4701

224 New Customhouse
Denver 2, Colorado

June 19, 1957

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket DMEA 4701 (Uranium) Wesley Anderson et al., (Jill et al., Claims) Harding County, South Dakota

Enclosed are the original and three copies of the Joint Report of Examination on the subject property by E. O. Binyon, USBM, and Walden P. Pratt, USGS.

The field examiners conclude that the probability for making a significant discovery is sufficiently promising to justify Government participation. Accordingly they recommend that the Applicant's work proposal be approved as modified by them to which the Field Team concurs.

Also enclosed are nine extra copies of Figure 2 for possible use in the preparation of the contract.

Original signed by
W. H. KING

W. H. King
Executive Officer

Enclosures

MHM:eh

cc: Harshman
DMEA/DFC (2)
Thurlow
Docket
Jones
Chron.

W/copy of Subject Report

Reviewed by
DMEA OPERATING COMMITTEE

(date)

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DMEA
RECEIVED 1957
DATE | INITIALS | CODE

OFFICE OF MINERALS EXPLORATION

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

SEP 16 1958

Messrs. Wesley Anderson,
Allen Burns, J. Donald Burns,
and Bob Fleming
Bowman, North Dakota

Re: Docket DMEA-4701 (Uranium)
Contract Ian-Kilis
Wesley Anderson, et al.,
Partnership
Harding County, South Dakota

Gentlemen:

The subject Contract required that you commence and complete three stages of exploration work during the month of September 1957. All efforts of this agency since that time in correspondence and conversations to obtain a specific proposal from you concerning the performance of Stage 1 work have been unsuccessful.

In these circumstances, it is not in the best interest of the Government to participate in the subject project and the Government hereby rescinds, revokes and cancels the subject Contract as of the date thereof.

Sincerely yours,

C. O. Mittendorf

ACTING Director

Copies to:
Messrs. Burns, Burns, and Fleming

HCRubin/hm 7/23/58
cc: DMEA Docket
Admr. reading file
Operating Committee
Mr. Kiilsgaard, Rm. 5224
Mr. Bishop
DMEA chron.
Field Team (Reg. III) - 2 copies
Mr. Rubin
Mr. Dwyer

MF-103
(Revised April 1952)

Use 8

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DMEA

DEPARTMENT OF THE INTERIOR
MAR 20 1957
REGION III
DENVER, COLORADO

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. 4701
Metal or Mineral URANIUM
Date Received 3-28-57
Estimated Cost $24,975
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. [illegible], Aaron Young, J. Peter Young, and [illegible]. The applicants are individuals, and the mailing address for each of them is Tourgen, North Dakota.

(*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. Not applicable.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. Not applicable.

(*d*) If a partnership, add to the above statement the names and addresses of all partners. Not applicable.

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. These contain uranium mining claims in the North Cove Hills area of Harding County, South Dakota, which are listed on the accompanying paper attached hereto. These claims are outlined in red on the map attached as Exhibit No. 1.

(*b*) State any mine name by which the property is known. Davis Drew Group of Claims.

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

(*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. Not applicable.

(*e*) If you own the land, describe any liens or encumbrances on it. There are no liens, encumbrances or adverse claims of any kind.

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

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 accompanying paper.

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

(*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. See accompanying paper.

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

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

16—66551-1

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

(*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. See accompanying paper

(*c*) The work will start within [illegible] days and be completed within [illegible] 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. See accompanying paper

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: See attached sheet

(*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)? Yes.

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

☒ 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 March 15, 195?

Wesley Anderson (Applicant)

By Alfred Burns (Applicant)

J Donald Burns (Applicant)

Bob Fleming (Applicant)

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

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UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

ACCOMPANYING PAPER RELATING TO DMEA APPLICATION OF:

Wesley Anderson, Allen Burns; J. Donald Burns; and Bob Fleming.

There being insufficient space on the printed form for all information required in the captioned application, the following additional information is given in connection with the respective instruction numbers indicated, to-wit:

3. There is no organized mining district in the vicinity of these s. Their geographic location in relation to section, township and range s is indicated on the map attached as Exhibit No. 1. The names of said and the book and page numbers for the respective recorded location notices, in the Records of Harding County, South Dakota, are as follows:

Claim Name and No.	Book No. (Miscellaneous Records)	Page No.
Burns No. 2	23	177
Burns No. 3	23	25
Jill No. 1	15	178
Jill No. 2	15	173
Jill No. 3	15	178
Jill No. 4	15	172
Jill No. 5	15	203
Jill No. 6	15	172
Jill No. 7	15	178
Mike No. 1	15	172
Mike No. 2	15	172
Mike No. 3	15	203
Jack No. 7	15	179
Bob No. 2	15	187
Bob No. 4	15	188
Bob No. 6	15	189
Al No. 1	15	189
Al No. 2	15	189
Al No. 3	15	190
Al No. 4	15	190
Al No. 5	15	206
Al No. 6	15	190
Al No. 7	15	190

4(a). There have been no mining, mine workings, or production facilities conducted on this property. The map attached as Exhibit No. 1 illustrates the exploratory operations, which consist of drill roads, drilling and dozer work, exposing the outcropping of a continuous uranium bearing vein of lignite. One can drive to any of these workings in a passenger automobile.

4(b). There has been no past or current production. No ore reserves have been established. However, the lignite beds carrying uranium are believed to be continuous, and the uranium has been found to be of a commercial grade.

4(c). The vein or bed to be explored is in the Fort Union Formation of the Tongue River member. It is the upper bench of the D bed or vein. As far as we have been able to determine, the mineralization is consistent throughout this vein, and the vein is also very consistent, excluding the locations that have faults or slides. The mineralization consists of a commercial grade of uranium, averaging 0.20% U_3O_8. We wish to explore more of the vein to determine the depth, thickness, and value of the vein. This will provide the basic data necessary to carry on further explorations, if then needed, and valuations to calculate for any subsequent development program.

4(d). This project is easily accessible by County and Forest Service roads, and by roads which we have built. Some of these roads are dirt, and chains are required after it rains. It is two miles from the black top to the beginning of the project site, with an additional ten miles of graded road to the far side of the project. It is 27 to 30 miles, mostly on black top, to Bowman, North Dakota, where there is ample shipping, supply and residence facilities.

4(e). Most of the manpower, materials, supplies, equipment, water and power will be obtained at Bowman, North Dakota, or Buffalo, South Dakota. These towns are equidistant from the project, and ample supplies are available at either. There is underground water on the project but no surface water, except for reservoirs.

5(b). We propose to build a drill road with a bulldozer, which will be just a simple path, so that the drilling equipment may follow and set up on the level at the site of each drill hole.

The first line of drilling and dozer road will be on top of the rim rock following the escarpment at an approximate distance of 50 to 100 feet from the edge. These test holes will be spaced 300 feet apart along this upper or first line of drilling. The holes will range from 130 to 150 feet deep. The reason for starting at the top and working down is to prevent the dozer operations from pushing dirt and rock on the workings below.

The second line of drilling and drill road will be below the escarpment or face on a horizontal plain, with exploratory holes drilled about 70 feet deep and 300 feet apart. The holes will be varied according to the contour or terrain. A horizontal or level line of drilling and drill road is less expensive, as it avoids drilling on the face of a cliff. Also, with a horizontal plain, drill holes will be started at approximately the same level, and ore will be encountered at the same depth in the various holes.

