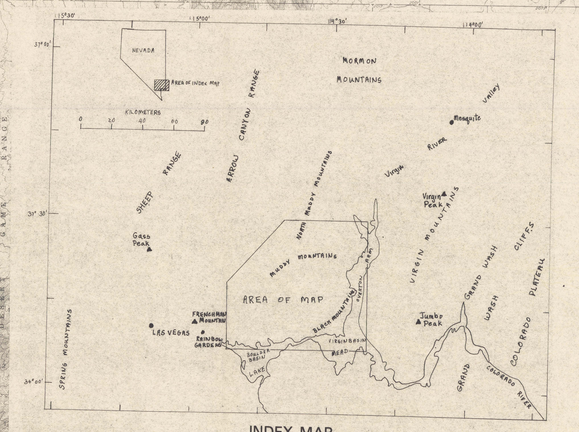
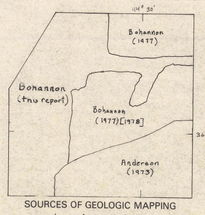
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN FILE REPORT
OF 81-796
SHEET 1 OF 3



INDEX MAP



SOURCES OF GEOLOGIC MAPPING
(see references cited)

Table 1.—Descriptions and interpretations for several major faults

Fault name	Fault type	Age	Pertinent data	Interpretation	References
Rogers Spring fault	Northeast-trending, west-to east-dipping, reverse to normal separation* fault.	Uncertain lower age limit; older than Muddy Creek Formation.	Dips to northwest at southern end and to southeast at northern end; at south end of fault upper plate of Muddy Mountain thrust shows normal separation, yet Tertiary rocks show reverse separation. The opposite occurs at north end. Abundant faults associated with Rogers Spring fault have well-developed reverse separation. Lateral component uncertain.	Difficult to interpret. Could be major Mesozoic fault with dominantly lateral offset that was reactivated during Tertiary.	None.
California Wash fault	North to north-east trending, west-dipping normal-slip fault.	Quaternary.	Offsets all but youngest stream gravel deposits. No lateral component noted.	Basin-bounding fault of California Wash	None.
North Buffington fault	East-trending thrust(?) fault.	Suspected to be late Mesozoic or early Tertiary fault.	Between Bonanza King Formation (north side) and Aztec Sandstone (south side). Parallel to bedding in Bonanza King, but apparently cuts bedding in Aztec.	Possibly Cretaceous thrust fault structurally beneath Muddy Mountain thrust fault; interpreted to connect in subsurface to Summit thrust.	Other interpretations presented by Longwell (1949, 1962); and Temple (1977).
Arrowhead fault of Longwell (1949)	East-trending zone of faults.	Late Mesozoic and early Tertiary.	Dips to south at 20 to 70 degrees at west end where bedding in Bonanza King Formation parallels fault trace. Dips steeply at east end where younger Paleozoic rocks occur south of fault zone. Faults that cut Tertiary beds in White Basin also cut Arrowhead fault at its west end, but appear to join into Arrowhead at its east end.	At its west end is probably Muddy Mountain thrust fault. At its east end where rocks younger than Bonanza King Formation are adjacent Arrowhead and where Tertiary faults join it, Arrowhead is probably a Tertiary feature.	Other interpretations presented by Longwell (1949, 1962); and Temple (1977).
Muddy Mountain thrust fault	Regional thrust fault.	Late Mesozoic to early Tertiary.	At most places is stratigraphically controlled with Bonanza King Formation in hanging wall and Aztec Sandstone in footwall except in southeast part of North Muddy Mountains. In western Buffington area geometric evidence suggests that fault cuts section of lower plate in subsurface.	Major thrust fault of Sevier Orogenic belt; probably correlative with Keystone thrust of Spring Mountains.	Longwell (1921, 1949, 1962); and Longwell and others (1965).
Baseline fault, Atlail fault, and associated faults	North-trending, west-dipping, normal separation* strike faults.	Tertiary.	Pervasive set of faults in Valley of Fire.	Normal fault set that flattens with depth causing strata1 tilts as a result of block rotation during fault activity.	Longwell (1949).
Summit thrust	Thrust fault.	Late Mesozoic.	Upper plate is overturned Mesozoic and Paleozoic rocks and lower plate is Mesozoic rocks.	Thrust fault in parautochton; overridden by Muddy Mountain thrust.	Longwell (1949).

