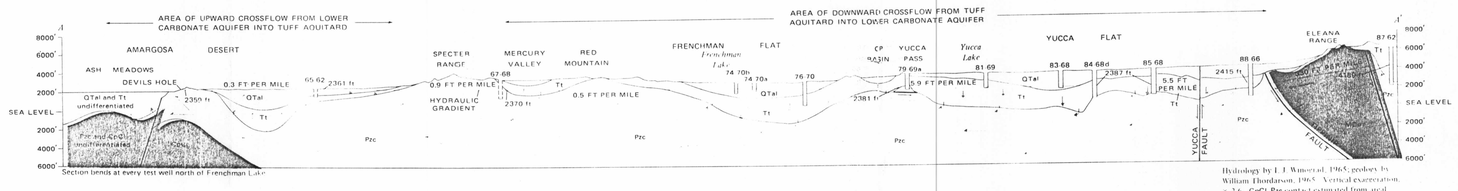
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared on behalf of the
U.S. ATOMIC ENERGY COMMISSION

Base from U.S. Geological Survey Coliente, Death Valley, Goldfield, and Las Vegas, 1954
100,000-foot grid based on Nevada coordinate system, central zone

SCALE 1:250,000
CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL



Hydrology by I. J. Winograd, 1965; geology by William Thordarson, 1965. Vertical exaggeration × 2.6. CpCl-Pzc contact estimated from areal and subsurface stratigraphic data. Pzc-Tt contact from gravity surveys and drill hole data

Hydrology by I. J. Winograd, 1965

HYDROGEOLOGIC MAP OF NEVADA TEST SITE AND VICINITY, SOUTHERN NEVADA

EXPLANATION

MAP

DEVONIAN AND MISSISSIPPIAN

Upper clastic aquitard

Argillite, quartzite, conglomerate, and minor limestone of the Eleana Formation; narrow-line pattern, outcrop; wide-line pattern, area beneath which the upper clastic aquitard is probably the major pre-Tertiary hydrogeologic unit within upper few thousand feet of zone of saturation; pattern includes small areas of the upper carbonate aquifer, Tippipah Limestone

PRECAMBRIAN AND CAMBRIAN

Lower clastic aquitard

Quartzite, siltstone, shale and minor limestone of the lower part of Carrara Formation, Zabriskie Quartzite, Wood Canyon Formation, Stirling Quartzite, and Johnnie Formation; includes minor Permian to Mesozoic granitic stocks, and in Timpahute Range includes Precambrian metamorphic rocks; narrow-line pattern, outcrop; wide-line pattern, area beneath which the lower clastic aquitard is probably the chief pre-Tertiary hydrogeologic unit within the zone of saturation

Contact
Queried where doubtful

(13)
Strike-slip fault
Arrows indicate direction of relative movement; dashed where inferred; number is major tectonic feature listed below

(4)
Thrust fault
Sawteeth on upper plate; dashed where inferred; number is major tectonic feature listed below

(18)
Normal fault
Bar and ball on downthrown side; dashed where inferred; number is major tectonic feature listed below

(8)
Anticline
Dashed where inferred; number is major tectonic feature listed below

(7)
Inferred syncline
Number is major tectonic feature listed below

LIST OF MAJOR TECTONIC FEATURES

Identifying number on map	Name	Source
1	Timber Mountain caldera	Carr (1964)
2	CP thrust fault	Barnes and Poole (1968)
3	Mine Mountain thrust fault	Hinrichs (1968)
4	Tippinip thrust fault	Barnes and Poole (1968)
5	Yucca fault	Hinrichs (1968)
6	Halfpint anticline	Do.
7	Spotted Range syncline	Name assigned by authors
8	Pintwater Range anticline	Longwell, Pampeyan, Bowyer, and Roberts (1965)
9	None	Tschanz and Pampeyan (1961)
10	None	Do.
11	Sheep Range syncline	Name assigned by authors
12	Gass Peak thrust fault	Longwell, Pampeyan, Bowyer, and Roberts (1965)
13	Las Vegas Valley shear zone	Do.
14	Wheeler Pass thrust fault	Longwell, Pampeyan, Bowyer, and Roberts (1965); Vincelette (1964)
15	Indian Springs syncline	Name assigned by authors
16	Montgomery thrust fault	(R. L. Christiansen, R. H. Moench, and M. W. Reynolds, unpub. data) and Hamill (1966)
17	Stewart Valley fault zone	Name assigned by authors (R. L. Christiansen, R. H. Moench, and M. W. Reynolds, unpub. data)
18	Gravity fault	(D. L. Healey and C. H. Miller, written commun.)
19	Specter Range thrust fault	(R. L. Christiansen, R. H. Moench, and M. W. Reynolds, unpub. data)
20	Roses Well anticline	Name assigned by authors (R. L. Christiansen, R. H. Moench, and M. W. Reynolds, unpub. data)

