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Bureau of Mines
Report of Investigations 4939

INVESTIGATION OF THE NEW ANNIVERSARY- BUCKY PEGMATITE, GUNNISON COUNTY, COLO.

BY S. R. WILSON AND W. A. YOUNG

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UNITED STATES DEPARTMENT OF THE INTERIOR
Oscar L. Chapman, Secretary
BUREAU OF MINES
J. J. Forbes, Director

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INTRODUCTION AND SUMMARY

The New Anniversary-Bucky pegmatite is one of the largest dikes in the Quartz Creek district, 21 miles east of Gunnison, Colo.

The major dike consists of quartz-albite pegmatite and graphic granite with many quartz masses as individual cores occurring within the dike. A mining operation on one of the largest core areas has exposed several mineralogic zones directly associated with the core. These zones, including the larger units of the dike, are quartz pegmatite, quartz-perthite pegmatite, perthite pegmatite, muscovite-feldspar-quartz pegmatite, quartz-albite pegmatite, and perthite-quartz (graphic granite) pegmatite. Muscovite and beryl are found in the muscovite-feldspar-quartz zone and are the only two products that have been marketed. Other potential products are perthite, graphic granite, and possibly small quantities of columbite-tantalite, monazite, and related radioactive minerals.

The Bureau of Mines drilled two diamond-drill holes during April 1950 to investigate the largest and most promising core area. This report describes the results of this drilling.

ACKNOWLEDGMENTS

Special acknowledgment is made to M. H. Staatz and A. F. Trites, Federal Geological Survey, for geologic maps and information and also for detailed logs of the diamond-drill holes.

The generous cooperation of C. A. Wemlinger, vice-president in charge of operations for the Beryllium Mining Co., Inc., is acknowledged also.

S. R. Wilson made the preliminary examination for the Bureau of Mines, and the field work was under the supervision of W. M. Traver, Jr., chief of the Colorado Branch, Mining Division.

LOCATION AND ACCESSIBILITY

The New Anniversary-Bucky property is in the Quartz Creek district of Gunnison County, Colo. (fig. 1). The specific location of the deposit is secs. 21 and 22, T. 50 N., R. 3 E., N. M. P. M. The pegmatite being explored lies on the north side of Willow Creek, 1 mile northwest of the junction of this creek and Quartz Creek, the main drainage channel in the area. Parlin, a rail point on the narrow-gage line of the Denver & Rio Grande Western Railroad, is 9 miles south of the property. Parlin is 53 miles west of Salida, Chaffee County, the junction point of the narrow- and standard-gage lines. A road log in reaching the property from Parlin is as follows:

Total miles	Distance	Description
0.0	0.0	Parlin. Take Colorado Highway 162 north.
4.0	4.0	Junction, road to Doyleville. Take road to left.
8.0	4.0	Junction, road leading west into Willow Creek.
9.0	1.0	New Anniversary camp and deposit.

Parlin is on U. S. Highway 50, the main east-west arterial in south-central Colorado. Colorado Highway 162 is a well-graded, hard dirt and gravel road leading north from Parlin through Ohio City, Pitkin, Tincup, and the Taylor Park area. Gunnison is 12 miles west of Parlin on U. S. Highway 50.

HISTORY AND PROPERTY OWNERSHIP

Mineral locations on ground now comprising the New Anniversary-Bucky group were made early in the history of the area. More recent locations include those made in May 1943 by J. T. Meyers, of Canon City, Colo., and A. L. Pearson, of Pitkin, Colo. The ground, consisting of eight standard mining claims, was located in 1947 by Rod Fields, and a limited amount of work was done. All eight claims are unpatented.

The Beryllium Mining Co., Inc., obtained the property from Fields early in 1948 and has since operated it continuously on a small scale, employing three to five men and producing a limited amount of beryl and muscovite.3/ No feldspar or graphic granite has been marketed to date, but negotiations are being made for sale of both products. Most of the recent work has been on the Bucky claim.

