

*TEXAS  
WATER  
DEVELOPMENT  
BOARD*



Report 152

*DEVELOPMENT OF GROUND  
WATER IN THE HOUSTON  
DISTRICT, TEXAS, 1966-69*

June 1972

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TEXAS WATER DEVELOPMENT BOARD

Report 152

DEVELOPMENT OF GROUND WATER  
IN THE HOUSTON DISTRICT,  
TEXAS, 1966-69

By

R. K. Gabrysch  
United States Geological Survey

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Houston and Galveston

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DEVELOPMENT OF GROUND WATER  
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ABSTRACT

Total withdrawals of ground water in the Houston district increased from about 412 mgd (million gallons per day) in 1966 to 507 mgd in 1969. Almost all of the increase occurred in the Katy, Pasadena, and Houston areas. Pumpage in the NASA area has become significant in the past few years, increasing from 5.3 mgd in 1966 to 11.2 mgd in 1969. Small increases occurred in the Baytown-La Porte and Texas City areas, but pumpage remained almost constant in the Alta Loma area.

Water-level declines continued, generally, at a greater rate than before 1966. The greatest declines in the past several years were in the Houston area, but the center of decline is still in the Pasadena area.

Although salt-water encroachment is probable in the district, no large increases in chloride were measured at the monitoring points.

# DEVELOPMENT OF GROUND WATER IN THE HOUSTON DISTRICT, TEXAS, 1966-69

## INTRODUCTION

Collection of data to define the ground-water resources in and around Houston, Texas, was begun by the U.S. Geological Survey about 1929. The present program of collection and dissemination of data is a cooperative effort by the U.S. Geological Survey, the Texas Water Development Board, and the cities of Houston and Galveston.

Many reports describing the geology and ground-water resources of the Houston district have been published. Some of the more comprehensive reports are listed in the "Selected References" at the end of this report. The most recent report summarizing the geology and hydrology of the Houston district is by Gabrysch (1967), the report also presents data on pumpage, changes in water levels, and information on land-surface subsidence.

As a result of recent studies in the coastal area of southeast Texas, it is now possible to define better the aquifer system in the Houston district. A mapping program to delineate the aquifers in the district is presently (1970) underway, and these maps will be presented in later reports.

The Houston district, as described in this report, includes all of Harris and Galveston Counties and parts of Chambers, Liberty, Montgomery, Waller, Fort Bend, and Brazoria Counties (Figure 1). Previous reports in this program described the same areas, but the ground-water conditions in Galveston County were reported separately. Galveston County is now included in the Houston district because of the related effects of extensive ground-water development in southeastern Harris County.

The author expresses his appreciation to the well drillers, industrial plant officials, municipal officials, and many well owners who contributed data used in this report. The cooperation and assistance of D. E. Van Buskirk, Superintendent of Production, Water Division, city of Houston, greatly facilitated data collection and preparation of this report.

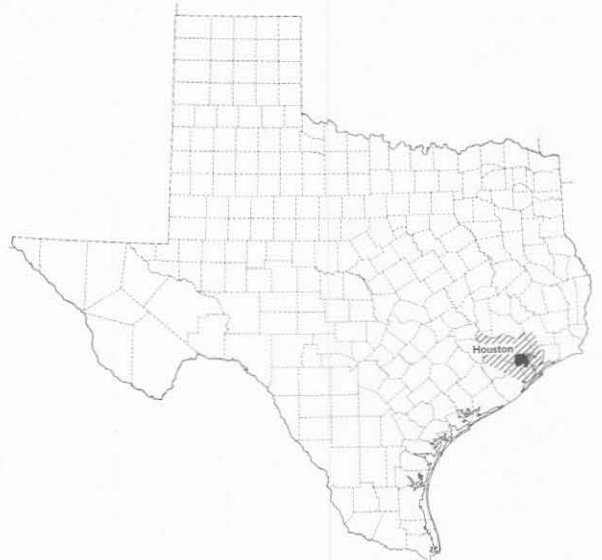


Figure 1.—Index Map Showing Area of Report

## AQUIFERS

The aquifers in the Houston district are composed of sand and clay beds that are not persistent in lithology or thickness. The beds grade into each other both laterally and vertically within short distances; consequently, differentiation of geologic formations on drillers' and electrical logs is almost impossible. However, White and others (1944, p. 146-147) and Lang and others (1950, p. 37) divided the aquifer system into seven zones based on the predominance of sand or clay. In the Houston District, water is being pumped only from sands above zone 2, a clay zone that contains some of the most continuous beds in the area.

The Alta Loma Sand of Rose (1943) (hereafter referred to as the Alta Loma Sand), which is the major aquifer in Galveston County and southern Harris County, is an exception in that it can be traced in the subsurface for great distances. The Alta Loma Sand is massive and about twice as permeable as the underlying sands, referred to by Wood and Gabrysch (1965) as the







































