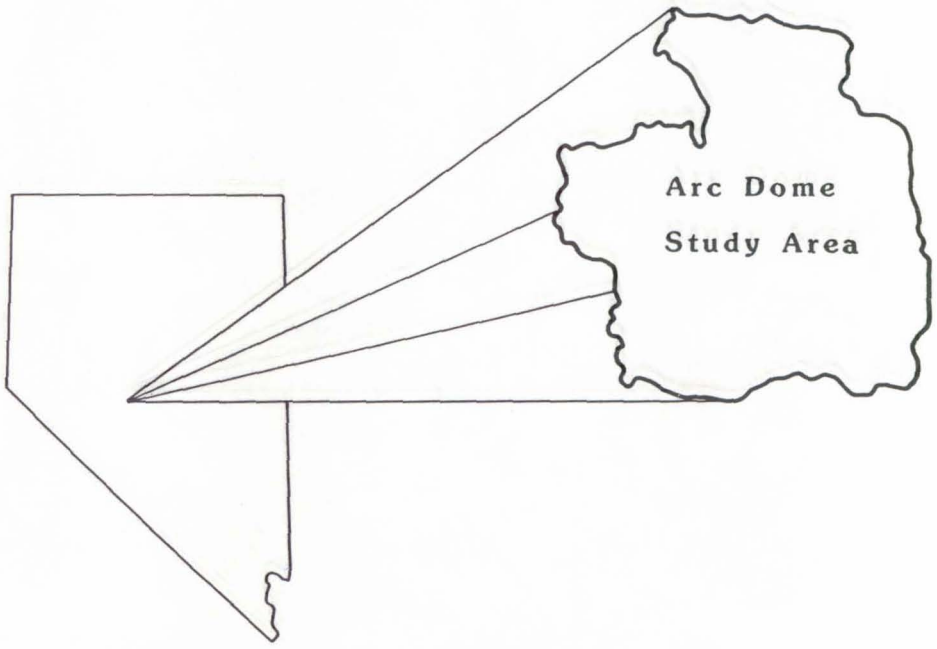
MLA 10-89

Mineral Land Assessment/1989
Open File Report

Mineral Resources of the Arc Dome Study Area, Nye County, Nevada



BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE ARC DOME STUDY AREA, NYE COUNTY, NEVADA

By
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MLA 10-89

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UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

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PREFACE

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts requires the U.S. Bureau of Mines and U.S. Geological Survey to survey certain areas of Federal lands ". . . to determine the mineral values, if any, that may be present . . ." Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a Bureau of Mines mineral survey of the Arc Dome study area (4-667), Nye County, NV, which was classified as Wilderness Recommended during the Second Roadless Area Review and Evaluation (RARE II) by the Forest Service, January 1979.

This open-file report contains data gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, WA 99202. The report has been edited by members of the Branch of Resource Evaluation at the field center and reviewed at the Branch of Mineral Land Assessment, Washington, D.C.

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UNIT OF MEASURE ABBREVIATIONS
USED IN THIS REPORT

cubic yard	yd^3
foot	ft
inch	in.
milligram	mg
mile	mi
millimeter	mm
part per million	ppm
percent	%
troy ounce	oz

SUMMARY

In 1984, at the request of the U.S. Forest Service, the U.S. Bureau of Mines began a study of the 94,370-acre Arc Dome study area (4-667) in order to appraise its mineral resources. The Bureau of Mines mapped and sampled mines, prospects, and mineralized sites in and near the area. The study area is located in the Toiyabe National Forest, about 54 mi north of Tonopah, Nye County, NV.

It is estimated that over 500 claims have been staked in the study area since the mid-1800's. In January 1986, there were 108 active mining claims completely inside and 59 on the boundary. Another 283 active claims were outside the study area but within 1 mi of the boundary. In addition to the large number of claims staked, exploration activity is also reflected by the almost 700 inactive workings that were found during field investigation.

Three poorly defined mining districts, the Twin River, Jett Canyon, and Peavine, extend into the study area. In 1864, precious metals were discovered at the Murphy mine, just north of the study area in the Twin River district. The mine produced about $755,000 in gold and silver during the late 1800's. The Wall Canyon mine, about 2 mi south of the study area and in the Jett Canyon mining district, produced 838 tons of antimony during World War I, and in the late 1930's, 1940's, and 1950's. There has been minor recorded production from the study area. Small amounts of gold and silver ore were produced from the Charley prospect and South Twin mine, and 150 tons of gold-silver-copper-lead-zinc ore were mined at the Broad Canyon mine. By far, the largest gold producer near the study area is the open pit Round Mountain mine, 8 mi southeast. Gold production at Round Mountain from 1977 through 1986 was greater than 840,000 oz.

The study area is in the Basin and Range province and lies within a west-tilted block of igneous, sedimentary, and metamorphic rocks bound on the east by a high-angle fault. Although no identified resources were delineated during this study, additional exploration is warranted in at least nine prospect localities in the study area. Eight prospects may have large-tonnage, low-grade, precious metal resources in disseminated-, stockwork-, and replacement-type deposits. Two prospects may contain precious metal resources in vein-type deposits. These conclusions are based on the presence of favorable geologic conditions and significant concentrations of precious metals and pathfinder elements delineated by the Bureau's sampling program. Large-tonnage, low-grade precious metal deposits are the most likely to be of economic interest because of the development of low-cost gold and silver recovery methods, high gold prices (about $450/oz), and depressed prices for other metals. With desirable mining and beneficiation conditions and a $450/oz gold price, a large open-pit mining operation can conceivably operate economically to an ore cutoff grade as low as 0.5 ppm gold.

Large-tonnage, low-grade molybdenum resources may also be defined in the area with additional work; however, domestic reserves of molybdenum are large and existing mine capacity utilization is low, averaging only 35 percent in 1987.

Extensive sand and gravel and stone occurrences in the study area are suitable for many construction purposes; however, adequate material is available closer to major markets in the region and, therefore, sand and gravel deposits presently do not constitute identified resources.

INTRODUCTION

This report describes the USBM (U.S. Bureau of Mines) investigation of mineral resources in the Arc Dome study area. The work was completed at request of the USFS (U.S. Forest Service) and includes an examination of individual mines, prospects, claims, and mineralized zones, as well as an evaluation of identified mineral resources. Results of the investigation will be used to help determine the suitability of the study area for inclusion into the National Wilderness Preservation System. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the Public for land-use decisions, the long-term objective is to ensure the Nation has an adequate and dependable supply of minerals at a reasonable cost.

Geographic Setting

The Arc Dome study area, encompassing 94,370 acres of the Toiyabe National Forest, is about 54 air mi north of Tonopah, NV (fig. 1). From the east, access is principally by dirt roads and jeep trails from State Highway 376, which, at its nearest point, is about 1 mi from the study area boundary (fig. 2). Most of the north side is bounded by a rough jeep trail. Southern and western portions of the study area are accessed by dirt roads and jeep trails, but these localities are much more remote than either the northern or eastern parts. Interior of the area has numerous trails suitable for foot and horseback travel.

The study area is in the high, central part of the Toiyabe Mountain Range and contains several mountain peaks exceeding 11,000 ft. Elevations range from 5,500 ft in Smoky Valley to 11,773 ft at the summit of Arc Dome. Topographic relief is greatest along the range front on the east side of the area. The study area is covered mainly with high-desert vegetation at lower elevations, scrubby evergreens in some canyons and in the southern and western parts, and weeds and grasses at the highest elevations. Winter snows provide enough water for numerous permanent streams; the summers are warm and dry.

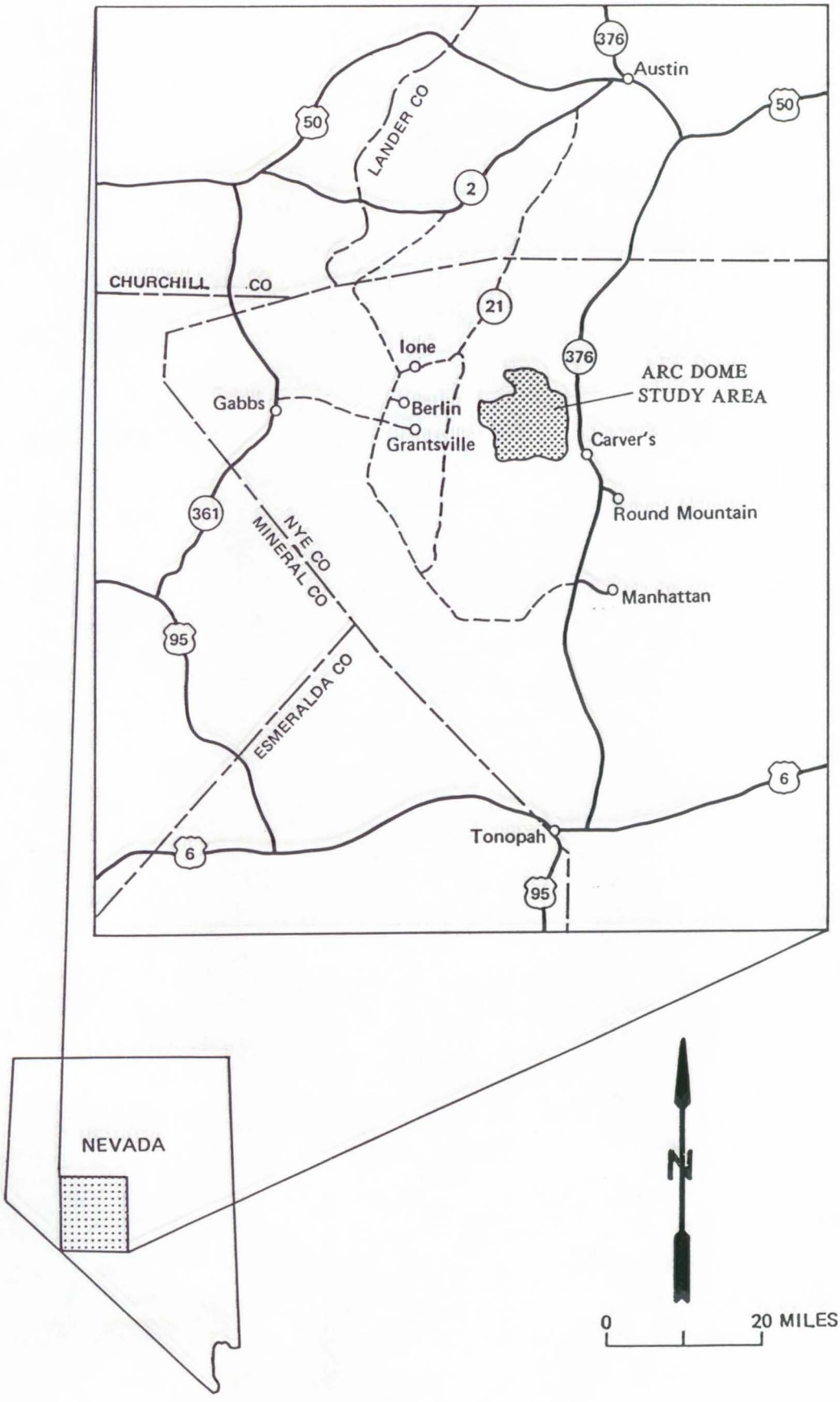


FIGURE 1.– Location of the Arc Dome study area, Nye County, NV

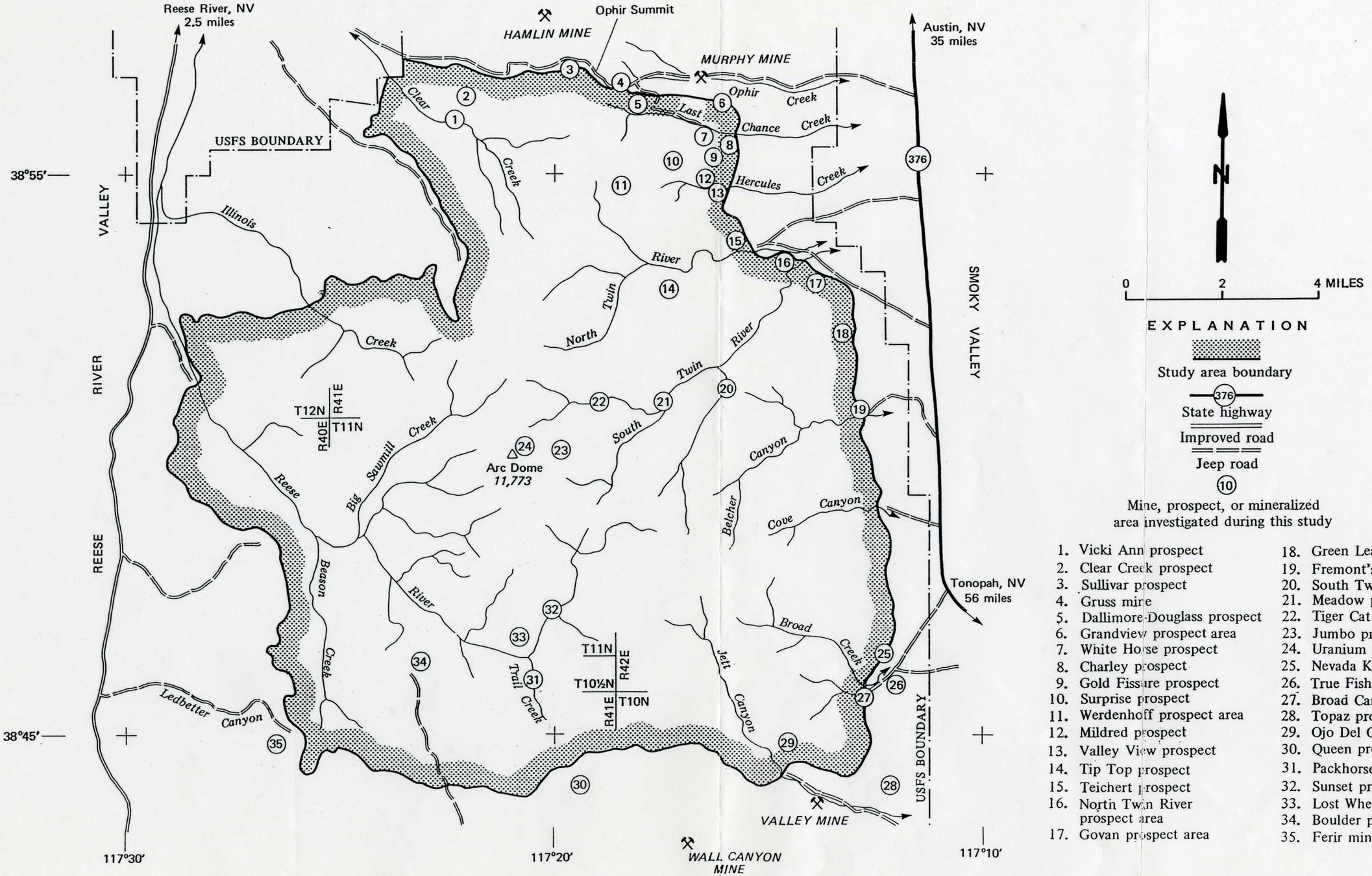


FIGURE 2.– Mines, prospects, and mineralized areas in and near the Arc Dome study area, Nye County, NV

Previous Studies

Several properties in the study area have been discussed by Kleinhample and Ziony (1984). Other important information on minerals in the area was reported by Kral (1951), and more recently in unpublished reports by Mills (1980, 1981, 1982) and Veek (1983). Geology of the Round Mountain Quandrangle was mapped by Ferguson and Cathcart (1954) and a detailed geologic study of the area was completed by Brem and others (in preparation).

Reports on mines and mineral occurrences in and near the study area were published by Bailey and Phoenix (1944), Schilling (1962, 1964), Lawrence (1963), Horton (1961, 1963), Johnson (1973), and Garside (1973). Garside and Schilling (1979) discussed thermal waters that occur at several locations near the study area. Couch and Carpenter (1943) reported early production statistics by districts, several of which are in or near the study area.

Present Study

Preliminary work included research of available geologic and mineral resource literature, mining claim records, and mine production data in and near the study area. Owners of active, or recently active claims identified during searches of Nye County and BLM (Bureau of Land Management) mining claim records, were notified of the study, and permission to examine their claims was requested. District and regional offices of the USFS were also contacted to obtain property and other information pertinent to the study.

Field work was conducted from May through September 1986, and from April through July 1987. All known mines, prospects, and mineral occurrences in and near the study area were sampled and mapped, where warranted. Sixty-six placer and 1,755 rock samples were taken during the study. Six types of samples were collected: 1) chip - a regular series of rock chips taken in a continuous line across a mineralized zone or other exposure; 2) random chip - an unsystematic series of chips taken from an exposure of apparently homogeneous rock; 3) grab - rock pieces collected unsystematically from a dump or stockpile, or float (loose rock lying on the ground); 4) select - an intentionally biased selection of rock taken because of a unique or unusual property; 5) petrographic - rock selected for analysis by microscropic methods to determine minerals present and history of formation; and 6) reconnaissance pan - a relatively small amount of material, usually stream sand and gravel, in which the heavy mineral fraction is concentrated by panning.

Most rock samples were crushed, pulverized, homogenized and split, and checked for radioactive and fluorescent minerals. Several analytical methods, including fire-assay, atomic absorption, colorimetric, inductively coupled plasma, and x-ray fluorescence, were employed to determine metal content. Both lower and upper detection limits for different elements vary according to assay method used, amount of sample dilution required, and the amount of interference from other elements. All analyses are reported in ppm except where noted. To convert ppm to troy oz per short ton, divide by 34.28. To convert ppm to percent, divide by 10,000.

Placer sample concentrates were sent to the USBM's Western Field Operations Center where each was further concentrated on a laboratory-size Wilfley 1/ table and checked for fluorescence and radioactivity. Gold was recovered by hand-picking the larger pieces from the concentrate and by amalgamating the smaller pieces with mercury. The gold was weighed in mg and multiplied by 0.00003215 to convert to oz. Gold content per yd^3 was calculated by dividing the gold weight by the original volume of the sample. Value per yd^3 was based on $450 per oz gold and an estimated fineness of 750.

ACKNOWLEDGEMENTS

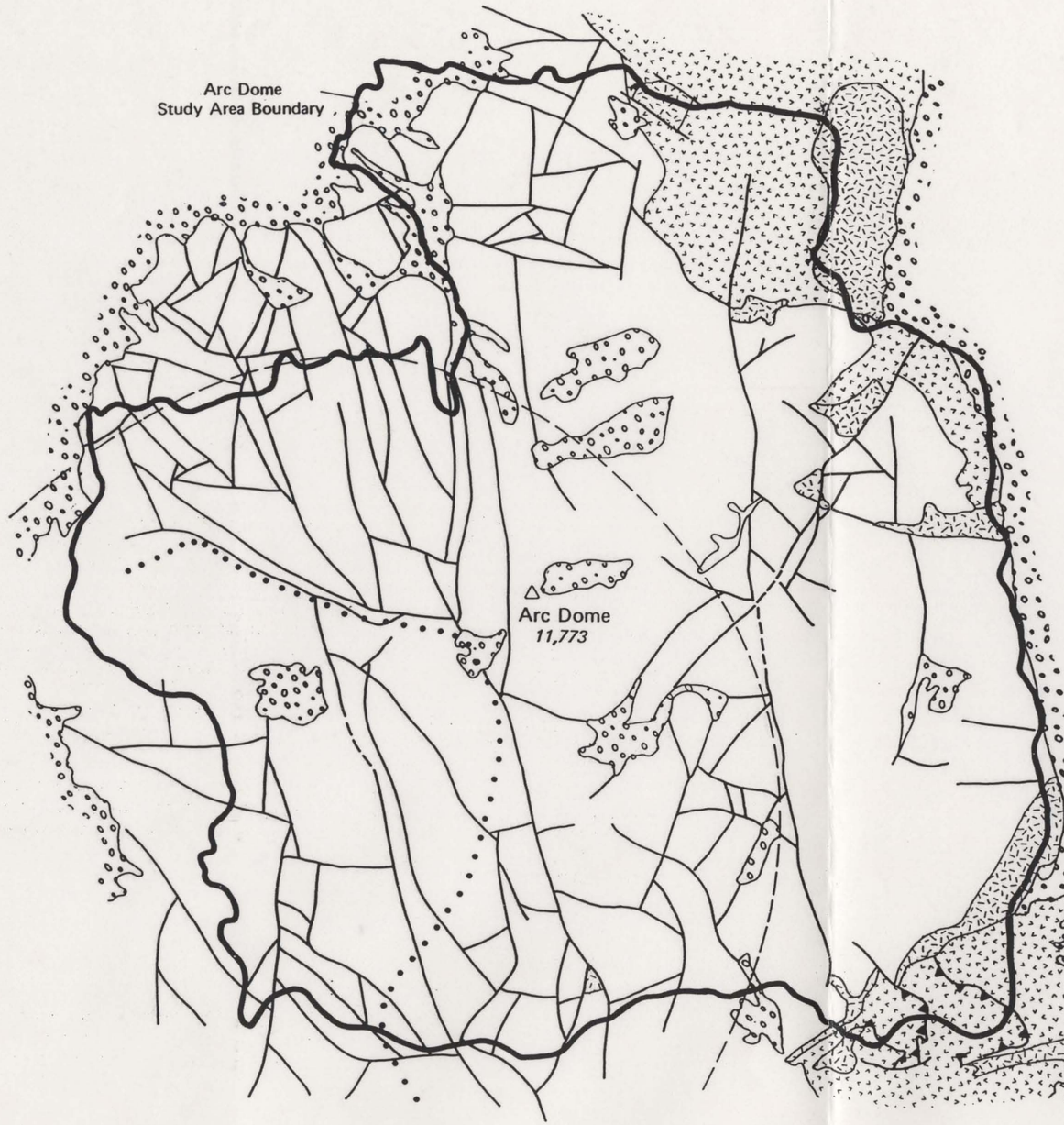
Gratitude is extended to the geologists at the Northumberland, Kingston-Victorine, Round Mountain, Manhattan, and Paradise Peak mines for the many discussions concerning deposit models and for information on rock types occurring in and near the Arc Dome study area. Numerous claim owners, including Bob Wilson, Dennis Doyle, Edward Tomany, and Robert Carver provided valuable data on specific properties. Appreciation is extended to members of the Nevada section of AIME (American Institute of Mining and Metallurgical Engineers) for their assistance in contacting property owners and company geologists.

Pilots Mel Cain and Jeff Cain, Sky Dance Helicopters, Inc., are commended for their expert flying ability and knowledge of the area. Finally, assistance by USBM employees Dave Brink, Doug Scott, and John Benham during the 1986 and 1987 field seasons is also appreciated.

GEOLOGIC SETTING

The Arc Dome study area is in the Basin and Range province of southwest Nevada. It lies within a west-tilted block of igneous, sedimentary, and metamorphic rocks bound on the east by a major high-angle fault (fig. 3).

1/ Reference to specific company names or products does not imply endorsement by USBM.



N

0 2 4 MILES

EXPLANATION

Quaternary alluvium, colluvium, landslide, and glacial deposits

Volcanic rocks— includes basalt, andesite, and rhyolite flows, crystal-rich and crystal-poor ash-flow tuffs, crystal-rich and crystal-poor densely welded ash-flow tuffs, variably metamorphosed crystal-rich to lithic-rich silicic ash-flow tuffs, and volcaniclastic sedimentary rocks

Porphyritic intrusive rocks— includes porphyritic granitic sills, dikes, and stocks with locally very fine-grained to aplitic border phases

Paleozoic rocks— includes variably metamorphosed volcanic and sedimentary rocks

Contact

Fault, dashed where approximately located

Thrust fault, sawteeth on upper plate

Caldera boundary, approximately located

Caldera ring fracture, approximately located

Geology adapted from Brem and others (in preparation) Mills, unpublished report (1981); and Ferguson and Cathcart (1954)

FIGURE 3.—Generalized geologic map of the Arc Dome study area, Nye County, NV

Paleozoic rocks are the oldest exposed in the area and are highly deformed and variably metamorphosed. They include andesite, tuff, pillow lava, greenstone, chert, conglomerate, slate, quartzite, limestone, dolomitic limestone, schist, argillite, and siltstone. These rocks are intruded by Mesozoic (?) granite, quartz monzonite, granodiorite, quartz diorite, diorite, and Tertiary(?) porphyritic granitic sills, dikes, and stocks. Volcanic rocks primarily consist of Tertiary rhyolite ash-flow tuffs, densely welded tuffs, andesite flows, and rhyolite domes; however, metamorphosed Mesozoic(?) ash-flow tuffs occur. Numerous high-angle faults occur throughout the study area and thrust faults have been identified near the southeast corner. Caldera boundaries and ring fractures, features generally considered favorable for metal deposition, also occur in the study area (Ferguson and Cathcart, 1954; Mills, unpublished report, 1981; Brem and others, in preparation).

Most significant mineralized zones investigated during this study are associated with faults and/or intrusive rocks. For example, gold and silver at the South Twin mine, a small past producer, are concentrated in and around fault intersections. Additionally, the Tip Top and Lost Wheelbarrow prospects may host low-grade gold and silver resources in large fracture zones at fault intersections.

Examples of granite-related mineralization occurred at the Gruss mine, Charley prospect, Teichert prospect, and Broad Canyon mine. The Sullivar, Werdenhoff, Dallimore-Douglass, and Ojo Del Oso prospects also may have metal-bearing deposits related to intrusive activity. It is postulated that metal-bearing solutions migrated from nearby intrusives into the country rock and/or the intrusive provided heat that mobilized and concentrated metals already in the country rock. Anomalous concentrations of molybdenum at the South Twin mine, Charley prospect, and Teichert prospect are associated with granitic rock exposed at the surface; anomalous molybdenum occurring at non-granitic prospect areas indicate that a granitic intrusion is not far below the surface. Geology at the Charley prospect is similar to large-tonnage, low-grade molybdenum deposits in Idaho, such as the Little Boulder Creek deposit, which is a stockwork in metasomatically altered Paleozoic sedimentary rock in contact with a quartz monzonite stock (Cavanaugh, 1979).

In addition to the typical deposit types occurring in this geologic environment (disseminated, vein, stockwork, and replacement), an association was noted between porphyritic quartz latite and rhyolite intruded along faults. Appreciable concentrations of silver and lead occur as disseminations and along fractures within these intrusives at the Tip Top prospect, the Govan prospect, and to a lesser extent, at the Ojo Del Oso prospect.

Also identified during this study is the potential existence of a major northwest-trending lineament from the Hamlin mine to the Govan prospect. Geologic evidence supporting this interpretation includes: 1) northwest trending faults and fault zones at the Govan prospect, North Twin River prospect, and Gruss mine; 2) a series of granitic intrusions aligned along the projected strike; and 3) a northwest-southeast displacement of the Toiyabe Range at the mouth of the North and South Twin Rivers. If projected farther northwest, this lineament would intersect the Shoshone Range at the Jackson mining district. If extended southeast through the Toquima Range, it would intersect the Round Mountain and Belmont mining districts.

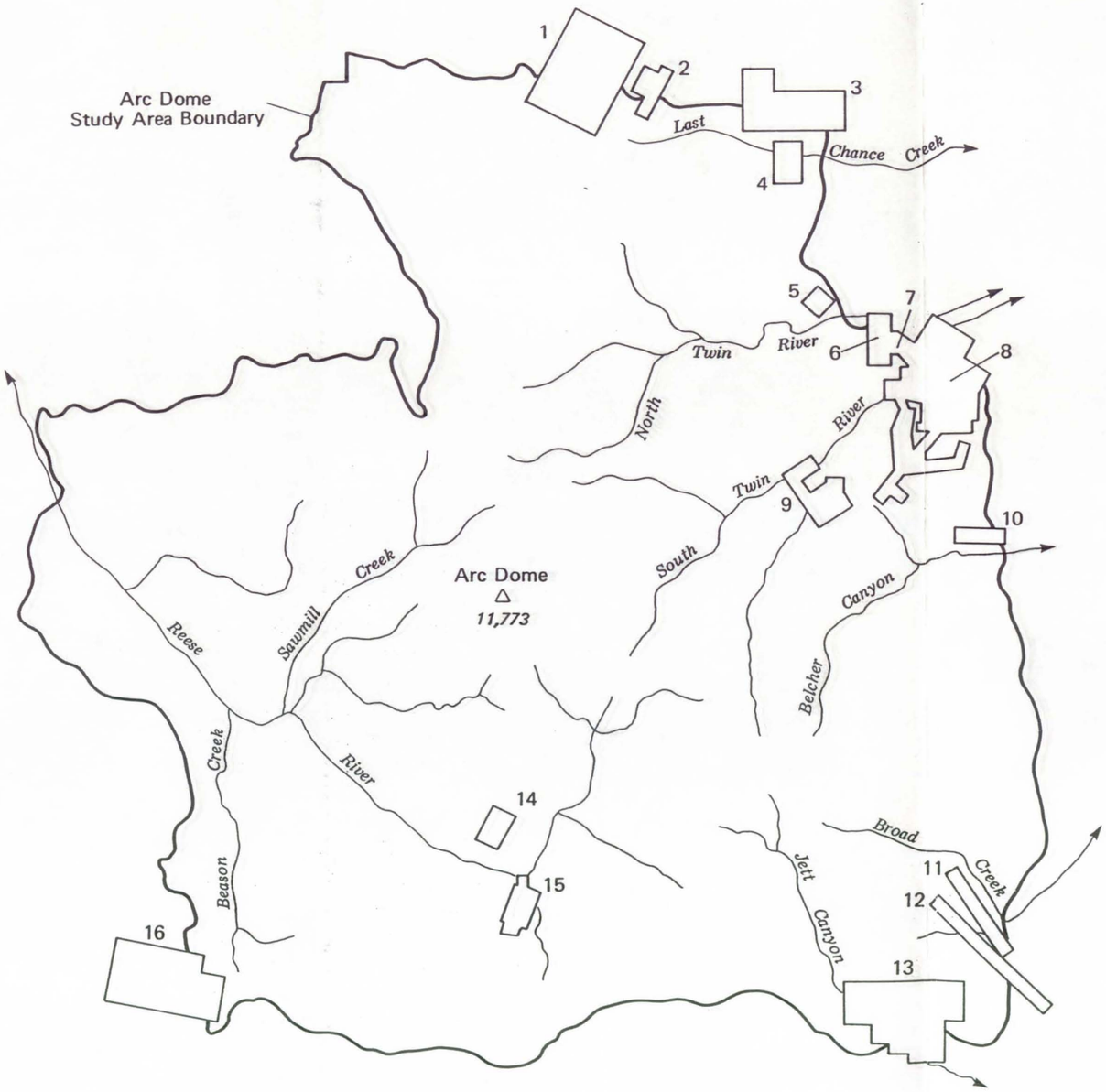
MINING HISTORY

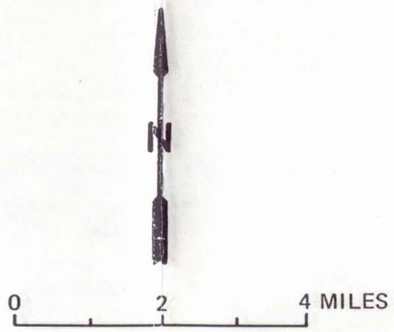
In January 1986, there were 108 current mining claims located inside the study area boundary (fig. 4). Fifty-nine additional, active claims were located on the boundary and another 283 claims within 1 mi of the boundary. There are no patented claims inside or adjoining the study area; however, five are within 1/2 mi of the boundary at the northeast corner. Courthouse records also show that from 1864 through 1920 slightly more than 200 claims were located within the study area and 176 were located within about 1 mi of the boundary. Based on incomplete records, it is believed that 500 or more claims may have been staked in and adjacent to the study area since the mid-1800's.

Three poorly defined mining districts, the Twin River, Jett Canyon, and Peavine extend into the study area. The first recorded mining activity was in the Twin River district and dates to 1864 when a silver-rich vein was discovered on the Murphy property outside the north boundary of the study area. Production began in 1866, and by 1890 about $755,000 of silver and gold had been shipped (Couch and Carpenter, 1943; Kral, 1951). Sporadic mining activity continued until 1937 when the shallow, high-grade deposit was apparently exhausted.

Interest in the Murphy mine area during the 19th century probably spurred the initial exploration of a number of properties in Ophir, Last Chance, and the Clear Creek Canyons. These drainages, along with the South Twin and North Twin River, are described in literature as the Twin River (also known as Millett and North Twin River) mining district (Kral, 1951). Exploration and claim staking in the district at the Sullivar, Dallimore-Douglass, Grandview, White Horse, and Charley prospects and Gruss mine have continued sporadically from the 1860's to 1987, but with little apparent success.

Other properties in the Twin River district are in the South Twin and North Twin Rivers drainages. The South Twin mine probably dates to the late 1800's. Although there is no recorded production, the presence of a mill built in the 1920's and significant underground development suggest that small amounts of gold and silver were produced. In 1987,





Claim names

1. Ophir claim group, Gold Reef claim group
2. Adirondac Lode, Horseshoe, Horseshoe Ext., Toiyabe, Cabin Cabin Ext., Spring, and Silverstar claims
3. Silver Lace claim group
4. White Horse claim group
5. John, Golden Wall, Jessica claims
6. MO claim group
7. Kent No. 1 and High & Dry claims
8. 3M-3MA-3MAA-3MAAA-Calvada claim group
9. K-T claim group
10. Golden Cloud, Rock of Ages, and Fremont's View claims
11. Mountain View claim group
12. Surprise-Valley View claim group
13. Ojo del Oso claim group
14. Lost Wheelbarrow claim group
15. Packhorse claim group
16. Ledbetter-Yellow Gold claim group

FIGURE 4.– Approximate location of recent mining claims in and near the Arc Dome study area, Nye County, NV

the mine was still actively claimed and the owners were trying to get clearance to reopen the access road. The Teichert, Govan, North Twin, Tip Top, and Werdenhoff properties were most likely prospected and developed in the late 1800's and early 1900's. There is no recorded mineral production at these properties.

The Jett Canyon mining district on the south side of the study area encompasses Jett, Broad, and Wall Canyons. Although active since 1870, there is little information in the literature concerning this district. Ferguson and Cathcart (1954) reported minor production in 1922 of silver-bearing galena from the range front near Jett Canyon. The production is presumed to be from a mine on the north side of the canyon mouth that is outside the study area and not included in this report. The Broad Canyon mine (Valley View claim group) on the south side of Broad Creek is reported by Kral (1951) to have produced about 150 tons of gold-silver-lead-zinc-copper ore. The Wall Canyon mine (Last Chance Antimony, Big Horn Antimony) in Wall Canyon, about 2 mi south of the study area, was staked in 1881 and is credited with production of 838 tons of antimony during World War I, the late 1930's, the 1940's, and 1950's (Big Horn Antimony Company, unpublished report, 1985). During the last 10 years, this property has been an exploration target for gold.

The Peavine mining district, while mostly south of the study area, does include some prospects in Toms Canyon, Trail Creek, and Reese River drainages. The district was organized in 1906 and most of the workings probably date to the 1910's and 1920's. Although the Packhorse prospect on Trail Creek was apparently mined in the 1930's (Tomany, personal communication, 1986), there is no recorded production from this district in or adjacent to the study area.

Although not within an organized mining district, the Ferir mine, in the southwest part of the area, was located in 1923 and by 1937 had produced several hundred tons of gold ore (Kral, 1951). Homestake Mining Co. currently holds an option on the property and is exploring for additional gold resources.

Tungsten, produced from Ophir and Wisconsin Canyons north of the study area, is valued at about $500,000 (Brem and others, in preparation) and was mined in the 1950's, 60's, and in 1974. Most was produced during the federal government's price-support program.

The Round Mountain mine, 8 mi southeast of the study area, was developed on vein-type gold deposits in 1906. Underground and placer operations began soon after and continued until 1935 and 1940, respectively. Placer operations resumed in 1949 and continued until 1957. In 1972, a large, low-grade gold deposit was developed by open pit methods and, from 1977 to 1986, produced 840,000 oz of gold (Round Mountain Gold Corp., unpublished report, 1986). This mine, and others like it in Nevada, sparked renewed interest in the Toiyabe Range and the Arc Dome area during the 1970's and 1980's. Mineral surveys were made by

several mining companies including Felmont Oil Corp., Copper Range Co., Round Mountain Gold Corp., Smokey Valley Mine Co., Homestake Mining Co., Utah International, Marshall Earth Resources, Noranda Mining Co., and Freeport Mining Co. The Ojo del Oso, Ophir, and Ledbetter-Yellow Gold claim groups, among others, were explored for low-grade, large-tonnage gold deposits.

APPRAISAL OF SITES EXAMINED

During field investigations, 18 prospects and surrounding areas were studied in detail to evaluate any resources present. Selection criteria included: 1) a significant amount of recent and historic exploration activity including claims staked, workings, and past production; 2) presence of favorable host rocks and the amount of alteration; 3) existence of favorable geologic structures including caldera ring fractures, thrust faults, high-angle faults, and brecciated zones; 4) presence of favorable source rocks - granitic intrusions and carbonaceous sedimentary rocks; and 5) favorable analytical results. Descriptions of the 18 prospects are presented in the following text. Data on prospects that either were poorly exposed or did not meet the criteria discussed above, appear in table 1 at the end of this section. Maps, sample descriptions and analyses, and photographs of the prospects are presented in Appendix A.

Sullivar Prospect

The Sullivar prospect (fig. 2, no. 3) is located along the northern boundary of the study area, near the head of the North Fork Clear Creek. The area is accessible by jeep roads from Reese River, 9 mi to the west, and from Nevada Highway 376, 9 mi to the east. Prospecting activity probably began here during the 1860's when the Murphy mine, 3 mi to the east, was in production. The Sullivar prospect was known as the Summit group around 1950; the owners were Philip and Louis Meyer and W. H. Thomas (Kral, 1951). In 1987, two claim groups were located. One group, owned by Marshall Earth Resources, Inc., consisted of 51 claims (Ophir claims). The other group was owned by Norman Coombs and consisted of 11 claims (Gold Reef claim group). Additional activity at the prospect included cursory examinations by Homestake Mining Company and Noranda Exploration, Inc. in 1968 and 1981, respectively.

Two adits totalling less than 40 ft, four caved adits, one 45-ft-deep shaft, and at least 106 pits, cuts, and trenches (figs. A-1 through A-3) were examined during the study. Note that some pit symbols on the figures represent multiple workings. Numerous workings occurring to northwest and northeast were too far outside the study area boundary to be included in this investigation.

The Sullivar prospect area is underlain by Tertiary volcanic rocks, Paleozoic sedimentary and volcanic rocks, and quartz monzonite. The volcanic rocks include welded, crystal-rich, rhyolite ash-flow tuff that is characterized by smoky quartz phenocrysts; crystal-poor, lithic ash-flow tuff; crystal-poor to crystal-rich, densely welded, ash-flow tuff; and volcaniclastic sedimentary rock. A plug of black obsidian also crops out at sample site no. 1322. The Paleozoic rocks include variably metamorphosed argillite, limestone, quartzite, sandstone, dolomite, conglomerate, and andesite. Hydrothermal alteration occurs throughout most of the prospect area but is most intense along a northwest trending zone in the northeast one-half of the claim block. This zone is probably bound by the extension of two parallel N. 50°-60° W. trending faults that are evident along the northeast and southwest sides of the quartz monzonite at the head of Ophir Creek. The amount of silicification decreases away from this zone and there appears to be a close association between the two faults, the quartz monzonite, and mineralization at this prospect, the Gruss mine, and Dallimore-Douglass prospect.

During the investigation, 174 samples were collected, described and analyzed (table A-1). Seventeen samples contained detectable gold, one contained more than 15 ppm silver, 19 contained more than 100 ppm arsenic, 11 contained more than 10 ppm antimony, and 25 contained more than 20 ppm molybdenum. Plotted on a map, the samples with anomalous metal analyses reflect the trend of the fault zone previously described. Maximum analyses were 0.918 ppm gold, 25.5 ppm silver, 5040 ppm arsenic, 46.7 ppm antimony, and 645 ppm molybdenum.

No resources were delineated at the Sullivar prospect because the gold assays were low and occur sporadically. However, additional exploration, including drilling, may outline a low-grade, large-tonnage, disseminated gold deposit. Evidence supporting this conclusion includes: 1) the presence of an arsenic-antimony-molybdenum anomaly; 2) the probable extension through the area of faults exposed to the east; 3) the presence of quartz monzonite, a potential source of metal-bearing solutions; 4) pervasive hydrothermal alteration including silicification; and 5) an association with a lineament transecting at least the Toiyabe Range.

Gruss Mine

The Gruss mine (fig. 2, no. 4), also known as the Adirondac, is at the head of Ophir Canyon at an elevation of about 10,000 ft. Access is by 7 mi of secondary and jeep roads up Ophir Canyon from Nevada Highway 376. One patented claim (Adirondac Lode), and six unpatented claims (Horseshoe, Horsehoe Extension, Spring, Cabin, Cabin Extension, and Silver Star) compose the property. The owner in 1987 was C. L. Lastrets of San Francisco, CA.

The mine was probably first prospected in the mid-1860's when the Murphy mine, located 1.5 mi down Ophir Canyon, was active. The Adirondac Lode was patented in 1870 and two adits and a shaft existed at that time. The unpatented claims were located between 1931 and 1940. Kral (1951) reported that the mine was worked by R. Gruss, until his death, with no reported production. Six adits, one shaft, 12 prospect pits, and two sheet steel buildings belong to this period of development. During the last 20 years, the property has been explored by at least ten bulldozer trenches. In 1987, the property was idle. Four of eight adits are open or partially open, while both shafts are caved (figs. A-4 to A-6). The open adits are 300, 25, 15, and 5 ft long.

Mineralized structures consist of narrow, sulfide-bearing fissure veins in a small quartz monzonite stock that is probably a part of the Mesozoic Ophir Pluton (Brem and others, in preparation). The stock is in fault contact with variably metamorphosed Paleozoic sedimentary and volcanic rocks on the northeast and southwest. The faults trend N. 56° W. and are nearly perpendicular to the northeast-trending, northwest-dipping fissure veins in the quartz monzonite. The veins, sporadically exposed for up to 1,000 ft and averaging less than 2.5 ft thick, contain various amounts of quartz, argentiferous galena, pyrite, chalcopyrite, pyrrhotite, bornite, tetrahedrite, chalcocite, covellite, pyromorphite, tourmaline, and cerrusite. The enclosing quartz monzonite wallrock ranges in alteration between relatively fresh and extensively kaolinized and oxidized.

Kleinhampl and Ziony (1985) discussed similarities between mineral occurrences at the Gruss and the Murphy mines. Both contain silver-bearing fissure veins, associations of galena and copper minerals, and similar lead-to-silver ratios. Both these occurrences and several others in the area appear to be related to the Ophir Pluton.

Fifty-one samples were taken during the field work; descriptions and analyses are presented in table A-2. Two areas associated with the vein system contain significant metal concentrations. One, located between sample sites 454 and 703 near the center of the Adirondac claim, contains averages of 0.91 ppm gold, 68.8 ppm silver, 8040 ppm lead, and 4440 ppm copper. The second, occurring in the 300-ft-long adit between sample sites 455 and 715, contains averages of 0.048 ppm gold, 34.4 ppm silver, 1713 ppm lead, and 1129 ppm copper. However, in both cases, the veins are narrow and metal concentrations are spotty.

The fissure veins at the Gruss mine contain significant amounts of silver but probably are too limited in size to constitute a resource. None of the veins appear to extend any appreciable distance into the study area. Mining would involve expensive underground methods requiring relatively large reserves and high grade.

Dallimore-Douglass Prospect

The Dallimore-Douglass prospect (fig. 2, no. 5), located near the head of Last Chance Creek, is accessible by about 5 mi of jeep road. According to Kral (1951), the Dallimore-Douglass claims were located in 1948 by G. Dallimore, R. Douglass, and C. Pefley of Reno, NV.

The area is underlain by variably metamorphosed Paleozoic sedimentary and volcanic rock, and quartz monzonite (figs. A-7 and A-8). Numerous faults, shear zones, and brecciated areas occur in the metamorphosed rocks and many of them are either silicified or contain northeast-trending, northwest-dipping quartz veins. The veins are as much as 3.1 ft thick but average considerably less. Most of the 22 pits, trenches, and cuts found during the investigation were dug in an apparent attempt to expose vein extensions.

Sixty-eight samples were taken from the Dallimore-Douglass prospect; descriptions and analyses are presented in table A-3. Eleven samples contained detectable gold and six contained silver greater than 15 ppm. Maximum gold and silver analyses are 16.5 ppm and 180.0 ppm, respectively. Veins in this area pinch and swell sporadically and are seldom continuous for more than 200 ft. Sampling results show that most of the notable metal concentrations are restricted to veins; metal concentrations in the enclosing country rock are low.

Although not readily apparent, resources might be delineated with additional work. The following evidence supports this conclusion: 1) proper ground preparation including faulting, shearing, and brecciation; 2) the presence of a potential source of metal-bearing solutions, i.e., quartz monzonite intrusive; 3) the presence of quartz veins containing significant metal concentrations; and 4) proximity of the Murphy mine, a major gold-silver producer, less than 2 mi northeast.

Grandview Prospect Area

The Grandview prospect area (fig. 2, no. 6) extends from Last Chance Creek, north into Ophir Creek, and is accessible by jeep roads in both drainages. The study area boundary follows the ridge dividing the two drainages. Prospecting probably occurred in the 1860's when the Murphy mine, 0.6 mi to the northwest, was in production. During this investigation, two adits totaling about 40 ft in length, one shallow shaft, 34 pits and trenches, and numerous old claim corners were found in the area (fig. A-9). A claim notice for the Grandview was found at one of the corners, but the date and locator were not legible.

Most of the area is underlain by faulted, sheared, brecciated, and variably metamorphosed, Paleozoic sedimentary and volcanic rocks. Altered aplite, associated with a porphyritic intrusion to the east (Ophir pluton), crops out along the east side of the area. A north-trending, steeply-dipping, resistant, white quartz vein is exposed near

the aplite-metamorphic rock contact. This vein is part of an extensive quartz vein system that is traceable from the breaks of the North Twin River drainage to a point north of Ophir Creek, a distance of more than 4 mi. Many of the faults, shear zones, and brecciated zones in the metasedimentary and metavolcanic rock are either silicified or contain quartz veins. Most of the workings are along these structures.

Forty-three samples were taken from the Grandview prospect area; descriptions and analyses are presented in table A-4. Six samples contained detectable gold and three contained more than 15 ppm silver; maximum analyses were 2.59 ppm gold and 80.3 ppm silver. Generally, precious metal concentrations in this area appears to be sporadic and low grade. Metal concentrations in the quartz veins and silicified zones are not high enough to be considered resources.

White Horse Prospect

The White Horse prospect (fig. 2, no. 7) is located near Last Chance Creek in the north part of the study area and is accessible by 8 mi of jeep road. Prospecting activity probably began here in the 1860's when the Murphy mine, 1.2 mi north, was producing. Claim records indicate that Arthur Noyes located the White Horse and White Horse No. 1 claims at the prospect in 1916. In 1950, the claims were reportedly owned by J. W. Berg of Round Mountain (Kral, 1951). More recent Nye County records show that six claims were located at the prospect by W. Reich in 1977. According to BLM records, the latest assessment work at the prospect was done in 1986 by L. J. Larson on the White Horse and White Horse No. 1 claims.

Faulted metavolcanic and metasedimentary rocks underlie the area (fig. A-10). A resistant white quartz vein that strikes north and dips 65°-80° W. is the dominant feature of this prospect (fig. A-11). The vein varies in thickness from 2 to more than 30 ft and stands as much as 30 ft above the surrounding topography. It is offset by a fault at about 8,400 ft elevation, truncated by a fault at the north end, and pinches out on the south end. The vein is, however, only part of the extensive vein system mentioned in the previous description of the Grandview area.

The vein system has been prospected sporadically along its entire length and, at the White Horse prospect, has been explored by several pits and bulldozer cuts. Kral (1951) reported that the vein was explored by a shallow shaft and short adit, but those workings were not found; they were probably destroyed by the bulldozer work. Two roads are on the claims; the most recent is shown on figure A-10.

Fourteen chip, random chip, and grab samples were taken of the quartz vein. Descriptions and analyses are presented in table A-5. Three samples contained detectable gold which averaged 1.32 ppm and one sample contained 27.3 ppm silver, 191 ppm lead, and 2985 ppm zinc, but no gold.

No resources were estimated for the White Horse prospect because apparent average gold content of the vein is too low and too sporadic to support a high cost underground economic mining venture.

Charley Prospect

The Charley prospect (fig. 2, no. 8) is located on the south side of Last Chance Creek, about 1.3 mi upstream from the mouth. The prospect is accessible by hiking downstream about 0.5 mi from the end of a jeep road at the White Horse prospect.

Like other prospects in the vicinity, exploration activity probably began in the 1860's when the Murphy mine was active. During field work, seven adits totaling 712 ft in length, three additional but inaccessible adits, one shaft, and 26 pits, trenches, and cuts (figs. A-12 through A-14) were investigated. The largest underground working included stoped areas, but production appears to have been minor.

The prospect is underlain by faulted, sheared, hydrothermally altered, and variably metamorphosed Paleozoic sedimentary and volcanic rocks that are intruded by aplite. Numerous quartz veins and lenses occur along the metamorphic-intrusive contact and in fault zones. The alteration is pervasive; one area surrounding sample site no. 2121 is partially silicified and contains disseminated pyrite.

Seventy-seven samples were collected from the prospect and descriptions and analyses are presented in table A-6. Forty-six samples contained detectable gold, 30 contained more than 15 ppm silver, 16 contained more than 1000 ppm copper, 13 contained more than 1 percent lead, 5 contained more than 1 percent zinc, and 16 contained more than 100 ppm molybdenum. Maximum analyses were 47.1 ppm gold, 490.0 ppm silver, 8000 ppm copper, 11 percent lead, 2.6 percent zinc, and 889 ppm molybdenum.

Although many of these analyses are notable, no resources were estimated for the Charley prospect because those quartz veins that contain the highest analyses tend to be narrow and pinch and swell sporadically. However, based on the following evidence, it is believed that additional work, including drilling, might delineate a resource: 1) relatively high precious and base metal analyses occur in some of the quartz veins; 2) some sample results indicate that areas of low-grade mineralization occur in the enclosing Paleozoic rock; 3) host rock that protrudes into intrusive rock, as it does here, is more likely to be mineralized than if the contact were linear; 4) an abundance of faults and shear zones shows that the Paleozoic rock was properly prepared for mineralization; and 5) the pervasive hydrothermal alteration.

If a low-grade, large-tonnage deposit were delineated, it might be mineable by low-cost, open pit methods. Even though water is available in Last Chance Creek, poor access and the rugged, narrow canyon would add appreciably to development costs.

Werdenhoff Prospect Area

The Werdenhoff prospect area (fig. 2, no. 11) is located along the south and west flanks of South Toiyabe Peak, north of the North Twin River. Access is 5 mi by trail from the mouth of North Twin River or 3 mi by trail south from a jeep road at Ophir Summit.

A search of mining claim records revealed that at least 50 claims were located in the Werdenhoff prospect area during the early 1900's. Historic claims include the Crescent group, Lost Mine, Tom Boy, Rio, Carbonate, Ethel, Bonanza, Cobweb group, C.O.S. group, Bimetallic group, Copper King, Silver King, Pilgrim, June Bug group, June Boy, Golden Goddess, May Flower, Inca, Silver Star, Fairweather, Surprise, Clondyke, Midas, Teddy, Silver Leaf, Alice Jean, Condor, Vulture, Two Pines, April Fool, Katy, Silver Lead group, Pyramid, Last Chance, Luella, and Rattle Weed. During field investigation one 15-ft-deep shaft, five caved adits, nine adits totalling 430 ft, and more than 50 pits, trenches, and cuts (figs. A-15 through A-18) were examined.

The area is underlain by variably metamorphosed Paleozoic sedimentary and volcanic rocks, Tertiary volcanic rocks, and porphyritic intrusive rocks. Tertiary volcanic rocks include crystal-poor, lithic, ash-flow tuff; both crystal-poor and moderately crystal-rich, densely welded, ash-flow tuff; and volcaniclastic sedimentary rocks. Much of the area has been faulted, sheared, brecciated, and hydrothermally altered. Numerous silicified zones form ridges and knobs (fig. A-19).

During the 1986 and 1987 field seasons, 297 samples were collected from the Werdenhoff prospect area; descriptions and analyses are presented in table A-7. Thirty-eight samples contained detectable gold, 12 contained more than 15 ppm silver, 32 contained more than 100 ppm arsenic, 9 contained more than 1.0 ppm mercury, 26 contained more than 10.0 ppm antimony, and 5 contained more than 10.0 ppm thallium. Maximum analyses were 7.87 ppm gold, 277 ppm silver, 8089 ppm arsenic, 5.8 ppm mercury, 1350 ppm antimony, and 30 ppm thallium.

Three highly altered areas contain significant amounts of precious metals and pathfinder elements. One area trends northeast on the southwest flank of South Toiyabe Peak (fig. A-17) and includes metamorphic rock that has been brecciated, silicified, and heavily stained by limonite and hematite. Ten samples from this area contained detectable gold, 13 contained more than 10 ppm antimony, and 12 contained more than 100 ppm arsenic.

Rock near the center of the second area (fig. A-15) is bleached, sheared, limonite-stained, partially silicified, ash-flow tuff that contains anomalous amounts of gold, mercury, and thallium. Thirteen samples contained detectable gold, seven contained more than 10 ppm thallium, and four contained more than 1.0 ppm mercury.

The third area, not as well defined, occurs in a north-trending zone (fig. A-16) and is underlain by bleached, sheared, limonite-stained, partially silicified, ash-flow tuff. Five samples contained detectable gold, and four contained more than 100 ppm arsenic. Sample no. 400, taken across a limonite- and malachite-stained, pyrite-bearing, silicified shear zone contained 7.87 ppm gold and 57.2 ppm silver.

Although several areas in the Werdenhoff prospect area contain low-grade gold, no resources were delineated because tonnage and grade cannot be estimated for disseminated gold deposits without drilling or bulk sampling. Additional soil and rock chip sampling could outline possible drilling targets.

Tip Top Prospect

The Tip Top prospect (fig. 2, no. 14), located on the south side of North Twin River about 3 mi from its mouth, is accessible by a trail along the river. Nye County mining claim records indicate that initial exploration activity occurred in 1908 when the Tip Top Nos. 1-3 claims were located by Mr. Werdenhoff. Five adits totaling 232 ft in length, one caved adit, and 35 pits, trenches, and cuts (figs. A-20 through A-22) were located during the field examination.

The prospect is underlain by grayish-tan, welded, rhyolite tuff in fault contact with silicified, variably metamorphosed, silicic ash-flow tuff (felsite). The major N. 15° W. trending fault zone that demarcates felsite from rhyolite tuff is intersected by a secondary, N. 50° E. trending fault in the felsite. A 600-ft by 1,500-ft area of limonite- and anglesite-stained, sheared, fractured, hydrothermally altered volcanic rock is exposed at this intersection. Quartz rhyolite porphyry intrudes the fault zone in at least two places; one near the fault intersection, and the other about 2,000 ft southeast. Precious and base metals appear to be restricted to the faults, shear zones, and quartz porphyry intrusive.

Table A-8 presents descriptions and analyses of 68 samples collected at the property. Nineteen contained detectable gold, 20 contained more than 15 ppm silver, 14 contained more than 100 ppm copper, 28 contained more than 1000 ppm lead, 36 contained more than 100 ppm zinc, and 41 contained more than 100 ppm arsenic. Maximum analyses were 1.31 ppm gold, 1068 ppm silver, 760 ppm copper, 21.4 percent lead, 1.05 percent zinc, and 21.2 percent arsenic.

When plotted on sample maps, the data show three areas that contain significant amounts of precious metal and pathfinder elements. Two areas occur in the large sheared zone previously discussed (fig. A-20). The third is 2,000 ft southeast and is not well exposed. Tonnage and grade estimates were not made because of the need for bulk surface sampling and

drilling. The extent of surface area containing significant amounts of gold and silver suggests, however, that a low-grade deposit on the order of several million tons may exist.

Although much of this prospect is steep and rugged, some of the mineralized rock might be amenable to low-cost, open pit mining methods. Adequate water for a heap-leaching operation is available in North Twin River. Difficult road building conditions along the river would add appreciably to development costs.

Teichert Prospect

The Teichert prospect (fig. 2, no. 15), located north of the North Twin River about 0.5 mi from its mouth, is accessible by 3.5 mi of rough road from Nevada State Highway 376.

A search of Nye County mining records revealed that exploration activity may have began here in 1866 when five claims (Ganges, Taylor, Boyd, Thames, and Colorado) were located by C. F. Horn. Many claims were located and relocated during the following years. In 1986, three claims (Golden Wall, Jessica, and John) held by C. Johnson, S. Shellhaas, and M. Morrison, were located at the prospect. During the field investigation, five adits totalling at least 335 ft, seven shafts totalling about 200 ft, and 28 pits, trenches, and cuts were found (figs. A-23 through A-25).

