MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. 3420
Metal or Mineral Uranium
Date Received
Estimated Cost $49,890
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: ~~Atlas Minerals Inc.,~~
~~Moab, Utah.~~

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

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

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

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

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

(*b*) State any mine name by which the property is known.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise

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

(*e*) If you own the land, describe any liens or encumbrances on it

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

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

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

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

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

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

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

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

(*c*) The work will start within 60 days and be completed within 4 months from the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated July 1, 1954, 195__

ALMAR MINERALS INC.
(Applicant)

By Kenneth K. Ruddock

Vice - President

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

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

Almar Minerals Inc.
Moab, Utah

Form MF-103

DMEA Loan

UNITED STATES DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

1. NAME OF APPLICANT

(a) Almar Minerals, Inc.

Moab, Utah

(b) A Corporation, incorporated in the State of Utah.

(c) Mr. A.B. Ruddock, President

1000 Quimby Bldg.

Los Angeles, California

Mr. A.R. Ruddock, Vice-President

Moab, Utah

Mr. Billings R. Ruddock, Vice-President

1000 Quimby Bldg.

Los Angeles, California

Mr. Edward Neuhoff, Sec'ty - Treasurer

1000 Quimby Bldg.

Los Angeles, California

(d) Not applicable

GEOLOGICAL SURVEY
TEPCO
RECEIVED
JUL 19 1954
Denver

Almar Minerals Inc,
Moab, Utah.

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3. APPLICANTS PROPERTY RIGHTS

(a.) 15 unpatented lode claims, i.e. Surital 1 through 15 inclusive. These claims are located in sections 33 and 34, T. 30 S., R. 24 E., in the Big Indian Wash (unorg.) Mining District, San Juan County, Utah.

(b.) None

(c.) The claims for which DMEA assistance is being applied were purchased from Dr. George D. Doherty of Grand Junction, Colorado. Photostatic copies of the deeds, and contracts are attached.

(d.) See above

(e.) Under the contract executed with Doherty, 5% royalty is to be paid out of all ores shipped, but any payment to the government under the provisions of DMEA Order 1, dated March 7, 1952., is to be given precedence over any payment to Doherty. (See attached Exhibit).

ALMAR MINERALS INC.
Moab, Utah.

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3. APPLICANTS PROPERTY RIGHTS (CONT.)

(f.)

CLAIM NAME	BOOK NO.	PAGE NO.	COUNTY
Surital #1	73	410	San Juan
Surital #2	73	411	San Juan
Surital #3	73	412	San Juan
Surital #4	73	414	San Juan
Surital #5	73	415	San Juan
Surital #6	73	416	San Juan
Surital #7	73	416	San Juan
Surital #8	73	417	San Juan
Surital #9	73	418	San Juan
Surital #10	73	419	San Juan
Surital #11	73	420	San Juan
Surital #12	73	421	San Juan
Surital #13	73	422	San Juan
Surital #14	73	423	San Juan
Surital #15	73	424	San Juan

4. PHYSICAL DESCRIPTION

(a.) Geological study and surveying

(b.) None

(c.) Please see attached geological report

(d.) Approach roads to the area have been constructed. The town of Moab, Utah, 40 miles to the north over good paved roads is the principal shipping and supply point. Milling facilities are available at the Town of Monticello, Utah, 30 miles to the south over good paved roads, and buying stations and sampling plants are located at Moab and Thompson, Utah.

4. PHYSICAL DESCRIPTION (CONT.)

(e.) Manpower, materials and supplies are readily available from the Town of Moab, Utah.

Water for drilling purposes is available from reservoirs constructed by the AEC and from streams about 8 miles north of the claims. Water for domestic use can be obtained from the Town of La Sal, Utah.

Power must be supplied by a diesel generator.

5. THE EXPLORATION PROJECT

(a.) Uranium ores

(b.) The projected program will consist of reconnaissance and exploration drilling which will be executed in stages.

Stage 1 - Reconnaissance drilling on 2,000 foot centers to an average depth of 1,200 feet. Six holes will be drilled in this stage and will require approximately 7,200 feet of core and non-core type diamond drilling

5. THE EXPLORATION PROJECT (CONT.)

(b.) Continued

Stage 2 - Exploration drilling on approximately 1,000 foot centers to close the grid completed under Stage 1, outlined above. A total of 6 holes will be drilled, temporarily assuming uniform favorability, for an expended drilled footage under this Stage of 7,200 feet. All holes in this stage will avorgge 1,200'in depth. (See attached map)

The minimum total footage to be expended under this contract will be 7,200 feet and the maximum footage will be 14,400 feet, assuming favorable results under first stage drilling.

(c.) Work will commence immediately upon approval of the DMEA Loan by Government officials, or within 60 days of approval, and the program will be completed within 4 months from the date drilling commences.

(d.) Almar Minerals Inc. is currently operating the San Juan Shaft in the Big Indian Wash area. Almar Minerals Inc. is presently conducting other drilling operations on the Plateau.

5. THE EXPLORATION PROJECT

(d.) Continued - Mr. Jack L.McClelland, formerly assigned as assistant supervising geologist in the Big Indian Wash area by the USAEC, is Chief Geologist of Almar Minerals Inc. and will conduct the drilling program.

6. ESTIMATE OF COSTS

(a.) Several bids were solicited for the proposed drilling program. The companies submitting bids were the Swank Drilling Company of Moab, Utah, the Brown Drilling Company of Moab and the Moab Drilling Company.

The low bid was submitted by the Swank Drilling Company of Moab, Utah. The average price per foot is $ 3.25 for both core and non-core type drilling to depths of 1200 - 1500 feet. Standby time will be charged for at the rate of $10.00 per hour. (See attached bid).