HYDRAULIC SYMBOLS

All altitudes and contours in feet; datum is mean sea level; well numbers and formations tested given on larger scale maps; see figures 31, 32, 33, 34, and plate 2

2381
Test well
Well tapping pre-Tertiary hydrogeologic units; number is altitude of static water level; symbol < denotes well was dry or fluid level was declining

2415 ± 2
2555
Test well or water well
Well tapping both Cenozoic and pre-Tertiary hydrogeologic units; upper number is altitude of static water level in pre-Tertiary aquifer or aquitard; lower number is altitude of static water level in Cenozoic aquifer or aquitard; a single number is altitude of composite static water level of both hydrogeologic units; P denotes perched water

2422
Test well
Well tapping Tertiary hydrogeologic units; number is altitude of static water level; W denotes water level; symbol < denotes well was dry or fluid level was declining

2411
Test well or water well
Well tapping valley-fill aquifer; number is altitude of static water level; W denotes water level; symbol < denotes well was dry or fluid level was declining

2410 ± 2
Test well
Well tapping valley-fill aquifer and Tertiary hydrogeologic units; number is altitude of composite static water level of both hydrogeologic units

Spring or cavern
Spring or cavern in, or near outcrop of, lower carbonate aquifer; number is altitude of land surface at spring or of water level in cavern

3238 ± 5
Spring in Quaternary and Tertiary valley-fill aquifer or lakebeds
Number is altitude of land surface at spring

Approximate area of extensive evapotranspiration

2380
Potentiometric contour
Shows altitude of potentiometric surface for pre-Tertiary aquifers and aquitards; dashed where inferred; contour interval is variable

4500
Potentiometric contour
Shows altitude of potentiometric surface for Quaternary-Tertiary valley-fill aquifer or for Tertiary hydrogeologic units; dashed where inferred; hachured, where probable downward crossflow into lower carbonate aquifer occurs; contour interval is variable

Inferred ground-water barrier
Width of symbol not intended to represent width of hydraulic barrier, which may vary from several tens to a few thousand feet

Approximate boundary of Ash Meadows ground-water basin
Long and short dash, boundary inferred from contact of lower carbonate aquifer and lower clastic aquitard, or from major hydraulic barrier; long dash and dot, boundary inferred from topographic divides and ideally from water levels in Cenozoic aquifers; long dash and query, inferred from topographic divides underlain directly or at depth by lower carbonate aquifer. In Ash Meadows area basin boundary, hydraulic barrier, and normal fault are coincident, but symbols separated for clarity

SECTION

81 69
Test well
Number is well number; dashed where projected into line of section

Flow lines
Long arrows, flow within the lower carbonate aquifer; short arrows, crossflow between tuff aquitards and lower carbonate aquifer or valley fill

Potentiometric surface in pre-Tertiary rocks

HYDROGEOLOGIC AND GEOLOGIC UNITS

SYMBOL	GEOLOGIC UNIT	HYDROGEOLOGIC UNIT
QTal	Quaternary and Tertiary valley fill	Valley-fill aquifer
Tt	Tertiary tuff, lakebeds, and lava flows	Welded-tuff and bedded-tuff aquifers; tuff and lava-flow aquitards
MDe	Eleana Formation	Upper clastic aquitard
Pzc	Paleozoic carbonate rocks	Lower Carbonate aquifer
CpCl	Early Cambrian and Precambrian clastic rocks	Lower clastic aquitard

SOURCES OF OTHER GEOLOGIC DATA

AREA	SOURCE
Emigrant Valley and Desert Range	Tschanz and Pampeyan (1961)
Kawich Valley	Ekren, Anderson, Rogers, and Noble (1971)
Yucca Flat	(Harley Barnes, unpub. data)
Frenchman Flat and Mercury Valley	(D. L. Healey and C. H. Miller, unpub. data)
Specter Range, east-central and southern Amargosa Desert, and western Pahrump Valley	(R. L. Christiansen, R. H. Moench, and M. W. Reynolds, unpub. data; D. L. Healey and C. H. Miller, unpub. data)
Northwestern Amargosa Desert, northeastern Funeral Mountains	Cornwall and Kleinhampel (1961 and 1964); Jennings (1958)
Black Mountains	Jennings (1958)
Furnace Creek Wash, Nevares Springs, southwestern Funeral Mountains	Hunt and Mabey (1966)

SOURCES OF HYDROLOGIC DATA OUTSIDE STUDY AREA

AREA	SOURCE
Pahranagat Valley	Eakin (1966)
Pahute Mesa	(R. K. Blankennagel and J. E. Weir, Jr., unpub. data 1966)
Sarcobatus Flat and Oasis Valley	Malmberg and Eakin (1962)
Northwest Las Vegas Valley	Malmberg (1965)
Southwestern Amargosa Desert	Walker and Eakin (1963)
Pahrump Valley	Malmberg (1967)