

LIST OF MAP UNITS

The complete description of map units and references are in the accompanying booklet. Units shown as a fraction indicate a thin layer of the upper unit occurs over the lower unit.

SURFICIAL DEPOSITS

HUMAN-MADE DEPOSITS

af Artificial fill (latest Holocene)

GLACIAL DEPOSITS

Qntf Neoglacial till (Holocene)  
Qpt Pinedale till, undivided (late Pleistocene)  
Qpty Pinedale till, younger (late Pleistocene)  
Qpto Pinedale till, older (late Pleistocene)  
Qbt Bull Lake till, undivided (middle Pleistocene)  
Qbty Bull Lake till, younger (late middle Pleistocene)  
Qbtb Bull Lake till, older (middle Pleistocene)  
Qbpt Pre-Bull Lake till, undivided (early Pleistocene)  
PERIGLACIAL AND LACUSTRINE DEPOSITS  
Org Rock glacier deposits, undivided (Holocene)  
Qrgo Rock glacier deposits, older (late Pleistocene)  
Qta Talus deposits, active (middle to late Holocene)  
Qt Talus deposits, undivided (Holocene)  
Qtf Talus fan deposits, undivided (Holocene)  
Qs Solifluction deposits (Holocene and late Pleistocene)  
Ql Lacustrine deposits, undivided (Holocene)

ALLUVIAL DEPOSITS

Qsl Stream-channel, flood-plain, and low-terrace alluvium (Holocene)  
Qpo Pinedale outwash deposits, undivided (late Pleistocene)  
Qpoy Pinedale outwash deposits, younger (late Pleistocene)  
Qpoo Pinedale outwash deposits, older (late Pleistocene)  
Qbo Bull Lake outwash deposits, undivided (middle Pleistocene)  
Qboy Bull Lake outwash deposits, younger (late middle Pleistocene)  
Qboo Bull Lake outwash deposits, older (middle Pleistocene)  
Qpbo Pre-Bull Lake outwash deposits (early Pleistocene)  
Ql Illinoisian(?) alluvium (early Pleistocene)  
Qk Kansan(?) alluvium (early Pleistocene)  
Qna Nebraskan(?) alluvium (early Pleistocene)  
Qn Nussbaum(?) alluvium (early Pleistocene)

COLLUVIAL DEPOSITS

Qc Colluvium (Holocene and late Pleistocene)

Qls Landslide deposits, undivided (Holocene to middle Pleistocene)

ALLUVIAL AND COLLUVIAL DEPOSITS

Qac Alluvium and colluvium, undivided (Holocene and late Pleistocene)  
Qaco Alluvium and colluvium, older (middle to late Pleistocene)  
Qrf Alluvial-fan deposits, undivided (Holocene to middle Pleistocene)  
Qfy Alluvial-fan deposits, younger (Holocene to late Pleistocene)  
Qfo Alluvial-fan deposits, older (late to middle Pleistocene)  
Qfp Pinedale alluvial-fan deposits (late Pleistocene)  
Qfb Bull Lake alluvial-fan deposits (middle Pleistocene)  
Qu Quaternary undifferentiated (Shown only on cross section)

SEDIMENTARY ROCKS

Td Dry Union Formation (Pliocene and Miocene)

IGNEOUS ROCKS

RIFT-RELATED BIMODAL MAGMATISM (late Oligocene-Miocene)

Tl Spessartite lamprophyre dikes (Miocene?)  
Trp Rhyolite porphyry dikes (Late Oligocene?)

MISCELLANEOUS MAGMATISM (early Oligocene?)

Tmd Monzonite to trachyte porphyry ring dikes (Oligocene?)  
Tv Volcanic (or hypabyssal?) rocks (late Eocene to early Oligocene?)  
MOUNT AETNA CAULDRON (early Oligocene; 34.4 Ma)  
Tma Mount Aetna quartz latite porphyry ring dikes (early Oligocene)  
Trs Mount Aetna ring shears (early Oligocene)  
Tib Mount Aetna intrusive breccias (early Oligocene)

MOUNT PRINCETON PLUTON (late Eocene; 36.6 Ma)

Tmpb Mount Princeton border unit (late Eocene)  
Tmpt Mount Princeton finer-grained quartz monzonite subunit (late Eocene)  
Tmpt Mount Princeton porphyritic K-feldspar subunit (late Eocene)  
Tmpt Mount Princeton quartz monzonite interior subunit (late Eocene)  
MISCELLANEOUS MAGMATISM (late Eocene)  
Tdd Dacite porphyry dikes (Eocene?)

PROTEROZOIC ROCKS

BERTHOUD PLUTONIC SUITE (1.40 Ga)

YXg Biotite granite (Early to Middle Proterozoic?)

YXp Pegmatite (Early to Middle Proterozoic?)

ROUTT PLUTONIC SUITE (1.70 TO 1.66 Ga)

Xhy Hybrid Dike (Early Proterozoic?)

Xqd Quartz diorite (Early Proterozoic?)

ROUTT PLUTONIC SUITE-DENNY CREEK EQUIVALENT (1.66 Ga)

Xgd Granodiorite/quartz monzonite (Early Proterozoic?)

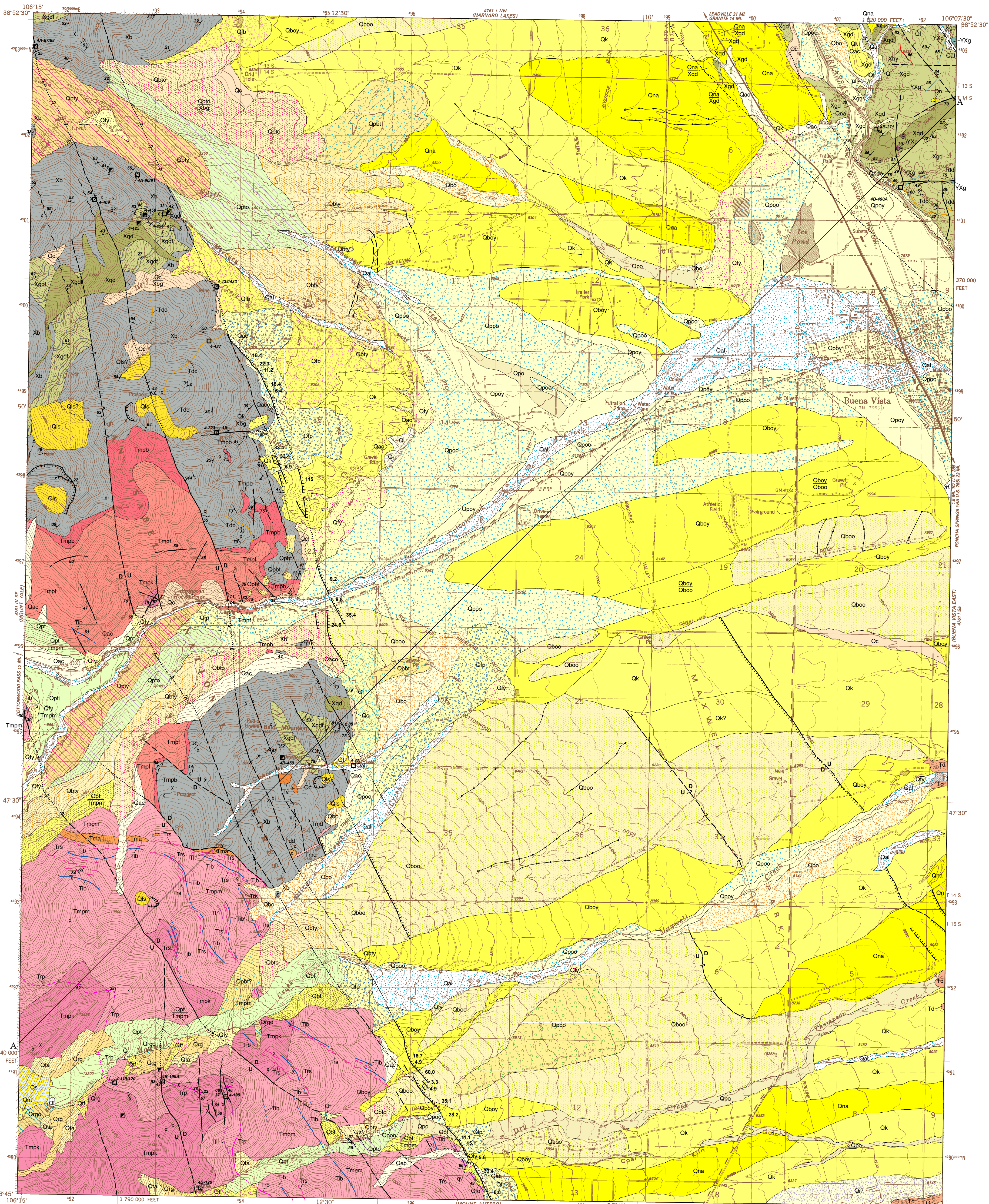
Xgdt Granodiorite augen gneiss (Early Proterozoic)

