RESULTS OF EXPLORATION AT LOST CREEK SCHROECKINGERITE DEPOSIT, SWEETWATER COUNTY, WYOMING

Trace Elements Memorandum Report 288

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IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

JUL 8 1952

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AEC-58/3

Dr. Phillip L. Merritt, Assistant Director
Division of Raw Materials
U. S. Atomic Energy Commission
P. O. Box 30, Ansonia Station
New York 23, New York

Dear Phil:

Transmitted herewith for your information and distribution are copies 5-6 of Trace Elements Memorandum Report 288, "Results of exploration at Lost Creek schroeckingerite deposit, Sweetwater County, Wyoming, July 1951 - February 1952, an interim report," by Douglas M. Sheridan, John T. Collier, and Richard S. Sears, July 1952.

This interim report presents the reserves of schroeckingerite-bearing material estimated to be in the areas explored during fiscal year 1952 at Lost Creek, Sweetwater County, Wyoming.

A contract for an additional 10,000 feet of trenching has been negotiated and will be paid for from fiscal-year 1952 funds. If possible some trenching will be done for several miles along the Cyclone Rim fault zone from the main area, to aid in determining the areal extent of the schroeckingerite-bearing material.

We are giving this report a limited distribution because of the size and number of maps. Mr. Hosted approved this distribution orally on July 7, 1952.

Sincerely yours,

W. H. Bradley
Chief Geologist

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Geology - Mineralogy

This document consists of 23 pages, plus 7 figures, No. 17 of 23 copies, Series A

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

RESULTS OF EXPLORATION AT LOST CREEK SCHROECKINGERITE DEPOSIT, SWEETWATER COUNTY, WYOMING, JULY 1951 - FEBRUARY 1952*

AN INTERIM REPORT

By

Douglas M. Sheridan, John T. Collier,
and Richard S. Sears

July 1952

Trace Elements Memorandum Report 288

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*This report concerns work done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission

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TEPCO, Washington (Including master)	18-23

CONTENTS

Page

TABLES

RESULTS OF EXPLORATION AT LOST CREEK SCHROECKINGERITE DEPOSIT, SWEETWATER COUNTY, WYOMING, JULY 1951-FEBRUARY 1952

- AN INTERIM REPORT -

By Douglas M. Sheridan, John T. Collier, and Richard S. Sears

ABSTRACT

The U. S. Geological Survey, on behalf of the Atomic Energy Commission, from July 1951 to February 1952, explored the Lost Creek schroeckingerite deposit, Sweetwater County, Wyoming, by means of auger-drilling, trenching, and bucket-drilling. This report presents an estimate of the inferred ore reserves obtained during this exploration.

The inferred reserves are presented under three schedules. Schedule A is the reserves calculated for the main schroeckingerite-bearing area; Schedule B is the reserves for the smaller schroeckingerite-bearing area to the north of the main area. The grade and tonnage estimates for both Schedule A and Schedule B are divided into two groups--data for selective mining, and data for bulk-mining. Schedule C presents reserve estimates for a semi-selective mining method and was calculated for four selected blocks in the western half of the main schroeckingerite-bearing area.

The inferred reserves of schroeckingerite available for bulk-mining in the area of Schedule A are about 3,000,000 tons that contain 0.005 percent uranium, or about 140 tons of metallic uranium. By bulk-mining, 900,000 tons containing 0.005 percent uranium, or 45 tons of metallic uranium, are available in the area of Schedule B.

The inferred reserves available for selective mining in the area of Schedule A are 100,000 tons of schroeckingerite deposits that contain 0.030 percent uranium, or 30 tons of metallic uranium. By selective mining, 35,000 tons of schroeckingerite deposits that contain the 0.030 percent uranium, or 10 tons of metallic uranium, are available in the area of Schedule B.

Semi-selective mining in the four areas of Schedule C will yield about 650,000 tons of rock containing 0.008 percent uranium, or 50 tons of metallic uranium.

INTRODUCTION

This interim report presents the grade and tonnage data collected during exploration at the Lost Creek schroeckingerite deposit, Sweetwater County, Wyoming, between July 1951 and February 1952. Discussions of the geologic results of exploration (lithology, mineralogy, structure, origin, etc.) are not included in this report and consequently the detailed lithology and structure have been omitted from the illustrations (figs. 1-7). Such detailed geologic information will be included in a Trace Elements Investigations report, to be prepared upon completion of the government exploration at Lost Creek.