The next or third line of drilling will also be on a horizontal plain, with a depth of about 40 feet, placed 300 feet apart. The fourth line of drilling and dozer road will be on the D bed itself, exposing the vein. Drilling from that point will reach the lower bench of the D bed and will run as much as 25 feet below the vein. This lower bench will average over three feet in thickness. It is mineralized throughout. Again, drilling will be 300 feet apart. At this point we would also take samples along the exposed outcrop, at regular intervals, for chemical assay.

The next or fifth line of dozer work (without any drilling) will expose the lower portion or bench of the D vein. This dozer work should expose 50 feet of vein, then jump 100 feet, before exposing another 50 feet, and so on until the vein is completed. There will be some variations on this lower line. In places it will not be practical to follow a set pattern because of the large amount of overburden that must be removed, or because roads for reaching the vein would fall on cliffs and faces. Chemical assays will also be taken along the outcrop at regular intervals, where the outcrop is exposed. More chemical assays are necessary in this lignite area because the radiometric is not always exact.

This type of operation will disclose the depth, thickness and value of the vein. It will enable engineers to estimate the cost of removing overburden; to estimate the amount of overburden to be removed; to determine the best mining methods; and to map the course of commercial ore. Some of this type of work has been carried out on our properties, and on other properties in the lignite area. We can by-pass a few steps in the project as we come to the locations that have been worked, since some of this type of exploration has been completed on the area under this application.

The maps attached as Exhibit No. 1, Exhibit No. 2, Exhibit No. 3 and Exhibit No. 4 are intended to show how the contours and escarpments are to be followed, and how the drilling is to be done.

5(d). The applicant Allen Burns will supervise the operations. He has done surveying, road building, map making, building construction, installation of water and sewer systems and related work for 25 years. For the last 18 months he has been employed by a uranium company in this same area, and during that time he worked under an engineer with 35 years of practical experience in the mining and exploring field.

The applicant Bob Fleming owns a core drilling rig. He has done a lot of drilling and core drilling in the area. He is familiar with machinery of all kinds.

The other applicants operate dozers and all kinds of machinery. They have worked at drilling in the area. All of the applicants are familiar with the area and the nature of the formations.

6. The detailed estimate of the costs of the proposed work is as follows:

(a) Independent contracts.--Vertical drilling is to be contracted at $1.25 per foot. It is estimated that 10,560 feet will be drilled. Therefore, the estimated drilling cost is - $ 13,200

(b) Labor, supervision, consultants.--Supervision is to be paid for on the basis of 11% of all other costs. The total of such other costs is estimated at $22,500. Therefore, the total estimated supervision cost is - - - - $ 2,475

(c) Operating materials and supplies.--None.

(d) Operating equipment.—A D-8 doger will be rented for $16 per hour, including operator, fuel and other expenses of running. It is estimated that 500 hours of dozing will be required. This would make the cost for a dozer amount to $8,000. The necessary testing equipment, such as geiger counters, reels and probers are to be rented for a flat rental of $3.00 per day. It is estimated that such equipment will be used 100 days, cost $300. Thus, the total estimated cost for operating equipment is - - - - $ 8,300

(e) Rehabilitation and repairs.—None.

(f) New buildings, improvements, installations.—None.

(g) Miscellaneous.—Chemical assays are expected to cost $4.00 each. We expect to have at least 250 such assays, or a total of $1,000 worth. Therefore, the estimated miscellaneous cost is - - - - - - - - - $ 1,000

(h) Contingencies.—None

ESTIMATED TOTAL COST OF PROJECT $ 24,975

June 26, 1957
Re: DMEA 4701
Wesley Anderson et al.
3311 etc. claims
Harding County, South Dakota
Applicants' Estimate $8[illegible],975 - Uranium
Recommended Estimate $ 7,021.95

Memorandum

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

From: N. K. Nelson, U. S. Geological Survey

Subject: Review of Field Team Report

The applicants requested assistance in exploring 3 lignite coal beds by bulldozing and auger drilling. The beds of coal occur in the Fort Union formation which contains uraniferous lignite beds of ore grade a few miles from the property.

The examiners and the Field Team recommend an alternative exploratory project consisting of bulldozing and auger drilling, the estimated cost of which is $7,021.95.

Sampling by the examiners, 3 samples, and by Kelly Minerals Co., 51 samples, indicates the "C" lignite coal bed is uraniferous in spots. Two of the examiners' samples and 8 of the Kelly Minerals' samples show ore grade material. The map does not show where the samples were taken, but discontinuity is suggested.

The examiners conclude a small amount of stripping and drilling is warranted and recommend a 3-stage work program consisting of:-

Stage I Bulldozing 30 hrs.	$1,296.30
Stage II & III Auger drilling 3,685 feet	5,725.65
	$7,021.95

The examiners make their qualified recommendation on geologic grounds noting the fact that as yet the uranium in lignite coal is not economically recoverable.

With the same qualification, I concur with their recommendation. Perhaps additional information concerning possible reserves is not now needed.

N. K. Nelson

Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
Chron. file
Jack Kratchman
James Pacne, 3643

NKNelson:pbb G: 6/26/57

IN REPLY REFER TO:

DMEA

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

DEPARTMENT OF THE INTERIOR
JUN 18 1957
REGION III
DENVER, COLORADO

TRANSMITTED

JUN 19 1957

June 18, 1957

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 4701 (Uranium), Wesley Andersen et al., (Jill et al., claims), Harding County, South Dakota

Enclosed are the original and nine copies of a joint examination report by Walden P. Pratt, U. S. Geological Survey, and E. O. Binyon, U. S. Bureau of Mines, covering their examination of the subject property.

Uranium is associated with lignite beds in the Fort Union formation. Assays on samples taken by the examining team and by Molly Minerals Company indicate that the area may be underlain by lignite beds containing significant amounts of uranium. The fact that uraniferous lignite is not amenable to treatment at the present time is not considered in the report.

The examining team recommends a modest program of bulldozing and drilling to explore the "C" bed. The estimated total cost of the proposed program is $7,021.95, Government participation 75 percent or $5,266.46.

I concur with the conclusions and recommendations of the examining team.

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RECEIVED JUN 21 1957

DATE	INITIALS

E. N. Harshman
E. N. Harshman
Member, Field Team

Enclosures (10)
ENHarshman:mp

Reviewed by
DMEA OPERATING COMMITTEE

FOR UNITED STATES GOVERNMENT USE ONLY

TRANSMITTED

JUN 19 1957

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 4701

Wesley Anderson et al.

Davis Draw group (Jill et al. claims)

Harding County, South Dakota

Uranium

Joint Engineering and Geologic Report

by

Walden P. Pratt, geologist
Geological Survey

E. O. Rinyon, Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

June 14, 1957

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ILLUSTRATIONS

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DMEA 4701

WESLEY ANDERSON et al.
DAVIS DRAW GROUP (JILL et al. CLAIMS)
HARDING COUNTY, SOUTH DAKOTA

SUMMARY

Wesley Anderson, Allen Burns, J. Ronald Burns, and Bob Fleming, of Bowman, North Dakota, have applied for assistance in exploring for uranium in lignite on a group of 23 claims in the North Cave Hills, Harding County, South Dakota. The area is underlain by Cretaceous and Tertiary sedimentary rocks including the Ludlow member of the Fort Union formation (Paleocene), which contains uraniferous lignite beds known to be of ore grade within a few miles of the property.

The applicants propose to explore two of the lignite beds in a single-stage program consisting of auger drilling, bulldozing of side-hill drill roads, and bulldozing cuts in the beds; estimated cost of this program is $24,975.00. After visiting the property and discussing it with J. D. Vine and G. N. Pipiringos of the Geological Survey, the examining team concludes that the lateral continuity of the lignite and the uranium content of some of the samples from the area indicate a reasonable chance for a significant discovery, and recommends approval of a modified, three-stage exploration program consisting of bulldozing and auger drilling. Total estimated cost of the recommended program is $7,021.95; the Government's share at 75 percent is $5,266.46.

