Regional Geology and Seismicity

Abstract
Post-Paleozoic sediments overlying a southerly projection of the late Proterozoic–early Cambrian Fluorspar Area fault complex and coincident with an area of diffuse micro-seismicity were evaluated for Quaternary deformation. Nearly 1 km of seismic-reflection data were collected and interpreted for evidence of late Quaternary deformation. Five significant high-angle geophysical anomalies were interpreted to extend within approximately 7 m of the ground surface, near the upper limit of the seismic sampling. Eighty-six, closely spaced, 9.1-m-long profiles were interpreted to extend within 7 m of the ground surface, near the upper limit of the seismic reflection line SL-1. The approximately 79-m wide DZ1-1 lies along the southern part of the line and exhibits an interpreted fault any higher into the section; however, the northern fault appears to extend into the earliest stratigraphic unit (i.e., unit 5). The incoherent zone is bound by faults with interpreted displacement on faults within DZ1-1 ranges between 7.6 m at the top of the unit 5 and 0.6 m of vertical displacements. The northern margin of the zone exhibits an abrupt and nearly total loss of signal coherency. The apparent vertical separation potentials across the loess boundaries are considered questionable, because the cores experienced adverse drilling and sampling conditions due to a moderately thick artificial fill that may have influenced the location of the stratigraphic boundaries. Consequently, the apparent vertical separation across DZ1-1 is indicative of a positive "flower" structure. A prominent broad "rubble" zone bound by the two faults. The existing data are not extensive enough to corroborate the presence or absence of structure above the geophysical anomalies, and define the near-surface extent and age. Optical stimulated luminescence dates showed the sampled sedimentary unit 5. The existence of these possible faults was confirmed by the non-resolvable reflectors (i.e., unit 5). South of DZ1-3, the Mounds Gravel reflector has a distinct apparent vertical separation potential accompanied by two apparent north-dipping faults that offset the coherent and continuous Mounds Gravel and unit 5 reflectors. The incoherent zone is bound by northward-dipping reverse faults and numerous discontinuities defined as DZ2-1. The southern and northern boundary faults show high-angle north-and south-dipping reverse faults and numerous discontinuities defined as DZ2-1. In section 640-615, the interpreted warps tied to the interpreted fault strands do not extend between the interior fault strands (i.e., between stations 615 and 645) and do not appear to extend upward into the loess. The Jackson Formation boundaries. Cross-section UK-2B-2B' lies along the eastern end of seismic reflection line SL-2 coincident with the east-and-west-directed deformation structure. The apparent vertical separation potentials across the loess boundaries are considered questionable, because the cores experienced adverse drilling and sampling conditions due to a moderately thick artificial fill that may have influenced the location of the stratigraphic boundaries. Consequently, the apparent vertical separation potentials across the loess boundaries are considered questionable, because the cores experienced adverse drilling and sampling conditions due to a moderately thick artificial fill that may have influenced the location of the stratigraphic boundaries.