	N½	26	51N	11E	11/26/62	320	Colo. State Lease	Fremont
1339-16	12/11/57	N½, W½SW¼	10	11S	77W	12/11/62	400	Colo. State Lease	Park

Note: 1329-16 through 1339-16. No copies of leases until approved by State Land Board.

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2. Physical Description:

(a) Exploration to date has been undertaken by various mine operators in the Tallahassee Mining District. To date, approximately 250,000 tons of proven uranium ore (.30%) has been developed. Ore shipments to Vitro Uranium Company at Salt Lake City, Utah, and the Union Carbide plant at Rifle, Colorado, have exceeded 10,000 tons of 0.30% U_3O_8. Companies making shipments included the Juniper Oil and Mining Company, the Huber Oil Company, The Cotter Corporation, the Williams Mining Company, Elmer Smaller and the Tidewater Oil Company. Although complete information on these adjacent holdings is not available, the DMEA inspection team can visit these properties and will have made available, any information which may be at our Canon City, Colorado, exploration office.

United Western Minerals Company is in the initial exploration phase on all properties submitted in this application and, therefore, has no production or development information available.

(b) United Western's interest in the above operations is only that in the event of construction by them of a uranium processing plant, they would consider receiving ore from outside properties.

(c) Only available from Juniper Oil and Mining Company First Annual Report for year ended November 30, 1956, as quoted.

"To date Juniper's mining activities have been restricted to uranium, though several other kinds of properties have been examined. Strip mining was started in the Tallahassee Creek District, Fremont County, Colorado and 3,576 dry tons of uranium ore were sold from the Dickson-Snooper No. 11 mine yielding a gross of $106,856.87 (which includes $35,000 Government bonus). Average per ton yield was thus $22.07 before bonus. The average uranium oxide content was 0.266% and the average vanadium

oxide content was 0.05%. Ore was shipped to the Union Carbide Nuclear Company mill at Rifle, Colorado up to November 10 but thereafter shipments have been made to the Vitro Uranium Company mill at Salt Lake City, Utah.

"Plans for 1957 call for mining about 1,000 wet tons of ore per month from the Dickson-Snooper No. 11 mine and commencement of stripping operations on the Thorne Ore Body. Of the total overburden on the Dickson-Snooper No. 11 ore body, approximately 77,000 cubic yards, or roughly 2/3 had been stripped by December 1. Stripping on other proved ore bodies may be started in 1957.

"Drilling during the year (all in the Tallahassee Creek District) totalled 29,748 feet, comprising 629 holes. Of these holes, 84, or 13.4%, penetrated ore of presently marketable grade indicating 33,080 tons of reserve. Restated, each foot drilled blocked out 1.11 tons of indicated uranium ore reserve. In addition, this drilling located 19,200 tons of inferred ore of presently marketable grade. Total blocked out reserves are thus 52,280 tons, based on calculations of Juniper's engineers and geologists.

"By including only those tons of ore stripped and thus developed for mining, and by considering direct drilling expense, pro rata stripping charges, and all appropriate overhead, the cost per ton of developed ore reserves for 1956 was $6.10. Of the 10,520 wet tons so developed, 4,108 tons were shipped, leaving 6,412 tons of developed reserves at year end. Of this 4,108 tons shipped, 2,120 tons went to Rifle and 1,988 tons went to Salt Lake City. The total cost per ton to the Company, including ore development costs, of ore marketed at Rifle was $8.97, of ore marketed at Salt Lake City, was $14.23. During 1957 the cost of marketing ore at Salt Lake City, should decrease owing to increased annual tonnage and consequently decreased unit overhead charges.

"Juniper enjoys a very favorable position regarding property. During the year the Company had control of 24,375 acres comprised of 43 leases and 205 unpatented mining claims, all in Colorado. At year end the Company holds 10 leases covering 7,400 acres and the 205 claims covering 2,870 acres; all of this property being essentially full interest. Of the total, 4,430 acres are in the Tallahassee Creek Mining District, 3,560 are in the Cottonwood area just to the north, 80 acres in the Cotopaxi area, and 2,200 acres in the South Park area.

"At year end, Juniper is operating one producing mine, is preparing to start stripping the Thorne Ore Body, and is engaged in the completion of drilling on the Hall Homestead Ore Body. Other unexplored occurrences of commercial grade and thickness of uranium ore are present on the Company's properties."

(d) Present reserves consist of a potential reserve in the Chumway Park Area of 40,000 tons..20% based on Babbel Probe results. (See Chumway Park Red Beds section for details.)

(e) Previous Work

To present a concise picture of the geology of so broad a geographic area as is considered here, would be impossible without a great volume of writing. This discussion is, therefore, generalized with the details reserved, somewhat, for subsequent presentation.

Considerable help in understanding the geology of the region was gained from previous work. The first known geological reference is the general reconnaissance in the Arkansas River-Tallahassee Creek Area by the Hayden Survey published in the 1870's. The Pike's Peak Quadrangle was studied by Whitman Cross and the results were published by the Geological Survey in 1894 as Folio No. 7. This work mapped and described the volcanic rocks and associated sediments at the eastern edge of the Thirty-nine Mile Volcanic Field, summarized the age of faulting as late Cretaceous and Tertiary, and dated the volcanic flows as early Tertiary. Of particular importance was the mapping of the Florissant Lake Beds (Tertiary).

The summary of the monumental study of the San Juan Volcanic Field by Cross and Larsen, published in 1935 as U.S.G.S. Bulletin 843, represents the only detailed work on volcanics in south-central Colorado. As such, it contributes much to the understanding of Tertiary tectonics and volcanism in the Thirty-nine Mile Volcanic Field as well as the Basin Ridge volcanics of South Park.

Stark and five associates studied and mapped the geology and reported the origin of South Park in G.S.A. Memoir 33, published in 1949. This report provides a valuable description of the lithology and stratigraphic

relationships of the sediments present in this area as well as the tectonics and resulting structural features. The age relationship of faulting with respect to sedimentation, as discussed in this report, is very pertinent.

Detailed mapping was done by MacPherson in the Tallahassee Creek District for the Atomic Energy Commission in 1956. Though the report on this work has not yet been published, the accompanying map and stratigraphic section is included here for reference regarding the Tallahassee locality.

General Geology

The stratigraphic section represented in the broad area under consideration includes sediments ranging in age from Paleozoic to Recent. Volcanic rocks, excluding those of the basement Pre-Cambrian, are represented by a considerable thickness of intrusives and extrusives of Tertiary Age. These volcanics in the vicinity of Thirty-nine Mile Mountain comprise a pile measuring 2,000 feet thickness and consist of a broad range of generally intermediate rock types including rhyolites and trachytes on the acidic end to andesites and basalts on the basic end.

The volcanics cover a considerable time range in the Tertiary as indicated by several prominent interflow erosion surfaces. These unconformities together with the topographic influence on the distribution of volcanic extrusions, multiple vents active at the same or different times in one or several localities, limited or discontinuous exposure, and isolation of deposits by erosion all contribute to the difficulties in deciphering the correlation and differentiation of geologic units.

The sediments associated with the volcanics are particularly important because of their role as uranium host rocks.

The environmental controls essential for ore occurrence in this region appear to be faulting, a favorable host rock, and the presence of a uranium precipitant. In the known ore bodies, fault planes apparently served as conduits for mineralizing fluids or gasses--there have been both normal and reverse faults observed in association with ore bodies. Generally permeable sediments, both unconsolidated, and consolidated act as mineral host rocks. They cover a nearly complete lithologic range including clays, sands and sandstones, shales, arkoses, tuffs and ash beds, conglomerates and agglomerates. Carbonaceous material is associated with the uranium in every known ore occurrence and is believed to function as the precipitating agent for uranium. In some places, the carbon is finely disseminated and quite evenly distributed, while in other places the carbon occurs in concentrations of carbonaceous trash showing woody structure. In some localities, however, there are thick zones of carbonaceous clays which are believed to be barren.

Since the stratigraphy of the region is included with the local maps of South Park and Tallahassee Creek, it will not be discussed generally here. However, some stratigraphic discussion will be necessary in the consideration of the following local areas.

Tallahassee Creek

The known ore deposits in the Tallahassee Creek Area, which is located in Townships 72 and 73 West, Range 17 South, Fremont County, Colorado, are in clastics and pyroclastics

associated with the Thirty-nine Mile Volcanics mentioned previously. The lower of the three ore horizions is a fine to coarse grained argillaceous arkosic sand which is locally conglomeratic. This member, which is Tertiary in age, overlies the Pre-Cambrian unconformably in discontinuous deposits and appears to be confined in pre-depositional basins or drainage courses. Of fluvial and possibly lacustrine origin, this arkose unit exhibits local development of cross-bedding.

The ore deposits are generally lenticular bodies which conform to sedimentary structures, and the main ore zones are contained in dark, carbonaceous clays. An example of ore in this unit is the Mary-L Mine in the west half of Section 13, Township 17 South, Range 73 West, and the adjacent Smaller pits in Section 14 in the same township and range. At the Mary-L Mine, a northwest-southeast trending reverse fault has displaced Pre-Cambrian granite, gneiss, and schist against Tertiary rocks limiting the ore body on the east. This fault may have served as a conduit for mineralizing solutions from which uranium minerals were precipitated in the favorable host.

The uranium mineralization in this arkose unit is finely disseminated uraninite in the unoxidized zone and autunite has been identified as a secondary mineral. Minor amounts of molybdenum, strontium, and zinc are associated with the uranium minerals.

Above the lower arkose unit and separated from it by several volcanic flows, is the second ore horizon. This ore zone host is a volcanic conglomerate containing angular to well rounded cobbles and pebbles in an argillaceous tuff matrix. The cobbles are mainly

Pre-Cambrian granite and metamorphics, with some volcanic boulders, and there are some discontinuous lenses of sandstone and shale in the conglomerate. The most prominent flows separating the lower arkose and the volcanic conglomerate are, from older to younger, a sanidine rhyolite and an augite andesite. A trachyte has been observed beneath the rhyolite in one locality.

As in the lower arkose, the ore bodies are lenticular in outline and follow sedimentary stratification. The mineralization in the volcanic conglomerate unit is the same as in the lower arkose--uraninite and autunite. The Sunshine Mine in Section 30, Township 17 South, Range 72 West; the Dickson-Snooper, Thorne, Picnic Tree, and Ponderosa pits in Section 26, Township 17 South, Range 73 West; and the Hall Homestead and Big Wash prospect in Section 27, Township 17 South, Range 73 West are all examples of ore bodies in the volcanic conglomerate unit.

The unit stratigraphically overlying the volcanic conglomerate is a light gray tuff, locally massive, but grading laterally and upward to an agglomerate. This unit is an ore host in Section 36, Township 17 South, Range 73 West. The mineralization is uraninite and autunite associated with carbonaceous material. Successively overlying the tuff unit, locally, are interbedded deposits of tuffaceous agglomerate, an andesite flow-breccia, thin to massive tuffs, and a capping rhyolite flow.

It is believed that mineralization occurred contemporaneously with faulting or possibly immediately after faulting. Faulting in the Tallahassee area, at any rate, is post-volcanic conglomerate but not pre-mineral.

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Radiometric anomalies in the Tallahassee Creek Area are significant if they exceed a magnitude of twice background. Drilling behind several of these surface anomalies has resulted in the discovery of .45% U_3O_8.

Black Mountain

In the vicinity of Black Mountain, Township 15 South, Range 74 West, Fremont County, Colorado, ore was discovered in the Bell and Moore pit in Section 10. The ore host is a pyroclastic unit consisting of argillaceous tuff, sand, and clay which contains abundant carbonaceous material. Capping this unit is an andesite breccia mass, but because of poor exposures, there has been insufficient work done to definitely establish the identity of the underlying unit. Because of the many similarities of color, texture, and lithology of this sequence with that of the tuff and tuff agglomerate overlying the volcanic conglomerate unit of the Tallahassee Creek Area, the Bell and Moore section has been tentatively correlated with this section in Tallahassee Creek. The uranium minerals are also the same as those in the Tallahassee Creek Area.

A number of prominent surface anomalies have been noted in the general vicinity of Black Mountain on United Western Mineral company properties. (See General Properties Map showing distribution of anomalies.) As of this date, these anomalies have not been explored with drilling in the Black Mountain Area, but this area is scheduled next week.

Chumway Park Red Beds

Conspicuous thicknesses of red to buff arkose outcrop along the drainages of Thirty-one Mile Creek and Paris

Creek in Township 15 South, Range 74 West, Park County, Colorado; and along Cottonwood Creek in Township 51 North, Range 75 West, Fremont County, Colorado. In the Thirty-one Mile Creek vicinity, the red to buff arkose, which is locally conglomeratic and sometimes shaley, lies in well sorted and well stratified beds. This unit shows well developed cross-bedding locally and strikes N70°W and dips from 5° to 20° NE. This unit unconformably overlies a gray to green arkose which locally grades to red shale and buff sandstone. The strike of these latter sediments is N40°W and the dip is 65° NE. The lower arkose is tentatively assigned to the Permian Maroon, and the upper red arkose to the Jurassic (?) Garo. Although paleontologic evidence has not yet been discovered to substantiate the age assignments proposed here, lithologic comparisons with known outcrops of these formations in South Park is so marked as to contribute considerable merit to the assignment. The lower gray arkose lies unconformably on the Pre-Cambrian. In the Thirty-one Mile Creek locality, the red arkose is capped by a trachyte flow and this, in turn, is covered by a prominent rhyolite flow. Near-vertical to vertical felsite porphyry and andesite dikes, which cut both arkose units, have been observed in this locality.

Of particular economic interest is the occurrence of uranium mineralization and ore in the gray arkose unit in Section 19, Township 15 South, Range 73 West. As a result of coring on a surface anomaly in this section, 30 feet of ore assaying .20% U_3O_8 (chem.) was cut; another hole showed 19 feet of ore assaying .40% U_3O_8 (chem.) and one hole showed 100 feet of .10% U_3O_8(RA). Chemical assays in this locality exceed radiometrics by approximately 30%.

Many surface anomalies are known in the vicinity of the ore in the Thirty-one Mile Creek Area Red Beds and several good anomalies are known in a similar environment in the Cottonwood Creek Red Beds. The proper evaluation of these anomalies can only be made by drilling. (See General Properties Map showing distribution of anomalies.)

