GEOLOGY

Structure

The property lies on the eastern flank of the Uncompahgre uplift. The formations are fairly flat, dipping 5-10° to the east. No faulting was noted on the claims.

Stratigraphy (See Fig. 3)

The formations exposed on the property range in age from pre-Cambrian to Cretaceous. Following is a brief description of these formations:

Unaweep (?) Granite (pre-Cambrian)

This formation consists of a medium to coarse grained granite that is cut by numerous veins, dikes, and stringers of white quartz and pegmatite material. This unit forms an erosional bench at the base of overlying Chinle formation.

Chinle Formation (Triassic)

Only the upper 121 feet of Chinle was deposited in this area. This portion consists of dark brick red mudstone and siltstone. A major hiatus is evident which has removed all of the Paleozoic formations between the pre-Cambrian and Chinle.

Wingate Sandstone (Triassic)

The Wingate is composed of dark red, cross-bedded, medium grained sandstone. In this area the Wingate is thinner, 250 feet thick, than in areas to the west. It is the only cliff former in the area.

Entrada Sandstone (Jurassic)

The entrada lies unconformably over the Wingate and is composed of a cross-bedded aeolin origin. This unit forms a "slick rim" which is void of vegetation and may be traced for many miles.

Summerville Formation (Jurassic)

The Summerville is 79 feet thick and consists primarily of reddish siltstone and mudstone. Limestones and limy shales occur near the base of the unit. This member generally forms a talus covered slope just below the basal Salt Wash.

Morrison Formation (Jurassic)

Salt Wash member. The Salt Wash in this area is about 25o feet thick and is composed of alternate layers of white to

reddish sandstone and red to gray-green mudstone. The more resistant sandstone beds form ledges or rims. The third rim is the principal potential ore horizon on the Plateau.

Brushy Basin member. The Brushy Basin is about 300 feet thick and is composed of mudstone and siltstone with minor amounts of sandstone, conglomerate, and limestone. The limestone is usually found in the lower 100 feet.

Burro Canyon-Dakota Formation (Cretaceous)

The lower part of the Burro Canyon-Dakota which remains in this area is composed of a basal conglomerate and a massive, cliff-forming, medium to coarse-grained sandstone. This unit is the main mesa capping formation in the region.

The formation of interest in uranium prospecting in Western Colorado is the Salt Wash member of the Morrison. However, the Brushy Basin is also locally mineralized, i.e., Jackpile Mine near Grants, New Mexico. The Three Forks Uranium mine located 3 miles to the north is the closest ore. This mine, which is located in a carbonaceous sandstone lens near the top of the Brushy Basin, has reportedly shipped 10 tons of 0.12% U_3O_8 ore. This company makes no claims that uranium ore will be found on this property.

CONCLUSIONS

1. In general the area east of the Uncompahgre Uplift has been unfavorable as far as uranium ore is concerned. However, mineralization of potential commercial value has been found in the Brushy Basin on the Three Forks Uranium property in east Unaweep Canyon and in the Salt Wash on Pathfinders Uranium property on Glade Park area, 10 miles west of Grand Junction, Colorado.

2. Channeling, alteration of mudstone, and plentiful carbonaceous material were noted on the property.

3. Only a minor amount of exploration work has been done on the area east of the Uncompahgre Uplift.

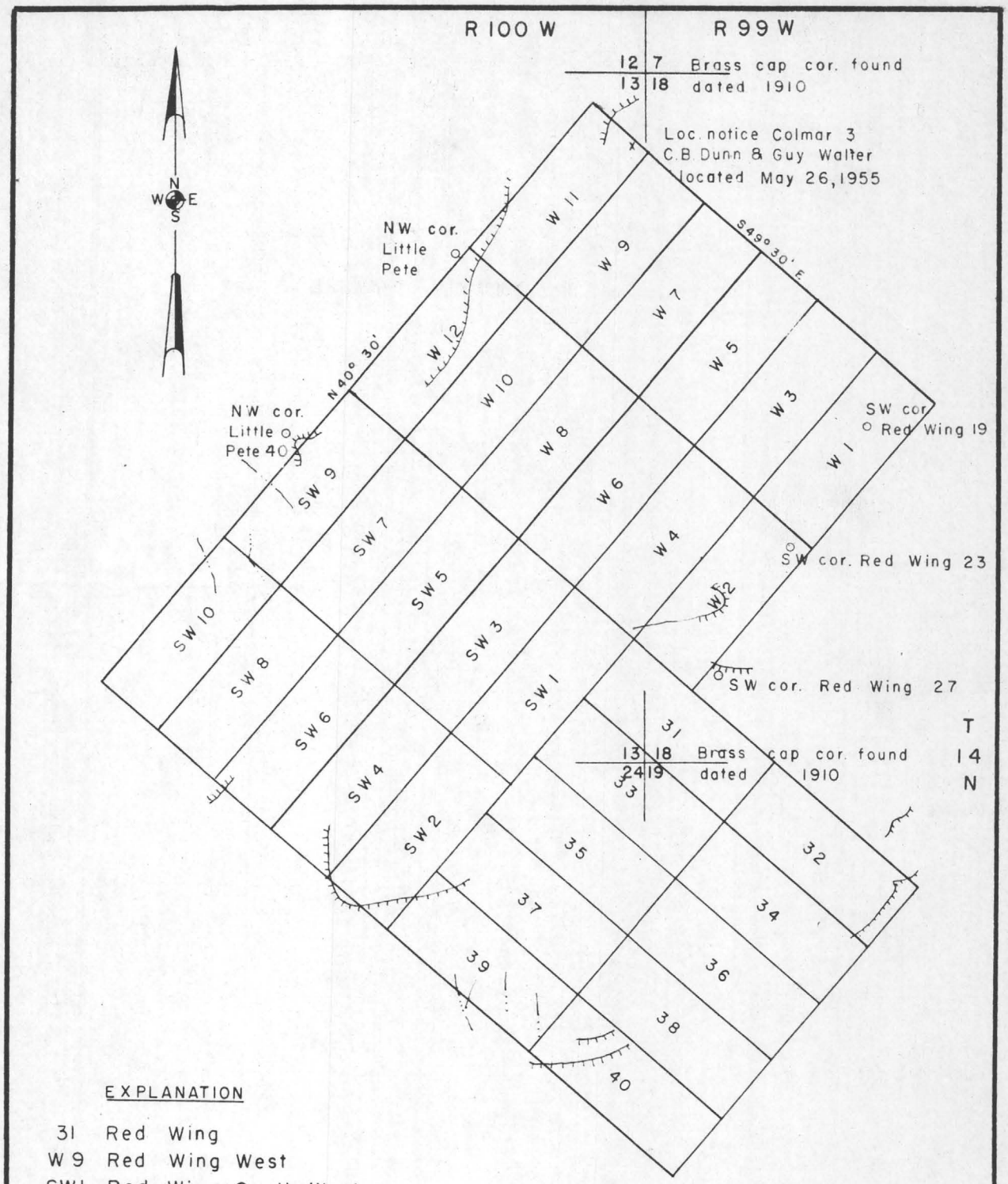
4. No mineralization was noted on this property.

RECOMMENDATIONS

1. Complete a detailed radiometric survey of all rim exposures of Salt Wash and Brushy Basin formations.

2. If any anomalous areas are encountered, plan a drilling program to prove or disprove the property.

3. Drilling depths would be approximately 200 feet.



EXPLANATION

31 Red Wing

W 9 Red Wing West

SW1 Red Wing South West

Rim where traverse lines of survey came across or along rim.

Dry wash-not all shown

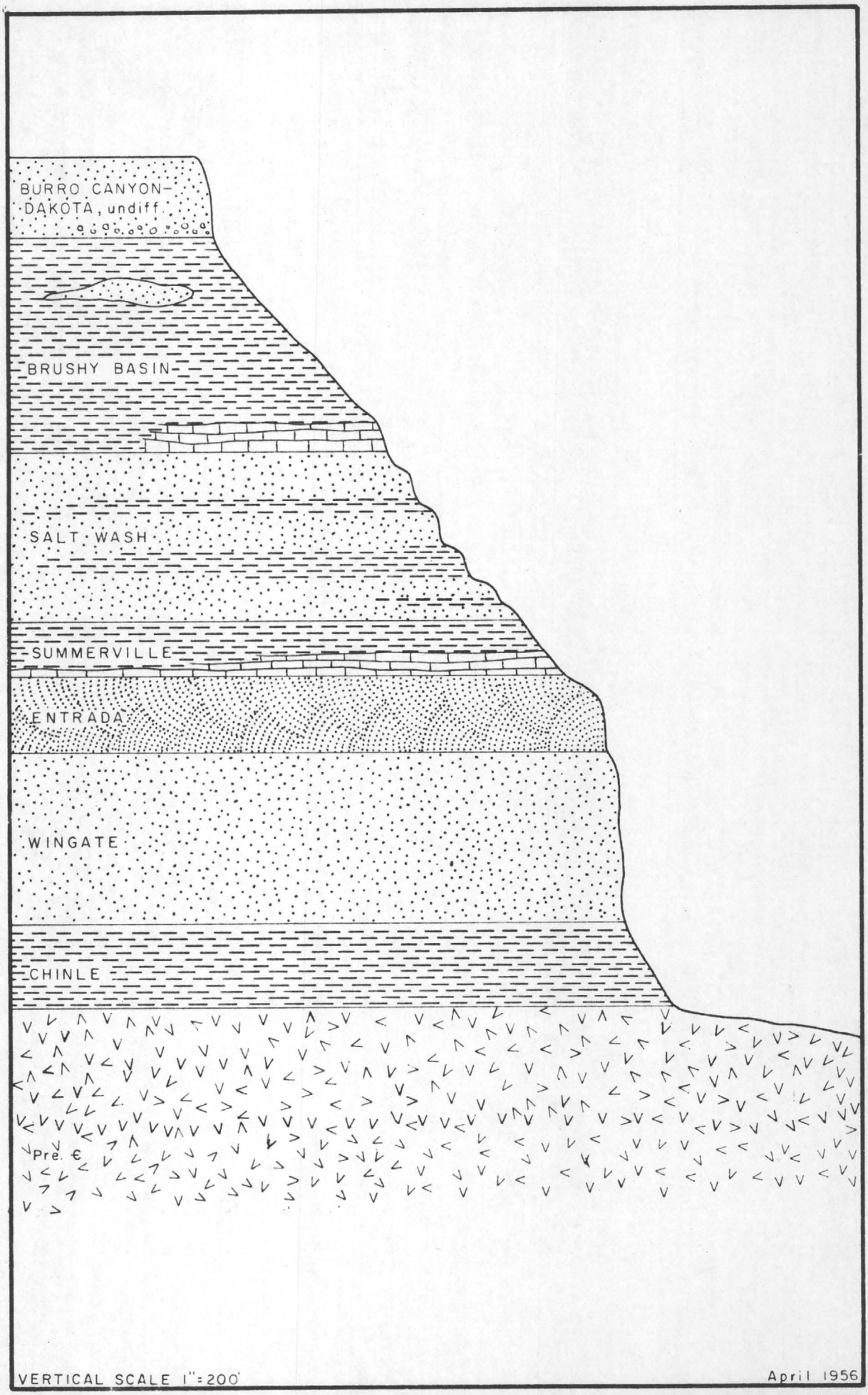
NOTE: Claims oriented with respect to corrected Mag. North
Mag. declination 15° E
Corner post-cut from natural materials-boundary posts have aluminum tag stamped with claim name and corner designation.

0 300 600 1200 2400
FEET

I, Gerald H. Pesman, hereby certify that this plat is drawn field notes made by me, or under my supervision, of a survey made Nov. 7 thru Dec. 9, 1955.
s/Gerald H. Peman Reg. Colo. Land Surveyor No. 2376

Claim map of Red Wing Group-Gibler Mountain-Mesa County, Colorado

Fig. 2



GENERALIZED STRATIGRAPHIC SECTION IN EAST UNAWEEP CANYON
MESA COUNTY, COLORADO
Fig. 3

GEOLOGICAL EVALUATION
OF
MONTEZUMA CANYON PROPERTIES

San Juan County, Utah

INTRODUCTION

The Montezuma properties of Alta Uranium Incorporated include three separate groups of claims. Because of the similarity of stratigraphy, structure, and ore deposits, the groups will be discussed in one report. Information for this report was received from written reports, field examination of the property, oral communication, and past experience of the author in the district.

PROPERTY AND LOCATION

The property consists of the following groups:

Meaux 1 - 6
Scorpion 1 - 10
Green Dragon 1 - 12.

Each group has been surveyed by a registered land surveyor. A tie has been made on each group from at least one claim corner to a section corner. Assessment work requirements must be met by July 1 this year. The claims were staked by R. E. Dorwart, J. D. Jarvis and Yule Dorwart in March, 1955.

The Meaux group is located in Sections 12, 13, T35S, R24E, and can be reached by turning south off U. S. Highway 160, 6.7 miles east of Monticello, Utah and by following a dirt road for 8.8 miles. The claims lie over the Dakota rim about one-quarter of a mile south of the end of the road. (See Figs. 2 and 3.)

The Scorpion group is located in Sections 19 and 30, T36S, R25E, and Sections 24, 25, T36S, R24E, and can be reached by turning south off U. S. Highway 160, 12.1 miles east of Monticello, Utah, and by following improved and unimproved dirt roads for 19.2 miles. (See Figs. 2 and 4.)

The Green Dragon group is located in Sections 14, 23, T38S, R24E. The road leading into Montezuma Canyon turns west off Utah State Highway 41, 5.3 miles south of Monticello, Utah. The Green Dragon group lies on the west side of the canyon 38.1 miles from the turnoff. (See Figs. 2 and 5.)

FACILITIES

Roads

All existing roads are in good condition and can probably be used throughout most of the year.

About one-quarter mile of road building is necessary to make the Meaux claims accessible.

Water

Water for drilling and mine use can be hauled from Coal Bed or Montezuma Creek. The length of water haul is less than 5 miles.

Timber

An ample supply of pinion and juniper is available on the property. If large timber is required, it will have to be hauled from Blanding or Monticello.

Plane Facilities

The nearest maintained landing strips are located at Monticello and Blanding, Utah.

Milling Facilities

The nearest buying station is the Government-owned Monticello mill. The haulage distance for the three groups of claims will range from 15 to 45 miles.

Development

No development work has been done on any of these claims.

GEOLOGY

General Geology

The formation of interest for exploration in the Montezuma Canyon district is the Salt Wash member of the Morrison formation. The Salt Wash is a fluvial deposit approximately 250 feet thick. The mineralization in this area occurs as rolls and replacement of fossil vegetation. Ore bodies are generally small, 200 to 2000 tons. Occasionally several en echelon pods make up a deposit. The ore mineral is carnotite. The vanadium to uranium ratio is approximately 7 to 1.

Mineralization in the Salt Wash in this area has been known since the vanadium mining era. However, exploration by private industry has been limited because of the presence of a cliff-forming sandstone, known as the Westwater Canyon, which overlies the Salt Wash. On the Uravan Mineral Belt, the Salt Wash forms wide benches which afford areas of shallow drilling. In the Montezuma area, where the benches are formed by the Westwater Canyon formation, the drilling depths are increased to 300 feet, and consequently a limited amount of exploration has been done.

Structure

The formations in the Montezuma are flat lying, dipping to the south 1-2°. No faulting was noted on any of the claims.

Stratigraphy (See Fig. 6)

The stratigraphy on all three groups of claims is similar. Thicknesses of some of the members vary slightly. The Westwater formation thickens from 170 to about 210 feet between the northern and southern groups of claims. In the canyon near the two northern groups of claims the Summerville, Entrada, Carmel and Navajo are exposed, but on the southern group the Salt Wash is the lowest exposed formation. Following is a brief description of these formations.

Burro Canyon-Dakota formation (Cretaceous)

The Burro Canyon-Dakota in the area is about 200 feet thick and consists of medium to coarse grained sandstone and conglomerate. This formation is the mesa capping unit in this region.

Morrison formation (Jurassic)

Brushy Basin member

The Brushy Basin is about 200 feet thick and consists of mudstone and siltstone with interbedded thin layers of sandstone, conglomerate, and limestone. Commercial mineralization has been found in the uppermost sandstone lenses in this unit in Section 16, T39S, R24E, about 10 miles south of the Green Dragon claims.

Westwater member (Jurassic)

The Westwater is composed of thick, massive layers of light colored sandstone separated by thin units of mudstone.

The northern pinchout of the Westwater member is located a few miles from the northernmost group of claims. Toward the south the unit thickens from 168 to about 210 feet.

Salt Wash member (Jurassic)

The Salt Wash is composed of alternate layers of white to reddish, fine to coarse grained sandstone interbedded with layers of red to gray green mudstone. This unit is lenticular and often contains abundant organic matter that may be completely replaced by carnotite.

Summerville formation (Jurassic)

The Summerville is about 80 feet thick and is composed of reddish shale with thin layers of sandstone and limestone. This unit generally forms the talus covered slopes beneath the Salt Wash.

Entrada sandstone (Jurassic)

The Entrada is about 170 feet thick and is composed of a light red, massive, medium grained sandstone of aeolin origin. This unit weathers into a typical slick rim that is devoid of vegetation.

Carmel formation (Jurassic)

The Carmel is about 40 feet thick and is composed of reddish mudstone and siltstone. This unit is generally present at the base of the canyon in upper Montezuma Canyon.

Navajo sandstone

The Navajo is composed of a white, medium grained, highly cross-bedded sandstone of aeolin origin.

CONCLUSIONS

1. Drilling depths will range from 100 to 400 feet.

2. Production within the area has been low, possibly because of the presence of the Westwater Canyon sandstone which overlies the Salt Wash and increases drilling depths to approximately 300 feet.

3. Only the upper part of the Salt Wash was exposed on any of these claims.

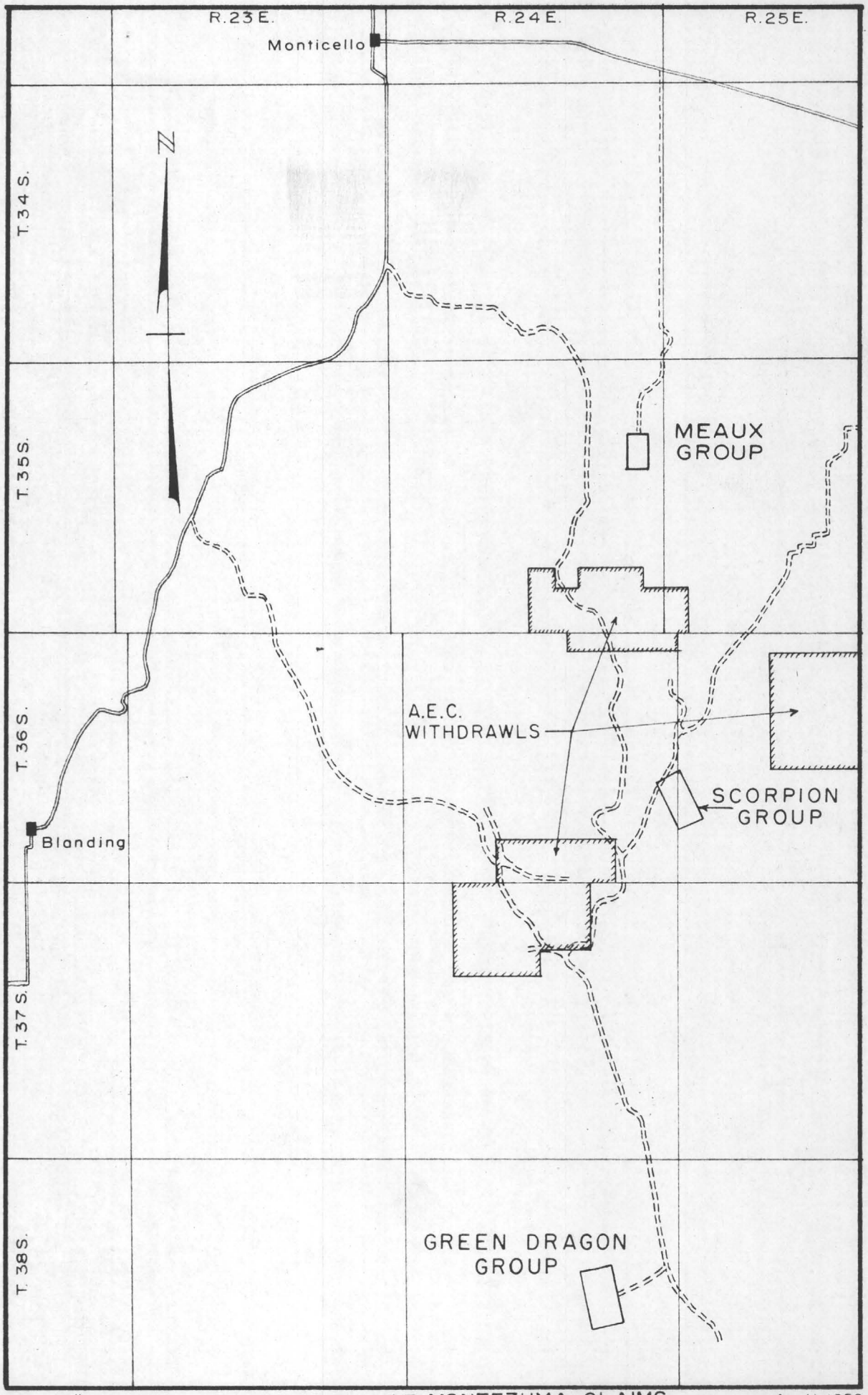
4. No radioactivity was noted on the property.

RECOMMENDATIONS

1. Complete radiometric survey of all rim exposures from the base of the Burro Canyon to the top of the Summerville.

2. Plan a drill program on any favorable anomaly or lens outcrop.

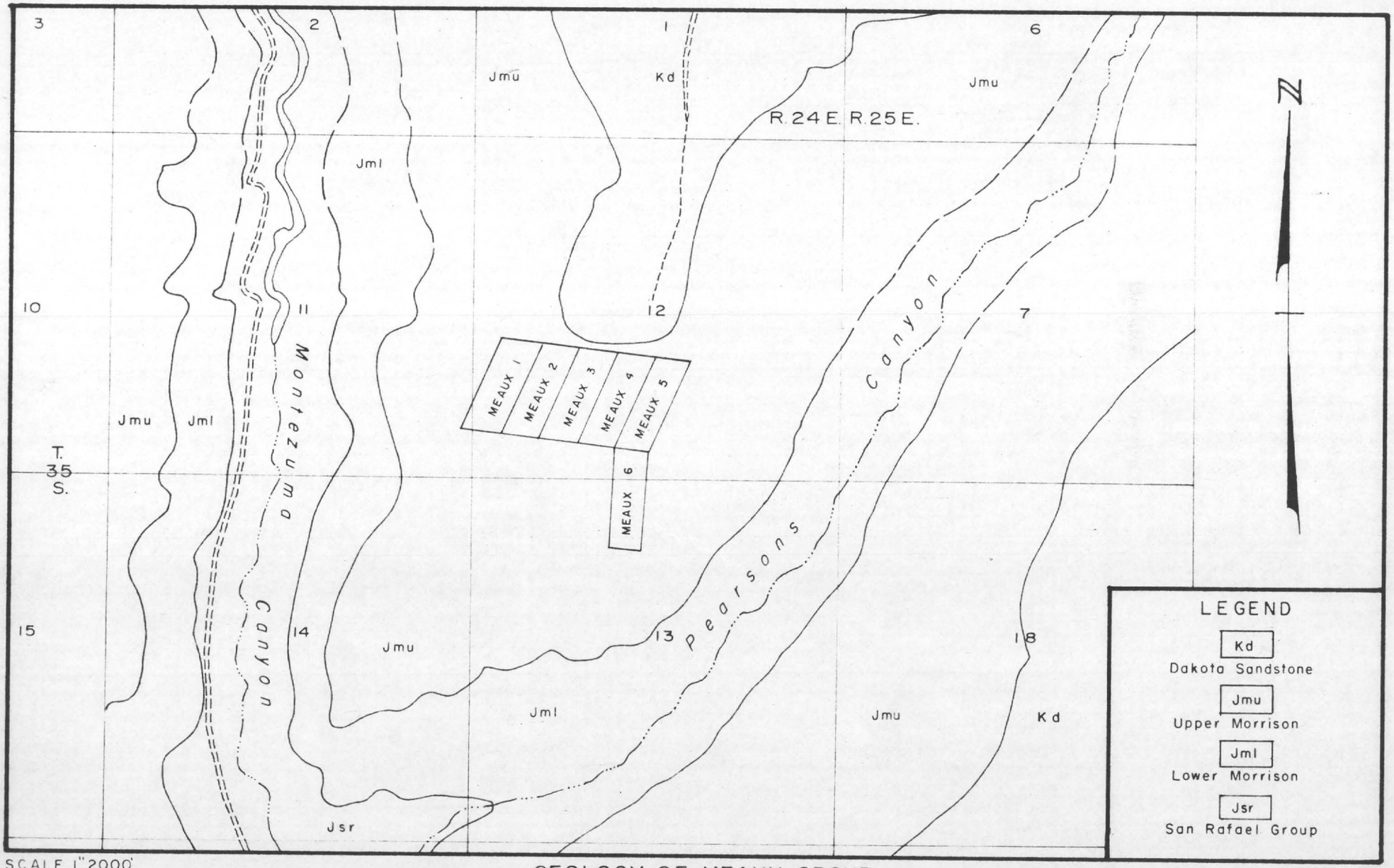
3. If no mineralization is found near the outcrops, plan a limited exploration drill program on 500 foot centers. If no mineralization is encountered in ten holes, dispose of the property.



SCALE 1" = 3 miles

LOCATION MAP OF MONTEZUMA CLAIMS
SAN JUAN COUNTY, UTAH
Fig. 2

April 1956

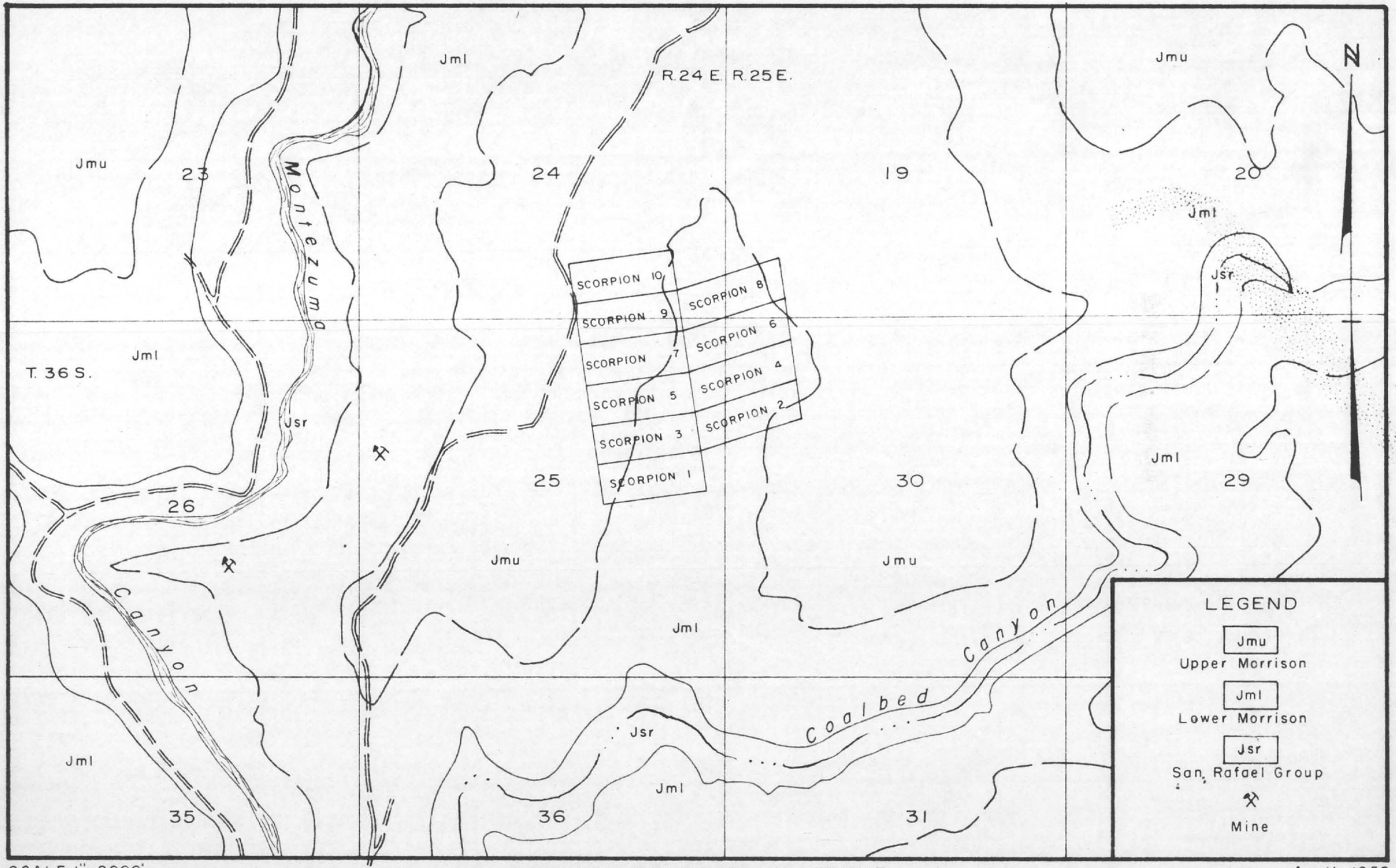


SCALE 1" 2000'

GEOLOGY OF MEAUX GROUP
MONTEZUMA CANYON
San Juan County, Utah

April 1956

Fig. 3

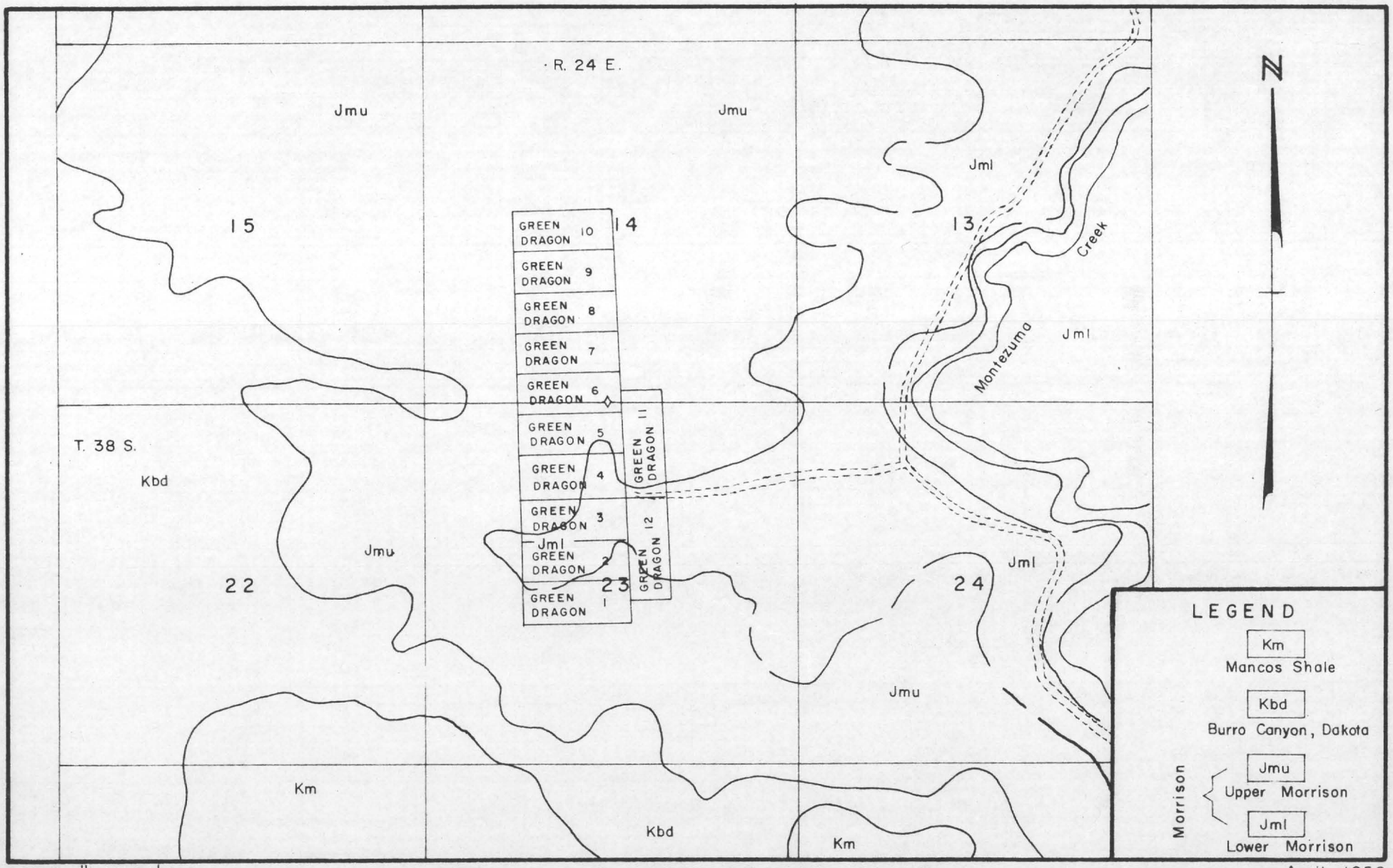


SCALE 1" = 2000'

GEOLOGY OF SCORPION GROUP
MONTEZUMA CANYON
San Juan County, Utah

April 1956

Fig. 4

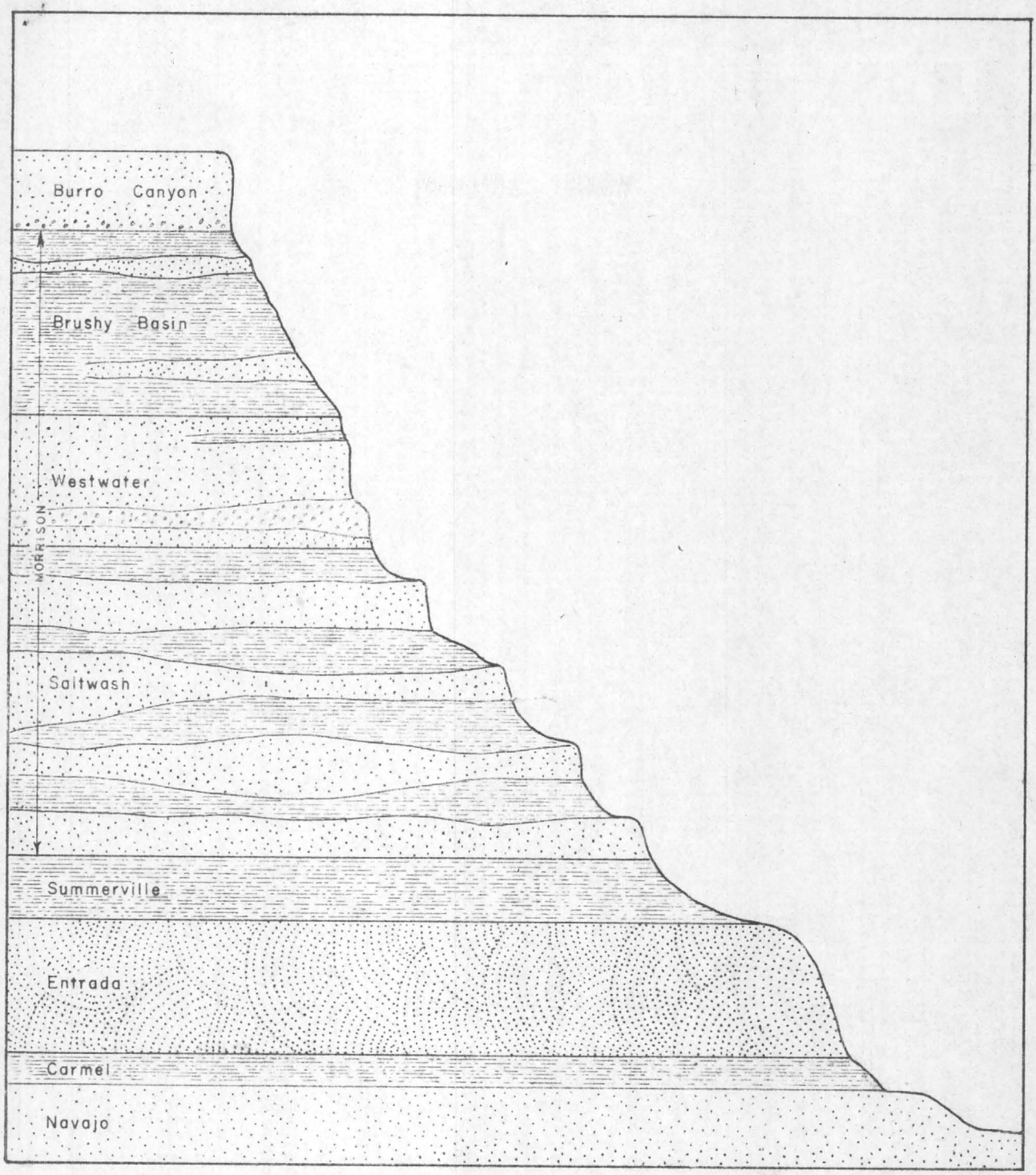


SCALE 1" = 2000'

GEOLOGY OF GREEN DRAGON GROUP
MONTEZUMA CANYON
San Juan County, Utah

April 1956

Fig. 5



Generalized Stratigraphic Section
Upper Montezuma Canyon
San Juan Co., Utah

SCALE: 1" = 200'

APRIL, 1956

Fig. 6

GEOLOGICAL EVALUATION

OF

SINBAD GROUP

Montrose County, Colorado

INTRODUCTION

The Sinbad properties of Alta Uranium Incorporated are located in an area which has produced both copper and uranium. The mineralization is confined to fault zones which are the result of a collapsed salt anticline. The potential for the production of copper and uranium will be discussed.

