INTRODUCTION

This atlas presents data on ground-water quality for the Caliente 1° x 2° quadrangle. The basic data were compiled as part of the Great Basin Regional Aquifer-Systems Analysis of the U.S. Geological Survey (Harrill and others, 1983).

The data herein were obtained from various sources, including published reports and computerized data files. The computer files accessed for this effort are: (1) WATSTORE, the National Water-Data Storage and Retrieval system maintained by the Water Resources Division of the U.S. Geological Survey; (2) WADS, a system created by the Desert Research Institute, University of Nevada; and (3) RASS, a system maintained by the Geologic Division of the U.S. Geological Survey. Other potential major sources of data are: the National Uranium Resource Evaluation (NURE), a U.S. Department of Energy project; reports of sampling efforts begun in 1980 by the U.S. Bureau of Land Management; and U.S. Geological Survey reports on various hydrographic areas. Only those analyses that pass certain quality-control criteria are included herein. A chemical analysis is excluded if (1) determinations do not exist for all of the principal ions, or (2) the analytical results do not meet the following criterion for electrical balance: total cations and total anions must agree within 10 percent, using the formula:

$$\text{imbalance (in percent)} = \frac{(\text{cations} - \text{anions})}{(\text{cations} + \text{anions})} \times 100 ,$$

where the concentrations are expressed in milliequivalents per liter. This electrical imbalance should be small for comprehensive analyses and it therefore serves as a check on the quality of the analytical results.

Where sample sites are closely spaced, or where more than one analysis is available for a single site, areal averaging is applied to prevent overprinting of information on the map (see side 1). Furthermore, if data for a deep well or for a thermal water are available within an area containing other data (shallow or nonthermal), the other data are not included in the averaging. Finally, if data for both a deep well (1,000 feet or greater) and a thermal water (30 °C or greater) are available, only the deep data are used. The averaging is done over a map area of 0.5 inch by 0.5 inch at a scale of 1:250,000, which is equivalent to about 4 square miles. One consequence of this procedure is that the actual map location corresponding to the sampling site does not necessarily coincide exactly with the computer-plotted location on the map (which is at the center of the 4-square-mile averaging area). Thus, the plotted data for springs may be offset from the spring locations shown on the topograhic base map.

The general chemical character of each water (that is, the relative proportions of principal cations and anions) is shown in the trilinear diagrams (side 1) and indicated by a letter code on the map (see "Explanation"). The characteristics and uses of trilinear diagrams are discussed by Hem (1985, p. 178-180). Both the map and the trilinear diagrams used the same depth-and-temperature symbols. The bar graph (side 1) indicates the relative proportion of major cations and anions for the indicated ranges of dissolved-solids concentration.

REFERENCES CITED

Bateman, R. L., 1976, Inventory and chemical quality of ground water in the White River - Muddy River - Meadow Valley Wash area, southeastern Nevada: Desert Research Institute Project Report 40, 45 p.

Ghusn, George, Jr., 1981, Statewide assessment, in Trexler, D. T., Koenig, B. A., Flynn, Thomas, Bruce, J. L., and Ghusn, George, Jr., Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies: Nevada Bureau of Mines and Geology Report DOE/NV/10039-3, p. 191-196.

Harrill, J. R., Welch, A. H., Prudic, D. E., Thomas, J. M., Carman, R. L., Plume, R. W., Gates, J. S., and Mason, J. L., 1983, Aquifer systems in the Great Basin Region of Nevada, Utah, and adjacent states--a study plan: U.S. Geological Survey Open-File Report 82-445, 49 p.

Hem, J. D., 1985, Study and interpretation of the chemical characteristics of natural water (3d ed.): U.S. Geological Survey Water-Supply Paper 2254, 263 p.

Trexler, D. T., Bruce, J. L., Flynn, Thomas, and Koenig, B. A., 1980, Assessment of geothermal resources of Caliente, Nevada: Nevada Bureau of Mines and Geology Report DOE/NV/10039-1, 23 p.

CONVERSION FACTORS AND ABBREVIATIONS

"Inch-pound" units of measure used in this report may be converted to International System (metric) units by using the following factors:

Multiply	*By*	*To obtain*
Feet (ft)	0.3048	Meters (m)
Inch (in.)	25.40	Millimeters (mm)
Square miles (mi^2)	2.590	Square kilometers (km^2)

For temperature, degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) by using the formula °F = [(1.8)(°C)] + 32.