The beryl, clean feldspar, muscovite, and other valuable minerals from a zone surrounding the main quartz core were hand-sorted for a short time on a motor-driven sorting belt a safe distance from the blasting, but most of the sorting has been done in the pit. The muscovite is marketed in the Pueblo, Colo., area and the beryl is trucked to Arvada, Colo.

PHYSICAL FEATURES

The property lies on the north side of Willow Creek at an altitude of approximately 9,000 feet. The creek in the vicinity of the property is approximately 300 feet lower than the outcrop of the main quartz mass.

Willow Creek, a small stream, drains the area surrounding the deposit and flows east into Quartz Creek, the main drainage channel for the general Quartz Creek district. The flow in Willow Creek is adequate for present mine and camp uses, but during the winter it may freeze because of the small amount of water. Water for the diamond drilling was hauled from Willow Creek to the point of use.

Small quantities of fair timber are available from the property for use underground. Additional timber may be obtained from areas of higher altitude west and north of the deposit.

3/ Colorado Mining Association, 1950 Yearbook.

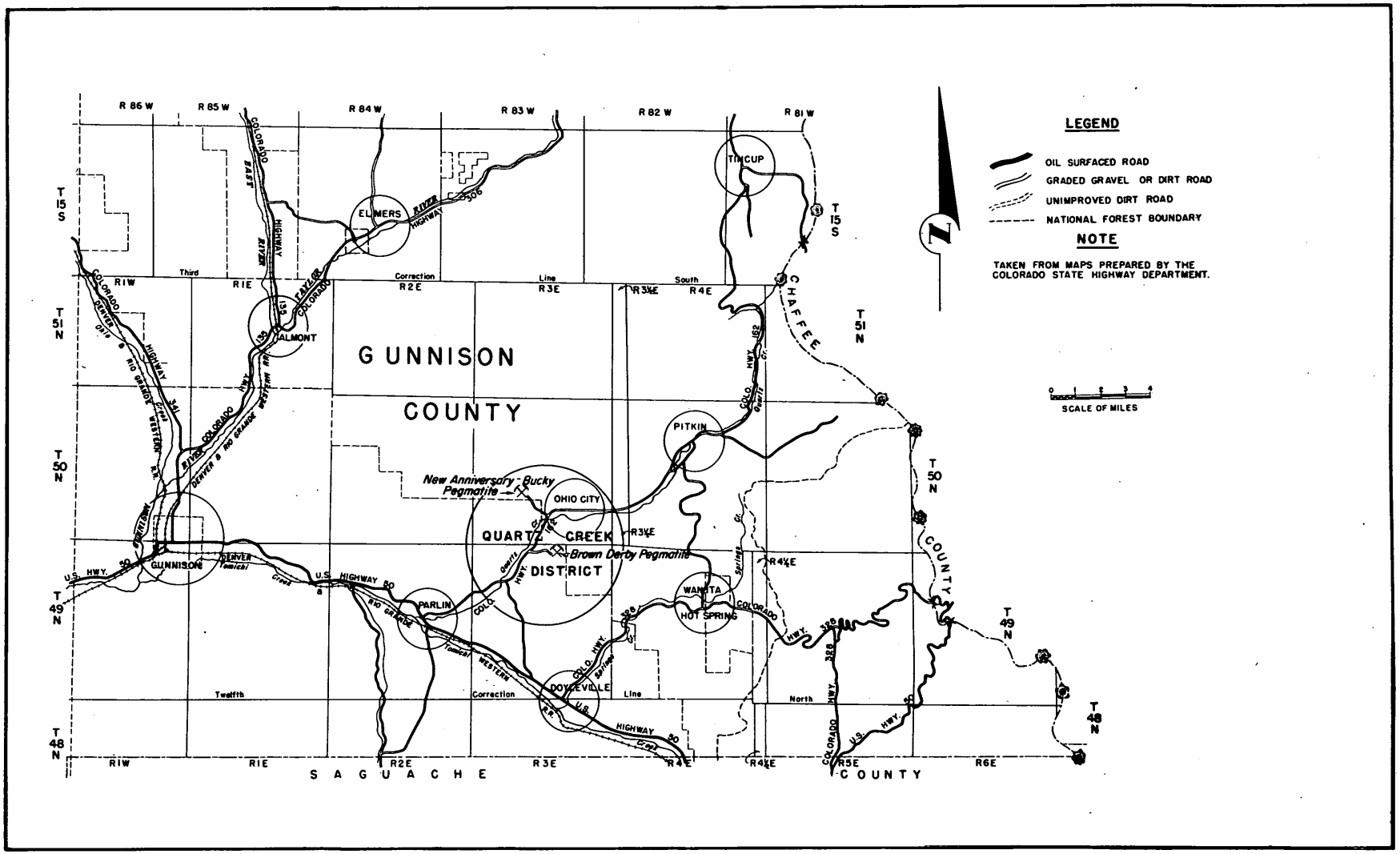

Figure 1. - Location map, Quartz Creek district, Gunnison County, Colo.

