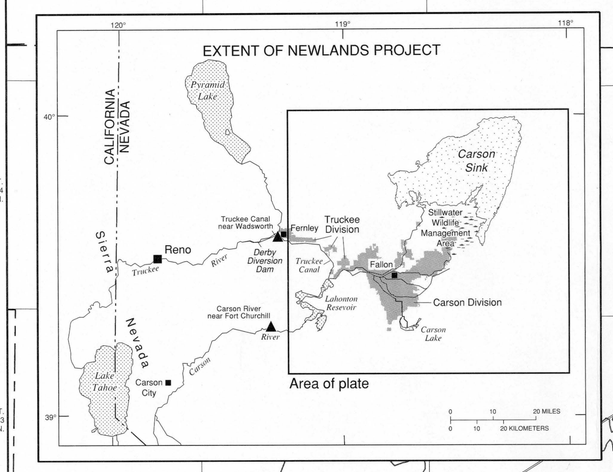
U.S.DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
BUREAU OF RECLAMATION

OPEN-FILE REPORT 93-463
PLATE 1



PERSHING CO
CHURCHILL CO

Humboldt Sink

WEST HUMBOLDT RANGE

CARSON SINK

Packard Valley

MOPUNG HILLS

LONE ROCK

Standard-Amoco SP Land No 1
Dt 3,165
Dv 5,000
Dm 13,000

Churchill-Churchill County No 1
Dt >2,615
Dv >2,615
Dm >2,615

Churchill TCID No 1
Dt >3,758
Dv >3,758
Dm >3,758

Lane and Thorpe Carson Sink No 1
Dt 1,640
Dv >1,640 and <2,805
Dm 2,805

FALLON NATIONAL WILDLIFE REFUGE

Phillips ST-6
Dt 360
Dv 730
Dm >1,934

Phillips DP 29-1
Dt 180
Dv 700
Dm 4,535

HOT SPRINGS MOUNTAINS

STILLWATER WILDLIFE MANAGEMENT AREA

STILLWATER NATIONAL WILDLIFE REFUGE

USGS Timber Lake Well
Dt >835
Dv >835
Dm >835

UPSAL HOGBACK

BLACK BUTTE

Hazen

Chevron 1-29
Dt 970
Dv 1,340
Dm 3,940

Chevron 11-33
Dt <1,940
Dv 1,940
Dm >2,000

Chevron 63-33
Dt <1,760
Dv 1,760
Dm >2,000

Chevron 44-5
Dt 1,520
Dv 4,600
Dm >5,069

ERDA Lahontan No 1
Dt 1,300
Dv 3,140
Dm 8,420

Union Richard Weishaupt No 1
Dt 2,550
Dv 2,700
Dm 19,569

Union DeBraga No 2
Dt 1,630
Dv 2,380
Dm >6,964

FALLON INDIAN RESERVATION

Stillwater

RATTLESNAKE HILL

Fallon

LYON CO
CHURCHILL CO

Lahontan Dam

Carson Diversion Dam

LAHONTAN VALLEY

University of Nevada Newlands Field Laboratory

NAS, Fallon

Churchill Stewart No 1
Dt >2,827
Dv >2,827
Dm >2,827

Churchill Reggie No 1
Dt >6,235
Dv >6,235
Dm >6,235

US Navy (Morrison's 38 L)
Dt >1,472
Dv >1,472
Dm >1,700

US Navy FOH-2
Dt 1,680
Dv 2,223
Dm >4,488

Haskins Reis Federal 36-1
Dt <700
Dv 700
Dm >2,800

LAHONTAN MOUNTAINS

Churchill Ernest No 1
Dt >3,860
Dv >3,860
Dm >3,860

Salt Wells

SALT WELLS BASIN

EIGHTMILE FLAT

FOURMILE FLAT

Syndicate Oil No 1
Dt >2,735
Dv >2,735
Dm >2,735

Halbouty Federal 1-14
Dt 100
Dv 2,500
Dm >2,500

Carson Lake

BIRDSONG MOUNTAINS

WHITE THRONE MOUNTAINS

BASS FLAT

DESERT MOUNTAINS

COCOON MOUNTAINS

BLOW SAND MOUNTAINS

BARNETT HILLS

SAND SPRINGS RANGE

DIXIE VALLEY

RAWHIDE FLATS

Lahontan Reservoir

Sheckler Reservoir

DEAD CAMEL MOUNTAINS

Stillwater Point Reservoir

Truckee Canal near Hazen

Carson River below Lahontan Reservoir

Carson River below Fallon

Carson River at Tarzan Road

Truckee River

Carson River

Indian Lakes

Soda Lakes

Old River Reservoir

Harmon Reservoir

S Line Reservoir

Swingbench

Marsh Slough

Upper Diagonal Drain

Schottner Drain

Paiute Diversion Canal

T-Line Canal

V-Line Canal

S-Line Canal

L-Line Canal

Walde Drain

Harmon Drain

Stillwater Slough

Stillwater Diversion Canal

Swingle Drain

Upper Paiute Drain

Oil Drain

D-Line Canal

Carson Lake Drain

Eastside Canal

Dixie Canal

Marvel Drain

Lead Drain

Paiute Drain

Fallon Main Canal

A-Line Canal

South Branch

Mustang Slough

Roads and hydrology from U.S. Geological Survey digital data, 1:100,000, 1979-80
Universal Transverse Mercator Projection, Zone 11

Hypsography and water bodies from U.S. Geological Survey digital data, 1:250,000, 1971