1st Drilling Stage Cost

7200' @ 3.25	$ 23,400.00
Standby, 20 hrs @$10.00	$ 200.00
TOTAL DRILLING COST, STAGE 1	$ 23,600.00

ALMAR MINERALS INC.
Moab, Utah

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6. ESTIMATE OF COSTS (CONTINUED)

(a.) cont.

2nd Drilling Stage Cost

7200' @ $3.25	$23,400.00
Standby, 20 hrs @ $10.00	$ 200.00
TOTAL DRILLING COST, STAGE 2	$23,600.00
TOTAL DRILLING COSTS, Stage 1 and 2	$47,200.00
Bulldozer operation, 20 hrs, @ $12.00/hr	$ 240.00
(b) Geologist and Surveyor fees	$ 750.00

(c.) None

(d.) None

(e.) None

(f.) None

(g.) Analytical work

40 samples @ $5.00	$ 200.00
(h.) Contingencies	$ 1,500.00
Total contract cost, assuming drilling of both stages.....	$49,890.00
ALMAR PARTICIPATION @ 25 %	$12,472.22

ALMAR MINERALS INC.,
Maob, Utah.

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7.

(a.) Almar Minerals Ic. is prepared to furnish its share of the costs of the project.

(b.) Almars share of the costs will be furnished in cash payable upon demand.

CERTIFICATION

Dated July 54

APPLICANT

By Merritt K Paddock

G.W. Swank Drilling Co.
G.W. Swank, Owner

The following is estimated costs of drilling your property in Big Indian Wash.

1. Collar in Wingate & Kayenta

Minimum footage of 10,000', core 300'

Maximum footage of 25,000', core 800'

Will drill and core the above at $2.75 per foot. In the event it is necessary to hold rig on standby time waiting for probe unit, there will be a rate of $10.00 per hour standing. In the event it is necessary to wash out holes there will be a charge of $15.00 per hour for time rig and drill pipe is in use.

2. Big Indian Wash, collar in Navajo.

Max. footage 40,000' core 1,500'

Max. depth of 1,500'

Min. depth of 1,000'

Will drill and core the above at $3.25 per foot. In the event of standby time for probing, or other waiting time. While rig is standing, $ 10.00 per hour. In the event of going in to wash out hole, and rig and drill pipe is used a charge of $15.00 per hour will be made.

G.W. Swank Drilling Co.

Drilling Bid

GEOLOGIC REPORT ON THE SURITAL

CLAIMS 1 - 15

T. 30 S., R. 24 E.

Big Indian Wash Area ,

San Juan County, Utah.

By

Richard A. Teichman Jr.,

and

Jack I. McLelland

June, 1954.

