SELECTED GROUND–WATER DATA FOR YUCCA MOUNTAIN REGION, SOUTHERN NEVADA AND EASTERN CALIFORNIA, THROUGH DECEMBER 1994

by Craig L. Westenburg and Richard J. La Camera

U.S. GEOLOGICAL SURVEY

Open-File Report 96-205

Prepared in cooperation with the
NEVADA OPERATIONS OFFICE,
U.S. DEPARTMENT OF ENERGY, under
Interagency Agreement DE-AI08-92NV10874

Carson City, Nevada
1996

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[Plate is in pocket]

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To Obtain
acre-foot (acre-ft)	1,233	cubic meter
foot (ft)	0.3048	meter
gallon per minute (gal/min)	0.06309	liter per second
inch (in.)	2.540	centimeter
mile (mi)	1.609	kilometer
million gallons (Mgal)	3,785	cubic meter
pound per square inch (lb/in^2)	6.896	kilopascal

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929, formerly called "Sea-Level Datum of 1929"), which is derived from a general adjustment of the first-order leveling networks of the United States and Canada.

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ABSTRACT

The U.S. Geological Survey, in support of the U.S. Department of Energy, Yucca Mountain Site Characterization Project, collects, compiles, and summarizes hydrologic data in the Yucca Mountain region. The data are collected to allow assessments of ground-water resources during studies to determine the potential suitability of Yucca Mountain for storing high-level nuclear waste.

Data on ground-water levels at 36 sites, ground-water discharge at 6 sites, and ground-water withdrawals within Crater Flat, Jackass Flats, Mercury Valley, and the Amargosa Desert are presented for calendar year 1994. Data collected prior to 1994 are graphically presented and data collected by other agencies (or as part of other programs) are included to further indicate variations of ground-water levels, discharges, and withdrawals through time.

A statistical summary of ground-water levels at seven wells in Jackass Flats is presented. The statistical summary includes the number of measurements, the maximum, minimum, and median water-level altitudes, and the average deviation of measured water-level altitudes for selected baseline periods and for calendar years 1992-94.

INTRODUCTION

Investigations are in progress or planned to determine the potential suitability of Yucca Mountain for storing high-level nuclear waste. The U.S. Department of Energy (USDOE) has declared that all facilities and activities associated with such investigations will be operated in a manner that maintains or protects environmental quality, and has established programs to allow assessments of environmental quality. In April 1989, the U.S. Geological Survey (USGS) began a cooperative program with USDOE to develop a monitoring program for ground-water resources in the vicinity of Yucca Mountain. The purposes of the monitoring program are to (1) document the historical and current conditions of ground-water resources, (2) detect and document changes in those resources during the investigations of Yucca Mountain, and (3) provide a basis for analyzing and identifying potential adverse effects on ground-water resources resulting from investigations of Yucca Mountain.

Purpose and Scope

This report presents and summarizes, in tabular and graphical form, data collected as part of the water-resources monitoring program. Included are 1994 data on ground-water levels at 36 sites, ground-water discharge at 6 sites (includes a flowing well), and ground-water withdrawals within Crater Flat, Jackass Flats, Mercury Valley, and Amargosa Desert. Data on ground-water levels, discharges, and withdrawals collected by other agencies (or collected as part of other programs) are included to further indicate variations through time at selected monitoring locations. A discussion of ground-water data for Jackass Flats includes a statistical summary of the data.

This report is the third of a series as part of the U.S. Geological Survey water-resources monitoring program. Parts of the text are taken from the first report in the series (La Camera and Westenburg, 1994), which includes data through December 1992. Hale and

Westenburg (1995) present data through calendar year 1993 in the second report of the series. Hereafter, the first two reports of this series are referred to as previous reports on selected ground-water data for the Yucca Mountain region.

Additional information for sites CF-2, JF-1, JF-2, JF-2a, J-13, J-11, and J-12 is presented by Boucher (1994), Gemmell (1990), Lobmeyer and others (1995), Luckey and others (1993), McKinley and others (1991), O'Brien (1991, 1993), O'Brien and others (1995), Robison (1984), Robison and others (1988), and Tucci and others (in press a, in press b).

Acknowledgments

Several organizations and programs contributed to this report. Specifically, data were provided by National Park Service; U.S. Fish and Wildlife Service; Nevada Department of Conservation and Natural Resources, Division of Water Resources; Nevada Department of Transportation; Cind-R-Lite Company; Raytheon Services Nevada; Reynolds Electrical and Engineering Company; Saga Exploration Company; U.S. Borax Corporation; U.S. Nevada Gold Search; USGS-Hydrologic Resources Management and Environmental Restoration Programs; and USGS-Yucca Mountain Project Branch studies of saturated-zone site hydrology and saturated-zone regional hydrology.

Additionally, the authors acknowledge the cooperation of the many individual property owners throughout the Amargosa Desert who allowed access to their property and the collection of hydrologic data.

DESCRIPTION OF STUDY AREA

The study area is the Yucca Mountain region of southern Nevada and eastern California (pl. 1). The Yucca Mountain region, as referred to in this report, is bounded approximately by latitudes 36°15′ and 37°00′ N. and longitudes 116°00′ and 117°00′ W. The region is within the Great Basin, a subdivision of the Basin and Range Physiographic Province (Fenneman, 1931, p. 328).

The study area is in the Death Valley ground-water flow system (Harrill and others, 1988, sheet 1) and, within that flow system, the Alkali Flat-Furnace Creek Ranch and Ash Meadows ground-water subbasins. Each ground-water subbasin is a zone consisting of ground-water recharge areas and flow paths to points of discharge at land surface (Waddell and others, 1984, p. 36 and pl. 3; Randell J. Laczniak, U.S. Geological Survey, written commun., 1993). Boundaries of the subbasins are defined on the basis of the location of low-permeability rocks, hydraulic gradients, and water chemistry. These boundaries are general indicators of restrictions on ground-water movement in the region.

Within the Alkali Flat-Furnace Creek Ranch and Ash Meadows subbasins, the study area is further subdivided by hydrographic areas (pl. 1). As defined by Rush (1968, p. 4), hydrographic areas generally consist of valleys (topographic lows) extending to their surrounding surface-water drainage divides (topographic highs). Hydrographic areas in the study area include Crater Flat, Jackass Flats, most of Rock Valley and Mercury Valley, and parts of Amargosa Desert and Death Valley (Rush, 1968; Harrill and others, 1988, sheet 2).

Alkali Flat-Furnace Creek Ranch Ground-Water Subbasin

In the Alkali Flat-Furnace Creek Ranch ground-water subbasin, ground-water recharge results principally from subsurface interbasin inflow and precipitation on mesas and mountains north of the study area. Subsurface interbasin inflow also may occur near the Ash Meadows area in the Amargosa Desert (Waddell and others, 1984, p. 29-36; Harrill and others, 1988, sheet 2). Ground water discharges principally in Death Valley and at Alkali Flat about 5 mi southeast of Death Valley Junction (Waddell and others, 1984, p. 38).

In the part of the subbasin within the northern half of the study area, ground-water flow is generally to the south or southeast. In the part of the subbasin within the southern half of the study area, ground-water flow is to the southeast toward Alkali Flat or southwest toward Death Valley (Waddell and others, 1984, pl. 3; Kilroy, 1991, p. 9-10).

Crater Flat and Jackass Flats (which include Yucca Mountain), most of Rock Valley, the west-central part of the Amargosa Desert, and part of the Death Valley hydrographic areas are within the Alkali Flat-Furnace Creek Ranch subbasin (pl. 1).

Ash Meadows Ground-Water Subbasin

In the Ash Meadows ground-water subbasin, ground-water recharge principally results from subsurface interbasin inflow and precipitation on mountains to the east and northeast of the study area (Waddell and others, 1984, p. 38; Harrill and others, 1988, sheet 2). Ground water discharges principally as springflow in the Ash Meadows area, and possibly as underflow into the Alkali Flat-Furnace Creek Ranch ground-water subbasin (Waddell and others, 1984, p. 36, 39). Ground water in the subbasin generally flows to the west or southwest (Waddell and others, 1984, p. 29, 38, and pl. 3; Harrill and others, 1988, sheet 2).

Most of Mercury Valley and the eastern part of the Amargosa Desert hydrographic areas are within the Ash Meadows subbasin (pl. 1). The southeastern part of the Amargosa Desert includes the Ash Meadows spring-discharge area. The Ash Meadows spring-discharge area is the gently sloping land watered by numerous springs (Dudley and Larson, 1976, p. 5) at the southwestern edge of the subbasin.

DATA-COLLECTION SITES

Locations of data-collection sites are shown on plate 1. Table 1 includes information on site identification, site location, site owner, and the types of data contained in this report for each site. Table 2 includes information on site identification, well construction, source of well-construction data, and contributing lithologic units. Monitoring site MV-1 did not have water-level data available in 1994, but is included because it is a part of the monitoring network. Sites CF-3, AD-3a, and AD-7a were added to the monitoring network in 1994 to replace sites AD-3, in which the water surface became inaccessible in 1993, AD-4, which is no longer measured at the owner's request, and AD-7, which was redrilled and developed by the new owner in 1994. All sites are wells or springs except site AM-4 (Devils Hole), which is an open fissure that intersects the ground-water table.

Site Number

Sites are identified on plate 1 and in table 1 by an alphanumeric number that also is used in tables, figures, and text of this report. The site number consists of two parts. The first part represents the hydrographic area in which the site is located: "CF" represents Crater Flat; "JF" or "J," Jackass Flats; "RV," Rock Valley; "MV," Mercury Valley; "AD" or "AM," Amargosa Desert; and "DV," Death Valley. "AM" further indicates that the site is located in the Ash Meadows spring-discharge area. The second part of the number represents the relative location of the site within the hydrographic area (or Ash Meadows spring-discharge area). Within each hydrographic area, sites generally are numbered sequentially in a north-to-south, then west-to-east order. Sites added subsequent to the initial numbering also are numbered as indicated above or are assigned the number of a nearby site and given the suffix of "a." Exceptions are sites J-13, J-11, and J-12, which are or were water-supply wells and were previously numbered by Raytheon Services Nevada; they were not renumbered for this report. The sequence of sites given in table 1 is used elsewhere throughout the report.

U.S. Geological Survey Site Identification

Sites are identified by the standard U.S. Geological Survey identification number, which is based on latitude and longitude. The site identification serves as a unique identification number in files and data bases of the USGS and indicates the approximate geographic location of each site. The identification consists of 15 digits: The first 6 denote the degrees, minutes, and seconds of latitude; the next 7 denote degrees, minutes, and seconds of longitude; and the last 2 digits (assigned sequentially) identify the site within a 1-second grid. For example, site 363530116021401 is at 36°35'30" latitude and 116°02'14" longitude, and it is the first site recorded in that 1-second grid. If a more precise latitude and longitude are subsequently determined, the unique identification number remains unchanged. Latitude and longitude shown for a site, therefore, are the most accurate locators.

Local Site Number

The local site number (table 1) is based on an index of hydrographic areas (Rush, 1968; Harrill and others, 1988) and the rectangular subdivision of the public

Table 1. Index to monitoring sites in Yucca Mountain region for calendar year 1994

Site number: Sites are grouped by hydrographic area and, within each area, are listed in general north-to-south, then west-to-east order. See text section titled "Site Number" for further discussion.

U.S. Geological Survey site identification: Unique identification number for sites as stored in files and data bases of U.S. Geological Survey.

Local site number: Alphanumeric number based on location of site within hydrographic areas and rectangular subdivisions of public lands. See text section titled "Local Site Number" for further discussion.

Owner: Abbreviations listed for sites owned by federal agencies: BLM, Bureau of Land Management; NPS, National Park Service; USDOE, U.S. Department of Energy; USFWS, U.S. Fish and Wildlife Service; USGS, U.S. Geological Survey.

Data type: Type of data included in this report. D, ground-water discharge; L, ground-water level; --, data not available for 1994.

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Local site number		Owner	Data type
CF-1	365520116370301	GEXA Well 4	365520	1163703	229	S12 E48 04DBB1	U.S. Nevada Gold Search	L
CF-1a	365445116383901	GEXA Well 3	365445	1163839	229	S12 E48 07ADD1	U.S. Nevada Gold Search	L
CF-2	364732116330701	USW VH-1	364732	1163307	229	S13 E48 27C1	USDOE	L
CF-3	364105116302601	Cind-R-Lite Well	364105	1163026	229	S15 E48 01AAA1	Cind-R-Lite Block Company	L
JF-1	365116116233801	UE-25 WT 15	365116	1162338	227A	S12 E50 33A1	USDOE	L
JF-2	364945116235001	UE-25 WT 13	364943	1162351	227A	S13 E50 18B1	USDOE	L
JF-2a	364938116252102	UE-25p 1 PTH	364938	1162521	227A	S13 E49 14A1	USDOE	L
J-13	364828116234001	J-13 WW	364828	1162340	227A	S13 E50 19C1	USDOE	L
J-11	364706116170601	J-11 WW	364706	1161706	227A	S13 E51 31B1	USDOE	L
J-12	364554116232401	J-12 WW	364554	1162324	227A	S14 E50 06A1	USDOE	L
JF-3	364528116232201	JF-3 Well	364528	1162322	227A	S14 E50 06D1	USDOE	L
RV-1	363815116175901	TW-5	363815	1161759	226	S15 E50 24A1	USDOE	L
MV-1	363530116021401	Army 1 WW	363530	1160214	225	S16 E53 05ADB1	USDOE	--
AD-1	364141116351401	NA-6 Well BGMW-10	364130	1164112	230	S14 E47 32DA1	USGS	L
AD-2	363830116241401	Airport Well	363825	1162433	230	S15 E49 24ABB1	Doing, Warren	L
AD-2a	363835116234001	NDOT Well	363835	1162358	230	S15 E50 18CCDB1	NV Dept. of Transportation	L
AD-3a	363521116352501	Davidson Well	363526	1163529	230	S16 E48 05CAB1	Davidson, Robert	L
AD-4a	363428116234701	Cooks East Well	363428	1162347	230	S16 E50 07CABB1	Cook, Lewis C.	L
AD-5	363310116294001	USBLM Well	363323	1162944	230	S16 E49 18DCCA1	BLM	L
AD-6	363213116133800	Tracer Well 3	363213	1161338	230	S16 E51 27BAA3	USGS	L
AD-7	363009116302701	Hallowell Well	363009	1163027	230	S17 E48 01AB1	Hallowell, David	L
AD-7a	363009116302702	Blackman Well	363009	1163027	230	S17 E48 01AB2	Blackman, Larry	L
AD-8	362929116085701	Cherry Patch Well	362929	1160857	230	S17 E52 08CDB1	Clark, Hershel & Et al	L
AD-9	362848116264201	Gilgans North Well	362848	1162646	230	S17 E49 15BBBB1	Steelman, James C.	L
AD-10	362525116274301	NA-9 Well	362525	1162743	230	N26 E05 05BC1	USGS	L
AD-11	361954116181201	GS-3 Well	361957	1161752	230	S19 E50 01BBD1	USGS	L
AD-12	362014116133901	GS-1 Well	362021	1161330	230	S18 E51 34CBD1	USGS	L
AD-13	361724116324201	S-1 Well	361724	1163242	230	N25 E04 21CB1	USGS	L
AD-14	361817116244701	Death Valley Jct Well	361817	1162447	230	N25 E05 14CB1	Ettie, Lee	L
AM-1	362858116195301	Rogers Spring Well	362855	1161950	230	S17 E50 10CDD1	USFWS	L
AM-1a	362924116203001	Fairbanks Spring	362926	1162028	230	S17 E50 09AD1	USFWS	D
AM-2	362755116190401	Five Springs Well	362755	1161904	230	S17 E50 23BBCA1	USFWS	D,L
AM-3	362555116205301	Garners Well	362555	1162053	230	S17 E50 33CAAB1	Garner, George	L
AM-4	362532116172700	Devils Hole	362532	1161727	230	S18 E50 36DC1	NPS	L
AM-5	362529116171100	Devils Hole Well	362530	1161715	230	S17 E50 36DDC1	USFWS	L
AM-5a	362502116192301	Crystal Pool	362513	1161927	230	S18 E50 03ADBA1	USFWS	D
AM-6	362432116165701	Point of Rocks North Well	362432	1161657	230	S18 E51 07BBBB1	USFWS	L
AM-7	362417116163600	Point of Rocks South Well	362420	1161637	230	S18 E51 07BDB1	USFWS	L
AM-8	362230116162001	Big Spring	362229	1161625	230	S18 E51 19ACB1	USFWS	D
DV-1	362728116501101	Texas Spring	362728	1165011	243	N27 E01 23ABB1	NPS	D
DV-2	362252116425301	Navel Spring	362252	1164253	243	N26 E02 13BD1	U.S. Borax & Chem. Corp.	D
DV-3	362230116392901	Travertine Point 1 Well	362235	1163929	243	N26 E03 21CA1	U.S. Borax & Chem. Corp.	L

lands referenced to the Mount Diablo base line and meridian for sites in Nevada or San Bernadino base line and meridian for sites in California. Each local site number consists of four units separated by spaces: The first unit is the hydrographic area number. The second unit is the township, preceded by an N or S to indicate location north or south of the base line. The third unit is the range, preceded by an E to indicate location east of the meridian. The fourth unit consists of the section number and letters designating the quarter section, quarter-quarter section and so on (A, B, C, and D, indicate the northeast, northwest, southwest, and southeast quarters, respectively), followed by a number indicating the sequence in which the well was recorded. For example, site 230 S18 E51 34CBD1 is in the Amargosa Desert (hydrographic area 230) and is the first site recorded in the southeast quarter of the northwest quarter of the southwest quarter of section 34, Township 18 South, Range 51 East, Mount Diablo base line and meridian.

Data Type

Data type (table 1) identifies the types of data (water level and discharge) presented for each site. Ground-water-level data are in tables 5-7 and ground-water-discharge data are in table 8.

Accessible Well Depth

Accessible well depth (table 2) is the measurable depth to the bottom of the well. The drilled depth may be greater than the depth of the well due to modifications of the well, obstructions, or accumulation of sediment at the bottom of the well. The depth of each well was measured by USGS (depths noted with "s") or was reported by other data sources. The USGS measured depths less than 1,000 ft by "sounding" the bottom of the well with weighted steel or electric tapes.

Top and Bottom of Open Interval

Open intervals (table 2) are parts of the borehole that are open to the surrounding lithologic intervals and may allow water to enter the well. An uncased section of a borehole is considered an open interval in this report.

Type of Open Interval

Type of open interval (table 2) is a physical description of the open intervals of a borehole. The types of openings are perforated or slotted casing, screened casing, and open hole with no casing.

Data Source

Data sources (table 2) are organizations or publications that provided information on depth of the well, open interval, and type of opening. Drillers' logs or records are filed with the Nevada Division of Water Resources (NDWR) or maintained by the well owner; Fenix and Scisson, Inc., and Raytheon Services Nevada are or were contractors for USDOE and maintain a summary of well-construction information for selected wells in the area. Publications are USGS reports written for USDOE as part of cooperative studies associated with weapons-testing hydrology programs (Thordarson and others, 1967; Johnston, 1968) or Yucca Mountain site-characterization studies (Robison and others, 1988; Luckey and others, 1993).

Contributing Lithologic Units

Contributing units (table 2) are the principal lithologic intervals at the site that yield water to the well. Robison and others (1988) describe the contributing units at sites CF-2, JF-1, JF-2, JF-2a, and J-13. McKinley and others (1991) describe the contributing units for sites J-11, J-12, MV-1, AD-4a, AD-5, AD-6, AD-8, and AM-8. Dudley and Larson (1976) describe the contributing units for sites AM-2, AM-5, and AM-7. Contributing-unit data are not available from listed data sources for some wells; the contributing units indicated for those wells are based on geologic data derived from drillers' logs and depth-to-water data.

Table 2. Well-completion data at monitoring sites in Yucca Mountain region

Site number: Sites are grouped by hydrographic area and, within each area, are listed in general north-to-south, then west-to-east order. See section "Site Number" for further discussion.

U.S. Geological Survey site identification: Unique identification number for site as stored in files and data bases of U.S. Geological Survey (USGS).

Accessible well depth: Well depths listed are as reported in sources listed in explanation for Data Source below or as measured by USGS personnel since September 1990 (noted with 's'). See section "Accessible Well Depth" for further discussion.

Casing diameter at land surface: Casing segment most prominent at land surface. Diameters have been rounded to nearest inch.

Top of open interval: Depth to top part(s) of borehole that can receive ground water from lithologic interval. As reported in sources listed in explanation for Data Source. Uncased borehole is designated open interval in this table. Open interval may be deeper than accessible well depth, which may reflect original drilled depth. U, unknown, no data.

Bottom of open interval: Depth to bottom part(s) of borehole that can receive ground water from lithologic interval. As reported in sources listed in explanation for Data Source. Uncased borehole is designated open interval in this table. Open interval may be deeper than accessible well depth, which may reflect original drilled depth. U, unknown, no data.

Diameter of open interval: Casing diameter has been rounded to nearest inch. Hole diameter is listed where no casing is present. U, unknown, no data.

Type of open interval: Description of open interval. P, perforated or slotted casing; S, screen, type not known; U, unknown, no data; X, uncased borehole.

Data source: D, Nevada well driller's log or report, or Fenix & Scisson, Inc., or Raytheon Services Nevada hole-history data; J, Johnston (1968); L, Luckey and others (1993); M, no source, data not available; O, Owner of well; R, Robison and others (1988); T, Thordarson and others (1967).

Contributing units: Saturated lithologic interval yielding water to well. C, carbonate rock; F, valley fill; S, undifferentiated sedimentary rock; V, volcanic rock.

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Accessible well depth (feet below land surface)	Casing diameter at land surface (inches)	Open interval				Data source	Contributing units
					Feet below land surface		Diameter (inches)	Type		
					Top	Bottom				
CF-1	365520116370301	GEXA Well 4	1,600	15	800	1,600	10	P	D	V
CF-1a	365445116383901	GEXA Well 3	700	7	208	313	6	P	D	S
					513	618	6	P		
					658	700	6	P		
CF-2	364732116330701	USW VH-1	2,501	10	911	2,501	6	X	R	V
CF-3	364105116302601	Cind-R-Lite Well	460	9	320	460	8	P	D	S
JF-1	365116116233801	UE-25 WT 15	1,360	11	127	130	15	X	R	V
					130	1,360	9	X		
JF-2	364945116235001	UE-25 WT 13	1,160	11	222	224	15	X	D	V
					224	1,150	9	X		
					1,150	1,160	8	X		
JF-2a	364938116252102	UE-25p 1 PTH	5,923	24	4,256	4,279	10	X	L	C
					4,279	5,900	7	X		
					5,900	5,923	6	X		
J-13	364828116234001	J -13 WW	3,488	13	996	1,301	13	P	T	V
					1,301	1,386	12	P		
					2,690	3,312	5	P		
					3,385	3,488	8	X		

Table 2. Well completion data at monitoring sites in Yucca Mountain region—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Accessible well depth (feet below land surface)	Casing diameter at land surface (inches)	Open interval				Data source	Contributing units
					Feet below land surface		Diameter (inches)	Type		
					Top	Bottom				
J-11	364706116170601	J -11 WW	1,327	13	1,075	1,095	13	P	D	V
					1,242	1,298	13	P		
J-12	364554116232401	J -12 WW	1,139	13	793	868	12	P	D	V
					887	1,139	12	X		
JF-3	364528116232201	JF- 3 Well	1,138	9	735	1,138	9	P	D	V
RV-1	363815116175901	TW- 5	800 s	6	735	800	6	P	T	S
					800	916	U	X		
MV-1	363530116021401	Army 1 WW	1,953	11	800	1,050	11	P	D	C
					1,368	1,370	10	X		
					1,370	1,684	9	X		
					1,684	1,953	7	X		
AD-1	364141116351401	NA-6 Well BGMW-10	960	2	930	940	2	S	D	F
AD-2	363830116241401	Airport Well	750 s	14	360	777	14	P	D	F
AD-2a	363835116234001	NDOT Well	495	7	395	495	8	P	D	F
AD-3a	363521116352501	Davidson Well	240 s	16	120	250	15	P	D	F
AD-4a	363428116234701	Cooks East Well	269 s	13	147	213	12	P	D	F
					238	286	12	P		
AD-5	363310116294001	USBLM Well	348 s	12	U	U	U	U	M	F
AD-6	363213116133800	Tracer Well 3	678 s	8	620	807	6	X	J	C
AD-7	363009116302701	Hallowell Well	112 s	16	73	131	15	P	D	F
AD-7a	363009116302702	Blackman Well	210	7	U	U	U	U	O	F
AD-8	362929116085701	Cherry Patch Well	215 s	15	U	U	U	U	M	F
AD-9	362848116264201	Gilgans North Well	396 s	12	60	90	12	P	D	F
					154	244	12	P		
					245	396	13	X		
AD-10	362525116274301	NA-9 Well	1,090	2	1,063	1,066	2	S	D	F
AD-11	361954116181201	GS-3 Well	2,000	2	1,969	1,979	2	S	D	F
AD-12	362014116133901	GS-1 Well	1,580	2	1,549	1,559	2	S	D	F
AD-13	361724116324201	S-1 Well	2,000	2	1,969	1,979	2	S	D	F
AD-14	361817116244701	Death Valley Jct Well	225 s	12	160	200	12	S	D	F

Table 2. Well completion data at monitoring sites in Yucca Mountain region—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Accessible well depth (feet below land surface)	Casing diameter at land surface (inches)	Open interval				Data source	Contributing units
					Feet below land surface		Diameter (inches)	Type		
					Top	Bottom				
AM-1	362858116195301	Rogers Spring Well	202 s	16	100	240	12	P	D	F
					240	420	13	X		
AM-2	362755116190401	Five Springs Well	123 s	13	0	100	13	P	D	C
					100	140	14	X		
AM-3	362555116205301	Garners Well	202 s	9	140	180	8	P	O	F
AM-5	362529116171100	Devils Hole Well	200 s	17	48	248	16	P	D	F
AM-6	362432116165701	Point of Rocks North Well	500	15	139	500	16	P	D	F
AM-7	362417116163600	Point of Rocks South Well	586 s	17	132	467	14	P	D	C
					468	818	14	X		
DV-3	362230116392901	Travertine Point 1 Well	650 s	4	100	970	5	X	D	C

DATA-COLLECTION PROCEDURES AND EQUIPMENT

Data-collection procedures and equipment used by the U.S. Geological Survey Environmental-Monitoring Program (USGS-EMP) and other sources are described by La Camera and Westenburg (1994, p. 7-13). Water-level and discharge data were compiled from available sources, from USGS files and data bases, and measurements made by USGS-EMP personnel. Water-use data are compiled from available sources as described in the section "Ground-Water Withdrawal Data."

Periodic Water-Level Data

Periodic water-level measurements (table 5) are generally made during site visits, using one of the methods described in the section "Water-Level Measurements." An exception is data that are based on water levels continually collected by the National Park Service at site AM-4 (Devils Hole; see "Other"). Supplemental information, including land-surface altitude, height of measurement point, method of measurement, site status, and source of data, is listed also in table 5.

Land-Surface Altitude and Height of Measurement Point

Land-surface altitude and height of the measurement point (MP) above (or depth below) land surface are included with periodically collected data in table 5. Land-surface altitude is a representative altitude of land at or near the site. An exception is site AM-4, where the land-surface altitude represents the altitude of the measurement point (a bolt fastened to the south wall of the fissure) that is not referenced to land surface. Land surveys were made by USGS personnel at the monitoring sites to determine the altitudes of land surface or the MP.

Heights of MP's for sites in Amargosa Desert (except AM-4), Death Valley, and Rock Valley were determined by measuring the distance of the MP above (or depth below) a representative point on the land surface at or near the well. The altitude of the MP was determined during the USGS land survey, and land-surface altitude was computed by adding or subtracting the MP height from the surveyed MP altitude.

At sites JF-1, JF-2, JF-2a, and J-13, USGS land surveys verified previously reported land-surface and MP altitudes. At sites CF-2, J-11, and J-12, USGS land surveys verified the previously reported land-surface altitudes and determined the MP altitude. At sites CF-1, CF-1a, and MV-1, USGS land surveys determined the land surface and MP altitudes. The height of the MP is the difference between the MP altitude and land-surface altitude. Land-surface altitudes are reported to the nearest tenth of a foot.

Depth to Water and Altitude of Water Surface

Depth to water is the depth to water below land surface. It is computed as the measured depth to water below the MP minus the height of the MP (above land surface) at the well. An exception is site AM-4, where depth to water is measured below the MP, and the MP is not referenced to land surface. Where depth to water is negative (site AM-2), the water surface is above land surface.

The altitude of water surface is the depth to water subtracted from the altitude of land surface and is reported to the nearest tenth of a foot.

Water-Level Measurements

Periodic water-level measurements were made or calculated using the procedures and equipment described in the following sections.

Calibrated Electric Tape

USGS-EMP personnel used four calibrated electric tapes during 1994. Each tape was marked with a unique identifier (YMP-1, YMP-2, YMP-5, and YMP-6) for quality-assurance purposes and each tape was calibrated against either the U.S. Geological Survey Site-Characterization Program (USGS-SCP) 2,600-ft calibrated steel tape for depths to water greater than 500 feet or the USGS-EMP 500-ft reference steel tape. Calibration data for the electric tapes are summarized in table 3. For USGS-SCP tapes, the correction was that used by USGS-SCP personnel at the time of measurement and is equal to the difference between the corrected and uncorrected readings; the corrections to reference steel tapes are applied to account for mechanical stretch and thermal expansion of the tape.

