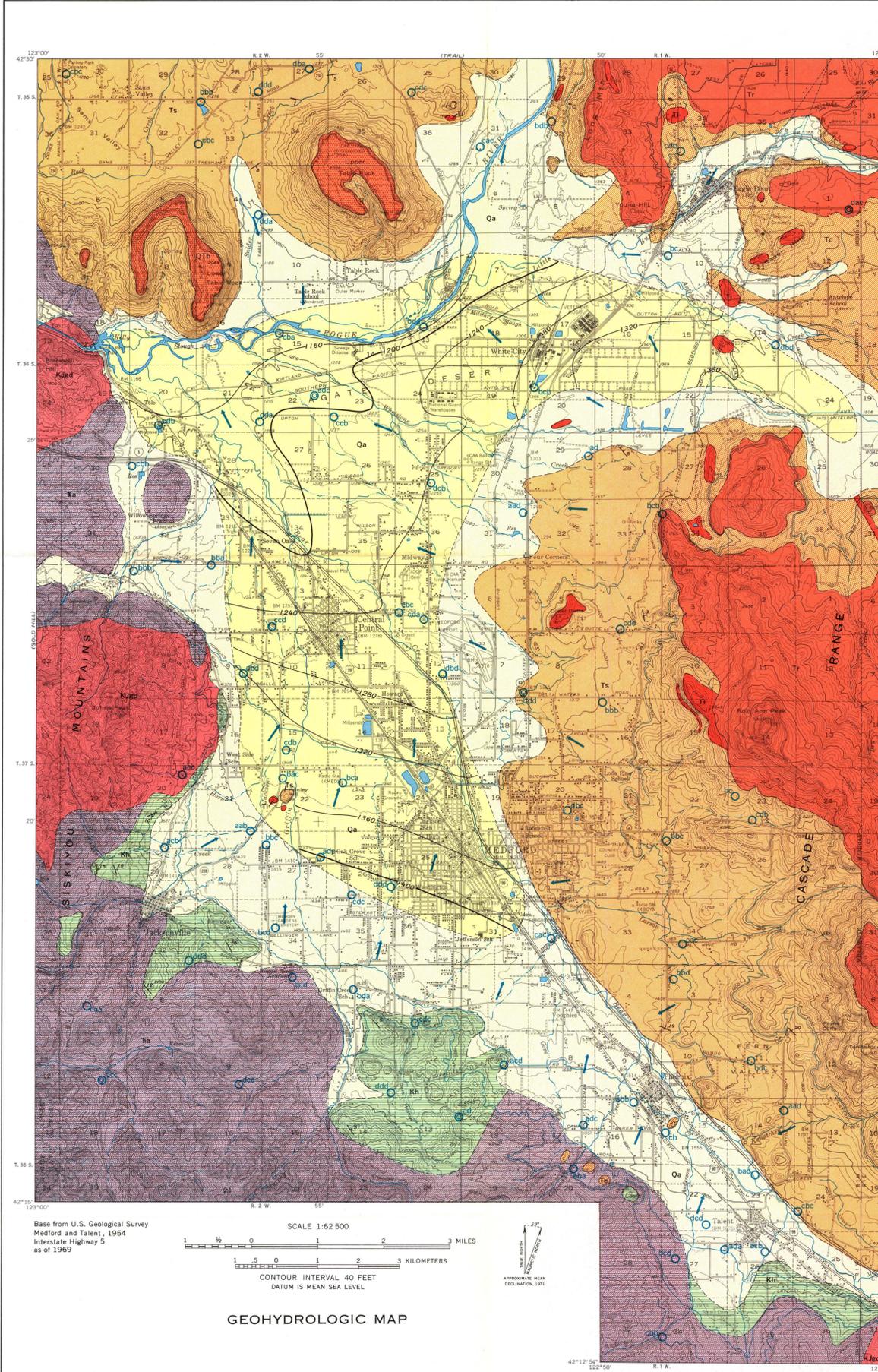


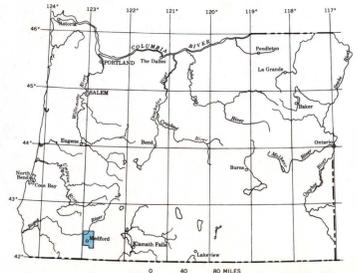
# GEOHYDROLOGY



Geologic Unit	Description	Age
Qa	Alluvium Sand and gravel deposited by Rogue River and tributaries. Poorly sorted, cross-bedded, gray, dark gray and blue-gray sand, with subrounded to subangular cobbles, and boulders. Older deposits form benches, and have a maximum thickness of about 100 feet in the Agate Desert area. In the lower, flatter part of Bear Creek Valley the older deposits are overlain by alluvium but younger and thinner alluvium. Alluvium is the most productive aquifer in the area. Where total thickness is generally 30 feet or more (darker shade on map) the unit usually has a saturated thickness of more than 10-15 feet, and will yield 10-50 gpm (gallons per minute) to wells. In a few areas, 100 gpm or more is obtainable from properly designed and constructed wells. Water is likely to be of good chemical quality for most uses, except excessive iron in shallow zones of areas.	QUATERNARY
QTb	Basalt Basalt flows in Rogue River Valley. Above water table. No known wells.	TERTIARY AND QUATERNARY
Ti	Intrusive rocks Diorite and gabbro sills; basalt and rhyolite dikes. No wells known to penetrate this unit. Probable yield to wells less than 5 gpm.	TERTIARY AND QUATERNARY
Tr	Roxy Formation Mostly volcanic flows, with various textures; color ranges from black through purple to pink to white. Local layers of tuff and volcanic breccia. Above the water table in much of the area, but capable of yielding 10 gpm or more where a sufficient thickness is saturated. Water is likely to be of good chemical quality for most uses.	TERTIARY AND QUATERNARY
Tc	Colectin Formation Water-deposited tuffs and conglomerates, with a few interbedded volcanic flows. Capable of yielding moderate amounts (about 20 gpm) of water to wells in many places. Water may be hard or saline in some areas.	TERTIARY
