Nevada Bureau of Mines and Geology

Prepared as part of the STATEMAP component of the National Cooperative Geologic Mapping Program in cooperation with the U.S. Geological Survey and in cooperation with the Nye County Department of Natural Resources and Federal Facilities

OPEN-FILE REPORT 03-19 PRELIMINARY GEOLOGIC MAP OF THE NORTHEAST QUARTER OF THE NOPAH PEAK QUADRANGLE, NYE COUNTY, NEVADA, AND INYO COUNTY, CALIFORNIA,

PRELIMINARY GEOLOGIC MAP OF THE NORTHEAST QUARTER OF THE NOPAH PEAK QUADRANGLE, NYE COUNTY, NEVADA, AND INYO COUNTY, CALIFORNIA

Craig M. dePolo
2003

Basin Deposits

Fluvial, eolian, spring, and paludal deposits that make up the valley bottom fill in northern Pahrump Valley. Settings range from active deposition to terraced and isolated deposits. Deposits are characteristically fine grained ranging from medium sands to clays, and ranging in consistency from loose to being indurated with gypsum or calcite. The basin floor is subject nearly daily to eolian processes, including deposition of clays and silts from local and distant sources. These are incorporated and moved by localized rains. Floods from the Spring Mountains also occasionally sweep across large portions of the valley bottom in broad sheets, modifying the landscape and depositing layers of fluvial sands and silts. The ages of basin deposits range from modern, active units to late Pleistocene deposits that are tilted and exposed in the south-central part of the quadrangle.

Qba **Qbgi** **Active and intermittently active basin alluvium** **Qba** Active fluvial and eolian deposits on the floor of Pahrump Valley. Light-brown fluvial silts and muds, much of this reworked from older basin deposits. Thin bedded to massive, unit ranges from surficial to 0.5 m thick. Active to late Holocene age. Subject to occasional flooding. **Qbgi** deposits are similar to Qba, but are only intermittently active during large floods, and dominantly contain overbank and eolian sediments.

Qbt **Transitional basin-piedmont deposits** Fine-grained fluvial and eolian silts and sands that form a transition zone between distal alluvial fans from the Nopah Range and fluvial deposits on the floor of Pahrump Valley.

Qp **Qpm** **Active playa deposits and playa margin deopists** Clay, silt, and sand deposits of an active playa that is occassionally filled with water. Deposits are lacustrine and eolian in nature. **Qpm** are playa margin deposits that are occassionally overrun by distal fan or floodplain deposits.

Qbsc **Colluvial deposits of the basin deposits of Browns Spring** Generally clays, silts, and carbonate clasts, with some gravels near outcrops of QTa. These deposits are made up of colluvium eroded from the Basin deposits of Browns Spring (Qbs), but may include deposits of the lower part of Qbs that erode easily and are difficult to discern from colluvium.

Qbg **Unit G** Light-brown eolian silt, alluvial silts and muds, light-brown to light-gray alluvial sands. Most of the alluvial units are reworked from older basin deposits. Late Holocene deposits are up to 1 m thick.

Qbf **Qbfc** **Unit F** Light-brown eolian silt, alluvial silts and muds, alluvial light-brown to light-gray sands. Much of the alluvial silts and muds are reworked from older basin deposits. Thin bedded to massive, deposits are friable and loose, and lack soil development. Deposits are as much as 1 to 2 m thick. Mid to late Holocene age. Radiocarbon dated at 5570±40 ybp on the adjacent Pahrump Quadrangle (dePolo and others, 1999). **Qbfc** indicates the upper part of the deposit is a brown clay or silt.

Alluvial Fan Deposits

Sandy, coarse-pebble gravel alluvial fan deposits originating from the small set of hills projecting southward from the Montgomery Mountains and the northeastern flank of the Nopah Range. Includes poorly sorted, weakly to moderately imbricated, generally clasts supported with minor matrix supported angular to subrounded gravel deposits. Thinly bedded to massive, with gravel lenses ranging from a few centimeters to 70 cm thick, and commonly 10 to 30 cm thick. Clasts are dominated by either limestones or quartzites depending on the source deposits. Some deposits, especially in the proximal areas, are thin beds (<0.5 m thick) overlying significantly older alluvial deposits. Deposits are middle Quaternary to late Holocene in age.