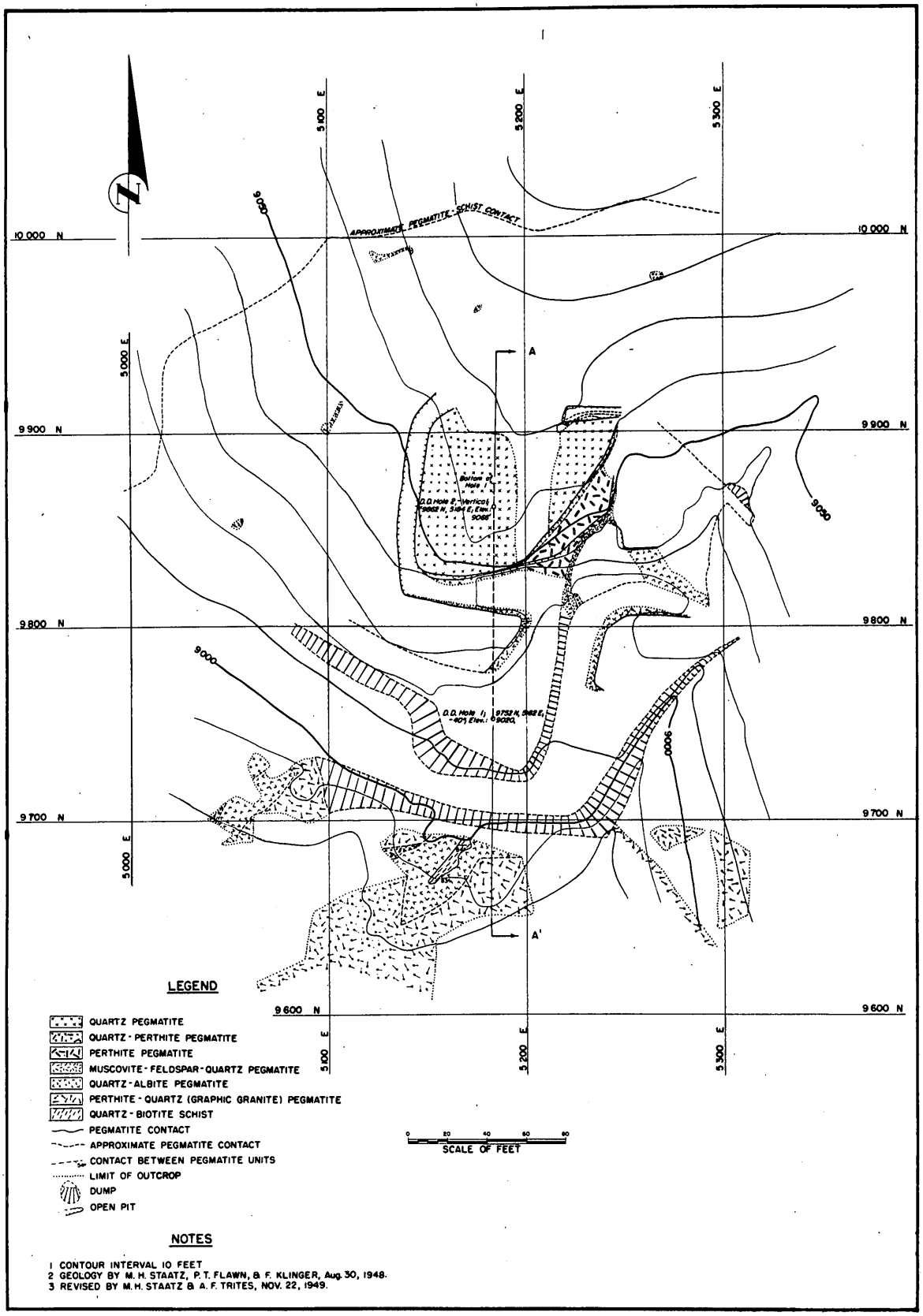

Figure 2. - Topographic and geologic map, New Anniversary-Bucky pegmatite, Gunnison County, Colo.

