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**DELIVERY OF WATER IN THE BRAZOS RIVER
FROM
POSSUM KINGDOM RESERVOIR TO RICHMOND, TEXAS
DURING AUGUST AND SEPTEMBER, 1948**

**by
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**Prepared in cooperation with the
TEXAS BOARD OF WATER ENGINEERS**

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REPORT ON DELIVERY OF WATER IN THE BRAZOS RIVER FROM POSSUM KINGDOM
RESERVOIR TO RICHMOND, TEX., DURING AUGUST AND SEPTEMBER, 1948.

Unusual drought conditions in the summer of 1948 led the irrigators in the lower Brazos River valley to request releases from Possum Kingdom Reservoir primarily for the irrigation of rice.

The purpose of this study is to determine the time of travel. The first release is identified as that passing the Palo Pinto gage, 20 miles downstream from the reservoir, from August 9 to 16, 1948; the second release is that from August 16 to 30; and the third release is that from August 30 to September 6.

Discharge hydrographs of gaging stations on the Brazos River near Palo Pinto, near Glen Rose, at Waco, near Bryan and at Richmond, Tex., are shown on Figure 1. The hydrograph of flow at Richmond includes the flow of the American Canal Company's Canal near Fulshear, Tex., and Richmond Irrigation Company's Canal near Richmond, Tex., both of which divert water from Brazos River upstream from the Richmond river gage. In addition to the gaging stations shown on Figure 1, the gages near Whitney and near San Felipe were used in computing time of travel of released water. All of the gaging stations named above were equipped with continuous water stage recorders.

The first release of 11,800 acre-feet as measured at the Palo Pinto gage could be followed downstream to Richmond fairly accurately. This release traveled in a relatively dry channel, as the peak discharge in the nine days preceding this release was only 610 second-feet at Palo Pinto and no runoff from rain was indicated during time of travel to

Richmond.

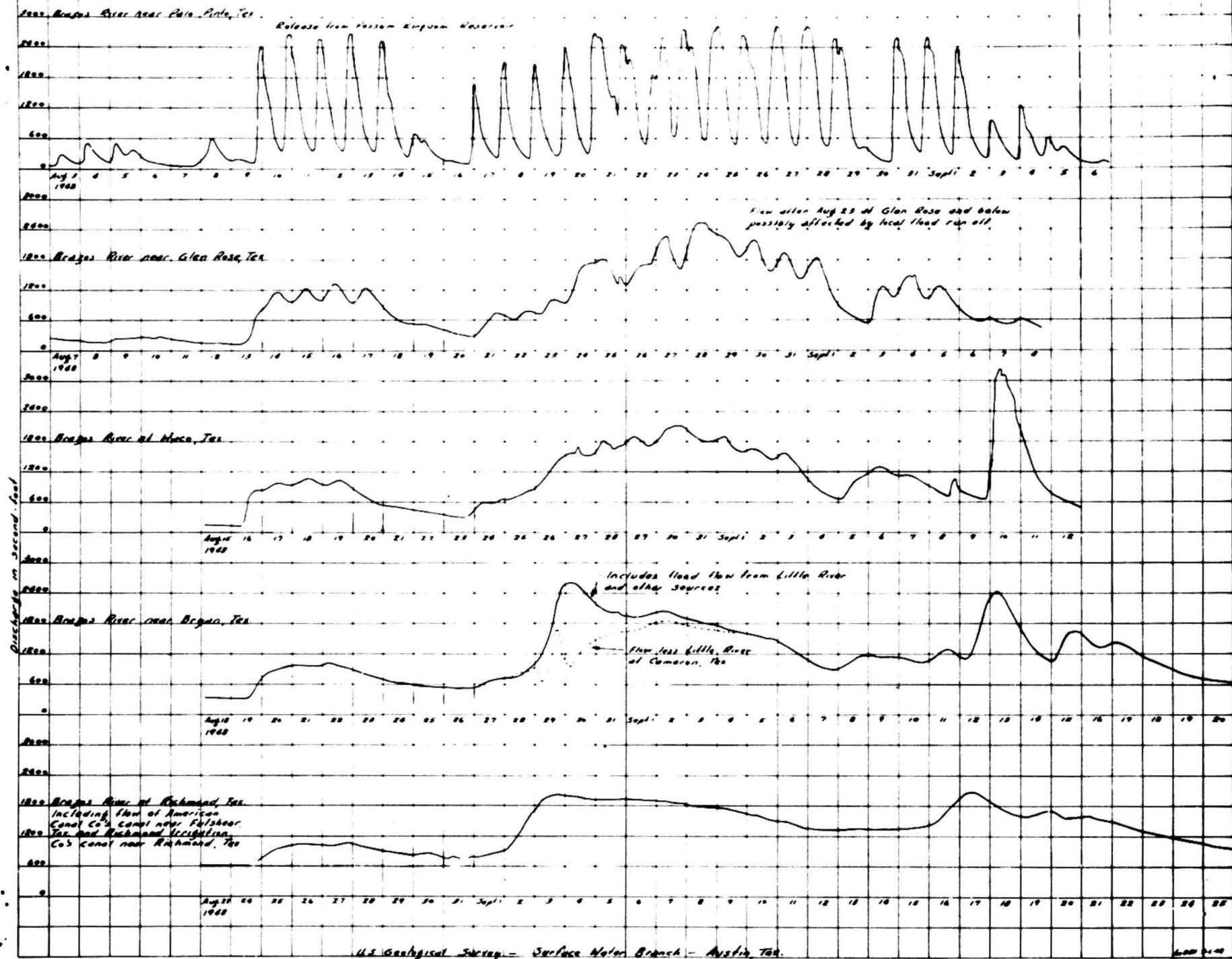
A graph showing the percent of the momentary peak discharge of the first release of 2,700 second-feet at the Palo Pinto gage that reached each gaging station is shown in Figure 2. Only 18 percent or 490 second-feet of this peak reached Richmond. This chart does not include base flow. The flow of the two canals mentioned above is included at Richmond. The peak discharges of the second and third releases were increased by runoff due to rain and a satisfactory determination of peak reduction could not be made.