Site designation[1]	Latitude, (deg-min-sec)	longitude[2]	Type of site	Temperature (degrees Celsius)	pH (units)	Specific conductance (microsiemens per centimeter at 25°C)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Silica (mg/L)	Dissolved solids[3] (mg/L)	Cation-anion balance[4]	Sampling date (year-month-day)	Well depth (feet)	Source of data[5]
LYTLE WELL	370522	1141923	Well	21	8.0	385	32	12	20	2.0	160	0	39	14	0.6	32	230	-4	75-07-11	--	Bateman, 1976
GATION WELL	370541	1144713	Well	14	7.7	415	53	14	9.4	3.1	190	0	25	18	0.1	33	250	2	84-06-14	--	WATSTORE
GARDEN SPRING	371552	1141716	Spring	28	7.7	830	100	19	34	2.0	220	0	230	17	1.8	43	550	-5	75-07-11	--	Bateman, 1976
RANDONO WELL, ELGIN, NV	371926	1143008	Well	17	7.6	760	46	14	100	8.4	350	0	63	44	2.3	54	500	-2	84-02-03	115	WATSTORE
STEVENS WELL	371952	1143022	Well	26	8.2	830	46	14	95	8.0	350	0	62	42	2.0	59	500	-3	75-07-03	--	Bateman, 1976
BRADSHAW WELL, ELGIN, NV	372057	1143238	Well	15	7.3	1,100	85	28	120	11	550	0	76	52	2.3	63	710	0	84-02-01	70	WATSTORE
RAILROAD WELL, ELGIN, NV	372104	1143202	Well	16	7.6	730	42	14	98	8.8	300	0	60	42	2.3	51	460	3	84-01-31	--	WATSTORE
ASH SPRING	372749	1151134	Spring	36	7.0	460	43	14	27	7.4	250	0	34	8.5	0.8	30	290	-4	81-07-20	--	WATSTORE
WELL-CLOVER CREEK VALLEY	373048	1141650	Well	22	7.8	415	60	6	8	3.0	180	0	13	26	0.4	58	260	-1	75-07-18	--	Bateman, 1976
CRYSTAL SPRING	373153	1151358	Spring	28	7.3	408	43	21	22	5.0	260	0	34	8.9	0.3	25	290	-3	81-07-20	--	WATSTORE
CITY WELL AT PARK	373657	1143048	Well	15	7.8	398	53	6.6	28	4.6	230	0	5.6	12	1.7	47	270	3	--	--	Trexler and others, 1980
LDS WELL	373704	1143045	Well	24	7.6	813	53	16	69	20	340	0	54	23	1.4	95	500	1	--	--	Trexler and others, 1980
K. PHILLIPS WELL	373714	1143048	Well	42	7.8	482	30	8.0	50	18	210	0	31	17	1.4	110	370	2	--	--	Trexler and others, 1980
HOT SPRINGS MOTEL WELL	373715	1143035	Well	45	8.0	504	35	6.9	50	22	200	0	30	30	1.4	140	410	3	--	--	Trexler and others, 1980
L. VAN KIRK WELL	373717	1143045	Well	43	8.1	462	25	6.4	54	23	230	0	19	13	1.7	110	370	2	--	--	Trexler and others, 1980
MILLER WELL	373718	1143047	Well	40	7.8	554	46	8.3	47	16	250	0	44	20	1.4	110	420	-1	--	--	Trexler and others, 1980
HOSPITAL REINJECTION WELL	373723	1143048	Well	29	7.5	617	40	6.4	70	36	320	0	32	9.3	2.5	150	500	2	--	--	Trexler and others, 1980
HOSPITAL ABANDONED WELL	373723	1143050	Well	49	7.8	476	38	6.6	46	17	190	0	37	15	1.4	100	350	6	--	--	Trexler and others, 1980
WALLIS WELL	373749	1143040	Well	67	7.7	414	33	4.7	40	15	190	0	33	8.0	1.5	100	330	1	--	--	Trexler and others, 1980
NEAR CRESTLINE	373843	1140529	Well	22	7.5	385	49	7.0	2.0	5.0	140	0	13	29	0.2	72	240	-2	--	--	Bateman, 1976
GUNDERSON WELL	373959	1154935	Well	28	7.9	309	16	1.8	44	7.0	120	0	35	12	2.5	100	280	0	--	--	Ghusn, 1981
WELL PAHRANGAT VALLEY	374000	1151150	Well	20	6.7	525	42	20	34	10	230	0	30	15	0.4	65	330	6	75-07-27	--	Bateman, 1976
NOT SPECIFIED	374826	1142250	Spring	29	7.8	385	30	9.4	42	7.3	180	0	29	15	1.6	51	270	4	84-04-26	--	WATSTORE
N06 E57 05B	375355	1153840	Well	34	7.6	405	52	10	19	2.7	220	0	23	5.4	0.3	24	250	1	68-09-11	--	WATSTORE
NOT SPECIFIED	375355	1153843	Spring	21	7.7	525	57	7.7	45	2.8	230	0	48	23	0.6	37	330	1	68-09-14	--	WATSTORE
WELL NEAR PIOCHE	375724	1142504	Well	24	7.3	280	33	4.0	13	5.0	110	0	11	21	0.3	68	210	1	75-07-25	--	Bateman, 1976

[1] Sample-site designations having format N06 E57 05B indicate township, range, and section, respectively; letter following section number indicates quarter section, as follows: A, northeast; B, northwest; C, southwest; D, southeast. Townships and ranges are referenced to Mount Diablo base line and meridian.

[2] Data are listed in order of increasing latitude and, for identical latitudes, increasing longitude.

[3] Computed sum (with bicarbonate multiplied by 0.492 to make results comparable with residue-on-evaporation values).

[4] Computed as described in introductory text. Negative value indicates that anions exceed cations.

[5] WATSTORE is U.S. Geological Survey's National Water Data Storage and Retrieval System. Citations for other sources are listed under "References Cited."