Antero Lake Beds

In the vicinity of Antero Reservoir and situated generally in Townships 13 and 14 South, Ranges 75 and 76 West, Park County, Colorado, there are considerable thicknesses of lacustrine sediments occupying several long, narrow, partly connected basins in the Pre-Cambrian. Stark et al have separated the Lake Beds into the Balfour Formation, which may be the top most member of the Denver Formation, and the Antero Formation. The Antero Formation includes the limestone-conglomerate facies identified by faunal remains as Oligocene Age. The Balfour (Denver?) is composed of sediments having an amazing resemblance to the inter-volcanic sediments of the Tallahassee Creek Area. These include clays and volcanic ash, argillaceous sandstone, trachyte flows, tuffs, and conglomerate with interbedded tuff.

In Section 20, Township 13 South, Range 76 West, drilling on a surface anomaly has resulted in ore discovery in the Balfour Formation. The ore zone is a dark carbonaceous clay with black layers of carbon scattered through it. The mineralized clay is covered by a tuff unit, which is capped by a rhyolite flow. In the prospect pit, this sequence strikes N 80°W and dips 50°S, while south of the prospect pit, the sequence is near-horizontal. An apparent fault has probably acted as a mineralizing conduit. The ore mineral or minerals have not yet been identified.

There are numerous surface anomalies on the Balfour Formation as well as the Antero Formation above it. The algal limestone ridges, which represent the lime facies of the Antero, are prominently radioactive in many known localities. Very little exploration has been done on the Balfour or Antero, but they both show considerable promise with known anomalies, known local faulting, and many carbonaceous horizons with favorable host characteristics.

Three Mile Area

In Townships 13 and 14 South, Range 74 West, Park County, Colorado, west and northwest of Thirty-nine Mile Mountain and generally drained by Three Mile Creek, there is a broad area which shows discontinuous exposures of anomalous arkosic clays. Though surface exposures are poor, the clay unit is thick and overlain by an andesite breccia. This sequence is very similar to the corresponding sedimentary sequence overlain by andesite breccia in the Tallahassee Creek Area.

The dearth of surface anomalies, a few good shows of uranium mineralization in old prospect pits, and the coincident lithology of the Three Mile Area with the Tallahassee Creek Area all combine to enhance the possibility of ore discovery in this locality. No exploration drilling has been done to date in this area.

Elkhorn Thrust Fault Area

The Elkhorn Thrust Fault is one of the major structural dislocations in Colorado. On the eastern edge of South Park, this low angle thrust, which dips to the east, has placed Pre-Cambrian rocks in contact with rocks of Jurassic through Eocene Age. The fault is Denver (Eocene) age.

Along the thrust plane and in the adjacent sediments, considerable uranium mineralization has been found in Townships 10 and 11 South, Range 75 West, Park County, Colorado. Because of its many carbonaceous zones near the top and the base, the Denver Formation could provide a favorable environment for uranium ore deposition. The Denver Formation will, therefore, be one of the major targets for exploration.

In normal fault block and graben basins east of the Elkhorn Thrust Fault, there are good thicknesses of lake beds of the Antero type which unconformably overlie the Pre-Cambrian thrust sheet. A number of surface radiometric anomalies are known to occur in these lake beds, providing another ore target in this locality.

In addition to the Elkhorn Thrust Area, there are many other normal and reverse faults in the general area of South Park where known favorable host rocks exist in similar environments. These other areas are being investigated on the surface as rapidly as possible, but at present this potential has barely been scratched.

High Park Area

In Townships 12 through 15 South, Ranges 70 and 71 West, Teller County, Colorado, there are discontinuous exposures of Florissant Lake Beds (upper Oligocene or lower Miocene) in a volcanic environment equivalent to the Tallahassee Creek Area. The Florissant is famous for the 1200 or more species of insect and plant life it has yielded, and it contains an abundance of carbonaceous trash. The Florissant Lake Beds, which are approximately 50 feet thick, are largely water laid tuffs and paper shales, but include some fluvial sediments. Whitman Cross,

in the Pikes Peak Folio, separated the generally overlying sandstones and conglomerates into the High Park Lake Beds and the Alnwick Lake Beds. These units are local, however, and are all considered Florissant for our purpose. Stratigraphically, the Florissant unconformably overlies the pre-Cambrian and is capped by the volcanic extrusive series. The flow which contacts the upper Florissant is a rhyolite.

Uranium mineralization in the Florissant Formation has been confirmed by outcrop sampling which yielded high-grade assays of 2 to 3 % U_3O_8. Limited drilling has revealed 50 feet of .08-.10% U_3O_8 in one hole, and 26 feet of .40% U_3O_8 in another. In addition to this known ore, there are a number of unexplored surface anomalies in the area. The uranium minerals in the Florissant have been identified as autunite and possibly uranophane.

(f) Reasons for Expecting Ore

Considering the vast region as a whole, there are many indications that this area can become a major uranium producer. First, there are abundant sediments which qualify as excellent uranium host rocks. The Denver-Balfour Formation of South Park, some of the Antero Lake Beds, the Florissant Lake Beds in the western part of the Pikes Peak quadrangle, and the channel or basin deposits of the same or approximately equivalent age in the Tallahassee Creek Area all fulfill the ideal host requirements. In addition, the Permian Maroon of the Thirty-one Mile Creek Area also meets these requirements. These sediments include abundant carbonaceous material, interwoven channeling, permiability due to sorting and grain size variations; and their areal extent and cumulative thickness is tremendous.

Igneous activity and alteration are widespread in the region, as are both major and minor dislocations due to faulting. Mineralization has been area wide, and the location of this region in the general belt of Central-Colorado metalization further enhances its possibilities. The extensive occurrence of radiometric anomalies, plus the frequency of ore discovery by drilling behind these anomalies, promises a continuing repetition of ore occurrence from Tallahassee northward through the Thirty-nine Mile Volcanic Field and on into South Park and the High Park-Florissant Area.

(g) List of geologic or engineering reports, assay maps, or technologic information, submitted with this report.

1. Property Map - Tallahassee-South Park Area showing anomalies.
2. Geologic Map - North of the Arkansas River.
3. Geologic Map, Tallahassee Creek District.
4. South Park Geologic Map.
5. South Park Lithologic Description.
6. Map showing proposed Exploration Drilling and United Western Minerals Company Property.
7. Teller County Property Map.
8. Rho Claims, Township Plat.
9. Phi Claims, Township Plat.
10. Tiny Tim and Iota Claims.
11. Gamma Claims, Township Plat.
12. Chile, Atomic, Lava Cap and Hass Claims.
13. Colorado Planimetric Sheet 237.
14. Colorado Planimetric Sheet 238.
15. Colorado Planimetric Sheet 266.
16. Colorado Planimetric Sheet 267.

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3. Accessibility of Project:

(a) Mr. Marvin C. Chase, District Geologist, United Western Minerals Company, available in Canon City, Colorado, to aid DMEA examining engineers and geologists.

Office: Room 8, Harrison Building, Phone 1869
Residence: 729 North 15th Street, Phone 1786

Properties cover an area of 120 square miles and are located within the Thirty-nine Mile Volcanic Field which ranges between Parkdale, Colorado, and Hartsel, Colorado. It will be necessary for United Western geologists to tour the holdings with the inspection team. At least three days will be required to cover this area.

The Thirty-nine Mile Volcanic Field, in most areas, is of gently rolling topography which can be traversed by large drill rigs without the aid of roads. There are a number of ranch, forest and county roads, and one State highway. All holdings are easily accessible by private car except during the winter time when jeeps are generally used.

(b) Canon City, Colorado, is an adequate shipping and supply point and all employees would reside there. The property would vary between 32 and 65 miles distance from this point.

Drilling crews and field personnel could reside at various ranches in the field which are presently leased by United Western.

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4. The Exploration Project: Phase I

(a) The proposed drilling project is designed to explore for uranium mineralization in the Thirty-nine Mile Volcanic Field and near-by Tertiary Lake sediments in Park, Teller and Fremont Counties, Colorado. Within the volcanic field, ore has been produced from arkosic clays lying in Pre-Cambrian basins and in carbonaceous sediments lying between the various volcanic flows. (Refer to 2(c) Juniper Oil and Mining Company Annual Report.)

Uranium occurrences and anomalies have been located in heretofore unexplored areas in the Thirty-nine Mile Volcanic Field. Present information indicates that the Tallahassee Creek Area type of uranium district may well repeat itself throughout the volcanic field. Initial drilling as shown on the accompanying maps is planned to offset trends of adjacent ore bodies, anomalies, and prospect pits showing mineralization. The remainder of the drilling in the first phase will be determined after initial results have been obtained.

Area I, Tallahassee District

The proposed noncore drilling in this area is designed to investigate both the Arkose and Volcanic Conglomerate units which have produced ore bodies in this area. Holes are spotted on the basis of present information; however, the locations would be subject to amendment as new data is developed. Formation drilling was done by Juniper Oil and Mining Company in this area with subsequent offsetting of mineralized holes. By this method, 1.1 tons of proven ore were developed for each foot drilled. At that time, there were two anomalies known in this area so that favorable formation drilling has proved successful.

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Non Core Drilling

The following program has been detailed on maps submitted herewith.

Property	Holes	Average Depth	Total
Russell Lease	40	200	8,000
Thorne Lease	110	200	22,000
Treasurer Claims	17	200	3,400
Pike Claims	10	200	2,000
Taylor-Smaller Leases	20	200	4,000
Tay Claims	11	200	2,200
Initial Drilling	208		41,600
Reserved to offset mineralization			8,000
Total Tallahassee			49,600

Area II, Chumway Park Red Bed Area

Property	Holes	Average Depth	Total
Various (See property map Sec. 19, T.15S.,R.73W.)	60	250	15,000
Reserved to offset mineralization	15	250	3,750
Total	75		18,750

Area III, Antero Lake Beds

Property	Holes	Average Depth	Total
Rho Claims & State Lease, Sec. 15, T.13S.,R.76W.	20	500	10,000
Phi Claims	9	500	4,500
Initial Drilling	29		14,500
Reserved to offset mineralization			2,500
Total			17,000

Area IV, Three Mile Creek Area

Property	Holes	Average Depth	Total
Tiny Tim Claims	10	200	2,000
Iota Claims	15	200	3,000
Initial Drilling	25		5,000
Reserved to offset mineralization			1,200
Total			6,200

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Area V, Elkhorn Thrust

Property	Holes	Average Depth	Total
Gamma Claims	14	500	7,000
Reserved to offset mineralization	4	500	2,000
Total	18		9,000

Area VI, High Park Area

Property	Holes	Average Depth	Total
Pi and Mu Claims	32	200	6,400
Reserved to offset mineralization	10	200	2,000
Total	42		8,400

Area VII, Black Mountain

Property	Holes	Average Depth	Total
Atomic, Lava Cap, and Chile Claims	35	200	7,000
Reserved to offset mineralization	10	200	2,000
Total	45		9,000

Summary - Drilling

Group No.	Planned Footage	Offset Reserve	Coring Reserve
I	41,600	8,000	
II	15,000	3,750	
III	14,500	2,500	
IV	5,000	1,200	No estimate by group.
V	7,000	2,000	
VI	6,400	2,000	
VII	7,000	2,000	
	96,500	21,450	2,500*

The total of the above proposed initial phase drilling is 96,500 feet with a reservation of 21,450 additional footage which will be used to offset mineralization where located.

*The 2,500 feet of diamond coring is to be used in coring only mineralized and ore sections where deemed necessary. We plan to plug down to the top of the section for which the core is required.

Because of the large acreage involved, two additional drilling phases of 100,000 feet each is proposed, contingent on favorable results on the primary program. By referring to the United Western general property map, it may readily be seen that only the most favorable properties have been included and that favorable horizons, anomalies and prospects exist on other lands which can be included in these later phases. The drilling program summarized above is designated as Phase I and is estimated to be completed by 120 days of field work.

Area to be selected with DMEA approval during Phase I of Drilling Program.

Drifts and Raises

500' of 4' x 6' drift at a unit cost	500'
100' of 4' x 4' (in the clear raises) at a unit cost	100'
Total - underground work	600'

Phase II

An additional 100,000 feet of drilling will be used to extend first phase mineralized areas as well as investigate newly discovered anomalies and geologic trends. With the approval of DMEA, we would also wish at that time to amend the contract by adding additional holdings which may have become significant as a result of the initial program.

Phase III

An additional 100,000 feet of drilling which would be used to investigate geologic structures and units which have been shown to be favorable for discovery of uranium ore bodies as a result of the first two phases. Primarily this drilling would be on the remaining acreage

held by United Western Minerals Company and the contract would have to be so amended.

In both of the later phases, 80,000 feet would be planned drill holes with the remainder used to offset mineralization. An additional 2,500 feet for coring would also be required.

(b) In some areas, drill roads will have to be constructed. The D-8 type of bulldozer has proved to be capable of doing this work in a rapid manner at a reasonable cost in the Thirty-nine Mile Field Area. These roads are not to be confused with access roads, but will be used to allow a level drill site on hillside areas.

For the first phase, from previous experience in the area, we would estimate 900 hours of dozing with one D-8 type unit.

(c) Work would commence within 30 days after execution of the DMEA Contract, with the option to start sooner if the necessary drilling contracts have been executed.

The average drilling rate in the contract area is 150 feet per day per drilling unit. On the basis of a six-day week, and allowing for the breakdown of some of the drills, it is estimated the eight drills can complete the first phase within 120 days after the commencement date.

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

5. Experience:

For experience of United Western Minerals Company see attached "2nd Annual Report 1957 United Western Minerals Co."

Persons who will supervise operations:

J. W. Patterson, Consulting Engineer

Marvin C. Chase, District Superintendent

Gordon O. VeneKlasen, District Geologist

Fred D. Waltman, Mining Engineer

J. W. Patterson: Age: 53

Education: University of Southern California - Special student in Chemistry - 1920
Colorado School of Mines - Engineer of Metallurgy - 1925 E.Met.
University of Wyoming - Master of Arts, (Geology) - 1926 M.A.
California Institute of Technology - Economic Geology - 1931 PhD.

Teaching Fellow in Geology - Cal-Tech. 1926
Research Fellow in Economic Geology, 1927-1931
In charge of Calif, Inst. of Tech. - Paleontological Field Work in Mexico, 1930-1940

Education and experience 1925-1936 under guidance of the late Dr. L. D. Ricketts. Research fellowships granted for study of Latin-American ore deposits and operations. Averaged 3 months per year study at Cal-Tech and remaining time with major commercial companies.