INTRODUCTION

Wesley Anderson, Allen Burns, J. Ronald Burns, and Bob Fleming, all of Bowman, North Dakota, have applied to the Defense Minerals Exploration Administration for assistance in exploration of 23 unpatented lode mining claims for uranium. These claims, a contiguous group, are in secs. 1, 2, 11, and 12, T. 21 N., R. 5 E., Black Hills Meridian, Harding County, South Dakota.

The application is for a single-stage program consisting of auger drilling, and bulldozing of side-hill drill roads and bulldozer cuts along two beds of lignite. The estimated over-all cost of the exploration program is $24,975.00. The lignite is known to be uraniferous; the purpose of the program is to explore the lignite for ore-grade material. The property was examined April 24, 1957, by Walden P. Pratt, geologist, Geological Survey, and E. O. Binyon, mining engineer, Bureau of Mines, in company with Wesley Anderson, Allen Burns, and Bob Fleming, three of the owners of the property. The team was also accompanied by Stanley Kung, Point-4 trainee from Formosa.

This property has been discussed with representatives of the AEC.

ACKNOWLEDGEMENTS

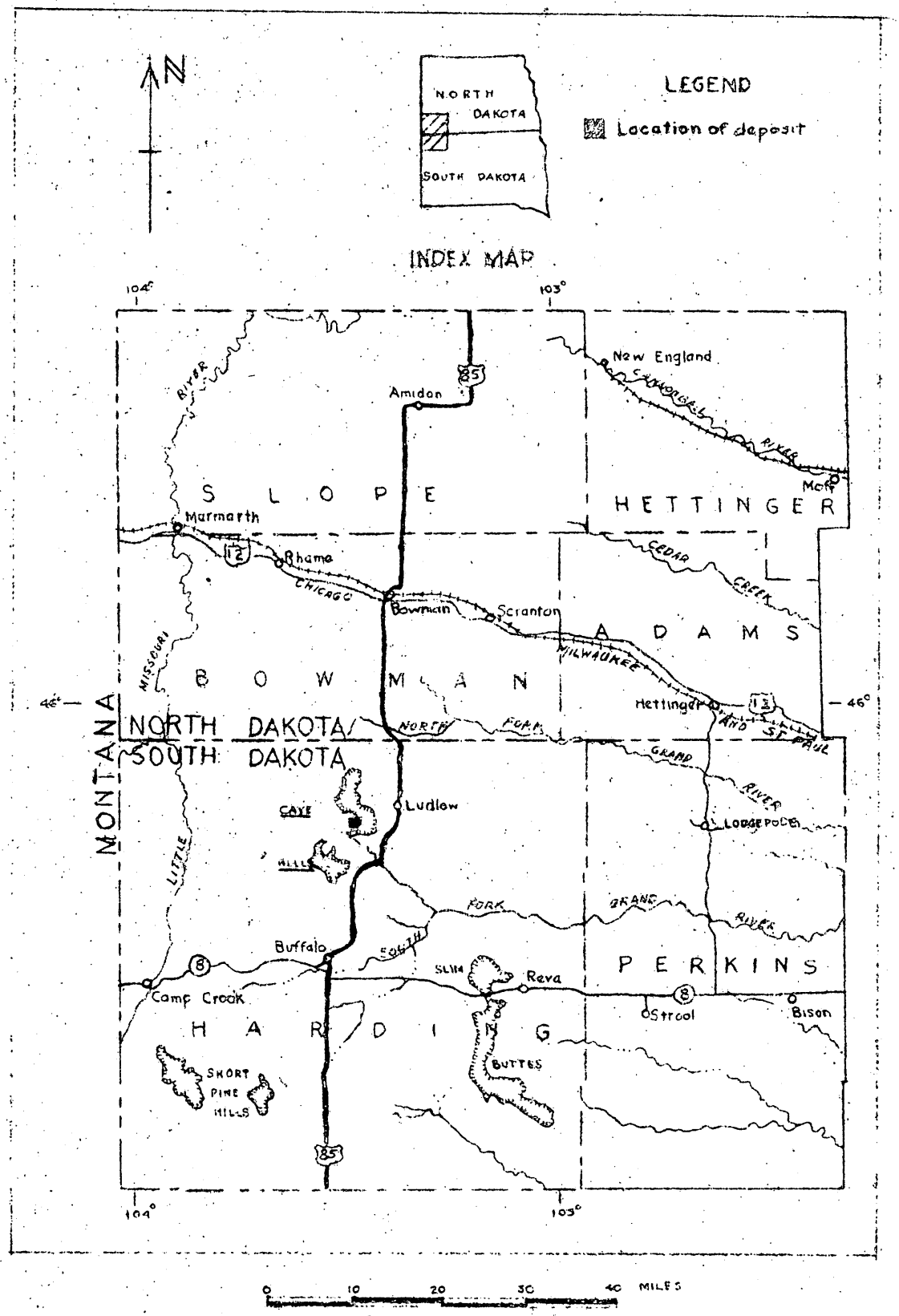
The examining team was accompanied by Wesley Anderson, Allen Burns, and Bob Fleming, three of the four owners of the property. Special acknowledgement is due James D. Vine and George N. Pipiringos of the Geological Survey for discussion of North Cave Hills geology and uranium deposits.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Davis Draw claims are in the North Cave Hills of South Dakota, 30 miles from Buffalo, South Dakota, and 32 miles from Bowman, North Dakota (fig. 1). The property included in the application consists of 23 claims and is in secs. 1, 2, 11, and 12, T. 21 N., R. 5 E., Black Hills Meridian, Harding County, South Dakota. The claims are related to the sections as shown in figure 2.

The property is reached from Buffalo by going 23 miles north on U. S. Highway 85 to Ludlow, South Dakota, turning left onto a dirt road and going 3.1 miles to a gate, then turning right and continuing 2.5 miles, taking the left fork at all junctions. At this point it is necessary to leave the road, going southwest about 0.3 mile and then south-southwest another 0.3 mile, onto Jill No. 3 claim, which is at about the center of the property.

The North Cave Hills appear to be a single mesa that rises 300 to 400 feet above the surrounding gently rolling plains, but the hills



0 10 20 30 40 MILES

Figure 1 - LOCATION MAP, JILL ET AL CLAIMS, WESLEY ANDERSON ET AL, HARDING COUNTY, SOUTH DAKOTA - DMEA 4701.

are in reality made up of flat-topped ridges capped by sandstone which forms a rim that is indented and cut by deep canyons. The property included in the application is marked by such a rim; altitude of the claims at the rim is about 3,450 feet, and at the bottom of the canyon about 3,250 feet.

Vegetation in the area consists of grasses with a scattering of pine on parts of the mesas. Grazing is the principal industry.

The climate reaches the extremes; summer temperatures of higher than 100° are not unusual and in the winter the temperatures drop to -40°. The annual rainfall is less than 10 inches, most of it coming in the spring. Most of the dirt roads become difficult or impossible to travel following heavy rains.

There is no water on the property except in the reservoirs used for stock, and no power is available. Gasoline- or diesel-driven equipment will have to be used for drilling or mining.

Manpower and small supplies are obtainable at either Bowman, North Dakota, or Buffalo, South Dakota.

OWNERSHIP AND EXTENT

The applicants, Wesley Anderson, Allen Burns, J. Donald Burns, and Bob Fleming are the locators and owners of the 22 full and one fraction lode mining claims included in the application. This contiguous group, designated the Davis Draw group, is near the center of a large group comprising 152 claims, all owned by the applicants.