Information for this report was obtained from field work, a report by John Vanderwilt on "Mineral Resources of Colorado," and U. S. Bureau of Mines R.I. 4869, titled "Investigations of the Colorado Copper Co. Properties, Mesa and Montrose Counties, Colorado."

LOCATION AND OWNERSHIP

The Sinbad properties of Alta Uranium Incorporated consist of 23 unpatented mining claims located on the southern rim of Sinbad Valley, Montrose, County, Colorado.

The claims, which were staked in August, 1954 by Tom Casto, are located in Sections 29, 30, 31, 32, T49N, R19W, NMPM. These claims have been surveyed by a registered land surveyor and are tied to an existing section corner found on the property.

The property can be reached by turning west off Colorado State Highway 141, 10.8 miles south of Gateway, Colorado and by following an improved dirt road for 8.0 miles to the ranch located in the southern part of Sinbad Valley. From the ranch an unimproved dirt road leads 3.6 miles to the southern rim of the valley; the claims lie 2.3 miles west of this road.

FACILITIES

Roads

Fair roads lead to the property; however, the last 5.9 miles of road leading from the ranch in Sanbad Valley to the property will not be open to other than four wheel drive vehicles during winter months.

Timber

An ample supply of timber is available within a few miles of the claims.

Water

Water for domestic use is available from springs in Sinbad Valley. Drill water may have to be hauled from the Salt Wash Creek, 10 miles away.

Milling Facilities

Uranium

The two closest mills are the Union Carbide mill at Uravan, Colorado, 35 miles away, and the Climax mill at Grand Junction, Colorado, 75 miles away.

Copper

The property contains two types of copper deposits. One type is deposited in shear zones in the Wingate sandstone and the other type is deposited in Pennsylvania limestones. High silica ore (plus 70% SiO_2) can be shipped to Midvale, Utah. Special milling facilities are required for the high lime copper ores. Freight rates from Whitewater to Midvale are approximately $7.00 per ton. Truck haulage to Whitewater from the property is approximately $6.00 per ton.

Structure

Sinbad Valley is an area of complex faulting that has been formed by the collapse of a salt dome structure. This structure is related to other such collapsed salt dome structures in western Colorado and eastern Utah.

The major series of faults in the area trend in a northwest-southeast direction, roughly parallel to the axis of the salt structure. A series of minor echelon faults that were formed by the collapse of the structure are found around the edge of the present valley.

Stratigraphy (See Fig. 4)

The formations exposed in the valley range from the Hermosa of Pennyslvanian age to the Burro Canyon-Dakota formation of Cretaceous age. Only the Mesozoic beds are present as cliff-formers around the edge of the valley with the Paleozoic rocks being found in the bottom more highly faulted areas. A brief description of the formations follows:

Hermosa formation (Pennsylvanian)

The salt flow that was responsible for the formation of Sinbad structure originated in the Paradox member of the Hermosa. As this salt was dissolved due to the change of ground water table during the uplift of the Colorado Plateau, probably during Miocene time, the structure collapsed, causing intense folding and fracturing of the rocks overlying the salt core.

The upper part of the Hermosa is composed of limestone, red sandstone and arkose.

Cutler formation

The Cutler formation is composed of maroon, purple, red, and mottled light red arkosic sandstone and conglomerate.

Moenkopi formation

The Moenkopi is about 200 feet thick and is composed of three main units. From bottom to top they are sandy mudstone, conglomerate, and conglomeratic sandstone and fine grained sandstone and shale.

Chinle formation

The Chinle is about 400 feet thick and is composed of reddish mudstone and siltstone with a thin conglomeratic unit present at the base of the Chinle.

Wingate sandstone (Triassic)

The Wingate is about 350 feet thick and is composed of reddish brown, fine to medium grained, massive to cross-bedded sandstone. The Wingate weathers into nearly vertical cliffs that are generally vertically jointed and may be coated with desert varnish.

Kayenta formation (Jurassic)

The Kayenta, which commonly forms an erosional bench on top of the Wingate, is about 200 feet thick and is composed of alternate layers of reddish, lavender, buff siltstone, shale, and sandstone.

Navajo sandstone

The Navajo is about 250 feet thick and is composed of gray to buff, highly cross-bedded, fine grained quartz sandstone.

Entrada sandstone (Jurassic)

The Entrada and Carmel formations are undivided in this area. The unit is about 270 feet thick and is composed of buff, white, fine grained sandstone on top and reddish siltstone and shale on the bottom.

Summerville formation (Jurassic)

The Summerville is about 100 feet thick and consists of thin, bedded, gray buff sandstone and shale with thin layers of limestone and chert near the base.

Morrison formation (Jurassic)

Salt Wash member

The Salt Wash consists of alternate layers of fine to medium grained, white to buff, lenticular sandstone and red to gray green mudstone. The unit is about 280 feet thick.

Brushy Basin member

The Brushy Basin is about 500 feet thick and is composed of variegated shale, white to gray sandstone and conglomerate. This unit weathers into badlands type topography.

Burro Canyon-Dakota formation

The Burro Canyon-Dakota consists of white to buff conglomerate and sandstone and is the capping formation in this area. All but the lower 100 feet of the formation has been removed by erosion.

Mineralization

All mineralization observed in Sinbad Valley was fault controlled.

A certain suite of minerals, including copper, uranium, silver, arsenic and other elements in varying amounts, has been noted from each mineralized area within and adjacent to Sinbad Valley.

Many of the faults in the Sinbad area are highly mineralized and were worked as copper mines and prospects as early as 1880. All of the copper depsits contain uranium in varying amounts, at least double background count on a scintillator. This relationship is intimate and one element is not likely to be found without the other.

The Rajah mine, which is one of the most famous of the old original radium mines worked in the 18880's, lies about three miles south of this property along the same series of faults that cut the northeast edge of this property. Records show that the first 10 ton shipment of ore from the Rajah mine ran 20% U_3O_8 and 15% V_2O_5. This concentration of uranium is many times greater than is usually found in other mines in this area. The production in this mine is from the Salt Wash formation. There is much speculation among geologists as to whether this mine is or is not fault control.

The Shadow Rock mine which is located adjacent to the Rajah has produced an unknown amount of ore from the Wingate along the same fault zone that ran between .20 and .80% U_3O_8. This company makes no claims that the ore continues to their property.

Several small prospects have been worked in the faulted area just northeast of the property. The mineralization in most of these

prospects was in the Wingate and both copper and uranium are found. The Wingate is not generally considered to be a good host rock for uranium. However, the largest copper deposits found in both Sinbad and Paradox Valley are located in the Wingate. The Chinle and Rico also contain known copper deposits within Sinbad Valley. The deposits in the Wingate are thin veins of copper oxides associated with small amounts of silver. The maximum width of mineralization seen by the author was one foot.

The deposits in the Pennsylvanian limestone occur both as disseminations and in shear zones and in bedding faults. Crystals of chalcopyrite were seen as well as copper oxides.

The results of the U. S. Bureau of Mines investigations were discouraging. Today's high market for copper, along with the advance in metallurgical methods, could possibly change the picture.

The amount of copper mineralization exposed warrants a series of tests on the metallurgy and a program of detailed mapping in conjunction with a limited exploration drill program.

CONCLUSIONS

1. Mineralization in Sinbad Valley is closely associated with faults.

2. Mineralization at the Rajah mine "appears" to be of fault control.

3. The same suite of elements are present in each mineralized area. There is an intimate relationship between the copper and uranium found in this area.

4. Faults which are on the same fault system as the Rajah mine cut the northeastern edge of the property.

5. Other faults cut and traverse the claims.

6. Copper mineralization was examined in trenches, pits, and underground mines.

7. No commercial uranium was associated with the copper mineralization.

8. Small amounts of copper have been produced sporadically for 40 years.

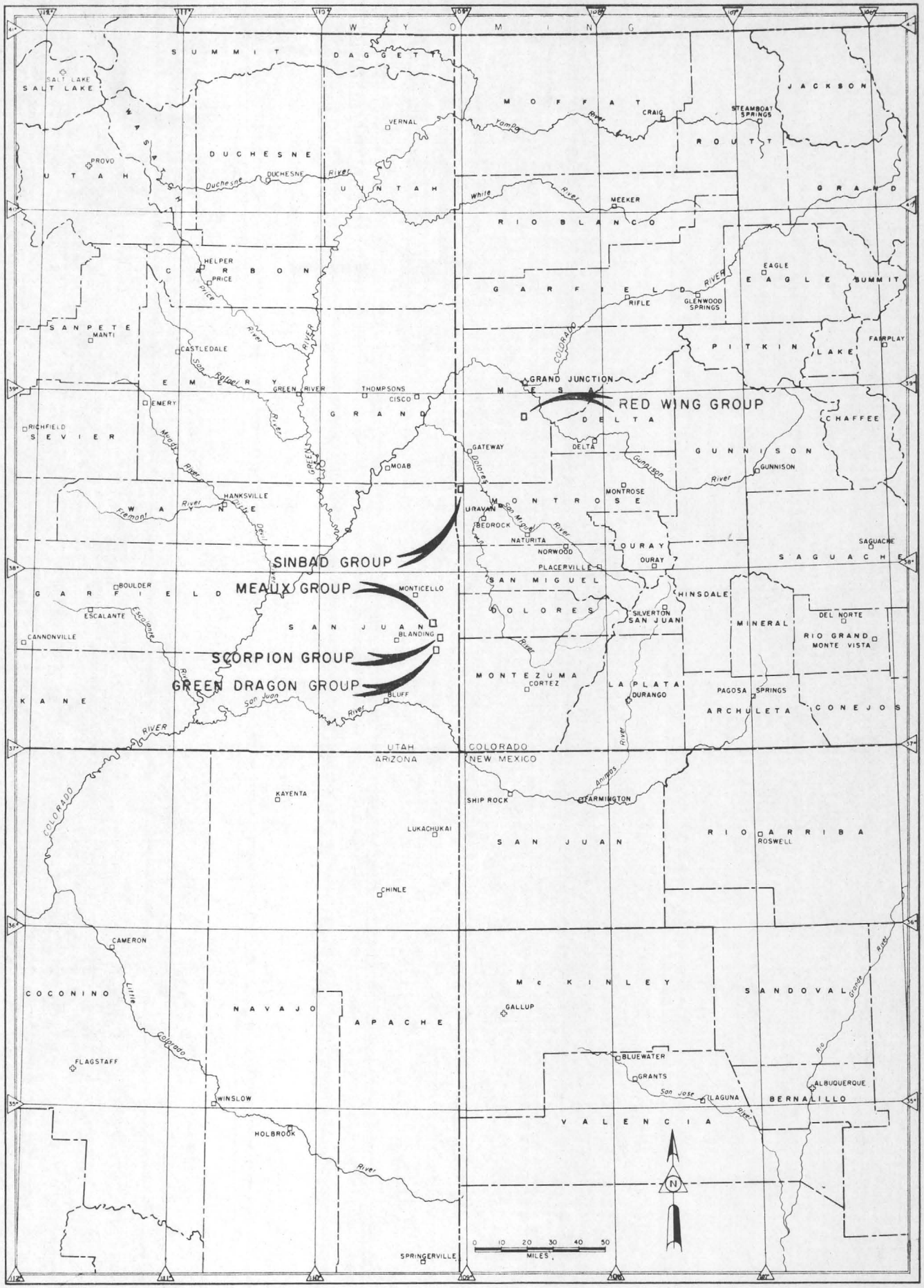
RECOMMENDATIONS

1. Complete the scintillometer survey along the strike of the faults.

2. Drill out any anomalies encountered.

3. Send 300 pound samples of mine run copper ore to the Colorado School of Mines Research Foundation for metallurgical testing.

4. If the ore can be milled at a profit, plan an exploration program to determine the reserves and to aid in the planning of a mining method.



April 1956

INDEX MAP OF ALTA URANIUM INC. PROPERTY

Fig. 1

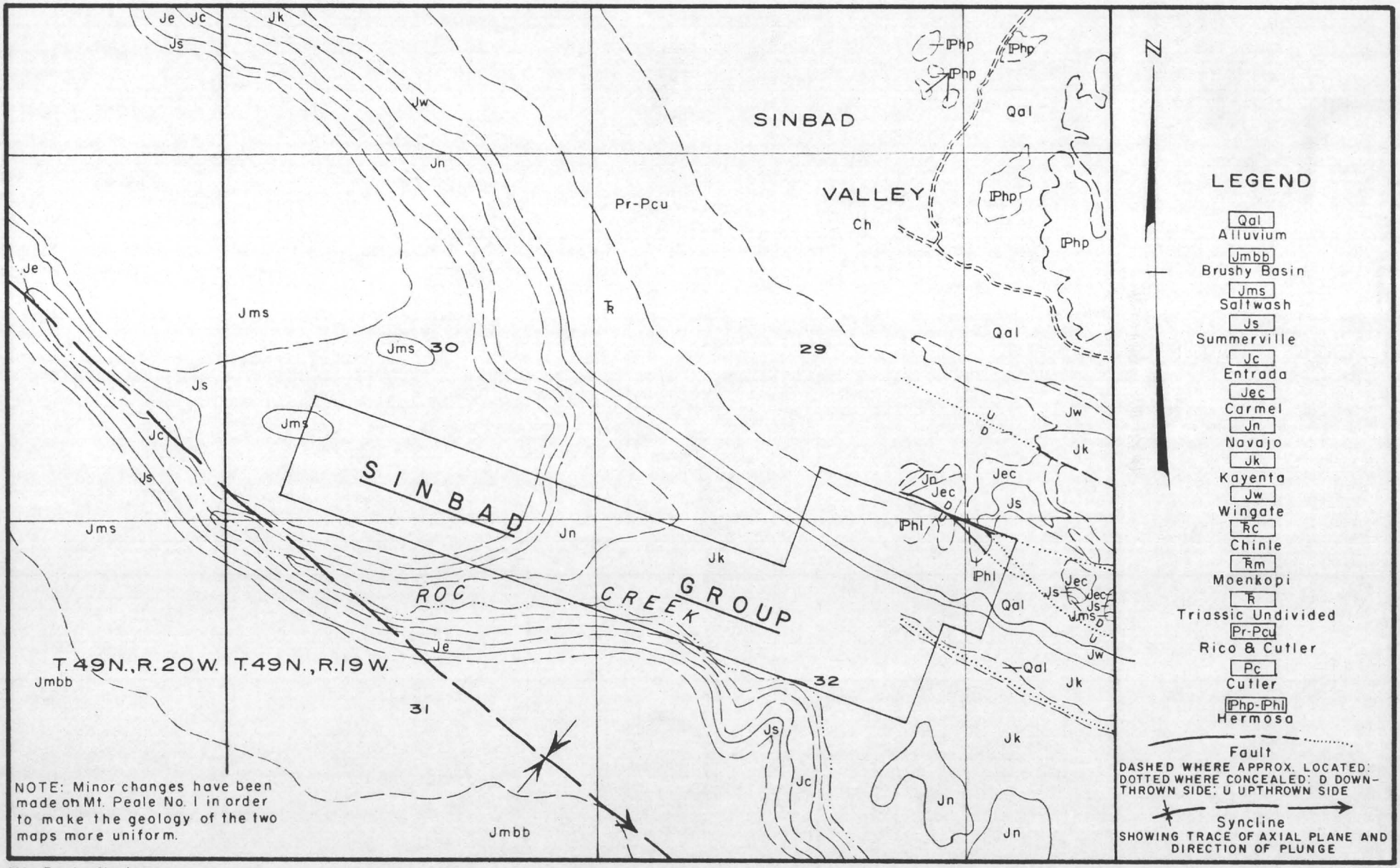
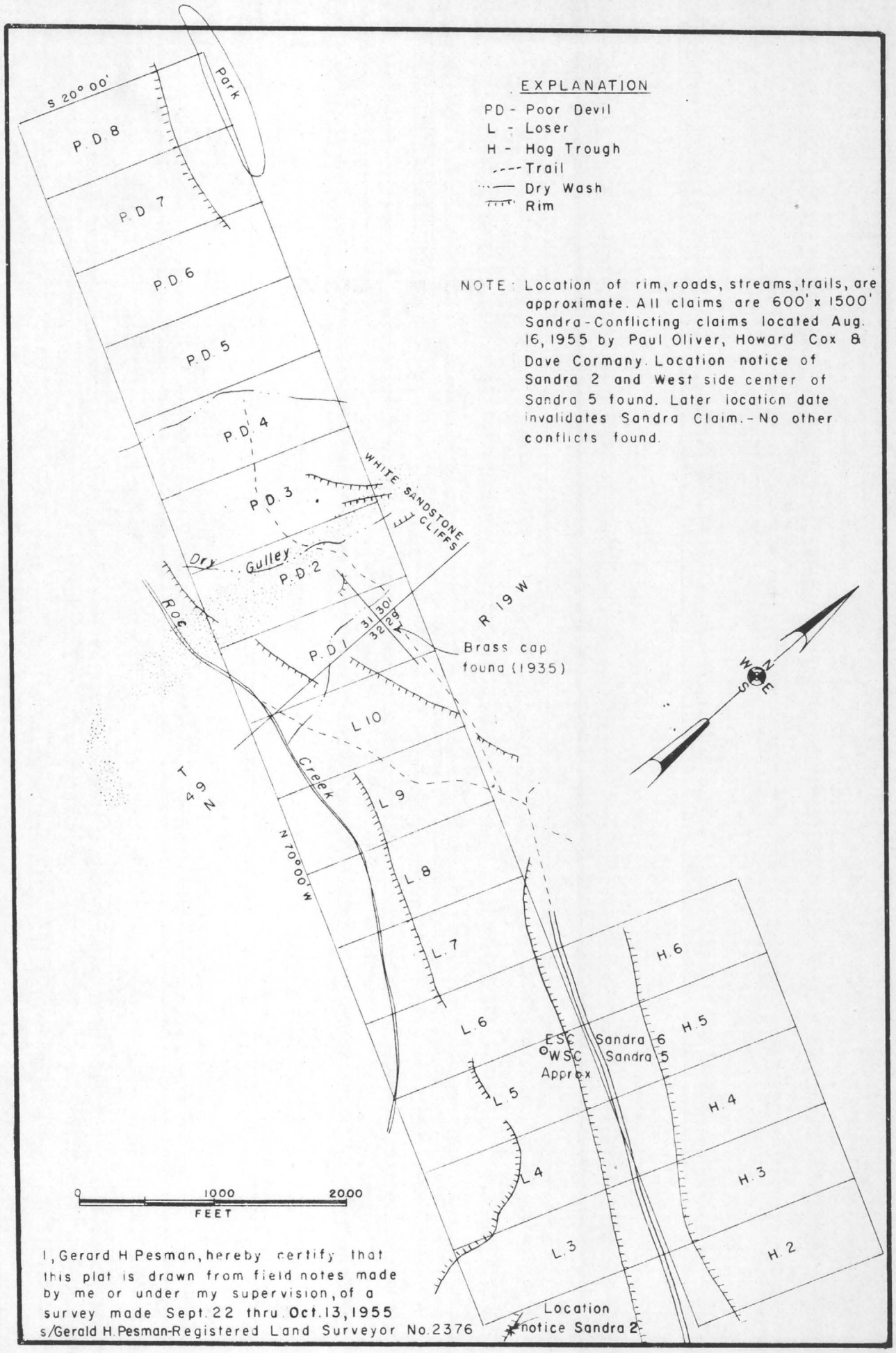


Fig. 2

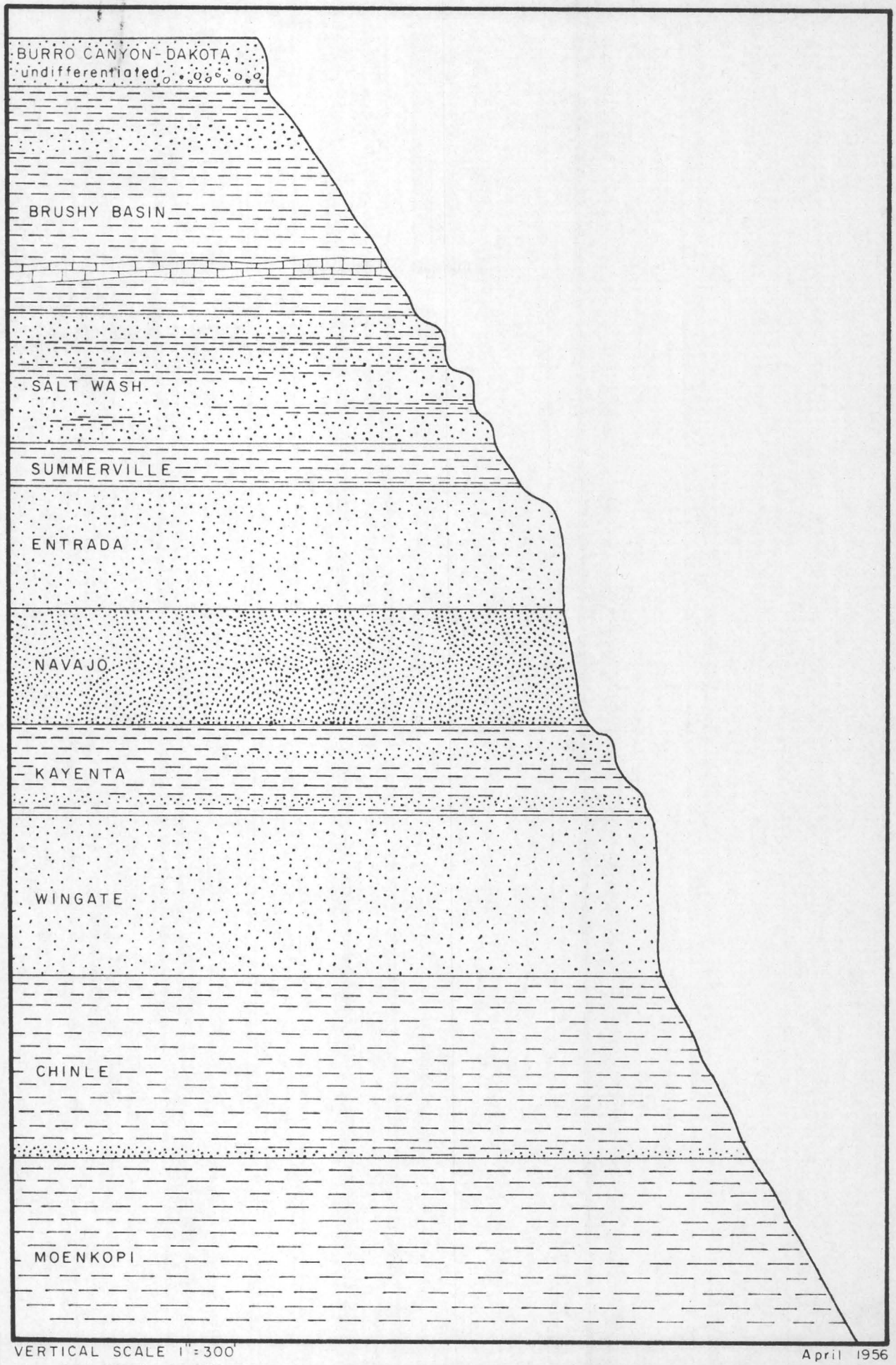
Mt. Peale No. 1
Scale 1" = 2000'

GEOLOGIC MAP OF SINBAD GROUP
MESA COUNTY, COLORADO

Roc Creek Quad.
April 1956



CLAIMS HELD BY ALTA URANIUM INC.
Located on Sinbad Ridge - Montrose County, Colorado
Fig 3

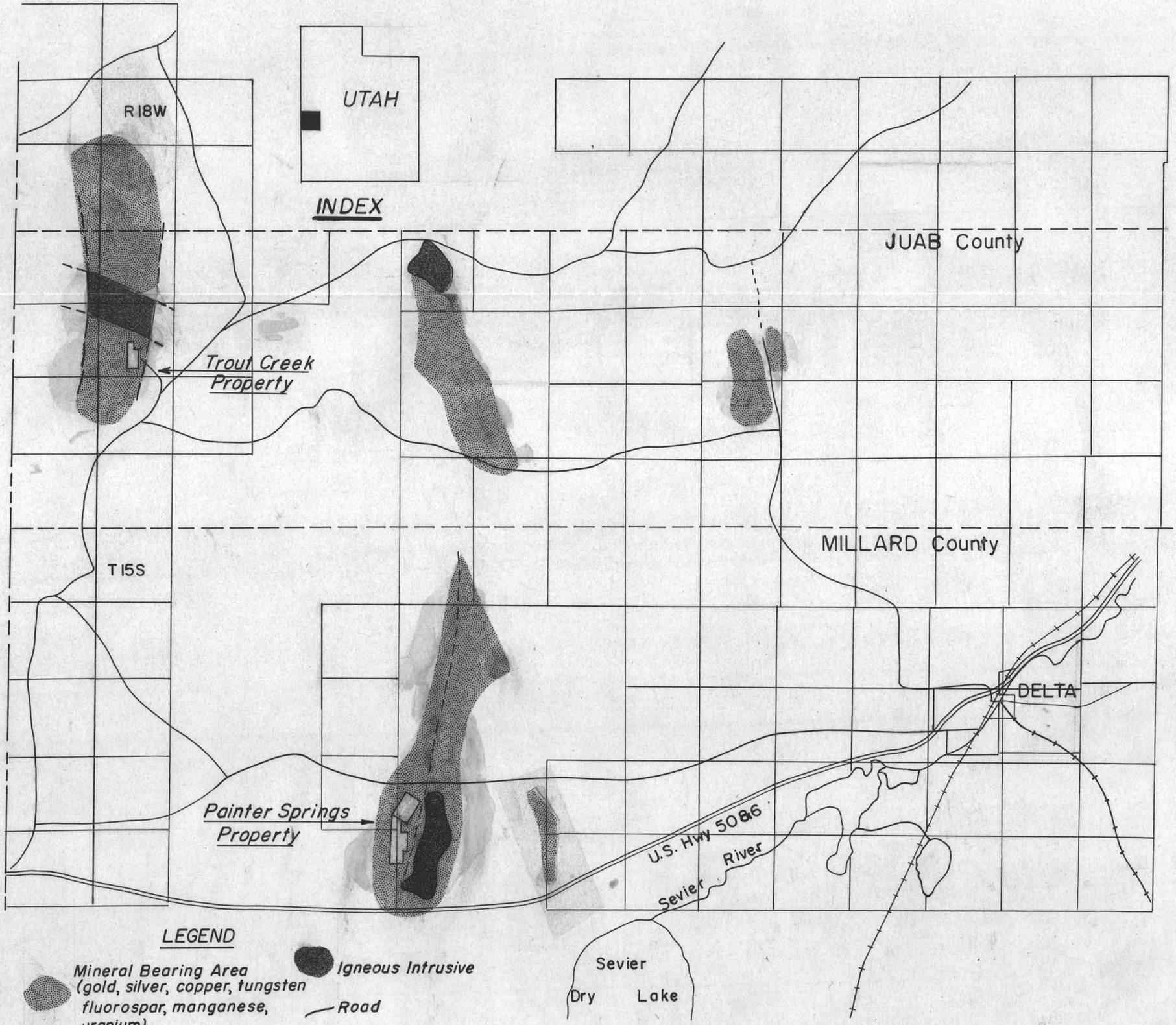


VERTICAL SCALE 1" = 300'

April 1956

GENERALIZED STRATIGRAPHIC SECTION OF NORTH SINDAD VALLEY
MESA COUNTY, COLORADO

Fig. 4



LOCATION MAP
Properties of ALTA URANIUM, Inc.
TUNGSTEN

xxxxxxxxxxxxxxxxxx

GEOLOGICAL EVALUATION
OF THE
BOB CLAIMS

White Earth Mining District
Gunnison County, Colorado

LOCATION AND ACCESSIBILITY

The Bob group consists of 13 unpatented lode claims in Sections 4 and 3 T. 47 N., R. 3 W., NMPM. They are located approximately 30 miles southwest of Gunnison and about 7 miles northwest of the Powderhorn Post Office in the White Earth Mining District. (See Fig. 2.) The claims are accessible by means of Colorado Highway 161 and about three miles of unimproved roads.

PURPOSE AND SCOPE OF INVESTIGATION

The preliminary geological evaluation of the Bob group was undertaken for the purpose of determining its thorium-producing potential.

The examination consisted of an aerial radiometric reconnaissance followed by ground geological and radiometric reconnaissance prior to claim staking.

HISTORY

Early-day mining in the White Earth district was centered on gold, copper, and lead-bearing veins in pre-Cambrian granites and gneiss. Production was minor with only the Vulcan Mine being of individual importance.

The thorium-bearing nature of some of these veins was discovered in 1951, but interest in them was not aroused until 1954, when active claim staking began. Many thorium-rich veins have been found by radiometric prospecting. Others have been found by sampling mines which produced gold and copper.

In 1954 a DMEA loan was granted to Lindsay Chemical for the exploration of the Little Johnny thorium vein one mile north of Powder horn.

TRANSPORTATION AND SUPPLIES

Transportation is limited to trucking in this area. The narrow gauge railroad has been dismantled. Commercial airline service is available in Gunnison, 25 miles northeast. Supplies can be purchased in Denver or Grand Junction, Colorado.

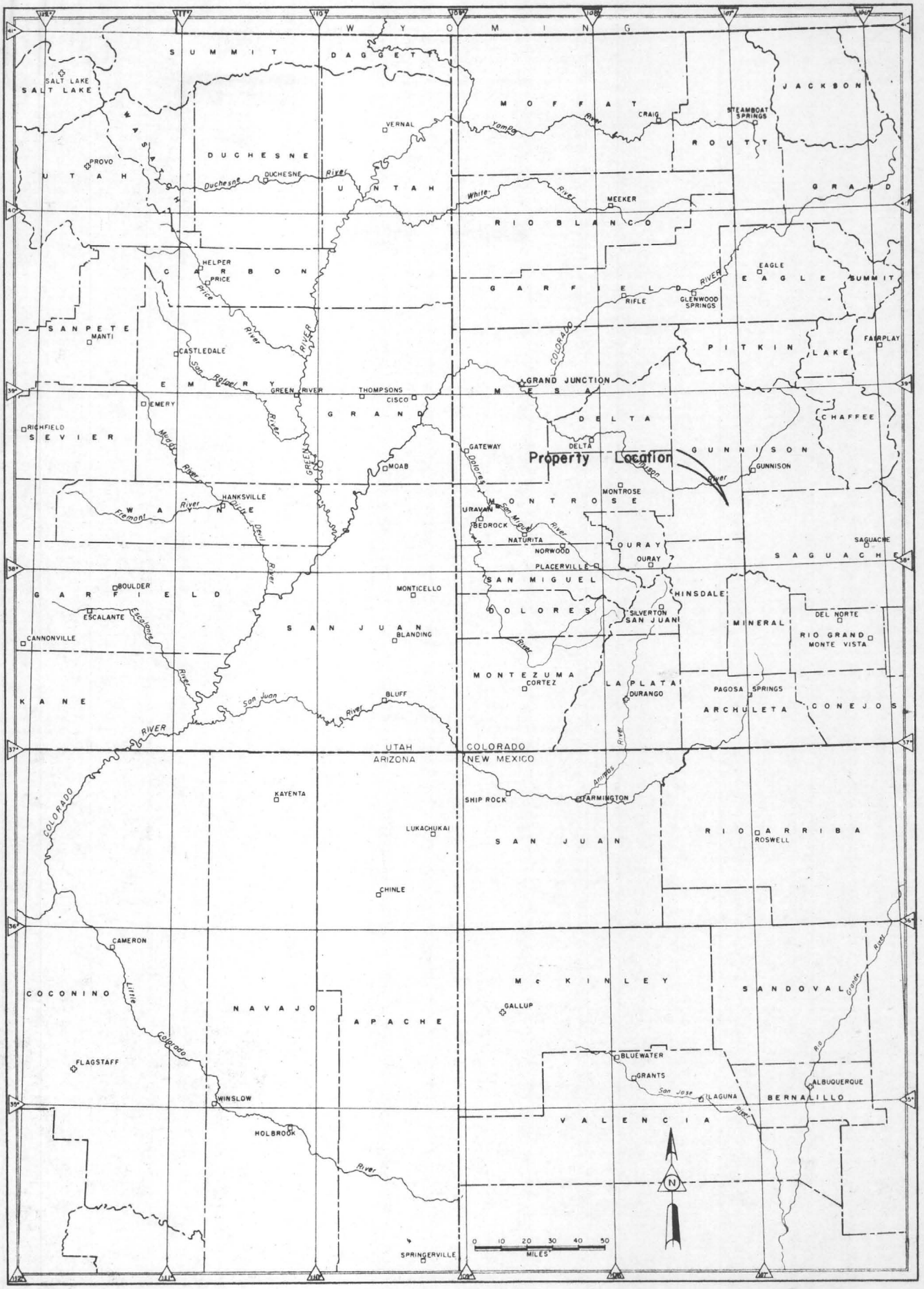


Fig. 1

LOCATION MAP

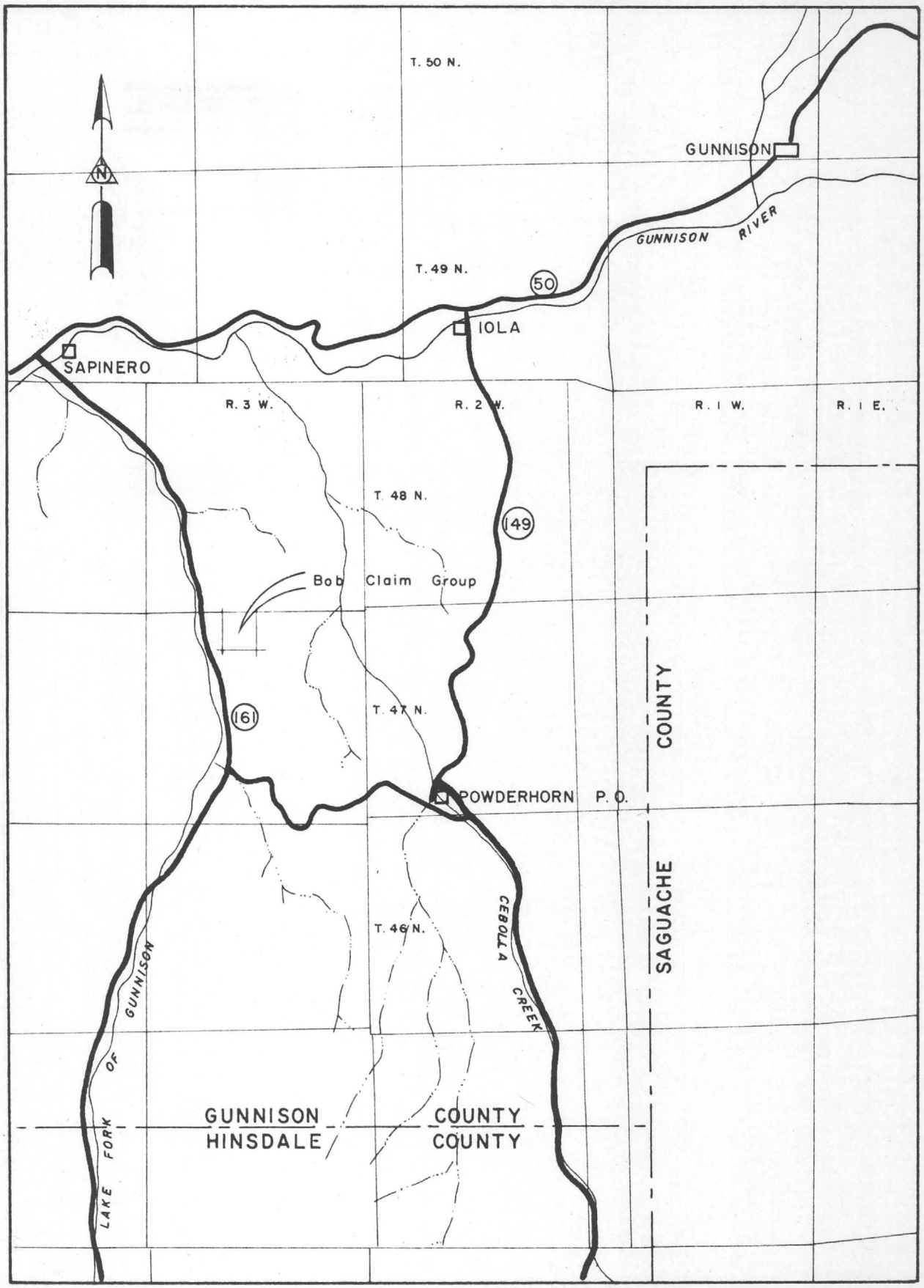
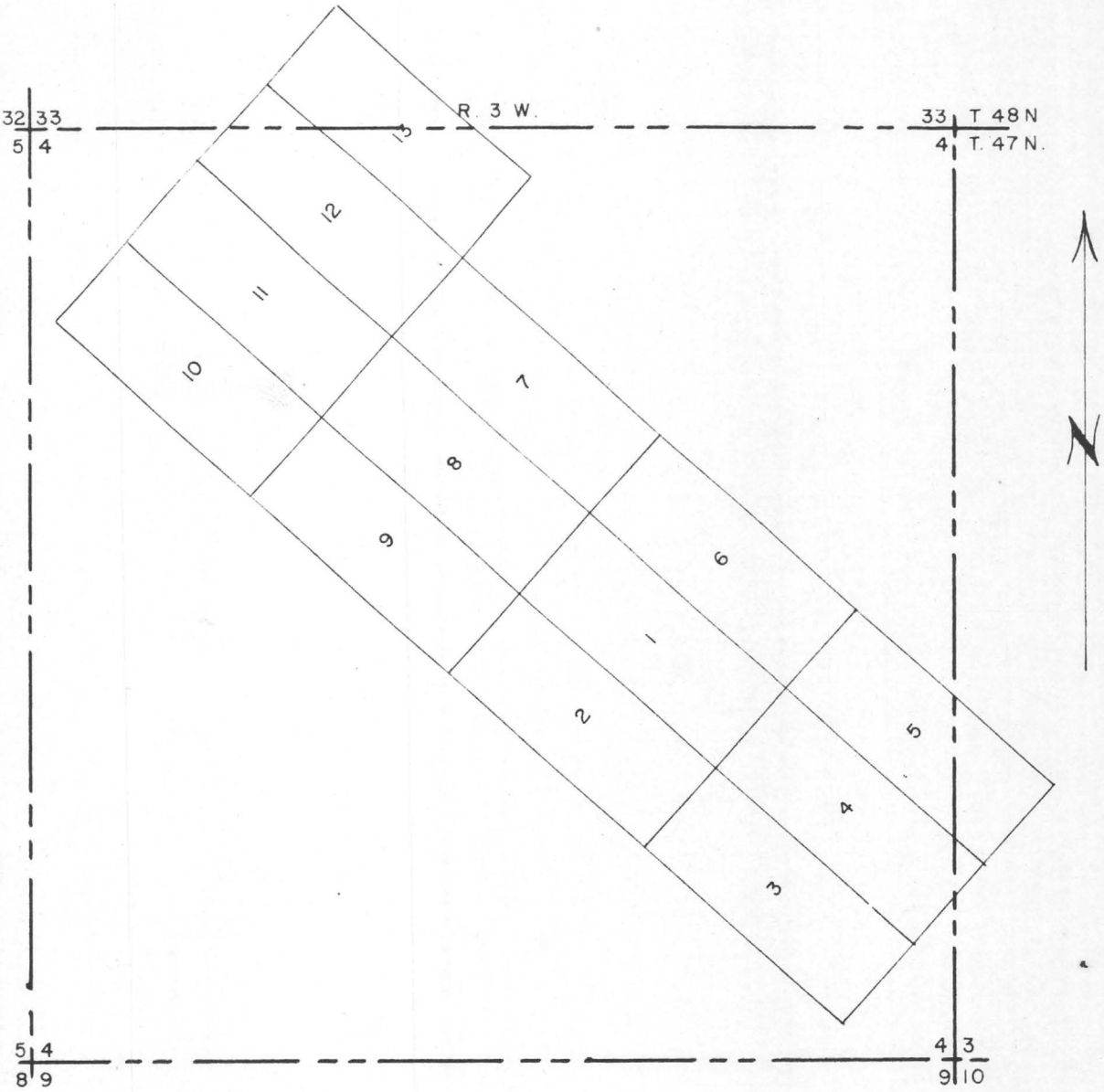


Fig. 2

INDEX MAP
of the
POWDERHORN AREA
Gunnison County, Colorado

Scale: 1" = 4 miles



CLAIM MAP
of the
Bob Claim Group
Associated Metals, Inc., Gunnison Co., Colo.
Scale: 1" = 1000'
Oct, 1956

Fig. 3

EQUIPMENT, MILLING FACILITIES, AND LABOR

Mine equipment is available from Denver and Grand Junction, Colorado.