Experience: 1925 Southern California Edison Company, Surveyor.
1929-1931 Oposura Project, Moctezuma, Sonora, Mexico, General Superintendent.
1931-1933 El Arco Mines, Lower California, Mexico, Manager.
1933-1934 American Smelting & Refining Company, Consulting Engineer.
1934-1944 Consulting Practice, Mills Bldg., El Paso, Texas.
1940-1943 Krome Corporation, Consulting Engineer.
1944-1945 Joshua Hendy Iron Works, Research.
1945-1949 Pacific Bridge Company, worked on chromium program.
1949-1950 Aspen project, Humphreys Gold Corporation.
1949-1953 New Caledonian project, chrome.
1953-1955 Western-Knapp Engineering Co., continued work on chrome project.
1956 - United Western Minerals Company, Consulting Engineer.

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

Marvin C. Chase: Age: 38

Education: Graduate State College of Washington, June 1948. B. S. degree in Mining Engineering, minor in Geology and Mathematics, Secretary-Treasurer Sigma Gamma Epsilon, Mining Honorary. President of Associated Muckers. Member of A.I.M.E. Sigma Nu Fraternity.

Experience: 1943-1951 Pend O'Reille Mines and Metals Company, Mining Engineer and Mine Shift Boss.
1951-1952 American Lead and Zinc Company, Mining Engineer and Mine Shift Boss.
1953-1955 U. S. Atomic Energy Commission, Denver Exploration Branch, Mining Engineer.
1955-1956 Farmington Funding Corporation, Director, Mining Division.
1956-1957 Juniper Oil & Mining Company, Superintendent of Mines.
1957 - United Western Minerals Company, District Superintendent.

Gordon O. VeneKlasen Age: 33

Education: Purdue University, pre-engineering.
Michigan College of Mining and Technology, graduated 1950 with B.S. Geology and Physics.

Experience: 1950-1951 Mountain Geophysical Co., Seismic party chief.
1951-1952 Mountain Seismic Co.,Geophysical party chief and supervisor.
1952-1955 Sinclair Oil & Gas Co., Geophysical Supervisor, Research Geologist, and Liaison Geophysicist.
1955-1956 Personal business ventures and consulting in oil and mining.
1957 - United Western Minerals Company, District Geologist.

Fred D. Waltman Age: 36

Education: 1938-1942 Colorado School of Mines, Golden, Colorado. Graduated with Engineer of Mines Degree.

Experience: 1942-1943, United States Vanadium Corporation, Miner and Junior Engineer.
1943-1946 United States Coast Guard.
1946-1947 United States Smelting, Refining, and Mining Company, Safety Engineer.
1947-1954 National Lead Company, from Engineer to Mine Superintendent.
1955-1956 St. Joseph Lead Company, Mine Superintendent.
1957, Florida Manganese, Inc., Deming, New Mexico, General Superintendent.
1957 - United Western Minerals Company, Mining Engineer

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

6. Estimate of Costs:

Phase I Drilling

(a) Independent Contracts

Drilling Non-Core	Estimated Cost /Foot	Total Cost
73,200' to aver. depth of 200'	$1.50	$109,800.00
18,750' to aver. depth of 250'	1.60	30,000.00
26,000' to aver. depth of 500'	2.10	54,600.00
117,950'		194,400.00

Gamma Ray Logging

117,950' @$0.10 /foot — 11,795.00

Diamond Drilling Core

2,500' @$3.50 /foot — 8,750.00

Drill road construction - D-8 Bulldozer

Estimated 900 hours @$17.00 /hour — 15,300.00

(b) Personal Services

	Salary	4 Months	
Consulting-Supervising Engineer	@$1,000 mo.	4,000	
Project Engineer	800	3,200	
Chief Geologist	750 600	3,000 → 2400	
Four Geologists (2 rigs each)	500 500	8,000 → 2000	
Engineer (Surveyor)	650	2,600	
Two Surveyor Helpers	350	2,800	
Two Draftsmen	400	3,200	
Stenographer	250	1,000	
Clerical and Bookeeping	400	1,600	
		29,400	29,400.00

(c) Operating Materials and Supplies

Fuel, oil, and maintenance on 6 Jeep Station wagons @$125.00/mo. each, 4 mos.	3,000	
Repairs, batteries, and electrical supplies for geiger counters and scintillators - 4 mos. $150.00 /mo.	600	
Drafting supplies, prints, copy work, etc. @$300.00 /mo.	1,200	
	4,800	4,800.00

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

6. (d) Operating Equipment

No.	Unit	Rental /mo. or Purchase	Total 4 mos.	
6	Jeep station wagons	$ 200.00	$4,800.00	
6	Scintillators	275.00 ea.	1,650.00	
6	Brunton compasses	55.00 ea.	330.00	
1	set Transit and Survey Equip.	75.00	300.00	
	Drafting Equipment Rental	75.00	300.00	
			7,380.00	7,380.00

(e) None

(f) New buildings, fixtures, installations, etc.

Unit	No.	Rent		
Field office	1	$100 /mo.		400.00

(g) Miscellaneous

Assaying (Uranium)		
1200 chemical assays @$4.00 ea.	$4,800.00	
400 radiometric assays @$2.00 ea.	800.00	
Accounting (Santa Fe) New Mexico, Workman's Compensation, insurance, payroll taxes, etc. @$2,000 /mo.	8,000.00	
	13,600.00	13,600.00
Total Phase I Drilling		$285,825.00

Phase I - Drifts & Raises

*Unit Costs

500' 4x6 drift @$40.00 /linear foot	20,000.00	
100' 4x4 (in the clear) raises @$40.00 /linear foot	4,000.00	
Timbering (drifts) as required but not exceeding 200' total @$5.00 /linear foot	1,000.00	
Timbering (raises) as required but not exceeding 75' total @$10.00 /linear foot	750.00	
Preparation work - Bulldozer work 16 hours @$17.00 /hr.	272.00	
Total Phase I - Drift & Raises	26,022.00	$26,022.00

*See Addendum for breakdown of estimated costs of Drifting and Raises.

Summary of Estimated Costs of Phase I.

1.	Drilling Program	$285,825.00
2.	Drifts and Raises	26,022.00
	Total Phase I	$311,847.00

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

7. (a) We are prepared to furnish our share of the cost of the proposed project in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order-I, Revised.

(b) We are prepared to furnish our share of the costs by providing money, use of equipment owned by us, personnel, etc.

ADDENDUM

MAPS, TECHNOLOGIC
INFORMATION, ETC.

UNITED WESTERN MINERALS COMPANY
136 W. Palace Avenue
Santa Fe, New Mexico

GEOLOGIC MAP AND SECTIONS OF SOUTH PARK, COLORADO

EXPLANATION

Sedimentary Rocks

Tertiary	Tt	Trump formation
	Tw	Wagontongue formation
	Ta	Antero formation (undifferentiated)
		Tal Limestone (Antero formation)
		Tac Conglomerate (facies-Oligocene)
	Tb	Balfour formation
	Td	Denver formation
Cretaceous	Kl	Laramie formation
	Kf	Fox Hills sandstone
	Kp	Pierre shale
	Kc	Colorado Group (Undifferentiated)
		Kn Niobrara formation -- Colorado Group
		Kd Dakota sandstone
Jurassic	Jm	Morrison formation
	Jg	Garo sandstone
Permian	Pm Ls	Maroon formation (Undifferentiated) (Ls, limestone bed)
		Pps Pony Springs member -- Maroon formation
		Pch Chubb member
	Pw	Weber (?) formation
Paleozoic	Pal	Early Paleozoic rocks (Undifferentiated)

Igneous and Metamorphic Rocks

Tertiary	Ttr	Trachyte
	Tba	Buffalo Peak andesite
	Tta	Thirty-nine Mile andesite
	Tep	Eshe Porphyry
	Tgp	Baker Lake porphyry
	Tlbp	Little Black porphyry
	Tcg	Chalmers granite
	To	Oil Well dikes
	Tobr	Rhyolite
	Tdbw	Red and White breccia - Denver Basin Group
	bt-Tdbv	Variolite breccia (bt, breccia and tuff member)
Pre-Cambrian	sp	Silver Plume granite
	pp	Pikes Peak granite
	Is	Idaho Springs formation
	PCu	Pre-Cambrian rocks (Undifferentiated)

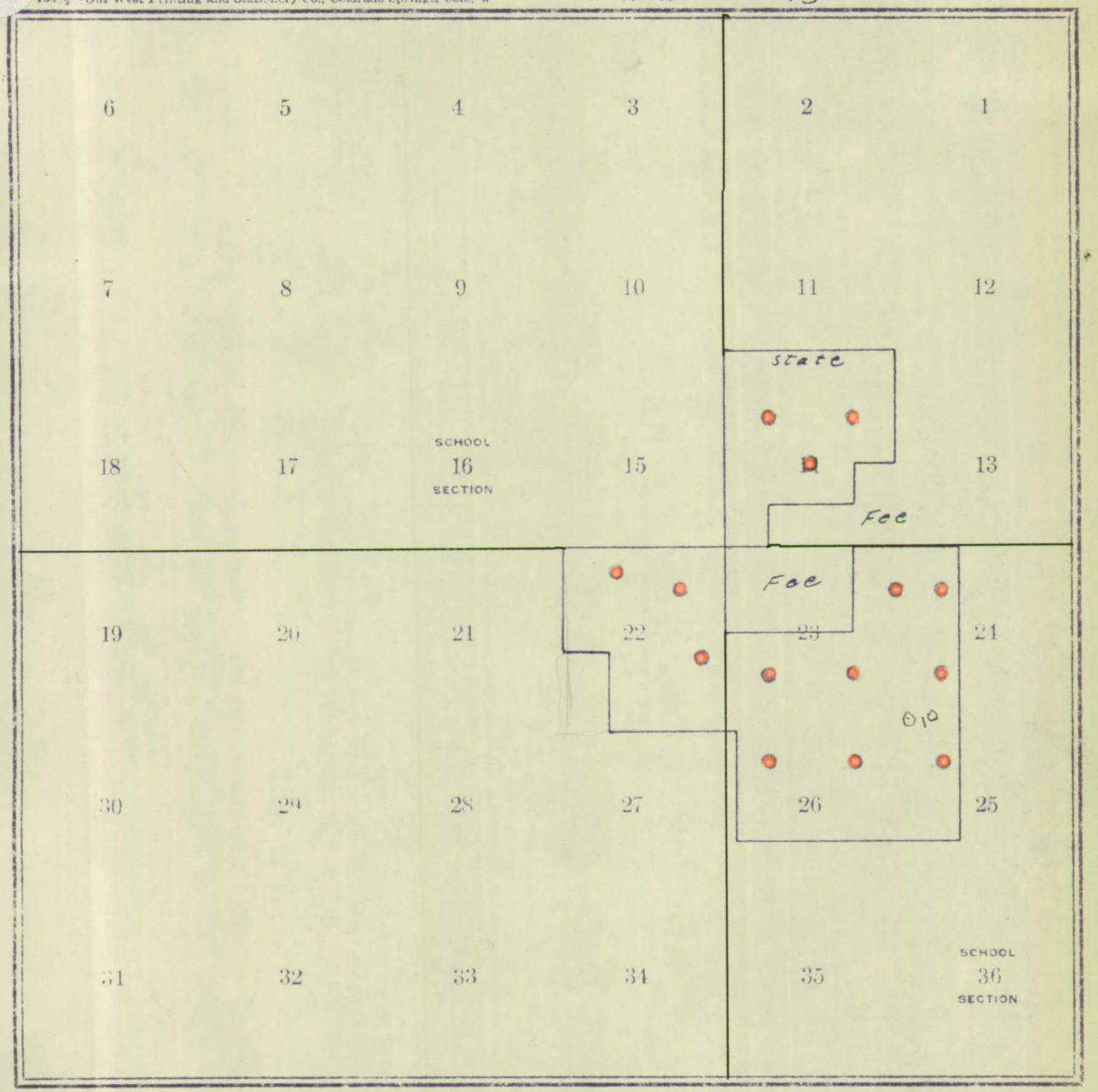
Date of Plat 12/10/57

Park County,

Township 11 S Range 75 W

43315—Out West Printing and Stationery Co., Colorado Springs, Colo. *

Gamma Claims



REFERENCES

Entered Land.
Homestead Application.
Pre-Emption Filing.
Timber Culture Claim.
Grant.
Coal Filing.
Coal Entry.
Desert Entry.
Oil Shale Placer Claims.
Oil Placer Claims.

Lands not otherwise marked are vacant.

Scale:
32 chains to one-half inch.