Table 3. Electric-tape calibration data used to derive correction factors for calendar year 1994

Date	Location	Tape used	Depth below measuring point		Correction (feet)
			Uncorrected (feet)	Corrected (feet)	
03/31/93	J-12	USGS-SCP ST (steel tape)	745.16	745.13	-0.03
		YMP-2	745.62	745.13	-.49
04/22/93	CF-2	USGS-SCP ST	605.02	604.98	-.04
		YMP-2	605.43	604.98	-.45
05/11/93	J-12	USGS-SCP ST	744.90	744.87	-.03
		YMP-1	745.52	744.87	-.65
11/08/93	J-12	USGS-SCP ST	745.25	745.22	-.03
		YMP-1	745.83	745.22	-.61
		YMP-5	744.93	745.22	+.29
11/09/93	CF-2	USGS-SCP ST	605.35	605.31	-.04
		YMP-5	605.14	605.31	+.17
		YMP-6	605.56	605.31	-.25
11/15/93	AD-11	USGS-EMP ST	226.79	226.79	.00
		YMP-5	226.84	226.79	-.05
		YMP-6	226.89	226.79	-.10
	AD-13	USGS-EMP ST	383.81	383.81	.00
		YMP-5	383.76	383.81	+.05
		YMP-6	383.91	383.81	-.10
11/18/93	AD-2a	USGS-EMP ST	342.64	342.64	.00
		YMP-5	342.60	342.64	+.04
		YMP-6	342.72	342.64	-.08
	AD-5	USGS-EMP ST	120.05	120.05	.00
		YMP-5	120.07	120.05	-.02
		YMP-6	120.11	120.05	-.06
05/5/94	J-12	USGS-SCP ST	745.12	745.09	-.03
		YMP-1	745.88	745.09	-.79
		YMP-5	744.65	745.09	+.44
	CF-2	USGS-SCP ST	605.08	605.04	-.04
		YMP-5	604.77	605.04	+.27
05/19/94	AD-11	USGS-EMP ST	226.90	226.90	.00
		YMP-5	226.90	226.90	.00
	AD-5	USGS-EMP ST	122.50	122.50	.00
		YMP-5	122.50	122.50	.00
	AD-13	USGS-EMP ST	383.10	383.10	.00
		YMP-5	383.05	383.10	+.05
01/11/95	AD-13	USGS-EMP ST	383.95	383.95	.00
		YMP-5	383.93	383.95	+.02
	AD-5	USGS-EMP ST	121.50	121.50	.00
		YMP-5	121.53	121.50	-.03

Table 3. Electric-tape calibration data used to derive correction factors for calendar year 1994—Continued

Date	Location	Tape used	Depth below measuring point		Correction (feet)
			Uncorrected (feet)	Corrected (feet)	
01/12/95	J-12	USGS-SCP ST	745.39	745.36	-.03
		YMP-1	746.16	745.36	-.80
		YMP-5	744.94	745.36	+.42
	CF-2	USGS-SCP ST	605.20	605.16	-.04
		YMP-5	604.93	605.16	+.23
01/18/95	AD-1	USGS-EMP ST	271.26	271.26	.00
		YMP-5	271.28	271.26	-.02

No corrections were necessary for the USGS-EMP reference steel tape. The correction for the electric tapes is the difference between the corrected USGS-SCP measurement or USGS-EMP steel-tape measurement and the USGS-EMP uncorrected measurement.

A summary of correction factors applied to USGS-EMP electric tapes, based on calibration data, is listed in table 4. These correction factors were computed from the corrections determined during tape calibrations listed in table 3 and account for mechanical stretch, inaccurate markings, and physical condition of electric tapes. The appropriate correction factor for electric-tape water-level measurements was determined by the date and depth to water listed in table 4. The correction factor used for a certain tape at a particular depth and time may represent the average of several corrections listed in table 3. For some measurement periods, the correction factor varied from the start of the period to the end of the period. The beginning and ending correction factors are shown in table 4 (represented by "to") and are evenly distributed with time through the measurement period. The measurement period represents the period in which those correction factors were used for the given depth-to-water range using a given electric tape.

Calibrated electric tapes were used at all sites when frequent repetitive measurements were required due to fluctuating water levels or depths to water were greater than 500 feet. Electric-tape measurements are made by lowering the tape to the water surface until a light or buzzer is activated when the probe contacts the water. The tape is raised and lowered slowly until the exact point of contact is located. While holding the tape on the MP, the depth to water below the MP is read from

Table 4. Applied correction factors for electric tapes YMP-1, YMP-2, YMP-5, and YMP-6

[--, no measurements made for given depth-to-water range during period specified]

Tape	Measurement period		Depth to water (feet below measurement point)			
	Start	End	Less than 300 feet	300-400 feet	500-700 feet	Greater than 700 feet
YMP-1	11/08/93	05/05/94	--	--	--	-0.63 to -0.80
	05/05/94	01/12/95	--	--	--	-.80
YMP-2	01/01/94	12/31/94	--	--	-0.47	-.47
YMP-5	11/08/93	05/05/94	-0.02	0.04	.17 to .25	.29 to .43
	05/05/94	01/18/95	-.02	.04	.25	.43
YMP-6	01/01/94	12/31/94	-.08	-.08	-.25	--

markings on the tape. At least one additional reading of depth to water is recorded for every measurement made with a calibrated electric tape to verify the initial reading. Supplemental measurements are made only if the two measured depths differ by more than 0.05 ft. If supplemental measurements indicate the difference is due to fluctuating water level, the measured depths and appropriate site status are recorded. An example of the calculation of depth to water below land surface, at a site, using USGS-EMP calibrated electric tape YMP-5 is shown below:

Location: JF-3
Date: June 28, 1994
Tape ID: YMP-5 **Correction factor: +0.43 ft (for depths greater than 700 ft)**

Depth belowMP	712.05 ft
Correction factor	+.43 ft
Corrected depth below MP	712.48 ft
Height of MP above land surface	-2.27 ft
Depth to water below land surface	710.21 ft

Steel Tape

USGS-SCP personnel made water-level measurements using calibrated steel tapes at sites CF-2, JF-1, JF-2, JF-2a, J-13, J-11, and J-12. Descriptions of the steel tapes, applicable corrections, and procedures used by USGS-SCP for making steel-tape measurements are given by Robison and others (1988, p. 6-11), Gemmell (1990, p. 8-12), and O'Brien (1991, p. 8-13). USGS-SCP steel-tape measurements were compiled from information provided by USGS-SCP (Michelle S. Boucher, U.S. Geological Survey, written communs., 1992-94). Corrected depth-below-MP measurements were provided by USGS-SCP personnel and converted to depth below land surface by USGS-EMP personnel by subtracting the height of the MP above land surface.

Water-level measurements at other sites were made by personnel from the USGS or U.S. Fish and Wildlife Service (USFWS) using 300- or 500-ft reeled steel tapes. General procedures for using 300- and 500-ft reeled steel tapes are to (1) chalk the bottom section of the tape, (2) lower the tape into the well until part of the chalked section is below the water surface, (3) hold the tape on the MP and record the "hold" reading, (4) raise the end of the tape to the surface, observing the "cut" (the top of the wet part of the chalked tape), (5) record the reading of the cut, (6) calculate the depth to water below the MP by subtracting the "cut" reading from the "hold" reading, and (7) calculate the depth to water below land surface by subtracting the height of the MP from the depth to water below MP.

USGS-EMP personnel maintain one 500-ft tape as a reference tape and use three field tapes (two 500-ft and one 300-ft) for routine measurements. All steel tapes are uniquely marked for identification purposes. The field tapes were checked against the reference tape at five sites during December 1992 at depths to water ranging from about 119 to 385 ft. All the steel-tape measurements were within 0.01 ft of the reference tape; as a result, no correction factor was used for water-level measurements made with USGS-EMP steel tapes. At least one additional reading of the depth to water is recorded for every measurement to verify the initial reading. Supplemental measurements are made only if the two measured depths differ by more than 0.05 ft. If supplemental measurements indicate the difference is due to fluctuating water level, the measured depths and appropriate site status are recorded.

Other

Site JF-2a (UE-25p 1 PTH) was equipped with a pressure transducer in March 1985 as part of site-characterization studies (Luckey and others, 1993, p. 117). USGS-SCP personnel calibrate the pressure transducer, develop an equation to convert transducer voltage to depth to water below the MP, and record voltage of the transducer during each site visit. Owing to the small diameter of the access tubes, the transducer must be removed to provide access for measuring the water level with a steel tape. When a steel-tape measurement cannot be made, the depth to water can be computed using the USGS-SCP transducer voltage data and current conversion equation. Periodic water-level measurements at site JF-2a, indicated with method "B" in table 5, are computed using this procedure. Installation, calibration, and operation of pressure transducers by USGS-SCP are described by Luckey and others (1993, p. 14-21).

A water-level recorder, operated by the National Park Service (NPS), at site AM-4 (Devils Hole) records the depth to water below an installed measurement point. The daily mean water levels for each month with a complete record are used to compute a monthly average water level. The monthly average water levels are listed in table 5 as periodic water-level data for the 15th of the month.

Some water-level measurements were made by USFWS with uncalibrated electric tapes; the procedure used is similar to that for a calibrated electric tape, except measurements are not corrected on the basis of comparisons to reference steel tapes.

Site AM-4 (Devils Hole) has a small metal bolt fastened to the south wall of the fissure; the bolt is the measurement point and depth-to-water below the MP is measured with a ruled tape by USGS-EMP personnel.

Methods of water-level measurement were not specified for some data provided by the Nevada Division of Water Resources. Measurements made using unknown methods are indicated by "Z" in table 5.

Continual Water-Level Data

Two sites, JF-3 and AD-6, are instrumented by USGS-EMP to continually record ground-water level, atmospheric pressure, and battery voltage at 15-minute intervals. Instrumentation includes a gaged (vented) pressure sensor installed below the water surface, a barometer, and a data logger. Recorded data are processed to produce data on continual depth to water, atmospheric pressure, battery voltage, and daily average depth to water.

The pressure sensors at sites JF-3 and AD-6 transmit data to the data logger in pounds per square inch, which varies with the height of the water above the sensor. The range of output is 0 to 5.000 lb/in^2, which corresponds to a theoretical range of 0 to 11.53 ft of water above the pressure sensor. The general steps for installing and calibrating pressure sensors and processing pressure-sensor data are as follows:

1. Depth to water below MP is measured with a steel or calibrated electric tape and recorded. If a calibrated electric-tape measurement is made, a correction factor is applied. Depth to water below MP is used for pressure-sensor calibration, rather than depth to water below land surface, because a fixed point of reference is required.

2. The pressure-sensor cable is connected to a data logger and the sensor is lowered down the well until a substantial change in readings indicates the water surface has been reached. These readings are recorded in the data logger and on a field sheet.

3. The sensor is lowered to a set point and the pressure-sensor readings are recorded after the sensor equilibrates. The set-point depth of the sensor is determined by adding the depth-to-water measurement to the depth at which the sensor is installed below the water surface. For example, if the depth-to-water is 710 ft below the MP and the sensor is installed 5 ft below the water surface, the set-point depth is 715 ft. The sensor cable is marked or tagged at the MP. This mark or tag is used for making measurements when the pressure sensor is raised or lowered.

4. Following installation the sensor is calibrated by simulating depths to water. Depth to water below MP is simulated by raising and lowering the pressure sensor. Raising the sensor 1 ft above the set point will decrease the amount of submergence of the pressure sensor by 1 ft, thereby simulating a 1 ft increase in depth to water. For example, if the depth to water is 710 ft below the MP (step 1) and the sensor is raised 1 ft the simulated depth to water below the MP would be 711 ft (710+1=711 ft). Lowering the sensor 1 ft below the set point will increase the amount of submergence of the pressure sensor by 1 ft, thereby simulating a 1 ft decrease in depth to water. If the depth to water is 710 ft below the MP and the sensor is lowered 1 ft, the simulated depth to water below the MP would be 709 ft (710-1=709 ft).

The sensor is raised and lowered at 1/2-, 1-, or 2-ft intervals above or below the set point. The tag or marking placed on the sensor cable at the set point (step 3) provides a reference for measuring the distance the sensor is raised or lowered. After the sensor output has stabilized at each interval, the time, pressure readings from the data logger (in pounds per square inch), distance of sensor above or below the set point, and simulated depth to water are recorded. The sensor cable is marked or tagged at the measured intervals and used for calibration checks. The sensor is raised and lowered for a range of depths that spans the anticipated range of water-level fluctuation.

5. Upon completion of pressure-sensor calibration the sensor is returned to the set point and the time and pressure readings from the data logger are recorded. Another water-level measurement is made with a steel or calibrated-electric tape and recorded to check for fluctuation of the water level during installation or calibration of the sensor.

6. Data recorded while calibrating the sensor are used to develop a regression equation to convert pressure readings to water level below MP. The pressure readings from the data logger and corresponding simulated depths below the MP are regressed using pressure

(in pounds per square inch) as the independent variable and depth below the MP (in feet) as the dependent variable.

Water-level measurements are made with a steel or calibrated-electric tape when a continual monitoring site is visited. The pressure-sensor reading is recorded at the time of the measurement. The reading is converted to depth to water, using the established regression equation, and recorded as predicted water level. The steel tape or calibrated electric tape water-level measurements are used as reference measurements and are compared to the predicted value. Any difference between the reference measurement and predicted value is applied as a correction to the continual record by linearly prorating the difference with time between consecutive visits to account for drift in pressure-sensor output.

Data are periodically retrieved from the data logger using a portable computer, transferred to the USGS National Water-Information System (NWIS), and processed using data-base programs to store pressure-sensor, barometer, and battery data. The pressure-sensor data are converted to depth below land surface and stored. Daily average values are computed from the continual data and stored in the data base. Daily average depth-to-water values are used to compute daily average water-level altitudes, which also are stored in the data base.

Pressure-Sensor System at Site JF-3

Instrumentation is installed at JF-3 to continually collect water-level data every 15 minutes. Equipment was calibrated on November 8, 1993, and a regression equation was developed: depth to water below land surface = (-2.741×pressure reading)+716.507. This equation is used to convert pressure readings stored in the data base to depth to water below land surface. Differences between reference measurements made with calibrated electric tapes and predicted water levels based on conversion of pressure readings ranged from -0.06 ft (January 6, 1994) to 0.02 ft (January 20, 1994). The transducer failed on February 27, 1994. A new transducer was installed and calibrated on March 29, 1994. A new regression equation was developed: depth to water below land surface=(-2.333×pressure reading)+715.310. Differences between reference measurements made with calibrated electric tapes and the predicted water levels, using the new regression equation, ranged from 0.00 ft (March 29, 1994) to -0.22 ft (June 22, 1994). On November 12, 1994, the transducer failed and was replaced January 18, 1995.

Depth-to-water measurements made with calibrated electric tapes during 1994 ranged from 709.95 ft (May 26) to 710.44 ft (October 19) below land surface. The daily average water-levels (table 6) ranged from 709.71 ft (February 17) to 710.70 ft (February 12) below land surface.

Pressure-Sensor System at Site AD-6

Instrumentation is installed at AD-6 to continually collect water-level data every 15 minutes. Equipment was calibrated on November 9, 1993, and a regression equation was developed: depth to water below land surface=(-2.340×pressure reading)+46.731. This equation is used to convert pressure readings stored in the data base to depth to water below land surface. Differences between reference measurements made with reeled steel tapes and predicted water levels based on conversion of pressure readings ranged from -0.10 ft (August 12, 1994) to 0.01 ft (October 6, 1994). No other calibrations were made in 1994.

Depth-to-water measurements made with calibrated electric or reeled steel tapes during 1994 ranged from 41.38 ft (March 22) to 41.65 ft (July 20) below land surface. The daily average water levels (table 7) ranged from 41.37 ft (February 17) to 41.78 ft (February 12 and November 22) below land surface.

Other

Five monitoring sites also are instrumented to continually collect water-level data as part of other programs; that data are collected, processed, and reviewed by personnel associated with other programs and can be obtained from principal investigators for those programs. Sites JF-2 and JF-2a were instrumented by USGS-SCP personnel. Sites RV-1, AM-5, and AM-7 were instrumented as part of the USGS-Hydrologic Resources Management and Environmental Restoration Programs.

Ground-Water Discharge Data

Measurements of ground-water discharge were collected and compiled for five springs and one flowing well. Four of the sites, AM-1a, AM-2, AM-5a, and

AM-8, are in the Ash Meadows spring-discharge area of the Amargosa Desert. The other two sites, DV-1 and DV-2, are in Death Valley.

Discharge measurements were made by NPS, USFWS, and USGS. Periodic or monthly mean discharge data were determined by the use of current meters, flumes, and volumetric techniques. The most commonly used method for measuring discharge was the vertical-axis current meter. This method is used to determine the average velocity of a partial section within a channel cross section. The average velocity of the partial section times the area of the partial section equals discharge of the section. The summation of the discharges for all the partial sections is the total discharge in the channel. This method is described in more detail by Buchanan and Somers (1969).

Some instantaneous discharge values were determined by measuring the depth of water inside a flume. This depth, or stage, is compared to an applicable stage-discharge relation for the flume to determine discharge. Where a continuous-recording instrument has been installed on a flume, monthly mean discharges can be computed from data collected and processed for an extended period. This method was used for site DV-1, where monthly mean discharge was computed only for months with complete data and reported for the 15th of the month. Determining discharges by the use of flumes is further described by Kilpatrick and Schneider (1983).

The volumetric method was used for measuring ground-water discharge from sites AM-2 and DV-2. A container with markings indicating known volumes was used to collect all discharge from the site while a stopwatch was used to determine the amount of time the discharge was collected. The container was positioned to collect the discharge and the stopwatch was started simultaneously. The container was removed, before it was overfilled, and the stopwatch was stopped simultaneously. The volume collected and elapsed time were recorded. The discharge rate is the volume collected divided by the time. This procedure was repeated three times and an average rate was computed for each site visit.

The accuracy of the methods is directly related to the operational conditions of the equipment used and to the environmental conditions in which the equipment operated. Discharge values are reported to two significant figures. Discharge determined by all methods ranged from 1.3 gal/min at site DV-2 to 2,700 gal/min at site AM-5a for 1994 (table 8).

Ground-Water Withdrawal Data

Ground-water withdrawals were estimated from compiled data and are listed in table 9. Withdrawal data were supplied by public agencies including USDOE, USGS, and the Nevada Division of Water Resources (NDWR), and private organizations including Reynolds Electrical and Engineering Company (REECo) and SAGA Exploration Company. Estimated annual ground-water withdrawals are based solely on available data. Estimates for some years, therefore, reflect a lack of information for an entire area or underestimate total withdrawals within an area.

Withdrawals from Alkali Flat-Furnace Creek Ranch Ground-Water Subbasin

Withdrawals from the part of the Amargosa Desert within the subbasin were recompiled from ground-water pumpage inventories taken by NDWR. The pumpage inventories were for the entire Amargosa Desert hydrographic area during 1994, and include estimated withdrawals for irrigation, mining, industrial, commercial, and quasi-municipal and domestic use. All reported withdrawals for irrigation, mining, industrial, and commercial use are from the Alkali Flat-Furnace Creek Ranch ground-water subbasin. All quasi-municipal and domestic use for the Amargosa Desert is included in the subbasin because data were not available to exclude the amount used in the Ash Meadows ground-water subbasin.

Withdrawals from Crater Flat were determined from totalizing flowmeters at site CF-2, site CF-3, and well USW VH-2 (which is located about 1.5 miles northwest of site CF-2). Withdrawals from site CF-2 are on the basis of quarterly pumpage reports provided by USDOE (Wendy Dixon, U.S. Department of Energy, written communs., 1994 and 1995). Withdrawals from site CF-3 were recompiled from flowmeter readings recorded by USGS-EMP personnel. Withdrawals from well USW VH-2 were recompiled from flowmeter readings and information supplied by SAGA Exploration Corporation for May 1991 to July 1993 and January to December 1994 (Charles Stevens, Mine Manager, written communs., 1993 and 1995). Withdrawals from Crater Flat for 1991 through 1993 have been revised from those listed in La Camera and Westenburg (1994) and Hale and Westenburg (1995) on the basis of data for well USW VH-2, which became available subsequent to publication of those reports.

Withdrawals from Jackass Flats were recompiled from flowmeter readings supplied by REECo for sites J-12 and J-13 (David B. Wood, U.S. Geological Survey, written commun., 1995). Withdrawals from Rock Valley are considered negligible on the basis of knowledge of activities in that area.

Withdrawals from Ash Meadows Ground-Water Subbasin

Withdrawals from Mercury Valley were recompiled from flowmeter readings supplied by REECo for site MV-1 (David B. Wood, U.S. Geological Survey, written commun., 1995). Withdrawals for quasi-municipal and domestic use from the part of the Amargosa Desert within the subbasin were not available, although ground water is known to have been pumped in 1994.

Quality Assurance

Stringent quality assurance is required for all work pertaining to Yucca Mountain studies to establish adequate confidence in the reliability of data collection, processing, and reporting. In the context of this data-collection program, quality assurance is defined as all planned or systematic actions designed to provide data and records of a desired quality. A variety of quality-control procedures, which are the operational techniques and activities used to meet the required quality objectives, have been implemented.

The numerous management and administrative procedures that control processing, record keeping, and reporting of data by USGS-EMP are not detailed in this report. Generally, data such as location, date and time of measurements, and field measurements are recorded onsite. Those data are reviewed for completeness and accuracy, stored in project files and data bases, and are subsequently included in publications by the USGS. Following publication, data are stored in a comprehensive record-keeping facility maintained by contractors for USDOE.

In addition to standard USGS practices and the procedures previously described, formal unpublished technical procedures associated with the Yucca Mountain Site Characterization Project have been developed for the collection of water-level and discharge data. Those technical procedures include equipment tests and calibrations, in addition to measurement techniques, to ensure that necessary and expected precision and accuracy are attained. The principal technical procedures that control the collection of data by project personnel are listed by La Camera and Westenburg (1994, p. 17).

PRESENTATION OF GROUND-WATER DATA

Tables included in this report generally list only 1994 ground-water data, whereas the figures show data for the period of record to illustrate changes in ground-water resources through time. Exceptions are tables 3, 4, 9, and 10; these tables include data from 1993 and 1995 used to determine correction factors for electric-tape measurements made during 1994, revised data for historical ground-water withdrawals from Crater Flat (on the basis of information which was previously unavailable), and a summary of historical water-level measurements in Jackass Flats. Below is a description of the content of the tables and figures presented in this report.

Tables 5-9 list ground-water data that have been collected and compiled in the Yucca Mountain region as part of this study; they are included at the back of this report. Figures 1-13 are hydrographs and other graphical representations of selected data from the tables in this report, La Camera and Westenburg (1994), Hale and Westenburg (1995), and data collected by USGS-SCP.

Pumping of water from or injecting water into a well or nearby well may cause transient water levels that differ from long-term or sustained ground-water levels. Observations about such activities (noted by field personnel during site visits) and corresponding water levels, which may represent transient conditions, are included in data tables. Those data, however, are excluded from the figures showing variations in water level over time.

Table 5 lists periodic measurements of depth to water and water-level altitude at 36 sites (including a flowing well) for 1994. Periodically collected data generally are from manual onsite measurements of depth to water. Data at site AM-4 (Devils Hole) reported as data source "NPS," however, are monthly average water levels and are based on continual water levels recorded by instrumentation at the site. Data collected by other agencies or programs are subject to revision upon further review by that agency or program.

Figures 1-4 show water-level altitude listed in this report and previous reports on selected ground-water data for the Yucca Mountain region. Data for wells with primary contributing units of carbonate rock, volcanic rock, valley fill, and undifferentiated sedimentary rock are presented.

Tables 6 and 7 list measurements of daily average water levels at sites JF-3 and AD-6, respectively for 1994. The daily average water levels are based on continually collected data at the sites, which are measurements of water levels recorded by instrumentation at 15-minute intervals.

Figures 5 and 6 show measurements of daily average depth to water and water-level altitude on the basis of continually collected data listed in tables 6 and 7 of this report, La Camera and Westenburg (1994), and Hale and Westenburg (1995) for sites JF-3 and AD-6, respectively. Data is presented for 1992 through 1994.

Table 8 lists periodic measurements of ground-water discharge at six sites for 1994. The data for site DV-1 (Texas Spring), reported as data source "NPS," represent monthly average discharge for each month with a complete record.

Figure 7 shows measurements of ground-water discharge at sites AM-1a, AM-5a, and AM-8 through 1994, as listed in this report and previous reports on selected ground-water data for the Yucca Mountain region. **Figures 8 and 9** show measurements of ground-water discharge at sites AM-2 and DV-2, and DV-1, through 1994, respectively, listed in this report and previous reports on selected ground-water data for the Yucca Mountain region.

Table 9 shows estimates of annual ground-water withdrawals from wells in the Yucca Mountain region for 1994. Also included are revised estimates of withdrawals from Crater Flat (on the basis of previously unavailable information) as presented in La Camera and Westenburg (1994) and Hale and Westenburg (1995) for calendar years, 1991-93. Estimated annual ground-water withdrawals are based solely on available data. Ground-water withdrawals, in millions of gallons and in acre-feet, from water-supply wells are grouped by ground-water subbasin and totaled by hydrographic area (or part of a hydrographic area) for calendar year 1994.

Figures 10 and 11 show estimates of annual ground-water withdrawals listed in this and previous reports on selected ground-water data for the Yucca Mountain region. Shown are withdrawals for areas with available data within the Alkali Flat-Furnace Creek Ranch and Ash Meadows ground-water subbasins, respectively, through 1994.

DISCUSSION OF GROUND-WATER LEVELS AND GROUND-WATER WITHDRAWALS IN JACKASS FLATS

In Jackass Flats, ground water is withdrawn to support several USDOE activities (including site characterization); if those withdrawals affect ground-water levels, the effects may be detected in Jackass Flats before they are detected elsewhere within the Yucca Mountain region. Therefore, the following section discusses data on ground-water levels and ground-water withdrawals in Jackass Flats. Changes in water-level altitudes at a particular site through time, discussed in the text towards the end of this section, are described in an order generally corresponding to increasing distance of the site from water-supply wells J-13 and J-12.

Figure 12 shows water-level altitudes for seven wells in Jackass Flats and estimated annual ground-water withdrawals in Jackass Flats from 1983 through 1994. Prior to 1983, data on ground-water withdrawals in Jackass Flats generally represent only the withdrawals from well J-12 rather than total withdrawals from Jackass Flats. For greater consistency and comparability of data on water-level altitudes, water levels in wells J-13, J-12, and JF-3 that may have been affected by pumping or recent pumping of the well are excluded from figure 12.

Water-level altitudes presented are based on discrete measurements or daily average water levels (when continual data recorded by instrumentation were available for more than half the year). Water levels based on discrete measurements made during site visits are shown for all sites prior to 1985; sites JF-1, JF-2 (in 1994), J-13, J-11, and J-12 since 1985; and site JF-3 prior to May 1992. Daily average water levels from USGS-SCP (R.P. Graves, U.S. Geological Survey, written commun., 1995) are shown for sites JF-2 for 1985 through 1993 and JF-2a for 1985 through 1994; continual data collection at site JF-2 was discontinued in June 1994 and daily water levels were consequently available for less than half the year. Daily average water levels also are shown for site JF-3 from May 1992 through December 1994; long-term monitoring and continual data collection at this site began in May 1992.

Ground-water withdrawals consist of combined pumpage from water-supply wells J-13 and J-12. Withdrawals from 1983 through 1994 are from data presented in this and previous reports on selected ground-water data for the Yucca Mountain region.

Total 1994 withdrawal in Jackass Flats was about 90 Mgal, an increase of about 23 Mgal (34 percent) from 1993. Median annual ground-water withdrawal in Jackass Flats was about 52 Mgal/yr for 1983 through 1991 (La Camera and Westenburg, 1994, p. 30). Compared to the median withdrawal for 1983 through 1991, total withdrawals in Jackass Flats decreased about 25 percent in 1992 and increased about 29 percent and 73 percent in 1993 and 1994, respectively.

Table 10 lists selected statistics, derived from data shown in figure 12, for water-level altitudes in Jackass Flats. Data for wells JF-1, JF-2, JF-2a, J-13, J-11, J-12, and JF-3 are summarized for the selected baseline periods and for calendar years 1992 through 1994. For well JF-3, completed in January 1992, statistical data for measurements during the baseline period also are listed to provide additional information. The table shows the number of measurements; the minimum, maximum, and median water-level altitude; and the average deviation of measured water-levels about the median water level for each period. Because of the recent availability of daily average water levels for wells JF-2 and JF-2a, summary statistics based on discrete water-level measurements listed by La Camera and Westenburg (1994) and Hale and Westenburg (1995) have been revised.

To minimize effects of variability in measurement frequency on median water-level altitudes calculated for the period prior to 1992, the selection of a baseline period for each site was based on (1) the maximum number of consecutive years (including 1991) for which water-level measurements are available and (2) consecutive years containing approximately similar frequencies of water-level measurement. For consistency, the baseline period selected at instrumented wells JF-2 and JF-2a was the period following installation of continual recorders. The baseline period for JF-3 was based solely on the availability of daily average water levels from the continual data recorder, which was installed in May 1992. These baseline periods will be the standard to which the following years will be compared.

The median water-level altitudes shown in table 10 indicate a statistically representative ground-water level for a particular time period. The median of water-level measurements is listed because the calculated median is less affected by a few high or low values than the arithmetic mean. When more than half a year of continual data at a site are available (recorded hourly or more frequently by instrumentation), the median of daily average water levels is listed.

The average deviation indicates the variability of the individual measurements about the median and how precisely the median approximates a typical water-level altitude during the period. It equals the sum of the absolute differences between individual measurements and the median, divided by the number of individual measurements.

Median water-level altitude in water-supply well J-13 is 2,390.0 ft above sea level for the baseline period (table 10). Median water-level altitude in well J-13 for 1994 is 2,389.7 ft, which is 0.3 ft lower than that for the baseline period. The amount of change in median water-level altitudes between the two periods is greater than the average deviation for the baseline period and that for 1994. Median water-level altitude in 1994 also is 0.2 ft lower than that for 1993. Continued monitoring of ground-water withdrawals in Jackass Flats and water levels at this site should indicate whether the apparent decline in median water level continues while withdrawals from water supply wells in the area increase (figure 12).

Median water-level altitude in water-supply well J-12 is 2,388.3 ft above sea level for the baseline period. Median water-level altitude in well J-12 for 1994 is 2,388.2 ft, which is 0.1 ft lower than that for the baseline period. The amount of change in median water-level altitudes is equal to the average deviation of water levels for the baseline period, but less than that for 1994. Median water-level altitude in 1994 also is 0.1 ft lower than that for 1993.

Median water-level altitude in well JF-3, which is 0.5 mi south of water-supply well J-12 and penetrates volcanic rock, is 2388.3 ft above sea level for the baseline period. Median water-level altitude in well JF-3 for 1994 is 2,388.1 ft, which is 0.2 ft lower than that for the baseline period. The amount of change in median water-level altitudes is greater than the average deviation for the baseline period and that for 1994. Median water-level altitude in 1994 also is 0.2 ft lower than that for 1993. Similar to well J-13, further monitoring at this site should indicate whether the apparent decline in water level continues.