The sale of thorium ores is subject to AEC licensing regulations. The nearest purchasing mill is located at Chicago, Illinois.

Experienced labor is plentiful in the Gunnison area.

GEOLOGY

REGIONAL GEOLOGY

Petrology

The White Earth district lies on the northern flank of the San Juan Mountains and at the edge of the San Juan volcanics where the rocks of the Potosi volcanic series have eroded to show pre-Cambrian basement rocks and small amounts of Jurassic and Cretaceous sediments.

Pre-Cambrian rocks are represented by several varieties of granite (red and gray being the most common), granite gneiss, and small amounts of schist.

Sedimentary rocks consist of Jurassic Morrison sandstone and shale capping a few of the hills and suspected Dakota sandstone in one or two localities.

The rest of the area is covered by various members of the Potosi volcanic series of Miocene age, the Alboroto rhyolite and quartz latite flows and tuffs being most prominent, with Lake Fork andesites also being present.

Mineralization

Although little work has been done to test the nature of thorium mineralization of the Powderhorn area, some conclusions can be drawn. Thorium mineralization is confined to shear zones, for the most part in granite. The Thorium mineral is thorite which occurs as fracture fillings, fracture coatings, and as replacements and is usually accompanied by abundant hematite and limonite, often by barite and occasionally by pyrite, chalcopyrite and galena with associated gold and silver. The hematite is abundant enough to cause a reddening of the country rock in the vicinity of the veins and thus serves as a prospecting guide.

Silicification of wall rocks and fracture-filling have both produced a heavily iron stained jasperoid which in places is thorium-bearing. Much of the mineralized material has a strong fetid odor which can be detected for a few seconds after the rock has been broken. This, too, is a useful prospecting guide.

The foregoing features of the Powderhorn thorium mineralization are almost identical with those of the thorium area in the Wet Mountains of Colorado as described in the USGS Circular 290. One difference is the amount of uranium contained in the mineralized material. Samples from the White Earth district are reported to contain as much as 0.50% U_3O_8 while those of the Wet Mountains contained under 0.01%.

LOCAL GEOLOGY

The Bob claims lie in an area almost wholly occupied by granite with minor amounts of andesite. Exact relationships between various rock types are difficult to determine since outcrops are scarce, the area being largely covered by humus and talus.

One small vein was found which gave anomalous readings throughout its length. Abnormally high readings were noted in several other isolated small shears.

CONCLUSIONS

1. The property contains no proven ore reserves.

2. Nor ore buying program has been instigated by the AEC. The Government has bought small amounts of thorium, however, for research on non-energy-use stockpiles.

3. The Bob group is located in an area known to be a thorium province.

4. Abnormal radioactivity was noted on several of the claims. Anomalous readings can be caused by other sources than commercial thorium.

RECOMMENDATIONS

A systematic program of evaluation and exploration of the Bob Group is here outlined. Each succeeding step should be dependent on the results of the preceding in order that the program not be extended beyond its logical and proper ending point.

1. Radiometric grid survey of the property to help determine strike and degree of mineralization of the veins. A station spacing of 100 feet is recommended.

2. Cutting of bulldozer trenches to enable inspection and sampling of areas of highest radioactivity.

3. Fifty scale geological mapping of selected areas.

4. Diamond drilling program to evaluate the actual thorium veins discovered by the foregoing.

Fred C. Hohne

INTERNATIONAL

MINERALS & CHEMICAL CORPORATION

GENERAL OFFICES · 20 NORTH WACKER DRIVE · CHICAGO 6

Tennessee Department - Phosphate Minerals Division
P. O. Box 591
COLUMBIA, TENNESSEE

November 19, 1956

Mr. Fred C. Hohne
Consulting Geologist
P. O. Box 1834
Grand Junction, Colorado

Dear Mr. Hohne:

Thanks very much for your letter of November 13. I, too, am sorry that I missed you on my recent visit to Grand Junction.

My Company will be interested in the guano deposit if it is of any size. I would appreciate very much seeing a copy of your report on the property.

In answer to your question, I must admit you have me stumped. As interesting as the problem is, time has not permitted me to do more basic research on the defecating habits of fish, fowl or mammals. If you intend to pursue the matter further, I am sure that some of our more eminent biologists, psychologists, etc., should be able to throw some light on the subject. I feel confident that you will find there is some relation between the sex life and the nocturnal habits of the bat, and that this in turn will have a direct bearing on their rate of production. It is indeed an interesting problem.

If the snow doesn't fly too soon on the Colorado plateau, I expect to be in Grand Junction again before Christmas. I trust that I will have the pleasure of meeting you in person at that time.

Very truly yours,

INTERNATIONAL MINERALS & CHEMICAL CORPORATION
PHOSPHATE MINERALS DIVISION

J R Hall

Exploration & Development Engineer

JRHall
fr

MAR 20 1957
ANSCHUTZ DRILLING CO.

GEOLOGIC REPORT

on the

LISBON VALLEY PROPERTY, SAN JUAN COUNTY, UTAH

for

COLOHOMA URANIUM, INCORPORATED

INTRODUCTION

This report is written at the request of Colohoma Uranium, Incorporated of Montrose, Colorado, on their uranium property in Eastern Utah. This property is known as the Lisbon Valley Group and is located in Lisbon Valley, San Juan County, Utah. A brief discussion of the general uranium geology of the Colorado Plateau is given along with the geology of the property, pertinent aspects on exploration of the property and the figures for the indication of ore reserves found on the property.

CONCLUSIONS

1. Ore reserves on the Lisbon Valley property are estimated at 17,200 tons of 0.23% U_3O_8 and 1.15% V_2O_5.
2. The Lisbon Valley property has approximately 200 acres remaining to be explored.
3. Drilling depths are estimated to be between 800 and 900 feet in the areas south and east of the probable ore reserves.
4. Producing mines are located to the north and west of the property.

LOCATION AND OWNERSHIP

The Lisbon Valley Group consists of 80 acres of patented land and the Loomis, Silvey, Knox, Rainey, Reeves, and Wright claims, all leased from William H. and Martha R. Wood, located in the east part of Section 1, Township 31 South, Range 25 East and in the west part of Section 6, Township 31 South, Range 26 East, S.L.P.M. The property is in the Lisbon Valley Mining District of San Juan County, Utah. (See Figure 1 & 2)

TOPOGRAPHY

The Lisbon Valley property is divided into two fairly level portions by a steep northwest trending escarpment along a major fault.

ACCESSIBILITY

The property is connected by 20 miles of dirt roads with U. S. Highway 160, an excellent paved road between Monticello and Moab, Utah.

GEOLOGY

General

The property of Colohoma Uranium, Inc. is located on the Colorado Plateau, a vast physiographic province of high mesas and deep, steep walled canyons cut by streams of the Colorado River drainage system. Uranium ore deposits occur in relatively flat lying sedimentary rocks that outcrop in the walls of canyons and on the mesa rims. Although some uranium has recently been discovered in the Cutler formation of Permian age, the common host rocks are the fluviatile formations of Jurassic and Triassic ages.

Geologists are not in accord as to the origin of the Colorado Plateau uranium deposits. Practically all agree, however, that although the method of placement is not clear, the favored host rocks are the light colored sandstones deposited by streams in channels cut by these streams during periods of erosion. The typical host sandstones are elongated lenses which interfinger with adjacent mudstones or shales.

The Triassic Chinle formation is the host to the deposit on the Colohoma property.

In the predominantly fine grained Chinle, the ore occurs in basal sandstone lenses which often scour into the underlying formations. Over much of Utah and Arizona, the sandstone at the stratigraphic zone at the base of the Chinle is named the Shinarump formation, which is now considered to be the second most important source of uranium.

The lenses or "channels" which are hosts to the ore bodies of the Chinle formation are usually single, well-defined bodies, completely

surrounded by mudstone or shale. Drilling across the direction of ancient stream gradients, upstream or downstream from a known deposit has often resulted in a discovery.

Ore Deposits

Deposits of commercial grade uranium and vanadium were first discovered along canyon walls and mesa rims. Seldom, however, has the exploration of these surface deposits led to large commerical production. The Colohoma deposit, like most of the larger deposits, was discovered by exploration drilling. It has been revealed that most of the valuable deposits initially discovered on the outcrops were actually the surface exposure of elongate assemblages of ore bodies resembling a string of beads extending along the gradient direction of the ancient stream which deposited the host lense or "channel". Ore bodies so arranged are said to be in the same trend and are usually oriented so that the long axis of individual ore bodies is parallel to the trend.

When considering an investment in a uranium exploration venture one should realize that, in general, uranium ore deposits are small, elongate pods containing less than 10,000 tons of ore. Some deposits, however, are large tabular masses varying from 10,000 to more than 100,000 tons. Never are large extensive areas underlain by ore of uniform thickness as are many bedded deposits.

Local Geology

The Lisbon Valley Group straddles the major fault along the southwest flank of Lisbon Valley, which brings the Cretaceous Burro Canyon formation into contact with older formations of Jurassic and Triassic age. (See Figures 3 & 4)

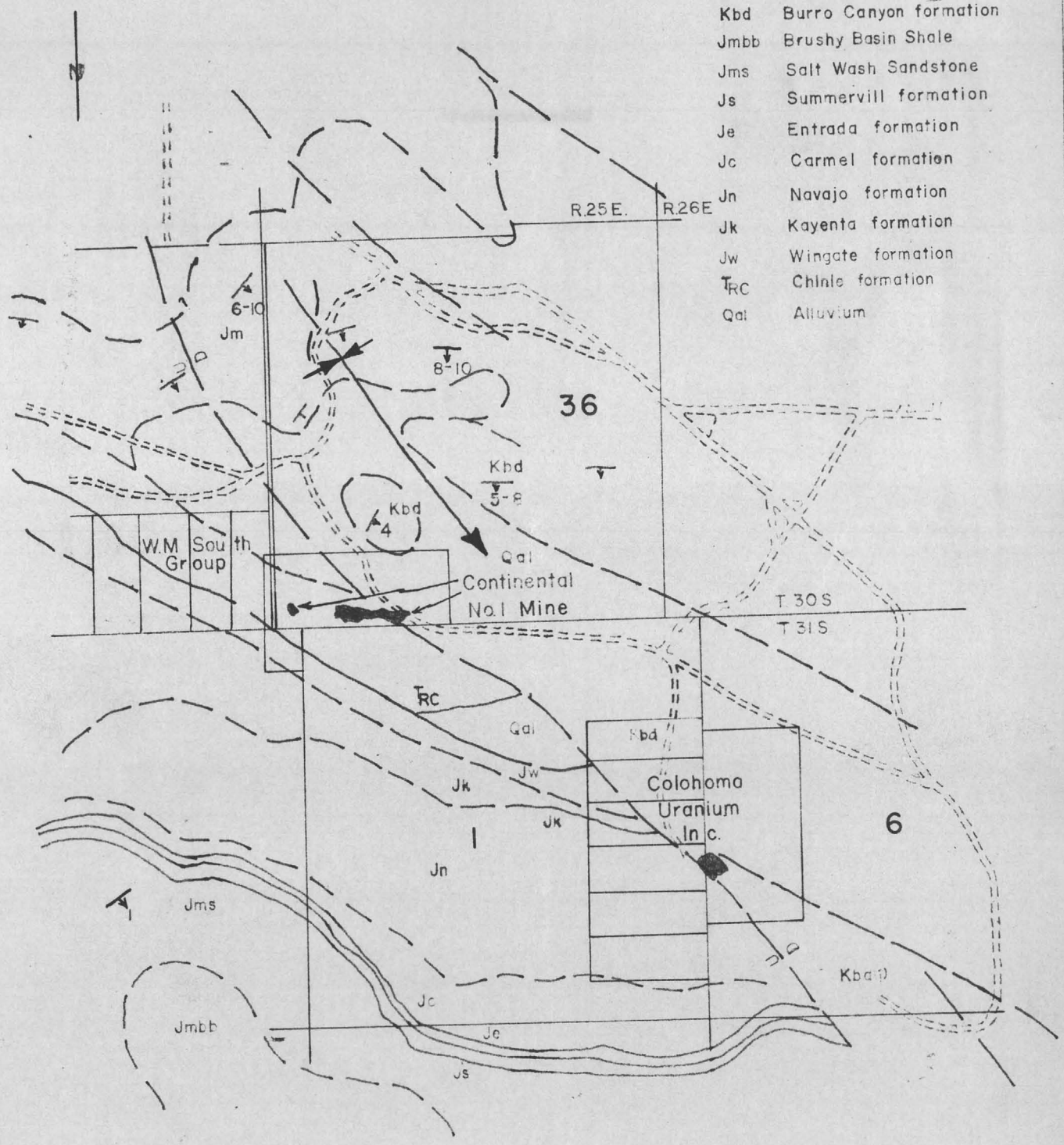
Uranium was discovered on this group by the entrepreneurs of Colohoma Uranium, Inc. in a sandstone at the base of the Triassic Chinle formation which is exposed in a triangular shaped area to the southwest of the fault on the Silvey and Knox claims.

A normal sequence of Jurassic beds ranging from the cliff-forming Wingate formation through the slope-forming Kayenta formation to the knoll-forming Navajo formation is exposed above the Chinle formation on the southwest side of the fault. Northwest of the fault, the only formation exposed is the Cretaceous Burro Canyon formation. Because of the relatively low angle of dip (about 60°) of the fault plane which has a strike of about North 45° East, it was possible to collar holes in the Burro Canyon formation on the downthrown side of the fault and drill to the Chinle ore horizon in the upthrown block without encountering excessive drilling depths. (See Figure 4)

COLOHOMA URANIUM INC.

Lisbon Valley Property

Geologic Mdp



Scale 1" = 2000'

U.S.G.S. Photogeologic

Mt. Peale Quadrangle

Figure 3

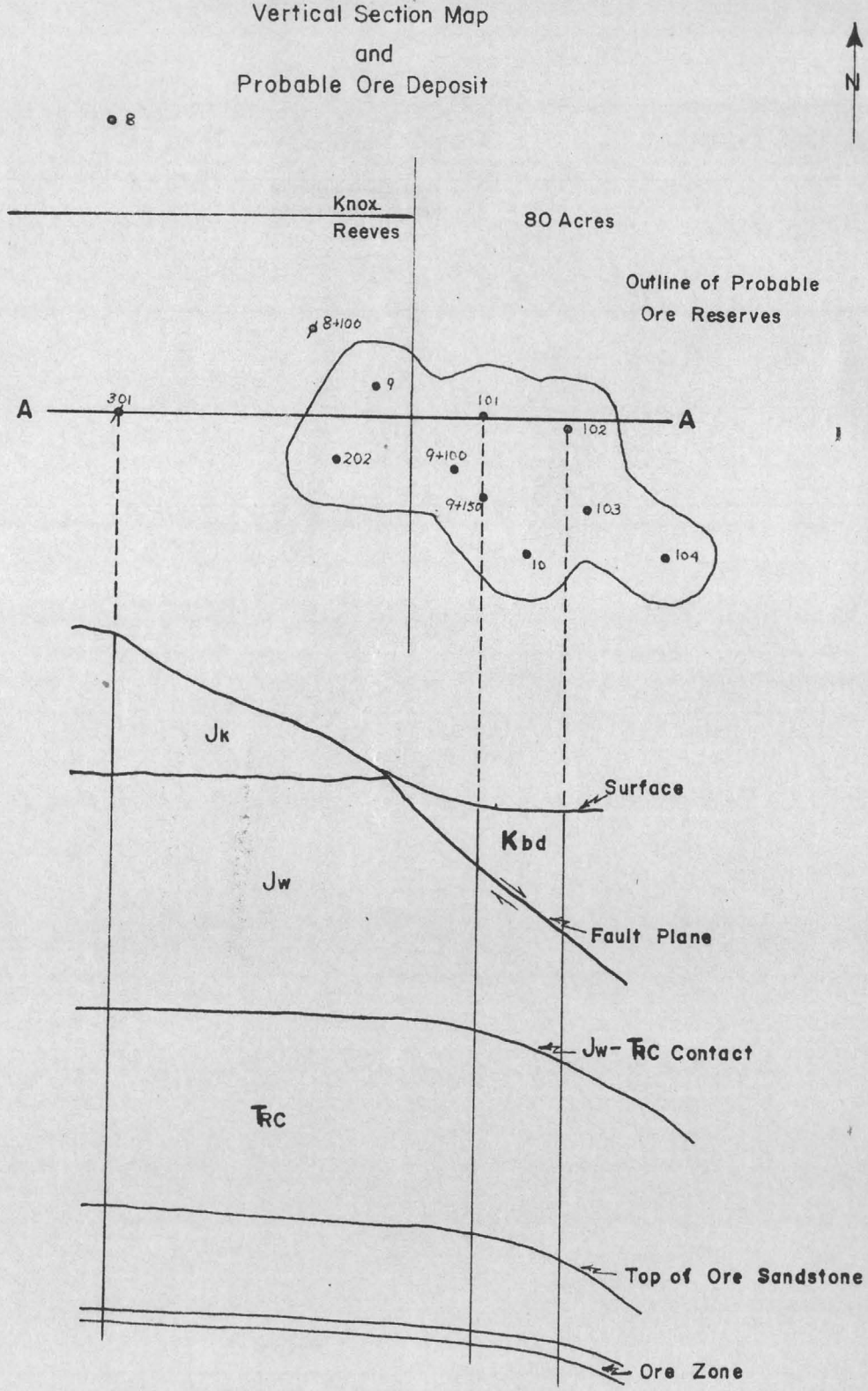
COLOHOMA URANIUM INC.

Lisbon Valley Property

Vertical Section Map

and

Probable Ore Deposit



Vertical Section thru A-A

Scale 1" = 200'

Figure 4

The Lisbon Valley Group is located in eastern Utah along one of the recently discovered and more important ore zones in the Chinle formation. Although development of this area is comparatively recent, it is becoming one of the more important producing areas of the Colorado Plateau.

Drilling on the property started in March of 1954 and resulted in the discovery of ore in June, 1954. The 21 holes drilled in the exploration program are shown on the map included as Figure 5.

ORE RESERVES

Ore reserves are estimated for the Lisbon Valley Group based on the results of the drill program completed several months ago. (See Figure 4) The calculated reserves are placed in the probable category because of the distance between drill holes and because part of the valuation had to be based on radiometric logs of holes which were drilled by non-core drilling methods. The method used in interpreting the radiometric logs is discussed thoroughly in this report. The logs are included as Exhibits 1 to 10. The chart provided by the Atomic Energy Commission for interpreting assay data from the logs is included as Figure 6. The logging was done by the Atomic Energy Commission and only the bottom portion of each log, which shows the ore zone, is for convenience, bound into this report. The usual method used by the Commission in estimating grade by the use of Figure 6, is to take 2/3 of the distance from the base of the curve on the gamma-ray log to the maximum deflection or peak multiplied by the multiplier for the circuit used. The counts per minute figure thus calculated is scaled off on the base of the graph shown in Figure 6, and projected to the curve for the gamma setting used. The point from the curve is then projected to the vertical scale which reads in counts per minute. When this was done using the 2/3 figure for the ore body in question, the assays taken from the graph were higher than those obtained from chemical analysis of core samples for the corresponding hole and depth interval. It was, therefore, necessary for the writers to calculate a factor to substitute for the 2/3 figure commonly used.

This was done by using the data for holes 10, 101, 102 and 104 for which results of chemical analysis of core samples were available. By taking from the chart on Figure 6, the counts per minute coinciding with the chemical analysis of the core samples and dividing by the maximum deflection times the multiplier for the circuit used, a factor which was relatively constant was calculated. This factor was used to reduce the counts per minute value so that satisfactory grade determinations could be made from the chart on Table 2. The results of this work are summarized and tabulated on Table 1.

COLOHOMA URANIUM INC.

Lisbon Valley Property
Location of Drill Holes

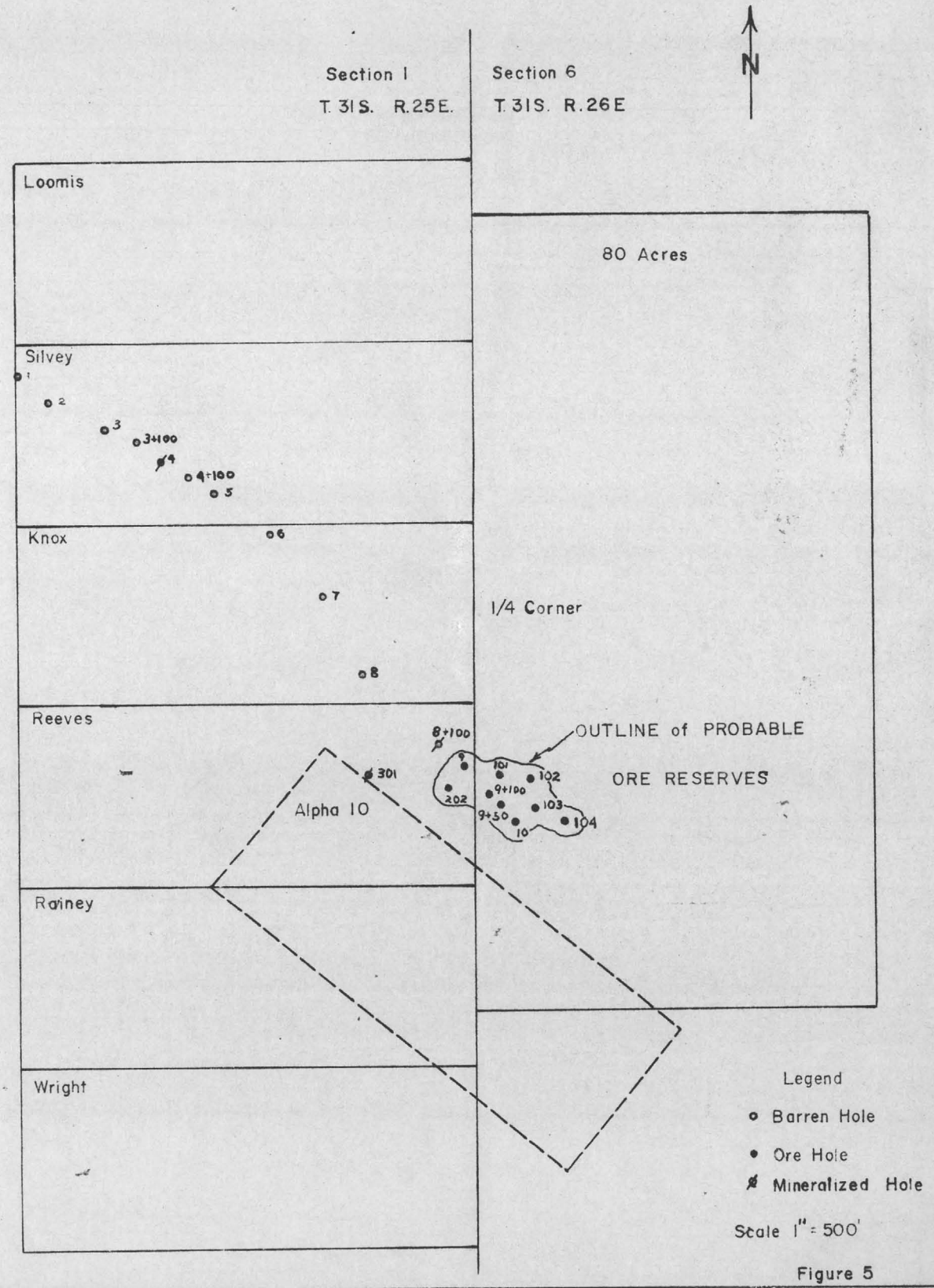


Figure 5

Gamma Setting Studies

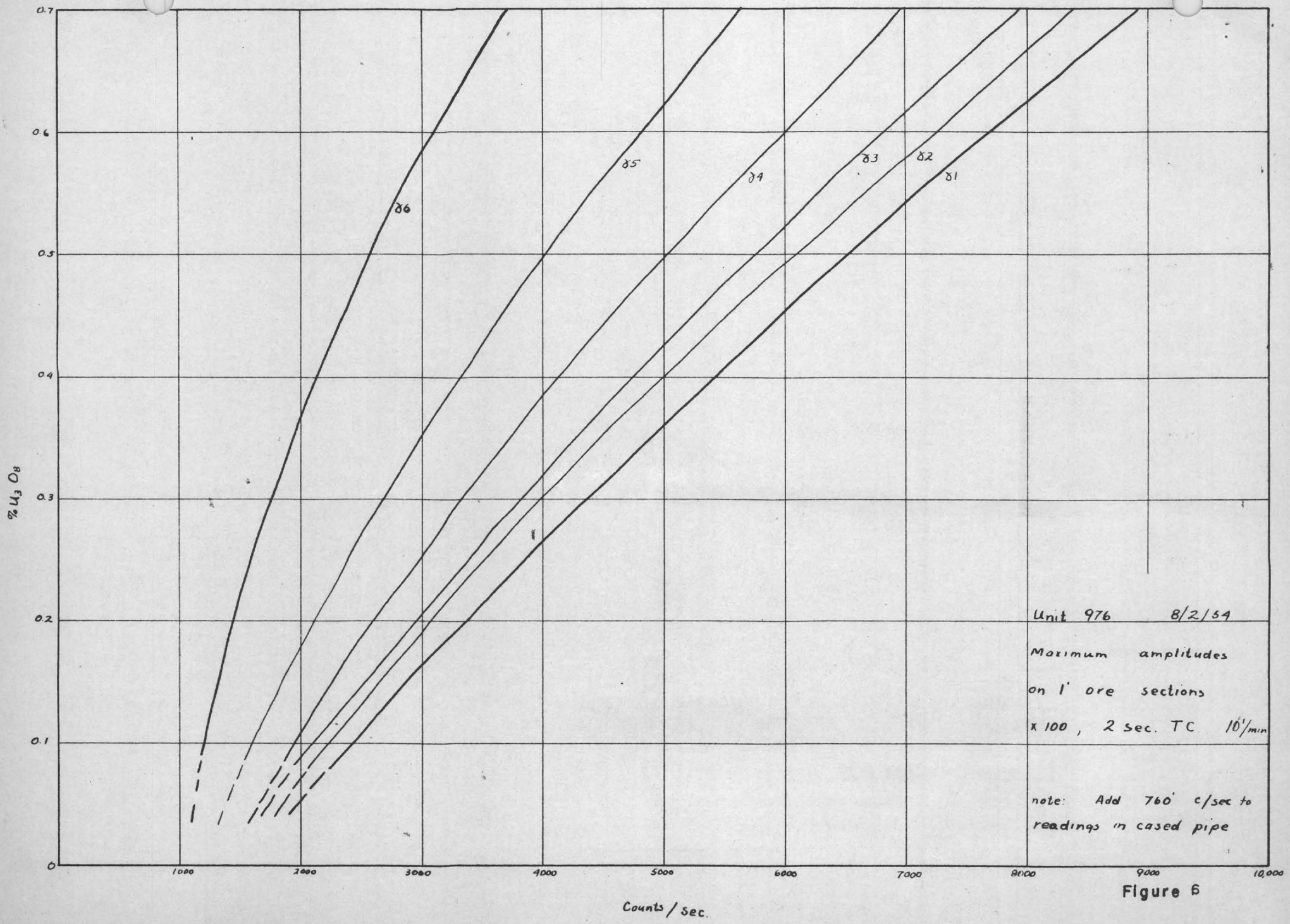


Figure 6

HOLE	THICKNESS	MAXIMUM RADIOACTIVE COUNT	PERCENT U_3O_8	RADIOACTIVE COUNT X FACTOR (.422)	PERCENT V_2O_5	THICKNESS X % U_3O_8	THICKNESS X % V_2O_5	LIME	THICKNESS X LIME	FACTOR
10	3.2'	7250 r 1	0.15(c)	2900 r 1	0.15	0.480	.48	13.20	42.56	$\frac{2900}{7250}$ = .400
101	2.0'	7250 r 5	0.37(c)	3100 r 5	7.14	0.740	14.28	3.20	6.40	$\frac{3100}{7250}$ = .427
102	2.0'	5930 r 5	0.28(c)	2600 r 5	0.18	0.560	.36	12.30	24.60	$\frac{2610}{5830}$ = .445
104	2.5'	5960 r 1	0.11(c)	2500 r 1	Nil	0.275	.00	3.70	9.25	$\frac{2500}{5960}$ = .419

Average factor (1.69 ÷ 4) = .422

(r) radiometric assay
(c) chemical assay

CALCULATION OF RADIOMETRIC FACTOR

TABLE I

Showing calculation of factor used for reducing maximum deflection to count per minute for the purpose of determining percent of U_3O_8 from Figure 7.

HOLE	DEPTH	THICKNESS	MAXIMUM RADIOACTIVE COUNT	PERCENT U_3O_8	RADIOACTIVE COUNT X FACTOR (.422)	PERCENT V_2O_5	THICKNESS X % U_3O_8	THICKNESS X % V_2O_5	LIME	THICKNESS X LIME
10	665	3.2'	7250 r 1	0.15 (c)	2900 r 1	0.15	0.480	.48	13.30	42.56
101	665	2.0'	7250 r 5	0.37 (c)	3100 r 5	7.14	0.740	14.28	3.20	6.40
102	690	2.0'	5830 r 5	0.28 (c)	2600 r 5	0.18	0.560	.36	12.30	24.60
104	720	2.5'	5960 r 1	0.11 (c)	2500 r 1	Nil	0.275	.00	3.70	9.25
9	645	2.0'		0.13 (c)		0.11	0.260	.22	7.6	15.20
9 + 100	620	4.0'	6900 r 5	0.33 (r)	2900 r 5	--	1.320	--		
9 + 150	661	4.5'	7675 r 1	0.19 (r)	3240 r 1	--	0.855	--		
103	695	1.0'		0.43 (c)		0.47	0.430	.47	20.4	20.40
202	710	1.2'		0.20 (c)		0.17	0.240	.240	9.0	10.80
Totals		22.4					5.160	16.01		129.21

$\frac{5.160}{22.4}$ = 0.23 % weighted average grade U_3O_8

$\frac{16.01}{13.9}$ = 1.15 % weighted average grade V_2O_5

$\frac{129.21}{13.9}$ (A) = 9.3 % weighted average Lime

$\frac{22.4}{9}$ = 2.49 ft. average thickness

Measured area of probable ore body = 89,900 Square feet

Total tons $\frac{89,900 \times 2.49}{13\ **}$ = 17,200

Value per ton 0.23 % U_3O_8 = $18.85

Value per ton 1.15 % V_2O_5 = 7.13

25.98

Less Lime Penalty = 2.20

$ 23.78 (b)

(r) radiometric assay
(c) chemical assay
** Cubic feet per ton of ore in place

(A) Total thickness of mineralized zone in holes chemically assayed.

(b) Before mining costs royalty and administrative expenses.

TABLE 2

CALCULATION OF PROBABLE ORE RESERVES.

Table 2 shows the ore reserve calculations. Volume was calculated by taking the average width indicated by core analysis and radiometric logging and multiplying it by the total area of the deposit. A sphere of influence method was not used because of the concentration of holes in the center and the thickest portion of the orebody. The indicated reserve calculated by this method is 17,200 tons of material estimated to contain 0.23% U_3O_8 and 1.15% V_2O_5. Based on these grade figures, the deposit is worth at present Atomic Energy Commission prices $25.98 per ton. From this value a lime penalty of $2.20 per ton should be deducted for the high lime content of 9.30%.

OVERALL MINING COSTS

In the absence of operating experience on the property, no reasonable estimate of mining costs can be made. However, the cost of the shaft and surface plant for the Lisbon operation should not exceed $150,000.00.