⊙ Drill holes (proposed)

11

EXTRA COPY
D M E A
RECEIVED JAN 16 1958

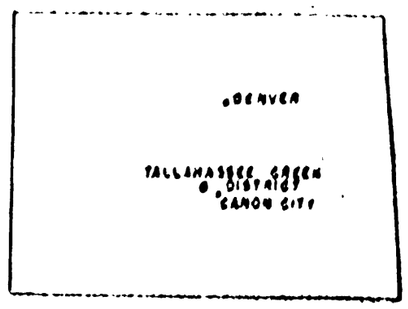
DATE	INITIALS	CODE

GEOLOGIC AGE		OUTCROP PATTERN & THICKNESS	LITHOGRAPHIC DESCRIPTION	URANIUM OCCURENCES
QUATERNARY	Recent?	Qcl 0' - 100'	Silt, sand and gravel derived from Precambrian rocks and Tertiary Volcanics and sediments. Forms thin veneer on Valley walls, and reaches its greatest thickness along the main drainages.	
QUATERNARY	Pleistocene	Qsld 0' - 50'?	Landslide debris, derived mostly from Upper Rhyolite.	
QUATERNARY		Qg 0' - 10'	Gravel Patches, unconsolidated, mostly Volcanic rocks.	
TERTIARY	Miocene and Oligocene	Tru 30' - 235' (Upper part eroded)	Rhyolite. Generally forms flat-topped divides on higher ridges and the higher cliffs on canyon walls. Weathers reddish brown, pick on fresh surface. Contains many flow structures and inclusions of foreign materials.	
TERTIARY	Miocene and Oligocene	T 0 - 60'	Tuff, thin to massive deposits. Well indurated. Sometimes forms vertical cliffs. Color varies from white to light gray speckled with black flakes of biotite. Visible feldspar.	
TERTIARY	Miocene and Oligocene	Tab 200' 600	Andesite flow breccia. Massive flows form prominent cliffs with many re-entrants. Weathered surfaces are dark brown. Fresh surfaces tend toward reddish-brown. Brecciated fragments range from less than one inch to several inches in diameter. Both matrix and Breccia are generally fine grained to aphanitic. Interbedded deposits of tuffaceous agglomerate. Composed of granular, yellowish-brown matrix and angular to rounded agglomerate consisting of vesicular basalt, andesite, volcanic glass and rhyolite. Tuff deposits occur locally in basal portion of this unit. They are light gray and contain a few dark pyroclastic constituents. At the contact with the overlying flows they have been opalized.	
TERTIARY	Miocene and Oligocene	Tvc 0' - 130'	Volcanic conglomerate. Angular to well-rounded conglomerate in fine grained tuffaceous matrix. Derived chiefly from disintegration of rhyolitic rock resembling Lower Rhyolite Flows in this area. Minor constituents consist of other volcanic rocks, pillowlava (?), and Precambrian granite and Metamorphic rocks. Discontinuous lenses of sandstone and shale. Local concentrations of carbonized and silicified wood.	Contains deposits of Uranium Minerals.
TERTIARY	Eocene?	Ta 0' - 135'	Augite andesite. Dense Black, weathers rusty brown. Well developed jointing. Calcite veinlets along joint planes, on fresh surface is equiangular, medium grained, with visible and black ferro-magnesium minerals.	Single occurence of Autunite (?) in calcite vienlets along joint surface.
TERTIARY	Eocene?	Tsr 60' - 200'	Sanidine rhyolite. Cliff-former overlying arkose. Weathers pink to brown. Texture, aphanitic with phenocrysts of sanidine. Numerous flow vesicles. Feldspars partially altered to clay.	No known uranium minerals.
TERTIARY	Eocene?	Toc 0' - 165'	Arkose and shale. Arkose is fine to very coarse grained, locally conglomeratic. Lies unconformably on Precambrian complex in discontinuous lenses. Cross-bedding locally well developed. Some concentrations of carbonaceous material present. Mudstone is red and green and generally confined to upper part of section.	Contains both oxidized and unoxidized uranium mineral. Deposits generally lenticular in outline and roughly concordant with sedimentary structures.
Precambrian		pre C	Granite, pegmatite, and matamorphic Rocks. Granite is pink to medium gray, course to medium grained; intrudes greenish gray micaceous shist. Shists highly concorted, exist only in small patches. Pegmatite intrudes shist and probably the granite.	Radioactive locally along fault and shear zones, ranges in intensity from 10 to 100 times background.

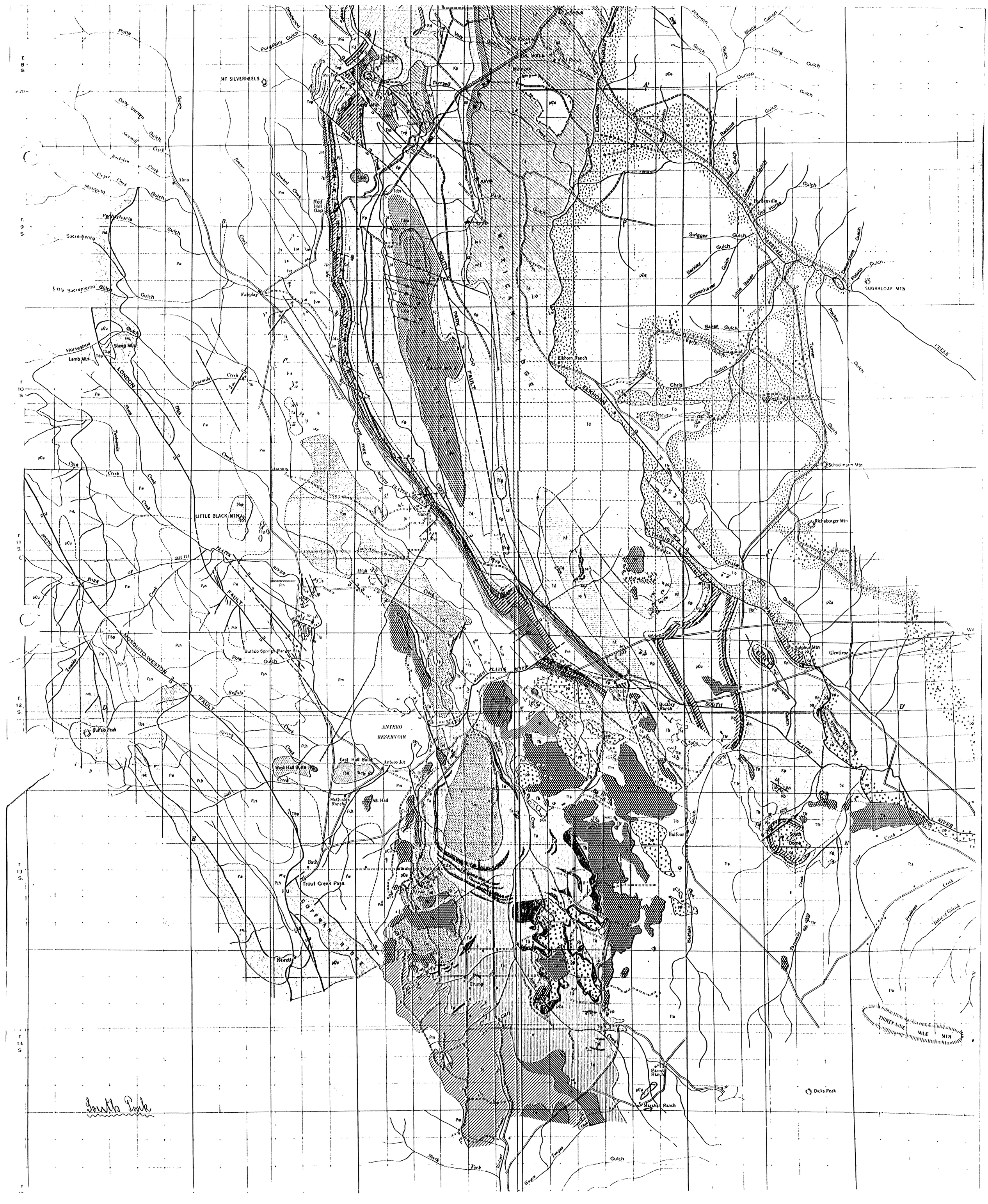
GEOLOGIC COLUMN - TALLAHASSEE CREEK DISTRICT
FREMONT COUNTY, COLORADO

LEGEND

- Fault - Dashed where inferred
- Formational contact
- Buildings
- Strike & dip of beds
- Mine
- Forest Service Triangulation Point



INDEX MAP FOR TALLAHASSEE CREEK DISTRICT


MT SILVERHEELS
Platte
Purgatory Gulch
Dolly Varden Gulch
Sawmill Creek
Buckskin Creek
Cedar Creek
Mosquito Gulch
Alma
Pennsylvania Gulch
Sacramento Gulch
Little Sacramento Gulch
Fairplay
Red Hill Gap
Horseshoe Gulch
Sheep Mtn
Lamb Mtn
LONDON
Tarryall Creek
Tarryall Mts
Kenosha Park
SOUTH PARK FAULT
TROUT
NORTH FORK OF SOUTH PLATTE RIVER
Elkhorn Ranch
ELKHORN THRUST
Chris Gulch
Baker Gulch
Early Gulch
Swigger Gulch
Berkley Gulch
Copenhaver Gulch
Little Baker Gulch
Hartsville
Old Horse Gulch
Radcliff Gulch
Dunlap Gulch
Johnson Gulch
Black Canon
Long Gulch
Potato Gulch
SUGARLOAF MTN
Schoolmarm Mtn
Richaborger Mtn
LITTLE BLACK MTN
MICHIGAN RIDGE
MICHIGAN THRUST
Chase Gulch
Sulphur Mtn
Glentivar
SOUTH PLATTE RIVER
MOSQUITO-WESTON FAULT
Buffalo Springs Ranger Sta
Pole Gulch
Buffalo Peak
ANTERO RESERVOIR
East Hall Butte
West Hall Butte
Antero Jct
McQuaids Ranch
Mt. Hall
Bath
Trout Creek Pass
COTTONWOOD RIDGE
Nevette
Buckley Ranch
Colorado Ranch
Balfour
South Dome
Parrot Ranch
Marshall Ranch
Dicks Peak
THIRTY-NINE MILE MTN
South Park

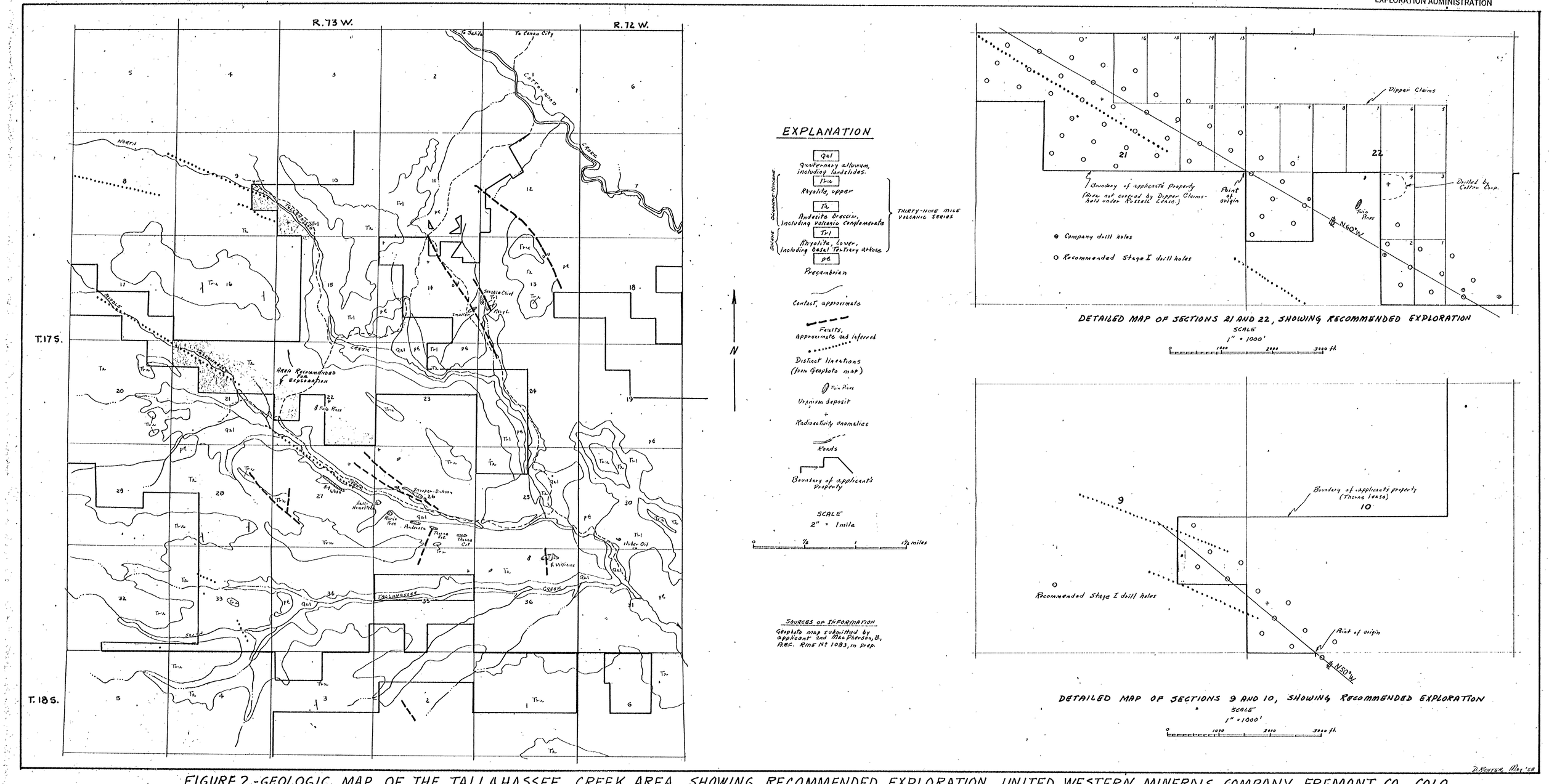
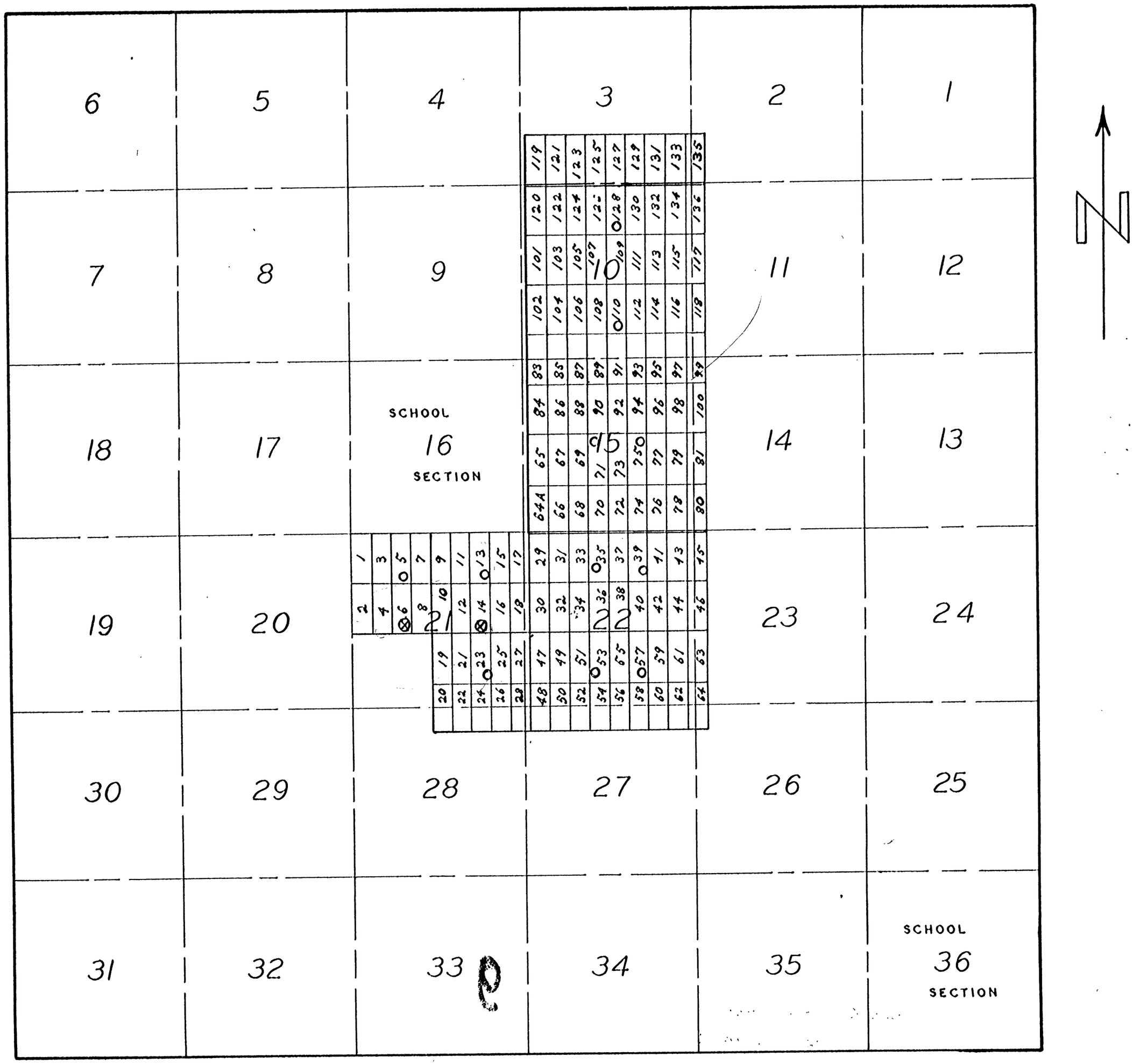
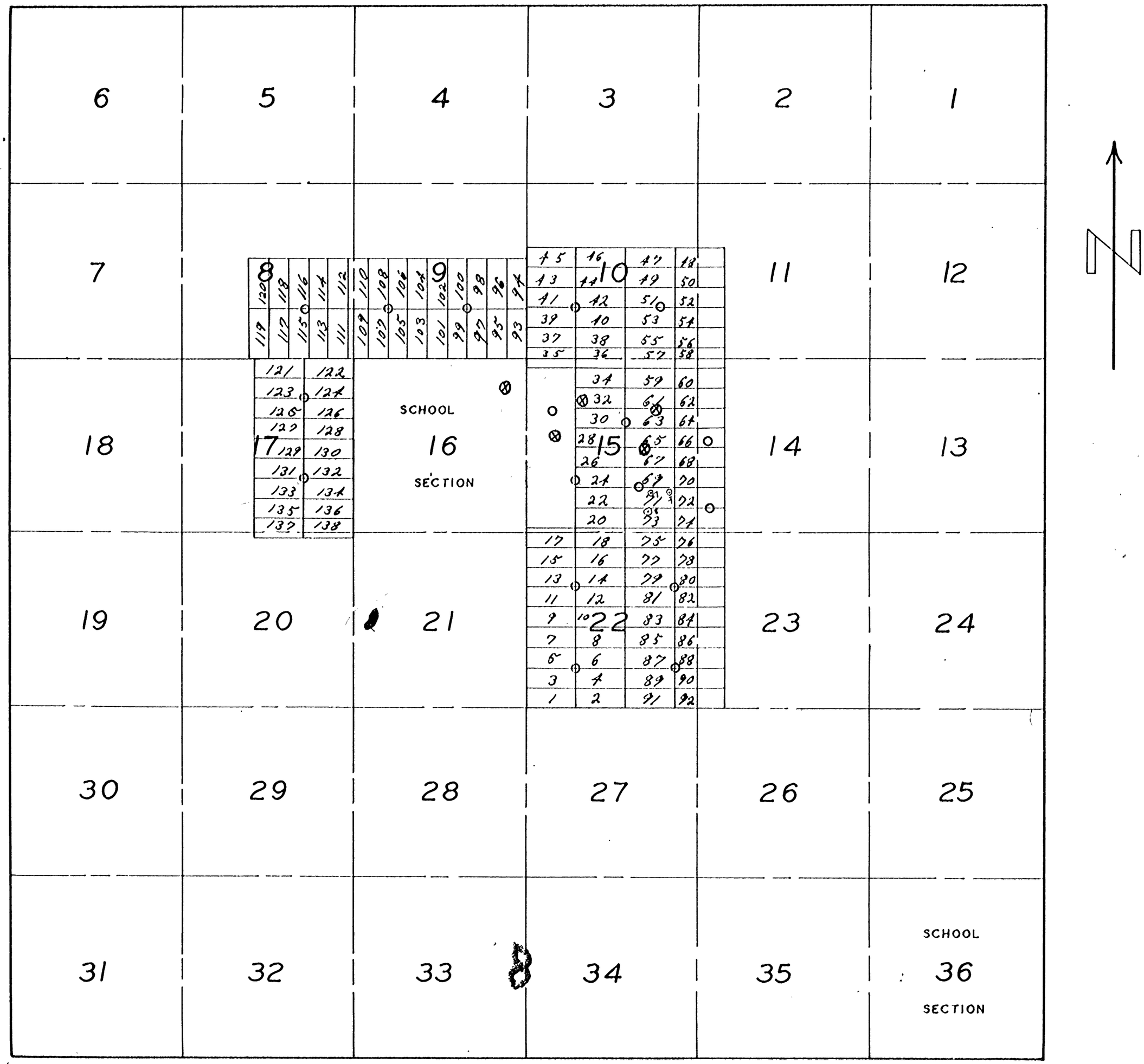