The claims included in the application were checked at the Register of Deeds office in Buffalo, South Dakota, and were found to be recorded as follows:

Claim & No.	Misc. Records Book	Page No.	Date Located	Date Recorded
Burns 2	23	177	12/23/55	2/7/56
Burns 3	23	25	12/23/55	2/7/56
Jill 1	15	178	1/23/55	2/23/55
Jill 2	15	173	1/17/55	2/24/55
Jill 3	15	178	1/23/55	2/23/55
Jill 4	15	172	do.	do.
Jill 5	15	203	do.	do.
Jill 6	15	172	do.	do.
Jill 7	15	178	do.	do.
Jack 7	15	179	do.	do.
Mike 1	15	172	do.	do.
Mike 2	15	193	do.	2/24/55
Mike 3	15	203	do.	do.
Bob 2	15	187	1/17/55	2/24/55
Bob 4	15	188	do.	do.
Bob 6	15	189	do.	do.
Al 1	15	189	do.	do.
Al 2	15	189	do.	do.
Al 3	15	190	1/17/55	2/24/55
Al 4	15	190	do.	do.
Al 5	15	206	do.	do.
Al 6	15	191	do.	do.
Al 7	15	191	do.	do.

The claims include an area of 464.08 acres.

HISTORY AND PRODUCTION

Most of the claims were located in January 1955 and were recorded in February of the same year; two of the claims were not located until December 1955. A minor amount of bulldozer work and auger drilling was done and it is reported that both the AEC and a private concern known as Holly Minerals Co. have sampled the dozer cuts.

PRESENT STATUS

Preliminary work done by the applicants consists of two dozer cuts on the "C" bed totaling about 1,400 feet, on the cliff that projects onto the Jill No. 3 and No. 5 claims, a cut on the "B" bed on the west side of this cliff, and a 50-feet side hill cut on the "C" bed about 1 mile east and just off the claims included in the application (fig. 2).

Except for this dozer work and the few auger drill holes mentioned, there has been no work on the property and there is no mining or milling equipment or other facilities.

GEOLOGY

General features

The North Cave Hills comprise several mesas or flat-topped ridges separated by narrow canyons and gullies. The hills are underlain by essentially flat-lying sedimentary rocks of Cretaceous and Tertiary age: the Hell Creek formation (Upper Cretaceous), the Ludlow and Tongue River

members of the Fort Union formation (Paleocene), and the White River group (Oligocene). The Tongue River member consists chiefly of massive sandstone, while the underlying Ludlow member varies laterally and consists mostly of sandstone, shale, and clay, minor siltstone, and several beds of lignite. The geology of the area is discussed in the following publications:

Denson, N. M., Bachman, G. O., and Zeller, H. D., 1954, Uranium-bearing lignite and its relation to the White River and Arikaree formations in northwestern South Dakota and adjacent states: U. S. Geol. Survey, TEIR 467, p. 60-64.

_____, 1955, Geologic map of Cave Hills and Table Mountain area, Harding County, South Dakota: U. S. Geol. Survey Coal Investigations Map C-34.

In the Davis Draw area the Tongue River member is the caprock of the mesa and forms a more-or-less continuous shear cliff 20 to 40 feet high. From the foot of the cliff (in most places the base of the Tongue River member), a steep to moderate slope extends down to the bottom of the canyon, cut on the less resistant sandstones and clays of the Ludlow member. The Bell Creek formation is exposed only in the lowermost part of the canyon.

Ore deposits

The Tertiary sedimentary rocks of northwestern South Dakota and the adjoining parts of North Dakota and Montana, are known in several localities to contain ore-grade concentrations of oxidized uranium minerals. In the Cave Hills the uranium minerals are chiefly in lignite

beds, which have been arbitrarily designated the "A," "B," "C," "D," and "E" beds, from the base up. The nature of the ore bodies is not well known. The Riley Pass deposit, 2 miles north of the Davis Draw area, is estimated to contain over 1.5 million tons of lignite containing about 0.20 percent U (as meta-autunite) in a bed averaging 1.4 feet thick and covering 460 acres. This would seem to imply uniformity of both grade and thickness; yet in another area, 3 miles northwest of Riley Pass, the grade varies as much as 0.1 percent within a few tens of feet laterally, and it would be difficult under such conditions to evaluate a single sample analysis. The lignite beds vary considerably in thickness over the distance between measured sections--on the order of a mile--but do not vary greatly within the distance in which samples would be taken or holes drilled, so on this scale the thicknesses can be regarded as fairly uniform.

GEOLOGIC BASIS FOR EXPLORATION

Two of the five lignite beds of the North Cave Hills crop out in the Davis Draw area, lying about 95 and 70 feet below the base of the Tongue River member; they are respectively the "B" and "C" beds. The applicant refers to them as the "B" beds, but previous mapping has shown that bed "B" is not present in the North Cave Hills (Denson, Bachman, and Zeller, 1954, p. 64; 1955). Bed "E" has in this area been almost entirely eroded, and remains only as a few small, thin patches over the capping sandstone; it is not of sufficient extent in the claim area to be considered for exploration.

The "B" and "C" beds have been exposed in bulldozer cuts at several places (see Present Status). Bed "B" actually consists of two beds, averaging 3 and 4 feet thick, separated by about 1 foot of clay; these beds give low radiometric readings (maximum 0.05 percent), and a 5.3-foot sample taken by the examining team assayed 0.011 percent U_3O_8. Bed "C" ranges from 1 to 3 feet thick and in general gives a radiometric reading corresponding to 0.1 percent U_3O_8. Three samples from this bed were taken by the examining team and assayed as follows:

Sample No.	Thickness	Radiometric reading	U_3O_8 (percent)
1	1.6'	0.14%	0.499
3	1.4'	0.06%	0.021
5	3.0'	0.2 - 0.9%	0.169

Sample #1 was taken in a section containing abundant coatings and flakes of autunite on fractures and bedding planes; the other two samples did not contain visible uranium minerals.

These beds were sampled previously by Holly Minerals Co. (for International Resources); results of these samples are as follows:

Sample No.	Thickness (feet)	eU_3O_8 (percent)	U_3O_8 (percent)
403	1.0	0.007	--
420	1.3	0.03	--
413B	---	1.61	1.31
413A	---	0.08	0.09
424	1.1	0.02	--

Sample No.	Thickness (feet)	eU_3O_8 (percent)	U_3O_8 (percent)
411	1.7	0.02	--
419	1.6	0.02	--
414B	1.2	0.08	0.12
410	3.1	0.007	
408B	1.2	0.02	
426	1.3	0.02	
407A	1.0	0.08	0.14
434C	1.8	0.014	
408	1.4	0.11	0.22
416	1.4	0.02	
427	1.0	0.014	
409A	0.8	1.57	2.11
407B	1.6	0.02	
422	1.2	0.02	
406A	1.0	0.02	
409B	1.7	0.05	
405A	0.3	0.04	
404	1.1	0.008	
425B	0.2	0.04	
425C	0.5	0.014	
436	1.3	0.003	
434A1	1.2	0.17	0.21
442	2.0	0.007	
428	1.2	0.02	
441	1.3	0.008	
434A2	0.6	0.03	
415A	1.0	0.03	
423	1.3	0.02	
414A	--	0.03	
425A	1.3	0.02	
402	--	0.007	
418	0.9	0.01	
406B	0.7	0.007	
415	--	0.04	
434	1.2	0.08	0.11
443	2.0	0.007	

Sample No.	Thickness (feet)	eU_3O_8 (percent)	V_2O_5 (percent)
435	1.1	0.011	
405B	1.2	0.02	
430	1.3	0.02	
429	1.4	0.03	
412B	3.5	0.003	
437	2.9	0.02	
431	2.2	0.01	
440	1.4	0.008	
412A	0.9	0.03	
417	1.5	0.10	0.22

On June 10, 1957, a letter from John W. King, Chief, Rapid City Branch office of the AEC, stated that AEC field men had looked at the property, were unimpressed, and had not written a report. No assay data were available from them.