Qa **Active alluvium** Cobbly, pebbly, sandy gravel within active washes within fans. Surface made up of anastomosing bar-and-swale microtopography, with no pavement or soil development. Subject to intermittent flooding.

Qay **Younger alluvium (undifferentiated)** Fans and fan remnants characterized by surfaces ranging from subdued bar and channel to fully smoothed with moderately well developed desert pavements. Commonly includes earlier younger alluvium (Qay_1) with interspersed, later younger alluvium (Qay_2) making delineation difficult. Latest Pleistocene to Holocene in age. Subject to intermittent flooding in places.

Qay_1 **Later younger alluvium** Fan remnants characterized by subdued bar-and-swale microtopography, incipient desert pavement, weak rock varnish, and none to slight etching of limestone and dolomitic surface clasts. Soils typically A-C and A-Bk-C profiles with a 1- to 5-cm-thick, light-brown silt eolian epipedon (Av), a 5- to 20-cm-thick, weak to non-existent calcic horizon (Bk) with Stage I carbonate development. Mid to late Holocene in age.

Qay_2 **Earlier younger alluvium** Fan remnants characterized by well-developed, moderately to tightly packed desert pavement, weakly to moderately developed rock varnish, incipient to moderate etching of surficial limestone and dolomitic clasts. Soils are typically A-Bw-Bk-C profiles with a 2- to 15-cm-thick, light brown eolian epipedon (Av), a 10- to 20-cm-thick, slightly reddened, silt infiltrated, cambic horizon (Bw), and a 30+ cm thick, calcic horizon with Stage I and II carbonate development. Latest Pleistocene to early Holocene in age.

Qai **Intermediate age alluvium** Fan-terrace remnants characterized by tightly packed desert pavement, dark rock varnish on non-carbonate clasts, and very strongly etched carbonate clasts. Flat-topped surfaces are quite prominent in this unit that is commonly well dissected, and elevated above surrounding fan surfaces. Unit typically contains a soil exhibiting a 5- to 10-cm-thick, light brown, eolian silt epipedon (Av), 10- to 30-cm-thick, reddened and well-structured argillic horizon (Bt), and 100- to 150-cm-thick calcic horizon (Bk) with up to Stage IV carbonate. Upper soil horizons may be erosional stripped in some areas. Late Pleistocene in age.

Qao **Older alluvium** Fan-terrace remnants characterized by deep dissection and discordant rounded remnants (ballenas), moderately to well-developed pavement with whitish calcrete litter abundant, and deeply etched carbonate clasts. Outcrops of massive calcic cementation common. Unit has been thoroughly infiltrated by silt and carbonate. Calcic horizons are several meters thick with development of Stage V (massive) carbonate, with horizontal layers of calcic deposits near the upper parts of the deposits. Other upper soil horizons have been stripped. Early to middle Pleistocene in age.

Quaternary Alluvium or Late Tertiary

Gravel channel that is relatively resistant in Pahrump Valley and caps the tops of small hills (inverted topography), and a landslide(?) breccia that covers the southernmost Montgomery Mountains.

QTa **Quaternary alluvium or late Tertiary** Calcite-cemented gravels, sands, and ash that make up a northwest alignment of hills that are typically capped by the gravels. Gravels are dominantly composed of limestone clasts, with some volcanic and granitic clasts. These deposits appear to be derived from the south based on clast lithology and underlie the basin fill of Browns Spring in the southern part of Pahrump Valley (Lundstrom and others, in prep.). The alignment of these hills is traverse to local drainages, and some drainages crossing Pahrump Valley are deflected around the hills of QTa and Qbs. The hills are aligned subparallel to the Pahrump Valley fault zone, and may be tectonic upwarps. An ash was found below the cemented gravels on one hill that is presumably the ash mentioned by Malmberg (1967). An $^{40}Ar/^{39}Ar$ date is pending.

Cambrian and Precambrian Sedimentary Rocks

Cambrian and Precambrian sedimentary rocks were compiled and modified from Burchfiel and others (1982). They include a faulted and broadly folded sequence of siliciclastic and carbonate rocks, principally quartzites and limestones.