FIGURE 2 - GEOLOGIC MAP OF THE TALLAHASSEE CREEK AREA, SHOWING RECOMMENDED EXPLORATION, UNITED WESTERN MINERALS COMPANY, FREMONT CO., COLO.



PHI CLAIMS
T 13S, R 75W, 6TH P.M.
PARK COUNTY, COLORADO
DRAWN BY: B.F DATE:
SCALE: 2" = 1 MILE

⊗ Anomolies
o Drill holes (Proposed)



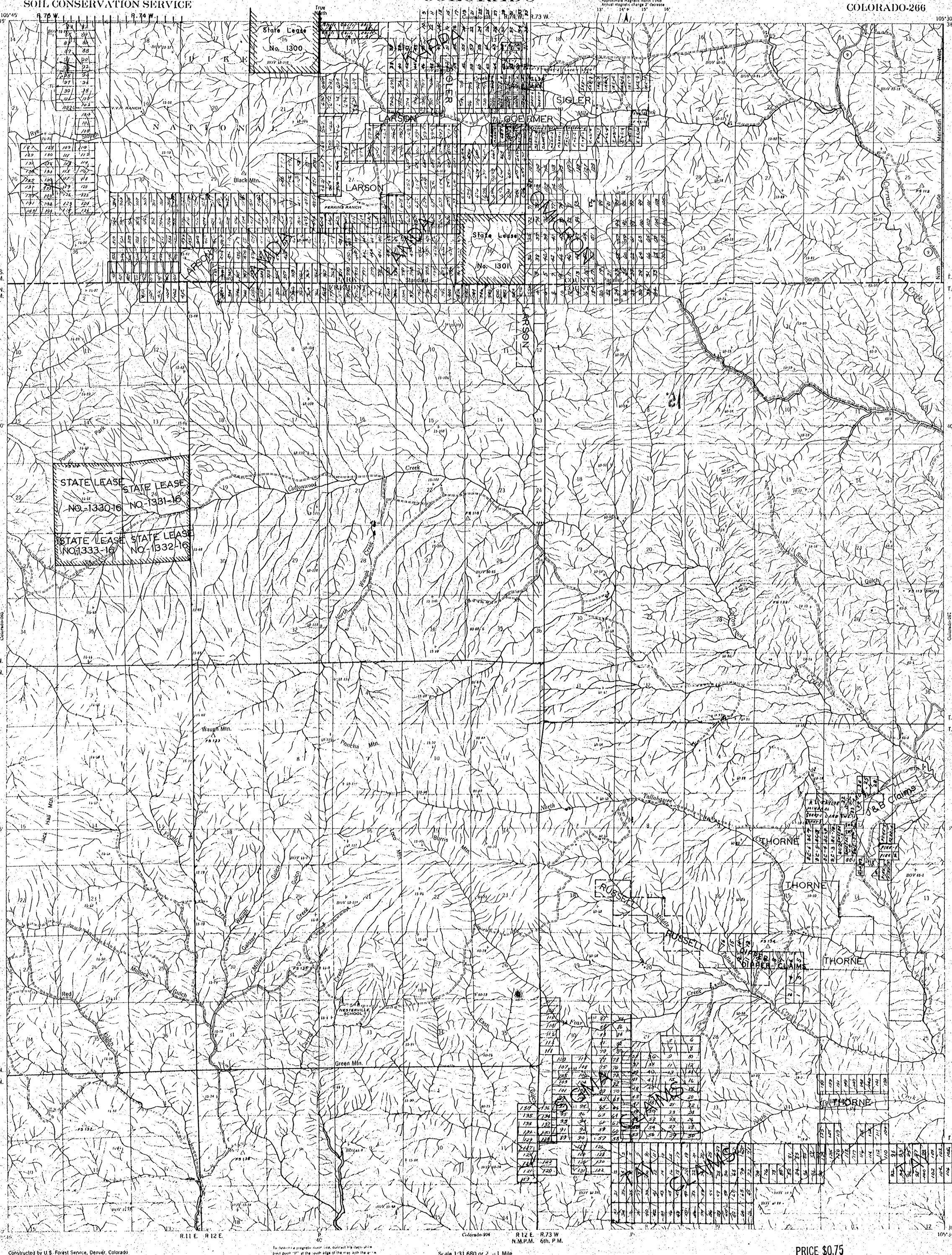
Orebody
Anomoly
Proposed drill holes

RHO CLAIMS
T 13S, R 76W, 6TH P.M.
PARK COUNTY, COLORADO
DRAWN BY: DATE: 9-21-57
SCALE: 2" = 1 MILE

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

COLORADO

SOUTHWEST REGION
COLORADO-266



Constructed by U.S. Forest Service, Denver, Colorado
from aerial survey flown by U.S.F.S. in 1938 39 41 Symbol: BOV
Drafting by Regional Cartographic Division,
U.S. Soil Conservation Service, Albuquerque, New Mexico 1948
Horizontal control by U.S.C.&G.S. and U.S.F.S.
Modified polyconic projection, North American datum 1927.
This map has not been checked in the field and is subject to correction

To determine magnetic north line, connect the declination diagram point "P" at the south edge of the map with the arrow as shown on the figure scale at the north edge of the map

Scale 1:31,680 or 2 in. = 1 Mile

1 0 1 2 3 4 Miles
5000 0 5000 10000 15000 20000 Feet

Center and number of aerial photograph

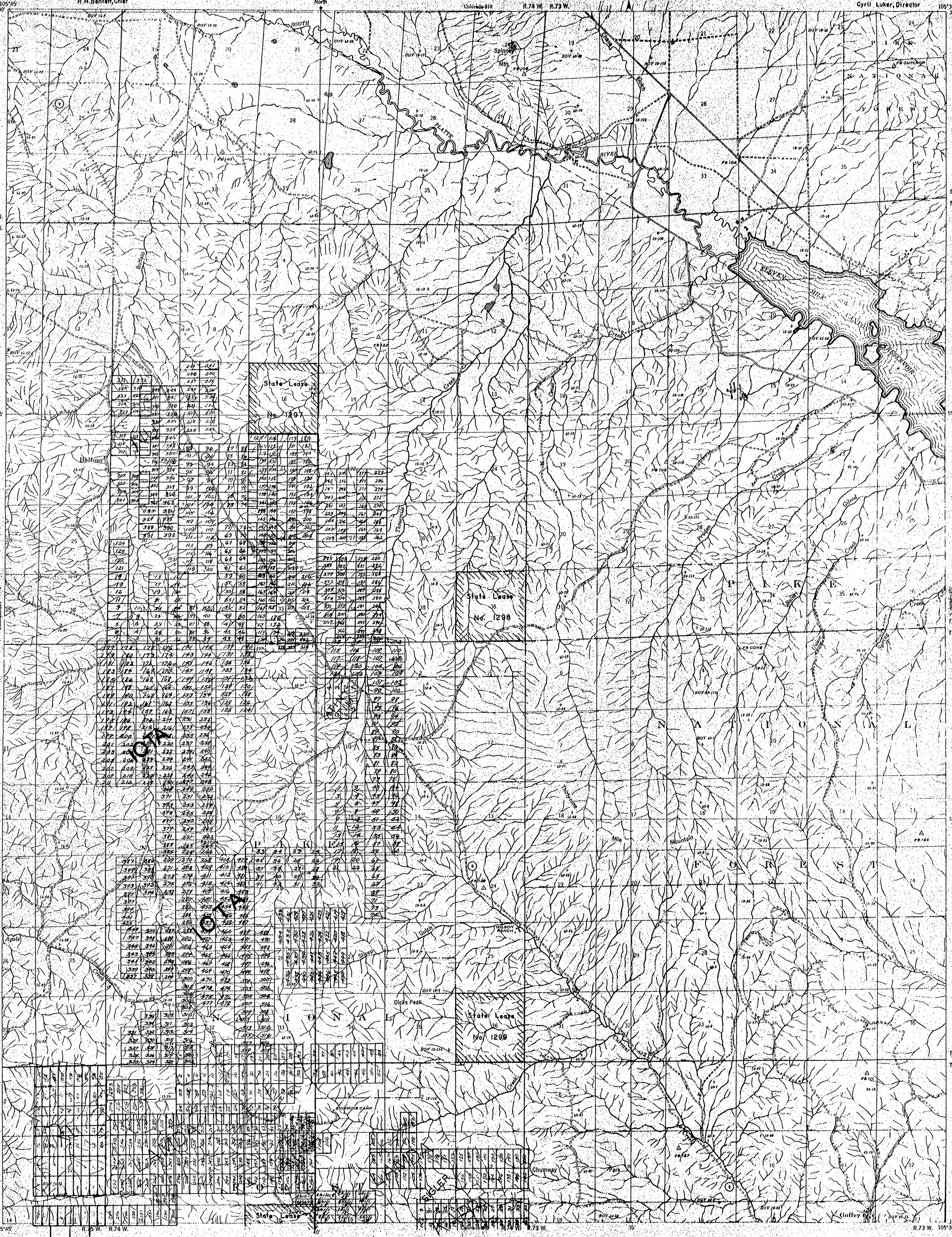
PRICE $0.75

COLORADO-266
Revised February, 1950

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H.H. Bennett, Chief

COLORADO

SOUTHWEST REGION
COLORADO-238
Cyril Luker, Director



Constructed by U.S. Forest Service, Denver, Colorado
from aerial survey flown by U.S.F.S. in 1938-41. Symbol: BOV
Drafting by Regional Cartographic Division,
U.S. Soil Conservation Service, Albuquerque, New Mexico 1948.
Horizontal control by U.S.C.&G.S. and U.S.F.S.
Land lines from G.L.O. surveys
Modified polyconic projection, North American datum 1927.
This map has not been checked in the field and is subject to correction.