Location and ownership

The Lost Creek schroeckingerite deposit, in northeastern Sweetwater County, 38 miles north of Wamsutter, Wyoming, is principally in secs. 30 and 31, T. 26 N., R. 94 W., 6th principal meridian, in the Red Desert of the Great Divide basin. Placer mining claims covering the deposit are owned by Mrs. Minnie McCormick (deceased) and eight associates--John A. McCormick, Louis A. McCormick, Mrs.

Mabel A. McVae, Mrs. Emma J. Eversole, Mrs. Laura E. A. McCargar, Kleber H. Hadsell, Tom W. Whelan, and C. A. Brimmer. The property was leased in January 1948 to Uranium, Inc. of Denver, Colorado.

Field work

The U. S. Geological Survey mapped the known parts of the deposit in 1949 and conducted preliminary auger-drilling studies in the fall of 1950 (Page, 1950; Wyant and Sheridan, 1951; Wyant, Sharp, and Sheridan, 1951).

During fiscal year 1952 the Geological Survey conducted a geologic exploration program at the Lost Creek deposit (Sheridan, 1951). The exploration consisted of auger-drilling, bucket-drilling, and trenching.

Exploratory auger-holes were drilled with a 4-inch jeep-mounted auger-drill during the period July to November, 1951, in order to study the distribution of schroeckingerite. Drill cuttings from 123 holes were examined with an ultra-violet light and geiger counter, and the holes were logged both for lithology and gamma-ray radioactivity. (See detailed logs in monthly progress report, July to November, 1951). The Geological Survey personnel at Lost Creek during the auger-drilling were D. M. Sheridan, A. J. Erickson, and J. T. Collier, assisted for about 1 month by A. M. Heyman.

A government contract for 8-inch auger-drilling (later changed to bucket-drilling) commenced in November 1951. Seventy holes were drilled, logged for lithology and gamma-ray activity. The drilling was suspended on December 21, 1951 and the drilling contract was terminated in May 1952, because this method of exploration had proven inferior to trenching.

A contract for exploratory trenching started effectively on December 5, 1951, and was completed on February 1, 1952. Detailed sections of both walls of each of 6 trenches (total mapped length of trenches was 5,694 feet) were prepared at a scale of 1 inch equals 10 feet. The trenches were examined at night with ultra-violet lights to determine the boundaries of individual schroeckingerite deposits and these boundaries were outlined for later mapping. During daylight hours the lithology, structure, and schroeckingerite deposits were mapped and samples were taken. The southern part of trench 3 (fig. 1) was completely filled with snow and could not be mapped during the winter field season; this part of trench 3 will be mapped during July 1952.

The Geological Survey personnel at Lost Creek during the contractual exploration consisted of D. M. Sheridan, J. T. Collier, R. S. Sears, and W. S. Cavender; A. J. Erickson assisted during December and L. R. Page and C. T. Pierson assisted in the mapping during two weeks of January. J. S. Adair handled the engineering duties in the field for the Engineering Exploration Unit, and was assisted part of the time by Joe Thomas, D. E. Blake, and H. L. Bittle.

Chemical analyses of samples were made by the Geological Survey Trace Elements Section Denver Laboratory.

This work was done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission.

GEOLOGY

Schroeckingerite, a complex hydrated sulfate, carbonate, and fluoride of calcium, sodium, and uranium occurs in beds consisting of interfingering facies of the Wasatch and Green River formations of late Early Eocene age.

These beds strike northwestward and dip about 20° NE. in the immediate area of the deposit. Two large schroeckingerite-bearing areas are known--a main area, at least 9,000 feet long (area of Schedule A, fig. 1), and a smaller area, to the north, that is at least 3,600 feet long (area of Schedule B, fig. 1). The main mineralized area is within the Cyclone Rim zone of faulting. This zone trends northwest for a distance of 12 to 15 miles and is about 1,100 feet wide in the vicinity of the deposit (Wyant, et al., 1951). Abundant evidence of faulting was noted and several faults were mapped during the trenching program. Quaternary deposits cover most of the Lost Creek area so that the distribution of the schroeckingerite deposits is known mainly from exploratory work.