The prospect is underlain by silicified, variably metamorphosed, silicic ash-flow tuff (felsite), quartz monzonite, and variably metamorphosed, Paleozoic sedimentary and volcanic rocks. A major west-northwest trending fault separates the felsite from the Paleozoic rocks which are sheared, fractured, and tightly folded, especially near the fault. Numerous quartz veins and lenses, some metal-bearing, occur in the folds and faults. The more common sulfide minerals noted were pyrite, arsenopyrite, galena, chalcopyrite, and sphalerite. Two areas in the Paleozoic rocks were completely silicified but contain only disseminated pyrite and a trace of chalcopyrite. Several diabase dikes also crop out on the prospect.

Seventy-four samples were taken during the 1986 and 1987 field seasons; descriptions and analyses are presented in table A-9. Twenty-three samples contained detectable gold, 29 contained more than 15 ppm silver, 39 contained more than 100 ppm arsenic, 11 contained more than 50 ppm molybdenum, 12 contained more than 1 percent lead, 10 contained more than 1 percent zinc, and 1 contained more than 1 percent copper. Maximum analyses were 8.36 ppm gold, 1652 ppm silver, 22.7 percent arsenic, 370 ppm molybdenum, 15.4 percent lead, 11.5 percent zinc, and 1.72 percent copper.

Notable concentrations of base and precious metals generally occur in three areas. The first area is along the fault that borders felsite. Quartz veins and lenses pinch and swell and contain spotty occurrences of galena. An inverse relationship appears to exist between the sulfide mineral concentrations along this fault and the distance from the quartz monzonite. This relationship also holds true for the second area, associated with another west-northwest trending fault. Sulfide-bearing quartz veins and lenses are in both quartz monzonite and Paleozoic rocks and are explored by the main underground working (samples 151-159, 250). The third area is on a ridge shown in the northwest part of figure A-23. High-grade, sulfide-bearing quartz lenses trend both northwest and northeast, but are either poorly exposed or rapidly pinch out. The highest silver assay at the Teichert prospect came from a select sample (1285) of quartz taken from a trench in the third area.

Sample analyses show precious- and base-metals associated with quartz veins and lenses that are generally near intrusive quartz monzonite. The enclosing country rock does not contain significant metal concentrations. No resources are estimated for the Teichert prospect because: 1) the quartz veins and lenses pinch and swell sporadically, and 2) metal concentrations are spotty.

North Twin River Prospect Area

The North Twin River prospect area (fig. 2, no. 16) is located along the range front between the North and South Twin Rivers just above the valley floor. Access is by 3.5 mi of improved gravel roads from Nevada State Highway 376.

In 1976, A. D. Reese staked the MO claim group in the area, but BLM records indicate that no claims were active in 1987. Workings consist of one caved adit, six accessible adits totaling 230 ft in length, two partially caved shafts (5 and 35 ft deep), and 20 pits and trenches (fig. A-26).

Many of the workings explore sulfide-bearing quartz veins and shear zones in Paleozoic metasedimentary rocks that are intruded by quartz monzonite. On the southeast side of the prospect area, mineralization occurred along shear zones in an altered part of the intrusion. The shears strike northwest and appear to be part of a structural zone that extends from the Govan prospect northwest to the Teichert prospect. The veins contain variable amounts of quartz, calcite, limonite, clay, pyrite, and malachite. In the northwest part of the prospect area, the veins also contain galena, sphalerite, and chalcopyrite.

Descriptions and analyses for the 39 samples collected are presented in table A-10. The analyses show that metal concentrations are generally spotty and low-grade. Ten samples from the northwest side of the prospect contained the only notable concentrations of silver, lead, and zinc; analyses ranged between 1.6 and 36 ppm silver, 206 and 7250 ppm lead, and 311 and 4286 ppm zinc.

No mineral resources are exposed at the North Twin River prospect. Also, the lack of detectable precious metals and the paucity of base metals suggest that a near-surface resource is unlikely.

Govan Prospect Area

The Govan prospect (fig. 2, no. 17) is located along the range front just southeast from the mouth of South Twin River. The area is accessible by 3 mi of dirt and gravel road from Nevada State Highway 376. Records are sketchy, but exploration activity probably began in the 1860's. In 1987, the 3M claim group, located by R. E. Wold and E. M. Mulligan, was staked at the prospect. During field work the following were examined: five adits totaling 440 ft, three caved adits, one shaft, and more than 60 pits, trenches, and cuts (figs. A-27 through A-31).

The area is underlain by variably metamorphosed Paleozoic sedimentary and volcanic rocks that include argillite, quartzite, conglomerate, limestone, dolomite, and andesite. Silicified, variably metamorphosed, silicic ash-flow tuff (felsite) is in fault contact with the Paleozoic rocks in the northwest and southwest part of the area (fig. A-27). A quartz latite intrusive in Paleozoic rock is exposed in the north part of the area and is shown in detail in figure A-28. A quartz latite porphyry dike, trending about N. 60° E. in the Paleozoic rocks, crops out in the east-central part of the area (fig. A-29). A N. 40°-50° W. trending fault zone, more than 1,000 ft wide and containing quartz veins and lenses, is exposed along the northeast part of the area. This fault zone may be related to a lineament which trends southeast from the Hamlin mine-Sullivar prospect area to the Govan prospect.

One hundred sixty-five samples were taken from the Govan prospect and adjoining area; see table A-11 for descriptions and analyses. Twenty-seven samples contained detectable gold, 21 contained more than 15 ppm silver, 24 contained more than 1000 ppm lead, 20 contained more than 1000 ppm zinc, 1 contained more than 1000 ppm copper, and 64 contained more than 100 ppm arsenic. Maximum analyses were 17.4 ppm gold, 4264 ppm silver, 21.7 percent lead, 1.36 percent zinc, 5481 ppm copper, and 8.81 percent arsenic.

The analyses show that nearly all of the significant amounts of lead and silver occur in the quartz latite porphyry dike. Silver is associated with galena that occurs in pods, veinlets, and along fractures. Gold is also associated with the dike, but unlike lead and silver, occurs in several other areas of the prospect. One area is along the contact of the quartz latite intrusive with Paleozoic rocks where small zones of tactite exist. A second gold-bearing tactite area occurs at sample site 1207 (fig. A-27). Analytical results also show that the Paleozoic rocks generally do not contain significant amounts of precious or base metals.

Although some small areas in the quartz latite porphyry dike are relatively high grade, the occurrences are too small and spotty to be economically mineable. Furthermore, sample data suggest that the entire dike is too low grade to be considered a bulk-mineable resource. Likewise, the gold-bearing tactite occurrences are too small and low grade to be considered resources at this time.

South Twin Mine

The South Twin mine (fig. 2, no. 20) is located 3.5 mi upstream from the mouth of the South Twin River, is accessible on foot by trail and washed-out road. The mine is part of the K claim group which consists of the T1 and T2 claims located in 1959, and the K1-K10, K millsite, and Kent #1 claims located in 1979. The property, historically known as the A-1 mine, is currently owned by K. Buffington, R. Carver, and R. Wilson, all of Round Mountain, Nevada.

Mining activity probably dates to the 1880's. Kral (1951) reported extensive workings and ruins of an old stamp mill that were active in the 1920's. An access road up the river was probably built about this time. While there is no recorded production, the presence of a mill and a significant amount of underground workings suggest that some ore was produced. The current owners filed an operating plan for the mine in 1986 that included reopening the access road.

In the last 25 years, renewed regional exploration interest and a change of land-use status in the Arc Dome area resulted in a number of surveys and evaluations of this property. Studies were conducted by the claim owners in 1959, Pauch and Co. in 1973, the USFS in 1979 and 1986, Homestake Mining Co. in 1980, Smokey Valley Mining Co. and CR Exploration in 1980-1983, and the Nevada Bureau of Mines and Geology in 1985. None of these studies have been published; the information is available only from the individual companies or agencies.

Development consists of a prospect pit, caved shaft, old cabin, compressor building, workshop, and three partially caved adits totaling about 1,100 ft (figs. A-32 and A-33). There are stopes in the lower and middle adit levels but access to them is restricted because of cave-ins. About 200 ft of strike length and 130 ft of dip length are exposed in the underground workings.

All mining was on a single gold- and silver-bearing structure that strikes from N. 67° - 88° W. and dips from 35° - 75° NE. The structure, about 8 ft wide, is exposed in all three adits and consists of quartz-sulfide veins and fault gouge in sheared and fractured Darrough felsite. The veins contain variable amounts of auriferous pyrite, manganese oxides, limonite, chalcanthite, native gold, molybdenite, fluorite, and calcite. The wallrock has undergone sericitization, chloritization, and silicification.

CR Exploration cited the property as having potential for a molybdenum porphyry deposit (unpublished report, 1983). This was based on: 1) similar characteristics of the granitic intrusion on the west side of the property compared to the intrusion at the Mt. Hope mine near Eureka, NV; 2) the presence of molybdenum; 3) the presence of lead-tungsten-fluorine anomalies in veins; and 4) alteration patterns similar to those at known molybdenum-porphyry deposits.

Descriptions and analyses of 69 samples collected during the field investigation are shown in table A-12. Of the 21 samples (294-300, 422-424, 501-511) taken from the mineralized structure, precious metal content ranged between 0 and 46.1 ppm gold, and between 0.5 ppm and 62.5 ppm silver. Averages for these samples are 3.81 ppm gold and 11.13 ppm silver. Anomalous averages for other elements include 231 ppm arsenic, 3.81 ppm antimony, and 102.2 ppm molybdenum. The analyses show that although some metal concentrations are relatively high, they are inconsistent. Additionally, the analyses of country rock in the mine area indicate that the felsite is not mineralized outside the sheared structure.

Nine samples taken along an altered fault zone on the southeast side of the property (fig. A-32, inset map) contain anomalous amounts of arsenic, antimony, and molybdenum but lack significant amounts of precious metal.

Analyses of 12 samples taken from the granitic intrusion on the west side of the property averaged 9.9 ppm molybdenum. These anomalous analyses support CR Exploration's hypothesis of a molybdenum-porphyry deposit.

Limited access to the stopes and the spotty occurrence of precious metals preclude meaningful resource estimates. However, since this mine is a past producer, renewed access to the stoped areas may reveal resources. In any case, mining this vein deposit would have to be by expensive underground methods and would require a large, high-grade resource before it would be economic.

Tiger Cat Prospect Area

The Tiger Cat prospect area (fig. 2, no. 22), located about 4 mi northeast of the summit of Arc Dome, is accessed by trail up South Twin River. One 80-ft-long adit, two caved adits, 15 pits, and numerous old claim corners were found in the area (fig. A-34). Two claim notices near one adit listed four claims (Tiger Cat Nos. 1-3 and Smitty No. 2) and were dated 1936 and 1937. There appears to have been no activity since then.

The prospect area is underlain by altered, crystal-poor, ash-flow tuff and densely welded, ash-flow tuff that is sheared, brecciated, and silicified in three large zones (fig. A-34).

Thirteen samples (306-315, 812-814) taken during 1986 contained appreciable gold and molybdenum (table A-13). Sample no. 315 was especially noteworthy because it assayed 0.311 ppm gold, 30.2 ppm silver, and 1309 ppm molybdenum, and was collected from one of the three large, brecciated zones. An additional 189 samples were collected in 1987 based on the following observations and data: 1) anomalous gold-silver-molybdenum assays; 2) presence of sheared, brecciated, and hydrothermally altered zones; 3) proximity to a molybdenum and gold prospect 3 mi to the east; 4) identification and mapping of a caldera ring fracture system in the area by a private mining company (Mills, unpublished report, 1981); and 5) presence of numerous, widespread, workings. Analyses of the additional samples did not clearly delineate any large precious metal-bearing areas. However, plots of the anomalous molybdenum analyses form a northeast-trending, linear pattern inferred to reflect a fault. The three silicified zones also fall into a roughly linear pattern which parallels the anomalous molybdenum. Based on the data gathered, precious metal and molybdenum resources might exist below the densely welded tuff.

Broad Canyon Mine

The Broad Canyon mine (fig. 2, no. 27) is located south of Broad Creek. A 2.6-mi-long jeep road up Broad Creek from Nevada State Highway 376 ends about 0.5 mi north of the mine area.

Evidence suggests that the first prospecting activity here probably began in the late 1800's. In 1987, the Surprise claim group, held by William and Carl Berg, was located at the mine. During field investigations, six adits totaling 316 ft, two shafts, and 17 pits,

trenches, and cuts (fig. A-35) were found. A stope to the surface at sample site 74 and a small stope in the southernmost adit at sample sites 67-68 indicate that some production took place. Additionally, Kral (1951) reports that 150 tons of gold-silver-copper-lead-zinc ore was mined and 6.5 tons of concentrate were shipped in 1948.

The mine area is underlain by variably metamorphosed Paleozoic volcanic and sedimentary rocks which include argillite, quartzite, conglomerate, limestone, and andesite. Quartz monzonite crops out in the northwest part of the area. Several types of mineralized structures, including sulfide-bearing shear zones, quartz veins, and tactite pods, occur at the mine. Although there appears to be no preferred orientation to the shear zones and quartz veins, they are confined within a northwest-trending, limonite-stained zone over 3,000 ft long and 1,000 ft wide. The pods of tactite and quartz veins and lenses are generally less than 4 ft thick, discontinuous, and isolated. The longest quartz vein exposure is about 200 ft and occurs at sample sites 70-74. Sulfide minerals, including galena, chalcopyrite, sphalerite, and pyrite, generally occur as blebs and fracture fillings.

Thirty samples were collected during 1986 and 1987; descriptions and analyses are presented in table A-14. Nine samples contained detectable gold, 16 contained more than 15 ppm silver, 1 contained more than 1 percent copper, 10 contained more than 1 percent lead, 11 contained more than 1 percent zinc, and 6 contained more than 100 ppm molybdenum. Maximum analyses were 0.102 ppm gold, 423 ppm silver, 1.44 percent copper, 2.9 percent lead, 6.1 percent zinc, and 404 ppm molybdenum.

No resources were estimated because the shear zones, quartz veins, and tactite pods are small, discontinuous, and metal concentrations within them are spotty.

Ojo Del Oso Prospect

The Ojo Del Oso claim group, consisting of 47 claims covering more than 900 acres, is located on both sides of Jett Canyon about 2.5 mi upstream from the canyon mouth (fig. 2, no. 29). In 1987, the claim group was held by Utah International Inc., Salt Lake City, UT. The area is accessible by a jeep road which follows the valley floor.

Initial exploration of the property was probably in the late 1870's when the Jett Canyon mining district became active. A mining camp was established during this period near the Valley mine on the south side of the claim group (Kleinhampl and Ziony, 1984). Mining in Jett Canyon has been limited and intermittent with reported activity in 1915 and 1916 (Tonopah Mining Co., unpublished reports, 1915 and 1916), in 1922 (Ferguson and Cathcart, 1954), in 1948 (Kral, 1951), and in 1951 (Kleinhampl and Ziony, 1984). The five shafts, three adits, and 15 prospect pits investigated during field work probably date to 1910 as

indicated by artifacts in the workings and several old claim notices. Interest in low-grade, bulk-tonnage gold deposits resulted in a survey of the Jett Canyon area by Freeport Gold Corp. between 1964 and 1971. The current owners located claims and conducted a geochemical survey in 1984 and completed a geological mapping program in 1985.

The Utah International Inc. claim block covers an exploration target for a precious metal-bearing, skarn-type replacement deposit related to a felsic intrusion believed to exist at depth (Utah International, Inc., unpublished report, 1985). The Jett Canyon area is believed to be on the southeast side of a Tertiary volcanic caldera outlined by the present distribution of the Darrough Felsite (Speed and McKee, 1976). Mineralization may have been related to the same magma from which the felsite was derived.

Country rock in the area consists mostly of sedimentary and metasedimentary rocks of the Ordovician Palmetto Formation and the Permian Diablo and Pablo Formations (fig. A-36). Rock types include limestone, shale, sandstone, conglomerate, and cherty phyllite that have been folded, thrust faulted, and subjected to several episodes of high-angle faulting, the last of which may be related to subsidence of the caldera discussed above. Also, these rocks have been intruded by quartz latite porphyry that, in composition and age, is correlative with the Darrough Felsite (Speed and McKee, 1976).

Metal-bearing zones exposed throughout the property are fault- and bedding-controlled. These zones contain pyrite, arsenopyrite, and pyrrhotite with smaller amounts of chalcocite, malachite, azurite, galena, and stibnite. The gangue includes quartz; silicified, brecciated, and bleached sedimentary rocks; hornfels; and calc-silicate minerals such as tremolite, epidote, and garnet. Metallic minerals are generally finely disseminated; limonite stains on weathered surfaces are typical. Massive sulfide veins occur at several locations.

Results of the 1984 current owner's geochemical survey are shown on figure A-37. Outlined areas show "hot spots" that are highly anomalous in arsenic, moderately anomalous in antimony and mercury, and very spotty but moderately anomalous in gold.

The 175 samples taken for this study are presented on figure A-37. Descriptions and analyses are presented in table A-15. Results of the sample program confirm the geochemical and geological work completed by Utah International Inc., i.e., the mineral system has spotty, low gold analyses; scattered, moderate to high silver analyses associated with moderate lead-copper-zinc analyses; spotty, low mercury analyses; and pervasive, moderate to high arsenic and antimony analyses. Of special note is sample 169 that contained 2030 ppm silver. The analyses also show that twelve samples contained anomalous cadmium that appears to be associated with zinc. Selenium, tellurium, and bismuth are anomalous in

ten samples. Molybdenum is anomalous in three samples and thallium in one sample. One sample, containing elevated levels of chromium and nickel, consists of metasedimentary rock with mariposite, a chromium mica.

While this study did not define resources on the property, the geology and sample results are suggestive of a skarn-type replacement deposit similar to the Fortitude ore body in the Copper Canyon mine, south of Battle Mountain, NV. At the Fortitude, lead-zinc-silver deposits enclose a central gold-bearing zone. At the Ojo Del Oso, the lack of high gold content and the presence of lead-zinc-silver zoning suggest that a gold-bearing zone, if present, would be at depth.

Packhorse Prospect

The Packhorse prospect (fig. 2, no. 31) is located in the southern part of the study area along Trail Creek, a tributary of Reese River. The prospect is accessible by trail from the end of the road in Toms Canyon 5 mi south. According to Ed Tomany (personal communication, 1986), placer deposits along Trail Creek were first mined during the 1930's. The low number and small size of workings indicate that there was little production. Two placer and six lode claims were staked in the drainage in 1980 by Ed Tomany and Frank Penola, both of Tonopah, NV.

The area is underlain mostly by volcanic rocks that include crystal-rich and crystal-poor, densely welded, ash-flow tuff; crystal-poor, lithic, ash-flow tuff; crystal-rich ash-flow tuff; and rhyolite flows. Some of the tuffs are variably metamorphosed. A small outcrop of porphyritic intrusive rock is exposed in the extreme south part of the drainage and appears to be in fault contact with the surrounding volcanic rocks. The volcanic rocks are faulted, and numerous areas show brecciation, shearing, and hydrothermal alteration, including leaching, bleaching, and silicification.

During field reconnaissance, 12 badly sloughed pits or trenches were located (figs. A-39 and A-40). In 1986, 16 rock and three placer samples were collected from the prospect. Each placer sample contained visible gold and analyses of two rock samples contained appreciable gold and silver. Based on these analytical results, the large amount of hydrothermal alteration, and presence of significant faulting, an additional 26 rock samples were collected in 1987. This was an attempt to delineate the source area for placer gold; possibly a low grade, large tonnage, disseminated deposit in the volcanic tuffs. However, the analyses did not outline such an area. Complete descriptions and analyses for all of the rock samples are presented in table A-16; data for the placer samples are presented in table A-19.

No lode or placer resources are evident. The gold value per cubic yard of gravel is much lower than that which would be required to operate an economic mining venture. No additional work is recommended in the Trail Creek drainage.

Lost Wheelbarrow Prospect

The Lost Wheelbarrow prospect (fig. 2, no. 33) is located north of the Reese River at its confluence with Trail Creek. It is accessible by 10 mi of trail up the Reese River, or by 7 mi of trail from the end of the road in Toms Canyon. Evidence suggests that most of the exploration activity probably dates to the early 1900's. During field investigations, one 42-ft-long adit, one caved shaft estimated to be 125 ft long, and 29 pits and trenches (fig. A-41) were located. Recent claims include the Lost Wheelbarrow 1, 2, 3, and 4, which were located in 1981 by Raymond Segura and Edgar Siri, both of Fallon, Nevada.

The area is underlain by volcanic rocks that include both crystal-rich and crystal-poor, densely welded, ash-flow tuff; crystal-poor, lithic, ash-flow tuff; and crystal-rich, ash-flow tuff. Most of the mineralization at this prospect appears to have been controlled by the intersection of a N. 70° E. trending, steeply dipping shear zone with a N. 15° W. trending fault. An area approximately 2,000 ft long and 700 ft wide, approximately centered at the fault intersection, is sheared, brecciated, bleached, partially silicified, and stained with limonite.

Forty-six samples were collected at the prospect during 1986 and 1987; descriptions and analyses are presented in table A-17. Sixteen chip and grab samples (264-273, 275-280, 1489) were taken from the partially silicified area previously mentioned. The samples averaged 0.07 ppm gold, 21 ppm silver, 151 ppm arsenic, 15 ppm antimony, and 44 ppm molybdenum. One select sample (275) from the area assayed 0.61 ppm gold, 658 ppm silver, 390 ppm arsenic, 150 ppm antimony, and 73 ppm molybdenum. While not ore grade, these analyses are significant and might indicate the presence of a low-grade, possibly large-tonnage, gold-silver deposit. Additional trenching, sampling, and drilling would be required to calculate a tonnage and grade.

If additional work did delineate an economic deposit, it could be mined by low-cost, open-pit methods. Ore could be trucked a short distance to the Reese River where it could be crushed and put on leach pads. An adequate supply of water would be available from the river.

Ferir Mine

The Ferir (Ledbetter) mine (fig. 2, no. 35) is at the head of Ledbetter Canyon and can be reached by 5 mi of jeep road from the Reese River Valley.

Kral (1951) reported that the mine was initially staked in 1923 and purchased by A. H. Ferir in 1927. In 1932, Ferir milled 400 tons of ore on the property, and in 1937, after a new mill was installed, the mine became idle. All workings on the property, three adits, one shaft, and at least 20 shallow pits and trenches, belong to this period of development. The current owner, C. L. Bracken of Tonopah, NV, located the Yellow Gold claims in 1979 and relocated them in 1985. The property was explored by Freeport Exploration Co. in 1984 and by Homestake Mining Co. in 1985. As a result, Homestake located the Ledbetter claim group (nos. 1-32) around the Yellow Gold claim group and negotiated a ten year lease with the owner.

Mineral occurrences are vein-type that are associated with a Tertiary rhyolite porphyry dike emplaced along a fault in densely welded tuff of the Toiyabe Quartz Latite (fig. A-42). The tuffs are an intercaldera deposit, also Tertiary (Brem and others, in preparation). The gold- and silver-bearing veins, as much as 2 ft thick, contain quartz, gouge, and a small amount of pyrite. Noteworthy is the lack of sulfide minerals occurring with precious metals. The rhyolite porphyry and welded tuff, in contact with the veins, are silicified and potassically altered. Enclosing country rock is also altered and contains quartz- and adularia-filled fractures.

Homestake believes that the property has potential for a low-grade, bulk-tonnage gold deposit (Bob Blakestead, personal communication, 1986). While gold content at the surface is limited to narrow veins in the welded tuff, rocks at depth with more porosity, may host a large disseminated deposit. This geologic model would be analogous to the Round Mountain deposit. The lack of sulfides suggested to the company that gold mineralization may have been syngenetic with the rhyolite porphyry, and the area was explored to detect additional gold occurrences associated with the rhyolite intrusive episode.

Locations for the 62 samples taken during field work are presented on figure A-42; descriptions and analyses are presented in table A-18. Eight samples from the best exposed vein (469-471, 473-475, 479-480) had an average of 15.8 ppm gold and 12.1 ppm silver; however, one high grade sample (479) skewed the average. Vein exposures in the shaft and in the winze of the long adit were not accessible and thus were not sampled or mapped. Samples from outside the immediate mine area to the east and south were generally devoid of significant mineral content. Four samples to the north (494, 496-498) contained anomalous amounts of arsenic and mercury.

The exposures of gold- and silver-bearing veins at the Ferir mine are too small for classification as a resource. However, drilling might delineate a disseminated gold deposit at depth. It appears unlikely that the mineral occurrences at the Ferir mine extend into the study area.

Placer Prospects

Numerous historic placer claims have been located in the Arc Dome study area, but BLM mining records show that only the Packhorse and Packhorse No. 1, located along Trail Creek, are still active. The only recorded placer mining in the area occurred in the 1930's and was also along Trail Creek (Tomany, personal communication, 1986). During the 1986 field season, 66 placer samples were taken from drainages in or near the study area. Their locations are presented on figure A-43. Gold content per yd^3 for each sample is listed in table A-19 along with its value in cents per yd^3 based on $450 per oz and a fineness of 750. Only 20 samples contained recoverable gold and none had a value of over $1.00 per yd^3. No gold placer resources were identified during this study.

Miscellaneous Prospects

Prospects that were either poorly exposed or lacked characteristics that would be favorable for resource formation are listed in table 1.

CONCLUSIONS

Although no metal resources were delineated during the study, several mine and prospect localities warrant further investigation. Additional geologic mapping, sampling, and possibly drilling may reveal large-tonnage, low-grade, precious metal resources at the following mines and prospects: Sullivar, Charley, Werdenhoff, Tip Top, Ojo Del Oso, Lost Wheelbarrow, Tiger Cat, and Ferir. During the last decade, development of low-cost gold and silver recovery methods, high gold prices (about $450 per oz) and depressed prices for other metals, created considerable interest in deposits of this type. With desirable mining and beneficiation conditions and a $450 per oz gold price, a large open pit mining operation could conceivably operate economically with an ore grade as low as 0.5 ppm gold. Desirable conditions would include a low stripping ratio, a short haul distance to a processing site, minimal crushing, and a 70 percent plus metal recovery from heap leaching.

Additional work at the South Twin mine and Dallimore-Douglass prospect may outline resources; however, vein deposits require a much higher grade of ore to support an economic mining operation. The cost of mining a vein deposit by underground methods varies greatly from one deposit to the next. Variables which affect the cost include vein width and dip, the type of enclosing country rock and its stability, the amount of water in the mine, the distance required to hoist and haul ore to the mine portal, and many others.

Noteworthy anomalous concentrations of molybdenum occur at the Tiger Cat, Sullivar, Lost Wheelbarrow, and Charley prospects; resources might be delineated with additional work. However, domestic resources of molybdenum are large and mine capacity utilization is low, averaging only 35 percent in 1987 (U.S. Bureau of Mines, 1988).

TABLE 1.--Miscellaneous prospects in and near the Arc Dome study area, Nye County, NV

Map no. (fig. 2)	Name	Summary	Workings and production	Sample and resource data
1	Vicki Ann prospect	Volcanic ash, historically mined for building stone, occurs in shades of white, yellow, and pink along fractures.	One 60-ft-long, 20-ft-wide pit and two smaller prospect pits.	Two samples were taken for routine zeolite check; one contained heulandite.
2	Clear Creek prospect	Volcanic ash, historically mined for building stone, is thin-bedded, light cream to green, and occasionally conglomeratic.	Four trenches totaling 150 ft in length.	Three samples checked for zeolites contained heulandite. Four other samples contained no minerals of economic interest.
9	Gold Fissure prospect	Discontinuous quartz vein, containing minor malachite, averages between 1 to 7 ft wide, strikes N. 30° E., and dips vertically in black shale. This is a continuation of the vein at the Whitehorse prospect (fig. 2, no. 7).	No workings.	Four chip samples had weighted averages of 3.04 ppm silver, 101 ppm arsenic, and 16 ppm molybdenum.
10	Surprise prospect	Quartz vein, containing pyrite, averages between 2 to 3.3 ft wide and occurs in a silicified shear zone that strikes N. 10° E., and dips 65° NW. Host rocks are shaley metasediments.	One prospect pit and one adit 80 ft long, with a small stope.	Two chip samples from the adit and one chip sample from the pit averaged 1.64 ppm silver and 17.7 ppm molybdenum.
12	Mildred prospect	Quartz vein, containing pyrite, chalcopyrite, and malachite, averages between 0.9 to 1.1 ft wide, strikes N. 5° E., and dips 70° NW. along foliation in shale and metavolcanic rock.	Two small prospect pits.	Two chip samples had a weighted average of 0.09 ppm gold, 14.5 ppm silver, 4573 ppm copper, 945 ppm zinc, 82.4 ppm arsenic, and 14.5 cadmium.
13	Valley View prospect	Quartz vein, containing limonite and some pyrite, averages between 0.3 to 2.7 ft wide, strikes N. 15° to 40° W., and dips about 25° SW. in sheared metasedimentary rock. The vein is exposed for 200 ft.	Three prospect pits and one 40-ft-deep shaft.	Four chip samples had a weighted average of 31.85 ppm silver, 765.2 ppm copper, 3285 ppm lead, 14.8 ppm molybdenum, and 33.1 ppm arsenic. A sample from the shaft contained 0.086 ppm gold.
18	Green Leaf prospect	Silicified shear zone, containing limonite, clay, and pyrite, strikes N. 80° E., and dips 45° SE. in cherty metasedimentary rock.	One prospect pit.	One 4-ft chip sample contained 0.363 ppm silver, 51.3 ppm arsenic, 118 ppm copper, and 9.99 ppm molybdenum.
19	Fremont's View prospect	Fault contact, of Darrough Felsite with a rhyolitic intrusion, is silicified and contains disseminated pyrite and limonite. This prospect is at the easternmost exposure of the structure at the South Twin mine (fig. 2, no. 20).	One prospect pit.	Four chip samples had a weighted average of 0.8 ppm silver, 164.8 ppm lead, and 141.7 ppm zinc.

TABLE 1.--Miscellaneous prospects in and near the Arc Dome Wilderness study area, Nye County, NV--Continued

Map no. (fig. 2)	Name	Summary	Workings and production	Sample and resource data
21	Meadow prospect	Quartz-cemented breccia zone strikes N. 25° W. and dips 68° SW. in a silicified, bleached, rhyolite and ash-flow tuff.	One prospect pit.	Two samples; no minerals of economic interest.
23	Jumbo prospect	Limonite-stained, crystal-rich tuff and volcaniclastic sedimentary rocks.	One prospect pit.	Three samples averaged 8.03 ppm uranium.
24	Uranium prospect	Reported uranium anomaly (Mills, 1981, plate XXIV) in crystal-rich, white, gray, and brown latite of the Toiyabe Quartz Latite.	No workings.	Sixteen samples averaged 7.2 ppm uranium and ranged from 3.6 ppm to 11.4 ppm. One sample contained 0.025 ppm gold.
25	Nevada King prospect	Contact of metasedimentary rocks with quartz monzonite. The metasedimentary rocks are hydrothermally altered and cut by felsite dikes.	Twenty-four pits and trenches.	Five samples were taken; two averaged 111 ppm arsenic, one contained 18 ppm molybdenum, and one contained 4.63 ppm gallium and 1.31 ppm selenium. 'The prospect was surveyed with ultraviolet lights and traces of tungsten were found.
26	True Fisher prospect	Limonite-stained quartz vein in metasedimentary rock.	One prospect pit.	Two samples had no minerals of economic interest.
28	Topaz prospect	Multiple veins of quartz and calcite, 0.5 in. to 2 ft thick, occur in shear zone striking N. 30° to 85° W., dipping 45° to 65° SW. in black metasedimentary rock.	One short adit, one caved shaft, and two prospect pits.	Eight samples averaged 112 ppm vanadium and 12.5 ppm molybdenum. One of these samples contained 2724 ppm zinc and 22.5 ppm cadmium.
30	Queen prospect	Limonite-stained quartz vein strikes N. 75° E. and dips 65° SW. in an argillically altered, silicified, crystal-rich tuff. The tuff contains disseminated pyrite and is adjacent to a porphyry intrusion.	Two prospect pits.	Four samples averaged 9.76 ppm silver; one contained 0.085 ppm gold.
32	Sunset prospect	Tuff breccia with silica flooding.	Two prospect trenches.	Two samples have no minerals of economic interest.
34	Boulder prospect	Propylitically-altered, crystal-rich tuff.	One prospect pit.	One sample contained no minerals of economic interest.

Extensive sand and gravel and stone occurrences in the study area are suitable for many construction purposes. However, transportation costs to current markets, a major part of total production costs for these high-bulk low-unit-value commodities, would far exceed the value. Therefore, these occurrences do not constitute identified resources. Adequate material is available closer to major markets in the region.

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APPENDIX

APPENDIX--Continued

TABLES

TABLES--Continued

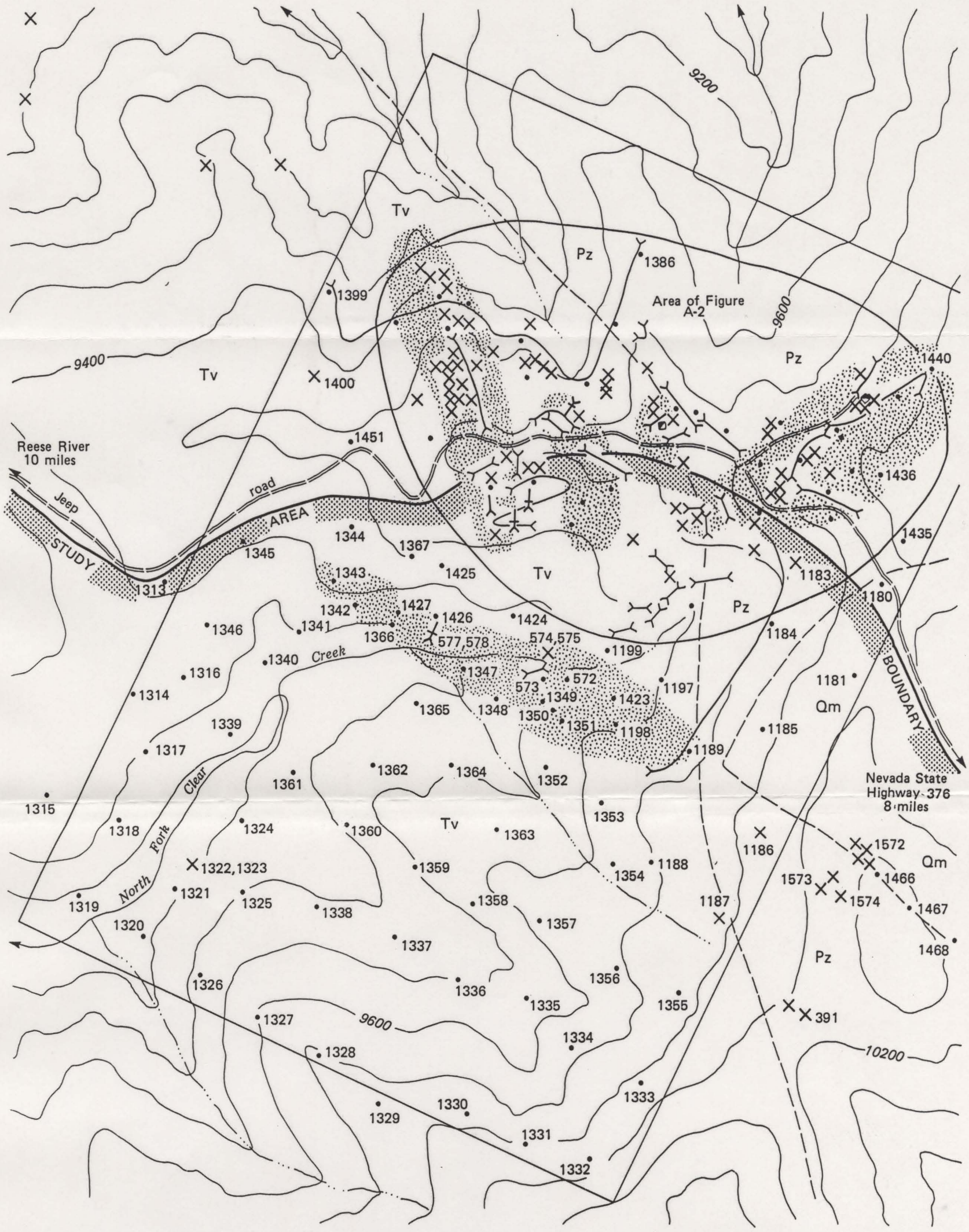
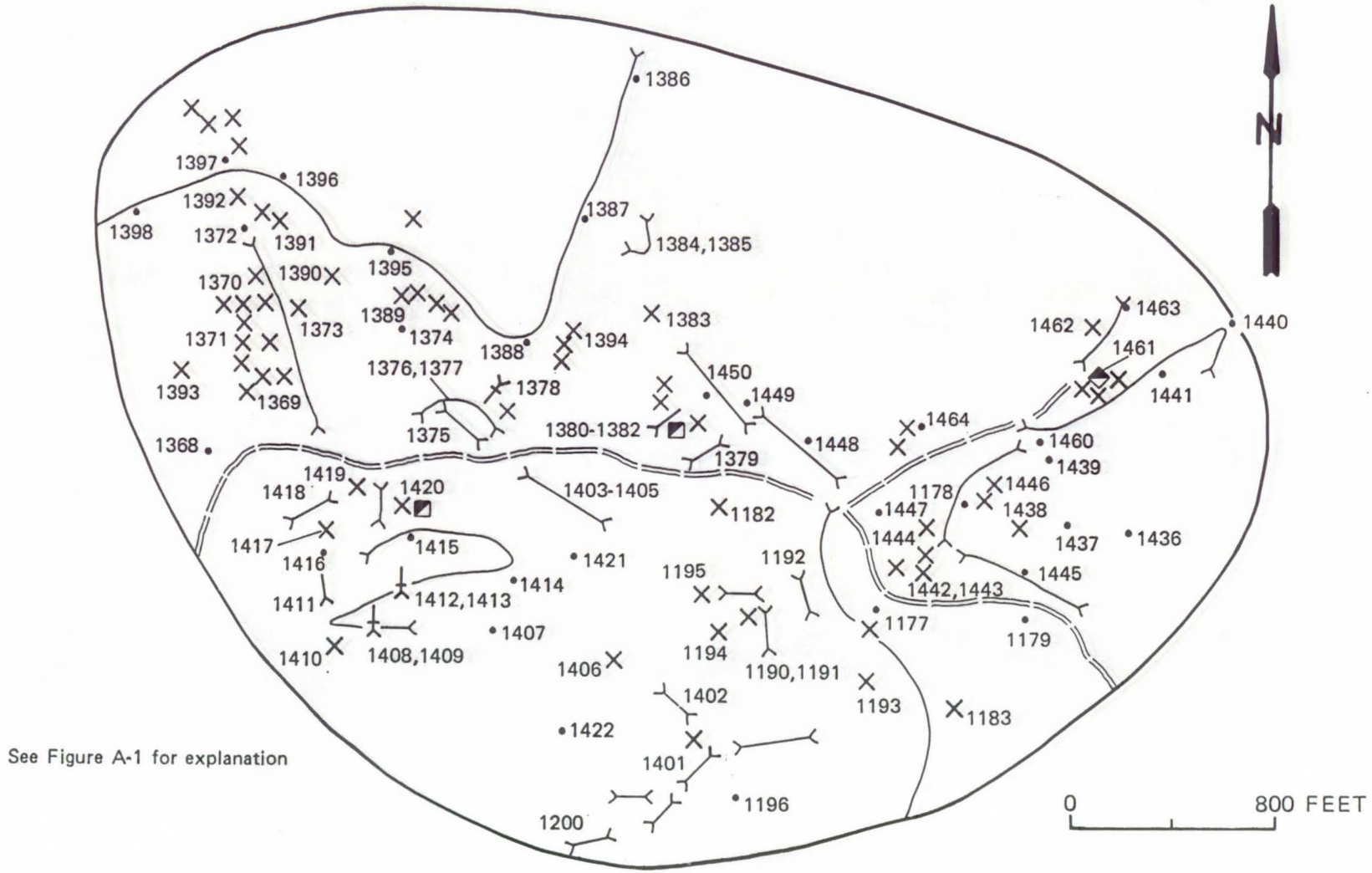


FIGURE A-1.—Workings, sample sites, and generalized geology, Sullivar prospect



See Figure A-1 for explanation

FIGURE A-2.—Enlargement of a portion of figure A-1 showing workings and sample sites

FIGURE A-3.--View looking south at the Sullivar prospect. Arc Dome (11,773 ft) is the highest peak in the background.

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
391	Grab.	NA	Limonite-stained, crystal-rich tuff from sloughed pit.	0.085	5.95	<0.05	5.77	1.12
572	Random chip.	NA	Bleached, silicified, limonite- and hematite-stained, pyrite-bearing tuff.	.092	188.0	<.05	17.5	4.55
573	do.	NA	do.	.258	611.0	.119	68.1	32.9
574	do.	NA	Bleached, limonite-stained, partially silicified tuff.	.386	135.0	<.05	41.8	7.29
575	Select.	NA	Limonite-stained, druzy quartz.	.482	93.2	<.05	258.0	8.89
577	do.	NA	Limonite-stained, partially silicified, crystal-rich tuff.	.055	4.54	<.05	3.59	.42
578	Grab.	NA	Bleached, partially silicified, crystal-rich tuff from dump of caved adit.	.079	5.55	<.05	5.88	.531
1177	Random chip.	NA	Quartz and silicified metasedimentary rock.	.189	6.49	<.05	9.51	.672
1178	do.	NA	Limonite-stained, brecciated, silicified metasedimentary rock.	.255	75.5	<.05	8.50	2.81
1179	Grab.	NA	Amphibolite, quartz, and metasedimentary float.	.064	7.65	<.05	2.97	2.76
1180	do.	NA	Quartz monzonite.	.023	3.15	<.05	2.58	.717
1181	do.	NA	Quartz monzonite containing quartz veinlets.	25.5	5040.	.241	13.2	26.4
1182	do.	NA	Intrusive rock altered to clay and grus.	.137	20.7	<.05	3.73	1.45
1183	do.	NA	Limonite-stained quartz.	.278	30.1	<.05	13.1	1.50
1184	do.	NA	Quartz monzonite float.	.028	2.50	<.05	3.98	.796
1185	do.	NA	do.	.017	3.12	<.05	6.86	.573
1186	do.	NA	Siliceous metasedimentary rock from pit.	.474	45.4	<.05	12.2	2.98

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1187	Grab.	NA	Limonite-stained, crystal-rich tuff from pit.	0.033	7.16	<0.05	5.12	0.995
1188	do.	NA	Light-colored ash-flow tuff.	.031	12.2	<.05	4.61	1.25
1189	Random chip.	NA	Silicified metasedimentary rock.	<.014	3.00	<.05	1.43	.637
1190	Grab.	NA	Limonite-stained, silicified, brecciated tuff (?).	.082	485.	.197	31.5	23.5
1191	do.	NA	Bleached, argillized, crystal-rich tuff.	.024	4.04	<.05	2.35	1.01
1192	do.	NA	Limonite-stained, silicified, brecciated metasedimentary rock.	.104	41.0	<.05	77.7	2.25
1193	do.	NA	Limonite-, and hematite-stained, silicified metasedimentary rock.	.055	23.2	<.05	9.92	.960
1194	Chip.	4.0	Limonite-stained, silicified, gray tuff.	.028	13.0	<.05	9.65	1.45
1195	Grab.	NA	Limonite- and hematite-stained, fractured, silicified tuff.	.057	29.9	<.05	22.2	.970
1196	do.	NA	Silicified breccia and quartz monzonite float.	.069	14.6	<.05	4.80	.291
1197	do.	NA	Quartz monzonite float.	.045	9.82	<.05	6.49	<.221
1198	Random chip.	NA	Hematite- and limonite-stained, silicified tuff containing traces of pyrite.	.06	99.7	<.05	21.5	4.62
1199	do.	NA	Limonite-stained, brecciated, silicified tuff containing quartz stringers.	.043	19.3	<.05	49.5	1.26
1200	Grab.	NA	Reddish, crystal-rich, partially welded, argillically altered tuff.	.025	3.87	<.05	5.11	.373
1313	do.	NA	Light-colored, crystal-rich tuff.	.108	17.6	<.05	2.55	.990
1314	do.	NA	do.	.043	52.4	<.05	5.74	4.39

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1315	Random chip.	NA	Crystal-rich tuff with quartz-filled, hairline fractures.	0.033	22.6	<0.05	3.84	8.88
1316	Grab.	NA	Crystal-rich tuff.	.057	37.9	<.05	5.32	4.87
1317	do.	NA	do.	.057	18.9	<.05	6.85	2.30
1318	do.	NA	do.	.069	6.60	<.05	5.02	2.86
1319	do.	NA	do.	.057	32.7	<.05	6.43	4.97
1320	do.	NA	do.	.039	50.5	<.05	5.12	4.66
1321	Random chip.	NA	Light-colored volcaniclastic rock.	.097	4.40	<.05	.837	.783
1322	do.	NA	Black obsidian plug extruding through volcaniclastic rock.	.057	7.31	<.05	1.65	.294
1323	do.	NA	Volcaniclastic rock.	.05	2.60	<.05	<.094	.729
1324	do.	NA	Bleached, limonite-stained, argillically altered, volcaniclastic rock.	.036	6.99	<.05	3.10	.507
1325	Grab.	NA	Crystal-rich tuff.	.039	20.3	<.05	4.11	4.95
1326	do.	NA	Pink crystal-rich tuff.	.044	5.50	<.05	4.43	.670
1327	do.	NA	do.	.054	6.98	<.05	4.03	.877
1328	do.	NA	do.	.038	3.84	<.05	6.48	2.83
1329	do.	NA	do.	.044	12.8	<.05	4.41	3.37
1330	do.	NA	do.	.039	19.8	<.05	6.41	3.83
1331	do.	NA	Bleached, crystal-rich tuff.	.04	15.6	<.05	4.62	2.29
1332	Random chip.	NA	Bleached, limonite-stained, argillically altered, crystal-rich tuff.	.053	3.43	<.05	4.29	.792

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1333	Random chip.	NA	Slightly altered, crystal-rich tuff.	0.034	15.1	<0.05	4.19	3.97
1334	Grab.	NA	Bleached, argillically altered tuff.	.036	17.1	<.05	5.51	3.70
1335	do.	NA	Argillically altered tuff.	.036	11.7	<.05	3.05	.832
1336	Random chip.	NA	Partially silicified, limonite-stained, argillically altered tuff.	.032	8.24	<.05	4.64	.435
1337	do.	NA	Bleached, partially silicified tuff.	.029	2.78	<.05	2.28	<.244
1338	Grab.	NA	Crystal-rich, light-colored, ash-flow tuff.	.027	4.18	<.05	4.84	1.34
1339	do.	NA	Argillically altered, crystal-rich tuff.	.023	3.28	<.05	4.45	.624
1340	do.	NA	do.	.024	4.64	<.05	1.59	.253
1341	Random chip.	NA	Limonite-stained, argillically altered, crystal-rich tuff.	.039	1.35	<.05	2.88	<.242
1342	do.	NA	do.	.017	1.03	<.05	1.69	<.246
1343	Grab.	NA	Reddish-brown, silicified, argillically altered, ash-flow tuff.	<.014	2.84	<.05	8.60	1.02
1344	do.	NA	Argillically altered, crystal-rich tuff.	.027	6.05	<.05	3.20	.537
1345	do.	NA	Crystal-rich tuff.	.028	15.6	<.05	6.63	2.06
1346	do.	NA	do.	.038	5.34	<.05	5.44	1.22
1347	do.	NA	Reddish-brown, silicified, crystal-rich tuff.	.034	8.56	<.05	6.22	1.14
1348	do.	NA	Bleached tuff.	.022	6.55	<.05	6.03	.984
1349	Random chip.	NA	Limonite-stained, silicified tuff containing a trace of pyrite.	.093	167.	<.05	18.0	5.20

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample								
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1350	Random chip.	NA	Limonite-stained, silicified tuff containing a trace of pyrite.	0.019	101.	<0.05	15.7	4.39
1351	do.	NA	do.	.022	24.0	<.05	6.78	1.53
1352	Grab.	NA	Argillically altered, crystal-rich tuff.	.035	9.31	<.05	5.02	.545
1353	do.	NA	do.	.036	14.1	<.05	4.61	.495
1354	do.	NA	Quartzite float.	.079	18.3	<.05	10.9	2.63
1355	do.	NA	Crystal-rich tuff.	.053	5.07	<.05	5.18	1.24
1356	Random chip.	NA	Argillically altered, crystal-rich tuff.	.025	22.4	<.05	3.94	.947
1357	do.	NA	do.	.036	41.9	<.05	8.88	1.00
1358	Grab.	NA	Argillically altered, partially silicified, crystal-rich tuff.	.027	15.0	<.05	6.15	.881
1359	do.	NA	Argillically altered, crystal-rich tuff.	.034	4.02	<.05	4.04	.306
1360	do.	NA	do.	.032	7.55	<.05	3.92	.247
1361	do.	NA	do.	.028	2.68	<.05	3.97	.280
1362	do.	NA	do.	.036	9.41	<.05	4.71	.545
1363	do.	NA	do.	.02	4.68	<.05	2.78	.353
1364	do.	NA	do.	.024	2.60	<.05	3.51	.586
1365	do.	NA	do.	.037	5.73	<.05	4.03	.775
1366	Random chip.	NA	Argillically altered, partially silicified tuff.	.028	6.67	<.05	4.39	.302

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1367	Random chip.	NA	Argillically altered, crystal-rich tuff.	<0.014	4.61	<0.05	2.60	0.343
1368	Grab.	NA	Argillically altered, partially silicified, crystal-rich tuff.	.035	91.8	<.05	6.92	3.42
1369	do.	NA	do.	.02	59.7	<.05	14.4	1.58
1370	Random chip.	NA	Gray, silicified tuff.	.075	22.3	<.05	22.3	3.77
1371	do.	NA	Bleached, limonite-stained, silicified tuff.	.091	44.2	<.05	14.1	2.39
1372	do.	NA	Partially silicified, crystal-rich tuff.	.037	5.81	<.05	9.96	1.90
1373	Grab.	NA	Gray, silicified tuff.	.049	20.8	<.05	18.7	3.10
1374	Random chip.	NA	Quartz latite porphyry.	.132	3.57	<.05	3.99	1.66
1375	do.	NA	Gray, silicified tuff.	.432	56.8	.110	39.6	4.61
1376	do.	NA	do.	.666	184.	.110	53.6	11.2
1377	Chip.	0.1	Quartz vein in silicified tuff.	.350	103.	.918	31.8	11.9
1378	Grab.	NA	Limonite-stained, silicified tuff from dump of caved adit.	.810	115.	.096	17.9	11.6
1379	Random chip.	NA	Limonite-stained, bleached, partially silicified tuff.	.717	35.3	<.05	26.2	46.7
1380	Grab.	NA	Bleached, partially silicified, pyrite-bearing tuff from dump of 45-ft-deep shaft.	.599	1.72	<.05	4.41	2.40
1381	Chip.	4.0	Silicified, pyrite-bearing shear zone trending N. 20° W. and dipping vertically.	1.66	14.9	<.05	16.1	6.88
1382	Random chip.	NA	Gray, pyrite-bearing, silicified tuff.	.355	79.4	.082	7.85	6.34

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1383	Grab.	NA	Green metasedimentary rock.	0.072	2.97	<0.05	1.17	1.37
1384	Random chip.	NA	Partially silicified, limonite-stained, bleached, metavolcanic rock(?).	.086	192.	<.05	5.52	5.40
1385	do.	NA	Light gray, brecciated, silicified tuff(?).	.07	51.7	<.05	8.23	2.35
1386	do.	NA	Light-colored tuff(?).	<.013	3.21	<.05	1.54	.681
1387	Grab.	NA	Partially silicified, brecciated, metasedimentary rock(?).	.082	209.	<.05	3.04	1.58
1388	do.	NA	Crystal-rich, welded tuff.	.128	50.7	<.05	11.3	6.12
1389	do.	NA	Quartz latite porphyry containing traces of pyrite.	.160	5.33	<.05	2.10	1.79
1390	Random chip.	NA	Light gray, brecciated, limonite-stained, silicified tuff.	.037	11.2	<.05	4.19	1.61
1391	Grab.	NA	Silicified, brecciated tuff and limonitic-hematitic gossan.	.228	567.	.193	48.1	36.4
1392	Random chip.	NA	Limonite-stained, gray, silicified, brecciated tuff.	.522	10.1	.09	10.8	7.19
1393	Grab.	NA	Hematite- and limonite-stained, crystal-rich, welded tuff.	.022	12.4	<.05	16.9	1.82
1394	do.	NA	Light-colored, partially silicified tuff.	.069	10.0	<.05	2.52	<.238
1395	Random chip.	NA	Light-colored, welded tuff containing pyrite.	.196	2.61	<.05	1.87	<.232
1396	do.	NA	Limonite-stained, silicified tuff.	.098	8.28	<.05	41.0	<.242
1397	Chip.	0.5	Heavily limonite- and hematite-stained zone in silicified tuff.	.227	143.	.072	14.2	8.35
1398	Random chip.	NA	Grayish-green, silicified, brecciated tuff.	.054	2.77	<.05	7.05	.618
1399	do.	NA	Limonite-stained, light-colored, ash-flow tuff.	.093	15.7	<.05	4.10	2.36

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1400	Grab.	NA	Crystal-rich tuff from sloughed bulldozer cut.	0.047	11.0	<0.05	4.47	0.589
1401	Chip.	36.0	Fractured, argillically altered, partially silicified welded tuff.	.049	1.00	<.05	3.56	1.58
1402	do.	39.0	Silicified, brecciated, limonite-stained tuff.	.022	15.5	<.05	12.8	.749
1403	do.	21.0	Limonite-stained, argillically altered, green tuff.	.034	63.4	<.05	7.37	2.30
1404	do.	33.0	Limonite-stained, fractured, argillically altered tuff.	.064	87.7	<.05	8.09	3.85
1405	do.	33.0	Limonite-stained, silicified tuff.	.069	135.	<.05	13.9	1.43
1406	do.	5.0	Hydrothermally altered tuff.	.048	4.60	<.05	3.47	2.64
1407	Random chip.	NA	Limonite- and hematite-stained, silicified, brecciated tuff and traces of adularia.	.078	10.7	<.05	11.0	.642
1408	Chip.	7.0	Fractured, argillically altered, limonite-stained tuff.	.052	11.2	<.05	55.5	1.60
1409	Select.	NA	Bleached, limonite-stained tuff and quartz from dump of caved adit.	.188	40.8	<.05	345	2.46
1410	Grab.	NA	Limonite-stained, partially silicified, argillically altered tuff.	.140	84.9	<.05	645	2.59
1411	Chip.	3.0	Limonite-stained, silicified, crystal-rich tuff exposed in 15-ft-long adit.	.046	11.0	<.05	9.76	<.242
1412	do.	9.0	Fractured, altered tuff exposed in trench.	.028	14.3	<.05	11.6	.399
1413	Select.	NA	Bleached, silicified tuff containing pyrite.	.351	44.6	.120	33.3	5.42
1414	Random chip.	NA	Limonite- and hematite-stained, brecciated, silicified tuff.	.055	14.1	<.05	19.7	.983
1415	Select.	NA	Bleached, silicified, pyrite-bearing tuff.	.316	42.2	<.05	9.70	2.14
1416	Random chip.	NA	Limonite-stained, silicified tuff.	.141	20.7	.072	27.8	1.35

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1417	Random chip.	NA	Bleached, silicified tuff.	0.077	9.81	<0.05	27.3	2.06
1418	do.	NA	Silicified, crystal-rich tuff.	.114	42.5	<.05	6.50	2.56
1419	Grab.	NA	Limonite-stained, bleached, fractured tuff from pit.	.134	50.9	<.05	25.1	1.93
1420	do.	NA	Limonite-stained, argillically altered, pyrite-bearing tuff from dump of 30-ft-deep shaft.	.203	48.2	<.05	12.5	2.60
1421	Random chip.	NA	Limonite-stained, silicified tuff.	.107	35.8	<.05	19.3	.388
1422	Grab.	NA	Argillically altered tuff.	.028	3.09	<.05	9.21	<.243
1423	do.	NA	Limonite-stained, silicified tuff.	.117	74.6	<.05	18.5	4.64
1424	do.	NA	Reddish-tan, crystal-rich, welded tuff.	.03	4.56	<.05	3.82	.818
1425	do.	NA	Partially silicified welded tuff.	.024	2.87	<.05	1.28	.407
1426	do.	NA	Limonite-stained, argillically altered, brecciated tuff.	.028	5.99	<.05	3.81	.438
1427	do.	NA	Limonite-stained, argillically altered tuff.	.022	2.71	<.05	2.39	.391
1435	do.	NA	Light green metasedimentary rock.	<.013	4.06	<.05	2.14	.772
1436	do.	NA	Brown, silicified metasedimentary rock.	.043	2.97	<.05	12.2	<.228
1437	do.	NA	do.	.391	40.1	.045	9.18	.691
1438	Select.	NA	Limonite-stained, silicified, brecciated metasedimentary rock.	.182	100.	<.05	6.18	1.44
1439	Grab.	NA	do.	.134	56.8	<.05	8.79	1.78
1440	do.	NA	do.	.022	9.83	<.05	6.62	1.68
1441	do.	NA	do.	<.013	47.3	<.05	3.57	3.24

