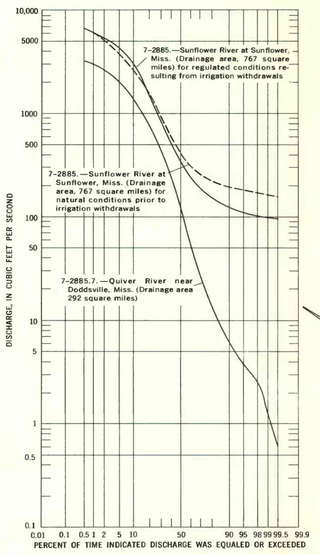
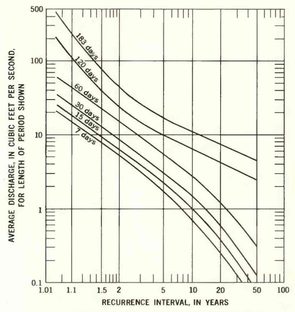


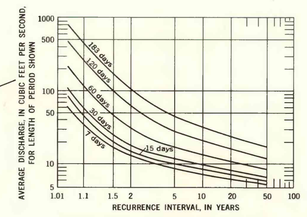

FLOW-DURATION CURVES FOR SUNFLOWER RIVER AT SUNFLOWER, AND QUIVER RIVER NEAR DODDSVILLE, MISS., 1929–57



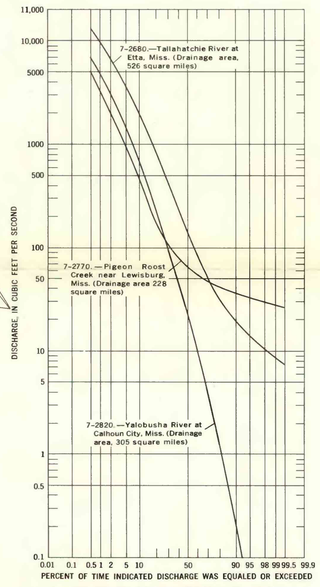

MAGNITUDE AND FREQUENCY OF ANNUAL LOW FLOW FOR QUIVER RIVER NEAR DODDSVILLE, MISS. (7–2885.7), 1929–57



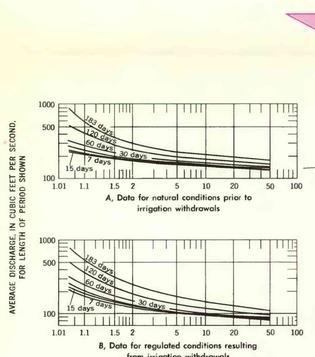

MAGNITUDE AND FREQUENCY OF ANNUAL LOW FLOW FOR PIGEON ROOST CREEK NEAR LEWISBURG, MISS. (7–2770), 1929–57




MAGNITUDE AND FREQUENCY OF ANNUAL LOW FLOW FOR TALLAHATCHIE RIVER AT ETTA, MISS. (7–2680), 1929–57




FLOW-DURATION CURVES FOR TALLAHATCHIE RIVER AT ETTA, PIGEON ROOST CREEK NEAR LEWISBURG, AND YALOBUSHA RIVER AT CALHOUN CITY, MISS., 1929–57

