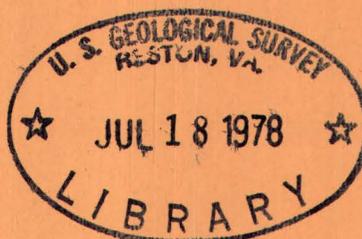


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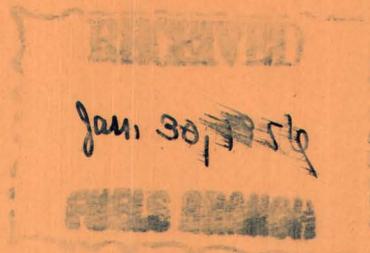
Carnotite resources of San Miguel bench, Montrose County, Colorado

By Donald C. Alvord



FEB-6 1956

D. C. DUNCAN



Trace Elements Investigations Report 289

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CARNOTITE RESOURCES OF SAN MIGUEL BENCH,¹
MONTROSE COUNTY, COLORADO*

By

Donald C. Alvord

September 1955

Trace Elements Investigations Report 289

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*This report concerns work done on behalf of the Division
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CARNOTITE RESOURCES OF SAN MIGUEL BENCH, MONTROSE COUNTY, COLORADO

By D. C. Alvord

ABSTRACT

San Miguel bench includes about 4 square miles in the southern part of T. 48 N., R. 17 W., New Mexico principal meridian, Montrose County, Colorado.

Production of carnotite ore from the area has been about 15,000 short tons having an estimated average grade of 0.31 percent U_3O_8 and 1.6 percent V_2O_5 .

Nearly all of the carnotite deposits occur in a single continuous sandstone bed near the top of the Salt Wash member of the Jurassic Morrison formation. These deposits consist chiefly of sandstone impregnated with uranium- and vanadium-bearing minerals. They are irregular tabular-shaped masses ranging in size from a few short tons to 30,000 short tons or more of minable carnotite ore.

During the period November 27, 1951, to April 17, 1953, the U. S. Geological Survey drilled 309 holes totaling 92,194 feet on the San Miguel bench.

Reserves total about 43,000 short tons of material 1 foot or more thick and contain 0.10 percent or more U_3O_8 or 1.0 percent or more V_2O_5 . Of these reserves 3,300 short tons occur in private land. These reserves are in ten deposits found by Geological Survey drilling. Potential reserves (reserves based on geologic evidence only) are predicted to total about 15,000 short tons, averaging 0.30 percent U_3O_8 and 1.6 percent V_2O_5 .

No additional exploration drilling in the San Miguel bench is planned by the Geological Survey. Some drilling by private enterprise is recommended.

INTRODUCTION

This report appraises the carnotite resources of San Miguel bench and summarizes information gained from U. S. Geological Survey diamond- drill exploration. The exploration was done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission.

San Miguel bench is north of Uravan, Montrose County, Colo., and is accessible by two unimproved roads from Colorado Highway 141 at points half a mile north and 2 miles northwest of Uravan (fig. 1). The explored ground includes parts of secs. 14, 21, 22, 23, 26, 27, 28, 34, 35, and 36, T. 48 N., R. 17 W., and secs. 1 and 2, T. 47 N., R. 17 W., New Mexico principal meridian. San Miguel bench is a rock terrace, partly surrounding Spring Creek Mesa, extending from Atkinson Creek on the northwest to Spring Creek on the southeast (fig. 2). Relief is moderate and altitudes range from 5,300 to 5,700 feet. The climate is semiarid. A sparse to dense growth of saltbush, sagebrush, juniper, and pinon pine covers the area. In the spring, two small check dams retain water from local drainage basins, but the nearest dependable water supply for drilling purposes is the San Miguel River.

About one-third of San Miguel bench is covered by private claims; the remaining two-thirds is public land.

Prospecting on the bench probably began soon after 1910, but no claims were patented in the area until 1924. The first recorded carnotite production began in 1939. Since 1939 the total production of carnotite ore from the area has been about 15,000 tons (table 1). (Shipments and reserves in this report are in short tons.) From 1939 to 1943 about 3,500 tons of ore having an estimated grade of about 0.40 percent U_3O_8 and 2.0 percent V_2O_5 was produced from the Wright group (Little Basin, Grass Roots, and other claims) and the Rock Raven claim. (fig. 2). During the period 1944-47 no ore was produced from the bench. Production from 1948 to April 1953 was about 11,000 tons, having a grade of 0.28 percent U_3O_8 and 1.46 percent V_2O_5 . This material came mostly from the Little Basin and Rock Raven claims.

About 40,000 feet of diamond drilling and 5,500 feet of wagon drilling have been done on San Miguel bench by private enterprise. This drilling was confined to areas where carnotite deposits would be likely to occur 150 feet or less below the surface.

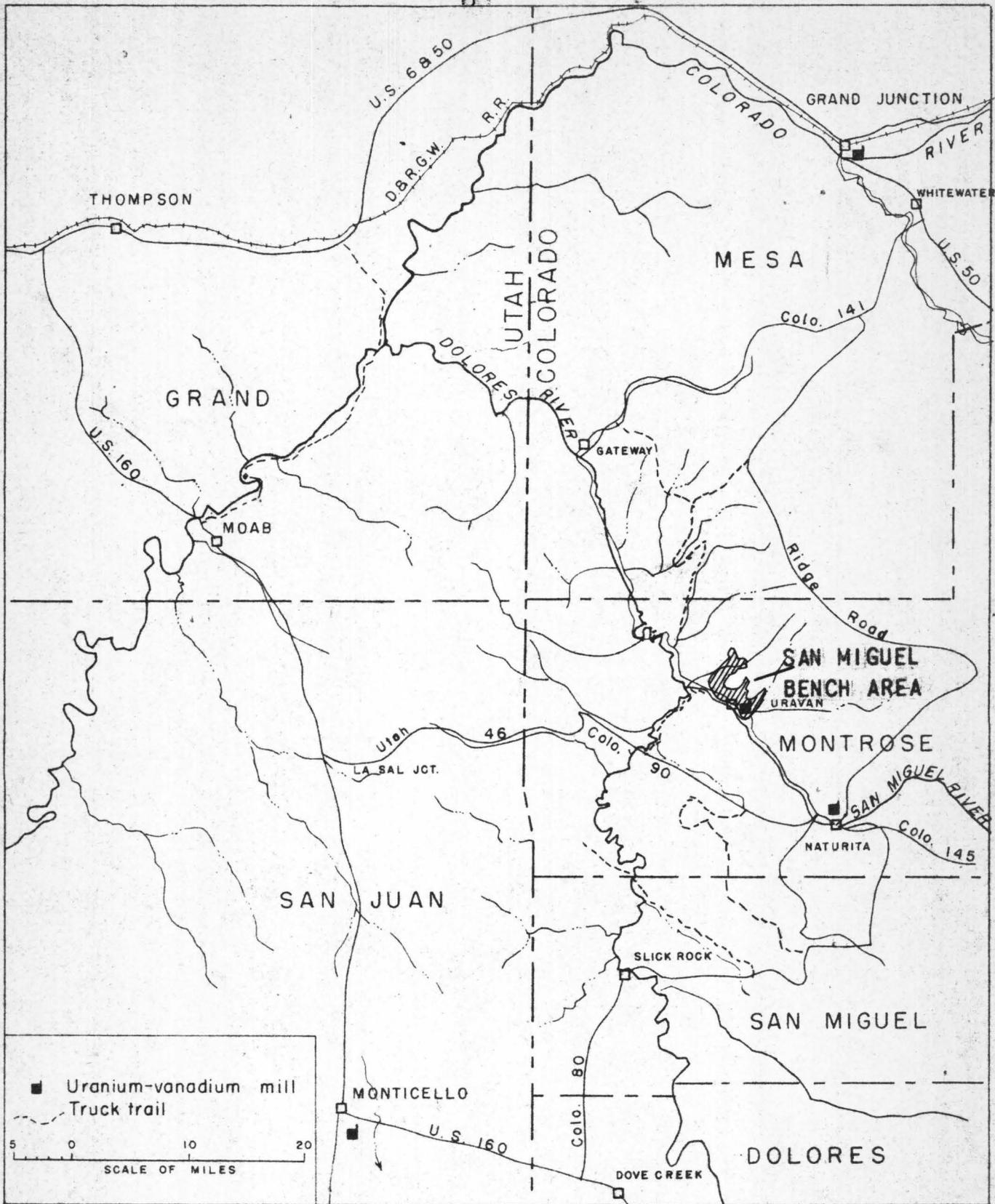


Figure 1. INDEX MAP OF PART OF THE COLORADO PLATEAU SHOWING THE LOCATION OF THE SAN MIGUEL BENCH AREA, MONTROSE COUNTY, COLORADO.