Table 1.—Descriptions and interpretations for several major faults—Continued

Fault name	Fault type	Age	Pertinent data	Interpretation	References
Hamblin Bay fault	Northeast-trending left-slip** fault.	Younger than 12.7 m.y.; older than 11.3 m.y.	Offsets 12.7 m.y. old Hamblin-Cleopatra volcano by about 20 km; left sense. Apparently does not deform 11.3 m.y. old lava flows at Callville Mesa.	Major branch of left-slip** Lake Mead fault system which has about 65 km total slip. Probably youngest branch; is not highly deformed or bent.	Anderson (1973).
Bitter Spring Valley fault	Northeast-trending left-slip** fault.	Active prior to 13 m.y., but ceased activity by 11.3 m.y.	About 45 km of offset of piercing points made by basal Rainbow Gardens Member above Mesozoic rock units as well as clasts of rapakivi granite from their source; left sense. Apparently does not deform 11.3 m.y. old lava flows at Callville Mesa, but probably was active during deposition of youngest Thumb Member through red sandstone unit.	Major branch of left-slip Lake Mead fault system. Probably slightly older than Hamblin Bay fault because appears bent and highly deformed by motion on latter fault.	Anderson (1973); and Bohannon (1979, unpub. data).
Las Vegas Valley shear zone?	West- to northwest-trending right-slip** fault.	Younger than 14 m.y.; older than 11.3 m.y.	Consists of complex zone of anastomozing faults. Permian rocks exposed within zone flanked by Thumb Member. Because zone is less than 0.5 km wide, such structural relief is not compatible with vertical displacements and strike slip is suspected. North-trending faults join into zone and are bent to southwesterly trends suggesting right-drag.	Interpreted to be main branch of Las Vegas Valley shear zone in Lake Mead region. Shear zone estimated to have from greater than 65 to less than 20 km offset by various authors. Most agree upon 40 km or more. Fault does not continue to southeast beyond Lake Mead fault system.	Longwell (1960); Ross and Longwell (1964); Stewart (1967); Stewart and others (1968); Desmond (1962); Poole and others (1967); and Ketner (1968).
Bowl of Fire fault	North-trending, west-dipping, low- to high-angle normal fault.	Younger than 10 to 12 m.y.	Very low angle fault in Bowl of Fire; steepens to 85° in White Basin. Involves rocks as young as red sandstone unit (Tr).	Interpreted to be downward flattening normal-slip fault that joins Las Vegas Valley shear zone?	None.
Muddy Peak fault	North-trending, east- to west-dipping, vertical-slip fault.	Active 13 to 10 m.y. ago, but may be older.	Vertical slip indicated by conglomerate facies in red sandstone unit (Tr) in western White Basin. Local source of Paleozoic rocks on Muddy Peak. Northern extent of conglomerate limited to northern extent of source rocks (see map A). No lateral slip component indicated. At most localities fault dips east, but in north it dips west indicating reverse slip there.	Master fault on west side of White Basin. Probably flattens with depth. Age of fault interpreted from facies relations of synstectonic conglomerate with 10- to 12-m.y.-old red sandstone unit. White basin thought to have formed concurrently.	Bohannon (1979, unpub. data).
White Basin fault and associated faults	Northeast-trending, west-dipping, high-angle, oblique-slip faults (chiefly vertical slip).	Uncertain; probably same as Muddy Peak fault.	Oblique slip indicated by slickensides with 60° pitch on fault surface with N. 10° E., 60° NW attitude in southeastern White Basin. Fault bounding northwest side of East Longwell Ridge is similar.	Normal fault showing left, oblique slip; flattens with depth. Bounds southeast margin of White Basin.	Bohannon (1979, unpub. data).
Willow Tank thrust	Thrust fault.	Late Mesozoic.	Aztec Sandstone in upper plate is thrust over Willow Tank Formation and Baseline Sandstone. Conglomerate in lower Baseline occurs adjacent to thrust and thought to be synstectonic.	Minor Mesozoic thrust fault.	Longwell (1949).

Base from U.S. Geological Survey
Dry Lake, 1952; Henderson, 1953; Hoover Dam, 1953; Muddy Peak, 1953;
Overton Beach, 1953; Virgin Basin, 1956; 1:62,500

Geology mapped Fall 1975 through Spring 1980

GEOLOGIC MAP, TECTONIC MAP, AND STRUCTURE SECTIONS OF THE MUDDY AND NORTHERN BLACK MOUNTAINS, CLARK COUNTY, NEVADA

By
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