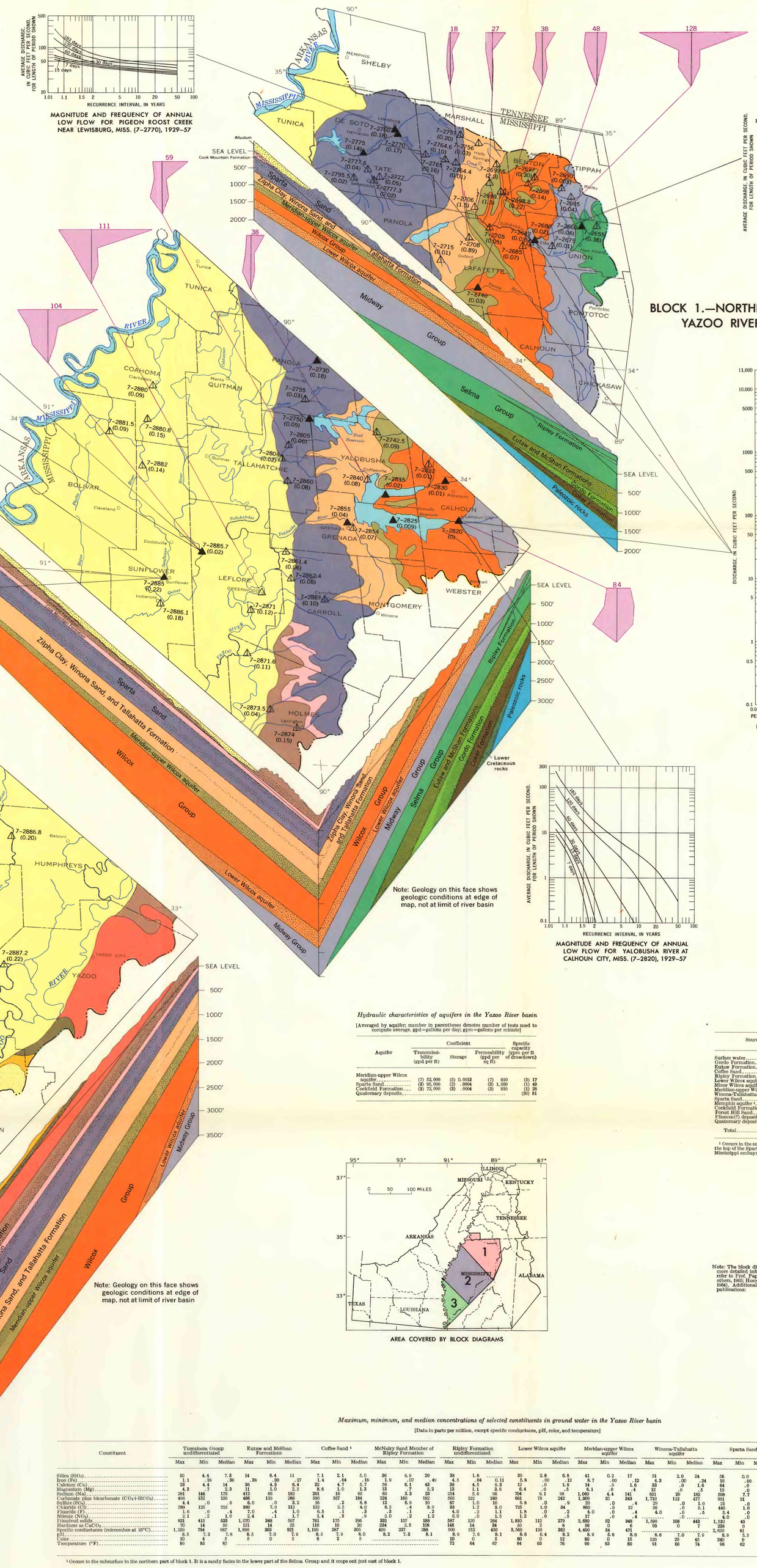



MAGNITUDE AND FREQUENCY OF ANNUAL LOW FLOW FOR SUNFLOWER RIVER AT SUNFLOWER, MISS. (7–2885), 1929–57

For the Sunflower station (7–2885) two sets of curves are shown, one for natural conditions prior to irrigation withdrawals and the other for regulated conditions resulting from irrigation withdrawals. The two sets of curves give some indication as to the range of the modification that the low flow has undergone as the result of regulation and withdrawals for irrigation