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Table 1. Production of carnotite ore from San Miguel bench,
Montrose County, Colorado, 1939-53^{1/}

Period	Group or claim	Ore (dry short tons) ^{2/}	Percent		Pounds ^{3/}	
			U ₃ O ₈	V ₂ O ₅	U ₃ O ₈	V ₂ O ₅
1939-40	Wright group ^{4/}	1,840	0.40 ^{5/}	2.0 ^{5/}	14,700 ^{5/}	73,600
1941-42		0	--	--	--	--
1943	Wright group ^{4/}	10	0.40 ^{5/}	2.0 ^{5/}	100	400
	Rock Raven	1,620	0.40 ^{5/}	2.14	12,950	69,350
1944-47		0	--	--	--	--
1948-53	Little Basin	7,040	0.32	1.33	45,050	187,250
	Rock Raven	2,280	0.17	1.90	7,750	86,650
	Grass Roots	940	0.26	1.47	4,900	27,650
	Star No. 3	830	0.25	1.31	4,150	21,750
Rounded totals and weighted averages		14,560	0.31	1.60	89,600	466,650

1/ Data for 1939-47 from files of U. S. Geological Survey, Grand Junction, Colo. Data for 1948-53 from the Production Division, Grand Junction Operations Office, Atomic Energy Commission, Grand Junction, Colo.

2/ Figures rounded to nearest 10 tons.

3/ Figures rounded to nearest 50 pounds.

4/ Probably all from the Little Basin and Grass Roots claims.

5/ Estimated.

GEOLOGY

Sedimentary rocks of the Morrison and Burro Canyon formations are exposed in the area of drilling on San Miguel bench. The Morrison formation, of Upper Jurassic age, is composed of two members, the Salt Wash sandstone and the overlying Brushy Basin shale. The Salt Wash sandstone is about 300 feet thick and is composed of about equal parts of cross-laminated sandstone lenses separated by horizontally bedded siltstone and mudstone strata. The Brushy Basin shale is about 400 feet thick and is composed mostly of mudstone and siltstone but includes some interbedded sandstone and conglomeratic sandstone lenses. The overlying Burro Canyon formation, of Lower Cretaceous age, consists almost entirely of sandstone, conglomeratic sandstone, and small quantities of mudstone and shale. The regional stratigraphy of these formations is described by Craig, and others, (1955).

The beds dip toward the northwest-trending San Miguel syncline (fig. 2) with dips ranging from 3° NE, near the San Miguel River to 1° SW, in the extreme northern part of the area.

With the exception of the Rock Raven deposit, which is in a sandstone lens near the base of the Brushy Basin shale, all of the known carnotite deposits on San Miguel bench occur in a single continuous sandstone bed near the top of the Salt Wash. This bed, known as the "ore-bearing sandstone," ranges from 15 to 70 feet or more in thickness. The outcrop of this sandstone is shown on figure 2. It is generally light reddish brown except in the vicinity of ore deposits where it is nearly always pale gray or, where speckled with limonite spots, light brown. The sandstone is mostly medium to coarse grained, is commonly cross-bedded, and generally is a composite of interfingering scour-and-fill sandstone lenses interbedded with minor amounts of mudstone. Reworked conglomeratic mudstone and carbonaceous trash zones are distributed irregularly throughout the sandstone but are found most frequently within scour-and-fill structures. The mudstone overlying, underlying, and within the ore-bearing sandstone is dominantly red. Near ore deposits this material is usually altered to a green gray. The thickness or amount of green-gray alteration seems to have a direct relation to the size of the ore deposits.

ORE DEPOSITS

The uranium and vanadium ore minerals are in part disseminated in the sandstone and in part absorbed in mudstone pebbles and films along bedding planes. The bulk of the uranium in these deposits is in carnotite-- $K_2(VO_4)_2 \cdot 3H_2O$. Tyuyamunite-- $Ca(UO_2)_2(VO_4)_2 \cdot 7-10 \frac{1}{2} H_2O$ -- is also present but only in minor amounts. Most of the vanadium is contained in a number of incompletely identified clay-like minerals. Carbonaceous material containing uranium and vanadium is often associated with carnotite-type deposits, but in San Miguel bench mineralized carbonaceous material is not present in sufficient quantity to form economic deposits.

The deposits are in irregular tabular-shaped masses that lie more or less parallel to the sandstone beds. Deposits range from a few tons to 30,000 tons of minable material. Their mineralized limits range from a few hundred to 100,000 or more square feet in areal extent and from less than one-tenth to more than 6 feet in thickness. The deposits have a general northeasterly trend (fig. 2).

A detailed discussion of the geology and character of the vanadium-uranium deposits of western Colorado and Utah is given by Fischer (1942).

GUIDES TO ORE

Several geologic features associated with ore deposits on San Miguel bench offer larger targets for drilling than do the deposits themselves. These features are used as guides to ore and are listed below according to the size of the target that they provide:

1. The "ore-bearing sandstone" in the vicinity of economic deposits almost without exception is pale to light brown. This color usually extends several hundred feet beyond the limits of groups of deposits. The pale-brown hue imposed upon an otherwise light-gray to white sandstone is caused probably by limonite spotting and a general limonite stain throughout the matrix. Sandstone farther removed from the major deposits generally is light red brown and has been found to contain few deposits of economic grade. The red-brown color seems to be due primarily to the presence of interstitial red mudstone.

2. The mudstone within and immediately above and below the "ore-bearing sandstone usually is altered from red to green gray in the vicinity of ore deposits. Generally the amount of alteration decreases as the distance from the deposit increases.

3. Most deposits of economic size are found within the thicker parts of the ore-bearing sandstone. The deposits of economic grade and size on San Miguel bench are within areas where the "ore-bearing sandstone" exceeds 40 feet in thickness.

Altered green-gray mudstone probably is the most useful single feature discussed, but in appraising ground the three features mentioned above should be considered. In general, where the "ore-bearing sandstone" is classified as favorable, the sandstone is light brown, averages 40 feet or more in thickness, and has associated with it an average of about 0.5 foot of green-gray mudstone. Most of the semifavorable ground in San Miguel bench contains light-brown sandstone less than 40 feet thick associated with green-gray mudstone beds (or units?) up to 1 foot or more thick. Although this ground is considered likely to contain carnotite deposits, drilling indicates it is unlikely that these deposits would be of economic size.

A general study and discussion of the use of geologic features as guides to vanadium-uranium deposits is given by Weir (1952).

GEOLOGICAL SURVEY EXPLORATION

Exploration on San Miguel bench by the Geological Survey was begun November 27, 1951, and was concluded April 17, 1953. During this period 309 diamond-drill holes totaling 92,194 feet were completed. The drilling was done during two separate contracts: (1) November 27, 1951, to November 29, 1952 (Eicher, 1953); and (2) January 11, 1953, to April 17, 1953 (Alvord, 1953a, b, and c).

Except in the vicinity of the Rock Raven mine, drilling was planned to test only the "ore-bearing sandstone." About 35 percent of the footage was used in widely spaced holes (500- to 1,000-foot centers) to test unexplored ground, 30 percent in moderately spaced holes (300-foot centers) to search for deposits, and 35 percent in closely spaced holes (110-foot centers) to delimit deposits.

About 60 percent of the holes and 65 percent of the footage was drilled on public land; the remainder was drilled on private land.

Mineralized rock was penetrated by 117 of the 309 holes drilled. Of these 117 holes, 23 are in material of the highest reserve class used in this report (material 1 foot or more thick containing 0.10 percent or more U_3O_8 or 1.0 percent or more V_2O_5 , based on chemical assay and gamma-ray data). These 23 holes are in 10 separate deposits estimated to contain reserves ranging from 50 to 29,800 tons each. In addition, 19 other deposits that do not meet the grade and thickness cutoffs for Class I ore were discovered, though one of these contains material that qualifies as a reserve at the lower grade and thickness cutoff (material 1 foot or more thick containing 0.05 percent or more U_3O_8 or 0.50 percent or more V_2O_5). The remainder of the deposits are too thin or too low grade to qualify as reserves.