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample								
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1442	Chip.	8.0	Metavolcanic rock.	0.052	9.86	<0.05	2.57	0.834
1443	do.	3.0	Limonite- and hematite-stained, partially silicified metavolcanic rock.	.967	89.1	.049	16.6	2.30
1444	Grab.	NA	Limonite-stained, pyrite-bearing, fractured, silicified metavolcanic rock.	.841	96.4	.081	27.2	4.86
1445	Chip.	20.0	Argillically altered, sheared, brecciated, limonite-stained, silicified metasedimentary rock.	.143	74.0	<.05	2.63	2.57
1446	Random chip.	NA	Limonite-stained, brecciated, silicified metasedimentary rock.	.233	63.5	<.05	7.95	2.38
1447	do.	NA	do.	.172	18.9	<.05	11.3	1.33
1448	Grab.	NA	Argillically altered, partially silicified metavolcanic rock.	.400	65.1	.073	9.72	2.24
1449	do.	NA	Altered metasedimentary rock.	.031	2.27	<.05	2.98	.428
1450	Random chip.	NA	Limonite-stained metavolcanic rock.	.09	12.1	<.05	.508	2.73
1451	Grab.	NA	Bleached, crystal-rich tuff.	.024	19.3	<.05	4.57	1.66
1460	Random chip.	NA	Limonite-stained, silicified metasedimentary rock.	.105	28.5	<.05	15.0	1.34
1461	Grab.	NA	Limonite-stained, partially silicified metasedimentary rock near 20-ft-deep shaft.	.098	41.9	<.05	4.11	1.42
1462	do.	NA	do.	.07	4.80	<.05	4.73	.907
1463	do.	NA	Limonite-stained, silicified, brecciated metavolcanic rock.	.029	17.7	<.05	6.06	1.34
1464	Random chip.	NA	Limonite-stained, silicified metasedimentary rock.	.203	7.50	<.05	14.9	1.12

TABLE A-1.--Descriptions and analyses for samples shown on figures A-1 and A-2, Sullivar prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1466	Random chip.	NA	Quartzite near contact with quartz monzonite.	0.239	36.9	<0.05	18.3	1.14
1467	Select.	NA	Brecciated quartzite recemented with hematite-rich silica.	.056	339.	<.05	27.3	31.4
1468	do.	NA	Hematitic-limonitic gossan near contact of quartzite with quartz monzonite.	.052	167.	<.05	9.64	2.72
1572	do.	NA	Limonite-stained, argillically altered fault breccia.	.139	224.	<.05	14.6	11.5
1573	do.	NA	Heavily limonite-stained fault breccia.	.366	629.	<.05	48.0	21.5
1574	Grab.	NA	Greenish-gray quartzite.	.044	44.4	<.05	10.3	2.25

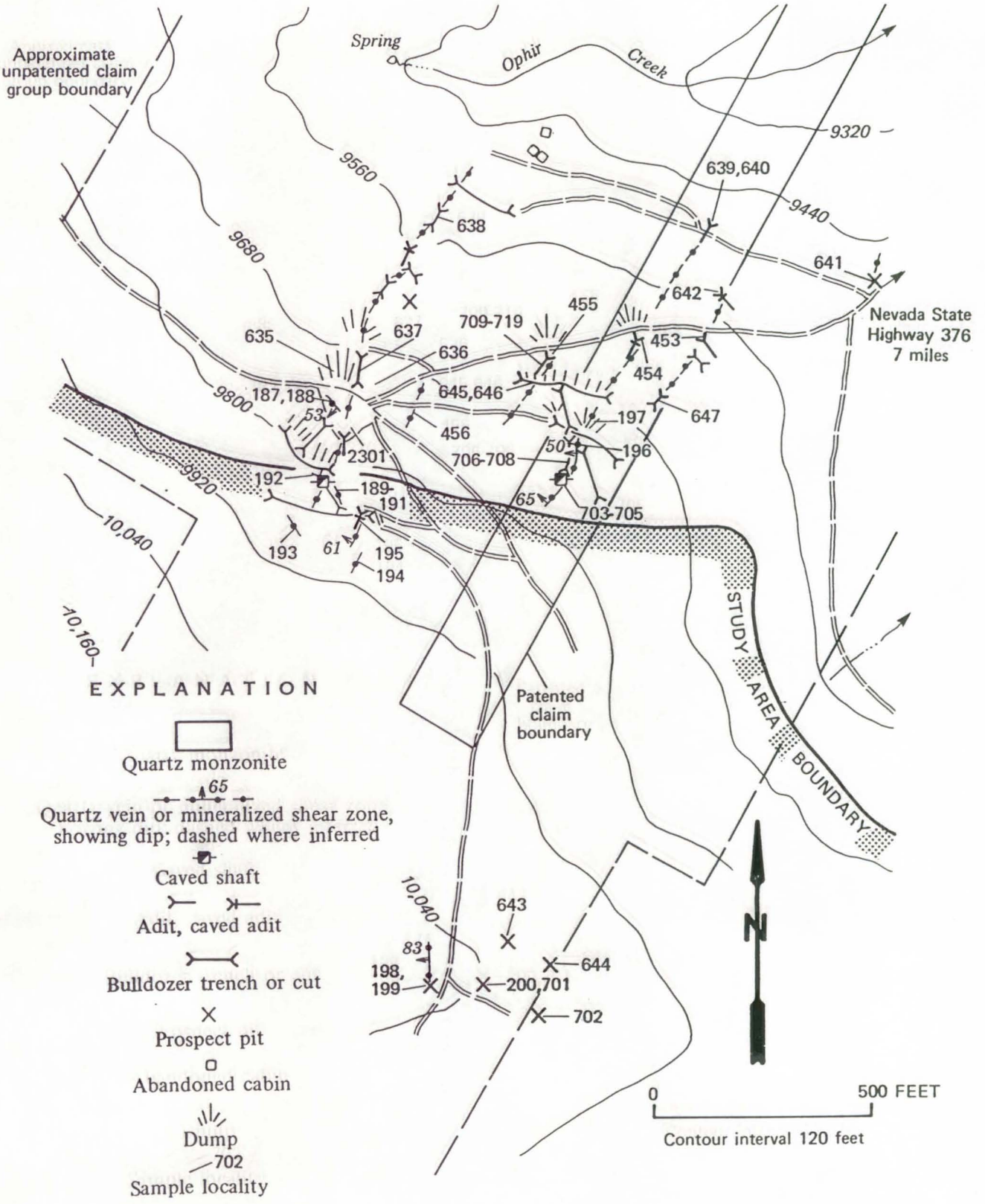


FIGURE A-4.—Workings, sample sites, and generalized geology, Gruss mine

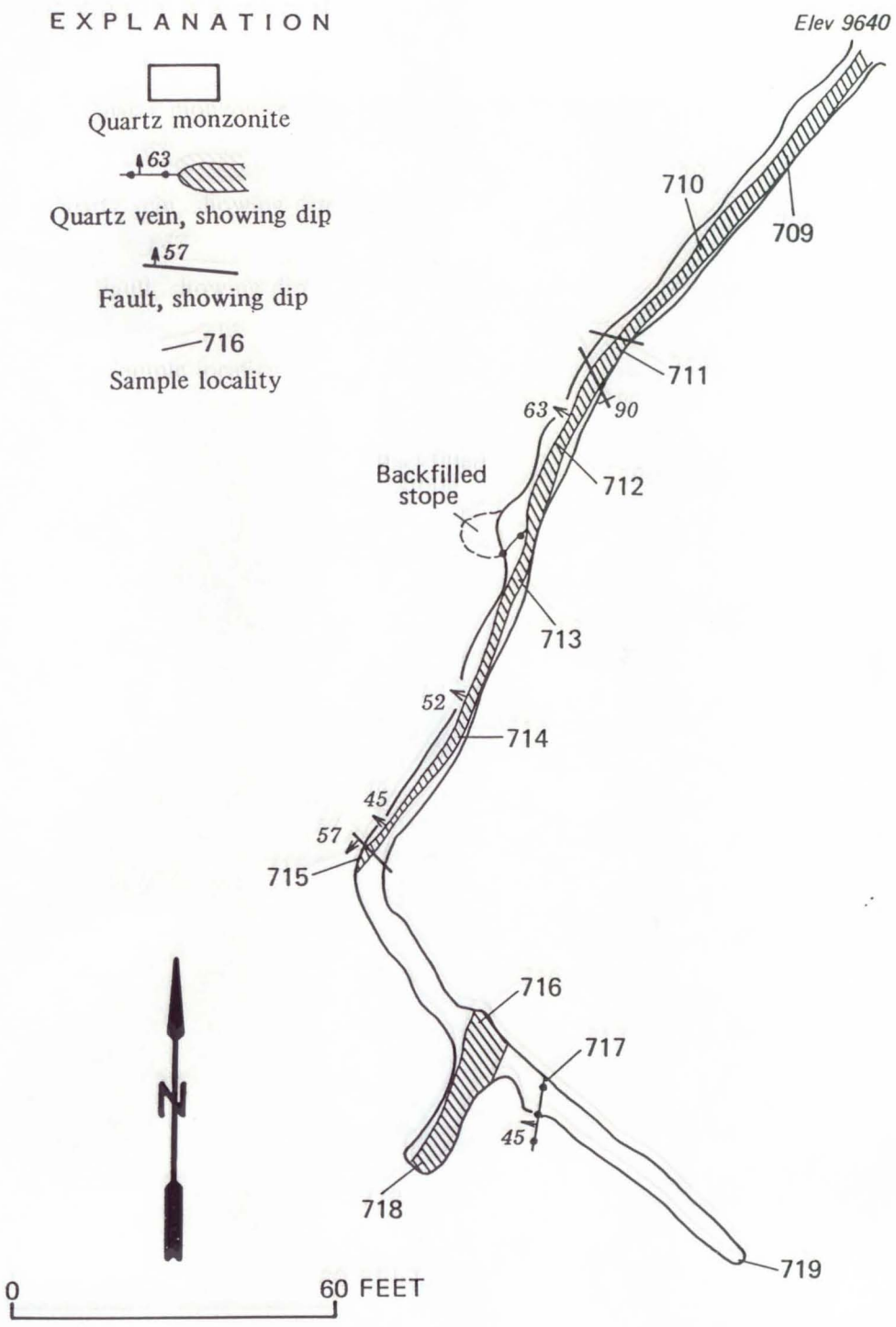


FIGURE A-5.—Underground workings showing generalized geology and sample sites, Gruss mine

FIGURE A-6.--View looking south at the Gruss mine.

TABLE A-2.--Descriptions and analyses for samples shown on figures A-4 and A-5, Gruss mine

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Bismuth
187	Random chip.	NA	Hanging wall of gouge and altered granite.	1.03	--	<0.07	<100	<10	100	--
188	Chip.	1.5	Quartz vein with galena and limonite.	359.9	--	2.26	600	140	2.20%	--
189	do.	1.0	Hanging wall of altered granite.	6.86	--	<.07	500	10	1600	--
190	do.	.6	Quartz vein with limonite, pyrite, galena, and chalcopyrite.	37.02	--	.07	300	30	1.45%	--
191	do.	.9	Silicified granite footwall with quartz, galena, pyrite, and pyrrhotite.	4.46	--	.55	100	20	800	--
192	Select.	NA	Quartz vein with galena, pyrite, chalcopyrite, and malachite.	401.1	--	.55	2900	30	3.86%	--
193	Chip.	1.3	Quartz vein with limonite.	<.34	--	<.07	<100	10	<100	--
194	do.	5.0	do.	<.34	--	<.07	<100	20	<100	--
195 1/	do.	1.8	Quartz vein with galena, pyrite, and chalcopyrite.	81.9	--	.75	500	30	3.80%	--
196	do.	.5	Quartz vein with fine, disseminated sulfides.	1.37	--	<.07	100	20	400	--
197	Select.	NA	Malachite-stained quartz vein with galena and pyrite.	798.7	--	1.17	1.35%	70	6.25%	--
198	Chip.	1.3	Quartz vein with fine, disseminated sulfides.	3.43	--	<.07	<100	30	400	--
199	Select.	NA	Manganese-stained granite.	4.11	--	<.07	200	<10	300	--
200	do.	NA	Quartz vein with fine, disseminated sulfides.	2.4	--	<.07	100	40	1100	--
453 2/	do.	NA	Quartz vein with galena, chalcopyrite, pyrite, covellite, and possible tetrahedrite.	208.0	160.0	5.8	739	127	8.37%	229.0
454	Chip.	1.0	Quartz vein, gouge, and silicified granite.	116.0	686.0	8.97	1.01%	1181	3.44%	211.0

TABLE A-2.--Descriptions and analyses for samples shown on figures A-4 and A-5, Gruss mine--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Bismuth
455	Chip.	1.8	Quartz vein with some malachite.	28.5	160.0	0.194	1752	50.6	3096	40.5
456 3/	Random chip.	NA	Quartz vein with galena, malachite, pyromorphite, and cerrusite.	422.0	872.0	.801	1615	130.0	3.56%	665.0
635	Select.	NA	Quartz vein with galena, chalcopyrite, pyrite, and malachite.	24.8	154.0	.123	1608	19.9	2235	37.3
636 4/	do.	NA	do.	268.0	111.0	.184	1915	29.3	1.46%	485.0
637	Random chip.	NA	Altered granite.	5.32	74.0	<.05	393.0	19.3	253	7.54
638	Chip.	8.5	Altered granite and limonite.	3.07	136.0	<.05	156.0	10.4	248.0	6.13
639	do.	1.0	Sheared granite and gouge.	.6	--	.020	400	15	64	2
640	do.	1.5	do.	.2	--	.010	204	23	32	<2
641	do.	2.5	Fractured granite, quartz, disseminated pyrite, and tourmaline.	.2	--	.030	48	7	38	2
642	Select.	NA	Quartz vein and limonite.	11.4	--	.095	156	38	1500	16
643	do.	NA	Quartz, altered granite, and tourmaline.	10.6	--	.185	146	21	770	14
644	do.	NA	Quartz vein with limonite, malachite, galena, and pyromorphite.	30.6	--	.925	1300	33	7500	28
645	do.	NA	Quartz vein, malachite, chalcopyrite, bornite, and galena.	1121	--	.715	2900	87	6.68%	1586
646	Chip.	2.0	Quartz vein, malachite, and chalcopyrite.	116.0	--	.155	2100	132	4800	172
647 5/	Select.	NA	do.	35.8	--	.240	720	35	5200	68
701 6/	do.	NA	Manganese-stained granite.	3.2	--	.0010	52	12	312	2
702	do.	NA	Quartz vein, limonite, and galena.	42.0	--	1.200	980	31	6200	16
703	Chip.	2.0	Quartz vein, galena, pyrite, and malachite.	136.0	--	.490	2100	35	1.46%	260

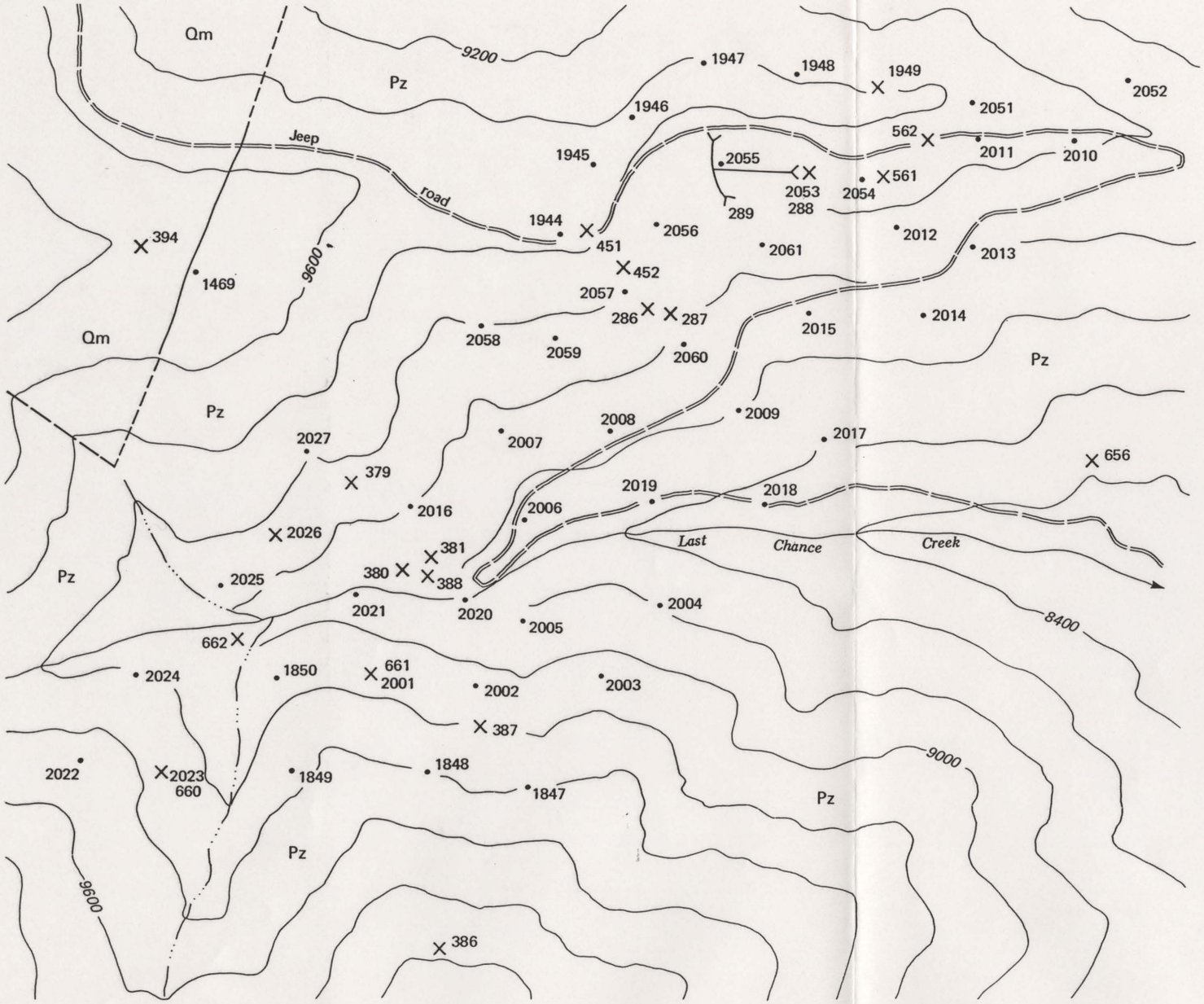
TABLE A-2.--Descriptions and analyses for samples shown on figures A-4 and A-5, Gruss mine--Continued

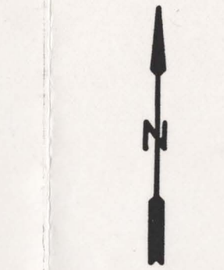
Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Bismuth
704	Select.	NA	do.	455.9	--	2.100	370	48	5.72%	810
705 6/	do.	NA	Malachite-stained quartz monzonite.	15.0	--	.085	1.4%	9	1100	6
706	Chip.	3.0	Quartz vein with malachite.	39.2	--	.010	1300	20	1020	22
707	do.	1.3	Quartz vein with galena and malachite.	92.0	--	.215	1880	57	2600	142
708	do.	.5	Footwall of malachite-stained granite.	284.9	--	.555	2.7%	199	2.02%	828
709	do.	1.2	Hanging wall of gouge and sheared granite.	29.4	--	.200	366	30	960	68
710	do.	2.2	Limonite- and malachite-stained quartz vein.	48.0	--	.120	2700	85	2500	96
711	do.	2.9	Quartz vein with malachite and chalcocite and altered granite.	22.2	--	--	698	42	1200	26
712	do.	4.2	Quartz stringers with malachite, chalcopyrite and chalcocite, and altered granite.	23.6	--	.055	1280	35	1020	38
713	do.	2.8	do.	14.8	--	.070	384	16	840	28
714	do.	2.5	Sheared, altered granite and quartz vein with limonite and malachite.	1.4	--	.010	102	15	92	<2
715	do.	1.2	Quartz with limonite, malachite, and chalcocite, and gouge.	25.4	--	.100	784	23	1000	50
716	do.	2.3	Quartz with limonite and malachite, and altered granite.	7.4	--	.100	886	47	6000	184
717	do.	.4	do.	8.2	--	.665	1520	35	1300	290

TABLE A-2.--Descriptions and analyses for samples shown on figures A-4 and A-5, Gruss mine--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Bismuth
718	Chip.	3.1	Quartz vein, gouge, and altered granite.	10.8	--	0.030	436	27	1040	14
719 6/	do.	3.0	Altered granite.	1.4	--	<.05	48	8	56	4
2301	Petrographic.		An altered and mineralized granite that originally consisted of 57% feldspar, 35% quartz, 8% biotite, and accessory apatite. The relict texture is subhedral granular with most grains being 0.25-2 mm wide. Feldspar has been intensely altered to sericite. Most feldspar was plagioclase with composition on the albite-oligoclase boundary. Quartz is lightly turbid due to fluid inclusions. Biotite is completely altered to muscovite and rutile with some grains containing bands of chlorite. The granite is cut by 5 mm-wide veinlets that contain single terminated quartz crystals up to 1.5 mm long and 1.5 mm-wide-clots of radial aggregates of columnar malachite crystals and tabular barite crystals. Some of the vein quartz is sheared and recrystallized. Clots of malachite also occur both along grain boundaries outside the veinlets and as intergrowths with intensely oxidized chalcopyrite and limonite. The sequence of events is as follows: 1) intrusion and crystallization of granite, 2) light autometamorphism partly altering biotite to chlorite, 3) fracturing followed by mineralization with quartz and sulfides along with intense sericitic alteration of feldspars and biotite, 4) further shearing along fractures causing partial recrystallization of vein quartz, 5) oxidation of chalcopyrite to malachite and limonite.							

1/ Sample 195 also contains 220 ppm tungsten.
2/ Sample 453 also contains 1.45 ppm mercury, 55.4 ppm antimony, and 18.7 ppm tellurium.
3/ Sample 456 also contains 33.9 ppm antimony and 23.0 ppm tellurium.
4/ Sample 636 also contains 35.5 ppm antimony and 9.62 ppm tellurium.
5/ Sample 647 also contains 110 ppm tungsten.
6/ Samples 701, 705, and 719 also contain 252 ppm, 181 ppm, and 256 ppm strontium, respectively.





0 1000 FEET

Contour interval 200 feet

EXPLANATION

Qm
Quartz monzonite

Pz
Variably metamorphosed sedimentary and volcanic rocks

Contact, dashed where inferred

Inferred fault

Bulldozer cut or trench

Pit or trench

•1850
Sample locality

FIGURE A-7.—Workings, sample sites, and generalized geology, Dallimore-Douglass prospect

FIGURE A-8.--View looking northwest at the Dallimore-Douglass prospect.

TABLE A-3.--Descriptions and analyses for samples shown on figure A-7, Dallimore-Douglass prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
286	Grab.	NA	Limonite-stained, silicified metasedimentary rock.	1.06	21.4	<0.05	28.6	75.6	19.9
287	Chip.	1.0	Limonite-stained, druzy quartz vein striking N. 30° E. and dipping 48° NW.	180.0	33.1	.493	782.0	2.03%	17.9
288	Grab	NA	Limonite-stained, dark-colored argillite.	1.13	10.9	<.05	52.6	85.4	47.1
289	do.	NA	Limonite-stained, brecciated argillite recemented with silica.	.596	20.6	<.05	94.7	37.8	38.6
379	Chip.	2.1	Pyrite-bearing quartz vein striking N. 70° E. and dipping 40° NW. in metavolcanic rock.	18.2	109.0	.163	86.1	2040	2.52
380	do.	2.3	Pyrite-bearing quartz vein striking N. 50° E. and dipping 60° NW. in metasedimentary rock.	29.5	23.5	1.73	133.0	2333	3.2
381	do.	3.1	do.	86.7	173.0	16.5	1213.	4070.	9.69
386	Grab.	NA	Limonite-stained, pyrite-bearing, silicified, sheared metasedimentary rock.	.592	6.51	<.05	16.2	40.3	6.58
387	do.	NA	Quartz from pit in sheared metasedimentary rock.	.342	21.1	<.05	53.1	16.8	10.9
388	Chip.	1.9	Quartz lense striking N. 50° E. and dipping 50° NW. in metasedimentary rock.	3.65	29.1	<.05	37.5	161.0	6.08
394	Grab.	NA	Quartz from vein trending N. 25° E. in quartz monzonite.	.882	11.3	<.05	22.0	34.3	1.18
451	do.	NA	Limonite-stained, brecciated, silicified metasedimentary rock.	.132	22.1	<.05	19.5	21.6	18.4
452	Select.	NA	Malachite- and limonite-stained, silicified metasedimentary rock.	70.1	21.8	7.15	3.17%	4024.	18.3
561	Chip.	3.0	Limonite-stained quartz vein trending N. 40° E. and dipping 36° NW. in metasedimentary rock.	.548	119.0	<.05	83.8	159.0	44.0

TABLE A-3.--Descriptions and analyses for samples shown on figure A-7, Dallimore-Douglass prospect--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
562	Select.	NA	Limonite-stained quartz from pit.	2.55	45.8	0.104	429.0	99.9	18.1
656	Grab.	NA	Bleached, silicified, sheared, calcareous metasedimentary rock.	.2	--	<.005	58	32	920
660	do.	NA	Sulfide-bearing quartz from pit near contact of rhyolite dike with metavolcanic rock.	130.0	--	.145	2.62	2.68	260
661	do.	NA	Limonite-stained, silicified metasedimentary rock.	.8	--	<.005	118	96	22
662	Chip.	1.2	Quartz vein striking N. 10° E. and dipping 70°-80° SE.	6.4	--	.015	102	2500	8
1469	Select.	NA	Brecciated quartzite recemented with limonite-rich silica near quartz monzonite.	1.33	2732	.052	29.1	26.6	14.1
1847	Random chip.	NA	Limonite- and hematite-stained quartzite.	.262	181.	<.05	10.6	1.98	16.2
1848	do.	NA	do.	.045	1.39	<.05	19.4	3.00	61.5
1849	Grab.	NA	Limonite-stained quartzite.	.077	27.7	<.05	47.6	1.33	17.7
1850	Random chip.	NA	Dark gray quartzite.	.259	77.7	<.05	93.8	10.3	12.0
1944	Select.	NA	Limonite-stained, dark gray, silicified metasedimentary rock.	.05	<.965	<.05	46.9	2.72	35.6
1945	do.	NA	do.	.104	69.0	<.05	104.	1.58	19.0
1946	Random chip.	NA	Limonite-stained, brecciated, silicified metasedimentary rock.	.607	60.2	<.05	86.7	4.39	12.1
1947	Grab.	NA	Silicified, dark gray siltstone.	.059	5.33	<.05	62.7	1.69	42.1
1948	do.	NA	Limonite-stained, gray, silicified metasedimentary rock with quartz veinlets.	.212	18.7	<.05	51.1	25.1	45.9
1949	Select.	NA	Limonite-stained quartz from pit.	6.56	32.3	.293	104.	158.	13.8

TABLE A-3.--Descriptions and analyses for samples shown on figure A-7, Dallimore-Douglass prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
2001	Grab.	NA	Quartzite from pit.	0.110	35.2	<0.05	39.6	7.96	13.7
2002	do.	NA	Siliceous metasiltstone.	.125	<.971	<.05	56.5	6.93	51.4
2003	do.	NA	Quartzite.	.088	46.5	<.05	20.2	3.79	14.4
2004	Random chip.	NA	Grayish-blue, siliceous metasedimentary rock.	.043	2.64	<.05	22.3	3.84	38.4
2005	do.	NA	Limonite-stained, siliceous metasiltstone.	<.015	3.55	<.05	3.14	2.81	87.0
2006	do.	NA	Limonite-stained quartzite.	.111	22.7	<.05	57.5	4.10	16.7
2007	do.	NA	Grayish-blue, very fine-grained quartzite.	.100	2.74	<.05	69.1	7.18	66.9
2008	Grab.	NA	do.	.074	2.95	<.05	22.0	5.08	27.5
2009	do.	NA	Black to dark gray, very fine-grained quartzite.	.183	37.2	<.05	48.0	16.2	35.7
2010	Random chip.	NA	Metasedimentary rock.	.058	25.4	<.05	88.8	6.93	68.8
2011	do.	NA	do.	.526	3.17	<.05	51.7	115.	51.7
2012	Grab.	NA	Gray quartzite.	.310	37.3	<.05	26.2	74.5	12.3
2013	do.	NA	Reddish-brown quartzite.	.286	19.2	<.05	11.4	46.8	14.8
2014	do.	NA	Hematite- and chrysocolla-stained quartzite.	.054	6.92	<.05	49.8	6.11	59.8
2015	Chip.	1.3	Limonite-stained, sugary textured quartzite.	.039	1.51	<.05	63.2	2.10	29.9
2016	Random chip.	NA	Dark gray quartzite.	.129	2.87	<.05	93.8	4.98	73.6
2017	Grab.	NA	Variegated quartzite.	.098	2.61	<.05	79.9	2.92	75.8
2018	do.	NA	Fine-grained, dark gray quartzite.	.136	7.92	<.05	97.0	4.18	52.6

TABLE A-3.--Descriptions and analyses for samples shown on figure A-7, Dallimore-Douglass prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
2019	Random chip.	NA	Fine-grained, dark gray quartzite.	0.103	1.10	<0.05	101.	3.81	74.7
2020	do.	NA	Sugary-textured, dark gray quartzite.	.116	9.26	<.05	82.1	5.12	57.8
2021	do.	NA	Fine-grained, limonite-stained quartzite.	.088	7.99	<.05	32.8	5.40	83.0
2022	do.	NA	Light-colored quartzite.	.111	3.65	<.05	29.5	3.60	15.6
2023	do.	NA	Brecciated, limonite-stained, silicified quartzite.	.029	2.47	<.05	3.08	3.33	2.57
2024	do.	NA	Light-colored, very fine-grained, silicified, brecciated quartzite.	.184	15.5	<.05	99.4	9.98	52.8
2025	Grab.	NA	Variegated quartzite.	.278	21.0	<.05	70.5	7.01	50.8
2026	Chip.	1.3	Quartz vein trending N. 83° E. and dipping 60° NW. in quartzite.	.350	3.64	<.05	30.1	51.1	2.82
2027	do.	1.0	Limonite-stained, fractured, quartzite breccia.	.321	42.1	<.05	43.1	45.6	20.5
2051	Random chip.	NA	Limonite-stained, sheared quartzite containing quartz veinlets.	.069	54.6	<.05	4.14	10.8	29.1
2052	Grab.	NA	Dark gray, sugary-textured quartzite.	.024	2.08	<.05	32.9	1.99	83.4
2053	Random chip.	NA	Two, pyrite- and galena-bearing quartz veins.	.424	45.4	.069	92.0	73.4	11.2
2054	Grab.	NA	Dark gray, silicified siltstone.	.077	4.47	<.05	37.5	7.50	35.7
2055	do.	NA	Limonite-stained, dark gray siltstone with quartz veinlets along fractures.	.099	42.1	<.05	34.8	7.12	30.5
2056	do.	NA	Limonite-stained, silicified metasedimentary rock.	.067	6.84	<.05	25.6	4.25	19.2
2057	Select.	NA	Malachite-stained, galena-bearing quartz and silicified metasedimentary rock.	6.00	2.58	<.05	2015	732.	1.99

TABLE A-3.--Descriptions and analyses for samples shown on figure A-7, Dallimore-Douglass prospect--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
2058	Select.	NA	Blood red, silicified metasedimentary rock with quartz veinlets.	0.051	4.05	<0.05	18.9	7.02	16.1
2059	Grab.	NA	Light-colored, silicified metavolcanic rock.	.354	44.3	<.05	115.	5.86	39.7
2060	do.	NA	Limonite-stained, silicified siltstone showing Liesegang banding.	.250	28.4	<.05	15.8	2.19	30.2
2061	do.	NA	Limonite-stained, silicified siltstone.	.254	118.	<.05	62.3	13.6	54.6

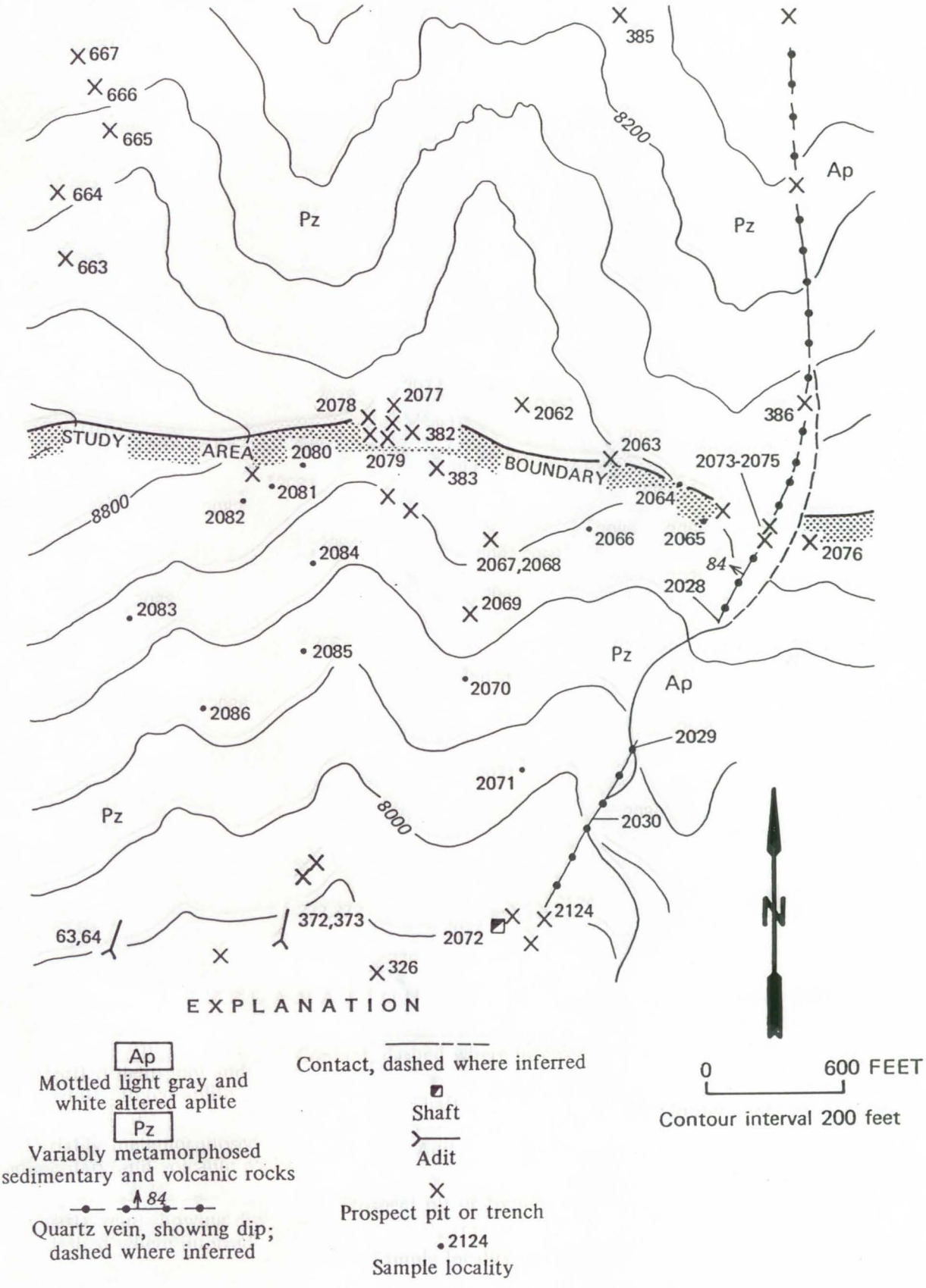


FIGURE A-9.–Workings, sample sites, and generalized geology, Grandview prospect area

TABLE A-4.--Descriptions and analyses for samples shown on figure A-9, Grandview prospect area

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Lead	Antimony
63	Chip.	5.5	Quartz vein trending N. 35° E. and dipping 45° NW. in shale.	1.4	30	<0.005	13	32	<10
64	Grab.	NA	Limonite- and malachite-stained quartz and shale from dump.	.13	2.67	<.05	1.93	5.36	1.15
326	Chip.	1.5	Quartz vein striking N. 40° E. and dipping 80° SE. in metasedimentary rock.	26.8	2968.	2.59	10.9	13.7	200.0
372	Random chip.	NA	Quartz and coxcomb quartz in metasedimentary rock exposed in pit.	1.41	226.0	<.05	19.3	4.65	11.2
373	Chip.	2.0	Silicified limestone striking N. 50° E. and dipping 85° NW.	26.4	666.0	<.05	48.7	2661.	4.65
382	do.	10.0	Quartz vein trending N. 10° E. and dipping 80° NW. in calcareous metasedimentary rock.	.996	57.1	<.05	18.7	33.2	1.02
383	do.	11.0	Quartz vein trending N. 10° E. and dipping 75° NW. in calcareous metasedimentary rock.	.513	18.7	<.05	4.96	29.3	.869
385	do.	1.4	Pyrite- and galena-bearing coxcomb quartz vein striking N. 70° W. and dipping 65° NE.	80.3	24.3	<.05	16.2	4729.	2.04
386	Grab.	NA	Silicified metasedimentary rock from dump of pit.	.592	6.51	<.05	10.0	40.3	.6
663	Chip.	4.6	Silicified shear zone in metavolcanic rock.	.4	--	<.005	16	8	--
664	Grab.	NA	Quartz and metavolcanic rock from dump of pit.	.2	--	<.005	15	2	--
665	Chip.	3.3	Quartz vein trending N. 20° E. and dipping 60° NW. in sheared metavolcanic rock.	.2	--	<.005	15	6	--
666	do.	1.3	Quartz vein trending N. 30° E. and dipping 55° SE. in sheared metavolcanic rock.	13.8	--	.450	20	2800	--

TABLE A-4.--Descriptions and analyses for samples shown on figure A-9, Grandview prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Lead	Antimony
667	Chip.	1.8	Quartz vein trending north and dipping steeply in sheared metavolcanic rock.	0.6	--	0.050	25	140	--
2028	Grab.	NA	Quartz from massive vein trending N. 10° E. and dipping 84° NW. in metasedimentary rock.	3.85	38.6	<.05	21.2	10.0	<.239
2029	do.	NA	Quartz from massive vein in aplite.	.261	3.53	<.05	15.5	3.41	<.248
2030	do.	NA	do.	1.37	7.10	<.05	22.1	7.84	<.237
2062	Random chip.	NA	Quartz vein striking N. 25° W. and dipping steeply in metasedimentary rock.	.406	24.4	<.05	14.3	2.25	<.24
2063	Select.	NA	Quartz and silica-cemented, brecciated metasedimentary rock from pit.	.372	5.65	<.05	12.0	3.57	<.216
2064	Random chip.	NA	Metavolcanic rock.	.103	30.5	<.05	7.07	33.5	<.228
2065	do.	NA	Silicified metasedimentary rock containing numerous quartz veinlets.	.269	39.5	<.05	5.46	5.68	<.233
2066	Grab.	NA	Limonite-stained, quartz-rich, metasiltstone float.	1.40	8.53	<.05	5.45	11.3	<.229
2067	Random chip.	NA	Limonite-stained quartz and silicified metasedimentary rock.	.390	155.	<.05	8.71	8.51	<.217
2068	Grab.	NA	Limonite-stained, silica-cemented, brecciated metasedimentary rock from pit.	1.33	88.8	<.05	9.91	97.7	1.10
2069	Chip.	.7	Contact of quartz vein with brecciated metasedimentary rock.	7.99	841.	<.05	33.6	37.3	32.2
2070	Random chip.	NA	Quartz-rich metasedimentary rock.	1.49	453.	.207	10.5	10.9	11.9
2071	Chip.	.8	Limonite-stained quartz vein and metasedimentary rock.	.381	41.4	.115	16.1	3.61	.661
2072	do.	1.0	Limonite-stained quartz vein exposed at shaft.	5.11	2376	.950	19.5	9.49	69.2

TABLE A-4.--Descriptions and analyses for samples shown on figure A-9, Grandview prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Lead	Antimony
2073	Grab.	NA	Quartz from dump of pit.	0.613	12.2	<0.05	14.7	3.55	<0.229
2074	Chip.	1.0	Contact of quartz vein with metasedimentary rock exposed in pit.	8.49	56.2	<.05	10.7	51.4	1.56
2075	Random chip.	NA	Quartz-rich zone exposed in pit.	.130	4.02	<.05	15.6	3.90	<.226
2076	Chip.	.8	Quartz vein in aplite.	.647	3.56	<.05	13.6	18.2	<.241
2077	do.	.6	Quartz vein and silicified metasedimentary rock.	.642	220.	<.05	14.6	12.1	.786
2078	do.	4.0	Silicified metasedimentary rock containing quartz veinlets.	2.99	338.	<.05	9.71	57.2	6.69
2079	do.	3.0	Quartz vein and silicified, brecciated, metasedimentary rock.	.237	24.1	<.05	14.0	4.02	<.242
2080	Select.	NA	Silicified metasedimentary rock containing quartz veinlets.	1.91	23.7	<.05	11.8	6.31	5.00
2081	Grab.	NA	Limonite-stained quartz float.	.028	5.16	<.05	15.2	1.67	<.229
2082	do.	NA	Sheared, hematite-stained, metasedimentary rock containing quartz veinlets.	.121	9.03	<.05	12.3	8.90	.465
2083	do.	NA	do.	.027	3.49	<.05	11.2	1.46	<.229
2084	do.	NA	Limonite-stained metasedimentary rock.	.875	141.	<.05	6.60	14.5	5.75
2085	do.	NA	Partially silicified metasedimentary rock and quartz float.	.340	541.	<.05	7.07	12.1	3.54
2086	do.	NA	Limonite-stained metavolcanic rock.	.187	8.30	<.05	4.06	7.20	1.37
2124	Chip.	4.0	Quartz vein and sheared metasedimentary rock exposed in pit.	7.50	121.	<.05	10.6	39.0	1.81

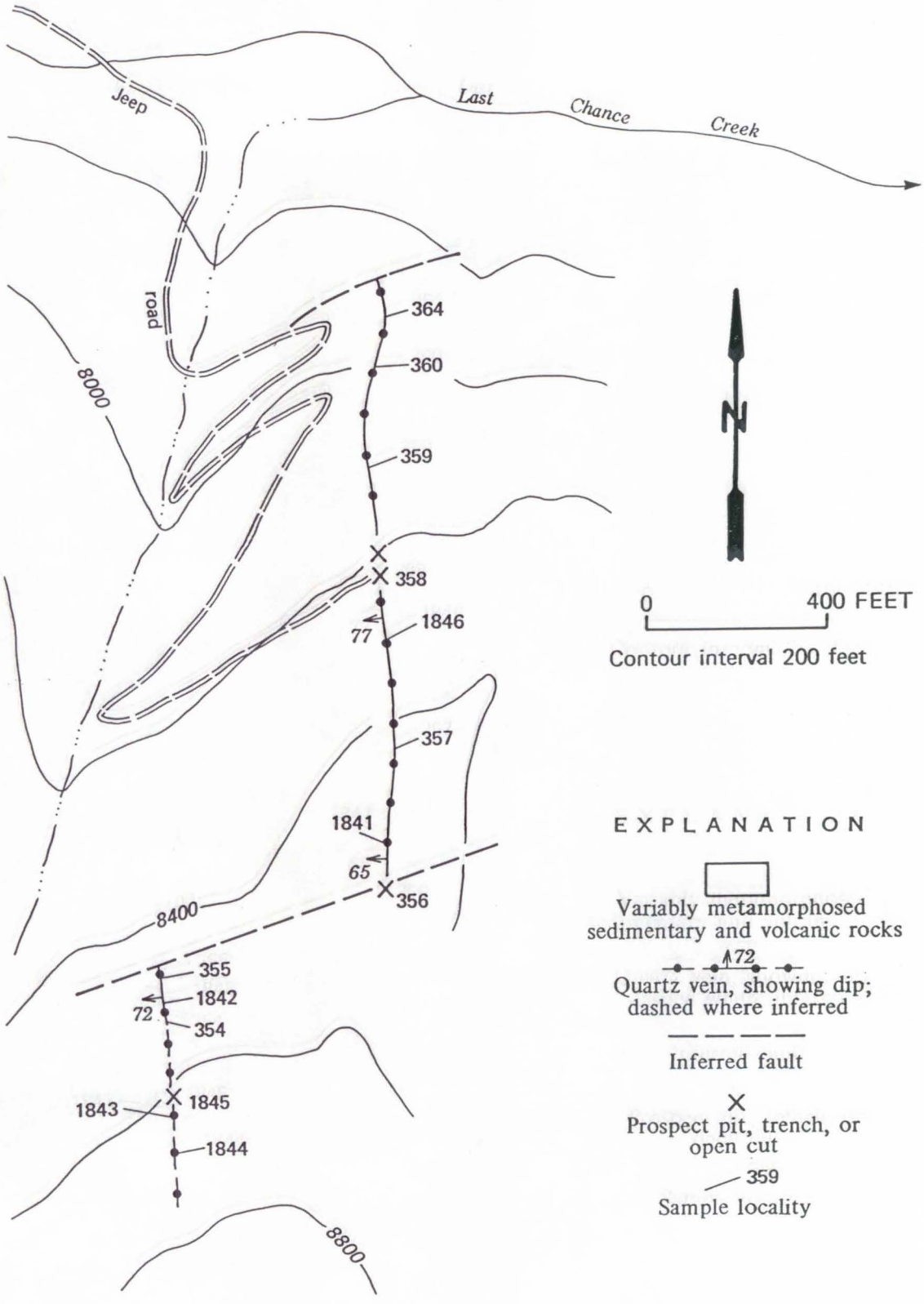


FIGURE A-10.–Workings, sample sites, and generalized geology, White Horse prospect

FIGURE A-11.--View looking south at the White Horse prospect.

TABLE A-5.--Descriptions and analyses for samples shown on figure A-10, White Horse prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
354	Grab	NA	Heavily limonite-stained quartz float.	27.3	108.0	<0.05	81.7	191.0	2985.
355	Random chip.	NA	Massive, white quartz vein containing fragments of metasedimentary rock.	.139	5.26	<.05	6.95	3.38	14.3
356	do.	NA	do.	1.48	109.0	<.05	11.9	25.2	8.2
357	do.	NA	Massive, white quartz vein in black, metavolcanic rock.	.203	40.2	<.05	4.74	7.15	17.8
358	do.	NA	do.	1.83	229.0	.332	14.9	81.1	60.4
359	do.	NA	Massive, white quartz vein in metasiltstone and metasandstone.	.345	166.0	.147	12.3	21.4	29.1
360	do.	NA	do.	3.95	150.0	3.47	9.52	88.2	33.9
364	Grab.	NA	Slightly limonite-stained, white quartz float.	.212	24.2	<.05	5.68	11.3	25.6
1841	Chip.	4.0	Massive, white quartz vein.	3.16	63.3	<.05	19.3	60.5	19.9
1842	Random chip.	NA	do.	.064	3.15	<.05	1.87	3.80	9.60
1843	Chip.	2.0	Limonite-stained, white quartz vein.	.04	10.3	<.05	5.67	.949	12.8
1844	do.	.5	White quartz vein and blue-gray limestone.	2.93	32.4	<.05	26.0	15.9	250.
1845	Random chip.	NA	Two-ft-thick, white quartz vein in metalimestone.	.438	47.0	<.05	3.90	2.15	4.64
1846	do.	NA	Massive, white quartz vein.	.111	24.7	<.05	4.44	3.29	3.91

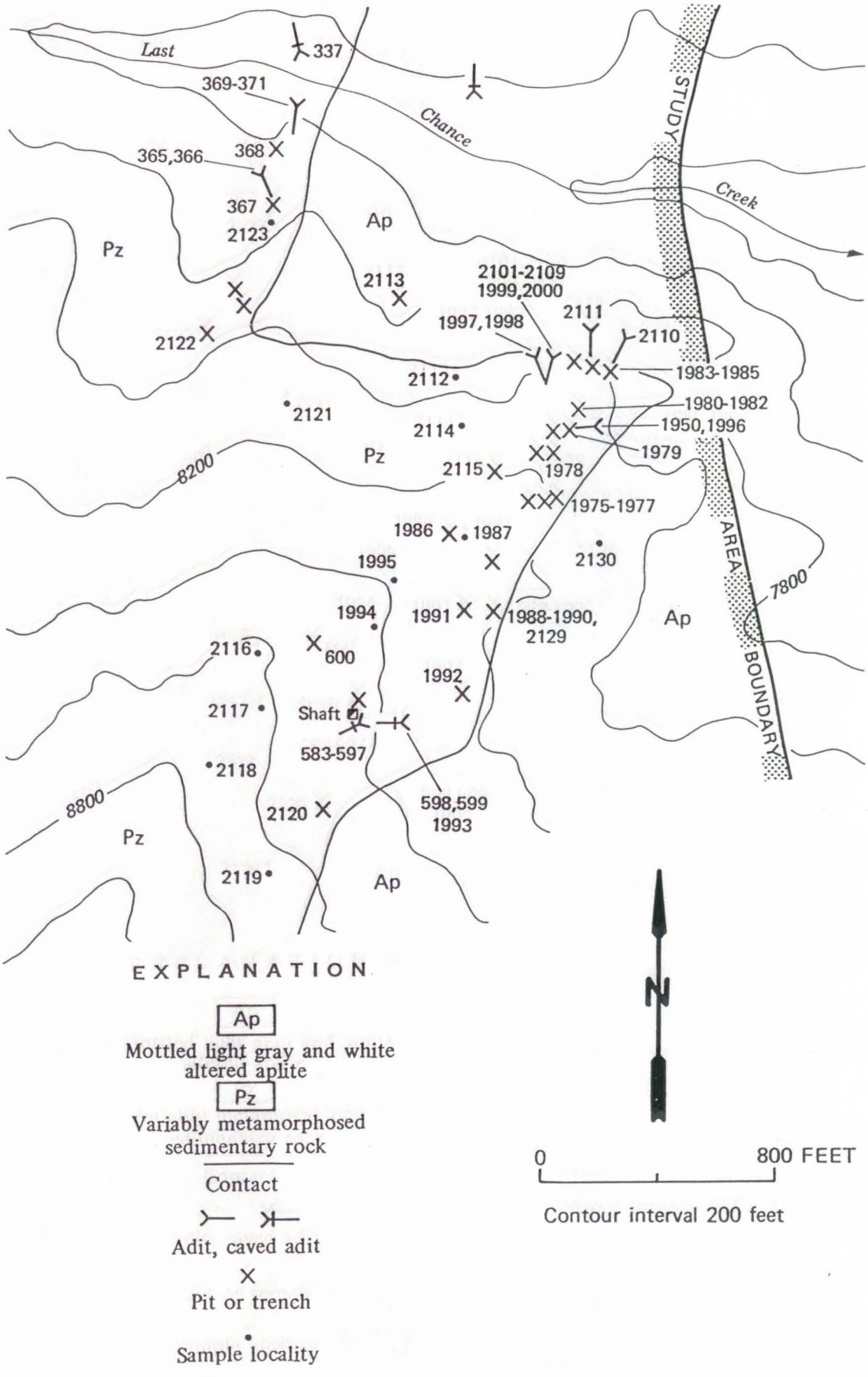


FIGURE A-12.—Workings, sample sites, and generalized geology, Charley prospect

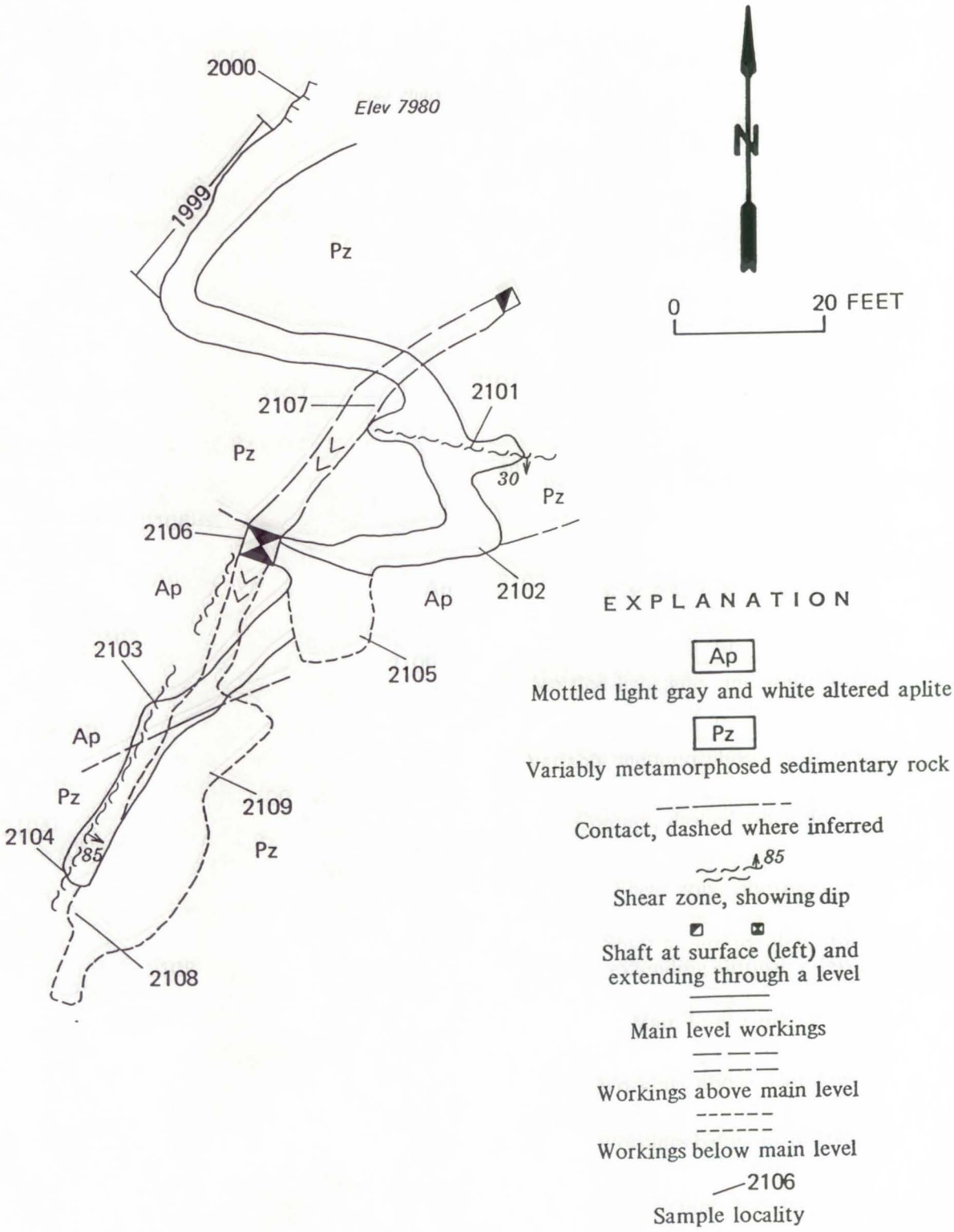
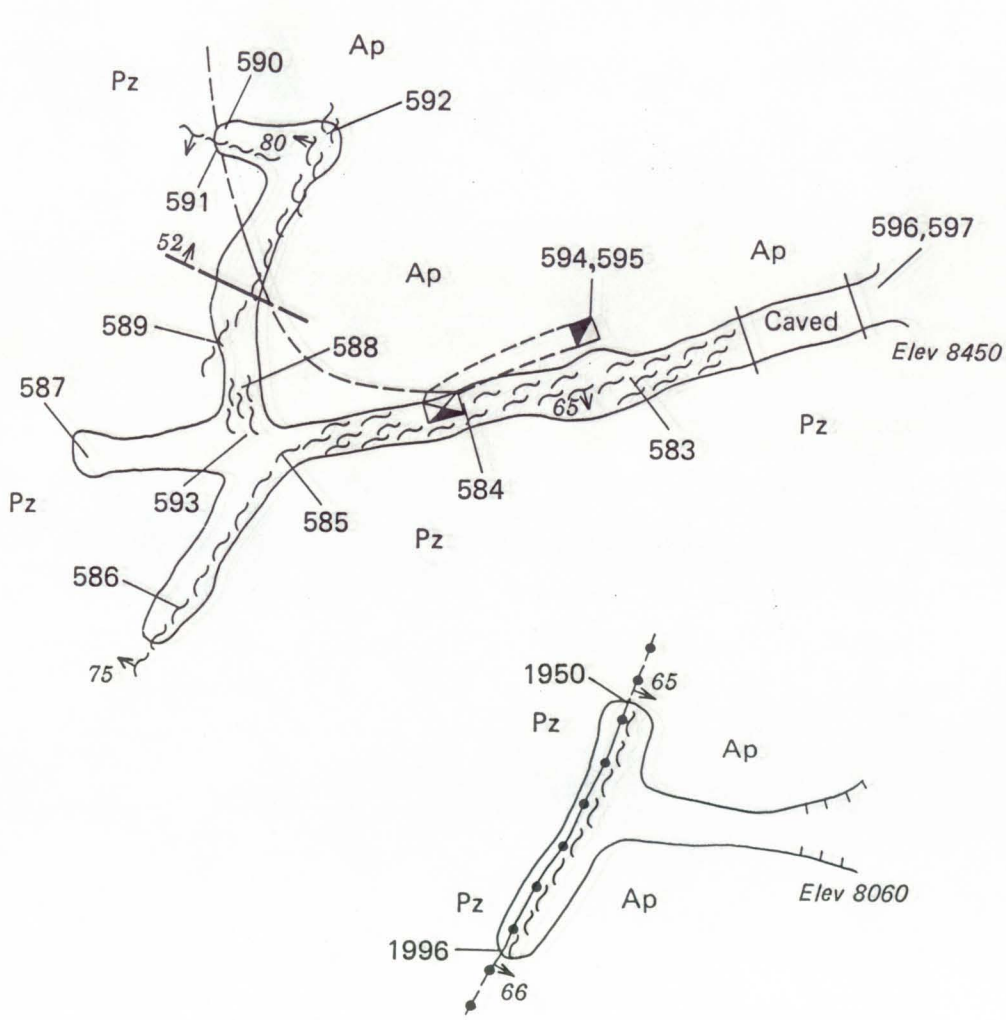
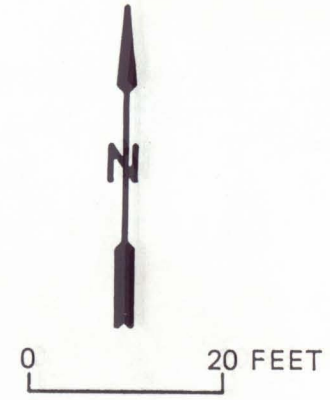


