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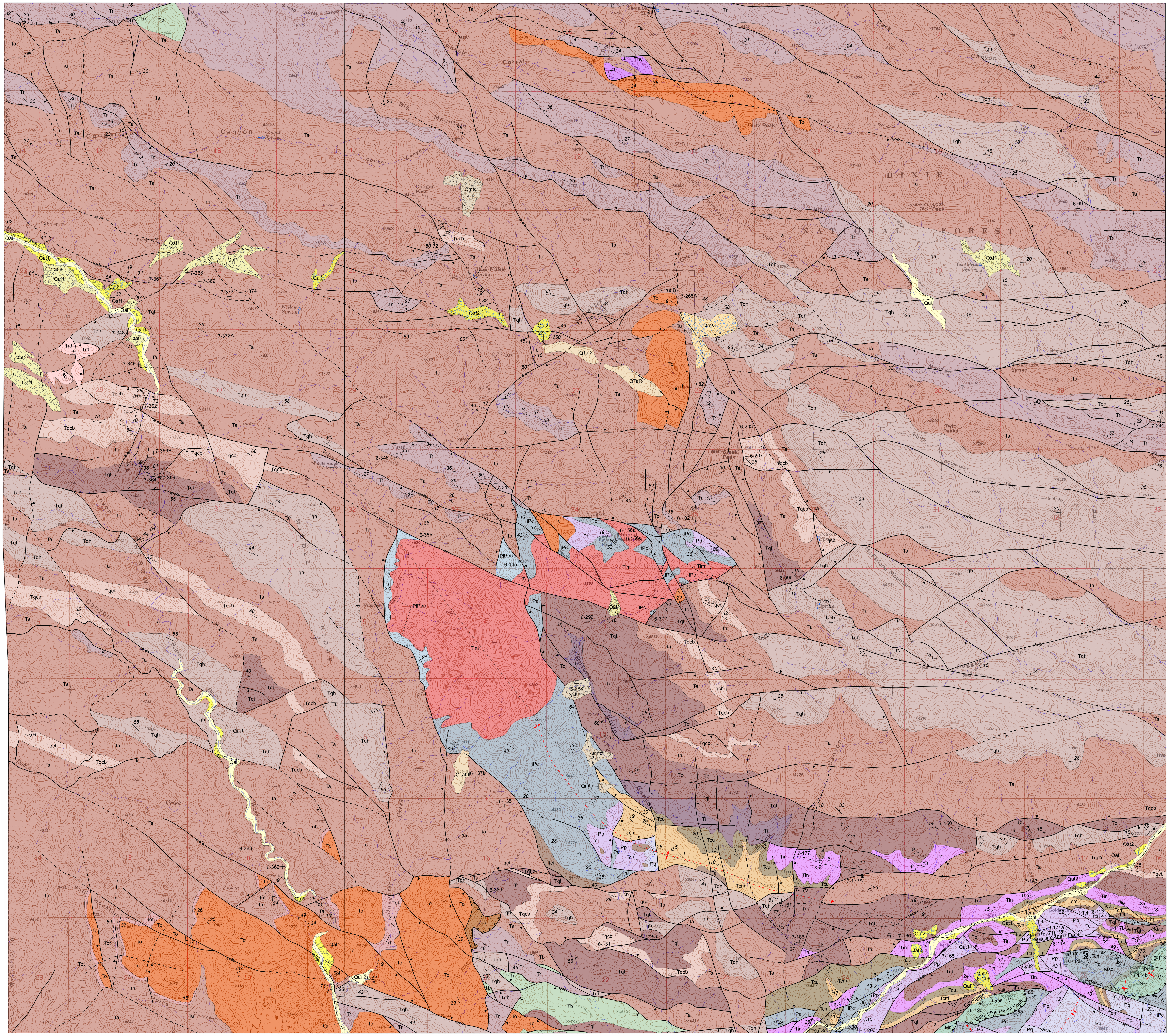

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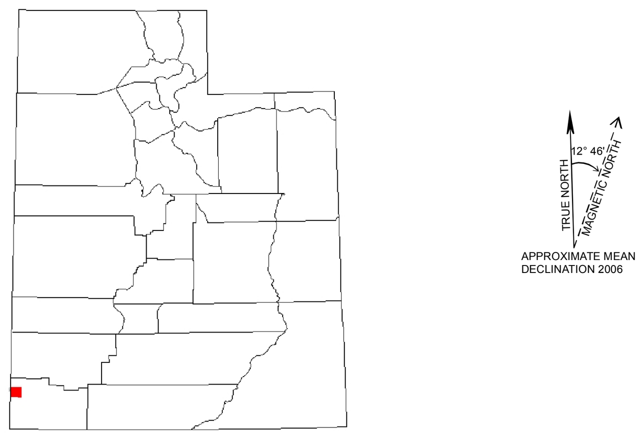

TRUE NORTH
MAGNETIC NORTH
12° 46'
APPROXIMATE MEAN DECLINATION 2006

SCALE 1:24,000
Contour Interval 40 Feet

0 0.25 0.5 1 1.5 2 Miles
0 0.45 0.9 1.8 2.7 3.6 Kilometers

Interim Geologic Map of the Goldstrike Quadrangle and the East Part of the Docs Pass Quadrangle, Washington County, Utah

by
Peter D. Rowley, R. Ernest Anderson, David B. Hacker, Jonathan T. Boswell, David J. Maxwell, Dennis P. Cox, Ronald Willden, and Don H. Adair

2007

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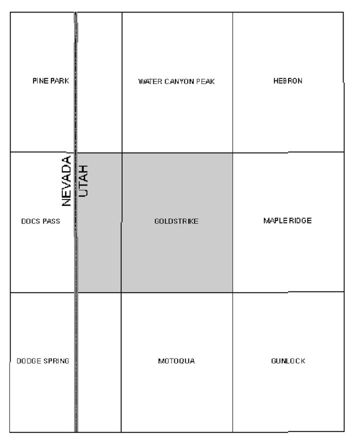

Base from U.S.G.S. Goldstrike (1972) and Docs Pass (1973) 7.5' quadrangles
Projection: UTM Zone 12
Datum: NAD 1927
Spheroid: Clarke 1866

Project Manager: Bob Biek, UGS
GIS and Cartography: Geo Mapping & Modeling
GIS Services & Consulting
Southern Utah University
J. Buck Ehler, UGS

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by

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OPEN-FILE REPORT 510
UTAH GEOLOGICAL SURVEY
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2007

DESCRIPTION OF MAP UNITS

Qal **Alluvium** (Holocene)—Youngest alluvium and colluvium in channels, floodplains, and adjacent low terraces of rivers and major streams; sand, silt, and clay with lenses of gravel; maximum thickness about 20 feet (6 m).

Qat_1 **Younger stream-terrace deposits** (Holocene and upper Pleistocene)—Sand and gravel that form dissected surfaces as much as 15 feet (5 m) above the level of adjacent modern streams; maximum thickness about 10 feet (3 m).

Qat_2 **Older stream-terrace deposits** (upper and middle Pleistocene)—Sand and gravel that form well-dissected surfaces as much as 15 to 30 feet (5 to 10 m) above the level of adjacent modern streams; maximum thickness about 10 feet (3 m).

Qaf_1 **Young alluvial-fan deposits** (Holocene and upper Pleistocene)—Poorly to moderately sorted silt, sand, and gravel deposited by streams, sheetwash, debris flows, and flash floods on alluvial fans and pediments; includes alluvium and colluvium in upper stream courses; surface is modern and generally undissected; maximum thickness at least 30 feet (10 m).

Qaf_2 **Middle alluvial-fan deposits** (upper and middle Pleistocene)—Poorly to moderately sorted silt, sand, and gravel deposited by streams, sheetwash, debris flows, and flash floods on alluvial fans and pediments; surface is moderately dissected by modern streams; maximum thickness about 50 feet (15 m).

$QTaf_3$ **Old alluvial-fan deposits** (middle Pleistocene and Pliocene)—Poorly to moderately sorted silt, sand, and gravel deposited by streams, sheetwash, debris flows, and flash floods on alluvial fans and pediments; surface is deeply dissected by modern and older streams; exposed west of Greek Peak and south of the Mineral Mountain intrusion (Tim); maximum thickness about 30 feet (10 m).

Qmtc **Talus and colluvium** (Holocene and upper Pleistocene)—Poorly sorted, mostly angular gravel, sand, and silt deposited by rockfall, creep, sheetwash, debris flow, and streams along scarps and hillsides; mostly mapped where conceals underlying bedrock; maximum thickness about 30 feet (10 m).

Qms **Landslide deposits** (Holocene to middle Pleistocene)—Unsorted, mostly angular, unstratified rock debris moved by gravity from nearby bedrock cliffs; maximum thickness about 50 feet (15 m).

Tgb **Gravity-slide breccia** (Miocene)—Moderately resistant tectonic breccia resulting from a gravity slide (huge landslide) carrying angular masses of volcanic rock, predominantly clasts of the Ox Valley Tuff (To), Racer Canyon Tuff (Tr), Harmony Hills Tuff (Tqh), and andesite (Ta); mapped in the southwest part of the Goldstrike quadrangle; the gravity slide was shed off higher areas, probably from a horst to the south that was uplifted by basin-range faults, but possibly from the southern part of the roof of a rapidly rising Mineral Mountain intrusion (Tim), which is probably a laccolith like most of the other plutons of the Iron Axis to which it belongs − other plutons of the Iron Axis are known to have spawned gravity slides that locally deroofed rising magma bodies, resulting in volcanic eruptions (Cook, 1957, 1960; Blank, 1959, 1993; Mackin, 1960; Blank and Mackin, 1967; Blank and others, 1992; Hacker, 1998; Hacker and others, 1996, 2002, 2007); clasts are as large as 50 feet (15 m); overall thickness about 180 feet (55 m).

Tb **Basalt** (Miocene)—Resistant, dark-gray and black, aphanitic, partly vesicular lava flows of olivine basalt that erupted at the southern and northwestern edge of the map area; has a K-Ar age of 8.8 ± 0.3 Ma from a sample collected about 2 miles (3 km) north of Motoqua, just south of the map area (Hintze and others, 1994), but other basalts near the map area range from about 20 Ma to late Quaternary (Best and others, 1980; Rowley and others, 2006, in press; Biek and others, 2007) and are synchronous with basin-range extension (Christiansen and Lipman, 1972; Rowley and Dixon, 2001); maximum thickness about 200 feet (60 m).