Geologic Report

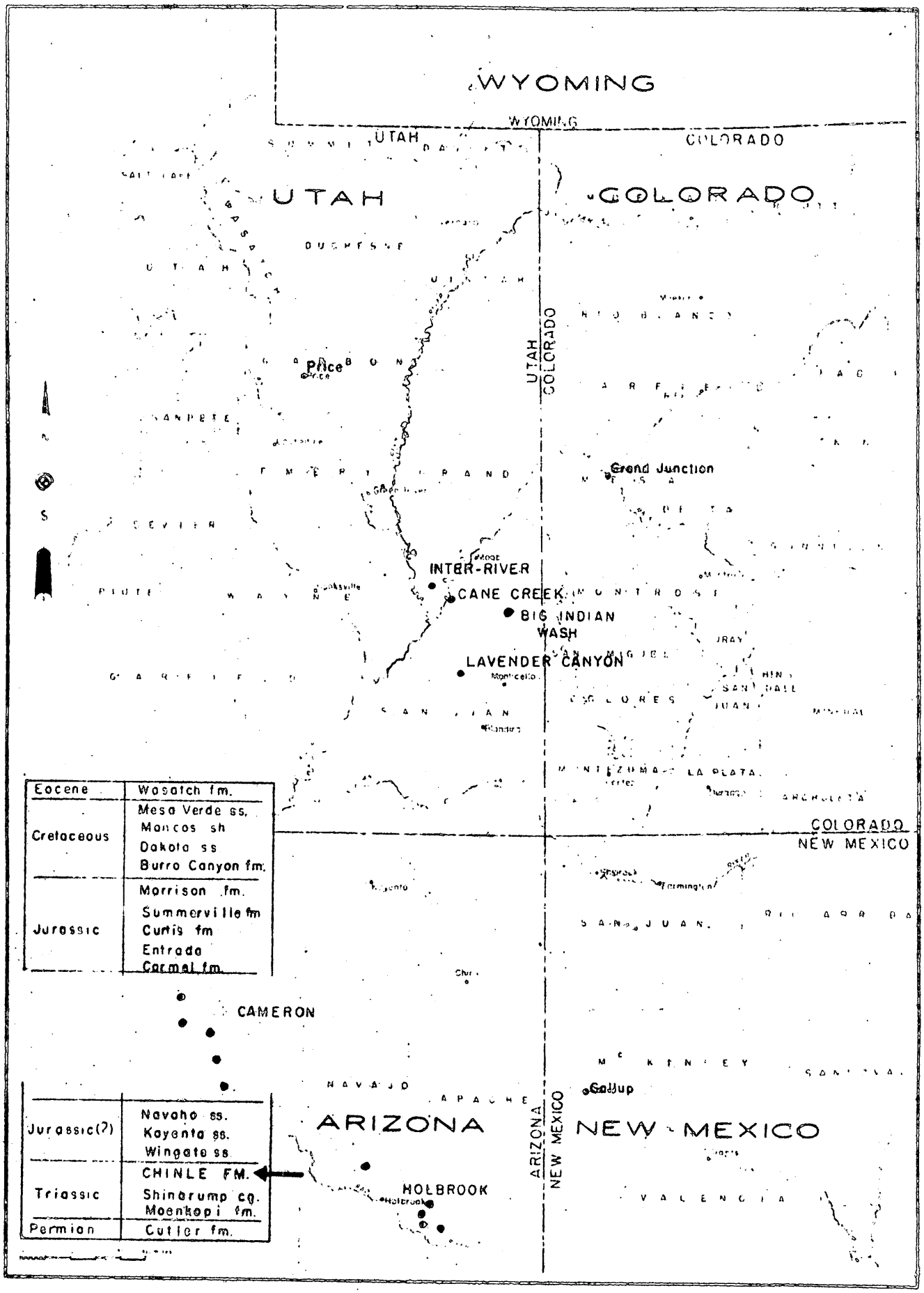

FIGURE - 1 Location Map, Lower Chinle Formation (Mossback) Deposits.

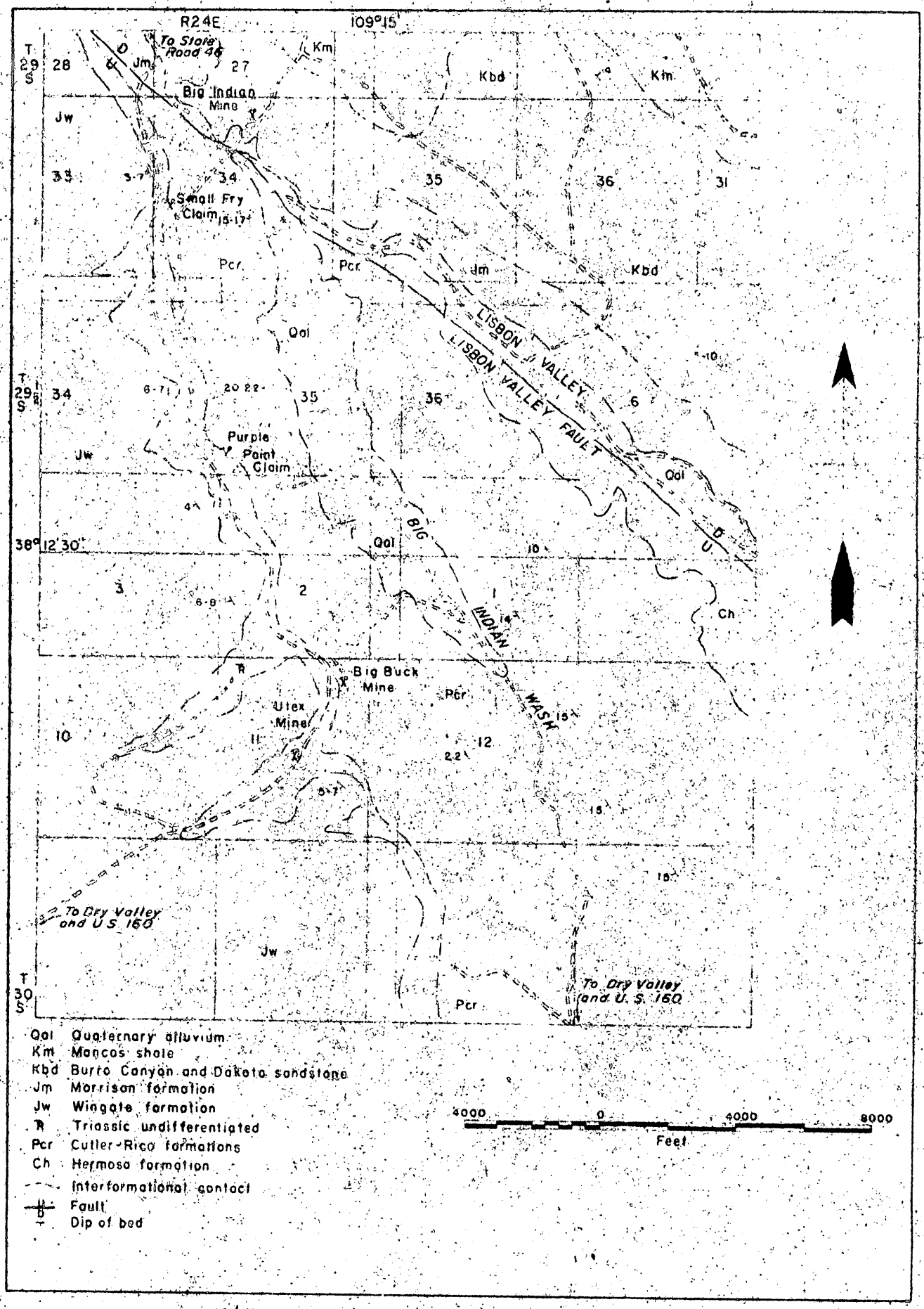

Figure 8. Geologic map of Big Indian Wash, San Juan County, Utah

INTRODUCTION:

During the months of May and June 1954, a reconnaissance of the Surital claims in the south Big Indian wash district was undertaken at the request of the ~~Sal Uranium~~ ALMAR MINERALS Company of Moab, Utah, to determine whether or not sufficient justification existed to recommended the above named properties for a DMEA loan under the provisions of DMEA Order 1, dated March 7, 1952. (Subsequently ammended to provide assistance for uranium exploration in the amount of 75% of the total.)

Specifically the objectives of the reconnaissance were:

1. to assess the potential of the Surital claims, compared to that of surrounding favorable ground.
2. to determine whether or not ore trends could be projected from known productive areas within the district into the area in question
3. to evaluate the information available from surrounding properties to determine the probability of discovering an ore body of commercial size within the confines of the Surital claims.