The examining team feels that the ore grade of the "C" bed, at least in places, indicated by the above analyses, plus the known presence of sizable deposits of uranium minerals in similar beds within a few miles, justify at least enough preliminary exploration to determine whether the grade is consistent enough over the minimum area necessary to constitute a minable ore body. If the results are favorable, then further exploration by drilling may be warranted to determine the extent more fully. The problem of economically extracting uranium from lignite is not considered in this report.

ORE RESERVES

There are no known ore reserves on the property.

APPLICANT'S PROJECT PROPOSAL

The applicants proposed a single-stage program which consisted of bulldozing cuts along the "B" and "C" beds, bulldozing drill roads at two levels on the slope above these beds, and auger drilling to cut the "B" and "C" beds from the drill roads and from the top of the mesa. A single line of holes about 25 feet back from the rim would be drilled first, then three other lines would be drilled from the cuts on the slope; the four lines of holes would thus be approximately parallel, separated by intervals of 35 to 50 feet, and the holes would be drilled at 300-foot intervals along each line (fig. 3). The net result would permit sampling (either drill or channel) at 300-foot intervals on five lines 35 to 50 feet apart and parallel to the edge of the rim. Depths of the drill holes would range from 150 feet (from the top of the mesa) to 40 feet (from the cuts on the "C" bed).

A breakdown of the estimated cost of the work is as follows:

Independent Contracts

Vertical drilling is to be contracted at $1.25 per foot. It is estimated that 10,560 feet will be drilled. Therefore the estimated cost of drilling is	$13,200.00

Labor, Supervision, Consultants

Supervision is to be paid for on the basis of 11% of all other costs. The total of such other costs is estimated at $22,500. Therefore the total estimated supervision cost is	2,475.00

Operating Materials and Supplies	none

Operating Equipment

A D-8 dozer (angle) will be rented for $16 per hour, including operator, fuel, and other expenses of running. It is estimated that 500 hours of dozing will be required. This would make the cost for a dozer amount to $8,000

The necessary testing equipment such as Geiger counter, reels, and probers are to be rented for a flat rental of $3 per day. It is estimated that such equipment will be used for 100 days, cost $300.

Thus the total estimated cost for operating equipment is	$ 8,300.00
Rehabilitation and Repairs	none
New Buildings, Improvements, Installations	none

Miscellaneous

Chemical assays are expected to cost $4 each. We expect to have at least 250 such assays or a total of $1,000 worth.

Therefore the estimated miscellaneous cost is	1,000.00
Contingencies	none
Estimated total cost of project	$24,975.00
Government's share at 75 percent	$18,731.25

The applicant has not designated the total number of holes nor the total footage in the dozer cuts; however, in measuring from the claim map, 120 drill holes and approximately 45,500 feet of bulldozing would be required to explore the property as proposed.

In the application it is stated that work will start in 60 days and will be completed within 12 months.

RECOMMENDED PROJECT PROPOSAL

In the opinion of the examining team, the property can be adequately explored by a modified three-stage program of bulldozing and drilling. This program is designed to explore bed "C" only; the team feels that bed "B" does not warrant exploration.

Stage I of the recommended program consists of five side hill dozer cuts exposing the bed at the locations designated 1 through 5 on figure 2. 1/ Cuts nos. 1, 2, 3, and 4 are to be 500 feet in length, the cuts extending 250 feet around each projection from its approximate center. Cut no. 5 is to be 1,000 feet in length and located as shown.

Stage II, which would depend on the results of Stage I and would be done only with prior approval by the Government, consists of auger drilling of 16 holes, each approximately 115 feet deep, making a total aggregate depth of 1,840 feet. These holes shall be drilled to a maximum depth of 5 feet below the bottom of the "C" bed, and the maximum total aggregate depth shall not exceed 2,000 feet. The location of the holes shall be as shown on figure 2.

1/ The geology on this figure has been enlarged approximately 10 times from the most reliable available map (Benson, Buchman, and Zeller, 1955). Further enlargement would imply an accuracy that does not exist.

Stage III, offset drilling, would be dependent on the results of Stage II drilling and would require prior Government approval. Under this stage a maximum of 13 holes with a total aggregate depth of 1,625 feet shall be drilled at a spacing of 200 feet from holes of Stage II showing significant mineralization or ore grade material. The Stage III holes shall be located as shown on figure 2.

Sampling of cuts no. 1, 2, 3, 4, and 5, and of the two existing cuts on the projection marked "A" on figure 2, shall be done at 50-foot intervals along the cuts. In all a total of 87 samples are to be taken: 11 each for cuts 1, 2, 3, and 4; 21 for cut 5; and 22 for projection "A," 13 to be taken from the cut on the east and 9 from the cut on the west side of the projection. The samples shall be channeled through the entire thickness of the C bed, the channel having a minimum depth of 3 inches and width of 6 inches.

In sampling the auger drill holes the cuttings from the entire thickness of the C bed of lignite shall be collected and these cutting shall constitute the sample for the hole.

On the basis of a bulldozer making 150 linear feet of side hill cut per hour, and one auger drill drilling 150 feet per hour per shift, it will take 28 days to complete the work of the project. With an allowance of 11 days for preparation of the final report the total time for completion of the project is 1-1/2 months.

The estimated cost of the work is as follows:

Stage I

Independent Contracts

Bulldozing side hill cuts with a D-8 caterpillar, 30 hours at $16 per hour	$ 480.00	
Total Independent Contracts		$ 480.00

Incidental Allowances

Labor, Supervision, Consultants

Supervising Geologist

10 days or 1/3 month at $600 per month	200.00	
Total Labor, Supervision, Consultants		200.00

Operating Material and Supplies

100 sample sacks at $1.25 each	125.00	
Total Operating Materials and Supplies		125.00

Operating Equipment

Transportation 700 miles at $0.07 per mile	49.00	
Total Operating Equipment		49.00

Rehabilitation and Repairs	none
New buildings, improvements, installations	none

Miscellaneous

Accounting 1/4 month at $50 per month	12.50	
No tax or workman's compensation allowance. Owner of property is doing the supervision and geologic work.	---	
Shipping charges for samples-freight 1,400 pounds at $2.80 per cwt.	39.20	

Analyses U_3O_8 - 87 samples at $4.00 each	$ 348.00	
Total Miscellaneous		$ 399.70
Contingencies		
10% of $425.70 (less analyses) (rounded)	42.60	
Total Contingencies		42.60
Total Incidental Allowances (less analyses)		468.30
Total Incidental Allowances per hour - 30 hours $15.61		
Total Stage I (with analyses)		1,296.30
Government participation at 75 percent		972.23

Stage II and III

Independent Contracts

Auger drilling 3,625 feet (2,000 feet Stage II 1,625 feet Stage III) at $1.25 per foot	$ 4,531.25	
Total Independent Contracts		$ 4,531.25
Incidental Allowances		
Labor, Supervision, Consultants		
Supervising Geologist		
29 days or 1-1/6 months at $600 per month	700.00	
Total Labor, Supervision, Consultants		700.00
Operating Materials and Supplies		
30 sample sacks at $1.25 each	37.50	
Total Operating Materials and Supplies		37.50