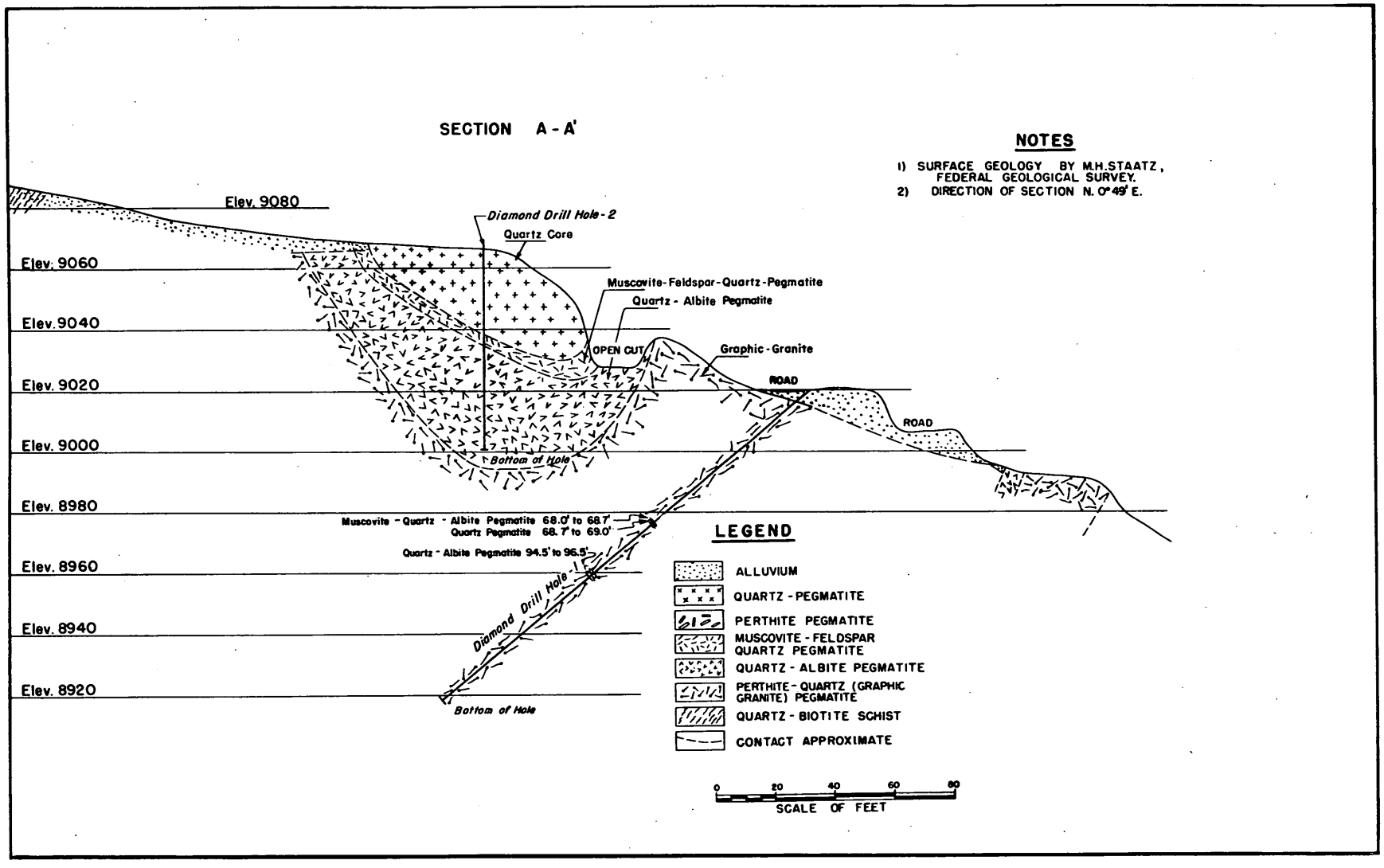

Figure 3. - Section thru diamond-drill holes 1 and 2, New Anniversary-Bucky pegmatite, Gunnison County, Colo.

Temperatures are often below zero during the winter, but the average quantity of snow ordinarily is not heavy enough to prevent surface operations for extensive periods. The present operators worked virtually every day during the 1948-49 winter season. Light snows are common in November but usually are not severe until late December or early January.

During the spring and summer ideal weather exists. Some sections are muddy, but in general the roads are hard enough to withstand the water from snow thaws or from heavy rains.

DESCRIPTION OF DEPOSIT

The New Anniversary-Bucky pegmatite occurs in dark, pre-Cambrian quartz-biotite schist.4/ The major part of the dike consists of quartz-albite pegmatite and graphic granite having a maximum strike length of approximately 4,000 feet and a width of 2,500 feet.

Individual, differentiated quartz masses occur within the pegmatite, chiefly around the periphery of the dike (fig. 2). Thirty-four such masses have been noted at the surface, one of the larger ones being 80 by 100 feet in cross section. Mining has been concentrated in the area where mineralogic zones associated with the quartz core contain beryl, muscovite, perthite, and smaller quantities of columbite-tantalite, monazite, and other radioactive minerals. The several zones, as mapped by the Federal Geological Survey, are as follows: Quartz pegmatite, quartz-perthite pegmatite, perthite pegmatite, muscovite-feldspar-quartz pegmatite, quartz-albite pegmatite, and perthite-quartz (graphic granite) pegmatite.

The beryl occurs chiefly in the muscovite-feldspar-quartz pegmatite as crystals 6 inches or more in length with no definite occurrence pattern. The zone in which the beryl and muscovite are found forms a rude, circular, but apparently discontinuous mass around the quartz core. Mining has uncovered the zone principally on the south and east sides of the core.

The perthite zone is a possible source of excellent-grade perthite, which was unknown owing to poor exposures until recent surface mining made the zone more discernible. M. H. Staatz and A. F. Trites, Federal Geological Survey, revised the original map of the property during November 1949. According to their interpretation, the perthite zone is found in part in an area previously assigned to the quartz core, and it is possible that the perthite may form a central septum dividing the core.