Respectfully submitted,

GEO-ENGINEERING

By Louis P. Gaggini

Louis P. Gaggini

Lewis D. Anderson

Lewis D. Anderson

Harold A. Culp

Harold A. Culp

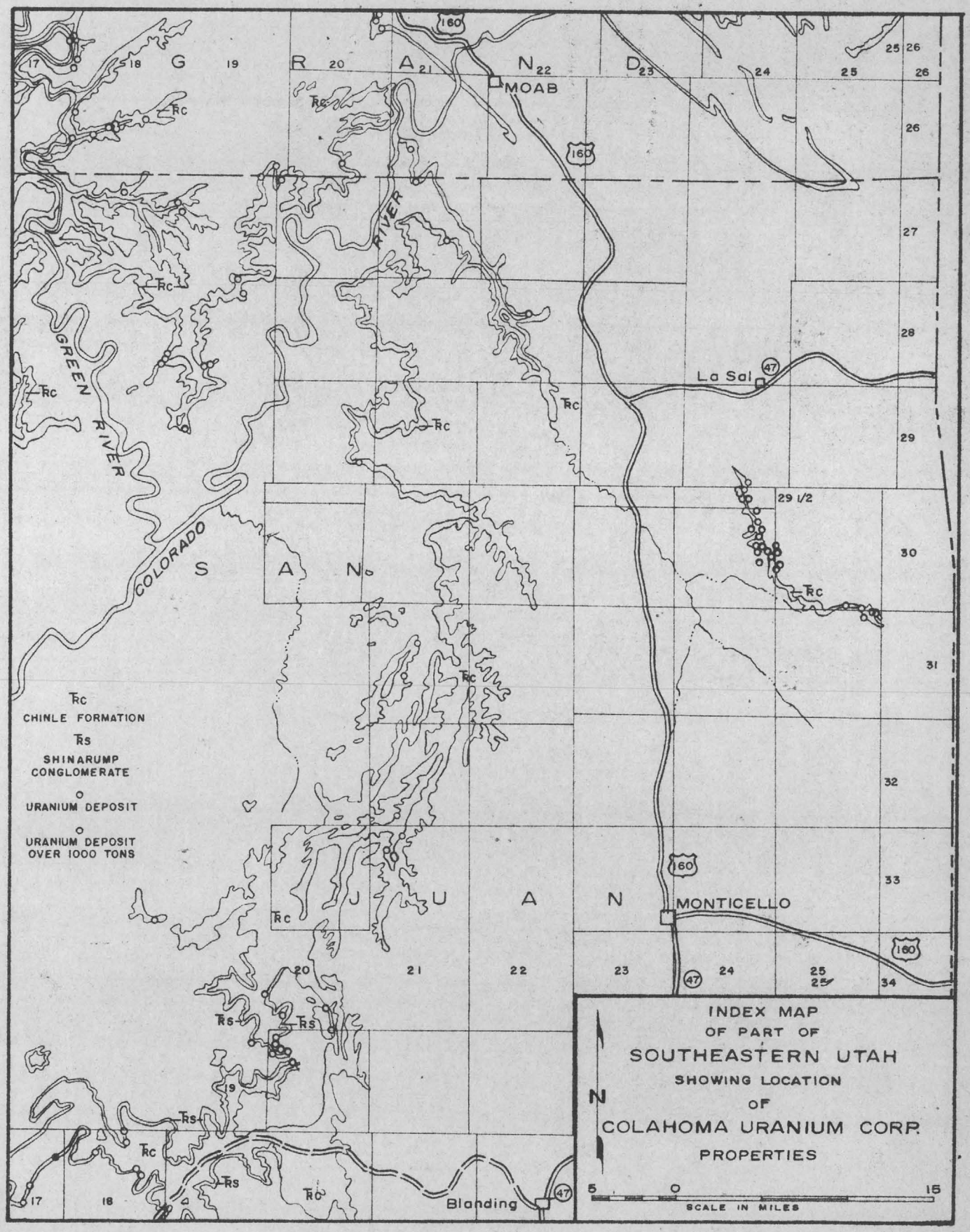

G R A N D
MOAB
GREEN RIVER
COLORADO RIVER
S A N J U A N
La Sal
MONTICELLO
Blanding
Trc
CHINLE FORMATION
Trs
SHINARUMP CONGLOMERATE
URANIUM DEPOSIT
URANIUM DEPOSIT OVER 1000 TONS
INDEX MAP OF PART OF SOUTHEASTERN UTAH SHOWING LOCATION OF COLAHOMA URANIUM CORP. PROPERTIES
N
5 0 15
SCALE IN MILES

Figure 2

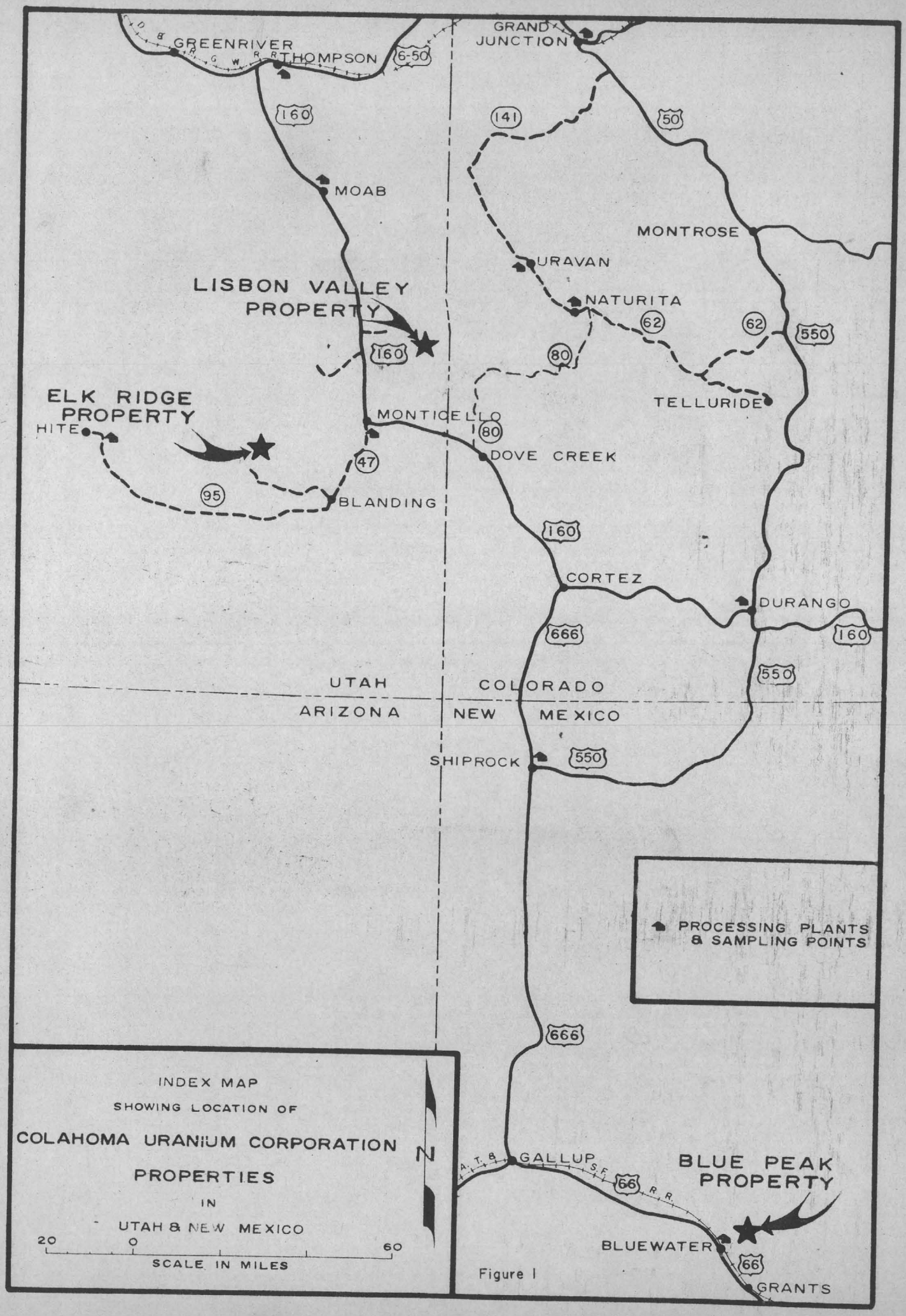

GREENRIVER
THOMPSON
D & R G W R R
6-50
GRAND JUNCTION
160
141
50
MOAB
MONTROSE
URAVAN
LISBON VALLEY PROPERTY
NATURITA
62
62
550
160
80
ELK RIDGE PROPERTY
HITE
MONTICELLO
TELLURIDE
80
DOVE CREEK
47
95
BLANDING
160
CORTEZ
DURANGO
666
160
550
UTAH
COLORADO
ARIZONA
NEW MEXICO
SHIPROCK
550
PROCESSING PLANTS & SAMPLING POINTS
666
INDEX MAP
SHOWING LOCATION OF
COLAHOMA URANIUM CORPORATION
PROPERTIES
IN
UTAH & NEW MEXICO
20
0
60
SCALE IN MILES
N
A. T. & S. F. R. R.
GALLUP
66
BLUE PEAK PROPERTY
BLUEWATER
66
GRANTS

Figure 1

GEOLOGIC REPORTS

COLOHOMA URANIUM, INCORPORATED, PROPERTIES

in Colorado and New Mexico

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GEOLOGIC REPORT

of the

ELK RIDGE CLAIM GROUP, SAN JUAN COUNTY, UTAH

for

COLOHOMA URANIUM, INCORPORATED

INTRODUCTION

This report is written at the request of Colohoma Uranium, Incorporated, Montrose, Colorado. The report concerns the geological possibilities of 20 unpatented mining claims located on Elk Ridge, San Juan County, Utah. The claims include Ed Nos. 10, 28, 29, 43A, 44A, 45A, 47, 49, 53, 56, 57, 62, 63 and 66; and Elk Nos. 5, 17, 19, 21 and 23.

CONCLUSIONS

1. Very little exploration or development has been done in the immediate area.

2. Producing mines are located to the northeast and southwest of the property. The production, however, comes from areas which were more accessible than the Elk Ridge Group.

3. Drilling depths will range from 150 to 250 feet.

4. The ore formation of interest on this property is the Shinarump. The Cutler is mineralized a few miles away but drilling depths on the Elk and Ed claims make exploration of this formation prohibitive.

RECOMMENDATIONS

1. Map all Shinarump exposures on or near the property, making special note of:

    a. channels or thickening lenses.
    b. carbonaceous material.
    c. limonite stain.
    d. color of mudstone and sandstone.
    e. texture of potential host rock.
    f. fracture patterns.
    g. direction of stream flow as evidenced by strike of lineation and fossil logs.

2. Make a rim scintillometer survey.

3. Plan a systematic exploration drill program, based on 1 and 2 above.

LOCATION & OWNERSHIP

The claims are located approximately 20 airline miles west of Blanding, Utah, and about 65 miles southwest of Moab, Utah. Haulage distance to the nearest mill at Monticello, Utah, is 47 miles. The property is located in an unsurveyed area in San Juan County, Utah. (See Figures 1 and 2)

The property was staked jointly by Geo-Engineering, Lippoth & Wein Drilling Company and Joe Willoughby. Colohoma Uranium, Incorporated has leased the claims from the original locators.

DEVELOPMENT

No exploration or development work has been done on the property.

FACILITIES

Roads

An all-weather A.E.C. access road passes through the property. Since the mesas are relatively flat, the cost of building drill roads will be very low.

Ore Shipment

Ore can be shipped either to the A.E.C. mill at Monticello, Utah, or to the buying station at Hite, Utah. The haulage distance to Monticello is 47 miles.

Timber

Elk Ridge is covered with an ample supply of good mine timber. Sawed lumber will have to be hauled from Blanding, Utah.

Plane Facilities

A landing strip sufficient for small planes is located one mile east of the property. Small planes can also land at Blanding. Moab and Monticello both have large runways. Car rentals are available at the Moab airport.

GEOLOGY

Regional Setting

Most of the domestic uranium production comes from the carnotite-roscoelite type deposits on the Colorado Plateau. The "Plateau" is a physiographic unit which covers more than 100,000 square miles. Tertiary intrusives are exposed in several areas. Uranium mineralization occurs in the sediments on the periphery of the intrusives.

The Elk Ridge Group is located on the Mitten Butte Anticline on the southwest slope of the Abajo Mountains, which are a Tertiary laccolith. The northerly nose of the anticline is called Elk Ridge. (See Figure 7)

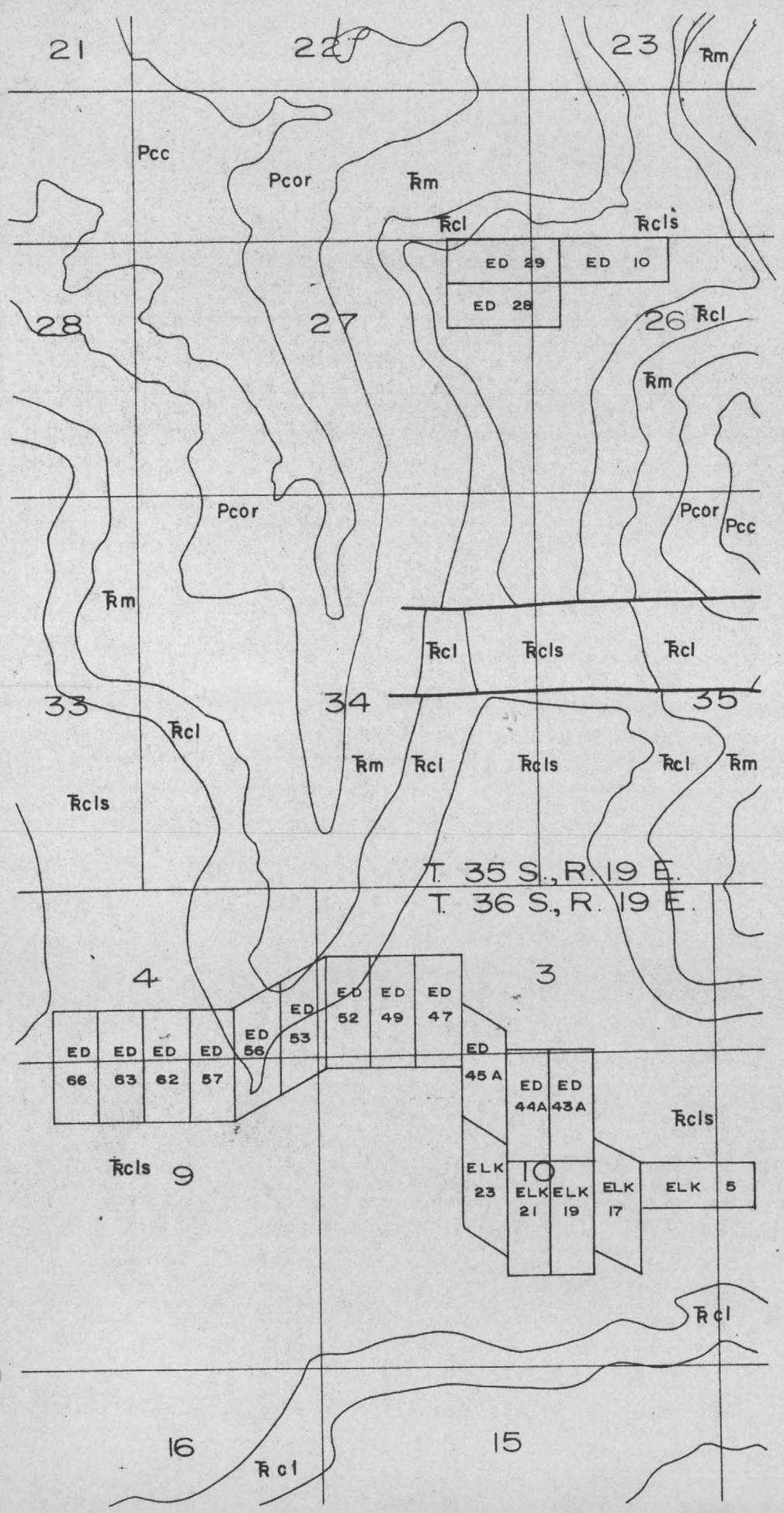
Local Geology

Known deposits of uranium minerals in the basal Shinarump sandstones occur in channels which were cut into the underlying Moenkopi formations. Carbonaceous material in the form of fossil trees has been deposited in the channels. This carbonaceous material was the chemical precipitant necessary for ore deposition.

The flat, narrow mesa upon which the claims lie is formed by the resistant Shinarump formation of late Triassic age. This formation is the only economically important ore bearing formation underlying this group of claims. Ore has been found in the Permian Cutler formation which also underlies the claims, but the cost of drilling the deep holes necessary to test this horizon would probably be prohibitive.

The term "Shinarump formation" as used in this report includes all of the caprock-forming sandstones that lie at the base of the Chinle formation or between the Chinle and Moenkopi formations. The units which have been called "Mossback", "Chinle", and "Commission Sandstone" by various stratigraphers are all included in the Shinarump formation as defined in this report.

In this area, which is close to the type locality, the Mossback unit of the Chinle is an apparently persistent, highly-resistant sandstone, the top of which lies about 150 feet above the Chinle-Moenkopi contact. The ore bodies of the area will probably occur in the sandstone lenses which lie at the Chinle-Moenkopi contact.



EXPLANATION

Rcls
Rcl

CHINLE FORMATION
Sandstone unit lower part
lower part

Rm

MOENKOPI FORMATION

Pcor
Pcc

CUTLER FORMATION
Organ rock tongue member
Cedar Mesa sandstone member

FAULT

FORMATION CONTACT

N

SCALE 1" = 2000'

GEOLOGIC
MAP OF
ED & ELK CLAIMS
PREPARED FOR
COLAHOMA URANIUM
INCORPORATED

Figure 7

System	Series	Formation	Section	Thickness	Character of Rocks
Jurassic	Glen Canyon Group	Navajo		300	SANDSTONE, CREAM-YELLOW, MASSIVE, CROSS-BEDDED
		Kayenta		200	SANDSTONE, DARK-RED, THIN-BEDDED
		Wingate		300	SANDSTONE, REDDISH-BROWN, MASSIVE, CROSS-BEDDED
Triassic	Upper	Chinle, Upper		100	SANDSTONE, RED-BROWN, THIN-BEDDED, CALCAREOUS
		Chinle, Middle		300 to 500	MUDSTONE, VARIEGATE, CALCAREOUS, BENTONITIC
		Chinle, Lower		200 to 245	CLAYS, GRAY-VARIEGATED; SANDSTONE & CONGLOMERATE
		Shinarump		0-75	CONGLOMERATE, YEL.-GRY.
		UNCONFORMITY			
	Lower	Moenkopi		200 to 350	SILTSTONE, DARK-BRN., THIN-BEDDED; SHALE & SANDSTONE
Permian		Cutler, White Rim		10-	SANDSTONE, CREAM, FINE-GRAINED
		Cutler, Organ Rock Tongue		200 to 300	SILTSTONE, REDDISH-BROWN SANDSTONE, FINE-GRAINED
		Cutler, Cedar Mesa		1000	SANDSTONE, CREAM, CROSS-BEDDED, LOCAL RED SHALE

Stratigraphic Section
White Canyon Area
San Juan County, Utah

Figure 3

Stratigraphy

See Stratigraphic Section for White Canyon District. (See Figure 8)

Structural Geology

Most base metal and uranium deposits are found on or near positive structures. The claims have been staked in an area that is structurally favorable. Detailed mapping will be necessary to delineate minor flexures as well as channels.

Economic Geology

The writer feels that the scarcity of exploration drilling in the vicinity of the claims is probably the principal reason that this immediate area is not presently producing ore.

Government drilling programs in White Canyon and on Deer Flat have been gradually proving the area northward toward Elk Ridge. Several of the ore bodies found to date by this drilling are being profitably exploited.

Areas immediately to the north and southwest of the claims have been withdrawn by the Atomic Energy Commission, and government exploration projects are now in progress upon them. Detailed results are, of course, not available to the writer, as this information is released only to claim owners.

Respectfully submitted,

MINERALS EXPLORATION RESEARCH CORPORATION

By Fred C. Hohne

Fred C. Hohne, Geologist

GEOLOGIC REPORT

on the

BLUE PEAK PROPERTY, McKINLEY COUNTY, NEW MEXICO

for

COLOHOMA URANIUM, INCORPORATED

INTRODUCTION

This is a geological report of the Blue Peak property, Haystack Mining District, Grants, New Mexico. The property consists of 22 unpatented mining claims, with an acreage of 313 acres, more or less. The claims include the Garcia 1-5, Blue Peak 1-7 and the Red Top 1-10.

This report is written at the request of Colohoma Uranium, Incorporated, Montrose, Colorado.

CONCLUSIONS

1. The property has produced ore worth approximately $100,000.

2. Large producing mines are located in the immediate vicinity.

3. Drilling depths are estimated to be between 150 and 300 feet.

4. The following is a list of assets of the property:

    a. Approximately 900 feet of drifts and crosscuts have been driven.
    b. Mineable ore up to three feet thick has been left in ribs and pillars.
    c. Haulage roads have been constructed.
    d. Drill roads have been constructed.
    e. Eight mineralized holes have been drilled, which give high radiometric readings, with thicknesses up to 11 feet.

RECOMMENDATIONS

1. Plan an efficient mining program.

2. The oxbow ore bodies are small but high grade and since the exploration drifts have been driven, an underground long hole program should be instigated to find more ore bodies.

3. Plan an exploration drilling program. Holes should be close-spaced in the north-south direction and rows of holes can be relatively wide-spaced in an east-west direction.

4. Make a scintillometer survey of rim exposures to the east and west of present workings. An outcrop of a parallel roll might be found.

LOCATION AND OWNERSHIP

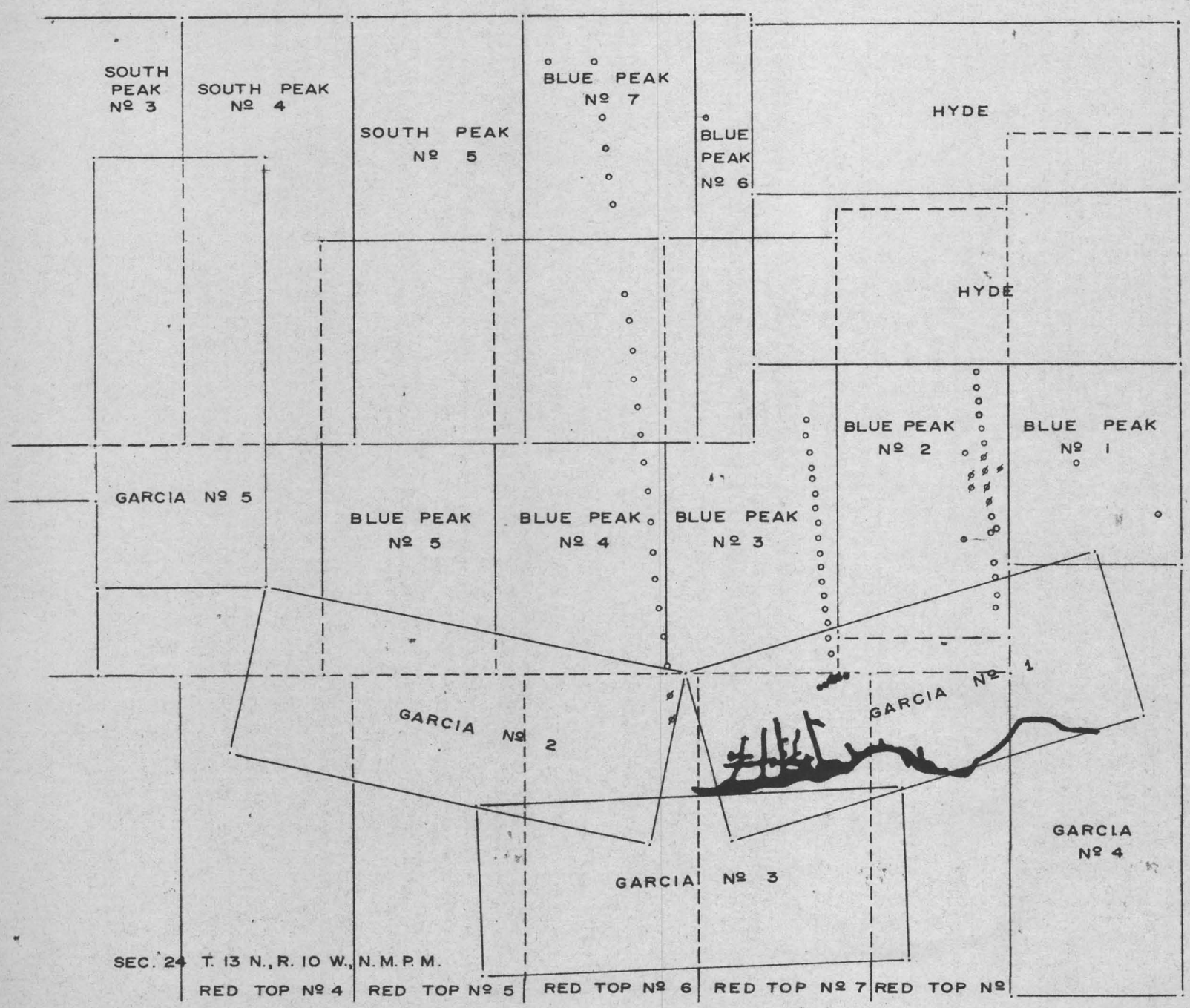
The mine and surrounding claims make up what is known as the Blue Peak property. The claims are located in Section 24, T. 13 N., R. 10 W., McKinley County, New Mexico. The mine is located approximately 14 miles north of Grants, New Mexico. (See Figure 1)

Colohoma Uranium Incorporated has leased the Blue Peak property from the Shawano Development Corporation.

PRODUCTION

The ore produced by previous operators is estimated at approximately 5,670 tons of mineable grade. These operators have driven about 900 feet of drifts and crosscuts. (See Figure 9) Mineable ore streaks up to three feet in thickness have been left in the pillars and ribs of the old workings. Initial production will come from this developed ore.

There is evidence of ore in eight holes drilled north of the present workings. It is not possible to estimate the amount and grade of ore cut by these holes by radiometric probe analysis but a table showing the analysis of each hole is included in this report as Table 3.



EXPLANATION

DRILL HOLES

○ Barren

ø Mineralized

• Ore

MINE WORKINGS

N

SCALE: 1" = 500'

COLAHOMA URANIUM INCORPORATED

BLUE PEAK PROPERTY

MC KINLEY COUNTY, NEW MEXICO

Figure 9

TABLE 3

Tabulation of radiometric analysis of ore holes, on Blue Peak property.

Hole No.	Thickness	Radiometric Assay % U_3O_8
BP_a	1.5'	0.25
BP_b	2.5'	0.27
BP_c	10.0'	0.59
BP_d	4.0'	0.21
BP_1	4.5'	0.71
BP_e	1.5'	0.17
BP_f	11.0'	0.77
BP_g	7.0'	0.28
BP_h	4.0'	0.31

FACILITIES

Roads

All the necessary haulage roads have been constructed by past operators. Drill roads are available and new roads can be constructed cheaply by brushing with a bull dozer.

Water

All domestic and mine water must be hauled from wells a few miles away. The mines are dry and at present there is no drainage problem.

Ore Shipment

The Anaconda Blue Water mill is located approximately 10 miles away.

Timber

The high mesa to the north of the property, formed by the Mesa Verde formation, is covered with pine and spruce. Saw mills are fairly numerous and timber is plentiful and cheap.

Buildings

No housing is available on the property, but it is unnecessary considering the proximity to Grants. A tool shed and powder magazine have been built by past operators.

Airport

An asphalt landing strip is located three miles northwest of Grants. Tie-down and refueling facilities are available, but no car rental or taxis.

GEOLOGY

Regional Setting

The Grants Uranium District is situated on the northeast flank of the Zuni Uplift. The center of the uplift is comprised of pre-Cambrian granites and metamorphic rocks, which make up the Zuni Mountains. The outer areas of the uplift are dotted with dikes, volcanic necks, and flows.

Local Geology

The known uranium deposits of the Grants area are distributed throughout a zone 85 miles by 10 miles. The easternmost deposits are near Albuquerque, the westernmost near Gallup. Most of the production has come from a 10 square mile area at the northeast corner of the Zuni Uplift and the Laguna Reservation. Ore is being produced from the Todilto limestone and the Morrison sandstones.

Stratigraphy

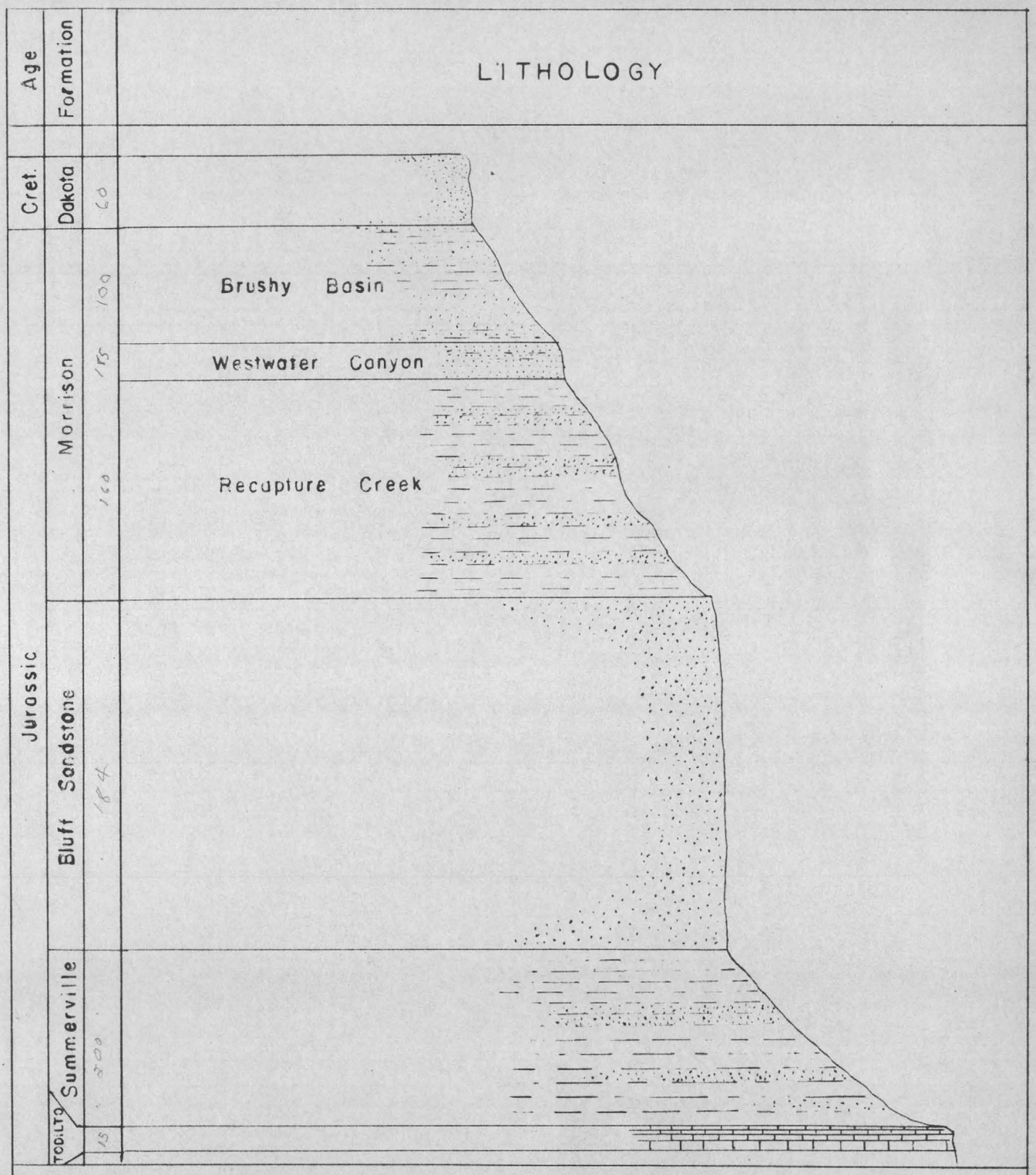
See Stratigraphic Section for Grants Mining District. (See Figure 11)

Structural Geology

Uranium deposition in the Grants District is largely confined to the areas influenced by three small, northeasterly-striking synclines. Individual ore bodies or channels trend nearly east-west.

Ore is found in two stratigraphic units, the Todilto limestone and the upper Morrison sandstone. Mineralization has been found in the Westwater Canyon sandstone; however, most large ore bodies have been found in the sandstone lenses of the Brushy Basin.

a. Todilto limestone: The limestone ore bodies generally are localized in the crests of northeast-trending drag folds. The small drag folds are probably the result of adjustment



STRATIGAPHIC SECTION

GRANTS MINING DISTRICT

NEW MEXICO

Figure II

during periods of major folding. Within the folds, the mineralization is controlled laterally by conjugate shear fractures and vertically by host rock favorability. The ore bodies are generally long (400 to 800 feet) and narrow (10 to 50 feet) with a thickness of one to twenty feet. Because of the relatively small target areas and extreme drilling depths (300 to 1200 feet) the presence of the Todilto is not a great asset, at the present time, to the Blue Peak property.

b. Morrison sandstone: Ore bodies in the sandstone occur in massive, bedded deposits, as in the Jackpile, or in rolls, such as on the Blue Peak property. During the examination of the mine, several small, isolated, high grade deposits were seen. The ore bodies were in the shape of small oxbows. The main roll has been mined for 300 feet and the end has not been found. En echelon ore bodies are common in Morrison sandstones. The eight holes in ore to the north of the mine are probably in a parallel roll. In drifting to the new ore body, small oxbow-shaped ore bodies will probably be encountered; however, the possible tonnage is small.

Fracturing of the sandstone and the deposits of fossil trees and asphalt are very important ore controls.

Economic Geology

The Grants District is large but the major production is derived from the Laguna Reservation and the Haystack-Poison Canyon area. (See Figure 10) The combined reserves of the Poison Canyon and Haystack ore bodies reportedly total over 1,000,000 tons. The Poison Canyon ore body is located half a mile east of the Blue Peak property, and is near the center of the structurally favorable area, where ore bodies are larger. The two deposits are similar in that they have a common long direction and both are deposited in the same stratigraphic horizon; i.e. Brushy Basin sandstones.

Two large ore bodies (in excess of 1,000,000 tons) have been found during the past several months in the same district. More will undoubtedly be found as exploration is increased.