More complete information on the geology and mineralogy has been included in an earlier report (Wyant et al., 1951).

RESULTS OF EXPLORATION

Prior to fiscal year 1952, the total known length of the schroeckingerite-bearing area at Lost Creek was 3,600 feet. Exploratory studies with a jeep-mounted auger extended the main mineralized area within the Cyclone Rim fault zone to at least 9,000 feet in length. The known length of a second schroeckingerite-bearing area was extended to 3,600 feet from a single known occurrence north of the main area.

The evaluation of grade and tonnage in the Lost Creek deposit in this report is based entirely upon the data accumulated during the fiscal year 1952 exploration program. Analyses of trench samples were used exclusively for the basis of grade calculations, because it has been demonstrated that auger-samples involve contamination and because bucket-drill samples cannot

be accurately weighted in calculations involving trenching data. The areal distribution of schroeckingerite, used in plotting the areas on the plan map (fig. 1) and in making the calculations, is based upon data accumulated during the auger-drilling and bucket-drilling programs as well as during the trenching program.

Sampling of trenches

The trench walls were sampled by several methods--channel samples at intervals across schroeckingerite deposits, channel samples in overburden (Quaternary deposits) and in Tertiary host rock, and face-cut samples in schroeckingerite deposits. The locations of samples are designated on the assay sections of the trenches (figs. 2-7); both walls of each of the trenches are plotted on the sections, and the bases and surfaces are indicated. For channel samples, the lengths (in feet) are designated after the sample numbers. For face-cut samples, the areas (in square feet) are designated after the sample numbers. Both equivalent uranium and uranium contents are reported on the assay sections.

In trench 1 (fig. 2) most of the sampling of schroeckingerite deposits was done by the channel method--cutting channels across the deposit at varying intervals, depending upon the size of the deposit. In the widened and deepened parts of trench 1, the schroeckingerite deposits were sampled by the face-cut method, which involved cutting a layer half an inch deep from the entire surface of the deposit; large deposits were divided into areas 5 feet in length for convenience of sampling. Horizontal channel samples in host rock and in schroeckingerite deposits and vertical samples in the overburden gave additional control.

Sampling in trenches 2-6 (figs. 3-7) consisted of face-cut sampling of the schroeckingerite deposits and horizontal channelling of the host rock.

Methods of evaluating reserves

The evaluation of inferred reserves is based upon three main considerations: (1) bulk-mining, (2) selective-mining, and (3) semi-selective mining. The calculations of grade and tonnage were divided into three "Schedules" (tables 1-4 and fig. 1):-

Schedule A

Calculations were made for the large main area of schroeckingerite-bearing rock that is cut by the 6 trenches (fig. 1 and table 1).

(1) Data for bulk-mining were calculated on the basis that the overburden would be stripped first and that the entire area would then be mined on a large scale to obtain all the schroeckingerite which occurs above a depth of 8.5 feet below the original surface. This scheme includes the relatively barren host rock which separates the schroeckingerite deposits.

(2) Data for selective mining were calculated on the basis that mining might be restricted to individual schroeckingerite deposits by pick-and-shovel methods. None of the host rock is involved in these calculations.

Schedule B

Calculations were made for the area north of the main area of schroeckingerite-bearing rock (fig. 1 and table 2). No trenches cut the area of Schedule B and the grade is inferred to be the same as that in the block of Schedule A.

