PREPARED IN COOPERATION WITH THE
U.S. BUREAU OF INDIAN AFFAIRS AND THE ARIZONA DEPARTMENT OF WATER RESOURCES

INTRODUCTION

The San Simon Wash area includes about 2,300 mi^2 in the Papago Indian Reservation in south-central Arizona and is characterized by low mountains separated by broad alluvial basins. Most of the basins and mountains trend north and slightly northwest. The basins are underlain by a thick sequence of basin-fill deposits. The mountains are composed of crystalline and consolidated sedimentary rocks, and thin alluvial deposits are present in the narrow mountain valleys and on pediments.

The climate is semiarid, and the precipitation pattern is characterized by two distinct types of storms—local summer thunderstorms and regional winter storms. In most of the area the average annual precipitation ranges from 5 to 10 in.; in the Baboquivari Mountains, however, the average annual precipitation is 20 in. (Sellers and Hill, 1974, p. 7). Owing to the small amount of precipitation and the abundant sunshine, the evaporation rate is about 8 to 10 times the average rainfall (Heindl and others, 1962). Storm runoff occurs mainly as sheetflow and floods of short duration. Although some runoff is diverted to catchment tanks for use by livestock, runoff is not known to be diverted for irrigation or public-supply uses.

Ground-water development has been slight compared with that in many areas in Arizona. In 1979 about 2,700 acre-ft of ground water was withdrawn, of which 2,200 acre-ft was used for irrigation at Papago Farms, and 500 acre-ft was used for public and livestock supplies.

The hydrologic data on which these maps are based are available, for the most part, in computer-printout form and may be consulted at the Arizona Department of Water Resources, 99 East Virginia, Phoenix, and at U.S. Geological Survey offices in: Federal Building, 301 West Congress Street, Tucson, and Valley Center, Suite 1880, Phoenix. Material from which copies can be made at private expense is available at the Tucson and Phoenix offices of the U.S. Geological Survey.

GEOHYDROLOGY

In the San Simon Wash area ground water is present in the basin-fill deposits and in the crystalline and consolidated sedimentary rocks and thin alluvial deposits in the mountains. The main water-bearing unit is the basin-fill deposits.

The basin-fill deposits consist of clay, silt, sand, gravel, and small amounts of evaporite deposits. The basin fill is a few hundred to several thousand feet thick; the unit generally is thickest along the axes of the basins and thins to extinction along the mountain fronts. Properly constructed and developed wells in the basin fill generally yield more than 50 gal/min. At Papago Farms, wells yield 1,500 to 2,500 gal/min from 400 to 700 ft of saturated basin fill and have specific capacities of 30 to 70 [(gal/min)/ft] of drawdown. The public-supply wells that furnish water to Sells are 6 mi west of the village, yield 200 to 600 gal/min from 200 to 400 ft of saturated basin fill, and have specific capacities of 1 to 9 [(gal/min)/ft] of drawdown.

Crystalline and consolidated sedimentary rocks make up the mountains and extend from the mountain fronts outward into the basins as pediments, which are covered by thin alluvial deposits. The edges of the pediments were used to delineate the boundary between the basin-fill deposits and the rocks of the mountains. The areal extent of the pediments was defined on the basis of geophysical studies by Hargan (1978), Greenes and others (1979), Greenes (1980), and the U.S. Geological Survey (1980). In the mountains water occurs in fractures and interstitial openings in the crystalline and consolidated sedimentary rocks and in the thin alluvial deposits in the narrow valleys and on the pediments. Many domestic and livestock wells have been dug along the fronts of the Baboquivari, Comobabi, and Artesa Mountains. The wells generally are less than 60 ft deep and do not furnish dependable water supplies.

In the San Simon Wash area ground water is derived mainly from precipitation that infiltrates along the mountain fronts. The water moves through the basin-fill deposits to the Papago Farms area and then southward into Mexico.

Ground-water withdrawal has not resulted in long-term water-level declines in the area. Water levels that are less than 60 ft below the land surface fluctuate in response to storm runoff, and water levels that are more than 100 ft below the land surface fluctuate mainly in response to pumping.