MINE WORKINGS

The area has been mined chiefly from surface excavations in circular form around the main quartz core (fig. 3). Shallow pits and cuts have been made in several other nearby smaller quartz masses. Much of this work was accomplished

4/ Hanley, J. B., Heinrich, E. W., and Page, L. R., Pegmatite Investigations in Colorado, Wyoming, and Utah: Geol. Survey Prof. Paper 227, 1950, p. 64.

with a bulldozer, and, as the terrain does not permit easy removal of waste debris, the area surrounding the core of the main deposit is heavily covered with dumps, obscuring the outcrops, particularly on the south and east sides.

BUILDINGS AND EQUIPMENT

The mine-camp buildings are a short distance below the main working area along Willow Creek. The buildings include living quarters for men, cookhouse, garage and ore-storage buildings, and shop and compressor house. An ore bin and picking belt assembly have been constructed along the road northwest of the deposit.

Equipment on the property includes a tractor and blade, tractor loader, compressor, miscellaneous mining tools, and several trucks.

WORK BY BUREAU OF MINES

The Bureau of Mines drilled two diamond-drill holes to investigate the largest and most promising core area of the dike. The first hole was drilled to a depth of 160 feet on a minus- 40° angle. This hole was begun from a point east of the quartz core and was directed to cut the quartz core and the associated zones at depth. This hole cut under the quartz mass.

Drill hole 2 was drilled vertically from the approximate center of the quartz pegmatite. This hole was drilled to a depth of 65 feet and was directed to show the depth of the quartz core and the size and composition of the related zones. Detailed logs of the diamond-drill holes are given in Appendix A.

SAMPLE AND ASSAY DATA

The beryl-producing zone of muscovite-feldspar-quartz pegmatite was cut only in hole 2 from 29.5 feet to 31.0 feet in depth. Spectrographic analysis of sludge from 28.0 feet to 34.0 feet verified the presence of quartz, feldspars, and muscovite, but showed no trace of beryl, thorium, columbium, or tantalum.

Forty-one core and sludge samples were tested for gold. The assay value for each interval sampled was < 0.005 ounce gold per ton.

APPENDIX A

DETAILED LOG OF DIAMOND DRILL HOLE NO. 1, BUCKY PEGMATITE, GUNNISON COUNTY, COLO.

By M. H. Staatz, Federal Geological Survey

Location:	9,752 N., 5,180 E.
Altitude of collar:	9,020 feet
Inclination:	Minus- 40°
Bearing:	N. 0° 49' E.
Total length:	160 feet

FEET	DESCRIPTION
0. - 160	Pegmatite
0 - 68	Perthite-quartz (graphic granite) pegmatite. Core recovery poor and from 0 to 30 feet completely absent. Most of the remaining core fragmentary. Rock consists of approximately 65 percent perthite, 20 percent quartz, 6 percent albite, 4 percent muscovite, trace of garnet, and trace of magnetite. Magnetite found as two small crystals between 40 and 45 feet, while garnet formed in nodules in comparatively albite-rich rock between 47.5 and 52.5 feet. Muscovite occurs in clots. This mineral is unusually rich between 55 and 60 feet and occurs in small amounts scattered through most of the rest of the core. Rock does not show good graphic granite in all places but between 60 and 66.5 feet forms a sort of a gradational rock between graphic granite pegmatite and quartz-albite pegmatite.
68 - 68.7	Muscovite-quartz albite pegmatite. Estimated to contain 45 percent muscovite, 30 percent quartz, and 25 percent albite. Muscovite occurs in sheets 1 to 2 inches across.
68.7 - 69	Quartz pegmatite. Rock consists of 100 percent white quartz.
69 - 94.5	Perthite-quartz (graphic granite) pegmatite. Estimated to contain 74 percent perthite, 20 percent quartz, 3 percent albite, 2 percent muscovite, and 1 percent biotite. Biotite occurs as long, thin, black sheaths 1 to 2 inches long. In places iron from biotite stains the perthite brown. Biotite appears at about 75 feet and is found scattered irregularly throughout rest of rock. Muscovite occurs in small clots and streaks but greatest concentration is between 69 and 74 feet where it makes up 4 to 5 percent of the rock. Graphic structure is not always present. Between 79 and 84 feet no graphic structure was noted and quartz makes up 35 percent of the rock. This relatively high quartz content probably exceeds limits needed to form graphic granite, and rock formed separate crystals of perthite and quartz.