Trd **Rhyolite and dacite lava flows** (Miocene)—Mostly resistant, generally light-gray and tan, crystal-poor, rhyolite and dacite volcanic domes and lava flows that erupted in the northwestern part of the map area; maximum thickness about 250 feet (75 m).

Ox Valley Tuff (Miocene)—Consists of the main densely welded ash-flow tuff and an underlying precursor tuff and sandstone.

To **Densely welded ash-flow tuff**—Mostly resistant, gray, pink, red, and orange, poorly to densely welded, crystal-poor (including distinctive large "eyes" of beta quartz), high-silica rhyolite ash-flow tuff exposed as outflow and intracaldera tuff; in the southwestern part of the map area, contains prominent, steeply dipping, cooling joints; petrographically and chemically distinctive (Rowley and others, 1995) and, in places where fresh, contains adularescent sanidine; contains red and gray lithic clasts (that is, angular fragments of volcanic rocks that were torn from the magma chamber or vent during ash-flow eruption); derived from a presumed caldera that is dismembered by faults and whose base is poorly exposed above the Mineral Mountain intrusion southwest of Greek Peak. Another area, extending from about 7 miles (11 km) south-southwest of Mineral Mountain to Dodge Spring, north and northwest of the community of Motoqua, was suggested to be a caldera source of the Ox Valley Tuff by Anderson and Hintze (1993) and Hintze and others (1994) because the thickness of the Ox Valley there is as much as 4,000 feet (1.2 km) and the rock is commonly densely welded, but it is here interpreted to represent deposition upon thin precursor tuff (Tot) that in turn rests on thick andesite lava flows and mudflows (Ta) on the southwestern flank of a mountain formed by rapid, sharp uplift of the laccolithic Mineral Mountain intrusion; the top of the laccolith is interpreted to have failed and erupted as a presumed small caldera. The age of the Ox Valley Tuff was formerly unclear and was considered to be 12.6 to 12.3 Ma (Rowley and others, 1995), but several new $^{40}Ar/^{39}Ar$ ages suggest that the age is 14.0 to 13.5 Ma (Snee and Rowley, 2000): (1) an age of 13.46 Ma from a sample collected from the lowest of four cooling units exposed in the type area of Ox Valley, 8 miles (13 km) northwest of Central, Utah (Rowley and others, 2006, in press); (2) an age of 14.10 Ma from a sample collected just west of Beaver Dam State Park, Nevada (Rowley and others, 2006, in press) just northwest of the map area; (3) an age of 12.19 Ma from a rhyolite flow resting on Ox Valley Tuff at Docs Pass, just west of the map area (Rowley and others, 2006, in press); and (4) an age of 13.93 Ma from a sample collected about 3 miles (5 km) southwest of Enterprise, just north of the map area (UGS and NMGRL, 2007a); this reinterpretation of the age of the Ox Valley Tuff (Biek and others, 2007; Rowley and others, 2006, in press) suggests, furthermore, that the Ox Valley Tuff may be correlative with the tuff of Etna, which is widely exposed as an outflow ash-flow sheet in the Caliente caldera complex, notably well exposed south of Caliente, Nevada, that has a similar composition and mineralogy as the Ox Valley Tuff and has an age interpreted to be 14.0 Ma based on ages of overlying and underlying rocks (Rowley and others, 1995); maximum thickness about 4,000 feet (1,200 m).

Tot **Precursor tuff and sandstone**—Poorly resistant, pink and light-gray, bedded and locally cross-bedded, crystal-poor, unwelded tuff and sandstone that predate densely welded Ox Valley Tuff; has similar mineralogy to the densely welded unit but contains fewer phenocrysts, so is considered to be an early eruptive phase of the Ox Valley Tuff; locally contains small red lithic clasts; largely formed by pyroclastic surge, airfall, and ash-flow origins, but some beds were deposited by streams; found only in the southwestern part of the map area, where it is underlain by crystal-poor, reddish-brown and dark-gray andesite or basaltic andesite lava flows (Ta) and where the overlying densely welded unit (To) is generally several thousand feet thick; the map unit and overlying densely welded tuff thus appear to have been deposited in a deep erosional or structural basin on the southern flank of andesite stratovolcanoes (Ta) and the Mineral Mountain intrusion; maximum thickness about 100 feet (30 m).

Tim **Mineral Mountain intrusion** (Miocene)—Resistant, gray and pink, high-silica granite porphyry stock, interpreted to be a laccolith; made up of mostly fine-grained orthoclase but with distinctive, abundant, large (as long as 0.3 inch [7 mm]) "eyes" of beta quartz and with minor ferromagnesian minerals; contains aplitic dikes and a chilled margin at its intrusive concordant roof of Pakoon Dolomite (Pp) and Callville Limestone (lPc); contains miarolitic cavities; located in the southwestern Bull Valley Mountains about 4 miles (6 km) northwest of the tiny, largely abandoned mining community of Goldstrike (Cook, 1960; Bullock, 1970; Eliopulos, 1974; Morris, 1980; Adair, 1986); considered to be the southern intrusion of the Iron Axis, a northeast-trending belt of intrusions structurally controlled by thrust faults and characterized by iron occurrences (Wells, 1938; Mackin, 1960; Tobey, 1976; Blank and others, 1992; Hacker, 1998; Hacker and others, 2002, 2007), including the large commercial deposits of the Iron Springs mining district (Mackin, 1947, 1954, 1960, 1968; Mackin and Ingerson, 1960; Blank and Mackin, 1967; Mackin and Rowley, 1976; Mackin and others, 1976; Rowley and Barker, 1978; Barker, 1995) northeast of the map area. The Mineral Mountain intrusion is compositionally much more silicic and much younger than the intrusions in other parts of the Iron Axis but, like most of the intrusions of the Iron Axis (Mackin, 1947, 1954, 1960, 1968; Mackin and Rowley, 1976; Mackin and others, 1976; Van Kooten, 1988), it appears to be concordant, probably a laccolith (Bullock, 1970; Eliopulos, 1974; Morris, 1980; Adair, 1986); the Mineral Mountain intrusion may have been the heat source for hydrothermal solutions (Adair, 1986; Willden and Adair, 1986; Limbach and Pansze, 1987) that moved by fracture flow as heated ground water along basin-range faults that were partly contemporaneous with the intrusion and led to disseminated gold deposits at and near Goldstrike. The intrusion is interpreted to be the magma source of the Ox Valley Tuff; it probably erupted when its concordant top or flank failed, presumably as a small caldera, when oversteepened during rapid emplacement, like most of the other concordant intrusions of the Iron Axis; a gravity slide (Tgb) might have been the trigger for failure, as in much of the Iron Axis; $^{40}Ar/^{39}Ar$ integrated age from a disturbed age spectrum is 12.1±1.9 Ma (UGS and NMGRL, 2007b).

Ta **Andesite** (Miocene)—Resistant to poorly resistant, brown, green, light- to dark-gray, red, and reddish-gray, mostly crystal-poor (generally plagioclase and minor pyroxene and hornblende in an aphanitic groundmass) lava flows, flow breccia, and volcanic mudflow breccia; flow bases locally are glassy; locally includes minor dacite flows in the upper part; at the top, unit includes at least 50 feet (15 m) of poorly resistant, partly consolidated, tan sandstone, shale, and conglomerate that represent stream-deposited basin-fill deposits that are significantly thicker outside the map area, where basin-range faults created basins; unit mostly represents a long-lived (an interval between about 23.5 and 13 Ma) complex of stratovolcanoes centered in and west of the western part of the map area, into which regional ash-flow tuffs are interfingered; unit thins and pinches out north, east, and south; the map unit is commonly weathered and poorly exposed, and generally hydrothermally altered, but its lithology at most stratigraphic intervals appears generally similar, thus without the tuffs, the age and stratigraphic position of individual andesite flows and mudflows cannot be determined; one exception to this uniform lithology is the reddish-brown andesite of Maple Ridge (Blank, 1959, 1993), which underlies the Racer Canyon Tuff (Tr) in the northwestern part of the map area and contains abundant large phenocrysts of plagioclase, pyroxene, and biotite; another exception is altered green andesite flows containing about 40 percent large (0.5 inch [1 cm]) phenocrysts of plagioclase and altered ferromagnesian minerals in the Narrows of Beaver Dam Wash and in Docs Pass Canyon; the more typical crystal-poor andesite between the Harmony Hills Tuff (Tqh) and the Bauers Tuff Member of the Condor Canyon Formation (Tqcb) was called the andesite of Little Creek by Blank (1993); maximum total thickness is at least 4,000 feet (1,200 m).

Thc **Tuff of Horse Canyon** (Miocene) —Moderately resistant, tan and light-yellow, unwelded to poorly welded, crystal poor (about 5 percent phenocrysts), rhyolite ash-flow tuff; contains abundant (at least several percent), mostly dark-gray lithic clasts and abundant light-yellow pumice; mapped as the upper member of the Racer Canyon Tuff (Tr) by Blank (1959) and Siders (1991); unit likely derived from a caldera to the west, perhaps buried, of the Caliente caldera complex; a tuff from one of these calderas, the tuff of Dow Mountain (Snee and Rowley, 2000) that is exposed south of Panaca Summit 20 miles (32 km) north-northwest of the map area, was correlated on the basis of petrography with a sample of what we call the tuff of Horse Canyon from upper Horse Canyon north of the map area (Rowley and others, in press); this sample has an $^{40}Ar/^{39}Ar$ age of 17.40 ± 0.06 Ma (Rowley and others, 2006, in press), although the sample shows some argon loss so its age could be slightly younger; exposed only in the northern part of the map area; maximum thickness about 60 feet (20 m).

Tr **Racer Canyon Tuff** (Miocene)—Resistant, tan, light-gray, light-yellow, and pink, poorly to moderately welded, moderately crystal-rich (where fresh, quartz is pink), low-silica rhyolite ash-flow tuff; contains abundant (several percent of rock volume) gray and pink lithic clasts and abundant (as much as 10 percent) light-yellow and light-gray pumice lenticules; where exposed in the map area, most of the unit is outflow tuff derived from the eastern part of the Caliente caldera complex (Rowley and others, 1995); some outflow tuffs of the unit just north of the map area contain pumice blocks as large as 2 feet (0.6 m) and abundant large phenocrysts, suggestive of proximity to its source; in the northwestern corner of the map area, a north-dipping stack of tuffs is tentatively interpreted to be intracaldera Racer Canyon Tuff, an interpretation that will be investigated during geologic mapping north of the map area in 2007 for the Utah Geological Survey; exact age of the Racer Canyon Tuff is unclear (Rowley and others, 1995) but our best estimate is that it is about 18.7 Ma based on two ages for sample 89-314e (Rowley and others, 2006, in press); in the Dodge Spring area, west of Motoqua, a unit here correlated with the Racer Canyon Tuff was mapped by Anderson and Hintze (1993) as Hiko Tuff, a unit that is almost identical to the Racer Canyon Tuff but slightly younger and clearly derived from the western end of the Caliente caldera complex (Rowley and others, 1995); about 12 outflow cooling units well exposed south of Upper Enterprise Reservoir, along the northern edge of the map area, collectively total at least 1,500 feet (450 m) thick, but the map unit thins abruptly southward through the rest of the map area.

Quichapa Group (Miocene)—Regional ash-flow sheets that are described in detail by Mackin (1960), Williams (1967), Anderson and Rowley (1975), Rowley and others (1995), and Scott and others (1995); consist of the petrographically and chemically distinctive Harmony Hills Tuff, Condor Canyon Formation, and Leach Canyon Formation.

Tqh **Harmony Hills Tuff**—Resistant, red, pink, gray, and tan, crystal-rich, moderately welded, dacitic ash-flow tuff; contains as much as 1 percent medium-gray lithic clasts; contains abundant (as much as 20 percent of rock volume) collapsed pumice as long as 1 foot (0.3 m), which commonly weathers out to lenticular cavities; source unknown but isopachs are centered on Bull Valley (Williams, 1967), suggesting that it was derived from the eastern Bull Valley Mountains, probably from an early voluminous eruptive phase of the Bull Valley intrusion, as suggested by Blank (1959), Williams (1967), and Rowley and others (1995); consistent with this interpretation is the fact that the $^{40}Ar/^{39}Ar$ age of the Harmony Hills Tuff is 22.03 Ma (Cornell and others, 2001), nearly identical to that of the Bull Valley intrusion (Rowley and others, 2006, in press; Biek and others, 2007); maximum thickness about 900 feet (275 m).

Tqcb **Bauers Tuff Member of the Condor Canyon Formation**—Resistant, brown, gray, and purple, crystal-poor, densely welded, dacitic to trachydacitic ash-flow tuff, commonly with a black basal vitrophyre, sparse lithic clasts, and long thin (generally less than 0.5 inch [1 cm] thick and as long as 3 feet [1 m], stony lenticules (considered by some persons to be "collapsed pumice"); derived from the northwestern part (Clover Creek caldera) of the Caliente caldera complex (Rowley and others, 1995); $^{40}Ar/^{39}Ar$ age is 22.8 Ma (Best and others, 1989b), which is also the $^{40}Ar/^{39}Ar$ age of its intracaldera intrusion exposed just north of Caliente (Rowley and others, 1994b); maximum thickness about 700 feet (215 m).

Tql **Leach Canyon Formation**—Moderately resistant, tan and light-gray, crystal-poor, poorly welded, low-silica rhyolite ash-flow tuff containing abundant cognate pumice and red lithic clasts; source is unknown but probably is the Caliente caldera complex because isopachs show that it thickens toward the complex (Williams, 1967); the $^{40}Ar/^{39}Ar$ age of the formation is about 23.8 Ma (Best and others, 1993; Rowley and others, 1995); maximum thickness about 600 feet (180 m).

Tin **Sedimentary rocks, Isom Formation, and Wah Wah Springs Formation, undivided** (Oligocene)—Intertongued, soft to resistant, mostly light-gray, hydrothermally altered, continental sedimentary rocks and dark ash-flow tuffs of the Isom and Wah Wah Springs Formations. From top to base, unit consists of moderately resistant, light-gray and tan, lacustrine limestone and tuffaceous fluvial sandstone as thick as 40 feet (12 m) thick; underlain by two resistant cooling units of the Isom Formation separated by soft, light-gray limestone and sandstone as much as 30 feet (10 m) thick; underlain in turn by moderately resistant, light-gray and light-yellow lacustrine limestone and fluvial sandstone as much as 50 feet (15 m) thick; then underlain by moderately resistant Wah Wah Springs Formation about 30 feet (10 m) thick (see description below). The intertonguing of these relatively thin ash-flow tuffs with continental Claron-type sedimentary rocks is described north, south, and east of the mapped area by Blank (1959), Hintze and others (1994), and Hacker (1998), but in the Iron Springs mining district to the northeast, where ash-flow tuffs of the Isom Formation and the Needles Range Group were defined and first described (Mackin, 1960; Anderson and Rowley, 1975), the rocks are fresh and thicker, and those of the Isom include at least a half dozen cooling units.

Ti **Isom Formation**—At least two resistant, trachydacitic cooling units of the Bald Hills Tuff Member, an upper purplish-red, densely welded, crystal-poor (about 15 percent) ash-flow tuff, and a lower dark-gray to black, flinty, densely welded, crystal-poor (about 5 percent) ash-flow tuff that contains linear vesicles; Isom derived perhaps from the Indian Peak caldera complex (Best and others, 1989a, b) north of the map area; age of the Isom appears to be about 27 to 26 Ma, on the basis of many $^{40}Ar/^{39}Ar$ and K-Ar ages (Best and others, 1989b; Rowley and others, 1994a); maximum thickness of each cooling unit is as much as 40 feet (12 m).

Tin **Wah Wah Springs Formation of the Needles Range Group**—Moderately resistant, light-gray, pink, reddish-purple, reddish-brown, and olive green, crystal-rich (about 30 percent), moderately welded, dacite ash-flow tuff that contains sparse lithic clasts and moderately abundant cognate pumice; petrographically resembles the Harmony Hills Tuff except that the Wah Wah Springs is lower in overall crystals and contains more quartz and sanidine; derived from the Indian Peak caldera complex (Best and others, 1989a, b); correlated on the basis of petrography and a K-Ar age of 29 Ma with a sample collected just southeast of the map area (Hintze and other, 1994); Best and others (1989a) considered the age of the Wah Wah Springs to be 29.5 Ma; thickness about 30 feet (10 m).

Tc **Claron Formation, undivided** (Oligocene, Eocene, and Paleocene?)—Undivided unit shown only in cross sections; soft to resistant, mostly red, maroon, white, yellow, gray, and pink, medium- to thick-bedded, lacustrine and fluvial limestone, calcrete, sandstone, siltstone, mudstone, and conglomerate; age poorly constrained; probably the Claron represents a restricted interval in the Oligocene and, perhaps in its lower part, the Eocene and Paleocene(?); exposed only in the southern part of the map area, where it is badly deformed and hydrothermally altered along normal and oblique-slip faults; better exposed south of the map area (Hintze and others, 1994); maximum thickness about 300 feet (100 m).

Tcu **Upper unit** (Oligocene)—Mostly resistant, light-gray and minor light-yellow, thin- to thick-bedded limestone, pebbly limestone, and minor sandstone, conglomerate, and shale; limestone contains algal filaments; maximum thickness about 150 feet (50 m).

Tcm **Middle unit** (Eocene and Paleocene?)—Poorly to moderately resistant, red, yellow, purple, and medium-gray sandstone, shale, pebble to cobble conglomerate, and limestone; maximum thickness about 150 feet (50 m).

Tcl **Lower unit** (Eocene and Paleocene?)—Moderately resistant, yellow, light-gray, and red, pebble to boulder conglomerate (clasts as large as 1.5 feet, or 0.5 m); south of the map area, unit locally correlated with the Grapevine Wash Formation (Hintze and others, 1994), which is well exposed as thick conglomerate and overlying sandstone and conglomerate in Grapevine Wash just east of the map area (Wiley, 1963); Adair (1986), Willden and Adair (1986), and Willden (2006), however, considered that an overlying sandstone and conglomerate in Grapevine Wash belongs to the Claron Formation and rests unconformably on the Grapevine Wash Formation; in and just east and south of the map area, unit is the host for many of the disseminated gold ore bodies in the Goldstrike district (Willden and Adair, 1986; Willden, 2006), perhaps localized by fossil plant material; maximum thickness about 100 feet (30 m).

Pq **Queantoweap Sandstone** (Lower Permian)—Resistant, well-cemented, light-gray, grayish-pink, light-orange, and greenish-gray, thin- to thick-bedded, commonly cross-bedded, fine-grained, shallow-marine and beach sandstone and quartzite; locally contains burrows but no other fossils; partial section at least 1,000 feet (300 m) thick.

PIPpc **Pakoon Formation and Callville Limestone, undivided** (Lower Permian and Lower Pennsylvanian)—Mapped together where highly deformed or hydrothermally altered, metamorphosed, or poorly exposed.

Pp **Pakoon Formation** (Lower Permian)—Resistant, light-gray and light-yellow, thick-bedded, fine-grained, shallow-marine dolomite that commonly weathers to light-brownish-gray cliffs and ledges; contains light-gray chert; includes tan dolomitic sandstone in the middle part of the formation; maximum thickness about 600 feet (180 m).

IPc **Callville Limestone** (Upper to Lower Pennsylvanian)—Resistant, light- to medium-gray and light-blue-gray, thin- to thick-bedded, commonly cherty and fossiliferous (corals, brachiopods, crinoids, fusulinids, and bryozoans), shallow-marine limestone that forms cliffs or ledge-and-step topography; converted to marble along the intrusive contacts of the Mineral Mountain intrusion (Tim); locally contains thin beds of light-orange sandstone and light-gray dolomite in the upper third of the formation; maximum thickness about 1,500 feet (450 m).

Msc **Scotty Wash Quartzite and Chainman Shale, undivided** (Upper Mississippian)—As first recognized by Adair (1986) and Willden and Adair (1986), the overlying Scotty Wash Quartzite is a resistant, medium- to dark-gray, tan, and brown, well-bedded, shallow-marine sandstone and quartzite, with minor thin sandy shale beds, that has a maximum thickness of about 80 feet (25 m); the underlying Chainman Shale is a soft, black, dark-gray, and greenish-gray marine shale that has a maximum thickness of about 80 feet (25 m).

Mr **Redwall Limestone** (Lower Mississippian)—Resistant, light- to dark-gray, locally fossiliferous (crinoids and corals), shallow-marine-shelf limestone, with minor interbedded light-gray sandstone and light-yellow-gray dolomite in the middle part of the unit; forms the upper plate of the Goldstrike thrust fault in the southeastern part of the map area; incomplete section, at least 550 feet (170 m) thick.

D **Devonian sedimentary rocks**—Shown only on the cross section.

C **Cambrian sedimentary rocks**—Shown only on the cross section.

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GEOLOGIC SYMBOLS

CONTACT

NORMAL FAULT – Dashed where location inferred; dotted where concealed; bar and ball on downthrown side; arrow perpendicular to fault shows dip of fault plane, whereas arrow at an angle to fault shows rake of slickensides on fault plane; arrows on cross sections show relative movement

STRIKE-SLIP FAULT – Dashed where location inferred; dotted where concealed; opposing arrows on either side of the fault on the map show relative movement; arrow perpendicular to fault shows dip of fault plane, whereas arrow at an angle shows rake of slickensides on fault plane; T (toward) and A (away) show relative movement on cross sections

OBLIQUE-SLIP FAULT – Dashed where location inferred; dotted where concealed; bar and ball on downthrown side and opposing arrows on either side of the fault plane show relative movement on map; arrow perpendicular to fault shows dip of fault plane, whereas arrow at an angle shows rake of slickensides on fault plane; arrows and T (toward) and A (away) show relative movement on cross sections

GOLDSTRIKE THRUST FAULT – Barbs on upper plate; arrows show relative movement on cross sections

GRAVITY-SLIDE SURFACE – Barbs on upper plate; arrows show relative movement on cross sections

CALDERA MARGIN – Queried where designation as a caldera is uncertain; hachures on downthrown side

ANTICLINE – Dashed where location inferred; arrow shows direction of plunge

SYNCLINE

OVERTURNED SYNCLINE – Dashed where location inferred

STRIKE AND DIP OF BEDDING – Includes foliation (based primarily on pumice and biotite) in ash-flow tuffs:

inclined

overturned

FLOW FOLIATION IN LAVA FLOWS

LOCATION OF CHEMICAL ANALYSIS – Includes sample number; analysis and coordinates given in the table; table includes some samples collected from just outside the map area

SPRING

MINE

ADIT

SHAFT

PROSPECT

Table 1. Trace-element analyses of rock samples in and near the Goldstrike quadrangle.

Sample Number	Rock Type	7.5' Quadrangle	Latitude	Longitude	Au ppm	Ag ppm	Al wt.%	As ppm
6-69	Jar alt Harmony Hills	Goldstrike	37*28'30.2"	113*53'18.1"	0.006	<0.2	0.93	7
6-92a	Prop alt andesite	Maple Ridge	37*24' 1.8"	113*51'23.9"	<0.005	0.8	1.73	3
6-97	Jar alt andesite	Goldstrike	37*25'29.4"	113*55'33.5"	<0.005	<0.2	1.65	6
6-99b	Jar alt andesite	Goldstrike	37*25'49.7"	113*55'53.2"	<0.005	<0.2	0.93	15
6-102	Jar alt andesite	Goldstrike	37*26'15.1"	113*56'49.4"	<0.005	0.3	0.92	<2
6-105	Faulted sed	Maple Ridge	37*22'56.5"	113*51'29.2"	0.044	0.2	0.17	301
6-106	Faulted sed	Maple Ridge	37*22'58.8"	113*51'31.8"	0.023	0.2	0.28	1470
6-109	Fault in E pit	Maple Ridge	37*23'16.6"	113*52' 6.5"	<0.005	<0.2	0.5	834
6-110a	Fault in E pit	Maple Ridge	37*23'12.2"	113*52' 3.3"	0.005	<0.2	0.2	2710
6-111b	Fault in E pit	Maple Ridge	37*23' 5.2"	113*52' 9.9"	0.075	<0.2	0.35	866
6-113	Fault, alt, sulfides	Goldstrike	37*23' 4.9"	113*52'30.7"	0.526	1	0.38	281
6-114b	Hamburg pit, qtz	Goldstrike	37*23' 0.3"	113*52'44.8"	0.612	7.1	0.17	184
6-117b	Fault, jar alt, pit	Goldstrike	37*23'18.4"	113*52'51.8"	0.023	0.4	0.28	151
6-118	Jar alt	Goldstrike	37*23'10.7"	113*53'31.6"	<0.005	0.2	1.17	96
6-119	Jar alt	Goldstrike	37*22'51.3"	113*54'11.5"	0.453	1.8	1.16	1110
6-120	Fault, jar alt	Goldstrike	37*22'38.5"	113*54'24.3"	<0.005	0.2	0.79	10
6-122a	Fault, pit	Motoqua	37*22'18.3"	113*54'55.1"	<0.005	<0.2	0.68	213
6-123	Jar, alt	Goldstrike	37*23'20.9"	113*52'59.8"	<0.005	<0.2	0.79	34
6-128	Fault, jar alt, gypsum	Motoqua	37*21'25.6"	113*58'40.9"	<0.005	<0.2	2.22	470
6-131	Jar alt	Goldstrike	37*23'' 7.0"	113*57'37.7"	<0.005	<0.2	0.76	28
6-135	Float, qtz	Goldstrike	37*24' 9.2"	113*58'32.2"	<0.005	<0.2	0.84	23
6-137b	Float, qtz	Goldstrike	37*24'21.4"	113*58'46.9"	<0.005	<0.2	0.16	8
6-145	Mag in Callville	Goldstrike	37*25'52.7"	113*58'28.7"	0.029	1.3	0.81	60
6-156a	Qtz, boxwork, Callville	Goldstrike	37*26' 5.0"	113*57'32.4"	<0.005	0.2	0.58	447
6-156e	Limonite in Callville	Goldstrike	37*26' 5.0"	113*57'32.4"	<0.005	<0.2	0.27	25
6-166	Fault, jar alt	Motoqua	37*22'16.3"	113*56'18.6"	0.067	<0.2	0.19	305
6-167a	Fault in Claron	Motoqua	37*22' 9.4"	113*56'11.0"	<0.005	<0.2	1.14	46
6-167b	Fault in Claron	Motoqua	37*22' 9.4"	113*56'11.0"	0.026	0.4	1.07	13
6-168	Jar alt	Maple Ridge	37*23'18.3"	113*52'22.9"	0.243	<0.2	0.11	21
6-169	Fault, Yavayampa pit, cal	Maple Ridge	37*23'23.1"	113*52'12.1"	0.047	0.4	0.12	217
6-171a	Jar alt, Claron, Bull Run	Goldstrike	37*23'12.0"	113*53'44.3"	<0.005	0.5	0.11	28
6-171b	Jar alt, Claron, Bull Run	Goldstrike	37*23'12.0"	113*53'44.3"	0.01	<0.2	5.63	238
6-175a	Fault, jar alt, pit	Motoqua	37*21'47.7"	113*55' 4.1"	1.735	2.5	0.04	192

Sample Number	Rock Type	7.5' Quad Name	Latitude	Longitude	Au ppm	Ag ppm	Al wt.%	As ppm
6-176	Claron, jar alt	Maple Ridge	37*23' 1.2"	113*50'33.2"	<0.005	<0.2	0.24	80
6-177	Claron, jar alt	Maple Ridge	37*23' 0.5"	113*50'36.9"	0.106	0.6	0.52	525
6-203	Jar alt andesite	Goldstrike	37*26'52.6"	113*56'22.0"	<0.005	0.2	1.44	7
6-207	Jar alt, Bauers Mbr	Goldstrike	37*26'42.0"	113*56'19.3"	0.007	0.3	0.72	147
6-288	Jar alt	Goldstrike	37*25' 2.8"	113*57'53.0"	0.02	<0.2	0.36	6
6-292	Jar alt, Leach Canyon	Goldstrike	37*25'29.8"	113*57'46.6"	<0.005	<0.2	0.88	9
6-302	Fault, jar alt	Goldstrike	37*25'31.5"	113*57'11.7"	0.005	0.2	0.59	36
6-346a	Jar alt, qtz	Goldstrike	37*26'41.4"	113*59'32.7"	0.008	<0.2	0.48	6
6-355	Jar alt, fault	Goldstrike	37*26' 7.6"	113*59'20.3"	<0.005	<0.2	0.46	3
6-362	Jar alt, qtz	Docs Pass	37*23'42.8"	114*00'33.9"	<0.005	<0.2	1.85	5
6-363	Jar alt, cal	Docs Pass	37*23'50.9"	114*00'48.8"	<0.005	0.3	0.35	12
6-389	Jar alt, fault	Goldstrike	37*23'32.2"	113*58'42.1"	<0.005	<0.2	0.69	26
7/27	Float of sil Ox Valley	Goldstrike	37*26’28.9”	113*58’17.8”	<0.005	<0.2	0.03	2
7/31	Jar alt Racer Canyon	Goldstrike	37*26’30.2”	113*58’36.9”	0.017	<0.2	1.72	2
7-143	Jar alt fault	Goldstrike	37*23’34.3”	113*53’41.8”	<0.005	0.3	3.15	19
7-150	Jar alt Leach Canyon	Goldstrike	37*23’59.6”	113*54’31.7”	<0.005	<0.2	1.14	3
7-165	Alt fault, cal	Goldstrike	37*23’4.5”	113*54’36.8”	<0.005	0.3	1.15	548
7-166	Jar alt fault in Leach	Goldstrike	37*23’10.4”	113*54’43.3”	<0.005	0.2	0.99	13
7-173A	Jar alt	Goldstrike	37*23'38.9”	113*55’16.9”	<0.005	<0.2	0.96	3
7-177	Jar alt fault in Isom	Goldstrike	37*23'45.4”	113*55’39.7”	<0.005	<0.2	0.87	29
7-179	Jar alt middle Claron	Goldstrike	37*23’33.5”	113*55’54.3”	0.273	0.8	0.3	542
7-181	Jar alt fault, Harmony	Goldstrike	37*23’27.8”	113*56’0.6”	<0.005	<0.2	0.89	9
7-183	Jar alt fault, Leach	Goldstrike	37*23’9.7”	113*55’50.7”	<0.005	0.2	0.78	27
7-200	Jar alt fault, upper Claron	Goldstrike	37*22’33.8”	113*55’32.5”	<0.005	<0.2	1.66	15
7-203	Jar alt fault, Tin	Goldstrike	37*22’32.0”	113*55’24.7”	<0.005	<0.2	1.3	354
7-244	Jar alt fault, Harmony	Goldstrike	37*26’57.4”	113*52’32.9”	0.006	<0.2	1.35	7
7-265A	Jar alt fault, Ox Valley	Goldstrike	37*27’52.0”	113*56’57.2”	<0.005	0.2	1.68	16
7-265B	Jar alt Ox Valley	Goldstrike	37*27’52.1”	113*57’2.3”	<0.005	<0.2	0.73	12
7-348	Jar alt fault	Docs Pass	37*27’35.8”	114*1’58.9”	0.007	<0.2	0.91	10
7-349	Jar alt fault, andesite	Docs Pass	37*27’22.0”	114*1’52.9”	<0.005	<0.2	1.17	<2
7-352	Jar alt fault, qtz, andesite	Docs Pass	37*27’2.7”	114*1’51.7”	<0.005	0.4	0.51	5
7-358	Jar alt fault, andesite	Docs Pass	37*28’3.2”	114*2’42.9”	<0.005	<0.2	3.32	<2
7-359	Jar alt fault, Leach	Docs Pass	37*26’33.2”	114*1’41.0”	<0.005	0.5	0.58	11
7-363B	Jar alt fault, andesite	Docs Pass	37*26’43.4”	114*1’44.6”	0.011	0.5	1.01	13

Sample Number	Rock Type	7.5' Quad Name	Latitude	Longitude	Au ppm	Ag ppm	Al wt.%	As ppm
7-364	Qtz, andesite	Docs Pass	37*26’32.0”	114*1’51.0”	0.377	27	0.17	3
7-367	Jar alt, andesite	Docs Pass	37*27’58.0”	114*1’47.3”	<0.005	<0.2	1.29	<2
7-368	Jar alt, andesite	Docs Pass	37*28’2.3”	114*1’25.9”	0.007	<0.2	2.13	6
7-369	Jar alt, gyp, andesite	Docs Pass	37*27'58.4”	114*1'19.1”	<0.005	<0.2	1.68	16
7-372A	Jar alt fault, andesite	Docs Pass	37*27’32.3”	114*1’5.0”	<0.005	<0.2	2.19	<2
7-373	Jar alt gyp, fault?	Docs Pass	37*27'51.8”	114*1’3.2”	<0.005	<0.2	1.35	<2
7-374	Jar alt gyp, fault?	Docs Pass	37*27'53.6”	114*0'56.8”	<0.005	<0.2	1.4	3

Notes: Gold analyses by fire assay fusion.
Trace-element analyses by ICP-AES (inductively coupled plasma with atomic emission spectroscopy).
Latitude and longitude determined from topographic base map.
All analyses performed by ALS Chemex Labs, Inc, Sparks, NV.
Abbreviations: (1) Jar=jarositic (sericitic); (2) Prop=propylitic; (3) alt=altered; (4) *=degrees;
(5) qtz=quartz veins; (6) mag=magnetite veins; (7) cal=calcite veins

Sample Number	B ppm	Ba ppm	Be ppm	Bi ppm	Ca wt.%	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe wt.%	Ga ppm
6-69	<10	50	<0.5	<2	0.27	<0.5	2	8	10	1.29	10
6-92a	<10	30	<0.5	<2	0.7	<0.5	10	69	49	2.32	<10
6-97	<10	120	0.5	<2	0.63	<0.5	15	85	28	3.55	10
6-99b	<10	60	0.5	<2	0.19	<0.5	<1	18	19	1.77	10
6-102	<10	50	<0.5	<2	0.2	<0.5	1	59	49	4.22	10
6-105	<10	40	0.6	<2	0.21	2	28	89	9	3.01	<10
6-106	<10	120	<0.5	<2	0.11	0.7	9	63	9	2.09	<10
6-109	<10	10	<0.5	<2	0.2	<0.5	2	46	11	3.88	<10
6-110a	<10	30	0.7	<2	8.73	0.8	2	68	11	3.93	<10
6-111b	<10	160	<0.5	<2	0.07	5.8	3	117	14	1.22	<10
6-113	<10	20	0.9	<2	0.54	<0.5	<1	64	6	0.86	<10
6-114b	<10	540	<0.5	<2	2.64	1.6	1	143	18	0.62	<10
6-117b	<10	490	<0.5	<2	3.77	<0.5	45	50	15	1.47	<10
6-118	<10	420	1.1	<2	0.49	<0.5	7	26	16	7.94	<10
6-119	<10	70	0.5	<2	0.42	<0.5	11	64	42	5.87	<10
6-120	<10	100	<0.5	<2	0.24	<0.5	<1	48	5	0.91	<10
6-122a	<10	60	0.5	<2	0.11	<0.5	7	43	17	5.34	<10
6-123	<10	90	<0.5	<2	0.52	<0.5	<1	106	13	6.74	<10
6-128	<10	120	1.8	<2	4.1	1.2	35	28	15	2.26	<10
6-131	<10	60	<0.5	<2	0.26	<0.5	2	58	15	1.56	<10
6-135	<10	50	<0.5	<2	0.8	<0.5	7	112	18	1.99	<10
6-137b	<10	20	<0.5	<2	6.75	<0.5	1	14	10	0.36	<10
6-145	140	<10	<0.5	4	11.05	11.4	7	4	72	30.9	<10
6-156a	220	10	<0.5	<2	4.61	2.2	1	17	2	0.32	<10
6-156e	10	30	0.6	6	17.2	1	7	2	9	2.54	<10
6-166	10	220	<0.5	<2	6.17	0.6	1	49	11	1.39	<10
6-167a	10	90	1.7	<2	0.62	0.5	11	36	11	1.02	<10
6-167b	<10	200	0.7	<2	3.54	<0.5	2	30	4	1.39	<10
6-168	<10	60	<0.5	<2	17	<0.5	<1	20	4	0.56	<10
6-169	<10	110	1.4	<2	22.9	0.5	1	12	5	2.07	<10
6-171a	<10	60	<0.5	<2	0.21	<0.5	1	88	4	0.45	<10
6-171b	<10	190	3.1	<2	9.07	1.8	24	36	15	1.52	<10
6-175a	<10	10	<0.5	<2	15.8	1.8	1	40	5	0.4	<10

Sample Number	B ppm	Ba ppm	Be ppm	Bi ppm	Ca wt.%	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe wt.%	Ga ppm
6-176	<10	80	1.2	<2	>25.0	<0.5	1	5	3	0.43	<10
6-177	<10	120	1.8	2	3.87	<0.5	51	53	13	8.89	<10
6-203	<10	100	0.9	<2	0.62	<0.5	10	55	41	8.72	10
6-207	<10	40	0.6	<2	0.35	<0.5	<1	26	93	6.1	<10
6-288	<10	160	<0.5	<2	0.08	<0.5	<1	24	10	1.32	<10
6-292	<10	60	<0.5	<2	0.09	<0.5	1	30	14	1.42	<10
6-302	<10	50	1.5	<2	0.14	0.5	8	65	43	4.04	10
6-346a	<10	100	0.8	<2	12.3	<0.5	2	22	4	0.87	<10
6-355	<10	100	0.8	<2	11.25	<0.5	<1	29	4	0.82	<10
6-362	<10	50	0.6	<2	0.66	<0.5	14	95	34	3.46	10
6-363	<10	10	0.8	<2	21.3	2.7	3	38	7	0.82	<10
6-389	<10	180	0.5	<2	0.31	<0.5	3	13	9	2.39	<10
7/27	<10	30	<0.5	<2	0.04	<0.5	1	23	9	0.35	<10
7/31	<10	230	0.7	2	0.06	<0.5	9	9	13	3.05	10
7-143	<10	40	2.1	<2	4.6	<0.5	11	64	44	2.68	10
7-150	<10	120	0.6	2	0.24	<0.5	2	4	10	1.13	<10
7-165	<10	270	0.7	<2	5.1	<0.5	9	6	27	2.78	<10
7-166	<10	80	0.5	<2	0.57	<0.5	4	3	14	1.58	<10
7-173A	<10	60	1.1	<2	0.33	<0.5	3	2	13	1.26	<10
7-177	<10	720	<0.5	2	0.24	<0.5	1	1	6	1.63	<10
7-179	<10	40	<0.5	<2	0.18	<0.5	2	7	29	2.67	<10
7-181	<10	90	0.8	<2	0.2	<0.5	2	2	14	1.95	<10
7-183	<10	80	0.8	<2	0.28	<0.5	3	<1	6	1.15	<10
7-200	10	30	1	<2	13.8	<0.5	1	<1	3	1.04	<10
7-203	10	260	0.5	<2	0.62	<0.5	12	2	17	4.06	<10
7-244	<10	190	<0.5	2	0.22	<0.5	3	19	18	2.54	10
7-265A	<10	140	0.5	<2	0.64	<0.5	13	53	21	4.26	10
7-265B	<10	50	<0.5	<2	0.19	<0.5	1	1	19	1.54	<10
7-348	<10	50	<0.5	<2	0.15	<0.5	7	34	10	3.85	<10
7-349	<10	80	<0.5	<2	0.36	<0.5	1	20	7	1.26	10
7-352	<10	60	<0.5	<2	6.81	<0.5	1	4	9	0.95	<10
7-358	<10	70	0.7	<2	1.04	<0.5	17	71	34	4.32	10
7-359	<10	40	<0.5	<2	0.05	<0.5	1	7	12	1.28	<10
7-363B	<10	30	<0.5	<2	0.24	<0.5	3	34	24	3.65	10

Sample Number	B ppm	Ba ppm	Be ppm	Bi ppm	Ca wt.%	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe wt.%	Ga ppm
7-364	<10	80	<0.5	2	12.1	<0.5	<1	7	4	0.33	<10
7-367	<10	270	0.6	<2	0.18	<0.5	15	24	41	7.25	10
7-368	<10	120	0.6	<2	0.61	<0.5	9	45	16	2.83	10
7-369	<10	110	<0.5	<2	1.99	<0.5	1	24	6	4.68	<10
7-372A	<10	90	0.5	<2	2.49	<0.5	12	60	18	3.31	10
7-373	20	90	<0.5	2	0.82	<0.5	1	6	7	1.5	<10
7-374	<10	150	<0.5	<2	0.22	<0.5	1	18	13	1.7	10

Sample Number	Hg ppm	K wt.%	La ppm	Mg wt.%	Mn ppm	Mo ppm	Na wt.%	Ni ppm	P ppm	Pb ppm	S wt.%
6-69	<1	0.27	50	0.26	419	1	0.05	6	310	17	0.03
6-92a	<1	0.3	30	1.12	251	<1	0.06	21	880	12	0.02
6-97	<1	0.15	40	0.64	348	<1	0.03	40	1030	13	0.01
6-99b	<1	0.14	30	0.12	32	<1	0.09	2	530	6	0.01
6-102	<1	0.1	10	0.17	40	1	0.03	4	680	10	0.03
6-105	1	0.02	<10	0.02	195	3	0.01	87	1020	<2	0.02
6-106	2	0.1	<10	0.01	54	4	0.03	20	1040	10	0.25
6-109	<1	0.02	<10	0.02	11	13	0.01	16	40	20	0.01
6-110a	2	0.06	10	0.09	195	2	0.02	58	2700	4	0.03
6-111b	3	0.11	10	0.02	11	4	0.01	20	160	8	0.06
6-113	1	0.2	10	0.04	18	11	0.01	15	110	2	0.02
6-114b	1	0.05	10	0.02	93	5	0.01	19	1620	26	0.03
6-117b	<1	0.09	<10	0.11	6350	96	0.02	17	1190	7	0.02
6-118	1	0.55	130	0.05	658	6	0.02	3	1810	27	0.8
6-119	<1	0.29	30	0.46	142	6	0.05	56	1030	11	0.08
6-120	<1	0.24	40	0.17	47	1	0.06	2	100	23	0.03
6-122a	<1	0.08	<10	0.03	197	6	0.01	19	130	11	0.06
6-123	<1	0.05	<10	0.06	10	2	0.01	5	70	8	0.05
6-128	4	0.06	20	0.12	2810	9	0.02	74	300	12	3.62
6-131	<1	0.11	20	0.2	59	3	0.01	4	230	14	0.05
6-135	<1	0.07	10	0.3	440	<1	0.06	41	1010	2	0.03
6-137b	<1	0.02	<10	0.27	291	1	0.02	3	230	5	0.14
6-145	<1	<0.01	<10	7.62	218	12	0.02	47	90	42	0.11
6-156a	<1	<0.01	10	23.6	83	1	0.01	4	30	48	0.04
6-156e	<1	<0.01	<10	8.88	298	55	0.02	11	100	10	<0.01
6-166	1	0.11	<10	3.54	67	3	0.02	11	220	3	0.12
6-167a	1	0.17	30	1.48	1175	4	0.02	14	200	14	0.02
6-167b	<1	0.25	40	0.32	157	1	0.04	3	290	8	0.02
6-168	1	0.06	<10	0.14	101	<1	0.01	4	60	<2	<0.01
6-169	2	0.05	<10	0.11	900	5	0.01	42	50	3	<0.01
6-171a	<1	0.03	<10	0.03	96	22	0.01	14	100	2	0.01
6-171b	1	0.04	10	1.44	3230	4	0.01	100	120	3	0.06
6-175a	1	0.01	10	0.05	611	3	0.01	7	1190	2	<0.01

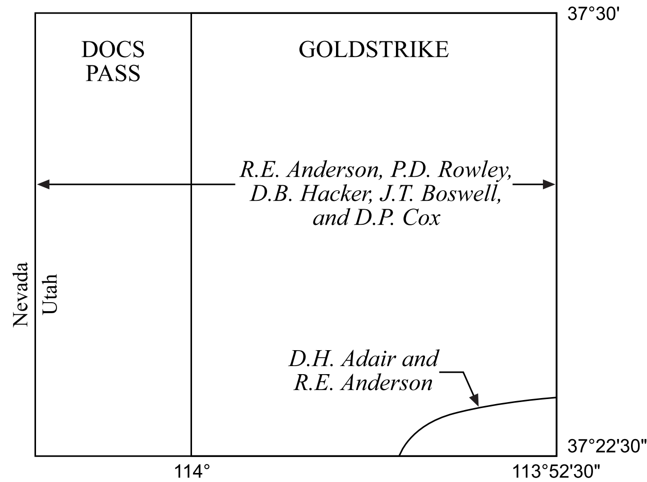
Sample Number	Hg ppm	K wt.%	La ppm	Mg wt.%	Mn ppm	Mo ppm	Na wt.%	Ni ppm	P ppm	Pb ppm	S wt.%
6-176	<1	0.02	<10	0.23	341	<1	0.02	5	430	<2	<0.01
6-177	8	0.04	<10	0.35	146	8	0.01	160	160	30	0.03
6-203	<1	0.18	40	0.49	256	3	0.03	21	1620	15	0.07
6-207	<1	0.14	<10	0.05	37	2	0.02	7	1130	15	0.02
6-288	<1	0.13	50	0.04	40	<1	0.04	1	180	14	0.02
6-292	<1	0.23	30	0.06	15	1	0.03	3	430	10	0.19
6-302	<1	0.24	30	0.13	690	6	0.04	4	220	64	0.01
6-346a	<1	0.14	20	6.58	523	1	0.03	2	140	6	0.02
6-355	<1	0.14	20	6.06	488	1	0.03	3	130	6	0.02
6-362	<1	0.07	30	1.51	470	<1	0.04	54	1280	6	0.01
6-363	<1	0.07	10	0.25	1515	<1	0.01	10	320	10	<0.01
6-389	<1	0.23	30	0.16	60	11	0.05	2	610	10	0.22
7/27	<1	<0.01	<10	0.01	50	<1	0.01	2	140	12	0.01
7/31	<1	0.17	<10	0.1	71	<1	0.01	40	50	20	0.01
7-143	<1	0.08	10	0.46	214	2	0.03	74	850	71	3.99
7-150	<1	0.26	40	0.28	118	<1	0.06	3	240	7	0.02
7-165	1	0.5	40	0.51	433	<1	0.02	8	640	34	0.79
7-166	1	0.23	50	0.12	553	<1	0.01	6	500	34	0.07
7-173A	<1	0.4	40	0.14	457	<1	0.03	4	550	22	<0.01
7-177	<1	0.2	40	0.05	88	3	0.01	<1	680	27	0.08
7-179	9	0.1	<10	0.03	28	38	<0.01	1	240	21	0.02
7-181	<1	0.28	30	0.12	85	<1	0.01	1	710	12	0.06
7-183	<1	0.35	30	0.1	228	<1	0.01	1	210	21	<0.01
7-200	<1	0.44	10	0.37	289	<1	0.01	<1	230	15	2.7
7-203	1	0.32	50	0.25	1420	65	0.04	<1	1440	26	0.03
7-244	<1	0.37	30	0.54	63	<1	0.08	8	700	20	0.02
7-265A	<1	0.33	30	0.95	451	<1	0.06	34	1330	33	0.09
7-265B	<1	0.31	50	0.1	85	2	0.05	1	160	27	0.06
7-348	<1	0.22	10	0.62	99	<1	0.02	6	990	12	0.07
7-349	1	0.44	10	0.09	17	<1	0.08	<1	480	22	0.22
7-352	<1	0.24	40	0.19	620	<1	0.05	<1	170	11	0.06
7-358	<1	0.15	30	2.26	805	<1	0.08	18	1470	10	0.03
7-359	<1	0.25	30	0.08	94	<1	0.12	2	140	58	0.26
7-363B	<1	0.15	20	0.88	336	<1	0.07	5	1000	7	0.7

Sample Number	Hg ppm	K wt.%	La ppm	Mg wt.%	Mn ppm	Mo ppm	Na wt.%	Ni ppm	P ppm	Pb ppm	S wt.%
7-364	<1	0.05	<10	0.04	496	<1	0.01	<1	30	7	0.02
7-367	<1	0.32	40	0.26	368	1	0.05	5	2370	22	0.47
7-368	<1	0.32	30	0.83	767	<1	0.05	14	1260	13	0.01
7-369	<1	0.67	40	0.28	29	4	0.14	<1	2810	24	2.19
7-372A	<1	0.17	30	1.61	729	<1	0.03	15	1180	23	0.01
7-373	1	0.54	<10	0.27	17	<1	0.06	<1	390	12	0.83
7-374	2	0.24	20	0.24	272	1	0.03	<1	840	9	0.39

Sample Number	Sb ppm	Sc ppm	Sr ppm	Ti wt.%	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
6-69	2	1	23	<0.01	<10	<10	14	<10	37
6-92a	<2	5	71	0.05	<10	<10	58	<10	52
6-97	<2	6	34	0.01	<10	<10	76	<10	54
6-99b	<2	2	32	0.01	<10	<10	21	<10	18
6-102	2	3	30	<0.01	<10	<10	111	<10	13
6-105	10	11	7	<0.01	<10	<10	13	<10	775
6-106	20	1	304	<0.01	50	<10	7	<10	25
6-109	3	5	4	<0.01	<10	<10	11	<10	20
6-110a	35	2	62	<0.01	<10	<10	50	<10	214
6-111b	74	1	13	<0.01	10	<10	7	<10	66
6-113	8	2	39	<0.01	<10	<10	8	<10	37
6-114b	23	1	33	<0.01	<10	<10	7	<10	307
6-117b	7	1	54	<0.01	<10	<10	4	<10	76
6-118	6	3	298	<0.01	<10	<10	7	<10	139
6-119	13	4	62	<0.01	<10	<10	158	<10	44
6-120	<2	1	36	0.02	<10	<10	12	<10	16
6-122a	6	2	6	<0.01	<10	<10	54	<10	63
6-123	6	2	11	<0.01	<10	<10	37	<10	9
6-128	4	5	19	<0.01	<10	<10	15	<10	206
6-131	<2	2	25	<0.01	<10	<10	34	<10	27
6-135	<2	5	72	0.24	<10	<10	64	<10	22
6-137b	<2	1	71	<0.01	10	<10	7	<10	17
6-145	7	1	25	0.03	<10	<10	26	<10	3010
6-156a	6	1	46	0.01	<10	<10	10	<10	358
6-156e	4	1	137	<0.01	<10	<10	8	<10	222
6-166	19	<1	29	<0.01	10	<10	4	<10	110
6-167a	<2	1	30	0.01	<10	<10	19	<10	71
6-167b	<2	2	89	0.01	<10	<10	18	<10	47
6-168	2	<1	138	<0.01	<10	<10	1	<10	27
6-169	23	4	120	<0.01	<10	<10	8	<10	467
6-171a	3	<1	4	<0.01	<10	<10	3	<10	67
6-171b	2	9	30	<0.01	<10	<10	16	<10	171
6-175a	26	3	65	<0.01	10	<10	14	<10	46

Sample Number	Sb ppm	Sc ppm	Sr ppm	Ti wt.%	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
6-176	4	1	116	<0.01	<10	<10	3	<10	34
6-177	6	14	21	<0.01	<10	<10	120	<10	83
6-203	3	4	46	0.01	<10	<10	83	<10	109
6-207	9	2	11	<0.01	<10	<10	74	<10	33
6-288	<2	1	17	<0.01	<10	<10	7	<10	16
6-292	<2	1	70	<0.01	<10	<10	6	<10	14
6-302	6	1	11	0.02	<10	<10	9	<10	95
6-346a	<2	<1	204	<0.01	<10	<10	5	<10	99
6-355	2	<1	187	<0.01	<10	<10	5	<10	92
6-362	3	5	48	0.03	<10	<10	80	<10	61
6-363	<2	1	472	<0.01	<10	<10	13	<10	86
6-389	<2	1	54	<0.01	<10	<10	27	<10	28
7/27	<2	<1	6	<0.01	<10	<10	2	<10	32
7/31	2	3	11	<0.01	<10	<10	12	<10	85
7-143	2	9	96	<0.01	<10	<10	42	<10	138
7-150	<2	1	23	0.02	<10	<10	13	<10	35
7-165	3	7	68	0.03	<10	<10	31	<10	49
7-166	2	2	18	<0.01	<10	<10	15	<10	65
7-173A	2	1	21	<0.01	<10	<10	12	<10	34
7-177	3	2	31	<0.01	<10	<10	8	<10	37
7-179	18	1	6	<0.01	10	<10	11	<10	54
7-181	<2	2	20	0.01	<10	<10	10	<10	51
7-183	4	1	18	<0.01	<10	<10	7	<10	31
7-200	3	2	138	<0.01	<10	<10	5	<10	40
7-203	7	3	37	0.01	10	<10	61	<10	63
7-244	<2	5	65	0.06	<10	<10	47	<10	40
7-265A	2	4	39	0.01	<10	<10	89	<10	80
7-265B	2	1	19	<0.01	<10	<10	5	<10	26
7-348	3	3	12	<0.01	<10	<10	39	<10	12
7-349	2	3	64	<0.01	<10	<10	21	<10	19
7-352	2	1	166	0.01	<10	<10	7	<10	27
7-358	<2	15	135	0.04	10	<10	99	<10	74
7-359	2	1	16	<0.01	<10	<10	8	<10	59
7-363B	2	3	20	0.01	<10	<10	72	<10	36

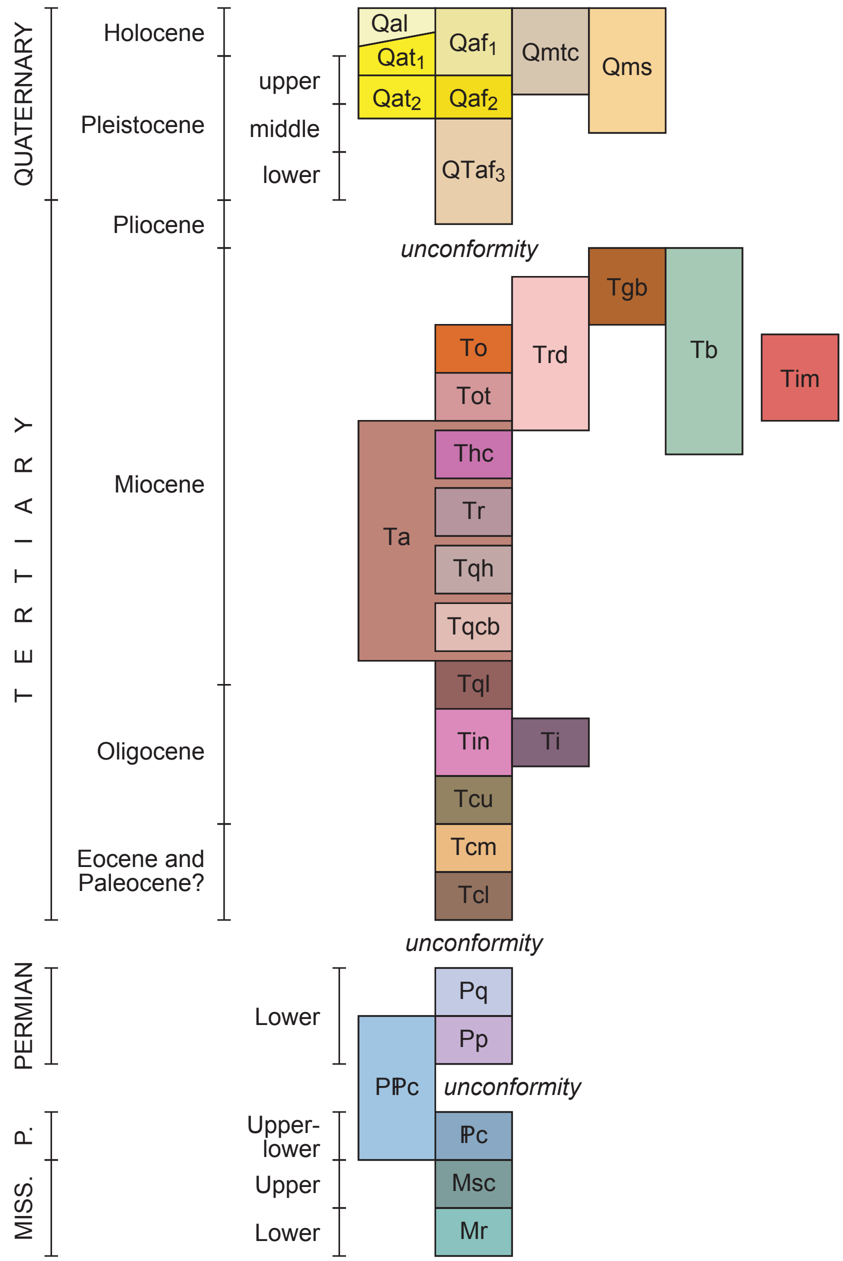
Sample Number	Sb ppm	Sc ppm	Sr ppm	Ti wt.%	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
7-364	2	<1	101	<0.01	<10	<10	2	<10	12
7-367	3	4	52	<0.01	10	<10	42	<10	49
7-368	4	5	55	0.02	<10	<10	63	<10	57
7-369	2	5	264	<0.01	<10	<10	29	<10	15
7-372A	2	5	56	<0.01	<10	<10	54	<10	65
7-373	<2	1	179	<0.01	<10	<10	10	<10	13
7-374	<2	3	179	<0.01	<10	<10	27	<10	41



Index map showing responsibility for geologic mapping.

CORRELATION OF MAP UNITS

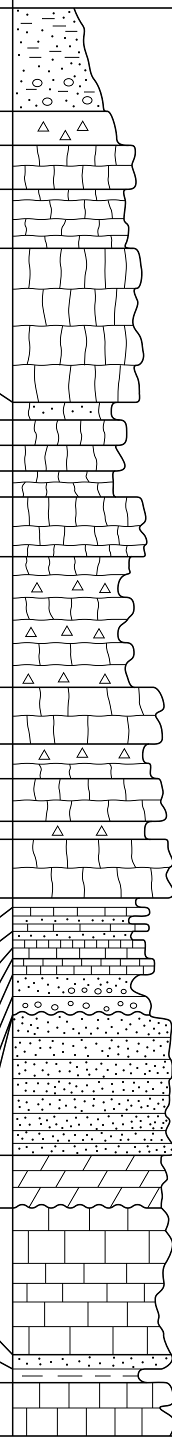
Goldstrike and East Part of Docs Pass Quadrangle, Washington County, Utah