Respectfully submitted,

MINERALS EXPLORATION RESEARCH CORPORATION

By Fred C. Hohne

Fred C. Hohne, Geologist

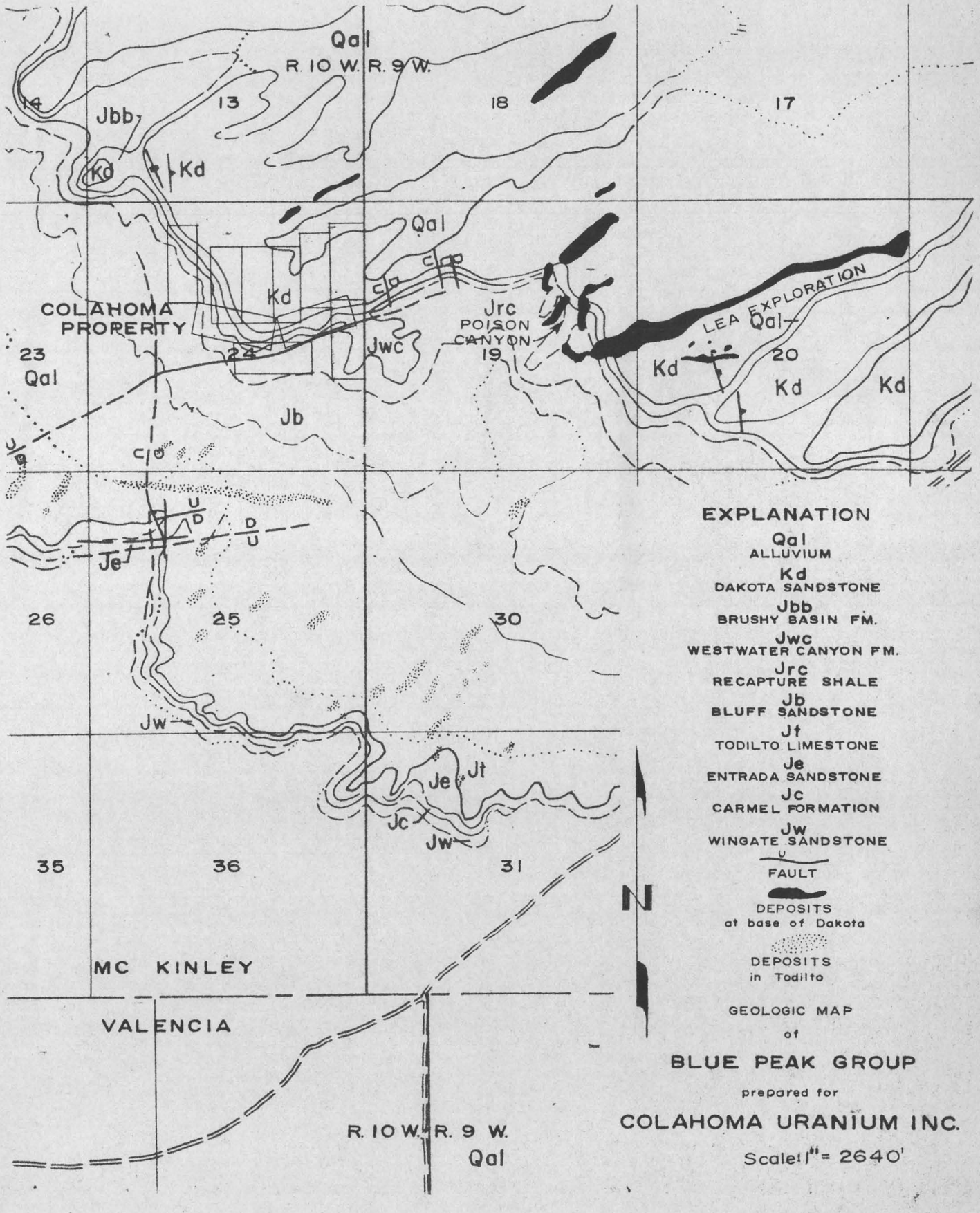
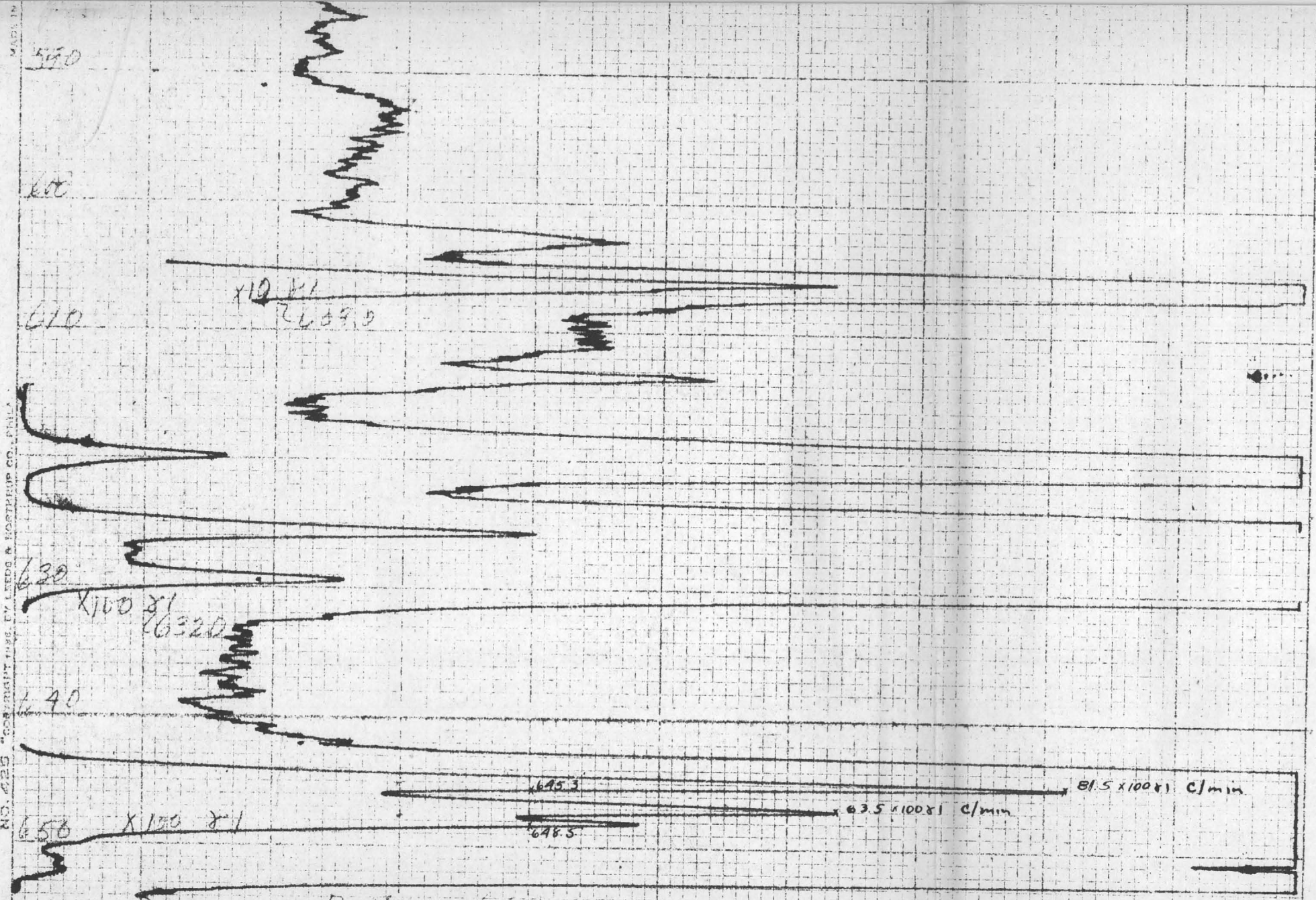

Qal
R. 10 W. R. 9 W.
14
13
18
17
Jbb
Kd
Kd
Qal
Kd
COLAHOMA
PROPERTY
Jrc
POISON
CANYON
Jwc
19
LEA EXPLORATION
Qal
Kd
20
Kd
Kd
23
Qal
24
Jb
Je
26
25
30
Jw
Je
Jt
Jc
Jw
35
36
31
N
MC KINLEY
VALENCIA
R. 10 W. R. 9 W.
Qal
EXPLANATION
Qal
ALLUVIUM
Kd
DAKOTA SANDSTONE
Jbb
BRUSHY BASIN FM.
Jwc
WESTWATER CANYON FM.
Jrc
RECAPTURE SHALE
Jb
BLUFF SANDSTONE
Jt
TODILTO LIMESTONE
Je
ENTRADA SANDSTONE
Jc
CARMEL FORMATION
Jw
WINGATE SANDSTONE
FAULT
DEPOSITS
at base of Dakota
DEPOSITS
in Todilto
GEOLOGIC MAP
of
BLUE PEAK GROUP
prepared for
COLAHOMA URANIUM INC.
Scale: 1" = 2640'

Figure 10



Control Log

Interval from 695.3 to 648.5'

Thickness = 3.2ft

Peak reading = $\frac{63.5 + 81.5}{2} \times 100 \times 1 = 7250 \times 1$

% U_3O_8 Chemical Assay = 0.15

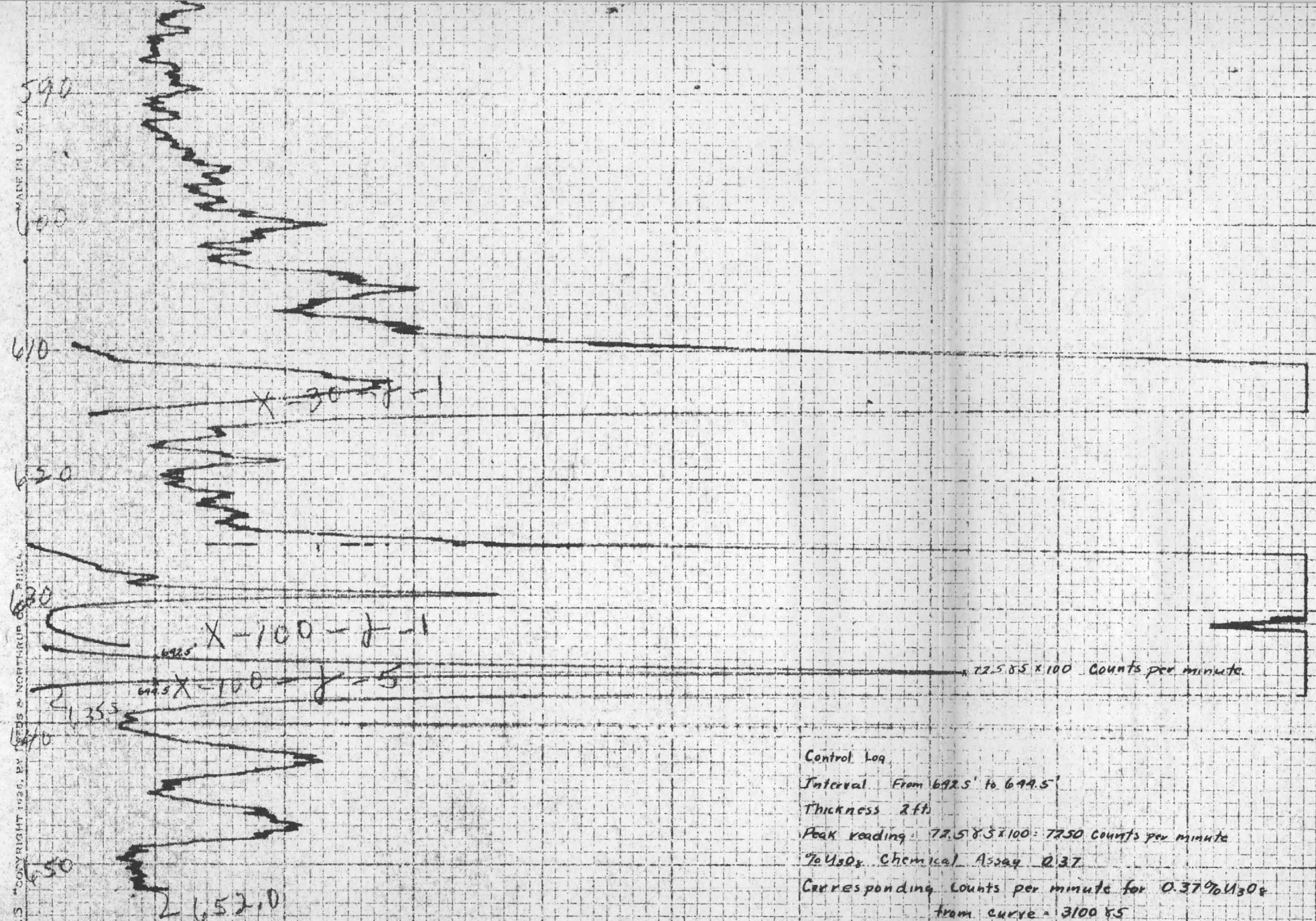
Corresponding counts per minute for 0.15% U_3O_8 from curve = 2900 ×1

Factor = $\frac{2900 \times 1}{7250 \times 1} = 0.400$

U. S. A. E. C.

Scintillation Logging Unit

Exhibit 1



Control Log

Interval From 692.5' to 694.5'

Thickness 2 ft

Peak reading: 72.5 8.5 x 100 = 7250 counts per minute

% U_3O_8 Chemical Assay 0.37

Corresponding counts per minute for 0.37% U_3O_8 from curve = 3100 85

Factor = $\frac{3100\ 85}{7250\ 85}$ = 0.427

Note: All depths are off 7.5 Meter read 0 when probe was 7.5' in hole

U. S. A. E. C.

Scintillation Logging Unit 1620

Project: [illegible] Date: [illegible]

Hole No.: [illegible] #101

Time Constant: 2

Range Setting: X-3

Gamma Setting: γ-1

Logging Speed: [illegible]

Counter Number: [illegible]

Operator: [illegible]

Exhibit 2

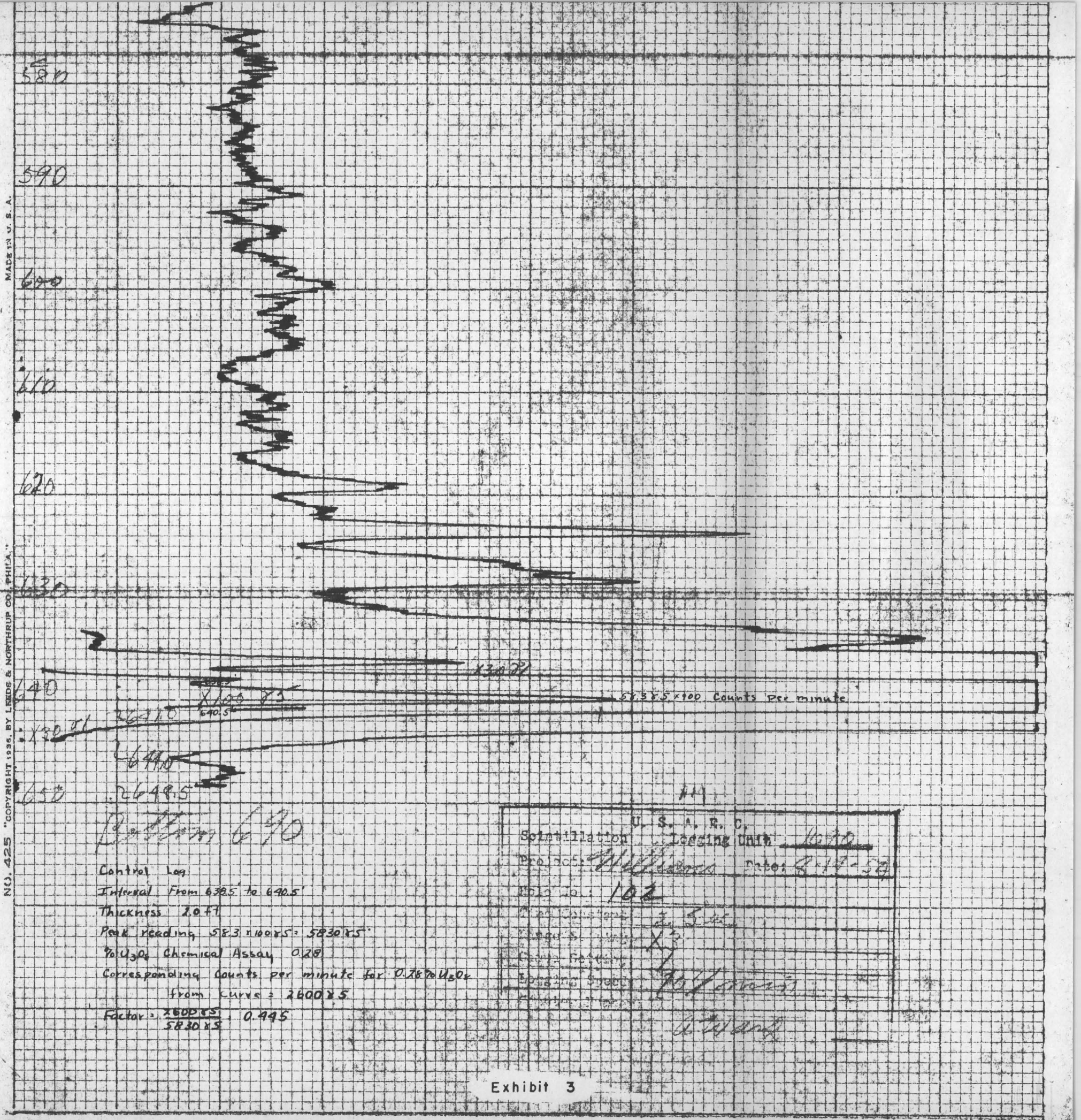
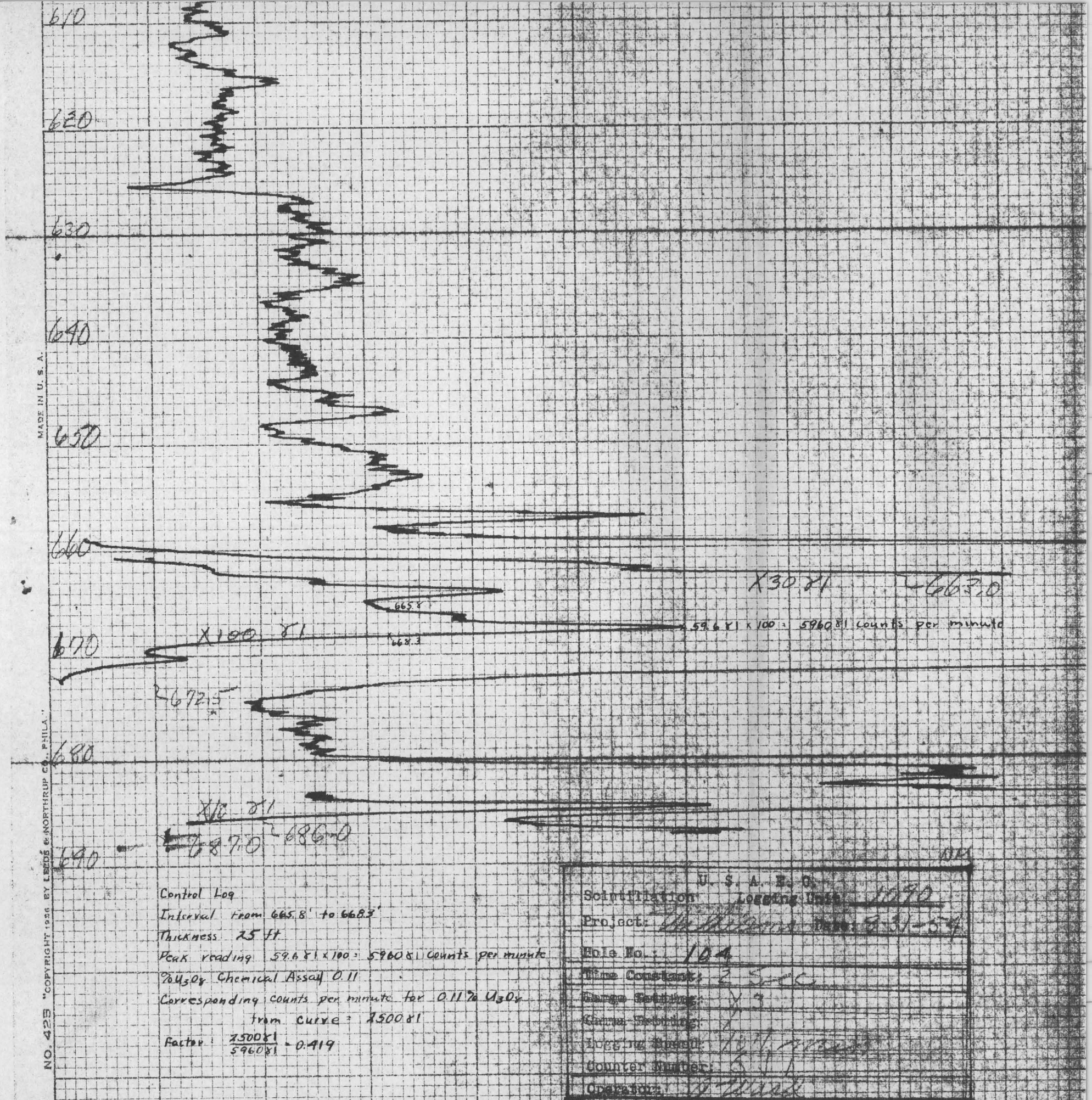


Exhibit 3

NO. 425 "COPYRIGHT 1935, BY LEEDS & NORTHRUP CO. PHILA." MADE IN U. S. A.



Control Log
Interval from 665.8' to 668.3'
Thickness 25 ft
Peak reading 59.6 81 x 100 = 596081 counts per minute
%U_3O_8 Chemical Assay 0.11
Corresponding counts per minute for 0.11% U_3O_8 from curve = 250081
Factor $\frac{250081}{596081} = 0.419$

U. S. A. E. C.
Scintillation Logging Unit 1070
Project: [illegible] Date: 9-31-54
Hole No.: 104
Time Constant: 2 sec
Range Setting: X 3
Chart Speed: 1
Logging Speed: 10 ft/min
Counter Number: 5 [illegible]
Operator: [illegible]

Exhibit 4

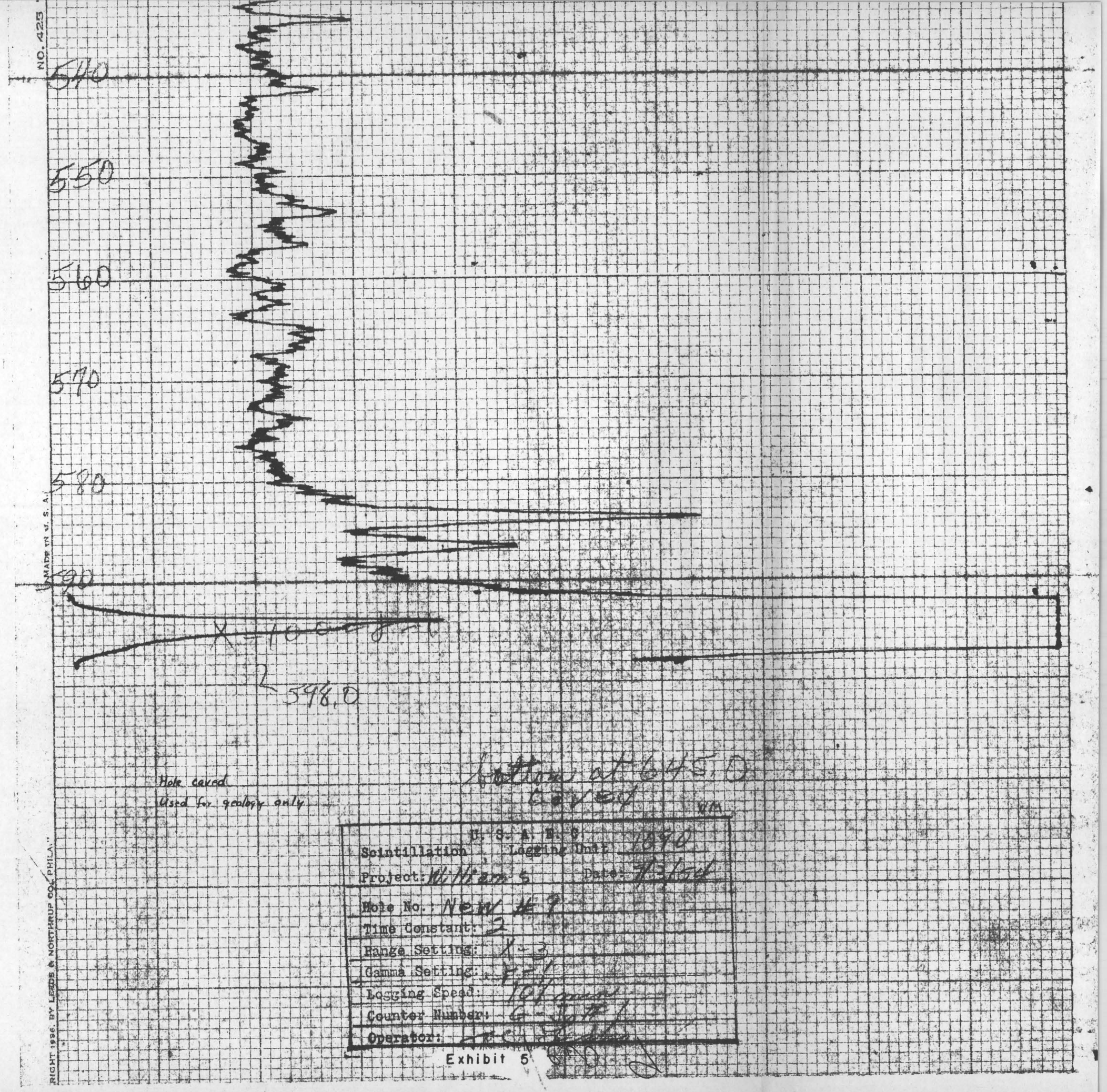
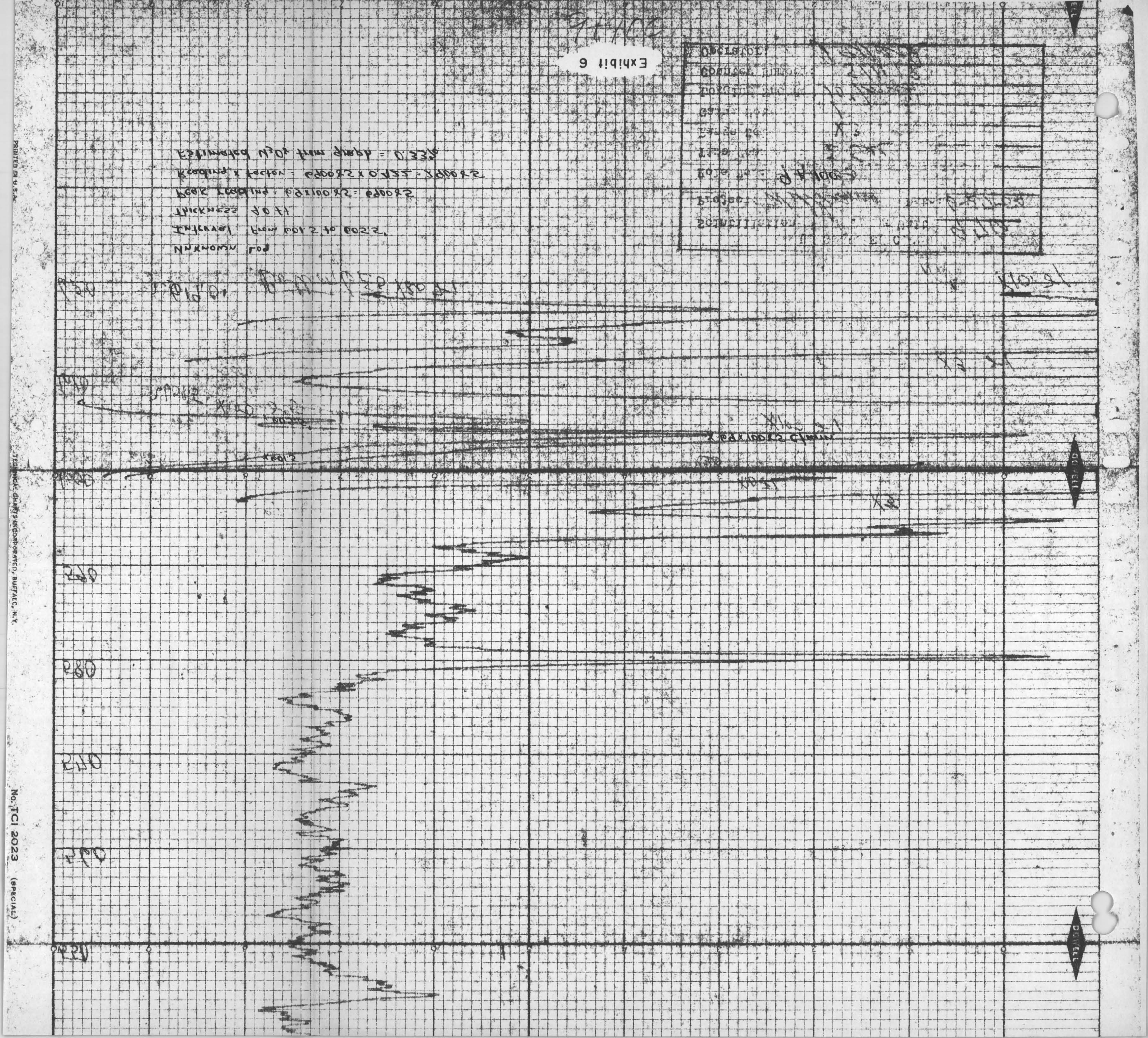

NO. 425
540
550
560
570
580
590
598.0
Hole caved
Used for geology only
U. S. A. E. C.
Scintillation Logging Unit 1590
Project:
Date:
Hole No.: New #7
Time Constant: 2
Range Setting: 1-3
Gamma Setting:
Logging Speed:
Counter Number:
Operator:
Exhibit 5
MADE IN U. S. A.
RIGHT 1956, BY LEEDS & NORTHRUP CO., PHILA.

Exhibit 6


Unknown rod
Interval from 2100 to 2022.
Thickness 40 ft
Back reading: 2.1001x2 = 2.002x2
Reading x factor = 2.002x2 x 0.333 = 1.332x2
Estimated wt of rock drop = 0.333
Project:
Contractor:
Date:
Time:
Crew:
Rig:
Operator:
Contract No.
Hole No.
Comments:
Operator:
2.002x2
2.002x2 Clamp
2.002x2
2.002x2
2.002x2

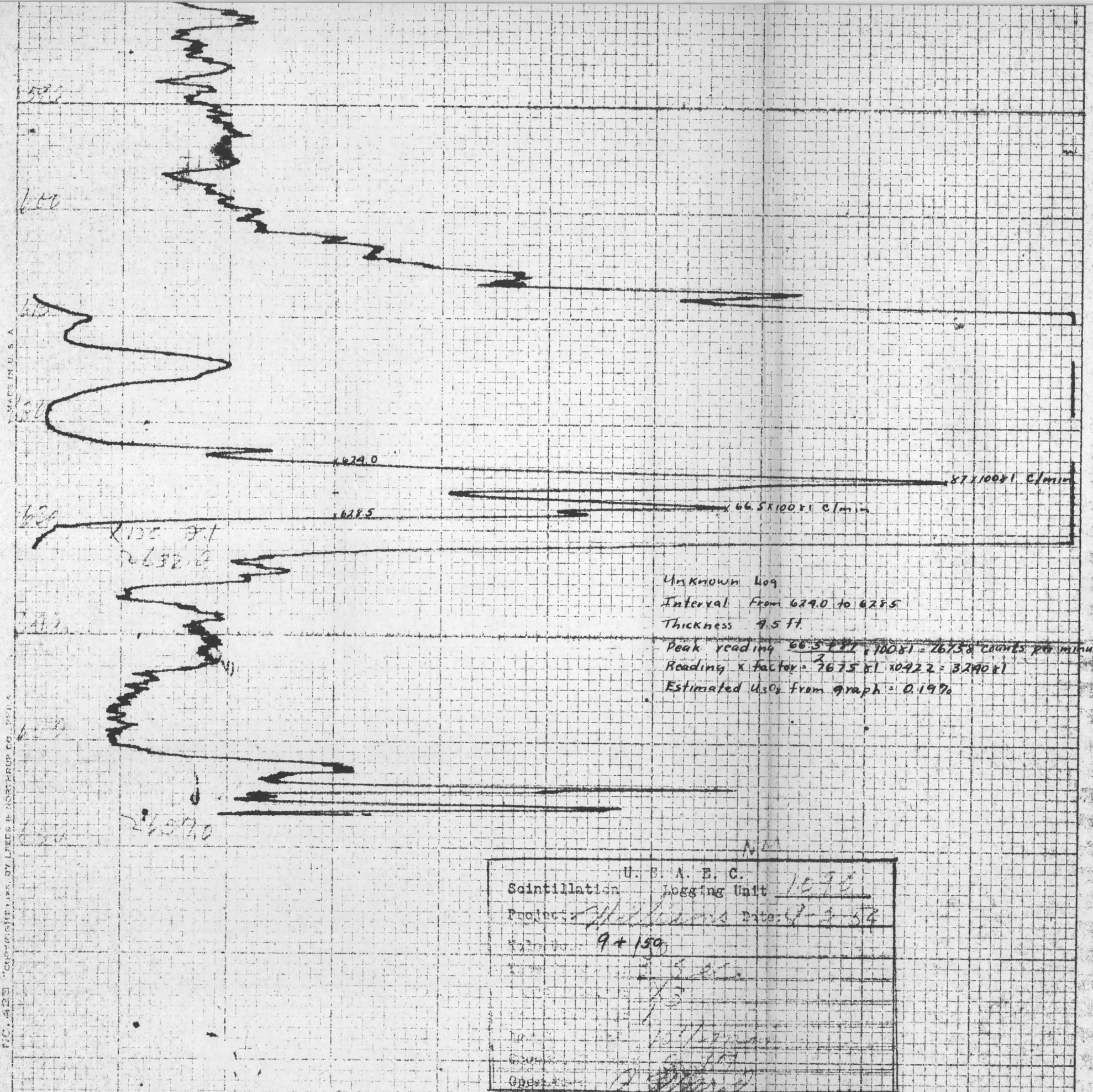
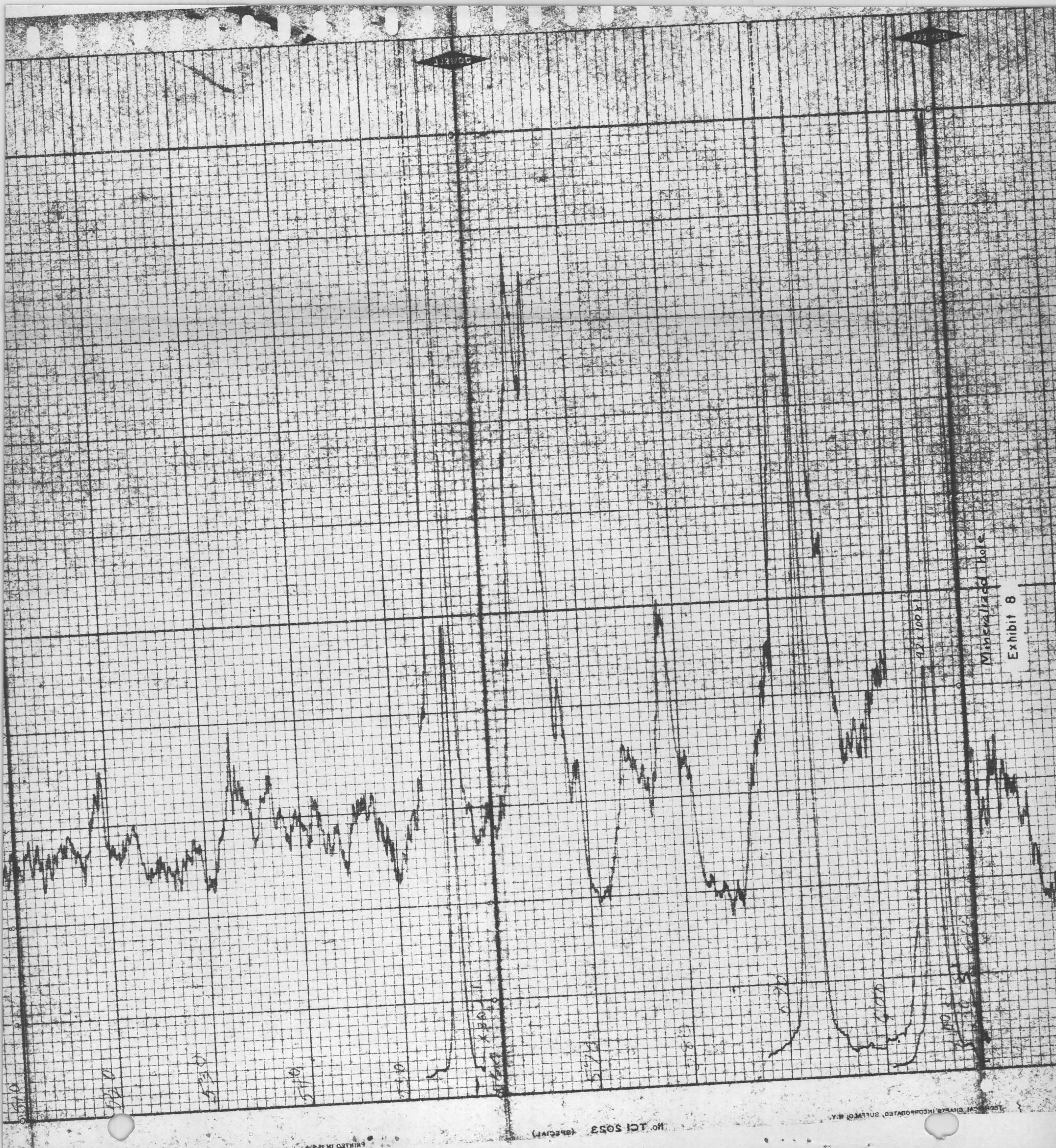

629.0
628.5
87 x 100 ±1 c/min
66.5 x 100 ±1 c/min
Unknown Log
Interval from 629.0 to 628.5
Thickness 9.5 ft.
Peak reading 66.5 ±1 x 100 ±1 = 6650 counts per minute
Reading x factor = 6650 ±1 x 0.422 = 3290 ±1
Estimated U_3O_8 from graph = 0.19%
U. S. A. E. C.
Scintillation Logging Unit
Project:
Date:
9 + 150
Operator:

Exhibit 7


Mineralized Hole
Exhibit 8

GEOLOGICAL AND GEOPHYSICAL EVALUATION OF A PORTION OF THE ELBERTA CLAIM GROUP

Cochetopa Mining District
Saguache County, Colorado

Charles E. Melbye

MINERALS EXPLORATION RESEARCH CORPORATION
CONSULTANTS AND CONTRACTORS IN MINERAL EXPLORATION, EVALUATION, DEVELOPMENT AND EXPLOITATION
MAIN OFFICE 2120 FORD STREET GOLDEN, COLORADO PHONE 937
DISTRICT OFFICE 1103 WHITE STREET GRAND JUNCTION, COLORADO PHONE 241

MERCO

December, 1954

GEOLOGICAL AND GEOPHYSICAL EVALUATION OF A PORTION OF THE ELBERTA CLAIM GROUP

Cochetopa Mining District
Saguache County, Colorado

A. LOCATION

The Elberta claim group is located approximately 14 miles southeast of Gunnison, Colorado and about one mile west of State Highway 114 in T48N, R2E, Section 31 and T47N, R2E, Section 6. There are five unpatented claims in the group, the Elberta #1, 3, 5, 7, and 9.

B. HISTORY

Fairly active gold and silver mining was carried on during the early history of the area. Uranium was discovered early in 1954.

C. PURPOSE AND SCOPE OF INVESTIGATIONS

During October, 1954 a program of geological mapping and scintillometer and magnetic surveys was conducted under the supervision of Mr. Fred C. Hohne and Mr. Charles E. Melbye. An airborne scintillometer survey was first made of the property. Detailed surveys were made on 300-foot profiles with 100-foot spacing. Three magnetic profiles were run 750 feet apart with 100-foot spacing between stations. This spacing would be classed as semi-detailed for the purpose of finding only prominent veins. Because of a misunderstanding as to the amount of work authorized and inasmuch as no further authorization or clarification was received, the geological mapping was terminated after mapping only the Elberta #1 and #3 claims. This phase of the investigation is, therefore, incomplete.

The purpose of these investigations was to evaluate the possibilities for the occurrence of uranium deposits and, if favorable, to outline an exploration program. Most of the results of these surveys were communicated orally to Mr. E. V. Storey and Mr. Hawkins, and this report is a summation of these results.

