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# Quaternary Fault and Fold Database of the United States

**As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.**

## unnamed faults of Pahute Mesa (Class A) No. 1092

**Last Review Date: 1998-12-18**

***citation for this record:*** **Anderson, R.E., compiler, 1998, Fault number 1092, unnamed faults of Pahute Mesa, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:19 PM.**

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| **Synopsis** | Quaternary faults on Pahute Mesa are diversely oriented, variably facing, discontinuous, and mostly weakly expressed as lineaments or scarps that are distributed over an area of about 15x25 km. One group of discontinuous scarps forms an alignment about 9.5 km long, otherwise the faults are less than 5 km long. A few are moderately to well expressed. Many show alignment along north trends, suggesting possible control by Tertiary faults of that orientation. Most show no clear association with Tertiary structures, and, together with their highly variable orientation, the lack of association may suggest a non-tectonic origin. Nothing is known of their slip rate or recurrence. |
| **Name comments** | Faults are widespread on Pahute Mesa, and some cut Quaternary deposits but most cut Tertiary strata as shown in compilations by |

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| | Dohrenwend and others (1992 #289), Reheis (1992 #1604), and Minor and others (1996 #2541). Piety (1995 #915) compiled the faults that are either mapped on surfaces of Quaternary deposits or align with such faults, and applied the name Pahute Mesa faults to them. Here, that name is modified to the unnamed faults of Pahute Mesa to emphasize their scattered nature, diverse orientation, and, in most cases, lack of association with known structures. These faults are expressed by a broad zone of dominantly north-striking faults and fault-related features in the region between Obsidian Butte and Black Mountain on the south, Mount Helen on the north, Stonewall Mountain on the west, and the south end of the Kawich Range on the east.<br><br>**Fault ID:** Faults referred to as PM by Piety (1995 #915). |
| **County(s) and State(s)** | NYE COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Fault traces are taken from Reheis (1992 #1604) who mapped them on 1:60,000 and 1:80,000 scale aerial photos and compiled them on a 1:100,000 scale topographic map. |
| **Geologic setting** | Pahute Mesa is an upland within the southern Nevada volcanic field, an area of large-volume Tertiary igneous activity and widespread mild extensional faulting (Carr, 1984 #1472; 1990 #1474). Most faults strike north to north-northeast and cut the Tertiary volcanic rocks that are much more widespread on the Mesa than are Quaternary deposits (Frizzell and Shulters, 1990 #1037). The faults are scattered over an area of about 15x25 km. As compared with the rather uniform strike of faults in Tertiary deposits on Pahute Mesa, the strike of faults interpreted to cut Quaternary deposits is much more variable (Reheis, 1992 #1604). The reason for the contrast is not known, but the possibility exists that the variably oriented Quaternary features are non-tectonic. Many of the Quaternary faults are aligned along north trends, suggesting control by Tertiary tectonic faults of that orientation. |
| **Length (km)** | 47 km. |
| **Average strike** | N14°E |

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| **Sense of movement** | Unspecified<br><br>*Comments:* Many Quaternary faults mapped by Reheis (1992 #1604) are marked by scarps, suggesting a dip-slip displacement, but the displacement direction is highly variable. Earthquakes triggered by underground nuclear explosions on Pahute Mesa have produced both dip-slip and right-lateral displacements on north- to north-northeast-striking faults, but right-lateral tectonic displacement has not been confirmed by field mapping (Hamilton and others, 1972 #1523; Reheis and Noller, 1989 #1610). |
| **Dip Direction** | Unknown<br><br>*Comments:* Highly variable, but mostly east or west as suggested by ticks on fault traces that probably also indicate the direction of throw and dip direction of the fault (Reheis, 1992 #1604). |
| **Paleoseismology studies** | |
| **Geomorphic expression** | Mostly weakly expressed with a few prominently expressed lineaments or scarps on surfaces of Quaternary deposits (Reheis, 1992 #1604). |
| **Age of faulted surficial deposits** | Photogeologic mapping by Reheis (1992 #1604) indicates that scarps and lineaments are present on Quaternary deposits or surfaces but no detailed mapping, or subdivision, of Quaternary deposits and surfaces has been done in this area. |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | undifferentiated Quaternary (<1.6 Ma)<br><br>*Comments:* Scarps and lineaments on Quaternary deposits and surfaces show evidence for Quaternary activity along faults of this fault zone (Reheis, 1992 #1604). |
| **Recurrence interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* No scarp-height data or stratigraphic information for Quaternary deposits are available to constrain the slip rate. The |

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| | late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. |
| **Date and Compiler(s)** | 1998<br>R. Ernest Anderson, U.S. Geological Survey, Emeritus |
| **References** | #1472 Carr, W.J., 1984, Regional structural setting of Yucca Mountain, southwestern Nevada, and late Cenozoic rates of tectonic activity in parts of the southwestern Great Basin, Nevada and California: U.S. Geological Survey Open-File Report 84-854, 114 p.<br><br>#1474 Carr, W.J., 1990, Styles of extension in the Nevada Test Site region, southern Walker Lane Belt—An integration of volcano-tectonic and detachment fault models, *in* Wernicke, B.P., ed., Basin and Range extensional tectonics near the latitude of Las Vegas, Nevada: Geological Society of America Memoir 176, p. 283-303.<br><br>#289 Dohrenwend, J.C., Schell, B.A., McKittrick, M.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Goldfield 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2183, 1 sheet, scale 1:250,000.<br><br>#1037 Frizzell, V.A., Jr., and Shulters, J., 1990, Geologic map of the Nevada Test Site, southern Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2046, 1 sheet, scale 1:100,000.<br><br>#1523 Hamilton, R.M., Smith, B.E., Fischer, F.G., and Papanek, P.J., 1972, Earthquakes caused by underground nuclear explosions on Pahute Mesa, Nevada Test Site: Bulletin of the Seismological Society of America, v. 62, p. 1319-1341.<br><br>#2541 Minor, S.A., Vick, G.S., Carr, M.D., and Wahl, R.R., 1996, Faults, lineaments, and earthquake epicenters digital map of the Pahute Mesa 30' x 60' quadrangle, Nevada: U.S. Geological Survey Open-File Report 96-262, 13 p.<br><br>#915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 |

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| | p., 2 pls., scale 1:250,000.<br><br>#1604 Reheis, M.C., 1992, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the Cactus Flat and Pahute Mesa 1:100,000 quadrangles and the western parts of the Timpahute Range, Pahranagat Range, Indian Springs, and Las Vegas 1:100,000 quadrangles, Nevada: U.S. Geological Survey Open-File Report 92-193, 14 p., 3 pls., scale 1:100,000.<br><br>#1610 Reheis, M.C., and Noller, J.S., 1989, New perspectives on Quaternary faulting in the southern Walker Lane, Nevada and California, *in* Ellis, M.A., ed., Late Cenozoic evolution of the southern Great Basin: Nevada Bureau of Mines and Geology Open-File Report 89-1, p. 57-61. |