NEVADA BUREAU OF MINES AND GEOLOGY

Prepared in cooperation with the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, National Park Service, and Virgin Valley Water District

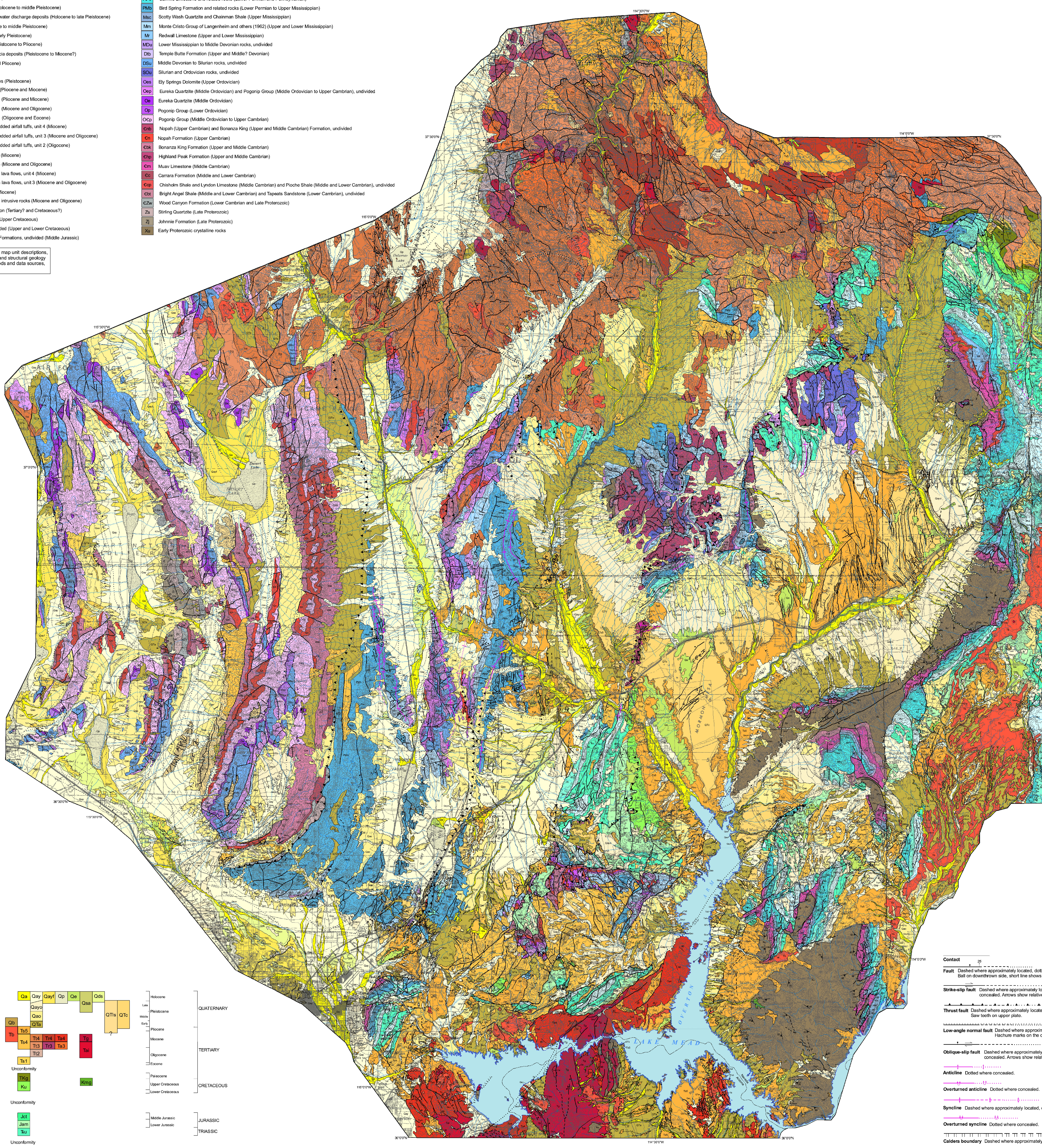
Surficial Units

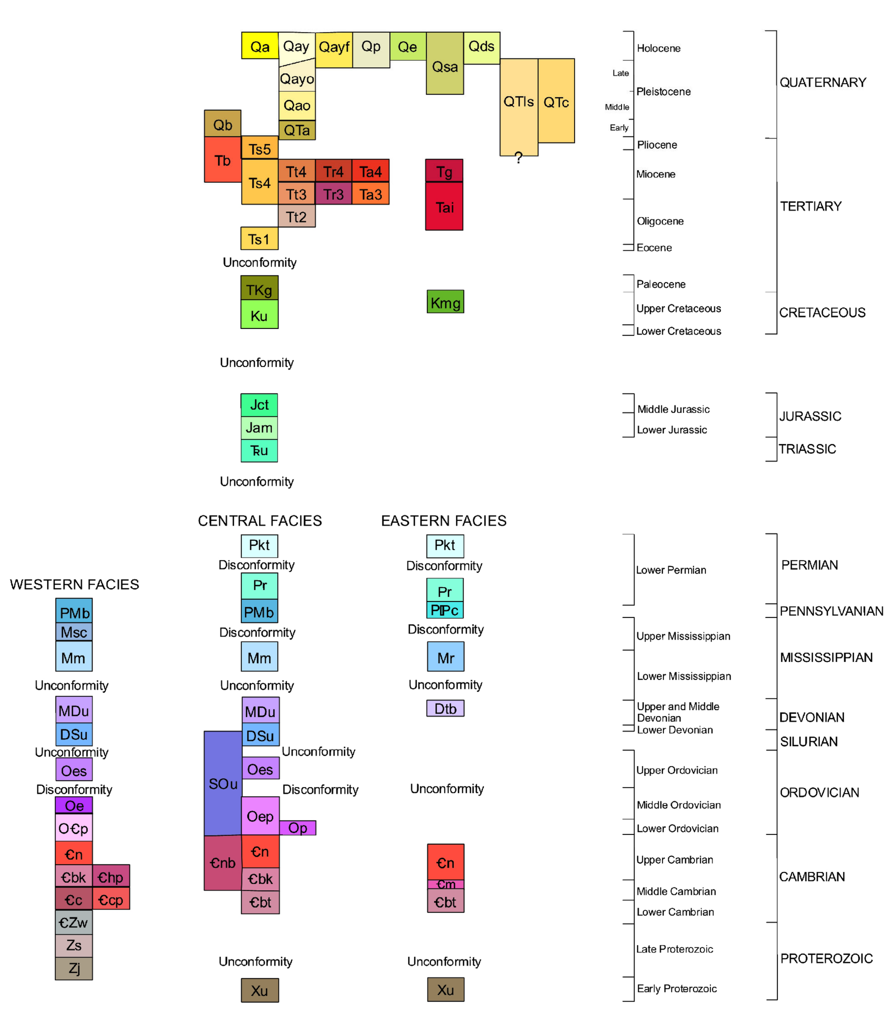
- Qa — Channel alluvium (Holocene)
- Qay — Young alluvium (Holocene to latest Pleistocene)
- Qayf — Young fine-grained alluvium (Holocene to late Pleistocene)
- Qp — Playa deposits (Holocene to late Pleistocene)
- Qe — Eolian deposits (Holocene)
- Qsa — Spring-apron deposits (Holocene to middle Pleistocene)
- Qds — Modern and past groundwater discharge deposits (Holocene to late Pleistocene)
- Qayo — Intermediate alluvium (late to middle Pleistocene)
- Qao — Old alluvium (middle to early Pleistocene)
- QTa — Oldest alluvium (early Pleistocene to Pliocene)
- QTls — Landslide and megabreccia deposits (Pleistocene to Miocene?)
- QTc — Calcrete (Pleistocene and Pliocene)

Bedrock Units

- Qb — Younger basaltic lava flows (Pleistocene)
- Tb — Older basaltic lava flows (Pliocene and Miocene)
- Ts5 — Sedimentary rocks, unit 5 (Pliocene and Miocene)
- Ts4 — Sedimentary rocks, unit 4 (Miocene and Oligocene)
- Ts1 — Sedimentary rocks, unit 1 (Oligocene and Eocene)
- Tt4 — Ash-flow tuffs and interbedded airfall tuffs, unit 4 (Miocene)
- Tt3 — Ash-flow tuffs and interbedded airfall tuffs, unit 3 (Miocene and Oligocene)
- Tt2 — Ash-flow tuffs and interbedded airfall tuffs, unit 2 (Oligocene)
- Tr4 — Rhyolite lava flows, unit 4 (Miocene)
- Tr3 — Rhyolite lava flows, unit 3 (Miocene and Oligocene)
- Ta4 — Intermediate-composition lava flows, unit 4 (Miocene)
- Ta3 — Intermediate-composition lava flows, unit 3 (Miocene and Oligocene)
- Tg — Granitic intrusive rocks (Miocene)
- Tai — Intermediate-composition intrusive rocks (Miocene and Oligocene)
- TKg — Grapevine Wash Formation (Tertiary? and Cretaceous?)
- Kmg — Granite of Walker Wash (Upper Cretaceous)
- Ku — Cretaceous rocks, undivided (Upper and Lower Cretaceous)
