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UNITED STATES
ATOMIC ENERGY COMMISSION
GRAND JUNCTION, COLORADO

ADDRESS REPLY TO:

AREA MANAGER
U. S. ATOMIC ENERGY COMMISSION
COLORADO AREA
P. O. BOX 270
GRAND JUNCTION, COLORADO

April 23, 1948

and refer to: AM:PCL

State of Arizona
Department of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Arizona

Attention: Mr. Chas. H. Dunning, Director

Gentlemen:

In accordance with your recent request, there is enclosed
copy of the Atomic Energy Commission ore prices and buying
schedule.

Yours very truly

P. C. Leahy
P. C. Leahy
Manager

Enclosures:
Release
Circulars 1, 2, 3

Bonus for Discovery and Production of Domestic Uranium Ores.

As a special incentive to stimulate prospecting for new high-grade domestic uranium deposits, other than deposits of so-called carnotite- or roscoelite-ores, the AEC will pay in addition to the prices established under the purchase schedule a bonus of \$10,000 for the production, upon delivery to the Commission, of the first 20 short tons of uranium ore or mechanically-produced concentrates assaying 20 per cent or more uranium oxide from any single lode or placer mining location on the public domain which has not previously been worked for uranium, or from a comparable area on private property. The discovery bonus will be paid only once for the production of ore from any single lode or placer location but the same person may receive a bonus for the production from each new location. Although this offer does not apply to production of carnotite- or roscoelite-ores, a special development allowance in addition to the base price has been provided to encourage discoveries of such ores.

Uranium-bearing Carnotite- or Roscoelite-type Ores of the Colorado Plateau Area

The AEC guarantees a minimum price schedule for delivery to it of carnotite- or roscoelite-type ores at Monticello, Utah or Durango, Colorado. The minimum prices, effective for three calendar years, are the highest per ton of average ore ever paid in the Colorado plateau area. Independent producers are currently receiving \$13.80 per ton from private industry for ore containing 2 per cent vanadium oxide and 0.2 per cent uranium oxide. Under the Atomic Energy Commission schedule the producers will receive \$20.40 per ton for this grade ore. The prices established by the Commission are based upon a comprehensive study of mining costs, current and past prices paid for ores by vanadium companies and by the Metals Reserve Company during the war, and numerous discussions with independent miners and representatives of the larger companies. The Commission has concluded that the increase in prevailing prices is necessary to stimulate exploration and increased production.

The schedule provides for payment of \$1.50 per pound of uranium oxide (U_3O_8) for the delivery of ores assaying 0.20 per cent, plus a development allowance of 50 cents per pound. Premiums will be paid for delivery of certain higher grade ores and a lower price will be paid for delivery of ores containing less than 0.20 per cent uranium oxide with no payment for ores containing less than 0.10 per cent. Payment also will be made based on the vanadium oxide content of the ore at 31 cents per pound for an amount not exceeding ten pounds for each pound of uranium oxide. No payment will be made for vanadium oxide in excess of this amount.

It is expected that the Monticello purchase depot will be ready to receive ore during July, 1948 and that the Durango depot will be in operation shortly

(more)

UNITED STATES ATOMIC ENERGY COMMISSION

Domestic Uranium Program

Circular No. 1

Ten Year Guaranteed Minimum Price

§ 1 Guarantee. To stimulate domestic production of uranium and in the interest of the common defense and security the United States Atomic Energy Commission hereby establishes the guaranteed minimum prices specified in § 2 of this circular, for the delivery to the Commission, in accordance with the terms of this circular during the ten calendar years following its effective date, of domestic refined uranium, high-grade uranium-bearing ores and mechanical concentrates, in not less than the quantity and grade specified in § 5 of this circular. This guarantee does not apply to uranium-bearing ores of the Colorado Plateau area, commonly known as carnotite-type or roscoelite-type ores, prices for which are established by Domestic Uranium Program, Circular No. 3.

NOTE: The term "domestic" in this circular, referring to uranium, uranium-bearing ores and mechanical concentrates, means such uranium, ores, and concentrates produced from deposits within the United States, its territories, possessions and the Canal Zone.

§ 2 Guaranteed Minimum Prices. The following minimum prices are established:

- (a) For uranium-bearing ores and mechanical concentrates, \$3.50 per pound of U_3O_8 (uranium oxide) determined by the Commission to be recoverable, less cost per pound of refining such ores or concentrates

to standards of purity required for the Commission's operations, to be determined by the Commission after assay of a representative sample.

- (b) For refined uranium products, \$3.50 per pound contained U_3O_8 (uranium oxide).

Prices are f.o.b. railroad cars or trucks at shipping point designated by the Commission convenient to mine, mill, or refinery.

Weights are avoirdupois dry weight.

§ 3 Making an offer. Anyone who has domestic refined uranium, high-grade uranium-bearing ores, or mechanical concentrates of the quantity and grade specified in § 5 of this circular, may offer it for delivery to the Commission by sending a letter or telegram addressed as follows:

United States Atomic Energy Commission
Post Office Box 30, Ansonia Station
New York 23, N. Y.
Attention: Division of Raw Materials

With each offer there should be furnished a representative ten-pound sample and the following information:

- (a) location of property;
- (b) character of material offered for delivery (state whether refined uranium, mechanical concentrates, or uranium-bearing ores, indicating approximate composition);
- (c) amount of material offered;
- (d) location of material offered;
- (e) origin of material if offered by other than producer;

(f) if material is owned, in whole or in part, by any person other than the person making the offer, the name of each person having such ownership and nature of his rights; and

(g) name and address of person making the offer.

NOTE: The reporting requirements hereof have been approved by the Bureau of the Budget pursuant to the Federal Reports Act of 1942.

§ 4 Purchase contract. Upon receipt of an offer and sample, an analysis of the sample will be made. If the sample and the information furnished are determined by the Commission to meet the conditions of this circular, the Commission will forward to the person making the offer a form of contract containing applicable terms and conditions ready for his acceptance. Prices will be not less than the applicable prices of § 2.

Special Provisions

§ 5 Minimum quantity and grade. No delivery will be accepted under this circular of less than ten short tons (2,000 pounds per ton) of ores or mechanical concentrates, nor of ore or mechanical concentrates which assay less than 10 per cent U_3O_8 by weight. No delivery will be accepted under this circular of less than one short ton of refined uranium, nor of refined uranium which contains by weight less than 97 per cent U_3O_8 in black uranium oxide or 87 per cent U_3O_8 in sodium uranate. However, the Commission will be interested in negotiating reasonable terms with respect to deliveries of high-grade ores and refined products in lesser quantities and grades than those specified in this circular.

§ 6 Large quantities or special conditions. The prices established in § 2 are minimum prices. The Commission may by negotiations establish higher prices for guaranteed delivery of lots of ores or mechanical concentrates substantially in excess of ten short tons, or for lots of refined uranium substantially in excess of one short ton. The Commission also may by negotiation establish higher prices for delivery of ores, mechanical concentrates, or refined uranium under other special conditions, taking into consideration such factors as refining and milling costs, transportation costs, and other applicable factors.

§ 7 Other valuable minerals. In making payment for material delivered to it in accordance with this circular, the Commission will give consideration to the existence of recoverable gold, silver, radium, thorium, or any other valuable constituent in the light of the cost of recovery.

§ 8 Licenses. Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this circular.

§ 9 Effective date. This circular will become effective at midnight, April 11, 1948.

Dated at Washington, D. C., this 9th day of April, 1948.

By order of the Commission.

WALTER J. WILLIAMS
Acting General Manager

UNITED STATES ATOMIC ENERGY COMMISSION

Domestic Uranium Program

Circular No. 2

Bonus for the Discovery and Production of High-
Grade Domestic Uranium Ore

§ 1. Discovery and production bonus. To stimulate prospecting for, discovery of, and production from new high-grade domestic uranium deposits and in the interest of the common defense and security the United States Atomic Energy Commission will pay, in addition to the guaranteed minimum price established in Domestic Uranium Program, Circular No. 1, a bonus of \$10,000 for delivery to the Commission, after the effective date of this circular, of the first 20 short tons (2,000 pounds avoirdupois dry weight per ton) of uranium-bearing ores or mechanical concentrates assaying 20 per cent or more U_3O_8 by weight from any single mining location, lode or placer, which has not previously been worked for uranium (or in the case of production from lands not covered by such a mining location, from an area comparable thereto, as determined by the Commission). This bonus offer does not apply to delivery of ores of the Colorado Plateau area commonly known as carnotite-type or roscoelite-type ores; under Domestic Uranium Program, Circular No. 3, the Commission has established guaranteed minimum prices for delivery of such ores including a development allowance and premiums for better grade.

NOTE: The term "domestic" in this circular, referring to uranium, uranium-bearing ores and mechanical concentrates, means such uranium, ores and concentrates produced from deposits within the United States, its territories, possessions and the Canal Zone.

§ 2. Nature of bonus. The bonus of \$10,000 offered in this circular is a bonus to encourage the discovery of new uranium resources. However, it will be paid, not for discovery alone but only in connection with delivery to the Commission, pursuant to Domestic Uranium Program, Circular No.1, of ores produced from the location, as an independent and additional part of the price established by the Commission under that circular.