Median water-level altitudes in wells JF-1 and JF-2, which are north of the water-supply wells and penetrate volcanic rock, are 2,392.5 and 2,392.1 ft

above sea level, respectively, for the baseline period. Median water-level altitude in well JF-1 for 1994 is 2,392.3 ft, which is 0.2 ft lower than that for the baseline period. The amount of change in median water-level altitudes is equal to the average deviation for the baseline period, and greater than that for 1994. Median water-level altitude in well JF-1 for 1994 also is 0.2 ft lower than that for 1993. The median water-level altitude in well JF-2 for 1994 is 2,392.2 ft, which is 0.1 ft higher than the median for the baseline period. This difference is less than the average deviation of water-levels during the baseline period.

Median water-level altitude in well JF-2a, which is northwest of the supply wells and penetrates carbonate rock, is 2,468.6 ft above sea level for the baseline period. Median water-level altitude in well JF-2a for 1994 is 2,469.0 ft above sea level, which is 0.4 ft higher than that for the baseline period. The difference in median water-level altitudes is equal to the average deviation for the baseline period and greater than the average deviation for 1994. Compared with data for most other wells summarized in table 10, however, long-term changes in water levels that exceed variability inherent in the data are difficult to identify due to the high variability in measurements prior to 1993. The median water-level altitude in JF-2a for 1994 is 0.2 ft higher than that for 1993.

Median water-level altitude in well J-11, which is east of water-supply wells J-13 and J-12 and penetrates volcanic rock, is 2,402.2 ft above sea level for the baseline period. Median water-level altitude in well J-11 for 1994 is 2,402.3 ft, which 0.1 ft higher than that for the baseline period. The difference in median water-level altitudes is equal to the average deviation for the baseline period and for 1994.

Figure 13 shows the median water-level altitudes and the average deviation of the water levels for wells JF-1, JF-2, JF-2a, J-13, J-11, J-12, and JF-3 for baseline periods and for 1992 through 1994. Further monitoring at wells JF-1, J-13, J-12, and JF-3 should indicate whether declines in median water-level altitudes at those sites since 1993 represent short-term fluctuations in water levels or represent sustained decreases during periods of increased ground-water withdrawals at the supply wells in Jackass Flats.

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BASIC DATA

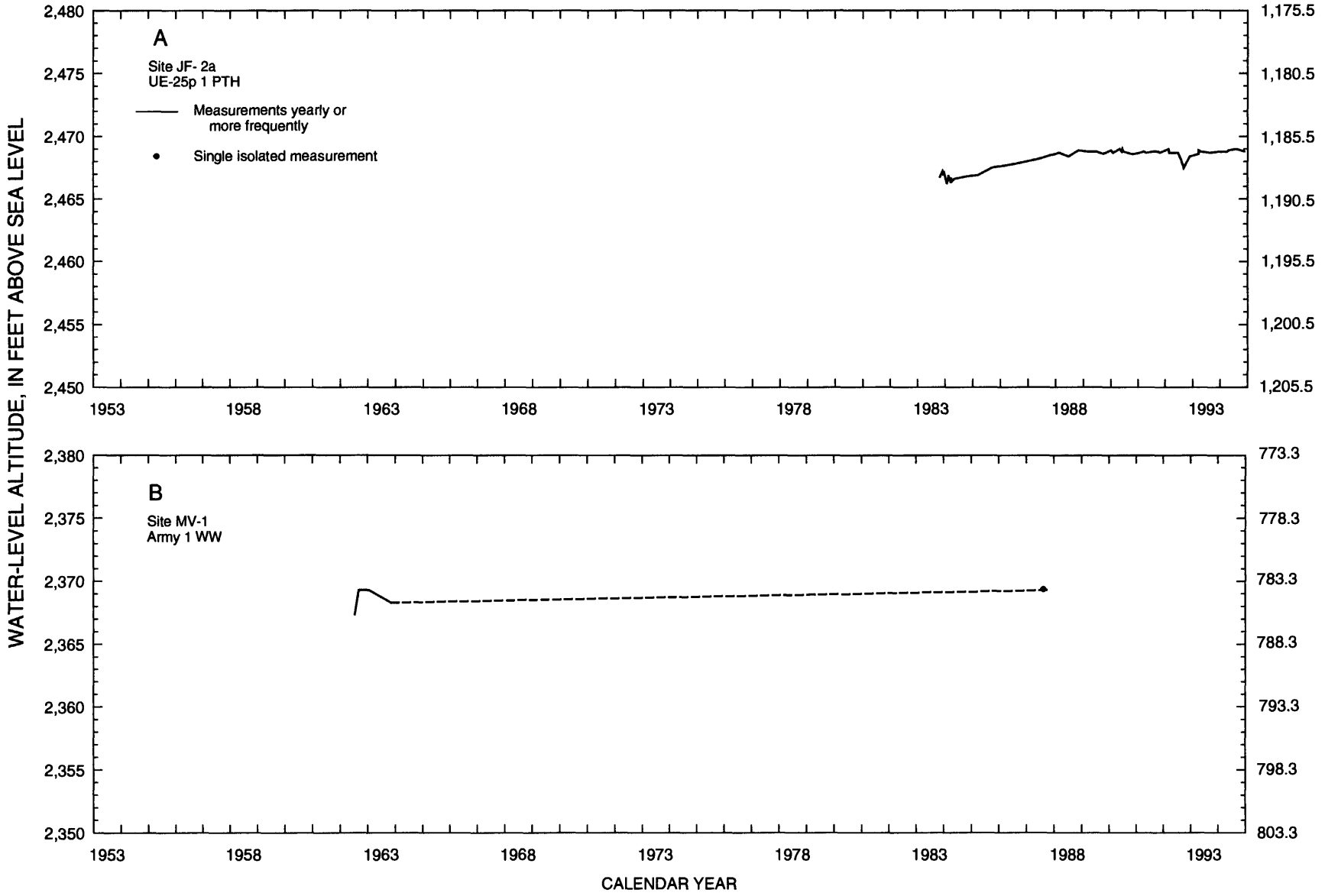
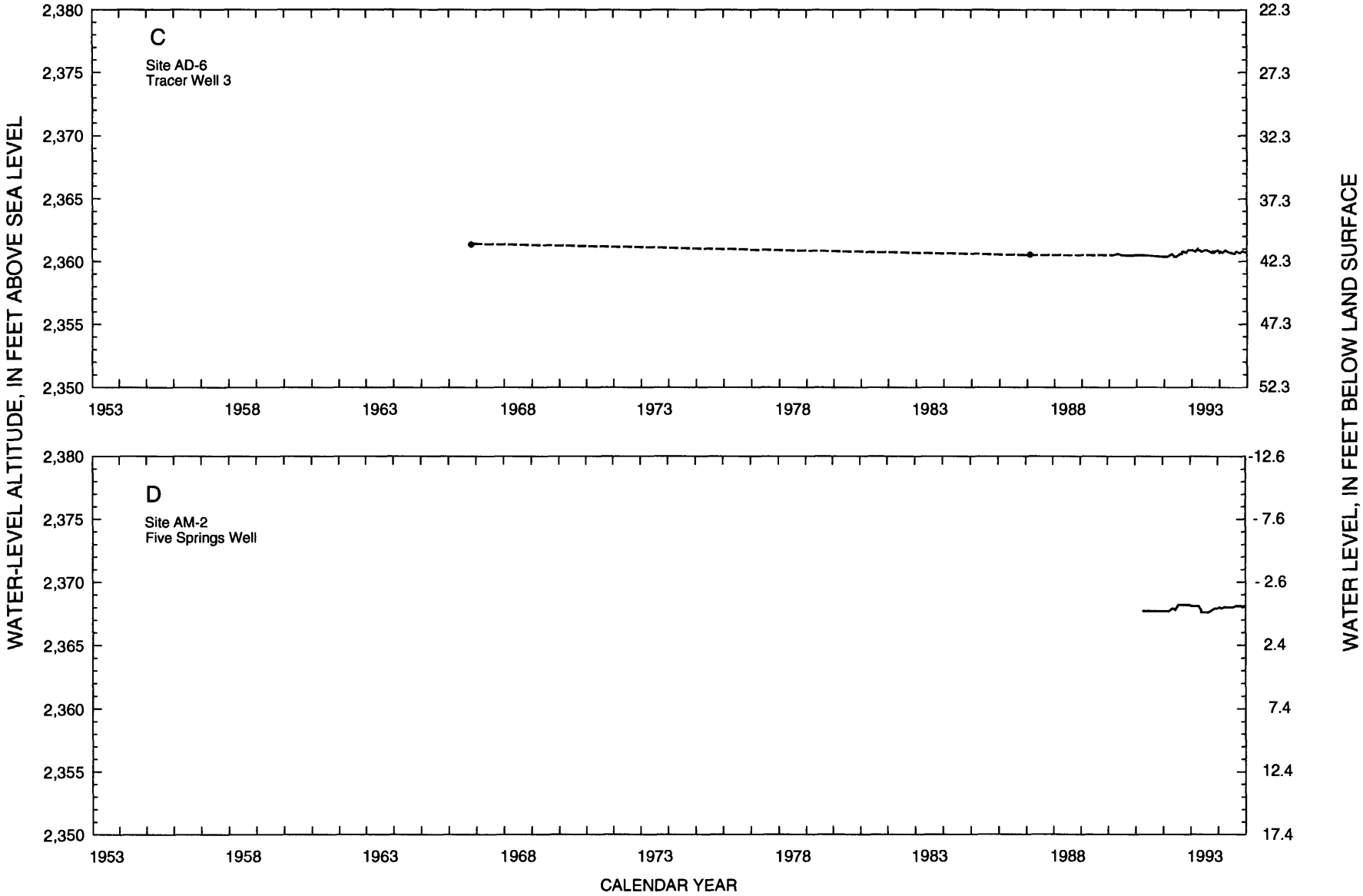


Figure 1. Periodic water levels through 1994 for selected sites at which primary contributing units are carbonate rock. Lines connect discrete data presented in this and previous reports on selected ground-water data for Yucca Mountain region and are dashed where measurements were not available for consecutive calendar years. Data that may represent transient conditions at a site have been excluded (see section titled "Presentation of Ground-Water Data").



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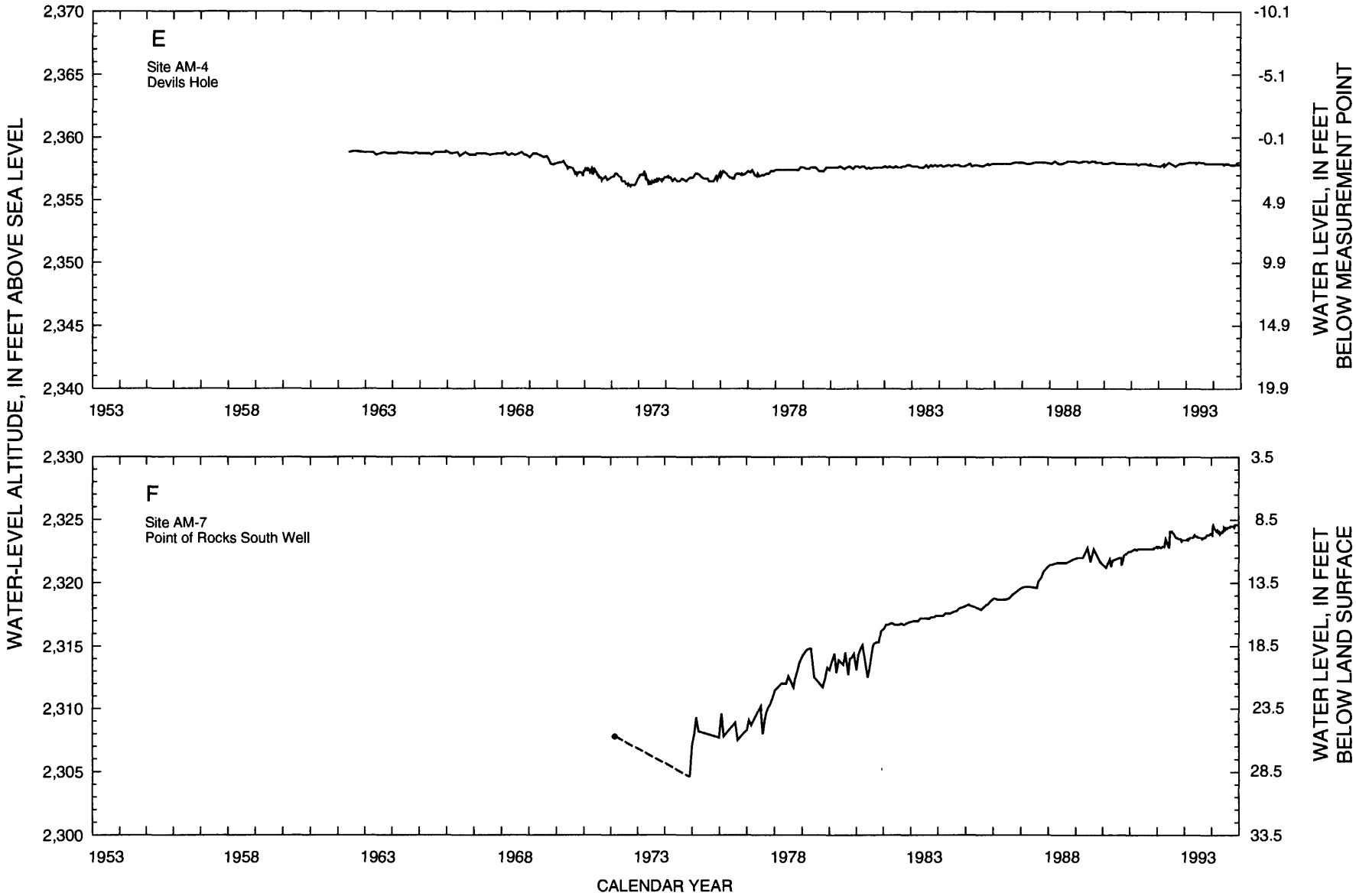

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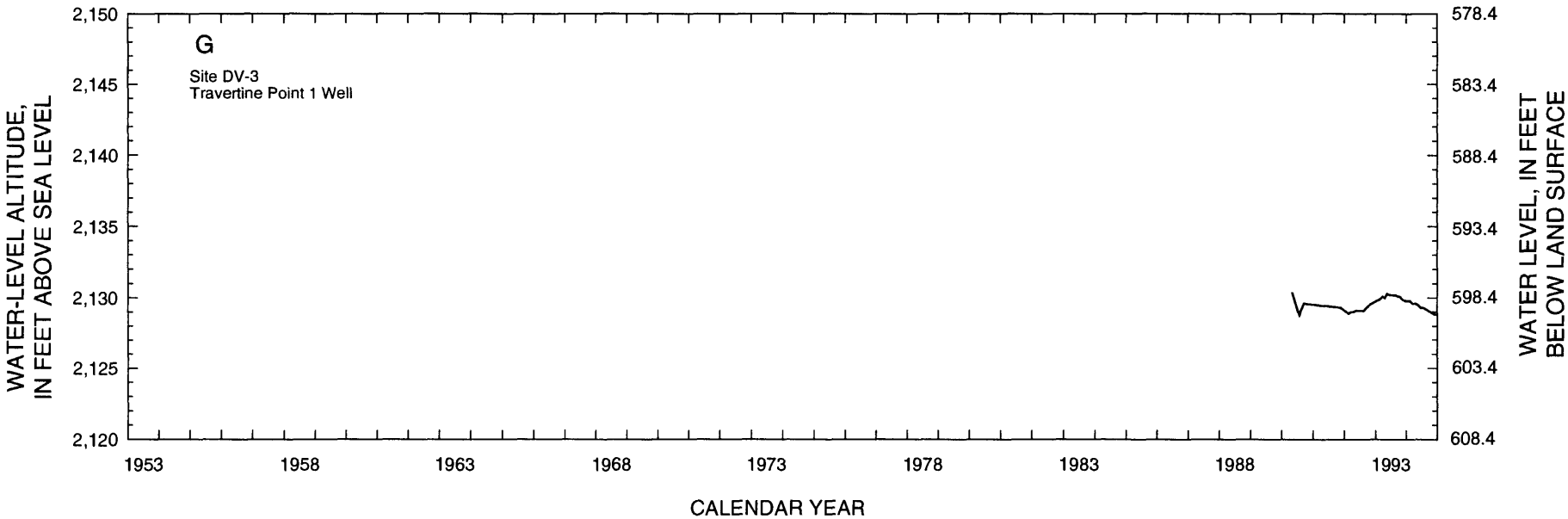

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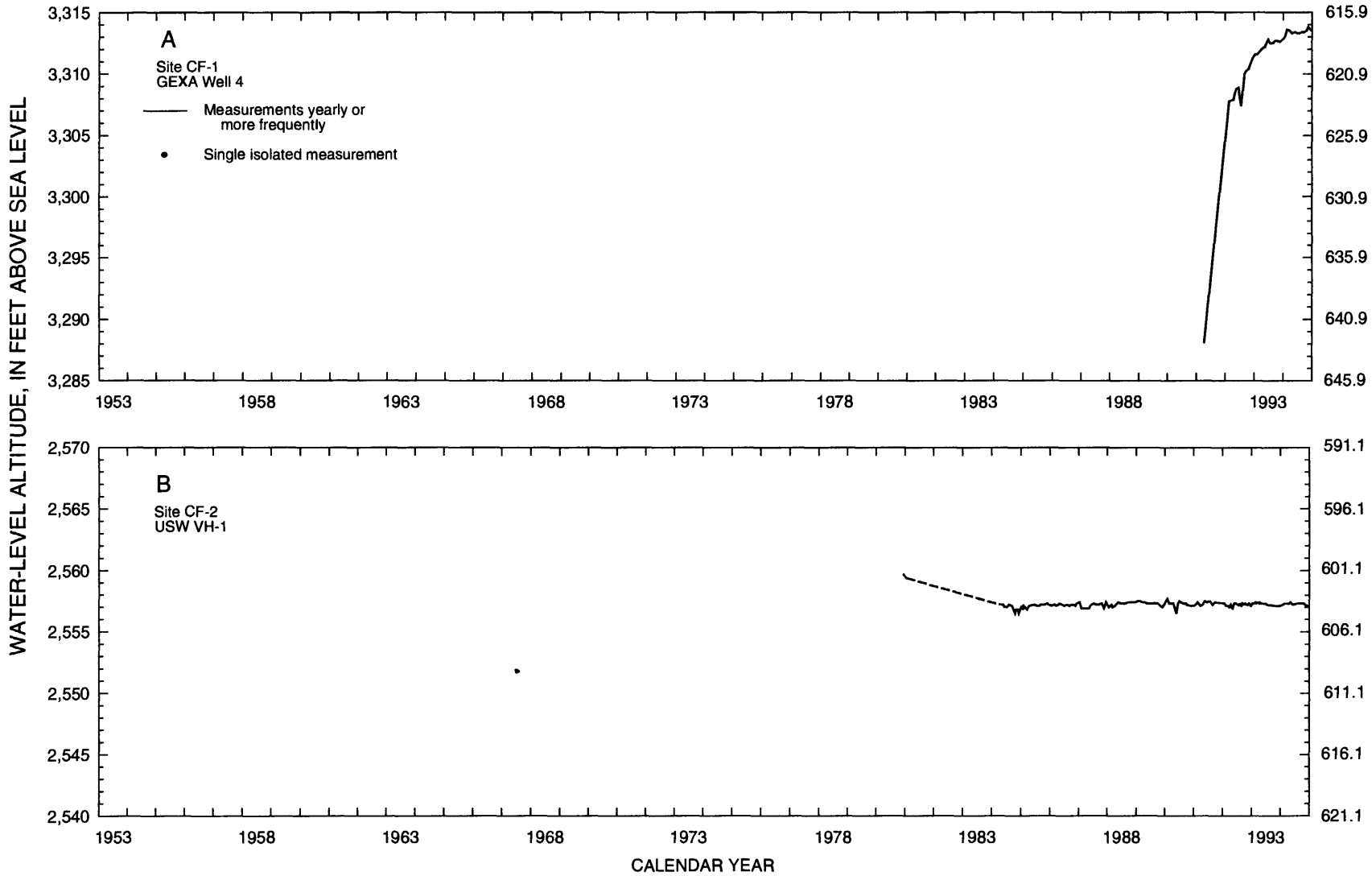
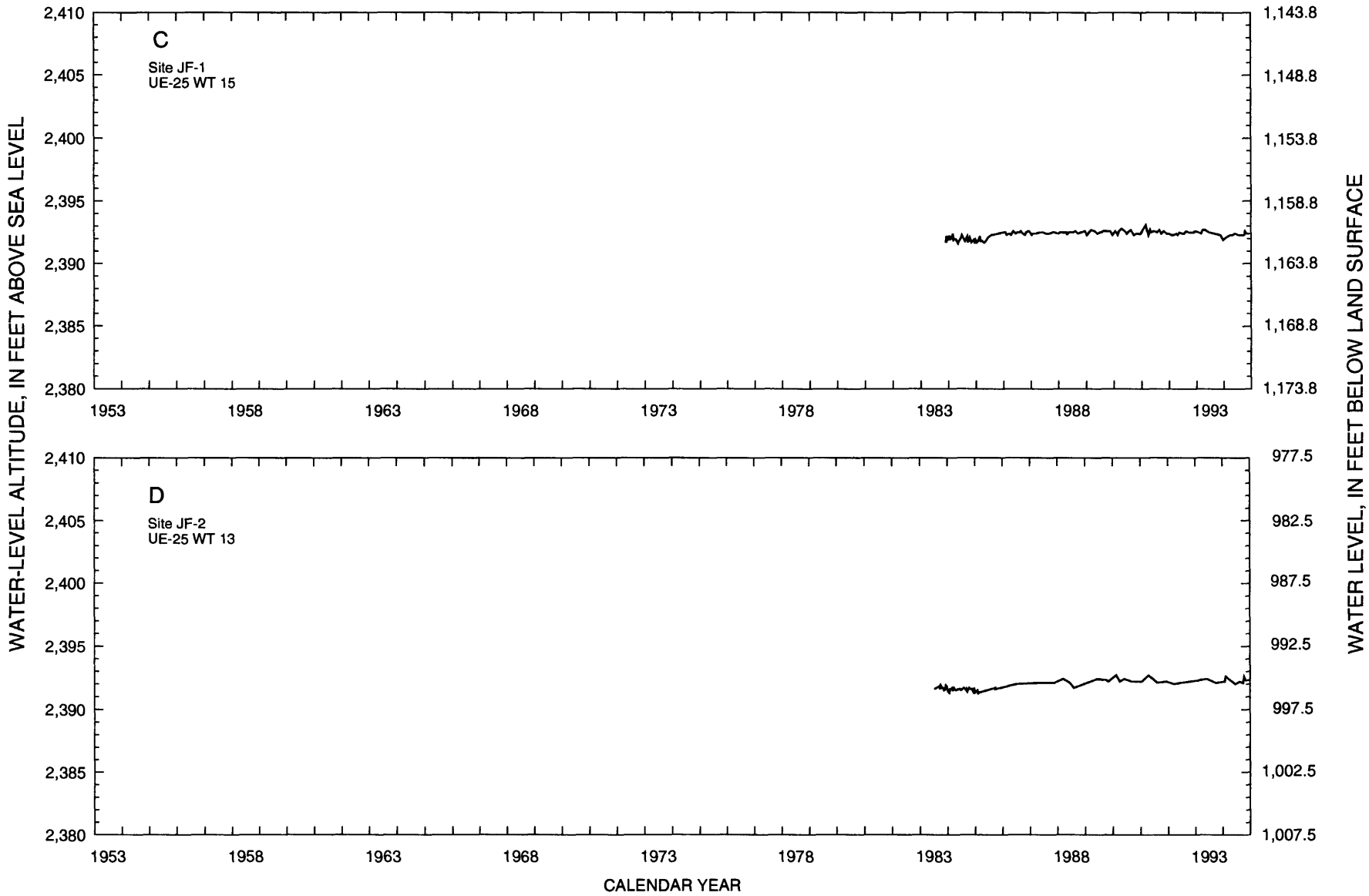


Figure 2. Periodic water levels through 1994 for selected sites at which primary contributing units are volcanic rock. Lines connect discrete data presented in this and previous reports on selected ground-water data for Yucca Mountain region and are dashed where measurements were not available for consecutive calendar years. Data that may represent transient conditions at a site have been excluded (see section titled "Presentation of Ground-Water Data").



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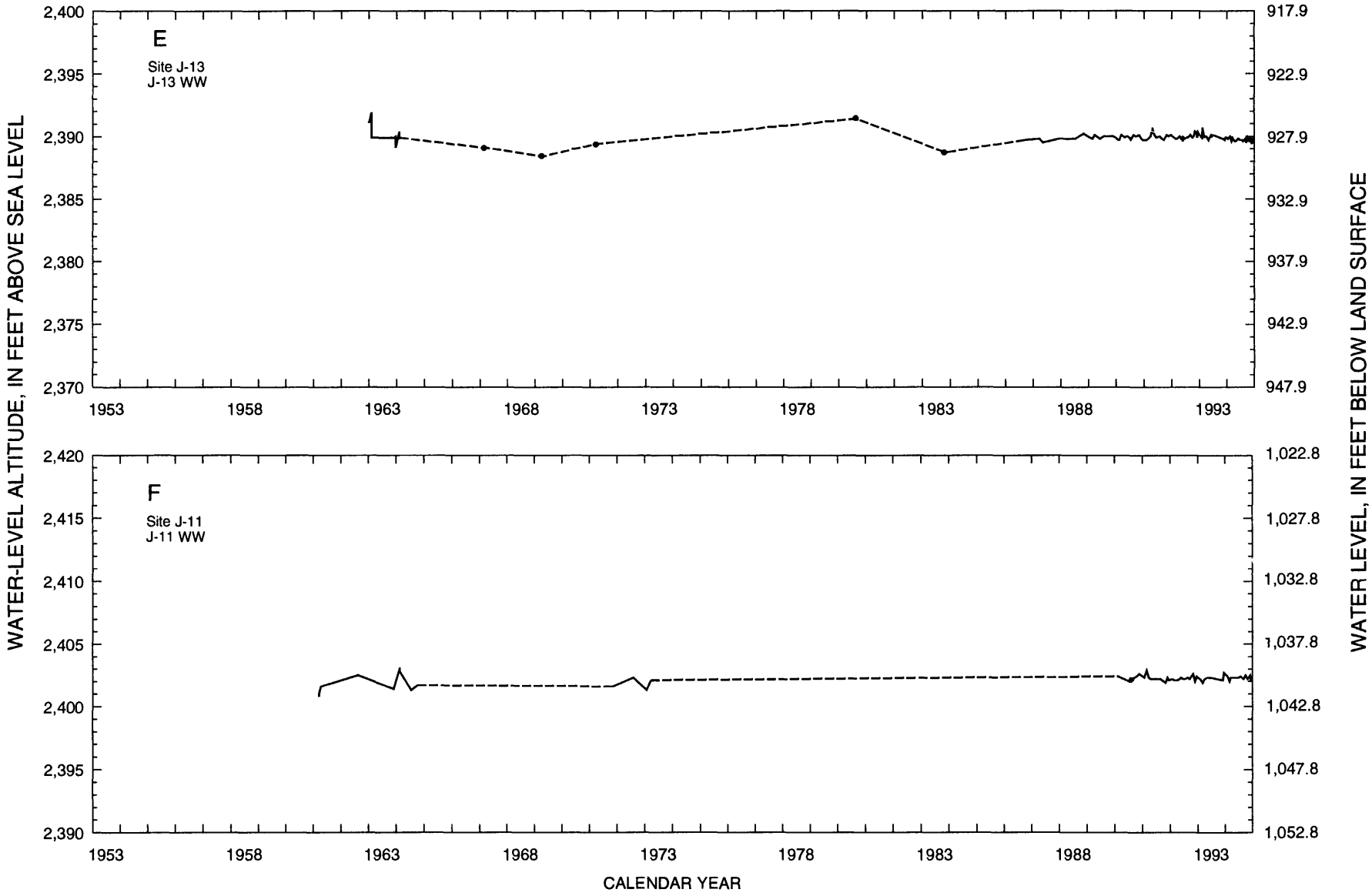

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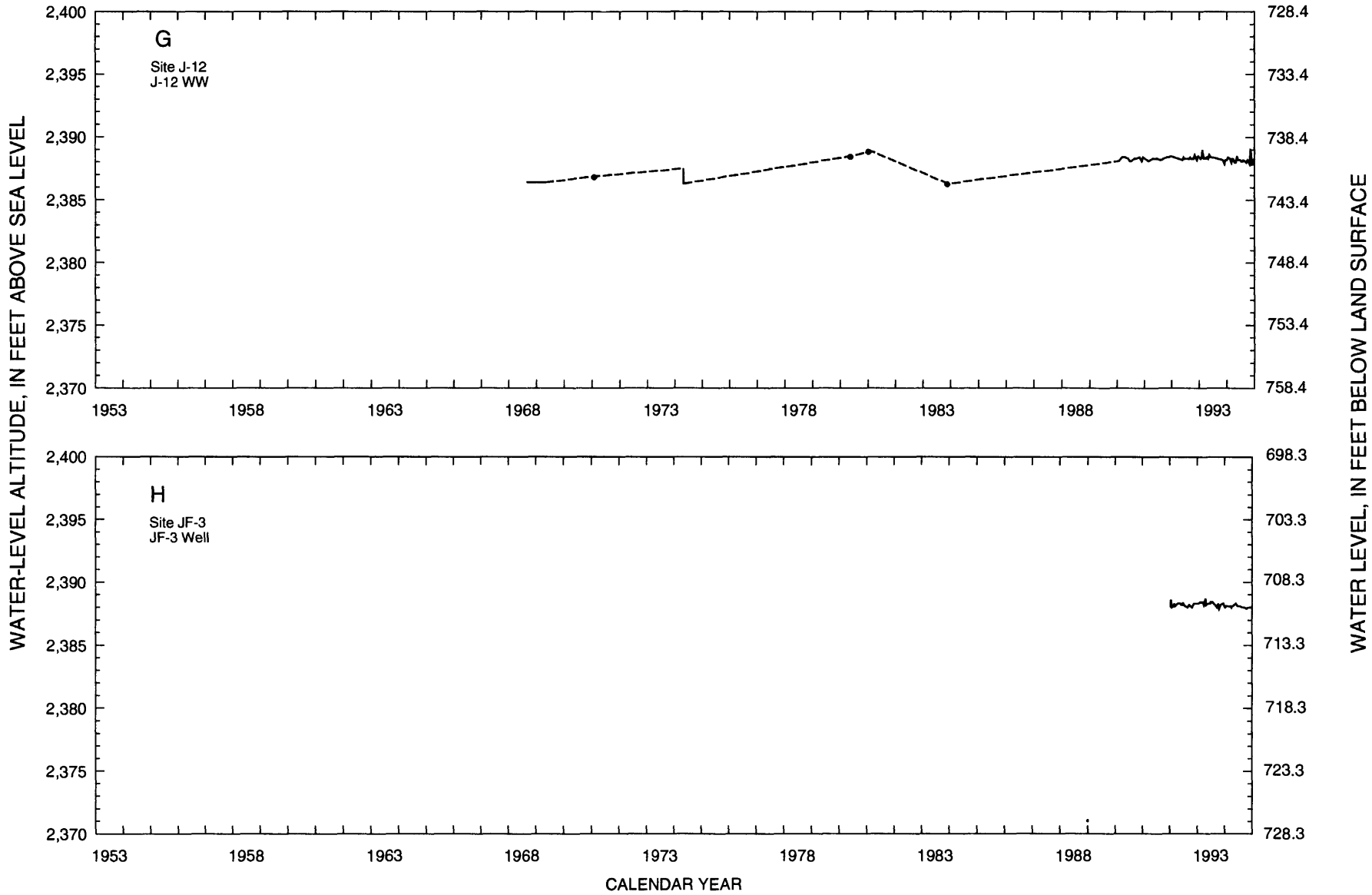