FEET	DESCRIPTION
94.5 - 96.5	Quartz-albite pegmatite. Estimated to contain 65 percent quartz, 25 percent albite, 10 percent parthite, < 1 percent muscovite. Granular grain size 1/2 to 3/4 inch.
96.5 - 142.0	Perthite-quartz (graphic granite) pegmatite. Estimated to contain 78 percent perthite, 20 percent quartz, 1 percent albite, 1 percent biotite, and < 1 percent muscovite. Muscovite in small scattered books with most of the core containing a little. Biotite occurs in thin, black sheaths 1 to 2 inches long and has an erratic destribution along whole core. Graphic structure well-developed and present on almost all pieces of core.
142.0 - 152.5	Quartz-albite pegmatite. Estimated to contain 70 percent quartz, 25 percent albite, 5 percent perthite, < 1 percent biotite, and < 1 percent garnet. Garnet occurs as a few scattered crystals between 142.0 and 142.7 feet. Feldspar not easily distinguished, but most of it appears to be albite. Feldspar fill in and around quartz crystals.
152.5 - 160.0	Perthite quartz (graphite granite) pegmatite. Estimated to contain 80 percent perthite, 19 percent quartz, 1 percent albite, and < 1 percent biotite. Well-developed graphic structure.

DETAILED LOG OF DIAMOND DRILL HOLE NO. 2, BUCKY PEGMATITE, GUNNISON COUNTY, COLO.

By A. F. Trites — Federal Geological Survey — May 6, 1950

Location: 9,862 N. 5,185 E.
Altitude of collar: 9,063 feet
Inclination: Vertical
Total length: 65.0 feet.

FEET	DESCRIPTION
0 - 65.0	Pegmatite.
0 - 29.5	Quartz pegmatite (core). White to pale-pink or lavender "bull" quartz. Upper 1.0 feet contains 3 or 4 small crystals of albite with average size 1/2 inch. Small fractures, covered with limonitic stain, occur at short intervals from 6.0 feet to 26.0 feet. Pink and lavender color seems associated with fractures, grading outward into white quartz. Core recovery poor between 10.0 and 12.0 feet, with two small breccia zones in this interval separated by 6 inches solid quartz. From 28.5 feet to 29.5 feet core recovery very poor, and core is in two small pieces. The bottom 2 inches of lower piece has 1/4-inch crystals of muscovite, possibly representing the only fraction of the muscovite-feldspar-quartz pegmatite recovered in core. (It was assumed that major loss of core occurred below mica, which was recovered.)

FEET	DESCRIPTION
29.5 - 31.0	Core missing. Possibly this interval represents the muscovite-feldspar-quartz pegmatite, although muscovite seen in the sludge is finer grain size than is found in this pegmatite unit.
31.0 - 65.0	Albite-quartz pegmatite. White, subgraphic intergrowth of albite and quartz with a texture of 1/4 inch to 3/8 inch. Composition varies but is estimated to be 30 to 60 percent albite, 30 to 65 percent quartz, and 0.5 to 15 percent muscovite. The albite crystals are up to 2 inches by 1 inch, the larger crystals sending off stringers between quartz grains to produce a graphic texture. Perthitie was not seen, although it may be present as a trace. The muscovite is in flakes, ranging from 1/64 inch to 1 inch across, between 43.5 feet to 48.5 feet is slightly curved. Two small (1/8-inch) crystals of garnet were found between 43.5 feet and 45.5 feet. From 48.5 feet to 59.0 feet albite is highly altered and core is crumbly.

Interior - Bureau of Mines, Pgh., Pa.