§ 3. Who may claim. The person lawfully entitled to deliver ore to the Commission pursuant to Circular No. 1, may claim the bonus offered in § 1. A bonus will be paid only once for production of ores from any single lode or placer location (or, in the case of production from lands not covered by such a location, from an area comparable thereto, as determined by the Commission). The Commission expressly reserves the right to determine whether production from a given location is the first production from such location for the purposes of this circular or whether such location or property has previously been worked for uranium, whether production is such as to which a bonus has already been paid, or whether for any other reason a bonus is not payable. In making this determination the Commission will be guided by the mining laws of the United States which provide, generally, that lode locations may extend in lode or vein formation up to 1,500 feet along the vein and in width 300 feet on

each side of the middle of the vein, the end lines of the location being parallel to each other; and that placer locations may not be greater than 20 acres for each location or 160 acres in a single location for up to eight locators. The fact that a bonus has already been received will not prevent the payment of another bonus to the same person with respect to production from a different location.

How to Report a Discovery

§ 4. Notice of discovery and production. Notice of the discovery of a uranium deposit and of production therefrom believed to meet the requirements of § 1. should be forwarded to the Commission by letter or telegram, to the address specified in § 6. below, together with an offer to deliver such ore to the Commission under Domestic Uranium Program, Circular No. 1. In addition to the information and the ten-pound sample required under Circular No. 1, the following must be furnished:

- (a) a brief description of the location or property indicating its size and relationship to mineral monuments or the public land surveys;
- (b) name of owner of record of property;
- (c) location of Recorder's Office where ownership is recorded.

NOTE: The reporting requirements hereof have been approved by the Bureau of the Budget pursuant to the Federal Reports Act of 1942.

§ 5. Inspection of claim. Upon receipt of a notice of discovery and sample, forwarded as required in Domestic Uranium Program, Circular No.1, an analysis of the sample will be made.

If the sample and supporting data indicate the claim is likely to meet the requirements of § 1, an inspection of the property and verification of the weights and assays of material produced will be undertaken by the Commission. On the basis of a report of such inspection and verification, if favorable, the Commission will determine the quantity of ore produced. If this determination indicates that the production requirements established in § 1. have been met, the Commission will pay the bonus in addition to the price established under Domestic Uranium Program, Circular No.1, when delivery of such ore is completed.

§ 6. Inquiries and communications. Inquiries about this circular and all other communications should be addressed as follows:

United States Atomic Energy Commission
Post Office Box 30, Ansonia Station
New York 23, N.Y.
Attention: Division of Raw Materials

§ 7. Licenses. Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this circular.

§ 8. Effective date. This circular will become effective at midnight, April 11, 1948.

Dated at Washington, D.C., this 9th day of April, 1948.

By order of the Commission.

WALTER J. WILLIAMS
Acting General Manager

UNITED STATES ATOMIC ENERGY COMMISSION

Domestic Uranium Program

Circular No. 3

Guaranteed Three Year Minimum Price for
Uranium-Bearing Carnotite-Type or Roscoelite-Type Ores of
the Colorado Plateau Area

§ 1 Guarantee. To stimulate domestic production of uranium-bearing ores of the Colorado Plateau area, commonly known as carnotite-type or roscoelite-type ores, and in the interest of the common defense and security the United States Atomic Energy Commission hereby establishes the guaranteed minimum prices specified in Schedule I of this circular, for the delivery of such ores to the Commission, at Monticello, Utah, and Durango, Colorado, in accordance with the terms of this circular during the three calendar years following its effective date.

NOTE: In Domestic Uranium Program, Circulars No. 1 and 2, the Commission has established guaranteed prices for other domestic uranium-bearing ores, mechanical concentrates, and refined uranium products.

§ 2 Definitions. As used herein, the term "Buyer" refers to the U. S. Atomic Energy Commission, or its authorized purchasing agent. The term "Seller" refers to any person offering uranium ores for delivery to the Commission. Weights are avoirdupois dry weight.

§ 3 Deliveries of not to exceed 1,000 tons per year. To aid small producers, any one Seller may deliver without a written contract but otherwise in accordance with this circular up to, but not exceeding, 1,000 short tons (2,000 pounds per ton) of ores during any calendar year.

§ 4 Deliveries in excess of 1,000 tons per year. Sellers desiring to deliver in excess of 1,000 short tons (2,000 pounds per ton) of ores during any calendar year will be required to execute a contract with the Commission. Buyer is not obligated to purchase in excess of 5,000 short tons of ores from any one Seller during any calendar year, although Buyer may elect to do so.

§ 5 Delivery. Seller, at his own expense, shall deliver and unload all ores at the Buyer's depots at Monticello, Utah, or Durango, Colorado. (Additional depots may be established at later dates.) Deliveries shall be in lots of not less than ten short tons (2,000 pounds per ton), but such lots may be delivered in more than one load. Days and hours during which ore may be delivered to a depot will be posted at the depot. The exact date on which ore buying will commence at the two depots mentioned will be announced later; no deliveries will be accepted prior to this announced date. It is expected that the Monticello depot will be ready to receive ore during the month of July 1948, and that the Durango depot will be in operation shortly thereafter.

§ 6 Weighing, sampling and assaying. Buyer will bear the cost of weighing, sampling and assaying. The net weight of each load will be determined by the Buyer's weighmaster on scales which will be provided by the Buyer at or in the vicinity of the purchase depot and such weight will be accepted as final. A weight ticket will be furnished Seller or his representative for each load. Each lot of ores will be sampled promptly by the

Buyer according to standard practice and such sampling will be accepted as final. Seller or his representative may be present at the sampling at his own expense. The absence of Seller or his representative shall be deemed a waiver of this right. Buyer will make moisture determinations according to standard practices in ore sampling. All final samples will be divided into four pulps and distributed as follows: (a) the Seller, or his representative, will receive one pulp; (b) the Buyer will retain one pulp; (c) the other two pulps will be reserved for possible umpire analysis. The Buyer's pulp will be assayed by the Buyer. The Seller may, if he desires, and at his own expense, have his pulp assayed by an independent assayer. In case of disagreement on assays as to any constituent of the ores, an umpire shall be selected in rotation from a list of umpires approved by the Buyer whose assays shall be final if within the limits of the assays of the two parties; if not, the assay which is nearer to that of the umpire shall prevail. The party whose assay is the farther from that of the umpire will pay the cost of the umpire's assay for the constituent of the ores which is in dispute. In the event that the umpire's assay is equally distant from the assay of each party, costs will be split equally. In case of Seller's failure to make or submit assays, Buyer's assays shall govern. After sampling, the ores may be placed in process, commingled, or otherwise disposed of by Buyer.

§ 7 Payment. Buyer will make payment promptly on payment dates to be posted at depots. Payment will not be made until

an entire minimum lot of ten short tons (2,000 pounds per ton) has been delivered and accepted, unless special arrangements have been agreed upon by Buyer, in which case there may be an extra charge for assaying and sampling. The analysis of any one lot consisting of more than one load will be based on a composite of the samples taken. Moisture determinations, analyses and settlement sheets, together with the check in payment, will be mailed to Seller.

§ 8 Inquiries. All inquiries concerning the provisions of this circular, offers to deliver ores, or questions about the Commission's uranium program in the Colorado Plateau area should be addressed to:

United States Atomic Energy Commission
Post Office Box 270
Grand Junction, Colorado
Telephone: Grand Junction 3000

§ 9 Licenses. Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this circular.

§ 10 Effective date. This circular will become effective at midnight, April 11, 1948.

Dated at Washington, D. C., this 9th day of April, 1948.
By order of the Commission

WALTER J. WILLIAMS
Acting General Manager

SCHEDULE I

Minimum Prices, Specifications, and Conditions

1. Quality and size. Ores will not be accepted by Buyer under this circular which, in Buyer's judgment at time of acceptance:

- (a) contain less than 0.10% U_3O_8
- (b) contain more than three parts of lime ($CaCO_3$) to one part of V_2O_5 , or a total of more than 6% lime in the ore;
- (c) contain other impurities deleterious to Buyer's extraction process;
- (d) contain lumps in excess of 12 inches in size.

2. Prices.

Payment for delivery of the ores will be computed on the following basis:

(a) Vanadium. V_2O_5 at \$0.31 per pound up to, but not exceeding, ten pounds of V_2O_5 for each pound of U_3O_8 contained in ores. No factor will be included for V_2O_5 in excess of ten pounds for each pound of U_3O_8 . (Example: For an ore containing two pounds of U_3O_8 and twenty-five pounds of V_2O_5 , payment would be made for twenty pounds of V_2O_5 at \$0.31 per pound, but no payment would be made for the additional five pounds.) Such excess V_2O_5 shall be deemed to be Buyer's property.

(b) Uranium.

- (1) Ores assaying less than 0.10% U_3O_8 : no payment. Any such ores which are delivered to the purchase depot shall become the property of the Buyer as liquidated damages for Buyer's expense of weighing, sampling and assaying, and after sampling may be placed in process, commingled, or otherwise disposed of by Buyer. If Seller has any question as to the quality of his ore, it is suggested that before shipment and delivery to the purchase depot a representative sample be submitted to the Buyer or to one of the umpires for assay at Seller's expense. The Buyer at his discretion may assay a limited number of samples without charge.
- (2) Ores assaying 0.10% U_3O_8 up to 0.15%: price of \$0.30 per pound of contained U_3O_8 for 0.10% ore, plus \$0.30 per pound for each 0.01% above 0.10% U_3O_8 up to (but not including) 0.15%. Example: The contained U_3O_8 in an ore assaying 0.13% U_3O_8 per ton would be paid for at $\$0.30 + (3 \times \$0.30) = \$1.20$ per pound. 7
- (3) Ores assaying 0.15% U_3O_8 and more: base price of \$1.50 per pound U_3O_8 content, plus

a "development allowance" (at Seller's option) of \$0.50 per pound, or a total of \$2.00 per pound U_3O_8 content.