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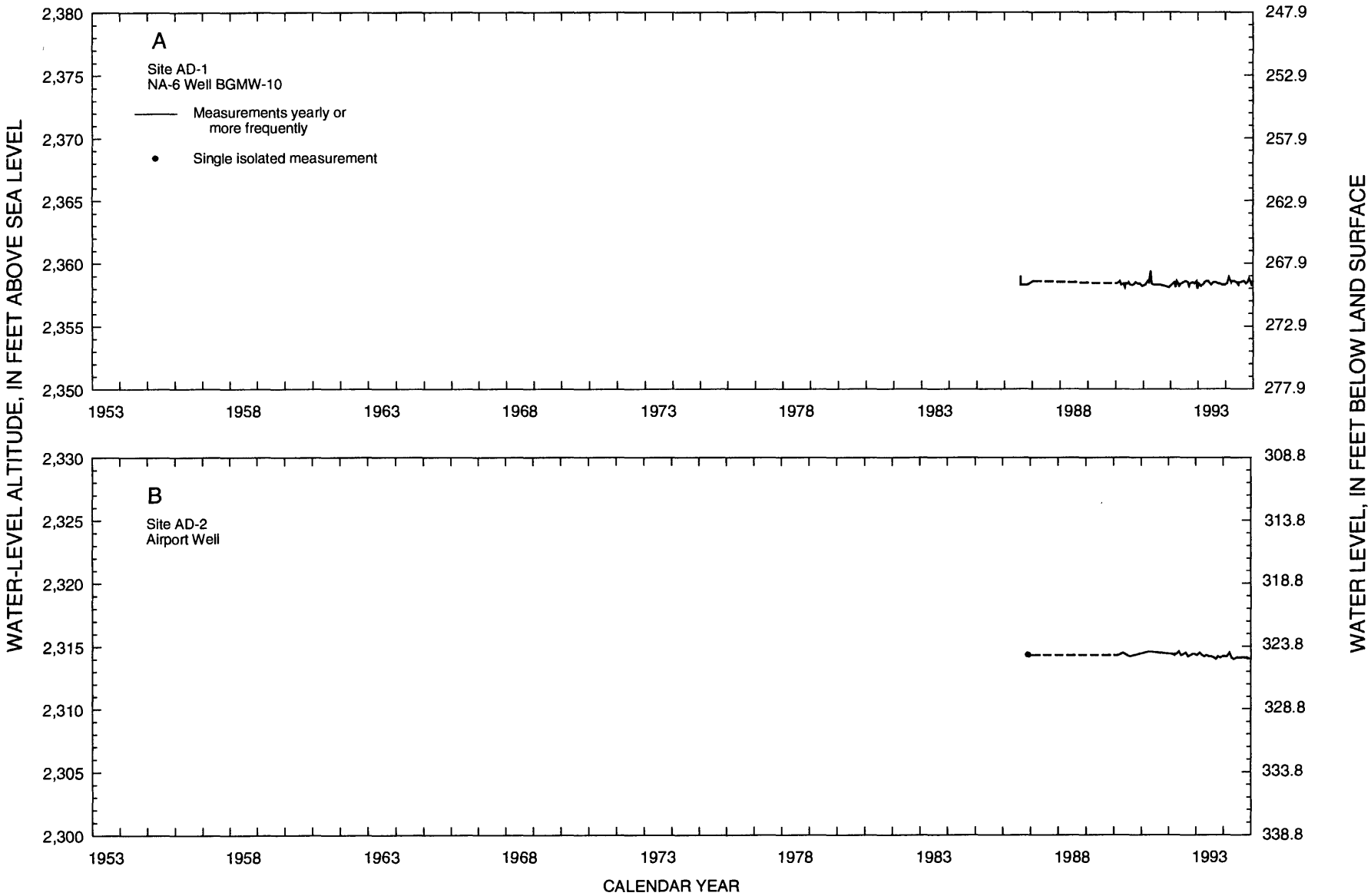
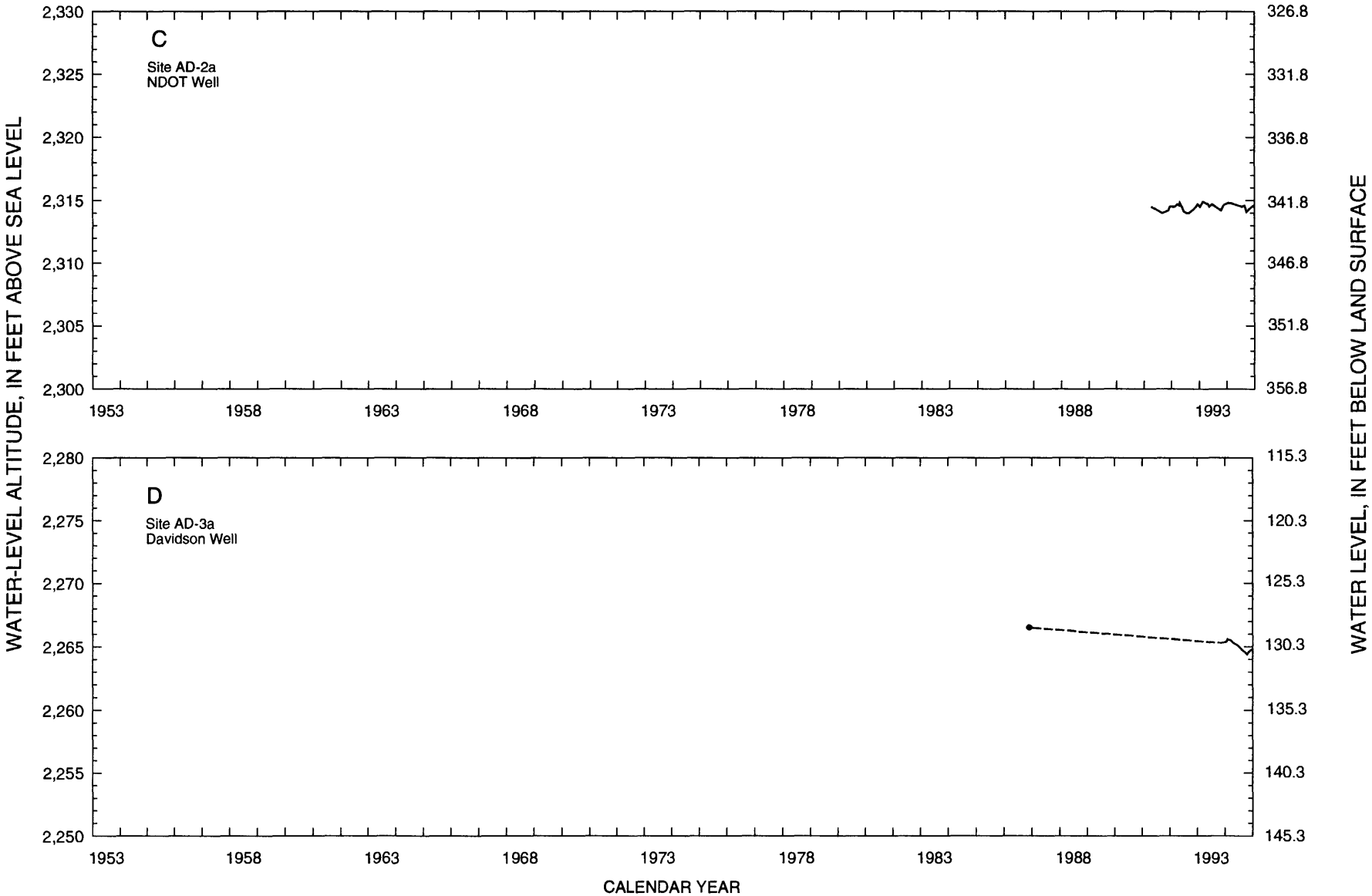


Figure 3. Periodic water levels through 1994 for selected sites at which primary contributing units are valley fill. Lines connect discrete data presented in this and previous reports on selected ground-water data for Yucca Mountain region and are dashed where measurements were not available for consecutive calendar years. Data that may represent transient conditions at a site have been excluded (see section titled "Presentation of Ground-Water Data").



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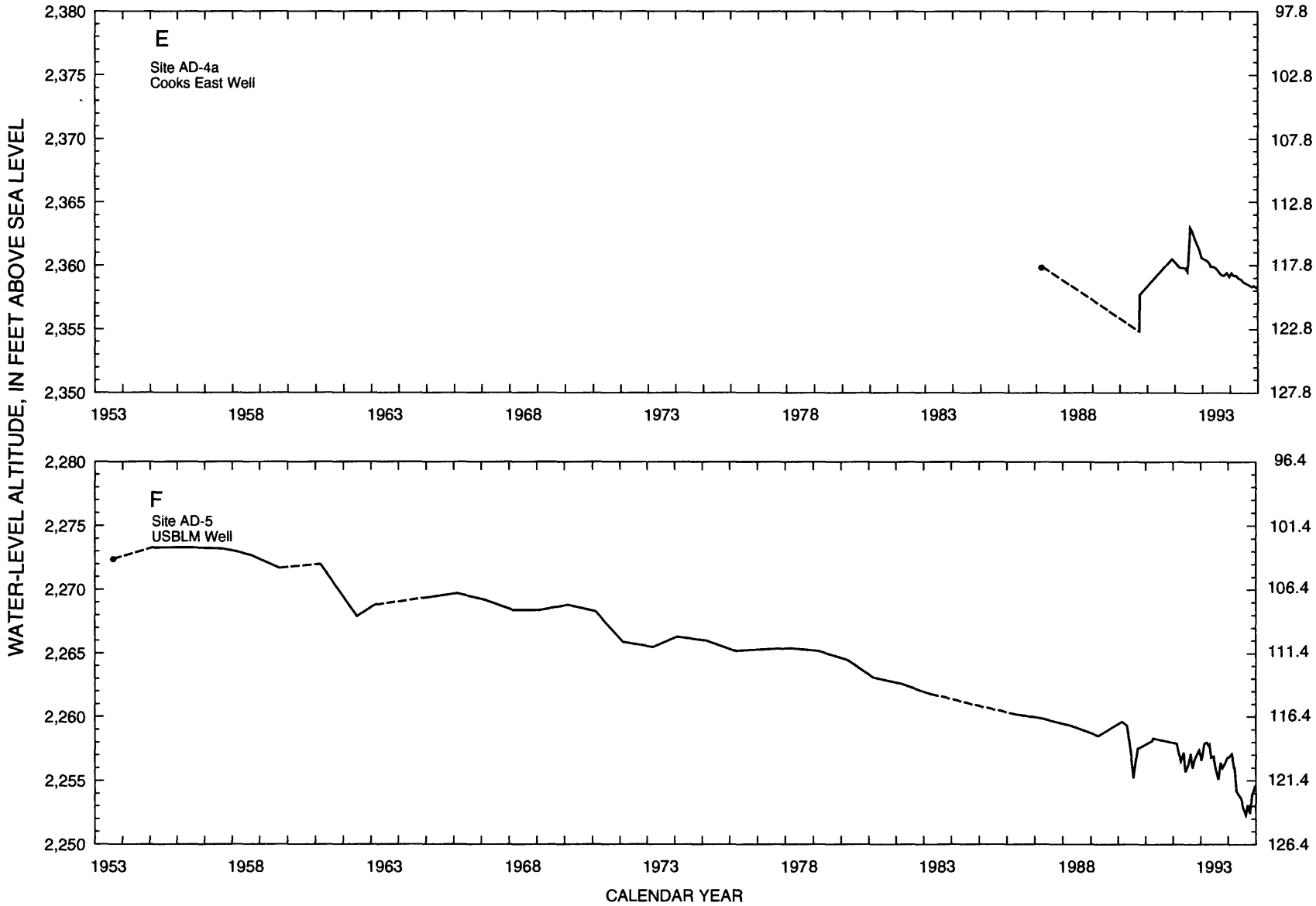

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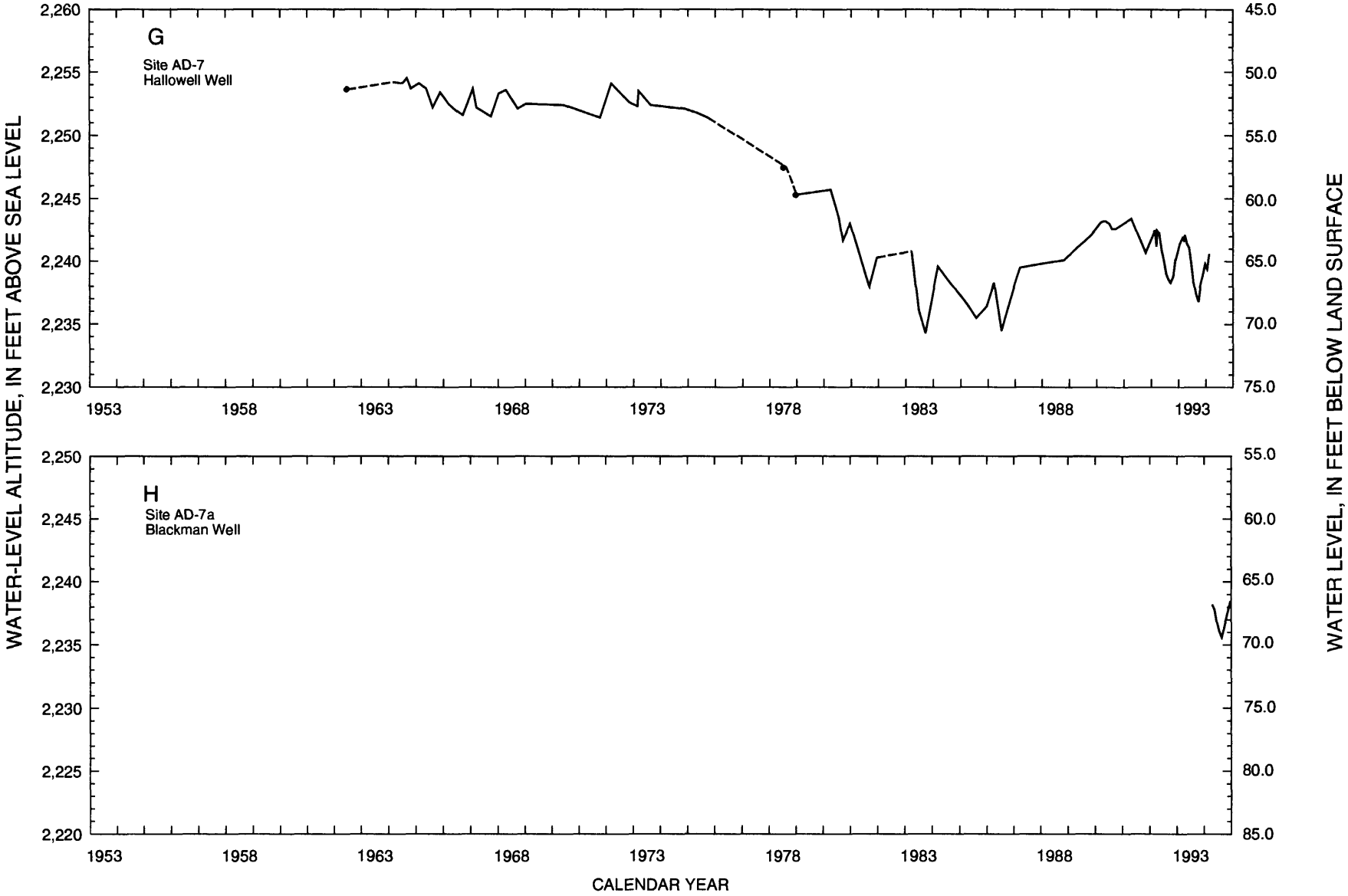

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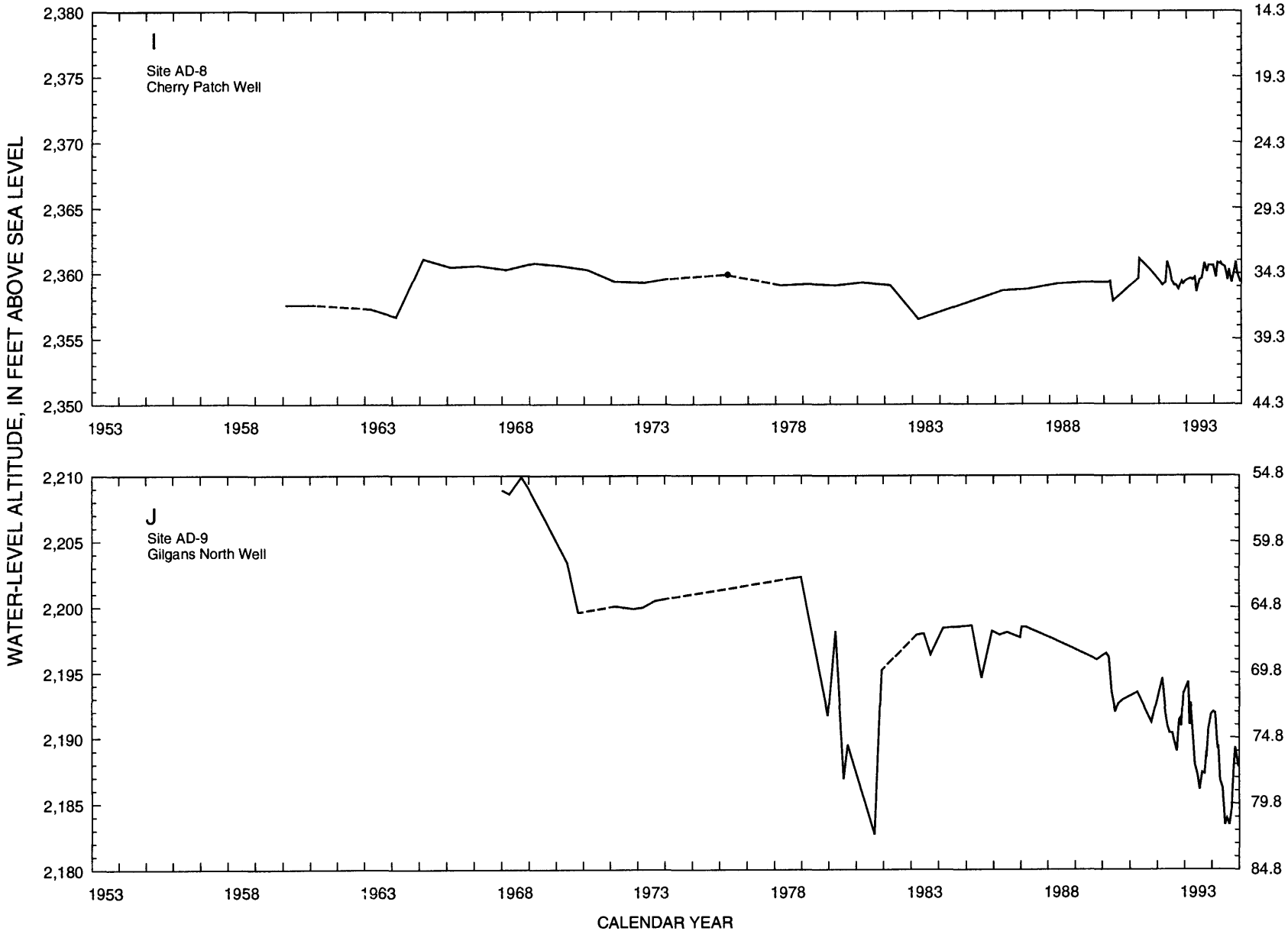

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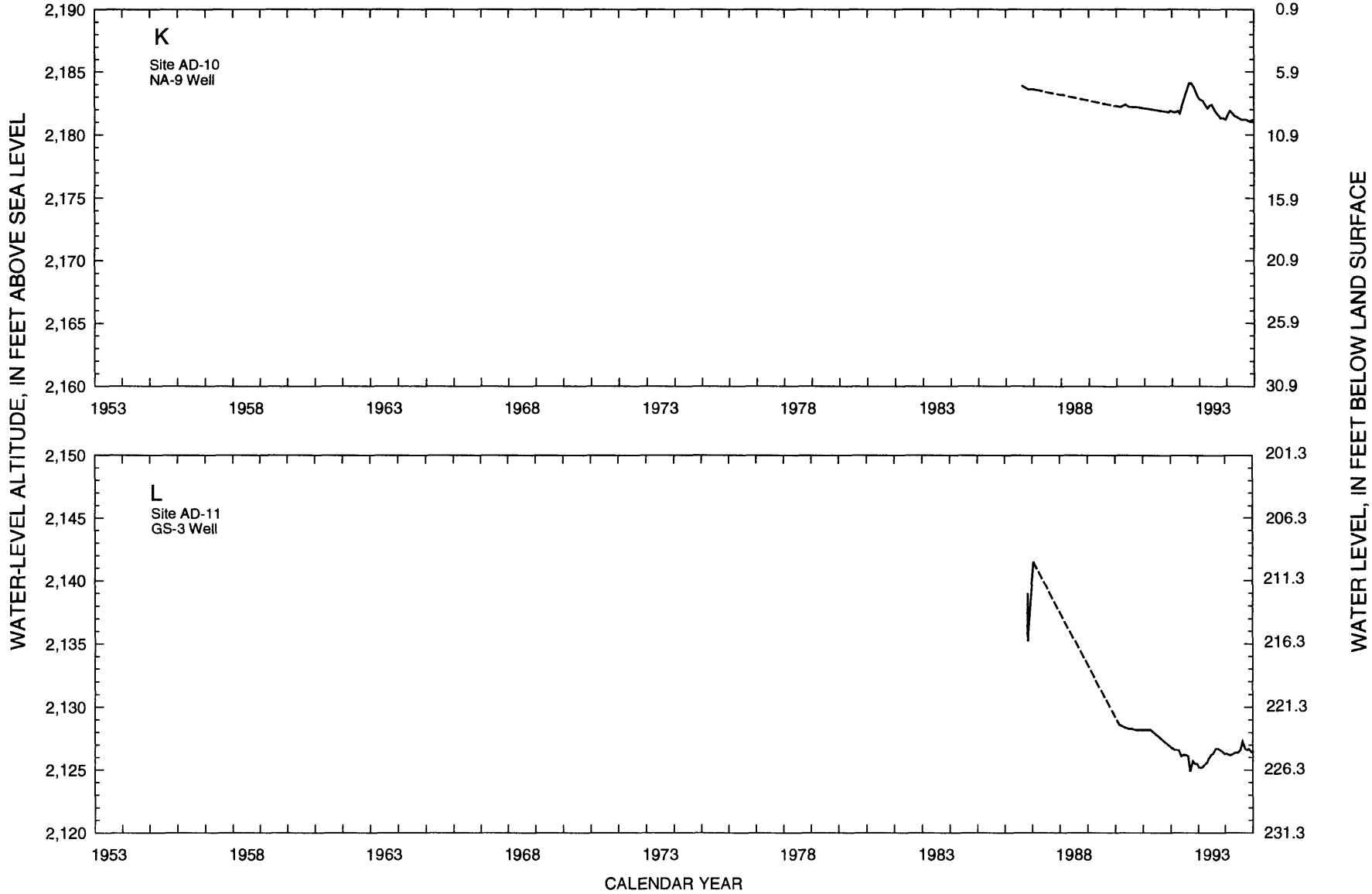

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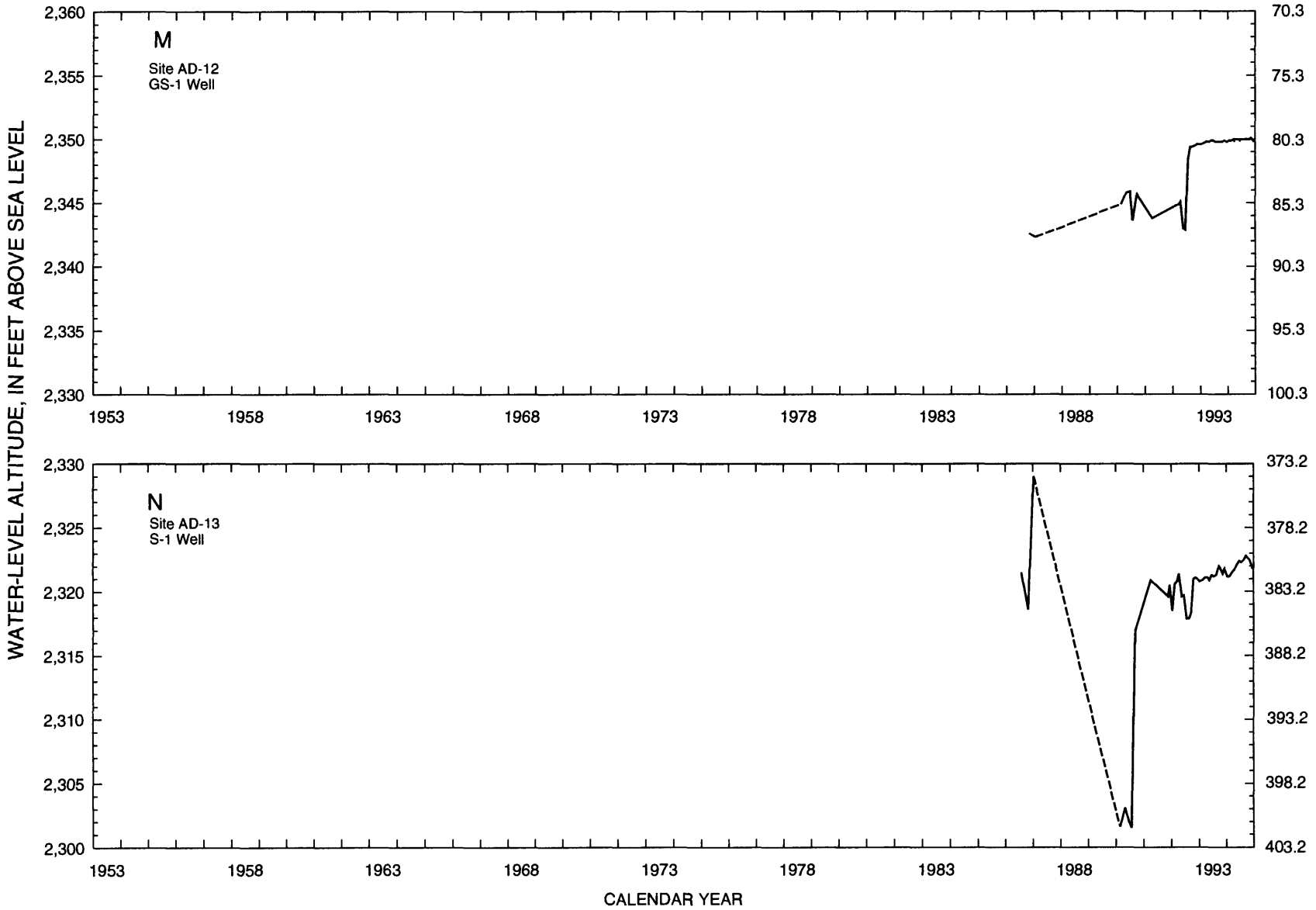

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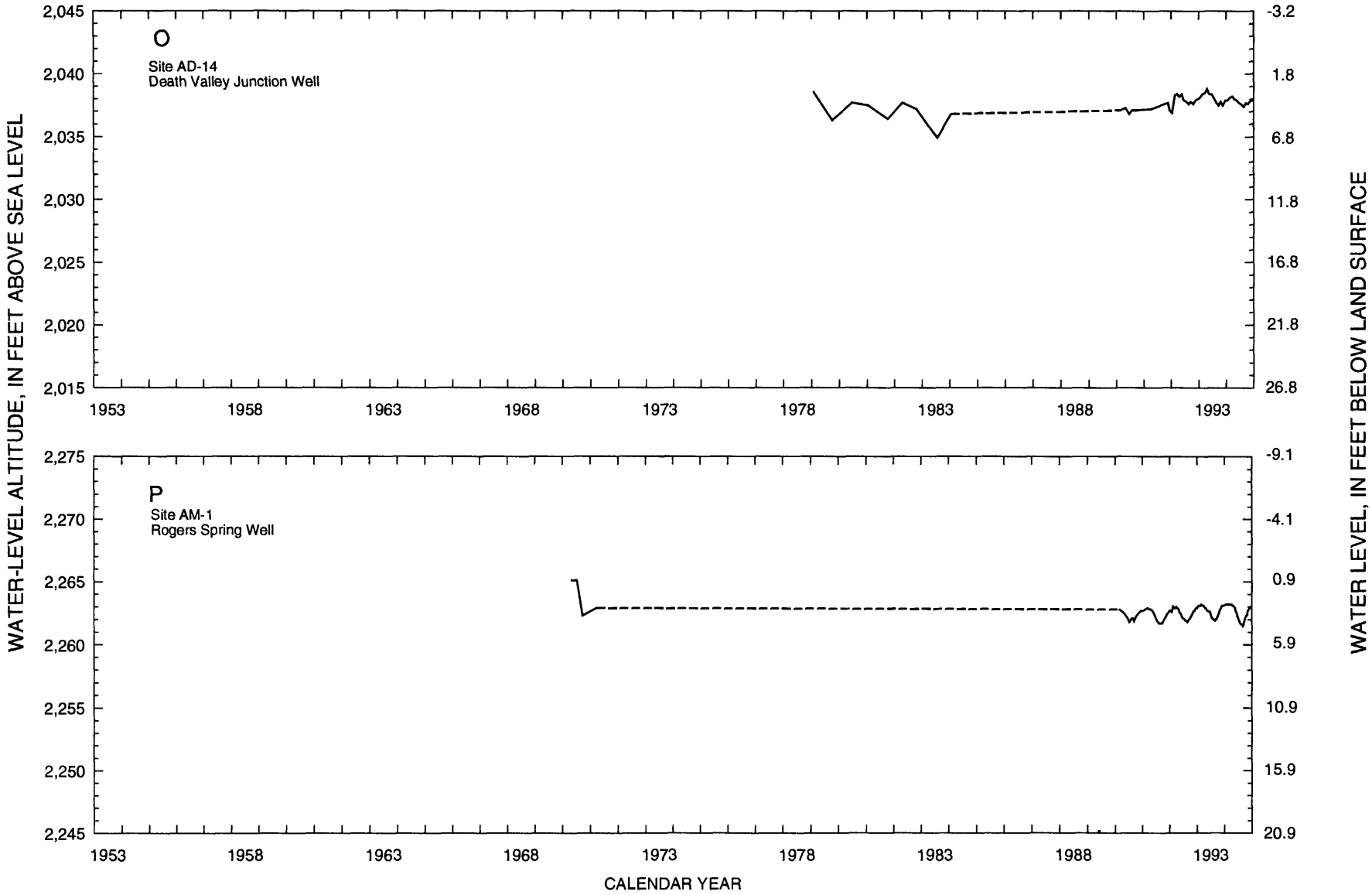