RESERVES

The terms "indicated" and "inferred" reserves are applied to the uranium- and vanadium-bearing material in the deposits that are known from exposures in outcrops, mine workings, or drill holes. These reserves are classified by thickness and grade cutoffs, and the method used in calculating them is explained below.

In addition to the known deposits, other deposits are probably present. They are predicted solely on interpretation of geologic evidence, for there is no physical proof of their existence. The term "potential" reserves is applied to the material in these anticipated deposits.

Although reserves are not classified in this report according to their availability for mining, consideration was given to the 1953 mining and milling practices in selecting the higher grade and thickness cutoffs. This was done to obtain figures for a category of reserves that would express as nearly as possible the tonnage and grade of the material that might actually be mined from these deposits under 1953 conditions. A summary of indicated and inferred reserves in this category, and in a lower-grade category, is given in table 2. More detailed figures expressing the calculated tonnage and grade of the indicated and inferred reserves for each reserve unit, or block, and for each grade cutoff, are given in table 3. The ground containing reserve blocks A, B, C, and D, which contain indicated and inferred reserves, and several geologic sections showing the position of the mineralized rock is shown on figure 3. No first class reserves were discovered in block D, but, 7,000 tons of second class reserves were inferred from the assay data and are tabulated in table 3.

Table 2. Summary of indicated and inferred reserves,
1 foot or more thick, San Miguel bench, Montrose County, Colorado

Reserves	Grade cutoff (percent)	Short tons ^{1/}	Percent		Pounds ^{2/}	
			U ₃ O ₈	V ₂ O ₅	U ₃ O ₈	V ₂ O ₅
Indicated	0.10 U ₃ O ₈ or 1.0 V ₂ O ₅	20,600	0.43	2.04	177,500	841,000
	0.05 U ₃ O ₈ or 0.50 V ₂ O ₅	43,200	0.28	1.45	242,000	1,253,000
Inferred	0.10 U ₃ O ₈ or 1.0 V ₂ O ₅	22,500	0.41	1.92	184,500	864,000
	0.05 U ₃ O ₈ or 0.50 V ₂ O ₅	48,400	0.21	1.23	203,500	1,190,500

1/ Figures rounded to nearest 100 tons

2/ Figures rounded to nearest 500 pounds

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Table 3. Indicated and inferred reserves, 1 foot or more thick, San Miguel bench, Montrose County, Colorado.
(based on U. S. Geological Survey exploration, 1951-52)

Block No.	Location	Indicated				Inferred			
		Grade cutoff (percent)		Grade cutoff (percent)		Grade cutoff (percent)		Grade cutoff (percent)	
		0.10 U ₃ O ₈ or 1.0 V ₂ O ₅		0.05 U ₃ O ₈ or 0.50 V ₂ O ₅		0.10 U ₃ O ₈ or 1.0 V ₂ O ₅		0.05 U ₃ O ₈ or 0.50 V ₂ O ₅	
	Short tons ^{1/}	Percent U ₃ O ₈ V ₂ O ₅	Short tons ^{1/}	Percent U ₃ O ₈ V ₂ O ₅	Short tons ^{1/}	Percent U ₃ O ₈ V ₂ O ₅	Short tons ^{1/}	Percent U ₃ O ₈ V ₂ O ₅	
A	Public Land	14,200	0.46 2.20	27,900	0.33 1.68	13,600	0.45 2.19	23,800	0.33 1.71
	Private Land Star No. 10, Star No. 13, and Wright claims	1,000	0.46 2.20	1,200	0.33 1.68	1,000	0.45 2.19	1,300	0.33 1.71
B	Public Land	2,300	0.47 1.74	5,900	0.22 0.99	3,600	0.38 1.13	3,800	0.24 0.85
	Private Land Star No. 6 and Movie Star claims	--	-- --	--	-- --	600	0.73 2.86	1,400	0.66 2.63
C	Public Land	3,100	0.30 1.48	6,400	0.20 1.00	4,000	0.30 1.48	7,700	0.20 1.00
	Private Land Last Star and Polar Star claims	--	-- --	1,800	0.09 0.86	700	0.12 0.76	3,400	0.09 0.61
D	Public Land	--	-- --	--	-- --	--	-- --	7,000	0.07 <0.10
	Total	20,600		43,200		22,500		48,400	
	Weighted averages		0.43 2.04		0.28 1.45		0.41 1.92		0.21 1.23

^{1/} Rounded to nearest 100 tons.

Indicated and inferred reserves

Definitions

Known reserves are classed as indicated and inferred. Owing to the erratic variations in thickness and grade of carnotite ore within short distances and the general lack of abundant sample data for individual reserve blocks, the amount of reserves, that can be calculated within a small limit of error and thus can be classed as "measured", is so small as to be nearly negligible. Therefore, reserves that might be classed as measured are included with indicated reserves.

Indicated reserves 1/ are those for which the grade and tonnage are computed from exposures in mine

1/ The definitions used here for indicated and inferred reserves are abstracted from the definitions adopted by the Bureau of Mines and the Geological Survey in April 1943.

workings and outcrops, drill-hole samples, gamma-ray logs, production data, and by projection on geologic evidence from points of exposure. Inferred reserves are quantitative estimates based largely on a broad knowledge of the geologic character of the deposits and on few, if any, samples or measurements.

Because of the variations in thickness and grade of ore and the scarcity of sample data, the indicated reserves in any single reserve block might actually amount to as much as twice or as little as one-half of the tonnage calculated. For this reason indicated reserves are not computed for single holes in ore-grade material that have not been offset or cannot be connected with known deposits or mine workings. The limit of error of the total tonnage for several blocks may not exceed more than 25 percent of the calculated tonnage. The limit of error in the tonnage figures for inferred reserves, of course, is apt to be higher than for indicated reserves. The limit of error in the calculated or estimated grade for both indicated and inferred reserves probably is somewhat smaller than the limit of error in the tonnage figures.

Thickness cutoff

Although mining practices vary from place to place in the region as well as with individual operators, under 1953 mining conditions, most ore bodies of shipping grade are being mined to a minimum thickness of about 1 foot. Layers of material less than 1 foot thick are mined if the grade is high.

Grade cutoffs

The deposits contain two metals of economic importance, uranium and vanadium. The oxides of these metals, U_3O_8 and V_2O_5 , occur in an average ratio of about 1:5 as determined from the assays of the Geological Survey drill cores from San Miguel bench (table 4). Within the deposits, however, the two metals are so erratically distributed that a single sample, such as that obtained from a drill hole, is not necessarily representative of the metal ratio or grade of the material near the sample point. Knowing this by experience, the miner will drive toward a drill hole that shows a good value in vanadium, even though the uranium content of the sample might be negligible. Thus the material in the vicinity of this sample must be classed as a reserve, even though the sample shows a value for only one metal.

Reserves 1 foot or more thick are classified by two grade cutoffs. The higher cutoff--0.10 percent U_3O_8 or 1.00 percent V_2O_5 --corresponds to the Atomic Energy Commission purchase cutoff for uranium and the commonly used mill cutoff for vanadium. Reserves are figured also on a lower cutoff--0.05 percent U_3O_8 or 0.50 percent V_2O_5 --on the possibility that conditions in the future might demand or permit the mills to accept lower-grade ore.

Calculation of tonnage

The method used for calculating the volume, and hence the tonnage, of a reserve unit 1 foot or more thick is based upon the premise that the reserve unit is a uniformly tapered mass. The average thickness of the drill-hole samples that can be combined within the specified grade class is assumed to be the average thickness of the reserve unit.

By definition, the tonnage of the indicated reserves ". . ." is computed by projection for a reasonable distance on geologic evidence." In some places in San Miguel bench, indicated reserves are projected where correlation of samples is good between drill holes that are not more than 100 feet apart. On the other hand, indicated reserves are not projected more than 30 feet beyond sample points, where the edge of the deposit has not been located or where correlation of data between sample points is lacking. Reserves are classed as inferred rather than indicated if the projection exceeds these lengths. Inferred reserves are projected to the assumed limits of the deposits, as determined by geologic evidence and interpretation.