Political boundaries and canal names from U.S. Geological Survey, 1:24,000, 1969-87

Stillwater Wildlife Management Area and National Wildlife Refuge boundaries from Ronald M. Anglin, U.S. Fish and Wildlife Service, written commun., 1992

EXPLANATION

Basin-fill deposits (Quaternary age) — Unconsolidated to semiconsolidated, unsorted to sorted clay, silt, sand, and gravel of pluvial-lake, alluvial-fan, delta, pediment, playa (stipple pattern), flood-plain, and dune deposits. Locally includes minor amounts of tuffaceous material. Fine-grained sediments are concentrated in center of basin, whereas coarse-grained sediments rim basin floor. Includes Lahontan Valley Group (Morrison, 1964). Locally contains deposits of salt, borate, and bentonitic clay (Willden and Speed, 1974, p. 52)

Mafic volcanic rocks (Quaternary and Tertiary age) — Consolidated Quaternary basalt and andesite flows, intrusive plugs, cinder tuff cones, and small amounts of agglomerate at Rattlesnake Hill, Lone Rock, and Upsal Hogback. Also includes semiconsolidated Quaternary mafic volcanic deposits at Soda Lakes and surrounding Upsal Hogback that consist of basaltic sand, silt, lapilli, and small amounts of tuff. Quaternary ages range from 1 Ma to 1,500 B.P. (Davis, 1978, table 8; Evans, 1980, p. 20). Contains Tertiary basalt and andesite flows, interbedded with basin-fill sediments and sedimentary rocks. Includes Bunejug Formation, predominantly volcanic parts of Truckee Formation, and Chloropagus and Desert Peak Formations of Axelrod (1956). Tertiary ages range from about 17 to 6 Ma (Evernden and James, 1964, table 3; Willden and Speed, 1974, table 4; Bell and others, 1984, p. 13-15)

Sedimentary rocks (Tertiary age) — Largely consolidated, tuffaceous shale, siltstone, sandstone, and conglomerate, along with small amounts of limestone and diatomite; interbedded with mafic volcanic rocks. Exposed along valley margins and in mountain ranges; presumably compose deeper basin fill in valleys. Includes predominantly sedimentary parts of Truckee Formation, and Desert Peak and Chloropagus Formations of Axelrod (1956). Ages range from about 17 to 6 Ma (Evernden and James, 1964, table 3; Willden and Speed, 1974, table 4)

Felsic volcanic rocks (Tertiary age) — Consolidated rhyolitic to latitic flows and flow breccias; domes; shallow intrusive bodies; and air-fall, waterlaid, ash-flow and welded tuffs. Locally interbedded with Tertiary mafic volcanic rocks. Locally altered to hydrous magnesium-aluminum sulfate (Willden and Speed, 1974, p. 52). Ages range from 31 to 12 Ma (Evernden and James,1964, table 3; Willden and Speed, 1974, p. 19-27, 41; Burke and McKee, 1979 p. 183-184; Bell and others, 1984, p. 14-15)

Igneous and sedimentary rocks (Tertiary to Triassic age) — Includes consolidated felsic intrusive igneous rocks, mafic intrusive and extrusive igneous rocks, and sedimentary and volcaniclastic rocks variably affected by weak regional metamorphism

Body of water

A — A' **Trace of geologic section on plate 2**

Fault of Quaternary age in basin-fill material — From Bell (1984) and Green and others (1991). Dotted where inferred

Hydrographic area boundary — From Rush (1968)

Hydrographic subbasin boundary — From Rush (1974)

Drain, canal, or ditch

Phillips DP 29-1
Dt 180
Dv 700
Dm >4,535

Drillhole, with name — Dt, depth to top of Tertiary section (sedimentary or volcanic rocks), in feet; Dv, depth to top of Tertiary volcanic rocks, in feet; Dm, depth to top of Mesozoic section, in feet. Drillhole data modified from Benoit and others (1982, p. 15-18); Chevron Resources Company (1979a, 1979b); Gale (1913, p. 303-311); Horton (1978, p. 14-36); Katzenstein and Bjornstad (1987, p. 11-12, 43-53); Melhorn ([1974?], p. 9-11); Morrison (1959, p. 205-206); Nevada Bureau of Mines and Geology (written commun., 1992); Sibbett (1979, appendix); Sibbett and Blackett (1982, appendix); Union 76 Geothermal Division ([1979?], chapter 2); and Union Oil Company of California (1981, p. 37-45). Top of Mesozoic section in Standard-Amoco SP Land No. 1 well is below bottom of well, and is estimated on basis of geophysical data (Hastings, 1979, fig. 2)

Surficial geology generalized from John H. Stewart (U.S. Geological Survey, written commun., 1987) and, in Upsal Hogback and Soda Lake areas, modified from Morrison (1964)

Maurer, D.K., Johnson, A.K., and Welch, A.H., 1994, Hydrogeology and potential changes in water use, Carson Desert agricultural area, Churchill County, Nevada: U.S. Geological Survey Open-File Report 93-463

SCALE 1:150 000
MILES 5 0 5 10
KILOMETERS 5 0 5 10

CONTOUR INTERVAL 1,000 FEET
WITH SUPPLEMENTARY CONTOUR AT 4,200 FEET

MAP SHOWING GENERALIZED GEOLOGY OF CARSON DESERT HYDROGRAPHIC AREA, CHURCHILL COUNTY, NEVADA

By
Douglas K. Maurer, Ann K. Johnson, and Alan H. Welch

1994