- (4) Premiums: \$0.25 per pound for each pound of U_3O_8 in excess of 4 pounds U_3O_8 per short ton (2,000 pounds per ton) and an additional premium of \$0.25 per pound for each pound in excess of ten pounds U_3O_8 per ton of ore.

Example: U_3O_8 payments for a short ton of ores assaying 0.6% U_3O_8 would be as follows:

Base price 12 lbs. @ \$1.50 = \$18.00

Development allowance 12 lbs.
@ \$0.50 = 6.00

Premium 8 lbs. (12-4) @ \$0.25 = 2.00

Additional Premium 2 lbs. (12-10)
@ \$0.25 = .50

Total U_3O_8 Payments \$26.50

- (c) Assays shall be adjusted to the nearest 0.01% for purposes of payment.

NOTES:

1. The "development allowance" of \$0.50 per pound of U_3O_8 contained in ores assaying 0.15% U_3O_8 or more, is offered by Buyer in recognition of the expenditures necessary for maintaining and increasing the developed reserves of uranium ores. Sellers accepting this allowance are deemed to agree to spend such funds for the development or exploration of their properties. Sellers delivering less than 1,000 short tons per calendar year will not be required to submit an accounting record of expenditures for

NOTES (continued)

development or exploration pursuant to this agreement but Sellers delivering in excess of 1,000 short tons per calendar year will be required, under the terms of their contracts, to submit proof satisfactory to the Commission that funds equivalent to the amount received as development allowance have been spent for development or exploration during the contract period or within six months thereafter.

2. Commitments by the Commission to accept delivery of ores are limited to the provisions of this circular, as amended from time to time, or to written contracts between the Commission and Sellers. Other commitments purporting to be made by the Commission's field personnel or other agents of the Commission will not bind the Commission unless they are in accord with the provisions of this circular or other official circulars.

3. Weights are avoirdupois dry weight; tons are short tons (2,000 pounds per ton).

TITLE 10—ATOMIC ENERGY

Chapter I—Atomic Energy Commission

[Domestic Uranium Program Circular 5]

PART 60—DOMESTIC URANIUM PROGRAM

GUARANTEED MINIMUM PRICE FOR URANIUM-BEARING CARNOTITE-TYPE OR ROSCOELITE-TYPE ORES OF COLORADO PLATEAU AREA

§ 60.5 *Guaranteed minimum price for uranium-bearing carnotite-type or roscoelite-type ores of the Colorado Plateau area*—(a) *Guarantee*. To stimulate domestic production of uranium-bearing ores of the Colorado Plateau area, commonly known as carnotite-type or roscoelite-type ores, and in the interest of the common defense and security, the United States Atomic Energy Commission hereby establishes the guaranteed minimum prices specified in § 60.5a effective during the period, February 1, 1949 through June 30, 1954, for the delivery of such ores to the Commission at Monticello, Utah in accordance with the terms of this section and § 60.5a.

NOTE: In §§ 60.1 and 60.2 (Domestic Uranium Program, Circulars No. 1 and 2), the Commission established guaranteed prices for other domestic uranium-bearing ores, mechanical concentrates, and refined uranium products.

(b) *Effect on §§ 60.3, 60.3a and 60.4*. Sections 60.3, 60.3a, 60.4 which also apply to carnotite and roscoelite ores, are not revoked by the issuance of this section and § 60.5a and sellers may elect to deliver ore under the provisions of §§ 60.3, 60.3a, and 60.4 rather than under this section and 60.5a, at their option, during the unexpired terms of §§ 60.3, 60.3a and 60.4 (through April 11, 1951 and June 30, 1949, respectively). It is believed, however, that in most cases the provisions of this section and § 60.5a will be more favorable to producers.

(c) *Definitions*. As used in this section and in § 60.5a, the term "buyer" refers to the U. S. Atomic Energy Commission, or its authorized purchasing agent. The term "ore" does not include mill tailings or other mill products. The term "seller" refers to any person offering uranium ores for delivery to the Commission. Weights are avoirdupois dry weights, unless otherwise specifically provided.

(d) *Deliveries of not to exceed 1,000 tons per year*. To aid small producers, any one seller may deliver without a written contract but otherwise in accordance with this circular up to, but not exceeding, 1,000 short tons (2,000 pounds per ton) of ores during any calendar year.

(e) *Deliveries in excess of 1,000 tons per year*. Sellers desiring to deliver in excess of 1,000 short tons (2,000 pounds per ton) of ores during any calendar year will be required to enter into a contract with the Commission providing for, among other things, a rate of delivery and the total quantity of ore to be delivered.

(f) *Delivery*. Seller, at his own expense, shall deliver and unload all ores at the buyer's depot at Monticello, Utah. Deliveries shall be in lots of not less than 10 short tons (2,000 pounds per ton) unless special arrangements have been agreed upon by buyer, but such lots may be delivered in more than one load. Days and hours during which ore may be delivered will be posted at the depot.

(g) *Weighing, sampling and assaying*. Buyer will bear the cost of weighing, sampling and assaying. The net weight of each load will be determined by the buyer's weighmaster on scales which will be provided by the buyer at or in the vicinity of the purchase depot and such weight will be accepted as final. A weight ticket will be furnished seller or his representative for each load. Each lot of ores will be sampled promptly by the buyer according to standard practice and such sampling will be accepted as final. Seller or his representative may be present at the sampling at his own expense. The absence of seller or his representative shall be deemed a waiver of this right. Buyer will make moisture determinations according to standard practices in ore sampling. All final samples will be divided into four pulps and distributed as follows: (1) The seller, or his representative, will receive one pulp; (2) the buyer will retain one pulp; (3) the other two pulps will be reserved for possible umpire analysis. The buyer's pulp will be assayed by the buyer. The seller may, if he desires, and at his own expense, have his pulp assayed by an independent assayer. In case of disagreement on assays as to any constituent of the ores, an umpire shall be selected in rotation from a list of umpires approved by the buyer whose assays shall be final if within the limits of the assays of the two parties; if not, the assay which is nearer to that of the umpire shall prevail. The party whose assay is the farther from that of the umpire will pay the cost of the umpire's assay for the constituent of the ores which is in dispute. In the event that the umpire's assay is equally distant from the assay of each party, costs will be split equally. In case of seller's failure to make or submit assays, buyer's assays shall govern. After sampling, the ores may be placed in process, commingled, or otherwise disposed of by buyer.

(h) *Payment*. Buyer will make payment promptly but payment will not be made until an entire minimum lot of ten short tons (2,000 pounds per ton) has been delivered and accepted, unless special arrangements have been agreed upon by buyer, in which case there may be an extra charge for assaying and sampling. Moisture determinations, analyses and settlement sheets, together with the check in payment, will be mailed to seller.

(i) *Inquiries*. All inquiries concerning the provisions of this section and § 60.5a, offers to deliver ores, or questions about the Commission's domestic uranium program in the Colorado Plateau area should be addressed to:

United States Atomic Energy Commission,
Post Office Box 270, Grand Junction, Colorado;
Telephone: Grand Junction 3000.

(j) *Licenses*. Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this section and § 60.5a.

(k) *Limitation of commitment*. Commitments by the Commission to accept delivery of ores are limited to the provisions of this section and § 60.5a as amended from time to time, or to written contracts between the Commission and sellers. Other commitments purporting to be made by the Commission's field personnel or other agents of the Commission will not bind the Commission unless they are in accord with the provisions of this section and § 60.5a or other official circulars.

§ 60.5a *Schedule I; Minimum prices, specifications, and conditions*—(a) *Prices*. Payment for delivery of the ores will be computed on the following basis:

(1) *Uranium*. (i) Ores assaying less than 0.10%: no payment. Any such ores which are delivered to the purchase depot shall, unless otherwise specifically agreed to by buyer, become the property of the buyer as liquidated damages for buyer's expense of weighing, sampling, and assaying, and after sampling may be placed in process, commingled, or otherwise disposed of by buyer. If seller has any question as to the quality of his ore, it is suggested that before shipment and delivery to the purchase depot a representative sample be submitted to the buyer or to one of the umpires for assay at seller's expense. The buyer at its discretion may assay a limited number of samples without charge.

(ii) Ores assaying 0.10% U_3O_8 and more, as follows:

U_3O_8 assay:	Payment per pound U_3O_8
0.10 percent.....	\$0.50
0.11 percent.....	.70
0.12 percent.....	.90
0.13 percent.....	1.10
0.14 percent.....	1.30
0.15 percent.....	1.50
0.16 percent.....	1.60
0.17 percent.....	1.70
0.18 percent.....	1.80
0.19 percent.....	1.90
0.20 percent and more.....	2.00

(iii) *Premiums on uranium*: \$0.25 per pound for each pound of U_3O_8 in excess of 4 pounds U_3O_8 per short ton (2,000 pounds per ton) of ore and an additional premium of \$0.25 per pound for each pound in excess of ten pounds U_3O_8 per short ton.