A constant of 14 cubic feet per ton is used to calculate tonnage.

Calculation of grade

The average grade of the indicated reserves is calculated by weighing the thickness and assay values of all samples that qualify as reserves within the grade and thickness limits. As strict grade cutoffs are used, it is generally expected that the average grade assigned to the reserve blocks will be somewhat higher than the average grade of the ore that eventually will be mined from them, owing to the unavoidable dilution of the ore with waste and low-grade material during mining. On the other hand, the tonnage assigned to these blocks should be somewhat lower than the tonnage mined from them, owing to the increment of waste and low-grade material.

Wherever a discrepancy was found between a uranium assay for a sample interval and the percentage of equivalent uranium as shown on the gamma-ray log, an attempt was made to adjust this difference by using the average grade of the deposit, as based on other drill-core assays and/or production figures.

Reserve blocks

Masses or units of mineralized rock that constitute an indicated or inferred reserve, as defined by the thickness and grade cutoffs, are called reserve blocks. The geometric limits of reserve blocks are determined by the rules used in calculating reserves. (See above.) The exact positions of the blocks are not shown on figures 2 and 3 though the carnotite-bearing ground that contains the blocks is designated by block letters. Where mineralized layers overlap, even though they contain two or more masses of reserves, a single block number is assigned, and the total tonnage of these masses, as well as their weighted grade, is shown on table 3.

Potential reserves

Potential reserves include material in deposits that have not yet been found and which are predicted solely on geologic evidence. Estimates for this reserve type are made only for material that would be in the indicated reserve class. In any particular area of favorable or semifavorable ground, potential reserves were estimated by a consideration of the size and grade of known deposits in relation to : (1) the spacing of the holes, (2) the extent of the outcrop of the ore-bearing sand within the area, (3) the number of mineralized holes, (4) the amount of mineralized material in the outcrop or adjacent areas, and (5) the distribution patterns and trends of known deposits.

The potential reserves of San Miguel bench are predicted to be 15,000 tons of material 1 foot or more thick, averaging 0.30 percent U_3O_8 and 1.60 percent V_2O_5 . Individual deposits are expected to average less than 1,000 tons each and to be found chiefly between the Little Basin deposit and reserve block A, between reserve blocks A and B, and in the area north and west from reserve blocks B and C.

Conclusions

No additional drilling by the Geological Survey is planned on San Miguel bench as most of the deposits of average size or larger probably have been found. However, additional close- to moderate- spaced drilling (50- to 300-foot centers) by private enterprise may be justified within and between reserve blocks B and C in the vicinity of holes 38, 122, and 237, (fig. 3). This drilling might disclose one or two elongate deposits of economic size. Other drilling in the vicinity of reserve blocks A, B, and C should be considered only when necessary to guide mining operations. Close-spaced holes should also be drilled around isolated mineralized holes in favorable ground. The area extending northwest from the Grass Roots and Little Basin deposits to reserve block A has been incompletely drilled. Completion of an approximate 300-foot grid of holes to search for deposits in this area is recommended.

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado

Geological Survey exploration, 1951-53. Assays by the Geological Survey. Samples in sandstone.

Rock units containing less than 0.020% U_3O_8 , less than 0.020% equivalent U_3O_8 , and less than 0.10% V_2O_5 , as determined by assay of drill core, are considered to be barren. Barren holes and rock units are omitted from this table.

Gamma-ray data obtained by probing drill holes with a radiometric logging unit. Radioactivity expressed as percent equivalent U_3O_8 . Values less than 0.020% eU_3O_8 are omitted from this table. These data are of doubtful reliability.

Assay data listed under blocks A, B, and C are within the blocks of calculated reserves.

Most collar elevations obtained by plane-table survey methods.

e Equivalent

< Less than

Undet Undetermined

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block A										
42 (5669)	294.2	294.7	0.5	0.028e	0.49	Undet	0.025	242.4	243.5	1.1
	294.7	295.0	0.3	0.033e	0.53	0.1				
	295.0	295.3	0.3	0.079	0.79	0.1	0.090	294.8	295.9	1.1
	302.1	302.4	0.3	0.49	1.70	0.6	3.2	302.4	303.4	1.0
	302.4	303.1	0.7	1.42	2.58	2.0	0.92	303.4	304.5	1.1
	303.1	305.0	1.9	0.51	2.24	1.8	2.4	304.5	305.4	0.9
	305.0	305.6	0.6	0.70	2.62	1.3	0.080	305.4	306.5	1.1
	305.6	305.9	0.3	0.074	0.40	1.6	1.6	306.5	307.2	0.7
	306.7	306.8	0.1	0.23	0.49	1.9				
	306.8	308.1	1.3	0.45	4.61	0.8				
	308.1	308.4	0.3	0.026e	0.38	Undet				
43 (5682)	No sample						0.030	353.0	354.2	1.2
113-A (5708)	329.4	329.7	0.3	0.09	1.44	10.7	0.21	316.2	317.0	0.8
	329.7	330.0	0.3	0.45	1.98	12.2				
	330.0	330.1	0.1	0.14	2.46	10.7	0.65	328.7	329.4	0.7

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent <u>eU₃O₈</u>	Depth in feet		Thickness (feet)
	From	To		<u>U₃O₈</u>	<u>V₂O₅</u>	<u>CaCO₃</u>		From	To	
Block A--Continued										
153	275.0	275.3	0.3	<0.020e	0.24	Undet	0.020	209.0	210.0	1.0
(5652)	275.3	275.7	0.4	0.057	0.68	0.4				
	275.7	276.0	0.3	0.10	0.97	0.1	0.26	275.7	277.5	1.8
	276.0	276.3	0.3	0.070	0.85	0.2				
	276.3	276.6	0.3	0.14	1.16	0.2	0.072	278.3	279.7	1.4
	276.6	278.1	1.5	0.035	0.65	1.4	0.19	279.7	281.8	2.1
	278.1	279.3	1.2	0.047	0.27	2.7	0.033	281.8	282.8	1.0
	279.3	279.9	0.6	0.13	0.36	1.3				
	279.9	280.5	0.6	0.098	0.34	0.8	0.15	289.9	290.6	0.7
	280.5	281.1	0.6	0.13	0.24	1.0				
	281.1	281.4	0.3	0.079	0.36	1.3	0.044	292.4	293.2	0.8
	281.4	281.7	0.3	0.031e	0.19	Undet				
							0.064	294.6	296.0	1.4
	289.9	291.1	1.2	0.031e	0.27	Undet				
	291.1	291.7	0.6	0.023e	0.14	Undet	0.43	299.5	300.3	0.8
							0.030	300.3	301.5	1.2
	292.6	292.9	0.3	0.054	0.12	3.6				
	293.8	295.0	1.2	0.042	0.14	3.1				
	298.5	298.8	0.3	0.082	0.17	16.0				
	299.0	300.0	1.0	0.030	0.48	10.2				
	300.0	301.1	1.1	0.047	0.19	14.6				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent ^{238}U	Depth in feet		Thickness (feet)
	From	To		U_3O_8	V_2O_5	CaCO_3		From	To	
Block A--Continued										
154 (5657)	294.1	295.8	1.7	<0.020	0.17	Undet	0.58	296.4	297.3	0.9
							0.12	297.3	297.8	0.5
	299.6	300.1	0.5	0.049	0.51	1.0	0.24	297.8	298.7	0.9
	300.1	301.3	1.2	0.13	1.98	0.3	0.036	298.7	300.1	1.4
	301.3	301.6	0.3	0.035	1.16	0.4	0.093	300.1	301.6	1.5
	301.6	302.1	0.5	0.21	1.23	0.5	0.48	301.6	302.6	1.0
	302.1	302.4	0.3	0.30	0.75	0.8	0.17	302.6	303.8	1.2
	302.4	303.4	1.0	0.13	0.48	0.8	0.037	303.8	305.5	1.7
	303.4	304.3	0.9	0.091	0.31	1.3				
	304.3	305.2	0.9	0.039	0.12	2.6				
155 (5666)	291.2	291.6	0.4	0.039	0.17	0.8	0.024	288.8	289.9	1.1
	291.6	292.0	0.4	0.13	1.94	0.1				
	292.0	292.3	0.3	0.18	0.22	0.1	0.32	292.3	293.5	1.2
	292.3	292.4	0.1	0.077	0.19	0.1				
	292.4	292.7	0.3	0.040	0.46	0.3	0.060	294.9	297.0	2.1
	292.7	294.2	1.5	<0.020e	0.27	Undet	2.6	297.0	297.9	0.9
	294.2	295.3	1.1	0.057	0.14	0.1				
	295.3	295.6	0.3	0.24	0.48	0.3				
	295.6	295.8	0.2	0.21	0.46	0.2				
	295.8	296.4	0.6	0.49	1.35	0.2				
	296.4	297.0	0.6	1.18	5.42	0.3				
	297.0	297.1	0.1	0.042	0.97	0.2				
157 (5678)	Barren						0.022	226.3	226.9	0.6