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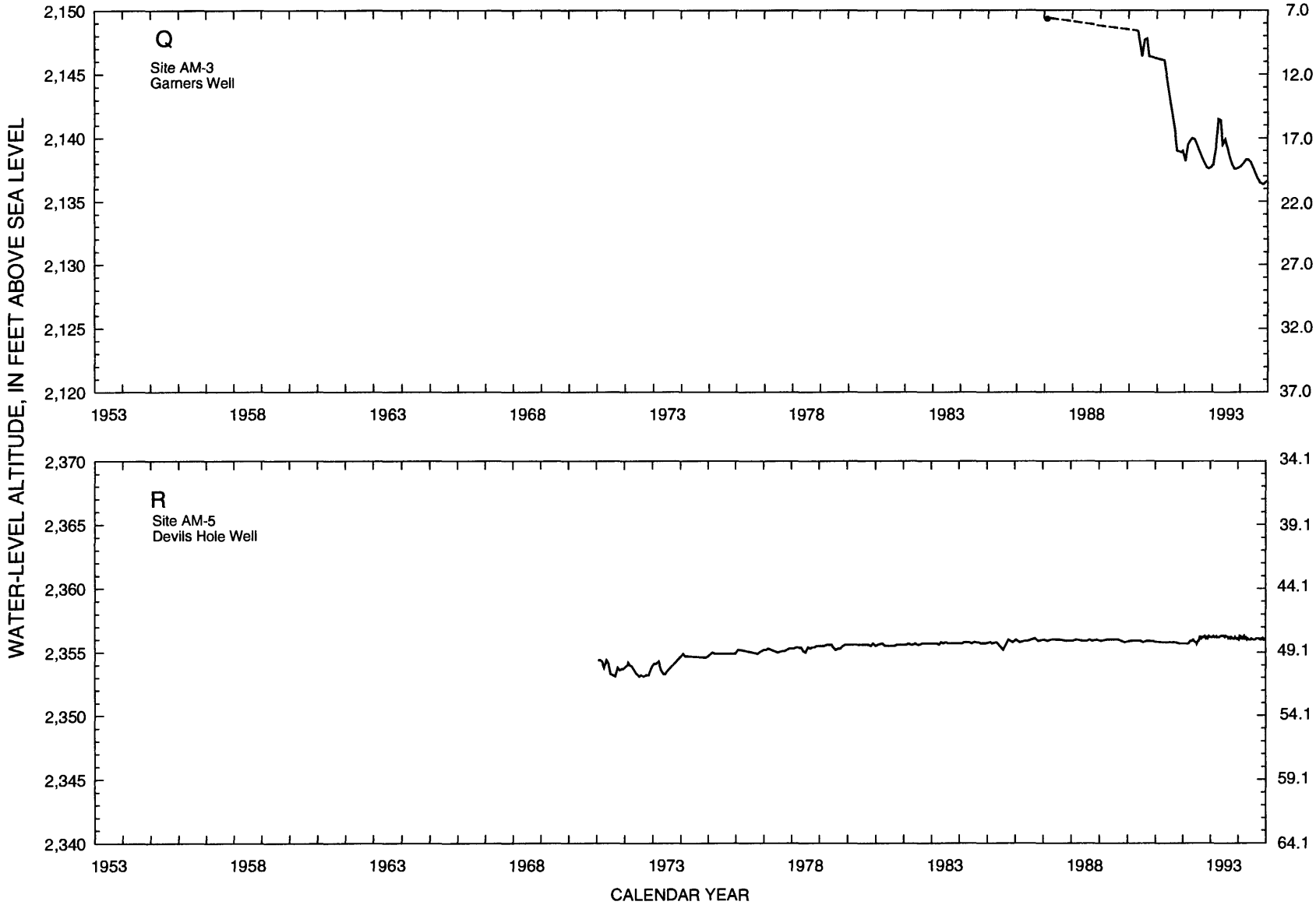

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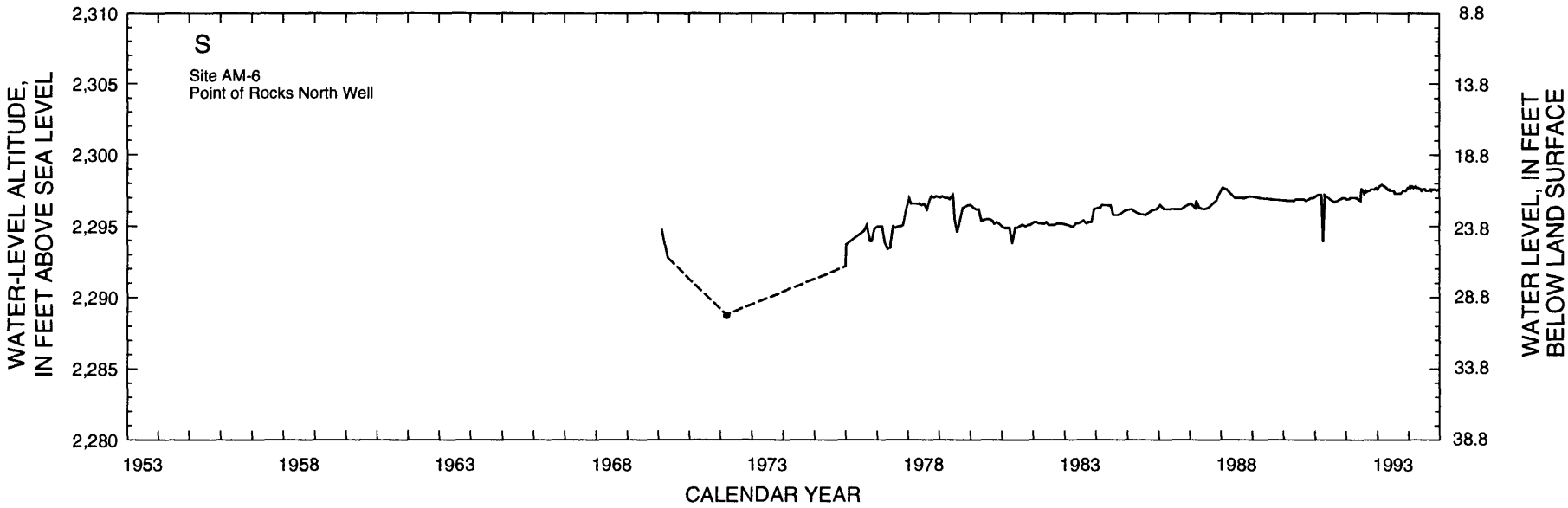

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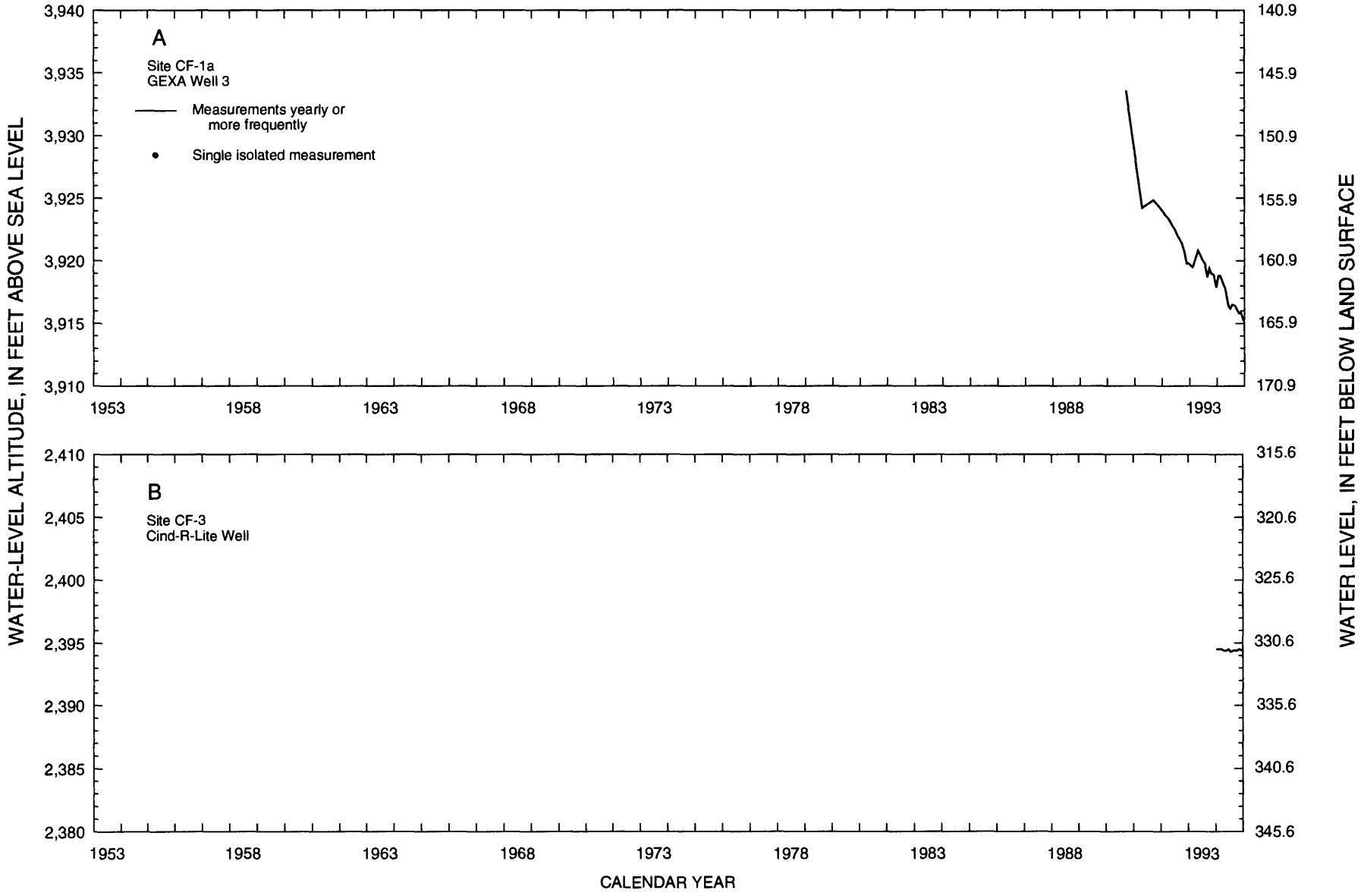
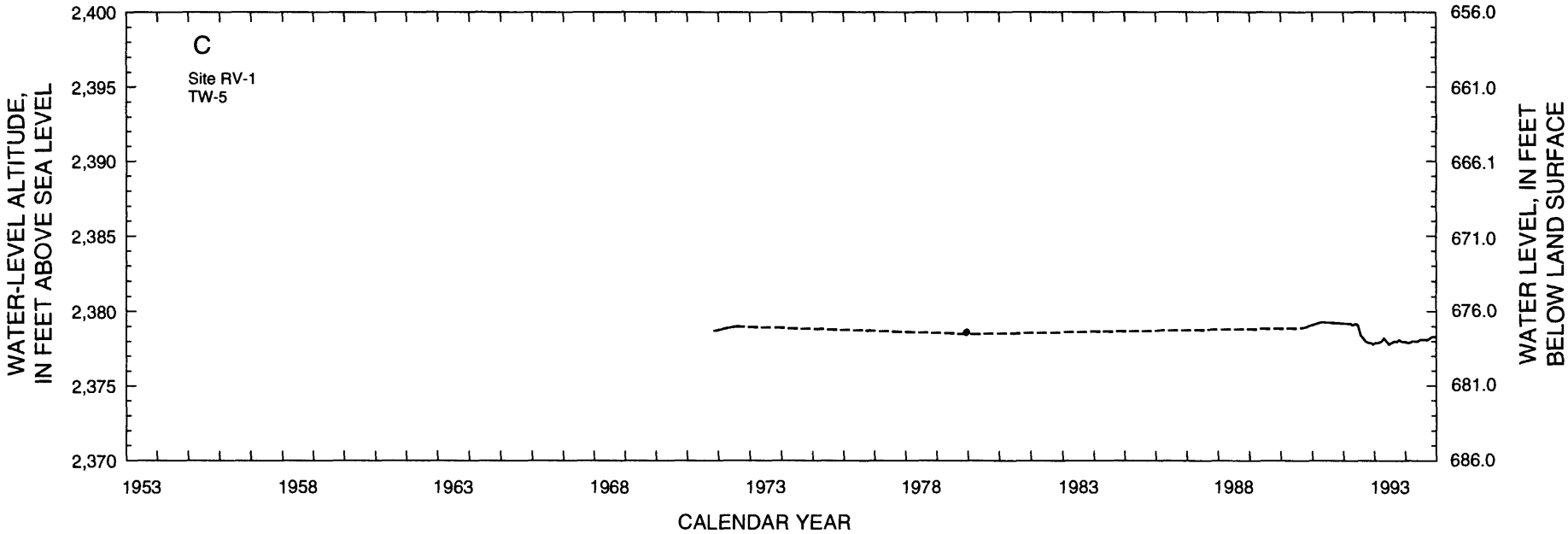


Figure 4. Periodic water levels through 1994 for selected sites at which primary contributing units are undifferentiated sedimentary rock. Lines connect discrete data presented in this and previous reports on selected ground-water data for Yucca Mountain region and are dashed where measurements were not available for consecutive calendar years. Data that may represent transient conditions at a site have been excluded (see section titled "Presentation of Ground-Water Data").



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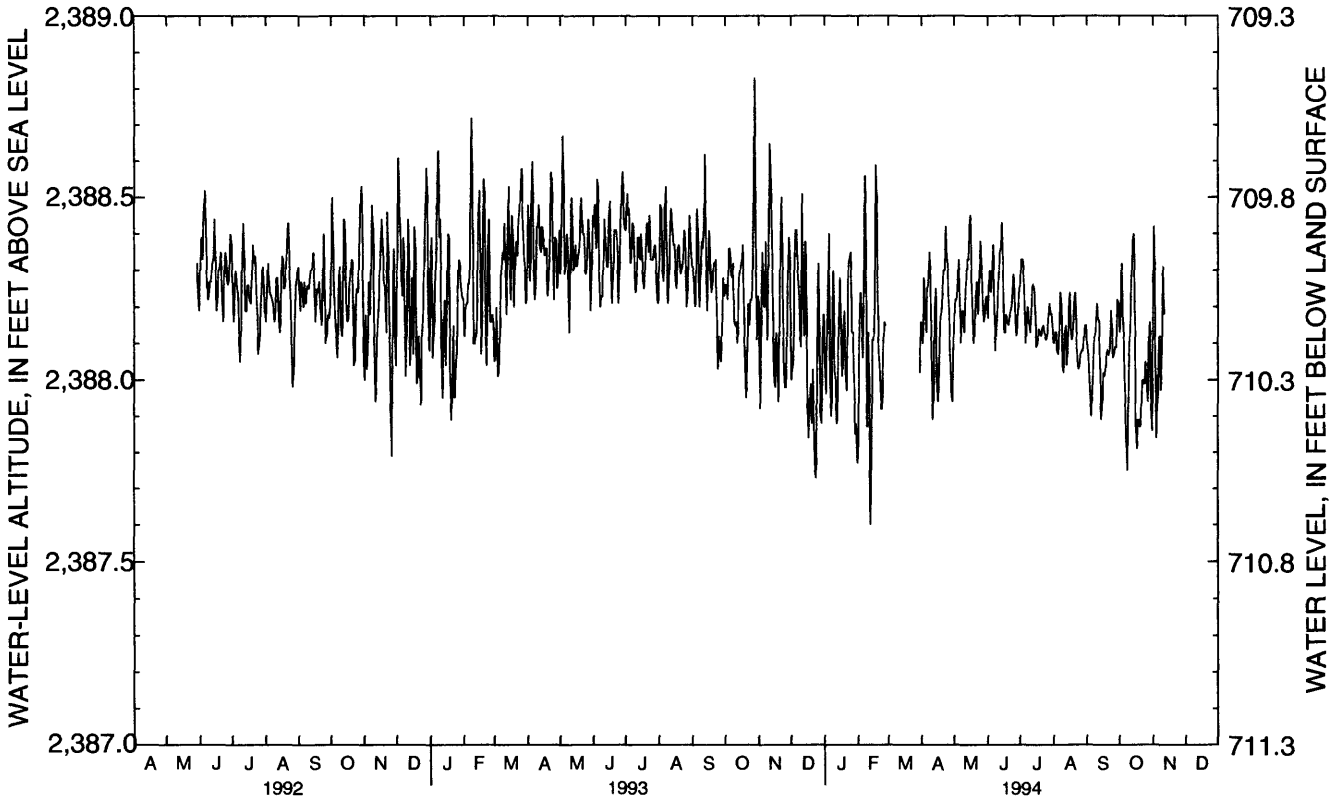


Figure 5. Daily average water levels in well JF-3, May 1992 through December 1994.

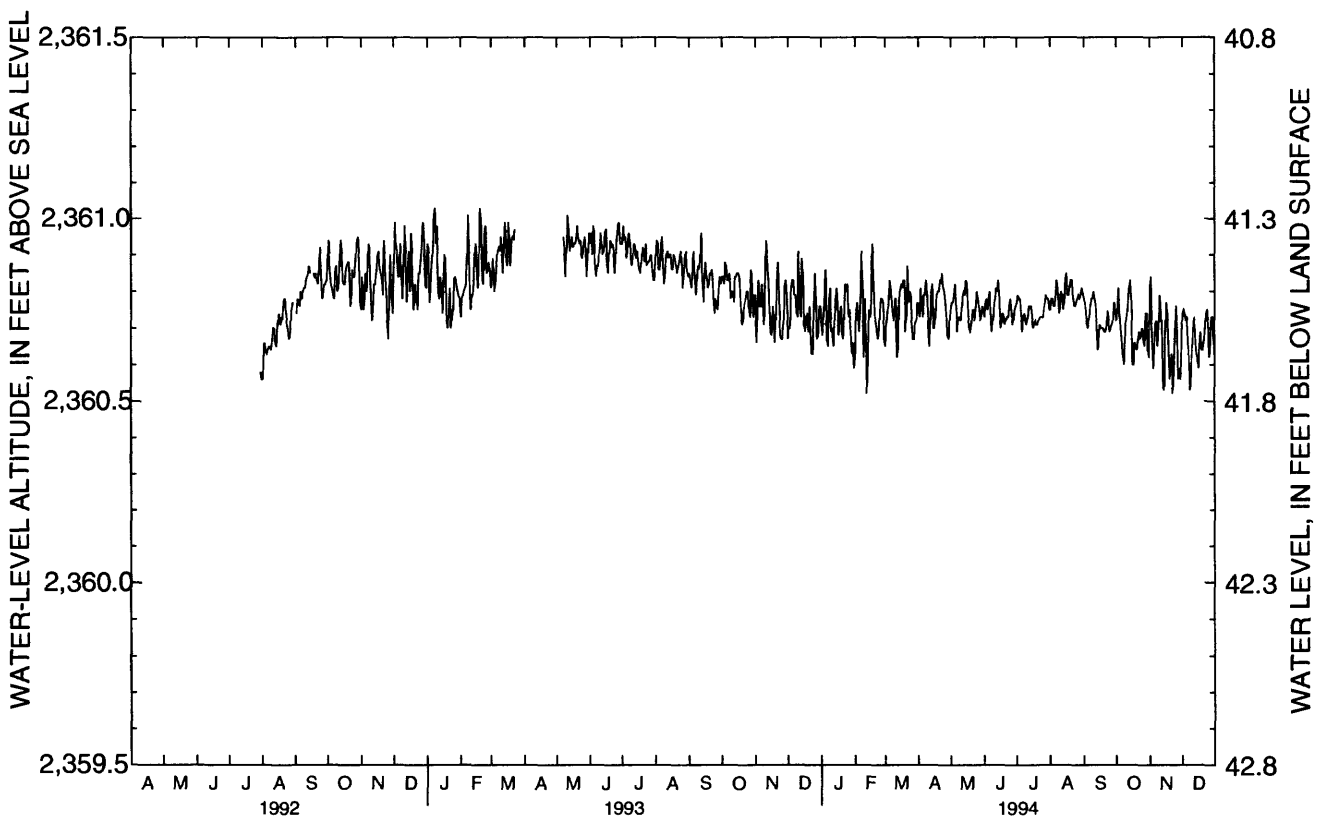


Figure 6. Daily average water levels in well AD-6, July 1992 through December 1994

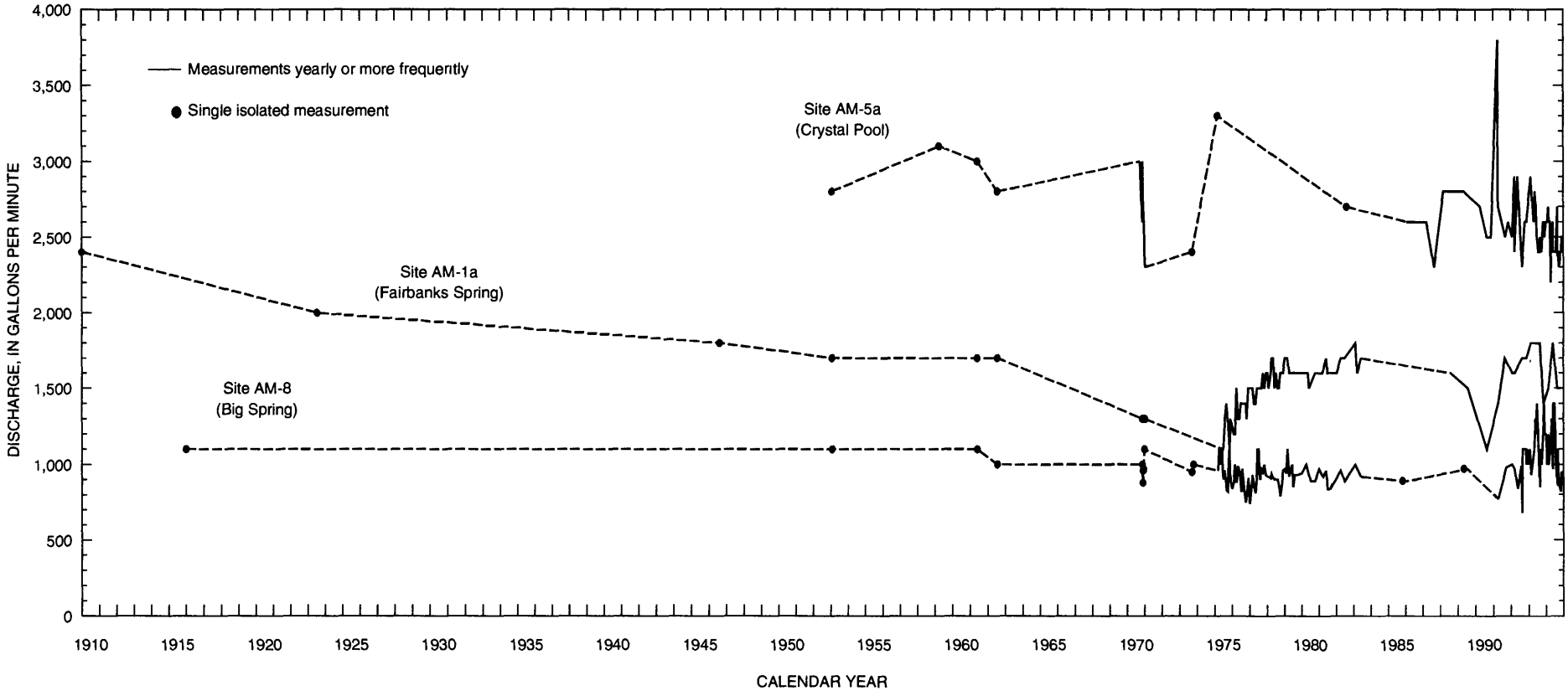


Figure 7. Discharge at sites AM-1a (Fairbanks Spring), AM-5a (Crystal Pool), and AM-8 (Big Spring) through 1994. Lines connect discrete measurements presented in this and previous reports on selected ground-water data for Yucca Mountain region and are dashed where measurements were not available for consecutive calendar years.

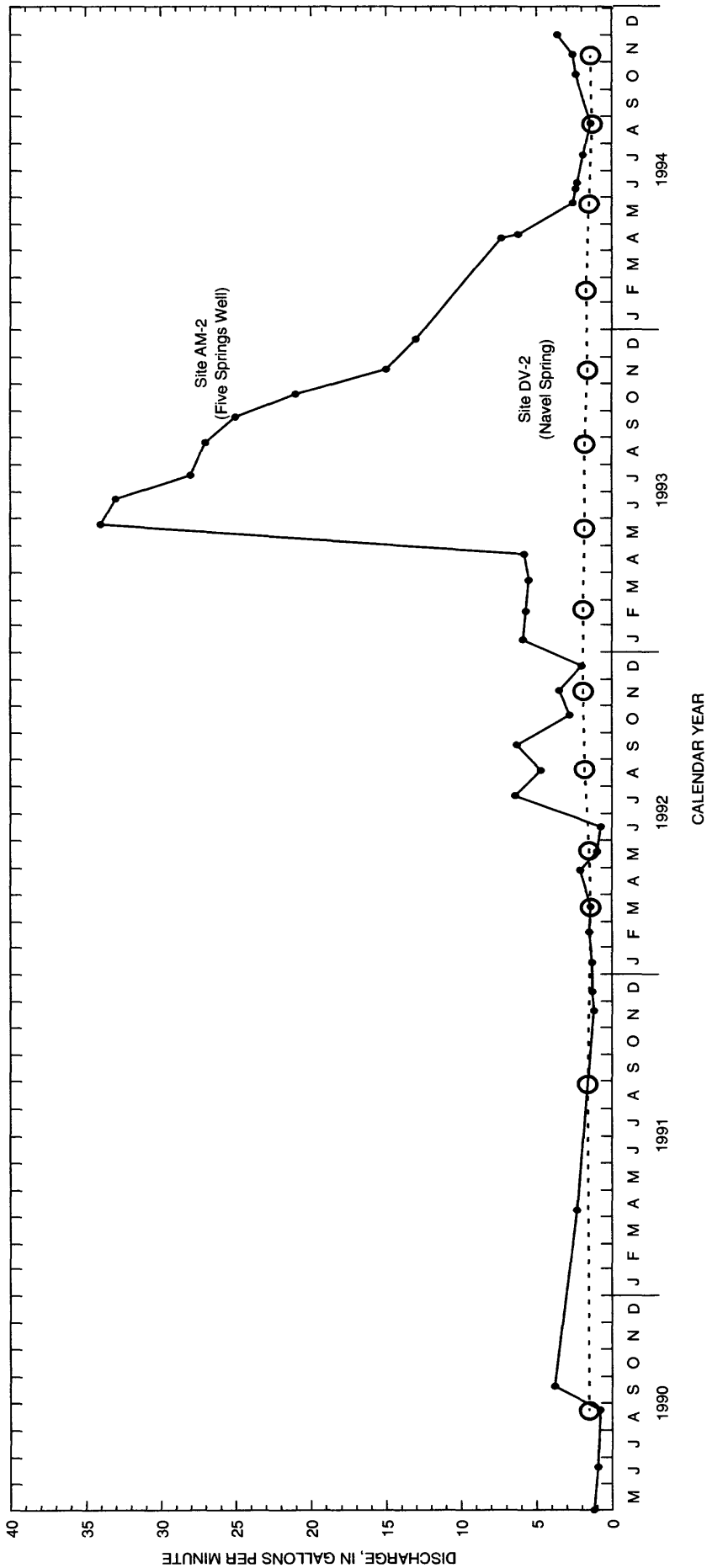


Figure 8. Discharge at sites AM-2 (Five Springs Well) and DV-2 (Navel Spring), 1990 through 1994. Symbols indicate discrete measurements presented in this and previous reports on selected ground-water data for Yucca Mountain region.