FIGURE A-13.—Underground workings showing generalized geology and sample sites, Charley prospect





EXPLANATION

Ap

Mottled light gray and white altered aplite

Pz

Variably metamorphosed volcanic and sedimentary rocks

66

Quartz vein, showing dip

Contact, dashed where inferred

52

Fault, showing dip; dashed where inferred

80

Shear zone, showing dip

Shaft at surface (left) and bottom

588

Sample locality

FIGURE A-14.—Underground workings showing generalized geology and sample sites, Charley prospect

TABLE A-6.--Descriptions and analyses for samples shown on figures A-12 through A-14, Charley prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
337	Chip.	1.0	Limonite-stained quartz vein trending N. 15° E. and dipping 60° NW.	37.4	<0.05	162.0	42.3	2.68%	1632.
365	do.	3.0	Quartz-rich shear zone exposed in 71-ft-long adit.	1.74	<.05	87.9	41.5	326.0	491.0
366	do.	50.0	Quartz-rich metasedimentary rock.	1.89	<.05	74.0	6.55	94.8	199.0
367	do.	20.0	Quartz-rich, silicified shear zone in metasedimentary rock.	2.66	.901	43.9	14.3	1232.	434.0
368	do.	2.5	Malachite-stained shear zone striking N. 55° E. and dipping 60° NW.	490.0	1.98	4066.	18.1	870.0	865.0
369	do.	3.7	Silicified shear zone containing fault gouge.	5.36	<.05	160.0	16.7	85.5	200.0
370	do.	3.6	Malachite-stained shear zone trending N. 15° E. and dipping 48° NW.	1.71	<.05	95.1	19.4	54.3	99.5
371	do.	.5	White quartz.	.468	<.05	8.47	9.4	7.27	12.2
583	do.	3.3	Sheared metasedimentary rock and fault gouge.	26.0	.725	200	357	1760	4407
584	do.	3.0	do.	11.8	.095	192	131	2000	3534
585	do.	2.7	do.	14.6	.690	196	515	2900	3968
586	do.	2.8	do.	54.0	.470	356	215	5600	6280
587	do.	3.3	Sheared metasedimentary rock containing numerous quartz stringers.	4.8	<.005	108	23	96	216
588	do.	4.0	Malachite-stained, sheared metasedimentary rock containing quartz stringers.	195.0	1.350	1300	151	4400	2.06%
589	do.	1.8	Fault gouge zone.	22.4	.050	192	5	760	1629
590	do.	2.8	Sheared, altered aplite.	7.8	1.720	104	23	392	1301
591	do.	1.5	Sheared, silicified metasedimentary rock.	12.2	.060	108	29	624	2365

TABLE A-6.--Descriptions and analyses for samples shown on figures A-12 through A-14, Charley prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
592	Chip.	2.5	Sheared, altered aplite and fault gouge.	7.2	.210	220	14	1140	2562
593	do.	5.2	Malachite-stained, sheared metasedimentary rock and fault gouge.	199.8	1.800	840	340	1.4%	1.54%
594	do.	2.0	Contact of altered aplite with metasedimentary rock.	114.8	>10.0	1800	528	1.82%	2.6%
595	do.	1.5	do.	7.0	.280	150	69	920	4500
596	do.	2.5	Metasedimentary rock and a 9-in.-thick quartz vein.	60.0	1.880	1660	277	2.0%	4807
597	Select.	NA	Red- and yellow-stained quartz.	401.	7.80	2500	228	11.0%	3557
598	do.	NA	Quartz containing malachite and galena from dump of caved adit.	148	8.05	8000	183	4.2%	6096
599	Grab.	NA	Altered aplite and metasedimentary rock from dump of caved adit.	23.0	1.900	910	100	5900	3005
600	Select.	NA	Quartz-epidote-garnet tactite float.	2.6	.025	52	9	320	338
1950	Chip.	3.4	Malachite-stained aplite and metasedimentary rock.	4.96	.086	118.	85.3	1507	1537
1975	Select.	NA	Gossan and limonite-stained metasedimentary rock from stockpile at pit.	6.41	<.05	107.	8.79	3036	936.
1976	Chip.	8.0	Quartz vein striking N. 25° E. and dipping 65° NW.	.076	<.05	3.72	12.8	13.7	15.2
1977	Random chip.	NA	Dark green metasedimentary rock in and around open cut.	3.20	<.05	157.	6.74	111.	468.
1978	Grab.	NA	Dark green metasedimentary rock and quartz from two trenches.	3.53	.393	131.	115.	914.	589.
1979	do.	NA	Dark green metasedimentary rock from two pits.	.165	<.05	105.	<.094	21.2	452.
1980	Select.	NA	Limonite-stained, sheared metasedimentary rock and quartz from stockpile.	54.8	22.8	631.	53.3	4758	801.
1981	Chip.	1.0	Quartz- and pyrite-rich zone along contact of metasedimentary rock with aplite.	40.6	9.40	1254	88.7	>2.4%	1278

TABLE A-6.--Descriptions and analyses for samples shown on figures A-12 through A-14, Charley prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
1982	Select.	NA	Pyrite-rich quartz from stockpile.	161.	47.1	3196	27.7	>2.3%	2.2%
1983	Chip.	0.7	Quartz vein containing pyrite, chalcopyrite, and sphalerite and trending N. 80° E. and dipping 50° SE.	69.2	14.7	603.	259.	2033	520.
1984	Select.	NA	Gossan and quartz from stockpile.	115.	2.06	1608	36.2	1.52%	2319
1985	Chip.	.6	Quartz vein trending N. 48° E. and dipping 82° SE. in altered aplite.	3.17	.250	25.5	18.2	303.	494.
1986	Select.	NA	White quartz from open cut.	5.57	.372	64.2	13.4	148.	111.
1987	Random chip.	NA	Brecciated, partially silicified, green metasedimentary rock.	2.13	<.05	62.8	5.36	26.2	141.
1988	Grab.	NA	Green, silicified, sheared, and brecciated metasedimentary rock from 1-ton stockpile.	32.9	11.6	2082	44.0	8426	2281
1989	Select.	NA	Dark green, heavily malachite-stained metasedimentary rock.	3.84	<.05	1944	49.2	1270	613.
1990	Grab.	NA	Green metasedimentary rock.	5.95	.313	315.	14.8	605.	2271
1991	do.	NA	Dark green metasedimentary rock and quartz from dump of open cut.	20.0	.068	2018	22.0	672.	1509
1992	Chip.	1.0	Partially silicified shear zone in metasedimentary rock.	1.35	<.05	26.5	8.78	70.0	432.
1993	Grab.	NA	Malachite- and limonite-stained quartz and metasedimentary rock from stockpile.	57.4	9.44	3042	56.8	1.19%	3260
1994	Random chip.	NA	Light green metasedimentary rock.	.731	<.05	15.1	5.55	101.	189.
1995	do.	NA	Limonite-stained, fissile, tan metasedimentary rock.	.404	<.05	59.6	4.81	46.1	73.5
1996	Chip.	.8	Malachite- and azurite-stained, quartz-rich area along footwall of shear zone.	95.9	5.63	5132	143.	>2.3%	1.09%
1997	do.	3.7	Sheared, green metasedimentary rock.	15.6	<.05	191.	11.8	290.	1600
1998	do.	.6	Partially silicified, sheared metasedimentary rock.	334.	4.47	509.	48.5	>2.4%	88.1

TABLE A-6.--Descriptions and analyses for samples shown on figures A-12 through A-14, Charley prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
1999	Chip.	26.0	Altered aplite and dark green metasedimentary rock.	3.53	<0.05	101.	5.96	458.	514.
2000	do.	.8	Malachite- and limonite-stained quartz vein trending N. 70° E. and dipping 35° SE.	42.6	32.3	197.	19.5	1037	111.
2101	do.	2.0	Quartz-rich, malachite-stained, sheared, green metasedimentary rock.	24.0	1.09	802.	67.0	4202	1364
2102	do.	.5	Sheared, dark green metasedimentary rock.	2.54	.056	58.2	8.40	175.	688.
2103	do.	.8	Shear zone in altered aplite.	2.99	<.05	90.0	13.2	683.	1605
2104	do.	3.0	Sheared, dark green, partially silicified metasedimentary rock.	.672	<.05	65.9	9.23	112.	241.
2105	do.	1.3	Sheared metasedimentary rock and quartz stringers.	1.53	<.05	43.4	8.98	125.	945.
2106	do.	.8	Altered aplite.	19.3	3.09	288.	262.	3270	4581
2107	do.	.6	Limonite-stained metasedimentary rock.	71.2	4.69	515.	889.	7439	1516
2108	do.	2.5	Dark green, sheared metasedimentary rock containing quartz and calcite.	9.54	.140	311.	70.5	5644	6382
2109	do.	1.0	do.	8.36	4.27	112.	62.7	904.	945.
2110	Grab.	NA	Quartz from stockpile near 12-ft-long adit.	4.91	8.26	21.7	19.4	273.	63.9
2111	Chip.	.5	Sheared aplite and 1-in.-thick quartz vein containing galena.	45.4	1.00	862.	40.9	>2.0%	2055
2112	Random chip.	NA	Green schistose metasedimentary rock.	.735	<.05	94.2	8.63	90.1	60.5
2113	Select.	NA	Malachite-, azurite-, and limonite-stained quartz and metasedimentary rock.	7.89	.210	1353	177.	2331	466.
2114	Random chip.	NA	Heavily limonite-stained metasedimentary rock.	.642	<.05	73.1	8.15	21.7	43.3
2115	do.	NA	Sheared metasedimentary rock containing quartz stringers.	62.8	.08	2526	14.3	153.	193.

TABLE A-6.--Descriptions and analyses for samples shown on figures A-12 through A-14, Charley prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
2116	Select.	NA	Limonite-stained quartz from quartz-rich zone in metasedimentary rock.	186.	0.067	421.	19.9	502.	2292
2117	Random chip.	NA	Limonite-stained, bleached, metasedimentary rock containing quartz veinlets.	6.12	<.05	75.0	5.44	30.6	65.1
2118	do.	NA	do.	1.40	<.05	90.8	7.23	19.8	80.7
2119	do.	NA	do.	.837	<.05	101.	7.33	8.34	62.5
2120	do.	NA	Altered aplite and metasedimentary rock at open cut.	12.1	.302	291.	22.5	88.7	238.
2121	do.	NA	Partially silicified metasedimentary rock containing disseminated pyrite.	1.43	<.05	44.1	5.59	21.0	119.
2122	Select.	NA	Limonite-stained metasedimentary rock from open cut.	2.72	<.05	57.6	34.8	16.2	35.8
2123	Random chip.	NA	Quartz-rich zone in metasedimentary rock.	.668	<.05	21.4	15.4	32.0	45.6

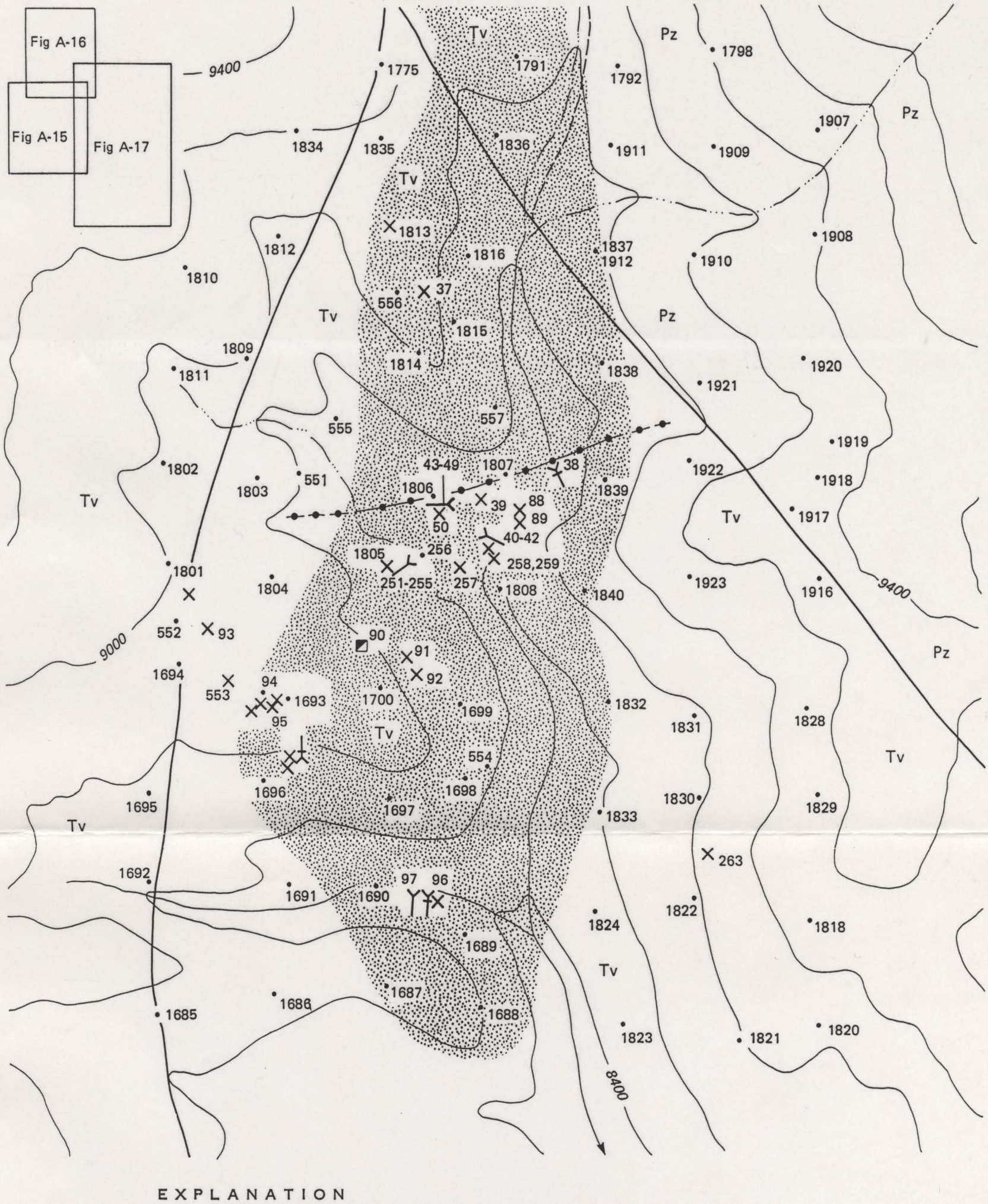
2129 Petrographic

A dark gray, silicified breccia. Most of the rock consists of cryptocrystalline quartz with disseminated clay, sericite, opaque dust, and granules (may include sulfides), and occasional grains of chlorite with radial habit. Some polycrystalline aggregates of microcrystalline quartz, 1/4 - 1 1/2 mm long, appear to be pseudomorphous after euhedral feldspar crystals. Other such aggregates up to 4 1/2 mm long, but having irregular form, are interpreted to be former rock fragments. A 3/4 mm long clot of sericite + dark oxides could be a former amphibole grain. A 1/2 mm opaque grain appears to be oxidized pyrite. The rock is cut by numerous fractures up to 1/2 mm wide. Some are filled with chlorite and limonite, but most are filled with anhedral to subhedral quartz. Some of these quartz veinlets contain malachite and limonite.

The microcrystalline quartz that replaces phenocrysts and some rock fragments is heavily strained and has sutured grain boundaries indicative of moderate recrystallization. Quartz in the veinlets is lightly strained. Thus, the rock was significantly silicified prior to fracturing and formation of the quartz veinlets. Malachite indicates some of the opaques probably are (were) chalcopyrite. Quartz phenocrysts would still be present if the original igneous rock contained them. Thus, the original rock probably was intermediate to mafic in composition.

TABLE A-6.--Descriptions and analyses for samples shown on figures A-12 through A-14, Charley prospect--Continued

Sample No.	Type	Description
2130	Petrographic	A mottled light gray and white, lightly cataclastically deformed and altered aplite. The rock consists of roughly equal amounts of quartz, microcline, and albite with accessory muscovite, altered biotite, altered hornblende(?), sphene, and oxidized pyrite. The textures are anhedral granular and cataclastic, and the grain size ranges from 0.05 - 1.5 mm. The rock is cut by a set of roughly orthogonal fractures. Displacement along these fracture is up to 1/2 mm. Cataclastic deformation along one set of fractures has resulted in the rock having weak gneissic banding. Albite is turbid due to pitting and is moderately altered to sericite. Microcline is relatively fresh but is lightly turbid due to pitting and fluid inclusions. Quartz has been moderately recrystallized to elongate polycrystalline aggregates with sutured grain boundaries. Fluid inclusions in quartz give it a lightly turbid appearance. Biotite has been completely replaced by muscovite + rutile. Hornblende(?) has been completely replaced by sericite and rutile, and has associated sphene. Pyrite occurs as occasional cubic crystals up to 3/8 mm across that have been completely oxidized to limonite. Sericite occurs along the shear fractures which generally are 1/4 - 3 mm apart.



EXPLANATION

Tv — Volcanic rock, mainly ash-flow tuff

Porphyritic intrusive rock

Pz — Variably metamorphosed volcanic and sedimentary rocks

Hydrothermally altered and silicified area

Silicified shear zone, dashed where inferred

Contact, dashed where inferred

Fault, dashed where inferred

Adit, caved adit

Shaft

Prospect pit or trench

• 1824 Sample locality

N

0 800 FEET

Contour interval 200 feet

FIGURE A-15.—Workings, sample sites, and generalized geology in the west part of the Werdenhoff prospect area

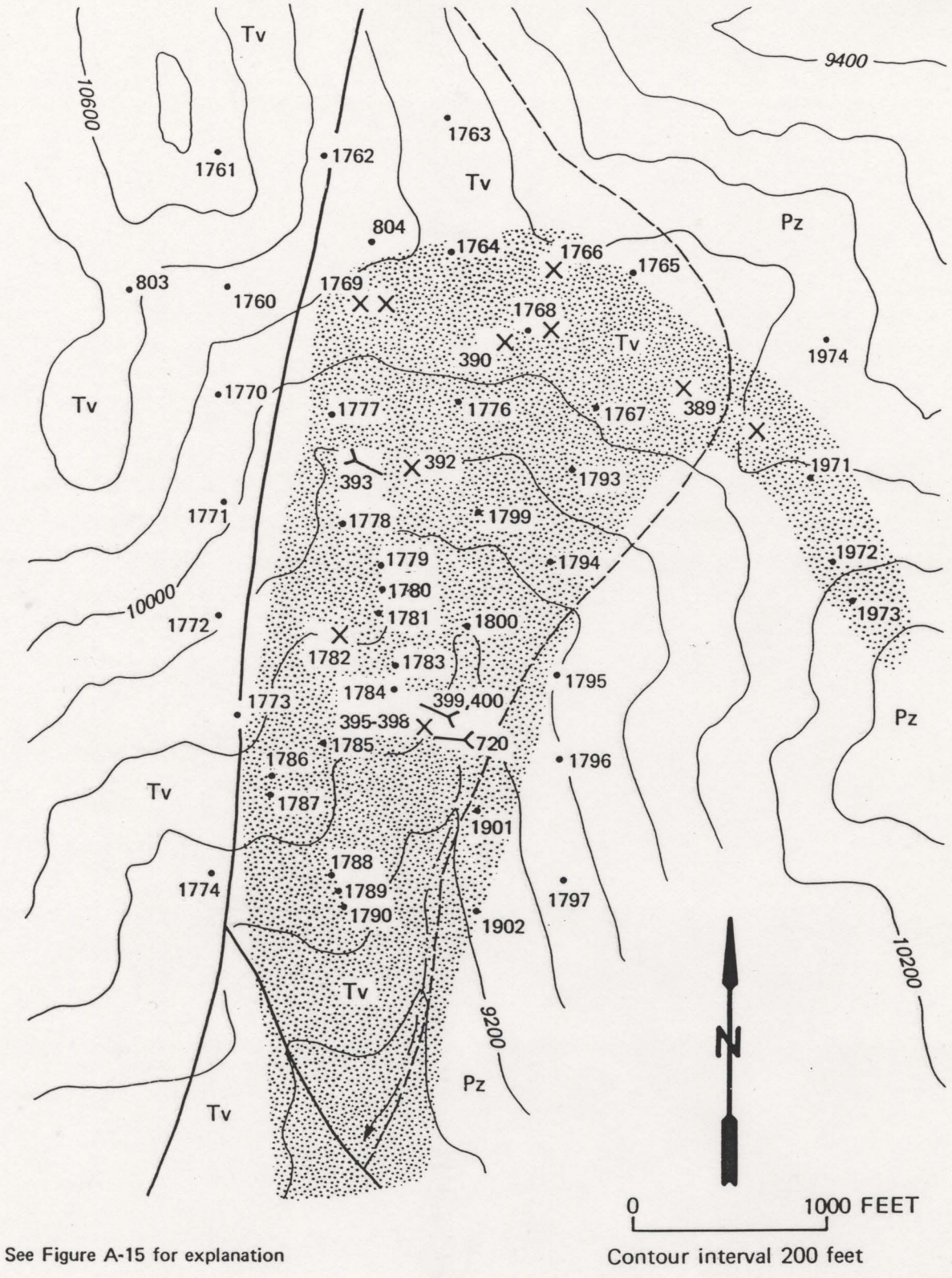


FIGURE A-16.–Workings, sample sites, and generalized geology in the northwest part of tne Werdenhoff prospect area

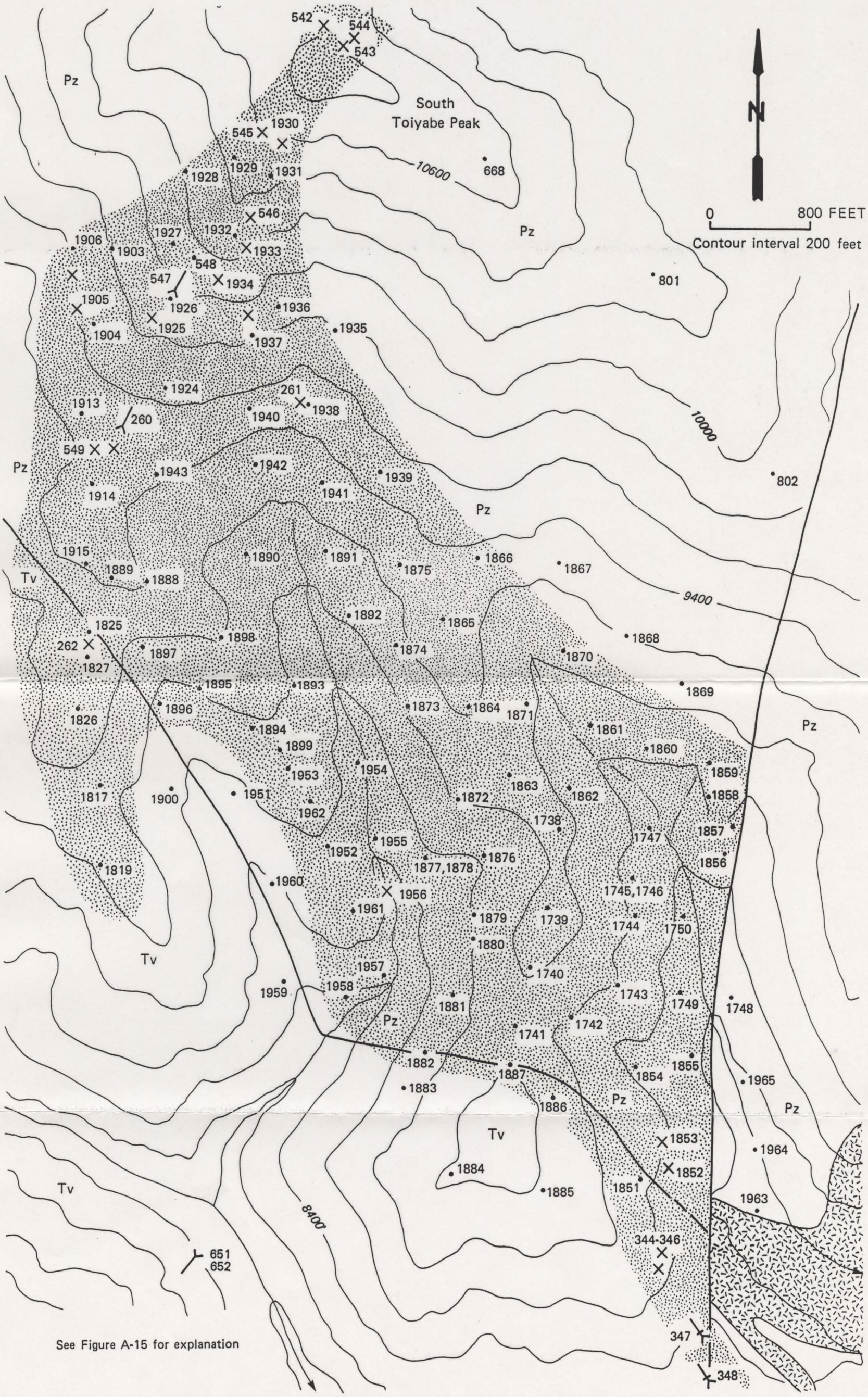


FIGURE A-17.—Workings, sample sites, and generalized geology in the southeast part of the Werdenhoff prospect area

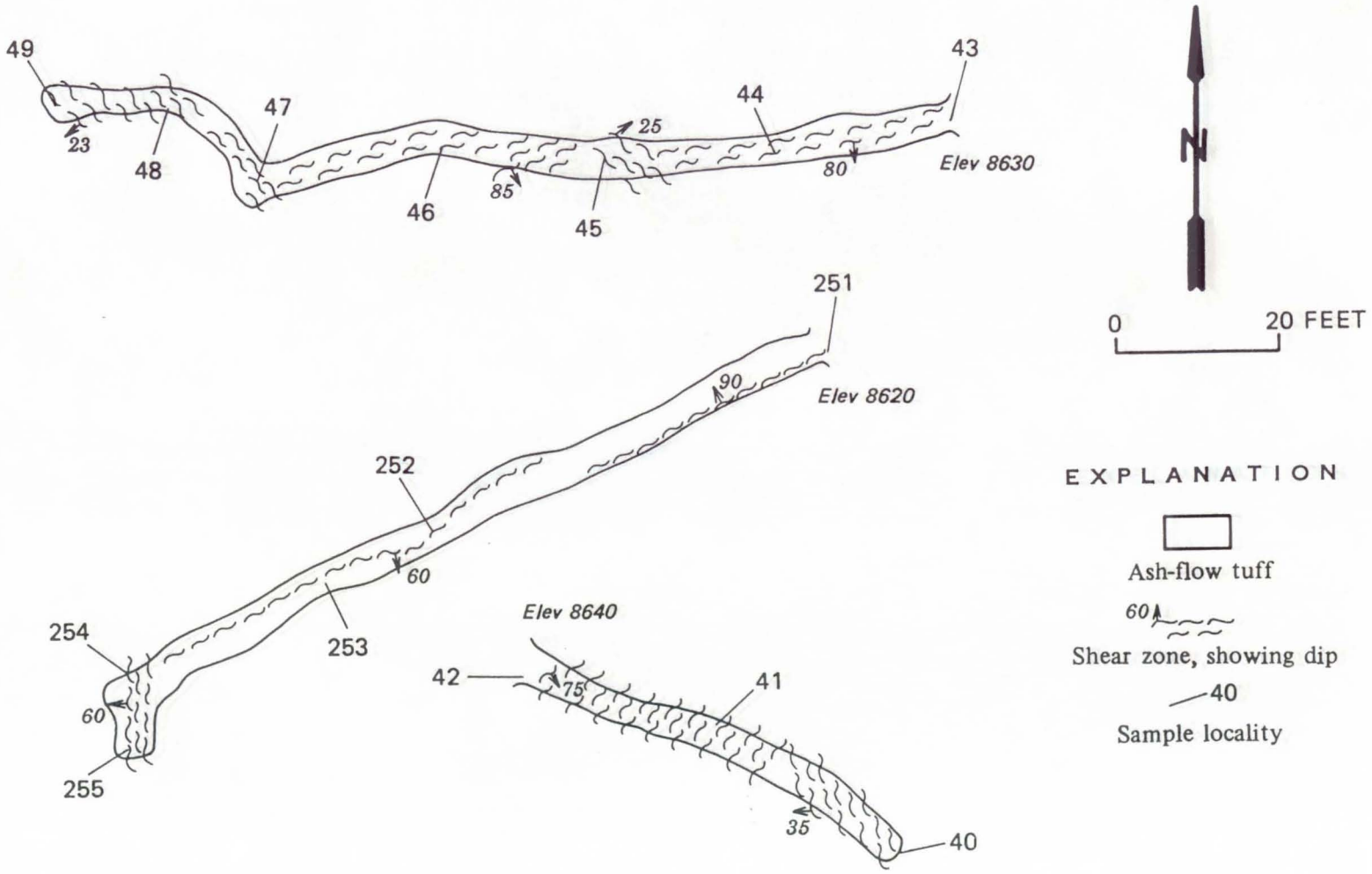


FIGURE A-18.—Underground workings showing generalized geology and sample sites, Werdenhoff prospect area

FIGURE A-19.--View looking north at the Werdenhoff prospect area.

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
37	Chip.	2.6	Shear zone trending N. 85° E. and dipping 85° NW. in ash-flow tuff.	0.15	84.2	<0.05	<0.5	10.4	0.546
38	Grab.	NA	Light gray, welded tuff from dump of caved adit.	.089	4.78	<.05	<.5	.931	<.50
39	do.	NA	Gray, welded tuff from dump of pit.	.084	6.75	<.05	<.5	1.65	<.50
40	Chip.	4.5	Sheared, welded tuff trending N. 70° W. and dipping 28° SW.	1.2	<10	<.005	--	<10	<10
41	do.	4.9	Sheared, ash-flow tuff and fault gouge.	.116	5.93	<.05	<.5	.81	<.50
42	do.	5.4	Pyrite-bearing, sheared, limonite-stained, welded tuff.	.8	<10	<.005	--	<10	10
43	do.	7.8	Limonite-stained, sheared, ash-flow tuff.	.4	10	<.05	--	<10	20
44	do.	3.0	do.	.211	11.3	<.05	<.5	1.07	<.50
45	do.	4.0	do.	.213	17.2	<.05	2.8	2.13	<.50
46	do.	3.3	Sheared, altered, greenish-gray, ash-flow tuff.	.614	8.75	.176	1.57	.964	.507
47	do.	4.4	do.	.203	9.47	<.05	5.8	1.22	.525
48	do.	4.3	do.	.432	33.1	<.05	1.23	18.6	.978
49	do.	3.0	Sheared, altered, ash-flow tuff and pods of quartz.	.6	40	.015	--	<10	20
50	do.	5.0	Limonite-stained, sheared, welded tuff.	.522	186.0	.062	<.5	7.53	<.5
88	Grab.	NA	Limonite-stained, ash-flow tuff containing traces of pyrite from dump of pit.	.2	<10	<.005	--	<10	10
89	Chip.	4.0	Pyrite-bearing, welded tuff exposed in pit.	33.0	8.12	<.05	<.5	1.27	<.5
90	do.	8.0	Limonite-stained shear zone trending N. 85° W. and dipping 85° SW. in ash-flow tuff.	.8	30	.350	--	<10	10

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
91	Grab.	NA	Silicified, ash-flow breccia from dump of pit.	4.2	10	0.035	--	<10	20
92	Chip.	12.0	Shear zone trending N. 20° E. and dipping 65° SE. in rhyolite flow breccia.	24.8	26.2	.306	<0.5	2.46	<.50
93	do.	2.0	Contact of rhyolite flow breccia and ash-flow tuff.	.2	<10	<.005	--	<10	30
94	do.	3.0	Silicified shear zone trending N. 70° E. and dipping 80° NW. in tuff.	.2	10	.005	--	<10	<10
95	Grab.	NA	Limonite-stained, pyrite-bearing tuff from dumps of four pits.	.434	17.9	<.05	<.5	4.92	<.50
96	Chip.	8.0	Partially silicified shear zone trending N. 05° E. and dipping 45° SE. in flow breccia.	.2	<10	<.005	--	<10	<10
97	do.	50.0	Sheared, partially silicified flow breccia exposed in 50-ft-long adit.	.171	5.86	<.05	<.5	4.21	<.50
251	do.	2.5	Sheared, limonite-stained, ash-flow tuff and fault gouge.	.207	2.66	.053	<.5	.992	<.50
252	do.	3.0	do.	1.6	20	.890	--	<10	<10
253	do.	3.0	do.	.651	19.5	.337	<.5	2.66	<.50
254	do.	2.0	do.	.211	4.79	.224	<.5	.492	<.50
255	do.	4.0	do.	.2	<10	<.005	--	<10	<10
256	Select.	NA	Bleached, limonite-stained, ash-flow tuff from dump.	.6	10	.210	--	<10	<10
257	Grab.	NA	Light gray, welded, ash-flow tuff from dump of small pit.	.154	11.6	<.05	<.5	1.46	<.50
258	Chip.	3.0	Shear zone trending N. 55° W. and dipping 85° SW. in ash-flow tuff.	.281	18.6	.158	<.5	1.48	<.50
259	do.	2.5	Shear zone trending N. 80° E. and dipping 75° NW. in welded, ash-flow tuff.	.179	8.63	<.05	<.5	.83	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
260	Select.	NA	Hematite-stained, partially silicified metasedimentary rock from stockpile.	36.0	90	0.580	--	80	<10
261	Grab.	NA	Pyrite-bearing, partially silicified metasedimentary rock from dump of trench.	.16	30.9	<.05	<0.5	3.18	<.50
262	Chip.	2.5	Partially silicified, strongly limonite-stained, shear zone trending N. 60° W. and dipping 68° SW.	.348	5.64	<.05	<.5	2.62	<.50
263	Grab.	NA	Light gray ash-flow tuff from dump of sloughed pit.	.113	2.92	<.05	<.5	.628	<.50
344	Chip.	3.5	Limonite-stained, sheared tuff, clay, and quartz exposed in trench.	259.0	8089.	<.05	<.1	1095.	<.50
345	do.	3.0	Limonite-stained, coarse-grained, rhyolite sill containing traces of pyrite.	13.5	878.0	<.05	<.1	122.0	<.50
346	do.	3.2	do.	23.4	1115.	<.05	<.1	104.0	<.50
347	do.	3.1	Partially silicified, limonite-stained, brecciated, rhyolite sill.	.781	65.8	<.05	<.1	3.81	<.50
348	Grab.	NA	Pyrite-bearing, silicified fault breccia from stockpile.	.691	33.6	<.05	<.1	1.93	<.50
389	do.	NA	Silicified, brecciated, gray ash-fall tuff from sloughed pit.	.515	<1.0	<.05	<.1	.896	<.50
390	Chip.	1.2	Limonite-stained, silicified shear zone trending N. 10° E. and dipping vertically.	1.24	189.0	.231	<.1	2.11	<.50
392	do.	12.0	Silicified shear zone trending N. 85° W. and dipping 85° NE. in brecciated, welded tuff.	2.71	1080.	.825	2.72	75.0	14.3
393	do.	5.0	Silicified shear zone exposed in 30-ft-long adit.	.904	28.8	.102	<.1	1.59	<.50
395	do.	15.0	Silicified shear zone trending N. 75° W. and dipping 66° SW. in ash-flow tuff.	<.03	--	<.07	--	<10	--
396	Grab.	NA	Massive, white quartz from dump.	<.03	--	<.07	--	<10	--

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
397	Select.	NA	Pyrrhotite-, galena-, chalcopyrite-, and pyrite-bearing quartz from dump.	277	--	<0.07	--	1350	--
398	Chip.	0.5	Quartz vein striking N. 85° W. and dipping 45° NE. in altered ash-flow tuff.	.105	3.91	<.05	<0.1	.329	<0.50
399	do.	1.5	Malachite-stained, silicified shear zone and fault gouge.	.351	54.6	.053	.209	.797	<.50
400	do.	.5	Limonite- and malachite-stained, pyrite-bearing, silicified shear zone.	57.2	69.8	7.87	.249	6.6	<.50
542	Select.	NA	Bleached, silicified, brecciated, limonite-stained, metasedimentary rock.	.27	27.7	<.05	<.1	4.68	<.50
543	do.	NA	Malachite- and limonite-stained, galena-bearing, druzy quartz from stockpile.	49.7	49.7	<.05	<.1	15.6	<.50
544	do.	NA	Galena-, pyrite-, chalcopyrite-, and malachite-bearing, druzy quartz from dump.	63.1	63.3	.055	<.1	22.5	<.50
545	do.	NA	Massive hematite and limonitic gossan from dump of sloughed pit.	1.54	77.0	<.05	<.1	14.7	<.50
546	Chip.	1.8	Vein trending N. 10° W. and dipping 60° NE. containing massive hematite.	3.24	438.0	.09	<.1	43.0	1.17
547	do.	3.0	Pervasively limonite-stained, silicified shear zone in metasedimentary rock.	.506	196.0	.059	.129	12.8	.652
548	do.	10.0	do.	.109	288.0	<.05	.752	9.07	1.1
549	Select.	NA	Sheared, silicified, hematite-stained, argillaceous rock containing veinlets of hematite.	<.025	1.52	<.05	<.1	.417	<.50
551	Random chip.	NA	Light gray-purple, moderately welded tuff.	1.96	558.0	<.05	<.5	4.33	<.50
552	Grab.	NA	Light green, silicified, ash-flow tuff.	.438	54.2	<.05	<.5	.834	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
553	Grab.	NA	Bleached, limonite-stained, partially silicified, ash-flow tuff from pit.	0.241	19.8	<0.05	<0.5	1.52	<0.50
554	Random chip.	NA	Altered, limonite-stained, dark gray, welded tuff.	3.03	66.5	.09	<.5	2.77	<.50
555	Grab.	NA	Limonite-stained, ash-flow tuff.	.952	54.3	<.05	<.5	7.89	<.50
556	do.	NA	do.	.276	22.9	<.05	<.5	1.66	<.50
557	do.	NA	do.	.171	16.6	<.05	<.5	1.33	<.50
651	do.	NA	Leached, limonite-stained, brecciated calcite and drusy quartz from dump.	31.2	--	.670	--	--	--
652	Chip.	5.0	Leached, silicified tuff at portal of 15-ft-long adit.	1.8	--	.035	--	--	--
668	do.	3.2	Silicified shear zone trending N. 30° W. and dipping 30° NE.	.2	--	<.005	--	--	--
720	do.	4.0	Silicified zone trending N. 05° E. and dipping 65° SE. in altered metasedimentary rock.	.2	--	<.005	--	--	--
801	Select.	NA	Limonite-stained quartz from vein striking N. 70° W. and dipping 65° SW. in argillite.	.2	--	<.005	--	--	--
802	do.	NA	Limonitic-gossan float.	16.0	--	.310	--	--	--
803	do.	NA	Limonite-stained, crystal-rich tuff from fault zone.	.6	--	<.005	--	--	--
804	do.	NA	Limonite-stained, bleached, rhyolite tuff.	.2	--	<.005	--	--	--
1685	Grab.	NA	Variegated, vesicular, welded tuff float.	.025	3.43	<.05	<.10	1.13	<.50
1686	do.	NA	Gray, massive tuff with limonite-staining along fractures.	<.014	2.49	<.05	<.10	.811	<.50
1687	do.	NA	Altered, vesicular tuff.	.019	10.3	<.05	<.10	.665	<.50
1688	do.	NA	do.	<.014	2.04	<.05	<.10	<.235	<.724

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1689	Grab.	NA	Altered, quartz-rich, gray tuff.	0.025	2.46	<0.05	<0.10	<0.237	<0.50
1690	do.	NA	do.	.083	15.8	<.05	<.10	.891	<.50
1691	do.	NA	Light gray, limonite-stained, welded tuff.	.027	1.29	<.05	<.10	.360	<.50
1692	do.	NA	Crystal-rich, silicified tuff.	.014	2.55	<.05	<.10	.466	<.50
1693	do.	NA	Vesicular, variegated tuff.	.065	3.76	<.05	<.10	1.07	<.50
1694	do.	NA	Gray, welded tuff.	.041	2.08	<.05	<.10	1.03	<.50
1695	do.	NA	do.	.023	1.01	<.05	<.10	.746	<.50
1696	do.	NA	Silicified, vesicular, variegated tuff.	.045	3.01	<.05	<.10	.751	<.50
1697	do.	NA	Variegated, vesicular tuff.	.038	1.20	<.05	<.10	.418	<.50
1698	do.	NA	Welded tuff float with limonite-staining along fractures.	.02	3.93	<.05	<.10	.472	<.50
1699	do.	NA	Welded, vesicular, variegated tuff.	.044	3.90	<.05	<.10	.629	<.50
1700	do.	NA	Altered, gray welded tuff.	.029	<.942	<.05	.127	.778	<.50
1738	Random chip.	NA	Limonite-stained, silicified fault breccia.	.056	573.	<.05	1.70	4.91	<.50
1739	do.	NA	Green, fine-grained, metasedimentary rock.	.056	3.07	<.05	<.10	.376	<.50
1740	do.	NA	Hematite- and limonite-stained, silicified fault breccia.	.110	272.	<.05	.597	2.87	<.50
1741	Grab.	NA	Limonite-stained, bleached metasedimentary rock.	.051	10.2	<.05	.101	.576	<.50
1742	do.	NA	Hematite-stained, silicified fault breccia.	.016	7.01	<.05	.133	3.99	.517
1743	Random chip.	NA	do.	.032	31.0	<.05	<.10	3.77	<.50
1744	do.	NA	do.	.160	17.4	<.05	<.10	4.75	.655

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1745	Select.	NA	Malachite-stained, chalcopyrite-bearing, silicified, brecciated, metasedimentary rock.	0.519	118.	<0.05	<0.10	4.92	0.759
1746	do.	NA	Hematite-stained, silicified fault breccia.	<.014	25.7	<.05	.098	.900	.580
1747	Random chip.	NA	Silicified fault breccia.	.158	81.9	<.05	.174	4.86	<.50
1748	Grab.	NA	Dark green, schistose metasedimentary rock.	.129	15.5	<.05	.096	.736	.686
1749	Random chip.	NA	Light green, silicified, sheared metasedimentary rock.	.098	6.55	<.05	.107	<.211	<.50
1750	Grab.	NA	Silicified metasedimentary rock.	.193	35.8	<.05	<.10	1.10	.574
1760	do.	NA	Limonite-stained, crystal-rich, welded tuff.	<.014	26.8	<.05	.136	8.38	.606
1761	do.	NA	do.	<.013	27.4	<.05	.136	1.40	.785
1762	do.	NA	do.	.018	17.1	<.05	.148	5.10	.536
1763	do.	NA	Crystal-rich, limonite-stained, altered, welded tuff.	.025	14.1	<.05	<.10	10.4	<.50
1764	Chip.	.8	Limonite-stained, silicified tuff.	.043	65.3	<.05	.266	2.74	<.50
1765	Grab.	NA	Crystal-rich, gray, welded tuff.	<.014	3.27	<.05	.162	.263	<.50
1766	do.	NA	Sheared, dark gray, welded tuff from pit.	.017	4.58	<.05	<.10	1.47	<.50
1767	Random chip.	NA	Limonite-stained, silicified, brecciated tuff.	.019	1.19	<.05	<.10	1.54	<.50
1768	Chip.	1.0	Limonite-stained, silicified, ash-flow tuff.	<.014	1.59	<.05	.098	.655	<.50
1769	do.	1.0	Silicified, brecciated tuff.	.288	11.8	<.05	<.10	2.09	<.50
1770	Random chip.	NA	Bleached, crystal-rich, welded tuff.	.02	8.10	<.05	<.10	1.78	.692
1771	Grab.	NA	Hematite-stained, crystal-rich, welded tuff.	.024	1.79	<.05	<.10	2.29	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1772	Grab.	NA	Hematite-stained, crystal-rich, welded tuff.	0.022	1.51	<0.05	<0.10	3.82	<0.50
1773	do.	NA	Light-colored, ash-flow tuff.	.025	1.84	<.05	<.10	1.35	<.50
1774	do.	NA	do.	.039	<.936	<.05	<.10	.244	<.50
1775	do.	NA	Limonite-stained, ash-flow tuff.	.049	16.5	<.05	.207	.665	.536
1776	do.	NA	Strongly altered, silicified rock.	<.013	1.76	<.05	.108	.278	<.50
1777	do.	NA	Limonite-stained, crystal-rich tuff.	<.014	24.8	<.05	.134	42.7	.585
1778	do.	NA	Crystal-rich, welded, ash-flow tuff.	.055	2.87	<.05	.214	<.226	.526
1779	Chip.	1.3	Silicified, fractured zone containing veinlets of quartz.	<.015	5.04	<.05	.121	1.05	.510
1780	do.	1.3	do.	<.013	4.95	<.05	.132	<.224	.465
1781	do.	.7	do.	<.013	2.05	<.05	<.10	.425	<.50
1782	Grab.	NA	Silicified breccia with quartz veinlets from small pit.	.017	3.83	<.05	<.10	.654	<.50
1783	Random chip.	NA	Silicified zone containing quartz veinlets.	<.013	3.78	<.05	.092	<.223	<.50
1784	do.	NA	Limonite-stained, silicified zone.	.135	10.2	<.05	<.10	.393	<.50
1785	do.	NA	Sheared, dark gray, silicified metasedimentary rock.	.107	5.50	<.05	.158	<.226	<.50
1786	do.	NA	Silicified zone containing quartz and limonite veinlets.	.021	104.	<.05	.119	4.24	<.50
1787	do.	NA	do.	.169	2.77	<.05	<.10	.401	<.50
1788	do.	NA	Limonite-stained, silicified shear zone.	.231	29.4	<.05	<.10	.716	<.50
1789	do.	NA	do.	.021	28.0	<.05	<.10	2.61	<.50
1790	do.	NA	do.	<.014	1.93	<.05	<.10	4.08	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1791	Random chip.	NA	Crystal-rich, welded tuff.	0.043	2.76	<0.05	<0.10	0.666	<0.50
1792	do.	NA	Silicified metasedimentary rock containing limonite veinlets.	.038	15.2	<.05	<.10	.848	<.50
1793	do.	NA	Limonite-stained, fractured, silicified tuff.	.048	8.96	<.05	<.10	1.15	<.50
1794	do.	NA	Silicified tuff containing veinlets of quartz and limonite along fractures.	.100	14.7	<.05	<.10	1.94	<.50
1795	do.	NA	Quartz-rich, limonite-stained, silicified metasedimentary rock.	.051	<.954	<.05	<.10	.334	<.50
1796	Grab.	NA	Limonite-stained, sheared, silicified metasedimentary rock.	.143	18.8	<.05	<.10	1.59	<.50
1797	do.	NA	do.	.158	15.4	<.05	<.10	1.65	<.50
1798	do.	NA	do.	.052	3.38	<.05	<.10	1.30	<.50
1799	Random chip.	NA	Silicified, ash-flow tuff.	<.014	5.00	<.05	.149	.333	<.50
1800	do.	NA	Brecciated, silicified, ash-flow tuff.	.140	77.4	<.05	.103	3.48	<.50
1801	Grab.	NA	Variegated, welded tuff.	.027	6.97	<.05	<.10	.263	<.50
1802	Random chip.	NA	Crystal-rich, gray dacite.	.045	1.37	<.05	<.10	<.222	<.50
1803	Grab.	NA	Crystal-rich dacite.	<.014	3.90	<.05	<.10	.641	<.50
1804	do.	NA	Crystal-rich dacite and ash-flow tuff breccia.	.014	5.46	<.05	<.10	.933	<.50
1805	do.	NA	Breccia, crystal-rich dacite, ash-flow tuff, and silicified volcanic rock from pit.	.019	2.33	<.05	<.10	.401	<.50
1806	Chip.	1.5	Silicified shear zone in ash-flow tuff.	.126	54.9	<.05	<.10	1.54	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1807	Chip.	0.7	Silicified shear zone in ash-flow tuff.	0.319	42.5	<0.05	<0.10	5.19	<0.50
1808	Grab.	NA	Ash-flow tuff.	.038	7.26	<.05	<.10	.806	<.50
1809	do.	NA	Bleached, variegated tuff.	.056	4.42	<.05	<.10	.458	<.50
1810	do.	NA	Ash-flow tuff.	.057	5.44	<.05	<.10	.910	<.50
1811	do.	NA	Altered, quartz-rich tuff.	.026	1.90	<.05	<.10	.584	<.50
1812	do.	NA	Altered, crystal-rich, gray, fractured, ash-flow tuff.	.029	1.05	<.05	<.10	.542	<.50
1813	Chip.	1.0	Quartz vein in silicified tuff exposed in pit.	.176	26.6	<.05	<.10	4.18	<.60
1814	do.	.5	Quartz vein in dark gray welded tuff.	1.26	31.1	1.36	.146	7.13	<.50
1815	Grab.	NA	Variegated, welded tuff and quartz float.	.156	15.8	<.05	<.10	2.56	<.50
1816	Random chip.	NA	Heavily altered, silicified, gray tuff.	.105	84.6	<.05	.400	2.23	<.50
1817	Grab.	NA	Bleached, silicified, ash-flow tuff.	.048	1.64	<.05	<.10	.539	<.50
1818	do.	NA	Gray, welded tuff.	.045	7.62	<.05	<.10	1.05	<.50
1819	do.	NA	Gray, fractured, silicified tuff.	.038	1.27	<.05	<.10	.706	<.50
1820	Chip.	1.0	Bleached, brecciated, quartz-rich tuff.	.018	<.931	<.05	<.10	.507	<.50
1821	Grab.	NA	Variegated tuff.	.039	2.85	<.05	<.10	.823	.510
1822	do.	NA	do.	.045	6.88	<.05	<.10	.841	<.50
1823	do.	NA	Variegated tuff and breccia.	.028	1.71	<.05	<.10	.781	<.50
1824	do.	NA	do.	.051	5.83	<.05	<.10	.852	<.50
1825	do.	NA	Sheared, silicified, ash-flow tuff.	.054	44.7	<.05	.123	2.38	<.66

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1826	Random chip.	NA	Silicified rhyolite.	0.156	5.59	<0.05	0.178	0.435	<0.50
1827	do.	NA	Zone of jasperoid.	.033	113.	<.05	.157	2.55	.504
1828	Grab.	NA	Light gray, altered, welded tuff.	.08	2.84	<.05	.103	.621	<.50
1829	do.	NA	Variegated tuff.	.04	1.21	<.05	<.10	.543	<.50
1830	do.	NA	do.	.068	3.24	<.05	<.10	.733	<.50
1831	do.	NA	Vesicular, welded, gray tuff.	.031	1.65	<.05	<.10	.620	<.50
1832	do.	NA	Bleached, variegated tuff.	.043	3.09	<.05	<.10	.801	<.56
1833	do.	NA	Variegated tuff and quartz float.	.047	4.20	<.05	<.10	.877	<.50
1834	do.	NA	Tan, ash-flow tuff.	.037	8.02	<.05	<.10	.590	<.50
1835	do.	NA	Vesicular, ash-flow tuff.	.341	17.4	<.05	.810	4.73	.614
1836	Random chip.	NA	Silicified, ash-flow tuff.	.025	3.04	<.05	<.10	.818	<.50
1837	Grab.	NA	Quartz breccia and silicified tuff breccia float.	.066	6.10	<.05	.114	1.01	<.50
1838	do.	NA	Variegated, silicified tuff.	.027	6.35	<.05	<.10	1.79	<.50
1839	do.	NA	Silicified, welded tuff.	.018	1.79	<.05	<.10	.714	<.50
1840	do.	NA	Variegated tuff.	.028	<.942	<.05	<.10	.307	<.50
1851	Random chip.	NA	Limonite-stained, silicified fault breccia.	<.013	41.4	<.05	<.10	1.06	<.50
1852	do.	NA	Silicified fault breccia containing quartz veinlets.	.078	8.99	<.05	<.10	.427	<.50
1853	Grab.	NA	Silicified metasedimentary rock and quartz from trench.	.059	26.9	<.05	<.10	1.41	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1854	Random chip.	NA	Limonite-stained, partially silicified, sheared metasedimentary rock.	<0.014	11.6	<0.05	<0.10	0.784	<0.50
1855	do.	NA	Hematite-stained, silicified fault breccia.	<.013	1.35	<.05	<.10	.637	<.50
1856	do.	NA	Limonite- and hematite-stained, dark gray, silicified fault breccia.	.049	6.23	<.05	<.10	.645	<.50
1857	Chip.	0.8	Limonite- and hematite-stained breccia zone in silicified metasedimentary rock.	1.13	344.	.193	<.10	6.28	<.50
1858	Random chip.	NA	Silicified, brecciated metasedimentary rock and coxcomb quartz.	1.13	57.0	<.05	<.10	1.92	<.50
1859	Select.	NA	Brecciated, limonite-stained sandstone cemented with calcite.	.384	63.3	<.05	<.10	5.46	<.50
1860	Random chip.	NA	Partially silicified, green metasedimentary rock.	.076	11.1	<.05	.142	.721	<.50
1861	do.	NA	Light-colored, silicified metasedimentary rock.	<.014	5.03	<.05	<.10	.302	<.50
1862	do.	NA	Limonite-stained, silicified fault breccia.	.061	5.99	<.05	<.10	.241	<.50
1863	do.	NA	Limonite-stained, silicified metasedimentary rock.	<.013	2.95	<.05	.109	.866	<.50
1864	do.	NA	Purple metasiltstone.	.015	1.27	<.05	<.10	.916	<.50
1865	Grab.	NA	Purple and light green, silicified siltstone.	.03	7.90	<.05	<.10	1.57	<.50
1866	Random chip.	NA	Limonite-stained, partially silicified, sheared siltstone.	.454	269.	.093	.180	7.74	<.50
1867	Grab.	NA	Schistose metasedimentary rock.	.156	64.2	<.05	<.10	4.48	<.50
1868	Random chip.	NA	Purple and green metasiltstone.	<.013	8.63	<.05	<.10	1.48	<.50
1869	do.	NA	Limonite-stained, sheared, schistose siltstone.	.983	747.	.076	<.10	16.6	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1870	Random chip.	NA	Limonite-stained, silicified siltstone.	0.331	171.	<0.05	<0.10	2.13	<0.50
1871	do.	NA	Purple metasiltstone.	<.013	1.33	<.05	<.10	.929	<.50
1872	do.	NA	Hematite-stained, silicified fault breccia.	.013	4.01	<.05	<.10	.438	<.50
1873	do.	NA	Limonite-stained, moderately silicified, variegated, metasedimentary rock.	.015	<.879	<.05	<.10	.307	<.50
1874	do.	NA	Purple siltstone.	.021	5.76	<.05	<.10	1.47	<.50
1875	Grab.	NA	Limonite-stained siltstone.	.105	35.4	<.05	<.10	1.83	<.50
1876	Random chip.	NA	Dark colored, silicified metasedimentary rock.	.113	25.9	<.05	<.10	1.67	<.50
1877	do.	NA	Rhyolite dike trending N. 20° W. and dipping vertically in metasedimentary rock.	.066	1.01	<.05	<.10	.458	<.50
1878	do.	NA	Bleached, silicified, brecciated metasedimentary rock.	<.013	3.85	<.05	<.10	.267	<.50
1879	do.	NA	Dark green metasedimentary rock.	<.014	2.16	<.05	<.10	1.65	<.50
1880	do.	NA	Silicified, brecciated, metasedimentary rock.	<.014	<.958	<.05	<.10	<.239	<.50
1881	do.	NA	Bright red, silicified siltstone.	.112	164.	<.05	.160	20.4	<.50
1882	Select.	NA	Limonite-stained, sheared, metasedimentary rock containing calcite veinlets.	.126	26.0	<.05	.137	3.14	<.50
1883	Grab.	NA	Light gray, partially welded, ash-flow breccia.	.03	<.906	<.05	<.10	.309	<.50
1884	Random chip.	NA	do.	.039	<.963	<.05	<.10	.505	<.50
1885	do.	NA	do.	.034	6.34	<.05	<.10	.431	<.50
1886	do.	NA	Bleached, limonite-stained, ash-flow breccia.	.138	37.6	<.05	<.10	1.26	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1887	Grab.	NA	Limonite-stained, metasedimentary rock and ash-flow breccia.	0.064	40.7	<0.05	<0.10	1.57	<0.50
1888	Random chip.	NA	Partially silicified, dark green metaconglomerate.	.035	3.24	<.05	.125	.397	<.50
1889	do.	NA	Limonite-stained, silicified, light-colored breccia.	.046	11.7	<.05	.279	.729	.475
1890	Grab.	NA	Light-colored, silicified, metasedimentary float.	.079	52.0	<.05	.274	1.18	<.50
1891	do.	NA	Hematite- and limonite-stained, silicified fault breccia.	.021	4.55	<.05	.199	.567	.474
1892	do.	NA	Limonite-stained, silicified metasiltstone.	<.014	<.904	<.05	.159	.349	.596
1893	Random chip.	NA	Limonite-stained, silicified, metasedimentary rock containing quartz veinlets.	<.013	5.41	<.05	.143	<.218	.515
1894	do.	NA	Tan, silicified, metasedimentary rock.	2.03	20.1	.127	<.10	1.97	<.50
1895	do.	NA	Limonite-stained, silicified, brecciated, ash-flow tuff.	.028	1.92	<.05	<.10	.490	<.50
1896	do.	NA	Leached, ash-flow tuff.	2.33	10.5	<.05	.476	18.2	<.50
1897	do.	NA	Light gray, bleached, partially silicified, metasedimentary rock.	<.014	<.926	<.05	<.10	<.231	<.50
1898	do.	NA	Purple and green, moderately silicified, metaconglomerate.	<.014	3.53	<.05	<.10	1.09	<.50
1899	do.	NA	Leached rhyolite dike.	.092	11.9	<.05	<.10	1.26	<.50
1900	do.	NA	Dark green metasedimentary rock.	.028	5.41	<.05	.124	.655	.761
1901	Grab.	NA	Silicified float with vugs and fractures filled with limonite.	.015	23.8	<.05	.125	<.236	.504
1902	do.	NA	do.	.582	134.	<.05	.201	4.93	.820
1903	do.	NA	Limonite-stained, silicified breccia.	.024	17.1	<.05	.205	1.55	.512