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent ϵ U ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block A--Continued										
158	283.8	284.1	0.3	0.014e	0.75	0.3	0.66	285.3	286.2	0.9
(5647)	284.1	284.7	0.6	0.52	2.83	0.4				
	284.7	285.0	0.3	0.054	0.27	1.3	0.96	292.0	293.5	1.5
	289.4	289.8	0.4	0.029e	0.31	Undet				
	289.8	290.1	0.3	0.27	0.68	1.8				
	290.1	290.5	0.4	0.074	0.80	1.8				
	290.5	291.3	0.8	0.93	2.37	3.1				
	291.3	291.5	0.2	0.41	0.70	8.5				
	291.5	291.8	0.3	1.21	8.56	2.1				
	291.8	292.0	0.2	0.10	0.94	5.0				
166	351.7	353.4	1.7	0.070	0.34	1.6	0.027	317.8	319.8	2.0
(5685)	353.4	353.7	0.3	0.17	0.29	1.6				
	353.7	353.9	0.2	0.15	1.57	0.4	0.072	353.4	354.3	0.9
	353.9	354.5	0.6	0.031e	0.12	Undet	0.14	354.3	355.8	1.5
							0.027	361.6	362.6	1.0
168	248.2	249.7	1.5	<0.020e	0.22	Undet	Barren			
(5617)	249.7	250.5	0.8	<0.020e	0.22	Undet				
185	284.7	285.0	0.3	0.032	0.39	0.2	0.034	283.3	284.9	1.6
(5631)										
186	No sample						0.034	186.6	187.8	1.2
(5635)										

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block A--Continued										
208 (5637)	296.7	297.3	0.6	0.033	<0.10	2.7	0.043	293.6	294.6	1.0
							0.045	295.4	296.4	1.0
209 (5667)	300.4	300.7	0.3	0.029	0.24	1.9	0.029	234.6	235.6	1.0
	300.7	301.2	0.5	2.54	7.80	1.9				
	301.2	301.8	0.6	0.029e	0.11	Undet	2.6	299.5	300.2	0.7
	303.0	303.9	0.9	0.034	0.11	8.8	0.055	302.2	303.1	0.9
	304.2	304.5	0.3	0.028e	<0.10	Undet	0.17	304.1	305.3	1.2
	304.8	305.5	0.7	0.035	0.24	7.6				
	305.5	305.8	0.3	0.15	1.69	8.3				
	305.8	306.4	0.6	0.043	1.74	0.4				
211 (5680)	306.7	308.2	1.5	0.031e	0.29	Undet	0.032	306.5	311.0	4.5
	311.7	312.1	0.4	0.030e	0.17	Undet	0.027	311.9	316.3	4.4
	342.7	343.6	0.9	0.047	0.27	4.3	0.039	342.3	344.2	1.9
213 (5725)	No sample						0.022	281.3	282.3	1.0
							0.021	363.7	365.0	1.3
							0.031	392.4	393.7	1.3
							0.023	393.7	394.7	1.0

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block A--Continued										
206	256.7	257.0	0.3	0.030	0.44	1.6	0.038	257.1	258.5	1.4
(5633)	257.0	257.5	0.5	0.031	0.69	0.9	0.022	258.5	259.1	0.6
	257.5	257.8	0.3	0.028e	0.15	Undet	0.022			
	265.5	267.1	1.6	0.58	1.89	0.9	2.20	265.7	266.4	0.7
	267.1	267.4	0.3	0.12	3.60	1.1	0.15	266.5	267.4	0.9
	267.4	267.7	0.3	0.11	1.42	1.7	0.18	271.3	271.9	0.6
	267.7	268.1	0.4	0.066	0.83	1.9	0.99	271.9	273.8	1.9
	271.7	273.2	1.5	0.39	1.57	9.6				
	273.2	274.2	1.0	0.63	2.57	10.7				
207-A	321.9	322.2	0.3	0.029e	0.12	Undet	0.026	320.0	322.3	2.3
(5703)	324.6	325.2	0.6	0.022e	<0.10	Undet	0.032	323.7	326.5	2.8
	325.5	326.4	0.9	0.028e	0.17	Undet	0.022	326.5	327.7	1.2
	326.4	327.6	1.2	0.025e	0.15	Undet				
	327.6	329.1	1.5	0.032e	0.12	Undet				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data				
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)	
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To		
Block A--Continued											
265 (5655)	270.5	270.7	0.2	0.027e	0.48	Undet	0.033	270.3	272.1	1.8	
		270.7	271.1	0.4	0.028e	0.25					Undet
267 (5648)	267.4	267.7	0.3	0.061	2.63	1.6	0.062	197.8	198.8	1.0	
		268.5	268.8	0.3	0.030e	0.33					Undet
	269.7	270.3	0.6	0.029e	0.44	Undet	0.056	266.8	267.7	0.9	
							0.029	267.6	269.6	1.9	
							0.072	269.6	270.5	0.9	
	272.1	273.7	1.6	0.052	0.20	4.3	0.030	271.7	273.3	1.6	
	273.7	274.3	0.6	0.33	2.10	3.3	0.46	273.3	274.7	1.4	
	274.3	274.6	0.3	0.79	4.29	4.3	0.15	274.7	276.0	1.3	
	274.6	275.2	0.6	0.31	2.85	4.8	0.035	276.0	276.7	0.7	
	275.2	275.4	0.2	0.13	2.05	6.3	0.68	276.7	277.6	0.9	
	275.4	276.0	0.6	0.049	0.23	6.5					
	276.0	276.3	0.3	0.20	0.18	12.8					
	276.3	276.6	0.3	0.057	0.15	2.0					
	276.6	276.9	0.3	0.031	0.23	5.2					
	276.9	277.6	0.7	0.20	0.93	9.6					
269 (5611)	242.2	242.5	0.3	0.033	1.25	0.5	0.27	243.0	243.9	0.9	
		242.5	242.9	0.4	0.12	1.66	1.6	0.024	243.9	245.5	1.6
		242.9	243.9	1.0	0.060	0.24	1.4	0.53	245.5	246.5	1.0
	244.4	244.7	0.3	0.023e	0.27	Undet	0.41	248.2	249.4	1.2	
	244.7	245.6	0.9	0.25	3.57	0.5					
							0.73	274.4	275.3	0.9	
	246.3	246.6	0.3	0.020e	0.37	Undet					
							0.16	278.7	281.4	2.7	
	247.4	248.8	1.4	0.25	3.06	0.6					

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data				
	Depth in feet		Thickness (feet)	Percent			Percent eU ₂ O ₈	Depth in feet		Thickness (feet)	
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To		
Block A--Continued											
269--Continued											
	272.9	273.2	0.3	0.21	1.42	2.9					
	273.2	273.6	0.4	<0.020e	0.29	Undet					
	273.6	274.3	0.7	0.42	2.03	2.1					
274 (5690)	331.0	331.7	0.7	1.67	4.08	1.4	3.9	332.0	332.8	0.8	
	331.7	333.2	1.5	0.35	2.30	5.0	0.14	332.8	334.5	1.7	
	333.2	333.8	0.6	0.080	1.91	8.6					
	333.8	334.4	0.6	0.031	0.20	9.1	4.3	354.5	355.3	0.8	
	354.5	354.7	0.2	0.056	0.15	0.2	0.060	355.3	356.7	1.4	
	354.7	355.0	0.3	5.13	7.99	1.6	0.13	356.7	358.1	1.4	
	355.0	355.7	0.7	0.19	1.78	0.3	0.042	358.1	360.3	2.2	
	355.7	356.5	0.8	0.11	0.98	0.4					
	356.5	356.8	0.3	0.036	0.15	1.3	0.039	361.4	362.9	1.5	
277 (5725)	407.6	407.9	0.3	0.030e	0.20	Undet	Barren				
	408.8	410.0	1.2	0.025e	<0.10	Undet					
278 (5697)	319.9	320.6	0.7	0.024e	0.15	Undet	0.033	314.6	316.8	2.2	
	320.6	321.0	0.4	0.047	2.37	4.3					
282 (5646)	282.9	283.8	0.9	0.028e	0.15	6.3	0.027	282.4	284.9	3.7	
	283.8	284.1	0.3	0.042	0.12	7.3					
	284.4	285.0	0.6	0.027	<0.10	6.0					