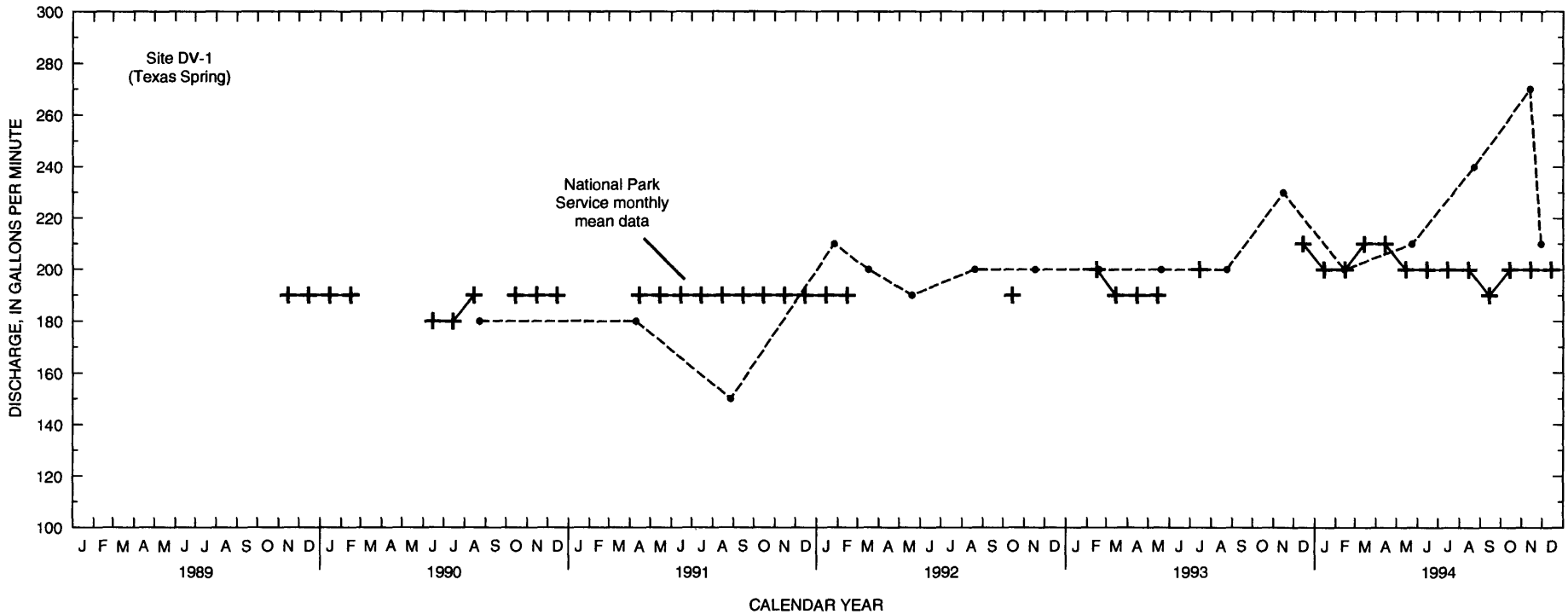


Figure 9. Discharge at site DV-1 (Texas Spring), 1989 through 1994. Dots indicate discrete USGS measurements presented in this and previous reports on selected ground-water data for Yucca Mountain region. Plus symbol represents the National Park Service monthly mean data for any given month. National Park Service monthly mean data are not connected by a line where data are not available for consecutive months.

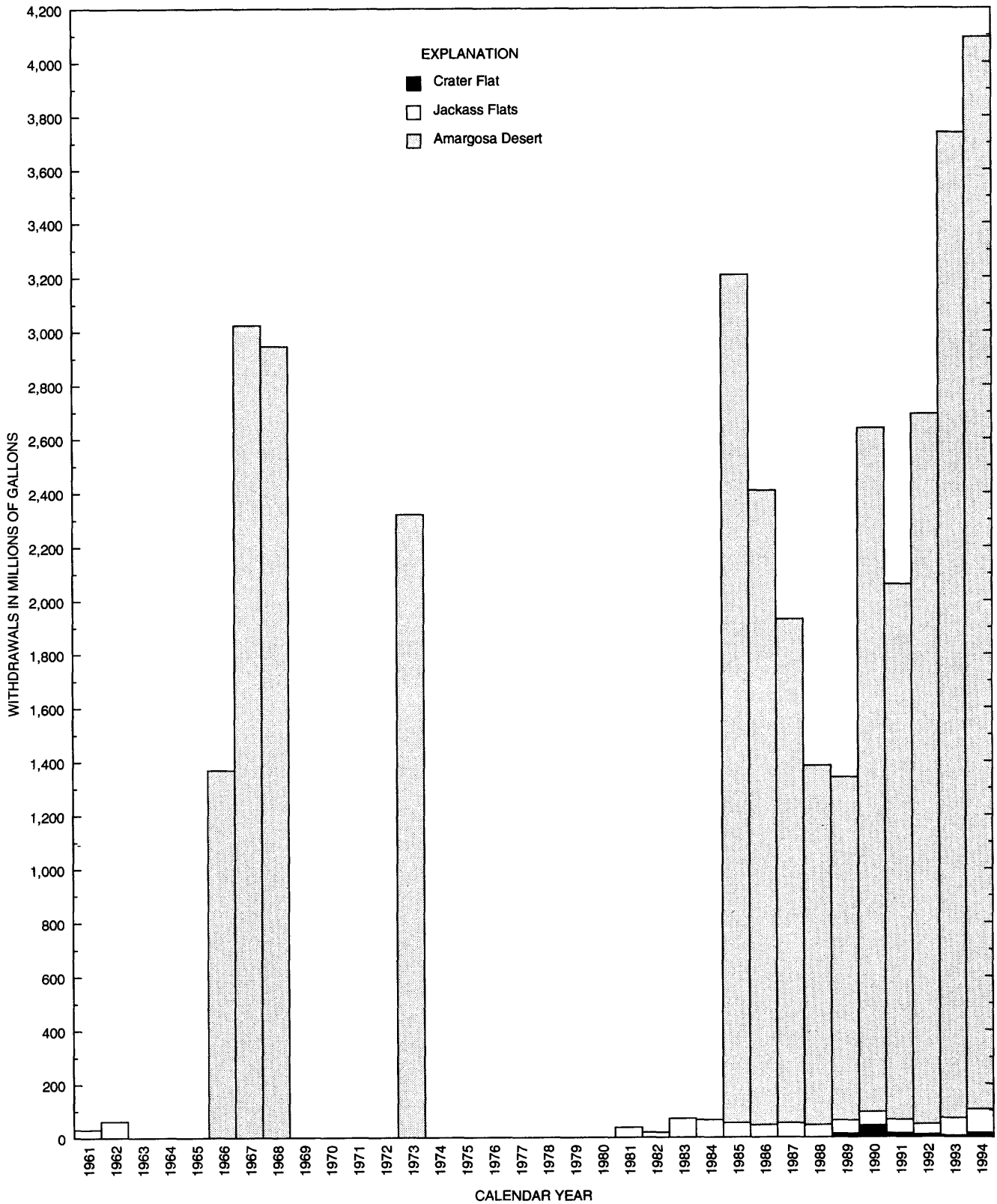


Figure 10. Available estimates of annual ground-water withdrawals for selected areas within Alkali Flat-Furnace Creek Ranch ground-water subbasin, 1961 through 1994. In each hydrographic area, ground water may have been withdrawn in years for which no estimates are available. Total bar height equals the approximate sum of withdrawals from all areas within subbasin for given year.

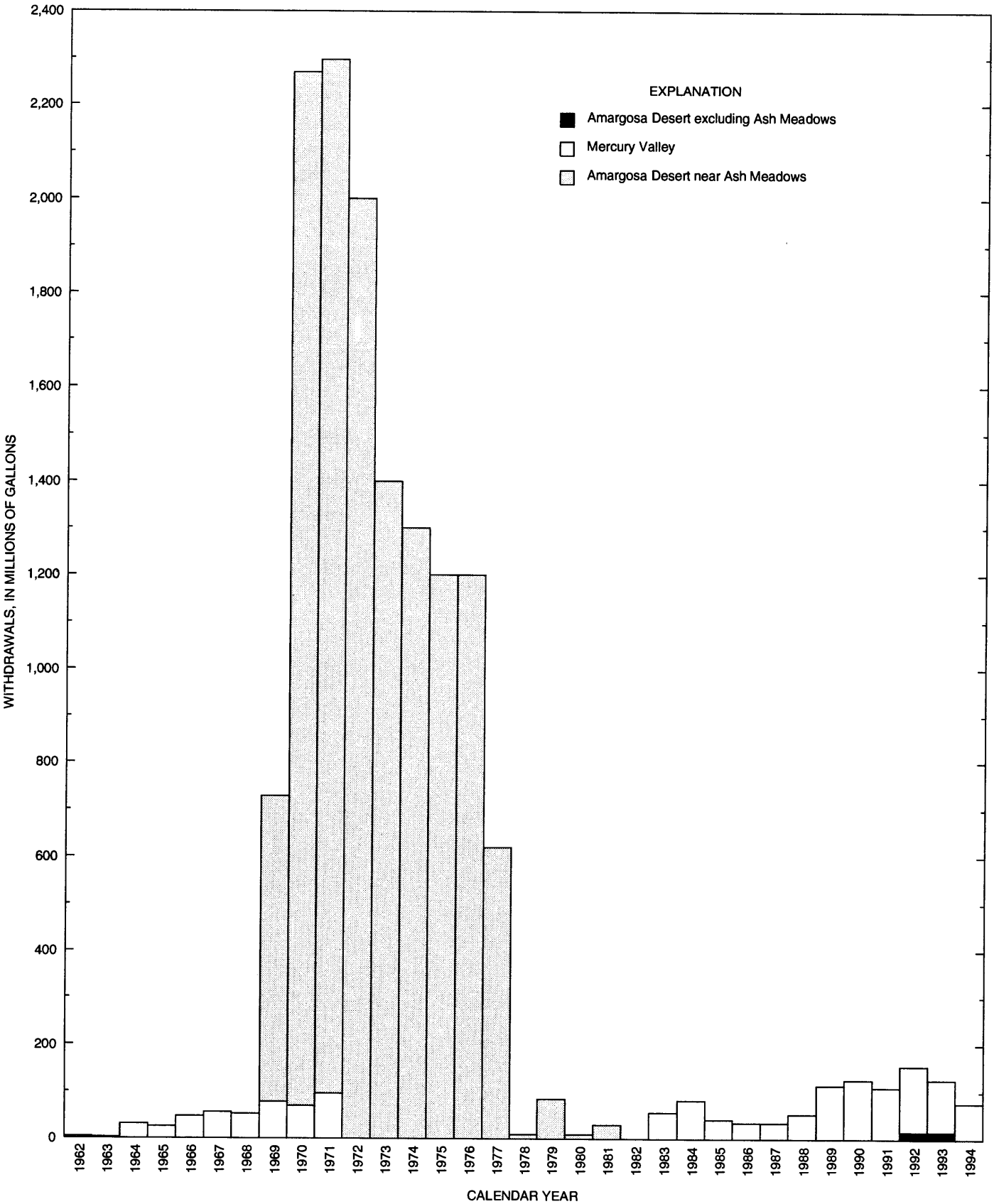


Figure 11. Available estimates of annual ground-water withdrawals for selected areas within Ash Meadows ground-water subbasin, 1962 through 1994. In each hydrographic area, ground water may have been withdrawn in years for which no estimates are available. Total bar height equals the approximate sum of withdrawals from all areas within subbasin for given year.

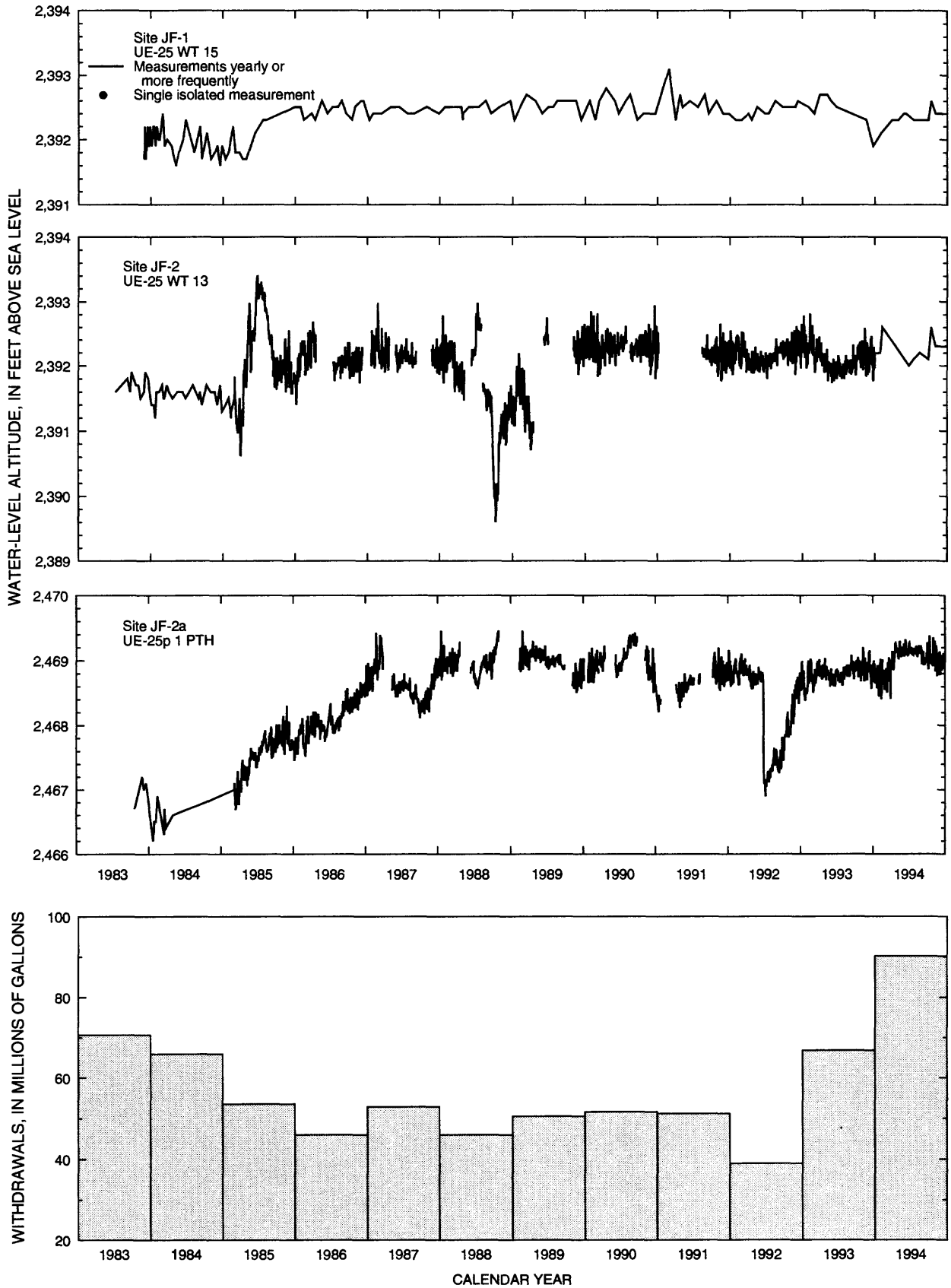


Figure 12. Water-level altitudes in wells JF-1, JF-2, JF-2a, J-13, J-11, J-12, and JF-3, and estimated ground-water withdrawals from Jackass Flats, 1983 through 1994. Lines connect discrete measurements or daily average water levels (when continual data recorded by instrumentation were available for more than half a year), and are dashed where measurements were not available for consecutive calendar years. Discrete measurements that may reflect transient conditions at a site have been excluded. Bar height for ground-water withdrawals equals sum of withdrawals from water-supply wells J-13 and J-12.

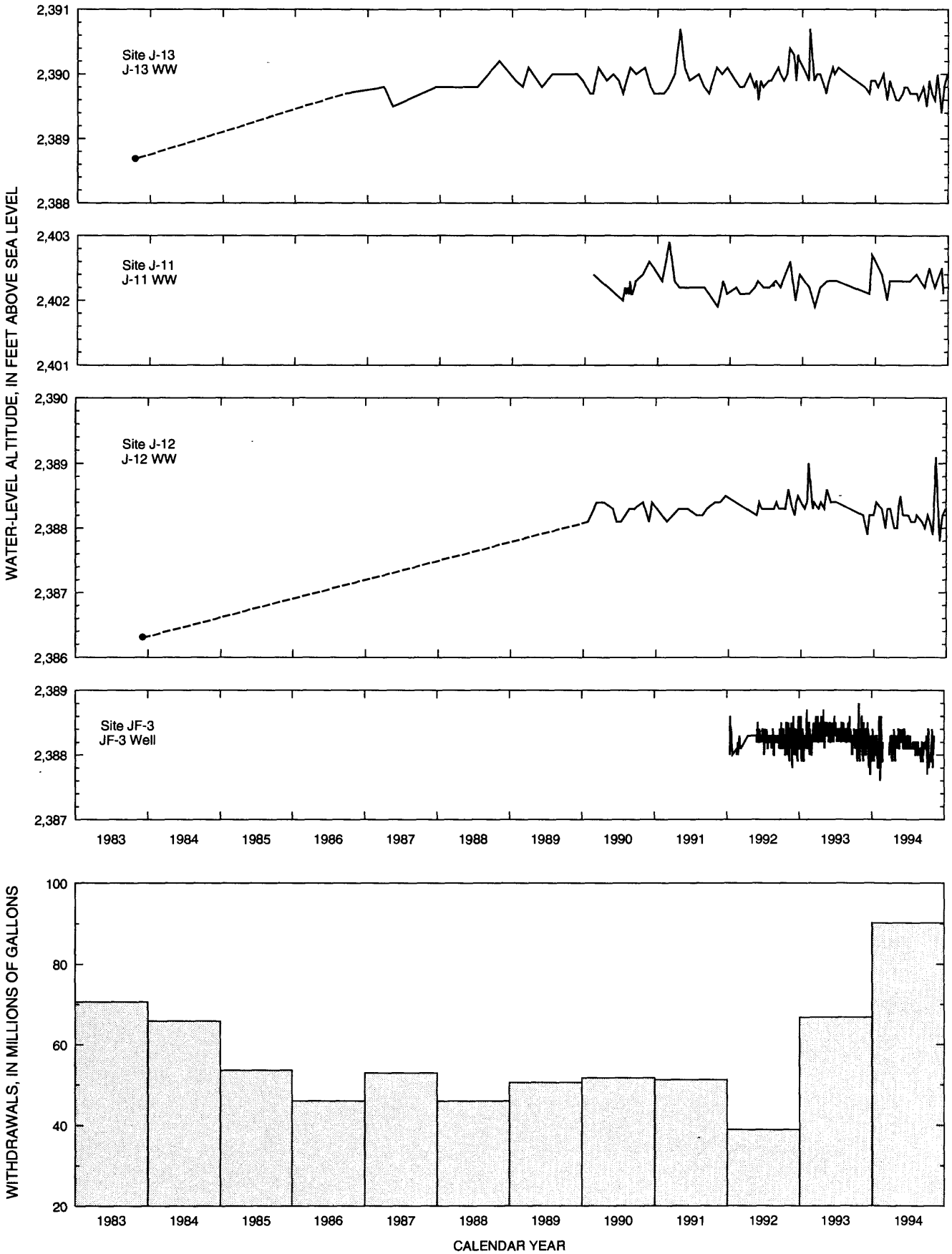


Figure 12. Continued.

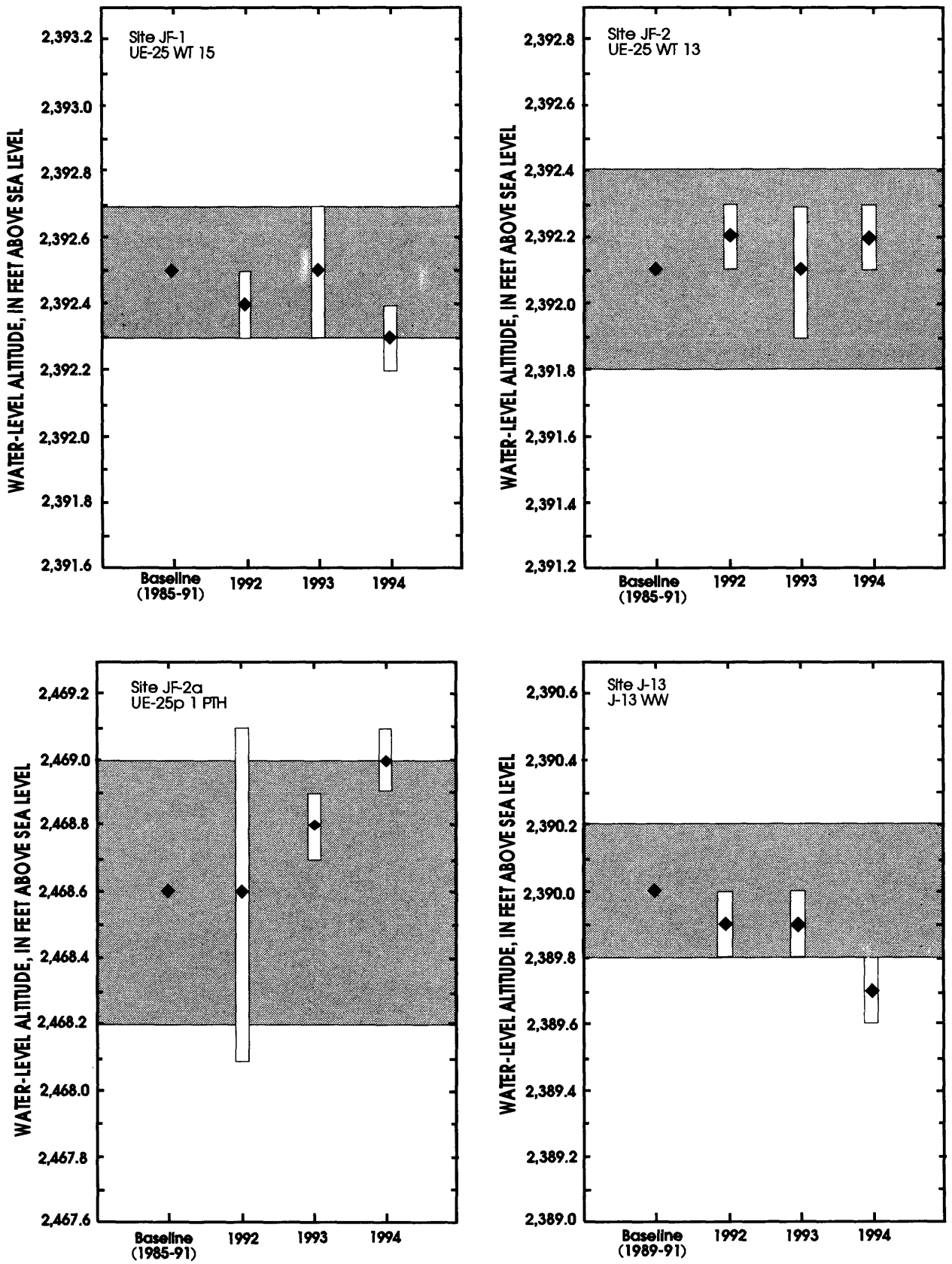
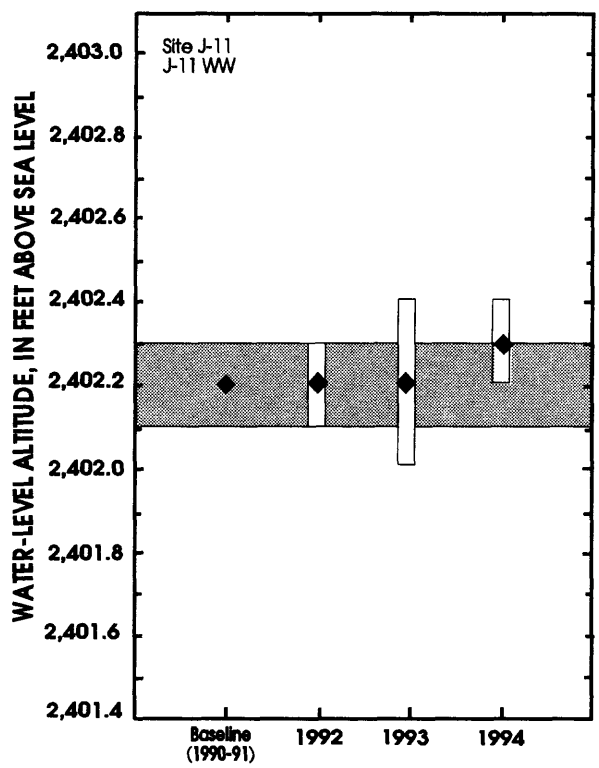
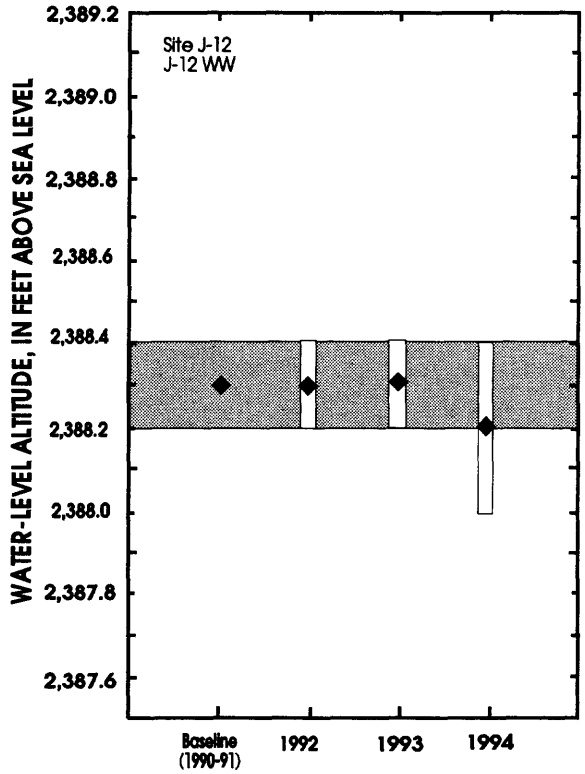
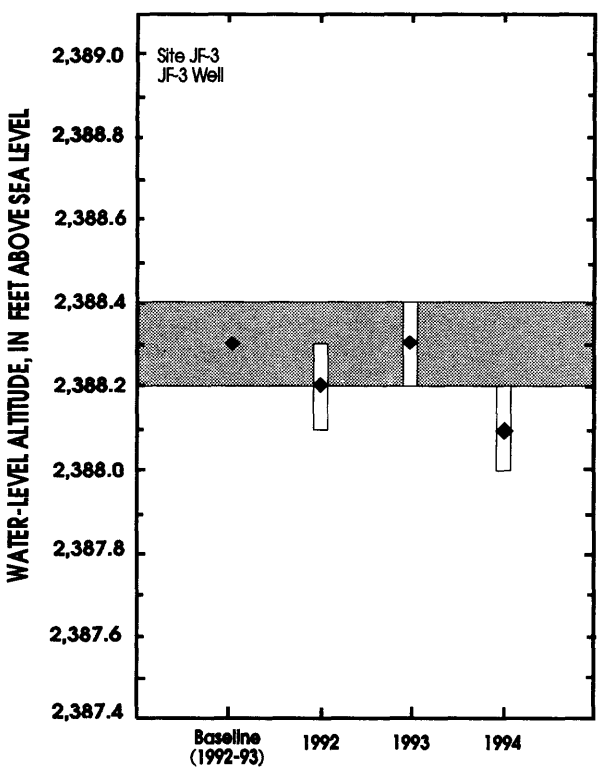


Figure 13. Median water-level altitudes and average deviation of water levels for wells JF-1, JF-2, JF-2a, J-13, J-11, J-12, and JF-3 for selected baseline periods and for calendar years 1992 through 1994.







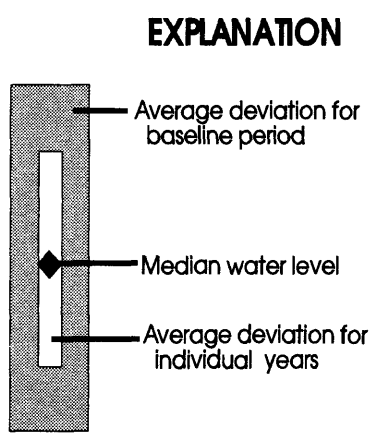


Figure 13. Continued.

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994

Site number: Sites are grouped by hydrographic area and, within each area, are listed in general north-to-south, then west-to-east order. See text section titled "Site Number" for further discussion.

U.S. Geological Survey site identification: Unique identification number for site as stored in files and data bases of U.S. Geological Survey (USGS).

Land-surface altitude: Altitude of land surface in vicinity of site. Exception is altitude for site AM-4, which is altitude of bolt that serves as measurement point. Altitudes are reported to nearest 0.1 foot and were derived from USGS land surveys.

Height of measurement point: Height of measurement point (MP) most recently used. MP is stable, recoverable point from which periodic measurements to depth of water are made. MP at site AM-4 is bolt fastened to south wall of fissure, and is not referenced to land surface. Negative number indicates MP is below land surface.

Depth to water: Depths listed generally represent water level below land surface. Exceptions are site AM-4, where data represent water level below measurement point, and site AM-2, where negative numbers represent water levels above land surface. Site AM-2 is flowing well with water standing above land surface in casing. Apparent differences in depth to water at sites that list data from several sources may result from differing estimates of distance from land surface to measurement point used.

Method: Method used to measure depth to water. A, average monthly water level, reported for 15th of month; B, depth to water calculated from millivolt output of transducer installed in well and most recent calibration of instrumentation; N, depth to water is measured below measurement point with ruled tape; S, steel tape; T, uncalibrated electric tape; V, calibrated electric tape; Z, measurement method unknown.

Site status: Known conditions at site that may have affected measured depth to water. F, flowing; P, pumping; R, well recently pumped; S, nearby well pumping during measurement..

Data source: EMP, Environmental-Monitoring Program (USGS); NDWR, Nevada Division of Water Resources; NPS, National Park Service; NTS, Hydrologic Resources Management and Environmental Restoration Programs (USGS); PVT, private owner measurement; SCP, Site-Characterization Project (USGS); USFWS, U.S. Fish and Wildlife Service; USGS-NV, other Nevada District Programs.