An average time of travel graph, showing the time of travel from Possum Kingdom Reservoir to Richmond, Texas, is given in Figure 2. Circular points indicate the time of travel of the water of the first release, x's indicate the time of travel of the peak of the first release, and the triangles indicate the time of travel of the water of the second release to each gage indicated. It took the water of the first release 340 hours to travel from Possum Kingdom Reservoir to Richmond and 370 hours for the second release. Travel time of the third release could not be determined accurately because of flood runoff.

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Revised 10/25/50

Note.- The original version of this report, prepared in September 1949, showed an estimate of the percent of the water released from Possum Kingdom Reservoir August 9-15, 1948, amounting to 11,800 acre-feet, that reached the gaging station on Brazos River at Richmond, Tex. This estimate was based on insufficient data to be conclusive and has been omitted from revised report.

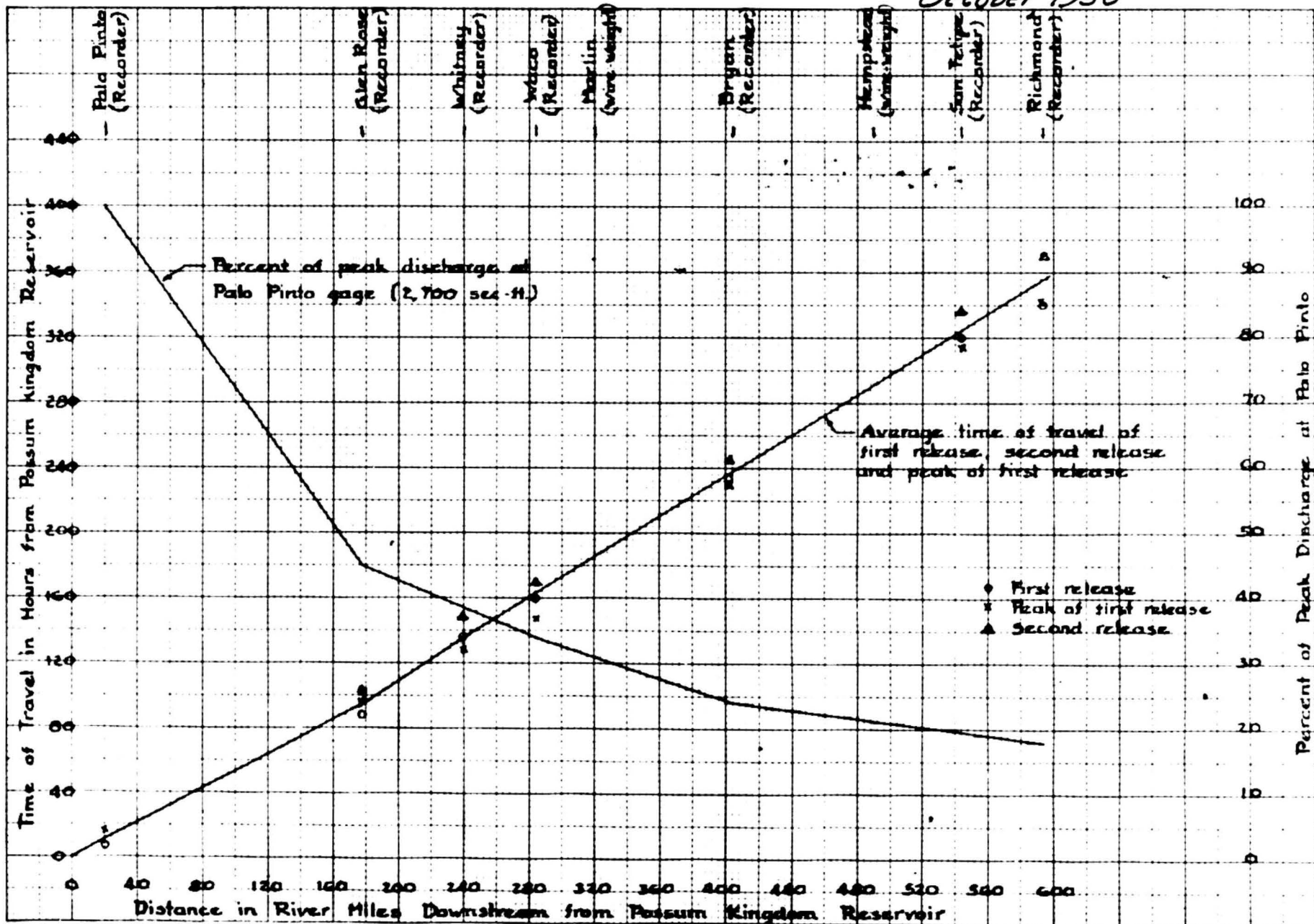
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Hydrographs of Discharge from Possum Kingdom Reservoir on Brazos River as Measured at Gaging Stations from Pate Pinta to Richmond, Tex August - September 1968 Graph prepared by D.E. Hovelsko, Sept 6, 1969

THESE ARE REVISED DATA

October 1950



Time of Travel and Reduction in Peak of Water Released from Possum Kingdom Reservoir August 9 to 16, 1948
U.S. Geological Survey - Surface Water Branch - Austin, Tex. Figure 2