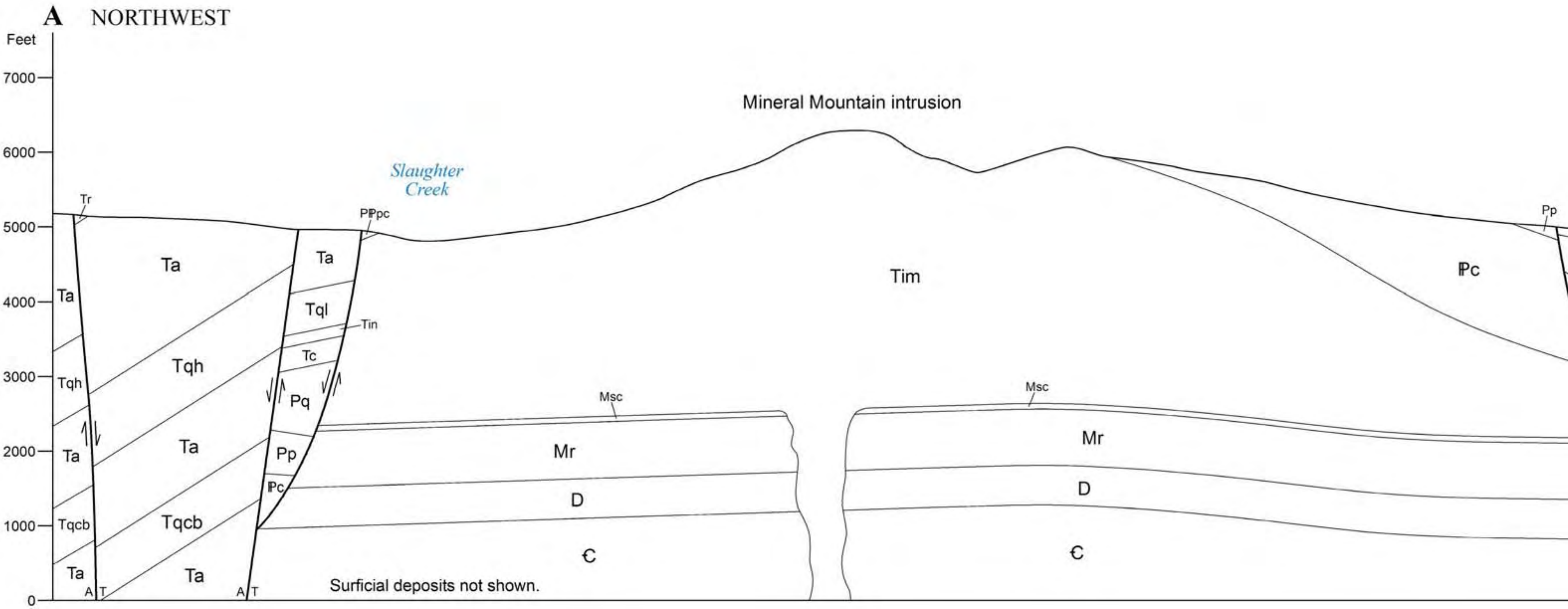


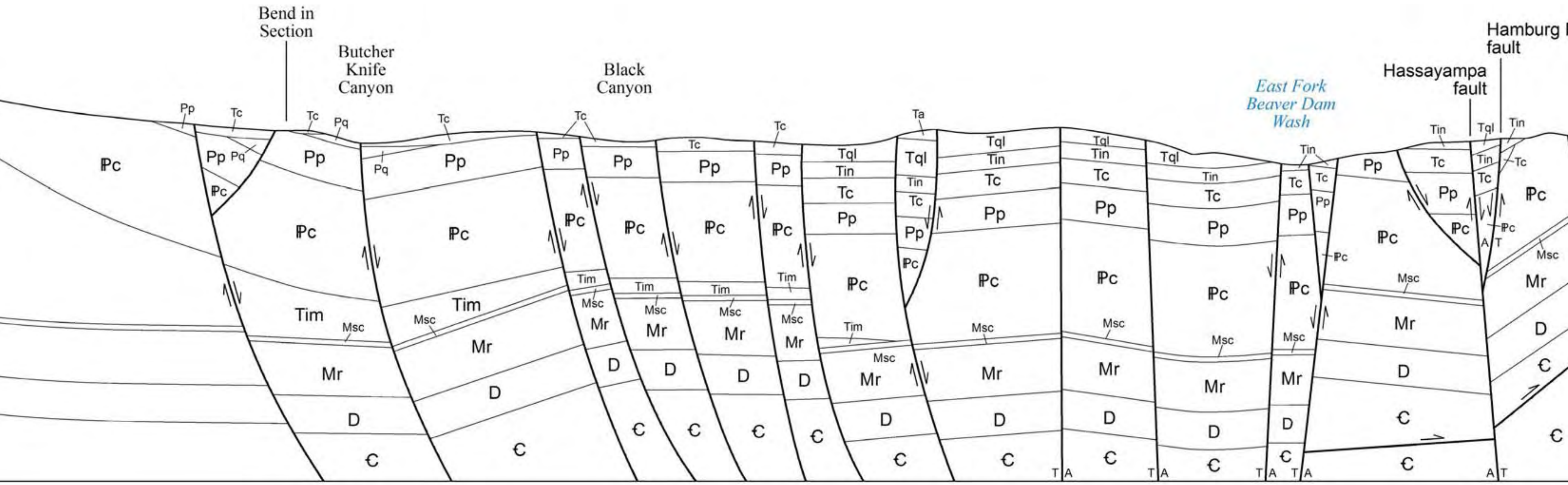
LITHOLOGIC COLUMN
Goldstrike Quadrangle

Ma	System	Series/stage	MAP UNIT	MAP SYMBOL	THICKNESS Feet (Meters)	NOTES	INTRUSIVE ROCKS
	Q.	Hol., Pleist.	surficial deposits	various Q, QT	----		
1.8	TERTIARY	Plio.					
5.3		Miocene	gravity-slide breccia	Tgb	180 (55)		
			basalt	Tb	200 (60)		
			rhyolite and dacite lava flows	Trd	250 (75)		
			Ox Valley Tuff	To	4000 (1200)	14-13.5 Ma derived from Mineral Mountain intrusion	Tim
				Tot	100 (30)		
			Tuff of Horse Canyon	Thc	60 (20)	derived from Caliente caldera complex	
			Racer Canyon Tuff	Tr	1500 (450)	18.7 Ma derived from Caliente caldera complex	
			andesite	Ta	4000 (1200)		
			Harmony Hills Tuff	Tqh	900 (275)	22.0 Ma probably derived from Bull Valley intrusion	
			Bauers Tuff Member of Condor Canyon Fm	Tqcb	700 (215)	22.8 Ma derived from Caliente caldera complex	
			Leach Canyon Formation	Tql	600 (180)	23.8 Ma probably derived from Caliente caldera complex	
23.03		Oligocene	Sedimentary rocks, Isom Formation, and Wah Wah Springs Formation	Ti	40 (12)	27-26 Ma	
				Tin	110 (34)	29.5 Ma	
					50 (15)		
					30 (10)		
			Claron Formation, upper unit	Tcu	150 (50)	host for gold deposits	
33.9		Eo., Paleo.	Claron Formation, middle unit	Tcm	150 (50)	unconformity	
			Claron Formation, lower unit	Tcl	100 (30)		
65.5 / 270			major unconformity				
	PERMIAN	Lower	Queantoweap Sandstone	Pq	1000+ (300+)		
			Pakoon Formation	Pp	600 (180)		
299	PENN.	Upper to Lower	Callville Limestone	Ᵽc	1500 (450)	unconformity; fossiliferous	
318	MISS.	U.	Scotty Wash Quartzite and Chainman Shale	Msc	80 (25)		
					80 (25)		
		L.	Redwall Limestone	Mr	550+ (170+)	crinoids and corals	
359							

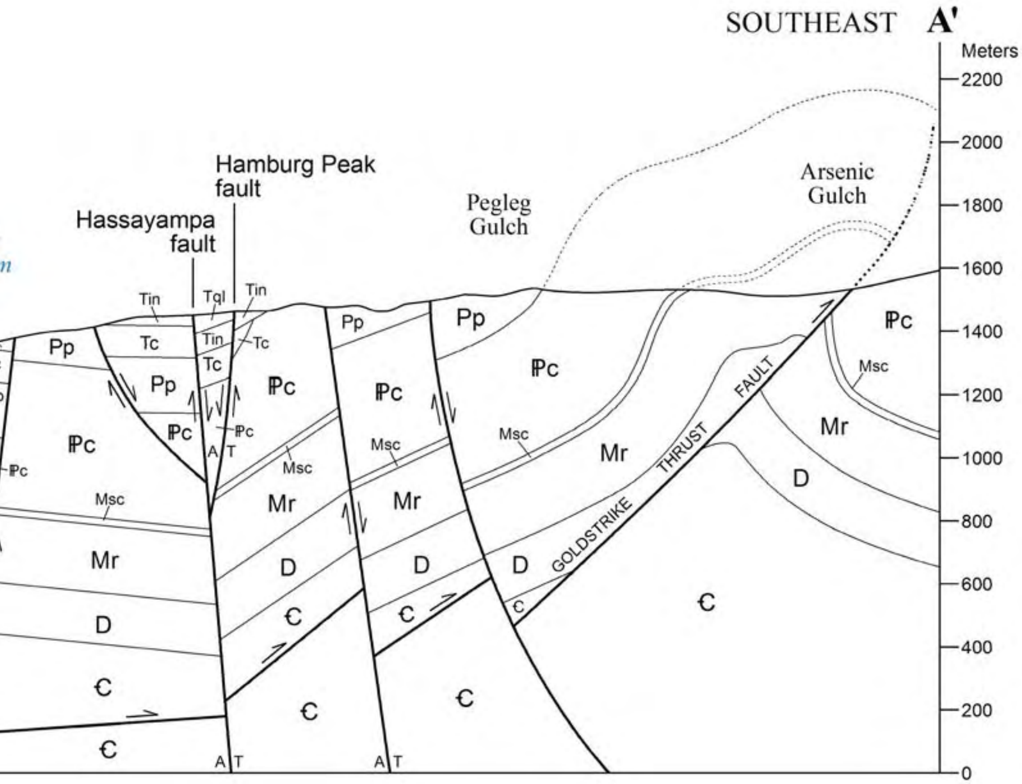
LITHOLOGY




A NORTHWEST
Feet
7000
6000
5000
4000
3000
2000
1000
0
Mineral Mountain intrusion
Slaughter Creek
Tr
PPpc
Pp
Ta
Tqh
Tqcb
Tql
Tin
Tc
Pq
Pp
Pc
Tim
Pc
Msc
Mr
D
Ꞓ
A T
Surficial deposits not shown.



Bend in Section
Butcher Knife Canyon
Black Canyon
East Fork Beaver Dam Wash
Hassayampa fault
Hamburg
fault



SOUTHEAST A'
Meters
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Hamburg Peak fault
Hassayampa fault
Pegleg Gulch
Arsenic Gulch
GOLDSTRIKE THRUST FAULT
Tin
Tql
Tc
Pp
₱c
Msc
Mr
D
Є
A
T