

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MAP SHOWING SURFICIAL GEOLOGY OF THE LATHROP
WELLS QUADRANGLE, NYE COUNTY, NEVADA

By W C Swadley

USGS/MAP/I--1361

TI87 008465

Prepared in cooperation with the
U.S. DEPARTMENT OF ENERGY

MISCELLANEOUS INVESTIGATIONS SERIES
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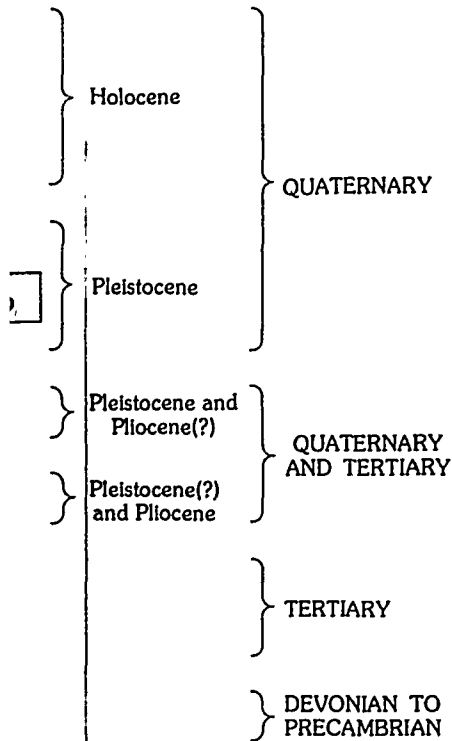
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25 R 49 E R 50 E (TOPRAH SPRING) U.S. DEPARTMENT PREPARED IN COOPER

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-1361

OF MAP UNITS



ION OF MAP UNITS

+ Q1s is used for Quaternary units where two are used where a veneer of the younger units masks, but underlying unit

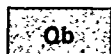
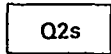
used where a veneer of the younger units masks, but underlying unit

OCENE)—Fluvial and eolian deposits of 1. Five subunits have been recognized in area (Hobver and others, 1981)

el, sand, and silt, intermixed and brownish-gray to light-gray, poorly to poorly to well bedded. Gravel is angular to 1 m in diameter. Unit occurs in bottoms of bed channels are common; maximum than 5 m. Unit locally mapped separately enough to show at the scale of this report; as narrow strips within Q1b and is bined unit Q1ab

ed map unit consisting largely of areas of strips of Q1a. Q1b deposits consist of sand and silt, intermixed and interbedded, poorly to moderately well sorted, well to is angular to subrounded, commonly less boulder patches and trains are common. es 1-2 m above floor of modern washes; ed, bar and swale topography is common. as developed on Q1b surfaces

el, sand, and silt, intermixed and brownish-gray to grayish-brown, poorly to



Eolian deposits—Sand, yellowish- to grayish-brown, fine to medium, silty, moderately well sorted; includes scattered pebbles, cobbles, and gravel lenses; near bedrock outcrops, sand commonly has a loosely to densely packed pavement of angular gravel. Unit forms dunes and large ramps of sand flanking bedrock hills along north and east edge of Amargosa Desert; most common on south-facing hillsides; sand ramps may be as much as 50 m thick. Soil of Q2e consists of well to moderately developed K horizon 1-2 m thick (stage II-III of Giles and others, 1966) and a light-brownish-gray vesicular silt and clay A horizon; the B horizon is missing, possibly eroded prior to the development of the A horizon. Basal part of unit includes thin beds and lenses of Bishop ash dated at 700,000 years, B.P.

Fluvial sheet sand deposits—Sand and minor gravel, yellowish- to grayish-brown, fine to medium, locally silty, moderately well sorted; contains as much as 10 percent pebbles and cobbles. Unit forms thin sheet deposits along larger drainages and on the lower parts of Q2bc alluvial fans; probably formed largely by fluvial reworking of Q2e deposits. Soil development consists of a light-brownish-gray vesicular A horizon, a light-reddish-brown poorly to well developed B horizon, and locally a thin poorly developed C horizon. The surfaces of Q2s deposits are smooth and largely undissected. A poorly to moderately well packed deflation pavement is common

BASALT (PLEISTOCENE)—Black scoriaceous olivine basalt flow; dated by K-Ar whole-rock method at about 300,000 years B.P. (R. J. Fleck and W. J. Carr, written commun., 1979). Flow occurs along west-central quadrangle border, largely covered by Q1e deposits