Approximately three square miles of property were examined during the course of the reconnaissance. Both reporting geologists are thoroughly familiar with the geologic setting of the entire district having been employed in the Big Indian wash area by the United States Atomic Energy Commission until May 1, 1954, as supervising

geologists. One of the reporting geologists has been active in the area since May 1954 as Mine Superintendent at the Cal Uranium Company San Juan Shaft which is operative about 6 miles north and east of the Surital claims.

The Surital claims are located in sections 33 and 34, T. 30 S., R. 24 E., Big Indian Mining District (unorg.), San Juan County, Utah.

LOCATION AND ACCESSIBILITY

Big Indian Wash begins 9 miles south of the town of La Sal, Utah. and extends south from that point for 5 miles. An escarpment parallels the wash for approximately 4 1/2 miles to the point where the wash turns west to drain into the Colorado River. This escarpment contains several mineralized outcrops in the Permian Cutler and Triassic Chinle formations.

The Big Indian Wash area is located within Townships 29, 29 1/2,30 S., and Ranges 24 and 25 East., Salt Lke. Principal Meridian. From Moab, Utah the Surital claims can be reached by travelling 36 miles south on U.S. Highway 160, a good paved road, thence east for approximately 6 miles to the claims, over a good county maintained gravelled road.

Ore from the area is being shipped either 38 miles to the mill at Monticello, Utah, or 60 miles to the buying station at Thompson, Utah. A sampling plant is being constructed at Moab and will be completed shortly.

PAST AND PRESENT MINING ACTIVITY

Three large mines are active in the Big Indian Wash area at the present time. These are:

1. The Cal Uranium Company San Juan Shaft
   (6 miles NNE of the Surital claims)
2. The Utex (Steen) mine
   (4 miles NNE of the Surital claims)
3. The Continental Uranium Co. Mine
   (7 miles SE of the Surital Claims)

In addition to the above listed properties two other large properties are being actively developed in the area. These are :

1. The Little Beaver Property (driving adit)
   (5 1/2 miles NNE of the Surital claims)
2. The Homestake property (sinking a shaft)
   (6 miles NNE of the Surital Claims)

The United States Atomic Energy Commission has a large reconnaissance camp located in the central part of Big Indian wash. The Commission is not now actively engaged in drilling, but the assigned personnel are gathering data and assisting private individuals and companies in their exploration programs. Gamma ray drill hole logging service is also being supplied.

Production of uranium and vanadium ores from the district has been confined to the Permian Cutler formation and the Triassic Chinle formation. The lower portion of the Chinle formation (Mossback) is by far the largest producer. The permian Cutler formation has produced sporadically since 1948, but the ore grade is low and the mines have been inoperative for many months.

During the first World War, the Ohio Copper Company mined a large amount of copper carbonate ore of unknown grade from a deposit located on a fracture zone in the northern part of the wash.

The Utex Exploration Company began producing from the Utex mine in November of 1952 and is using a modified room and pillar method of mining. Very little timber is used in the workings, but a large number of roof bolts have been used to advantage. Production in the Utex mine is from the Mossback member of the Priassic Chinle formation.

The Cal Uranium Company of Moab, Utah, has sunk a two-compartment 'cribbed' shaft into an ore body 6 miles north-northeast of the Surital Claims. Development work has been completed and ore is being shipped on a regular schedule.

The La Sal Mining and Development Co. recently sold its holdings to the Homestake Mining Co. and operation preceding the sinking of a large shaft are underway. The property is located immediately west of the San Juan Shaft. It is anticipated that the Homestake shaft will be sunk to the 600 foot level.

The Continental Uranium Company of Grand Junction, Colo. has located a large ore body in the southern part of Big Indian Wash. Development work has been completed and ore is being

shipped.

GEOMORPHOLOGY AND CLIMATE

The Big Indian Wash district has an elevation ranging from 6,400 feet to 7,100 feet. Two prominent east-facing cuestas (fig.-3) are the major land forms. The western-most cuesta is capped by the Jurassic Wingate sandstone which has been eroded parallel to the stratification of the dipping beds, and is the most important land form. One mile to the northeast, across an alluvium filled valley, is the second prominent cuesta formed by the Hermosa Limestone of the Pennsylvanian. Facing the Hermosa cuesta across the Lisbon Valley is the Burro Canyon memberof the Cretaceous Dakota formation. The Lisbon Valley is formed by the Lisbon Valley fault and shows the amount of displacement along the fault by having Dakota and Hermosa facing each other.

In the Lisbon Valley - Big Indian Wash area, streams are subsequent, intermittent and in a stage of early maturity. Severl obsequent canyons have developed in areas where cross-jointing is prominently developed.

After leaving the valleys the streams are consequent and of late maturity. A trellis pattern is formed by the cuestas. Drainage for the area as a whole displays a dendritic pattern. The northern third of Lisbon Valley drains westward through Big Indian Wash to Hatch Wash, thence to the Colorado River, whereas the southern part of Lisbon Valley drains westward to the Dolores River. The streams in the area are at present in a stage of downcutting due to rejuvenation.

The climate is semi-arid with sparse amounts of rain and snow. Precipitation amounts to less then 20 inches a year.

Vegetation consists of sage and cactus and small pinon and juniper trees.

Working conditions are good throughout the year, although seasonal rains and snows make some roads temporarily impassable.

GEOLOGY

Previous reports on the Big Indian Wash district are:

1. Interim Report on the Examination of Big Indian Wash Uranium Properties, San Juan County, Utah, April 1949, by Charles M. Nasor.

This report recommended that the Pre-Salt wash formations in the Big Indian Wash district be studied in detail.

