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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 in Excelsior Mountains (Class A) No. 1316

**Last Review Date: 1998-07-19**

***citation for this record:*** **Adams, K., and Sawyer, T.L., compilers, 1998, Fault number 1316, unnamed faults in Excelsior Mountains, 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 02:15 PM.**

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| **Synopsis** | Two discrete groups of generally east-striking faults, which are described together because of proximity and similar orientation. Faults in the southern group are short right-stepping faults which bound a north facing range front at the eastern end of the zone near Tonopah Junction and juxtapose upper Quaternary alluvium against Quaternary to Tertiary gravel and bedrock. To the west, another group of faults traverses an intermontane saddle and bounds the south facing range front of the Excelsior Mountains north of Teels Marsh where Holocene through middle and lower Pleistocene alluvium are offset and/or juxtaposed against bedrock. Faults in the northern group are short east-striking intermontane faults which include the fault that ruptured in the 1934 Excelsior Mountain earthquake. Reconnaissance photogeologic mapping, detailed mapping on 1934 ruptures, and general bedrock mapping are the sources of data. Trench and scarp morphology studies has |

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| | not been conducted. |
| **Name comments** | Refers to faults along south side and within the Excelsior Mountains from near Tonopah Junction on the east to west and south of Excelsior Mountain on the west. Faults mapped by Callaghan and Gianella (1935 #2925), Slemmons (1966, unpublished Walker Lake 1:2500,000-scale map), Dohrenwend (1982 #2481; 1982 #2870; 1982 #2900), and Stewart and others (1982 #2873). Included in this group are the Excelsior Mountain fault and parts of the Huntoon Valley fault system of dePolo (1998 #2845).<br><br>**Fault ID:** Corresponds to fault number WL22 (Excelsior Mountains fault) and part of WL21E (Huntoon Valley fault system) of dePolo (1998 #2845). |
| **County(s) and State(s)** | MINERAL COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Location based on 1:62,500-scale (Dohrenwend, 1982 #2900) and 1:250,000-scale maps (Dohrenwend, 1982 #2481; 1982 #2870); small-scale mapping by photogeologic analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. |
| **Geologic setting** | These east-trending short, generally right-stepping faults forms two discrete groups; one of which predominately bounds the southern range front of the Excelsior Mountains and the other of which is located within the Excelsior Mountains block. They bound the north edge of a strong gravity low centered in the northern part of Teels Marsh (Plouff, 1984 #2910). Near the northwest corner of the Teels Marsh basin and where the Excelsior Mountains bend to the southwest, several short faults change orientations from predominately west to southwest. The fault that ruptured in the 1934 Excelsior Mountains earthquake (Callaghan and Gianella, 1935 #2925) is included in this group. |

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| **Length (km)** | 34 km. |
| **Average strike** | N89°E |
| **Sense of movement** | Left lateral<br><br>*Comments:* Callaghan and Gianella (1935 #2925) reported oblique sinistral movement with north side down on the short fault that ruptured in 1934. Other faults in the group have not been studied in detail. Sinistral sense is inferred from general knowledge of sense of movement on east-striking faults in the region; normal sense of movement is inferred from topography. |
| **Dip** | 73° NW.<br><br>*Comments:* Callaghan and Gianella (1935 #2925) reported a dip of 73 NW. based on the surface expression of the 1934 surface rupture across a gully west-southwest of the Endowment Mine. |
| **Paleoseismology studies** | |
| **Geomorphic expression** | The faults are expressed as scarps on Quaternary alluvium and as faults that juxtapose Quaternary alluvium and erosional surfaces against bedrock (Dohrenwend, 1982 #2481; 1982 #2870; 1982 #2900). Intermontane faults are located along aligned drainages and saddles and some bound small alluvial filled basins. Callaghan and Gianella (1935 #2925) reported that the intermontane fault that ruptured in 1934 was marked by a gully, but that there were no scarps or other indication of recent movement prior to the Excelsior Mountain earthquake. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 134 m (110–158 m)along the fault bordering Teel Marsh, which could be this structure and (or) an unnamed fault [1303]. |
| **Age of faulted surficial deposits** | Holocene through Mesozoic. Dohrenwend (1982 #2481; 1982 #2900) mapped faults displacing Holocene and upper Pleistocene piedmont slope and valley floor deposits and juxtaposing Holocene and upper Pleistocene deposits against bedrock. Several faults also have been mapped displacing Tertiary through Mesozoic bedrock (Stewart and others, 1982 #2873). |
| **Historic earthquake** | Excelsior Mountains earthquake 1934 |

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| **Most recent prehistoric deformation** | undifferentiated Quaternary (<1.6 Ma)<br><br>*Comments:* The timing of most recent event is not well constrained, and some of the mapping may indicate young faulting (Dohrenwend, 1982 #2900). However, the Quaternary age assignment here is based on Dohrenwend and others (1996 #2846). |
| **Recurrence interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical displacement rate of 0.248 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is of a lesser magnitude. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. |
| **Date and Compiler(s)** | 1998<br>Kenneth Adams, Piedmont Geosciences, Inc.<br>Thomas L. Sawyer, Piedmont Geosciences, Inc. |
| **References** | #2925 Callaghan, E., and Gianella, V.P., 1935, The earthquake of January 30, 1934, at Excelsior Mountain, Nevada: Bulletin of the Seismological Society of America, v. 25, no. 1, p. 161-168.<br><br>#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p.<br><br>#2481 Dohrenwend, J.C., 1982, Map showing late Cenozoic faults in the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-D, 1 sheet, scale 1:250,000. |

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| | #2870 Dohrenwend, J.C., 1982, Surficial geologic map of the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-C, 1 sheet, scale 1:250,000.<br><br>#2900 Dohrenwend, J.C., 1982, Preliminary surficial geologic map of the Excelsior Mountains area, west-central Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1372, scale 1:62,500.<br><br>#2846 Dohrenwend, J.C., Schell, B.A., Menges, C.M., Moring, B.C., and McKittrick, M.A., 1996, Reconnaissance photogeologic map of young (Quaternary and late Tertiary) faults in Nevada, *in* Singer, D.A., ed., Analysis of Nevada's metal-bearing mineral resources: Nevada Bureau of Mines and Geology Open-File Report 96-2, 1 pl., scale 1:1,000,000.<br><br>#2910 Plouff, D., 1984, Bouguer gravity map of Nevada, Walker Lake sheet: Nevada Bureau of Mines and Geology Map 83, scale 1:250,000.<br><br>#2873 Stewart, J.H., Carlson, J.E., and Johannesen, D.C., 1982, Geologic map of the Walker Lake 1° by 2° quadrangle, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-A, scale 1:250,000. |