THIRD REPORT OF THE BOARD OF WATER ENGINEERS FOR THE STATE OF TEXAS. COVERING THE TWO YEAR PERIOD FROM SEPTEMBER 1, 1916, TO AUGUST 31, 1918, INCLUSIVE

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VON BOECKMANN-JONES CO., PRINTERS, AUSTIN, TEXAS
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LETTER OF TRANSMITTAL

December 7, 1918.

To Honorable W. P. Hobby, Governor of Texas, Executive Office.

SIR: I have the honor to transmit herewith the Third Report of the Board of Water Engineers for the State of Texas, covering the biennium from September 1, 1916, to August 31, 1918. In this report the Board has given, with as minute detail as is practicable, a complete statement of the operations of this department, in the administration of the law, relating to the water resources of the State; in the measurement of stream flow; the determination of the duty of water in irrigation; the conservation and use of storm and flood water; the inspection of streams; the satisfactory settlement of all controversies relating to the distribution and use of all public waters; and the adjudication and determination of all existing claims of right in certain Texas streams.

There is also embodied a complete statement of all expenditures, and recommendation of the appropriations deemed necessary to the success of this work during the next two fiscal years. It is the request of the Board that this report be printed.

Respectfully submitted,

W. T. POTTER,
Chairman of the Board.

Automatic Water Stage Recorder installed on Highway bridge across the Colorado River at Congress Avenue, Austin, Texas, maintained by the Board of Water Engineers of Texas, the United States Geological Survey cooperating.

SOME UNITS OF MEASURE, WITH CONVENIENT EQUIVALENTS.

1 cubic foot per second (c. f. s.) is the quantity of water which will flow through an area of one square foot, measured at right angles to the direction of flow, with an average velocity of one foot per second.

1 acre-foot of water (a. ft.) is the quantity required to cover one acre to a depth of one foot.

1 acre-inch of water (a. in.) is the quantity required to cover one acre one inch deep, and equals one-twelfth of an acre-foot.

1 cubic foot per second=1.98347 acre-feet per day of 24 hours (or, roughly, 1 c. f. s.=2 acre-feet per day).

1 cubic foot=7.4805 U. S. gallons (roughly 7½ gallons).

1 cubic foot per second=448.83 U. S. gallons per minute (or, roughly, 1 c. f. s.=450 gals. per min.).

1 cubic foot per second=1 acre-inch per hour (nearly).

1 cubic foot per second for one year (365 days)=724 acre-feet.

1 cubic foot per second for one year will cover one square mile to a depth of 1.13125 feet, or 13.575 inches.

1,000,000,000 (1 U. S. billion) cubic feet=11,574 cubic feet per second for one day.

1,000,000 U. S. gallons=3.07 acre-feet.

1,000,000 U. S. gallons per day=1.55 cubic feet per second.

1,000,000 cubic feet=22.95 acre-feet.

1 acre-foot=325,851 U. S. gallons=271,472 Imperial gallons.

1 acre-foot=43,560 cubic feet=1,613.333 cubic yards.

1 acre=43,560 square feet=209 feet square (nearly).

1 foot pound is the work required to raise one pound one foot vertically.

1 horsepower=550 foot pounds per second=33,000 foot pounds per minute.

1 horsepower=746 watts.

1 horsepower=1 cubic foot per second of water falling 8.80 feet vertically.

1⅓ horsepower=1 kilowatt.

Assuming 80 per cent efficiency for a water wheel the net horsepower of a stream $= \frac{\text{cu. ft. per sec.} \times \text{fall in feet.}}{11}$