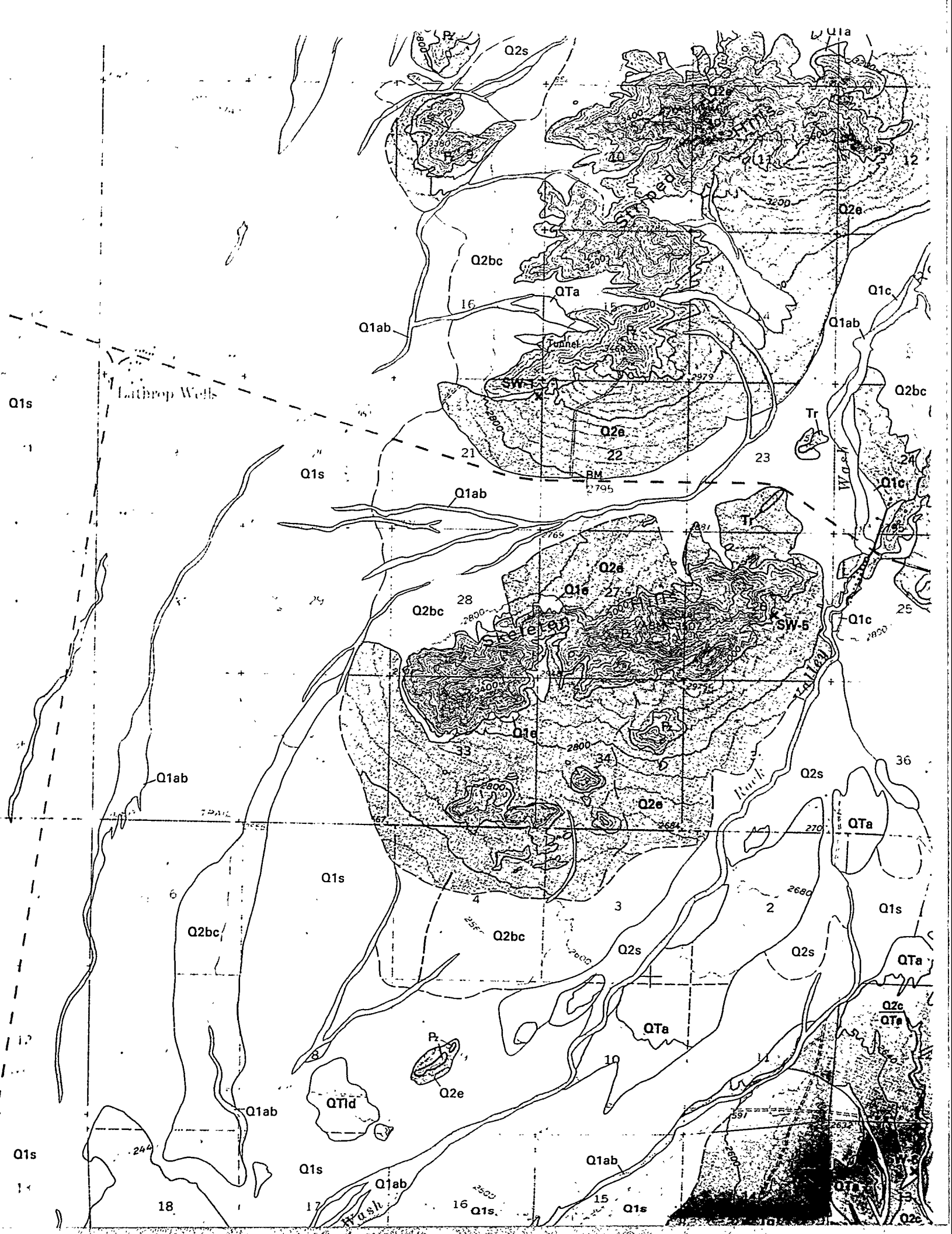
OLDER DEPOSITS (PLEISTOCENE AND PLIOCENE?)

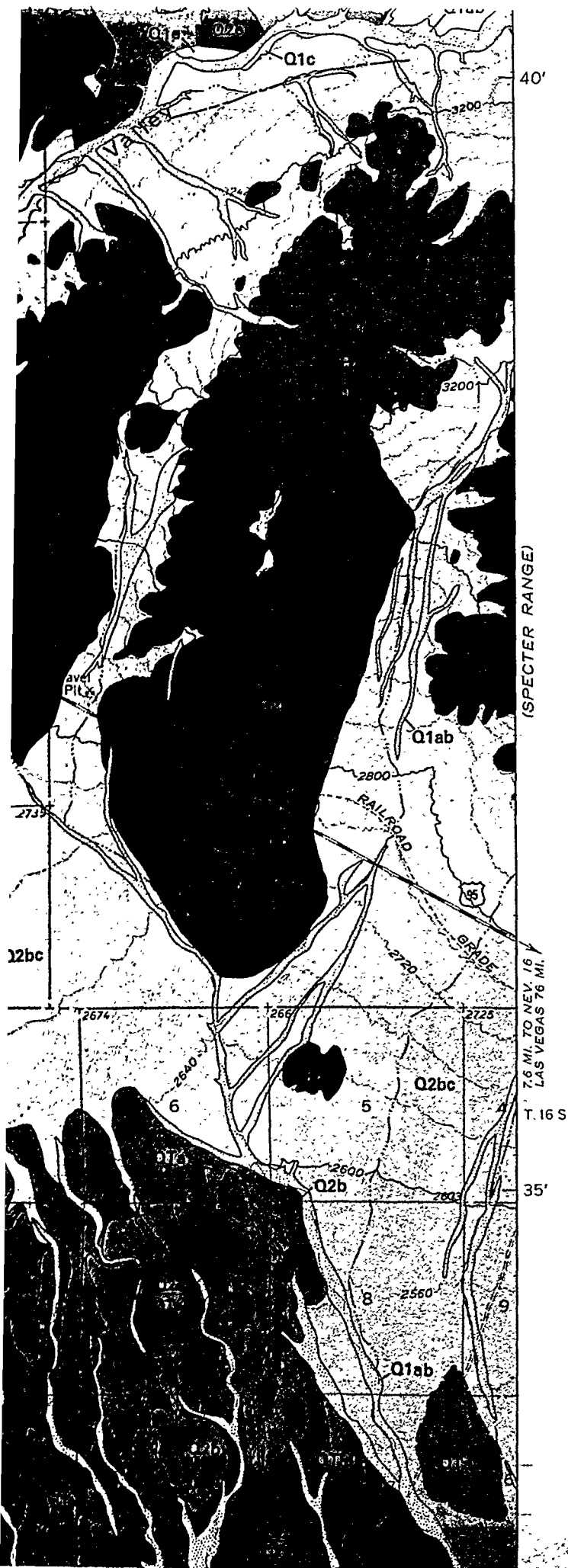
Alluvium—Gravel, angular to subrounded, poorly sorted; contains clasts several meters in diameter; includes only minor amounts of sand and finer material; little or no bedding apparent; outcrops commonly heavily cemented with dense caliche of K horizon (stage IV of Giles and others, 1966) 3 m or more thick, laminated in upper part. Unit forms dissected fans flanking bedrock hills and rounded ridges and isolated mounds away from bedrock; generally poorly exposed except in a few cutbanks along modern washes. On flat surfaces, unit locally develops a dense, varnished desert pavement. Lack of fine material and absence of bedding suggest deposition largely by debris flows. In southeast quarter of quadrangle, unit includes large amounts of well-rounded gravel reworked from Tertiary fluvial gravel. Blocks of dense, banded travertine as much as 1.3 m across are found scattered to abundant along south-flowing wash in secs. 13 and 24, T. 16 S., R. 50 E.