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block A--Continued										
284 (5630)	232.5	232.8	0.3	<0.020e	0.15	2.4	0.036	167.3	168.6	1.3
	233.0	234.1	1.1	0.39	2.44	2.1	0.46	231.5	232.5	1.0
	234.1	234.6	0.5	0.13	1.34	0.9	0.035	245.8	248.2	2.4
	246.0	246.3	0.3	0.063	1.03	0.2	0.047	257.6	258.7	1.1
Block B										
38 (5624)	259.3	259.6	0.3	<0.020e	0.36	Undet	0.029	261.8	262.9	1.1
	259.6	260.1	0.5	0.030e	0.47	Undet				
	260.1	260.6	0.5	0.57	2.60	0.2	0.96	263.6	264.4	0.8
	260.6	260.7	0.1	0.23	0.62	0.6	3.4	264.4	265.5	1.1
	260.7	261.2	0.5	0.28	1.56	0.2	0.042	265.5	267.6	2.1
	261.2	261.4	0.2	0.69	1.96	0.1				
	261.4	261.9	0.5	1.44	5.24	0.2	0.050	268.4	269.4	1.0
	261.9	262.1	0.2	0.091	0.55	0.5				
	262.1	262.9	0.8	0.034e	0.34	Undet				
	262.9	263.6	0.7	0.035	0.23	0.7				
	264.5	264.8	0.3	<0.020e	0.13	Undet				
	264.8	265.3	0.5	0.091	0.75	0.8				
	265.3	265.5	0.2	0.034e	0.53	0.5				
116 (5634)	281.1	281.4	0.3	<0.020e	0.13	Undet	0.026	284.8	285.8	1.0
	282.6	282.9	0.3	0.031e	0.11	Undet	0.070	287.5	288.6	1.1
	283.2	283.8	0.6	0.031e	0.23	Undet	0.029	288.6	289.9	1.3
	284.1	284.4	0.3	0.021	0.12	Undet	0.029	290.3	292.0	1.7

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data				
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)	
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To		
Block B--Continued											
116--Continued	286.2	287.1	0.9	0.033e	<0.10	Undet					
119 (5629)	267.6	268.1	0.5	0.031e	0.93	0.2	0.093	267.4	268.1	0.7	
137 (5664)	No sample						0.032	358.2	359.1	0.9	
215 (5636)	269.2	269.5	0.3	0.034	0.49	0.2	0.71	268.4	269.2	0.8	
	269.5	270.3	0.8	0.20	0.69	0.2					
	270.3	270.6	0.3	<0.020e	0.24	Undet					
	270.6	271.0	0.4	<0.020e	0.22	Undet					
	279.5	280.1	0.6	0.025	<0.10	7.6					
	280.1	280.2	0.1	0.023	<0.10	5.7					
216 (5600)	236.0	236.3	0.3	0.021e	0.12	Undet	0.033	235.0	236.2	1.2	
218 (5617)	255.4	255.7	0.3	0.028e	0.12	Undet	0.026	255.3	256.5	1.2	
	256.6	256.9	0.3	<0.020e	0.20	Undet	0.39	257.4	258.4	1.0	
	256.9	257.7	0.8	0.27	0.78	0.3	0.048	258.4	259.2	0.8	
	257.7	259.6	1.9	0.036	0.22	0.2					
	259.6	259.9	0.3	0.16	0.58	0.2	0.17	259.6	260.5	0.9	
	259.9	260.2	0.3	0.060	0.54	0.2					
	260.2	260.5	0.3	<0.020e	0.51	0.1	0.15	260.9	261.6	0.7	
	260.5	261.4	0.9	0.063	0.59	0.3					
	261.4	261.6	0.2	0.021e	0.37	Undet					
		262.5	262.8	0.3	0.020e	0.47	Undet				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block B--Continued										
221 (5596)	224.7	225.0	0.3	0.033e	<0.10	Undet	0.050	223.0	224.1	1.1
	232.1	232.7	0.6	<0.020e	0.47	Undet	0.052	231.8	232.8	1.0
	232.7	233.2	0.5	0.050	0.39	0.1				
	233.2	233.8	0.6	0.064	0.51	0.1				
	233.8	234.3	0.5	0.044	0.22	2.2				
	234.3	234.6	0.3	0.053	0.17	4.6				
225 (5642)	280.2	280.5	0.3	0.031e	0.28	Undet	0.020	278.5	280.4	1.9
232 (5578)	No sample						0.052	227.6	228.5	0.9
233 (5571)	216.3	216.6	0.3	0.025e	<0.10	Undet	0.040	217.5	218.9	1.4
	221.3	221.7	0.4	0.023e	0.93	0.6	0.032	221.8	222.8	1.0
256 (5607)	241.0	242.2	1.2	0.033e	0.19	Undet	0.030	235.0	236.4	1.4
258 (5615)	No sample						0.36	252.2	253.0	0.8
259 (5630)	No sample						0.033	204.8	205.8	1.0
							0.022	271.7	272.6	0.9