UNITED STATES
ATOMIC ENERGY COMMISSION
Washington 25, D.C.

INFORMATION FOR THE PRESS
No. 96, April 10, 1948
Tel. ST 8000, Brs. 307, 308

FOR RELEASE SUNDAY MORNING
NEWSPAPERS, April 11, 1948

U. S. ATOMIC ENERGY COMMISSION ANNOUNCES PROGRAM
TO STIMULATE PRODUCTION OF DOMESTIC URANIUM

The United States Atomic Energy Commission today announced a three-point program to stimulate the discovery and production of domestic uranium by private competitive enterprise.

The major elements of the program are:

1. Government guaranteed ten-year minimum prices for domestic refined uranium, high-grade uranium ores and mechanical concentrates.
2. A bonus of \$10,000 for the discovery and production of high-grade uranium ores from new domestic deposits.
3. Government guaranteed three-year minimum prices for the low-grade carnotite- and roscoelite-type uranium-vanadium ores of the Colorado plateau area and Government operation of two vanadium-uranium plants in that area.

John K. Gustafson, Director of the AEC Division of Raw Materials, describes the program as "an opportunity for prospectors and mining companies to participate in the nation's atomic energy industry by exercise of their own initiative and with the profit incentive. The Commission recognizes that, in line with the policies expressed in the Atomic Energy Act of 1946, development and production of uranium ores can be stimulated most effectively by the type of private operations responsible for the growth and efficiency of the American mining industry. The interest and energies of individual prospectors, small operators and large mining companies are now required in the production of source materials for atomic energy."

The AEC plans to continue and expand its own exploration, development and research relative to raw materials. This work is designed to aid rather than limit the activities of private enterprise in prospecting, ore production and ore beneficiation. Commission-sponsored diamond drilling and geological surveys in the Colorado Plateau area, and in other sections of continental United States and its territories, will cover private as well as public lands.

(more)

UNITED STATES
ATOMIC ENERGY COMMISSION
Washington 25, D.C.

INFORMATION FOR THE PRESS
No. 105, May 12, 1948
Tel. ST 8000, Exts. 307, 308

FOR RELEASE AFTER
12:00 NOON (EDT)
Wednesday, May 12, 1948

AEC ANNOUNCES PRICE INCREASE
FOR URANIUM BEARING ORES

The United States Atomic Energy Commission announced today two additional allowances will be paid for delivery of carnotite-type or roscoelite-type uranium bearing ores in the Colorado plateau area. The allowances will become effective June 1, 1948 and will be continued until July 1, 1949, for ores accepted by the AEC at its Colorado purchase depots. The payments in addition to the present base are:

1. A haulage allowance of 6¢ per ton mile for transporting ore from the mine to the purchase depot specified by the Commission, with the maximum allowance limited to a haulage of 100 miles. The haulage distance from the mine to the purchase depot will be determined by the Commission and its decision will be final.

This haulage allowance is intended to eliminate any need for the establishment of small intermediate purchase depots to serve mines remote from the processing plants.

2. An allowance of 50¢ per pound of uranium oxide (U_3O_8) contained in ores assaying 0.20%, or more, U_3O_8 to stimulate reopening and equipping closed mines and increasing the production facilities of mines now operating. This allowance is in addition to the development allowance provided in Circular No. 3.

Additional allowances announced today resulted from a recent field survey of operating conditions in the Colorado Plateau area and conferences with both independent miners and representatives of large companies. Low levels of operation for the past several years and other factors involving costs and productive capacity led to the decision to increase payments.

Production of the ores needed for the atomic energy program will require the reopening and equipping of closed mines as well as increased production at mines now operating. This will necessitate construction and repair of roads and attraction of skilled miners to the area.

In limiting the new allowances to the period ending July 1, 1949, the Commission announced that price schedules may be revised next year on the basis of experience obtained under the new price levels. Prices guaranteed prior to today's announcement are effective for a three-year period.

Information developed by the AEC concerning individual deposits will be made available to the owners of these deposits, but for security reasons may not be released for publication. In general, deposits of uranium discovered by the Commission on public lands are expected to be made available for development by private operators.

Uranium in deposits on the public lands, and other lands owned by the United States, is now reserved to the United States, subject to mineral rights established on or before August 1, 1946 (the date of the Atomic Energy Act). However, the Commission's guaranteed minimum prices have been made applicable to deliveries to it of ores containing such reserved uranium in consonance with the Commission's authority to pay fair and reasonable sums, including profits, for discovery, delivery, and other services performed with respect to such ores. The Commission wishes to encourage prospecting for new deposits of uranium ores on the public domain and has been advised by the Department of the Interior, which administers the disposition of the public lands, that valid locations may be staked on such deposits if the uranium occurs in a deposit which is valuable because of other minerals. In the unlikely event of the discovery of a deposit of uranium-bearing ore which does not contain some other valuable mineral, the Commission, upon notice, will take steps to protect the prospector's equity.

The price and bonus program, which is detailed in circulars available from the Commission, is essentially as follows:

Domestic refined uranium, high-grade uranium-bearing ores and mechanical concentrates.

The AEC guarantees minimum prices for delivery to it of domestic refined uranium, high-grade uranium-bearing ores and mechanical concentrates in accordance with the terms of its circular for 10 calendar years. The guaranteed minimum prices are:

Uranium-bearing Ores and Concentrates. \$3.50 per pound of recoverable uranium oxide, less the cost per pound to refine to necessary purity as determined by the AEC after assay of a representative sample.

Refined Uranium Products. \$3.50 per pound of uranium oxide.

The prices established are minimum prices for small lots. Higher prices may be established by negotiation with the seller for larger quantities, taking into consideration such factors as refining and milling costs, transportation costs and other applicable items. The Commission also will give consideration to the presence of recoverable gold, silver, radium, thorium and other valuable constituents of the ores, depending upon the cost of recovery.

(more)



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TRINITY 4791

E. O. SLATER, PRES. AND MGR.
OTTO WARTENWEILER, VICE-PRES.
D. F. ROBERTS, TREASURER

June 14, 1948

AIR MAIL

State of Arizona,
Department of Mineral Resources,
Mineral Building,
Fairgrounds,
Phoenix, Arizona.

Attention: Chas. H. Dunning, Director.

Gentlemen:

Re: SE No. 293681

We received your letters of June 8th and 11th and also sample of ore. We have made the determinations requested and submit our report herewith.

In your letter of June 8th, you state "Give us any advice you can as to how the uranium occurs". There is uranium present and since there is copper and phosphorus present, it is possible the uranium occurs in the mineral torbernite, a hydrous phosphate of uranium and copper. In order to determine the mineral in which the uranium occurs more positively, we suggest that a concentrate be made which contains the uranium mineral and then make an X-ray defraction examination of it. Our charge for this examination is \$25.00.

In your letter of June 8th you refer to sending a purchase order. We have proceeded with the work and completed it before receiving the purchase order. We presume this will come forward in due course.

In your letter of June 11th you asked us to return the rejects, which we are doing today.

Very truly yours,

SMITH-EMERY COMPANY

By E. O. Slater
E.O. Slater, President.

Enclosures.

EQS:
fb

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July 9, 1948

State of Arizona,
Department of Mineral Resources,
Mineral Building,
Fairgrounds,
Phoenix, Arizona.

Attention: Chas. H. Dunning,
Director.

Gentlemen:

We received your letter of July 2, 1948 and the samples of ore.

We have done all the work requested except the X-Ray defraction examination, so we are reporting and billing you now for this part of the work. The X-Ray defraction examination result will come later, after we have had an opportunity of preparing and examining the sample.

Very truly yours,

SMITH-EMERY COMPANY

By E. O. Slater
E. O. Slater, President.

Enclosures.
EOS:fb

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August 23, 1948

State Of Arizona
Department of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Arizona

Attn: Mr. Chas. H. Dunning, Director

Dear Sir:

We are replying to your letter of July 13, 1948. Upon receipt of your letter, we checked the samples you have previously sent us, and in a few days when the sample referred to in the last paragraph of your letter was received, the chemical determination for uranium was made on it.

Our check determinations both with the Geiger Counter and Chemical Method agree closely with those previously made and reported. We list below the results we have obtained:

<u>Lab. #</u>	<u>Mark</u>	<u>Uranium (U%)</u>	
		<u>Geiger</u>	<u>Chemical</u>
293681	-	0.80	0.74
293681	Checked same	0.75	0.65
294653	(Sample #1 - lowgrade)	0.04	Nil
294654	(Sample #2 - highgrade)	0.70	0.69
294654	Checked same	0.65	0.70
295053	(Similar - Sample #2)	--	0.73

It is always possible that a mineral contains other radioactive elements than Uranium. This might account for a higher indicated result by the Geiger Counter than by the Chemical Method.

We are sorry this work has not been reported sooner which was due to vacations, and a great rush of work at the same time.

Very truly yours,

SMITH-EMERY COMPANY

E. O. Slater

E.O. Slater, President

EOS:km

Encl.

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SAN FRANCISCO MILWAUKEE CINCINNATI NEW ORLEANS SEATTLE BIRMINGHAM DALLAS HOUSTON TAMPA EASTON EUROPEAN COUNTRIES

ADDRESS REPLY TO:

DIVISION OF RAW MATERIALS
U. S. ATOMIC ENERGY COMMISSION
P. O. BOX 30, ANSONIA STATION
NEW YORK 23, NEW YORK

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF RAW MATERIALS
NEW YORK OFFICE

and refer to:

RME:MM

September 10, 1948

Mr. Charles H. Dunning, Director
Department of Mineral Resources
State of Arizona
Mineral Building, Fairgrounds
Phoenix, Arizona

Subject: HACK'S CANYON URANIUM MINE

Dear Mr. Dunning:


Reference is made to your letter of September 3, enclosing your report on Hack's Canyon Uranium Mine.