Table 1.--Schedule A - Grade and tonnage

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Location of block 1/	Length (feet)	Planimetered area 2/ (sq. feet)		Width (feet)	Average thickness of overburden (feet)	Mining thickness (feet)	DATA FOR SELECTIVE MINING 3/ Avg. total cross-sectional area schroeckingerite deposits (sq. feet)	Total volume of schroeckingerite deposits (cu. feet)	Total tons of schroeckingerite deposits	Average grade (percent uranium)	Tons of uranium	DATA FOR BULK MINING 4/ Avg. grade of all schroeckingerite deposits in schedule A (percent uranium)	Total volume of rock (cu. feet)	Total tons of rock	Avg. grade (percent uranium)	Tons of uranium	Avg. grade of all rock in Schedule A, bulk-mining (percent uranium)
			West end	465	1.5	7											
West of Trench 5	1050 (approximate)	951,000					201.50	211,575	15,112	0.050	7.56		6,515,600	465,400	0.007	32.58	
			Trench 5	975	1.5	7											
Between Trench 5 and Trench 1	1750 (approximate)	1,613,265					254.35	445,112	31,794	0.039	12.40		11,292,855	806,632	0.006	48.39	
			Trench 1	920	1	7											
Between Trench 1 and Trench 2	995						318.14	316,549	22,610	0.022	4.97		6,390,387	456,456	0.0045	20.54	
			Trench 2	915	1	7											
Between Trench 2 and Trench 6	1350						217.82	294,057	21,004	0.020	4.20		5,757,750	411,268	0.004	16.45	
			Trench 6	425	2	5											
Between Trench 6 and Trench 3	1360						53.80	73,168	5,226	0.015	0.78		3,213,000	229,500	0.003	6.88	
			Trench 3	520	3	5											
Between Trench 3 and Trench 4	1500						54.32	81,480	5,820	0.014	0.81		4,267,500	304,281	0.003	10.13	
			Trench 4	515	2	6											
East of Trench 4	1500						28.52	42,780	3,056	0.015	0.46		3,712,500	265,178	0.003	7.95	
			East end	310	2	6											
TOTALS	9505			5045 (Numerical avg. =630)				1,464,721	104,622		31.18	0.030	41,149,592	2,938,715		142.92	0.005

1/ Location of Schedule A area, is shown on the plan map (fig. 1).

2/ Planimetered surface areas were used for calculation of volumes of rock for bulk mining for the block west of Trench 5 and the block between Trench 5 and Trench 2.

3/ Data for selective mining:- calculated for schroeckingerite deposits only. It was assumed that the areas of schroeckingerite deposits exposed by the Trenches are representative.

4/ Data for bulk mining:- calculated for both the schroeckingerite deposits and the enclosing host rock. The calculations include all schroeckingerite to a depth of 815 in the area shown on the map (fig. 1).

Table 2. --Schedule B - Grade and tonnage

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Location of Schedule B area 1/	Length (feet)	Inferred width (feet)	Inferred average thickness 2/ (feet)	Volume of rock (cu. feet)	Tons of rock	DATA FOR SELECTIVE MINING: Percentage of total volume of rock as schroeckingerite deposits 3/	DATA FOR SELECTIVE MINING: Tons of schroeckingerite deposits	DATA FOR SELECTIVE MINING: Average grade 4/ (percent uranium)	DATA FOR SELECTIVE MINING: Tons of uranium	DATA FOR BULK MINING: Tons of rock	DATA FOR BULK MINING: Average grade 5/ (percent uranium)	DATA FOR BULK MINING: Tons of uranium
See plan map (fig. 7)	3600 (at least)	500	7	12,600,000	900,000	3.8	34,200	0.030	10.26	900,000	0.005	45.00

1/ The Schedule B area is located north of the main area. No trenches have been excavated as yet in the Schedule B area. The presence of schroeckingerite has been proven by test-pitting and auger-drilling but no accurate figures are available for distribution and grade.

2/ An average thickness of 7 feet is inferred from the Schedule A area.

3/ In the Schedule A area, 2101.45 square feet of schroeckingerite deposits are exposed in 54,770 square feet of trench walls. Therefore approximately 3.8 percent of the total trench wall exposures consist of schroeckingerite deposits. This percentage is inferred for the Schedule B area.

4/ Average grade for schroeckingerite deposits, 0.030 percent, is inferred from the Schedule A data.

5/ Average grade for bulk mining rock, 0.005 percent, is inferred from the Schedule A data.