Operating equipment		
Rental of probing equipment at $3.00 per day 24 days	$ 72.00	
Transportation 1,300 miles at $0.07 per mile	91.00	
Total Operating equipment		$ 163.00
Rehabilitation and repairs		none
New Buildings, improvements, installations		none
Miscellaneous		
Accounting 1-1/4 months at $50.00 per month	62.50	
No tax or workman's compensation allowance. Owner of property is doing the supervision and geologic work.	---	
Shipping charges for samples-freight 750 pounds at $2.80 per cwt.	21.00	
Analyses U_3O_8 28 samples at $4.00 each	112.00	
Total Miscellaneous		195.50
Contingencies		
10% of $984.00 (less analyses)	98.40	
Total Contingencies		98.40
Total Incidental Allowances (less analyses)		1,082.40
Total Incidental Allowances per foot for 3,625 feet $0.2986 (less analyses)		
Total Stage II and III		$ 5,725.65
Government's share at 75 percent		$ 4,294.24
Total cost of recommended project Stages I, II, and III		$ 7,021.95
Government participation at 75 percent		$ 5,266.46

Summary of Cost

Stage I - 30 hours bulldozing side hill cuts	$ 1,296.30
Stages II and III - Auger drilling 3,625 feet	5,725.65
Total	$ 7,021.95

The applicant was requested to submit three bids on the independent contracts, but they have not yet been received.

CONCLUSIONS AND RECOMMENDATIONS

The examining team concludes that the uranium content of the "C" bed of lignite, and the apparent persistence of the bed on the property, indicate a reasonable possibility of discovering a significant deposit of ore-grade uraniferous lignite. Processing of this type of ore is not considered in this report.

The team recommends approval of a modified exploration program of bulldozing and auger drilling, at a total estimated cost of $7,021.95.

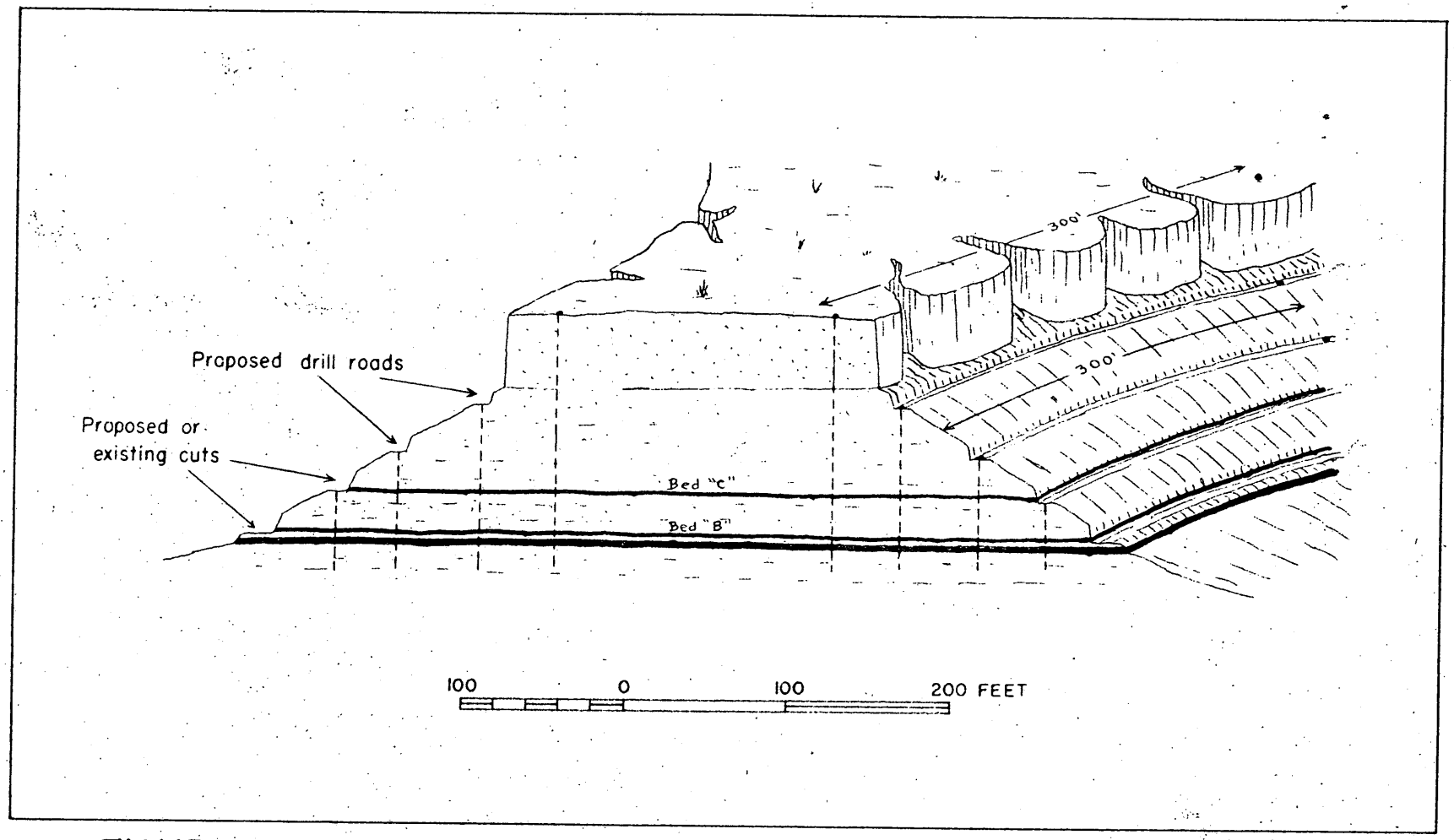
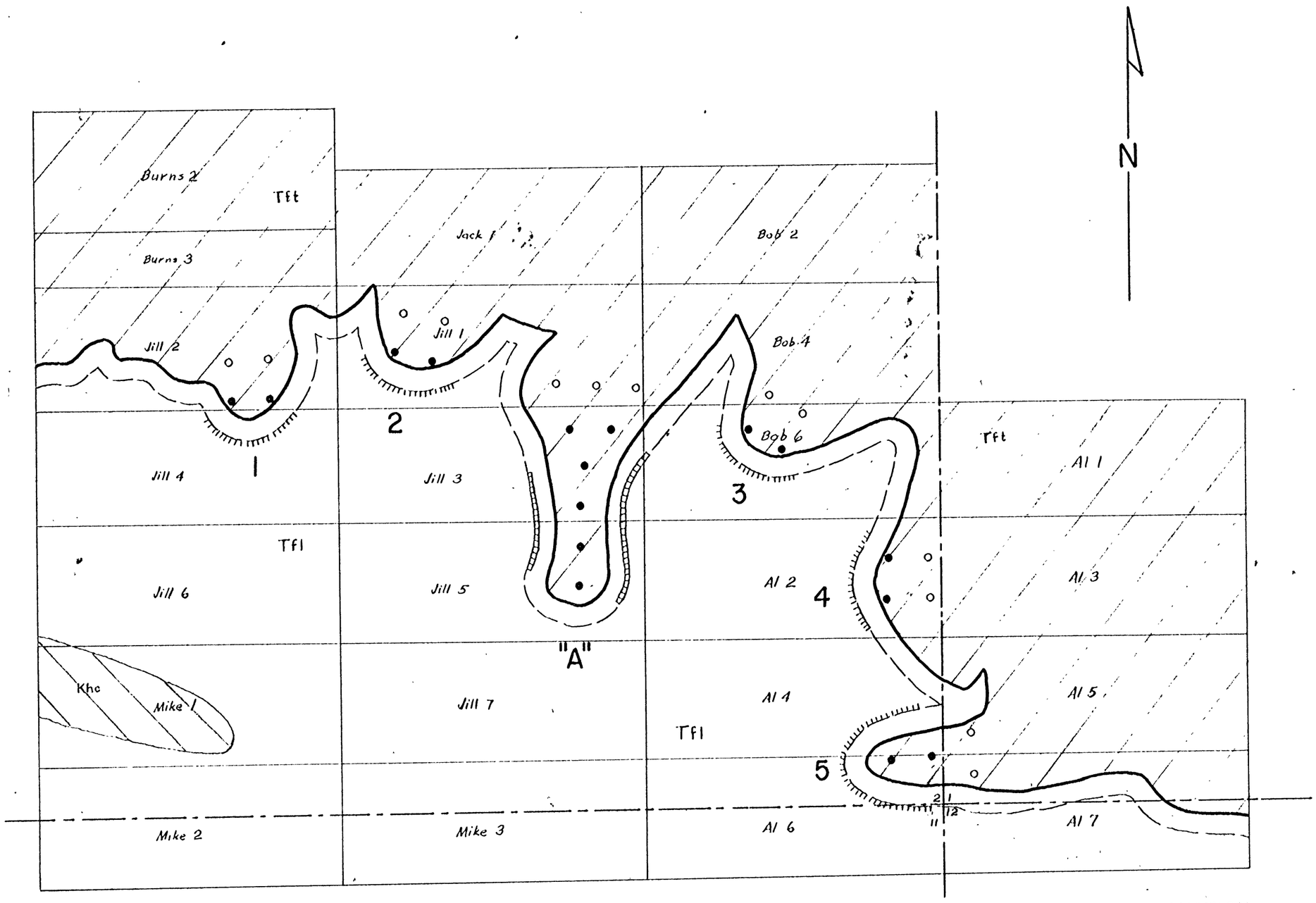