I am extremely interested in all of the information outlined therein and appreciate the difficulties and problems attendant to completing it. I feel that your report is indeed well done and that it reflects all of the effort you may have put into it. It outlines the problem most effectively.

We are anxious to cooperate with you in the further study of this region and as we pointed out in our letter of September 3, we plan to send a field man to the area in October. We would be happy to have you or one of your men accompany him if you find that convenient.

If you have available another copy of your report, we would appreciate your sending it to Dr. Wallace G. Fetzner, Chief, Grand Junction Extension, New York Division of Raw Materials, P. O. Box 270, Grand Junction, Colorado. He would probably like to read this before he or one of his field men visit the area.

Very truly yours,


Phillip L. Merritt
Assistant Director

UNITED STATES ATOMIC ENERGY COMMISSION

DOMESTIC URANIUM PROGRAM

CIRCULAR NO. 1

TEN YEAR GUARANTEED MINIMUM PRICE

§ 60.1 *Ten year guaranteed minimum price*—(a) *Guarantee.* To stimulate domestic production of uranium and in the interest of the common defense and security the United States Atomic Energy Commission hereby establishes the guaranteed minimum prices specified in paragraph (b) of this section, for the delivery to the Commission, in accordance with the terms of this section during the ten calendar years following its effective date, of domestic refined uranium, high-grade uranium-bearing ores and mechanical concentrates, in not less than the quantity and grade specified in paragraph (e) of this section. This guarantee does not apply to uranium-bearing ores of the Colorado Plateau area, commonly known as carnotite-type or roscoelite-type ores, prices for which are established by § 60.3.

NOTE: The term "domestic" in this section, referring to uranium, uranium-bearing ores and mechanical concentrates, means such uranium, ores, and concentrates produced from deposits within the United States, its territories, possessions and the Canal Zone.

(b) *Guaranteed minimum prices.* The following minimum prices are established:

(1) For uranium-bearing ores and mechanical concentrates, \$3.50 per pound of U_3O_8 (uranium oxide) determined by the Commission to be recoverable, less cost per pound of refining such ores or concentrates to standards of purity required for the Commission's operations, to be determined by the Commission after assay of a representative sample.

(2) For refined uranium products, \$3.50 per pound contained U_3O_8 (uranium oxide).

Prices are f. o. b. railroad cars or trucks at shipping point designated by the Commission convenient to mine, mill, or refinery. Weights are avoirdupois dry weight.

(c) *Making an offer.* Anyone who has domestic refined uranium, high-grade uranium-bearing ores, or mechanical concentrates of the quantity and grade

specified in paragraph (e) of this section, may offer it for delivery to the Commission by sending a letter or telegram addressed as follows:

United States Atomic Energy Commission,
Post Office Box 30, Ansonia Station,
New York 23, N. Y.
Attention: Division of Raw Materials.

With each offer there should be furnished a representative ten-pound sample and the following information:

- (1) Location of property;
- (2) Character of material offered for delivery (state whether refined uranium, mechanical concentrates, or uranium-bearing ores, indicating approximate composition);
- (3) Amount of material offered;
- (4) Location of material offered;
- (5) Origin of material if offered by other than producer;
- (6) If material is owned, in whole or in part, by any person other than the person making the offer, the name of each person having such ownership and nature of his rights; and
- (7) Name and address of person making the offer.

NOTE: The reporting requirements hereof have been approved by the Bureau of the Budget pursuant to the Federal Reports Act of 1942.

(d) *Purchase contract.* Upon receipt of an offer and sample, an analysis of the sample will be made. If the sample and the information furnished are determined by the Commission to meet the conditions of this section, the Commission will forward to the person making the offer a form of contract containing applicable terms and conditions ready for his acceptance. Prices will be not less than the applicable prices of paragraph (b) of this section.

(e) *Minimum quantity and grade.* No delivery will be accepted under this section of less than ten short tons (2,000 pounds per ton) of ores or mechanical concentrates, nor of ore or mechanical concentrates which assay less than 10 per cent U_3O_8 by weight. No delivery will

be accepted under this section of less than one short ton of refined uranium, nor of refined uranium which contains by weight less than 97 per cent U_3O_8 in black uranium oxide or 87 per cent U_3O_8 in sodium uranate. However, the Commission will be interested in negotiating reasonable terms with respect to deliveries of high-grade ores and refined products in lesser quantities and grades than those specified in this section.

(f) *Large quantities or special conditions.* The prices established in paragraph (b) of this section are minimum prices. The Commission may by negotiations establish higher prices for guaranteed delivery of lots of ores or mechanical concentrates substantially in excess of ten short tons, or for lots of refined uranium substantially in excess of one short ton. The Commission also may by negotiation establish higher prices for delivery of ores, mechanical concentrates, or refined uranium under other special conditions, taking into consideration such factors as refining and milling costs, transportation costs, and other applicable factors.

(g) *Other valuable minerals.* In making payment for material delivered to it in accordance with this section, the Commission will give consideration to the existence of recoverable gold, silver, radium, thorium, or any other valuable constituent in the light of the cost of recovery.

(h) *Licenses.* Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this section. (Sec. 5 (b), 60 Stat. 761)

Effective date. This circular will become effective at midnight, April 11, 1948.

Dated at Washington, D. C., this 9th day of April 1948.

By order of the Commission.

WALTER J. WILLIAMS,
Acting General Manager.

UNITED STATES ATOMIC ENERGY COMMISSION

DOMESTIC URANIUM PROGRAM

CIRCULAR NO. 2

BONUS FOR THE DISCOVERY AND PRODUCTION OF HIGH-GRADE DOMESTIC URANIUM ORE

§ 60.2 *Bonus for the discovery and production of high-grade domestic uranium ore*—(a) *Discovery and production bonus.* To stimulate prospecting for, discovery of, and production from new high-grade domestic uranium deposits and in the interest of the common defense and security the United States Atomic Energy Commission will pay, in addition to the guaranteed minimum price established in § 60.1, a bonus of \$10,000 for delivery to the Commission, after the effective date of this section, of the first 20 short tons (2,000 pounds avoirdupois dry weight per ton) of uranium-bearing ores or mechanical concentrates assaying 20 percent or more U_3O_8 by weight from any single mining location, lode or placer, which has not previously been worked for uranium (or in the case of production from lands not covered by such a mining location, from an area comparable thereto, as determined by the Commission). This bonus offer does not apply to delivery of ores of the Colorado Plateau area commonly known as carnotite-type or roscoelite-type ores; under § 60.3, the Commission has established guaranteed minimum prices for delivery of such ores including a development allowance and premiums for better grade.

NOTE: The term "domestic" in this section, referring to uranium, uranium-bearing ores and mechanical concentrates, means such uranium, ores and concentrates produced from deposits within the United States, its territories, possessions and the Canal Zone.

(b) *Nature of bonus.* The bonus of \$10,000 offered in this section is a bonus to encourage the discovery of new uranium resources. However, it will be paid, not for discovery alone, but only in connection with delivery to the Commission, pursuant to § 60.1, of ores produced from the location, as an independent and additional part of the price established by the Commission under that section.

(c) *Who may claim.* The person lawfully entitled to deliver ore to the Commission pursuant to § 60.1, may claim

the bonus offered in paragraph (a) of this section. A bonus will be paid only once for production of ores from any single lode or placer location (or, in the case of production from lands not covered by such a location, from an area comparable thereto, as determined by the Commission). The Commission expressly reserves the right to determine whether production from a given location is the first production from such location for the purposes of this section or whether such location or property has previously been worked for uranium, whether production is such as to which a bonus has already been paid, or whether for any other reason a bonus is not payable. In making this determination the Commission will be guided by the mining laws of the United States which provide, generally, that lode locations may extend in lode or vein formation up to 1,500 feet along the vein and in width 300 feet on each side of the middle of the vein, the end lines of the location being parallel to each other; and that placer locations may not be greater than 20 acres for each location or 160 acres in a single location for up to eight locators. The fact that a bonus has already been received will not prevent the payment of another bonus to the same person with respect to production from a different location.

(d) *Notice of discovery and production.* Notice of the discovery of a uranium deposit and of production therefrom believed to meet the requirements of paragraph (a) of this section should be forwarded to the Commission by letter or telegram, to the address specified in paragraph (f) of this section, together with an offer to deliver such ore to the Commission under § 60.1. In addition to the information and the 10-pound sample required under § 60.1, the following must be furnished:

(1) A brief description of the location or property indicating its size and relationship to mineral monuments or the public land surveys;

(2) Name of owner of record of property;

(3) Location of Recorder's Office where ownership is recorded.

NOTE: The reporting requirements hereof have been approved by the Bureau of the Budget pursuant to the Federal Reports Act of 1942.