Ꞓbk **Bonanza King Formation** The Bonanza King Formation is a limestone sequence that can be divided into a lower, massive limestone unit, the Papoose Flat Member **(Ꞓbk$_l$)** (not shown on this quad), and an upper group **(Ꞓbk)** of bedded, banded limestone, the Banded Mountain Member (Barnes and Palmer, 1961). The Banded Mountain Member **(Ꞓbk)** consists of interbedded dark-gray to black and white limestone and dolomite that gives the formation its conspicuous banded appearance. The basal 27 to 40 m of the upper member is composed of red-brown-weathering silty and sandy limestones, and the base of this unit is the contact between the two members. The Banded Mountain Member is about 860 m thick at the northwestern part of the quadrangle.

References

Barnes, H., and Palmer, A.R., 1961, Revisions of stratigraphic nomenclature of Cambrian rocks, Nevada Test Site and vicinity: U.S. Geological Survey Professional Paper 424-C, p. C100-C103.
Burchfiel, B.C., Hamill, G.S., and Wilhelms, D.E., 1982, Stratigraphy of the Montgomery Mountains and the northern half of the Nopah and Resting Spring Ranges, Nevada and California: Geological Society of America, Map and Chart Series, MC-44.
dePolo, C.M., Ramelli, A.R., and Bell, J.W.,1999, Geologic map of the Pahrump Quadrangle, Nevada: Nevada Bureau of Mines and Geology, Open-File Report 99-14, 1:24,000.
Lundstrom, S.C., Mahan, S. A., Blakely, R.J., Paces, J.B., Young, O.D., and Dixon, G.L., in prep., Geologic map of the Mound Spring Quadrangle, Nye and Clark Counties, Nevada and California: U.S. Geological Survey, MF map in prep.
Malmberg, G.T., 1967, Hydrology of the valley-fill and carbonate-rock reservoirs, Pahrump Valley, Nevada-California: U.S. Geological Survey Water-Supply Paper 1832.

Lithologic contact Dashed where inferred or approximately located.

Normal-slip fault Ball on downthrown side; dashed where inferred or approximately located; dotted where concealed.

Lineament Determined from aerial photography.

Scale 1:24,000

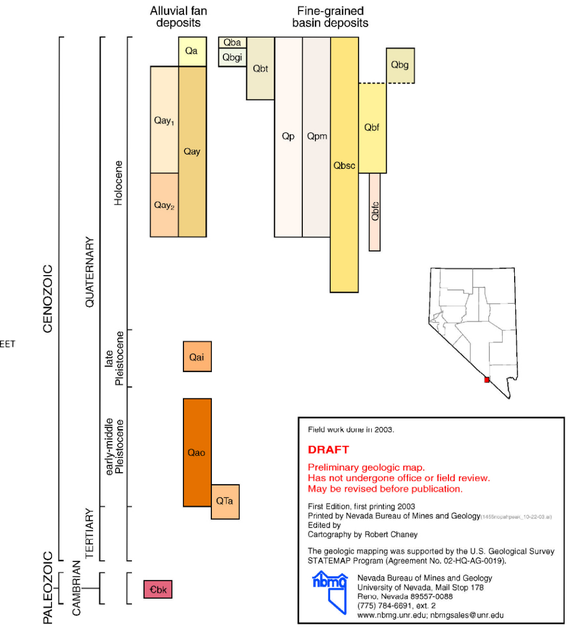
0 0.5 1 kilometer

0 0.5 1 mile

0 1000 2000 3000 4000 5000 feet

CONTOUR INTERVAL 10 METERS
Supplementary Contour Interval 2.5 meters

Base map: U.S. Geological Survey Nopah Peak 7.5' Quadrangle, 1984 Digital Raster Graphic (DRG)
Universal Transverse Mercator projection, Zone 11
Horizontal Datum: NAD27



Field work done in 2003.

DRAFT

Preliminary geologic map.
Has not undergone office or field review.
May be revised before publication.

First Edition, first printing 2003
Printed by Nevada Bureau of Mines and Geology
Edited by
Cartography by Robert Chaney

The geologic mapping was supported by the U.S. Geological Survey STATEMAP Program (Agreement No. 02-HQ-AG-0019).

Nevada Bureau of Mines and Geology
University of Nevada, Mail Stop 178
Reno, Nevada 89557-0088
(775) 784-6691, ext. 2
www.nbmg.unr.edu; nbmgsales@unr.edu