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Table 3. --Compilation of grade and tonnage from Schedules A and B

	DATA FOR SELECTIVE MINING			DATA FOR BULK MINING		
Schedule	Tons of schroeckingerite deposits	Tons of uranium	Average grade (percent uranium)	Tons of rock	Tons of uranium	Average grade
A	104, 622	31. 18	0. 030	2, 938, 715	142. 92	0. 005
B	34, 200	10. 26	0. 030	900, 000	45. 00	0. 005
Totals - -	138, 822	41. 44		3, 838, 715	187. 92	

Table 4.--Schedule C - Grade and tonnage

Block	Location 1/	Average thickness (feet)	Planimetered area (sq. feet)	Volume of rock (cu. feet)	Tons of rock	Average grade (percent uranium)	Tons of uranium	Average grade of entire block (percent uranium)	Average grade of Schedule C (Blocks I, II, III, and IV) (percent uranium)
I	West of Trench 5	4.0	4,320	17,280	1,234.29	0.009	0.11		
	Between Trench 5 and Trench 1	3.2	169,400	542,080	38,720.00	0.005	1.93		
	Between Trench 1 and Trench 2	3.5	122,200	427,700	30,550.00	0.004	1.22		
	Between Trench 2 and Trench 6	4.0	64,000	256,000	18,285.71	0.005	0.91		
	Subtotals:		359,920	1,243,060	88,790.00		4.17	0.005	
II	West of Trench 5	4.0	253,400	1,013,600	72,400.00	0.011	7.96		
	Between Trench 5 and Trench 1	3.8	342,760	1,302,488	93,034.85	0.010	9.30		
	Between Trench 1 and Trench 2	3.8	158,800	603,440	43,102.86	0.006	2.59		
	Between Trench 2 and Trench 6	4.0	290,000	1,160,000	82,857.14	0.005	4.14		
	Subtotals:		1,044,960	4,079,528	291,394.85		23.99	0.008	
III	West of Trench 5	4.0	3,000	12,000	857.14	0.010	0.09		
			1,400	5,600	400.00	0.014	0.06		
	Between Trench 5 and Trench 1	3.3	325,800	1,075,140	76,795.71	0.011	8.45		
	Between Trench 1 and Trench 2	3.7	249,080	921,596	65,828.28	0.008	5.27		
	East of Trench 2	4.0	165,600	662,400	47,314.28	0.007	3.31		
	Subtotals:		744,880	2,676,736	191,195.41		17.18	0.009	
IV	West of Trench 5	4.0	87,600	350,400	25,028.57	0.007	1.75		
			28,280	113,120	8,080.00	0.004	0.32		
	Between Trench 5 and Trench 1	3.5	198,320	694,120	49,580.00	0.006	2.97		
	Between Trench 1 and Trench 2	3.2	118,640	379,648	27,117.71	0.006	1.63		
	East of Trench 2	4.0	8,200	32,800	2,342.86	0.008	0.19		
			1,520	6,080	434.29	0.002	0.01		
	Subtotals:		442,560	1,576,168	112,583.43		6.87	0.006	
GRAND TOTALS for Schedule C			2,592,320	9,575,492	683,963.69		52.21		0.008

1/ NOTE:- Locations of Blocks are shown on the plan map (fig. 1) and on the assay sections (figs. 2-7)

(1) Data for bulk-mining were calculated on the same basis as for Schedule A.

(2) Data for selective-mining were calculated on the same basis as for Schedule A.

Schedule C

Calculations were made for four blocks in the western half of the main area of schroeckingerite-bearing rock (fig. 1 and table 4). The outlines of these four blocks have been inferred from available mineral distribution data. The western part of the main mineralized area was selected as a basis for the calculations of data for Schedule C because both the grade and abundance of schroeckingerite deposits are greater than at the eastern part of the area. Schedule C is an attempt to present data for a possible semi-selective mining scheme, in which bulk-mining methods could be used, but on selected areas. The calculations involve a lay-out of mining blocks that include as much of the richer schroeckingerite deposits as possible, and, at the same time, excludes as much of the host rock as might be possible in semi-selective mining. The positions of the various blocks of Schedule C are indicated also on the assay sections of trenches 1, 2, 5, and 6 (figs. 2, 3, 6, and 7).

In all of the above evaluation methods the basic assumption had to be made that the grade and distribution of the schroeckingerite deposits and the grade of the host rock in the 6 trenches is representative of the intervening and end areas. Closer spacing of trenches in a large low-grade deposit of this type would allow more accurate calculations.