(e) *Inspection of claim.* Upon receipt of a notice of discovery and sample, forwarded as required in § 60.1, an analysis of the sample will be made. If the sample and supporting data indicate the claim is likely to meet the requirements of paragraph (a) of this section, an inspection of the property and verification of the weights and assays of material produced will be undertaken by the Commission. On the basis of a report of such inspection and verification, if favorable, the Commission will determine the quantity of ore produced. If this determination indicates that the production requirements established in paragraph (a) of this section have been met, the Commission will pay the bonus in addition to the price established under § 60.1, when delivery of such ore is completed.

(f) *Inquiries and communications.* Inquiries about this section and all other communications should be addressed as follows:

United States Atomic Energy Commission,
Post Office Box 30, Ansonia Station,
New York 23, N. Y.

Attention: Division of Raw Materials.

(g) *Licenses.* Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this section. (Sec. 5 (b), 60 Stat. 761)

Effective date. This circular will become effective at midnight, April 11, 1948.

Dated at Washington, D. C., this 9th day of April 1948.

By order of the Commission.

WALTER J. WILLIAMS,
Acting General Manager.

UNITED STATES ATOMIC ENERGY COMMISSION

DOMESTIC URANIUM PROGRAM

CIRCULAR NO. 3

GUARANTEED THREE YEAR MINIMUM PRICE FOR URANIUM-BEARING CARNOTITE-TYPE OR ROSCOELITE-TYPE ORES OF THE COLORADO PLATEAU AREA

§ 60.3 *Guaranteed three year minimum price for uranium-bearing carnotite-type or roscoelite-type ores of the Colorado Plateau area—(a) Guarantee.* To stimulate domestic production of uranium-bearing ores of the Colorado Plateau area, commonly known as carnotite-type or roscoelite-type ores, and in the interest of the common defense and security the United States Atomic Energy Commission hereby establishes the guaranteed minimum prices specified in Schedule I of this section, for the delivery of such ores to the Commission, at Monticello, Utah, and Durango, Colorado, in accordance with the terms of this section during the three calendar years following its effective date.

NOTE: In §§ 60.1 and 60.2 (Domestic Uranium Program, Circulars No. 1 and 2), the Commission has established guaranteed prices for other domestic uranium-bearing ores, mechanical concentrates, and refined uranium products.

(b) *Definitions.* As used herein, the term "buyer" refers to the U. S. Atomic Energy Commission, or its authorized purchasing agent. The term "seller" refers to any person offering uranium ores for delivery to the Commission. Weights are avoirdupois dry weight.

(c) *Deliveries of not to exceed 1,000 tons per year.* To aid small producers, any one seller may deliver without a written contract but otherwise in accordance with this section up to, but not exceeding, 1,000 short tons (2,000 pounds per ton) of ores during any calendar year.

(d) *Deliveries in excess of 1,000 tons per year.* Sellers desiring to deliver in excess of 1,000 short tons (2,000 pounds per ton) of ores during any calendar year will be required to execute a contract with the Commission. Buyer is not obligated to purchase in excess of 5,000 short tons of ores from any one seller during any calendar year, although buyer may elect to do so.

(e) *Delivery.* Seller, at his own expense, shall deliver and unload all ores at the buyer's depots at Monticello, Utah, or Durango, Colorado. (Additional depots may be established at later dates.) Deliveries shall be in lots of not less than 10 short tons (2,000 pounds per ton), but such lots may be delivered in more than one load. Days and hours during which ore may be delivered to a depot will be posted at the depot. The exact date on which ore buying will commence at the two depots mentioned will be announced later; no deliveries will be accepted prior to this announced date. It is expected that the Monticello depot

will be ready to receive ore during the month of July 1948, and that the Durango depot will be in operation shortly thereafter.

(f) *Weighing, sampling and assaying.* Buyer will bear the cost of weighing, sampling and assaying. The net weight of each load will be determined by the buyer's weighmaster on scales which will be provided by the buyer at or in the vicinity of the purchase depot and such weight will be accepted as final. A weight ticket will be furnished seller or his representative for each load. Each lot of ores will be sampled promptly by the buyer according to standard practice and such sampling will be accepted as final. Seller or his representative may be present at the sampling at his own expense. The absence of seller or his representative shall be deemed a waiver of this right. Buyer will make moisture determinations according to standard practices in ore sampling. All final samples will be divided into four pulps and distributed as follows: (1) the seller, or his representative, will receive one pulp; (2) the buyer will retain one pulp; (3) the other two pulps will be reserved for possible umpire analysis. The buyer's pulp will be assayed by the buyer. The seller may, if he desires, and at his own expense, have his pulp assayed by an independent assayer. In case of disagreement on assays as to any constituent of the ores, an umpire shall be selected in rotation from a list of umpires approved by the buyer whose assays shall be final if within the limits of the assays of the two parties; if not, the assay which is nearer to that of the umpire shall prevail. The party whose assay is the farther from that of the umpire will pay the cost of the umpire's assay for the constituent of the ores which is in dispute. In the event that the umpire's assay is equally distant from the assay of each party, costs will be split equally. In case of seller's failure to make or submit assays, buyer's assays shall govern. After sampling, the ores may be placed in process, commingled, or otherwise disposed of by buyer.

(g) *Payment.* Buyer will make payment promptly on payment dates to be posted at depots. Payment will not be made until an entire minimum lot of ten short tons (2,000 pounds per ton) has been delivered and accepted, unless special arrangements have been agreed upon by buyer, in which case there may be an extra charge for assaying and sampling. The analysis of any one lot consisting of more than one load will be based

on a composite of the samples taken. Moisture determinations, analyses and settlement sheets, together with the check in payment, will be mailed to seller.

(h) *Inquiries.* All inquiries concerning the provisions of this section, offers to deliver ores, or questions about the Commission's uranium program in the Colorado Plateau area should be addressed to:

United States Atomic Energy Commission,
Post Office Box 270,
Grand Junction, Colorado.
Telephone: Grand Junction 3000.

(i) *Licenses.* Arrangements will be made by the Commission for the issuance of licenses, pursuant to the Atomic Energy Act of 1946, covering deliveries of source material to the Commission under this section.

SCHEDULE I—MINIMUM PRICES, SPECIFICATIONS, AND CONDITIONS

1. *Quality and size.* Ores will not be accepted by buyer under this section which, in buyer's judgment at time of acceptance:

- (a) Contain less than 0.10% U_3O_8 ;
- (b) Contain more than three parts of lime ($CaCO_3$) to one part of V_2O_5 , or a total of more than 6% lime in the ore;
- (c) Contain other impurities deleterious to buyer's extraction process;
- (d) Contain lumps in excess of 12 inches in size.

2. *Prices.* Payment for delivery of the ores will be computed on the following basis:

(a) *Vanadium.* V_2O_5 at \$0.31 per pound up to, but not exceeding, ten pounds of V_2O_5 for each pound of U_3O_8 contained in ores. No factor will be included for V_2O_5 in excess of ten pounds for each pound of U_3O_8 . (Example: For an ore containing two pounds of U_3O_8 and twenty-five pounds of V_2O_5 , payment would be made for twenty pounds of V_2O_5 at \$0.31 per pound, but no payment would be made for the additional five pounds.) Such excess V_2O_5 shall be deemed to be buyer's property.

(b) *Uranium.* (1) Ores assaying less than 0.10% U_3O_8 : no payment. Any such ores which are delivered to the purchase depot shall become the property of the buyer as liquidated damages for buyer's expense of weighing, sampling and assaying, and after sampling may be placed in process, commingled, or otherwise disposed of by buyer. If seller has any question as to the quality of his ore, it is suggested that before shipment and delivery to the purchase depot a representative sample be submitted to the buyer or to one of the umpires for assay at seller's expense. The buyer at his discretion may assay a limited number of samples without charge.

(2) Ores assaying 0.10% U_3O_8 up to 0.15%: price of \$0.30 per pound of contained U_3O_8 . For 0.10% ore, plus \$0.30 per pound for each 0.01% above 0.10% U_3O_8 up to (but not in-

cluding) 0.15%. (Example: The content of U_3O_8 in an ore assaying 0.13% U_3O_8 per pound would be paid for at $\$0.30 + (3 \times 0.30) = \0.90 per pound.)

(3) Ores assaying 0.15% U_3O_8 and more: base price of \$1.50 per pound U_3O_8 content, plus a "development allowance" (at seller's option) of \$0.50 per pound, or a total of \$2.00 per pound U_3O_8 content.

(4) Premiums: \$0.25 per pound for each pound of U_3O_8 in excess of 4 pounds U_3O_8 per short ton (2,000 pounds per ton) and an additional premium of \$0.25 per pound for each pound in excess of ten pounds U_3O_8 per ton of ore.

(Example: U_3O_8 payments for a short ton of ores assaying 0.6% U_3O_8 would be as follows:

Base price 12 lbs. @ \$1.50	\$18.00
Development allowance 12 lbs. @ \$0.50	6.00
Premium 8 lbs. (12-4) @ \$0.25	2.00
Additional Premium 2 lbs. (12-10) @ \$0.25	.50
Total U_3O_8 Payments	26.50

(c) Assays shall be adjusted to the nearest 0.01% for purposes of payment.

NOTES: 1. The "development allowance" of \$0.50 per pound of U_3O_8 contained in ores assaying 0.15% U_3O_8 or more, is offered by buyer in recognition of the expenditures necessary for maintaining and increasing the developed reserves of uranium ores. Sellers accepting this allowance are deemed to agree to spend such funds for the development or exploration of their properties. Sellers delivering less than 1,000 short tons per calendar year will not be required to submit an accounting record of expenditures for development or exploration pursuant to this agreement but sellers delivering in excess of 1,000 short tons per calendar year will be required, under the terms of their contracts, to submit proof satisfactory to the Commission that funds equivalent to the amount received as development allowance have been spent for development or exploration during the contract period or within six months thereafter.