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
CF- 1	365520116370301	GEXA Well 4	3,930.9	1.82	01-20-1994	0910	617.88	3,313.0	V	-	EMP
					02-17-1994	1050	617.33	3,313.6	V	-	EMP
					03-23-1994	1440	617.38	3,313.5	V	-	EMP
					04-20-1994	1025	617.56	3,313.3	V	-	EMP
					05-27-1994	1035	617.48	3,313.4	V	-	EMP
					06-22-1994	1245	617.62	3,313.3	V	-	EMP
					07-20-1994	1225	617.60	3,313.3	V	-	EMP
					08-29-1994	1325	617.45	3,313.4	V	-	EMP
					09-21-1994	1200	617.46	3,313.4	V	-	EMP
					10-20-1994	0840	617.40	3,313.5	V	-	EMP
					11-10-1994	1100	617.12	3,313.8	V	-	EMP
					12-22-1994	1200	617.41	3,313.5	V	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
CF- 1a	365445116383901	GEXA Well 3	4,080.9	1.68	01-20-1994	0845	162.08	3,918.8	S	-	EMP
					02-17-1994	1014	162.11	3,918.8	S	-	EMP
					03-23-1994	1415	162.68	3,918.2	S	-	EMP
					04-20-1994	1005	163.14	3,917.8	S	-	EMP
					05-31-1994	1445	164.51	3,916.4	S	-	EMP
					06-22-1994	1224	164.66	3,916.2	S	-	EMP
					07-20-1994	1200	164.44	3,916.5	S	-	EMP
					08-29-1994	1240	164.54	3,916.4	S	-	EMP
					09-21-1994	1115	164.84	3,916.1	S	-	EMP
					10-20-1994	0815	165.07	3,915.8	S	-	EMP
					11-10-1994	1035	164.99	3,915.9	S	-	EMP
					12-22-1994	1145	165.67	3,915.2	S	-	EMP
CF- 2	364732116330701	USW VH-1	3,161.1	1.17	02-01-1994	1110	603.92	2,557.2	S	-	SCP
					02-25-1994	1158	603.78	2,557.3	S	-	SCP
					03-29-1994	1238	603.81	2,557.3	S	-	SCP
					04-22-1994	1123	603.80	2,557.3	S	-	SCP
					05-05-1994	1144	603.70	2,557.4	S	-	SCP
					06-08-1994	1002	603.94	2,557.2	S	-	SCP
					07-29-1994	1146	603.80	2,557.3	S	-	SCP
					08-25-1994	1253	603.80	2,557.3	S	-	SCP
					09-22-1994	1343	603.77	2,557.3	S	-	SCP
					10-26-1994	1335	603.75	2,557.4	S	-	SCP
					11-22-1994	1153	603.99	2,557.1	S	-	SCP
					12-09-1994	0936	603.87	2,557.2	S	-	SCP
					12-09-1994	1001	603.87	2,557.2	S	-	SCP
CF- 3	364105116302601	Cind-R-Lite Well	2,725.6	-3.20	01-14-1994	0951	331.13	2,394.5	V	-	EMP
					02-03-1994	0830	331.12	2,394.5	S	-	EMP
					03-23-1994	1310	331.13	2,394.5	S	-	EMP
					04-20-1994	0910	331.20	2,394.4	S	-	EMP
					05-27-1994	0850	331.22	2,394.4	S	-	EMP
					06-22-1994	1110	331.10	2,394.5	S	-	EMP
					07-20-1994	1040	331.27	2,394.3	S	-	EMP
					08-29-1994	1130	331.15	2,394.4	S	-	EMP
					09-21-1994	0940	331.24	2,394.4	S	-	EMP
					10-19-1994	1255	331.15	2,394.4	S	-	EMP
					11-10-1994	0930	331.08	2,394.5	S	-	EMP
					12-22-1994	1025	331.17	2,394.4	S	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
JF- 1	365116116233801	UE-25 WT 15	3,553.8	0.18	01-31-1994	1127	1161.67	2,392.1	S	-	SCP
					02-28-1994	1217	1161.57	2,392.2	S	-	SCP
					03-28-1994	1345	1161.52	2,392.3	S	-	SCP
					04-29-1994	1046	1161.50	2,392.3	S	-	SCP
					05-26-1994	1030	1161.39	2,392.4	S	-	SCP
					06-07-1994	1001	1161.43	2,392.4	S	-	SCP
					07-15-1994	0932	1161.51	2,392.3	S	-	SCP
					08-15-1994	1016	1161.47	2,392.3	S	-	SCP
					09-28-1994	1142	1161.51	2,392.3	S	-	SCP
					10-13-1994	1232	1161.16	2,392.6	S	-	SCP
					11-03-1994	1107	1161.38	2,392.4	S	-	SCP
					12-13-1994	1140	1161.37	2,392.4	S	-	SCP
JF- 2	364945116235001	UE-25 WT 13	3,387.5	1.00	01-27-1994	0948	995.27	2,392.2	S	-	SCP
					02-08-1994	0935	994.93	2,392.6	S	-	SCP
					06-21-1994	1109	995.45	2,392.0	S	-	SCP
					07-15-1994	1000	995.35	2,392.2	S	-	SCP
					08-15-1994	1047	995.28	2,392.2	S	-	SCP
					09-28-1994	1215	995.37	2,392.1	S	-	SCP
					10-13-1994	1308	994.92	2,392.6	S	-	SCP
					11-03-1994	1140	995.21	2,392.3	S	-	SCP
					12-29-1994	1231	995.21	2,392.3	S	-	SCP
JF- 2a	364938116252102	UE-25p 1 PTH	3,655.5	.56	03-31-1994	1029	1,186.70	2,468.8	S	-	SCP
					04-17-1994	1112	1,186.61	2,468.9	B	-	SCP
					07-28-1994	1153	1,186.49	2,469.0	B	-	SCP
					11-23-1994	1527	1,186.74	2,468.8	B	-	SCP
J-13	364828116234001	J -13 WW	3,317.9	1.11	01-14-1994	1143	928.12	2,389.8	S	-	SCP
					02-10-1994	0928	927.89	2,390.0	S	-	SCP
					03-01-1994	0959	928.29	2,389.6	S	-	SCP
					03-15-1994	0826	927.95	2,390.0	S	-	SCP
					03-24-1994	1003	928.08	2,389.8	S	-	SCP
					04-15-1994	1009	928.27	2,389.6	S	-	SCP
					04-29-1994	1148	928.34	2,389.6	S	-	SCP
					05-18-1994	1144	928.23	2,389.7	S	-	SCP
					05-27-1994	1029	928.09	2,389.8	S	-	SCP
					06-10-1994	0810	928.11	2,389.8	S	-	SCP
					06-24-1994	1026	928.17	2,389.7	S	-	SCP
					07-08-1994	0814	928.22	2,389.7	S	-	SCP
					07-27-1994	0918	928.17	2,389.7	S	-	SCP
					08-05-1994	0853	928.28	2,389.6	S	-	SCP
					08-31-1994	0907	928.11	2,389.8	S	-	SCP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
J-13	364828116234001	J-13 WW	3,317.9	1.11	09-16-1994	1018	928.44	2,389.5	S	-	SCP
					09-30-1994	0737	927.95	2,390.0	S	-	SCP
					10-12-1994	0843	928.17	2,389.7	S	-	SCP
					10-27-1994	0947	928.30	2,389.6	S	-	SCP
					11-10-1994	0811	927.87	2,390.0	S	-	SCP
					11-29-1994	0847	928.47	2,389.4	S	-	SCP
					12-13-1994	0842	928.09	2,389.8	S	-	SCP
					12-29-1994	1304	927.89	2,390.0	S	-	SCP
J-11	364706116170601	J-11 WW	3,442.8	2.11	02-03-1994	1202	1,040.41	2,402.4	S	-	SCP
					03-01-1994	1326	1,040.77	2,402.0	S	-	SCP
					03-15-1994	1109	1,040.47	2,402.3	S	-	SCP
					05-02-1994	1155	1,040.53	2,402.3	S	-	SCP
					05-27-1994	1106	1,040.45	2,402.4	S	-	SCP
					06-24-1994	1144	1,040.51	2,402.3	S	-	SCP
					07-27-1994	1423	1,040.43	2,402.4	S	-	SCP
					09-06-1994	1026	1,040.60	2,402.2	S	-	SCP
					09-30-1994	1007	1,040.31	2,402.5	S	-	SCP
					10-27-1994	1024	1,040.64	2,402.2	S	-	SCP
					12-02-1994	1018	1,040.31	2,402.5	S	-	SCP
					12-08-1994	1053	1,040.74	2,402.1	S	-	SCP
J-12	364554116232401	J-12 WW	3,128.4	5.04	01-14-1994	1154	739.95	2,388.4	S	-	SCP
					02-10-1994	0858	740.13	2,388.3	S	-	SCP
					03-01-1994	0932	740.44	2,388.0	S	-	SCP
					03-10-1994	1258	740.10	2,388.3	S	-	SCP
					03-24-1994	0940	740.11	2,388.3	S	-	SCP
					04-15-1994	0900	740.38	2,388.0	S	-	SCP
					04-29-1994	1125	740.43	2,388.0	S	-	SCP
					05-05-1994	0901	740.06	2,388.3	S	-	SCP
					05-16-1994	1310	739.94	2,388.5	S	-	SCP
					05-27-1994	0948	740.18	2,388.2	S	-	SCP
					06-10-1994	0739	740.18	2,388.2	S	-	SCP
					06-24-1994	0955	740.19	2,388.2	S	-	SCP
					07-08-1994	0735	740.29	2,388.1	S	-	SCP
					07-28-1994	1223	740.29	2,388.1	S	-	SCP
					08-05-1994	0824	740.16	2,388.2	S	-	SCP
					08-31-1994	0941	740.28	2,388.1	S	-	SCP
					09-16-1994	0928	740.37	2,388.0	S	-	SCP
					09-30-1994	0715	740.18	2,388.2	S	-	SCP
					10-11-1994	1247	740.25	2,388.2	S	-	SCP
					10-27-1994	0907	740.46	2,387.9	S	-	SCP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
J-12	364554116232401	J-12 WW	3,128.4	5.04	11-10-1994	0903	739.33	2,389.1	S	-	SCP
					11-29-1994	0819	740.57	2,387.8	S	-	SCP
					12-13-1994	0922	740.20	2,388.2	S	-	SCP
					12-29-1994	1336	740.08	2,388.3	S	-	SCP
JF-3	364528116232201	JF-3 Well	3,098.3	2.27	01-06-1994	1415	710.29	2,388.0	V	-	EMP
					01-20-1994	0651	710.24	2,388.1	V	-	EMP
					02-16-1994	0755	710.16	2,388.1	V	-	EMP
					03-23-1994	0819	710.19	2,388.1	V	-	EMP
					03-29-1994	1207	710.31	2,388.0	V	-	EMP
					04-05-1994	1028	710.24	2,388.1	V	-	EMP
					04-05-1994	1040	710.22	2,388.1	V	-	EMP
					04-19-1994	0713	710.15	2,388.2	V	-	EMP
					05-26-1994	1435	709.95	2,388.4	V	-	EMP
					06-22-1994	0955	710.17	2,388.1	V	-	EMP
					06-28-1994	1040	710.21	2,388.1	V	-	EMP
					07-20-1994	0943	710.24	2,388.1	V	-	EMP
					08-24-1994	0710	710.30	2,388.0	V	-	EMP
					09-20-1994	0713	710.27	2,388.0	V	-	EMP
					10-19-1994	0835	710.44	2,387.9	V	-	EMP
					11-09-1994	0725	710.34	2,388.0	V	-	EMP
					12-22-1994	0805	710.26	2,388.0	V	-	EMP
RV- 1	363815116175901	TW- 5	3,056.0	1.6	01-24-1994	1210	678.15	2,377.8	V	-	EMP
					02-17-1994	0815	678.11	2,377.9	V	-	EMP
					03-23-1994	1140	678.04	2,378.0	V	-	EMP
					04-20-1994	0737	678.03	2,378.0	V	-	EMP
					05-27-1994	0750	677.95	2,378.0	V	-	EMP
					06-22-1994	0710	677.92	2,378.1	V	-	EMP
					07-05-1994	1030	677.90	2,378.1	V	-	EMP
					07-20-1994	0655	677.91	2,378.1	V	-	EMP
					08-25-1994	0710	677.86	2,378.1	V	-	EMP
					09-21-1994	0830	677.89	2,378.1	V	-	EMP
					10-19-1994	1020	677.84	2,378.2	V	-	EMP
					11-10-1994	0735	677.72	2,378.3	V	-	EMP
					12-22-1994	0920	677.75	2,378.2	V	-	EMP
MV- 1	363530116021401	Army 1 WW	3,153.3	.30	--	--	--	--	-	-	--
AD- 1	364141116351401	NA-6 Well BGMW-10	2,627.9	1.7	01-20-1994	1020	269.51	2,358.4	V	-	EMP
					02-17-1994	1156	269.03	2,358.9	V	-	EMP
					03-16-1994	--	269.4	2,358.5	Z	-	PVT
					03-23-1994	1550	269.32	2,358.6	V	-	EMP
					04-20-1994	1130	269.32	2,358.6	V	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD- 1	364141116351401	NA-6 Well BGMW-10	2,627.9	1.7	05-27-1994	1145	269.38	2,358.5	V	-	EMP
					06-21-1994	--	269.6	2,358.3	Z	-	PVT
					06-22-1994	1402	269.36	2,358.5	V	-	EMP
					07-20-1994	1325	269.38	2,358.5	V	-	EMP
					08-29-1994	1425	269.31	2,358.6	V	-	EMP
					09-21-1994	1310	269.37	2,358.5	V	-	EMP
					09-28-1994	--	269.5	2,358.4	Z	-	PVT
					10-20-1994	1000	269.44	2,358.5	V	-	EMP
					11-10-1994	1230	269.13	2,358.8	V	-	EMP
					12-18-1994	--	269.7	2,358.2	Z	-	PVT
					12-22-1994	1325	269.33	2,358.6	V	-	EMP
AD- 2	363830116241401	Airport Well	2,638.8	1.05	01-19-1994	1130	324.56	2,314.2	V	-	EMP
					02-15-1994	1350	324.61	2,314.2	V	-	EMP
					03-22-1994	0835	324.32	2,314.5	V	-	EMP
					04-19-1994	1035	324.65	2,314.2	V	-	EMP
					05-19-1994	1040	324.77	2,314.0	V	-	EMP
					06-28-1994	1150	324.66	2,314.1	V	-	EMP
					07-19-1994	1155	324.72	2,314.1	V	-	EMP
					08-24-1994	1350	324.68	2,314.1	V	-	EMP
					09-20-1994	0820	324.70	2,314.1	V	-	EMP
					10-18-1994	0730	324.73	2,314.1	V	-	EMP
					11-09-1994	0805	324.71	2,314.1	V	-	EMP
					12-21-1994	0935	324.75	2,314.0	V	-	EMP
AD- 2a	363835116234001	NDOT Well	2,656.8	.4	01-20-1994	0603	341.99	2,314.8	V	-	EMP
					02-15-1994	1407	342.02	2,314.8	V	-	EMP
					03-22-1994	0755	343.08	2,313.7	V	R	EMP
					04-20-1994	1240	344.23	2,312.6	S	R	EMP
					05-19-1994	1100	342.40	2,314.4	S	R	EMP
					06-22-1994	0855	343.99	2,312.8	S	P	EMP
					07-20-1994	1410	342.34	2,314.5	S	-	EMP
					08-24-1994	0750	342.15	2,314.6	S	-	EMP
					09-20-1994	0750	342.72	2,314.1	S	-	EMP
					10-20-1994	1045	342.50	2,314.3	S	-	EMP
					11-09-1994	1300	342.14	2,314.7	S	R	EMP
					12-21-1994	0900	342.17	2,314.6	S	-	EMP
AD- 3a	363521116352501	Davidson Well	2,395.3	1.00	01-19-1994	1025	129.88	2,265.4	S	-	EMP
					02-02-1994	1240	129.71	2,265.6	S	-	EMP
					03-22-1994	0940	129.81	2,265.5	S	-	EMP
					04-19-1994	1155	130.02	2,265.3	S	-	EMP
					05-23-1994	1435	130.09	2,265.2	S	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD- 3a	363521116352501	Davidson Well	2,395.3	1.0	06-21-1994	1355	130.24	2,265.1	S	-	EMP
					07-19-1994	1300	130.40	2,264.9	S	-	EMP
					08-23-1994	1440	130.57	2,264.7	S	-	EMP
					09-20-1994	0930	130.72	2,264.6	S	-	EMP
					10-18-1994	0850	130.85	2,264.4	S	-	EMP
					11-08-1994	1425	130.74	2,264.6	S	-	EMP
					12-20-1994	1310	130.54	2,264.8	S	-	EMP
AD- 4a	363428116234701	Cooks East Well	2,477.8	1.0	01-19-1994	1105	118.42	2,359.4	V	-	EMP
					02-15-1994	0735	118.58	2,359.2	V	-	EMP
					03-22-1994	0855	118.63	2,359.2	V	-	EMP
					04-19-1994	1055	118.84	2,359.0	V	-	EMP
					05-25-1994	1205	118.94	2,358.9	V	-	EMP
					06-22-1994	0830	119.12	2,358.7	V	-	EMP
					07-19-1994	1215	119.20	2,358.6	V	-	EMP
					08-24-1994	0830	119.33	2,358.5	V	-	EMP
					09-20-1994	0840	119.39	2,358.4	V	-	EMP
					10-18-1994	0750	119.45	2,358.4	V	-	EMP
					11-09-1994	0825	119.44	2,358.4	V	-	EMP
					12-21-1994	0955	119.55	2,358.2	V	-	EMP
AD- 5	363310116294001	USBLM Well	2,376.4	0.0	01-19-1994	0935	119.52	2,256.9	S	-	EMP
					02-15-1994	0800	119.27	2,257.1	S	-	EMP
					03-22-1994	0915	120.42	2,256.0	S	-	EMP
					03-28-1994	1010	120.35	2,256.0	S	-	USGS-NV
					04-19-1994	1115	122.21	2,254.2	S	-	EMP
					05-19-1994	1155	122.50	2,253.9	S	-	EMP
					06-21-1994	1325	122.84	2,253.6	S	-	EMP
					07-19-1994	1240	123.49	2,252.9	S	-	EMP
					08-23-1994	1415	124.13	2,252.3	S	-	EMP
					09-20-1994	0905	123.34	2,253.1	S	-	EMP
					10-18-1994	0820	123.95	2,252.4	S	-	EMP
					11-08-1994	1400	122.57	2,253.8	S	-	EMP
					12-20-1994	1235	121.84	2,254.6	S	-	EMP
AD- 6	363213116133800	Tracer Well 3	2,402.3	.4	01-06-1994	1010	41.63	2,360.7	S	-	EMP
					01-19-1994	1240	41.52	2,360.8	S	-	EMP
					02-15-1994	1506	41.60	2,360.7	S	-	EMP
					03-22-1994	1430	41.38	2,360.9	S	-	EMP
					04-19-1994	0823	41.54	2,360.8	S	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD- 6	363213116133800	Tracer Well 3	2,402.3	0.4	05-25-1994	1320	41.58	2,360.7	S	-	EMP
					06-10-1994	1042	41.61	2,360.7	S	-	EMP
					07-20-1994	0824	41.65	2,360.6	S	-	EMP
					08-16-1994	1020	41.50	2,360.8	S	-	EMP
					09-21-1994	0652	41.59	2,360.7	S	-	EMP
					10-06-1994	1035	41.63	2,360.7	S	-	EMP
					11-01-1994	1303	41.45	2,360.8	S	-	EMP
					12-21-1994	0805	41.63	2,360.7	S	-	EMP
AD- 7	363009116302701	Hallowell Well	2,305.0	.2	01-19-1994	0915	65.58	2,239.4	S	-	EMP
					02-15-1994	0825	64.39	2,240.6	S	-	EMP
AD- 7a	363009116302702	Blackman Well	2,305.0	.78	04-22-1994	1005	66.78	2,238.2	S	-	EMP
					05-23-1994	1405	67.23	2,237.8	S	-	EMP
					06-21-1994	1255	68.22	2,236.8	S	-	EMP
					07-19-1994	1330	68.91	2,236.1	S	-	EMP
					08-23-1994	1345	69.36	2,235.6	S	-	EMP
					12-20-1994	1340	66.46	2,238.5	S	-	EMP
AD- 8	362929116085701	Cherry Patch Well	2,394.3	.6	01-24-1994	1100	34.62	2,359.7	S	-	EMP
					02-14-1994	1015	33.53	2,360.8	S	-	EMP
					03-21-1994	0940	33.55	2,360.8	S	-	EMP
					03-28-1994	0925	33.49	2,360.8	S	-	USGS-NV
					04-18-1994	1025	33.68	2,360.6	S	-	EMP
					05-23-1994	1030	33.78	2,360.5	S	-	EMP
					06-28-1994	0820	34.75	2,359.6	S	-	EMP
					07-18-1994	1020	33.99	2,360.3	S	-	EMP
					08-22-1994	1040	35.04	2,359.3	S	-	EMP
					09-19-1994	1025	34.26	2,360.0	S	-	EMP
					10-18-1994	0630	33.35	2,361.0	S	-	EMP
					11-07-1994	1140	34.30	2,360.0	S	-	EMP
					12-19-1994	0940	34.99	2,359.3	S	-	EMP
AD- 9	362848116264201	Gilgans North Well	2,264.8	- .1	01-19-1994	0754	72.77	2,192.0	S	-	EMP
					02-15-1994	0845	72.89	2,191.9	S	-	EMP
					03-16-1994	--	75.58	2,189.2	Z	-	NDWR
					03-22-1994	1025	75.10	2,189.7	S	S	EMP
					03-28-1994	1022	75.38	2,189.4	S	-	NTS
					04-19-1994	1225	78.04	2,186.8	S	-	EMP
					05-23-1994	1345	78.63	2,186.2	S	-	EMP
					06-21-1994	1150	81.35	2,183.4	S	-	EMP
					07-19-1994	1345	80.85	2,184.0	S	-	EMP
					08-22-1994	1505	81.40	2,183.4	S	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD- 9	362848116264201	Gilgans North Well	2,264.8	- 0.1	09-20-1994	1015	80.15	2,184.6	S	-	EMP
					10-18-1994	0935	77.11	2,187.7	S	-	EMP
					11-08-1994	1330	75.50	2,189.3	S	-	EMP
					12-20-1994	1400	77.00	2,187.8	S	-	EMP
AD-10	362525116274301	NA-9 Well	2,190.9	1.3	01-19-1994	0728	9.34	2,181.6	S	-	EMP
					02-15-1994	0915	9.01	2,181.9	S	-	EMP
					03-21-1994	1430	9.15	2,181.8	S	-	EMP
					04-19-1994	1255	9.37	2,181.5	S	-	EMP
					05-23-1994	1315	9.54	2,181.4	S	-	EMP
					06-20-1994	1220	9.63	2,181.3	S	-	EMP
					07-18-1994	1400	9.66	2,181.2	S	-	EMP
					08-22-1994	1440	9.67	2,181.2	S	-	EMP
					09-20-1994	1050	9.66	2,181.2	S	-	EMP
					10-18-1994	0955	9.80	2,181.1	S	-	EMP
					11-08-1994	1250	9.78	2,181.1	S	-	EMP
					12-21-1994	1025	9.74	2,181.2	S	-	EMP
AD-11	361954116181201	GS-3 Well	2,351.3	1.1	01-18-1994	1220	225.00	2,126.3	S	-	EMP
					02-14-1994	1200	225.08	2,126.2	S	-	EMP
					03-21-1994	1130	225.05	2,126.2	S	-	EMP
					04-18-1994	1210	225.02	2,126.3	S	-	EMP
					05-19-1994	1430	224.90	2,126.4	S	-	EMP
					06-20-1994	1025	224.92	2,126.4	S	-	EMP
					07-18-1994	1215	224.72	2,126.6	S	-	EMP
					08-22-1994	1225	224.00	2,127.3	S	-	EMP
					09-19-1994	1205	224.64	2,126.7	S	-	EMP
					10-17-1994	1240	224.65	2,126.6	S	-	EMP
					11-07-1994	1330	224.63	2,126.7	S	-	EMP
					12-19-1994	1140	224.93	2,126.4	S	-	EMP
AD-12	362014116133901	GS-1 Well	2,430.3	2.0	01-18-1994	1130	80.41	2,349.9	S	-	EMP
					02-14-1994	1125	80.38	2,349.9	S	-	EMP
					03-21-1994	1030	80.34	2,350.0	S	-	EMP
					03-28-1994	0801	80.39	2,349.9	S	-	NTS
					04-06-1994	0750	80.29	2,350.0	S	-	NTS
					04-18-1994	1140	80.30	2,350.0	S	-	EMP
					05-23-1994	1145	80.28	2,350.0	S	-	EMP
					06-10-1994	1525	80.35	2,350.0	S	-	NTS
					06-17-1994	0833	80.32	2,350.0	S	-	NTS
					07-01-1994	1632	80.32	2,350.0	S	-	NTS

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD-12	362014116133901	GS-1 Well	2,430.3	2.0	07-18-1994	1130	80.29	2,350.0	S	-	EMP
					08-22-1994	1150	80.26	2,350.0	S	-	EMP
					09-12-1994	0708	80.29	2,350.0	S	-	NTS
					09-19-1994	1135	80.30	2,350.0	S	-	EMP
					10-17-1994	1210	80.30	2,350.0	S	-	EMP
					11-07-1994	1300	80.24	2,350.1	S	-	EMP
					12-19-1994	1112	80.54	2,349.8	S	-	EMP
AD-13	361724116324201	S-1 Well	2,703.2	2.0	01-18-1994	1333	382.04	2,321.2	V	-	EMP
					02-14-1994	1309	382.00	2,321.2	V	-	EMP
					03-21-1994	1240	381.66	2,321.5	V	-	EMP
					04-18-1994	1310	381.48	2,321.7	V	-	EMP
					05-19-1994	1315	381.10	2,322.1	S	-	EMP
					06-20-1994	1135	380.83	2,322.4	V	-	EMP
					07-18-1994	1315	380.86	2,322.3	V	-	EMP
					08-22-1994	1345	380.68	2,322.5	V	-	EMP
					09-19-1994	1320	380.44	2,322.8	V	-	EMP
					10-17-1994	1410	380.62	2,322.6	V	-	EMP
					11-07-1994	1505	380.72	2,322.5	V	-	EMP
					12-19-1994	1255	381.43	2,321.8	V	-	EMP
AD-14	361817116244701	Death Valley Jct Well	2,041.8	.7	01-18-1994	1308	3.87	2,037.9	S	-	EMP
					02-14-1994	1235	3.70	2,038.1	S	-	EMP
					03-21-1994	1210	3.63	2,038.2	S	-	EMP
					03-28-1994	0947	3.58	2,038.2	S	-	NTS
					04-18-1994	1240	3.80	2,038.0	S	-	EMP
					05-23-1994	1235	3.94	2,037.9	S	-	EMP
					06-20-1994	1100	4.10	2,037.7	S	-	EMP
					07-18-1994	1250	4.20	2,037.6	S	-	EMP
					08-22-1994	1305	4.35	2,037.4	S	-	EMP
					09-19-1994	1255	4.11	2,037.7	S	-	EMP
					10-17-1994	1320	4.18	2,037.6	S	-	EMP
					11-07-1994	1430	4.03	2,037.8	S	-	EMP
					12-19-1994	1225	3.90	2,037.9	S	-	EMP
AM- 1	362858116195301	Rogers Spring Well	2,265.9	.1	01-19-1994	1600	2.71	2,263.2	S	-	EMP
					01-25-1994	--	2.69	2,263.2	S	-	USFWS
					02-15-1994	1010	2.69	2,263.2	S	-	EMP
					02-28-1994	--	2.70	2,263.2	S	-	USFWS
					03-22-1994	1200	2.68	2,263.2	S	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM- 1	362858116195301	Rogers Spring Well	2,265.9	0.1	03-30-1994	--	2.72	2,263.2	S	-	USFWS
					04-07-1994	1129	2.73	2,263.2	S	-	NTS
					04-19-1994	1335	2.78	2,263.1	S	-	EMP
					04-29-1994	--	2.83	2,263.1	S	-	USFWS
					05-25-1994	1055	3.02	2,262.9	S	-	EMP
					05-31-1994	--	3.17	2,262.7	S	-	USFWS
					06-17-1994	1146	3.40	2,262.5	S	-	NTS
					06-21-1994	1045	3.50	2,262.4	S	-	EMP
					06-28-1994	--	3.66	2,262.2	S	-	USFWS
					07-01-1994	0800	3.72	2,262.2	S	-	NTS
					07-19-1994	0905	4.03	2,261.9	S	-	EMP
					07-26-1994	--	4.08	2,261.8	S	-	USFWS
					08-02-1994	1030	4.20	2,261.7	S	-	NTS
					08-24-1994	1125	4.34	2,261.6	S	-	EMP
					08-30-1994	--	4.36	2,261.5	S	-	USFWS
					09-12-1994	1840	4.29	2,261.6	S	-	NTS
					09-20-1994	1150	4.12	2,261.8	S	-	EMP
					09-29-1994	--	3.94	2,262.0	S	-	USFWS
					10-18-1994	1115	3.62	2,262.3	S	-	EMP
					10-21-1994	1028	3.55	2,262.4	S	-	NTS
					10-31-1994	--	3.45	2,262.4	S	-	USFWS
					11-07-1994	0953	3.20	2,262.7	S	-	NTS
					11-09-1994	1025	3.18	2,262.7	S	-	EMP
					11-30-1994	--	3.01	2,262.9	T	-	USFWS
					12-02-1994	0833	2.95	2,263.0	S	-	NTS
					12-19-1994	0936	2.93	2,263.0	S	-	NTS
					12-21-1994	1125	2.92	2,263.0	S	-	EMP
					12-23-1994	--	2.77	2,263.1	T	-	USFWS
AM- 2	362755116190401	Five Springs Well	2,367.4	1.17	01-19-1994	1620	-.56	2,368.0	S	F	EMP
					02-15-1994	1030	-.55	2,368.0	S	F	EMP
					03-22-1994	1205	-.58	2,368.0	S	F	EMP
					03-28-1994	1213	-.57	2,368.0	S	F	NTS
					04-05-1994	1330	-.58	2,368.0	S	F	EMP
					04-07-1994	1025	-.60	2,368.0	S	F	NTS
					04-19-1994	1340	-.60	2,368.0	S	F	EMP
					05-25-1994	1100	-.64	2,368.0	S	F	EMP
					06-10-1994	1150	-.61	2,368.0	S	F	EMP
					06-17-1994	0113	-.65	2,368.0	S	F	NTS