Ts	Nonmarine sedimentary rocks Buff to dark gray sandstone and shale, with some conglomerate. (Dark gray shale is sometimes reported as "basalt" by drillers.) Formerly assigned to the marine Umpqua Formation (Wells, 1956); revised by Wells and Peck (1961). Capable of yielding 5-15 gpm to small wells in most areas. Ground water contains excessive boron and fluoride in some areas. Too saline for use in a few areas; may be saline below moderate depths in most areas.	TERTIARY
Kh	Hornbrook Formation Greenish to buff sandstone with layers of conglomerate containing pebbles of quartz, diorite, gneiss, and greenstone. Capable of yielding 5-10 gpm in some areas, but in others less than 1 gpm is obtainable. Many drilling attempts abandoned as failures due to insufficient yield. Chemical quality of water variable.	CRETACEOUS
Kjgd	Grandiorite Light-gray igneous rock with orthoclase, plagioclase, quartz, hornblende, and biotite. Small yields (less than 5 gpm) to wells can be expected. Water is likely to be of good chemical quality.	JURASSIC OR CRETACEOUS
Ta	Applegate Group Mostly altered lava flows, flow breccias, pyroclastic rocks, and granitic crystalline rocks, but includes tuffaceous sediments, argillite, quartzite, chert, and limestone. Small yields (commonly less than 5 gpm) obtainable from wells. Chemical quality of water variable.	TRIASSIC
Contact Dashed where approximately located		
Limit of area where alluvium generally more than 30 feet thick (darker shade on map)		
Approximate contours Shows altitude of base of alluvium where alluvium is greater than 30 feet thick. Contour interval 50 feet. Datum is mean sea level.		
Strike and dip of sedimentary beds		
Inferred direction of ground-water movement		
Well for which water analysis is listed in chemical analyses table on sheet 2 Letters are last three digits of well number (see well-numbering diagram)		
Well for which lithologic log shown Letters are last three digits of well number (see well-numbering diagram)		

## SELECTED LIST OF GEOLOGIC UNITS AND TERMS USED BY LOCAL DRILLERS TO DESCRIBE THEM

**Alluvium:** Sand; gravel; boulders; brown sandstone; brown, yellow, or gray clay; soil; hardpan.  
**Roxy Formation:** Purple or red clay, red or brown claystone, cinders, basalt.  
**Colectin Formation:** Blue, yellow, or maroon claystone; brown or lavender clay; red, yellow, or blue sandstone; red or gray conglomerate.  
**Nonmarine sedimentary rocks:** Tan, brown, yellow, gray, or blue clay; tan, brown, yellow, gray, or blue claystone; tan, brown, yellow, gray, or blue sandstone; shale; conglomerate; coal.  
**Hornbrook Formation:** Blue sandstone, gray or blue claystone, gray boulders, granite, quartzite, shale, slate, conglomerate.  
**Grandiorite:** Granite, gray boulders, granodiorite, conglomerate, blue or gray sandstone.  
**Applegate Group:** Gray or blue basalt (often in fact claystone or shale), blue or black claystone, gray granite, blue conglomerate, diorite, quartzite, sandstone.



INDEX MAP OF OREGON, SHOWING THE STUDY AREA

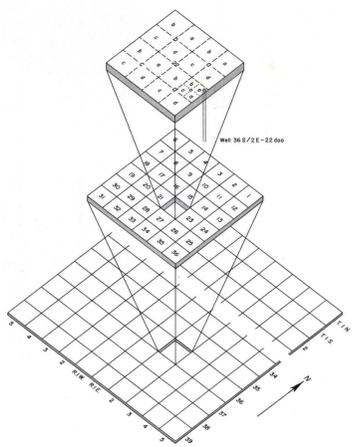


DIAGRAM SHOWING WELL-NUMBERING SYSTEM

## INTRODUCTION

This hydrologic atlas presents information on geology and existing water wells in a form that will enable water users, potential water users, and planners to estimate the prospects of obtaining adequate and suitable ground-water supplies at desired locations.

The Medford area in southwestern Oregon (see index map) is dominated by the lower Bear Creek valley, including the broad area where the creek enters the Rogue River. The Siskiyou Mountains border the valley to the west, and the Cascade Range borders the valley to the east.

The climate is mild, and the summers are warm and dry. Annual precipitation ranged from 10 to 29 inches and averaged 18.70 inches in the period 1912-67.

The population within the area was estimated to be about 50,000 in 1968. Agriculture is dominant in the economy; pear production contributes substantially to it. The area is also a regional center of timber-processing operations. The most heavily traveled highway between southern California and British Columbia, Canada (Interstate 5) passes through Bear Creek valley.

More than 40,000 people live in communities served by the Medford municipal water system, whose source is Big Butte Springs, 17 miles east of Eagle Point. In addition to Medford, the communities served by the Medford system include Central Point, Jacksonville, Eagle Point, and White City. Communities using water from other sources include Talent, which treats surface water for municipal use, and Phoenix, which is supplied by wells.

In most of the valley, irrigation water is supplied from the Rogue River Basin Project, Talent Division, of the U.S. Bureau of Reclamation. The source is mostly Little Butte Creek. The Table Rock area uses diversions from the Rogue River.

Because ground water is pumped mostly for domestic use, the volume withdrawn is not large; however, it is important, as there are several thousand wells in the valley, both within and beyond areas supplied by surface water.

## GEOHYDROLOGY

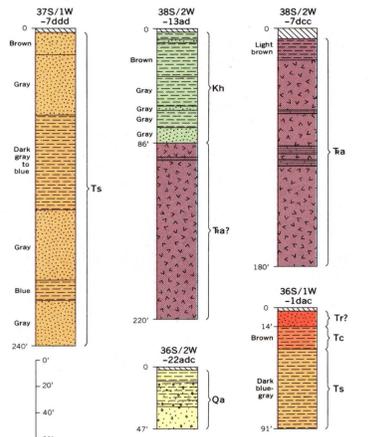
The areal distribution of geologic units is shown on the geohydrologic map. The alluvium is the most productive aquifer in the area, and its base has been contoured where thickness averages more than 30 feet. In the contoured area, the saturated thickness is likely to be sufficient for the unit to yield water to wells.

In most places, the alluvium is underlain by nonmarine sedimentary rocks (Wells and Peck, 1961). Many of the moderate to deep wells in the valley areas may penetrate the alluvium and the nonmarine sedimentary rocks, and enter one of the older formations. In the valley areas northeast of Jacksonville and southwest of Phoenix, the top of the Applegate may be shallow enough to be penetrated by many wells. The Dark Hollow area is underlain by the Hornbrook Formation, which has a maximum thickness of 250 to 300 feet beneath the hillsides but much less in other places. A number of wells penetrate the Hornbrook and terminate in the Applegate.

Arrows on the map show inferred directions of ground-water movement, based on water levels in wells. In general, movement is from areas of recharge toward areas of discharge.

Hydrographs of two wells show seasonal fluctuation of water levels. Although well 36S/1W-21aa appears to show a slight long-term decline, water-level declines are not known.

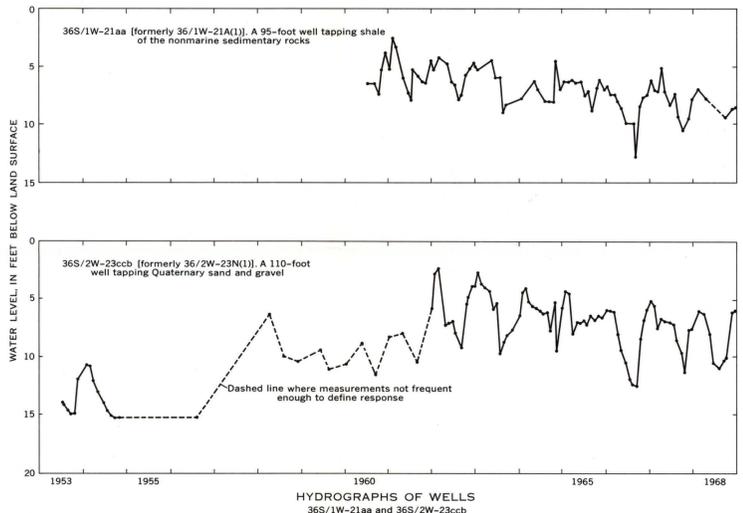
to be a problem in the area. Wells tapping relatively low-yield formations could be expected to show some decline under stress of normal pumping. Were large volumes to be withdrawn, water levels would be lowered generally.



LOGS OF SELECTED WELLS

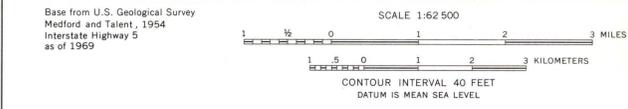
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HYDROGRAPHS OF WELLS  
36S/1W-21aa and 36S/2W-23ccb

## GEOHYDROLOGIC MAP



Base from U.S. Geological Survey Medford and Talent, 1954 Interstate Highway 5 as of 1969

Geology adapted from J. G. Wells (1956) and J. G. Wells and D. L. Peck (1961)

# AVAILABILITY AND QUALITY OF GROUND WATER IN THE MEDFORD AREA, JACKSON COUNTY, OREGON

By  
J. H. Robison  
1971