- Jct — Carmel and Temple Cap Formations, undivided (Middle Jurassic)
- Jam — Aztec Sandstone, Navajo Sandstone, Kayenta Formation, and Moenave Formation, undivided (Lower Jurassic)
- ₮u — Triassic rocks, undivided (Triassic)
- Pkt — Kaibab and Toroweap Formations undivided (Lower Permian)
- Pr — Lower Permian redbeds
- P₱c — Callville Limestone and related rocks (Lower Permian and Pennsylvanian)
- PMb — Bird Spring Formation and related rocks (Lower Permian to Upper Mississippian)
- Msc — Scotty Wash Quartzite and Chainman Shale (Upper Mississippian)
- Mm — Monte Cristo Group of Langenheim and others (1962) (Upper and Lower Mississippian)
- Mr — Redwall Limestone (Upper and Lower Mississippian)
- MDu — Lower Mississippian to Middle Devonian rocks, undivided
- Dtb — Temple Butte Formation (Upper and Middle? Devonian)
- DSu — Middle Devonian to Silurian rocks, undivided
- SOu — Silurian and Ordovician rocks, undivided
- Oes — Ely Springs Dolomite (Upper Ordovician)
- Oep — Eureka Quartzite (Middle Ordovician) and Pogonip Group (Middle Ordovician to Upper Cambrian), undivided
- Oe — Eureka Quartzite (Middle Ordovician)
- Op — Pogonip Group (Lower Ordovician)
- O€p — Pogonip Group (Middle Ordovician to Upper Cambrian)
- €nb — Nopah (Upper Cambrian) and Bonanza King (Upper and Middle Cambrian) Formation, undivided
- €n — Nopah Formation (Upper Cambrian)
- €bk — Bonanza King Formation (Upper and Middle Cambrian)
- €hp — Highland Peak Formation (Upper and Middle Cambrian)
- €m — Muav Limestone (Middle Cambrian)
- €c — Carrara Formation (Middle and Lower Cambrian)
- €cp — Chisholm Shale and Lyndon Limestone (Middle Cambrian) and Pioche Shale (Middle and Lower Cambrian), undivided
- €bt — Bright Angel Shale (Middle and Lower Cambrian) and Tapeats Sandstone (Lower Cambrian), undivided
- €Zw — Wood Canyon Formation (Lower Cambrian and Late Proterozoic)
- Zs — Stirling Quartzite (Late Proterozoic)
- Zj — Johnnie Formation (Late Proterozoic)
- Xu — Early Proterozoic crystalline rocks