2. The Uranium Deposits of Big Indian Wash, January 1953, by George P. Dix, Jr.

This report recommended ~~an~~ investigative drilling program in the Big Indian Wash district.

3. Bureau of Mines Information Circular 7669: Uranium Mining Operations of the Utex Exploration Company in the Big Indian Wash District, San Juan County, Utah, October 19, 1953, By Steen, Dix, Hazen and McLellan.

This report briefly described mining operations, geology and the mineralogy of the Utex mine.

4. Geology and Ore Deposits of the Big Indian Wash District, by Teichman, R., McLelland, J., and Fick, H, 1954, USAEC. (unpub.)

This report covers the geology and structure of the Big Indian Wash district, and the paragenesis of the areas.

The rocks exposed in the Big Indian Wash district range in age from the Pennsylvanian Hermosa Limestone to

the Jurassic Navajo formation. The principal uranium bearing horizon is a sandstone member in the lower part of the Triassic Chinle formation which has been tentatively identified as the Mossback member of the Chinle formation.

TECTONIC STRUCTURE

Big Indian Wash is located midway between two major laccolithic intrusives; the La Sal Mountains and the Abajo Mountains, and approximately one mile east of the Lisbon Valley-Dolores anticline. The Lisbon Valley-Dolores anticline trends northwest from a point 20 miles east of Upheaval Dome in the Inter River area northwest of Moab, Utah.

Determination of the attitude of and displacement along the Lisbon Valley fault is difficult due to the presence of alluvium in the fault zone. However, present field evidence from crossections and drill hole data show the fault to be hinged at the north and reaching a maximum displacement of approximately 5,000 feet east of the Big Indian Rock, and 'horse tailing' out in the south.

A pronounced joint system is present in the Big Indian Wash district and aerial photographs indicate that in the northern part of the district, where private development is currently centered, the joints strike northwest. In two places, as seen from aerial photographs, closely spaced conjugate joint sets exist. These two areas are in the vicinity of Steen's canyon and the Canyon immediately north of Steen Canyon. This well-developed conjugate joint set doubtless influenced the canyon development.

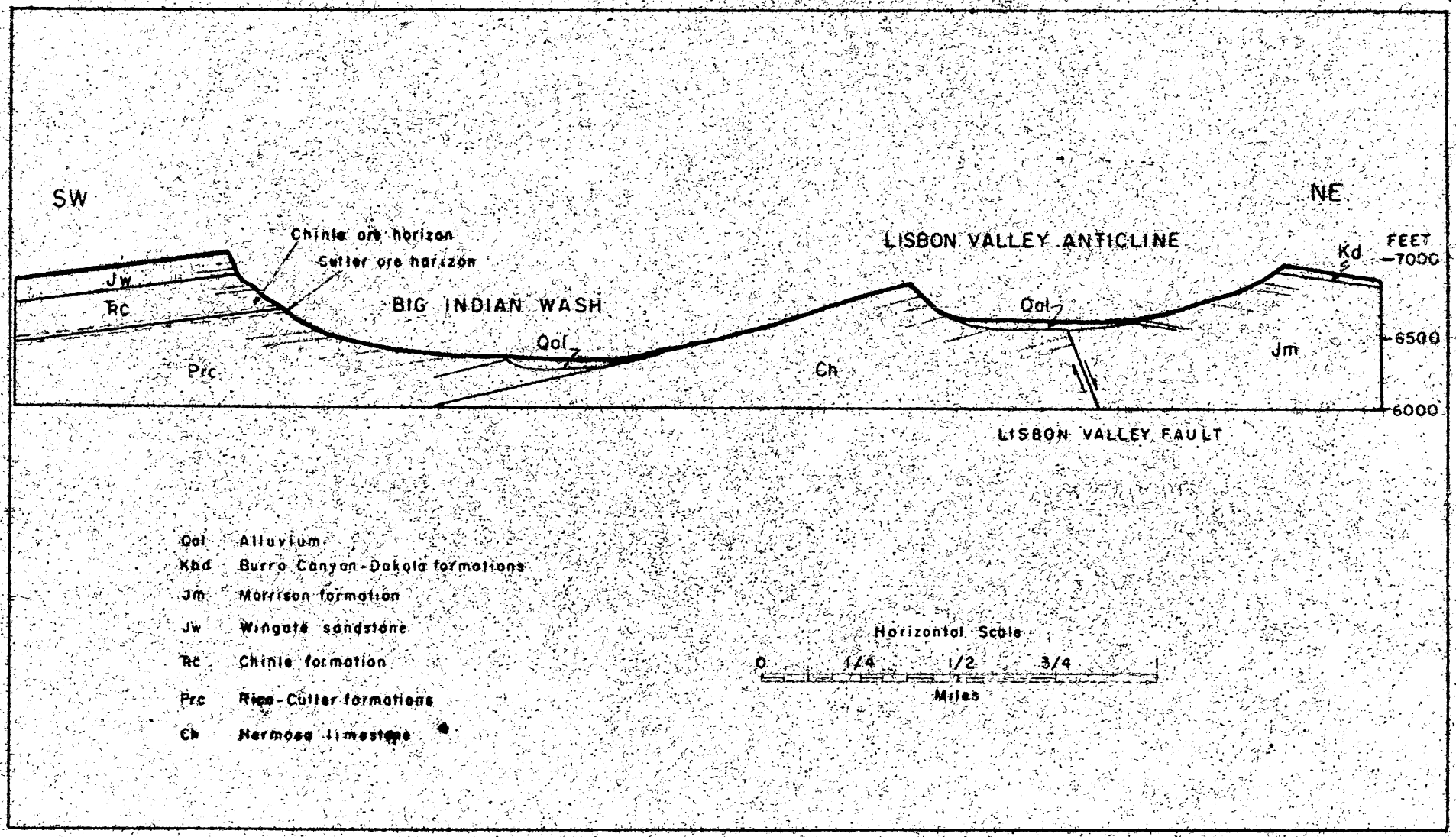

Figure 3. Geologic section across Lisbon Valley Anticline in the vicinity of Utex and Big Buck Mines, San Juan County, Utah

ECONOMIC GEOLOGY

In the Big Indian Wash area, uranium mineralization is found in the lower part of the Chinle formation (Mossback) and in the upper part of the Permian Cutler formation. The mineralized zone within the Chinle formation is exposed immediately east of the Utex mine. Mineralization within the Cutler formation is confined to 5 arkosic lenses. Four of these lenses are within a hundred feet of the Cutler-Chinle contact and one is within 150 feet of the contact.