Grade

It has been found that field observations of drill-cuttings and of trench walls at nights with ultraviolet lights always indicated a percentage of schroeckingerite higher (generally by a factor of 2 to 10) than the schroeckingerite content indicated by chemical analyses. The actual reasons for this discrepancy between observation and analysis have not been determined satisfactorily. Visual estimates by a number of geologists have agreed and were checked against scheelite charts and a chart of measured percentages. A Rosiwal analysis of a night Kodachrome (taken under ultraviolet light) of a typical schroeckingerite deposit indicated a percentage of schroeckingerite 7 to 60 times higher than was indicated by individual analyses of samples from the same general area. Carefully controlled checks were made on methods of sample preparation and chemical analysis by L. F. Rader of the Trace Elements Section Denver Laboratory. His results (Rader, 1952) indicate that there cannot be any significant error in the analytical work done by the laboratory by the regular fluorimetric method. Pending results of further mineralogic work it is assumed that the discrepancy between analyses and visual estimates is caused by one or a combination of several physical factors which could allow erroneous visual impressions:--1) pore-spaces in the schroeckingerite pellets; 2) orientation of micaceous schroeckingerite plates; and 3) diffusion of fluorescence.

The grades reported in this report are based entirely on chemical analyses. The visual estimates were not considered, even though the discrepancies remain unsolved.

The calculations of grade were made by planimetering the area of each schroeckingerite deposit on each wall of the trenches (figs. 2-7). For trench 1, analyses of channel samples in schroeckingerite deposits were first weighted against lengths to obtain the grade of a single deposit or part of

a deposit. These values were then weighted against areas to obtain the average grades of schroeckingerite-bearing material within the various limits of the schedules. In trenches 1-6, analyses of face-cut samples of the schroeckingerite deposits were weighted against sample lengths to obtain average values. The grade of the host rock was weighted against the grade of the schroeckingerite deposits, again by using areas, for the calculation of average grade involved in Schedule A (bulk-mining data) and in Schedule C. Grades for Schedule B were inferred from Schedule A. The planimetered areas reported on the assay sections (figs. 2 to 7) are the areas of each face-cut sample. These values could be used only for Schedule A. The areas of many of the samples in trenches 1, 2, 5, and 6 were planimetered again for the Schedule C calculations, in order to include only those areas falling within the outlines of blocks shown on the assay sections. The planimetered areas of schroeckingerite deposits used in Schedule C are not indicated on the assay sections.

The grade of individual samples from the schroeckingerite deposits ranges from 0.001 percent uranium to 0.260 percent uranium. The average grades of schroeckingerite deposits in trenches 1 to 6 are respectively: 0.026, 0.020, 0.014, 0.015, 0.050, and 0.016 percent uranium. The overall average grade of all schroeckingerite deposits in the trenches is 0.028 percent uranium.

The average grades of host rock within the limits of Schedule A in trenches 1 to 6 are respectively: 0.0039, 0.0034, 0.0027, 0.0024, 0.0032, and 0.0026 percent uranium.

The average grade of the Quaternary alluvium (weighted from vertical channel samples) in trench 1 is 0.002 percent uranium.

The average grade of schroeckingerite deposits of the various blocks of Schedule A ranges from 0.014 percent uranium to 0.050 percent uranium. The average grade of all schroeckingerite deposits in the area included in Schedule A is 0.030 percent uranium (table 1, data for selective-mining).

The grades of rock in the various blocks reported under the bulk-mining scheme of Schedule A (table 1) range from 0.003 percent uranium to 0.007 percent uranium; the average is 0.005 percent uranium. These values have been weighted by areas for the uranium content of schroeckingerite deposits and of host rock.

The grades indicated in table 2 for Schedule B are inferred from the data of Schedule A.

The average grades of the blocks in Schedule C (table 4) range from 0.005 percent uranium for Block I to 0.009 percent uranium for Block III. The overall average grade for Schedule C is 0.008 percent uranium. The grades along the trenches between the limits of blocks of Schedule C have been indicated on the plan map (fig. 1).

Tonnage

All tonnage calculations were based on an assumed average conversion factor of 14 cubic feet per ton.

Calculations of volume for bulk-mining under Schedule A were made by 2 methods. For the blocks west of trench 5 and for the block between trench 5 and trench 1 (fig. 1 and table 1), the planimetered surface area of the block was multiplied by the mining thickness to obtain the total volume. For the remainder of blocks, the width at each end of a block was multiplied by

the mining thickness, and the average of the 2 end areas was then multiplied by the length of the block to obtain the volume.