MAGNITUDE AND FREQUENCY OF ANNUAL LOW FLOW FOR YALOBUSHA RIVER AT CALHOUN CITY, MISS. (7–2820), 1929–57







AREA COVERED BY BLOCK DIAGRAMS

## EXPLANATION

| Epoch | Group | Formation | Symbol |
|---|---|---|---|
| Miocene, Pleistocene, and Pliocene(?) Holocene | | Alluvium | |
| Miocene and Pliocene(?) | | Miocene and younger deposits | |
| Oligocene | | Vicksburg Group | |
| Oligocene | | Forest Hill Sand | |
| Eocene | Claiborne Group | Jackson Group | |
| Eocene | Claiborne Group | Cockfield Formation | |
| Eocene | Claiborne Group | Cook Mountain Formation | |
| Eocene | Claiborne Group | Sparta Sand | |
| Eocene | Claiborne Group | Zilpha Clay, Winona Sand, and Tallahatta Formation | |
| Eocene | Claiborne Group | Meridian-upper Wilcox aquifer | |
| Eocene | | Wilcox Group (Lighter tone is lower Wilcox aquifer) | |
| Paleocene | | Midway Group | |
| Upper Cretaceous | | Selma Group (Lighter tone is Ripley Formation) | |
| Upper Cretaceous | Tuscaloosa Group | Eutaw and McShan Formations | |
| Upper Cretaceous | Tuscaloosa Group | Gordo Formation | |
| Upper Cretaceous | Tuscaloosa Group | Coker Formation | |
| Lower Cretaceous | | Lower Cretaceous rocks | |
| | | Paleozoic rocks | |

QUATERNARY; TERTIARY; CRETACEOUS; PALEOZOIC

### WATER-BEARING ZONES

- Fresh water (contains less than 1,000 parts per million dissolved solids)
- Saline water (contains more than 1,000 parts per million dissolved solids)

Contact

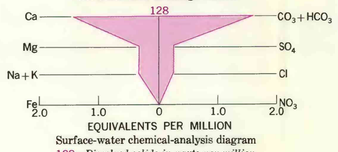
Basin boundary

7–2760 (0.18) Daily-record station

7–2874 (0.15) Partial-record or short-term daily-record station

*Upper number is station identification; number in parentheses is 7-day 2-year low flow, in cubic feet per second per square mile, adjusted to 1929–57. For a few of the stations that became subject to withdrawals for irrigation during the study period, low-flow data are shown for natural conditions*

Surface-water sampling location at site other than discharge station




Surface-water chemical-analysis diagram

128—*Dissolved solids in parts per million*

*Hydraulic characteristics of aquifers in the Yazoo River basin*

[Averaged by aquifer; number in parentheses denotes number of tests used to compute average, gpd=gallons per day; gpm=gallons per minute]

| Aquifer | Coefficient: Transmissibility (gpd per ft) | Coefficient: Storage | Coefficient: Permeability (gpd per sq ft) | Specific capacity (gpm per ft of drawdown) |
|---|---|---|---|---|
| Meridian-upper Wilcox aquifer | (7) 52,000 | (5) 0.0013 | (7) 610 | (3) 17 |
| Sparta Sand | (3) 95,000 | (2) .0004 | (3) 1,050 | (1) 49 |
| Cockfield Formation | (3) 72,000 | (3) .0004 | (3) 910 | (1) 28 |
| Quaternary deposits | | | | (35) 81 |

*Water use, 1965*

[Results in millions of gallons per day]

| Source | Public supplies | Industrial supplies | Irrigation | Other | Total |
|---|---|---|---|---|---|
| Surface water | 0 | 0 | 500 | 0.1 | 500.1 |
| Gordo Formation | .3 | .2 | 0 | .1 | .6 |
| Eutaw Formation | 1 | .5 | 0 | .3 | 1.8 |
| Coffee Sand | .3 | 1 | 0 | .3 | 1.6 |
| Ripley Formation | 2 | 3 | 0 | 1 | 6 |
| Lower Wilcox aquifer | 4 | 3 | 0 | 1 | 8 |
| Minor Wilcox aquifers | 1 | 2 | 0 | 1 | 4 |
| Meridian-upper Wilcox aquifer | 10 | 7 | 1 | 5 | 23 |
| Winona-Tallahatta aquifer | 1.5 | 1.5 | 0 | 1 | 4.0 |
| Sparta Sand | 17 | 20 | 1 | 5 | 43 |
| Memphis aquifer [1] | 5 | 1 | 0 | 1 | 7 |
| Cockfield Formation | 12 | 8 | 0 | 2 | 22 |
| Forest Hill Sand | .2 | .3 | 0 | .2 | .7 |
| Pliocene(?) deposits | 0 | 0 | 0 | .1 | .1 |
| Quaternary deposits | 0 | 44 | 1,100 | 3 | 1,147 |
| Total | 55.3 | 90.5 | 1,602 | 21.1 | 1,768.9 |

[1] Occurs in the subsurface in the extreme northern part of block 1. It is the interval from the top of the Sparta Sand to the base of the Claiborne Group in the northern part of the Mississippi embayment.

Note: The block diagrams are schematic, and depths and distances are not exact. For more detailed information about the aquifers and low flow of streams in this basin, refer to Prof. Papers 448-B, C, D, E, and I (Cushing and others, 1964; Boswell and others, 1965; Horsman and others, 1966; and Spiker and others, 1964). Additional water information for this basin is contained in the following publications:

Boswell (1963)
Brown (1947)
Gaydos (1965)
Golden (1960)
Harvey (1956)
Robinson and Skelton (1960)
Wasson (1965)

*Maximum, minimum, and median concentrations of selected constituents in ground water in the Yazoo River basin*

[Data in parts per million, except specific conductance, pH, color, and temperature]

| Constituent | Tuscaloosa Group undifferentiated Max | Min | Median | Eutaw and McShan Formations Max | Min | Median | Coffee Sand [1] Max | Min | Median | McNairy Sand Member of Ripley Formation Max | Min | Median | Ripley Formation undifferentiated Max | Min | Median | Lower Wilcox aquifer Max | Min | Median | Meridian-upper Wilcox aquifer Max | Min | Median | Winona-Tallahatta aquifer Max | Min | Median | Sparta Sand Max | Min | Median | Cockfield Formation Max | Min | Median | Quaternary deposits Max | Min | Median |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Silica ($SiO_2$) | 10 | 4.4 | 7.3 | 14 | 6.4 | 11 | 7.1 | 2.1 | 5.0 | 36 | 9.9 | 20 | 38 | 1.8 | ..... | 39 | 2.8 | 6.8 | 41 | 0.2 | 17 | 51 | 2.0 | 24 | 58 | 0.0 | 12 | 18 | 2.8 | 10 | 41 | 21 | 30 |
| Iron (Fe) | 1.1 | .18 | .36 | 38 | .00 | .27 | 1.4 | .04 | .18 | 1.9 | .07 | .49 | 4.5 | .04 | 0.11 | 5.8 | .00 | .12 | 8.7 | .00 | .12 | 4.3 | .00 | .24 | 16 | .00 | .13 | 4.8 | .00 | .20 | 26 | .20 | 6.6 |
| Calcium (Ca) | 23 | 4.4 | 14 | 36 | 4.3 | 6.4 | 32 | 4.7 | 5.7 | 56 | 6.1 | 43 | 38 | 4.5 | 9.3 | 12 | .0 | 1.9 | 14 | .0 | 1.6 | 33 | .0 | 1.6 | 64 | .0 | 3.2 | 82 | .0 | 2.4 | 144 | 22 | 72 |
| Magnesium (Mg) | 4.3 | .7 | 2.3 | 11 | 1.0 | 2.2 | 8.6 | 1.0 | 1.3 | 13 | .7 | 5.2 | 13 | 1.1 | 3.6 | 6.4 | .0 | .5 | 6.1 | .0 | .4 | 12 | .0 | .5 | 19 | .0 | 1.2 | 36 | .0 | .5 | 46 | 7.2 | 21 |
| Sodium (Na) | 281 | 146 | 178 | 412 | 66 | 182 | 261 | 16 | 65 | 60 | 3.3 | 23 | 214 | 5.6 | 96 | 704 | 9.1 | 98 | 1,060 | 4.4 | 141 | 651 | 29 | 182 | 598 | 7.7 | 82 | 1,910 | 23 | 156 | 58 | 5.8 | 14 |
| Carbonate plus bicarbonate ($CO_3$+$HCO_3$) | 496 | 132 | 150 | 466 | 119 | 286 | 580 | 167 | 184 | 224 | 160 | 182 | 566 | 122 | 240 | 661 | 78 | 242 | 1,300 | 10 | 343 | 1,710 | 112 | 477 | 991 | 21 | 239 | 1,590 | 143 | 293 | 697 | 87 | 348 |