CHINLE DEPOSITS

A continuous outcrop of the Chinle ore horizon composed of sandstone, siltstone, and conglomerate extends for eight miles across the Big Indian Wash area, and south into Lisbon Valley. Mineralization has been noted on the rim in the northern, central and southern parts of the area. Five large ore deposits have been discovered during the course of development drilling. (Mentioned previously)

Study of the cores in the northern part of the area indicated that the ore is principally disseminated uraninite, and is confined to closely spaced horizons within the lower Chinle formation (Mossback).

The host rock consists of a gray, medium-grained, poorly cemented, micaceous sandstone, to a gray-green siltstone. The ore horizons are seperated by one to two feet of barren sandstone and siltstone. These barren mudstones are composed of the illite and montmorillonite-type clays. The sandstone contains pyrite and marcasite. Muscovite is found along the bedding planes. Calcite is the most common cementing material, and is accompanied by iron oxides and vanadium minerals.

Thin sections have been cut and autoradiographs made by the United States Atomic Energy Commission of selected ore-bearing samples from the lower part of the Chinle (Mossback) formation. Autoradiographs of the thin sections show a few alpha tracks and clusters originated from black, opaque specks in altered feldspar grains or on their borders. The following ore and gangue minerals have been identified from the lower Chinle deposits in Big Indian Wash:

carnotite	pyrite	rutile
tyuyamunite	muscovite	zircon
montroseite	orthoclase	epidote
doloroseite	chert	garnet
corvusite	quartz	magnetite
uraninite	calcite	pyrolusite
		greenockite
		sphalerite
		galena

Paragenesis shows this depositional order; detritals, authigenic quartz, cement and lastly ore minerals. The cement is made up of several materials: calcite, clay, barite and chlorite. Their times of depositation are possibly simultaneous. One thin section from the Continental Uranium Company deposit is of interest. It shows a pyrite band deposited before the ore minerals on the contact of the fine and coarse textured material, and it has incompletely replaced all detritals and matrix except zircon. Detrital quartz is a abundant in all thin sections except those of the limestone conglomerates. These conglomerates are granule to pebble in size and the presence of quartz-feldspar lenses show the interbraiding of different source material within the lower Chinle (Mossback). The quartz grains show corrosion b y earlier solutions than the cement. Calcite is the most abundant cementing material and it replaces feldspars; it in

turn is replaced by later ore minerals. On the basis of paragenesis the ore minerals it can be said that the Mossbake deposits in this area are similar. There are some small differences, however. Those are more silica cement, lack of barite and the lack of tyuyamunite in the Continental Uranium Company deposit in the southern part of the wash. These differences may be small on the basis of further core study.

ORE DEPOSITS

In the discussion of the deposits in the Big Indian Wash area only those deposits in the northern part of the wash will be considered. At present 5 large deposits have been located by drilling and are being actively exploited. They are: (see map)

1. A Steen discovery in the central part of the wash. Approximately 3,500 feet long and 1,500 feet wide. (As of May 1, 1954.)

2. The Cal Uranium - Maimie deposit in the northern part of the wash. Approximately 2,500 feet long and 1,500 feet wide.

3. The Hudson discovery in the northern part of the wash. Approximately 300 feet long and 600 feet wide and as yet undeveloped.

4. The Homestake (Little Beaver) property immediately southwest of the Steen deposit and probably contiguous. Dimensions unknown, but tonnage about 40,000.

5. The Continental Uranium Co. deposit in the extreme southern part of the wash. Extent of the deposit known not, but about 60,000 tons.

The Steen deposit is elongated in a northwesterly direction, and it is the only deposit that shows any degree of

linearity.

It is to be noted that the strike of the other deposits varies radically from one to the other. It appears at this time that a combination of structure and favorable lithology were the basic controls of deposition on the Hudson property.

In using the apparent size of ore bodies to determine drill hole spacings the following criteria have been used:

$$\text{Probability} = \frac{\text{target size (size of ore bodies)}}{\text{area of elementary figure (spacing)}}$$

In computing the spacings necessary to find ore on strongly mineralized ground it has been found that initial drill hole spacings of 1,000 feet are more than adequate to explore ground within the Big Indian Wash area. This, of course, is based on the assumption that the basic central, lithology, is a factor to which no value can be given in outlining a drilling program. Further refinement of a drilling grid based on statistical probability can be had by using to advantage increasing gamma ray values taken from subsurface gamma ray logs through the ore-bearing horizon. The appearance of a favorable lithology, in this case an arkosic sandstone is another factor to be considered in projecting drilling patterns or trends, but this factor has not yet been fully evaluated.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions have been reached during the course of the reconnaissance investigation of the Surital claims:

1. The Surital claims appear to favorably located with respect to known ore deposits in the Big Indian Wash area. No mines are operative near the property, but mineralization has been observed on outcrops east of the claims. (See attached map).
2. No criteria have yet been developed for the Big Indian wash area which would allow of prediction of ore trends into the area covered by the Surital claims. However, considering the possibility of extension of the mineralization noted on the outcrop to the east of the property, the following is recommended:

    1. It is recommended that a limited exploratory drilling property be conducted upon the property. (Limited considering the depth of hole required to penetrate the ore horizon).
        a. The drilling program should be accomplished in stages; the first stage to consist of 6 holes spaced on 2,000 foot centers to an average depth of 1200 feet.
        b. Should favorable results be encountered during the first drilling stage it is recommended

that stage 2 be drilled. Stage 2 will consist of 6 holes spaced on 1,000 foot centers to an average depth of 1,200 feet, to delineate the favorable ground located under stage 1. (The drilling stage map is idealized)

No drilling has been done in the area immediately surrounding the Surital claims, but both the National Lead Company and the Roberts Construction Company of California plan extensive drilling projects shortly. (See map)

Initial drilling will be designed to locate favorable ground and subsequent drilling to delineate the favorable ground. Due to the depth of hole, no provision has been made at this time for continued drilling in the area beyond stage 2. Evaluation of the results of the two drilling stages will provided the information necessary for further planning

CONTRACT FILE

1. Quit Claim Deed
2. Contract of Sale

CONTRACT OF SALE

This contract of sale made and entered into on the 27th day of May, 1954, by and between GEORGE O. DOHERTY and [illegible] A. DOHERTY, his wife, of [illegible] Junction, hereinafter referred to as SELLERS and [illegible] MINERALS COMPANY, a Utah corporation, hereinafter referred to as BUYER,

[redacted]

WHEREAS, the SELLERS are the owners of certain unpatented mining properties located in San Juan County, State of Utah, and whereas the notices of location are recorded in the County Recorder's of said county and whereas the name, book and page where each of the aforesaid notices is recorded are as follows:

NAME	BOOK	PAGE
Surital #1	73	410
Surital #2	73	411
Surital #3	73	412
Surital #4	73	413
Surital #5	73	414
Surital #6	73	415
Surital #7	73	416
Surital #8	73	417
Surital #9	73	418
Surital #10	73	419
Surital #11	73	420
Surital #12	73	421
Surital #13	73	422
Surital #14	73	423
Surital #15	73	424

WHEREAS, the SELLERS desire to sell the aforesaid mining properties and the BUYER wishes to purchase the same upon the terms and conditions hereinafter provided.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter contained it is agreed as follows:

1. The SELLERS hereby agree to sell to the buyer the above described mining properties and the BUYER agrees to pay therefor

LAW OFFICES
REYNOLDS AND DIXON
21 MAIN STREET
MOAB, UTAH
MOAB 2001

the sum of One thousand one hundred dollars ($1,100.00) as advanced minimum royalty and thereafter the BUYER AGrees to cause to be paid to the SELLERS a five per cent (5%) gross royalty on all ore mined, shipped or sold from the above described mining properties which shall include five per cent (5%) royalty on all bonus or premium payments made by any governmental agency of the United States; provided, however, in calculating the five per cent (5%) gross royalty haulage and development allowances shall be deducted from gross receipts. It is specifically agreed and understood that the five per cent (5%) gross royalty hereinabove provided shall be paid to the SELLERS only from mining operations conducted by the BUYER, ALMAR MINERALS COMPANY or its agents during any period of time when the buyer shall hold title to the properties sold hereunder. In the event that ALMAR MINERALS COMPANY, the BUYER, shall sell the aforesaid mining properties the five per cent (5%) gross royalty hereinabove provided shall terminate, expire and be of no further force or effect upon such a sale; provided, however, in the event of such a sale by the BUYER, the SELLERS shall receive five per cent (5%) of such sale price.

2. It is mutually agreed and understood that the One thousand one hundred dollars ($1,100.00) to be paid to the SELLERS shall be paid upon completion of all necessary staking and filing of notices of lode application ~~[illegible]~~ as hereinbefore provided.

3. The SELLERS covenant and agree to do all things, to take all steps necessary ~~[illegible]~~ to take advantage of legislation validating the aforesaid mining properties as mining claims.

4. Contemporaneously with the execution of this contract

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21 MAIN STREET
MOAB, UTAH
MOAB 2001

QUIT CLAIM DEED

GEORGE O. DOHERTY and [illegible], of [illegible], GRANTORS, hereby forever quit claim to ALMAR MINERALS COMPANY, a Utah Corporation, GRANTEE, for and in consideration of the sum of Ten and no/100 Dollars ($10.00) and other good and valuable consideration all of GRANTORS' right, title and interest in and to the following described unpatented mining properties located in San Juan County, and being as follows, to wit:

NAME	BOOK	PAGE
Surital #1	73	410
Surital #2	73	411
Surital #3	73	412
Surital #4	73	413
Surital #5	73	414
Surital #6	73	415
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Surital #9	73	418
Surital #10	73	419
Surital #11	73	420
Surital #12	73	421
Surital #13	73	422
Surital #14	73	423
Surital #15	73	424

Together with all metals, ores, gold and silver-bearing quartz, rock and earth, together with all carnotite, uranium, vanadium and fissionable bearing ores located thereon; and all dips and spurs, rights, privileges and franchises, tenements, hereditaments and appurtenances thereto incident or belonging, or therewith used and enjoyed, and all the estate, right, title, interest, property claim and demand whatsoever, legal and equitable, as well in possession as in expectancy, of the GRANTORS, of, in or to said premises, and every part thereof.

WITNESS THE HANDS of the GRANTORS the 24 day of May, 1954.