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1904	Grab.	NA	Limonite-stained, silicified breccia containing quartz veinlets.	5.53	1156	0.289	2.11	36.6	3.34
1905	do.	NA	do.	.210	184.	<.05	.162	7.01	.483
1906	Random chip.	NA	Limonite-stained, pyrite-bearing, silicified breccia.	.054	24.9	<.05	<.10	.619	<.50
1907	do.	NA	Pale green, metasedimentary rock.	.069	5.86	<.05	<.10	.370	<.50
1908	Grab.	NA	Limonite-stained, bleached, silicified breccia.	4.22	795.	<.05	4.10	63.6	4.92
1909	do.	NA	Slightly limonite-stained metasedimentary rock.	.029	29.8	<.05	<.10	.799	<.50
1910	do.	NA	do.	<.013	14.5	<.05	<.10	5.66	<.50
1911	do.	NA	do.	<.015	2.44	<.05	<.10	.386	<.50
1912	do.	NA	Crystal-rich, welded tuff.	<.014	38.9	<.05	<.10	6.03	<.50
1913	Select.	NA	Leached, limonite-stained, silicified metasedimentary rock.	1.38	341.	<.05	1.05	33.6	.877
1914	Grab.	NA	Partially silicified, limonite-stained metasedimentary rock.	.046	20.8	<.05	<.10	.996	<.50
1915	do.	NA	Limonite-stained, silicified metasedimentary rock.	.015	2.62	<.05	<.10	1.03	<.50
1916	do.	NA	Partially silicified ash-flow tuff.	.031	7.04	<.05	<.10	.647	<.50
1917	Random chip.	NA	Fractured, slightly silicified ash-flow tuff.	.015	1.26	<.05	<.10	.934	<.50
1918	Grab.	NA	Partially silicified, limonite-stained metasedimentary rock.	.111	50.0	<.05	<.10	1.39	<.50
1919	do.	NA	do.	.350	10.8	<.05	.218	3.26	<.50
1920	do.	NA	Limonite-stained metasedimentary rock.	.017	6.76	<.05	<.10	.870	<.50

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1921	Select.	NA	Limonite-stained metasedimentary rock.	<0.014	6.32	<0.05	0.320	1.29	0.561
1922	Grab.	NA	Limonite-stained welded tuff.	.026	2.50	<.05	.166	.471	.610
1923	do.	NA	do.	.035	1.45	.05	.216	<.236	.489
1924	Select.	NA	Brecciated, silicified, limonite-stained metasedimentary rock.	.519	380.	<.05	.556	19.8	.521
1925	Chip.	1.5	Sheared, silicified, limonite-stained metasedimentary rock.	.505	279.	.054	.114	8.65	.572
1926	Random chip.	NA	Limonite- and hematite-stained, brecciated, silicified metasedimentary rock.	.481	167.	<.05	.254	10.3	.536
1927	Select.	NA	Bleached, limonite-stained, sheared, silicified metasedimentary rock.	.024	11.8	<.05	<.10	.594	<.50
1928	do.	NA	do.	.441	87.6	<.05	<.10	3.45	<.56
1929	do.	NA	Limonite-stained, silicified, galena-bearing metasedimentary rock.	17.0	24.6	.112	<.10	9.19	<.50
1930	do.	NA	Galena-bearing, silicified metasedimentary rock.	2.89	16.8	.616	<.10	1.95	.521
1931	do.	NA	Silicified, sheared, metasedimentary rock containing quartz veinlets.	.034	31.2	<.05	<.10	2.01	.546
1932	Random chip.	NA	do.	.158	76.3	<.05	<.10	2.02	<.50
1933	Chip.	8.0	Silicified shear zone trending N. 15° E. in metasedimentary rock.	5.63	787.	.143	<.10	58.3	<.50
1934	Grab.	NA	Limonite-stained, silicified metasedimentary rock from dump.	1.06	757.	.225	<.10	25.5	<.73
1935	Select.	NA	Bleached, limonite-stained, silicified breccia.	.056	11.9	<.05	<.10	1.46	<.77

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1936	Random chip.	NA	Limonite-stained, silicified, shear zone in metasedimentary rock.	0.417	98.2	<0.05	<0.10	12.0	<0.60
1937	Select.	NA	Limonite-stained, silicified metasedimentary rock.	<.014	5.60	<.050	<.10	.489	<.50
1938	do.	NA	do.	.066	28.7	<.05	<.10	1.20	<.50
1939	do.	NA	Hematite-stained, silicified, metasedimentary rock.	.063	10.1	<.05	<.10	3.09	<.50
1940	do.	NA	Silicified, limonite-stained breccia.	.051	7.62	<.05	<.10	1.01	<.50
1941	Grab.	NA	do.	.102	61.1	<.05	<.10	2.93	<.50
1942	Select.	NA	Silicified breccia containing veinlets of quartz and limonite.	.033	11.4	<.05	<.10	1.22	<.50
1943	do.	NA	Dark gray, silicified, limonite-stained metasedimentary rock.	<.014	56.8	<.05	<.10	2.34	<.50
1951	Random chip.	NA	Sheared metasedimentary rock and tuff.	.047	3.04	<.05	.205	.484	.669
1952	do.	NA	Limonite-stained, silicified metasedimentary rock.	.167	112.	<.05	.300	2.15	.476
1953	do.	NA	do.	.064	14.0	<.05	.186	.277	<.50
1954	do.	NA	Partially silicified, purple and green metasedimentary rock.	.045	1.71	<.05	<.10	.777	<.64
1955	do.	NA	Purple to brown siltstone.	<.013	1.07	<.05	<.10	1.27	<.50
1956	Grab.	NA	Silicified, purple siltstone from badly sloughed open cut.	<.014	1.09	<.05	<.10	<.233	<.50
1957	Random chip.	NA	Dark green metasiltstone with calcite veinlets.	.045	2.11	<.05	<.10	1.15	<.58
1958	Grab.	NA	Green and purple, silicified, brecciated siltstone.	<.014	1.51	<.05	<.10	.526	<.50
1959	Random chip.	NA	Limonite-stained, sheared, green siltstone.	.112	10.5	<.05	<.10	2.62	<.62

TABLE A-7.--Descriptions and analyses for samples shown on figures A-15 through A-18, Werdenhoff prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony	Thallium
1960	Random chip.	NA	Limonite-stained, partially silicified, green metasedimentary rock.	0.065	6.33	<0.05	<0.10	1.29	<0.50
1961	do.	NA	Purple metasiltstone with fractures filled with quartz.	.017	5.23	<.05	<.10	1.40	<.50
1962	do.	NA	Hematite-stained, silicified, brecciated siltstone.	.287	80.5	.058	<.10	3.53	.541
1963	do.	NA	Porphyritic intrusive rock at contact with metasedimentary rock.	.187	52.0	<.05	<.10	.452	<.65
1964	do.	NA	Fissile, green, metasiltstone.	.178	18.6	<.05	<.10	.674	<.50
1965	Grab.	NA	Sheared, partially silicified, green metasedimentary rock.	.145	24.8	<.05	<.10	.852	.446
1971	do.	NA	Hematite-stained, silicified, brecciated metasedimentary rock.	.043	3.25	<.05	<.10	.409	<.50
1972	Random chip.	NA	Limonite-stained, silicified, brecciated metasedimentary rock.	.045	6.95	<.05	<.10	.401	<.50
1973	Chip	3.0	Bleached, limonite-stained shear zone trending N. 70° W. and dipping 80° SW.	.09	10.4	<.05	<.10	1.15	<.52
1974	Random chip.	NA	Silicified metasedimentary rock.	.109	202.	<.05	.344	10.6	<.50

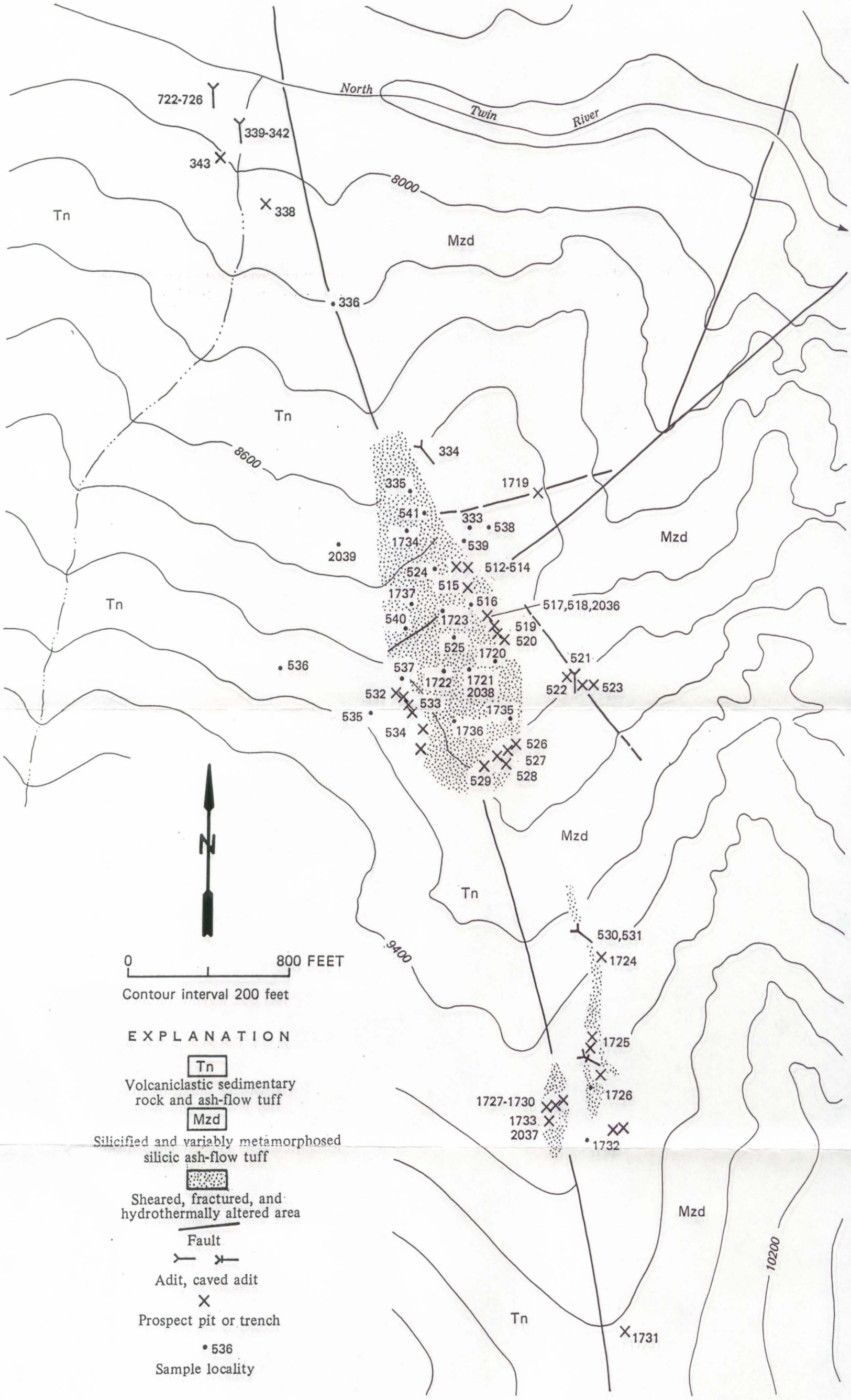


FIGURE A-20.--Workings, sample sites, and generalized geology, Tip Top prospect

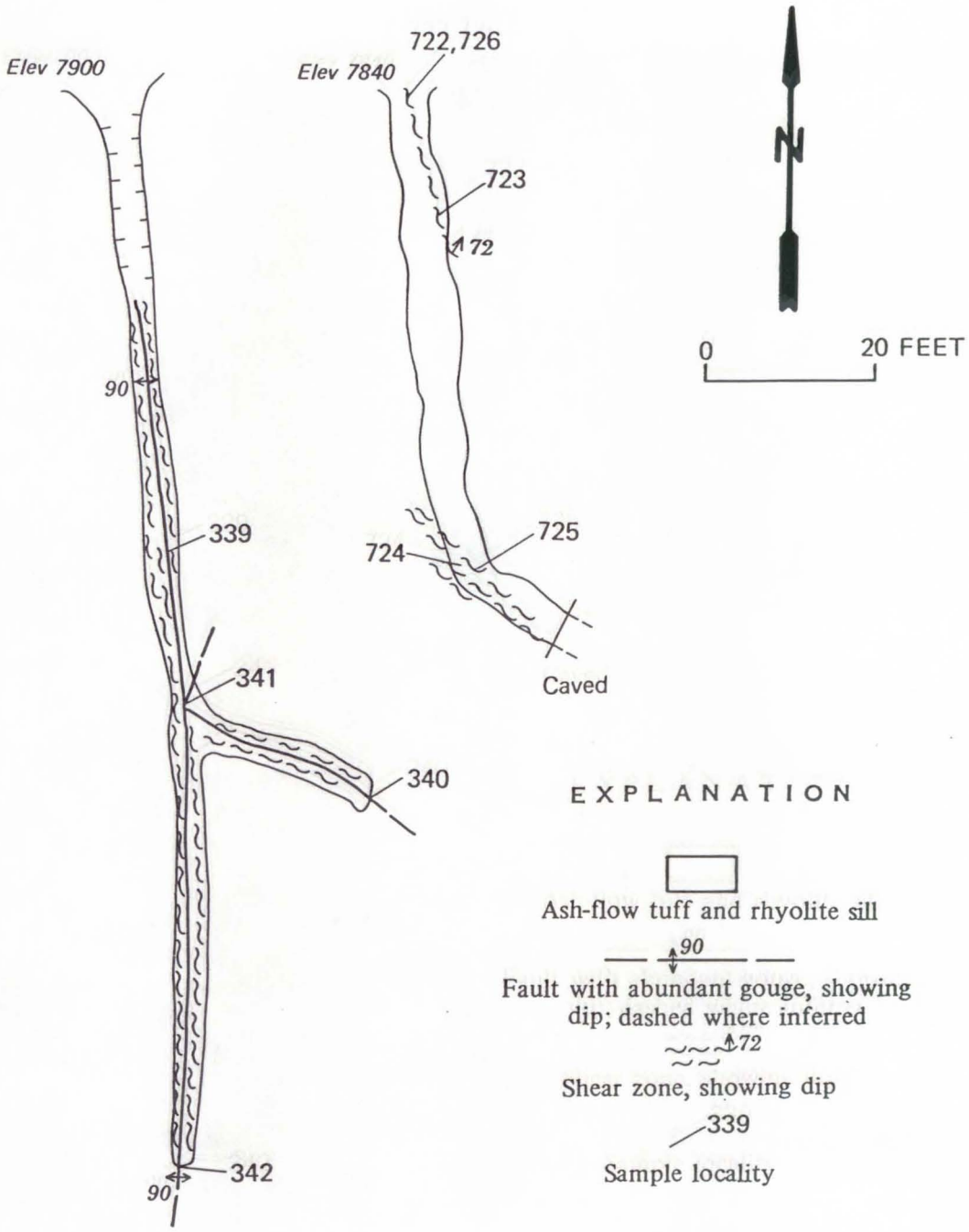


FIGURE A-21.—Underground workings showing generalized geology and sample sites, Tip Top prospect

FIGURE A-22.--View looking southeast at the Tip Top prospect.

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
333	Chip.	20.0	Limonite-stained felsite.	11.0	--	<0.07	<100	500	200
334	do.	3.0	Limonite-stained, fractured, silicified, argillized felsite.	.3	--	<.07	<100	<100	<100
335	do.	20.0	Limonite-stained, fine-grained rhyolite dike striking N. 20° W. and dipping 80° SE.	.3	--	<.07	<100	<100	<100
336	do.	20.0	Fault zone in volcanic rocks.	.3	--	<.07	<100	<100	<100
338	Grab.	NA	Altered fault breccia from dump of trench.	41.4	4271.	<.05	202.0	1.19%	925.0
339	Chip.	3.5	Silicified shear zone in altered rhyolite.	5.89	408.0	<.05	9.27	191.0	140.0
340	do.	3.0	Shear zone containing fault gouge.	14.6	636.0	<.05	15.1	224.0	496.0
341	do.	4.0	Limonite-stained, silicified rhyolite.	7.89	565.0	<.05	13.5	139.0	362.0
342	do.	3.5	Shear zone containing gouge and pyrite casts.	6.33	734.0	<.05	6.76	133.0	250.0
343	Grab.	NA	Ash-flow tuff from sloughed pit.	.406	22.1	<.05	6.24	42.3	38.1
512	Select.	NA	Slightly brecciated, silicified, anglesite- and limonite-stained tuff.	182.0	7581.	.178	149.0	2.31%	382.0
513	Grab.	NA	Bleached, limonite-stained, moderately fractured, silicified tuff.	12.5	504.0	.591	45.2	1958.	161.0
514	Chip.	2.0	Silicified shear zone trending N. 50° W. and dipping 65° SW.	20.4	8831.	.578	93.7	4885.	188.0
515	Grab.	NA	Slightly brecciated, bleached, anglesite- and limonite-stained tuff.	137.0	1.42%	.11	198.0	2.16%	158.0
516	do.	NA	Partially silicified, limonite-stained, bleached tuff.	24.7	1062.	.142	23.8	3823.	102.0

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
517	Chip.	2.8	Shear zone containing slightly silicified, limonite- and anglesite-stained, bleached tuff.	178.0	1.42%	0.219	224.0	1.64%	322.0
518	Random chip.	NA	Slightly brecciated, bleached, limonite-stained felsite.	6.38	298.0	<.05	27.7	835.0	90.4
519	Select.	NA	Heavily limonite-stained, silicified tuff.	13.2	6714.	.07	176.0	5788.	937.0
520	Chip.	1.8	Shear zone containing bleached, limonite-stained, brecciated tuff and clay.	10.9	4347.	<.05	32.7	2227.	71.1
521	do.	3.0	North-trending, west-dipping shear zone containing bleached, limonite-stained felsite.	37.9	1.34%	.465	82.8	6667.	349.0
522	do.	.3	Shear zone containing felsite and galena.	1068.	1.74%	.072	283.0	21.4%	6532.
523	Random chip.	NA	Gray, fine-grained felsite.	1.92	240.0	<.05	8.09	227.0	1070.
524	do.	NA	Brecciated, silicified, bleached, limonite-stained felsite.	5.97	243.0	.061	9.49	807.0	83.0
525	do.	NA	Bleached, moderately silicified, limonite-stained felsite.	.708	386.0	.172	18.4	132.0	59.8
526	do.	NA	Brecciated, limonite-stained, silicified felsite containing small quartz veinlets.	8.52	4537.	.245	51.4	1056.	140.0
527	do.	NA	Brecciated, anglesite- and limonite-stained, vuggy felsite.	55.1	1.06%	.67	323.0	3043.	244.0
528	do.	NA	do.	110.0	1.38%	.499	216.0	6301.	142.0
529	do.	NA	do.	42.4	3728.	.056	93.5	6333.	273.0
530	Chip.	2.5	Sheared, limonite-stained, gray felsite.	43.2	1.91%	<.05	168.0	6091.	586.0

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
531	Select.	NA	Bleached, limonite-stained felsite containing galena pyrite, and arsenopyrite from stockpile near 27.5-ft-long adit.	237.0	21.2%	1.31	760.0	1.15%	18.6
532	do.	NA	Bleached, limonite-stained tuff.	17.1	1695.	<.05	38.1	2003.	334.0
533	do.	NA	Bleached, brecciated, anglesite- and limonite-stained tuff.	51.2	3241.	<.05	85.5	8097.	562.0
534	Random chip.	NA	Relatively unaltered, gray tuff containing white ash clasts to 0.5 in. diameter. Joints in the tuff are limonite stained.	0.412	28.1	<.05	2.53	75.6	46.1
535	do.	NA	do.	.17	11.6	<.05	1.37	31.8	32.0
536	do.	NA	do.	.163	2.72	<.05	4.33	42.3	31.9
537	Grab.	NA	do.	.112	11.6	<.05	2.43	22.0	33.6
538	Random chip.	NA	Gray felsite.	.067	12.5	<.05	5.03	12.8	82.3
539	do.	NA	Bleached, limonite-stained, brecciated tuff.	.61	31.4	<.05	3.21	40.7	25.7
540	do.	NA	Bleached, limonite-stained, moderately silicified tuff.	.441	92.1	<.05	3.59	24.5	18.0
541	Chip.	35.0	Heavily limonite-stained, silicified tuff.	.819	37.5	<.05	7.56	72.2	89.3
722	do.	1.0	Shear zone trending N. 20° W. and dipping 72° NE. in rhyolite.	3.4	--	<.005	4	44	78
723	do.	1.0	do.	4.0	--	<.005	4	40	58
724	do.	2.0	Silicified, pyrite-bearing shear zone trending N. 40° W. and dipping 72° SW. in rhyolite.	3.2	--	<.005	4	36	34
725	do.	4.5	do.	2.6	--	<.005	2	28	33

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
726	Chip.	5.0	Limonite-stained rhyolite porphyry containing pyrite casts.	2.6	--	<0.005	2	22	40
1719	do.	5.0	Shear zone trending N. 25° E. and dipping 70° SE. in dark green felsite.	2.38	815.	<.05	22.5	74.0	260.
1720	Random chip.	NA	Bleached, limonite-stained, fractured felsite.	2.84	563.	<.05	35.3	805.	437.
1721	do.	NA	Strongly altered, sulfide-bearing, fractured tuff.	.387	58.1	<.05	15.8	29.6	187.
1722	do.	NA	Limonite- and anglesite-stained, fractured, silicified quartz porphyry.	3.90	651.	<.05	41.4	1375	117.
1723	do.	NA	Bleached, limonite-stained, fractured, silicified felsite.	1.00	547.	<.05	11.3	36.1	17.0
1724	Select.	NA	Bleached, sulfide-bearing, fractured, limonite-stained felsite from open cut.	31.6	726.	<.05	357.	2874	1.05%
1725	do.	NA	Anglesite- and limonite-stained, silicified fault breccia from stockpile.	20.0	5487	.056	298.	1604	3303
1726	Chip.	100.0	Silicified, bleached, limonite-stained fault zone in felsite.	7.95	1042	<.05	57.1	1765	357.
1727	do.	10.0	Anglesite- and limonite-stained, sulfide-bearing zone in larger fault zone.	24.3	3687	<.05	75.6	5036	451.
1728	do.	10.0	Hematite- and limonite-stained, pyrite-, galena-, and sphalerite-bearing zone in larger fault zone.	16.7	1781	.190	114.	6505	2841
1729	do.	10.0	Limonite- and anglesite-stained, silicified, bleached, brecciated felsite.	20.9	6440	.063	152.	4371.	988.
1730	Random chip.	NA	Anglesite-stained, bleached, fractured quartz porphyry.	13.3	5303	<.05	83.7	1789	47.9
1731	Grab.	NA	Ash-flow tuff from sloughed pit.	.268	80.1	<.05	10.7	35.1	48.8

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
1732	Select.	NA	Bleached, fractured, silicified felsite containing pyrite casts.	12.4	6312	<0.05	92.0	2984	114.
1733	Random chip.	NA	Anglesite- and limonite-stained, bleached, fractured quartz porphyry exposed in cut.	2.41	106.	<.05	6.28	115.	39.9
1734	do.	NA	Hematite- and limonite-stained, bleached, silicified felsite.	1.40	53.0	<.05	7.75	127.	40.3
1735	do.	NA	do.	.246	96.4	<.05	6.88	116.	229.
1736	do.	NA	Limonite-stained, bleached, silicified felsite.	3.54	247.	<.05	26.1	710.	755.
1737	do.	NA	Limonite-stained, bleached, silicified, ash-flow tuff.	.606	90.1	<.05	4.48	19.5	8.69
2036	Petrographic.		A yellow-green stained, grayish-white quartz porphyry that has been fractured and mineralized with quartz, galena, anglesite, and limonite.						

Quartz phenocrysts are up to 1.5 mm across, and occur in a sericitized felsic groundmass with 0.1 mm grain size. Some completely sericitized feldspar phenocrysts up to 1.5. mm long are present. Phenocrysts comprise perhaps 10% of the rock.

The rock is cut by fractures up to 3.5 mm wide that comprise 1/4 of this section. These fractures are largely filled with microcrystalline and cryptocrystalline quartz. Microcrystalline quartz tends to occur along the walls of fractures, and has micro-comb structure. The larger quartz-filled fractures are shear (in contrast to extension) fractures, and contain brecciated fragments of the host rock.

Mostly oxidized cubic crystals of galena, up to 1 mm across, occur in fracture zones that roughly parallel the quartz-filled fractures. These fractures are now largely filled with anglesite (pale yellow-green color in hand sample) and minor limonite. Anglesite also fills cubic voids in the groundmass, and generally has radial habit. Minute grains of fresh galena can be seen in the hand sample. Prior to oxidation the rock contained about 1% galena. Anglesite also fills narrow fractures that cut the quartz-filled fractures.

This sample obviously came from a fault zone. The geologic history is as follows: (1) Formation of quartz porphyry, (2) fracturing, (3) mineralization with quartz and sericitic alteration of feldspar, (4) fracturing, (5) mineralization with galena, (6) fracturing, (7) oxidation of galena to anglesite.

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect--Continued

Sample No.	Type	Description
2037	Petrographic.	A sericitized rhyolite porphyry consisting of 90% felsic groundmass, 8% quartz phenocrysts, and 2% sanidine phenocrysts. Quartz phenocrysts are up to 3 mm across, and sometimes are intergrown with sanidine. Sanidine phenocrysts are up to 2.2 mm across and are partly sericitized. Groundmass grains generally are 0.02 - 0.15 mm across, and the sanidine grains here are partly sericitized. The rhyolite is cut by occasional fractures, 0.1 - 0.5 mm wide, that are filled with microcrystalline quartz and limonite. These fractures are relatively straight and even like extension fractures, and the quartz grains that fill them are anhedral to subhedral. Minor limonite in these fractures may be from oxidized pyrite. This rock appears to be the same as 2036, except for this sample being from outside the shear zone of the fault and thus not heavily fractured or mineralized.
2038	do.	A white spotted, grayish-green, altered dacite porphyry that originally consisted of 92% groundmass, 7% plagioclase phenocrysts, 2% amphibole phenocrysts, and quartz phenocrysts. The groundmass is plagioclase-rich with lesser amounts of altered amphibole and K-feldspar. Plagioclase is heavily altered to sericite and carbonate. Amphibole is completely altered to calcite, chlorite, and rutile. Groundmass grains are up to 1/4 mm across, but commonly are less than 0.1 mm. Plagioclase phenocrysts are up to 5 mm across and are almost completely altered to sericite and carbonate. Amphibole phenocrysts are up to 2 mm long, and have been completely altered to calcite, chlorite, rutile, and pyrite (oxidized to limonite). Rounded quartz phenocrysts are up to 1 mm across, and are partly replaced by calcite. Some quartz phenocrysts have been crushed into fragments. Limonite-stained fractures cut the rock. Parallel alignment of plagioclase crystals indicate a weak flow structure, but at the same time inhomogeneities in the rock and broken quartz phenocrysts suggest it may be a breccia or possibly a tuff. The intense alteration obscures the true origin of this rock, but examination of a sawed slab of a larger sample may solve this problem. Sericitic alteration appears to pre-date calcite alteration.

TABLE A-8.--Descriptions and analyses for samples shown on figures A-20 and A-21, Tip Top prospect--Continued

Sample No.	Type	Description
2039	Petrographic.	A grayish-tan, devitrified, rhyolite tuff containing crystals and angular crystal fragments of quartz, sanidine, plagioclase, and altered biotite. These mineral grains generally are 1/4 - 2 mm across, and account for less than 10% of the rock. Most of the tuff consists of glassy rock fragments, ash (including glass shards), and pumice. Individual rock fragments are up to 4 mm across. The rock has spherulitic texture; however, it is not strongly welded, indicated by the lack of eutaxitic texture. Plagioclase (albite) is moderately altered to smectite. Biotite has been replaced by muscovite + rutile. Occasional cubic pyrite grains up to 3/8 mm across have been oxidized to limonite. Microcrystalline quartz fills voids. Thus, it may be concluded this rhyolite tuff has undergone weak alteration and mineralization.

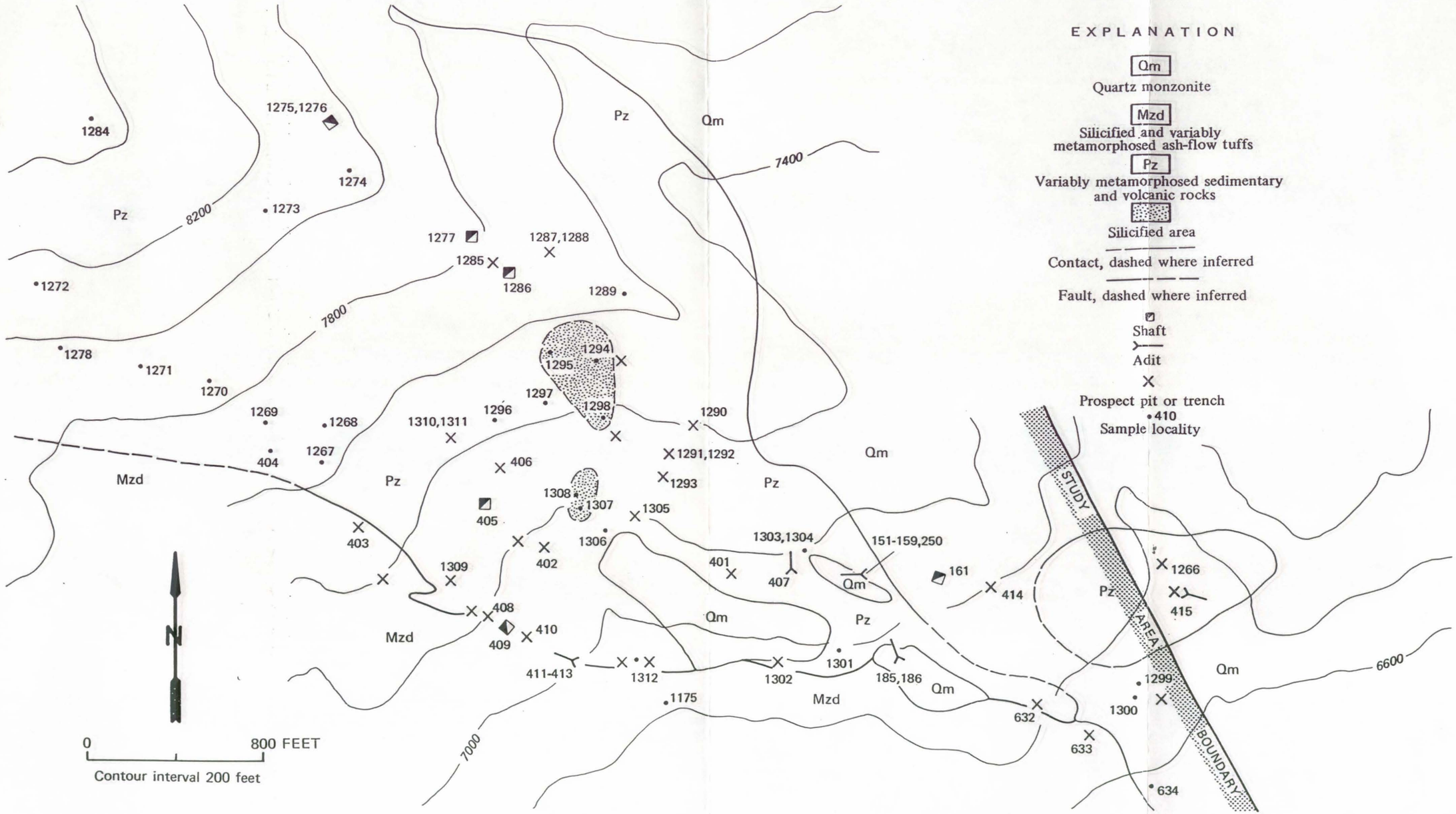


FIGURE A-23.—Workings, sample sites, and generalized geology, Teichert prospect

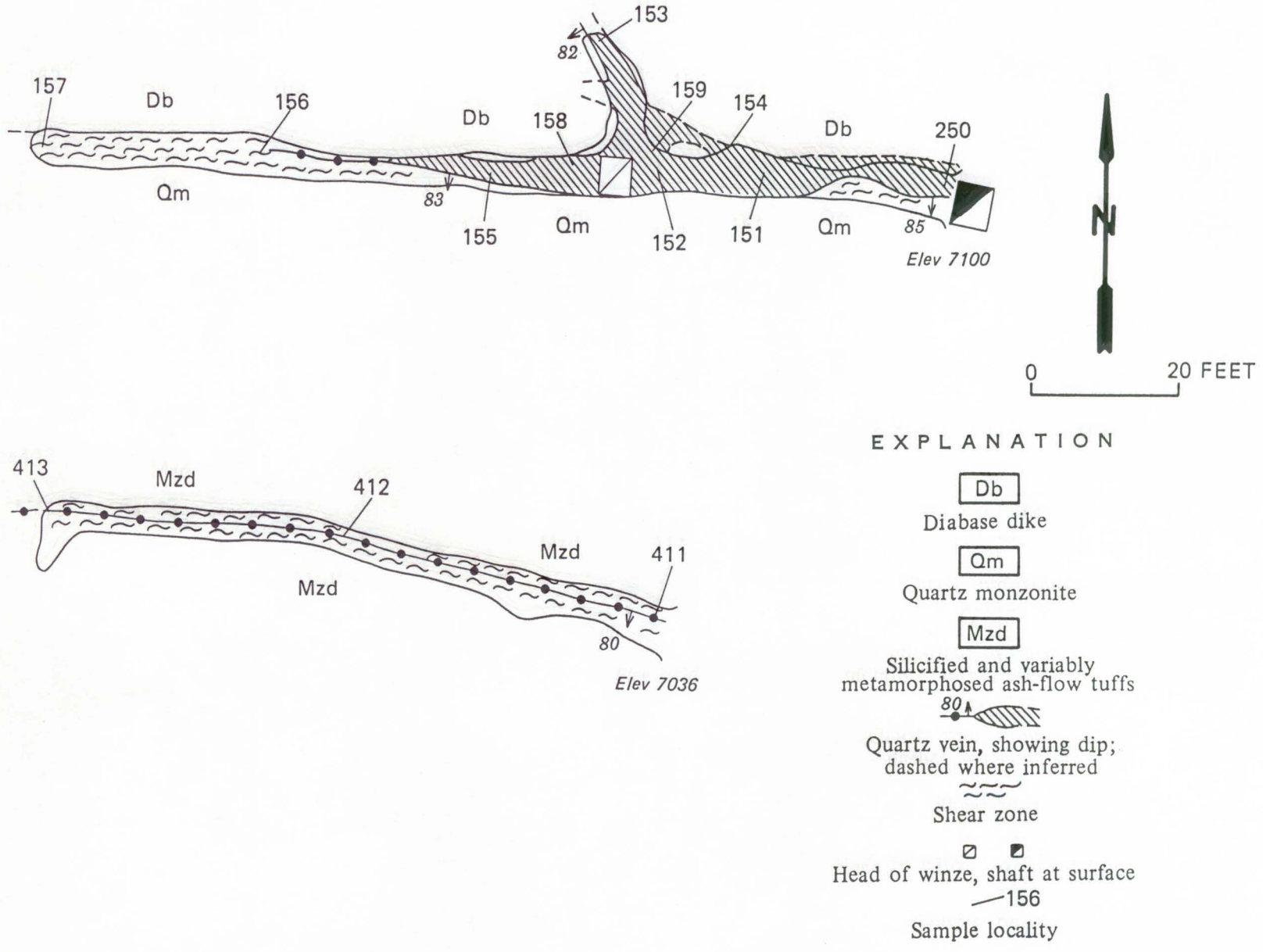


FIGURE A-24.—Underground workings showing generalized geology and sample sites, Teichert prospect

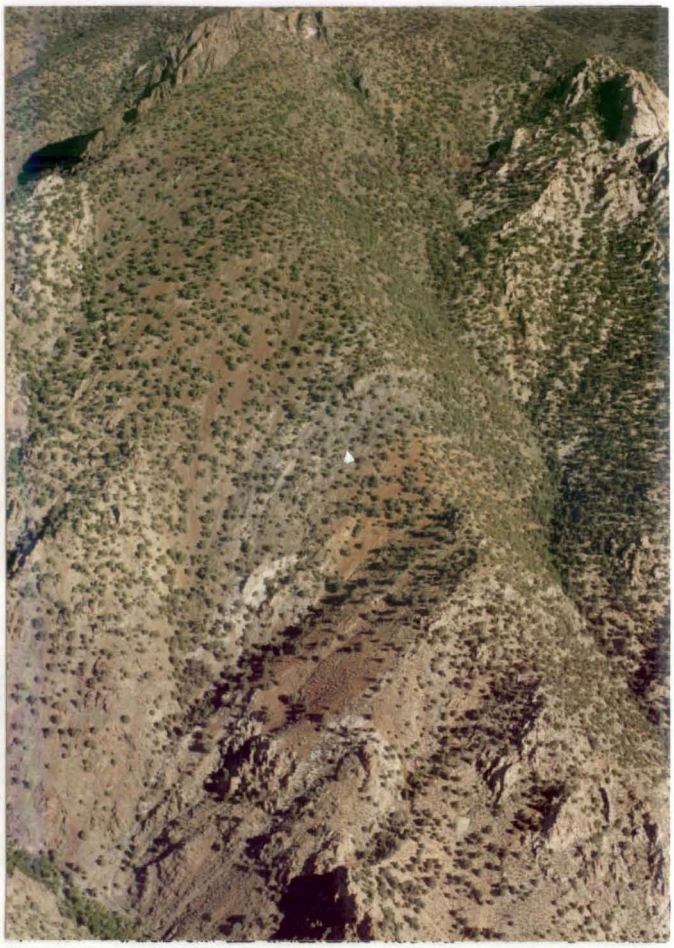


FIGURE A-25.--View looking northwest at the Teichert prospect.

TABLE A-9.--Descriptions and analyses for samples shown on figures A-23 and A-24, Teichert prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Zinc
151	Chip.	3.8	Malachite-stained, galena- and pyrite-bearing quartz vein.	41.0	850	0.48	3450	37	1.2%	2.5%
152	do.	3.5	Pyrite-, arsenopyrite-, galena-, sphalerite-, and chalcopyrite-bearing quartz vein.	46.0	6500	8.36	2910	15	3.32%	11.5%
153	do.	3.0	Sulfide-bearing quartz vein and diabase.	19.0	1100	.27	257	67	2200	4490
154	do.	1.2	Malachite-stained quartz vein containing pods of sphalerite, stibnite, and pyrite.	53.0	320	.21	1840	85	2060	2.39%
155	do.	2.0	Quartz vein containing pyrite and fault gouge.	38.0	1800	.48	1390	40	6290	2.5%
156	do.	4.5	Sheared felsite, fault gouge, and sulfide-bearing quartz stringers.	160.	1.46%	1.44	3350	42	1.8%	5550
157	do.	4.0	do.	31.	440	.07	960	85	3800	4120
158	Select.	NA	Grab from the best sulfide-bearing zones over a 6-ft length.	64.	660	4.32	5260	370	8.69%	5.4%
159	Chip.	5.0	Sphalerite-rich zone in quartz vein.	55.0	750	.34	2370	9	2880	1.56%
161	do.	4.0	Fault gouge and limonite-stained quartz vein at 44-ft-deep shaft.	38.0	570	.82	390	45	2170	317
185	do.	3.0	Quartz vein striking N. 80° W. and dipping 80° SW. at portal of flooded adit.	4.80	--	<.07	300	30	300	1700
186	Select.	NA	Limonite-stained, calcite-, galena-, sphalerite-, and pyrite-bearing quartz from dump.	40.1	--	1.30	700	10	1.21%	3.31%
250	Chip.	5.0	Limonite-stained quartz and diabase near 41-ft-deep shaft.	36.4	313.0	.214	1361.	61.4	9371.	1.24%
401	do.	3.0	Fault zone containing quartz veins up to 10 in. thick, sheared argillite, and gouge.	.774	34.1	<.05	8.59	9.76	8.23	47.6

TABLE A-9.--Descriptions and analyses for samples shown on figures A-23 and A-24, Teichert prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Zinc
402	Grab.	NA	Quartz and limonite-stained argillite from two pits.	1.37	40.6	<0.05	14.1	11.5	81.7	144.0
403	do.	NA	Quartz from 4-in.-thick veins striking N. 20° W. and dipping 65° SW.	.44	39.5	<.05	12.4	14.5	34.5	36.7
404	Chip.	8.0	Zone of quartz veinlets and pods striking N. 70° W. and dipping 85° SW. in argillite.	1.47	79.7	.09	25.4	14.1	49.4	112.0
405	do.	5.0	Fault zone containing quartz veins up to 10 in. thick and sheared argillite.	12.3	110	<.07	94	25	117	650
406	do.	3.0	Fault zone containing quartz veins up to 5 in. thick and sheared argillite.	2.75	176.0	.114	156.0	4.37	269.0	583.0
407	do.	2.2	Sheared argillite and sphalerite-, galena-, chalcopyrite-, and pyrite-bearing quartz veins.	44.0	4100	1.44	1130	58	3.08%	9600
408	do.	3.5	Fault zone containing sheared argillite, quartz veinlets, and gouge.	17.6	1317.	<.05	1669.	39.1	67.6	3307.
409	do.	4.0	do.	76.0	880	.21	310	14	2870	5910
410	do.	4.0	Fault zone containing brecciated, pyrite-bearing argillite, quartz veinlets, and gouge.	161.0	6.3%	<.05	1655.	64.1	4389.	1194.
411	do.	3.5	Galena-bearing, limonite-stained, brecciated quartz in sheared metasedimentary rock.	62.0	2000	.27	417	28	1.93%	550
412	do.	3.0	One-ft-thick quartz vein, fault gouge, and galena-bearing, silicified breccia.	16.1	987.0	<.05	214.0	21.5	1805.	1805.
413	do.	4.0	Two-ft-thick quartz vein, fault gouge, and galena-bearing, silicified breccia.	20.0	390	1.37	295	13	1820	2810
414	do.	3.0	Fault zone containing quartz veins and sheared quartz monzonite.	9.86	143.0	.065	156.0	92.6	1002.	311.0
415	do.	2.2	Quartz vein in metasedimentary rock near contact with quartz monzonite.	9.1	320	.07	242	70	1320	2150

TABLE A-9.--Descriptions and analyses for samples shown on figures A-23 and A-24, Teichert prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Zinc
632	Chip.	4.5	Quartz vein striking N. 74° W. and dipping 80° SW. in metasedimentary rock.	1.3	39.6	<0.05	43.9	5.15	57.1	236.0
633	do.	.8	Quartz vein in felsite.	.688	9.67	<.05	7.66	3.32	39.3	50.9
634	Select.	NA	Galena-, sphalerite-, pyrite-, chalcopyrite-, stibnite-, and arsenopyrite-bearing quartz from stockpile.	498.0	1335.	2.06	5675.	15.0	15.4%	3.21%
1175	Random chip.	NA	Contact of diabase dike with felsite.	.150	6.61	<.05	86.1	1.16	5.19	90.0
1266	do.	NA	Dark green metasedimentary rock exposed in pit.	.185	9.46	<.05	20.1	1.76	3.44	84.9
1267	Chip.	1.0	Quartz vein striking N. 25° W. and dipping 68° SW. in metasedimentary rock.	2.89	32.2	<.05	13.2	13.9	28.4	39.5
1268	do.	2.0	White quartz vein striking N. 90° W. and dipping 80° S. in limonite-stained schist.	.927	59.1	<.05	6.52	13.5	83.0	31.1
1269	Random chip.	NA	Silicified zone containing coxcomb quartz stringers, diopside, and garnet in limestone.	.878	102.	<.05	36.0	6.90	94.4	55.4
1270	do.	NA	Sheared, folded, gray metasedimentary rock that has been flooded with quartz.	.484	37.7	<.05	13.4	13.2	18.7	73.5
1271	Chip.	2.0	Quartz vein striking N. 75° W. and dipping vertically in gray metasedimentary rock.	3.96	182.	<.05	60.0	11.6	1087	290.
1272	do.	.7	Quartz vein striking N. 10° W. and dipping 58° SW. in sheared, folded, silicified metasedimentary rock.	.241	99.3	<.05	10.7	12.1	33.8	55.0
1273	Random chip.	NA	Gray siltstone striking N. 25° W. and dipping vertically.	.347	7.22	<.05	48.1	9.51	10.3	35.3
1274	Chip.	2.0	Quartz vein striking N. 10° W. and dipping 80° SW. in contact with diabase dike.	.951	2.77	<.05	12.2	12.8	61.1	156.
1275	Select.	NA	Limonite- and hematite-stained, pyrite-bearing quartz from dump of 100-ft-deep shaft.	96.4	3.44	<.05	2382	25.2	419.	4629

TABLE A-9.--Descriptions and analyses for samples shown on figures A-23 and A-24, Teichert prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Zinc
1276	Grab.	NA	Carbonaceous black shale from dump.	41.3	24.6	<0.05	2512	23.8	138.	3.61%
1277	Select.	NA	Limonite gossan and quartz from shear zone trending N. 25° W. and dipping 85° SW.	305.	1.76%	<.5	2870	36.4	5.83%	3327
1278	Chip.	3.0	Quartz vein striking N. 68° W. and dipping 80° SW. in metasedimentary rock.	1.70	184.	<.05	39.3	16.7	105.	194.
1284	do.	1.0	Quartz vein striking N. 20° W. and dipping 50° SW. in metasiltstone and limestone.	.082	5.29	<.05	10.4	8.96	5.32	12.7
1285	Select.	NA	Sulfide-bearing quartz from dump of trench.	1652	22.7%	<.5	2618	117.	6.54%	336.
1286	Chip.	1.0	Quartz vein striking N. 05° E. and dipping 85° NW. in gray limestone.	10.0	625.	<.05	370.	24.5	217.	348.
1287	Select.	NA	Pyrite-bearing quartz from dump of pit.	.681	75.4	<.05	26.2	11.4	23.8	162.
1288	Chip.	2.0	Green-yellow schist exposed in pit.	2.51	231.	<.05	113.	.196	73.7	208.
1289	Random chip.	NA	Limonite-stained, bleached, metasedimentary rock.	.642	608.	<.05	80.0	6.23	8.00	17.4
1290	Chip.	1.5	Limonite-stained shear zone trending N. 15° W. and dipping 75° SW. in partially silicified limestone.	1.36	73.0	<.05	176.	14.2	25.4	10.2
1291	do.	.3	Quartz vein striking N. 60° W. and dipping vertically in pyrite-bearing, silicified metasedimentary rock.	10.3	1.16%	.338	114.	22.1	3632	674.
1292	Grab.	NA	Bleached, limonite-stained, silicified metasedimentary rock from pit.	3.29	46.3	<.05	231.	10.5	248.	886.
1293	Random chip.	NA	Limonite-stained, pyrite-bearing, silicified zone in limestone.	.997	131.	<.05	178.	1.34	14.1	33.5
1294	do.	NA	Hematite- and limonite-stained, silicified metasedimentary rock containing pyrite.	.332	5.49	<.05	173.	<.097	2.84	121.
1295	do.	NA	do.	.358	6.66	<.05	126.	<.091	4.78	128.

TABLE A-9.--Descriptions and analyses for samples shown on figures A-23 and A-24, Teichert prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Zinc
1296	Chip.	3.0	Calcite and quartz vein striking N. 45° W. and dipping vertically in gray limestone.	1.35	14.2	<0.05	5.07	11.2	24.6	44.9
1297	do.	2.0	Quartz vein striking N. 30° W. and dipping 65° SW. in gray limestone.	.293	6.69	<.05	4.29	12.9	15.1	57.5
1298	Random chip.	NA	Hematite- and limonite-stained, silicified metasedimentary rock containing pyrite.	1.34	361.	<.05	128.	9.78	10.6	29.6
1299	Chip.	2.0	Quartz vein striking N. 68° W. and dipping 65° NE. in metasedimentary rock.	.265	10.0	<.05	5.55	8.82	14.6	96.0
1300	do.	2.0	Quartz vein in both metasedimentary rock and quartz monzonite.	.336	9.77	<.05	2.52	9.21	18.9	3.75
1301	do.	1.0	Quartz vein striking N. 82° E. and dipping 80° SE. near contact of felsite with metasedimentary rock.	103.	417.	<.05	7.63	36.7	1.29%	32.6
1302	do.	1.0	Quartz vein in shear zone along contact of felsite with quartz monzonite.	3.50	64.7	<.05	521.	12.9	108.	156.
1303	do.	.6	Galena-rich part of 2.6-ft-thick quartz vein.	255.	7543	.952	2502	26.3	6.34%	1287
1304	do.	2.0	Rest of quartz vein not sampled in 1303.	3.57	35.7	<.05	33.4	34.1	308.	373.
1305	Grab.	NA	Silicified metasedimentary rock from pit.	1.10	40.7	<.05	31.9	10.3	145.	42.4
1306	Chip.	1.0	Two galena-bearing quartz veins striking N. 85° E. and dipping 62° NW.	11.2	367.	<.05	316.	19.2	154.	147.
1307	Random chip.	NA	Hematite- and limonite-stained, silicified metasedimentary rock containing pyrite.	.513	6.87	<.05	97.4	.702	21.9	48.4
1308	Chip.	2.0	Calcite and coxcomb quartz vein.	.911	55.3	<.05	19.0	14.7	12.4	26.8
1309	do.	2.0	Sulfide-bearing quartz vein striking N. 55° W. and dipping 75° SW. in metasedimentary rock.	25.1	720.	<.05	313.	42.7	101.	717.

TABLE A-9.--Descriptions and analyses for samples shown on figures A-23 and A-24, Teichert prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Molybdenum	Lead	Zinc
1310	Chip.	0.6	Limonite, limestone, and calcite breccia zone trending N. 35° W. and dipping vertically.	3.58	54.9	<0.05	70.1	35.9	105.	1198
1311	Select.	NA	Malachite- and azurite-stained, brecciated limestone and quartz from dump of pit.	630.	137.	<.05	1.72%	86.4	2592	7369
1312	Chip.	1.2	Coxcomb quartz vein striking N. 74° W. and dipping vertically in metasedimentary rock.	16.9	79.1	<.05	34.2	21.1	240.	429.