See accompanying text for map unit descriptions, discussion of stratigraphy and structural geology of the mapped area, methods and data sources, and references.





Contact

Fault Dashed where approximately located, dotted where concealed. Ball on downthrown side, short line shows direction and amount of dip.

Strike-slip fault Dashed where approximately located, dotted where concealed. Arrows show relative direction of movement.

Thrust fault Dashed where approximately located, dotted where concealed. Saw teeth on upper plate.

Low-angle normal fault Dashed where approximately located, dotted where concealed. Hachure marks on the down side.

Oblique-slip fault Dashed where approximately located, dotted where concealed. Arrows show relative direction of movement.

Anticline Dotted where concealed.

Overturned anticline Dotted where concealed.

Syncline Dashed where approximately located, dotted where concealed.

Overturned syncline Dotted where concealed.

Caldera boundary Dashed where approximately located, dotted where concealed.

Carbonate veins

Fissure

Strike and dip of beds
Inclined Vertical Overturned Horizontal

Strike and dip of foliation in metamorphic rocks
Inclined Vertical

Strike and dip of joints
Vertical

GEOLOGIC MAP OF PARTS OF THE COLORADO, WHITE RIVER, AND DEATH VALLEY GROUNDWATER FLOW SYSTEMS, NEVADA, UTAH, AND ARIZONA

William R. Page[1], Gary L. Dixon[2], Peter D. Rowley[3], and David W. Brickey[4]

[1]U.S. Geological Survey, Denver, CO
[2]Southwest Geology Inc., Blackfoot, ID
[3]Geologic Mapping Inc., New Harmony, UT
[4]TerraSpectra Geomatics, Las Vegas, NV

2005

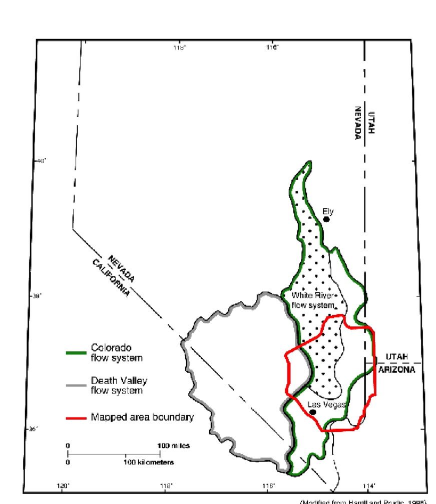
Scale 1:250,000

0 5 10 Miles

0 5 10 15 Kilometers

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

Base maps: U.S. Geologic Survey, 1:250,000 Digital Line Graph (DLG) Hydrology 1:250,000 DLG Transportation, 1:250,000 Digital Raster Graphic (DRG)
Projection: UTM, Zone 11, Datum NAD27



NEVADA BUREAU OF MINES AND GEOLOGY
MACKAY SCHOOL OF EARTH SCIENCES AND ENGINEERING
UNIVERSITY OF NEVADA, RENO

Reviewed by:
James Faulds, NBMG
Mel Kuntz, USGS
Grant Willis, Utah Geologic Survey

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Edited by Dick Meeuwig and Elizabeth Crouse
Cartography by G. Johnson and C. Arritt

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

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