FIGURE 3. EXAMPLE OF APPLICANT'S EXPLORATION PROPOSAL
DAVIS DRAW GROUP OF CLAIMS
NORTH CAVE HILLS, SOUTH DAKOTA
DMEA DOCKET 4701

EXTRA COPY
DMEA
RECEIVED JUN 21 1957

DATE	INITIALS	CODE



EXPLANATION

Edge of mesa

Inferred outcrop of bed "C"

Existing cut

Proposed cut, Stage I

Proposed drill hole, Stage II

Proposed drill hole, Stage III

500 0 500 1000 1500 2000 FEET

Tertiary { Tft Tongue River member; Tfl Ludlow member } Fort Union formation

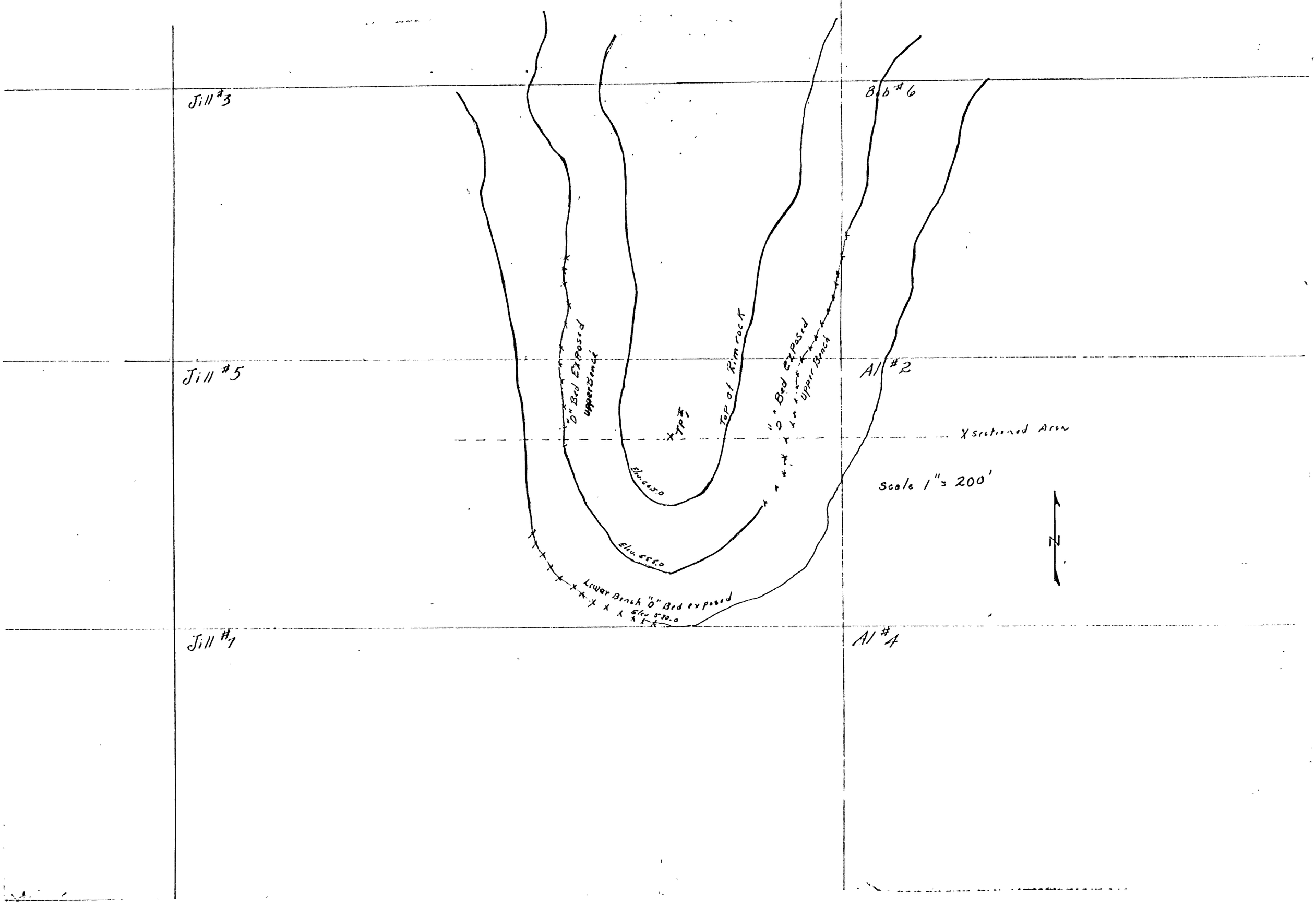
Cretaceous { Khc Hell Creek formation

FIGURE 2. RECOMMENDED EXPLORATION
DAVIS DRAW GROUP OF CLAIMS
NORTH CAVE HILLS, SOUTH DAKOTA
DMEA DOCKET 4701

DMEA Application Of

Wesley Anderson	Bowman, N. Dak.
Allen Burns	Bowman, N. Dak.
J. Donald Burns	Bowman, N. Dak.
Bob Fleming	Bowman, N. Dak.