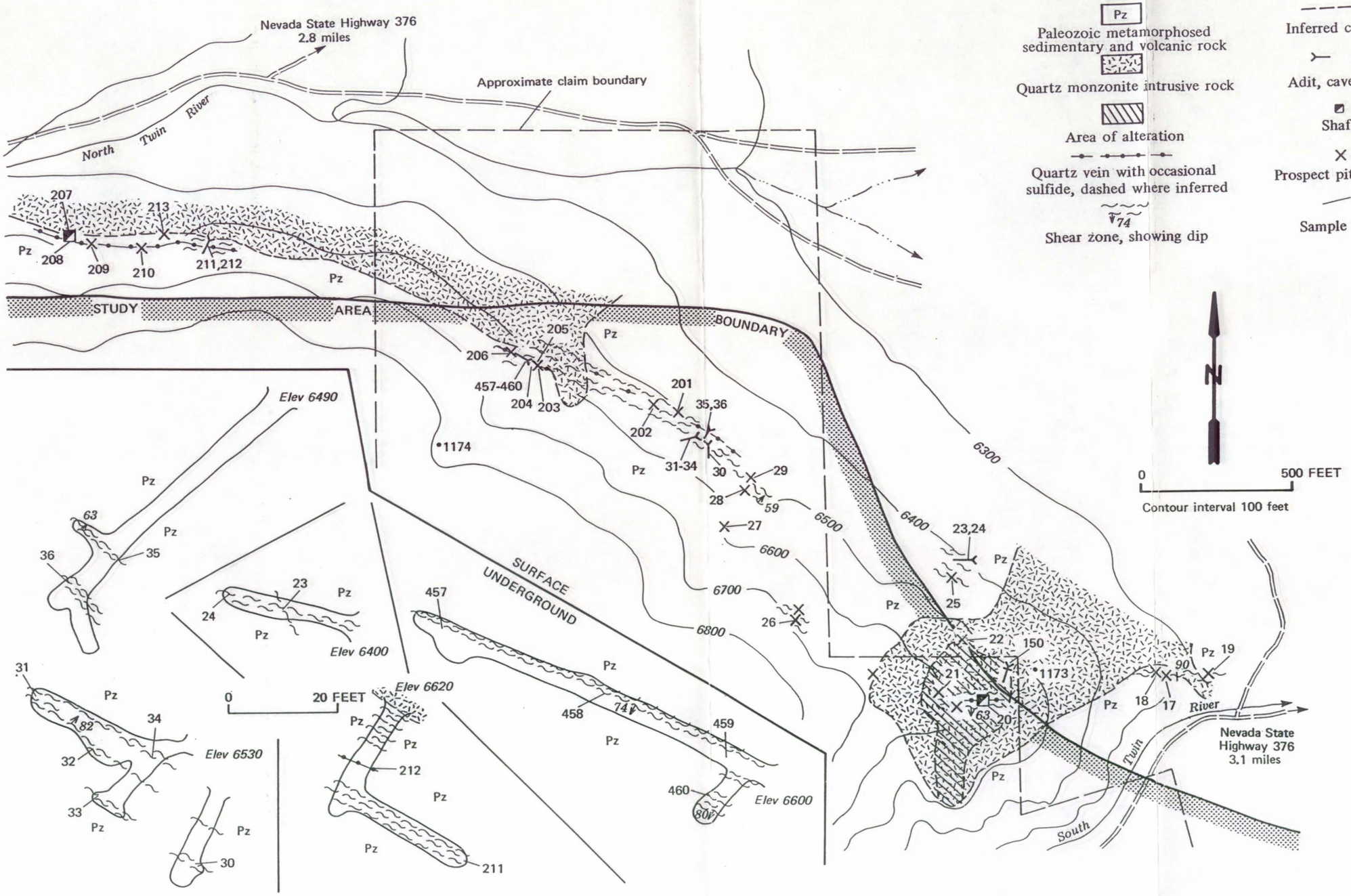


FIGURE A-26.—Workings, sample sites, and generalized geology, North Twin River prospect area

TABLE A-10.--Descriptions and analyses for samples shown on figure A-26, North Twin River prospect area

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
17	Chip.	5.0	Iron-stained, sheared metasedimentary rock with minor quartz and barite.	0.4	870	0.025	304	4	230
18	do.	4.0	do.	.524	27.7	<.05	86.5	13.2	65.2
19 1/	Select.	NA	Chloritized metasedimentary rocks with garnet and calcite.	.2	20	<.005	20	12	50
20	Chip.	5.0	Altered quartz monzonite with minor pyrite and quartz vein.	1.2	520	<.005	267	6	20
21	do.	8.2	Altered quartz monzonite, clay, limonite, and 3-in.-thick quartz vein.	.103	28.8	<.05	30.9	7.32	21.2
22	Grab.	NA	Altered quartz monzonite with quartz veinlets in fractures.	.199	78.5	<.05	48.1	4.23	7.22
23	Chip.	1.6	Sheared argillite and gouge with quartz and calcite veinlets.	.2	50	<.005	46	2	100
24	do.	2.6	do.	.083	26.7	<.05	58.4	5.01	77.2
25	do.	3.4	Sheared metasedimentary rocks with calcite stringers.	.129	27.5	<.05	23.4	12.0	76.2
26	do.	6.5	Altered metasedimentary rocks.	.245	48.1	<.05	37.9	10.0	195.0
27	do.	7.0	Sheared metasedimentary rocks with limonite and calcite stringers.	.082	23.9	<.05	15.4	4.48	56.6
28	do.	2.3	Sheared metasedimentary rocks with chlorite and calcite veins.	.265	26.2	<.05	117.0	4.94	49.1
29 1/	Select.	NA	Calcite vein with minor malachite.	.2	20	<.005	438	22	20
30	Chip.	1.5	Sheared, calcareous metasedimentary rocks and clay.	.099	21.8	<.05	21.4	3.49	130.0
31 1/	do.	2.5	Sheared, siliceous metasedimentary rocks and clay.	.2	40	<.005	63	14	70

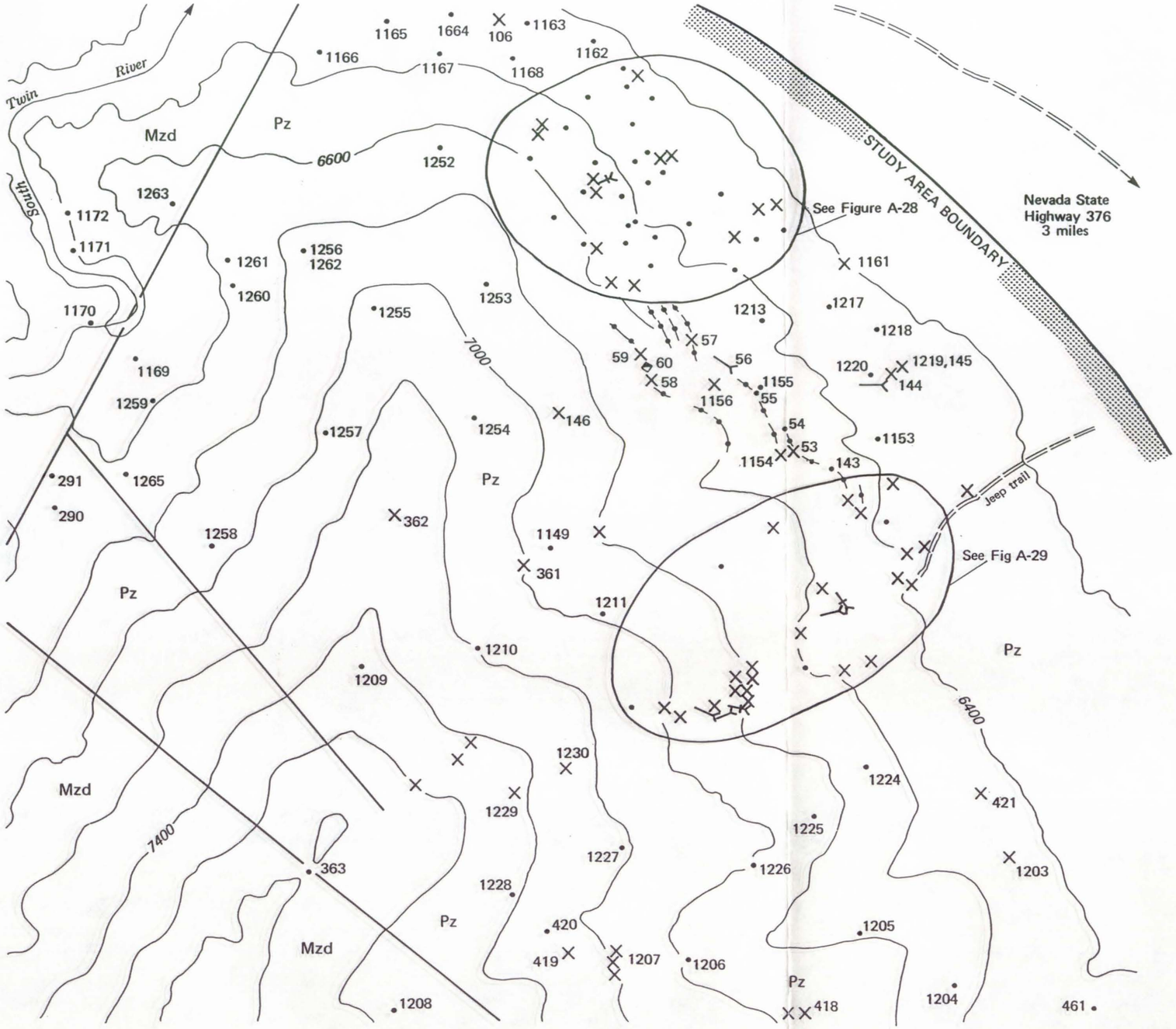
TABLE A-10.--Descriptions and analyses for samples shown on figure A-26, North Twin River prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
32	Chip.	2.2	Sheared, calcareous metasedimentary rocks, calcite veinlets, and limonite.	0.256	31.3	<0.05	38.8	24.6	105.0
33	do.	2.5	do.	.306	52.8	<.05	43.9	15.3	80.8
34	do.	3.3	do.	.2	40	<.005	104	184	290
35 1/	do.	1.3	do.	.2	30	<.005	65	14	230
36	do.	4.3	Sheared argillite and limestone, and clay gouge.	.274	41.0	<.05	50.5	5.99	98.4
201	Select.	NA	Stockpile of quartz vein and limonitic boxwork.	.124	20.6	<.05	4.43	14.3	25.7
202	Random chip.	NA	Fractured greenstone with limonite.	.383	55.9	<.05	23.1	19.5	136.0
203	Grab.	NA	Argillite with pyrite.	.367	36.1	<.05	70.6	15.8	35.5
204	Chip.	6.0	Sheared argillite and limestone with quartz vein and gouge.	.725	54.6	<.05	59.1	261.0	286.0
205 2/	Select	NA	Stockpile of quartz vein with galena, pyrite, and chalcopyrite.	11.0	80	.005	740	7450	3550
206 3/	do.	NA	Siliceous metasedimentary rocks and quartz with galena and malachite.	33.5	194.0	<.05	422.0	1.47%	2488
207 4/	do.	NA	Quartz vein with galena, malachite, and limonite.	14.4	320	.020	295	2842	4220
208 5/	Chip.	1.8	Quartz vein with limonite boxwork, chlorite, and minor galena.	11.8	371.0	<.05	136.0	2645	3298
209 6/	do.	1.6	Six-in.-thick quartz vein and fractured quartz monzonite.	13.5	537.0	<.05	216.0	2632	3614
210 7/	do.	3.3	Eight-in.-thick quartz vein and altered metasedimentary rocks.	28.8	247.0	<.05	544.0	1777	495.0

TABLE A-10.--Descriptions and analyses for samples shown on figure A-26, North Twin River prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
211	Chip.	2.6	Sheared, highly altered metasedimentary rocks with malachite, pyrite, and quartz veins.	1.99	46.0	<0.05	44.4	206.0	311.0
212 8/	do.	1.5	Quartz vein with 1- to 2-in.-thick stringer of galena, pyrite, hematite, and pyrolusite.	36.0	170	.220	757	7256	4286
213 9/	do.	2.5	Chloritized quartz vein with minor galena and sheared metasedimentary rocks.	1.6	30	<.005	45	296	586
457	do.	2.3	Sheared metasedimentary rocks with quartz veinlets and gouge.	.814	69.9	<.05	49.5	274.0	219.0
458	do.	3.0	Sheared metasedimentary rocks and gouge.	3.85	49.3	<.05	53.1	337.0	425.0
459	do.	2.7	do.	.861	74.0	<.05	85.4	8.8	100.0
460	do.	11.0	do.	.561	61.7	<.05	113.0	26.5	108.0
1173	Random chip.	NA	Outcrop of quartz monzonite with disseminated pyrite.	.043	3.51	<.05	28.9	5.50	100
1174	Grab.	NA	Talus of siliceous metasedimentary rock with fine disseminated sulfides.	.193	10.4	<.05	36.2	7.24	46.8

1/ Samples 19, 29, 31, and 35 also contain 475 ppm, 273 ppm, 276 ppm, and 138 ppm strontium, respectively.
2/ Sample 205 also contains 41 ppm molybdenum.
3/ Sample 206 also contains 31.9 ppm bismuth and 1.43 ppm tellurium.
4/ Sample 207 also contains 24 ppm bismuth.
5/ Sample 208 also contains 20 ppm molybdenum.
6/ Sample 209 also contains 24.5 molybdenum, 20.7 ppm bismuth, and 2.02 ppm tellurium.
7/ Sample 210 also contains 132.0 ppm bismuth.
8/ Sample 212 also contains 90 ppm bismuth and 50 ppm molybdenum.
9/ Sample 213 also contains 129 ppm strontium.



0 800 FEET

Contour interval 200 feet

EXPLANATION

Qlp
Quartz latite porphyry

Ql
Quartz latite

Mzd
Silicified and variably metamorphosed ash-flow tuffs

Pz
Variably metamorphosed sedimentary and volcanic rocks

Silicified shear zone, dashed where inferred

Contact, dashed where inferred

Fault

Shaft

Adit, caved adit

Prospect pit or trench

•1225
Sample locality

FIGURE A-27.—Workings, sample sites, and generalized geology, Govan prospect area

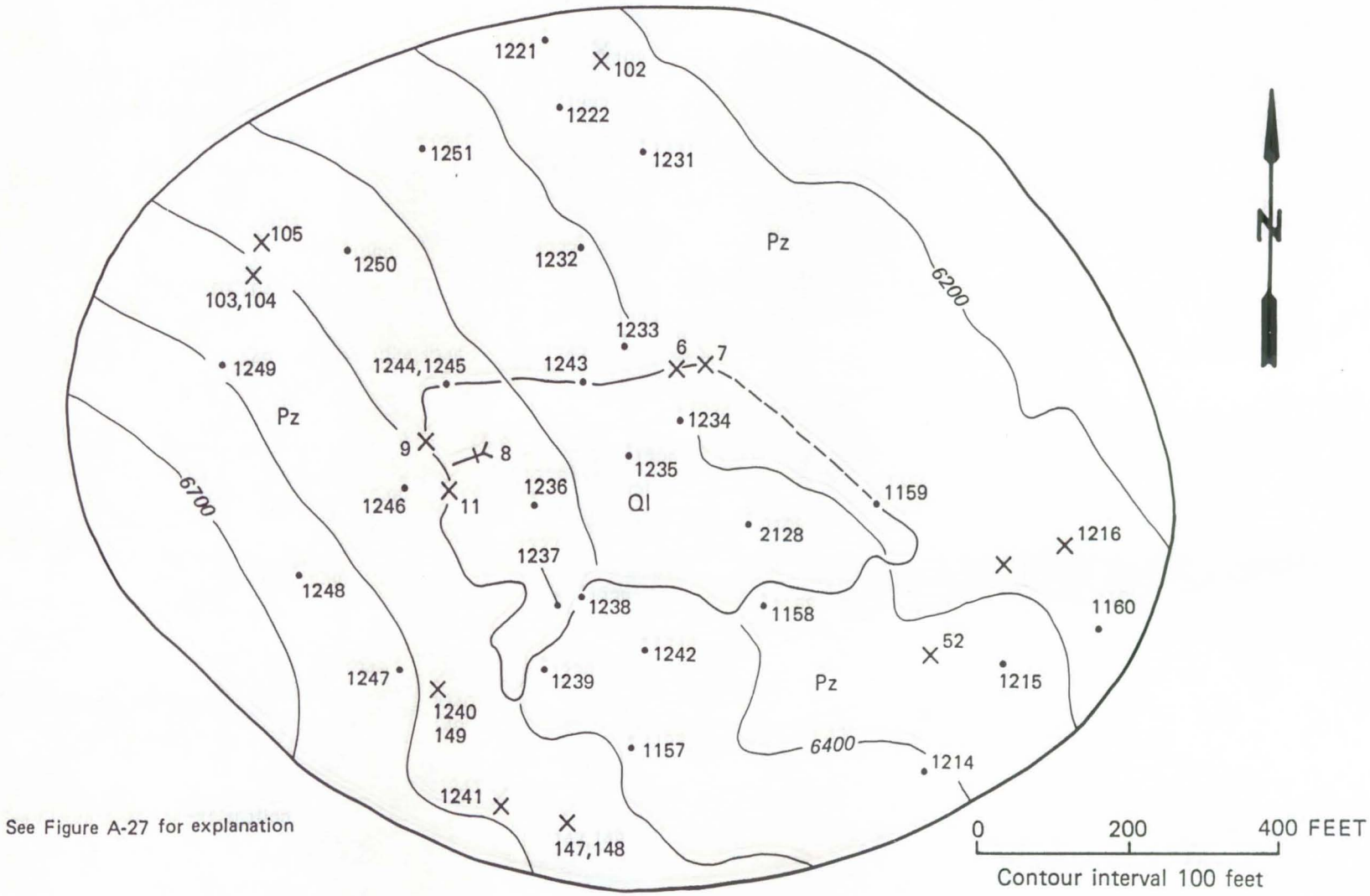


FIGURE A-28.--Enlargement of a portion of figure A-27 showing workings, sample sites, and generalized geology

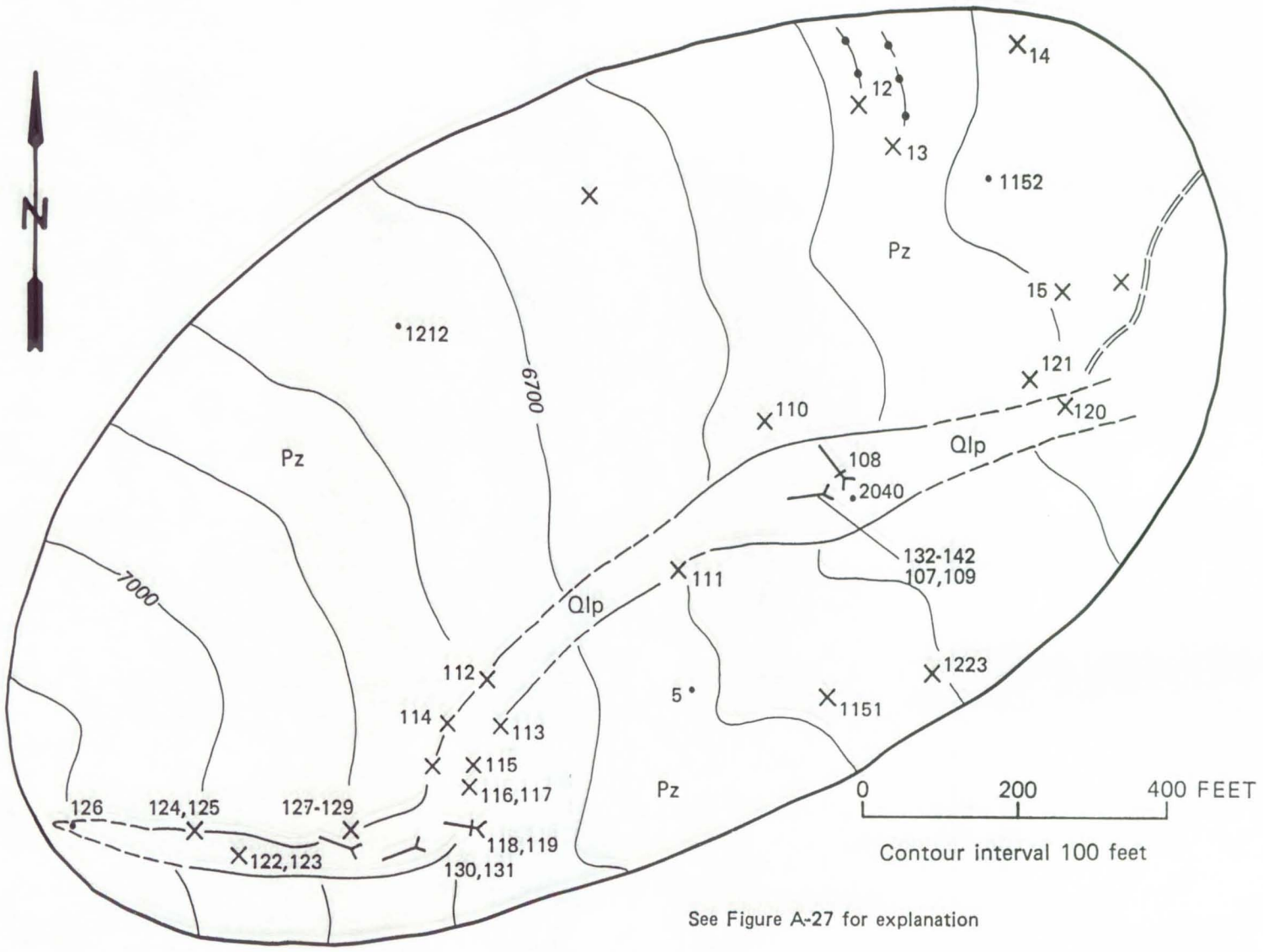


FIGURE A-29.--Enlargement of a portion of figure A-27 showing workings, sample sites, and generalized geology

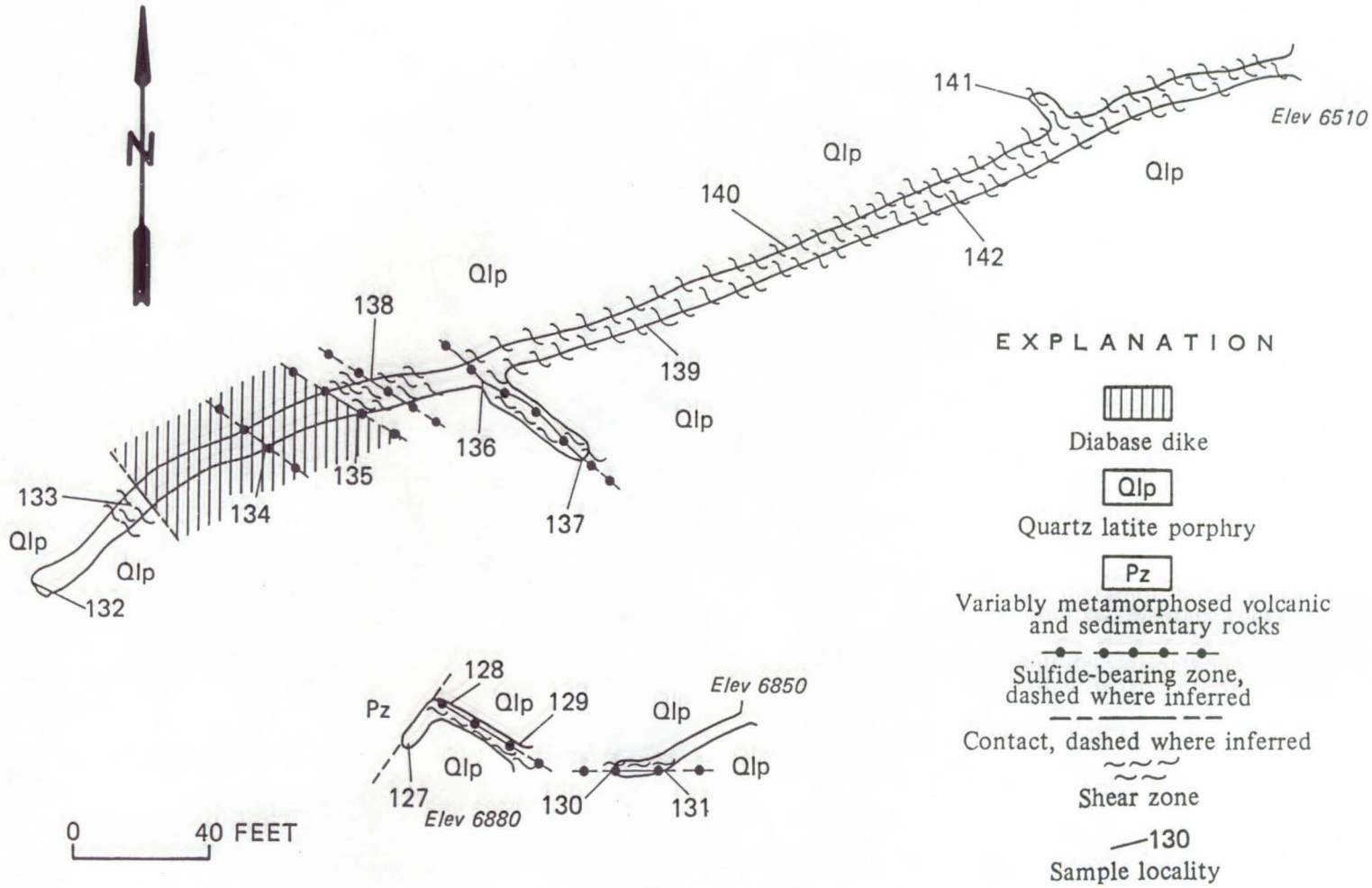


FIGURE A-30.—Underground workings showing generalized geology and sample sites, Govan prospect area

FIGURE A-31.--View looking at the Govan prospect area.

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
5	Select.	NA	Anglesite-stained quartz latite porphyry containing galena.	620.	2.59%	0.255	127	6.62%	980
6	do.	NA	Altered, sheared quartz latite from fault exposed in pit.	3.6	1050	.020	168	490	30
7	Chip.	2.0	Contact of fractured diabase dike with quartz latite.	.6	1430	2.10	164	52	130
8	do.	.5	Sheared, limonite-stained quartz porphyry.	.4	9290	.800	24	102	10
9	Select.	NA	Strongly altered quartz latite from dump of pit.	.6	3.9%	2.200	184	16	<10
11	Grab.	NA	do.	.2	9880	.435	137	2	<10
12	Chip.	.7	Silicified shear zone.	27.0	90	<.005	11	980	10
13	do.	6.0	Limonite-stained shear zone containing pyrite.	.6	120	<.005	67	10	10
14	Grab.	NA	Fine-grained metasedimentary rock containing quartz veinlets.	3.53	181.0	<.05	720.0	18.1	21.9
15	do.	NA	Limonite-stained quartz from trench.	.4	10	<.005	8	20	<10
52	Chip.	4.3	Epidote- and garnet-bearing, silicified shear zone in metalimestone.	1.54	15.2	<.05	20.0	76.7	90.5
53	do.	8.0	Silicified shear zone in metavolcanic and metasedimentary rock.	.4	30	<.005	77	12	10
54	do.	10.0	do.	.6	40	<.005	16	8	<10
55	do.	15.0	do.	.4	170	<.005	10	6	<10
56	do.	6.0	Silicified shear zone at face of 6-ft-long adit.	.2	110	<.005	26	2	<10
57	do.	11.0	Silicified shear zone in metasedimentary rock.	.2	20	<.005	14	2	<10
58	do.	3.1	Malachite-stained, silicified shear zone in metasedimentary rock.	2.6	120	.02	21	18	<10

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
59	Chip.	2.0	Malachite-stained, silicified shear zone in metasedimentary rock.	0.2	20	<0.005	12	2	<10
60	do.	2.7	Malachite-stained, silicified shear zone in metasedimentary and metavolcanic rock.	1.4	480	<.005	37	8	<10
102	do.	9.0	Fractured, limonite-stained metasedimentary rock exposed in pit.	.2	30	<.005	16	<2	20
103	do.	4.1	Partially silicified, actinolite- and garnet-bearing limestone exposed in pit.	.2	180	<.005	52	<2	60
104	do.	8.5	Altered metasedimentary rock exposed in pit.	.2	20	<.005	21	14	60
105	do.	3.0	Quartz in silicified limestone.	.2	10	<.005	15	10	10
106	Grab.	NA	Altered limestone from sloughed pit.	.2	150	<.005	80	12	180
107	do.	NA	Pyrite-bearing quartz latite porphyry from dump.	.46	180.0	<.05	13.1	98.3	60.3
108	do.	NA	Limonite- and anglesite-stained quartz latite porphyry from dump.	72.4	1842.	.947	696.0	2.25%	2322.
109	Chip.	5.0	Limonite- and manganese-stained quartz porphyry latite.	1.94	120.0	<.05	15.5	360.0	92.8
110	do.	1.5	Quartz vein containing specular hematite and epidote.	.703	40.8	<.05	2.0	100.0	52.4
111	do.	.4	Anglesite-stained quartz latite porphyry.	749.0	2.25%	17.4	249.0	9.09%	8576.
112	Grab.	NA	Anglesite- and limonite-stained quartz latite porphyry from dump.	51.6	6685.	.592	30.4	8139.	684.0
113	do.	NA	Anglesite-stained quartz latite porphyry containing galena from dump.	33.3	1543.	<.05	52.8	3342.	1342.
114	do.	NA	do.	11.8	834.0	<.05	21.1	749.0	719.0
115	do.	NA	do.	162.0	6218.	.2	47.4	1.75%	832.0
116	Select.	NA	Anglesite-stained, galena-bearing quartz latite porphyry from small stockpile.	1258	2.2%	2.6	120	11.3%	1020

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
117	Grab.	NA	Anglesite-stained, galena-bearing quartz latite porphyry from small stockpile.	238.0	1.5%	0.676	163.0	6.97%	1001.
118	Chip.	5.7	Strongly altered, sheared, limonite- and anglesite-stained quartz latite porphyry.	111.0	7799.	.28	119.0	1.88%	2080.
119	Select.	NA	Limonite- and anglesite-stained, galena-bearing quartz latite porphyry from dump.	135.0	1.44%	.444	111.0	3.86%	771.0
120	Chip.	3.2	Fractured, limonite-stained quartz latite porphyry.	17.3	788.0	.065	92.3	7959.	1794.
121	Select.	NA	Anglesite-stained quartz latite porphyry from sloughed pit.	1.31	507.0	<.05	206.0	158.0	34.8
122	Chip.	4.0	Limonite- and anglesite-stained, galena-bearing shear zone in quartz latite porphyry.	150	1.36%	.165	225	4.31%	5140
123	do.	13.0	Limonite- and anglesite-stained, galena-bearing quartz latite porphyry.	10.4	1617.	<.05	46.1	3115.	1168.
124	do.	1.0	Limonite- and anglesite-stained, strongly altered shear zone in quartz latite porphry.	1017.	8.81%	1.8	804.0	16.6%	2291.
125	Select.	NA	Galena-bearing, anglesite-stained quartz latite porphyry from stockpile.	116	1.52%	1.3	186	3.8%	1190
126	Grab.	NA	Quartz latite porphyry float.	10.1	870.0	<.05	13.5	1297.	119.0
127	Chip.	.6	Sheared quartz latite porphyry at contact with metasedimentary rock.	1.42	441.0	<.05	25.9	172.0	543.0
128	do.	.6	Sheared quartz latite porphyry containing a narrow galena vein.	1440.	7210	2.4	210	20.9%	1900
129	do.	.9	do.	1059	4320	2.7	339	21.7%	1370
130	do.	2.0	Anglesite- and limonite-stained, sheared quartz latite porphyry.	31.9	3376.	<.05	69.2	9534.	5770.
131	do.	1.0	do.	4264.	1.64%	9.99	463.0	21.7%	2419.
132	do.	5.0	Slightly fractured quartz latite porphyry.	99.1	942.0	.283	23.5	5301.	181.0

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
133	Chip.	0.4	Contact of sheared quartz latite porphyry with a diabase dike.	5.74	159.0	<0.05	58.9	398.0	383.0
134	do.	1.2	Sheared diabase containing gouge and sulfide-bearing quartz veinlets.	1.38	279.0	<.05	32.6	103.0	118.0
135	do.	.5	Sulfide-bearing, sheared contact between diabase dike and quartz latite porphyry.	108	950	.440	205	7832	660
136	do.	.6	Anglesite-stained, galena- and pyrite-bearing quartz vein in sheared quartz latite porphyry.	10	8020	.150	344	720	1260
137	do.	2.5	Shear zone in quartz latite porphyry.	.861	67.3	<.05	29.3	101.0	60.4
138	do.	1.3	Clay- and quartz-rich zone in sheared quartz latite porphyry.	1.82	506.0	<.05	120.0	602.0	3286.
139	do.	3.8	Sheared quartz latite porphyry and fault gouge.	.302	30.2	<.05	4.11	50.5	8.1
140	do.	1.3	Diabase dike.	.439	206.0	<.05	24.6	114.0	156.0
141	do.	2.5	Limonite-stained, sheared quartz latite porphyry and fault gouge.	.092	11.3	<.05	3.89	12.7	19.0
142	do.	3.2	Anglesite-stained, galena-bearing, quartz latite porphry.	9.42	922.0	.412	63.7	2113.	726.0
143	do.	4.5	Silicified shear zone in metasedimentary rock.	.334	76.4	<.05	24.0	36.6	18.1
144	do.	4.1	Silicified, sheared metasedimentary rock and fault gouge.	.327	84.8	<.05	9.19	31.0	61.5
145	do.	12.0	Strongly altered intrusive rock and fault gouge.	.613	130.0	<.05	61.7	20.7	76.1
146	Grab.	NA	Metasedimentary rock containing disseminated pyrite.	.758	25.5	<.05	15.6	26.0	132.0
147	Chip.	6.5	Dark green metasedimentary rock exposed in pit.	1.68	105.0	<.05	251.0	238.0	127.0
148	do.	.4	Quartz vein.	5.2	190	.035	455	776	240
149	do.	2.0	1.5-ft-thick quartz vein and sheared metasedimentary rock.	6.65	23.7	<.05	60.4	66.7	36.1

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
290	Chip.	0.3	Galena-, calcite-, and epidote-bearing shear zone in metasedimentary rock.	0.3	41	<0.07	8	31	53
291	Select.	NA	Dark gray, siliceous, argillaceous metasedimentary rock containing epidote and traces of malachite.	.453	21.9	<.05	166.0	29.2	52.3
361	Random chip.	NA	One-ft-thick quartz vein and limonite-stained metasedimentary rock.	2.06	6.95	<.05	4.84	74.2	252.0
362	do.	NA	Limonite-stained, fractured metasedimentary rock containing quartz veinlets.	.44	212.0	<.05	89.7	7.18	11.8
363	do.	NA	do.	.996	71.5	.076	21.6	43.4	63.9
418	Grab.	NA	Strongly altered, epidote-, garnet-, and specular hematite-bearing, black argillite from trench.	.4	15	<.07	8	47	67
419	do.	NA	Limonite-stained, arsenopyrite-bearing, black argillite from pit.	.961	478.0	<.05	81.5	54.0	55.9
420	do.	NA	Limonite-stained, black argillite.	.743	163.0	<.05	73.3	21.7	67.0
421	Chip.	2.0	Quartz vein trending N. 55° W. and dipping 80° NE. in argillite.	.2	9	<.07	10	32	16
461	Grab.	NA	Quartz from sloughed pit.	.252	4.21	<.05	20.6	8.42	16.9
1149	Random chip.	NA	Gray shale containing disseminated pyrite.	1.91	216.	<.05	82.2	19.2	1180
1151	Grab.	NA	Quartz and metasedimentary rock from dump.	.335	77.5	<.05	31.6	23.2	36.4
1152	do.	NA	Metasiltstone and metasandstone float.	1.01	103.	<.05	49.7	28.0	16.2
1153	Random chip.	NA	Silicified pebble conglomerate from float.	.408	49.3	<.05	20.1	62.2	75.2
1154	Grab.	NA	Silicified, brecciated, limonite-stained metasedimentary rock from open cut.	.516	188.	<.05	42.5	10.5	26.5
1155	do.	NA	Black shale and siltstone float.	.420	91.5	<.05	69.0	22.0	44.2

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
1156	Grab.	NA	Limonite-stained siltstone from sloughed pit.	0.487	44.6	<0.05	57.8	31.7	58.5
1157	do.	NA	Diabase dike.	.073	21.2	<.05	54.1	7.25	105.
1158	do.	NA	Quartz latite float.	.047	6.82	<.05	7.37	6.20	17.2
1159	do.	NA	Diabase float.	.136	214.	<.05	221.	5.53	85.9
1160	do.	NA	Altered, limonite-stained metasedimentary rock.	.245	42.0	<.05	54.7	5.88	62.2
1161	Random chip.	NA	Green metasedimentary rock containing quartz veins up to 2 in. thick.	.066	5.14	<.05	16.4	3.93	55.3
1162	Grab.	NA	Metasedimentary rock and gneiss float.	.068	14.6	<.05	19.5	3.92	40.6
1163	do.	NA	Partially silicified metasedimentary rock.	.388	13.7	<.05	41.1	8.71	51.8
1164	do.	NA	Limestone, silty sandstone, and chert float.	.363	19.6	<.05	16.4	7.89	102.
1165	do.	NA	Brecciated, calcite-cemented limestone and chert float.	.452	32.2	<.05	30.6	13.2	57.1
1166	Random chip.	NA	Altered, sheared metasedimentary rock.	.658	115.	<.05	103.	16.3	129.
1167	do.	NA	do.	.710	44.2	<.05	34.5	13.4	231.
1168	do.	NA	Limonite- and hematite-stained metasiltstone.	.984	21.4	<.05	88.4	7.19	22.1
1169	do.	NA	Sheared shale.	.698	80.0	<.05	112.	12.3	144.
1170	Grab.	NA	Felsite float containing disseminated pyrite.	.156	9.70	<.05	18.6	8.85	28.9
1171	Random chip.	NA	Felsite containing disseminated pyrite.	.207	17.5	<.05	20.6	8.48	13.7
1172	do.	NA	do.	.166	7.46	<.05	60.0	3.72	16.4
1203	do.	NA	Dark green metasedimentary rock exposed in pit.	.133	12.4	<.05	47.0	11.3	23.5
1204	do.	NA	Dark green metasedimentary rock.	.165	7.74	<.05	68.9	4.41	24.7

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
1205	Random chip.	NA	Dark green metasedimentary rock.	0.024	2.55	<0.05	1.36	5.40	112.
1206	do.	NA	Dark brown metasedimentary rock.	.096	16.1	<.05	33.4	1.83	66.5
1207	Grab.	NA	Epidote-diopside-calcite-grossularite-andradite tactite from two pits.	15.2	111.	.255	5481	208.	1.36%
1208	Random chip.	NA	Gray felsite.	.271	27.8	<.05	56.0	6.70	80.6
1209	do.	NA	Silty, calcareous dolomite.	4.60	18.3	<.05	4.58	3102	2850
1210	do.	NA	Dark gray siltstone.	2.96	61.6	<.05	50.1	28.9	802.
1211	do.	NA	Gray limestone and siltstone.	.292	55.3	<.05	15.8	14.7	27.2
1212	do.	NA	Dark green, metasedimentary rock.	.142	14.1	<.05	55.9	4.29	42.5
1213	do.	NA	Dark green schistose metasedimentary rock containing garnet.	.105	25.3	<.05	23.3	4.48	36.8
1214	do.	NA	Metasiltstone containing calcite, garnet, and diopside.	.183	14.0	<.05	35.2	16.4	37.3
1215	do.	NA	do.	.147	22.4	<.05	37.1	3.90	44.7
1216	Grab.	NA	Dark green, metasedimentary rock containing garnet and diopside from pit.	.227	41.8	<.05	41.8	16.6	35.1
1217	Random chip.	NA	Dark green schistose metasedimentary rock.	.109	6.67	<.05	24.8	3.66	53.1
1218	do.	NA	do.	.157	3.57	<.05	40.0	8.86	52.0
1219	do.	NA	do.	1.76	898.	<.05	398.	4.61	23.4
1220	Chip.	8.0	Sheared, partially silicified, limonite-stained, green metasedimentary rock.	.326	65.1	<.05	52.0	26.7	72.6
1221	Random chip.	NA	Dark green metasedimentary rock.	<.013	29.3	<.05	4.88	1.61	16.2

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
1222	Random chip.	NA	Silicified, gray limestone.	0.104	19.0	<0.05	5.26	5.86	32.4
1223	do.	NA	Dark green metasedimentary rock.	.187	19.1	<.05	43.6	16.2	34.2
1224	do.	NA	Green, schistose metasedimentary rock.	.181	16.7	<.05	66.2	4.93	66.3
1225	do.	NA	do.	.098	11.9	<.05	34.3	8.59	27.6
1226	do.	NA	do.	.235	11.7	<.05	95.6	19.7	45.1
1227	do.	NA	Multicolored, partially silicified metasedimentary rock.	.468	319.	<.05	39.8	18.8	82.1
1228	do.	NA	Dark gray, partially silicified metasedimentary rock.	.281	29.5	<.05	74.6	5.48	38.7
1229	do.	NA	Dark gray metasedimentary rock exposed in pit.	1.07	69.4	<.05	29.7	20.6	42.5
1230	do.	NA	Quartz latite porphyry exposed in pit.	.137	122.	<.05	6.67	33.3	34.4
1231	do.	NA	Brecciated, slightly silicified, dark green metasedimentary rock.	.039	69.4	<.05	4.08	1.68	21.5
1232	do.	NA	Silicified, gray limestone.	.128	65.5	<.05	20.3	3.75	40.4
1233	do.	NA	Fractured, dark green metasedimentary rock.	.067	167.	<.05	32.7	2.42	20.5
1234	do.	NA	Quartz latite.	.026	23.9	<.05	14.5	2.99	21.4
1235	do.	NA	Diabase dike in quartz latite.	.022	17.7	<.05	33.1	5.65	106.
1236	do.	NA	Quartz latite.	.051	81.3	<.05	8.25	5.09	12.8
1237	do.	NA	do.	.200	87.5	<.05	24.7	6.50	17.2
1238	do.	NA	Silicified limestone and dark green metasedimentary rock.	.091	56.2	<.05	6.15	4.30	50.9
1239	do.	NA	Dark gray metasiltstone.	.122	23.3	<.05	38.6	2.31	22.8
1240	do.	NA	Brecciated quartz vein exposed in pit.	2.26	4.45	<.05	33.4	21.7	7.25

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
1241	Random chip.	NA	Quartz-filled fractures in sheared, dark green, metasedimentary rock.	0.117	43.6	<0.05	21.2	4.89	30.3
1242	do.	NA	Dark green metasedimentary rock.	.110	78.1	.068	7.46	6.37	62.8
1243	do.	NA	do.	.145	184.	<.05	58.4	1.62	20.8
1244	do.	NA	Dark green metasedimentary rock at contact with quartz latite.	.032	9.73	<.05	3.08	1.45	64.5
1245	do.	NA	Quartz latite at contact with metasedimentary rock.	.051	20.6	<.05	11.9	5.22	12.0
1246	do.	NA	Light gray, silicified limestone.	.056	62.1	<.05	6.82	3.96	5.64
1247	do.	NA	Sheared, limonite-stained, dark green metasedimentary rock.	.538	95.7	<.05	23.8	9.68	26.4
1248	do.	NA	do.	.474	192.	<.05	34.0	8.19	142.
1249	do.	NA	Brecciated, silicified limestone.	.282	15.7	<.05	21.9	8.75	96.9
1250	do.	NA	Weathered diabase dike.	.046	8.83	<.05	121	1.76	69.0
1251	Grab.	NA	Dark gray metasedimentary rock.	.104	38.8	<.05	9.79	4.29	49.3
1252	Random chip.	NA	Dark gray limestone.	.038	2.25	<.05	1.30	4.68	145.
1253	do.	NA	Silicified, slightly brecciated, gray limestone.	.023	14.7	<.05	1.60	2.17	7.42
1254	Grab.	NA	Sheared metasedimentary rock with quartz-filled fractures.	1.63	60.2	<.05	37.4	10.1	313.
1255	Random chip.	NA	Brecciated, gray limestone.	.760	32.2	<.05	13.2	47.0	80.7
1256	do.	NA	Felsic intrusive rock near contact with gray limestone.	.159	17.6	<.05	10.0	10.0	13.5
1257	Chip.	2.0	Sheared, silicified limestone in zone trending N. 25° E. and dipping 55° NW.	.636	86.6	<.05	51.2	12.6	499.

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Zinc
1258	Random chip.	NA	Fractured, silty-gray limestone.	0.174	76.9	<0.05	23.9	4.76	6.65
1259	Grab.	NA	Slightly sheared, brecciated siltstone and limestone float.	.309	44.2	<.05	17.9	10.7	112.
1260	Random chip.	NA	Sheared, limonite-stained, dark gray limestone and siltstone.	.317	109.	<.05	40.0	10.0	40.2
1261	do.	NA	Sheared, silicified, gray limestone.	.393	63.9	<.05	28.4	15.7	174.
1262	do.	NA	Brecciated, silicified, gray limestone at contact with felsic intrusive rock.	.523	79.3	<.05	30.8	29.0	91.4
1263	do.	NA	Dark green metasedimentary rock.	.026	4.93	<.05	8.44	3.70	31.8
1265	do.	NA	Sheared metasedimentary rock.	.342	38.4	<.05	39.9	7.00	77.4
2040	Petrographic.		A grayish-white, altered quartz latite porphyry consisting of 88% groundmass, 6% plagioclase phenocrysts, 3% quartz phenocrysts, 3% sanidine phenocrysts, altered ferromagnesian silicates, and accessory zircon. The groundmass consists roughly of 1/2 plagioclase, 1/4 quartz, and 1/4 sanidine, and has a grain size 0.02 - 0.2 mm. Phenocrysts range in size from 0.5 - 4.5 mm. Plagioclase and sanidine are heavily altered to sericite and calcite, and are turbid due to pitting. Occasional ferromagnesian silicate grains have been completely replaced by calcite with small amounts of sericite and rutile. The rock is cut by a few calcite-filled fractures up to 1/4 mm wide.						
2088	do.		A distinctive, white-spotted, andesite porphyry consisting of 50% phenocrysts and 50% groundmass. Plagioclase comprises 47% of the phenocrysts with the other 3% being pyroxene. Phenocrysts range in size from 3/4 mm - 2 cm. Groundmass grains range in size from 0.06 - 0.3 mm and consist of 21% plagioclase, 20% hornblende + pyroxene, 7% K-feldspar, and 2% ilmenite. Plagioclase phenocrysts have andesine composition, and are heavily altered to sericite and epidote. Groundmass plagioclase also has andesine composition, but these grains are only lightly to moderately altered.						

TABLE A-11.--Descriptions and analyses for samples shown on figures A-27 through A-30, Govan prospect area--Continued

Sample No.	Type	Description
2088	(Continued)	Pyroxene phenocrysts occur as 1 - 3 mm grains that mostly are replaced by adularia (with a small 2V), brown biotite largely altered to chlorite, epidote, and sphene. Some relatively fresh pyroxene grains occur in the groundmass. Hornblende is colored shades of brown and green. Some clusters of hornblende grains possibly represent former pyroxene phenocrysts. Ilmenite is heavily altered to leucoxene. The andesite is cut by several fractures up to 0.1 mm wide that are filled with adularia. A 1/4 mm oxidized pyrite cube occurs along one of these fractures.
2128	Petrographic.	A white- and gray-spotted quartz latite with seriate texture, and grain size ranging from 0.01 - 6 mm. 60% of the mineral grains are greater than 0.05 mm, and these consist of 20% quartz, 20% sanidine, 15% plagioclase, and 5% biotite. In general, the coarser tectosilicate grains occur as rounded euhedra. The fraction with less than 0.05 mm grain size is sanidine and quartz rich with a lesser amount of plagioclase. A few polycrystalline quartz fragments with 1/4 mm grain size are present. Accessory and alteration minerals include pyroxene(?), zircon, carbonate, and epidote. Plagioclase has oligoclase composition, oscillatory zoning, and is lightly to heavily altered to sericite, carbonate, and epidote. Quartz and sanidine are lightly turbid due to pitting and fluid inclusions. Three-phase fluid inclusions can be seen in quartz. Biotite is light brown to reddish-brown with green rims. Smaller grains are altered to chlorite. Pyroxene(?) occurs as a turbide, 1/4 mm, polycrystalline aggregate. Zircon occurs in biotite with pleochroic haloes, and as 0.1 mm rounded crystals in the fine-grained portion of the rock. Carbonate is an alteration mineral of plagioclase, and fills fractures in large plagioclase and quartz crystals. These fractures fade out where they pass through biotite and the fine-grained part of the rock. Epidote occurs as elongate lenses along cleavages in green biotite and as granules in some plagioclase. The crystals of this rock are not broken, thus I have no reason to suspect it might be a crystal tuff. The rock seems to have come from a magma that was undergoing rapid crystal growth of numerous nuclei prior to intrusion that rapidly cooled the remaining melt. Light fracturing and alteration occurred after final crystallization.

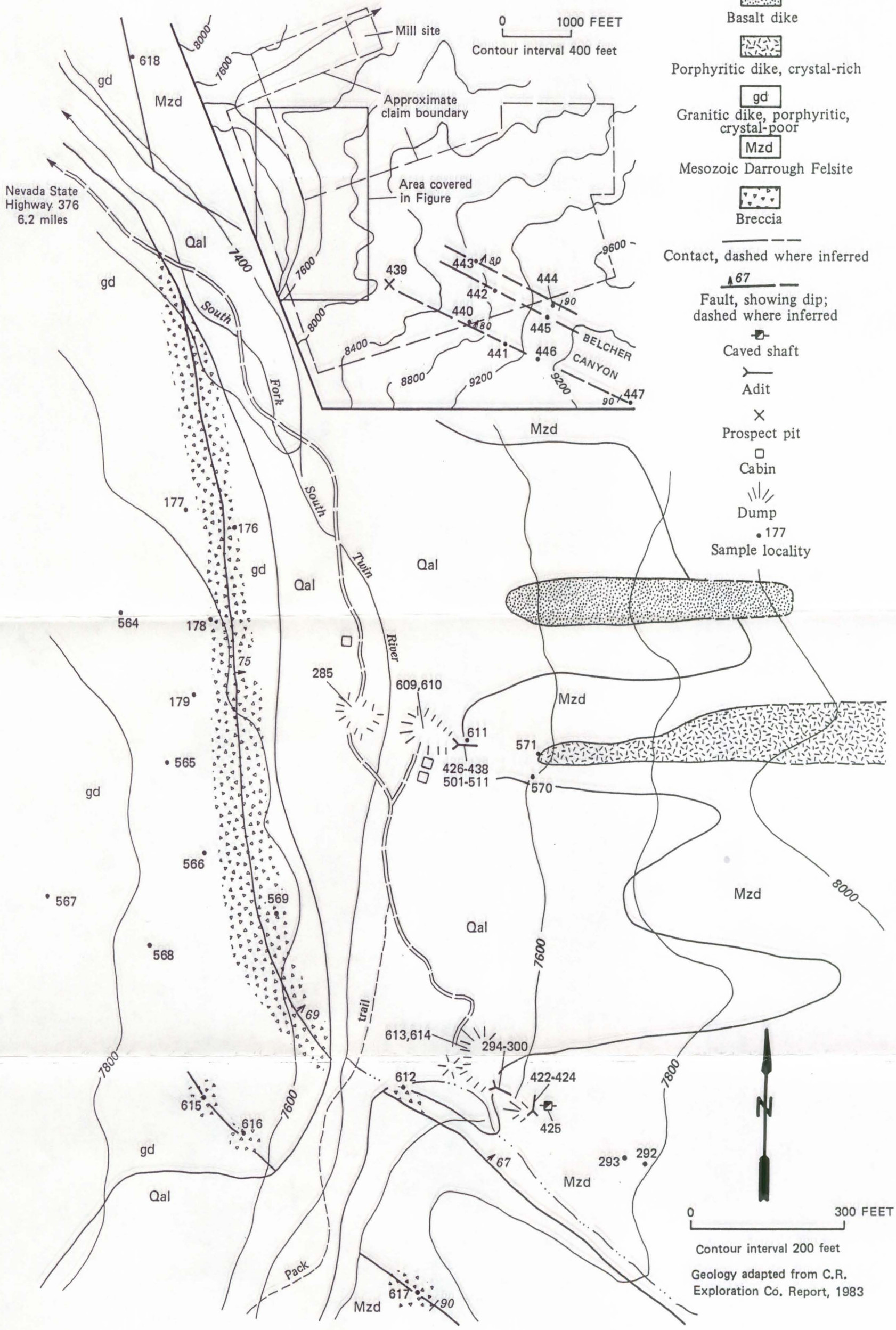


FIGURE A-32.—Workings, sample sites, and generalized geology, South Twin mine

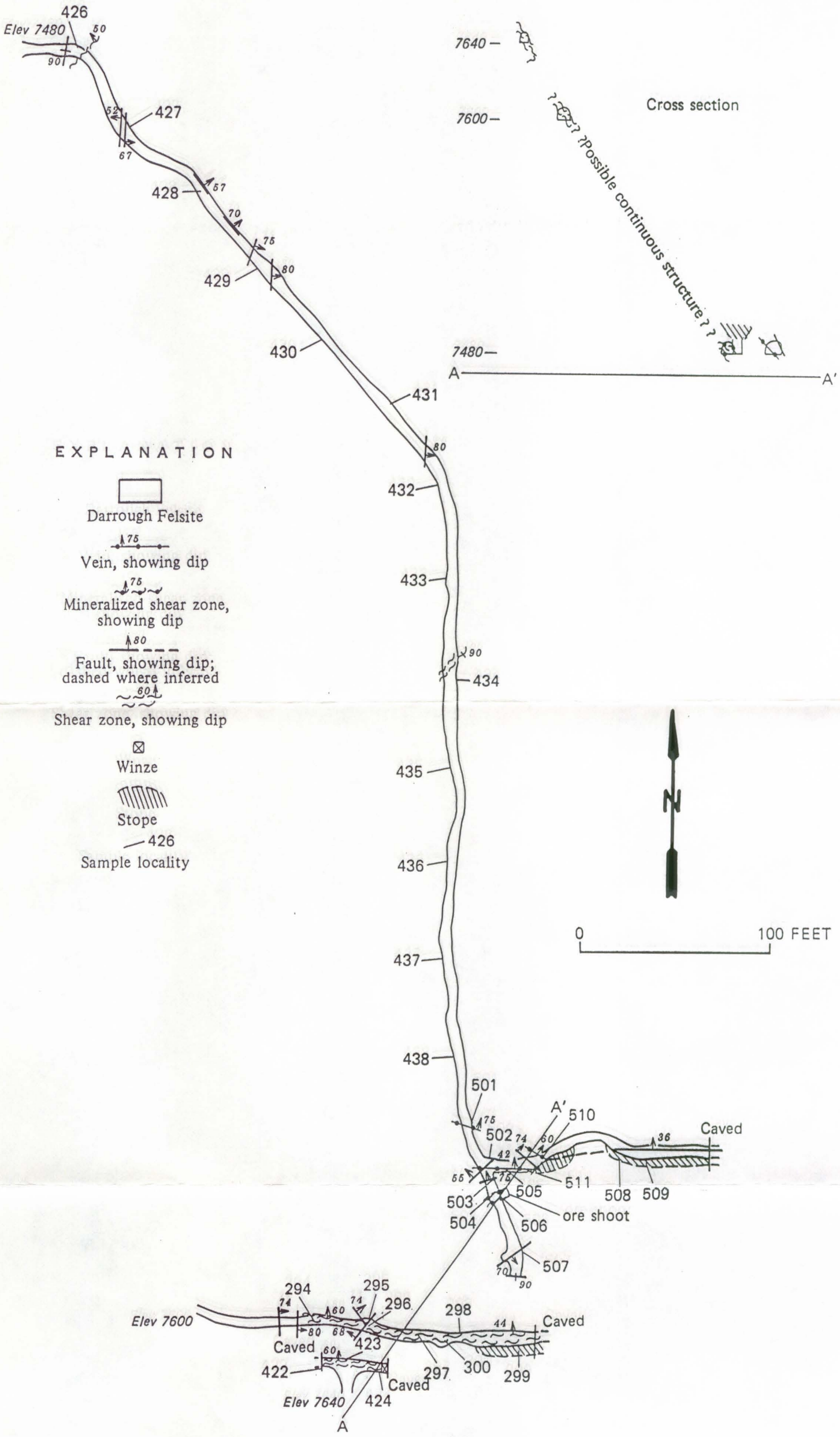


FIGURE A-33.—Underground workings showing generalized geology and sample sites, South Twin mine

TABLE A-12.--Descriptions and analyses for samples shown on figures A-32 and A-33, South Twin mine

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
176	Random chip.	NA	Crystal-rich granitic intrusion, some breccia.	0.2	4.9	<0.05	8.44	0.786
177	do.	NA	Crystal-rich granitic intrusion.	.139	5.21	<.05	7.64	.471
178	do.	NA	do.	.13	6.34	<.05	7.0	.467
179	do.	NA	do.	.172	5.83	<.05	10.4	.609
285	Select.	NA	Stockpile of argillized felsite with quartz veinlets and disseminated pyrite.	23.0	140	2.40	47	3.8
292	Chip.	4.0	Three-in.-thick quartz vein in altered, iron-stained felsite.	9.6	100	4.11	28	1.8
293	do.	2.0	Iron-stained quartz vein.	5.2	170	1.51	40	3.2
294 1/	do.	2.5	Sheared felsite with quartz and gouge seams.	3.1	110	.41	60	1.4
295 1/	do.	3.0	Sheared felsite with limonite and pyrite.	.5	11	.07	4	.4
296 1/	do.	3.5	Sheared felsite with limonite.	.7	15	<.07	6	.4
297 1/	do.	2.3	Sheared felsite with gouge seams and pyrite.	6.3	25	.34	140	3.0
298	do.	3.7	do.	11.7	69.0	5.55	117.0	4.22
299	do.	2.5	Sheared felsite and gouge.	2.92	131.0	.812	5.14	2.55
300	do.	1.3	Felsite breccia and gouge with disseminated pyrite.	3.13	105.0	.101	309.0	2.48
422 1/	do.	2.3	Felsite breccia and gouge.	5.6	90	.27	170	4.2
423	do.	2.8	do.	3.39	37.6	.075	17.2	1.1
424	do.	3.0	Felsite breccia and gouge with disseminated pyrite.	3.81	96.7	<.05	460.0	2.24
425	do.	2.0	Faulted and brecciated felsite with 1/8-in.-thick gouge seam.	.817	36.5	<.05	1.72	1.05
426	do.	5.0	Fractured felsite.	.188	17.2	<.05	10.6	.6
427	do.	5.0	do.	.669	21.3	<.05	.828	.857
428	do.	5.0	do.	.179	55.7	<.05	1.0	1.57

TABLE A-12.--Descriptions and analyses for samples shown on figures A-32 and A-33, South Twin mine--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
429	Chip.	5.0	Fractured felsite.	.33	60.4	<.05	9.11	1.63
430	do.	5.0	do.	.103	8.03	<.05	.575	.785
431	do.	5.0	do.	.166	6.84	<.05	1.18	.638
432 2/	do.	5.0	do.	.154	8.53	<.05	1.26	.771
433	do.	5.0	do.	.251	17.8	<.05	8.39	.766
434	do.	5.0	do.	.194	10.6	<.05	.865	.636
435	do.	5.0	do.	.139	5.02	<.05	1.14	.501
436	do.	5.0	do.	.257	16.9	<.05	1.42	.506
437	do.	5.0	do.	.188	9.75	<.05	9.12	.644
438	do.	5.0	do.	.153	5.84	<.05	3.84	.604
439	Grab.	NA	Iron-stained felsite.	.312	59.7	<.05	2.48	2.37
440	Chip.	3.0	Iron-stained, silicified felsite with quartz veinlets up to 0.25 in. thick.	2.15	402.0	.167	9.88	12.5
441	do.	1.5	Faulted, silicified felsite with limonite and quartz veinlets up to 0.12 in. thick.	3.5	76.7	<.05	44.5	8.59
442	Grab.	NA	Iron-stained, faulted felsite.	1.41	1027	<.05	10.0	11.0
443	Chip.	3.0	do.	.585	362.0	<.05	12.5	9.82
444	do.	5.0	Iron-stained, faulted, silicified felsite with quartz veinlets up to 0.5 in. thick.	.975	37.8	<.05	32.4	3.31
445	do.	5.0	Iron-stained, faulted felsite.	.538	115.0	<.05	6.43	4.16
446	Chip.	5.0	Iron-stained, faulted, silicified felsite.	0.38	61.9	<0.05	2.5	1.78
447	do.	4.0	do.	.546	17.0	<.05	1.47	.831

TABLE A-12.--Descriptions and analyses for samples shown on figures A-32 and A-33, South Twin mine--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
501	Chip.	.4	Gouge and calcite vein.	62.5	76.9	46.1	13.1	1.28
502	do.	.1	Quartz vein with pyrite.	3.69	67.3	1.21	11.2	1.53
503	do.	.4	Gouge, quartz, and pyrite.	6.47	73.5	1.63	89.3	2.11
504	do.	3.5	Quartz, gouge, and sheared felsite, with limonite and pyrite.	11.7	132.0	.412	302.0	6.38
505 2/	do.	.3	Quartz with pyrite and limonite.	11.3	371.0	7.5	27.7	3.99
506	Grab.	NA	Gouge and limonite-coated felsite from ore shoot.	15.0	149.0	9.51	22.2	2.52
507 3/	Chip.	2.5	Sheared, siliceous felsite with quartz veinlets, limonite, and pyrite.	24.4	2655	.541	117.0	28.4
508	do.	2.0	Sheared, argillically altered felsite.	1.81	186	.167	34.7	2.82
509	do.	2.6	Gouge and quartz pods.	8.84	288.0	1.91	80.1	4.34
510	do.	0.5	Gouge and quartz stringers.	35.9	88.1	12.0	11.9	1.61
511	do.	2.2	Gouge, quartz pods, and disseminated pyrite.	11.0	72.4	4.15	149.0	3.07
564	Random chip.	NA	Crystal-rich granitic intrusion, fractured and recemented with silica.	.304	4.8	.187	10.4	.323
565	do.	NA	Fractured, crystal-rich granitic intrusion with limonite after pyrite.	.206	19.9	<.05	11.9	.402
566	do.	NA	Altered, fractured, crystal-rich granitic intrusion with limonite after pyrite.	.194	9.07	<.05	10.6	.326
567	do.	NA	Silicified granitic intrusion with disseminated pyrite.	.434	17.1	<.05	16.8	.345
568	do.	NA	Silicified, crystal-rich granitic intrusion.	.325	4.41	<.05	10.4	.291
569	do.	NA	Silicified granitic breccia with quartz veinlets.	.108	5.41	<.05	10.3	.393
570	do.	NA	Crystal-rich granitic intrusion.	.059	4.73	<.05	8.31	.352

TABLE A-12.--Descriptions and analyses for samples shown on figures A-32 and A-33, South Twin mine--Continued

Sample								
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
571	Random chip.	NA	Crystal-rich porphyry dike.	.089	12.5	<.05	5.69	.6
609	Grab.	NA	Dump material of silicified felsite with disseminated pyrite.	.6	--	<.05	10	--
610	do.	NA	Dump material of porphyritic dike.	.162	5.1	<.05	5.84	.412
611	Random chip.	NA	Felsite with some disseminated pyrite.	.201	3.12	<.05	8.47	.375
612	do.	NA	Felsite breccia with quartz fissure fillings.	.35	16.6	<.05	11.3	.603
613	Select.	NA	Stockpile of felsite and quartz vein with pyrite and limonite.	4.52	72.5	2.62	34.4	2.03
614	Grab.	NA	Dump of altered felsite and clay.	1.81	55.3	.452	11.0	.969
615	Random chip.	NA	Brecciated, crystal-rich granitic intrusion.	.154	9.2	<.05	7.6	.575
616	do.	NA	Silicified, brecciated, crystal-rich granitic intrusion.	0.102	6.35	<0.05	7.1	0.403
617	do.	NA	Sheared felsite with quartz, calcite, and limonite veins.	.271	6.66	<.05	14.9	.323
618	do.	NA	Silicified, brecciated felsite.	.682	12.3	<.05	.969	.331

1/ Samples 294, 295, 296, 297, and 422 also contain 2.0 ppm, 1.7 ppm, 1.4 ppm, 1.8 ppm, and 2.1 ppm thallium, respectively.
2/ Samples 432 and 505 also contain 2.7 ppm and 1.39 ppm mercury, respectively.
3/ Sample 507 also contains 6024 ppm lead and 8397 ppm zinc.