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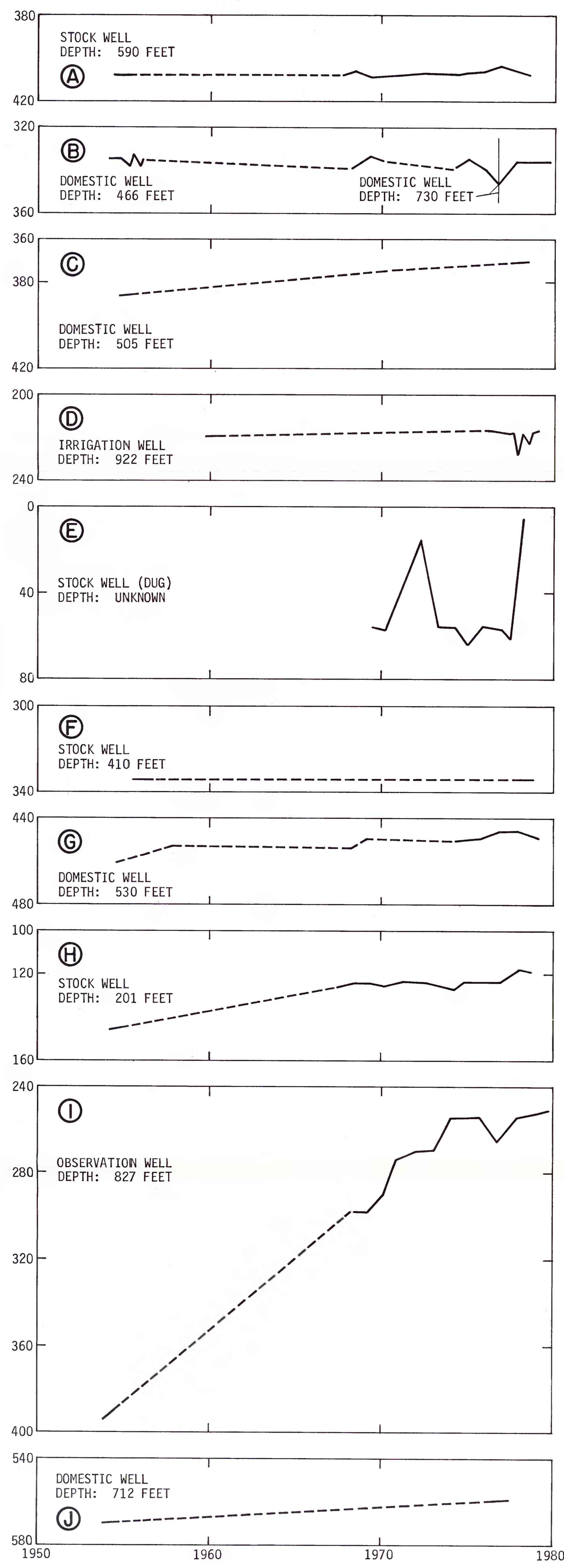
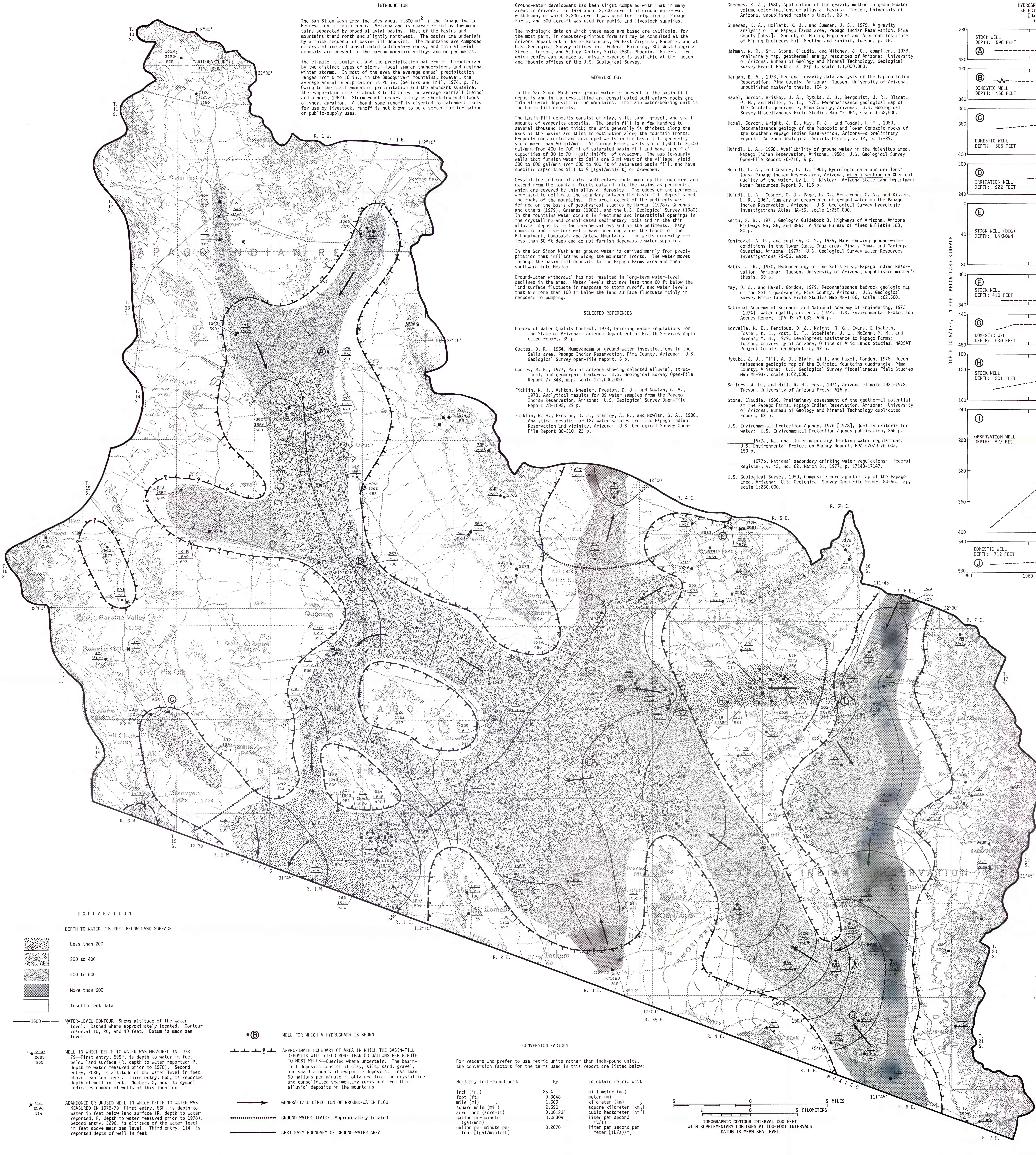