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM- 2	362755116190401	Five Springs Well	2,367.4	1.17	07-01-1994	0817	-.65	2,368.0	S	F	NTS
					07-19-1994	0915	-.65	2,368.0	S	F	EMP
					08-24-1994	1154	-.70	2,368.1	S	F	EMP
					09-13-1994	0834	-.75	2,368.2	S	F	NTS
					09-20-1994	1205	-.72	2,368.1	S	F	EMP
					10-18-1994	1145	-.70	2,368.1	S	F	EMP
					11-09-1994	1045	-.70	2,368.1	S	F	EMP
					12-01-1994	1235	-.68	2,368.1	S	F	EMP
					12-14-1994	1602	-.70	2,368.1	S	F	NTS
AM- 3	362555116205301	Garners Well	2,157.0	1.15	01-19-1994	1535	19.15	2,137.8	S	-	EMP
					02-15-1994	1045	18.98	2,138.0	S	-	EMP
					03-22-1994	1130	18.72	2,138.3	S	-	EMP
					04-07-1994	0856	18.73	2,138.3	S	-	NTS
					04-19-1994	1315	18.75	2,138.2	S	-	EMP
					05-25-1994	1135	18.93	2,138.1	S	-	EMP
					06-21-1994	1020	19.27	2,137.7	S	-	EMP
					07-01-1994	0950	19.42	2,137.6	S	-	NTS
					07-19-1994	0845	19.69	2,137.3	S	-	EMP
					08-24-1994	1045	20.25	2,136.8	S	-	EMP
					09-13-1994	0658	20.43	2,136.6	S	-	NTS
					09-20-1994	1125	20.54	2,136.5	S	-	EMP
					10-18-1994	1040	20.63	2,136.4	S	-	EMP
					11-09-1994	0855	20.59	2,136.4	S	-	EMP
					12-21-1994	1100	20.41	2,136.6	S	-	EMP
AM- 4	362532116172700	Devils Hole	2,359.9	--	02-15-1994	--	2.01	2,357.9	A	-	NPS
					02-16-1994	1130	1.99	2,357.9	N	-	EMP
					03-15-1994	--	1.99	2,357.9	A	-	NPS
					04-15-1994	--	1.98	2,357.9	A	-	NPS
					05-15-1994	--	2.01	2,357.9	A	-	NPS
					05-26-1994	1135	2.13	2,357.8	N	-	EMP
					06-15-1994	--	2.02	2,357.9	A	-	NPS
					07-15-1994	--	2.03	2,357.9	A	-	NPS
					08-15-1994	--	2.05	2,357.8	A	-	NPS
					08-24-1994	1300	2.09	2,357.8	N	-	EMP

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM- 4	362532116172700	Devils Hole	2,359.9	--	10-15-1994	--	2.08	2,357.8	A	-	NPS
					11-09-1994	1000	1.98	2,357.9	N	-	EMP
					11-15-1994	--	2.10	2,357.8	A	-	NPS
					12-15-1994	--	2.06	2,357.8	A	-	NPS
AM- 5	362529116171100	Devils Hole Well	2,404.1	0.9	01-12-1994	1519	48.08	2,356.0	S	-	NTS
					01-19-1994	1645	47.94	2,356.2	S	-	EMP
					01-25-1994	--	48.03	2,356.1	S	-	USFWS
					02-15-1994	1104	47.96	2,356.1	S	-	EMP
					02-16-1994	0720	47.93	2,356.2	S	-	NTS
					02-28-1994	--	48.02	2,356.1	S	-	USFWS
					03-10-1994	1331	47.91	2,356.2	S	-	NTS
					03-22-1994	1230	47.83	2,356.3	S	-	EMP
					03-28-1994	1253	48.05	2,356.0	S	-	NTS
					03-28-1994	1539	47.99	2,356.1	S	-	NTS
					03-30-1994	--	48.02	2,356.1	S	-	USFWS
					04-06-1994	1343	47.93	2,356.2	S	-	NTS
					04-19-1994	1425	47.93	2,356.2	S	-	EMP
					04-29-1994	0919	48.05	2,356.0	S	-	NTS
					04-29-1994	1200	48.09	2,356.0	S	-	USFWS
					05-11-1994	0822	48.02	2,356.1	S	-	NTS
					05-25-1994	1024	48.05	2,356.0	S	-	EMP
					05-26-1994	1313	48.06	2,356.0	S	-	NTS
					05-31-1994	--	48.09	2,356.0	S	-	USFWS
					06-16-1994	1531	48.06	2,356.0	S	-	NTS
					06-21-1994	1120	48.12	2,356.0	S	-	EMP
					06-28-1994	--	48.04	2,356.1	S	-	USFWS
					06-30-1994	1823	48.01	2,356.1	S	-	NTS
					07-12-1994	1322	48.05	2,356.0	S	-	NTS
					07-19-1994	0950	48.13	2,356.0	S	-	EMP
					07-26-1994	0738	48.05	2,356.0	S	-	NTS
					07-26-1994	1200	48.05	2,356.0	S	-	NTS
					07-26-1994	1313	48.09	2,356.0	S	-	USFWS
					08-02-1994	0858	48.13	2,356.0	S	-	NTS
					08-11-1994	1237	48.07	2,356.0	S	-	NTS
					08-16-1994	1000	48.10	2,356.0	S	-	EMP
					08-30-1994	--	47.99	2,356.1	S	-	USFWS
					09-12-1994	1041	48.00	2,356.1	S	-	NTS
					09-20-1994	1250	48.02	2,356.1	S	-	EMP
					09-28-1994	1244	47.99	2,356.1	S	-	NTS
					09-29-1994	--	47.99	2,356.1	S	-	USFWS

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM- 5	362529116171100	Devils Hole Well	2,404.1	0.9	10-18-1994	1230	48.06	2,356.0	S	-	EMP
					10-21-1994	1211	48.08	2,356.0	S	-	NTS
					10-31-1994	--	48.13	2,356.0	S	-	USFWS
					11-07-1994	1346	48.00	2,356.1	S	-	NTS
					11-09-1994	0925	48.02	2,356.1	S	-	EMP
					11-30-1994	--	48.05	2,356.0	T	-	USFWS
					12-02-1994	1147	48.02	2,356.1	S	-	NTS
					12-19-1994	1334	48.08	2,356.0	S	-	NTS
					12-21-1994	1215	48.08	2,356.0	S	-	EMP
					12-23-1994	--	48.01	2,356.1	T	-	USFWS
AM- 6	362432116165701	Point of Rocks North Well	2,318.8	.0	01-19-1994	1605	20.98	2,297.8	S	-	EMP
					01-25-1994	--	21.08	2,297.7	S	-	USFWS
					02-15-1994	1200	21.04	2,297.8	S	-	EMP
					02-28-1994	--	21.08	2,297.7	S	-	USFWS
					03-22-1994	1257	20.96	2,297.8	S	-	EMP
					03-28-1994	1505	21.03	2,297.8	S	-	NTS
					03-30-1994	--	21.04	2,297.8	S	-	USFWS
					04-06-1994	1209	21.08	2,297.7	S	-	NTS
					04-19-1994	1455	21.10	2,297.7	S	-	EMP
					04-29-1994	--	21.10	2,297.7	S	-	USFWS
					05-25-1994	0925	21.24	2,297.6	S	-	EMP
					05-31-1994	--	21.28	2,297.5	S	-	USFWS
					06-10-1994	1235	21.27	2,297.5	S	-	EMP
					06-17-1994	1015	21.24	2,297.6	S	-	NTS
					06-28-1994	--	21.24	2,297.6	S	-	USFWS
					07-01-1994	1146	21.24	2,297.6	S	-	NTS
					07-19-1994	1025	21.24	2,297.6	S	-	EMP
					07-26-1994	--	21.25	2,297.6	S	-	USFWS
					08-25-1994	0845	21.26	2,297.5	S	-	EMP
					08-30-1994	--	21.29	2,297.5	S	-	USFWS
					09-12-1994	0744	21.23	2,297.6	S	-	NTS
					09-20-1994	1325	21.23	2,297.6	S	-	EMP
					09-29-1994	--	21.25	2,297.6	S	-	USFWS
					10-18-1994	1300	21.21	2,297.6	S	-	EMP
					10-31-1994	--	21.20	2,297.6	S	-	USFWS
					11-09-1994	1145	21.16	2,297.6	S	-	EMP
					11-30-1994	--	21.25	2,297.6	T	-	USFWS
					12-21-1994	1240	21.18	2,297.6	S	-	EMP
					12-22-1994	--	21.15	2,297.6	T	-	USFWS

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM- 7	362417116163600	Point of Rocks South Well	2,333.5	0.8	01-12-1994	1553	9.65	2,323.8	S	-	NTS
					01-19-1994	1740	8.96	2,324.5	S	-	EMP
					01-25-1994	--	8.94	2,324.6	S	-	USFWS
					02-14-1994	1123	9.17	2,324.3	S	-	NTS
					02-15-1994	1245	9.17	2,324.3	S	-	EMP
					02-28-1994	--	9.32	2,324.2	S	-	USFWS
					03-10-1994	0944	9.35	2,324.2	S	-	NTS
					03-22-1994	1310	9.30	2,324.2	S	-	EMP
					03-28-1994	1400	9.42	2,324.1	S	-	NTS
					03-30-1994	--	9.42	2,324.1	S	-	USFWS
					04-06-1994	1147	9.45	2,324.0	S	-	NTS
					04-19-1994	1510	9.41	2,324.1	S	-	EMP
					04-29-1994	0903	9.53	2,324.0	S	-	NTS
					04-29-1994	1200	9.57	2,323.9	S	-	USFWS
					05-11-1994	1300	9.46	2,324.0	S	-	NTS
					05-25-1994	0955	9.47	2,324.0	S	-	EMP
					05-26-1994	1223	9.46	2,324.0	S	-	NTS
					05-31-1994	--	9.40	2,324.1	S	-	USFWS
					06-10-1994	1255	9.37	2,324.1	S	-	EMP
					06-17-1994	0915	9.18	2,324.3	S	-	NTS
					06-17-1994	1359	9.14	2,324.4	S	-	NTS
					06-28-1994	--	9.17	2,324.3	S	-	USFWS
					06-30-1994	1956	9.13	2,324.4	S	-	NTS
					07-01-1994	1215	9.12	2,324.4	S	-	NTS
					07-12-1994	1106	9.13	2,324.4	S	-	NTS
					07-19-1994	1045	9.20	2,324.3	S	-	EMP
					07-26-1994	--	9.16	2,324.3	S	-	USFWS
					08-11-1994	1138	9.10	2,324.4	S	-	NTS
					08-25-1994	0910	9.07	2,324.4	S	-	EMP
					08-30-1994	--	9.07	2,324.4	S	-	USFWS
					09-12-1994	0805	9.03	2,324.5	S	-	NTS
					09-20-1994	1345	9.00	2,324.5	S	-	EMP
					09-28-1994	1312	9.00	2,324.5	S	-	NTS
					09-29-1994	--	9.00	2,324.5	S	-	USFWS
					10-18-1994	1320	9.02	2,324.5	S	-	EMP
					10-19-1994	1400	9.03	2,324.5	S	-	NTS
					10-19-1994	1500	9.01	2,324.5	S	-	NTS
					10-21-1994	1333	9.03	2,324.5	S	-	NTS
					10-31-1994	--	9.06	2,324.4	S	-	USFWS
					11-07-1994	1438	8.95	2,324.6	S	-	NTS

Table 5. Periodic measurements of water levels at monitoring sites in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S. Geological Survey site identification	Site name	Land-surface altitude (feet above sea level)	Height of measure-ment point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM- 7	362417116163600	Point of Rocks South Well	2,333.5	0.8	11-09-1994	1215	8.94	2,324.6	S	-	EMP
					11-30-1994	--	8.94	2,324.6	T	-	USFWS
					12-02-1994	1229	8.92	2,324.6	S	-	NTS
					12-19-1994	1436	8.90	2,324.6	S	-	NTS
					12-21-1994	1305	8.90	2,324.6	S	-	EMP
					12-22-1994	--	8.90	2,324.6	T	-	USFWS
DV- 3	362230116392901	Travertine Point 1 Well	2,728.4	2.0	01-18-1994	1425	598.58	2,129.8	V	-	EMP
					02-14-1994	1415	598.60	2,129.8	V	-	EMP
					03-21-1994	1340	598.75	2,129.6	V	-	EMP
					04-18-1994	1410	598.83	2,129.6	V	-	EMP
					05-24-1994	1010	598.93	2,129.5	V	-	EMP
					06-21-1994	0850	599.05	2,129.4	V	-	EMP
					07-19-1994	0720	599.12	2,129.3	V	-	EMP
					08-23-1994	0745	599.22	2,129.2	V	-	EMP
					09-19-1994	1420	599.29	2,129.1	V	-	EMP
					10-17-1994	1505	599.42	2,129.0	V	-	EMP
					11-08-1994	0805	599.47	2,128.9	V	-	EMP
					12-19-1994	1410	599.61	2,128.8	V	-	EMP

Table 6. Daily average water levels in well JF-3 for calendar year 1994
[--, data not available]

Day	Water level, in feet below land surface											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	710.22	710.46	---	710.16	710.12	710.13	710.04	710.20	710.20	710.17	710.02	---
2	710.34	710.13	---	710.20	710.08	710.04	709.97	710.17	710.22	710.11	709.88	---
3	710.21	710.06	---	710.02	710.08	710.00	709.97	710.17	710.29	709.98	710.24	---
4	710.04	710.12	---	710.08	710.05	710.06	709.99	710.22	710.36	710.12	710.46	---
5	709.90	710.24	---	710.17	709.97	710.00	710.09	710.23	710.40	710.20	710.36	---
6	710.31	710.06	---	710.05	710.05	709.93	710.20	710.16	710.31	710.33	710.24	---
7	710.40	709.74	---	710.04	710.20	710.10	710.15	710.06	710.24	710.46	710.18	---
8	710.12	709.90	---	709.95	710.12	710.22	710.10	710.09	710.18	710.55	710.33	---
9	710.00	710.43	---	710.01	710.11	710.16	710.14	710.26	710.16	710.39	710.22	---
10	710.27	710.17	---	710.21	710.17	710.09	710.17	710.28	710.09	710.21	709.99	---
11	710.30	710.29	---	710.41	710.10	710.03	710.13	710.17	710.13	710.14	710.12	---
12	710.42	710.70	---	710.33	710.03	709.95	710.05	710.15	710.14	710.02	---	---
13	710.32	710.48	---	710.11	709.97	709.94	710.04	710.26	710.27	709.93	---	---
14	710.14	710.19	---	710.05	709.97	709.87	710.05	710.23	710.41	709.90	---	---
15	710.02	710.19	---	710.33	709.88	709.97	710.13	710.10	710.36	710.03	---	---
16	710.14	710.09	---	710.36	709.85	710.17	710.21	710.06	710.28	710.42	---	---
17	710.29	709.71	---	710.26	710.01	710.17	710.20	710.17	710.29	710.49	---	---
18	710.18	709.82	---	710.14	710.14	710.12	710.16	710.19	710.27	710.41	---	---
19	710.11	710.11	---	710.11	710.20	710.14	710.17	710.16	710.23	710.41	---	---
20	710.26	710.23	---	710.08	710.15	710.15	710.18	710.09	710.22	710.43	---	---
21	710.33	710.29	---	710.00	710.06	710.13	710.16	710.06	710.23	710.39	---	---
22	710.18	710.38	---	710.00	710.03	710.11	710.15	710.15	710.22	710.30	---	---
23	709.98	710.38	---	709.88	710.12	710.10	710.17	710.25	710.11	710.31	---	---
24	709.96	710.20	---	709.96	710.05	710.05	710.18	710.27	710.16	710.31	---	---
25	709.95	710.14	---	710.00	709.92	710.01	710.19	710.26	710.24	710.25	---	---
26	710.17	710.15	---	710.10	709.97	710.08	710.17	710.23	710.23	710.31	---	---
27	710.17	---	---	710.20	710.04	710.18	710.12	710.22	710.21	710.36	---	---
28	710.31	---	---	710.33	710.14	710.17	710.09	710.22	710.21	710.18	---	---
29	710.45		---	710.36	710.13	710.11	710.12	710.19	710.08	710.14	---	---
30	710.42		710.28	710.24	710.08	710.06	710.12	710.15	710.09	710.35	---	---
31	710.53		710.14		710.07		710.18	710.15		710.44		---
Mean	710.21	710.18	---	710.14	710.06	710.07	710.12	710.18	710.23	710.26	710.19	---
Maximum	710.53	710.70	---	710.41	710.20	710.22	710.21	710.28	710.41	710.55	710.46	---
Minimum	709.90	709.71	---	709.88	709.85	709.87	709.97	710.06	710.08	709.90	709.88	---
(1994 annual summary		Mean 710.16		Maximum 710.70		Minimum 709.71)						

Table 7. Daily average water levels in well AD-6 for calendar year 1994

Day	Water level, in feet below land surface											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	41.58	41.68	41.65	41.55	41.54	41.57	41.53	41.55	41.52	41.58	41.49	41.56
2	41.62	41.55	41.59	41.57	41.53	41.53	41.51	41.52	41.53	41.55	41.46	41.55
3	41.56	41.53	41.55	41.49	41.53	41.52	41.52	41.52	41.56	41.49	41.64	41.56
4	41.49	41.57	41.54	41.53	41.51	41.55	41.52	41.54	41.59	41.57	41.71	41.58
5	41.44	41.61	41.47	41.57	41.48	41.52	41.56	41.54	41.60	41.59	41.65	41.57
6	41.63	41.52	41.49	41.51	41.54	41.50	41.61	41.51	41.57	41.63	41.59	41.62
7	41.65	41.39	41.53	41.51	41.61	41.58	41.57	41.47	41.54	41.67	41.58	41.69
8	41.53	41.47	41.57	41.47	41.57	41.61	41.56	41.49	41.52	41.70	41.65	41.77
9	41.49	41.68	41.58	41.50	41.57	41.58	41.58	41.56	41.52	41.64	41.59	41.72
10	41.61	41.52	41.52	41.58	41.58	41.54	41.59	41.55	41.50	41.58	41.51	41.65
11	41.60	41.60	41.52	41.65	41.55	41.52	41.57	41.50	41.52	41.56	41.58	41.61
12	41.65	41.78	41.68	41.60	41.51	41.49	41.54	41.51	41.54	41.52	41.58	41.57
13	41.59	41.66	41.66	41.50	41.50	41.50	41.54	41.55	41.60	41.49	41.76	41.61
14	41.52	41.55	41.52	41.48	41.51	41.47	41.54	41.53	41.66	41.47	41.77	41.67
15	41.49	41.57	41.50	41.60	41.47	41.52	41.57	41.47	41.62	41.53	41.62	41.68
16	41.55	41.53	41.48	41.60	41.48	41.60	41.60	41.45	41.59	41.70	41.53	41.71
17	41.62	41.37	41.49	41.55	41.56	41.59	41.59	41.51	41.60	41.70	41.56	41.65
18	41.56	41.45	41.47	41.51	41.60	41.56	41.58	41.51	41.60	41.64	41.62	41.61
19	41.54	41.56	41.47	41.50	41.61	41.57	41.59	41.49	41.60	41.65	41.74	41.66
20	41.61	41.58	41.61	41.50	41.60	41.59	41.59	41.47	41.61	41.66	41.70	41.66
21	41.63	41.60	41.56	41.47	41.55	41.58	41.58	41.47	41.61	41.64	41.67	41.64
22	41.56	41.63	41.43	41.48	41.55	41.57	41.57	41.51	41.60	41.61	41.78	41.61
23	41.48	41.62	41.53	41.45	41.58	41.57	41.57	41.54	41.55	41.63	41.71	41.56
24	41.49	41.55	41.50	41.49	41.54	41.54	41.57	41.54	41.58	41.62	41.63	41.55
25	41.48	41.52	41.51	41.50	41.50	41.52	41.57	41.53	41.61	41.60	41.54	41.59
26	41.57	41.52	41.59	41.54	41.52	41.55	41.55	41.52	41.60	41.63	41.59	41.68
27	41.55	41.53	41.63	41.57	41.54	41.59	41.53	41.51	41.59	41.65	41.74	41.64
28	41.61	41.63	41.63	41.62	41.58	41.58	41.51	41.52	41.58	41.56	41.71	41.57
29	41.67		41.59	41.63	41.57	41.55	41.52	41.51	41.53	41.56	41.74	41.57
30	41.64		41.58	41.58	41.54	41.54	41.52	41.49	41.55	41.66	41.66	41.64
31	41.71		41.53		41.55		41.55	41.50		41.68		41.68
Mean	41.57	41.56	41.55	41.54	41.54	41.55	41.56	41.51	41.57	41.61	41.64	41.63
Maximum	41.71	41.78	41.68	41.65	41.61	41.61	41.61	41.56	41.66	41.70	41.78	41.77
Minimum	41.44	41.37	41.43	41.45	41.48	41.47	41.51	41.45	41.50	41.47	41.46	41.55

(1994 annual summary Mean 41.57 Maximum 41.78 Minimum 41.37)

Table 8. Ground-water-discharge data in Yucca Mountain region for calendar year 1994

Site number: Sites are grouped by hydrographic area and, within each area, are listed in general north-to-south, then west-to-east order. See text section titled "Site Number" for further discussion.

U.S. Geological Survey site identification: Unique identification number for site as stored in files and data bases of U.S. Geological Survey.

Time: Time measurement was made, in military time; --, measurement time unknown.

Discharge: Reported to two significant figures.

Method: Method used to measure discharge. C, current meter; F, depth of water measured in flume and converted to discharge, on basis of applicable discharge table for Parshall flume; V, volumetric; Z, discharge represents monthly mean discharge.

Data source: EMP, Environmental-Monitoring Program (U.S. Geological Survey); NPS, National Park Service; USFWS, U.S. Fish and Wildlife Service; USGS-NV, other Nevada District programs (U.S. Geological Survey)

Site number (plate 1)	U.S.Geological Survey site identification	Site name	Discharge measurement				
			Date	Time	Discharge (gallons per minute)	Method	Data source
AM-1a	362924116203001	Fairbanks Spring	02-16-1994	0950	1,500	C	EMP
			05-26-1994	0800	1,800	F	EMP
			08-24-1994	0900	1,500	C	EMP
			11-15-1994	0800	1,500	C	EMP
AM-2	362755116190401	Five Springs Well	04-15-1994	1330	7.3	V	EMP
			04-19-1994	1340	6.2	V	EMP
			05-25-1994	1100	2.6	V	EMP
			06-10-1994	1150	2.4	V	EMP
			06-17-1994	1130	2.3	V	EMP
			07-19-1994	0930	1.9	V	EMP
			08-24-1994	1155	1.4	V	EMP
			10-18-1994	1145	2.4	V	EMP
			11-09-1994	1050	2.6	V	EMP
			12-01-1994	1240	3.6	V	EMP
AM-5a	362502116192301	Crystal Pool	01-25-1994	--	2,600	C	USFWS
			02-16-1994	1205	2,700	C	EMP
			02-28-1994	--	2,600	C	USFWS
			03-30-1994	--	2,600	C	USFWS
			04-08-1994	--	2,200	C	USGS-NV
			04-29-1994	--	2,500	C	USFWS
			05-26-1994	1238	2,600	C	EMP
			05-31-1994	--	2,400	C	USFWS
			06-28-1994	--	2,400	C	USFWS
			07-27-1994	--	2,400	C	USFWS
			08-25-1994	1321	2,700	C	EMP
			08-30-1994	--	2,400	C	USFWS
			09-29-1994	--	2,300	C	USFWS
			10-31-1994	--	2,400	C	USFWS
			11-15-1994	1355	2,400	C	EMP
			11-30-1994	--	2,500	C	USFWS
			12-22-1994	--	2,500	C	USFWS

Table 8. Ground-water-discharge data in Yucca Mountain region for calendar year 1994—Continued

Site number (plate 1)	U.S.Geological Survey site identification	Site name	Discharge measurement				
			Date	Time	Discharge (gallons per minute)	Method	Data source
AM-8	362230116162001	Big Spring	01-24-1994	--	1,000	C	USFWS
			02-16-1994	1346	1,200	C	EMP
			02-28-1994	--	1,000	C	USFWS
			03-30-1994	--	1,100	C	USFWS
			04-29-1994		1,300	C	USFWS
			05-26-1994	0930	970	C	EMP
			05-31-1994	--	1,400	C	USFWS
			06-28-1994	--	1,400	C	USFWS
			07-27-1994	--	1,000	C	USFWS
			08-25-1994	1025	860	C	EMP
			08-30-1994	--	1,100	C	USFWS
			09-29-1994	--	860	C	USFWS
			10-31-1994	--	820	C	USFWS
			11-25-1994	1100	950	C	EMP
			11-30-1994	--	890	C	USFWS
			12-01-1994	1035	920	C	EMP
			12-22-1994	--	890	C	USFWS
DV-1	362728116501101	Texas Spring	01-15-1994	--	200	Z	NPS
			02-14-1994	1547	200	C	EMP
			02-15-1994	--	200	Z	NPS
			03-15-1994	--	210	Z	NPS
			04-15-1994	--	210	Z	NPS
			05-15-1994	--	200	Z	NPS
			05-24-1994	1152	210	C	EMP
			06-15-1994	--	200	Z	NPS
			07-15-1994	--	200	Z	NPS
			08-15-1994	--	200	Z	NPS
			08-23-1994	0915	240	C	EMP
			09-15-1994	--	190	Z	NPS
			10-15-1994	--	200	Z	NPS
			11-14-1994	1445	270	C	EMP
			11-15-1994	--	200	Z	NPS
			11-30-1994	1415	210	C	EMP
			12-15-1994	--	200	Z	NPS
DV-2	362252116425301	Navel Spring	02-14-1994	1715	1.7	V	EMP
			05-24-1994	1325	1.5	V	EMP
			08-23-1994	1100	1.3	V	EMP
			11-08-1994	1030	1.4	V	EMP

Table 9. Estimated annual ground-water withdrawals from wells in Yucca Mountain region for calendar year 1994

Ground-water subbasin	Hydrographic area	Ground-water withdrawal [1]		
		Year	Millions of gallons	Acre-feet
Alkali Flat-Furnace Creek Ranch	Amargosa Desert [2]	1994	3,987	12,235
	Crater Flat[3]	1991	13.9	43
		1992	9.5	29
		1993	4.9	15
		1994	14.8	45
	Jackass Flats [3]	1994	90.2	277
Ash Meadows	Mercury Valley[3]	1994	76.9	236

[1] See section "Ground-Water Withdrawals" for discussion of data sources.

[2] Data recompiled from ground-water pumpage inventory for entire Amargosa Desert, listed to nearest acre-foot. Conversion to million of gallons are rounded to nearest 1 million gallons. All withdrawals for Amargosa Desert are included in Alkali Flat-Furnace Creek Ranch ground-water subbasin because data were not available to exclude withdrawals within Ash Meadows subbasin.

[3] Data recompiled from flowmeter readings listed to nearest 0.1 million gallons. Conversions to acre-feet are rounded to nearest acre-foot.

Table 10. Minimum, maximum, and median water-level altitudes, and average deviation of measurements, at wells in Jackass Flats for selected baseline periods and for calendar years 1992 through 1994. Excludes water-level altitudes that may reflect possible transient conditions at a site.

Calendar years: Years for which measurements were used to calculate summary statistics. Italics indicate selected baseline period.

Number: Number of water-level measurements for year(s) specified. For JF-2 (1985-93), JF-2a, and JF-3, value represents number of daily average water levels.

Water level: Based on discrete water-level measurements made during site visits for JF-1, JF-2 (in 1994), J-13, J-11, and J-12. Based on daily average water levels collected from continual data recorders for JF-2 (1985-93), JF-2a, and JF-3.

Minimum: Minimum water-level altitude or minimum daily average water level for year(s) specified.

Maximum: Maximum water-level altitude or maximum daily average water level for year(s) specified.

Median: Statistically representative water-level altitude calculated from discrete measurements or daily average water levels for year(s) specified.

Average deviation: Calculated dispersion of measurements about median water-level altitude. Average deviation is equal to sum of absolute differences between measured water levels and median, divided by number of measurements.

Change in median: Differences between median water level for calendar years 1992, 1993, and 1994 compared with baseline period. Minus sign indicates that median water-level altitude was lower for the specified year compared with the baseline period.

[Abbreviations and symbols: N/A, not applicable (data field is not related to referenced data set)]

Site number (plate 1)	Calendar year(s)	Number	Water level (feet above sea level)			Average deviation (feet)	Change in median (feet)
			Minimum	Maximum	Median		
JF-1	*1985-91*	86	2,391.7	2,393.1	2,392.5	0.2	N/A
JF-2	*1985-91*	1,777	2,389.6	2,393.4	2,392.1	.3	N/A
JF-2a	*1985-91*	1,876	2,466.7	2,469.5	2,468.6	.4	N/A
J-13	*1989-91*	32	2,389.7	2,390.7	2,390.0	.2	N/A
J-11	*1990-91*	25	2,401.9	2,402.9	2,402.2	.1	N/A
J-12	*1990-91*	22	2,388.1	2,388.5	2,388.3	.1	N/A
JF-3	*1992-93*	582	2,387.7	2,388.8	2,388.3	.1	N/A
JF-1	1992	12	2,392.3	2,392.6	2,392.4	0.1	-0.1
JF-2	1992	357	2,391.8	2,392.6	2,392.2	.1	.1
JF-2a	1992	342	2,466.9	2,469.2	2,468.6	.5	0.0
J-13	1992	21	2,389.6	2,390.4	2,389.9	.1	-.1
J-11	1992	12	2,402.0	2,402.6	2,402.2	.1	0.0
J-12	1992	17	2,388.2	2,388.6	2,388.3	.1	0.0
JF-3	1992	217	2,387.8	2,388.6	2,388.2	.1	N/A
JF-1	1993	8	2,391.9	2,392.7	2,392.5	0.2	0.0
JF-2	1993	362	2,391.7	2,392.8	2,392.1	.2	0.0
JF-2a	1993	365	2,468.4	2,469.2	2,468.8	.1	.2
J-13	1993	16	2,389.7	2,390.7	2,389.9	.1	-.1
J-11	1993	8	2,401.9	2,402.7	2,402.2	.2	0.0
J-12	1993	19	2,387.9	2,389.0	2,388.3	.1	0.0
JF-3	1993	365	2,387.7	2,388.8	2,388.3	.1	N/A
JF-1	1994	12	2,392.1	2,392.6	2,392.3	0.1	-0.2
JF-2	1994	9	2,392.0	2,392.6	2,392.2	.1	.1
JF-2a	1994	356	2,468.4	2,469.4	2,469.0	.1	.4
J-13	1994	23	2,389.4	2,390.0	2,389.7	.1	-.3
J-11	1994	12	2,402.0	2,402.5	2,402.3	.1	.1
J-12	1994	24	2,387.8	2,389.1	2,388.2	.2	-.1
JF-3	1994	284	2,387.6	2,388.6	2,388.1	.1	-.2

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The distribution code for this report is UC-814.