2. Commitments by the Commission to accept delivery of ores are limited to the provisions of this section, as amended from time to time, or to written contracts between the Commission and sellers. Other commitments purporting to be made by the Commission's field personnel or other agents of the Commission will not bind the Commission unless they are in accord with the provisions of this circular or other official circulars.

3. Weights are avoirdupois dry weight; tons are short tons (2,000 pounds per ton).

(Sec. 5 (b), 60 Stat. 761)

Effective date. This circular will become effective at midnight, April 11, 1948.

Dated at Washington, D. C., this 9th day of April 1948.

By order of the Commission.

WALTER J. WILLIAMS,
Acting General Manager.

TITLE 11—ATOMIC ENERGY

Chapter I—Atomic Energy Commission

[Circular 4]

PART 60—DOMESTIC URANIUM PROGRAM

TEMPORARY ADDITIONAL ALLOWANCES, COLORADO PLATEAU AREA CARNOTITE-TYPE AND ROSCOELITE-TYPE ORES

§ 60.4 *Temporary additional allowances, Colorado Plateau area carnotite-type and roscoelite-type ores*—(a) *Additional allowances.* In addition to the guaranteed minimum prices specified in § 60.3 (Circular No. 3) issued April 9, 1948, the relevant terms and conditions of which are hereby incorporated in this section by reference, the Commission will pay the allowances specified in paragraph (b) of this section in connection with the delivery of carnotite-type or roscoelite-type uranium-bearing ores at the Commission's established purchase depots in the Colorado Plateau area.

(b) *Allowances specified.* The following allowances are specified:

(1) A haulage allowance of 6¢ per ton mile for transportation of ore from the mine where produced to the purchase depot specified by the Commission, up to a maximum of 100 miles. The haulage distance from the mine to the purchase depot will be determined by the Commission and its decision will be final.

(2) An allowance of 50¢ per pound for uranium oxide (U_3O_8) contained in ores assaying 0.20% or more U_3O_8 , in addition to the development allowance provided for in Schedule I of § 60.3.

(c) *Inquiries.* All inquiries concerning the provisions of this section, offers to deliver ores, or questions about the Commission's uranium program in the Colorado Plateau area should be addressed to:

United States Atomic Energy Commission,
Post Office Box 270,
Grand Junction, Colorado,
Telephone: Grand Junction 3000.

(d) *Effective date.* The allowances provided for in this section will become effective June 1, 1948 and will be in effect until July 1, 1949, and shall, during this period, constitute guaranteed minimum prices in addition to those specified in § 60.3. (Sec. 5 (b), 60 Stat. 761)

Dated at Washington, D. C., this 15th day of June 1948.

By order of the Commission.

CARROLL L. WILSON,
General Manager.

[F. R. Doc. 48-5526; Filed, June 21, 1948;
8:47 a. m.]

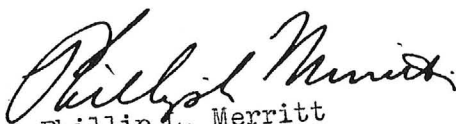
In addition, we shall try to definitely determine the black radioactive mineral that frequently cements the quartz grains; we have reason to believe that it may be pitchblende. If you have obtained the results of the x-ray defraction pattern on this mineral from Smith Emery, we would be interested in seeing it. We would also like to obtain a sample of the most radioactive variety of this black sandstone, if you have such available.

I seriously question whether you can do much in a quantitative way with your Omaha Scientific Company field counter especially in the low grade material. We find that the field counters are useful for only very rough quantitative work and even our expensive laboratory counter requires careful scrutiny of the results and continuous standardization to produce reliable results. In addition it represents a considerable expenditure. I regret also that at present we are unable to supply you with a counter.

We are forwarding a complete copy of this file to Dr. Wallace G. Fetzner, Chief, Exploration Branch of the Division of Raw Materials at Grand Junction, at P. O. Box 270, Grand Junction, Colorado. He is in charge of exploration for the Raw Materials Division in your area. I have advised him to send a field man to this region to study it in greater detail but at the present we doubt whether anyone will reach there before October. In any event Dr. Fetzner will contact your office before sending anyone to Hacks Canyon and I am certain that he will appreciate any cooperation you may give him.

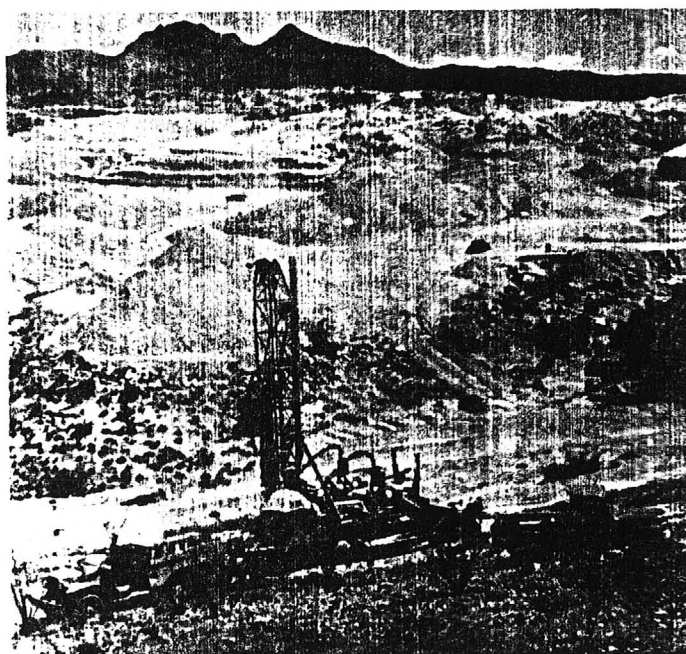
We thank you for all the work you have done in connection with these deposits and regret that we have been unable to reply sooner. The overwhelming number of samples we have recently received has prevented our keeping up to date with many of them. If you care to send us any more samples we will endeavor to work them more quickly; in any event we shall send you the radiometric analyses on them immediately.

Very truly yours,


Phillip L. Merritt
Assistant Director



Adits in the Little Joe-Workman mine areas of the Sierra Anchas of Gila County. Uranium is contained in the late Precambrian Dripping Spring Quartzite. This area is continuing as an exploration target in the 1980s. Photo by R. Scarborough.



Mining and drilling in 1958 at the Anderson mine of Yavapai County. Renewed drilling in the 1970s outlined a large low-grade uranium orebody nearby which now awaits favorable economic conditions for further development. Photo by W. Chenoweth, Dept. of Energy.

1959 on, ore was hoisted through a crosscut and 1,600 foot shaft directly to the canyon rim. Most ore was trucked to the Rare Metals Mill in Tuba City.

More than 60 exotic minerals have been identified at the Orphan mine. Detailed analyses indicate primary ore deposition at temperatures of 60° to 110° C, with uranium-lead age dates suggesting a Jurassic age of ore deposition. Interestingly, this very nearly coincides with the age of the Morrison Formation sedimentation in the Four Corners region to the east.

Other Arizona Production

Between 10,000 and 20,000 tons of uranium ore have been shipped from each of three other sources in Arizona: The Cretaceous Toreva Formation on the eastern extent of Black Mesa; the Precambrian Dripping Spring Quartzite of the Sierra Ancha of Gila County; and scattered shipments from 11 different sources in the Basin and Range portion of the state. The Toreva Formation and Dripping Spring Quartzite ores are both interpreted as stratabound deposits (Chenoweth and Malan, 1973; Williams, 1957). The two largest southern Basin and Range sources (both in the 1950s) have been the Anderson mine of Yavapai County (consisting of Miocene carbonaceous and siliceous sediments) and the Duranum mine of Santa Cruz County (a shear zone in Cretaceous quartzites).

RECENT TRENDS IN URANIUM INDUSTRY

The 1970s has been a decade of increased exploration and mining of uranium on a national scale. During this ten-year period, average production figures (DOE open file report 100(80)) for New Mexico were 6,200 tons of U_3O_8 concentrate per year, 4,400 tons per year for Wyoming, and 4,300 tons per year for all other states combined (Colorado, Utah, Washington and Texas). Viewed in comparison with these figures, the total cumulative Arizona uranium output to date is 9,164 tons of U_3O_8 , or 2.82% of the U.S. cumulative total production for 324,900 tons of U_3O_8 as of January 1, 1980. Nationally, 1979 drilling footage for uranium was distributed geographically as follows: 35% in Wyoming basins, 33% on the Colorado Plateau, 20% in west Gulf Coast plains, about 2.5% in the Basin and Range Province, and about 10% in all other areas.