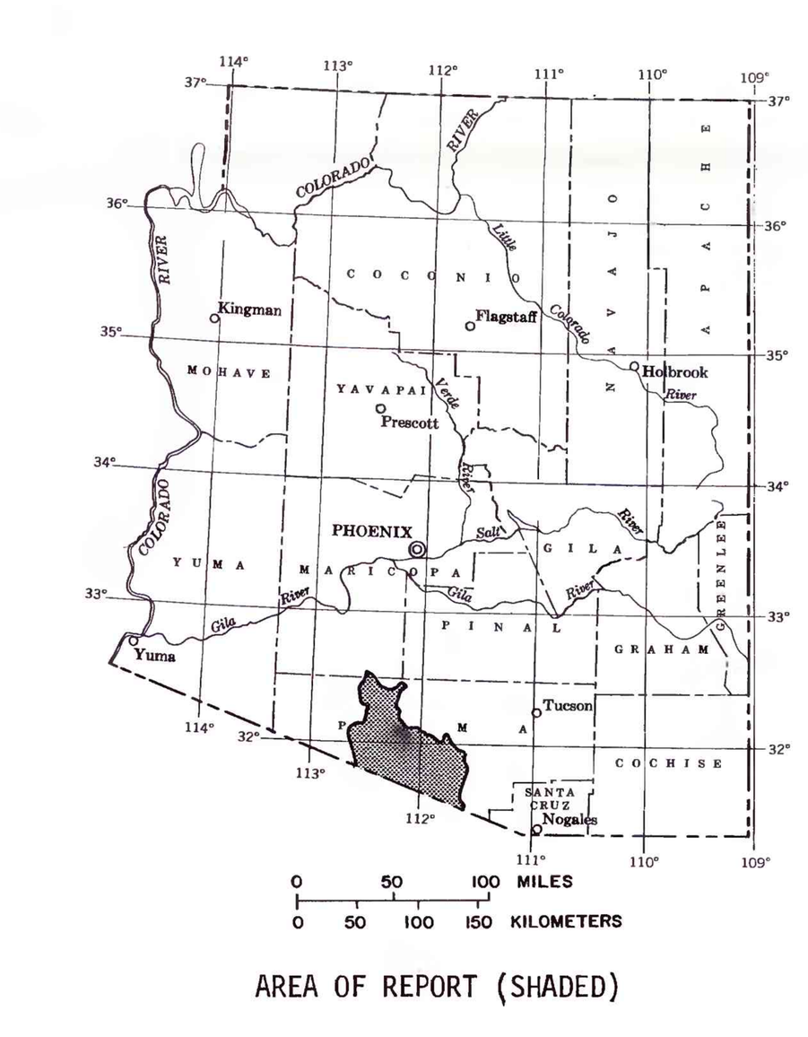
HYDROGRAPHS OF THE WATER LEVEL IN SELECTED WELLS SHOWN ON THE MAP
[Dashed line indicates an inferred water level]







EXPLANATION

DEPTH TO WATER, IN FEET BELOW LAND SURFACE

- Less than 200
- 200 to 400
- 400 to 600
- More than 600
- Insufficient data

1600 — WATER-LEVEL CONTOUR—Shows altitude of the water level. Dashed where approximately located. Contour interval 10, 20, and 40 feet. Datum is mean sea level

2 • 595P / 2085 / 855 — WELL IN WHICH DEPTH TO WATER WAS MEASURED IN 1978-79—First entry, 595P, is depth to water in feet below land surface (R, depth to water reported; P, depth to water measured prior to 1978). Second entry, 2085, is altitude of the water level in feet above mean sea level. Third entry, 855, is reported depth of well in feet. Number, 2, next to symbol indicates number of wells at this location

85P / 2296 / 114 — ABANDONED OR UNUSED WELL IN WHICH DEPTH TO WATER WAS MEASURED IN 1978-79—First entry, 85P, is depth to water in feet below land surface (R, depth to water reported; P, depth to water measured prior to 1978). Second entry, 2296, is altitude of the water level in feet above mean sea level. Third entry, 114, is reported depth of well in feet

•(B) WELL FOR WHICH A HYDROGRAPH IS SHOWN

APPROXIMATE BOUNDARY OF AREA IN WHICH THE BASIN-FILL DEPOSITS WILL YIELD MORE THAN 50 GALLONS PER MINUTE TO MOST WELLS—Queried where uncertain. The basin-fill deposits consist of clay, silt, sand, gravel, and small amounts of evaporite deposits. Less than 50 gallons per minute is obtained from the crystalline and consolidated sedimentary rocks and from thin alluvial deposits in the mountains

GENERALIZED DIRECTION OF GROUND-WATER FLOW

GROUND-WATER DIVIDE—Approximately located

ARBITRARY BOUNDARY OF GROUND-WATER AREA

CONVERSION FACTORS

For readers who prefer to use metric units rather than inch-pound units, the conversion factors for the terms used in this report are listed below:

Multiply inch-pound unit	By	To obtain metric unit
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm^3)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
gallon per minute per foot [(gal/min)/ft]	0.2070	liter per second per meter [(L/s)/m]

5 0 5 MILES
5 0 5 KILOMETERS

TOPOGRAPHIC CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100-FOOT INTERVALS
DATUM IS MEAN SEA LEVEL

BASE FROM U.S. GEOLOGICAL SURVEY
AJO 1:250,000, 1953-69,
LUKEVILLE 1:250,000, 1963-76,
NOGALES 1:250,000, 1956-69, AND
TUCSON 1:250,000, 1956-69

Unsurveyed township lines extrapolated (dotted) by Heindl and others (1962)

DEPTH TO WATER, ALTITUDE OF THE WATER LEVEL, AND WELL DEPTH

MAPS SHOWING GROUND-WATER CONDITIONS IN THE SAN SIMON WASH AREA, PAPAGO INDIAN RESERVATION, ARIZONA–1979

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