| Sulfate ($SO_4$) | 4.4 | .0 | .6 | 6.0 | .0 | 3.2 | 16 | .2 | 8.8 | 12 | 6.9 | 10 | 87 | 1.0 | 10 | 5.8 | .0 | .9 | 20 | .0 | .4 | 29 | .0 | 1.0 | 21 | .0 | 3.0 | 82 | .0 | 1.0 | 74 | .0 | 6.6 |
| Chloride (Cl) | 280 | 125 | 215 | 380 | 7.0 | 112 | 122 | 2.5 | 4.0 | 6.5 | .4 | 3.0 | 33 | 1.2 | 3.0 | 725 | 1.0 | 34 | 860 | .0 | 12 | 56 | .0 | 5.1 | 440 | 1.0 | 7.8 | 2,380 | 2.0 | 26 | 36 | 1.0 | 6.6 |
| Fluoride (F) | 1.6 | .0 | .4 | 7.0 | .4 | 1.0 | 6.5 | .1 | .3 | .3 | .1 | .2 | 6.0 | .2 | 1.1 | 1.8 | .0 | .2 | 4.0 | .0 | .4 | 4.0 | .0 | .5 | 5.4 | .0 | .2 | 4.0 | .0 | .4 | .6 | .0 | .1 |
| Nitrate ($NO_3$) | 2.1 | .2 | 1.0 | 2.4 | .1 | 1.7 | 1.4 | .3 | .9 | 2.0 | .2 | 1.2 | 6.0 | .0 | 1.5 | 1.2 | .0 | .5 | 17 | .0 | .4 | ..... | .0 | ..... | 4.0 | .0 | .4 | 2.1 | .0 | .4 | 4.0 | .0 | .1 |
| Dissolved solids | 821 | 415 | 533 | 1,070 | 348 | 507 | 761 | 173 | 196 | 331 | 157 | 188 | 587 | 120 | 264 | 1,810 | 112 | 279 | 2,680 | 52 | 348 | 1,590 | 108 | 443 | 1,930 | 45 | 236 | 4,870 | 164 | 278 | 622 | 149 | 345 |
| Hardness as $CaCO_3$ | 70 | 14 | 50 | 121 | 14 | 25 | 116 | 16 | 20 | 234 | 2.5 | 108 | 148 | 14 | 34 | 50 | 2 | 8 | 56 | 0 | 6 | 93 | 0 | 7 | 238 | 0 | 10 | 351 | 0 | 8 | 850 | 87 | 273 |
| Specific conductance (micromhos at 25°C) | 1,250 | 734 | 987 | 1,890 | 363 | 821 | 1,190 | 287 | 305 | 455 | 237 | 288 | 990 | 212 | 450 | 3,560 | 126 | 382 | 4,450 | 54 | 471 | ..... | ..... | ..... | 2,620 | 81 | 243 | 8,430 | 274 | 1,063 | 1,060 | 216 | 556 |
| pH | 8.5 | 7.3 | 7.8 | 8.5 | 7.0 | 7.9 | 8.5 | 7.0 | 8.0 | 8.2 | 7.3 | 8.1 | 8.9 | 7.6 | 8.1 | 8.6 | 6.4 | 8.2 | 8.9 | 5.6 | 8.0 | 8.6 | 7.0 | 7.9 | 8.9 | 5.5 | 7.9 | 8.9 | 7.3 | 8.5 | 8.5 | 6.5 | 7.7 |
| Color | 10 | 4 | 5 | 5 | 0 | 5 | 6 | 2 | 5 | ..... | ..... | ..... | 10 | 0 | 5 | 60 | 0 | 12 | 80 | 0 | 15 | 120 | 20 | 45 | 240 | 0 | 20 | 1,200 | 0 | 50 | 40 | 0 | 5 |
| Temperature (°F) | 89 | 85 | 87 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 72 | 64 | 67 | 84 | 63 | 76 | 99 | 63 | 80 | 91 | 66 | 74 | 96 | 62 | 67 | 88 | 71 | 74 | 68 | 62 | 65 |

[1] Occurs in the subsurface in the northern part of block 1. It is a sandy facies in the lower part of the Selma Group and it crops out just east of block 1.

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# BLOCK DIAGRAMS, GRAPHS, AND CHEMICAL-ANALYSES DIAGRAMS SHOWING AVAILABILITY AND QUALITY OF WATER IN THE CENTRAL PART OF THE MISSISSIPPI EMBAYMENT