D. GEOLOGY

1. REGIONAL GEOLOGY

A structural culmination axis extends through Cripple Creek, Bonanza, and Silverton. A metallogenic belt is genetically related to and coincident with this structural positive. The immediate axis of such culmination axes is usually a productive base and precious metal belt, whereas low intensity extensions on the flank are often uranium producing. The Elberta claim group is on the flank of such an axis. The Cochetopa district is in an area of pre-Cambrian gneiss and granite overlain by the Salt Wash sandstone and the Brushy Basin shales of the Morrison formation, and the Dakota sandstone.

The Tertiary Alboroto quartz latite flows form hill cappings in some parts of the district. Occasional intrusive dikes of intermediate to basic composition are also found. Gold and silver mineralization is found along shear zones over a wide area.

2. LOCAL GEOLOGY

a. Petrology: The major part of the mapped area is composed of dense pre-Cambrian schists and gneisses of intermediate composition. A few small pegmatite dikelets were also mapped. There are a number of outcrops but most of the area is soil-covered. The schistosity of the gneiss strikes N 40° - 60° E with a nearly vertical dip.

No sediments were observed on the two claims, but occasional quartzite float in the soil was mapped.

An intrusive stock or dike of probable Tertiary age outcrops in the southwest corners of the Elberta #1 and #3, and mapping of the soil indicates its presence also in the southeast corner of the Elberta #1. The intrusive is basic in composition and would be classed as a diorite or gabbro. This type of intrusive is not generally regarded as a good source for hydrothermal ore solutions of the low-intensity uranium type.

b. Structure: No significant faulting or folding was observed.

c. Alteration and Mineralization: The only alteration in the two-claim area was chloritization in small schist and basic intrusive outcrops in the western part of Elberta #1. Silicification is present only in the form of quartzite float.

No mineralization was observed.

d. Interpretation of Magnetic and Radiometric Surveys: The pronounced magnetic high along the south and west edges of Elberta #1 coincides with the basic intrusive, which usually contain a high amount of magnetite. The magnetic low just to the north of the high may then be due to the intrusive body dipping to the north, and the reverse polarity at the opposite end caused a low instead of a high. There is a radiometric high of .025 mr/hr coinciding with the magnetic low but the mapping did not indicate a vein. The magnetic low implies the destruction of magnetic by hydrothermal ore solutions.

The radiometric highs of from .025 - .038 mr/hr in the north-center part of Elberta #5 coincide with a moderate east-west low of -400 to -629 gammas. Another radiometric high of .025 mr/hr in the southeast corner of Elberta #9 coincides with another east-west low along the claim length. At the west end of the claim there is a substantial low of -1228 gammas. The geological mapping did not extend to these anomaly areas and their significance cannot be evaluated at this time. The

magnetic anomalies strike generally in an east-west to northwest direction which is at right angles to the strike of the schistosity in the gneiss. This would probably rule out anomalies due to composition changes in the gneiss.

E. CONCLUSIONS

1. The Elberta #1 and #3 claims show no evidence for substantial mineralization and therefore do not warrant further exploration.

2. The remainder of the claim group cannot be intelligently evaluated without geological mapping. The coincidence of two separate magnetic lows with radiometric highs is a favorable indication of uranium mineralization.

3. The presence of substantial uranium ore bodies in the pre-Cambrian gneiss has not been definitely proven in the Cochetopa mining district. This factor will be an important one in evaluating the potential of the Elberta claims.

F. RECOMMENDATIONS

1. Geological mapping of the Elberta claim group should be completed.

2. Bulldozer cuts should be made on favorable areas to expose the soil-covered rock. These cuts should be mapped and the data integrated for geological interpretation.

3. The foregoing results should be considered and a decision made as to the advisability of exploration drilling.

Charles E. Melbye

Charles E. Melbye

MINERALS EXPLORATION RESEARCH CORPORATION
CONSULTANTS AND CONTRACTORS IN MINERAL EXPLORATION, EVALUATION, DEVELOPMENT AND EXPLOITATION
MAIN OFFICE 2120 FORD STREET GOLDEN, COLORADO PHONE 937
DISTRICT OFFICE 1103 WHITE STREET GRAND JUNCTION, COLORADO PHONE 241

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Cochetopa Mining District
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December, 1954

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Fairly active gold and silver mining was carried on during the early history of the area. Uranium was discovered early in 1954.

C. PURPOSE AND SCOPE OF INVESTIGATIONS

During October, 1954 a program of geological mapping and scintillometer and magnetic surveys was conducted under the supervision of Mr. Fred C. Hohne and Mr. Charles E. Melbye. An airborne scintillometer survey was first made of the property. Detailed surveys were made on 300-foot profiles with 100-foot spacing. Three magnetic profiles were run 750 feet apart with 100-foot spacing between stations. This spacing would be classed as semi-detailed for the purpose of finding only prominent veins. Because of a misunderstanding as to the amount of work authorized and inasmuch as no further authorization or clarification was received, the geological mapping was terminated after mapping only the Elberta #1 and #3 claims. This phase of the investigation is, therefore, incomplete.

The purpose of these investigations was to evaluate the possibilities for the occurrence of uranium deposits and, if favorable, to outline an exploration program. Most of the results of these surveys were communicated orally to Mr. E. V. Storey and Mr. Hawkins, and this report is a summation of these results.

D. GEOLOGY

1. REGIONAL GEOLOGY

A structural culmination axis extends through Cripple Creek, Bonanza, and Silverton. A metallogenic belt is genetically related to and coincident with this structural positive. The immediate axis of such culmination axes is usually a productive base and precious metal belt, whereas low intensity extensions on the flank are often uranium producing. The Elberta claim group is on the flank of such an axis. The Cochetopa district is in an area of pre-Cambrian gneiss and granite overlain by the Salt Wash sandstone and the Brushy Basin shales of the Morrison formation, and the Dakota sandstone.

The Tertiary Alborota quartz latite flows from hill cappings in some parts of the district. Occasional intrusive dikes of intermediate to basic composition are also found. Gold and silver mineralization is found along shear zones over a wide area.

2. LOCAL GEOLOGY

a. Petrology: The major part of the mapped area is composed of dense pre-Cambrian schists and gneisses of intermediate composition. A few small pegmatite dikelets were also mapped. There are a number of outcrops but most of the area is soil-covered. The schistosity of the gneiss strikes N 40° - 60° E with a nearly vertical dip.

No sediments were observed on the two claims, but occasional quartzite float in the soil was mapped.

An intrusive stock or dike of probable Tertiary age outcrops in the southwest corners of the Elberta #1 and #3, and mapping of the soil indicates its presence also in the southeast corner of the Elberta #1. The intrusive is basic in composition and would be classed as a diorite or gabbro. This type of intrusive is not generally regarded as a good source for hydrothermal ore solutions of the low-intensity uranium type.

b. Structure: No significant faulting or folding was observed.

c. Alteration and Mineralization: The only alteration in the two-claim area was chloritization in small schist and basic intrusive outcrops in the western part of Elberta #1. Silicification is present only in the form of quartzite float.

No mineralization was observed.

d. Interpretation of Magnetic and Radiometric Surveys: The pronounced magnetic high along the south and west edges of Elberta #1 coincides with the basic intrusive, which usually contain a high amount of magnetite. The magnetic low just to the north of the high may then be due to the intrusive body dipping to the north, and the reverse polarity at the opposite end caused a low instead of a high. There is a radiometric high of .025 mr/hr coinciding with the magnetic low but the mapping did not indicate a vein. The magnetic low implies the destruction of magnetic by hydrothermal ore solutions.

The radiometric highs of from .025 - .038 mr/hr in the north-center part of Elberta #5 coincide with a moderate east-west low of -400 to -629 gammas. Another radiometric high of .025 mr/hr in the southeast corner of Elberta #9 coincides with another east-west low along the claim length. At the west end of the claim there is a substantial low of -1228 gammas. The geological mapping did not extend to these anomaly areas and their significance connot be evaluated at this time. The

magnetic anomalies strike generally in an east-west to northwest direction which is at right angles to the strike of the schistosity in the gneiss. This would probably rule out anomalies due to composition changes in the gneiss.

E. CONCLUSIONS

1. The Elberta #1 and #3 claims show no evidence for substantial mineralization and therefore do not warrant further exploration.

2. The remainder of the claim group cannot be intelligently evaluated without geological mapping. The coincidence of two separate magnetic lows with radiometric highs is a favorable indication of uranium mineralization.

3. The presence of substantial uranium ore bodies in the pre-Cambrian gneiss has not been definitely proven in the Cochetopa mining district. This factor will be an important one in evaluating the potential of the Elberta claims.

F. RECOMMENDATIONS

1. Geological mapping of the Elberta claim group should be completed.

2. Bulldozer cuts should be made on favorable areas to expose the soil-covered rock. These cuts should be mapped and the data integrated for geological interpretation.

3. The foregoing results should be considered and a decision made as to the advisability of exploration drilling.

COPY

Charles E. Melbye

PRELIMINARY VALUATION OF AND RECOMMENDATIONS FOR
KERR-McGEE PROPERTIES, LUKACHUKAI, ARIZONA.

A preliminary valuation of Mesas I, I-1/2, I-3/4, II, II-1/2, III, IV, IV-1/2 and V on the northeastern side of the mountains, and Flag Mesa, Bare Rock Mesa, Knife Edge Mesa, and a part of Little Mesa on the southwestern side of the mountains has been made to determine the relative importance of the mesas. Valuation is based on drill hole data, outcrop data, and remaining bonus. Valuation of drill hole data is based on: percentage of holes in ore*, percentage of holes mineralized, grade of ore, thickness of ore, and drifting distance to ore holes.

Valuation of outcrop data is based on Raymond Starr's notes, number of outcrops, samples, and percentage of mineralized rim. Valuation of bonus is based on the remaining pounds which can be mined from each lease or permit.

Valuations based on percentage of holes in ore and on percentage of holes mineralized must be cautiously considered because of poor core recovery (strip logs and gamma logs will be combined to better valuate ore horizons); some holes were not drilled to the ore horizon; and some holes were not drilled in sandstone lenses, rather in the mudstone facies. Therefore, most reliance is placed on grade and thickness of ore and the drifting distance to the ore.

I. Drill Hole Data (Mesas I, II, III, IV, V) Table I

Mesas arranged according to importance

Mesa I
Mesa V
Mesa IV
Mesa III
Mesa II

*0.10% U_3O_8, A.E.C. standard

II. Outcrop Data [redacted]V Table II

Mesas arranged according to importance

Outcrops 51-56 southwest side
Outcrops 41-51 southwest side
II-1/2
IV
I
III
I-3/4 and II
I-1/2

III. Bonus Remaining	Lbs.	Dollars
Mesa I , 248 A.lease	-0-	-0-
Mesa I-1/2, 65 A.permit	10,000	$35,000.00
Mesa I,I-1/2,I-3/4, 320 A.permit	10,000	35,000.00
Mesa II (Point), 72 A.lease	8,554.72	29,941.52
Mesa II,II-1/2,I-3/4, 200 A.lease	5,943.25	20,801.38
Mesa III, VIII, 575 A. permit	10,000	35,000.00
Mesa IV, 198 A. lease	2,762.32	9,668.12
Mesa V, 130 A. lease	-0-	-0-
Mesa IV-1/2, ? A. permit	10,000	35,000.00
Flag - Knife Edge, 320 A.lease	10,000	35,000.00
Knife Edge , 320 A. permit	10,000	35,000.00

Conclusions

Based on Drill Hole Data, outcrop data, bonus, and A.E.C. observations, the mesas are arranged in order of importance. Considerable importance is given to whether or not a bonus remains on the mesa, as bonus payments end March, 1954.

Least importance is assigned to drill hole data because of grade, thickness, and length of "dead" drifting. After subsurface correlations have been made, more importance can be attached to drill hole data.

1. Outcrop 51-55
2. I
3. Outcrop 41-51
4. II-1/2
5. IV
6. III
7. IV-1/2
8. I-3/4 and II
9. I-1/2
10. V

Recommendations

I. Map of Lukachukai Mountains - photogrametric

A. Scale: 1" = 100' ; 1" = 20' for Mine Maps
B. Countour Interval: 5'
C. Triangle net, with permanent stations, for Lukachukai Mountains should be made prior to photography. Remaining triangle net can be made by a professional engineer.
D. After photography, plat Jb-Jmsw contact on photographs and include contact on map. Jb-Jmsw contact can be mapped by this office on the same photographs that are used for ground control (108,500' of contact).
E. After map is received, lease corners can be established by office and field surveying and permanent ground corners established.

II. Rim Stripping Table III

A. 108,500' of "cat" work is necessary to strip all rims. However, this figure can be reduced by walking the rims prior to stripping and eliminating the mudstone facies where ore does not occur.
   1. One "cat" should be used on the southwest side of the mountains to strip the favorable ground from outcrop 55 to outcrop 52. From outcrop 41 to west of knife Edge Mesa, ore is in a higher rim. Here, favorable ground, to be established by walking rim, should be stripped next.

   2. The second "cat" should be kept on Mesa I to complete stripping there and then move to Mesa II-1/2 and strip favorable ground.

3. Favorable ground on the remaining mesas should be stripped according to order of importance (Conclusions). This order of importance will probably change as more is learned of ore occurrances.

III. Mesa I

A. Mines 12 and 13. Probing, mapping of sedimentary features, mapping of lithology and ore deposits, and sampling should continue in the mines. Structure contour maps on the base of the ore-bearing sandstone, isopach maps of the ore bearing sandstone, and assay maps should be made in an effort to further correlate sedimentary trends and ore trends in the mines.

B. Mesa I Subsurface Work. Subsurface correlations should be combined with mine information and rim information. Mesa I has considerable rim, mine, and drill hole data available which can be used as a "model" for work on the other mesas. Some of the features which may be useful are:

1. Structure map on base of ore-bearing sandstone
2. Isopach map of ore-bearing sandstone
3. Iso-rad map
4. Facies change map
5. Color of sandstones and mudstones - red sandstone and mudstone are unfavorable whereas white sandstone and gray mudstone are favorable.

C. Probing. Horizontal probe holes should be drilled along the rim east of A.E.C. Hole No. 56, into the tim at Mine 11, and in Mine 14. No mining should be conducted in these areas until after the holes are probed.

IV. Determination of ownership of property labeled Tom Joe Mining Permit.

Climax also claims an interest in this property. One ore hole contains 8' of 0.50% U_3O_8 and another recently drilled hole has a gamma amplitude twice as great (no chemical assay yet). Both holes are within drifting distance. A.E.C. geologists have agreed to drill more development holes if this property is to be leased by Kerr-McGee. Also the area southwest of Mesa IV and the area on Mesa IV-1/4 should be acquired as soon as possible if it is not already staked. A.E.C. ore trends extend in that direction.

V. Mining on Mesas Other than Mesa I.

A. Mining plans for the near future should be made in consideration of bonus which ends March, 1954. The full bonus can be received for ore shipments from the southwest side. Outcrop No. 54 appears to be the most promising and A.E.C. geologists have agreed to drill behind outcrops No. 54, 55, and then 53 and 54, beginning this week. The rim should be stripped along these outcrops, 25' holes (horizontal) should be drilled and probed, and mining can be conducted at promising localities.

B. Provided the Tom Joe Mining Permit is leased to Kerr-McGee, mining can be conducted. Full bonus could be received.

C. As soon as the Mesa II-1/2 rim is stripped, outcrops 22 and 23 should be examined, and as soon as the permit on the Western side of Mesa II-1/2 is converted to a lease, outcrops 24, 25, and 26 should be further examined (note outcrops 23 and 26).

PRELIMINARY GEOLOGICAL EVALUATION
OF THE
GOLDEN EAGLE MINING CLAIMS

Montrose and San Miguel Counties, Colorado

PRELIMINARY GEOLOGICAL EVALUATION
OF THE
GOLDEN EAGLE MINING CLAIMS

Montrose and San Miguel Counties, Colorado

INTRODUCTION

This report is written at the request of Mr. Worth Offutt, Manager of the Golden Eagle Corporation of Grand Junction, Colorado. It is a preliminary geological evaluation of the Dry Creek property, and contains a general description of facilities and geology, along with recommendations pertaining to the possibility of producing uranium ore.

Location

The property lies in secs. 33 and 34, T. 46 N., R. 16 W.; and in secs. 3, 4, 9, 10, 11, 15, 16, 21, 22, T. 45 N., R. 16 W., in Montrose and San Miguel Counties, Colorado. The claim groups lie 7 miles southwest of Naturita, Colorado, and 16 miles southeast of Uravan, Colorado. Dry Creek, an intermittent stream, flows through the northern edge of the claim groups. Structurally, the property lies on the southwest portion of the Paradox Valley Anticline. The elevation is approximately 7000 feet. (See Plate I.)

General Description

The claim groups consist of the following:

Rose 1 - 12
Lucky 1 - 10
Sailor 1 - 10
Golden Eagle 1 - 20
Black Eagle 1 - 47
Sitting Eagle 1 - 20

The area, in part, is cut by steep canyons, but the lower portions of the valley are somewhat rolling. The geologic formations are the are the Mancos shale, Dakota, Brushy Basin, and the Salt Wash. The Golden Eagle Corp. owns the property.

Climate

The climate is arid, with few rains during the summer and with light snows during the winter.

Accessibility

The property can be reached by driving 7 miles southwest of Naturita, Colorado, to the property. The road is gravelled and is kept in fair condition.

There are several roads which can be used for drill sites.

Drilling

Drilling costs in this area are approximately $2/ft. Drilling depths vary between 100 and 300 feet. Where drill sites will be necessary, their total costs should not exceed $500.

Facilities

Water may be obtained from the San Miguel River about 4 miles to the east or from Dry Creek during the winter and early spring. Timber may be purchased from saw mills in Paradox Valley, and equipment may be purchased in Naturita or Uravan. Manpower is available in the area.

Examination

Scope

Examination of the property consisted in examining outcrops for evidence of uranium mineralization. A regional study was made of the stratigraphic and structural relationships to uranium mineralization as these factors may apply to ore finding on this property. Mr. E. V. Cockram was present during the examination which took three days.

Golden Eagle Mining Claims

Surface mineralization appeared spotty, as are most uranium deposits. Several small, high grade outcrops were examined. Grab samples assaying higher than 0.50% were taken; however, the showings are too small to mine. Bleaching associated with the mineralization was noted and was somewhat extensive over a large portion of the claims. Structurally, the property lies along the axis of a small fold, or anticline, the northeast flank of which dips into Paradox Valley. Although mineralization was noted in the lower rim (of three rims) of the Salt Wash, an extensive bed of carbon, approximately 20 feet thick, indicated a possibility of deposition within the intermediate rim. The 6 - 12 inches of mineralization in the lower rim was intimately associated with fossil carbon leaves and trees.

Adjacent and Surrounding Properties

Some of the better mines on the Colorado Plateau are on the flanks of the Paradox Valley. Two of these mines are the well-known Joe Dandy and Monogram. The ore of these mines is associated with slump blocks which border the Paradox Valley rims. The size of of the two ore bodies is approximately 100,000 tons. These mines lie a few miles north of the Golden Eagle property,on the same structure. The corporation does not wish to imply that the presence of ore on nearby property will indicate ore on the Dry Creek Group.

GEOLOGY

Summary of Pertinent Geology

The Uravan Mineral Belt is an arcuate zone within which a very large number of the Salt Wash ore bodies lie. This zone seems to have some relationship to Tertiary intrusions. The reason for this association is not clearly understood. Of perhaps more importance in ore localization is structure. The Paradox Valley structure is anticlinal, the center portion of which has slumped or dropped because of the removal by solution of the underlying salt. This sumping is accompanied by a great deal of faulting, folding and fracturing in the valley.

Stratigraphy

Only the formations found in the immediate vicinity are included in this report. Their relative positions along with their approximate thicknesses are shown in the stratigraphic section enclosed. (See Fig. 3)

Structure (See Fig. 2)

The property lies on the southwest flank of the Paradox Salt Anticline. Mineralization was found in basal Morrison sandstones in a minor breached anticline. The small anticline is the result of subsidence of the beds overlying a salt core which was dissolved by water solutions.

ORE DEPOSITS

Minerals

A number of uranium minerals are found in this locality, but the only mineral of importance is carnotite. Associated minerals are vanadium and copper carbonates. The uranium to vanadium ratio is approximately 1:8.

Ore Deposition Control

Structural

Faulting often affords the initial channels through which ore solutions may flow. Uranium ore bodies have a relationship with flexures, or folds, and with intrusions such as are in the cores of the Henry Mountains, the La Sal Mountains, and others. Other structural factors important to uranium ore deposition are fractures, flexures, porosity, and channels.

Stratigraphic

As with all sedimentary ore bodies, there seems to be an affinity of the ore solutions for certain beds or formations. Host rock favorability is due to factors of chemistry and structure. The

chemical factors are somewhat complicated and in different localities seem to vary. The physical properties of ore localization are more clearly understood. These properties seem to all have a marked importance with the ease with which they allow a solution to flow through the beds. In the Paradox Valley the Salt Wash member of the Morrison formation is an ideal host rock.

ECONOMICS

Development

The only development on the Golden Eagle property was the construction of roads to the ore rim, and rim stripping on one small group of claims (Fig. 2).

Mining

All mining will have to be done by an underground mining method. Cost on this property would be somewhat higher than on other properties because of steep dips--up to 30 degrees. The cut-off, or lowest grade and thickness of mineralization that can be mined at a profit, is approximately 2 feet of 0.20% U_3O_8.

Production

There has been no production. The ratio of vanadium to uranium will be approximately 8:1. The ore is low in lime.

Milling

Milling is done in Naturita, Colorado, by the Vanadium Corporation of America, or in Uravan, Colorado, by Union Carbide Nuclear Company.

Haulage

Haulage distance to Naturita is about 5 miles, and to Uravan about 16 miles.

CONCLUSIONS

1. No exploration drilling has been done, consequently, the property has no proven ore reserves.

2. Several pods of mineralization were found on lower rim exposures. Lower rim ore bodies are usually small--less than 1000 tons.

3. Access roads have been built to the property.

4. The property is geologically favorably located.

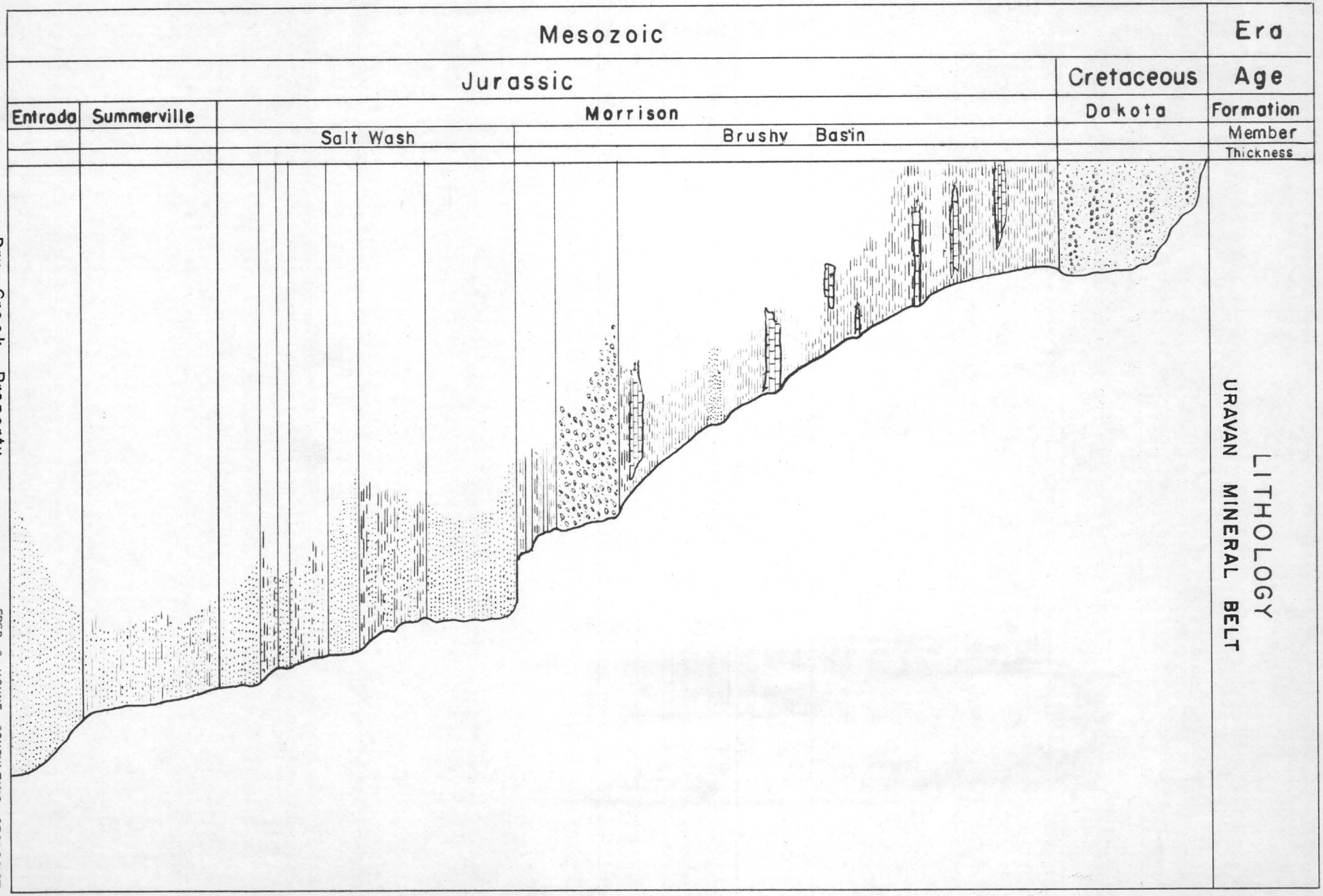
RECOMMENDATIONS

1. Complete rim scintillometer surveys.

2. Plan an exploration drill program behind mineralized exposures and thick bleached sandstone.

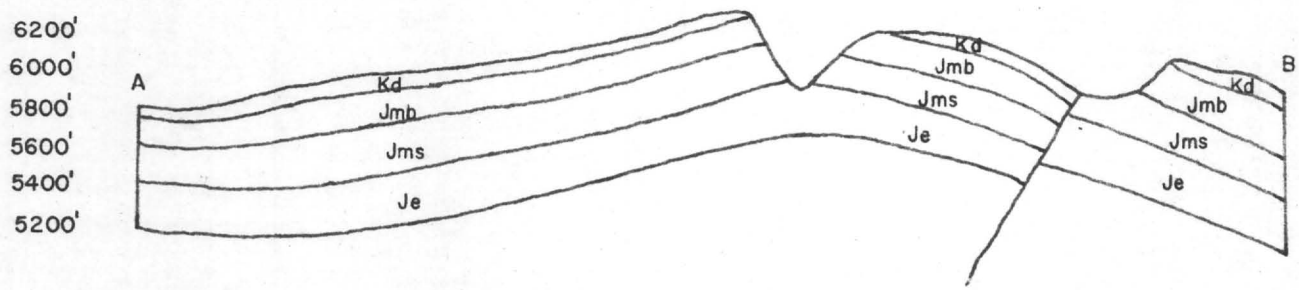
Fred C. Hohne
Consulting Geologist

July, 1956



Dry Creek Property

FRED C. HOHNE, CONSULTING GEOLOGIST



SECTION ALONG LINE A-B of FIG. Nº 1

LEGEND

Kd — Dakota S.S.

Jmb — Brushy Basin

Jms — Saltwash

Je — Entrada S.S.

Fig. Nº 2

GEOLOGICAL EVALUATION

HUNTLEY & JOUFLAS

PROPERTIES

GEOLOGICAL EVALUATION
OF
BLACK ROCK CLAIMS

Eagle County, Colorado

INTRODUCTION

The property consisting of five unpatented mining claims is located in Section 9, T. 2 S., R. 84 W., 6th P.M., on the Red Canyon anticline approximately 5 miles southwest of McCoy. (Fig. 2)

FACILITIES

Roads

The property can be reached by a good all-weather road.

Water

Domestic and drill water is available near the property.

Timber

Mine timber can be obtained in the area.

Supplies and Manpower

Mine supplies can be obtained from either Denver or Grand Junction. An ample supply of manpower is available in the district.

Available Mills

The nearest mill to the McCoy area is the Union Carbide Nuclear plant at Rifle, Colorado.

REGIONAL GEOLOGY

Stratigraphy

A detailed stratigraphic section of the area is shown on Fig. 3. The following formations are present:

Pennsylvanian or Permian:

Schoolhouse sandstone: The Schoolhouse sandstone is the oldest formation shown in the section. It is a brown, arkosic, poorly sorted sandstone of variable thickness.

Permian

State Bridge formation: This formation is approximately 800 feet thick where the Red Canyon section was measured. It is composed primarily of red to maroon siltstones, containing some interbedded sandstone, limestones and a few gypsiferous beds.

Triassic

Shinarump formation: The Shinarump is from 25 to 35 feet thick in the area of the Black Rock claims and consists of white to gray or red (often mottled with purple), coarse-grained sandstone. Its lithology is practically identical to that of the Shinarump of the Colorado Plateau where it is one of the important host rocks of high-grade primary uranium mineralization.

Chinle formation: The formation consists of red to maroon sandstone, siltstones, shales and some limestones near the base. At Red Canyon its thickness is 198 feet. It thins rapidly to the north, being 68 feet thick at Antelope Creek three miles to the north.

Jurassic

Entrada formation: This formation is present as a cross-bedded, buff-yellow to salmon-pink sandstone. The thickness increases from about 20 feet at Red Canyon to over a hundred feet a few miles to the north at Antelope Creek.

Curtis formation: The Curtis limestones overlie the Entrada in the area of the claims but lenses out a few miles to the east. It is a brown to dark gray, sandy limestone with a thickness of from 10 to 25 feet.

Morrison formation: Divided into two members as follows:

Salt Wash Sandstone: The Salt Wash member is present as a blocky, white sandstone containing numerous radioactive fossil bones. The Salt Wash and Curtis form a prominent ridge traversing the area from north to south.

Brushy Basin Shale: This member is composed of 50 to 60 feet of green and red varied siltstones, mudstone, and shales which can be seen as red and green soil in a saddle between the Curtis limestones and the Dakota sandstone outcrop.

Cretaceous

Dakota formation: The Dakota is the capping rock (to the west) of the area, but because of the steep dip of the anticlinal structure in the area, only remnants of the Dakota are found as float over most of the Black Rock claim group.

The sedimentary rocks present in the Black Rock claim group are in most respects identical to those found in the Colorado Plateau, although individual thicknesses are not as great.

Igneous Rocks

Tertiary intrusives of monzonite porphyry were intruded into the sediments either contemporaneously with or later than the major faulting of the area. Basaltic and andesitic lavas with interbedded tuffs, breccia and ash were laid down during Miocene time now cap the higher mountains. During Pliocene time a smaller basaltic flow was extruded, with the formation of two cinder cones at a somewhat later date.

Structural Geology

In late Cretaceous time the area was folded into asymmetrical anticlines, which trend north-south and pitch to the south, and faulting accompanied this folding. The western flanks of the anticlines have the steepest dip. The faults generally follow the axes of the anticlines, although minor faults were developed at right angles to the major ones.

Regional Metallogenic Setting

The Black Rock claims are located on the western flank of the Gore Mountains structural positive. Regional metallogenic studies indicate that the flanks of such flexures are favorable for the deposition of uranium and associated mineralization. Lithologically, the rocks exposed in the area are favorable for uranium mineralization.

A study of the metallization fabric map shows that the property is situated on the northeastern extension of the Kremmling-Laramie metallogenic base and precious metal trend.

LOCAL GEOLOGY

Stratigraphy and Structure

A. The property examined lies on the western flank of a north-trending anticline. The exposed rocks are Mesozoic sediments having a steep 25-35° westerly dip. Only the State Bridge to Morrison formations are exposed within the boundaries of the property. The Dakota formation is exposed immediately to the west. No igneous rocks outcrop on the property.

B. No uranium mineralization was observed on the property. The radiometric survey of the Shinarump and Salt Wash formations indicated a count about double normal regional background. Abnormal radioactivity can be caused by thorium, rare earths, and cosmic rays.

CONCLUSIONS

The claims are located in a region favorable for uranium mineralization, as indicated by the following evidence:

1. The claims are located on the flank of a base metal trend, and experience has shown that uranium in the western states almost universally occurs in such an environment.

2. The claims are located on the flank of an anticline, which also has been shown to be the most favorable structural environment for uranium deposition.

3. Low intensity copper-uranium mineralization has been found in the McCoy area. Many known uranium deposits in the Colorado Plateau are found in zones around this type of deposit.

4. The property contains no proven ore reserves.

5. Occurrences of uranium mineralization have been found in the McCoy area, but to date no production has come from the district.

RECOMMENDATIONS

1. Complete the radiometric survey of Cretaceous and Jurassic rocks.

2. Since mineralization is found in Permian rocks in the McCoy area, a scintillator survey should be made of any bleached exposures in this formation.