Colluvium—Rubble, angular pebble- to boulder-size fragments, very poorly sorted, nonbedded, locally cemented with caliche. Forms talus deposits along base of steep slopes developed on Tertiary volcanic rocks at Little Skull Mountain

LACUSTRINE DEPOSITS (PLEISTOCENE? AND PLIOCENE)

Marl—Pale-yellowish-brown, weathers white to very light gray; silty, soft, plastic when wet; consists of calcite, quartz silt, sand-sized rock fragments and clay; includes several thin limestone beds as much as 1 m thick. Poorly exposed; locally covered by a lag of limestone rubble; many areas of lacustrine deposits partly masked by thin, discontinuous cover of wind-blown sand. Age and stratigraphic position of unit not well known; some outcrops overlain unconformably by QTa; at south end of bedrock hills near





Q1ab

mapped as part of combined unit Q1ab
 Fluvial deposits—Combined map unit consisting largely of ar-
 Q1b containing narrow strips of Q1a. Q1b deposits con-
 fluvial gravel, sand, and silt, intermixed and interbe-
 light-brownish-gray, poorly to moderately well sorted, w
 poorly bedded. Gravel is angular to subrounded, common
 than 1 m in diameter; boulder patches and trains are con
 Unit forms fluvial terraces 1–2 m above floor of modern w
 surface is highly dissected, bar and swale topography is con
 No soil or pavement has developed on Q1b surfaces

Q1c

Fluvial deposits—Gravel, sand, and silt, intermixed
 interbedded, light-brownish-gray to grayish-brown, poc
 moderately well sorted, moderately well bedded. Gravel is a
 to subrounded, clasts as much as 1 m in diameter. Unit
 terrace remnants along larger drainages and probably un
 large areas of Q1s along and south of Fortymile Wash. Sur
 commonly smooth, in sharp contrast to irregular surface o
 Soil development consists of minor carbonate leaching
 weakly developed C horizon (stage I of Giles and others,

Q1e

Eolian deposits—Sand, pale-yellowish-brown to yellowish
 fine to medium, moderately well sorted, silty; locally include
 pebbles and cobbles near bedrock outcrops. Forms small
 eolian sheets, and vegetation-stabilized mounds; derived
 from Q1s and Q2e deposits. Unit includes deposits both ol
 younger than Q1b. Soil development limited to minor car
 leaching in older deposits of unit

Q1s

Fluvial sheet sand deposits—Sand, pale-yellowish-brown,
 medium, moderately well sorted, silty; contains scattered
 and gravel lenses. Unit forms extensive thin sheets coverin
 of the western half of the area; surfaces are flat and smoo
 almost no drainages developed within the sheets. Consists
 of stream-reworked wind-blown sand. Soil development lin
 minor carbonate leaching; locally a loosely packed deflation
 ment is developed. Unit probably covers large areas of unit
 Q2c, and QTa; locally overlaps deposits of Q2e. Gray t
 indicates areas where sand is moderately to strongly cement
 caliche

INTERMEDIATE AGE DEPOSITS (PLEISTOCENE)—Include
 and eolian units. Unit has been subdivided in the Nevada T
 area into five subunits based on lithology, geomorp
 depositional environment, and soil development (Hoo
 others, 1981); one subunit (Q2a) has not been recognize
 quadrangle

Q2a

Fluvial deposits—Gravel, sand, and silt. Gravel, yellow
 grayish-brown, poorly to moderately well sorted, poorly
 bedded; clasts commonly less than 0.5 m. Sand and silt c
 matrix of gravel and as sand and gravelly sand beds and
 interbedded with gravel. Unit occurs as terraces along
 washes cut into Q2c surfaces and as the lower parts of alluv
 below bedrock hills; forms smooth slopes. Fan deposits
 upslope into unit Q2c