LAW OFFICES
REYNOLDS AND DIXON
21 MAIN STREET
MOAB, UTAH
MOAB 2001

George O. Doherty
GEORGE O. DOHERTY

Caroline T. Doherty
CAROLINE T. DOHERTY

STATE OF UTAH)
) ss
COUNTY OF GRAND)

On the 24th day of May, 1954, personally appeared before me GEORGE O. DOHERTY and [illegible], the signers of the foregoing instrument, who being first duly sworn, acknowledged to me that they executed the same.

[illegible]
Notary Public, Residing in
Grand County
Utah

My Commission Expires:
February 18, 1955

MAP FILE

1. Index Map; Big Hid. Wash
2. Drill Stage Map

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ATOMIC ENERGY COMMISSION

COMPILATION OF PHOTOGEOLOGY AND SURFACE GEOLOGY
COLORADO PLATEAU AREA, UNITED STATES

TRACE ELEMENTS MEMORANDUM REPORT 380 - A

EXPLANATION

QUATERNARY

Qal — Alluvium (Valley fill and terrace gravel)

CRETACEOUS

Km — Mancos shale

Kbd — Burro Canyon formation and Dakota sandstone, undifferentiated

JURASSIC

Upper and Lower: Jm, Jmb, Jms — Morrison formation. Brushy Basin shale member, Jmbb; Salt Wash sandstone member, Jms

Upper: Js — Summerville formation

Upper and Middle: Jem, Jel — Entrada sandstone. Moab tongue, Jem; lower unit, Jel

Jc — Carmel formation

Jn — Navajo sandstone

Jk — Kayenta formation

Jw — Wingate sandstone

TRIASSIC

Upper (?): R — Triassic rocks, undifferentiated

PERMIAN

Prc — Rico ? Cutler formations, undifferentiated

Contact (Can be accurately located within 30 feet horizontally)

Contact (Can be approximately located within 30 to 200 feet horizontally)

Contact (Cannot be located accurately; probable error greater than 200 feet)

Probable or doubtful contact

Fault (Dashed where approximately located. U, upthrown side; D, downthrown side)

Strike and dip of beds (Based on photo-interpretation)

Horizontal beds

Mine or quarry

Prospect or open cut

Primary road

Secondary road

Trail

Fence

BASE MAP COMPILED BY SOIL CONSERVATION SERVICE
U. S. DEPT. OF AGRICULTURE

MT. PEALE QUADRANGLE

TRUE NORTH

PHOTOGEOLOGIC MAP
MT. PEALE - 11
SAN JUAN COUNTY, UTAH

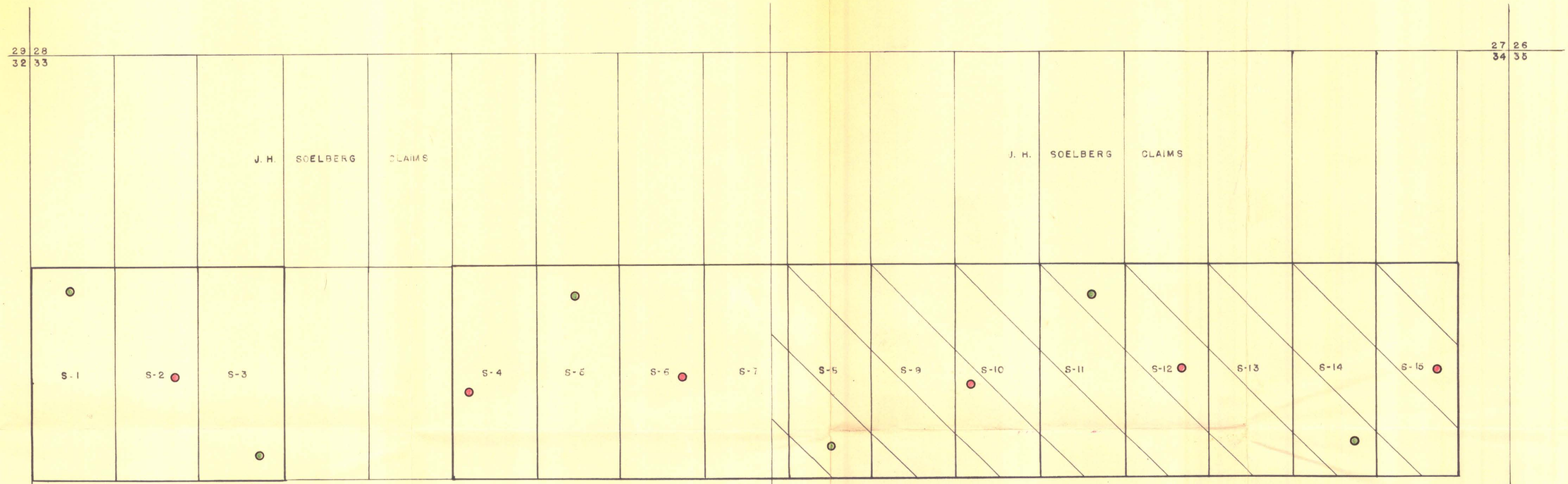
PHOTOGEOLOGY BY R. J. HACKMAN AND G. E. TOLBERT
SCALE 1:24,000
1 MILE

REVISED OCTOBER 1952

Stratigraphic column modified from U. S. Geol. Survey Bull. 841 and U. S. Geol. Survey Strategic Minerals Inv., Geologic map of vanadium region of southwestern Colorado and southeastern Utah, by R. P. Fischer, 1944.

11

U 287 NE



ALMAR MINERALS INC.

SURITAL CLAIMS

NO.S 1-15

BIG INDIAN WASH DIST.

SAN JUAN COUNTY, UTAH

T 30 S, R 24 E

OIL & GAS LAND

SCALE 1"-500'

5 4 3 2 1 0 500

DRILLING STAGES

STAGE #1

STAGE #2