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data							
	Depth in feet		Thickness (feet)	Percent			Percent eU_3O_8	Depth in feet		Thickness (feet)				
	From	To		U_3O_8	V_2O_5	$CaCO_3$		From	To					
Block B--Continued														
260 (5633)	273.2	273.9	0.7	<0.020e	0.29	Undet	0.13	273.2	276.9	3.7				
	273.9	274.8	0.9	0.063	0.67	0.5								
	274.8	275.4	0.6	0.19	0.47	0.3	0.033	277.9	279.2	1.3				
	275.4	275.6	0.2	0.064	0.21	0.1								
	275.6	275.9	0.3	0.071	<0.10	0.2								
	275.9	276.2	0.3	0.11	0.14	0.3								
	276.2	276.5	0.3	0.19	0.10	0.3								
	276.5	276.8	0.3	0.15	0.16	0.1								
	276.8	277.1	0.3	0.15	0.13	<0.10								
	277.1	277.5	0.4	0.041	0.25	0.2								
	278.8	279.8	1.0	0.063	<0.10	6.8								
262 (5557)	183.9	184.8	0.9	0.50	1.62	<0.10	1.8	185.3	186.6	1.3				
	184.8	185.7	0.9	0.71	3.90	0.2								
	185.7	186.0	0.3	0.22	2.92	0.1								
264 (5557)	183.0	183.5	0.5	<0.020e	0.23	<0.10	0.072	183.7	184.8	1.1				
	183.5	184.2	0.7	0.075	1.20	0.3					0.67	184.8	186.0	1.2
	184.2	185.0	0.8	1.56	4.07	1.6					2.8	186.0	186.9	0.9
293 (5624)	260.5	260.8	0.3	0.029e	0.22	1.8	0.033	199.9	201.2	1.3				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU_3O_8	Depth in feet		Thickness (feet)
	From	To		U_3O_8	V_2O_5	$CaCO_3$		From	To	
Block B--Continued										
293--Continued	261.1	262.7	1.6	0.045	0.32	1.8	0.035	202.0	202.9	0.9
	262.7	263.0	0.3	0.033	2.44	0.1				
	263.0	263.3	0.3	0.24	1.00	1.7	0.055	259.0	259.9	0.9
	263.3	263.6	0.3	0.034e	0.51	4.1				
	263.6	263.9	0.3	<0.020e	0.90	5.1	0.047	260.5	261.7	1.2
	263.9	264.5	0.6	0.027e	0.29	5.7	0.092	261.7	263.2	1.5
	264.5	265.1	0.6	0.25	1.05	8.0				
	265.1	265.5	0.4	0.040	0.78	5.9	0.30	263.6	264.8	1.2
294 (5617)	No sample						0.024	262.0	264.0	2.0
296 (5596)	238.6	238.9	0.3	<0.020e	0.42	Undet	0.097	237.5	238.7	1.2
	238.9	239.6	0.7	0.029e	0.49	Undet	0.030	238.7	241.5	2.8
							0.18	241.5	242.5	1.0
	242.6	242.9	0.3	0.075	0.76	0.2	0.062	242.5	244.1	1.6
	242.9	243.3	0.4	0.13	0.27	0.2				
	243.3	243.8	0.5	0.033e	0.56	0.1				
	243.8	245.6	1.8	0.032e	0.32	Undet				
297 (5530)	134.5	134.7	0.2	0.038	0.15	13.8	0.28	132.1	133.3	1.2
							0.044	133.3	134.2	0.9
	134.8	135.3	0.5	0.083	0.68	10.2				
	135.3	136.1	0.8	0.063	0.24	7.7				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block C										
24 (5571)	276.7	278.0	1.3	0.040	0.11	7.1	0.028	275.4	277.1	1.7
	278.1	279.1	1.0	0.028e	0.28	Undet	0.066	277.1	278.3	1.2
							0.078	278.8	278.9	0.6
							0.042	278.9	279.9	1.0
							0.028	279.9	281.6	1.7
33	288.3	288.9	0.6	<0.020e	0.53	0.1	0.020	286.1	289.1	3.0
(5604)	288.9	289.9	1.0	<0.020e	0.64	0.3	0.92	289.1	289.9	0.8
	289.9	290.4	0.5	<0.020e	0.63	0.8				
	290.4	291.0	0.6	0.028e	1.04	0.9	0.066	291.4	292.2	0.8
	291.0	291.3	0.3	0.19	1.85	1.4				
	291.3	291.8	0.5	0.037	0.66	8.0				
	291.8	292.0	0.2	<0.020e	0.53	1.4				
	292.7	293.4	0.7	<0.020e	1.47	19.4				
122	290.8	291.1	0.3	<0.020e	0.12	Undet	0.32	290.4	291.6	1.2
(5617)	291.1	291.5	0.4	0.036	0.28	0.4	0.078	291.6	292.5	0.9
	291.5	291.8	0.3	<0.020e	0.80	0.2	0.11	292.5	293.4	0.9
	291.8	293.0	1.2	0.13	1.40	0.1	0.025	293.4	294.0	0.6
	293.0	295.0	2.0	0.090	0.20	1.1	0.073	294.0	295.3	1.3
	295.0	296.0	1.0	0.082	0.18	3.4				
	296.0	297.2	1.2	0.026	0.17	4.1	0.062	295.9	296.8	0.9
	297.2	298.1	0.9	0.032	0.34	5.6				
125	280.5	280.7	0.2	0.094	5.71	7.1	0.22	278.7	279.4	0.7
(5580)	280.7	281.0	0.3	0.044	0.33	0.4	0.024	279.4	280.1	0.7
	281.1	282.3	1.2	0.035	0.15	3.9	0.20	280.1	281.4	1.3
	282.3	283.8	1.5	0.025	0.35	6.3				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block C--Continued										
131 (5639)	342.5	342.8	0.3	0.023e	0.12	Undet	0.029	345.9	347.1	1.2
	343.4	343.7	0.3	0.025e	<0.10	Undet	0.036	347.9	349.0	1.1
	344.7	345.8	1.1	0.028e	0.29	Undet				
139 (5576)	No sample						0.036	270.1	272.0	1.9
144 (5586)	288.1	289.3	1.2	0.047	0.16	4.6	0.27	288.0	289.0	1.0
	289.3	290.2	0.9	0.024e	0.23	Undet	0.021	289.0	290.2	1.2
							0.023	291.3	292.6	1.3
150 (5636)	327.4	328.4	1.0	0.047	0.50	8.5	0.055	326.7	327.4	0.7
	328.4	329.2	0.8	0.13	0.35	6.8				
	329.2	330.4	1.2	0.053	0.19	7.0	0.041	329.2	330.7	1.5
151 (5610)	315.6	316.8	1.2	0.033e	0.25	Undet	0.042	316.4	318.5	2.1
214 (5594)	272.5	272.8	0.3	0.039	0.68	12.8	0.024	269.8	271.7	1.9
217-A (5588)	281.7	282.0	0.3	<0.020e	0.10	Undet	0.16	282.2	283.6	1.4
	282.0	282.1	0.1	0.12	0.25	11.3				
	282.1	282.4	0.3	0.19	1.54	7.7				
	282.4	283.4	1.0	0.12	1.40	6.2				
	283.4	283.7	0.3	0.037	0.43	4.7				

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block C--Continued										
220 (5584)	284.9	285.8	0.9	0.27	2.68	0.2	2.3	286.4	287.2	0.8
	285.8	286.4	0.6	0.44	3.90	0.2	0.13	287.2	288.5	1.3
	286.4	287.0	0.6	2.72	3.90	0.7				
	287.0	287.3	0.3	0.15	1.96	0.5				
	287.3	287.6	0.3	0.062	2.94	0.3				
	287.6	287.9	0.3	0.077	3.03	0.3				
	287.9	288.3	0.4	0.085	1.35	0.2				
227 (5621)	290.1	290.4	0.3	<0.020e	0.60	0.2	0.037	285.1	286.4	1.3
	290.4	290.7	0.3	0.034e	0.36	Undet				
	290.7	290.9	0.2	0.024e	0.76	0.1				
	290.9	291.2	0.3	0.024e	0.19	Undet				
	291.2	291.7	0.5	<0.020e	0.33	Undet				
228 (5620)	297.6	298.2	0.6	0.028e	0.21	Undet	0.080	296.3	297.2	0.9
							0.020	297.2	298.3	1.1
	300.3	300.9	0.6	0.071	<0.10	13.0				
							0.077	299.3	300.0	0.7
230 (5637)	304.3	304.7	0.4	0.089	0.58	6.2	0.032	306.7	307.5	0.8
	305.0	305.3	0.3	0.030e	0.21	Undet				
235 (5607)	No sample						0.029	292.5	293.6	1.1

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent ^{238}U	Depth in feet		Thickness (feet)
	From	To		U_3O_8	V_2O_5	CaCO_3		From	To	
Block C--Continued										
237 (5611)	290.2	291.4	1.2	0.057	0.27	2.6	0.060	271.3	272.2	0.9
	291.4	291.7	0.3	0.12	0.52	1.5	0.092	272.2	274.6	2.4
	291.7	292.0	0.3	0.14	0.52	1.5	0.020	274.6	276.0	1.4
	292.0	292.3	0.3	0.092	0.52	1.5				
	292.3	292.9	0.6	0.11	0.35	2.1				
	292.9	293.8	0.9	0.084	0.35	2.7				
238 (5609)	269.2	269.5	0.3	<0.020e	0.24	Undet	0.12	268.1	268.9	0.8
	269.5	269.8	0.3	0.084	0.95	<0.1				
	269.8	270.1	0.3	0.064	0.88	0.1	0.31	269.5	270.2	0.7
	270.7	271.0	0.3	0.020e	<0.10	Undet				
	271.0	271.3	0.3	0.12	1.72	0.1				
	271.3	271.6	0.3	0.095	1.40	0.5				
239 (5596)	290.8	291.1	0.3	0.021e	0.13	Undet	0.032	298.8	299.3	5.5
	292.4	292.9	0.5	<0.020e	0.91	0.8	0.034	300.5	301.9	1.4
	292.9	294.1	1.2	0.059	0.56	1.3				
	294.1	294.2	0.1	<0.020e	0.77	1.0				
	294.4	295.0	0.6	0.027e	0.37	Undet				
	295.1	295.8	0.7	0.064	0.45	2.3				
	295.8	296.4	0.6	0.034e	0.58	4.3				
	296.4	297.9	1.5	0.060	0.14	5.7				
299.3	299.9	0.6	0.044	0.19	14.4					