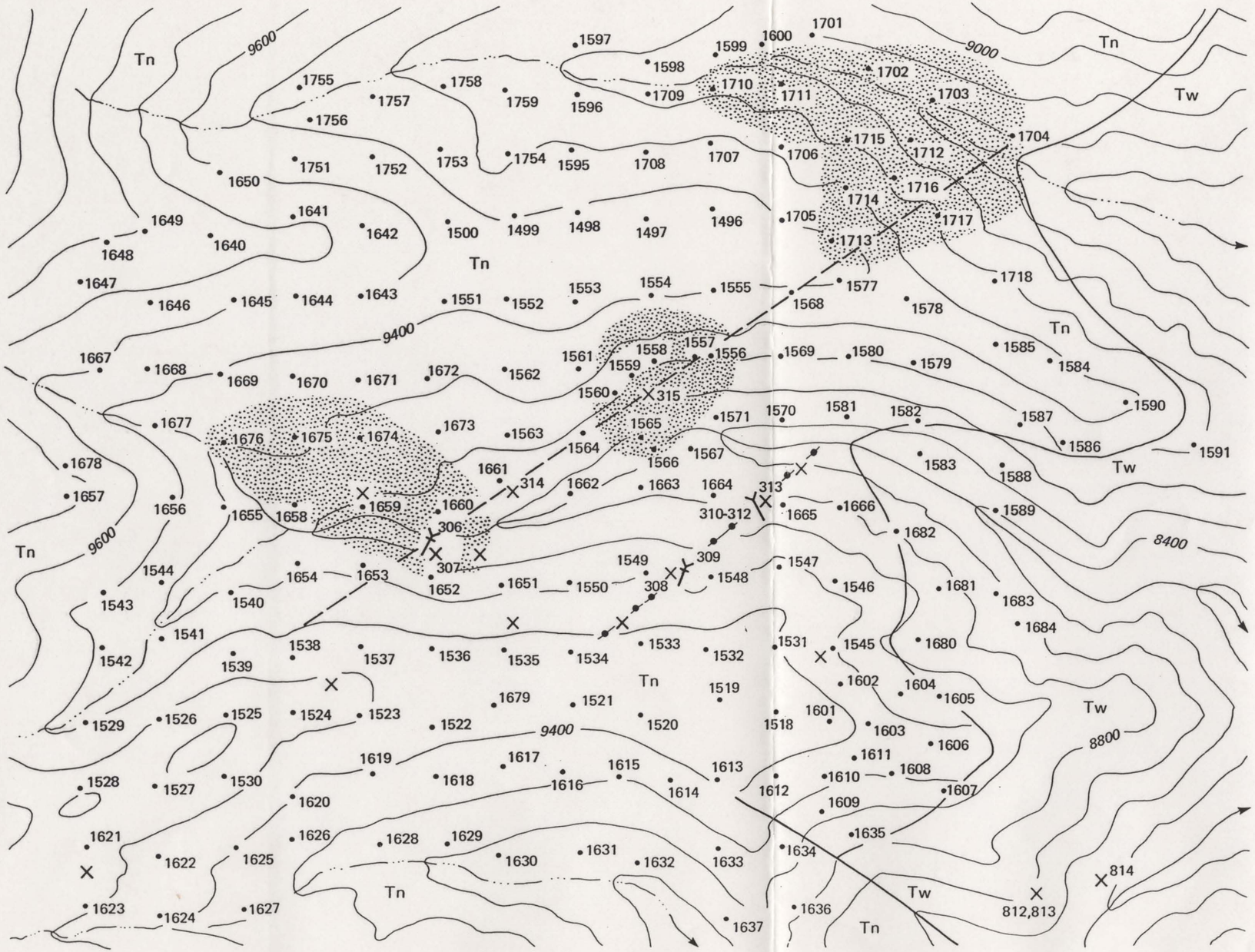


FIGURE A-34.—Workings, sample sites, and generalized geology, Tiger Cat prospect area

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
306	Chip.	16.0	Silicified shear zone trending N. 85° E. and dipping 85° SE. in bleached tuff.	2.54	31.9	<0.05	6.85	<0.5	85.6
307	do.	4.0	Bleached tuff outside the shear zone.	.931	29.6	.075	4.49	<.5	19.3
308	do.	.8	Coxcomb quartz vein striking N. 70° E. and dipping 80° SE. in sheared welded tuff.	15.4	29.9	6.08	41.7	<.5	28.7
309	do.	4.0	Silicified shear zone trending N. 62° E. and dipping 85° SE. in bleached tuff.	4.43	46.1	.273	20.8	<.5	121.0
310	do.	2.5	Limonite-stained, sheared tuff and clay exposed in 80-ft-long adit.	7.89	16.0	.105	5.0	<.5	25.6
311	do.	50.0	Limonite-stained, silicified, fractured tuff exposed in adit.	1.24	23.4	<.05	11.0	<.5	8.13
312	do.	30.0	do.	.162	3.1	<.05	6.86	<.5	.692
313	do.	2.0	Limonite-stained, silicified shear zone.	.494	8.64	<.05	2.76	<.5	6.47
314	Grab.	NA	Limonite-stained, silicified tuff containing pyrite from sloughed pit.	5.3	37.4	.064	2.88	<.5	113.0
315	do.	NA	Limonite-stained, brecciated tuff near sloughed pit.	30.2	244.0	.311	6.11	<.5	1309.
812	Select.	NA	Bleached, argillized, crystal-poor, welded tuff containing pyrite.	1.2	--	.025	2	--	15
813	do.	NA	Silicified, bleached welded tuff.	24.3	--	.180	2	--	70
814	do.	NA	Bleached, crystal-poor, welded tuff containing quartz-filled fractures.	.6	--	<.005	2	--	9
1496	Grab.	NA	Bleached tuff.	.041	4.12	<.05	2.02	<.10	2.93
1497	do.	NA	do.	.045	3.40	<.05	1.98	<.10	3.80

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1498	Grab.	NA	Limonite-stained, bleached, ash-flow tuff.	0.047	3.92	<0.05	1.88	<0.10	4.00
1499	do.	NA	do.	.043	4.76	<.05	1.68	<.10	3.94
1500	do.	NA	do.	.045	4.13	<.05	1.09	<.10	6.35
1518	do.	NA	Light gray, welded tuff containing quartz crystals.	.021	5.14	<.05	3.34	<.10	3.51
1519	do.	NA	Lithic, gray ash-flow tuff.	.023	4.02	<.05	2.76	<.10	3.48
1520	do.	NA	do.	.027	2.36	<.05	2.67	<.10	3.42
1521	do.	NA	do.	.026	3.83	<.05	3.67	<.10	2.97
1522	do.	NA	Gray, welded tuff.	.041	3.97	<.05	2.14	<.10	4.42
1523	do.	NA	Limonite-stained, gray, welded tuff.	.031	6.21	<.05	3.19	<.10	3.91
1524	do.	NA	do.	.033	6.50	<.05	2.38	<.10	4.57
1525	do.	NA	Variegated, vesicular tuff.	.033	3.33	<.05	3.23	<.10	2.99
1526	do.	NA	do.	.033	2.62	<.05	2.73	<.10	2.97
1527	do.	NA	Gray, vesicular, welded tuff.	.022	4.10	<.05	2.68	.133	8.42
1528	do.	NA	Light-colored, vesicular, welded tuff.	.036	5.11	<.05	3.49	<.10	1.35
1529	do.	NA	do.	.078	2.19	<.05	2.82	<.10	1.70
1530	do.	NA	Light-colored, ash-flow tuff.	.042	5.12	<.05	3.06	.133	4.89
1531	do.	NA	do.	.02	4.50	<.05	3.18	<.10	4.04
1532	do.	NA	Bleached, ash-flow tuff.	.028	4.29	<.05	1.90	<.10	5.10
1533	do.	NA	Gray, ash-flow tuff.	.025	3.95	<.05	2.37	<.10	4.06
1534	do.	NA	do.	.035	4.07	<.05	1.93	<.10	5.08

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1535	Grab.	NA	Variegated, vesicular, ash-flow tuff.	0.03	2.51	<0.05	2.26	<0.10	3.62
1536	do.	NA	Bleached, ash-flow tuff.	.054	6.70	<.05	2.67	.119	4.84
1537	do.	NA	Light-colored, ash-flow tuff.	.249	8.76	<.05	2.22	.110	5.43
1538	do.	NA	Light-colored, vesicular, ash-flow tuff.	.043	3.65	<.05	2.28	<.10	7.17
1539	do.	NA	do.	.102	5.97	<.05	2.69	.150	9.73
1540	do.	NA	Bleached, silicified, ash-flow tuff.	.387	12.1	<.05	2.35	.223	22.4
1541	do.	NA	Bleached, argillized, ash-flow tuff.	.022	2.59	<.05	1.26	<.10	3.09
1542	do.	NA	do.	.022	2.33	<.05	1.60	.089	3.96
1543	do.	NA	Reddish-brown, silicified, welded tuff.	.035	4.48	<.05	1.69	<.10	6.83
1544	do.	NA	do.	.022	3.12	<.05	1.50	<.10	5.76
1545	do.	NA	Gray, welded tuff.	.022	1.86	<.05	2.60	.118	4.61
1546	do.	NA	Limonite-stained, gray, welded tuff containing quartz crystals.	.028	1.48	<.05	2.49	.107	2.92
1547	do.	NA	do.	.031	1.85	<.05	2.57	<.10	4.90
1548	do.	NA	do.	.032	2.70	<.05	1.99	<.10	4.02
1549	do.	NA	Gray to brown, ash-flow tuff.	.021	2.40	<.05	2.21	<.10	4.15
1550	do.	NA	Limonite-stained, gray, ash-flow tuff.	.035	2.67	<.05	2.61	<.10	3.44
1551	do.	NA	Bleached, ash-flow tuff.	.042	5.22	<.05	1.53	.098	5.37
1552	do.	NA	do.	.037	3.84	<.05	1.83	.130	4.62
1553	do.	NA	Partially silicified, bleached, limonite-stained, ash-flow tuff.	.054	7.67	<.05	2.47	<.10	4.68

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1554	Grab.	NA	Partially silicified, bleached, limonite-stained, ash-flow tuff.	0.037	7.66	<0.05	2.21	0.145	4.31
1555	do.	NA	Limonite-stained, bleached, ash-flow tuff.	.351	47.5	<.05	5.65	.110	17.7
1556	Select.	NA	Partially silcified, limonite-stained, acid leached, ash-flow tuff.	.792	64.0	<.05	1.76	.095	37.2
1557	Random chip.	NA	Light gray, welded tuff with Liesegang banding.	.056	6.41	<.05	2.36	<.10	7.38
1558	do.	NA	Limonite-, hematite-, and manganese-stained, bleached, partially silicified, ash-flow tuff.	6.07	121.	.066	7.34	.108	132.
1559	do.	NA	do.	.114	9.93	<.05	1.68	<.10	5.89
1560	do.	NA	Limonite-stained, partially silicified, ash-flow tuff containing disseminated pyrite.	.492	27.9	<.05	3.57	.302	14.0
1561	Grab.	NA	Bleached, ash-flow tuff with quartz lining vugs.	.052	2.27	<.05	1.73	<.10	4.03
1562	do.	NA	Light gray, ash-flow tuff.	.037	4.49	<.05	1.83	<.10	4.64
1563	do.	NA	Bleached, ash-flow tuff.	.09	7.98	<.05	2.86	<.10	5.99
1564	do.	NA	Light gray, limonite-stained, ash-flow tuff.	.042	3.57	<.05	2.10	<.10	3.45
1565	do.	NA	Gray, limonite-stained, partially silicified, ash-flow tuff.	.191	11.8	<.05	1.75	.111	8.50
1566	do.	NA	Limonite-stained, silicified, pyrite-bearing, ash-flow tuff.	.08	4.19	<.05	2.14	<.10	3.52
1567	do.	NA	Limonite-stained, partially silicified, ash-flow tuff.	.063	4.14	<.05	1.64	<.10	5.08
1568	do.	NA	Limonite-stained, partially silicified, ash-flow tuff containing pyrite.	.181	90.6	<.05	2.82	.523	6.77
1569	do.	NA	do.	.166	25.5	<.05	3.34	.724	5.18

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1570	Grab.	NA	Slightly limonite-stained, partially silicified, ash-flow tuff.	0.117	7.33	<0.05	2.94	0.107	3.40
1571	do.	NA	do.	.139	6.52	<.05	2.16	<.10	4.79
1577	Random chip.	NA	Bleached, limonite-stained, partially silicified, ash-flow tuff.	.774	69.1	<.05	4.78	.230	23.8
1578	do.	NA	do.	.173	3.81	<.05	3.23	<.10	5.70
1579	do.	NA	do.	.244	9.50	<.05	2.61	<.10	5.09
1580	do.	NA	do.	.189	65.1	<.05	3.60	.534	14.3
1581	do.	NA	do.	.149	13.9	<.05	2.81	.255	5.42
1582	do.	NA	Dense, gray, welded tuff.	.057	2.92	<.05	1.93	<.10	3.90
1583	Select.	NA	Bleached, welded tuff.	.123	9.81	<.05	1.86	<.10	3.59
1584	Random chip.	NA	Light gray, ash-flow tuff.	.098	3.08	<.05	1.94	<.10	3.71
1585	do.	NA	Hematite-stained, bleached, ash-flow tuff.	.177	2.71	<.05	1.93	.09	4.91
1586	do.	NA	Dense, welded tuff.	.124	5.04	<.05	2.08	.199	3.67
1587	do.	NA	Light gray, limonite-stained, welded tuff showing Liesegang banding.	.240	2.96	<.05	2.85	.097	4.95
1588	do.	NA	Dense, gray, welded tuff.	.031	1.44	<.05	1.99	.109	3.78
1589	Select.	NA	Limonite-stained, welded tuff.	.290	9.51	<.05	4.83	.371	9.97
1590	Random chip.	NA	Bleached, welded tuff.	.077	1.17	<.05	2.63	.098	2.61
1591	do.	NA	Light greenish-gray tuff.	.04	<.969	<.05	1.89	.181	3.39
1595	Grab.	NA	Bleached, ash-flow tuff.	.04	3.00	<.05	3.29	<.10	3.75

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1596	Grab.	NA	Bleached, ash-flow tuff.	0.043	4.34	<0.05	2.27	<0.10	4.56
1597	do.	NA	do.	.038	4.23	<.05	2.05	<.10	4.60
1598	do.	NA	Limonite-stained, bleached, ash-flow tuff.	.041	4.01	<.05	2.30	<.10	4.09
1599	do.	NA	Light gray, partially welded, ash-flow tuff.	.053	2.95	<.05	2.77	.102	5.09
1600	do.	NA	do.	.041	2.13	<.05	4.25	<.10	5.26
1601	do.	NA	Partially welded, gray, ash-flow tuff.	.037	7.12	<.05	4.59	.092	4.52
1602	do.	NA	do.	.026	6.14	<.05	2.77	<.10	4.10
1603	do.	NA	do.	.018	5.08	<.05	2.25	<.10	2.94
1604	do.	NA	Partially welded, gray, ash-flow tuff containing vugs filled with limonite.	.015	5.64	<.05	1.93	<.10	3.63
1605	do.	NA	do.	.018	5.22	<.05	2.80	<.10	3.59
1606	do.	NA	Limonite-stained, fractured, gray, welded, ash-flow tuff.	.03	1.60	<.05	2.60	<.10	3.20
1607	do.	NA	do.	.04	6.05	<.05	2.21	<.10	2.80
1608	do.	NA	do.	.02	6.15	<.05	2.15	.119	3.80
1609	do.	NA	do.	.028	6.37	<.05	3.40	.132	4.80
1610	do.	NA	Limonite-stained, gray, partially welded tuff showing Liesegang banding.	.045	6.51	<.05	3.47	.144	5.72
1611	do.	NA	Limonite-stained, light gray, partially welded, ash-flow tuff.	.035	6.64	<.05	3.22	<.10	4.69
1612	do.	NA	do.	.029	8.06	<.05	13.7	<.10	3.82
1613	do.	NA	Limonite-stained, gray, ash-flow tuff.	.032	4.24	<.05	2.90	<.10	4.35

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1614	Grab.	NA	Limonite-stained, gray, ash-flow tuff.	0.023	1.58	<0.05	2.69	<0.10	2.45
1615	do.	NA	do.	.019	<7.01	<.05	1.65	<.10	3.49
1616	do.	NA	do.	.033	6.18	<.05	2.78	<.10	3.06
1617	do.	NA	Limonite-stained, gray, ash-flow tuff with a trace of pyrite.	.206	12.2	<.05	2.90	<.10	6.35
1618	do.	NA	Limonite-stained, gray, ash-flow tuff.	.032	7.25	<.05	2.19	<.10	3.58
1619	do.	NA	do.	.024	4.56	<.05	1.66	<.10	4.34
1620	do.	NA	Limonite-stained, gray, vesicular, ash-flow tuff.	.033	5.30	<.05	2.65	<.10	2.94
1621	do.	NA	Limonite-stained, bleached, vesicular, ash-flow tuff.	.048	3.55	<.05	4.22	.134	1.86
1622	do.	NA	Light-gray, vesicular, ash-flow tuff.	.028	2.07	<.05	3.81	.215	1.78
1623	do.	NA	Crystal-rich tuff.	.029	1.10	<.05	2.10	<.10	5.26
1624	do.	NA	do.	.034	3.56	<.05	3.10	<.10	4.43
1625	do.	NA	Hematite-stained, partially silicified, ash-flow tuff showing Liesegang banding.	.028	7.81	<.05	1.61	.160	5.77
1626	do.	NA	Limonite-stained, partially welded, gray, ash-flow tuff.	.022	4.42	<.05	3.26	<.10	2.82
1627	do.	NA	Crystal-rich, ash-flow tuff.	.035	3.57	<.05	2.31	<.10	6.81
1628	do.	NA	Partially welded tuff.	.038	4.23	<.05	4.90	.099	5.18
1629	do.	NA	Light gray and green ash-flow tuff.	.06	7.07	<.05	2.98	<.10	1.82
1630	do.	NA	do.	.06	3.74	<.05	2.74	<.10	5.46
1631	do.	NA	Partially silicified, limonite-stained, ash-flow tuff.	.286	7.40	<.05	2.94	<.10	8.51
1632	do.	NA	Partially silicified, limonite-stained, ash-flow tuff showing Liesegang banding.	.029	1.44	<.05	2.65	<.10	4.12

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1633	Grab.	NA	Partially silicified, limonite-stained, ash-flow tuff showing Liesegang banding.	0.032	1.80	<0.05	2.63	<0.10	4.31
1634	do.	NA	Fractured, limonite-stained, partially welded, gray, ash-flow tuff.	.044	3.01	<.05	2.02	<.10	2.90
1635	do.	NA	Limonite-stained, welded tuff.	.067	1.89	<.05	2.23	<.10	4.69
1636	do.	NA	Partially welded, ash-flow tuff.	.061	2.45	<.05	1.99	<.10	2.96
1637	do.	NA	do.	.035	3.17	<.05	2.39	.118	4.49
1640	do.	NA	Partially silicified, limonite-stained, ash-flow tuff.	.015	117.	<.05	6.54	.145	10.5
1641	do.	NA	Bleached, vesicular, ash-flow tuff.	.045	13.0	<.05	55.3	.251	38.4
1642	do.	NA	Limonite-stained, vesicular, ash-flow tuff.	.025	4.15	<.05	2.54	<.10	5.21
1643	do.	NA	do.	.037	1.86	<.05	2.85	<.10	4.38
1644	do.	NA	do.	.029	3.28	<.05	2.75	.097	5.51
1645	do.	NA	do.	.037	19.6	<.05	3.81	<.10	2.27
1646	do.	NA	Limonite-stained, partially welded, ash-flow tuff showing Liesegang banding.	.034	39.4	<.05	4.56	.111	4.93
1647	do.	NA	Crystal-rich, partially welded, ash-flow tuff.	.015	1.57	<.05	2.88	<.10	4.75
1648	do.	NA	Brecciated, silicified tuff.	.032	4.09	<.05	2.94	.095	7.24
1649	do.	NA	do.	.023	8.52	<.05	2.34	.287	4.60
1650	do.	NA	Partially welded, limonite-stained, ash-flow tuff.	.039	69.5	<.05	3.99	.108	8.22
1651	do.	NA	Light-colored, ash-flow tuff.	.05	4.98	<.05	2.21	.110	4.89
1652	do.	NA	Variegated, vesicular, ash-flow tuff.	.048	4.58	<.05	2.47	<.10	5.30

TABLE A-13.--Descriptions and analyses for sample shown on figure A-34, Tiger Cat prospect area--Continued

Sample										
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1653	Grab.	NA	Variegated, vesicular, ash-flow tuff.	0.197	16.3	<0.05	2.31	<0.10	8.55
1654	do.	NA	do.	.031	1.59	<.05	1.36	<.10	5.03
1655	do.	NA	Bleached, gray, ash-flow tuff.	.021	1.68	<.05	1.79	<.10	4.09
1656	Chip.	0.9	Gray, ash-flow tuff.	.037	2.66	<.05	2.74	.178	7.92
1657	do.	NA	Gray, welded tuff.	.059	7.45	<.05	1.87	.302	1.75
1658	do.	NA	Partially silicified, vesicular, ash-flow tuff.	.025	4.00	<.05	2.52	.206	6.71
1659	do.	NA	Silicified, argillized, crystal-rich, ash-flow tuff.	.03	3.93	<.05	1.37	.159	9.57
1660	do.	NA	do.	<.013	<.876	<.05	2.34	<.10	7.74
1661	do.	NA	Fractured, partially welded, ash-flow tuff.	.983	16.9	<.05	2.47	.156	13.6
1662	do.	NA	Limonite-stained, partially welded, ash-flow tuff.	.05	2.59	<.05	2.36	.158	7.03
1663	do.	NA	Limonite-stained, ash-flow tuff.	.048	1.81	<.05	1.63	.121	5.75
1664	do.	NA	Partially welded, ash-flow tuff.	.026	2.00	<.05	2.30	.123	3.56
1665	do.	NA	do.	.05	1.34	<.05	2.61	.159	2.94
1666	do.	NA	do.	.061	1.20	<.05	2.97	<.10	2.71
1667	do.	NA	Silicified, crystal-rich tuff.	.017	<.896	<.05	2.19	<.10	5.55
1668	do.	NA	Bleached, argillized, ash-flow tuff.	<.013	7.41	<.05	2.21	<.10	2.87
1669	do.	NA	Variegated, vesicular, ash-flow tuff.	.025	7.49	<.05	3.88	.127	2.49
1670	do.	NA	do.	.027	10.1	<.05	2.75	<.10	6.80
1671	do.	NA	do.	.063	3.31	<.05	3.13	<.10	4.09

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1672	Grab.	NA	Variegated, vesicular, ash-flow tuff.	0.017	2.33	<0.05	1.90	<0.10	2.76
1673	do.	NA	do.	.033	1.32	<.05	1.75	<.10	4.26
1674	do.	NA	Silicified, argillized, ash-flow tuff.	.022	3.13	<.05	1.99	<.10	3.49
1675	do.	NA	do.	<.015	<.971	<.05	1.13	<.10	2.73
1676	do.	NA	do.	.017	4.44	<.05	1.92	<.10	4.24
1677	do.	NA	Bleached, argillized, ash-flow tuff.	.053	2.76	<.05	2.47	<.10	2.67
1678	do.	NA	Gray, ash-flow tuff.	.026	6.12	<.05	3.48	<.10	2.48
1679	do.	NA	Vesicular, ash-flow tuff.	.046	<.921	<.05	1.77	<.10	2.89
1680	do.	NA	Dense, gray, welded tuff.	.019	2.05	<.05	2.57	<.10	2.28
1681	do.	NA	Fractured, limonite-stained rhyolite.	.017	10.9	<.05	2.45	<.10	2.70
1682	do.	NA	Dense, gray, welded, ash-flow tuff.	.016	5.52	<.05	1.29	<.10	1.89
1683	do.	NA	Fractured rhyolite.	.016	4.68	<.05	1.07	<.10	2.49
1684	do.	NA	do.	.043	4.06	<.05	1.54	<.10	2.27
1701	do.	NA	Light gray, limonite-stained, partially welded, ash-flow tuff.	.077	4.26	<.05	3.32	.141	9.63
1702	do.	NA	Silicified, ash-flow tuff.	.082	3.07	<.05	3.05	.177	6.51
1703	do.	NA	Partially silicified, limonite-stained, ash-flow tuff showing Liesegang banding.	.118	3.80	<.05	2.50	.185	6.36
1704	do.	NA	do.	.084	4.18	<.05	2.87	.270	6.24
1705	do.	NA	Bleached, ash-flow tuff.	.033	2.10	<.05	2.40	.225	5.52
1706	do.	NA	Light-gray, ash-flow tuff.	.031	1.50	<.05	2.57	<.10	6.07

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1707	Grab.	NA	Light-gray, ash-flow tuff.	0.038	1.71	<0.05	2.05	0.152	4.70
1708	do.	NA	do.	.027	1.12	<.05	2.15	<.10	3.87
1709	do.	NA	do.	.025	<.929	<.05	2.32	<.10	3.11
1710	do.	NA	Limonite-stained, partially silicified, ash-flow tuff.	.094	<.982	<.05	2.19	<.10	4.43
1711	do.	NA	do.	.04	<.911	<.05	2.94	<.10	3.18
1712	do.	NA	do.	.074	4.42	<.05	2.69	.365	3.35
1713	do.	NA	do.	.079	7.77	<.05	3.00	.107	5.33
1714	do.	NA	Greenish-gray, silicified tuff.	.028	<.949	<.05	2.86	<.10	4.19
1715	do.	NA	Limonite-stained, silicified, light gray, ash-flow tuff.	.032	1.07	<.05	2.74	<.10	3.29
1716	do.	NA	do.	.434	27.8	.07	2.78	.322	8.65
1717	do.	NA	Limonite-stained, silicified, ash-flow tuff showing Liesegang banding.	.295	3.87	<.05	3.08	.246	4.88
1718	do.	NA	Bleached, argillized, ash-flow tuff showing Liesegang banding.	.171	22.8	<.05	2.48	.099	4.28
1751	do.	NA	Limonite-stained, bleached, ash-flow tuff.	<.016	<.938	<.05	2.47	<.10	3.67
1752	do.	NA	Limonite-stained, vesicular, ash-flow tuff.	.025	<.926	<.05	3.22	<.10	4.26
1753	do.	NA	do.	.027	1.10	<.05	1.58	<.10	3.87
1754	do.	NA	Light-colored, ash-flow tuff.	.036	4.11	<.05	2.66	<.10	5.90
1755	do.	NA	Limonite-stained, light-colored, ash-flow tuff.	.033	12.4	<.05	3.29	.168	4.51
1756	do.	NA	do.	.018	10.7	<.05	3.42	.146	8.21

TABLE A-13.--Descriptions and analyses for samples shown on figure A-34, Tiger Cat prospect area--Continued

Sample									
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Mercury	Molybdenum
1757	Grab.	NA	Vesicular, limonite-stained, ash-flow tuff.	0.144	9.01	<0.05	4.36	0.121	6.38
1758	do.	NA	do.	.035	5.14	<.05	2.82	<.10	6.67
1759	do.	NA	do.	.031	4.67	<.05	3.85	<.10	3.45

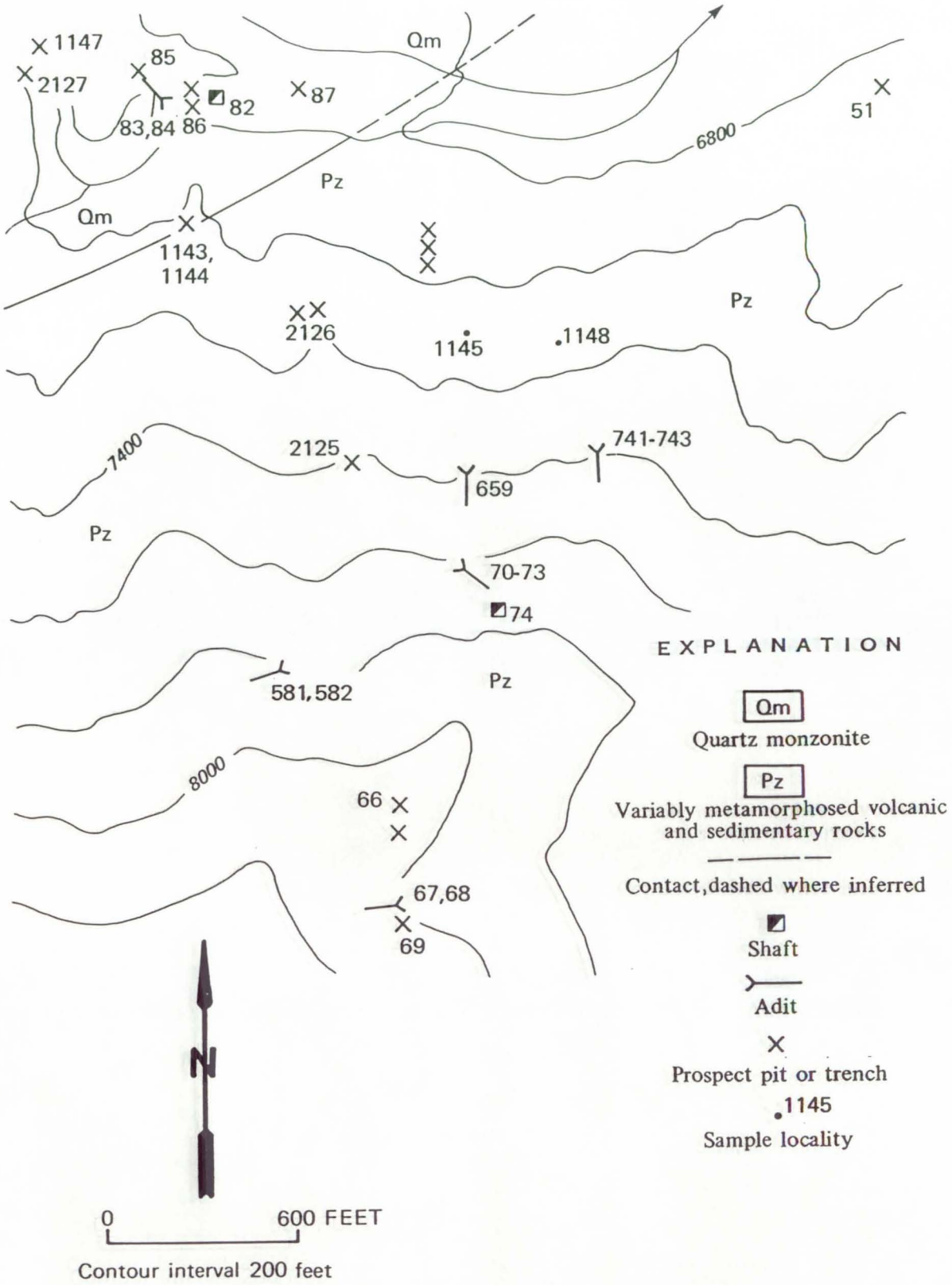


FIGURE A-35.—Workings, sample sites, and generalized geology, Broad Canyon mine

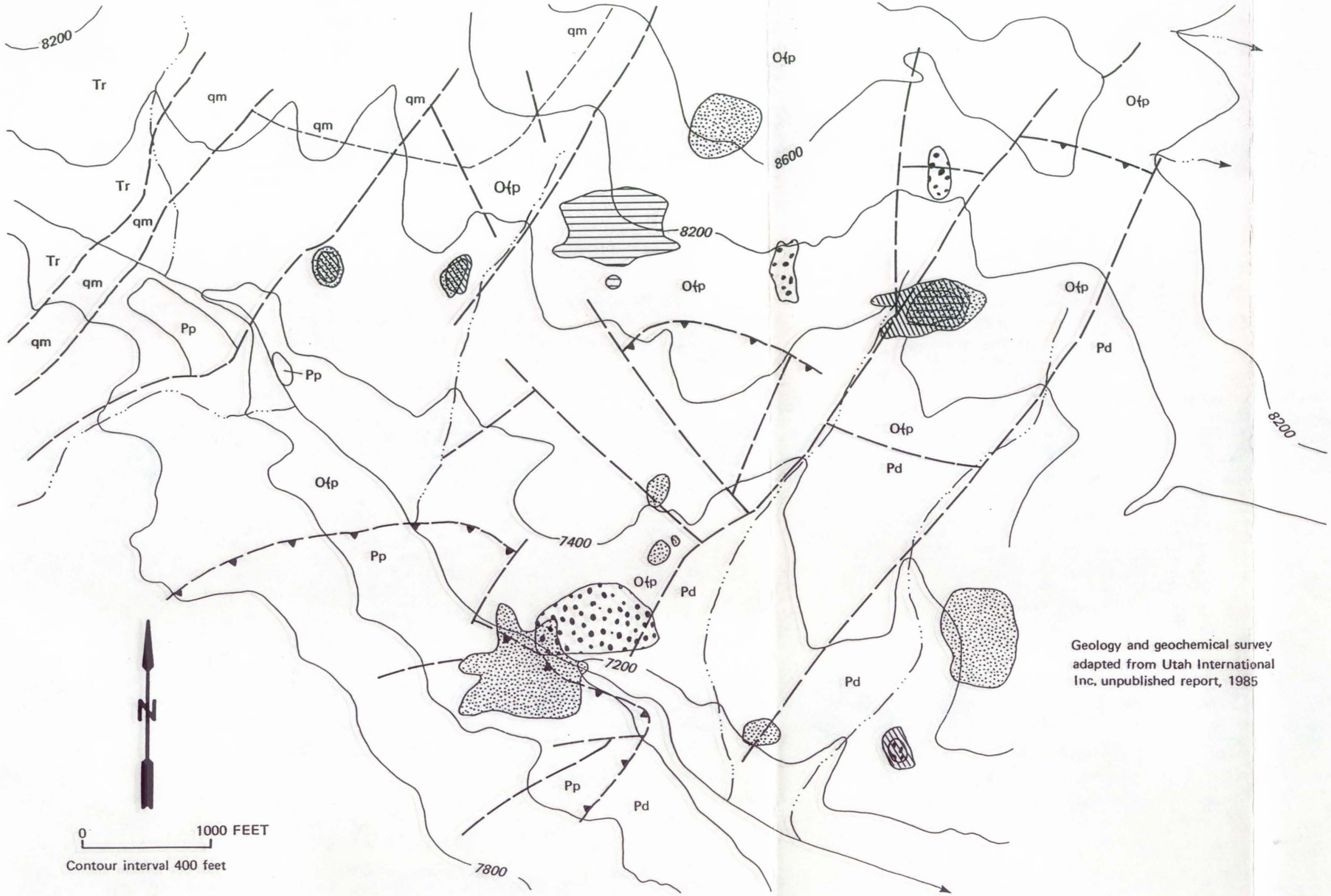
TABLE A-14.--Descriptions and analyses for samples shown on figure A-35, Broad Canyon mine

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
51	Chip.	0.7	Quartz vein striking N. 50° W. and dipping vertically in metasedimentary rock.	0.122	<0.05	9.37	0.671	5.49	13.5
66	do.	4.0	Shear zone containing limestone, quartz, and galena.	68.4	<.05	35.5	238.0	1.47%	1.67%
67	Grab.	NA	Galena-bearing, drusy quartz from stockpile.	296.0	<.05	9.17	108.0	2.29%	2.11%
68	Chip.	2.0	Galena-bearing quartz vein striking N. 15°-25° E. and dipping 20°-30° NW.	140.	.015	49	94	2.16%	5.47%
69	do.	2.1	Galena-bearing quartz vein striking N. 20°-30° E. and dipping 20°-30° NW.	135.0	<.05	16.9	24.7	1.3%	5381.
70	do.	4.3	Sheared, argillaceous limestone containing quartz and calcite veins.	2.8	<.005	19	10	314	662
71	do.	1.8	Quartz and calcite vein containing galena.	6.79	<.05	12.9	4.93	509.0	309.0
72	do.	3.1	do.	66.4	<.05	12.3	56.1	4201.	2648.
73	Select.	NA	Altered, green metasedimentary rock from shear zone.	2.8	.015	79	18	1.63%	1.27%
74	Grab.	NA	Galena-bearing, drusy quartz and calcite from stockpile.	423.0	<.05	65.6	404.0	1.85%	1.14%
82	Chip.	4.0	Shear zone containing metasedimentary rock and lenses of magnetite.	17.6	.050	1.44%	51	58	554
83	do.	2.0	Pyrite-rich shear zone in rhyolite dike striking N. 40° W. and dipping 45° NE.	4.0	.085	1235	17	56	1348
84	do.	2.5	Sulfide-bearing shear zone.	2.9	<.05	932.0	10.9	66.7	298.0
85	Grab.	NA	Altered, sulfide-bearing rhyolite from trench.	2.22	.068	231.0	26.2	42.6	59.5
86	Chip.	1.7	Quartz vein containing magnetite and hematite.	2.7	.102	343.0	80.7	46.1	117.0
87	Select.	NA	Specular hematite-bearing quartz from dump of pit.	87.2	<.05	281.0	129.0	4901.	6169.

TABLE A-14.--Descriptions and analyses for samples shown on figure A-35, Broad Canyon mine--Continued

Sample No.	Type	Length (ft)	Description	Silver	Gold	Copper	Molybdenum	Lead	Zinc
581	Chip.	1.0	Shear zone trending N. 65° E. and dipping 23° NW. in metasedimentary rock.	389.0	<0.05	57.6	13.5	1.75%	4.07%
582	do.	1.0	do.	42.2	<.05	6060.	126.0	4168.	8421.
659	do.	1.0	Limonite- and malachite-stained shear zone in argillaceous limestone.	2.8	<.005	18	15.	154	2784
741	Select.	NA	Tactite containing galena, sphalerite, and pyrite.	38.8	.035	126	10.	2.9%	2.4%
742	Chip.	4.0	do.	250.	.020	228	16	1.46%	6.1%
743	do.	4.0	do.	108.	.015	160	9	1.96%	2.26%
1143	Select.	NA	Limonitic-hematitic rock from pit at contact of quartz monzonite with metasedimentary rock.	18.7	<.05	450.	186.	1839	777.
1144	Random chip.	NA	Hydrothermally altered, sheared, metasedimentary rock containing calcite veins.	1.98	<.05	58.0	4.66	145.	1482
1145	Chip.	.2	Limonite-actinolite-calcite-epidote-rich zone in sheared metasedimentary rock.	13.0	<.05	579.	45.5	604.	1.86%
1147	Select.	NA	Magnetite- and pyrite-bearing quartz from zone adjacent to diabase dike.	1.97	<.05	66.2	16.4	68.8	266.
1148	Random chip.	NA	Limonite-stained, sheared, silicified siltstone containing disseminated pyrite.	.191	<.05	60.4	12.1	4.13	10.8
2125	Chip.	6.0	Limonite-stained metasedimentary rock.	120.	<.05	105.	6.42	5197	>4.3%
2126	Grab.	NA	Sheared, limonite-stained metasedimentary rock from two pits.	31.0	<.05	293.	59.8	506.	2004
2127	Chip.	.5	Sheared contact of bleached, limonite-stained metasedimentary rock with quartz monzonite.	2.03	<.05	138.	20.9	94.8	216.



EXPLANATION

Tr
Trachyte porphyry

qm
Quartz monzonite

Pp
Permian Pablo Formation

Pd
Permian Diablo Formation

Ofp
Ordovician-Cambrian Palmetto Formation

Contact, dashed where inferred

Fault approximately located

Thrust fault, approximately located; sawteeth on upper plate

Gold in soil ≥ 100 parts per billion

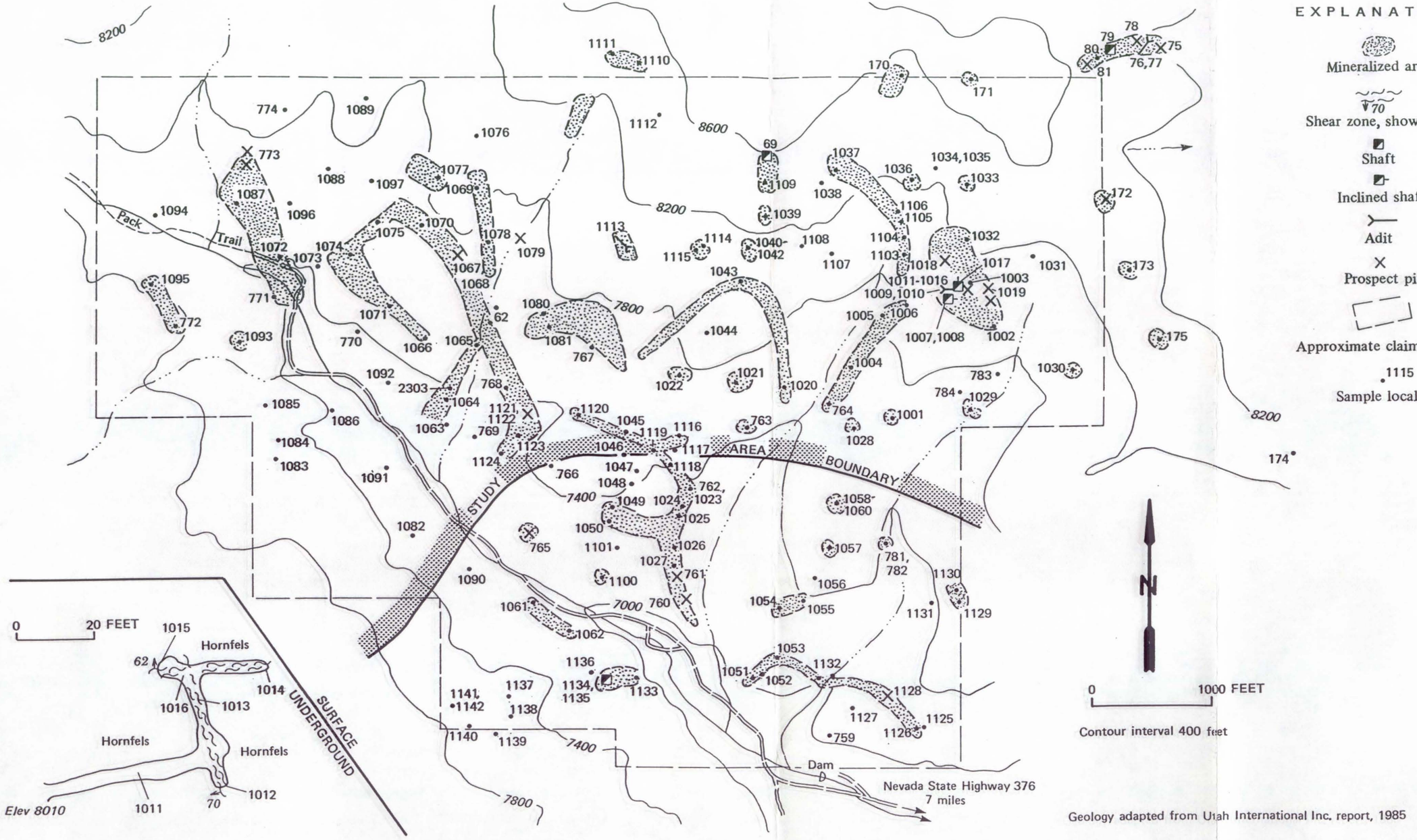
Antimony in soil ≥300 parts per million

Arsenic in soil ≥ 2000 parts per million

Mercury in soil ≥ 200 parts per million

Geology and geochemical survey adapted from Utah International Inc, unpublished report, 1985

FIGURE A-36.–Geologic map showing geochemical anomalies, Ojo Del Oso prospect



Geology adapted from Utah International Inc. report, 1985

FIGURE A-37.—Workings, sample sites, and generalized metal-bearing areas, Ojo Del Oso prospect

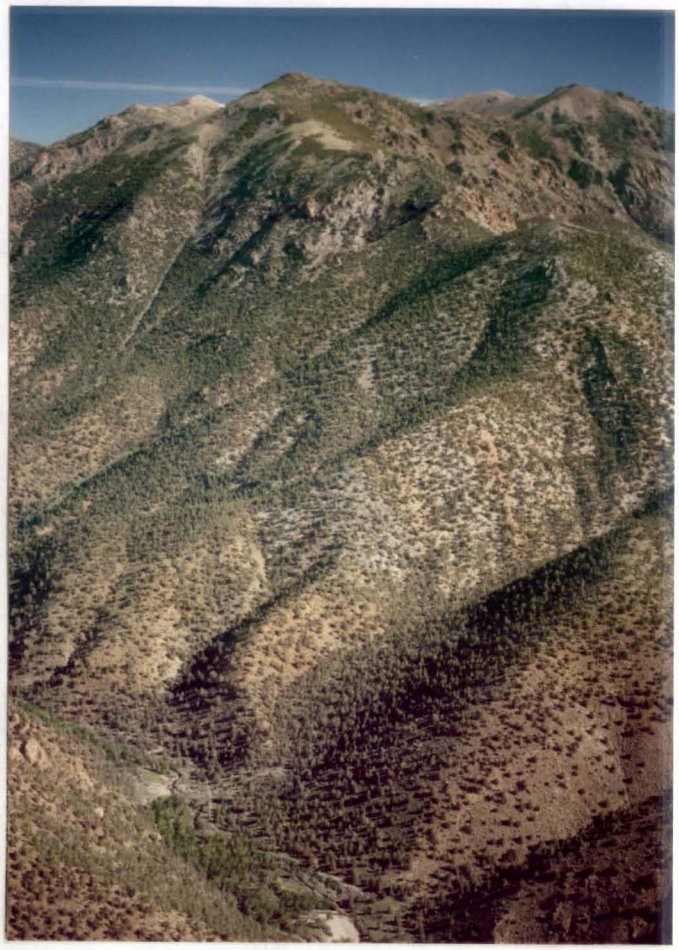


FIGURE A-38.--View looking northwest at the Ojo Del Oso prospect area.

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
62	Chip.	1.7	Metasedimentary rocks with quartz, limonite, and arsenopyrite.	0.2	80	<0.005	16	2	<10	<10
75 1/	Grab.	NA	Dump material of siliceous limestone with malachite, azurite, and possible chalcocite.	630.8	230	.19	1.12%	154	2060	3380
76	Chip.	5.0	Fractured quartz vein in argillite.	4.0	30	<.005	139	72	20	388
77	do.	4.5	Argillite footwall with quartz stringers.	3.81	34.2	<.05	34.0	169.0	7.38	571.0
78	do.	4.3	Quartz in argillite.	.8	20	<.005	16	94	<10	286
79 2/	do.	2.0	Quartz in argillite with limonite and malachite.	5.2	290	.005	34	158	10	1670
80	do.	1.5	Quartz vein with limonite.	1.92	47.0	<.05	19.6	46.5	38.6	377.0
81	do.	1.8	Quartz vein in argillaceous limestone with minor malachite.	1.48	87.9	<.05	21.2	30.7	42.3	158.0
169 3/	Select.	NA	Quartz and metasedimentary rocks with azurite and malachite.	2030	236.0	<.05	1.08%	1413	4074	414.0
170	Grab.	NA	Limonite-stained metasedimentary rocks with disseminated arsenopyrite.	3.27	231.0	<.05	38.3	20.7	27.9	10.4
171	Select.	NA	do.	6.28	57.5	<.05	61.5	46.0	18.3	68.6
172 4/	Random chip.	NA	Contact of gray limestone and altered limestone containing mariposite.	34.3	677.0	<.05	114.0	1240	22.9	3017
173	Grab.	NA	Limonite-stained quartz.	1.51	528.0	<.05	12.4	12.4	8.74	9.91
174	do.	NA	Quartz vein in metasedimentary rocks.	.293	5.18	<.05	4.32	1.88	1.51	2.92
175	do.	NA	Quartz vein.	.289	133.0	.143	3.76	3.05	2.51	50.7

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
759	Random chip.	NA	Conglomerate and argillite.	0.2	--	<0.005	32	8	--	76
760	do.	NA	Quartzite and argillite with disseminated arsenopyrite.	.2	--	<.005	48	4	--	7
761	do.	NA	Altered argillite, siliceous rock and barite vein.	.2	--	<.005	50	2	--	19
762	do.	NA	Quartzite and siliceous metasedimentary rock with disseminated arsenopyrite.	.6	--	.51	4	24	--	18
763	Grab.	NA	Calc-silicate rock with epidote veins.	.6	--	<.005	20	4	--	32
764	Random chip.	NA	Argillite with arsenopyrite, and limonite, quartz, and chrysocolla on fractures.	.4	--	<.005	8	8	--	72
765 5/	Grab.	NA	Calc-silicate rock with pervasive mariposite, siderite veins, and drusy quartz fracture fillings.	.8	--	<.005	142	2	--	24
766	Random chip.	NA	Siliceous metasedimentary rock with disseminated arsenopyrite.	.4	--	<.005	6	4	--	6
767	do.	NA	do.	1.2	--	<.005	28	8	--	22
768	do.	NA	Altered, silicified conglomerate with disseminated arsenopyrite.	1.0	--	<.005	20	4	--	30
769	do.	NA	Altered argillite and gossan.	1.2	--	<.005	56	116	--	96
770	do.	NA	Siliceous metasedimentary rock with 1 to 2 percent arsenopyrite.	.4	--	<.005	50	8	--	26
771	do.	NA	Siliceous metasedimentary rock with up to 10 percent arsenopyrite.	.6	--	<.005	64	4	--	45
772	Grab.	NA	Siliceous metasedimentary rock with up to 1 percent arsenopyrite.	.2	--	<.005	62	4	--	36
773	Random chip.	NA	Altered, siliceous metasedimentary rock with limonite, disseminated arsenopyrite, and gypsum fracture fillings.	1.2	--	<.005	40	10	--	97

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
774	Random chip.	NA	Siliceous argillite and conglomerate.	0.4	--	<0.005	44	10	--	41
781	do.	NA	Sheared argillite and conglomerate with mariposite and siderite.	.6	--	<.005	18	16	--	54
782	Grab.	NA	Fractured, siliceous metasedimentary rock with limonite.	2.6	--	6.3	30	6	--	12
783	Random chip.	NA	Fractured argillite.	.4	--	.01	30	6	--	79
784	do.	NA	Fractured, altered metasedimentary rock with limonite and hematite.	.2	--	.01	10	4	--	47
1001	Grab.	NA	Conglomerate with some mariposite.	.198	383	<.05	23.2	5.54	13.3	45.2
1002	do.	NA	Stretched pebble conglomerate with disseminated arsenopyrite.	.717	356	<.05	141	19.3	2.71	143
1003 6/	Select.	NA	Stockpile of massive arsenopyrite, manganese, malachite, and azurite.	46.3	9.52%	<.487	2587	3374	261	71.8
1004	Random chip.	NA	Cherty limestone.	.462	1523	<.05	22.4	30.1	6.13	37.6
1005	do.	NA	Hornfels.	.154	286	<.05	8.64	9.82	2.56	12.2
1006	do.	NA	Dacite intrusion with disseminated arsenopyrite.	.170	80.9	<.05	22.3	9.29	2.85	83.2
1007 7/	Grab.	NA	Stockpile of massive arsenopyrite in hornfels.	<.143	11.3%	<.478	26.8	107	379	<9.55
1008	Random chip.	NA	Hornfels.	1.61	5473	<.05	140	79.8	9.89	1348
1009 8/	Select.	NA	Stockpile of gossan and limonite boxwork.	206	8558	.09	966	2069	180	9783
1010 9/	Grab.	NA	Stockpile of massive arsenopyrite and quartz.	7.79	7.88%	<.5	257	1819	237	131

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1011	Chip.	3.0	Sheared hornfels with stringers of arsenopyrite and limonite.	1.09	3.38%	<0.243	73.4	44.6	168	61.7
1012	do.	1.2	Sheared hornfels with limonite.	.887	4390	<.05	75.7	5.88	22.1	42.6
1013	10/do.	2.0	Sheared hornfels with azurite and limonite.	27.3	687	<.05	2601	902	11.1	3391
1014	do.	2.0	Sheared hornfels with limonite.	3.32	744	<.05	311	40.9	8.76	193
1015	11/do.	6.0	Sheared hornfels with malachite, limonite, and 6-in.-thick arsenopyrite vein.	11.7	3.24%	<.25	498	1387	262	1169
1016	12/do.	2.5	Footwall of massive arsenopyrite and azurite.	196	7.78%	<.25	1199	4.08%	427	1.02%
1017	13/do.	2.0	Incline face of sheared hornfels with limonite, arsenopyrite, azurite, and chalcanthite.	160	3327	<.25	2.07%	676	19.2	5765
1018	Grab.	NA	Limonite-stained hornfels with pyrite.	.400	725	<.05	29.2	43.1	20.6	52.5
1019	Random chip.	NA	Brecciated limestone with silica fracture fillings.	.588	383	.290	27.9	18.9	462	315
1020	do.	NA	Hornfels with finely disseminated arsenopyrite.	.676	193	<.05	48.4	15.0	4.33	18.3
1021	do.	NA	do.	.425	196	<.05	30.1	9.18	5.24	57.5
1022	14/do.	NA	Felsite dike with disseminated arsenopyrite.	.209	783	<.05	25.3	13.7	14.0	46.5
1023	do.	NA	Limonite-stained hornfels.	.879	399	<.05	71.9	7.65	7.67	16.3
1024	do.	NA	do.	.463	326	<.05	28.0	10.2	17.4	10.8
1025	do.	NA	Silicified metasedimentary rocks with limonite.	.183	365	.221	20.1	1.73	.730	7.68
1026	do.	NA	Silicified breccia with limonite.	.627	2044	<.05	135	13.9	20.4	1.37
1027	do.	NA	Silicified, limonite-stained hornfels.	.127	559	.064	11.2	3.10	.995	7.61

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1028	Random chip.	NA	Limonite-stained limestone breccia recemented with quartz and calcite.	0.175	219	<0.05	21.8	7.48	8.44	18.7
1029	do.	NA	Limonite-stained hornfels.	.716	665	<.05	51.4	22.8	7.03	17.8
1030	Grab.	NA	Pebble conglomerate.	.257	278	<.05	23.0	10.9	2.76	71.7
1031	do.	NA	Hornfels.	.357	65.2	<.05	32.5	7.54	.769	10.4
1032	15/do.	NA	Metasedimentary rock with calcite veins.	6.38	93.3	<.05	5.17	403	3.29	1387
1033	do.	NA	Limonite-stained hornfels.	.578	1733	.072	68.2	13.1	5.35	17.8
1034	do.	NA	Porphyritic quartz latite with disseminated pyrite.	.147	76.6	<.05	4.13	24.1	15.0	5.97
1035	do.	NA	Brecciated, cherty limestone.	.465	128	<.05	24.1	40.1	12.8	41.4
1036	do.	NA	Limonite-stained metasedimentary rocks with disseminated arsenopyrite.	.447	1929	<.05	23.8	13.0	32.0	13.1
1037	Random chip.	NA	Limonite-stained hornfels.	.563	508	<.05	39.5	18.3	12.6	16.8
1038	Grab.	NA	Latite intrusion.	.480	67.1	<.05	35.8	14.3	4.56	13.6
1039	Select.	NA	Gossan with silica webbing.	1.49	244	<.05	31.2	113	116	1977
1040	16/Random chip.	NA	do.	1.75	340	<.05	28.3	352	115	300
1041	do.	NA	Silicified limestone.	4.58	272	.448	20.9	56.2	36.2	83.3
1042	do.	NA	Quartz vein with some limonite and azurite.	63.8	73.8	.819	83.4	88.7	35.8	60.2
1043	do.	NA	Silicified, bleached, cherty limestone.	.326	20.3	<.05	3.46	9.94	5.17	63.5
1044	Grab.	NA	Cherty limestone.	.394	14.0	<.05	11.0	3.80	1.35	11.2

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample										
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1045	Random chip.	NA	Limonite-stained, sheared, silicified limestone.	0.04	491	<0.05	13.5	6.56	20.5	13.6
1046	do.	NA	Limonite-stained, sheared metasedimentary rocks.	.025	30.8	<.05	75.9	2.50	9.01	100
1047	do.	NA	do.	.621	120	<.05	18.3	4.74	1.69	16.6
1048	do.	NA	Sheared, limonite-stained, siliceous metasedimentary rocks.	.204	18.7	<.05	52.0	15.6	1.64	46.4
1049	Grab.	NA	do.	.038	198	<.05	7.17	1.70	8.52	6.17
1050	Select.	NA	Silicified breccia cemented with quartz and hematite.	.085	652	<.05	15.6	2.20	45.5	16.4
1051	Random chip.	NA	Brecciated metasedimentary rocks with calcite and quartz veinlets, chloritic alteration and minor pyrite.	.103	294	<.05	13.4	3.43	4.17	39.1
1052	do.	NA	Pebble conglomerate.	.810	60.6	<.05	137	6.40	5.66	54.4
1053	Grab.	NA	Gossan and altered pebble conglomerate.	2.20	1414	.103	40.6	26.5	83.1	10.2
1054	do.	NA	Altered latite with some pyrite.	.061	19.0	<.05	18.2	4.66	4.57	61.8
1055	do.	NA	Quartzose breccia.	.151	282	<.05	9.09	5.00	12.4	7.70
1056	do.	NA	Quartz and metasiltstone with disseminated pyrite.	.086	35.2	<.05	4.73	1.28	1.32	3.54
1057	do.	NA	Metasiltstone with quartz veinlets.	.550	93.8	<.05	23.7	6.49	5.13	7.76
1058	do.	NA	Altered, siliceous metasedimentary rock with disseminated arsenopyrite.	1.38	706	<.05	22.3	26.3	25.5	12.7
1059	Random chip.	NA	do.	1.73	1727	<.05	97.5	38.0	72.1	19.2
1060	do.	NA	Siliceous breccia, boxwork, and finely disseminated arsenoyprite.	1.12	277	<.05	5.66	10.1	29.0	1.91

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample										
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1061	Random chip.	NA	Sheared, silicified metasedimentary rock with limonite and some disseminated pyrite.	0.259	144	<0.05	13.4	2.57	4.29	2.73
1062	do.	NA	Silicified shale and sandstone with quartz and limonite or fractures.	.033	77.3	<.05	6.37	1.05	.504	1.29
1063	do.	NA	Limonite-stained pebble conglomerate.	.053	82.5	<.05	39.3	3.00	2.69	13.5
1064	do.	NA	Sheared, silicified metasedimentary rock with disseminated arsenopyrite.	.371	195	<.05	23.0	36.0	53.1	13.8
1065	do.	NA	Pebble conglomerate and siliceous metasedimentary rock with disseminated arsenopyrite.	.453	589	<.05	31.3	8.70	20.0	16.3
1066	Chip.	10.0	Silicified metasedimentary rock with disseminated pyrite.	.081	27.2	<.05	53.4	9.71	5.53	46.3
1067	do.	4.5	do.	.357	1173	.184	9.59	14.7	19.6	6.15
1068	Select.	NA	Silicified metasedimentary rock with 1% arsenopyrite and secondary quartz veinlets.	1.12	2688	.950	17.7	9.78	57.8	13.4
1069	Grab.	NA	Conglomerate and breccia with disseminated arsenopyrite.	.234	411	<.05	34.4	7.45	11.9	11.5
1070	Random chip.	NA	Siliceous metasedimentary rock with disseminated pyrite.	.162	40.4	<.05	97.7	7.26	9.04	11.4
1071	do.	NA	Silicified metasedimentary rock with disseminated pyrite.	.352	67.7	<.05	133	10.8	17.2	11.7
1072	Grab.	NA	Hornfels with finely disseminated arsenopyrite.	.038	293	<.05	50.5	5.06	9.32	71.4
1073	do.	NA	Silicified metasedimentary rock with disseminated pyrite.	.1	25.0	<.05	43.4	14.3	31.4	17.9
1074	Random chip.	NA	do.	.479	393	.922	72.7	8.13	8.84	97.5

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample										
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1075	Random chip.	NA	Silicified metasedimentary rock with disseminated pyrite.	0.254	49.7	<0.05	86.7	22.7	9.82	65.1
1076	do.	NA	Quartz porphyry intrusion.	.03	58.0	<.05	2.63	12.2	3.00	5.81
1077	do.	NA	Silicified metasedimentary rock with disseminated arsenopyrite.	.305	350	<.05	63.1	11.7	12.9	16.3
1078	Grab.	NA	Silicified pebble conglomerate with fine disseminated pyrite.	.333	37.9	<.05	36.9	8.53	5.30	20.5
1079	do.	NA	Silicified metasedimentary rock with disseminated arsenopyrite.	.260	345	<.05	22.7	11.5	9.23	50.6
1080	Random chip.	NA	Siltstone and metasiltstone.	.396	149	<.05	46.4	5.23	10.6	23.9
1081	do.	NA	Silicified metasedimentary rock with disseminated arsenopyrite.	.126	93.9	<.05	18.3	4.74	1.55	6.46
1082	do.	NA	Sheared, cherty siltstone and quartzite with fine pyrite.	.167	33.6	<.05	46.6	3.11	1.56	34.8
1083	do.	NA	Iron-stained siltstone with adularia veinlets.	.055	38.3	<.05	16.3	2.77	1.03	42.2
1084	Grab.	NA	Metasiltstone with quartz and adularia in fractures.	.142	20.2	<.05	31.0	5.41	.959	61.3
1085	Random chip.	NA	Iron-stained siltstone with quartz and adularia veinlets.	.057	34.7	<.05	28.8	5.36	2.12	47.6
1086	do.	NA	Latite with limonite.	.100	55.1	<.05	99.0	2.33	4.98	38.9
1087	do.	NA	Silicified metasedimentary rock with disseminated pyrite.	.161	10.1	<.05	37.9	8.81	8.69	21.1
1088	do.	NA	Siliceous hornfels and quartzite with some adularia.	.135	106	<.05	18.2	4.49	6.01	8.26
1089	Grab.	NA	Quartz porphyry with limonite.	.127	39.8	<.05	3.39	9.83	.477	11.4

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample										
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1090	Grab.	NA	Metasiltstone with quartz veinlets, chlorite, and epidote.	0.017	3.76	<0.05	56.1	1.56	<0.218	94.8
1091	Random chip.	NA	Hornfels and metasiltstone with stringers of quartz, epidote, and hematite.	.03	2.36	<.05	63.6	2.06	<.236	74.5
1092	do.	NA	Siliceous metasedimentary rock.	.057	18.1	<.05	79.2	4.75	3.16	60.0
1093	Grab.	NA	Hornfels and metasiltstone with epidote, garnet, quartz, and minor malachite.	.210	34.4	<.05	148	2.38	2.12	74.0
1094	do.	NA	Slightly altered quartz porphyry and trachyte.	.074	3.77	<.05	2.94	9.98	<.217	35.2
1095	do.	NA	Silicified metasiltstone with disseminated arsenopyrite.	.116	57.2	<.05	96.7	7.06	4.60	62.6
1096	Random chip.	NA	Fractured hornfels.	.140	13.7	<.05	37.7	17.7	1.37	45.9
1097	do.	NA	Partially silicified hornfels.	.1	6.91	<.05	47.7	5.65	.763	82.7
1101	do.	NA	Sheared, limonite-stained metasedimentary rock.	.076	53.5	<.05	31.2	2.44	1.22	59.9
1102	do.	NA	Silicified breccia with manganese oxides.	.930	172	<.05	8.83	3.14	1.90	9.23
1103	do.	NA	Limonite-stained metasiltstone with disseminated arsenopyrite.	.141	184	<.05	19.1	9.19	8.24	38.2
1104	do.	NA	Limonite-stained, bleached, limestone breccia.	1.31	864	<.05	9.98	12.5	173	7.04
1105	do.	NA	Limonite-stained, brecciated, cherty limestone and siltstone.	.176	190	<.05	15.3	6.66	6.77	23.6
1106	do.	NA	do.	2.41	1744	.224	20.9	65.2	48.5	47.9
1107	do.	NA	Folded, cherty limestone.	1.11	32.2	<.05	37.2	112	5.35	179
1108	do.	NA	Brecciated, cherty limestone.	.097	90.2	.05	3.81	3.66	13.5	43.2

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample										
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1109	Chip.	0.8	Gossan and limestone.	2.67	225	0.07	16.2	1436	474	7856
1110	Random chip.	NA	Faulted, silicifed limestone with unaltered limestone.	.277	171	<.05	7.26	14.4	13.7	38.8
1111	do.	NA	Limonite-stained hornfels.	.178	197	<.05	28.9	5.37	6.96	13.4
1112	do.	NA	Faulted, carbonaceous limestone.	.204	27.7	<.05	5.33	24.6	18.6	135
1113	do.	NA	Brecciated limestone with limonite and epidote.	2.34	119	<.05	40.3	269	5363	582
1114	Select.	NA	Silicified gossan.	.652	375	<.05	17.0	17.6	138	362
1115	Random chip.	NA	Brecciated limestone.	.205	66.0	<.05	11.2	5.60	30.0	19.6
1116	Select.	NA	Brecciated, cherty limestone with hematite, limonite, and quartz.	.165	57.5	<.05	10.1	3.70	41.2	82.9
1117	Random chip.	NA	Silicified limestone.	1.19	41.6	<.05	8.06	64.8	4.66	56.8
1118	do.	NA	Limonite-stained metasiltstone.	.327	197	<.05	53.4	10.1	15.9	19.6
1119	do.	NA	Sheared, silicified limestone with limonite.	1.29	427	<.05	263	17.5	37.5	262
1120	do.	NA	Sheared, altered metasedimentary rock and gouge.	.195	115	<.05	62.4	3.58	6.79	82.9
1121	Select.	NA	Stockpile of silicified siltstone with abundant pyrite.	.119	8.24	<.05	14.6	5.79	12.0	19.1
1122	Random chip.	NA	Brecciated, altered siltstone.	.186	74.2	<.05	29.7	8.64	16.9	10.9
1123	do.	NA	Silicified metasedimentary rocks with disseminated pyrite.	.089	22.1	<.05	20.1	5.31	30.1	25.5
1124	do.	NA	Brecciated, silicified siltstone with disseminated pyrite.	<.014	3.68	<.05	68.9	1.43	1.18	31.8

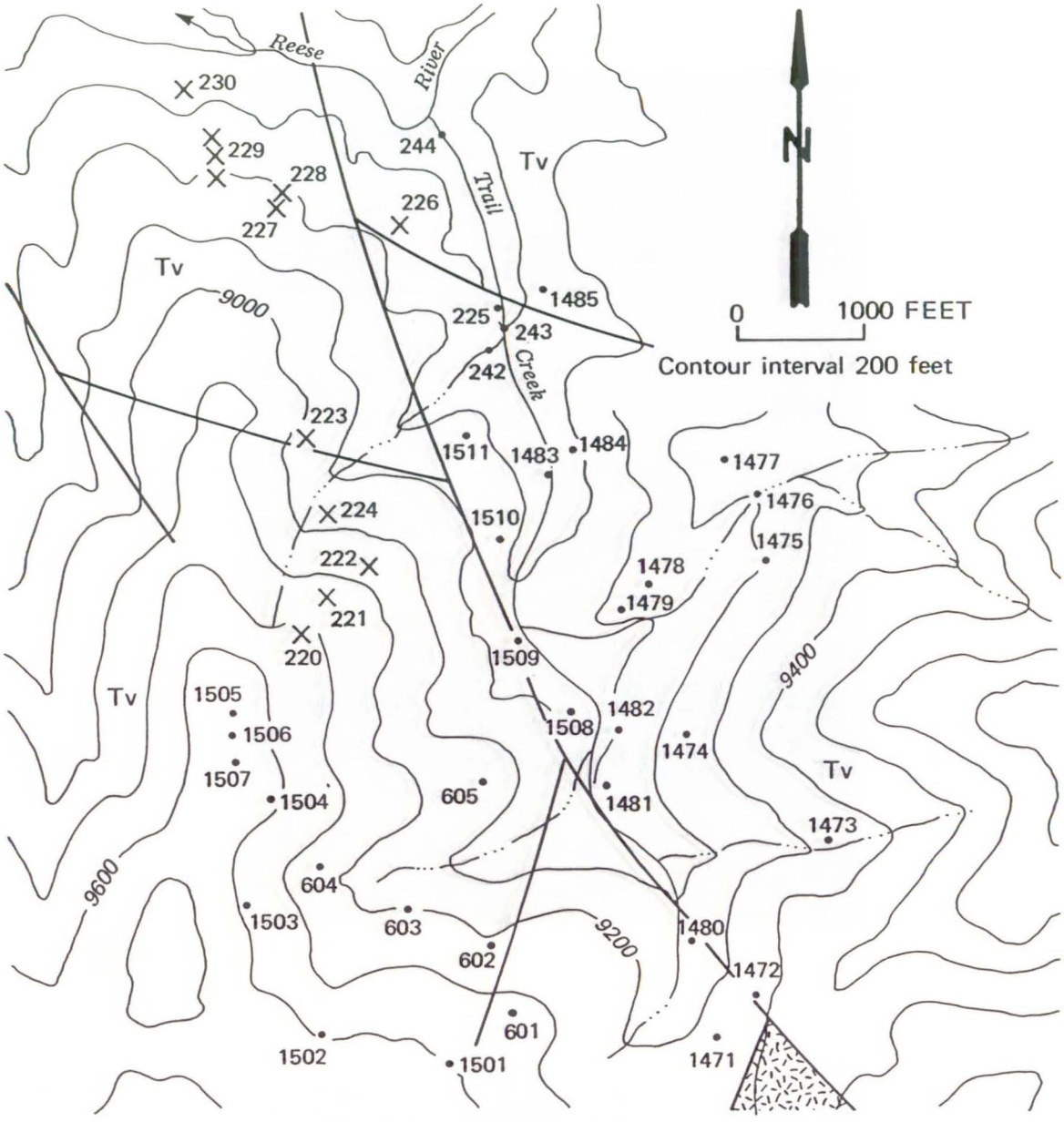
TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1125	17/Select.	NA	Talus of gossan with quartz.	22.9	358	<0.05	921	5915	21.3	5127
1126	Grab.	NA	Pebble conglomerate with mariposite.	.265	201	<.05	23.7	21.7	3.30	63.3
1127	Random chip.	NA	Pebble conglomerate.	.272	39.6	<.05	32.4	8.67	1.56	66.3
1128	18/Select.	NA	Brecciated, limonite-stained conglomerate with traces of chalcopyrite, malachite, galena, and adularia.	85.8	270	<.05	1026	2.2%	82.4	5370
1129	Random chip.	NA	Pebble conglomerate with mariposite.	.357	168	<.05	21.3	100	3.99	97.6
1130	do.	NA	do.	.227	24.1	<.05	22.4	29.1	1.93	75.8
1131	do.	NA	do.	.403	76.6	<.05	63.1	12.3	3.12	69.5
1132	19/Select.	NA	Brecciated metasedimentary rock with limonite.	11.7	55.1	.207	651	5365	10.2	5207
1133	Random chip.	NA	Silicified breccia with limonite and hematite.	.119	163	<.05	22.2	48.5	5.26	109
1134	do.	NA	Brecciated, altered limestone and siltstone with limonite and hematite.	.091	452	<.05	11.2	8.32	5.34	26.0
1135	Chip.	2.0	Shaft collar of silicified metasedimentary rock with abundant of limonite and hematite.	.044	2635	<.05	22.7	4.27	2.86	6.74
1136	Random chip.	NA	Siltstone.	<.013	11.8	<.05	2.67	7.74	5.61	21.7
1137	do.	NA	Sheared siltstone.	<.014	24.2	<.05	4.30	2.25	1.88	12.8
1138	do.	NA	Silicified siltstone breccia.	<.014	8.52	<.05	12.2	3.31	1.60	20.7
1139	do.	NA	Sheared, limonite-stained siltstone.	<.015	4.16	<.05	131	1.70	2.25	60.3
1140	do.	NA	Silicified siltstone breccia.	<.014	6.80	<.05	13.5	3.06	3.50	17.6

TABLE A-15.--Descriptions and analyses for samples shown on figure A-37, Ojo Del Oso prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Copper	Lead	Antimony	Zinc
1141	Chip.	1.0	Sheared, limonite-stained siltstone.	<0.013	5.38	<0.05	62.8	2.14	3.29	46.2
1142	Random chip.	NA	do.	<.014	2.73	<.05	75.5	2.42	2.52	180
303	Petrographic.		A limonite-stained, mineralized, and brecciated, contact-metamorphic rock consisting of 58% vein quartz, 39% tremolite, sulfides and K-feldspar. Quartz ranges in size from breccia 1.5 mm in width down to recrystallized, turbid, cryptocrystalline quartz. Some large quartz grains have terminations. Tremolite occurs in clots up to 0.5 cm across, and along fractures in quartz. Some clots contain quartz fragments while some tremolite occurs as columnar crystals up to 0.5 mm long, most are grains less than 0.1 mm wide. Most of the quartz and tremolite were deposited before brecciation. Oxidized sulfide grains, including pyrite, are up to 0.5 mm across and are scattered throughout the rock, often along grain boundaries. Many of the sulfides appear to have been deposited after brecciation. The yellow-brown color of the limonite stains may be due to, in part, mimetite. Occasional clusters of K-feldspar grains are intergrown with quartz, tremolite, and oxidized sulfides.							

1/ Sample 75 also contains 88 ppm cadmium and 16 ppm bismuth.
2/ Sample 79 also contains 33.5 ppm cadmium.
3/ Sample 169 also contains 25.6 ppm cadmium and 7.56 ppm selenium.
4/ Sample 172 also conains 71.6 ppm bismuth, 97.1 ppm cadmium, 14.0 ppm selenium, and 5.12 ppm tellurium.
5/ Sample 765 also contains 300 ppm nickel and 1885 chrome.
6/ Sample 1003 also contains 12.7 ppm bismuth, 443 ppm selenium, and 5.45 ppm tellurium.
7/ Sample 1007 also contains 90.2 ppm selenium.
8/ Sample 1009 also contains 174 ppm molybdenum, 106 ppm bismuth, 200 ppm cadmium, 22.1 ppm selenium, and 36.6 ppm tellurium.
9/ Sample 1010 also contains 173 ppm selenium and 6.18 ppm tellurium.
10/ Sample 1013 also contains 52.8 ppm cadmium.
11/ Sample 1015 also contains 35.8 ppm cadmium and 163 ppm selenium.
12/ Sample 1016 also contains 245 ppm bismuth, >500 ppm selenium, 224 ppm cadmium, and 7.72 ppm tellurium.
13/ Sample 1017 also contains 151 ppm molybdenum, 80 ppm selenium, and 2.78 ppm tellurium.
14/ Sample 1022 also contains 1.03 ppm thallium.
15/ Sample 1032 also contains 69.2 ppm cadmium.
16/ Sample 1040 also contains 350 ppm molybdenum.
17/ Sample 1125 also contains 34.3 ppm cadmium.
18/ Sample 1128 also contains 41.8 ppm cadmium and 10.5 ppm selenium.
19/ Sample 1132 also contains 34.2 ppm cadmium.



EXPLANATION

Tv
Ash-flow tuff and volcaniclastic sedimentary rocks

Porphyritic intrusive rock

Fault

Prospect pit or trench

604
Sample locality

FIGURE A-39.—Workings, sample sites, and generalized geology, Packhorse prospect

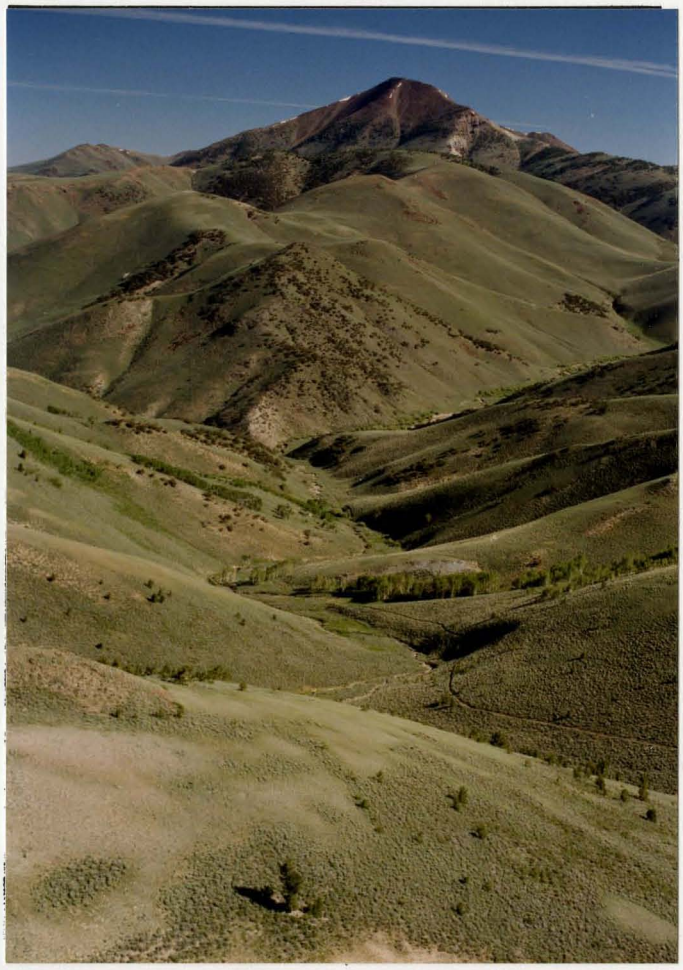


FIGURE A-40.--View looking north down Trail Creek.

TABLE A-16.--Descriptions and analyses for samples shown on figure A-39, Packhorse prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample								
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
220	Grab.	NA	Tan to lavender, ash-flow tuff from pit.	0.131	2.45	<0.05	<0.5	1.17
221	do.	NA	Crystal-rich, ash-flow tuff from pit.	.882	8.51	<.05	<.5	.679
222	do.	NA	Altered, brecciated, ash-flow tuff from pit.	.8	20	.005	8	<10
223	do.	NA	Brecciated, partially silicified, ash-flow tuff from trench.	.378	5.08	<.05	2.45	1.32
224	do.	NA	Welded ash-flow tuff containing disseminated pyrite from sloughed pit.	.402	2.72	<.05	<.5	1.35
225	Random chip.	NA	Light tan, altered, ash-flow tuff.	.306	25.9	<.05	4.41	1.57
226	Grab.	NA	Crystal-rich, welded tuff from pit.	.632	5.66	<.05	.748	.369
227	do.	NA	Gossan and ash-flow tuff from trench.	33.3	2.16	<.05	3.75	2.78
228	do.	NA	Gossan and bleached, partially silicified, ash-flow tuff.	1.2	20	.180	43	<10
229	Grab.	NA	Partially silicified, bleached, brecciated, ash-flow tuff from two pits.	1.43	9.54	<.05	9.04	1.88
230	Chip.	2.6	Altered, crystal-rich tuff with pyrite casts.	.862	8.96	<.05	5.17	1.56
601	Grab.	NA	Altered, welded ash-flow tuff.	.034	3.65	<.05	<.5	.508
602	Random chip.	NA	Limonite-stained, bleached, ash-flow tuff.	.034	7.37	<.05	1.01	.571
603	Grab.	NA	do.	.372	38.2	<.05	5.75	12.3
604	Random chip.	NA	Altered, brecciated, ash-flow tuff.	.063	3.31	<.05	<.5	.886
605	Grab.	NA	Limonite-stained, brecciated, bleached, partially silicified tuff.	.285	14.2	<.05	.809	.698

TABLE A-16.--Descriptions and analyses for samples shown on figure A-39, Packhorse prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1471	Grab.	NA	Slightly silicified, pink, ash-flow tuff.	1.99	55.1	<0.05	13.2	4.39
1472	do.	NA	Crystal-rich, pink, ash-flow tuff.	.195	10.1	<.05	5.51	1.63
1473	do.	NA	Crystal-rich, partially welded, purple, ash-flow tuff.	.067	6.34	<.05	6.46	.545
1474	do.	NA	Altered, variegated, crystal-rich tuff.	.066	3.78	<.05	6.65	1.88
1475	do.	NA	do.	.041	4.92	<.05	7.00	1.60
1476	do.	NA	Pink, partially silicified, brecciated, ash-flow tuff.	.07	8.84	<.05	3.52	3.30
1477	do.	NA	do.	.042	6.62	<.05	3.39	1.86
1478	do.	NA	Light-colored, moderately crystal-rich tuff.	.049	6.34	<.05	4.45	<.224
1479	do.	NA	Bleached, limonite-stained, ash-flow tuff.	1.91	28.3	<.05	53.1	4.61
1480	do.	NA	Light colored, ash-flow tuff.	.191	16.7	<.05	6.10	.930
1481	do.	NA	do.	.442	10.4	<.05	6.34	.615
1482	do.	NA	Partially silicified, brecciated, ash-flow tuff.	1.02	5.76	<.05	5.13	<.238
1483	do.	NA	Gray, partially welded, limonite-stained tuff.	.302	38.0	<.05	5.86	1.68
1484	do.	NA	Partially silicified, gray, bleached, ash-flow tuff.	.210	44.4	<.05	13.6	.388
1485	do.	NA	Altered, light green, ash-flow tuff.	.088	10.0	<.05	7.20	.774
1501	do.	NA	Light gray, welded, ash-flow tuff.	.043	19.2	<.05	2.83	2.89
1502	do.	NA	Crystal-rich, welded, ash-flow tuff.	.034	4.41	<.05	3.25	1.66
1503	do.	NA	do.	.065	2.01	<.05	4.98	<.235
1504	do.	NA	Altered, reddish-brown to gray, ash-flow tuff.	.041	3.13	<.05	2.90	<.427
1505	do.	NA	do.	.038	9.08	<.05	3.54	1.64

TABLE A-16.--Descriptions and analyses for samples shown on figure A-39, Packhorse prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1506	Grab.	NA	Bleached, ash-flow tuff.	0.042	1.46	<0.05	1.77	<0.246
1507	do.	NA	Partially silicified, reddish-brown, ash-flow tuff.	.035	1.93	<.05	4.20	.330
1508	do.	NA	Partially silicified, reddish-brown, ash-flow tuff, exhibiting Liesegang banding.	.662	10.0	<.05	7.81	<.663
1509	do.	NA	Bleached, ash-flow tuff.	.256	23.4	<.05	5.54	1.45
1510	do.	NA	Altered, ash-flow tuff containing disseminated pyrite.	.053	1.76	<.05	3.19	<.243
1511	do.	NA	Limonite-stained, ash-flow tuff.	.075	3.07	<.05	3.36	.451

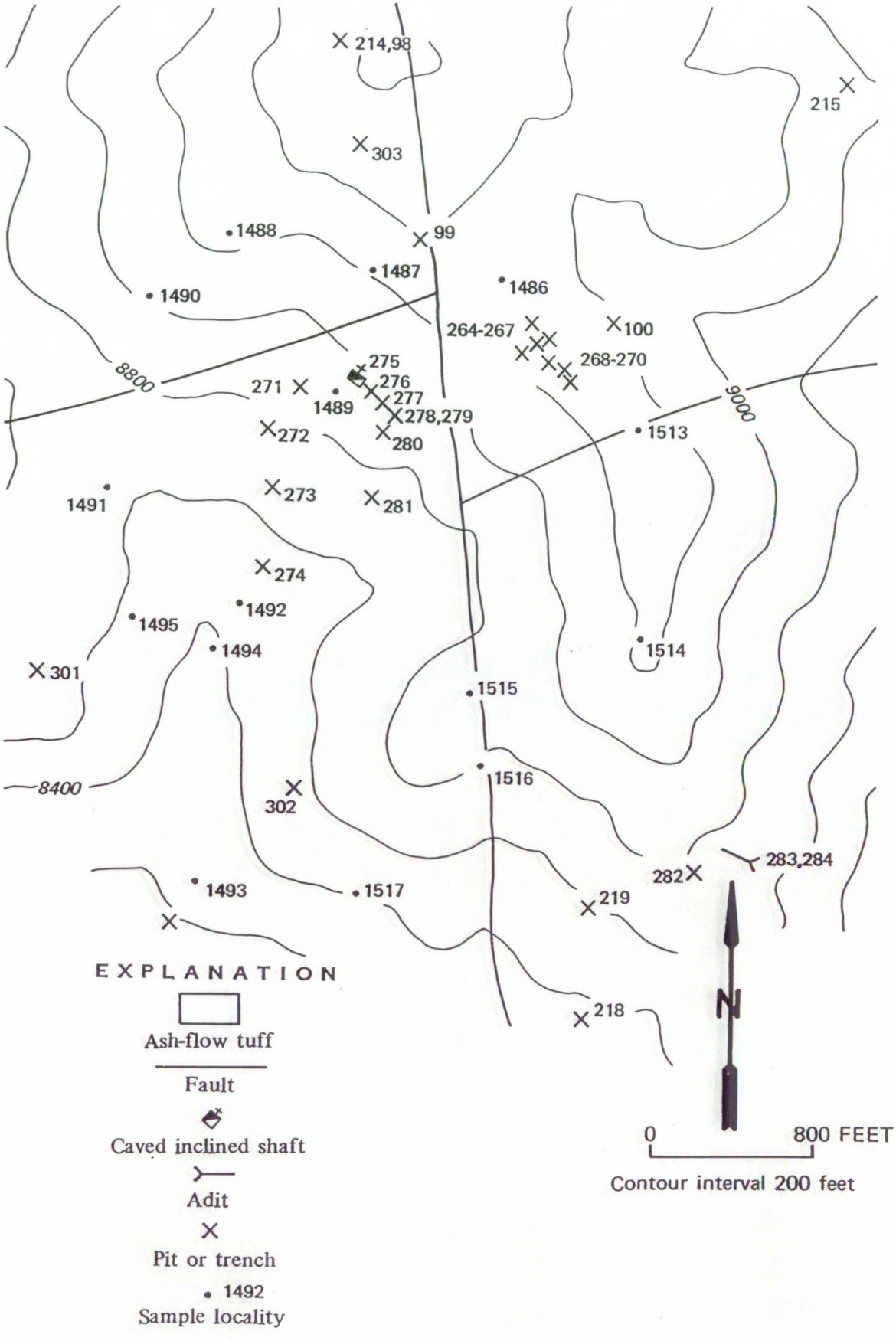


FIGURE A-41.—Workings, sample sites, and generalized geology, Lost Wheelbarrow prospect

TABLE A-17.--Descriptions and analyses for samples shown on figure A-41, Lost Wheelbarrow prospect

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
98	Grab.	NA	Limonite-stained, crystal-rich tuff from pit.	0.228	7.68	<0.05	1.2	0.932
99	do.	NA	do.	.093	3.71	<.05	.638	.671
100	do.	NA	Altered, rhyolite flow breccia from trench.	.2	30	<.005	6	<10
214	do.	NA	Limonite-stained, crystal-rich tuff from pit.	.232	3.21	<.05	.944	.819
215	Chip.	0.8	Altered, ash-flow tuff exposed in trench.	.056	2.39	<.05	.812	.911
218	do.	8.0	Sheared, altered, ash-flow tuff in trench.	1.0	20	.04	63	<10
219	do.	6.0	do.	.219	16.8	<.05	9.92	1.98
264	Grab.	NA	Altered, ash-flow tuff from trench.	.198	68.8	<.05	1.12	3.52
265	do.	NA	Limonite-stained, silicified tuff.	54.0	150	.10	37	10
266	Chip.	4.0	Limonite-stained, silicified tuff containing quartz stringers.	22.0	280	.09	62	10
267	do.	10.0	Silicified shear zone in ash-flow tuff.	100.0	230	.235	38	30
268	Grab.	NA	Crystal-rich, ash-flow tuff from trench.	.48	26.0	<.05	1.8	3.22
269	do.	NA	Crystal-rich, limonite-stained, bleached tuff from trench.	.6	10	<.005	4	<10
270	do.	NA	Crystal-rich, limonite-stained, ash-flow tuff containing pyrite casts.	.168	15.6	<.05	.764	1.84
271	do.	NA	Gray, welded tuff from sloughed pit.	.495	30.3	<.05	.883	1.62
272	do.	NA	Soil and gravel from badly sloughed pit.	.048	4.56	<.05	.647	1.06
273	do.	NA	Bleached, welded, ash-flow tuff from pit.	2.93	87.9	<.05	1.99	4.56

TABLE A-17.--Descriptions and analyses for samples shown on figure A-41, Lost Wheelbarrow prospect--Continued

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
274	Grab.	NA	Bleached, welded, ash-flow tuff from pit.	1.6	410	0.015	17	<10
275	Select.	NA	Bleached, silicified, ash-flow tuff containing chalcopyrite and arsenopyrite from stockpile.	658	390	.610	73	150
276	Grab.	NA	Limonite-stained, silicified tuff containing pyrite casts from pit.	5.82	461.0	.103	91.1	35.1
277	do.	NA	Limonite-stained jasperoid.	118.0	350	.540	209	90
278	Chip	60.0	Fractured, limonite-stained, silicified tuff containing pyrite.	15.0	335.0	<.05	126.0	28.5
279	do.	60.0	do.	13.1	293.0	<.05	126.0	13.3
280	do.	90.0	Fractured, crystal-rich tuff.	.198	8.33	<.05	1.66	1.42
281	do.	4.0	Shear zone in ash-flow tuff.	17.0	204.0	<.05	77.8	17.7
282	do.	.5	Quartz vein striking N. 90° E. and dipping 85° S.	33.0	10	.070	39	<10
283	do.	.8	Clay-bearing shear zone in tuff.	1.0	20	.010	12	<10
284	do.	3.5	Crystal-rich, green to white, ash-flow tuff.	.33	13.2	<.05	19.2	4.67
301	do.	15.0	do.	<.025	4.43	<.05	.529	1.05
302	do.	8.0	Limonite-stained, ash-flow tuff.	.048	7.61	<.05	.607	.672
303	Grab.	NA	Altered, limonite-stained, ash-flow tuff from sloughed pit.	.036	10.0	<.05	.863	1.82
1486	do.	NA	Gray, crystal-rich, ash-flow tuff.	.147	27.3	<.05	3.49	.890
1487	do.	NA	Limonite-stained, crystal-rich, partially welded, ash-flow tuff.	3.62	36.9	<.05	3.35	.837
1488	do.	NA	Crystal-rich, ash-flow tuff.	.025	2.89	<.05	3.99	.498
1489	do.	NA	Bleached, limonite-stained, crystal-rich, ash-flow tuff.	2.10	72.9	<.05	4.21	2.54

TABLE A-17.--Descriptions and analyses for samples shown on figure A-41, Lost Wheelbarrow prospect--Continued

Sample								
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Molybdenum	Antimony
1490	Grab.	NA	Partially welded, gray, ash-flow tuff.	2.36	73.3	<.05	3.87	2.13
1491	do.	NA	Altered, ash-flow tuff.	.049	2.20	<.05	4.00	.432
1492	do.	NA	Welded, light gray, ash-flow tuff.	2.27	146.	<.05	14.9	2.95
1493	do.	NA	Altered, partially silicified, ash-flow tuff.	9.99	3475	.118	4.63	17.1
1494	Select.	NA	Limonite-stained fault breccia.	10.8	2588	.086	156.	52.5
1495	Random chip.	NA	Altered, crystal-rich, ash-flow tuff.	.029	5.83	<.05	2.82	.787
1513	Grab.	NA	Limonite-stained, dark gray tuff.	.084	8.61	<.05	4.43	1.70
1514	do.	NA	Dark gray, crystal-rich, welded, ash-flow tuff.	.022	3.09	<.05	3.46	.608
1515	do.	NA	do.	.039	3.27	<.05	3.88	<.237
1516	Chip.	1.0	Light gray welded, ash-flow tuff.	.051	5.44	<.05	4.94	.332
1517	Grab.	NA	Altered, light gray, welded tuff.	.167	9.54	<.05	35.2	1.29

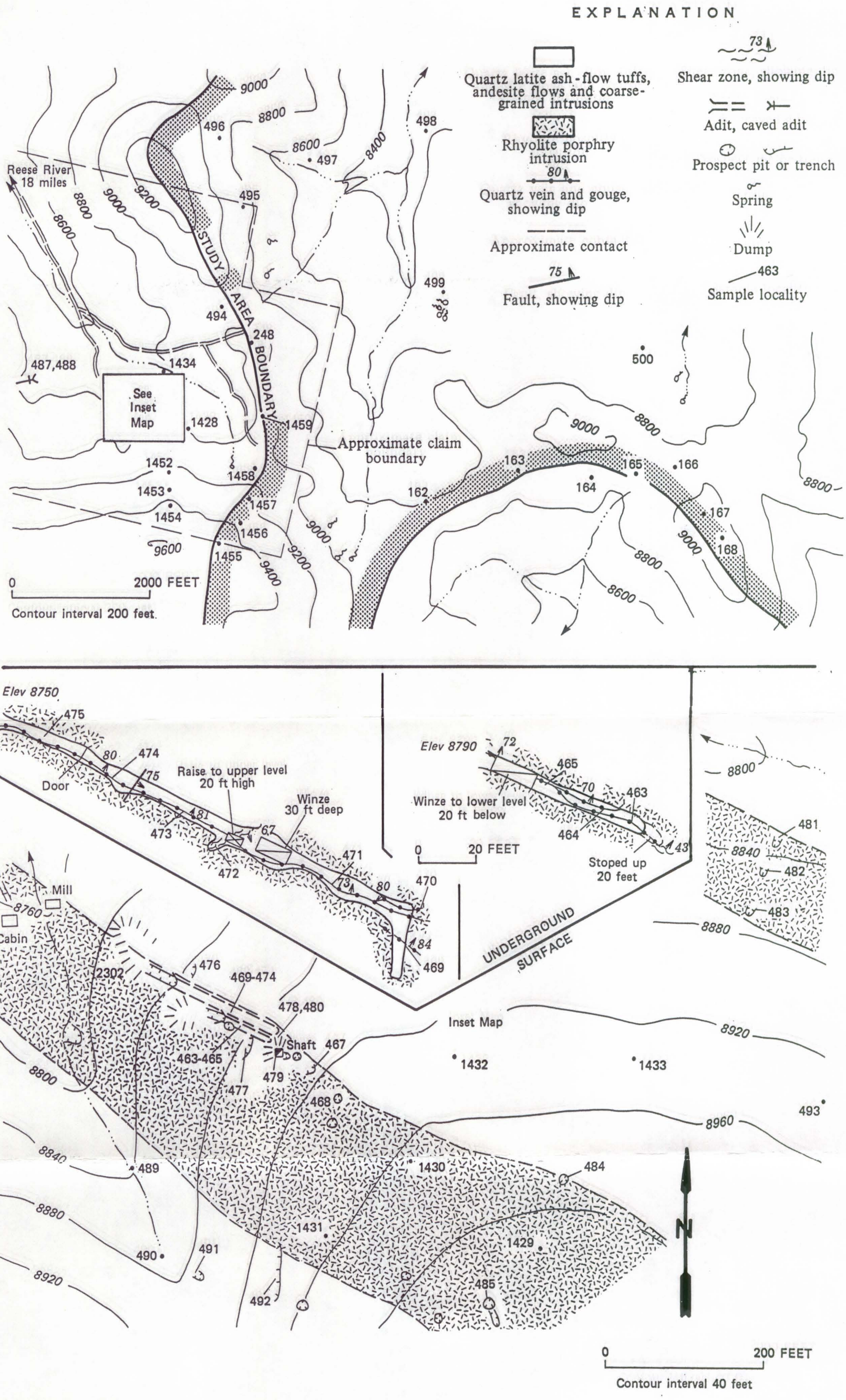


FIGURE A-42.–Workings, sample sites, and generalized geology, Ferir mine

TABLE A-18.--Descriptions and analyses for samples shown on figure A-42, Ferir mine

(<, less than; --, not analyzed; NA, not applicable; %, percent)
[All analyses in ppm unless otherwise noted]

Sample								
No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony
162	Random chip.	NA	Gray latite porphyry.	1.6	2.48	<0.05	<0.1	7.7
163	do.	NA	Basaltic andesite.	1.5	2.41	<.05	<.1	6.33
164	do.	NA	Gray latite porphyry.	.251	3.05	<.05	<.1	1.11
165	do.	NA	do.	.839	2.36	<.05	<.1	3.66
166	do.	NA	do.	.261	1.49	<.05	<.1	1.81
167	do.	NA	do.	.212	1.97	<.05	<.1	1.19
168	Grab.	NA	Altered latite porphyry.	.086	<1.0	<.05	<.1	.421
248	do.	NA	Altered, partially welded tuff.	.032	2.43	<.05	<.5	.492
463	Chip.	6.0	Altered rhyolite porphyry with limonite.	5.44	13.5	2.56	1.3	3.77
464	do.	4.0	Altered rhyolite porphyry and quartz vein.	3.08	8.38	1.06	.91	5.57
465	do.	3.0	do.	4.68	6.66	2.57	1.03	1.72
466	do.	2.7	Altered rhyolite porphyry and quartz vein.	8.94	15.3	14.1	.66	5.19
467	Grab.	NA	Altered and silicified rhyolite porphyry from dump.	.378	7.25	<.05	<.5	1.82
468	do.	NA	do.	.504	8.92	<.05	<.5	4.58
469	Chip.	2.0	Two-in.-thick quartz vein in altered rhyolite porphyry.	6.68	3.51	2.53	6.96	3.58
470	do.	4.0	do.	5.3	112	1.79	3.01	18.1
471	do.	6.0	do.	5.8	3.45	6.33	3.88	3.48
472	do.	3.5	Argillically altered rhyolite porphyry.	2.0	61.3	1.18	1.21	4.72

TABLE A-18.--Descriptions and analyses for samples shown on figure A-42, Ferir mine

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony
473	Chip.	4.5	Altered rhyolite porphyry.	1.22	2.45	1.61	2.13	1.3
474	do.	3.75	Altered and silicified rhyolite porphry.	1.06	4.7	1.24	1.34	7.93
475	do.	3.25	Altered rhyolite porphyry with 1-in.-thick quartz vein.	.33	3.47	<.05	.72	4.23
476	Grab.	NA	Welded tuff with druzy quartz in fractures and 1- to 2-in. thick quartz vein, from dump.	18.5	5.39	29.4	1.55	2.9
477	do.	NA	Altered, silicified rhyolite porphyry with quartz stringers, from dump.	2.26	15.4	.08	.58	3.79
478	Select.	NA	Silicified rhyolite porphyry with quartz veins and limonite, from dump.	9.69	51.3	6.08	3.04	6.25
479	Random chip.	NA	Quartz vein and altered rhyolite porphyry in shaft collar.	70.4	17.2	113.0	3.7	6.41
480	Grab.	NA	Argillically altered rhyolite porphyry with some silicification and limonite from dump.	5.89	73.3	<.05	1.25	8.47
481	do.	NA	Altered and silicified rhyolite porphyry from dump.	.259	59.3	<.05	.89	8.42
482	do.	NA	Altered and silicified rhyolite porphyry with 1-in.-thick quartz vein, from dump.	1.51	35.8	1.81	.249	3.63
483	do.	NA	Altered rhyolite porphyry with Liesegang banding and limonite from dump.	.174	69.9	<.05	<.5	7.3
484	Select.	NA	Altered and silicified rhyolite porphyry from dump.	2.46	31.6	.205	1.04	5.87
485	Grab.	NA	Altered rhyolite porphyry with adularia veinlets, from dump.	6.76	21.0	1.57	2.61	2.44
486	do.	NA	Silicified tuff with drusy quartz and adularia, from dump.	.389	80.7	<.05	<.5	6.65
487	Random chip.	NA	Welded tuff with 2-in.-thick quartz vein.	.543	11.0	.069	<.5	1.37

TABLE A-18.--Descriptions and analyses for samples shown on figure A-42, Ferir mine

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony
488	Chip.	5.5	Unwelded tuff with some silicification and limonite, from dump.	1.45	62.4	0.516	0.47	15.4
489	Random chip.	NA	Argillically altered tuff with drusy quartz and adularia on fractures, from dump.	.467	93.1	<.05	<.5	4.01
490	Select.	NA	Argillically altered tuff with limonite.	6.91	30.8	<.05	<.5	3.37
491	Grab.	NA	Altered and silicified welded tuff with drusy quartz and limonite on fractures, from dump.	1.51	174	.114	.781	6.96
492	do.	NA	Altered welded tuff with quartz veinlets, from dump.	3.51	14.4	1.18	.685	2.51
493	do.	NA	Altered and silicified tuff.	.195	32.0	<.05	<.5	5.28
494	do.	NA	Argillically altered welded tuff.	.159	61.0	<.05	1.99	11.5
495	Random chip.	NA	Gray, crystal-rich tuff.	.101	1.62	<.05	<.5	.542
496	Grab.	NA	do.	.059	2.04	<.05	.539	1.03
497	Random chip.	NA	do.	.289	81.5	<.05	<.5	1.13
498	do.	NA	Gray latite porphyry.	.078	73.9	<.05	<.5	.367
499	do.	NA	do.	.029	4.22	<.05	<.5	.522
500	do.	NA	do.	<.025	3.16	<.05	<.5	.326
1428	Grab.	NA	Altered, crystal-rich tuff with quartz veinlets.	.218	35.7	.074	.226	4.27
1429	do.	NA	Tan tuff with limonite.	.430	55.9	<.05	.479	4.86
1430	do.	NA	Altered tuff with limonite.	.185	50.8	<.05	.169	1.98
1431	do.	NA	Silicified tuff with limonite and adularia veinlets.	.259	38.7	<.05	.596	4.15

TABLE A-18.--Descriptions and analyses for samples shown on figure A-42, Ferir mine

Sample No.	Type	Length (ft)	Description	Silver	Arsenic	Gold	Mercury	Antimony
1432	Grab.	NA	Altered tuff with quartz veinlets.	1.41	49.2	2.13	0.223	2.79
1433	do.	NA	do.	.253	35.1	<.05	.394	2.79
1434	do.	NA	Altered, welded tuff and rhyolite porphyry with limonite.	.370	63.4	<.05	.452	5.91
1452	Random chip.	NA	Gray, crystal-rich tuff.	.022	<.984	<.05	<.10	<.246
1453	do.	NA	do.	.018	3.29	<.05	<.10	<.234
1454	do.	NA	Altered, gray, crystal-rich tuff.	.02	<.89	<.05	<.10	<.222
1455	do.	NA	Dark, gray tuff.	.032	<.899	<.05	<.10	<.225
1456	do.	NA	Gray, welded tuff.	.026	<.874	<.05	<.10	.335
1457	do.	NA	Argillically altered, red, ash-flow tuff.	<.014	<.912	<.05	<.10	<.228
1458	do.	NA	Altered, gray tuff.	<.015	<.994	<.05	<.10	.358
1459	do.	NA	Green tuff.	.031	1.04	<.05	<.10	.448
2301	Petrographic.		A light gray, argillized, rhyolite porphyry containing 11% phenocrysts, 0.25-4 mm in diameter, and 89% groundmass with grain size less than 0.1 mm. Phenocrysts included altered sanadine, quartz, and altered biotite. The sanadine phenocryst have some plagioclase inclusions but most plagioclase is completely argillized. These phenocrysts have been lightly to heavily altered to clay and many appear to have been removed by leaching. The quartz phenocrysts are anhedral, with deep embayments, to euhedral. Biotite phenocrysts contain accessory apatite and have been completely altered to vermiculite and rutile. Minor oxidized pyrite also is present. The groundmass has undergone heavy clay alteration, contains 7% quartz and 50% sanadine and shows very weak flow structure.					

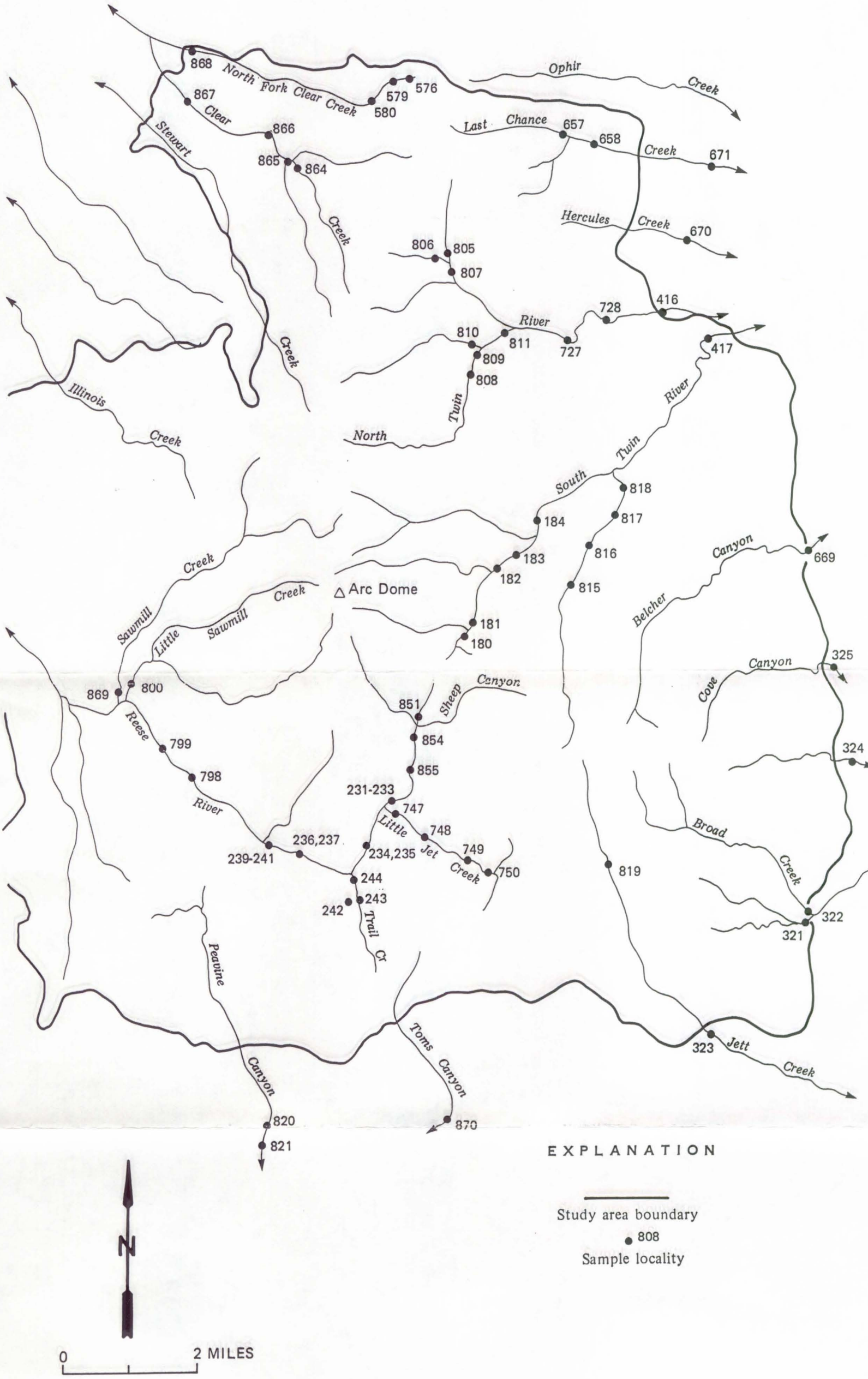


FIGURE A-43.—Map showing placer sample locations in and near the Arc Dome study area, Nye, County, NV

TABLE A-19.--Sample data for placer samples shown on figure A-43

Sample number	Depth interval (in.)	Gold (milligrams (per yd^3)	Value* (cents per yd^3)	Sample number	Depth interval (in.)	Gold (milligrams (per yd^3)	Value* (cents per yd^3)
180	Surface	0.375	0.4	323	Surface	None	--
181	do.	None	--	324	do.	None	--
182	do.	None	--	325	do.	None	--
183	do.	None	--	416	do.	0.375	0.4
184	do.	None	--	417	do.	None	--
231	0-21	None	--	576	do.	.50	.5
232	21-51	.086	.1	579	do.	None	--
233	51-91	None	--	580	do.	.667	.7
234	0-39	.266	.3	657	do.	None	--
235	39-87	None	--	658	do.	3.63	3.9
236	0-20	1.23	1.3	669	do.	None	--
237	20-63	.241	.3	670	do.	None	--
239	0-39	.498	.5	671	do.	None	--
240	39-60	None	--	727	do.	.625	.7
241	60-92	1.58	1.7	728	do.	2.13	2.3
242	0-47	11.9	12.9	747	do.	None	--
243	0-68	8.90	9.7	748	do.	None	--
244	0-63	1.67	1.8	749	do.	None	--
321	Surface	None	--	750	do.	None	--
322	do.	None	--	798	do.	2.75	3.0

TABLE A-19.--Sample data for placer samples shown on figure A-43--Continued

Sample number	Depth interval (in.)	Gold (milligrams (per yd^3)	Value* (cents per yd^3)	Sample number	Depth interval (in.)	Gold (milligrams (per yd^3)	Value* (cents per yd^3)
799	Surface	0.500	0.5	821	Surface	None	--
800	do.	None	--	851	do.	None	--
805	do.	.833	.9	854	do.	None	--
806	do.	None	--	855	0-24	74.6	80.9
807	do.	None	--	864	Surface	None	--
808	do.	None	--	865	do.	None	--
809	do.	None	--	866	do.	None	--
810	do.	None	--	867	do.	None	--
811	do.	None	--	868	do.	None	--
815	do.	None	--	869	do.	None	--
				870	do.	None	--
816	do.	None	--				
817	do.	None	--				
818	do.	None	--				
819	do.	None	--				
820	do.	None	--				

*Value is based on a gold price of $450 per troy ounce and a fineness of 750.