LAYERED BIOTITE AND FELSIC AND HORNBLENDIC GNEISS COMPLEX (1.74 Ga)

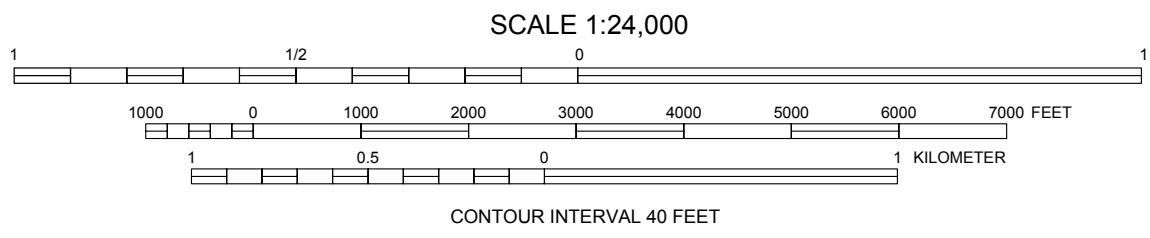
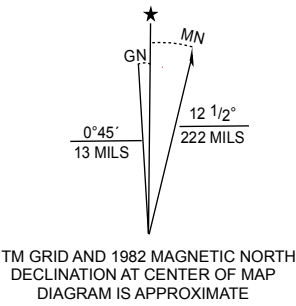
Xb Biotite-garnet felsic and biotite-hornblende intermediate gneiss and amphibolite (Early Proterozoic?)

MAP SYMBOLS

Contact—Approximately located  
Fault—Dashed where approximately located, dotted where concealed.  
U, upthrown side, D, downthrown side Tick mark shows dip of plane.  
Fault or landslide scarp—Vertical surface offset, in feet  
Terrace riser  
Shear zone—Ductile shear zones in Proterozoic Rocks  
Quartz Vein (post-late Eocene)  
Strike and dip of bedding or contacts  
Inclined—Showing direction and angle of dip  
Vertical  
Strike and dip of metamorphic foliation and/or gneissic layering  
Inclined—Showing direction and angle of dip  
Vertical  
Sample location for whole rock chemistry, assay, and geochemistry  
Abandoned prospect  
Abandoned mine shaft  
Abandoned adit  
Alignment of cross section



Base from U.S. Geological Survey, 1982  
Lambert Conformal Conic projection, 1927 North American Datum  
10,000-foot grid based on Colorado coordinate system, central zone  
1,000-meter Universal Transverse Mercator grid ticks, zone 13



Colorado  
Quadrangle Location

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

1 Mount Harvard  
2 Harvard Lakes  
3 Mount Peak  
4 Mount Vale  
5 Buena Vista East  
6 Saint Elmo  
7 Mount Antero  
8 Natchez

GEOLOGIC MAP OF THE BUENA VISTA WEST QUADRANGLE, CHAFFEE COUNTY, COLORADO

By James P. McCalpin and James R. Shannon  
2005



Bill Owens, Governor,  
State of Colorado  
Russell George, Executive Director,  
Department of Natural Resources  
Vincent Matthews,  
State Geologist and Division Director,  
Colorado Geological Survey