Text and references accompanying Nevada Bureau of Mines and Geology Open-File Report 16-6

Preliminary Geologic Map of the South Half of the Mount Rose NW Quadrangle, Washoe County, Nevada

by

Nicholas H. Hinz and Alan R. Ramelli

Nevada Bureau of Mines and Geology, University of Nevada, Reno, NV

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DESCRIPTION OF MAP UNITS

Quaternary Deposits

Qb Basin-fill deposits (Anthropocene to Holocene) Mostly fine-grained deposits in ponded or low-gradient areas, commonly with a variable content of sand- to boulder-sized clasts. Thickness typically a few meters or less.

Qay Young alluvial deposits (Holocene to latest Pleistocene) Moderately to well sorted sand and gravel. Includes recently active washes that are too small to distinguish at map scale. Thickness typically a few to several meters.

Qai Intermediate-aged alluvial deposits (late Pleistocene) Moderately to well sorted sand and gravel. Surfaces are typically smoothed. Correlative with Qgm_2 and Qgm_3 deposits. Thickness typically a few to several meters.

Qao Older alluvial deposits (middle Pleistocene) Moderately to well sorted sand and gravel. Surfaces are typically smoothed and erosionally rounded. Thickness typically a few to tens of meters.

Qgm_2 Glacial deposits (late Pleistocene) Unsorted or poorly sorted sand, gravel, and boulders (till). Granitic rocks slightly weathered and typically abundant on surfaces. Commonly form sharp-crested moraines. Equivalent to the Tioga Till of Blackwelder (1931).

Qgm_3 Glacial deposits (late Pleistocene) Unsorted or poorly sorted sand, gravel, and boulders (till). Granitic rocks typically moderately to highly weathered. Surfaces typically smoother, with fewer preserved boulders, relative to Qgm_2. Equivalent to the Tahoe Till of Blackwelder (1931).

Qls Landslide deposits (Holocene to late Pleistocene) Slope-failure deposits with a wide range in characteristics and composition. Locally downdropped, mostly intact blocks, or masses dominated by highly fractured or jumbled bedrock, with a varying percentage of poorly to moderately sorted gravel. Typically form uneven, hummocky surfaces.

Qc Colluvial deposits (Holocene to late Pleistocene) Poorly to well sorted sand and gravel mantling steep to moderate slopes. Typically contain a high percentage of resistant volcanic clasts derived from upslope outcrop.

Qt Talus deposits (Holocene) Moderately to well-sorted boulder deposits. Typically angle-of-repose deposits just downslope from cliff-forming source outcrop. Typically nonvegetated.

Late Tertiary and Quaternary Volcanic and Sedimentary Deposits

Qr Rhyolite (Pleistocene) A single lava dome emplaced on QTba near the location of the 2.4 Ma date on QTba by Cousens et al. (2011). This unit is white to light gray and is porphyritic, containing ~8% phenocrysts of biotote (5%, 1–2 mm), sanidine (2%, 2 mm), and plagioclase, 1% (2mm). 73.4% SiO_2 by weight, whole rock composition (this study). Identical overall geochemistry to Qri. Up to 40 m thick.

Qvc Basaltic andesite cinders (Pleistocene) Reddish basaltic andesite cinder deposits forming a highly eroded cinder cone to the west of Davis Meadow. These cinders

rest on top of QTba and may be the youngest basaltic andesite unit in this quadrangle. Up to 25 m thick.

QTba Basaltic andesite and andesite lavas (Pleistocene to late Pliocene) Generally dark-gray, aphanitic to finely porphyritic flows with compositions including basaltic andesite, basaltic trachyandesite, trachyandesite, and andesite (Cousens et al., 2011; this study). Typically rest on Miocene volcanic rocks. Age ranges at least from 1.44 Ma to 3.17 Ma (Cousens et al., 2011). Upper (younger) flows are typically flat-lying to gently dipping, whereas lower (older) flows are commonly tilted by amounts similar to underlying Miocene rocks. Maximum thickness of 200 to 400 m; may reach 600 to 800 m thick where QTba filled paleotopographic low areas.

QTvc Basaltic trachyandesite cinders (Pleistocene to late Pliocene) Reddish basaltic trachyandesite cinder deposits exposed along lower Bronco Creek, probably associated with a partially buried and highly eroded cinder cone. The single QTbai intrusion probably fed the cinder cone that is the source of QTvc. Up to 40 m thick.

QTbag Basaltic andesite gravel deposits (Pleistocene to late Pliocene) Well-rounded cobble gravel correlative with more extensive deposits to the north of the map area (unit QTlg of Thompson and White, 1964). Composed predominantly of QTba clasts and common throughout areas of QTba flows, but typically poorly exposed and distinguished only in one location in the southwest part of the map area, where it ranges from 5 to 12 m thick.

Tertiary Volcanic and Sedimentary Rocks

Tcpa Coarse-grained plagioclase-hornblende porphyritic andesite (late Miocene) Medium gray porphyritic dacite domes and lavas that contain ~25–35% phenocrysts of plagioclase (15–28%, 2–8 mm long, and up to 13 mm long), hornblende (5–10%, 2–6 mm long, and up to 12 mm long), and pyroxene (0–5%, 1–2 mm). Forms thick flow-banded flows and domes interbedded with Tvs, Tppa, and Tpha in the middle to upper parts of the late Miocene stratigraphy. Thickness generally ranges about 20 to 200 m and may reach as much as 600 m thick based on interpretations in the cross section.