Q2c

Fluvial deposits—Gravel, sand, and silt. Gravel, yellowish-
 brown, poorly to moderately well sorted, nonbedded to well-
 includes boulders commonly 0.5 m in diameter, rarely
 than 1 m. Sand and silt occur in gravel matrix and
 and gravelly sand beds and lenses within gravel. Unit very
 to Q2b except for topographic position and soil devel
 Forms the middle and upper parts of extensive fans de
 on and downslope from QTa fans; merges downslope w
 fans. Soils developed on Q2c vary from a well-developed K
 1–2 m thick to a moderately developed C horizon 0.5–1
 (stage IV and stage III, respectively, of Giles and others,
 overlain by a B horizon that varies from silicified reddis
 argillic to a light-brown cambic, and which is overlain by
 brownish-gray vesicular silt and clay A horizon. Desert p
 developed on Q2c is commonly densely packed, moder
 well sorted, and has a well-developed black varnish. Unit d
 by both debris-flow and fluvial deposition; reported to be
 as 65 m thick in drill holes

Q2b

Fluvial deposits—Combined map unit consisting of Q2c all

It occurs as narrow strips within Q1b and is of combined unit Q1ab

Combined map unit consisting largely of areas of narrow strips of Q1a. Q1b deposits consist of sand, and silt, intermixed and interbedded, very poorly to moderately well sorted, well to gravel is angular to subrounded, commonly less meter; boulder patches and trains are common. Terraces 1-2 m above floor of modern washes; dissected, bar and swale topography is common. Unit has developed on Q1b surfaces

Gravel, sand, and silt, intermixed and light-brownish-gray to grayish-brown, poorly sorted, moderately well bedded. Gravel is angular and lasts as much as 1 m in diameter. Unit forms terraces along larger drainages and probably underlies terraces along and south of Fortymile Wash. Surface is smooth, in sharp contrast to irregular surface of Q1b. Unit consists of minor carbonate leaching and a C horizon (stage I of Giles and others, 1966) and, pale-yellowish-brown to yellowish-gray, moderately well sorted, silty; locally includes a few pebbles near bedrock outcrops. Forms small dunes, and vegetation-stabilized mounds; derived in part from fluvial deposits. Unit includes deposits both older and younger. Soil development limited to minor carbonate deposits of unit

deposits—Sand, pale-yellowish-brown, fine to moderately well sorted, silty; contains scattered pebbles. Unit forms extensive thin sheets covering much of the area; surfaces are flat and smooth with terraces developed within the sheets. Consists largely of sand and wind-blown sand. Soil development limited to minor carbonate leaching; locally a loosely packed deflation pavement. Unit probably covers large areas of units Q1c, and locally overlaps deposits of Q2e. Gray tone in the sand is moderately to strongly cemented with

DEPOSITS (PLEISTOCENE)—Includes fluvial unit has been subdivided in the Nevada Test Site units based on lithology, geomorphology, soil development, and soil development (Hoover and others; subunit (Q2a) has not been recognized in this

gravel, sand, and silt. Gravel, yellowish- to grayish-brown, poorly to moderately well sorted, poorly to well sorted, commonly less than 0.5 m. Sand and silt occur as thin beds and gravelly sand beds and lenses of gravel. Unit occurs as terraces along some of the surfaces and as the lower parts of alluvial fans and terraces; forms smooth slopes. Fan deposits merge with Q2c

Gravel, sand, and silt. Gravel, yellowish- to grayish-brown, moderately well sorted, nonbedded to well-bedded; commonly 0.5 m in diameter, rarely greater than 1 m. Sand and silt occur in gravel matrix and as sand beds and lenses within gravel. Unit very similar to Q1b in topographic position and soil development. Unit and upper parts of extensive fans deposited from Q1a fans; merges downslope with Q2b and Q2c vary from a well-developed K horizon to a moderately developed C horizon 0.5-1 m thick (stage III, respectively, of Giles and others, 1966); soil horizon that varies from silicified reddish-brown to brown cambic, and which is overlain by a light-colored silt and clay A horizon. Desert pavement is commonly densely packed, moderately to strongly cemented, and is overlain by a well-developed black varnish. Unit deposited by fluvial and fluvial deposition; reported to be as much

Q1c

Colluvium—Rubble, angular pebble- to boulder-size fragments, very poorly sorted, nonbedded, locally cemented with caliche. Forms talus deposits along base of steep slopes developed on Tertiary volcanic rocks at Little Skull Mountain

Q1d

LACUSTRINE DEPOSITS (PLEISTOCENE? AND PLEISTOCENE)

Marl—Pale-yellowish-brown, weathers white to very light gray; silty, soft, plastic when wet; consists of calcite, quartz silt, sand-sized rock fragments and clay; includes several thin limestone beds as much as 1 m thick. Poorly exposed; locally covered by a lag of limestone rubble; many areas of lacustrine deposits partly masked by thin, discontinuous cover of wind-blown sand. Age and stratigraphic position of unit not well known; some outcrops overlain unconformably by Q1a; at south end of bedrock hills near south-central border, unit includes a Pearlette-type ash bed dated at more than 800,000 years B.P. (J. N. Rosholt, written commun., 1979) based on its thorium content

Q1e

Limestone—White to light-gray, weathers white to very light gray; finely crystalline, hard; locally includes sand and small pebbles; weathers to a very rough, pitted surface. Maximum exposed thickness about 3.5 m near south edge of quadrangle; thins northward to a feather edge. Unit forms resistant caps on several flat-topped ridges underlain by marl in southeast quarter of the quadrangle

Tg

FLUVIAL GRAVEL (TERTIARY)—Gravel, subrounded to well-rounded, poorly sorted; silty, sandy matrix, locally well cemented with caliche; includes well-rounded boulders as much as 0.6 m in diameter, largely quartzite and argillite with lesser amounts of limestone, dolomite, and volcanic and plutonic rocks. Unit poorly exposed, forms a low ridge in southeast part of area that is largely masked by Q2(?) sand and a lag of reworked Tg gravel. Best exposure is in cutbank of small wash at northwest edge of area of Tg

Q2a

TERTIARY ROCKS—Undivided rocks of Tertiary age that include welded and nonwelded tuffs, basalt flows, and minor amounts of conglomerate, sandstone, and limestone. Tertiary rocks of the quadrangle are described by Burchfiel (1966), Sargent and others (1970), and McKay and Sargent (1970). Small areas of previously unmapped Tertiary(?) rocks in the southeast quarter of the area consist of black scoriaceous to dense basalt flows; in part overlain by unit Q1a

Q2b

PALEOZOIC ROCKS (DEVONIAN TO PRECAMBRIAN)—Undivided rocks of Paleozoic and Precambrian age including dolomite, limestone, quartzite, siltstone, and minor amounts of chert and shale. Formations of the quadrangle mapped and described by Burchfiel (1966) and Sargent and others (1970)

CONTACT

CONTACT—Dashed where approximately located

FAULT

FAULT—Dashed where inferred; dotted where concealed. Ball and bar on downthrown side

LINEAMENT

LINEAMENT—Probably fault related

AREAS OF ABUNDANT FRAGMENTS OF CALCIFIED VEGETAL MATS

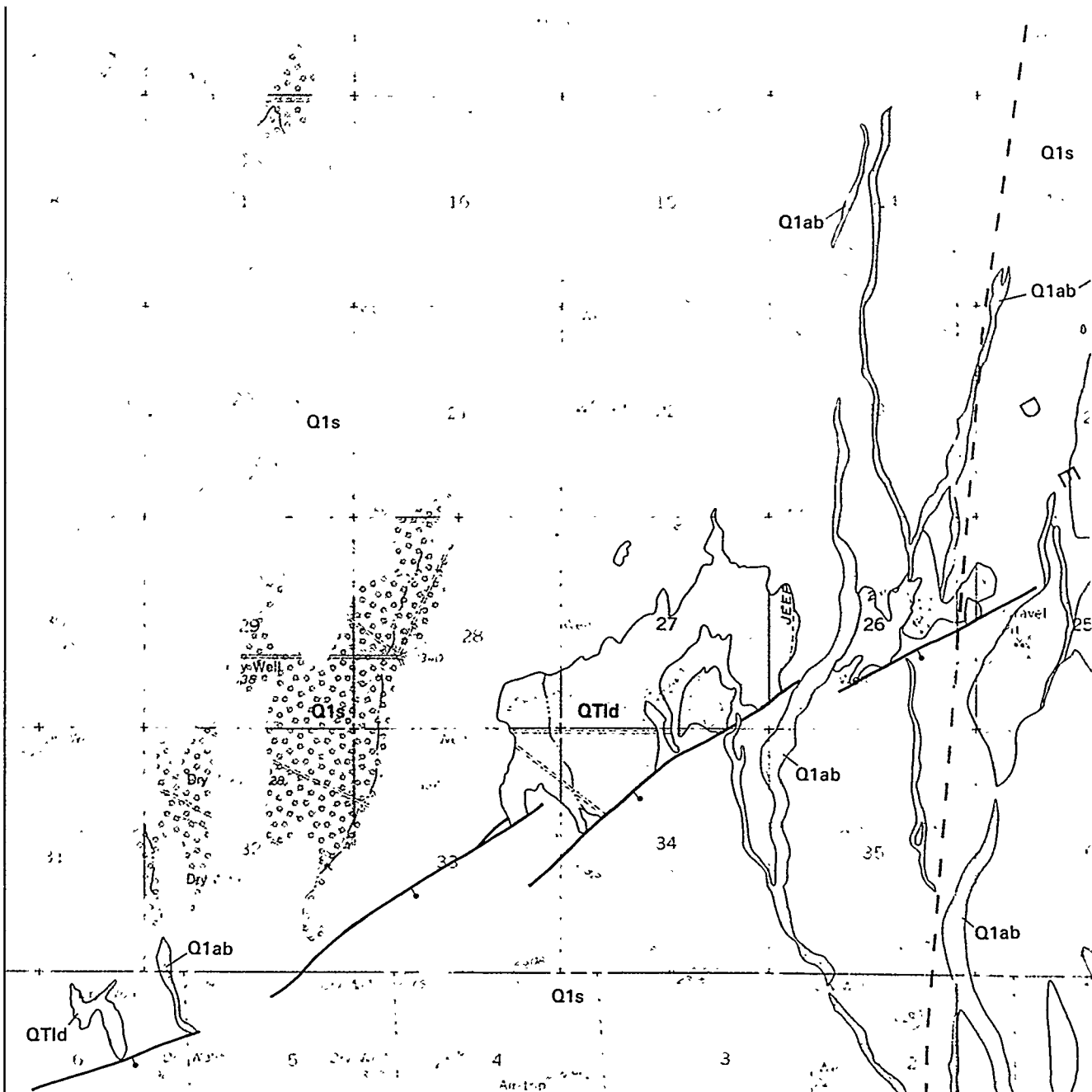
AREAS OF ABUNDANT FRAGMENTS OF CALCIFIED VEGETAL MATS—Probably deposited in marsh areas

SW-6

SAMPLE LOCALITY—Pliocene or Pleistocene silicic ash bed

REFERENCES CITED

- Burchfiel, B. C., 1966, Reconnaissance geologic map of the Lathrop Wells 15-minute quadrangle, Nye County, Nevada: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-474, scale 1:62,500.
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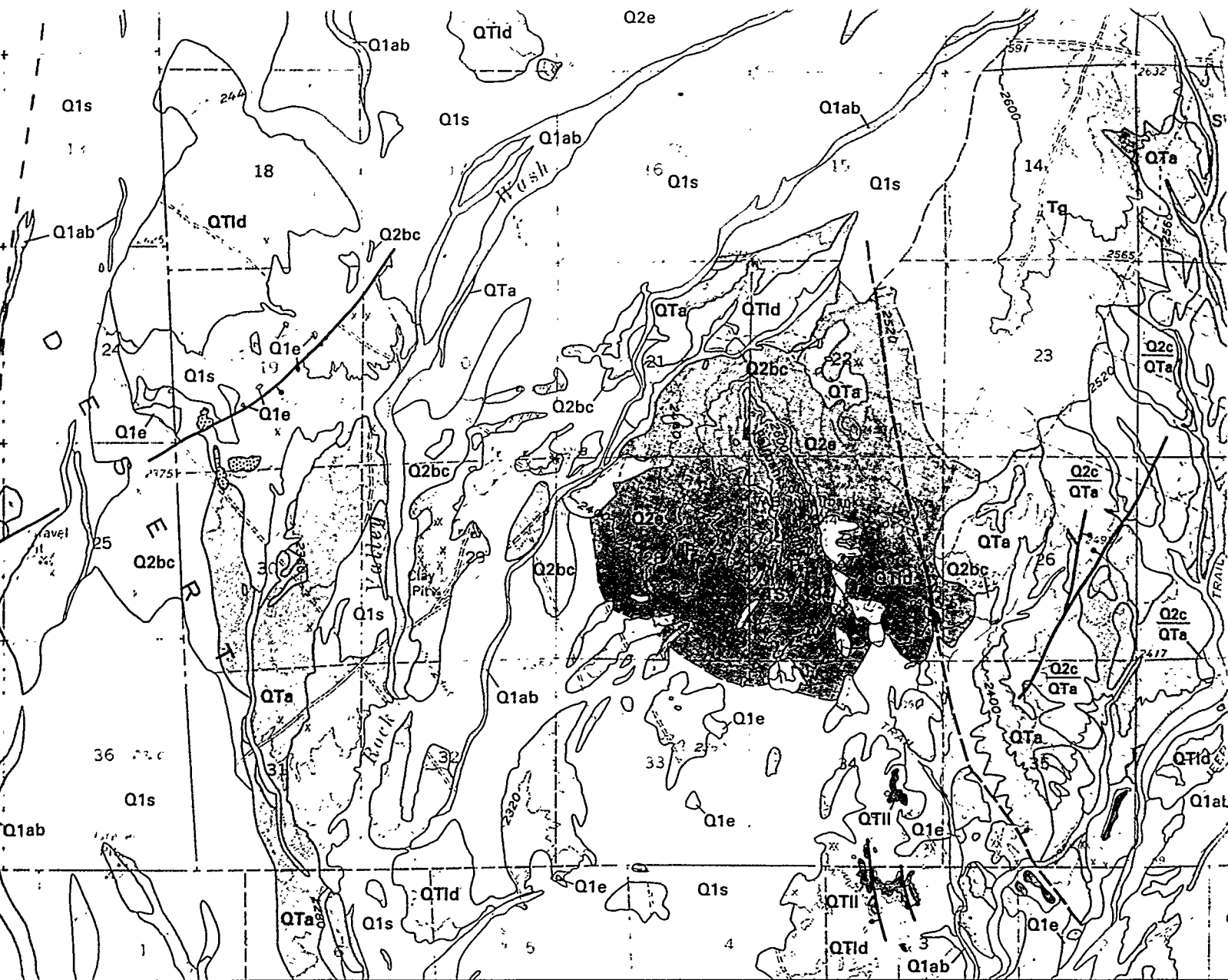


DEATH VALLEY JUNCTION CALIF 14 M
BAKER CALIF 08 M

Base from U.S. Geological Survey
1:62,500, 1961
10,000-foot grid based on Nevada coordinate
system, central zone
1000-meter Universal Transverse Mercator
grid ticks, zone 11, shown in blue

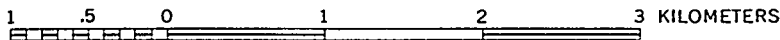
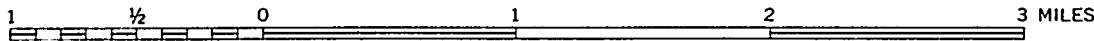


MAP SHOWING SURFICIAL GEOLOGY (



R 49 E R 50 E (ASH MEADOWS)

SCALE 1:48 000



CONTOUR INTERVAL 40 FEET
 DOTTED LINES REPRESENT 20-FOOT CONTOURS
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

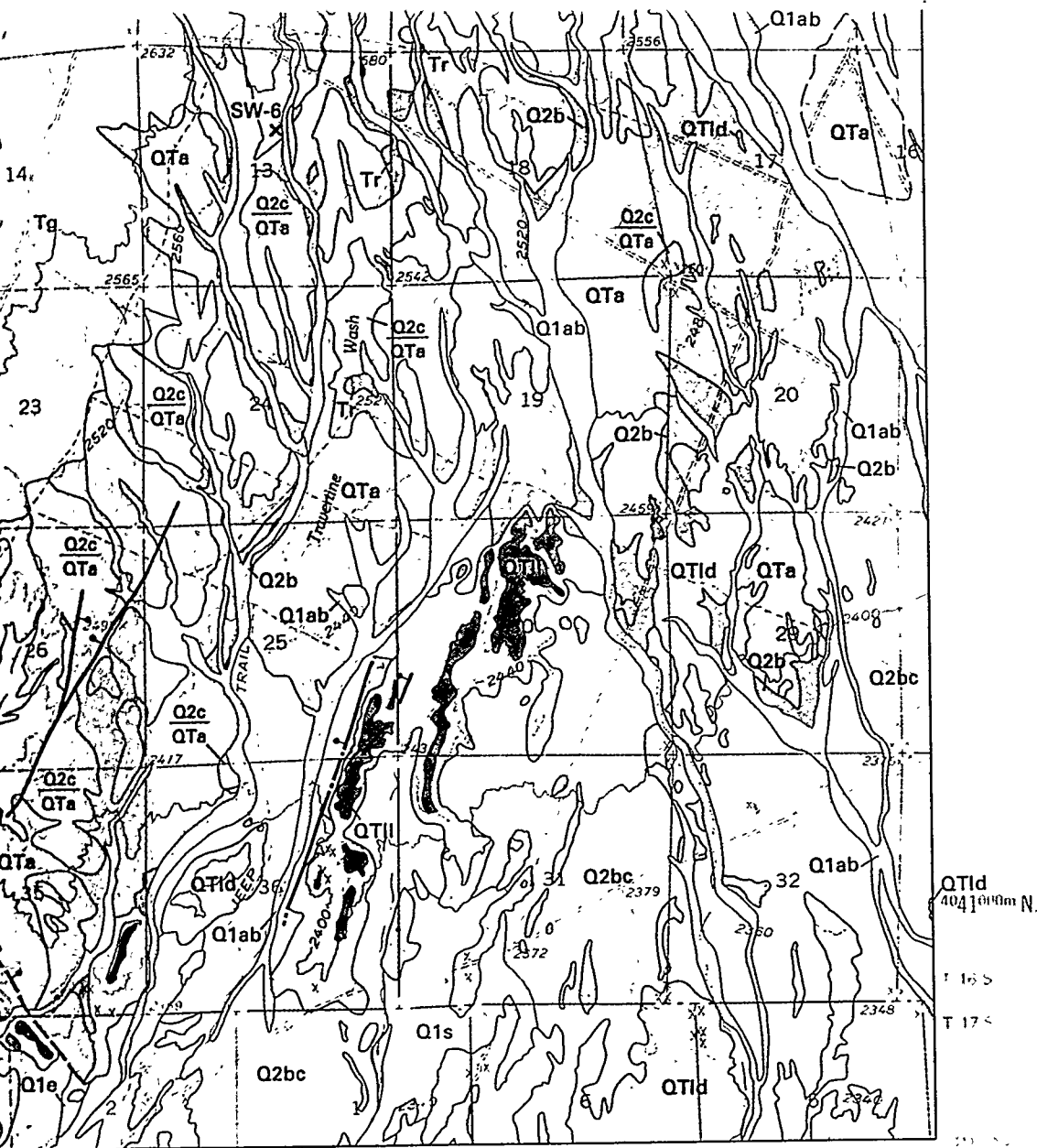
QUADRA

GEOLOGY OF THE LATHROP WELLS QUADRANGLE, N

By
W C Swadley
 1983

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63000m E. INTERIOR—GEOLOGICAL SURVEY, RESTON, VA -- 1987 - G81119
 Geology mapped in 1978-79



QUADRANGLE LOCATION

ANGLE, NYE COUNTY, NEVADA

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 ing by the United States Government or any agency thereof. The views
 thors expressed herein do not necessarily state or reflect those of the
 nment or any agency thereof.

Q2bc

1-2 m thick to a moder-
 (stage IV and stage III, 1
 overlain by a B horizon
 argillic to a light-brown
 brownish-gray vesicular s
 developed on Q2c is co
 well sorted, and has a we
 by both debris-flow and f
 as 65 m thick in drill
 Fluvial deposits—Combine
 and terrace deposits th
 terrace deposits

TABLE 1.—IDENTIF

Sample No.	Location	lc
SW-1 (79G4) ¹	Striped Hills	
SW-5 (79W61) ¹	Skeleton Hills	
SW-6 (79W67) ¹	Travertine Wash.	t
SW-9	SE Yucca Mtn.	Co Fre b C 1
SW-10	SW Yucca Mtn.	Prob Fla
TSV-194 (79W68) ¹	Fairbanks Hills	P:

¹Sample number assigned by G. Izett.
²Not yet analyzed as of Sept. 1980.

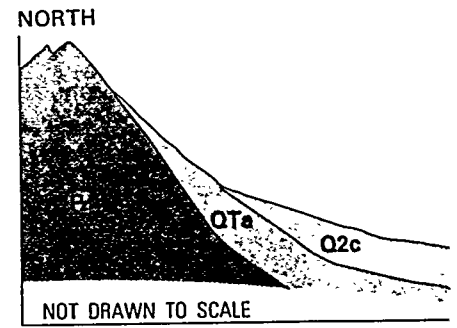


FIGURE 1—H

MASTER

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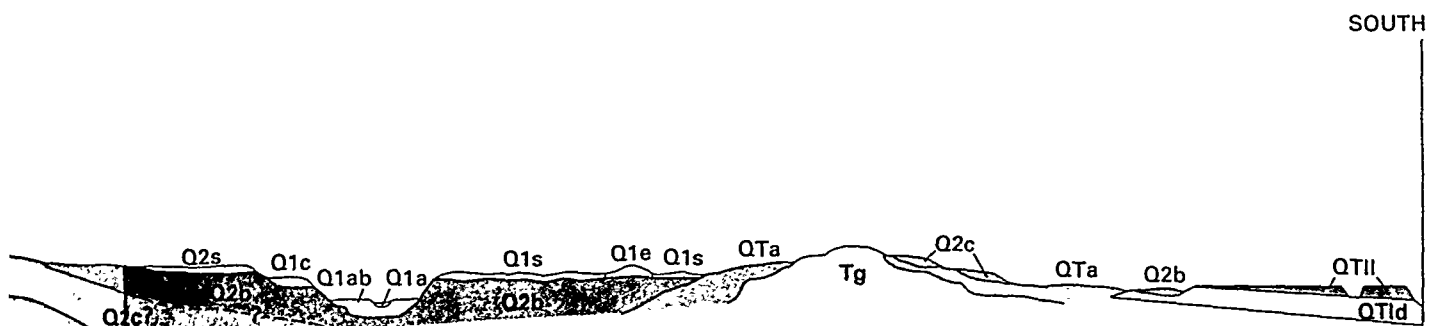
92

Q2a fans; merges downslope with Q2b Q2c vary from a well-developed K horizon ately developed C horizon 0.5-1 m thick respectively, of Giles and others, 1966); that varies from silicified reddish-brown cambic, and which is overlain by a light-silt and clay A horizon. Desert pavement commonly densely packed, moderately to well-developed black varnish. Unit deposited fluvial deposition; reported to be as much holes ed map unit consisting of Q2c alluvial fan at grade downslope into Q2b fan and

Giles, L. H., Peterson, F. F., and Grossman, R. B., 1966, Morphological and genetic sequences of carbonate accumulations in desert soils: Soil Science, v. 101, no. 5, 347-360.
 Hoover, D. L., Swadley, W C, and Gordon, A. J., 1981, Correlation of Quaternary alluvial fan deposits in the Nevada Test Site area: U.S. Geological Survey Open-File Report 81-512, 27p.
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 Sargent, K. A., McKay, E. J., and Burchfiel, B. C., 1970, Geologic map of the Striped Hills quadrangle, Nye County, Nevada: U.S. Geological Survey Geologic Quadrangle Map GQ-882, scale 1:24,000.

IDENTIFICATION OF ASH BEDS IN LATHROP WELLS QUADRANGLE, NYE COUNTY, NEVADA

Identification	Age (yrs.)	Stratigraphic position	Remarks
Bishop ash	700,000	Underlain by Cambrian rocks; overlain by intermediate sand (unit Q2e).	Identified by G. Izett (oral commun., 1979).
Bishop ash	700,000	Within intermediate eolian sand (unit Q2e).	Identified by G. Izett (oral commun., 1979).
Unidentified	Quaternary	Within intermediate alluvium (unit Q2c).	Ash altered. Zircon separate contaminated with Tertiary and Mesozoic age zircons. Biotite separate gave Miocene age (Marvin and Cole, 1978).
Correlated with Frenchman Flat ash bed (Izett, written Commun., 1981)	2.2 million	Underlain by Tertiary volcanics; overlain by intermediate eolian sand (unit Q2e), adjacent to extensive area of eolian sand (unit Q2e).	Identified by Izett (written commun., 1981) Similar to Bishop ash but age is 2.2 m.y. by fission track on Frenchman Flat ash (Izett, written Commun., 1981)
Possibly Frenchman Flat ash bed	2.2 million?	Underlain by Tertiary volcanics; overlain by colluvium; adjacent to intermediate eolian sand (unit Q2e).	Not identified, but similar to SW-9 in appearance
Possibly older Pearlette ash	Quaternary(?)	Within lake deposits of Pleistocene (?) and Pliocene age (unit QTld).	Thorium content appropriate for Pearlette-type "B" or "S" ash (J. N. Rosholt, written commun., 1979), but could be one of several other ash beds.



HYPOTHETICAL CROSS SECTION SHOWING RELATIONS OF THE QUATERNARY AND TERTIARY SURFICIAL DEPOSITS OF THE LATHROP WELLS QUADRANGLE

For sale by Branch of Distribution, U.S. Geological Survey
 Box 25286, Federal Center, Denver, CO 80225