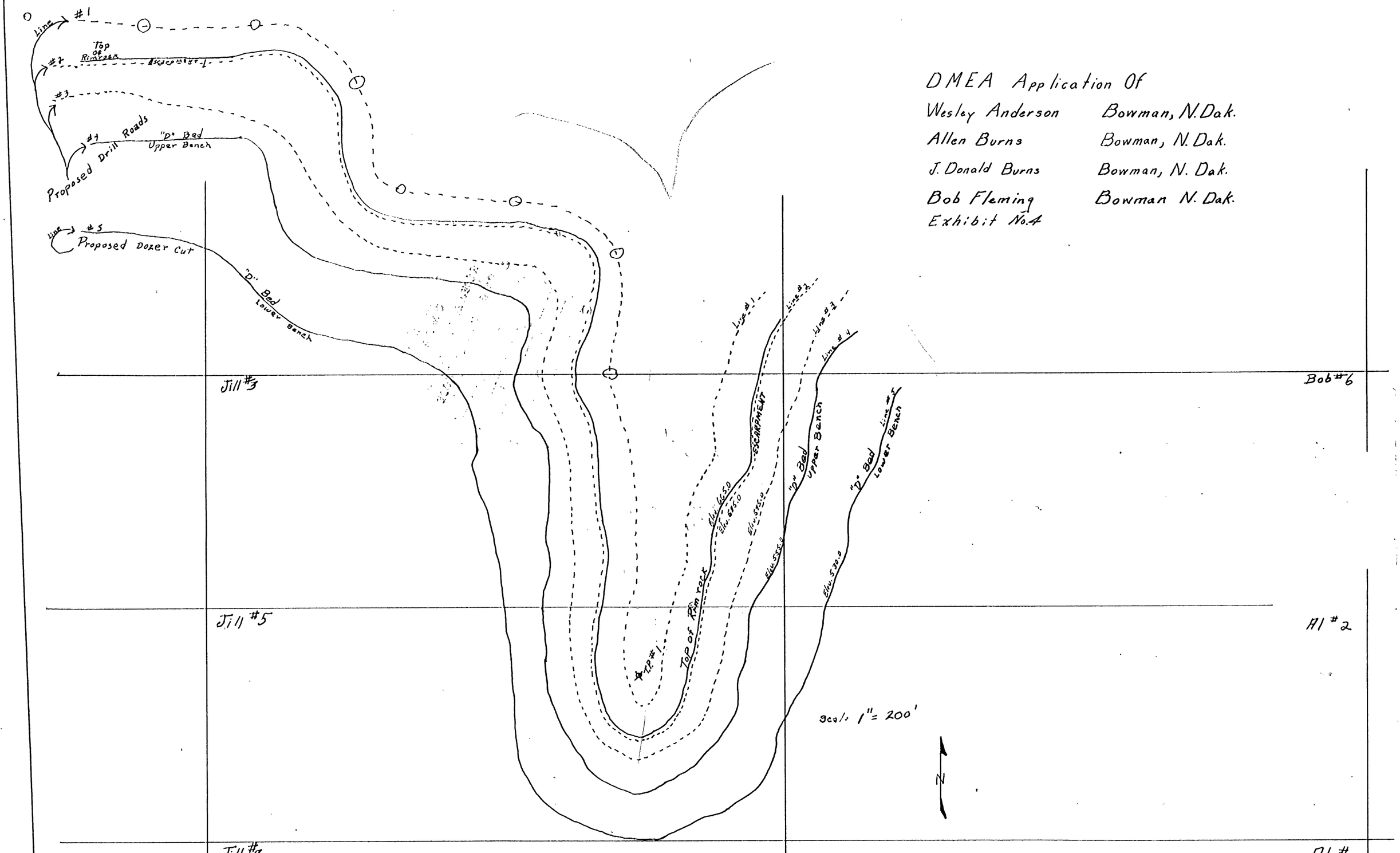
Exhibit No. 2



DMEA Application Of

Wesley Anderson	Bowman, N. Dak.
Allen Burns	Bowman, N. Dak.
J. Donald Burns	Bowman, N. Dak.
Bob Fleming	Bowman N. Dak.

Exhibit No. 4



Typical Top View

[redacted]

DMEA Application of

Wesley Anderson Bowman, N. Dak.
Allen Burns " " "
J. Donald Burns " " "
Bob Fleming " " "

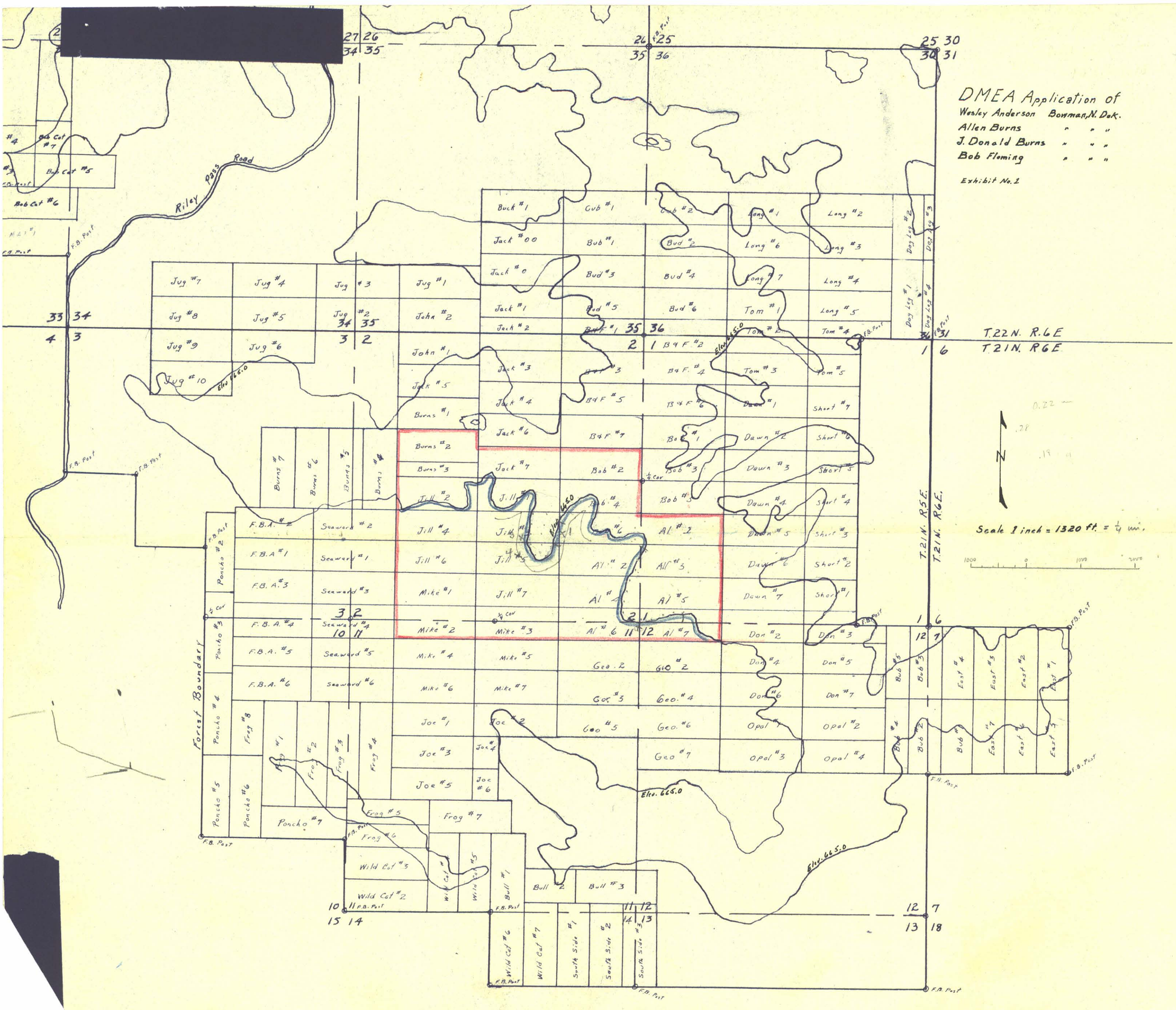



Exhibit No. 1