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**High-Resolution Seismic Reflection Profiling Across the Black Hills Fault, Clark County, Nevada: Preliminary Results**

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The Black Hills fault (BHF) is located in the central Basin and Range Province of western North America, a region that has undergone significant Cenozoic extension. The BHF is an east-dipping normal fault that forms the northwestern structural boundary of the Eldorado basin and lies ~20 km southeast of Las Vegas, Nevada. A recent trench study indicated that the fault offsets Holocene strata, and is capable of producing Mw 6.4–6.8 earthquakes. These estimates indicate a subsurface rupture length at least 10 km greater than the length of the scarp. This poses a significant hazard to structures such as the nearby Hoover Dam Bypass Bridge, which is being built to withstand a Mw 6.2–

7.0 earthquake on local faults. If the BHF does continue in the subsurface, this structure, as well as nearby communities (Las Vegas, Boulder City, and Henderson), may not be as safe as previously expected. Previous attempts to image the fault with shallow seismics (hammer source) were inconclusive. However, gravity studies imply that the fault continues south of the scarp. Therefore, a new experiment utilizing high-resolution seismic reflection was performed to image subsurface geologic structures south of the scarp. At each shot point, a stack of four 30–160 Hz vibroseis sweeps of 15 s duration was recorded on a 60-channel system with 40 Hz geophones. This produced two 300 m reflection profiles, with a maximum depth of 500–600 m. A preliminary look at these data indicates the existence of two faults, potentially confirming that the BHF continues in the subsurface south of the scarp.

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