3. If mineralization is found, plan a more thorough exploration program.

Fred C. Hohne

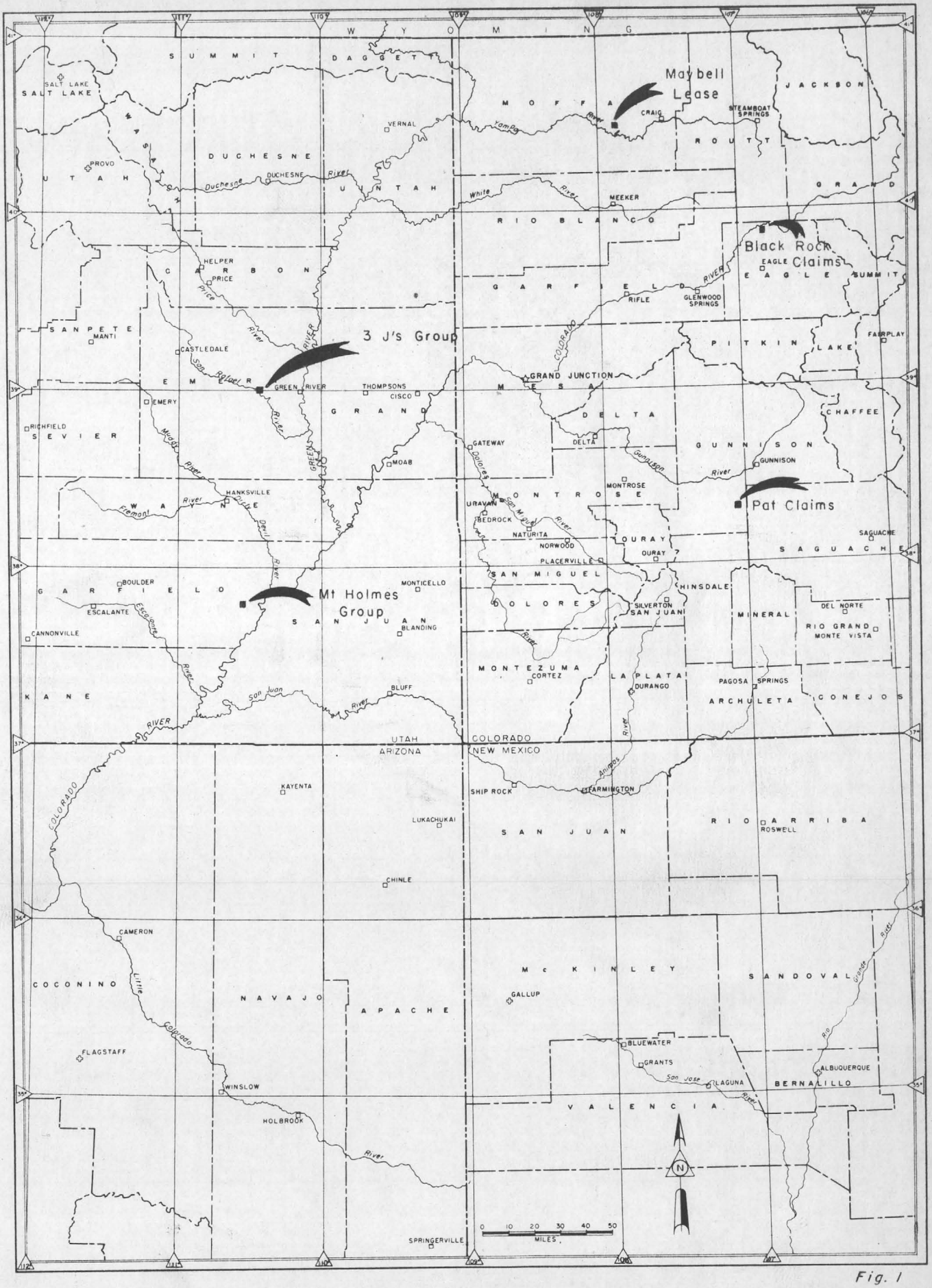
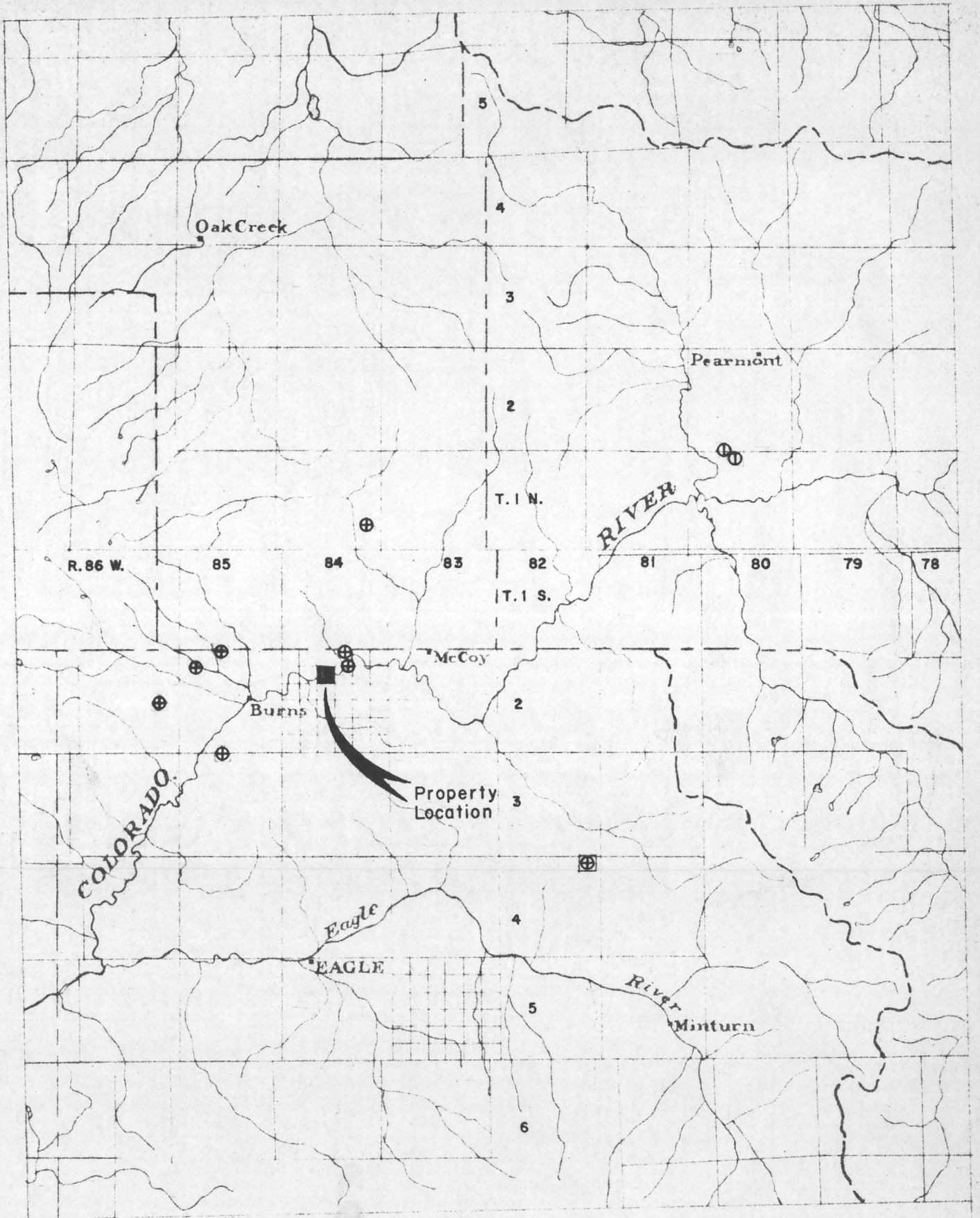


Fig. 1

Property location map



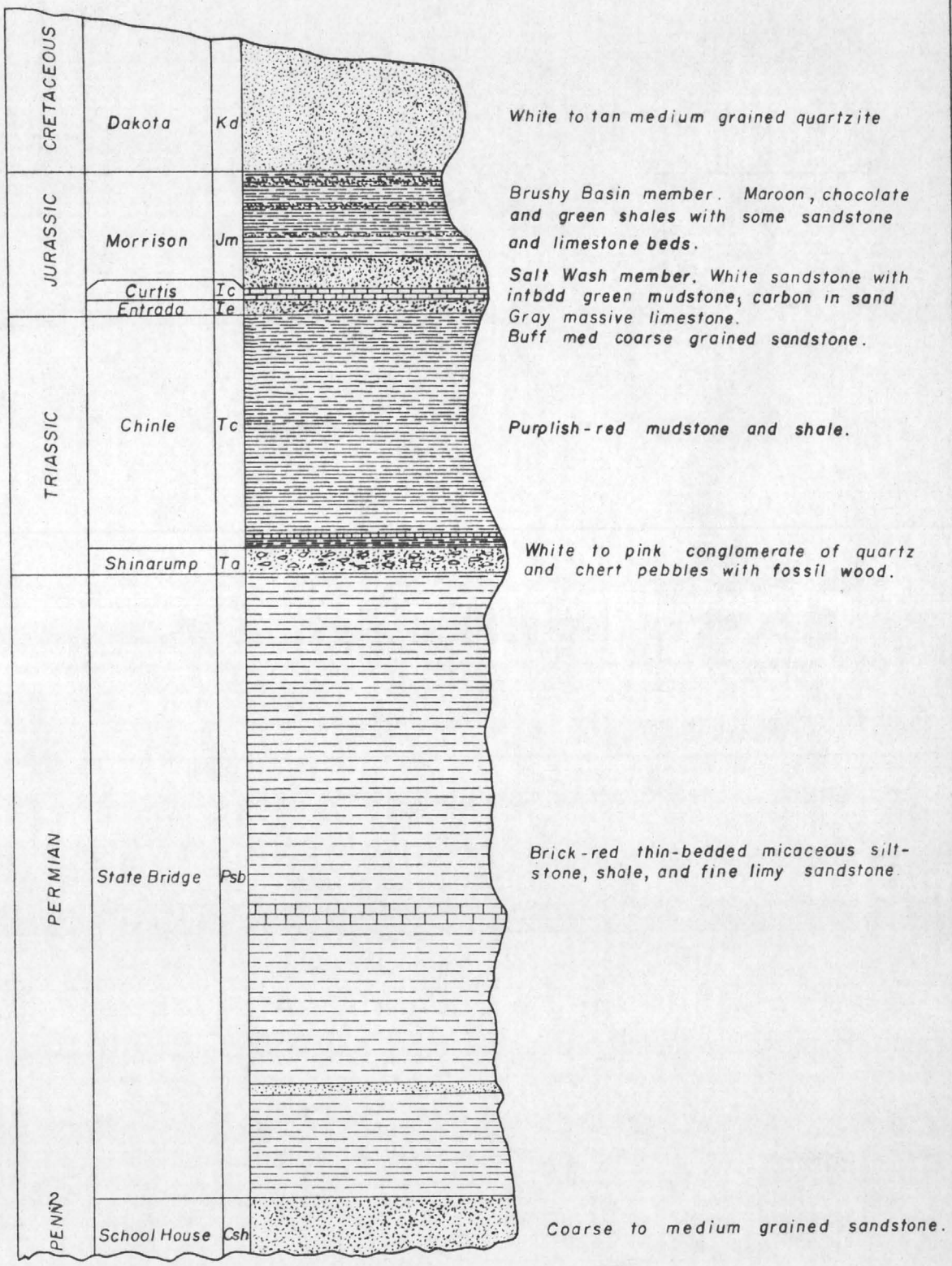
⊕ Uranium deposit

BLACK ROCK CLAIMS
EAGLE COUNTY, COLORADO

Scale : 1-500,000

⦶ Radiometric anomaly

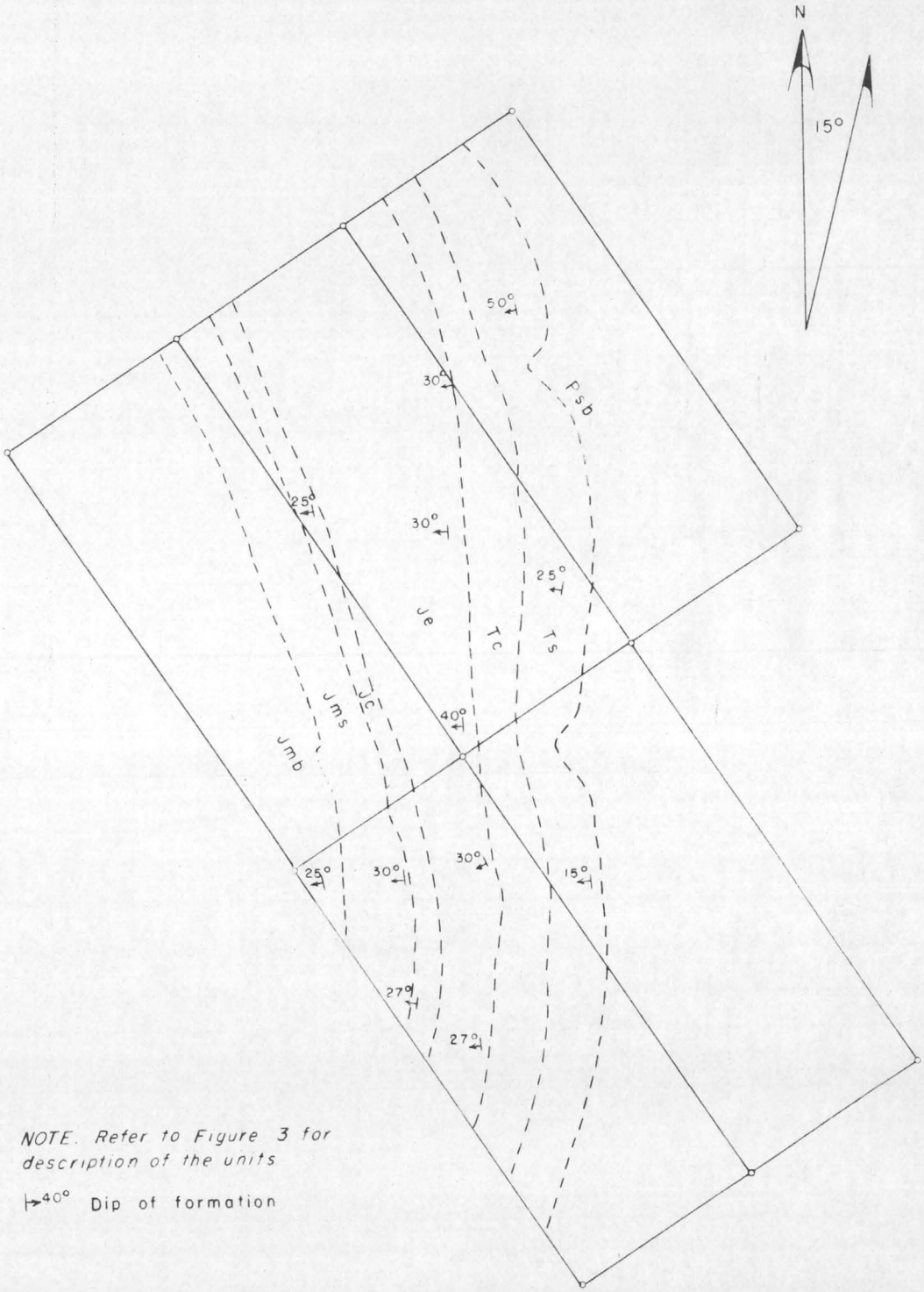
Fig. 2



GENERALIZED COLUMNAR SECTION
OF EAGLE - McCOY AREA

Routt and Eagle Counties, Colorado
1 inch equals 200 feet

Fig. 3



NOTE. Refer to Figure 3 for description of the units

⊢40° Dip of formation

GEOLOGICAL RECONNAISSANCE MAP OF THE BLACK ROCK CLAIMS

EAGLE COUNTY, COLORADO

Scale: 1" = 500'

T. 2 S. R. 84 W. SEC. 9. 6TH P.M.

Figure 4

GEOLOGICAL EVALUATION
OF
MT. HOLMES PROPERTY

Garfield County, Utah

INTRODUCTION

A brief examination was made of each of the canyons on the property for the purpose of examining any basal Chinle exposures for possible mineralization. This report will contain a brief discussion of the geology along with recommendations for exploration.

LOCATION

The property is located in Proposed T. 34 S., R. 12 E., in the unsurveyed area of eastern Utah on the north and east flanks of Mt. Holmes, which is the southernmost peak of the Henry Mountains intrusive. The claims have been tied to Government triangulation stations in the area. (See Figs. 2 and 3.)

OWNERSHIP

The 72 unpatented mining claims were staked by Grant Huntley in May, 1955. Claims have been surveyed with transit and stadia.

EXPLORATION

No exploration has been done on the property.

FACILITIES

Roads

A road has been built to the northern edge of the property, making part of the claims accessible for four wheel drive vehicles. The areas of interest for exploration are the bottoms of the canyons. No access road has been built to these drill sites.

Ore Shipment

The claims are located seven to eight airline miles west of Hite, Utah. The nearest buying station is at the Happy Jack Mine, 6 miles east of Hite, Utah. However, ore will have to be shipped to Green River, unless roads are built to Hite.

Timber

An ample supply of mine timber can be cut on the upper slopes of the Henry Mountains.

Plane Facilities

A landing strip sufficient for small planes has been built near the northern edge of the property.

GEOLOGY

Stratigraphy

The formations exposed on the property range from Triassic Moenkopi to Jurassic Navajo.

Moenkopi formation (Triassic)

The Moenkopi formation is about 290 feet thick and consists of alternate layers of bright red to brown siltstone, mudstone, and sandstone. The beds range in thickness from a few inches to several feet. Ripple marks and sandstone dikes are common.

Shinarump conglomerate (Triassic)

The Shinarump conglomerate, the formation of interest for exploration in this area, ranges in thickness from a feather edge to 100 feet and is composed of light colored conglomerate, sandstone and light to dark colored mudstone. The formation is described in more detail below.

Chinle formation (Triassic)

The Chinle in this area is about 590 feet thick and is composed of lenticular sandstone, mudstone, siltstone, limestone and conglomerate. In general the upper one-third of the formation is reddish brown and the lower two-thirds is variegated red, white, gray, yellow and purple.

The formation can be roughly divided into three parts: the lower, variegated mudstone and then bedded sandstone; the middle, interbedded friable sandstone, mudstone and ledge forming limestone and the upper, massive cross-bedded sandstone.

The lower contact with the Shinarump is gradational and the contact between the two formations is arbitrary.

Wingate formation (Triassic)

The Wingate is about 300 feet thick and is composed of thick, massive, bedded, light red-brown sandstone. This formation weathers to a

nearly vertical cliff that is commonly vertically jointed and coated with desert varnish.

Kayenta formation (Jurassic)

The Kayenta is composed of alternate layers of sandstone and mudstone with occasional thin layers of limestone. This unit weathers into a blocky bench-forming ledge on top of the Wingate.

Navajo sandstone (Jurassic)

Only the lower portion of the Navajo remains on the property. The upper part has been removed by erosion. The formation is composed of a massive, highly cross-bedded, white sandstone of eolian origin.

Economic Geology

The formation of interest for exploration drilling is the Shinarump conglomerate. Ore deposits in this formation are commonly located in channels or scours which were cut into the Moenkopi by paleo-drainage. The channels were subsequently filled with sandstone, mudstone, and conglomerate. Fossil trees and vegetation are commonly found in the channels. Copper and uranium minerals are deposited in and around the carbonaceous material.

The first step in the exploration of Shinarump rocks is to locate a channel by exploratory drilling. On this property no Shinarump out-crops are available for study. The bottoms of the numerous canyons are in Chinle rocks, which are immediately above the formation of interest for exploration.

At the present time no inexpensive method for locating channels has been devised. Geophysical methods have proved helpful in relatively level areas, but are not effective in areas of rugged terrain. Considering the cost of drill sites and drilling depths, the only areas which can be recommended for drilling are the bottoms of the canyons which are located at the eastern edge of the property. Access to the drill sites will be from the Colorado River. Approximately four miles of road will be necessary for access to each canyon.

In the Mt. Holmes area, the Morrison rocks are productive on Trachyte Creek to the north, and at White Canyon to the east, the Shinarump is mineralized. It is possible that mineralization will be found on the property.

CONCLUSIONS

1. The property contains no proven ore reserves.

2. The Shinarump, which is the producing formation in White Canyon, is the formation of interest for exploration.

3. Drilling depths to the Shinarump will be from 100 to 200 feet in the canyons on the eastern edge of the claims.

4. Commercial mineralization has been found over a wide area east and southeast from Hite, Utah. The Corporation makes no implication that mineralization will be found on this property.

5. Activity on the west bank of the Colorado River near Hite has been confined to claim staking only.

6. It is improbable that uranium mineralization is confined to only the eastern side of the river.

RECOMMENDATIONS

1. Build a drill road from the Colorado River to the eastern portion of the claims.

2. Plan an exploration drill program in the bottom of the canyons.

3. Drill on 500 foot centers in order to outline favorable areas.

4. If a favorable area is located, plan a development drilling program.

Fred C. Hohne

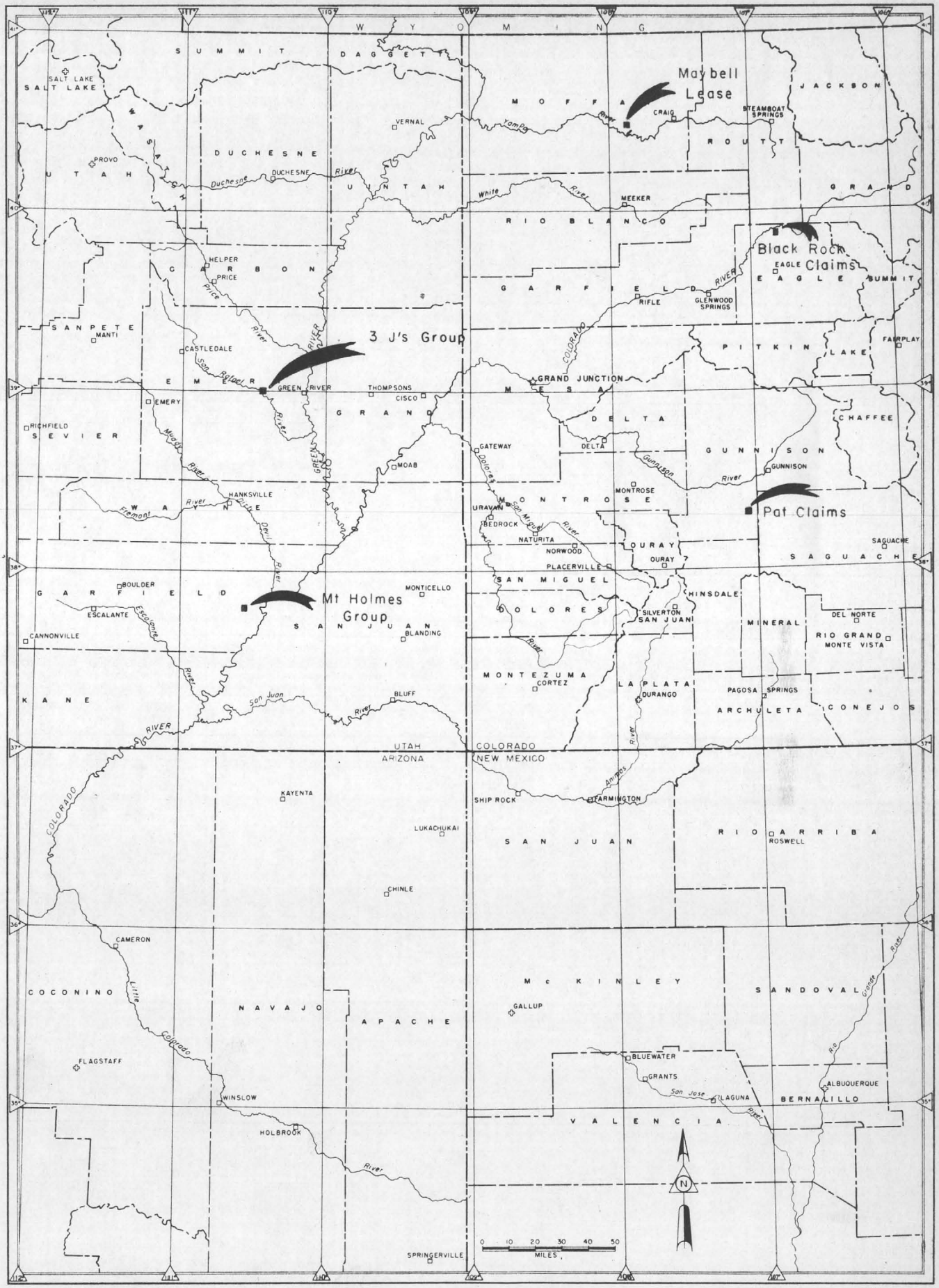
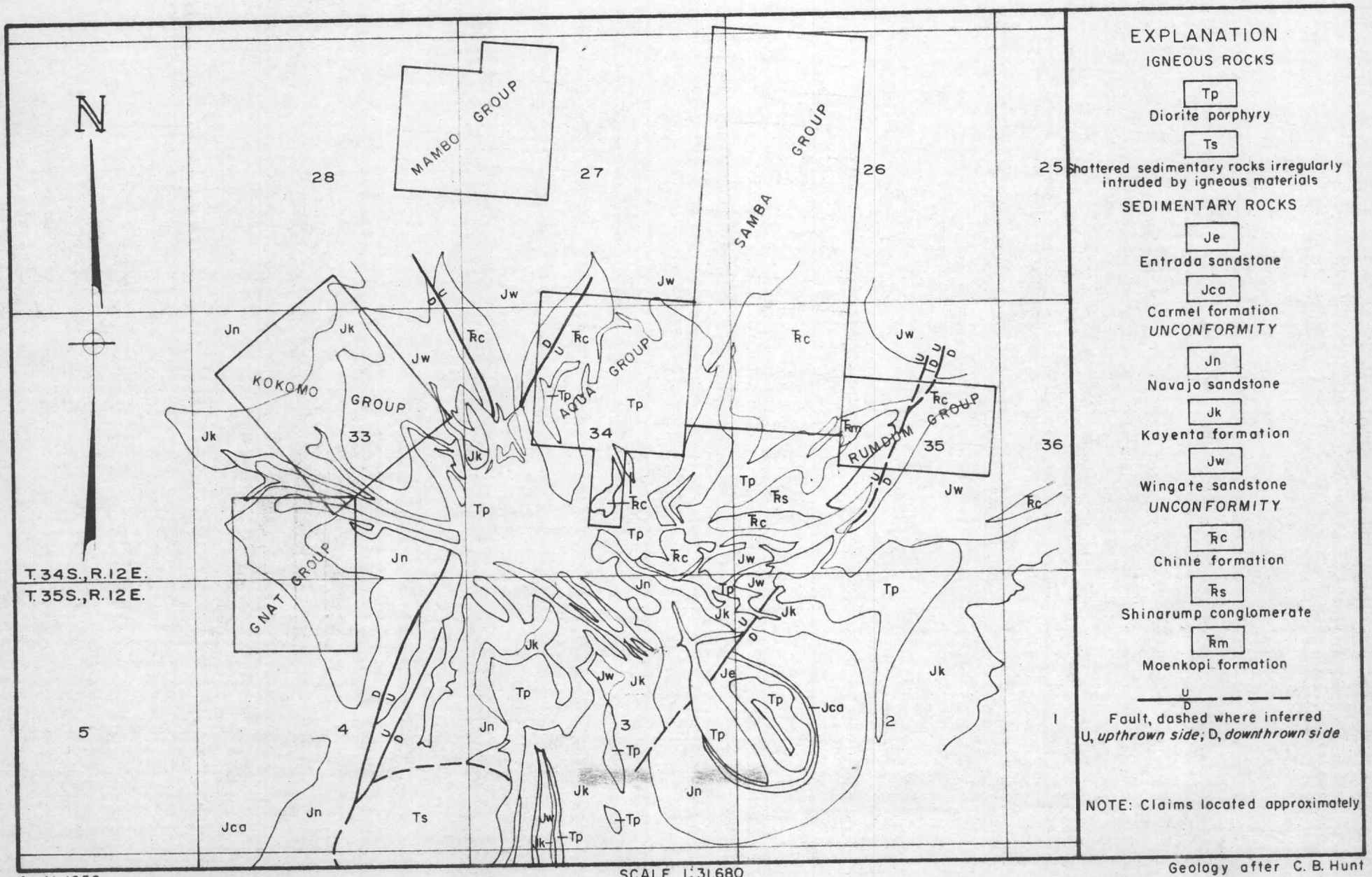


Fig. 1

Property location map



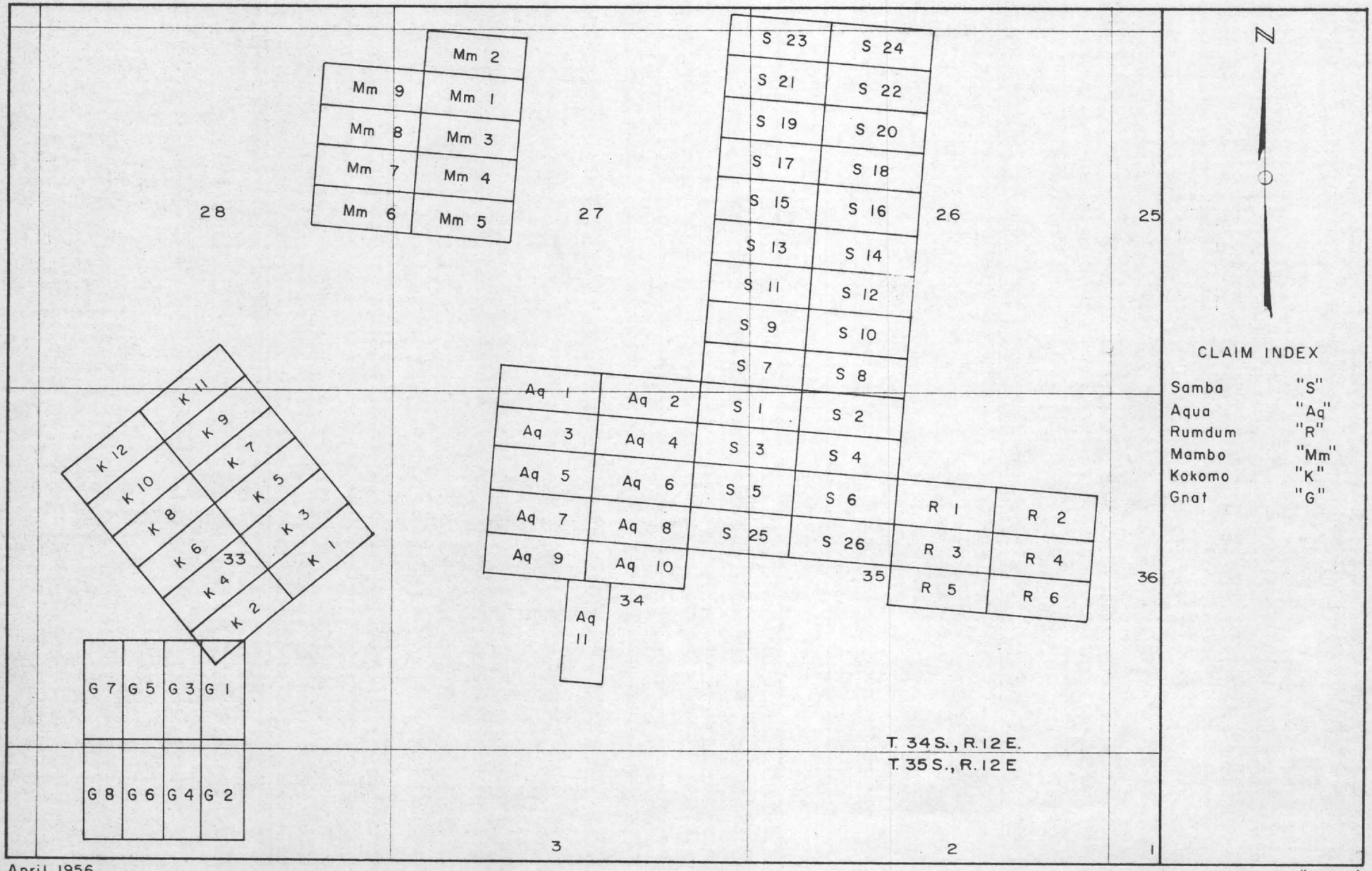
April 1956

SCALE 1:31,680

Geology after C. B. Hunt

Fig. 2

Geologic map of Mt. Holmes, Henry Mountains
Garfield County, Utah

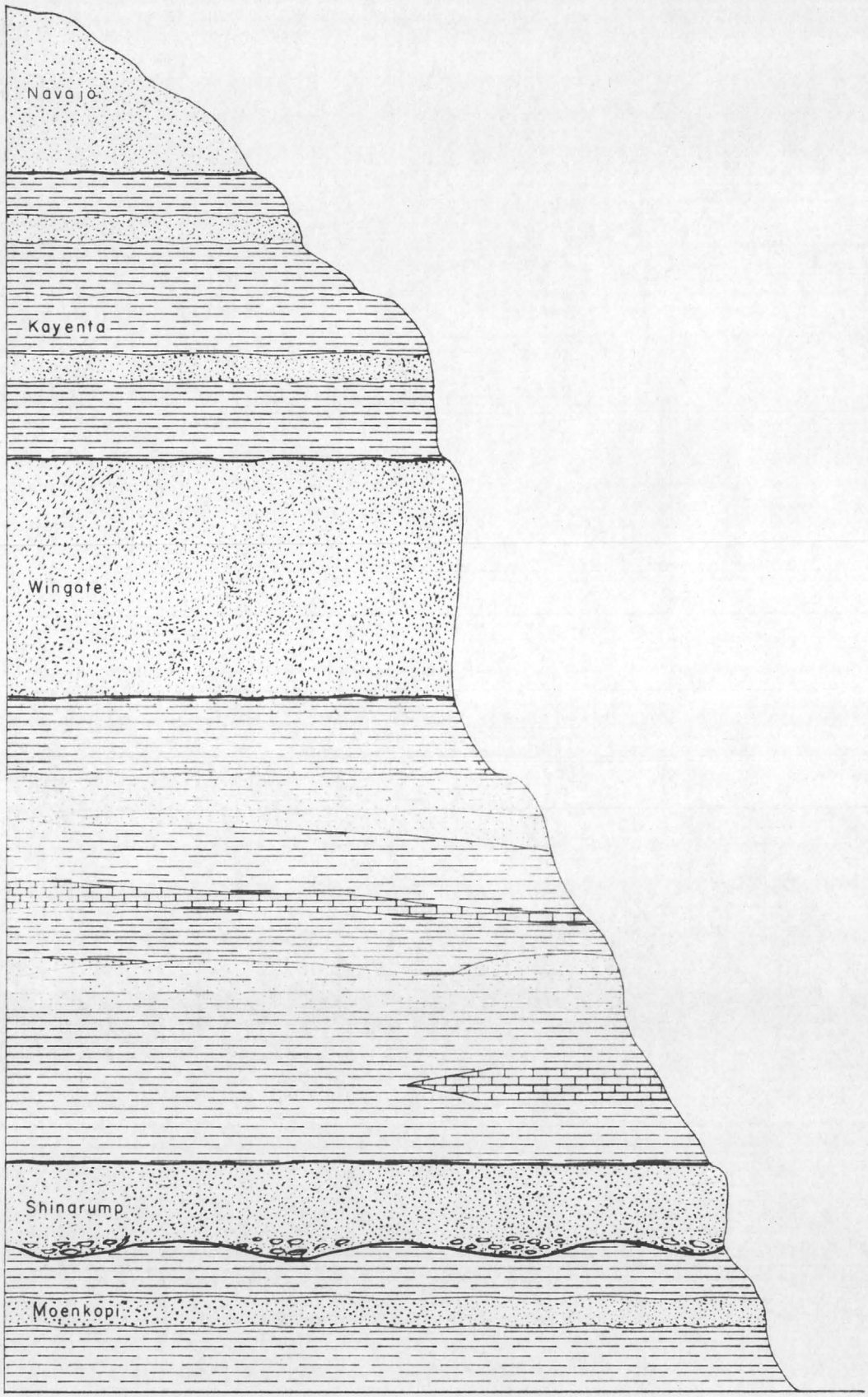


April 1956

Scale 1"=2000'

Claim map of Mt. Holmes property
Garfield County, Utah

Fig. 3



Vertical Scale : 1" = 200'

April 1956

Fig. 4

Generalized Crossection Mt. Holmes Area

Garfield County, Utah

GEOLOGICAL EVALUATION
OF THE
PAT CLAIMS

White Earth Mining District
Gunnison County, Colorado

LOCATION AND ACCESSIBILITY

The Pat group consists of 10 unpatented lode claims in Sections 15 and 22, T. 46 N., R. 2 W., NMPM. They are located approximately 24 miles southwest of Gunnison and about three and one-half miles south of the Powderhorn Post Office. (See Fig 2.) The claims are accessible by means of Colorado Highway 149 and about three miles of unimproved roads.

PURPOSE AND SCOPE OF INVESTIGATION

The preliminary geological evaluation of the Pat group was undertaken for the purpose of determining its thorium-producing potential.

The examination consisted of an aerial radiometric reconnaissance followed by ground geological and radiometric reconnaissance prior to claim staking and 1" to 500' geological mapping and radiometric checking subsequent to staking.

HISTORY

Early-day mining in the White Earth district was centered on gold, copper, and lead-bearing veins in pre-Cambrian granites and gneiss. Production was minor with only the Vulcan Mine being of individual importance.

The thorium-bearing nature of some of these veins was discovered in 1951, but interest in them was not aroused until 1954, when active claim staking began. Many thorium-rich veins have been found by radiometric prospecting. Others have been found by sampling mines which produced gold and copper.

In 1954 a DMEA loan was granted to Lindsay Chemical for the exploration of the Little Johnny thorium vein one mile north of Powder horn.

GEOLOGY

REGIONAL GEOLOGY

Petrology

The White Earth district lies on the northern flank of the San Juan Mountains and at the edge of the San Juan volcanics where the rocks of the Potosi volcanic series have eroded to show pre-Cambrian basement rocks and small amounts of Jurassic and Cretaceous sediments.

Pre-Cambrian rocks are represented by several varieties of granite (red and gray being the most common), granite gneiss, and small amounts of schist.

Sedimentary rocks consist of Jurassic Morrison sandstone and shale capping a few of the hills and suspected Dakota sandstone in one or two localities.

The rest of the area is covered by various members of the Potosi volcanic series of Miocene age, the Alboroto rhyolite and quartz latite flows and tuffs being most prominent, with Lake Fork andesites also being present.

Mineralization

Although little work has been done to test the nature of thorium mineralization of the Powderhorn area, some conclusions can be drawn. Thorium mineralization is confined to sheared zones, for the most part in granite. The Thorium mineral is thorite which occurs as fracture fillings, fracture coatings, and as replacements and is usually accompanied by abundant hematite and limonite, often by barite and occasionally by pyrite, chalcopyrite and galena with associated gold and silver. The hematite is abundant enough to cause a reddening of the country rock in the vicinity of the veins and thus serves as a prospecting guide.

Silicification of wall rocks and fracture-filling have both produced a heavily iron stained jasperoid which in places is thorium-bearing. Much of the mineralized material has a strong fetid odor which can be detected for a few seconds after the rock has been broken. This, too, is a useful prospecting guide.

The foregoing features of the Powderhorn thorium mineralization are almost identical with those of the thorium area in the Wet Mountains of Colorado as described in the USGS Circular 290. One difference is the amount of uranium contained in the mineralized material. Samples from the White Earth district are reported to contain as much as 0.50% U_3O_8 while those of the Wet Mountains contained under 0.01%.

LOCAL GEOLOGY

The Pat claims lie in an area almost wholly occupied by granite with minor amounts of andesite. Exact relationships between various rock types are difficult to determine since outcrops are scarce, the area being largely covered by humus and talus.

Pink and gray granite with some pegmatite dikes occupy most of the Pat claims. Pat 7 and 9 contain a few small outcrops of grayish-green, fine-grained rock which are probably related to the Lake Fork andesites but, as suggested by field relationships, probably represent a series of east-west trending dikes rather than remnants of a flow. Similar rock types (usually silicified) were noted in the float in other parts of the claims.

A sharp north-south trending ridge line dominates the topography in the area, the slopes on either side ranging from 10° to 35°. On Pat 4 and 6 this ridge is cut by a series of strong fractures containing fillings of reddish-brown jasperoid vein quartz and brecciated granite. These fracture zones occupy a width of roughly 1000 feet along the ridge line where scintillometer readings ranged from 0.03 mr/hr to 0.10 mr/hr when the background was only about 0.02 mr/hr. Kaolinitic alteration of this area, together with heavy iron staining, indicates the probability of rather intense mineralization activity.

These veins are exposed only on the crest of the ridge and even here it is difficult to determine their strike direction. Evidence of the strike of these veins can be seen on Pat 1 where vein material, limonite gossan and altered rock, is present in the float.

Vein material was also found on the southwest end of Pat 2 accompanied by a scintillator reading of 0.04 to 0.045 mr/hr. This may be an extension of one of the veins of Pat 4. A granite outcrop adjacent to the fractured zone on Pat 4 gave a radiometric reading of 0.15 to 0.20 mr/hr.

CONCLUSIONS

The Pat claims are in an area which is known to be mineralized and which can be considered a thorium province.