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block C--Continued										
240 (5579)	275.5	276.0	0.5	<0.020e	0.64	0.7	0.023	276.2	278.1	1.9
	276.0	277.0	1.0	<0.020e	0.57	0.7				
	277.0	277.3	0.3	0.026e	0.52	0.6	0.030	281.4	282.2	0.8
	277.3	277.5	0.2	0.021e	0.16	Undet				
	277.5	277.8	0.3	0.096	1.16	0.3	0.050	282.7	283.8	1.1
	277.8	277.9	0.1	<0.020e	1.47	0.2				
	281.4	282.2	0.8	0.034	0.97	0.5				
	283.4	283.6	0.2	0.17	0.88	7.7				
241 (5598)	304.4	305.0	0.6	0.055	0.15	8.1	Barren			
242 (5576)	265.3	265.6	0.3	0.021e	0.15	Undet	0.075	268.4	271.5	3.1
							0.17	271.5	272.7	1.2
	269.5	270.7	1.2	0.058	0.17	4.3				
	270.7	271.4	0.7	0.047	0.29	2.5	0.16	274.4	276.5	2.1
							0.033	276.5	278.7	2.2
	271.5	272.1	0.6	0.043	0.35	2.0				
	272.1	273.1	1.0	0.061	0.69	1.9	0.035	289.6	290.6	1.0
	274.2	274.9	0.7	0.031e	0.14	Undet				
	274.9	275.2	0.3	0.12	0.27	6.5				
	275.2	275.8	0.6	0.063	0.57	11.3				
275.8	276.1	0.3	0.14	0.43	7.6					
276.1	277.1	1.0	0.061	0.35	3.6					
277.1	278.9	1.8	0.027e	0.28	Undet					

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₂ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block C--Continued										
243 (5571)	264.8	266.3	1.5	0.025e	0.14	Undet	0.021	206.7	207.8	1.1
	266.3	267.8	1.5	0.031e	0.10	Undet				
							0.084	225.0	225.8	0.8
	268.1	269.9	1.8	0.033e	0.10	Undet	0.037	225.8	227.1	2.3
							0.050	227.1	228.7	1.6
	272.6	272.9	0.3	0.032e	0.23	Undet	0.038	228.7	230.3	1.6
	275.4	277.1	1.7	0.030e	0.11	Undet	0.027	231.8	237.0	5.2
							0.023	237.0	239.8	2.8
		285.0	285.6	0.6	0.28	0.12	12.2			
	285.6	285.9	0.3	0.06	<0.10	13.8	0.38	247.0	247.9	0.9
	285.9	286.5	0.6	--	--	--				
	286.5	286.6	0.1	0.085	0.18	9.5	0.040	248.6	249.3	0.7
244 (5596)	292.9	293.3	0.4	0.023e	<0.10	Undet	0.022	289.6	292.0	2.4
	297.1	297.4	0.3	0.034e	0.21	Undet	0.035	296.8	298.2	1.4
	303.6	304.5	0.9	0.029e	0.10	Undet	0.036	303.1	304.6	1.5
							0.023	307.8	309.1	1.3
263 (5590)	260.9	261.5	0.6	0.034e	0.44	0.3	0.24	261.8	263.0	1.2
	261.5	261.8	0.3	0.14	0.64	0.2				
	261.8	262.5	0.7	0.088	1.76	0.1	0.55	280.6	281.5	0.9
	278.4	279.0	0.6	<0.020e	0.17	Undet				
	279.0	279.3	0.3	0.062	0.39	5.4				
	279.3	279.6	0.3	0.11	0.73	4.7				
	279.6	280.2	0.6	0.38	3.42	2.8				
280.2	280.4	0.2	0.058	1.17	2.3					

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data				
	Depth in feet		Thickness (feet)	Percent			Percent $\mu\text{U}_3\text{O}_8$	Depth in feet		Thickness (feet)	
	From	To		U_3O_8	V_2O_5	CaCO_3		From	To		
Block C--Continued											
266 (5580)	259.6	260.8	1.2	0.028	1.03	<0.1	0.092	259.8	261.0	1.2	
	260.8	261.5	0.7	0.024e	0.81	<0.1		0.028	261.0	262.4	1.4
268 (5581)	286.3	286.9	0.6	0.031	0.20	<0.1	0.020	284.0	285.8	1.8	
	287.5	288.1	0.6	0.025e	0.37	Undet		0.059	288.4	290.3	1.9
270 (5606)	295.1	295.7	0.6	0.035	<0.1	3.9	0.25	274.9	275.9	1.0	
	295.7	296.6	0.9	0.18	0.24	1.8					
	296.6	297.2	0.6	0.044	0.15	1.4					
275 (5585)	288.1	288.4	0.3	0.042	0.17	7.0	0.024	272.4	274.1	1.7	
	288.7	289.5	0.8	0.028e	0.20	Undet		0.025	274.8	275.6	0.8
	289.8	290.9	1.1	0.021e	0.15	Undet		0.034	286.4	287.6	1.2
	290.9	292.2	1.3	0.052	0.17	3.5		0.031	288.7	293.1	4.4
	292.2	292.5	0.3	0.15	0.24	2.3					
	292.5	293.8	1.3	0.14	0.32	2.0					
	293.8	294.9	1.1	0.18	0.24	9.2					
	294.9	295.0	0.1	0.14	0.29	6.5					
	295.0	295.8	0.8	0.13	0.44	9.3					
	276 (5607)	266.9	267.2	0.3	0.038	0.61		<0.10	0.55	266.8	267.7
267.2		267.6	0.4	0.76	6.48	<0.10					
267.6		267.9	0.3	0.046	0.51	<0.10					
267.9		268.0	0.1	<0.020e	0.12	<0.10					

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent ^{238}U	Depth in feet		Thickness (feet)
	From	To		U_3O_8	V_2O_5	CaCO_3		From	To	
Block C--Continued										
285 (5607)	273.5	274.4	0.9	0.045	0.12	3.6	0.12	274.1	275.7	1.6
							0.086	275.7	276.9	1.2
	274.5	276.0	1.5	0.075	0.29	2.0	0.035	276.9	278.4	1.5
	276.0	277.1	1.1	0.063	0.22	1.0				
	277.4	278.0	0.6	<0.020e	0.15	0.8	0.047	283.9	285.1	1.2
							0.026	285.1	286.4	1.3
286 (5575)	271.1	271.4	0.3	<0.020	0.12	10.7	Barren			
	No sample						0.024	264.4	265.6	1.2
287 (5576)	No sample						0.025	270.8	272.4	1.6
	No sample						0.048	279.4	281.1	1.7
289 (5585)	282.4	283.6	1.2	0.042	0.24	2.8				
	283.6	284.2	0.6	0.032e	0.20	3.8	0.030	290.3	292.0	1.7
	295.4	295.7	0.3	0.030e	0.20	1.1	0.020	293.0	294.5	1.5
	298.2	299.1	0.9	0.058	0.17	8.3				
	299.1	299.7	0.6	0.19	0.20	4.9	0.15	295.4	296.2	0.8
	299.7	300.1	0.4	0.075	0.24	0.4	0.073	296.2	296.6	0.4
	300.1	300.6	0.5	0.033e	<0.10	6.6	0.33	296.6	297.4	0.8
							0.033	297.4	299.3	1.9
300 (5590)	260.9	261.5	0.6	0.28	1.76	2.2	0.46	262.9	263.5	0.6

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Table 4. Assay data, San Miguel bench, Montrose County, Colorado--Continued

Hole No. and collar elev. (feet)	Assay data						Gamma-ray data			
	Depth in feet		Thickness (feet)	Percent			Percent eU ₃ O ₈	Depth in feet		Thickness (feet)
	From	To		U ₃ O ₈	V ₂ O ₅	CaCO ₃		From	To	
Block C--Continued										
301 (5602)	253.4	253.7	0.3	0.024e	0.20	Undet	0.025	251.6	253.0	1.4
	292.5	292.8	0.3	0.027e	<0.10	Undet	0.027	290.0	293.2	3.2
302 (5585)	295.5	296.1	0.6	0.020	0.51	3.8	0.23	291.6	293.0	1.4
	296.1	296.9	0.8	0.16	0.46	6.5				1.2
	296.9	297.2	0.3	0.24	0.49	3.3	0.028	295.5	296.8	1.3
	297.2	297.5	0.3	0.033	0.29	5.4				
	298.1	298.4	0.3	0.061	0.24	4.6				
303 (5598)	265.8	266.1	0.3	0.078	1.52	0.1	0.10	263.1	264.1	1.0
	289.5	290.0	0.5	0.025e	1.05	0.4	0.056	286.6	288.7	2.1
	290.0	291.8	1.8	0.041	0.22	2.8				