To determine magnetic north line, connect the declination pivot point "P" at the south edge of the map with the arrow as shown on the degree scale at the north edge of the map.

Scale 1:31,680 or 2" = 1 Mile

1 0 1 2 3 4 Miles
5000 0 5000 10000 15000 20000 Feet

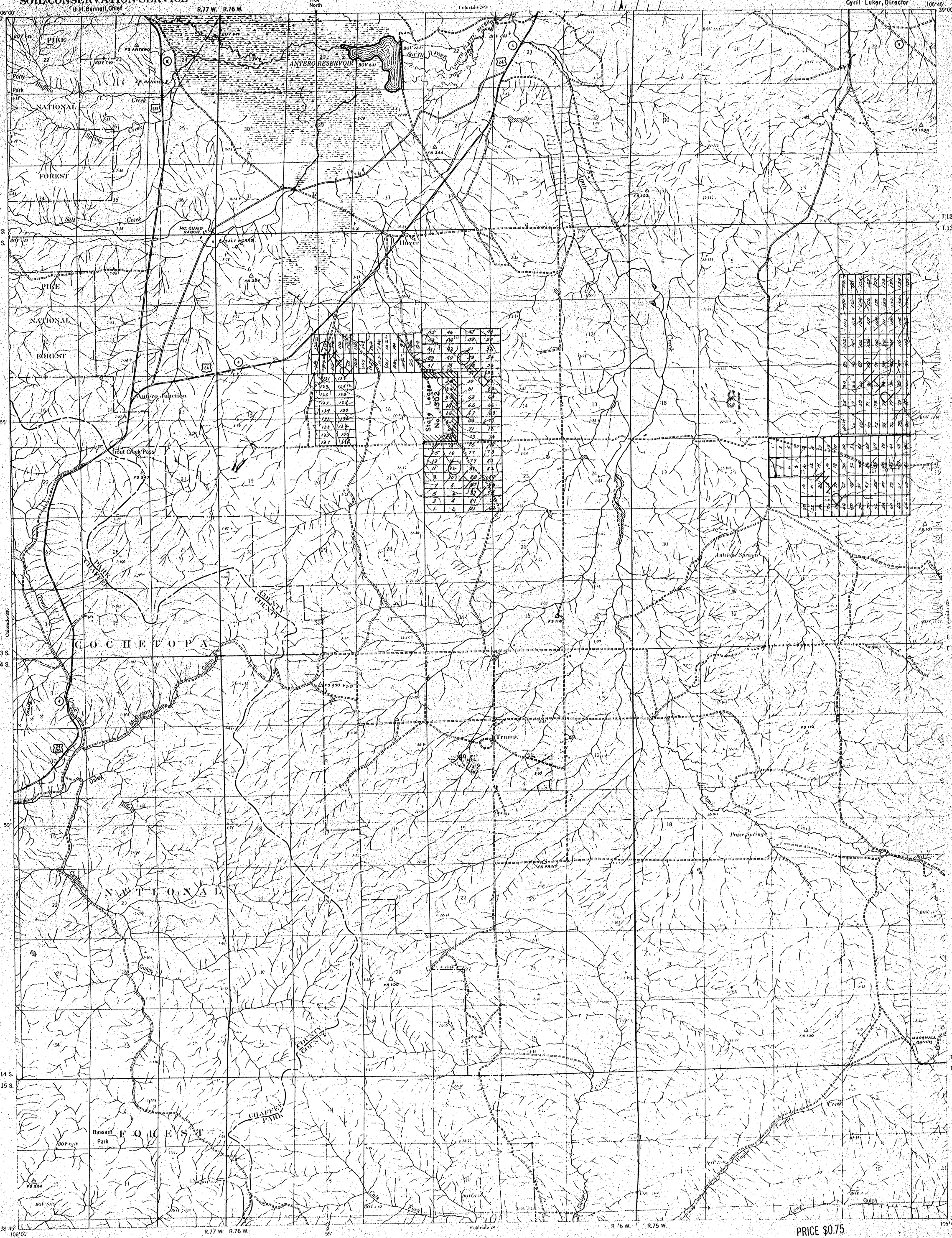
Center and number of aerial photograph

COLORADO-238
Reprinted February, 1950

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. Bennett, Chief

COLORADO

SOUTHWEST REGION
COLORADO-237
Cyril Luker, Director



PRICE $0.75

Constructed by U.S. Forest Service, Denver, Colorado
from aerial survey flown by U.S.F.S. in 1938. Symbol: BOV.
Drafting by Regional Cartographic Division,
Soil Conservation Service, Albuquerque, New Mexico 1947.
Horizontal control by U.S.C.&G.S. and U.S.F.S.
Land lines from G.L.O. surveys and field identification on aerial photographs.
Modified polyconic projection. North American datum 1927.
This map has not been checked in the field and is subject to correction.

To determine magnetic north line, connect the declination diagram point at the south edge of the map with the point as shown on the degree scale at the north edge of the map.

Scale 1:31,680 or 2" = 1 Mile

1 0 1 2 3 4 Miles
5000 0 5000 10000 15000 20000 Feet

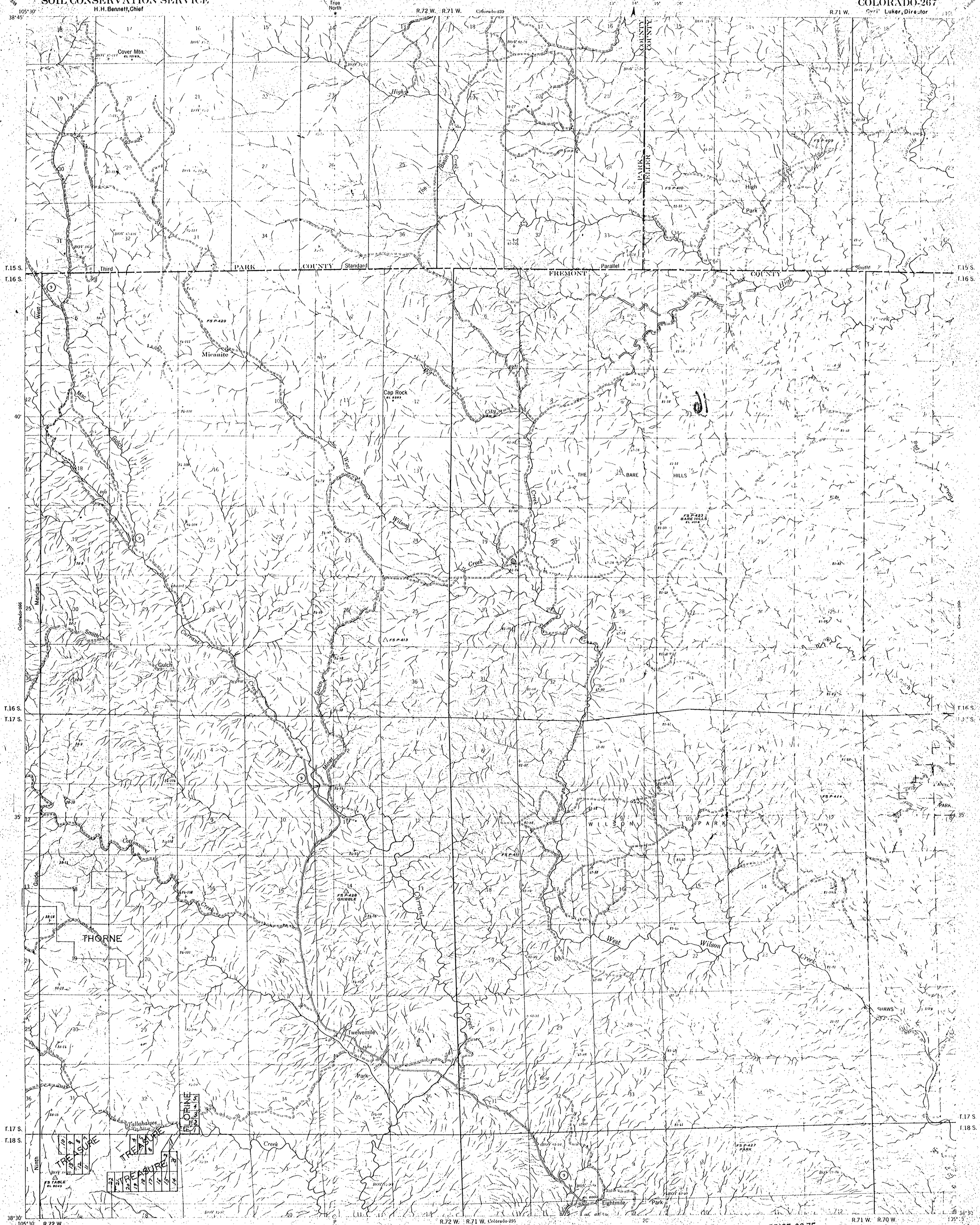
Center and number of aerial photograph

COLORADO-237
Reprinted February, 1950

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H.H. Bennett, Chief

COLORADO

SOUTHWEST REGION
COLORADO-267
Carl Luker, Director



PRICE $0.75

Constructed by the Regional Cartographic Division, U.S. Soil Conservation Service, Albuquerque, N.M. 1947 from aerial survey flown by U.S.F.S. in 1938-40. Symbol: BOV
Horizontal control by U.S.C.&G.S. and U.S.F.S.
Land lines from G.L.O. surveys
Modified polyconic projection, North American datum 1927.
This map has not been checked in the field and is subject to correction.

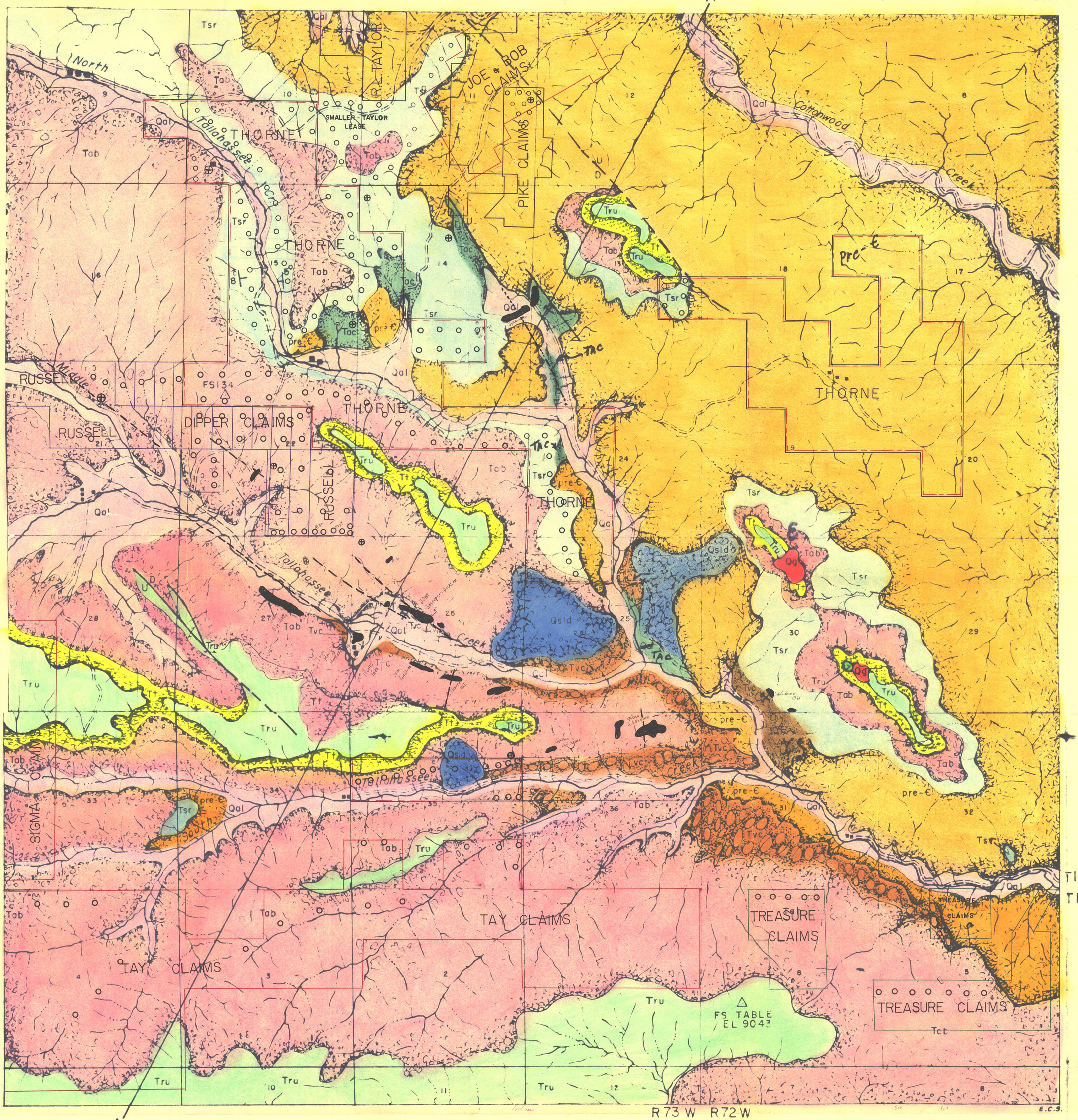
To determine magnetic north line, connect the declination pivot point "P" at the south edge of the map with the arrow as shown on the degree scale at the north edge of the map

Scale 1:31,680 or 2" = 1 Mile.