RECENT ACTIVITY IN ARIZONA

Although Arizona has only produced moderate amounts of uranium in the past, considerable exploration efforts have been expended in the state during the last decade, particularly in reference to breccia pipe and Cenozoic sedimentary targets. Recent trends of exploration drilling in Arizona are illustrated in Table 2. Land held for exploration and development by companies and individuals in Arizona was at an all-time high at about 1.7 million acres, as of January 1, 1980, up 30% over the January 1979 holdings. Drilling in the first half of 1980 was down about 50% from the same time in 1979, probably related at least in part to nuclear reactor cancellations following the Three Mile Island incident. The drilling peak in 1976 was centered around renewed interest in the Miocene sediments of the Date Creek basin of Yavapai and Yuma Counties. During this surge, Minerals Exploration and Urangeshesha drilled out low-grade ore reserves in excess of 30 million pounds of U_3O_8 in the shallow subsurface near the Old Anderson mine (*Fieldnotes*, v. 9, n. 3, p. 15). Announcements in 1977 of new mining and milling plans were temporarily canceled in mid-1980 because of financial considerations. However, considerable interest remains in the Date Creek basin area and many other Cenozoic sedimentary deposits (see Otton, 1977; Scarborough and Wilt, 1979).

TABLE 2

EXPLORATION DRILLING FOR URANIUM IN ARIZONA, 1970-1980

Calendar Year	Number of Holes	Footage
1970	14	3,500
1971	24	2,200
1972	37	6,000
1973	50	8,700
1974	127	52,000
1975	1,165	176,200
1976	1,465	544,700
1977	1,035	500,400
1978	1,372	688,300
1979	663	378,400
1980*	98	64,300

*First six (6) months only.

Source: W. Chenoweth, DOE, Grand Junction

obtained through underground room-and-pillar techniques with adits or surface declines driven from mesa rims developed on cliffs of the Salt Wash Member of the Morrison Formation.

The Salt Wash Member of the Morrison Formation is interpreted as continental fluvial-floodplain deposits (Chenoweth and Malan, 1973); the uranium-vanadium ores are stratigraphically confined to certain mudstone and sandstone layers which contain abundant fossil woody-plant trash and carbonized log fragments. Ore grade is closely associated with organic content, which, in turn may be related to the position of point bar deposits with respect to paleo-meander bends in the stream courses.

Most workers interpret the ore deposition as quickly following sediment deposition, before later diagenesis solidified the mudstones. In the Carrizo Mountains at the Zona Mine, Chenoweth and Malan (1973) interpreted the ore deposition to have taken place before the Salt Wash sediments were intruded and baked by the Laramide-age Carrizo Mountain laccoliths. Hence the ore deposition is pre-Laramide (~ 70 m.y.) in age.

An unexplained attribute of the Salt Wash ores is a ratio of vanadium to uranium of approximately 4:1 up to 8:1. This ratio is a high for Arizona uranium deposits and accounts for 17.9 million pounds of V_2O_5 production from mines in the Salt Wash Member alone. The uranium and vanadium apparently migrated together under appropriate geochemical conditions, presumably from the source area of the Salt Wash sediments, somewhere to the west of what is today Lee's Ferry on the Colorado River (Craig and others, 1955).

Chinle Formation

The basal part of the Triassic Chinle Formation in the Cameron area and in the Monument Valley region of Arizona and Utah had sustained production of uranium between 1948 and 1969. In the Cameron area, the lower part of the Chinle Formation (termed the sandstone and siltstone member by Repenning and others, 1969, p. 5) and various horizons in the Petrified Forest Member contain ore zones that consist of interbedded sands and mudstones with abundant silicified logs. These strata are exposed along both sides of the Little Colorado River for 40 miles. A total of 102 mines, most of which were open pits averaging between 20 and 60 feet deep, produced 1.24 million pounds of U_3O_8 and 212,000 pounds of V_2O_5 between 1954 and 1963 (see Bollin and Kerr, 1958). These mined areas represent only the most accessible ore bodies. Certainly, some potential for slightly deeper ore bodies remains in the area, as suggested by some recent drilling results. In the eastern part of the Cameron area, minor production is recorded from the basal Kayenta Formation.

Monument Valley has been the single most productive area for uranium in Arizona. In this region, well-defined channels of the basal Chinle conglomerate (the Shinarump) were cut into the underlying Triassic Moenkopi Formation and were subsequently mineralized locally. The channel fill consists of pebbly conglomerates with sandstone and mudstone lenses and locally abundant carbonized and silicified logs. Total Monument Valley production from 34 mines between 1948 and 1969 amounts to 8.7 million pounds of U_3O_8 and 24.4 million pounds of V_2O_5 . Arizona's largest single mine group is the Monument No. 2 mine, operated by the Vanadium Corporation of America. This Monument mine is in an erosional remnant of a low scour in a single Shinarump channel, with both upstream and downstream portions removed by later erosion. The preserved channel remnant is cut through the Moenkopi Formation into the underlying De Chelly Sandstone, and is about 700 feet wide and up to 60 feet deep. Monument No. 2 production alone accounts for 5.2 million pounds of U_3O_8 and 21.8 million pounds of V_2O_5 from 1952 to 1967. Earlier underground workings were eventually replaced by an open pit which followed the course of the Shinarump channel. Production was enhanced from 1955 to 1964 by a mechanical upgrader situated near the mine that separated higher grade clay-silt ore averaging 0.24% U_3O_8 and 2.6% V_2O_5 from more sandy materials (0.02% U_3O_8 and 0.18% V_2O_5) which were discarded. During 1964-1967, heap leaching of the sand residue and some low grade ore resulted



Mining at the Charlie Huskon No. 3 open pit in the Cameron area, April 1966. Uranium here is in sands and shales of the Triassic-age Chinle Formation. Petrified wood in the sediments is especially uranium rich. Photo by W. Chenoweth, Dept. of Energy.

in additional production. Ore minerals at Monument No. 2 are tyuyamunite, carnotite, becquerelite, hervettite and uraninite; they impregnate sandstone lenses, fill fractures, and replace clay and fossil plant fragments. Most workers hypothesize ore deposition in Shinarump channels to have occurred through the trapping of uranium-vanadium minerals by organic debris in the channels from groundwater solutions which were moving through the permeable channelways in the post-Shinarump time. However, Finnell (1957) suggests a Laramide age of low-temperature hydrothermal ore deposition.

Breccia Pipe Sources

Breccia pipes are found in large areas of the Colorado Plateau country. More than 100 have been postulated by DOE subcontract studies to exist in the region surrounding the Grand Canyon. The pipes take the form of vertically elongate, cylindrical masses filled with heterogeneous assemblages of sedimentary rock fragments that have been displaced downward, presumably by collapse into a solution cavity formed in Mississippian-age Redwall Limestone. Radial and concentric faults and fractures mark the lateral pipe boundaries. Where explored, the pipes never contain sedimentary material that can be proven to have moved upward, nor do they contain any volcanic debris. Many, but by no means all, of the Arizona Plateau pipes contain varying degrees of copper and/or uranium mineralization. Past uranium production in Arizona is recorded from five pipes. The first four (Chapel, Hack Canyon, Ridenour and Riverview) supplied a cumulative total of 1852 tons of uraninite-type ore that contained about 0.5% U_3O_8 between 1950 and 1964. The fifth, the Orphan Lode, is the second largest individual Arizona uranium mine. It is credited with 509,000 tons of ore that contained 0.43% U_3O_8 , and with considerable values of copper and silver. Vanadium content was quite low.

The Orphan ores are mostly primary uraninite-pyrite-chalcocite-tennantite, with some secondary ores found near the present surface of the mine, 1,000 feet below the top of the Grand Canyon. The ores have been subdivided into basically two types. A central "B" orebody occupies a "pipe within a pipe" structure, where the ore has impregnated the highly brecciated pipe-fill derived largely from the Coconino Sandstone. The annular ring orebody is found mostly outside the pipe perimeter, 200-400 feet below the surface. Outside of the pipe perimeter, rich ore selectively replaced certain mudstone layers in the Supai Formation. For details of Orphan geology, see Gornitz and Kerr (1970) and Kofford (1969).

Ore mined in 1956 to 1959 was hoisted to the canyon rim by an aerial bucket tramway with a 1,000 ton-per-month capacity. From

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT

Date June 25, 1978

1. Mine: Canyon Copper
2. Location: Sec. 4 W ^{Range} 37 N ^{Twp} Nearest Town Fredonia
Distance 37 Miles Direction N. E Road Condition Fair to top of Canyon - truck only road
Got way
3. Mining District & County: Hacks Canyon - Mohave
4. Former Name of Mine:
5. Owner: G. C. Harwood et al
Address: 1521 W Wilshire Drive, Phoenix, Ariz.
6. Operator: Idle at time of visit
Address:
7. Principal Minerals: Cu. Chromium
8. Number of Claims: 14 Lode Placer
Patented Unpatented
9. Type of Surrounding Terrain: Dugged perpendicular canyon
walls up to 700' in height.
Elev. 4200 Sparse vegetation
10. Geology & Mineralization:

11. Dimension & Value of Ore Body:

Undetermined

12. Ore "Blocked Out" or "In Sight": Uranium shows over area 80' feet in length on 1st level below adit, but insufficient development work to determine extent.

Ore Probable:

13. Mine Workings—Amount and Condition:

No.	Feet	Condition
Shafts 2	1 incline 96', 50° fair condition 1 vert 60' good "	
Raises 1	?	poor
Tunnels 1	50	excellent.
Crosscuts		about 500' drifting
Stopes		none

14. Water Supply: sufficient for camp.

15. Brief History: First worked about 1900 and abandoned. Worked 1934 again abandoned. Present operators started 1940 shipped some Cu ore. Uranium discovered 1947.

16. Signature: visited Danning & Manning 6-25-48

17. If Property for Sale, List Approximate Price and Terms: