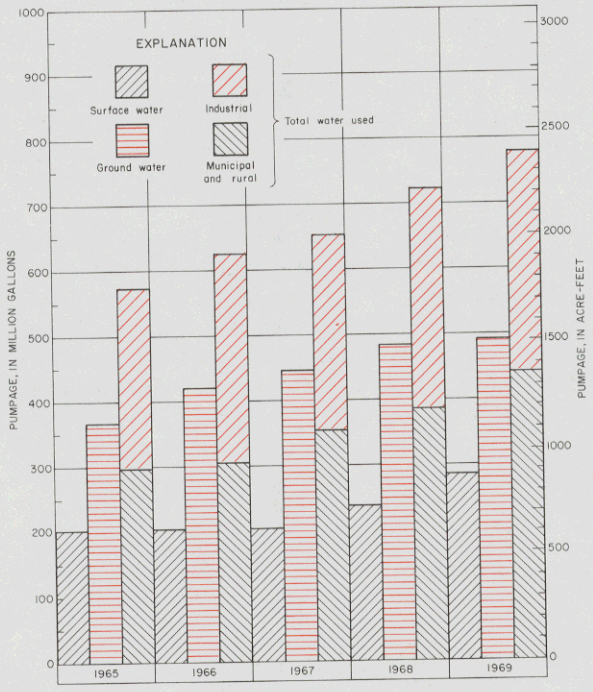

Figure 19.—Source and Amount of Water Reported Used, 1965-69

Industrial Supply

Industry in Rains and Van Zandt Counties pumped a reported 337.80 million gallons in 1969. Most of the water, 315.85 million gallons, was used in processing gas and in mining and processing salt.

One industry reported that 20.99 million gallons of surface water was used for secondary recovery of oil and other industrial operations in the Van Field during 1969. The use of surface water in the field has declined more than 50 percent since 1965, principally due to recycling oilfield-production water.

Figure 19 and Table 3 show that the industrial demand for water has increased by about 63 million gallons, or about 23 percent, since 1965. However, most of the increase in pumpage was for expansion of operations in established industries.

Irrigation

The use of water for irrigation in Rains and Van Zandt Counties is very small. Gillett and Janca (1965, Table 1) show that 262 acre-feet was applied on 590 acres in the two counties during 1964. Most of this amount, 226 acre-feet, was pumped from ponds or streams; the remaining 36 acre-feet was pumped from wells.

During this investigation, eight irrigation wells were inventoried, but only four, YS-34-25-602, YS-34-25-603, YS-34-26-102, and YS-34-26-103 were in use. The total pumpage from these wells in 1969 is estimated to be about 30 acre-feet.

Changes in Water Levels in Wells

Changes in water levels in wells depend largely upon the rate at which water is recharged to an aquifer compared to the rate at which it is discharged. When discharge exceeds recharge, the water levels decline; when recharge is greater than discharge, the water levels rise.

Records of water levels in wells are given in Table 4. Nearly all of the levels were measured during this investigation; historical records showing changes in water levels are available for only a few wells.

Water levels in the shallow dug or bored (augered) wells are reported to decline as much as 10 feet during dry years. Most of the decline occurs during the summer and fall when rainfall is least and the demand for water is greatest. Normally, the water levels recover after heavy rains in the spring.

During a reconnaissance by Baker and others (1963), water levels were measured in a few wells in the deeper aquifers. A comparison of these levels with those measured during this investigation indicates that there has been no appreciable change in the water levels except in the vicinity of Grand Saline, which is an area of large ground-water withdrawals.

In response to concentrated pumping for municipal supply and industrial use, water levels in wells in and near the city of Grand Saline have declined about 100 feet since 1936 (Figures 20 and 21). During the years 1936-54, the water level in well YS-34-19-403 declined 11 feet, an average of about 1.5 feet per year (Figure 20). In December 1954, the water level in well YS-34-19-412, located 0.2 mile north of well YS-34-19-403, was 73 feet below land surface. By August 1969, the water level in this well had declined 95 feet to 168 feet below land surface. However, part of this decline (as much as 15 feet) was seasonal.

At the current rate of pumping in the Grand Saline area (350 million gallons per year), the water levels in the municipal and industrial wells will undoubtedly continue to decline.

WELL CONSTRUCTION

Industrial and Public-Supply Wells

To determine adequate spacing and proper construction of large-capacity wells, a comprehensive program of sand and water sampling, electrical logging, and test pumping in one or more test holes is required.