Geological mapping has disclosed many of the features typical of the Powderhorn and Wet Mountain thorium deposits.

Radiometric checking has disclosed several areas within the Pat claims which have abnormally high radioactivity.

It is concluded that the foregoing indicate that the Pat claims have an excellent possibility of containing commercial quantities and grades of thorium ore and, also, that the possibility of finding associated uranium in commercial quantity is not precluded.

RECOMMENDATIONS

A systematic program of evaluation and exploration of the Pat Group is here outlined. Each succeeding step should be dependent on the results of the preceding in order that the program not be extended beyond its logical and proper ending point.

1. Radiometric grid survey of the property to help determine strike and degree of mineralization of the veins. A station spacing of 100 feet is recommended.

2. Cutting of bulldozer trenches to enable inspection and sampling of areas of highest radioactivity.

3. Fifty scale geological mapping of selected areas.

4. Diamond drilling program to evaluate the actual thorium veins discovered by the foregoing.

Fred C. Hohne

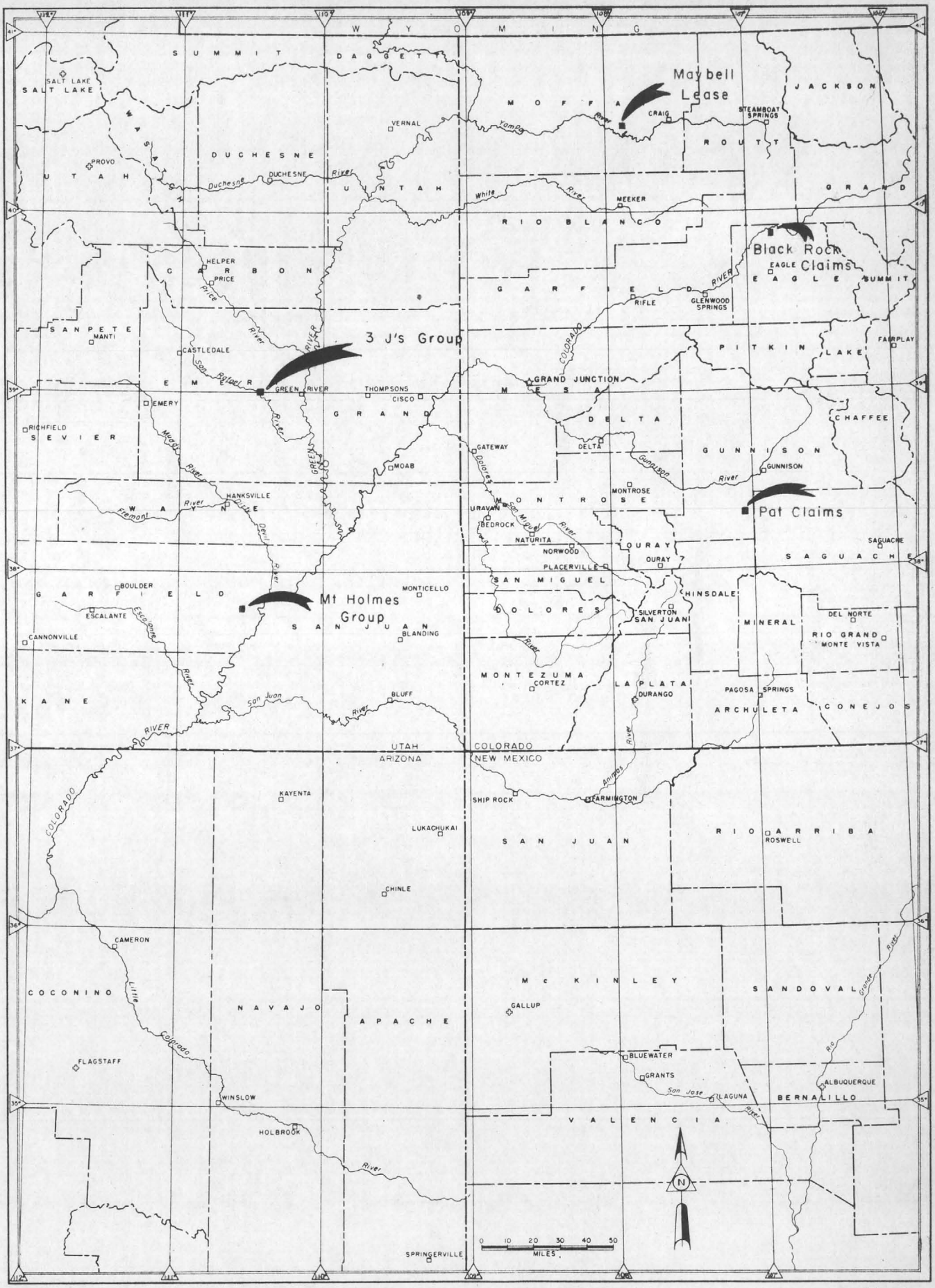
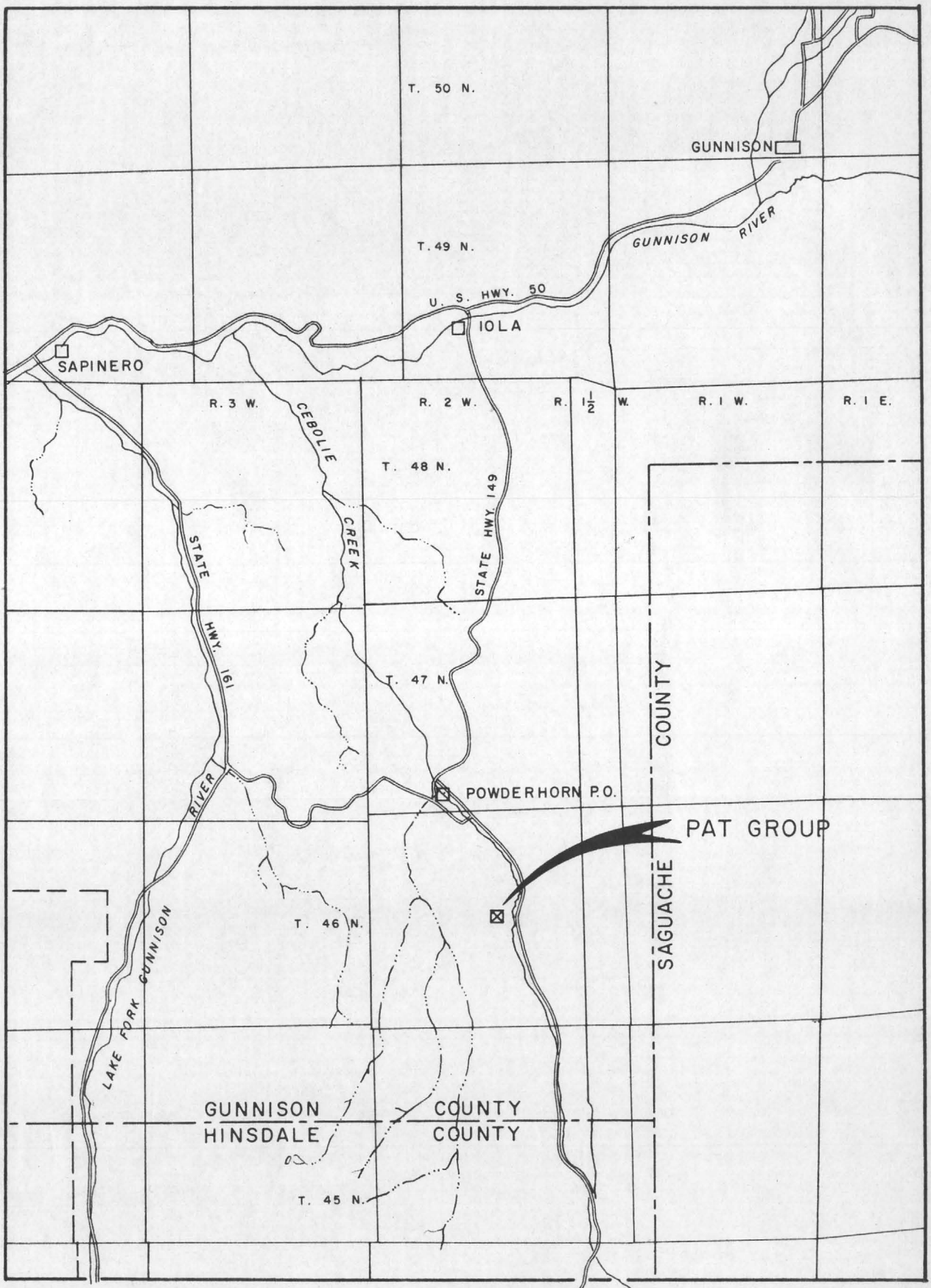


Fig. 1

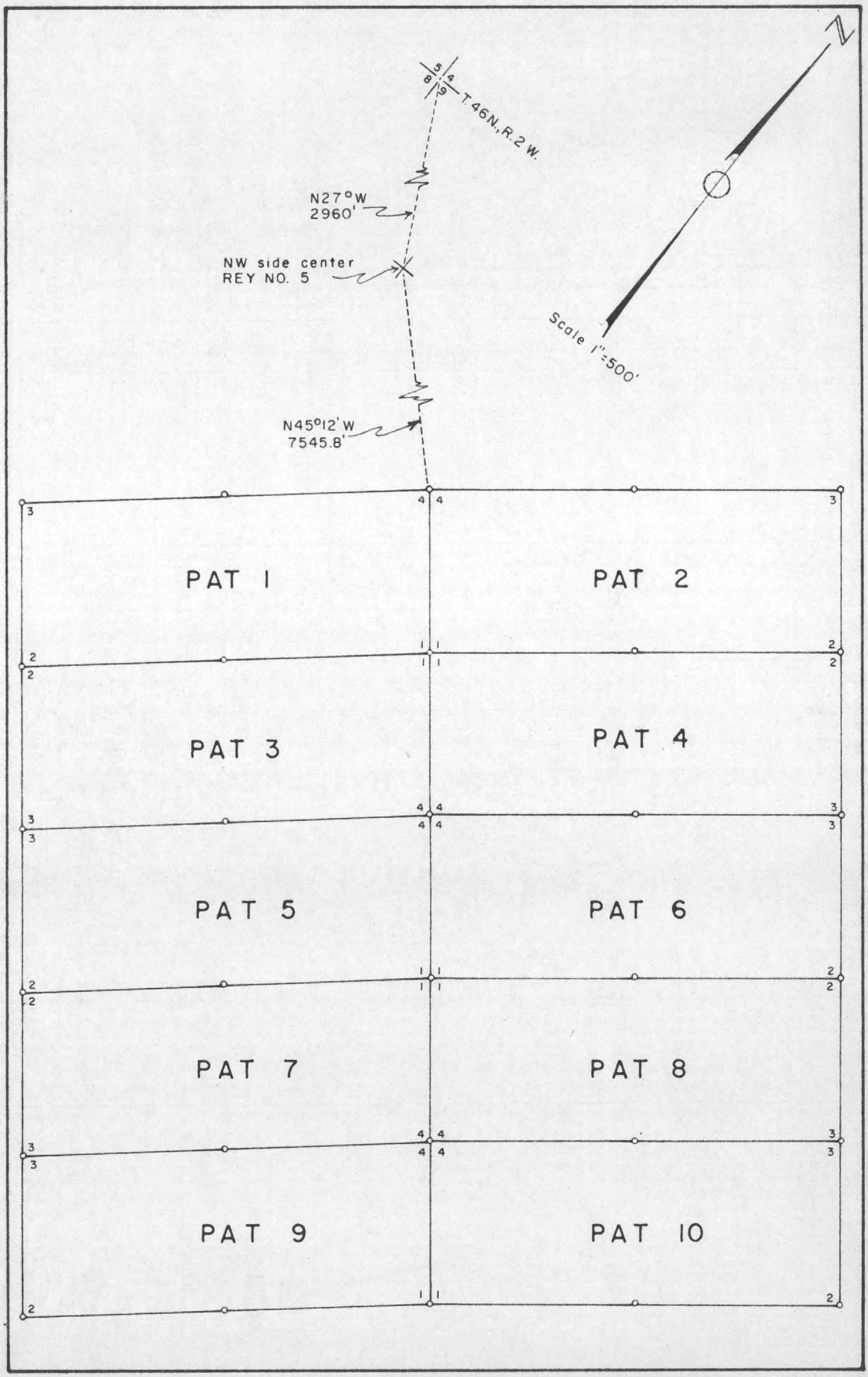
Property location map



PAT CLAIM GROUP IS LOCATED IN
T. 46 N., R. 2 W SEC. 15 & 22

Fig. 2

INDEX MAP
of the
POWDERHORN AREA
Gunnison County, Colorado
Scale 1" = 4 miles



Claim map of Pat Group, Gunnison County, Colorado

Fig. 3

GEOLOGICAL EVALUATION
OF THE
MAYBELL LEASE
MOFFAT COUNTY, COLORADO

INTRODUCTION

This report was made at the request of Grant H. Huntley. Information for the report was obtained from field work, verbal communication with Atomic Energy Commission and private company geologists working in the area, and from published reports. Properties in all stages of mining were examined.

The methods of exploration, development, and exploitation will be discussed.

PROPERTY AND LOCATION

The subject property consists of 160 acres of fee land. A lease on the NE¼ of Section 32 in T. 7 N., R. 94 W., was obtained by Grant H. Huntley, G. P. and C. P. Jouflas. The terms of the lease are for _____years. A gross royalty of 12-1/2% is applied to the production. For location of the property in regards to known ore-bodies see Fig. 2. The property lies adjacent to U. S. Highway 40 approximately 25 miles west of Craig, Colorado.

HISTORY OF THE AREA

The Maybell-Lay area is relatively new to uranium production. Most exploration on the Plateau has been in the Morrison, Chinle and Shinarump formations. Recently, the past two years, commercial deposits have been found in the Tertiary sediments. Private industry has pioneered the work in this area. To date, two and possibly more ore-bodies have been blocked out which contain reserves in excess of 100,000 tons.

FACILITIES

ROADS

No drill roads will be necessary since the terrain is relatively flat. U. S. Highway 40 bisects the property. The proposed Trace Elements millsite is located approximately 3 miles to the west.

ORE SHIPMENT

Present production from the area is being shipped to Rifle or Salt Lake City. All ore will be shipped to the Trace Elements mill upon its completion.

TIMBER

No timber is needed since the ore will be mined from an open pit. A shaft is being used in the district at present to test mining methods. Timber must be hauled from Craig for such uses.

PLANE FACILITIES

An airstrip has been built on the Trace Elements property. A city airport is located at Craig.

WATER

No drilling water will be needed, however, an ample supply is available from a stream on the property or from the Yampa River which is located 3 - 4 miles to the west.

~~DEVELOPMENT~~ Exploration

No exploration or development work has been done on the property.

GEOLOGY

STRATIGRAPHY (See Fig. 3)

The Browns Park, a continental sandstone, is of Tertiary (Miocene)

age. Two distinct units have been described. The upper is composed of white to gray sandstone, tuffaceous sandstone, chert layers, and occasional beds of limestone. The sandstones are unconsolidated except in isolated areas where fault-controlled silicification occurs. This extreme lack of cohesion will cause difficulty in underground mining. Mudstones occupy a small percentage of the stratigraphic column. Organic material is absent. Vertical ore controls are controversial.

The basal unit, probably 50 to 100 feet thick, is composed of the weathered fragments of the pre-Cambrian Juniper Mountain. Cobbles of granite, schist, gneiss and quartzite are common.

The Browns Park formation is deposited in a syncline and thicknesses vary considerably. The maximum depth of the formation, in the Maybell area, is 900 feet, however, it pinches to a feather edge on Juniper Mountain. The thickness is estimated to be 500 feet on this property

ECONOMIC GEOLOGY

Uranium minerals include uraninite, uranophane, and meta-autunite. The ore occurs as coatings on sand grains and as a cementing material in limonite and jarosite. Limonite staining and bleaching of the sandstones are common in areas of mineralization.

Lateral ore controls are small inconspicuous faults. Vertical control along the faulting is not known. Faults are by no means mineralized continuously nor is every fault mineralized. Locally fault zones are silicified and may contain calcium carbonate, pyrite, and uraninite.

No pisitive statement can be made about the equilibrium factor, however, ores below the oxidized zone commonly contain more uranium than is indicated by the radiometric assay.

STRUCTURAL GEOLOGY

The Maybell-Lay district lies on the flanks of Juniper Mountain, which is point of intersection of two structural positives. The economic importance of such intersections is known to both petroleum and mining men.

GEOLOGY OF THE PROPERTY

The subject property lies within the area of maximum interest for exploration at this time. Ore-bodies have been found in the immediate area as a result of drilling exploratory holes on radiometric anomalies. Two U. S. G. S. airborne anomalies have been found on this property (Fig. 2), however, the company does not wish to imply that ore will be found by drilling these anomalies. Ground reconnaissance has disclosed several anomalies not shown on the airborne map.

CONCLUSIONS

1. The Maybell-Lay area is fast developing into a major uranium province.
2. The property is favorably located.
3. Exploration costs are low in comparison to Plateau standards.
4. Chances are good that commercial ore will be found on the property.

RECOMMENDATIONS

The following method of exploration has been developed by the oldest companies in the Maybell-Lay area. It has been tried and proven and is hereby recommended.

1. Drill a 500 foot hole for stratigraphy.
2. Drill holes on a 300 foot grid to a depth of 150 feet.
3. Plug-bit all holes and save no dust samples on the preliminary drilling.
4. Probe all holes, preferably with instruments and operators working in the district.
5. Block out ore around all mineralized holes on 50 foot centers.
6. Save cuttings of one foot drill runs from 5 to 6 holes in each ore-body to determine the equilibrium factor for probing. Have several radiometric and chemical assays made for comparison.

Fred C. Hohne

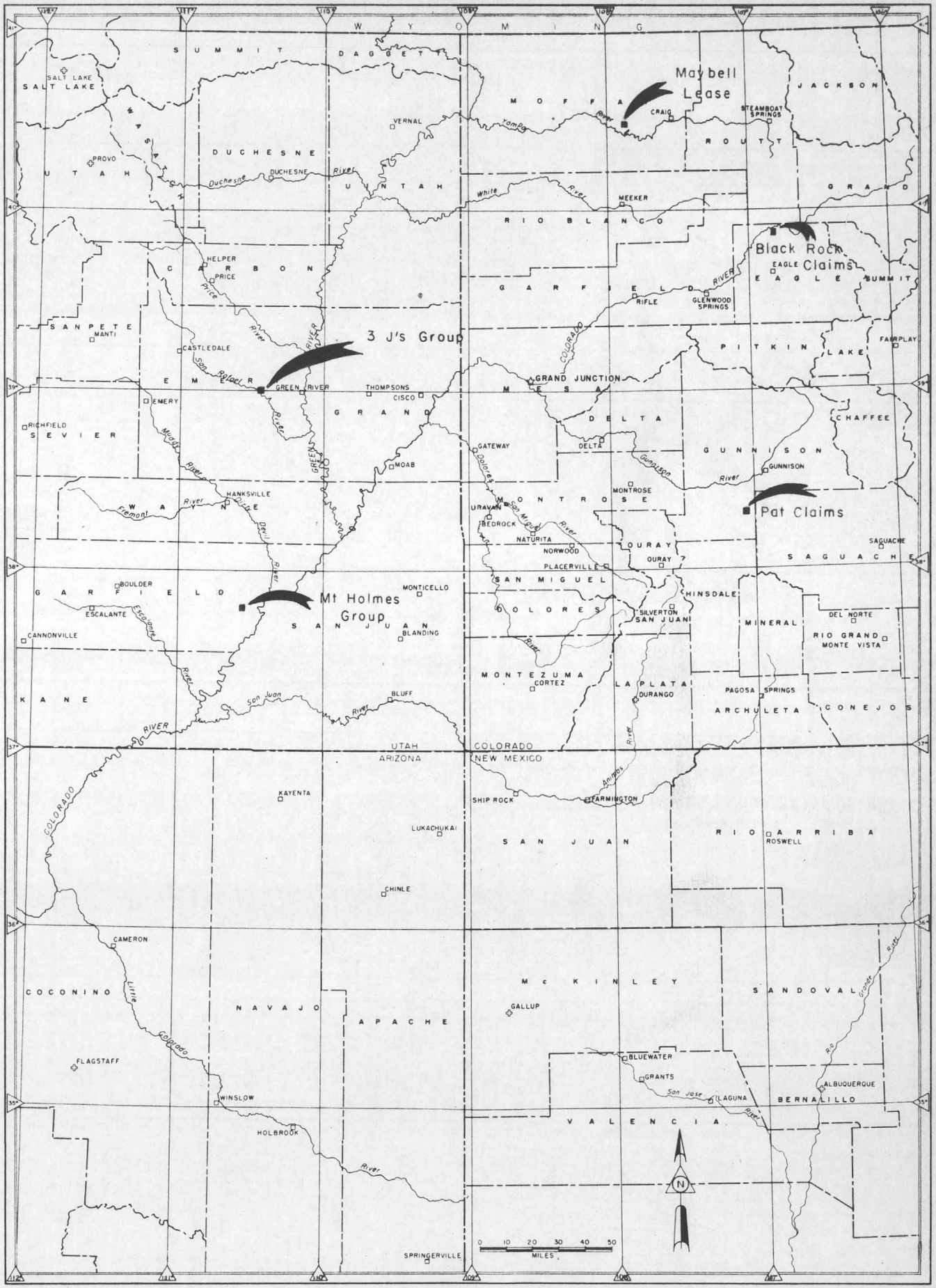
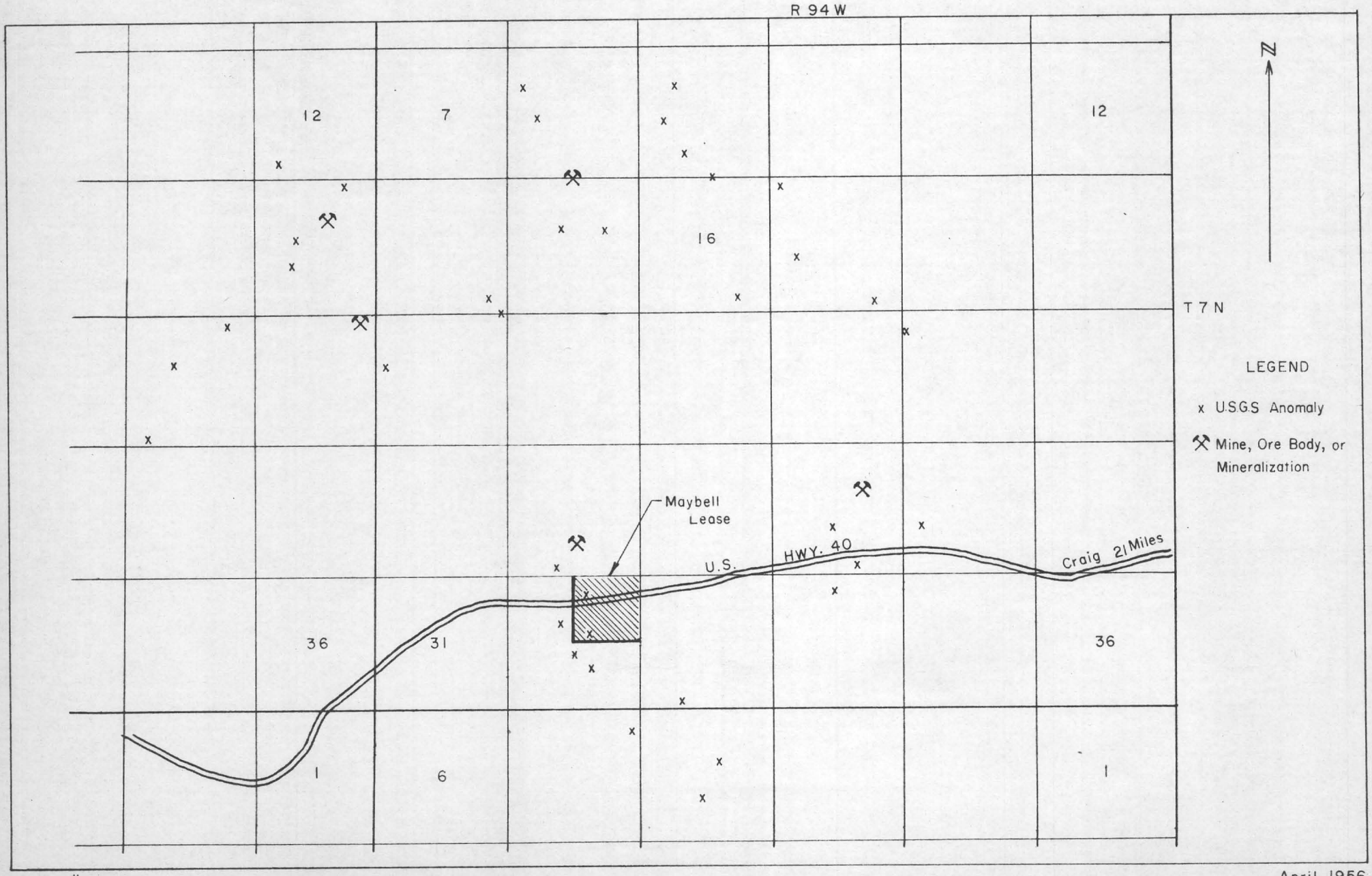


Fig. 1

Property location map



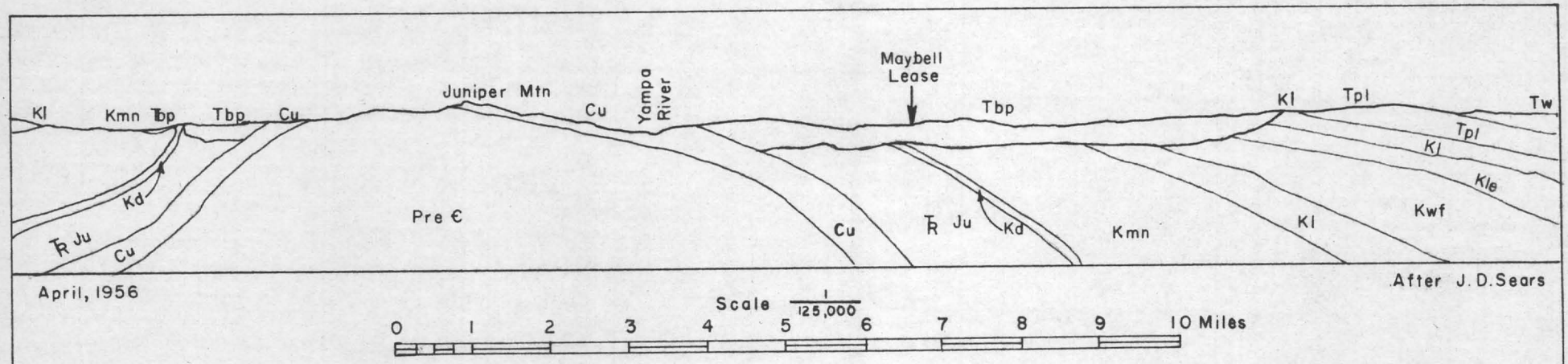
Scale 1" = 1 mile

April, 1956

Fig. 2

MAYBELL LEASE

MOFFAT COUNTY, COLORADO



April, 1956

After J. D. Sears

Scale $\frac{1}{125,000}$

0 1 2 3 4 5 6 7 8 9 10 Miles

Tbp	Browns Park Formation
Unconformity	
Tw	Wasatch Formation
Unconformity	
Tpl	Post "Laramie" Formation
Unconformity	
Kl	Laramie Formation
Kle	Lewis Shale
Kws	Williams Fork Formation
Ki	Iles Formation
Kmn	Mancos Shale
Kd	Dakota Formation
TR Ju	Triassic Jurassic Undifferentiated
Cu	Paleozoic Undifferentiated
Pre€	Pre Cambrian

CROSS SECTION OF MAYBELL LEASE,

MOFFAT COUNTY, COLORADO

Fig. 3

Chris Jouflas
Helper, Utah

GEOLOGICAL EVALUATION
OF
3 J's CLAIMS

Mexican Bend Area, San Rafael Swell
Emery County, Utah

one copy

INTRODUCTION

The San Rafael properties of Messrs. Jackson, Jouflas ~~and~~ _____ of Helper, Utah includes two groups of claims, the northern group, the 3 J's numbers 51 to 124, and the southern group, the 3 J's numbers 1 to 50. This report includes a brief discussion of the geology of the property, plus recommendations for proving the property.

PROPERTY AND LOCATION

The two groups of claims are located approximately 18 miles west of Green River, Utah (see Fig. 1) in Townships 19, 20 and 21 South and Ranges 12 and 13 East.

The northern group of claims is accessible by four wheel drive vehicle, but about four miles of road building would be necessary to reach the southern group of claims.

OWNERSHIP

The claims were staked in AUGUST, 1955 by Messrs. Jackson, Jouflas ~~and~~ _____. ~~The property was leased by Grant Huntley. A 12½% royalty exists on the claims.~~

FACILITIES

Roads

An unimproved dirt road has been built to the northern group. Four miles of road building will be necessary to reach the southern group of claims.

Timber

Mine timber is available in Price, Utah.

Water

Drill water can be hauled from the San Rafael River, which lies within one mile of both groups of claims. Domestic water will have to be hauled from Price or Green River, Utah.

Milling Facilities

The nearest mills are the Vitro Mill at Salt Lake City, Utah and the Metals Reduction mill at Moab, Utah. An AEC ore buying station is operated at Green River, Utah, where ore can also be sold.

Development

No exploration or development has been done on the property.

GEOLOGY

Structure

The property lies in the northeastern portion of the San Rafael Swell. The formations in this area are relatively flat lying, dipping 2-10° to the northeast. A few miles south of this area the formations form a steep "reef" and dip 70-80° to the east.

Minor faulting is noted on the northern group of claims.

Stratigraphy (See Fig. 4)

Formations ranging in age from the Permian to the Jurassic are exposed in this area. Following is a brief description of these formations:

Coconino sandstone (Permian)

The Coconino is composed of a massive white to gray, friable sandstone that has a maximum thickness of 650 feet in the northern part of the San Rafael Swell.

Kaibab limestone (Permian)

The Kaibab is composed of a sandy, vug filled, gray-brown limestone that weathers to form a bench at the base of the Moenkopi. In the northern part of the San Rafael Swell it is about 80 feet thick.

Moenkopi (Triassic)

The Moenkopi is divided into three units in the San Rafael Swell. They are the lower mudstone-siltstone unit, the middle Sinbad limestone member, and the upper mudstone-siltstone unit. The Sinbad limestone member is about 100 feet thick and is composed of a massive dense gray limestone. This unit forms a prominent bench within the Moenkopi formation. The rocks, both above and below the Sinbad limestone, have been altered from red to a light brownish gray. The lower and upper units are composed of dark red-brown mudstone, siltstone and thin layers of sandstone; ripple marks and sandstone dikes are common.

Chinle formation (Triassic)

The Chinle formation in this area is about 355 feet thick and is divided into the following members:

The Temple Mountain member is composed of sandstone and mudstone and ranges in thickness from a feather edge to 50 feet. Channeling and scouring is common. The closest area of production is approximately 6 miles to the south.

The Mossback member is approximately 125 feet in thickness and is composed of conglomerate and sandstone with minor amounts of mudstone. Channels and scours are common at the base of this member. Silicified fossil logs up to two feet in diameter are commonly found at the base of the Mossback. At many areas through the Swell this unit has been ore bearing.

The Church Rock member is approximately 200 feet in thickness and is composed of dark red-brown siltstone, mudstone, and sandstone.

Wingate sandstone (Triassic)

The Wingate is about 400 feet thick. It is composed of massive, cross-bedded, brick red sandstone which forms a nearly vertical cliff. Outcrops are commonly coated with desert varnish. The upper contact with the Kayenta formation is gradational and is difficult to determine.

Kayenta formation (Jurassic)

The Kayenta is about 225 feet thick and is composed of alternate layers of sandstone and mudstone. Occasional thin layers of limestone occur. This formation forms a bench at the top of the Wingate cliff.

Navajo sandstone (Jurassic)

Only the lower 450 feet of this formation remain in the area. The upper part has been removed by erosion. This formation is composed of a massive, light buff, highly corss-bedded sandstone of aeolin origin.

The formations of interest for exploration are the Mossback and Temple Mountain members of the Chinle formation. Ore occurs in basal sandstone lenses in scours or channels which have been eroded into the underlying beds by paleo-streams. Mineralization is associated with fossil vegetation. Occasionally logs are completely replaced by uranium ore. In other cases logs are barren, but a halo of mineralization exists around them. The ores in this region are known to be associated with asphaltic material.

Exploration drilling patterns should be located at right angles to the direction of the channel. Channels are worthy of exploration if bleaching

of the underlying mudstone occurs or if radioactive anomalies are found on surface exposure.

CONCLUSIONS

1. Chinle ore bodies occur in channels. Such channels are believed to exist on this property.

2. Four miles of rim exposures were examined of a total of approximately 8 miles and no anomalous readings were found.

3. Asphaltic material and fossil vegetation are present in the rocks.

4. The area is not productive at this time; however, little exploration has been undertaken.

RECOMMENDATIONS

1. Complete the radiometric survey of rim exposures.

2. If any favorable areas are encountered, a rim stripping operation or a drilling operation should be carried on to further evaluate the area.

Fred C. Hohne

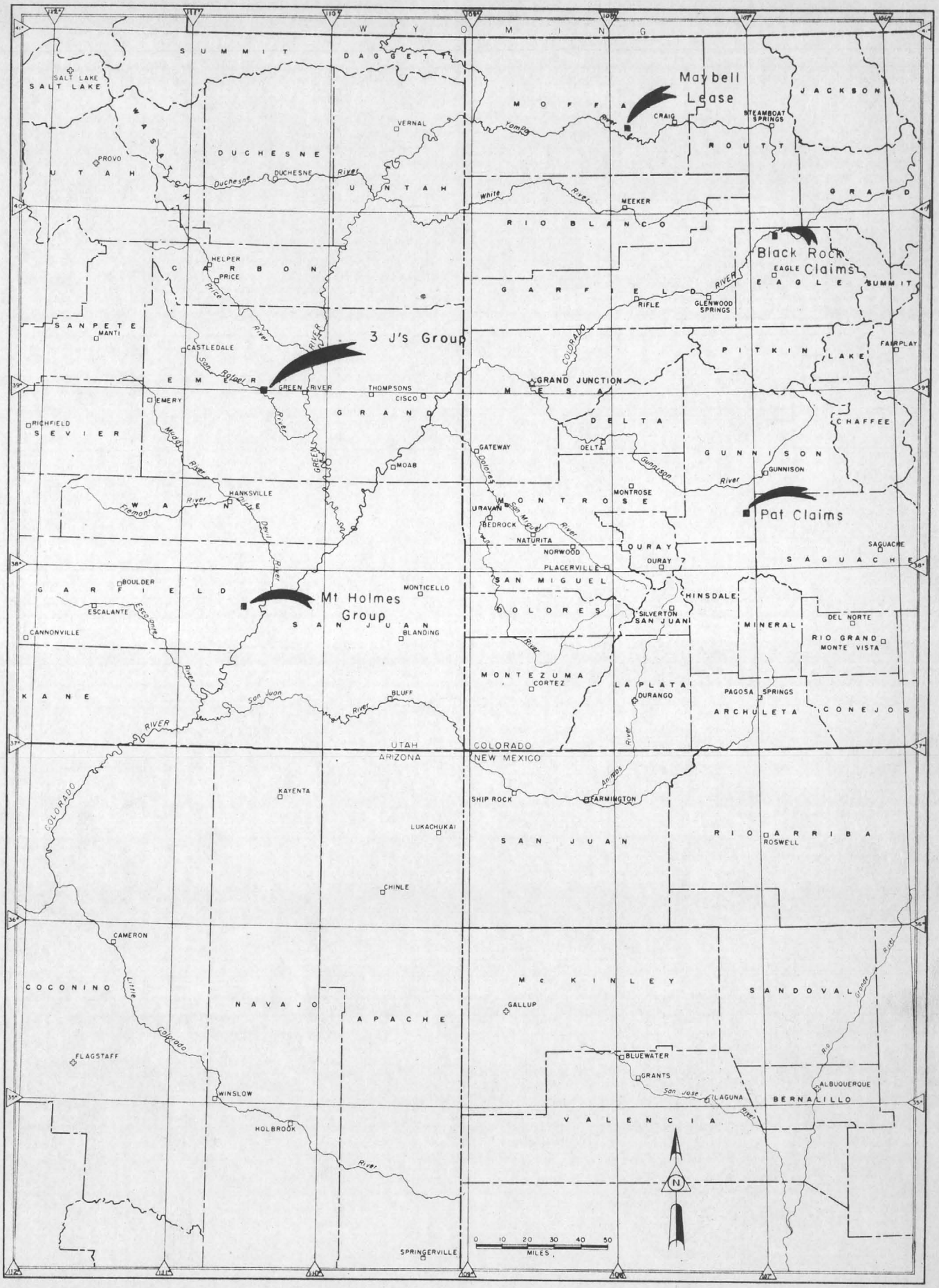


Fig. 1

Property location map