1 0 1 2 3 4 Miles
5000 0 5000 10000 15000 20000 Feet

Center and number of aerial photograph

COLORADO-267
Reprinted February, 1950



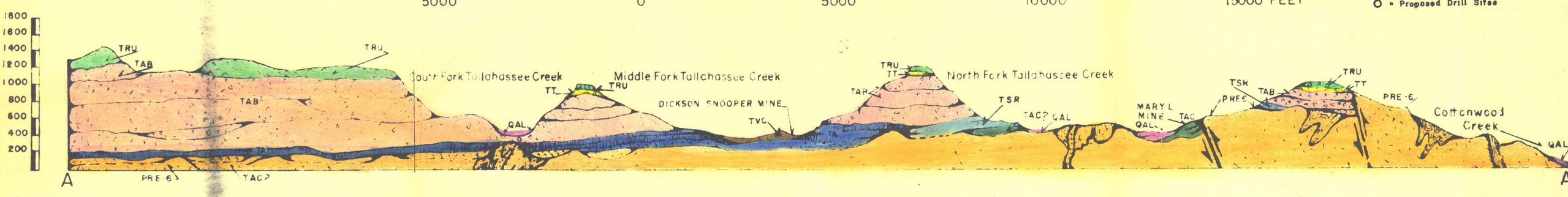
GEOLOGIC MAP OF THE TALLAHASSEE CREEK DISTRICT
FREMONT COUNTY, COLORADO

Base map from U.S. Dept of Agriculture, S.C.S. maps, S.W. Region, Colorado 266 and 267.
Geology by Bruce A. Mac Pherson. - 1956

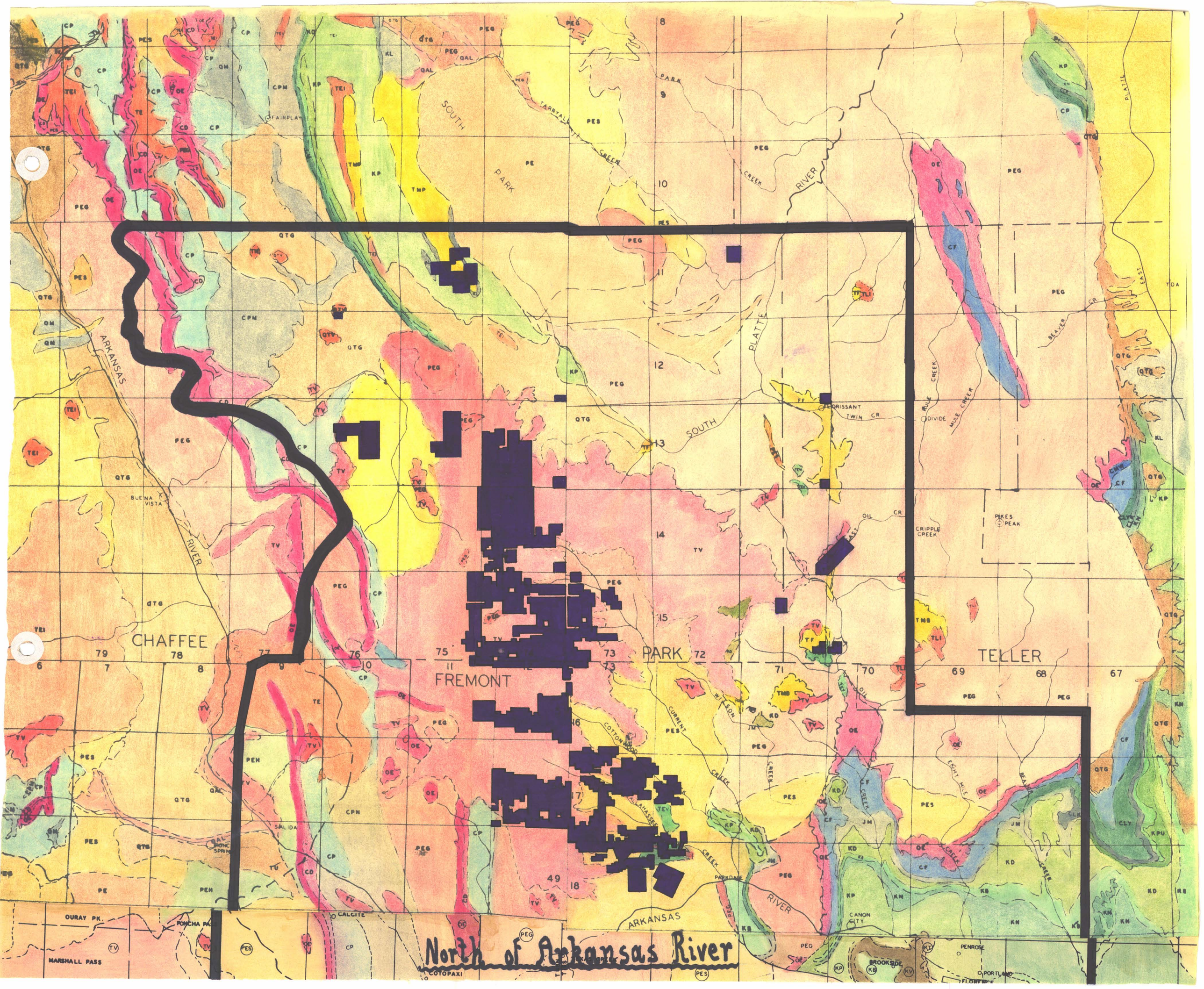
1 0 1 2 3 MILES

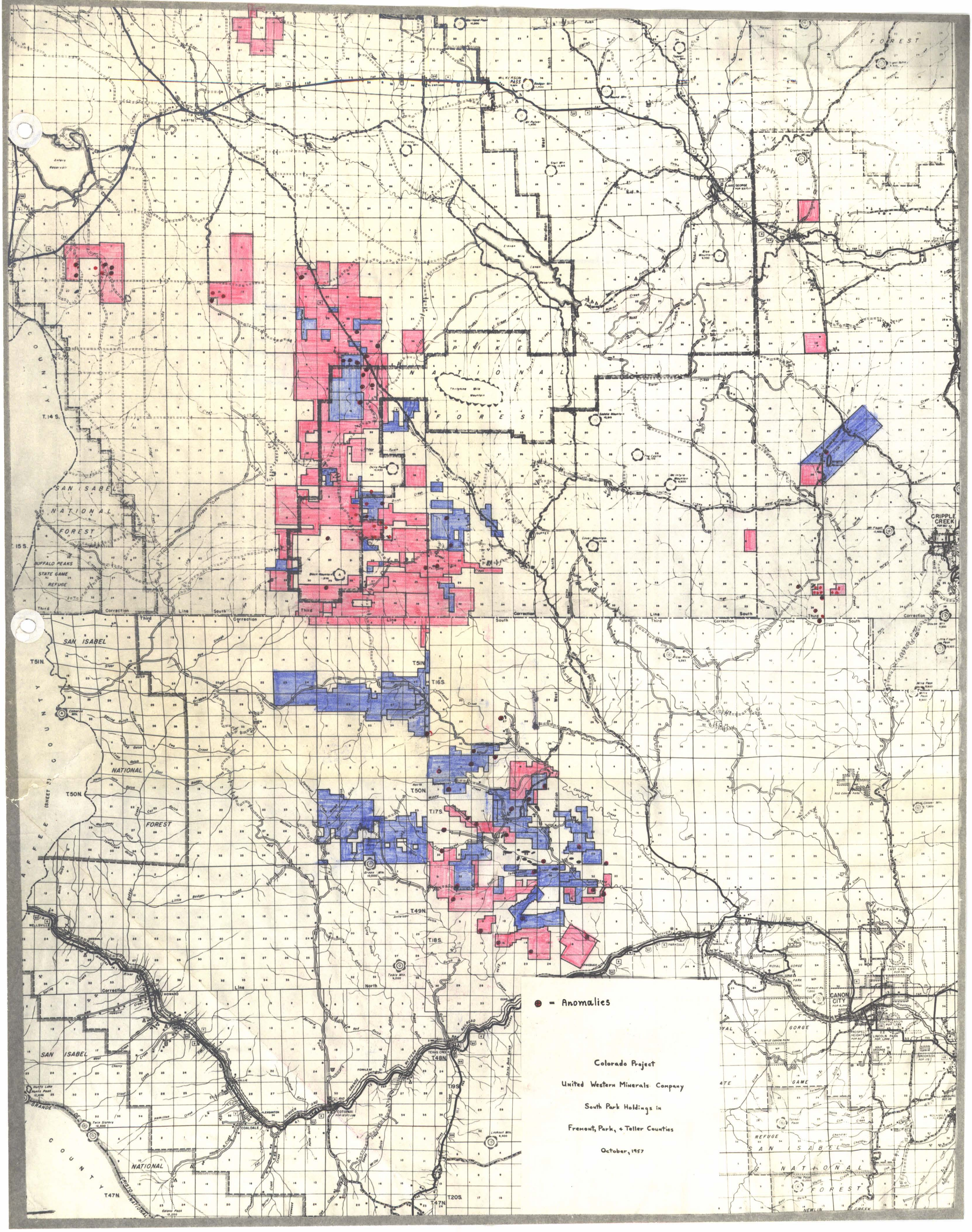
5000 0 5000 10000 15000 FEET

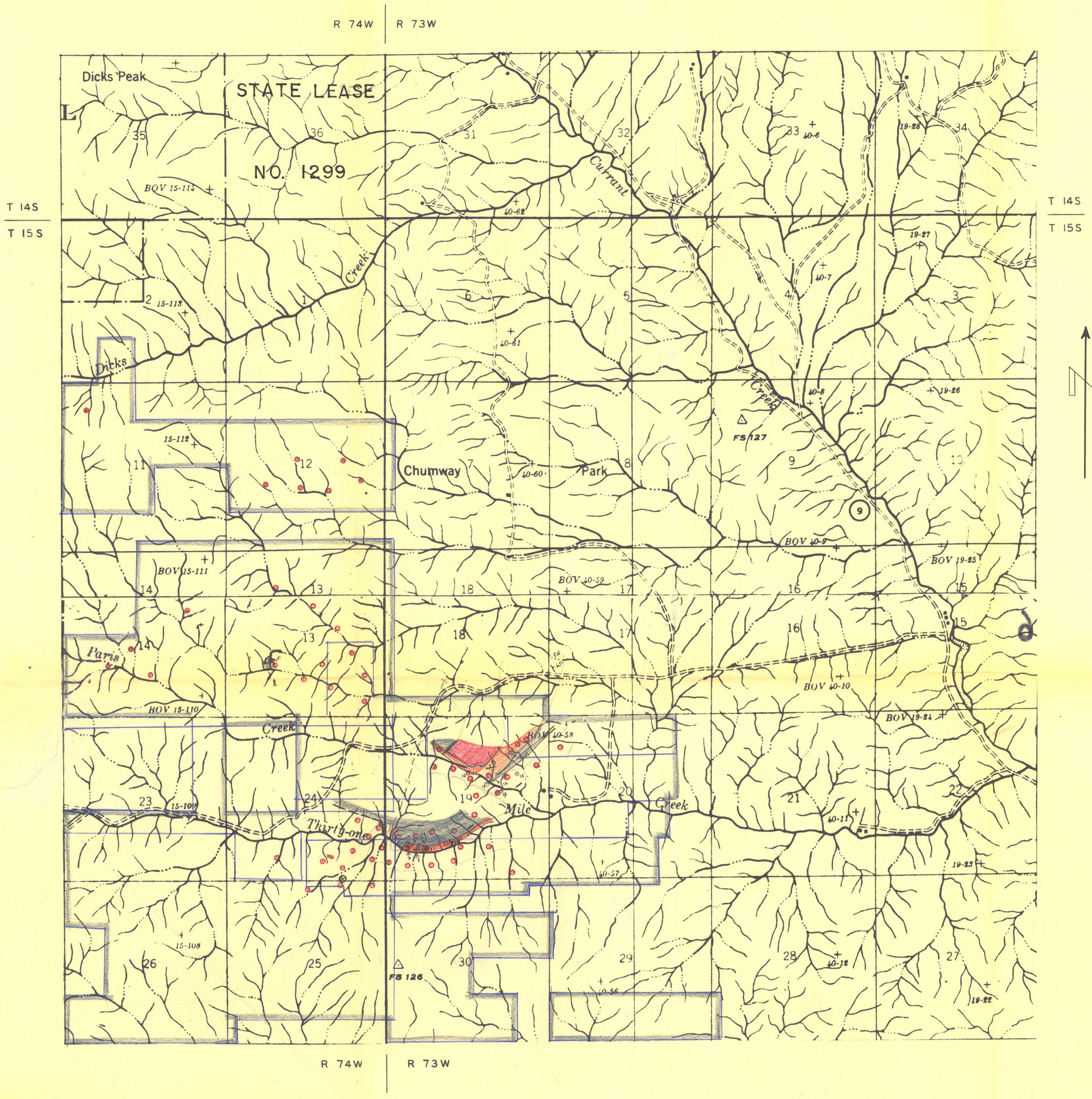
= Ore Bodies
= Anomalies
= Proposed Drill Sites



GEOLOGIC SECTION A-A'
VERTICAL EXAGGERATION 2x


North of Arkansas River
CHAFFEE
FREMONT
PARK
TELLER
SOUTH PARK
SOUTH PLATTE RIVER
ARKANSAS RIVER
TARRYALL CREEK
FAIRPLAY
BUENA VISTA
SALIDA
CALCITE
COTOPAXI
MARSHALL PASS
OURAY PK.
PONCHA PASS
PARKDALE
CANON CITY
BROOKSIDE
PENROSE
PORTLAND
FLORENCE
CRIPPLE CREEK
PIKES PEAK
DIVIDE
FORISSANT
TWIN CR
MULE CREEK
BEAVER CR
EAST PLATTE
OIL CR
EIGHT MILE CREEK
CURRENT CREEK
WILSON CREEK
COTTONWOOD CREEK
ALLAHASSEE CREEK
PEG
PES
QTG
CP
CPM
CPN
PEN
PE
TV
TEI
TE
TMP
TMB
TLI
TF
KP
KD
KN
KB
KV
KL
KPU
CLY
CF
OE
QAL
JM
TU
TDA


● - Anomalies
Colorado Project
United Western Minerals Company
South Park Holdings in
Fremont, Park, + Teller Counties
October, 1957
PIKE NATIONAL FOREST
SAN ISABEL NATIONAL FOREST
BUFFALO PEAKS STATE GAME REFUGE
CRIPPLE CREEK
CANON CITY
LAKE GEORGE
WILKERSON PASS
HARTSEL
WELLSVILLE
HOWARD
COALDALE
PARKDALE
T.14 S.
15 S.
T51N.
T50N.
T49N.
T48N.
T47N.
T16S.
T17S.
T18S.
T19S.
T20S.
Third Correction Line South
Ninth West Meridian
Guide Meridian



UNITED WESTERN MINERALS CO.

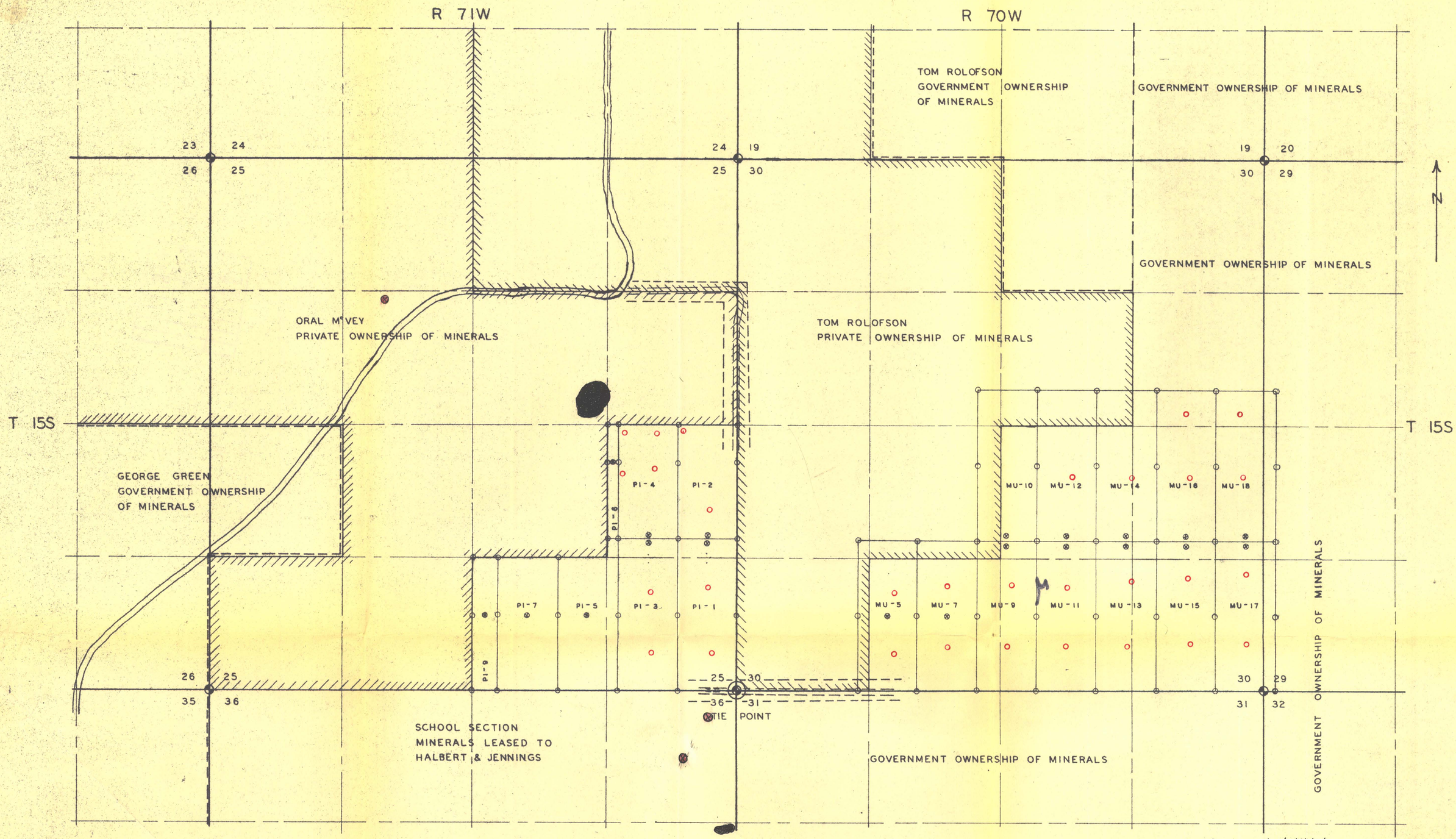
Felsite Porph (Tert)
Arkose (P)
Granite (PE)
Basic Dike
Anomolies
Test Holes
Boundary line of United's property

Colorado Planimetric Map Blow-up Series
Reference Maps: S.C.S., Colo. Nos. 238 & 266
Drawn By: B.F.
Scale: 3" = 1 Mile

Map No. B.U. - 1

Date: Nov. 30, 1957

15 – 20000 ft.
2000 on State Leases off map in Cottonwood Area
60 Holes
Av. depth 250'



○ *Propesed drill holes*

⊗ *Anomolies*

Present Ore bodies

UNITED WESTERN MINERALS CO.

PROPERTY MAP TELLER COUNTY, COLO.

PI CLAIMS NO. 1,2,3,4,5,6,7,9

MU CLAIMS NO. 5,7,9,10,11,12,13,14,15,16,17,18

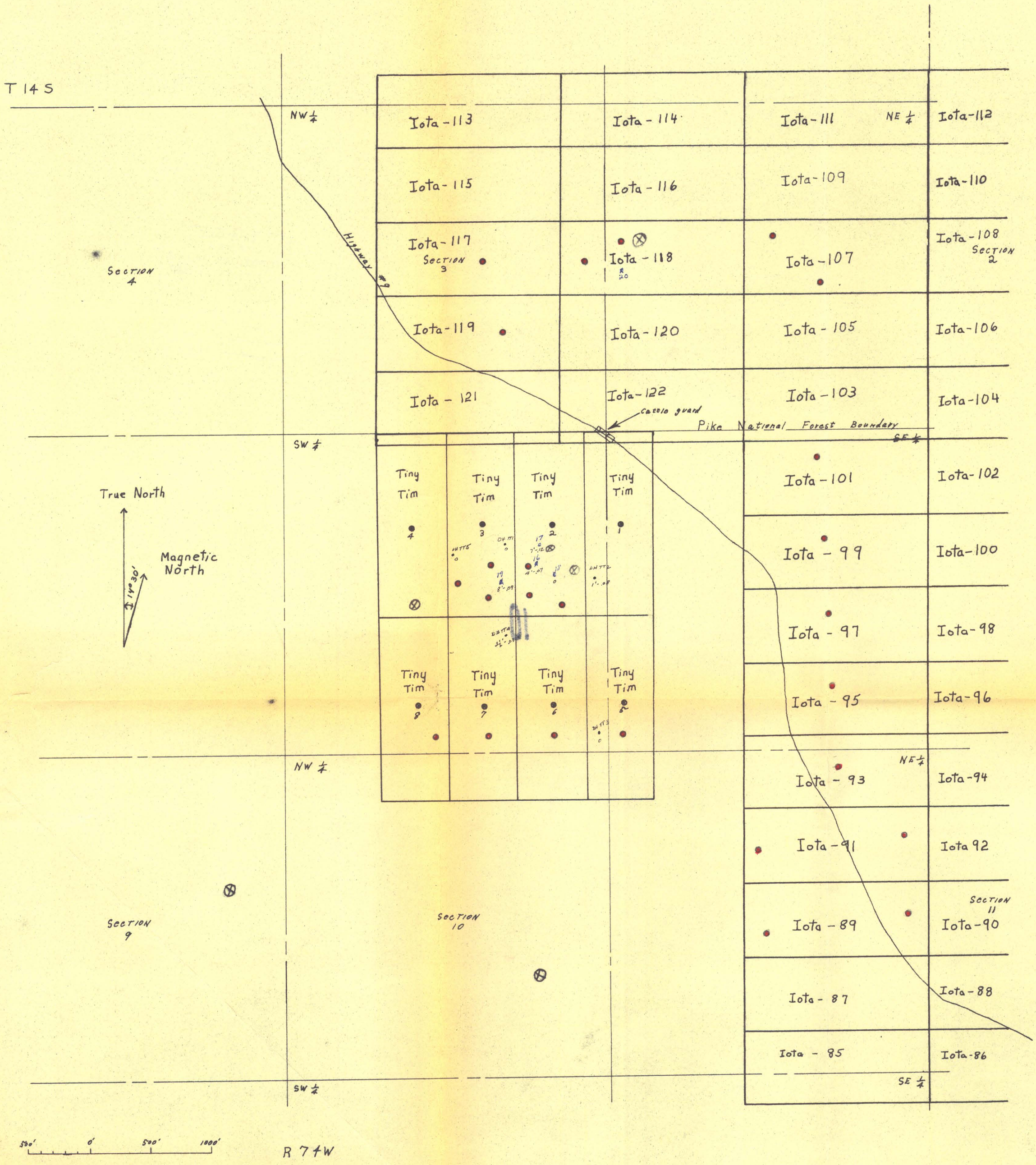
SCALE: 1" = 500' SEPT. 13, 1957

PROPOSED ROAD RIGHT OF WAY = = = = =

DISCOVERY MONUMENT ⊗

MONUMENT ○

DRAWN BY B.F.

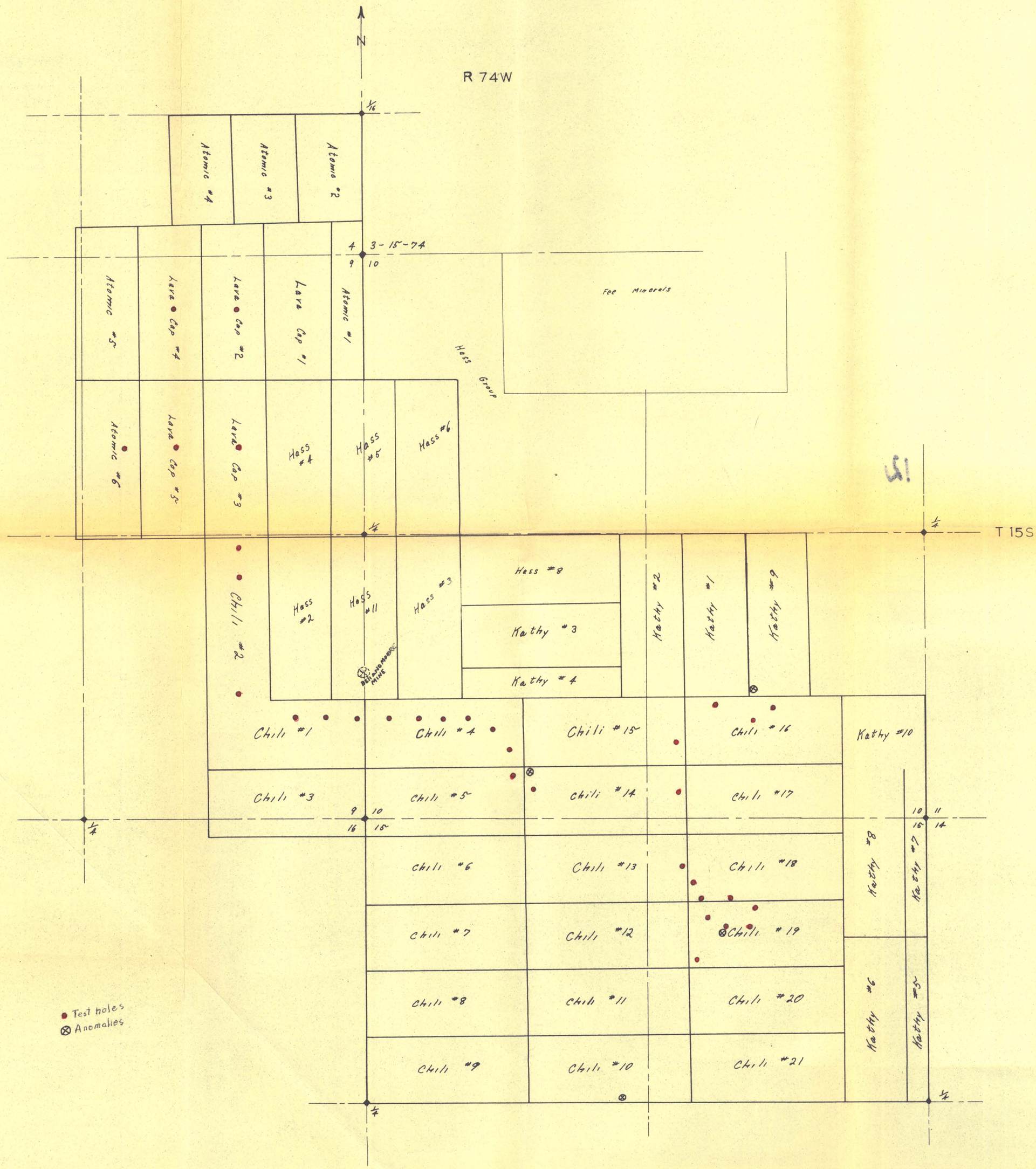


Holes 16-19
drilled by UMW

Holes TT-1 - TT6
drilled by Newmont during period
4-4-58 → 4-10-58

TINY TIM CLAIMS
Leased By Arthur West
To United Western Minerals Company

● Location notices
⊗ Anomalies
● Proposed drill sites 25 holes 200' each


N
R 74W
T 15S
1/16
3-15-74
4
9
10
Atomic #4
Atomic #3
Atomic #2
Atomic #1
Atomic #5
Atomic #6
Lava Cap #4
Lava Cap #2
Lava Cap #1
Lava Cap #5
Lava Cap #3
Hass #4
Hass #5
Hass #6
Hass Group
Fee Minerals
Chili #2
Hass #2
Hass #11
Hass #3
Hass #8
Kathy #3
Kathy #4
Kathy #2
Kathy #1
Kathy #9
BEILAND MOORE MINE
Chili #1
Chili #4
Chili #15
Chili #16
Kathy #10
Chili #3
Chili #5
Chili #14
Chili #17
16
15
Chili #6
Chili #13
Chili #18
Kathy #8
Kathy #7
Chili #7
Chili #12
Chili #19
Kathy #6
Kathy #5
Chili #8
Chili #11
Chili #20
Chili #9
Chili #10
Chili #21
11
14
1/4
Test holes
Anomalies