Tpha Plagioclase-hornblende-pyroxene porphyritic andesite (late Miocene) Medium to light gray porphyritic andesite and lesser dacite lavas that contain ~22–35% phenocrysts of plagioclase (13–30%, 1–4 mm), hornblende (2–8%, 1–5 mm long), and pyroxene (1–6%, 1–3 m long). An age date of 7.0 Ma was obtained from Tpha lavas in the Mount Rose quadrangle to the south (Hinz et al., 2014).

Tppa Plagioclase-pyroxene porphyritic andesite (late Miocene) Light to dark gray porphyritic andesite and lesser dacite lavas that contain ~20–35% phenocrysts of plagioclase (15–28%, 1–2 mm long and up to 3 mm long), pyroxene (5–10%, 1–2 mm long, and up to 3 mm long), and hornblende (0–2% phenocrysts, 1–5 mm long). Age ranges from 6.5 Ma to 7.1 Ma (Hinz et al., 2014). Contains numerous thin, 1–3 m-thick beds of intercalated volcanic sedimentary rocks that are too small to distinguish at this map scale. Thickness ranges about 10 to 200 m thick.

Tba Sparsely porphyritic basaltic andesite and andesite (late Miocene) Medium to dark gray sparsely porphyritic basaltic andesite and andesite lavas that contain 5–10% phenocrysts of pyroxene (3–5%, 1–1.5 mm long) and plagioclase (2–5%, 1–2 mm long). This unit is limited to the lower part of the Miocene section in the southeast part of the quadrangle, and probably correlates with the solitary Tbai intrusion located in the same general area. Up to 60 m thick.

Tvs Volcaniclastic sedimentary rocks (late Miocene) Coarse-grained, generally poorly sorted, thin- to thick-bedded, or massive volcanic sedimentary rocks of predominantly polylithologic composition. Includes mudflows, lahars, pyroclastic flows, landslide breccia, and alluvial deposits. Dominant clast lithologies are Tpha and Tppa. This unit is the dominant Tertiary unit in this quadrangle and is typically interbedded with Tppa and Tpha flows, and solitary, thin andesite flows were locally lumped with this unit. Thickness reaches at least 1000 m thick.

Tcc Tuff of Campbell Creek (Oligocene) Light gray to white non-welded to weakly welded ash-flow tuff that contains ~6–10% phenocrysts of sanidine (2–3%, 1–2 mm), deeply embayed quartz (2–3%, <1–4 mm), plagioclase (1–3%, 1–2 mm), and biotite (<1%, ≤1 mm). This Oligocene unit is widespread across northwest Nevada and parts of northeastern California, and the age is well established at 28.8 Ma (Henry et al., 2012). In the Mount Rose NW quadrangle, this unit is limited to a single outcrop, depositional on Kgr along the west-central side of the quadrangle. Reaches 15–20 m thick.

Quaternary and Tertiary Intrusive Rocks

Qri Rhyolite (Pleistocene) This unit includes a single, white to light gray, strongly flow-banded intrusion exposed along Bronco Creek in the southern part of the quadrangle. Porphyritic, containing ~5% phenocrysts of sanidine (3%, 1–2 mm), biotite (1%, 1–2 mm), and plagioclase (1%, 1–2 mm). 73.6% SiO_2 by weight, whole rock composition (this study). Identical overall geochemistry to Qr.

QTbai Basaltic trachyandesite intrusion (Pleistocene to late Pliocene) Sparsely porphyritic, dark gray basaltic trachyandesite plug that probably fed a cinder cone represented by QTvc in lower Bronco Creek.

Tphai Plagioclase-hornblende-pyroxene porphyritic andesite (late Miocene) Medium gray porphyritic andesite

dikes that contain ~20–25% phenocrysts of plagioclase (20–22%, 1–4 mm), hornblende (2–4%, 1–3 mm long), and pyroxene (<1–2%, 1–2 m long). This unit is represented by a single intrusion, exposed along the west side of the quadrangle.

Tppi Plagioclase-pyroxene porphyritic andesite (late Miocene) Light to dark gray porphyritic andesite dikes that contain ~20–25% phenocrysts of plagioclase (18–19%, 1–2 mm long and up to 3 mm long), pyroxene (5–6%, 1–2 mm long, and up to 3 mm long), and hornblende (1% phenocrysts, 1–5 mm long). This unit forms one sill ~35 m thick and also several plugs across the quadrangle.

Trdi Rhyodacite (late Miocene) Medium gray porphyritic rhyodacite intrusion exposed along the west-central edge of the quadrangle. Contains ~27–30% phenocrysts of plagioclase (20–23%, 1–5 mm), hornblende (3%, 1–3 mm), pyroxene (2%, 1–2 mm), and quartz (2%, 1–2mm). 67.2% SiO_2 by weight, whole rock composition (this study).

Tbai Basaltic andesite (late Miocene) Medium to dark gray sparsely porphyritic basaltic andesite that contain 5–10% phenocrysts of pyroxene (3–5%, 1–1.5 mm long) and plagioclase (2–5%, 1–2 mm long). The solitary Tbai intrusion probably correlates with Tba located in the same general area.

Mesozoic Basement

Kgr Undivided granitic pluton(s?) (Cretaceous) Composed of granite, granodiorite, quartz monzonite, monzodiorite, and diorite.

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