Calculations of volume for the selective mining data under Schedule A (table 1) were made as follows: The average total cross-sectional area of schroeckingerite deposits for a single section in a block was obtained by averaging the totals of areas of deposits exposed in the walls of the trenches at the ends of individual blocks; it was assumed that this average cross-sectional area would be the same in any section across a block; the average total cross-sectional area of schroeckingerite deposits was multiplied by the length of the block to obtain the total volume.

Calculations of volume for bulk-mining under Schedule B (fig. 1 and table 2) were made by multiplying the known length of 3,600 feet, by the inferred width of 500 feet and by an inferred mining thickness of 7 feet. Approximately 3.8 percent of the total trench wall exposures in Schedule A consist of schroeckingerite deposits; the figure of 3.8 percent was used to calculate the total volume of schroeckingerite deposits in Schedule B, under the selective-mining data. Further exploration is needed to check the correctness of these assumptions.

Calculations of the volume of each part of a block in Schedule C (table 4) were made by multiplying the planimetered surface area by the average thickness. The positions of the blocks for Schedule C are shown on all the illustrations.

The total tonnage of schroeckingerite deposits in Schedule A is 100,000 1/, whereas there is 3,000,000 tons of rock for bulk-mining

1/ Tonnage figures are rounded in text. Actual calculated figures are in tables 1-4.

under Schedule A (table 1). There is 35,000 tons of schroeckingerite deposits inferred for Schedule B, whereas the total tonnage of bulk-mining rock in Schedule B is 900,000 (table 2). There is 140,000 tons of schroeckingerite deposits in Schedules A and B, and 4,000,000 tons of bulk-mining rock in Schedules A and B (table 3).

There is 650,000 tons of rock in Schedule C, the semi-selective mining plan (table 4).

Summary of inferred reserves

By bulk-mining 140 tons of uranium in 3,000,000 tons of rock is available in the area of Schedule A (table 1), and 45 tons of uranium in 900,000 tons of rock is available in the area of Schedule B (table 2). The total for bulk-mining in Schedules A and B is 185 tons of uranium in 4,000,000 tons of rock (table 3). The average grade of rock for bulk mining is 0.005 percent uranium.

By selective-mining, 30 tons of uranium in 100,000 tons of schroeckingerite deposits is available in the area of Schedule A (table 1) and 10 tons of uranium in 35,000 tons of schroeckingerite deposits is available in the area of Schedule B (table 2). The total for selective-mining in areas of Schedules A and B is 40 tons of uranium in 140,000 tons of schroeckingerite deposits (table 3). The average grade for the selective-mining system is 0.030 percent uranium.

By semi-selective mining in the four areas of Schedule C, 50 tons of uranium in 650,000 tons of rock (fig. 1 and table 4) is available. The average grade is 0.008 percent uranium.

METALLURGICAL TESTING

Three 1,000-pound samples were obtained from trench 2 and a small bulk sample (about 50 pounds) was obtained for preliminary metallurgical testing.

Preliminary work by L. F. Rader in the Trace Elements Section Denver Laboratory indicated that about 85 percent of the uranium in the small bulk sample can be extracted by soda-ash leaching (Rader, 1952).

Metallurgical testing of one of the 1,000-pound samples is being done for the Atomic Energy Commission by A. E. Bach, U. S. Bureau of Mines Experiment Station, Salt Lake City, Utah. Results of this testing have not been received yet.

PLANS FOR FUTURE WORK

Two new contracts have been negotiated, with the remainder of the Lost Creek exploration funds for fiscal year 1952. One of the contracts provides for excavation of trenches and will start about July 7; the other contract provides for backfilling of trenches and will commence after all the trenches have been completely mapped and sampled. The exploration program will provide about 10,000 running feet of trenches. Present plans are to locate new trenches in the area of Schedule B, and to the southeast and northwest of the areas of Schedules A and B (fig. 1).

If possible, one trench will be excavated several miles from the main area to test the extension of mineralized ground along the trend of the Cyclone Rim zone of faulting. The trenches will be mapped and sampled as before and the additional areas covered by the exploration will be mapped by plane table.

After completion of the field work a final report will be prepared, which will include both geologic and economic results of all government exploration at Lost Creek.

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