

GAM Task 10-023 Model Run Report

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June 8, 2010

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EXECUTIVE SUMMARY:

We ran the groundwater availability model for the southern portion of the Ogallala Aquifer and the Edwards-Trinity (High Plains) Aquifer from 2009 to 2060 to estimate the future condition of the aquifer under three different scenarios. In each of these scenarios, pumping in the Ogallala aquifer in the northern portion of Groundwater Management Area 2 results in approximately 50 percent of the estimated 2008 volume of water in the aquifer remaining in 2060. In the southern portion of Groundwater Management Area 2, pumping in the Ogallala Aquifer in the three scenarios approximates a specified rate of water level decline. In the first two scenarios, pumping within Groundwater Management Area 2 is taken from previously completed groundwater availability model runs. In the third scenario, pumping was determined iteratively to achieve, to the extent possible, the specified future condition of the aquifer. Results are compared to previously completed groundwater availability model runs and are reported by county, groundwater conservation district, and groundwater management area for each aquifer.

PURPOSE OF MODEL RUNS:

The three model runs contained in this report were performed using the groundwater availability model for the southern portion of the Ogallala Aquifer and the Edwards-Trinity (High Plains) Aquifer to evaluate and determine the compatibility of different potential desired future conditions for selected aquifers located in the northern and southern portions of Groundwater Management Area 2.

DESCRIPTION OF MODEL RUNS:

The counties comprising the northern and southern portions of Groundwater Management Area 2 are shown in Figure 1. In the northern portion of Groundwater Management Area 2, the pumping specified in each of the three scenarios achieves approximately 50 percent of the 2008 volume of water in the Ogallala Aquifer remaining in 2060. In the southern portion of Groundwater Management Area 2, pumping in scenarios 1 and 2 in this report is taken from the two scenarios presented in Groundwater Availability Model Run 08-85 (Smith and others, 2009). In Scenario 3, pumping in the Ogallala Aquifer in the southern portion of Groundwater Management Area 2 was determined iteratively to achieve, to the extent possible, the 5- or 10-year average water level declines reported in Smith and others (2009).

Though the pumping specified in the model for the Edwards-Trinity (High Plains) Aquifer was not adjusted among the three scenarios presented here, results are reported for this aquifer to show the affect on this aquifer of the different pumping scenarios for the overlying Ogallala Aquifer.

METHODS:

We used the groundwater availability model for the southern portion of the Ogallala Aquifer and the Edwards-Trinity (High Plains) Aquifer to complete the predictive simulations described in this report. This groundwater availability model is based on the U.S. Geological Survey's MODFLOW 2000 groundwater modeling code (Harbaugh and others, 2000).

The pumping assigned within and outside of Groundwater Management Area 2 for each of the scenarios is described in the Pumping section below. Note that we converted the MODFLOW Multi-Node Well package to the MODFLOW Well package for the predictive simulations presented here. This was done to allow pumping to be adjusted in the Ogallala Aquifer without changing the pumping in the underlying Edwards-Trinity (High Plains) Aquifer. In essence, the model simulations are identical using either the MODFLOW Multi-Node Well package or the Well package through the historical-calibration portion of the model (1930 to 2000) as well as during the interim period prior to the beginning of the predictive simulation (2001 to 2008). The location of the converted multi-node wells is shown in the model update report (Blandford and others, 2008), but is primarily limited to Gaines and Dawson counties.

PARAMETERS AND ASSUMPTIONS:

The parameters and assumptions for the model run using the groundwater availability model for the southern portion of the Ogallala Aquifer and the Edwards-Trinity (High Plains) Aquifer are described below:

- We used version 2.01 of the groundwater availability model for the southern portion of the Ogallala Aquifer and the Edwards-Trinity (High Plains) Aquifer. This model is an expansion on and update to the previously developed groundwater availability model for the southern portion of the Ogallala Aquifer described in Blandford and others (2003). See Blandford and others (2008) and Blandford and others (2003) for assumptions and limitations of the groundwater availability model.
- The model includes four layers representing the southern portion of the Ogallala and Edwards-Trinity (High Plains) aquifers. The units comprising the Edwards-Trinity (High Plains) Aquifer (primarily Edwards, Comanche Peak, and Antlers Sand formations) are separated from the overlying Ogallala Aquifer by a layer of Cretaceous shale, where present.
- The mean absolute error (a measure of the difference between simulated and measured water levels during model calibration) for the Ogallala Aquifer in 2000 is 33 feet. The mean absolute error for the Edwards-Trinity (High Plains) Aquifer in 1997 is 25 feet (Blandford and others, 2008). This represents 1.8 and 3.0 percent of the hydraulic head drop across the model area for each aquifer, respectively.
- We used Groundwater Vistas version 5.36 Build 10 (Environmental Simulations, Inc., 2007) as the interface run model simulations.
- Cells were assigned to individual counties and groundwater conservation districts as shown in the September 14, 2009 version of the model grid for the southern portion of the Ogallala Aquifer and the Edwards-Trinity (High Plains) Aquifer.
- The recharge used for the model run represents average recharge as described in Blandford and others (2003).

Pumping

The pumping for each of the three scenarios described here was either extracted from a previous groundwater availability model run or was determined through an iterative process to achieve a specific future condition of the aquifer. The changes to the existing pumping were made using the same methods as described in Groundwater Availability Model Run (GAM Run) 09-023 (Oliver, 2010a). Briefly, where a decrease in pumping was required to achieve a specific desired future condition, the pumping value for each cell in the area was decreased by a uniform factor, preserving the original pumping distribution. Where an increase in pumping was required, pumping was uniformly increased over all model cells in the area that contained pumping during the last year of the historical-calibration portion of the model. This process was repeated until the decline in the aquifer matched the specified desired future condition.

Table 1 contains a summary of the pumping sources in each area of the model for each scenario. Figure 2 shows this same information in map-form. For Groundwater Management Area 1, pumping in each of the three scenarios was calculated to match a 50 percent decline over the area as a whole over 50 years. This is consistent with the desired future conditions of the aquifer adopted by Groundwater Management Area 1.

For the northern portion of Groundwater Management Area 2, pumping in scenarios 1 and 2 was taken from GAM Run 09-023 (Oliver, 2010a). In GAM Run 09-023, this pumping achieved 50 percent of the 2008 volume of water in the Ogallala Aquifer remaining in 2060. However, due to changes in pumping outside of these counties, this level of pumping may not result in exactly 50 percent remaining as it did in GAM Run 09-023 (for example, Lynn and Hockley counties). For this reason, Scenario 3 contains pumping that has been adjusted slightly to achieve 50 percent of the 2008 volume of water in the Ogallala Aquifer remaining in 2060 in each county.

For the counties making up the southern portion of Groundwater Management Area 2 (see Figure 1), pumping for Scenario 1 was taken from the 5- or 10-year average decline scenario of GAM Run 08-85 (Smith and others, 2009). The average water-level decline for all counties in Groundwater Management Area 2 for this scenario was 0.675 feet per year. The two exceptions are Howard and Martin counties. Since these counties achieved an average increase in water levels during the 5-year period of 2003 to 2007, pumping was held constant here at the level for the last year of the historical-calibration portion of the model (2000). In Scenario 2 in the southern portion of Groundwater Management Area 2, the same assumptions were made for Howard and Martin counties as in Scenario 1. Elsewhere, pumping was taken from the weighted 1-foot average decline scenario of GAM Run 08-85. For Scenario 3, pumping was adjusted to achieve, to the extent possible, the 5- or 10-year average declines reported in GAM Run 08-85 (excluding Howard and Martin counties). Note that in Yoakum County the rate of pumping was held at the level in Scenario 1 during Scenario 3 because the annual rate of decline could not be maintained through 2060. In all scenarios, pumping in Andrews and Borden counties was held constant at the level during the last year of the historical-calibration period since these were not assessed in GAM Run 08-85.

In Groundwater Management Area 6, pumping was determined iteratively to match a 50 percent decline in each county over the 52 year period from 2009 to 2060. This is consistent with the decline in the Ogallala in the neighboring counties in Groundwater Management Area 2.

In Groundwater Management Area 7, pumping for scenarios 1 and 2 was taken from GAM Run 09-027 (Oliver, 2010b). In GAM Run 09-027, this level of pumping achieved a 50 percent decline in the volume of water in the Ogallala Aquifer between 2009 and 2060 in each county. However, as described above, this level of pumping may not achieve that exact decline due to changes in pumping outside of these counties. In Scenario 3, pumping in Groundwater Management Area 7 was adjusted to achieve a 50 percent decline in the volume water in the Ogallala Aquifer in each county over the 52 year predictive period.

In New Mexico, pumping was held constant at the level for the last year of the historical-calibration portion of the model. In the underlying Edwards-Trinity (High Plains) Aquifer, pumping was set to the same level as the last year of the interim period (2008), which is between the end of the historical-calibration period (2000) and the beginning of the predictive simulation (2009). As mentioned above, the modified MODFLOW Well package imitates the results that would be achieved if the original MODFLOW Multi-Node Well and Well packages were used and held constant from the end of the historical-calibration period through the interim period of 2001 to 2008. However, due to the nature of the Multi-Node package, pumping from the Edwards-Trinity (High Plains) Aquifer adjusts through time with changing water levels in the Edwards-Trinity (High Plains) and Ogallala aquifers. For this reason pumping from the last year of the interim period was used instead of pumping from the last year of the historical-calibration portion of the model through the predictive simulation.

RESULTS:

Table 2 below contains a summary of the total amount of pumping in Groundwater Management Area 2 from the Ogallala Aquifer by decade for various groundwater availability model runs. These include the 5- or 10-year average decline scenario from GAM Run 08-85 (Smith and others, 2009), the weighted 1-foot per year average decline scenario from GAM Run 08-85, the 50-percent reduction scenario in each county from GAM Run 09-023 (Oliver, 2010a), and the three scenarios documented in this report. Note that no results are presented for GAM Run 08-85 in 2060 because the model simulations only extended to 2056. In both the previous model runs and the runs presented here, the pumping output from the model decreases through time. This is due to cells going inactive. A cell goes inactive when the water level in the cell drops below the base of the aquifer. In this situation pumping can no longer occur.

In Table 2 the weighted 1-foot per year average decline scenario from GAM Run 08-85 contains the highest amount of pumping in 2010. GAM Run 09-023, with the lowest level of pumping in 2010 at approximately 2,175,000 acre-feet per year, contains the highest amount of pumping in 2060 at 1,431,000 acre-feet per year.

The model runs presented in this report follow a similar trend as the model runs completed previously in the relationship between the initial level of pumping and the rate of decline in

the amount that is pumped. For example, the run with the highest level of pumping in 2010 (Scenario 2) contains the lowest level of pumping in 2060. Alternatively, the run with the lowest level of pumping in 2010 (Scenario 1) contains the highest level of pumping in 2060.

Note that a direct correlation should not be made between the total pumping in Groundwater Management Area 2 for the two scenarios in GAM Run 08-85 and the other model runs shown in Table 2. The first reason for this is that the initial volume of water in the Ogallala Aquifer was more precisely assessed (based on water level measurements for 2008) for GAM Run 09-023 and the three scenarios documented in this report than was done for GAM Run 08-85. This assessment led to the use of a correction factor (an 8.7 percent reduction) for pumping output from the model that was not applied in GAM Run 08-85. See GAM Run 09-023 for more information on the initial volume calculation and the correction factor applied to the pumping. The second reason is that GAM Run 08-85 was based on the first, single-layer version of the model documented Blandford and others (2003). The most recent version of the model, documented in Blandford and others (2008), was updated to account for the interaction of the Ogallala Aquifer with the Edwards-Trinity (High plains) Aquifer.

Finally, in the two scenarios documented in GAM Run 08-85, pumping during the predictive period was only applied to those counties with a specified average annual change in water levels (see Table 1 in GAM Run 08-85). A significant effect of this is that the pumping totals for GAM Run 08-85 shown in Table 2 do not include pumping for the counties without specified rates of decline. Within Groundwater Management Area 2 this includes Andrews, Borden, Swisher, and Briscoe counties. For GAM Run 09-023 and the three scenarios documented in this report, these four counties collectively contain between 163,000 and 211,000 acre-feet per year of pumping in 2010. By 2060, these same counties account for between 85,000 and 117,000 acre-feet per year of the total amount of pumping. The omission of pumping in GAM Run 08-85 from those areas not shown in Table 1 of that report may also have affected results in neighboring counties due to changes in the magnitude of lateral flow from one area to another. Though the effect of this has not been directly assessed, it is unlikely to have been large because lateral flow constitutes a much smaller portion of the water budget for the Ogallala Aquifer than recharge from precipitation and pumping. See Appendix C of Oliver (2010a) for examples of full water budget information for the Ogallala Aquifer by county, groundwater conservation district, and groundwater management area.

Tables 3, 4 and 5 below show the results for Scenario 1 for the Ogallala Aquifer, the Edwards-Trinity (High Plains) Aquifer, and the combined Ogallala and Edwards-Trinity (High Plains) aquifers, respectively. These results are shown by decade and are divided by county, groundwater conservation district, and groundwater management area. Note that the results by groundwater conservation district are for the districts as a whole and are not limited to Groundwater Management Area 2. Each of the tables contains the pumping output from the model and the average drawdown within each area. Additionally, Table 3 contains information on the percent of the estimated 2008 volume of water in the Ogallala Aquifer that is remaining through time. Tables 6 through 8 and 9 through 11 show the corresponding results for scenarios 2 and 3, respectively.

It is important to note that sub-regional water budgets are not exact. This is due to the size of the model cells and the approach used to extract data from the model. To avoid double

accounting, a model cell that straddles a political boundary (for example, a county) is assigned to one side of the boundary based on the location of the centroid of the model cell.

REFERENCES AND ASSOCIATED MODEL RUNS:

- Blandford, T.N., Blazer, D.J., Calhoun, K.C., Dutton, A.R., Naing, T., Reedy, R.C., and Scanlon, B.R., 2003, Groundwater availability of the southern Ogallala aquifer in Texas and New Mexico—Numerical simulations through 2050: Final report prepared for the Texas Water Development Board by Daniel B. Stephens & Associates, Inc., 158 p.
- Blandford, T.N., Kuchanur, M., Standen, A., Ruggiero, R., Calhoun, K.C., Kirby, P., and Shah, G., 2008, Groundwater availability model of the Edwards-Trinity (High Plains) Aquifer in Texas and New Mexico: Final report prepared for the Texas Water Development Board by Daniel B. Stephens & Associates, Inc., 176 p.
- Environmental Simulations, Inc., 2007, Guide to using Groundwater Vistas Version 5, 381 p.
- Harbaugh, A.W., Banta, E.R., Hill, M.C., McDonald, M.G., 2000, MODFLOW-2000, The U.S. Geological Survey modular ground-water model—User guide to modularization concepts and the groundwater-water flow process: U.S. Geological Survey, Open-File Report 00-92.
- Oliver, W., 2010a, GAM run 09-023: Texas Water Development Board, GAM Run 09-023 Report, 30 p.
- Oliver, W., 2010b, GAM run 09-027: Texas Water Development Board, GAM Run 09-027 Report, 22 p.
- Smith, R., Aschenbach, E., Wade, S., 2009, GAM Run 08-85: Texas Water Development Board, GAM Run 08-85 Report, 42 p.

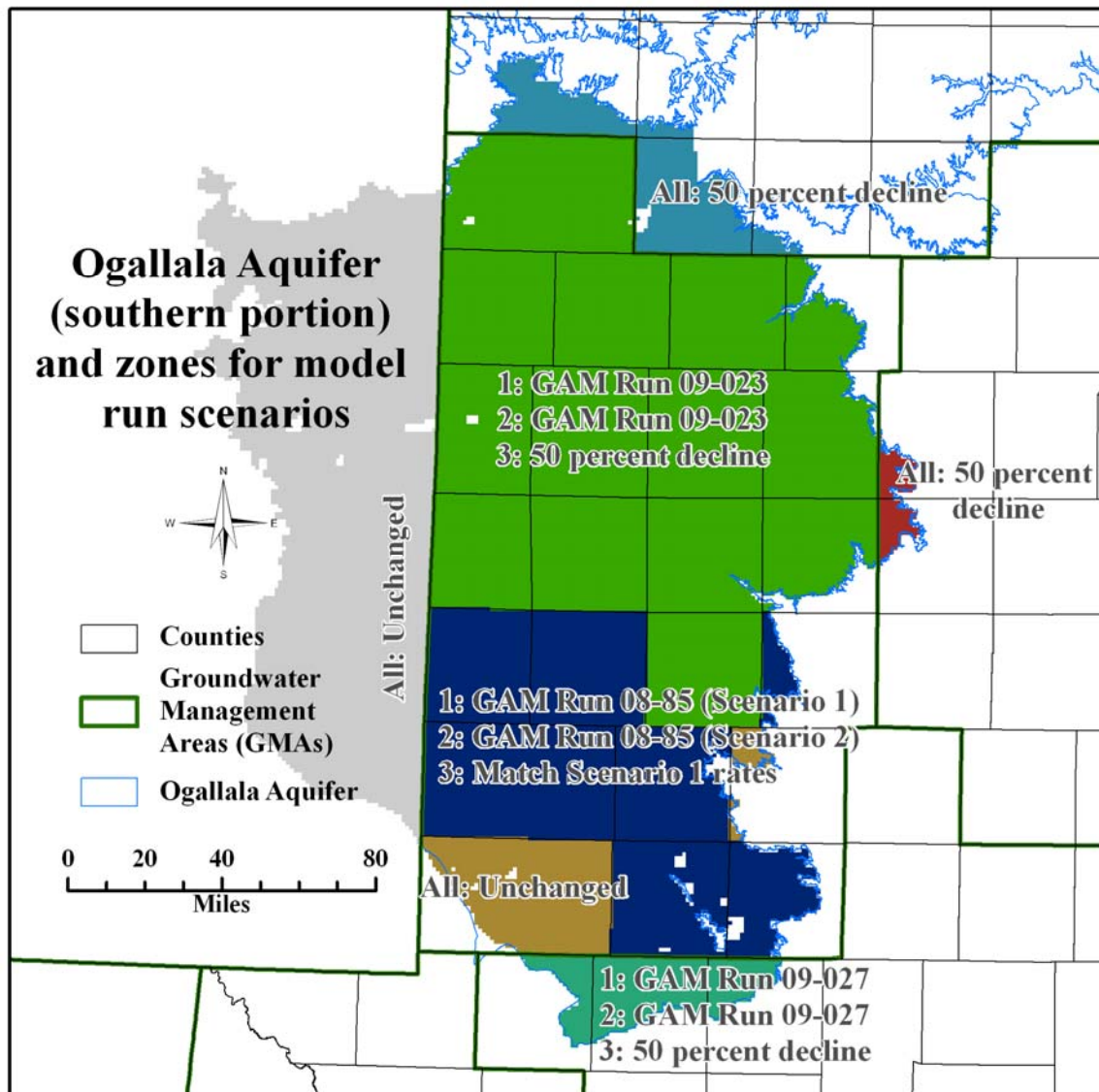


Figure 2. Map showing the zones in the groundwater availability model and the pumping sources for the three model run scenarios.

Table 1. Sources of pumping for each zone of the model shown in figures 1 and 2 for each scenario.

| | Scenario 1 | Scenario 2 | Scenario 3 |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Groundwater Management Area 1 | Calculated to match 50 percent decline over 50 years | | |
| Northern portion of Groundwater Management Area 2 | GAM Run 09-023 (Oliver, 2010a) | | Calculated to match 50 percent decline in each county over 52 years |
| Southern portion of Groundwater Management Area 2 | Average decline scenario from GAM Run 08-85 (Smith and others, 2009) | Weighted 1-foot average decline scenario from GAM Run 08-85 | Calculated to match requested decline rates for average decline scenario in GAM Run 08-85 |
| Andrews and Bordon counties within Groundwater Management Area 2 | Held constant at the level during the last year of the historical-calibration period in the model | | |
| Groundwater Management Area 6 | Calculated to match 50 percent decline in each county over 52 years | | |
| Groundwater Management Area 7 | GAM Run 09-027 (Oliver, 2010b) | | Calculated to match 50 percent decline in each county over 52 years |
| New Mexico | Held constant at the level during the last year of the historical-calibration period in the model | | |

Table 2. Comparison of the total pumping from Groundwater Management Area 2 by decade for various groundwater availability model runs (GAM Runs). All pumping is in acre-feet per year.

| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|-------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| GAM Run 08-85* (10-year average decline) | 2,212,348 | 2,155,597 | 2,051,227 | 1,878,120 | 1,703,365 | - |
| GAM Run 08-85* (weighted 1-foot average decline) | 2,842,757 | 2,698,639 | 2,392,243 | 2,038,359 | 1,674,069 | - |
| GAM Run 09-023 | 2,175,279 | 2,011,192 | 1,869,880 | 1,724,743 | 1,567,632 | 1,430,799 |
| T10-023 Scenario 1 | 2,221,924 | 2,077,823 | 1,936,375 | 1,764,889 | 1,567,305 | 1,374,361 |
| T10-023 Scenario 2 | 2,451,937 | 2,241,461 | 2,012,461 | 1,743,907 | 1,455,067 | 1,210,890 |
| T10-023 Scenario 3 | 2,366,866 | 2,132,678 | 1,907,968 | 1,699,823 | 1,496,184 | 1,306,684 |

*Note that the model simulations reported in GAM Run 08-85 do not extend to 2060 and do not contain pumping in Andrews, Borden, Briscoe, or Swisher counties within Groundwater Management Area 2. The pumping totals for GAM Run 08-85 presented in this table, therefore, do not contain pumping for these areas. See the Results section above for more details.

Table 3. Pumping (in acre-feet per year), remaining volume, and drawdown (in feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model by decade for the Ogallala Aquifer in Scenario 1. UWCD is Underground Water Conservation District.

| <i>Scenario 1:</i> <i>Ogallala Aquifer</i> | Pumping reduced by 8.7 percent correction factor | | | | | | Percent volume remaining | | | | | | Average drawdown | | | | | |
|-----------------------------------------------|--------------------------------------------------|---------|---------|---------|---------|---------|--------------------------|------|------|------|------|------|------------------|------|------|------|------|------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | | | | | | | |
| Andrews | 17,639 | 15,646 | 13,718 | 12,054 | 10,572 | 8,797 | 99 | 96 | 94 | 91 | 88 | 86 | 0 | 2 | 3 | 4 | 5 | 5 |
| Armstrong | 8,301 | 8,301 | 8,301 | 8,301 | 8,241 | 8,186 | 98 | 87 | 76 | 66 | 56 | 46 | 2 | 13 | 23 | 32 | 42 | 52 |
| Bailey | 63,086 | 41,340 | 34,937 | 30,093 | 24,048 | 21,429 | 96 | 82 | 71 | 62 | 55 | 50 | 1 | 6 | 10 | 13 | 15 | 17 |
| Borden | 398 | 398 | 398 | 398 | 398 | 398 | 101 | 104 | 104 | 103 | 102 | 102 | -1 | -2 | -2 | -1 | -1 | 0 |
| Briscoe | 33,629 | 26,464 | 19,728 | 14,226 | 13,043 | 11,938 | 97 | 82 | 71 | 63 | 56 | 50 | 2 | 9 | 15 | 19 | 23 | 28 |
| Castro | 127,426 | 127,306 | 126,511 | 125,819 | 123,284 | 118,002 | 98 | 88 | 78 | 69 | 59 | 50 | 2 | 11 | 20 | 29 | 38 | 46 |
| Cochran | 48,346 | 36,663 | 33,642 | 30,696 | 28,085 | 25,372 | 97 | 85 | 75 | 66 | 57 | 50 | 1 | 6 | 11 | 15 | 18 | 22 |
| Crosby | 135,582 | 135,399 | 135,399 | 135,399 | 135,399 | 135,399 | 98 | 88 | 79 | 69 | 59 | 50 | 3 | 19 | 35 | 51 | 67 | 83 |
| Dawson | 171,559 | 171,193 | 165,709 | 158,163 | 145,993 | 119,450 | 97 | 80 | 64 | 50 | 36 | 24 | 3 | 19 | 34 | 50 | 65 | 79 |
| Deaf Smith | 129,744 | 118,728 | 106,838 | 97,043 | 80,372 | 65,913 | 97 | 86 | 75 | 65 | 57 | 50 | 1 | 8 | 14 | 20 | 24 | 28 |
| Dickens | 12,339 | 12,339 | 12,339 | 12,121 | 12,121 | 11,594 | 98 | 88 | 78 | 69 | 59 | 50 | 2 | 14 | 25 | 36 | 47 | 57 |
| Ector | 8,665 | 8,026 | 7,730 | 7,171 | 7,135 | 6,727 | 98 | 88 | 78 | 69 | 61 | 52 | 1 | 5 | 9 | 13 | 17 | 21 |
| Floyd | 155,716 | 150,092 | 146,069 | 139,063 | 130,113 | 124,898 | 98 | 87 | 77 | 67 | 58 | 50 | 3 | 18 | 33 | 47 | 61 | 75 |
| Gaines | 262,385 | 224,000 | 191,414 | 161,746 | 133,601 | 103,960 | 95 | 73 | 55 | 40 | 28 | 19 | 4 | 20 | 35 | 49 | 63 | 77 |
| Garza | 17,859 | 17,732 | 17,641 | 17,641 | 17,537 | 17,381 | 98 | 89 | 80 | 71 | 62 | 54 | 2 | 9 | 17 | 25 | 32 | 40 |
| Glasscock | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 98 | 87 | 78 | 68 | 60 | 53 | 2 | 14 | 26 | 37 | 47 | 58 |
| Hale | 130,611 | 129,806 | 128,007 | 126,003 | 120,127 | 112,250 | 98 | 88 | 78 | 68 | 59 | 50 | 2 | 10 | 19 | 28 | 37 | 45 |
| Hockley | 96,973 | 93,816 | 89,259 | 85,148 | 77,610 | 67,042 | 98 | 87 | 76 | 67 | 57 | 49 | 1 | 9 | 15 | 22 | 27 | 32 |
| Howard | 4,435 | 4,429 | 4,425 | 4,381 | 4,381 | 4,350 | 100 | 99 | 98 | 97 | 96 | 94 | 0 | 0 | 1 | 1 | 2 | 3 |
| Lamb | 147,672 | 137,607 | 125,457 | 111,501 | 95,689 | 85,184 | 97 | 85 | 75 | 65 | 57 | 50 | 2 | 11 | 20 | 27 | 33 | 38 |
| Lubbock | 124,773 | 120,231 | 115,282 | 108,636 | 100,702 | 90,781 | 98 | 87 | 77 | 67 | 58 | 50 | 2 | 10 | 19 | 27 | 34 | 40 |
| Lynn | 105,723 | 105,456 | 104,657 | 101,804 | 93,960 | 85,207 | 98 | 87 | 76 | 66 | 57 | 49 | 1 | 8 | 15 | 22 | 27 | 32 |
| Martin | 7,690 | 7,690 | 7,669 | 7,634 | 7,634 | 7,621 | 100 | 100 | 99 | 98 | 97 | 96 | 0 | 0 | 1 | 2 | 3 | 4 |
| Midland | 39,227 | 38,388 | 36,824 | 34,623 | 32,995 | 31,696 | 98 | 87 | 78 | 68 | 60 | 52 | 2 | 9 | 16 | 23 | 30 | 37 |
| Motley | 9,936 | 9,936 | 9,936 | 9,936 | 9,936 | 9,576 | 98 | 88 | 79 | 69 | 59 | 50 | 2 | 13 | 24 | 35 | 45 | 56 |
| Oldham | 19,236 | 16,416 | 15,640 | 14,911 | 13,530 | 12,691 | 98 | 90 | 82 | 75 | 68 | 62 | 1 | 6 | 10 | 15 | 19 | 23 |
| Parmer | 68,909 | 63,430 | 56,590 | 52,156 | 45,626 | 40,986 | 97 | 86 | 75 | 65 | 57 | 50 | 1 | 6 | 11 | 15 | 18 | 21 |
| Potter | 6,290 | 4,173 | 2,591 | 1,769 | 1,769 | 1,468 | 96 | 78 | 66 | 59 | 53 | 47 | 3 | 13 | 19 | 22 | 27 | 31 |
| Randall | 72,963 | 70,740 | 69,626 | 64,546 | 59,098 | 49,709 | 97 | 85 | 73 | 61 | 51 | 42 | 2 | 10 | 18 | 25 | 32 | 38 |
| Swisher | 111,506 | 107,605 | 101,015 | 84,830 | 73,860 | 64,309 | 98 | 86 | 75 | 65 | 57 | 50 | 2 | 11 | 20 | 27 | 34 | 39 |
| Terry | 159,965 | 158,682 | 153,428 | 128,354 | 92,681 | 59,403 | 96 | 75 | 55 | 36 | 22 | 12 | 2 | 15 | 27 | 38 | 49 | 60 |
| Yoakum | 100,298 | 84,107 | 58,583 | 32,102 | 12,592 | 4,293 | 92 | 57 | 30 | 13 | 4 | 1 | 2 | 14 | 25 | 37 | 48 | 58 |

Table 3. Continued.

| <i>Scenario 1:</i> <i>Ogallala Aquifer</i> | Pumping reduced by 8.7 percent correction factor | | | | | | Percent volume remaining | | | | | | Average drawdown | | | | | |
|-----------------------------------------------|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|--------------------------|------|------|------|------|------|------------------|------|------|------|------|------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| District | | | | | | | | | | | | | | | | | | |
| Garza County UWCD | 17,859 | 17,732 | 17,641 | 17,641 | 17,537 | 17,381 | 98 | 89 | 80 | 71 | 62 | 54 | 2 | 9 | 17 | 25 | 32 | 40 |
| Glasscock GCD | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 98 | 87 | 78 | 68 | 60 | 53 | 2 | 14 | 26 | 37 | 47 | 58 |
| High Plains UWCD No. 1 | 1,381,614 | 1,303,274 | 1,244,003 | 1,179,433 | 1,087,154 | 996,494 | 98 | 86 | 75 | 65 | 56 | 47 | 2 | 11 | 20 | 29 | 37 | 44 |
| Llano Estacado UWCD | 262,385 | 224,000 | 191,414 | 161,746 | 133,601 | 103,960 | 95 | 73 | 55 | 40 | 28 | 19 | 4 | 20 | 35 | 49 | 63 | 77 |
| Mesa UWCD | 171,559 | 171,193 | 165,709 | 158,163 | 145,993 | 119,450 | 97 | 80 | 64 | 50 | 36 | 24 | 3 | 19 | 34 | 50 | 65 | 79 |
| Panhandle GCD | 370 | 370 | 370 | 370 | 370 | 370 | 98 | 93 | 89 | 84 | 80 | 77 | 1 | 4 | 7 | 10 | 12 | 14 |
| Permian Basin UWCD | 12,049 | 12,043 | 12,017 | 11,938 | 11,938 | 11,894 | 100 | 99 | 99 | 98 | 97 | 95 | 0 | 0 | 1 | 2 | 2 | 3 |
| Sandy Land UWCD | 100,298 | 84,107 | 58,583 | 32,102 | 12,592 | 4,293 | 92 | 57 | 30 | 13 | 4 | 1 | 2 | 14 | 25 | 37 | 48 | 58 |
| South Plains UWCD | 160,601 | 159,318 | 154,064 | 128,991 | 93,317 | 60,039 | 96 | 75 | 56 | 37 | 23 | 13 | 2 | 15 | 26 | 38 | 49 | 59 |
| Management Area | | | | | | | | | | | | | | | | | | |
| Out-of-State | 76,546 | 65,120 | 55,688 | 48,697 | 43,015 | 39,677 | 100 | 98 | 97 | 95 | 95 | 94 | 0 | 1 | 1 | 1 | 1 | 2 |
| GMA 1 | 106,789 | 99,630 | 96,158 | 89,526 | 82,639 | 72,054 | 98 | 86 | 75 | 66 | 56 | 48 | 2 | 9 | 16 | 22 | 28 | 34 |
| GMA 2 | 2,221,924 | 2,077,823 | 1,936,375 | 1,764,889 | 1,567,305 | 1,374,361 | 97 | 86 | 75 | 65 | 56 | 48 | 2 | 10 | 18 | 26 | 32 | 38 |
| GMA 6 | 22,275 | 22,275 | 22,275 | 22,056 | 22,056 | 21,170 | 98 | 88 | 79 | 69 | 59 | 50 | 2 | 13 | 24 | 35 | 46 | 57 |
| GMA 7 | 69,665 | 67,737 | 65,429 | 61,883 | 57,529 | 53,620 | 98 | 87 | 78 | 68 | 60 | 52 | 2 | 9 | 17 | 24 | 31 | 37 |

Table 4. Pumping (acre-feet per year) and drawdown (feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model for the Edwards-Trinity (High Plains) Aquifer in Scenario 1. UWCD is Underground Water Conservation District.

| <i>Scenario 1: Edwards-Trinity (High Plains) Aquifer</i> | | Pumping | | | | | Average drawdown | | | | | | |
|--------------------------------------------------------------|--|----------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | | |
| Bailey | | 279 | 279 | 279 | 279 | 279 | 279 | 0 | 1 | 2 | 4 | 4 | 5 |
| Borden | | 106 | 106 | 106 | 106 | 106 | 106 | 0 | 1 | 1 | 2 | 3 | 4 |
| Cochran | | 263 | 263 | 263 | 263 | 263 | 263 | -1 | 0 | 3 | 6 | 9 | 11 |
| Dawson | | 1,103 | 1,103 | 1,103 | 1,103 | 1,103 | 1,101 | 3 | 18 | 33 | 46 | 57 | 66 |
| Floyd | | 1,216 | 1,216 | 1,216 | 1,213 | 1,200 | 1,182 | 3 | 16 | 29 | 41 | 52 | 62 |
| Gaines | | 85,129 | 46,841 | 31,478 | 23,394 | 16,262 | 12,902 | 5 | 27 | 43 | 56 | 64 | 70 |
| Garza | | 18 | 18 | 18 | 18 | 18 | 18 | 1 | 8 | 14 | 21 | 28 | 34 |
| Hale | | 3,523 | 3,523 | 3,523 | 3,523 | 3,523 | 3,419 | 1 | 8 | 15 | 22 | 29 | 36 |
| Hockley | | 96 | 96 | 96 | 96 | 96 | 96 | 1 | 6 | 13 | 19 | 24 | 28 |
| Lamb | | 164 | 164 | 164 | 164 | 164 | 164 | 0 | 1 | 1 | 2 | 3 | 3 |
| Lubbock | | 689 | 689 | 689 | 689 | 689 | 689 | 1 | 8 | 14 | 19 | 24 | 29 |
| Lynn | | 230 | 230 | 230 | 230 | 230 | 230 | 0 | 7 | 14 | 21 | 27 | 32 |
| Terry | | 982 | 982 | 945 | 945 | 945 | 945 | 1 | 10 | 20 | 29 | 36 | 40 |
| Yoakum | | 2,532 | 1,893 | 1,757 | 1,642 | 1,642 | 1,524 | 1 | 7 | 12 | 15 | 17 | 18 |
| District | | | | | | | | | | | | | |
| Garza County UWCD | | 18 | 18 | 18 | 18 | 18 | 18 | 1 | 8 | 14 | 21 | 28 | 34 |
| High Plains UWCD No. 1 | | 6,415 | 6,415 | 6,415 | 6,412 | 6,399 | 6,277 | 1 | 5 | 11 | 17 | 21 | 26 |
| Llano Estacado UWCD | | 85,129 | 46,841 | 31,478 | 23,394 | 16,262 | 12,902 | 5 | 27 | 43 | 56 | 64 | 70 |
| Mesa UWCD | | 1,103 | 1,103 | 1,103 | 1,103 | 1,103 | 1,101 | 3 | 18 | 33 | 46 | 57 | 66 |
| Sandy Land UWCD | | 2,532 | 1,893 | 1,757 | 1,642 | 1,642 | 1,524 | 1 | 7 | 12 | 15 | 17 | 18 |
| South Plains UWCD | | 982 | 982 | 945 | 945 | 945 | 945 | 1 | 10 | 20 | 29 | 36 | 40 |
| Management Area | | | | | | | | | | | | | |
| Out-of-State | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 3 |
| GMA 2 | | 96,331 | 57,404 | 41,868 | 33,665 | 26,521 | 22,919 | 1 | 8 | 15 | 21 | 26 | 30 |

Table 5. Pumping (acre-feet per year) and drawdown (feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model for the Ogallala and Edwards-Trinity (High Plains) aquifers in Scenario 1. UWCD is Underground Water Conservation District.

| <i>Scenario 1: Ogallala and Edwards-Trinity (High Plains) Aquifers</i> | Pumping | | | | | | Average drawdown | | | | | |
|------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|------------------|------|------|------|------|------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | |
| Andrews | 17,639 | 15,646 | 13,718 | 12,054 | 10,572 | 8,797 | 0 | 2 | 3 | 4 | 5 | 5 |
| Armstrong | 8,301 | 8,301 | 8,301 | 8,301 | 8,241 | 8,186 | 2 | 13 | 23 | 32 | 42 | 52 |
| Bailey | 63,365 | 41,619 | 35,215 | 30,371 | 24,327 | 21,708 | 1 | 3 | 6 | 8 | 8 | 10 |
| Borden | 504 | 504 | 504 | 504 | 504 | 504 | 0 | 0 | 1 | 2 | 2 | 3 |
| Briscoe | 33,629 | 26,464 | 19,728 | 14,226 | 13,043 | 11,938 | 2 | 9 | 15 | 19 | 23 | 28 |
| Castro | 127,426 | 127,306 | 126,511 | 125,819 | 123,284 | 118,002 | 2 | 11 | 20 | 29 | 38 | 46 |
| Cochran | 48,609 | 36,926 | 33,906 | 30,960 | 28,348 | 25,635 | 0 | 1 | 5 | 8 | 11 | 13 |
| Crosby | 135,582 | 135,399 | 135,399 | 135,399 | 135,399 | 135,399 | 3 | 19 | 35 | 51 | 67 | 83 |
| Dawson | 172,663 | 172,296 | 166,812 | 159,266 | 147,096 | 120,551 | 3 | 19 | 34 | 48 | 61 | 71 |
| Deaf Smith | 129,744 | 118,728 | 106,838 | 97,043 | 80,372 | 65,913 | 1 | 8 | 14 | 20 | 24 | 28 |
| Dickens | 12,339 | 12,339 | 12,339 | 12,121 | 12,121 | 11,594 | 2 | 14 | 25 | 36 | 47 | 57 |
| Ector | 8,665 | 8,026 | 7,730 | 7,171 | 7,135 | 6,727 | 1 | 5 | 9 | 13 | 17 | 21 |
| Floyd | 156,932 | 151,308 | 147,284 | 140,276 | 131,312 | 126,080 | 3 | 17 | 31 | 45 | 57 | 69 |
| Gaines | 347,515 | 270,841 | 222,892 | 185,139 | 149,864 | 116,862 | 5 | 24 | 39 | 53 | 64 | 72 |
| Garza | 17,877 | 17,750 | 17,659 | 17,659 | 17,555 | 17,399 | 1 | 8 | 16 | 23 | 30 | 37 |
| Glasscock | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 2 | 14 | 26 | 37 | 47 | 58 |
| Hale | 134,135 | 133,329 | 131,530 | 129,526 | 123,651 | 115,669 | 2 | 10 | 18 | 27 | 35 | 43 |
| Hockley | 97,069 | 93,912 | 89,355 | 85,244 | 77,706 | 67,138 | 1 | 7 | 13 | 19 | 25 | 29 |
| Howard | 4,435 | 4,429 | 4,425 | 4,381 | 4,381 | 4,350 | 0 | 0 | 1 | 1 | 2 | 3 |
| Lamb | 147,836 | 137,771 | 125,621 | 111,665 | 95,853 | 85,348 | 1 | 7 | 12 | 16 | 19 | 21 |
| Lubbock | 125,462 | 120,921 | 115,972 | 109,325 | 101,392 | 91,470 | 1 | 9 | 15 | 22 | 27 | 32 |
| Lynn | 105,953 | 105,686 | 104,887 | 102,034 | 94,190 | 85,437 | 1 | 7 | 14 | 21 | 27 | 32 |
| Martin | 7,690 | 7,690 | 7,669 | 7,634 | 7,634 | 7,621 | 0 | 0 | 1 | 2 | 3 | 4 |
| Midland | 39,227 | 38,388 | 36,824 | 34,623 | 32,995 | 31,696 | 2 | 9 | 16 | 23 | 30 | 37 |
| Motley | 9,936 | 9,936 | 9,936 | 9,936 | 9,936 | 9,576 | 2 | 13 | 24 | 35 | 45 | 56 |
| Oldham | 19,236 | 16,416 | 15,640 | 14,911 | 13,530 | 12,691 | 1 | 6 | 10 | 15 | 19 | 23 |
| Parmer | 68,909 | 63,430 | 56,590 | 52,156 | 45,626 | 40,986 | 1 | 6 | 11 | 15 | 18 | 21 |
| Potter | 6,290 | 4,173 | 2,591 | 1,769 | 1,769 | 1,468 | 3 | 13 | 19 | 22 | 27 | 31 |
| Randall | 72,963 | 70,740 | 69,626 | 64,546 | 59,098 | 49,709 | 2 | 10 | 18 | 25 | 32 | 38 |
| Swisher | 111,506 | 107,605 | 101,015 | 84,830 | 73,860 | 64,309 | 2 | 11 | 20 | 27 | 34 | 39 |
| Terry | 160,946 | 159,664 | 154,373 | 129,299 | 93,626 | 60,347 | 2 | 11 | 22 | 31 | 38 | 43 |
| Yoakum | 102,830 | 86,000 | 60,340 | 33,744 | 14,233 | 5,818 | 1 | 8 | 14 | 17 | 18 | 19 |

Table 5. Continued.

| <i>Scenario 1: Ogallala and Edwards- Trinity (High Plains) Aquifers</i> | Pumping | | | | | | Average drawdown | | | | | |
|-----------------------------------------------------------------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| District | | | | | | | | | | | | |
| Garza County UWCD | 17,877 | 17,750 | 17,659 | 17,659 | 17,555 | 17,399 | 1 | 8 | 16 | 23 | 30 | 37 |
| Glasscock GCD | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 2 | 14 | 26 | 37 | 47 | 58 |
| High Plains UWCD No. 1 | 1,388,029 | 1,309,689 | 1,250,417 | 1,185,845 | 1,093,553 | 1,002,770 | 1 | 8 | 15 | 22 | 28 | 34 |
| Llano Estacado UWCD | 347,515 | 270,841 | 222,892 | 185,139 | 149,864 | 116,862 | 5 | 24 | 39 | 53 | 64 | 72 |
| Mesa UWCD | 172,663 | 172,296 | 166,812 | 159,266 | 147,096 | 120,551 | 3 | 19 | 34 | 48 | 61 | 71 |
| Panhandle GCD | 370 | 370 | 370 | 370 | 370 | 370 | 1 | 4 | 7 | 10 | 12 | 14 |
| Permian Basin UWCD | 12,049 | 12,043 | 12,017 | 11,938 | 11,938 | 11,894 | 0 | 0 | 1 | 2 | 2 | 3 |
| Sandy Land UWCD | 102,830 | 86,000 | 60,340 | 33,744 | 14,233 | 5,818 | 1 | 8 | 14 | 17 | 18 | 19 |
| South Plains UWCD | 161,582 | 160,300 | 155,009 | 129,935 | 94,262 | 60,984 | 2 | 11 | 22 | 31 | 38 | 42 |
| Management Area | | | | | | | | | | | | |
| Out-of-State | 76,547 | 65,121 | 55,689 | 48,698 | 43,016 | 39,678 | 0 | 1 | 1 | 2 | 2 | 2 |
| GMA 1 | 106,789 | 99,630 | 96,158 | 89,526 | 82,639 | 72,054 | 2 | 9 | 16 | 22 | 28 | 34 |
| GMA 2 | 2,318,256 | 2,135,226 | 1,978,243 | 1,798,555 | 1,593,826 | 1,397,279 | 1 | 9 | 17 | 23 | 29 | 33 |
| GMA 6 | 22,275 | 22,275 | 22,275 | 22,056 | 22,056 | 21,170 | 2 | 13 | 24 | 35 | 46 | 57 |
| GMA 7 | 69,665 | 67,737 | 65,429 | 61,883 | 57,529 | 53,620 | 2 | 9 | 17 | 24 | 31 | 37 |

Table 6. Pumping (in acre-feet per year), remaining volume, and drawdown (in feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model by decade for the Ogallala Aquifer in Scenario 2. UWCD is Underground Water Conservation District.

| <i>Scenario 2:</i> <i>Ogallala Aquifer</i> | Pumping reduced by 8.7 percent correction factor | | | | | | Percent volume remaining | | | | | | Average drawdown | | | | | |
|-----------------------------------------------|--------------------------------------------------|---------|---------|---------|---------|---------|--------------------------|------|------|------|------|------|------------------|------|------|------|------|------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | | | | | | | |
| Andrews | 17,639 | 15,135 | 13,718 | 12,054 | 10,572 | 8,079 | 99 | 96 | 93 | 90 | 87 | 85 | 0 | 2 | 3 | 4 | 5 | 6 |
| Armstrong | 8,301 | 8,301 | 8,301 | 8,301 | 8,241 | 8,186 | 98 | 87 | 76 | 66 | 56 | 46 | 2 | 13 | 23 | 32 | 42 | 52 |
| Bailey | 63,086 | 41,315 | 34,937 | 30,093 | 24,048 | 21,429 | 96 | 82 | 71 | 62 | 55 | 50 | 1 | 6 | 10 | 13 | 15 | 17 |
| Borden | 398 | 398 | 398 | 398 | 398 | 398 | 101 | 102 | 102 | 101 | 100 | 100 | -1 | -1 | -1 | 0 | 0 | 1 |
| Briscoe | 33,629 | 26,464 | 19,728 | 14,226 | 13,082 | 11,938 | 97 | 82 | 71 | 63 | 56 | 50 | 2 | 9 | 15 | 19 | 23 | 28 |
| Castro | 127,426 | 127,306 | 126,511 | 125,819 | 123,284 | 118,002 | 98 | 88 | 78 | 69 | 59 | 50 | 2 | 11 | 20 | 29 | 38 | 46 |
| Cochran | 48,346 | 36,209 | 33,642 | 30,696 | 28,264 | 25,372 | 97 | 85 | 75 | 66 | 57 | 50 | 1 | 6 | 11 | 15 | 18 | 22 |
| Crosby | 135,582 | 135,399 | 135,399 | 135,399 | 135,399 | 135,399 | 98 | 88 | 79 | 69 | 59 | 50 | 3 | 19 | 35 | 51 | 67 | 83 |
| Dawson | 226,777 | 223,172 | 207,547 | 178,367 | 107,946 | 51,990 | 95 | 71 | 49 | 30 | 15 | 8 | 5 | 28 | 50 | 72 | 91 | 104 |
| Deaf Smith | 129,744 | 118,133 | 106,838 | 97,043 | 81,080 | 65,913 | 97 | 86 | 75 | 65 | 57 | 50 | 1 | 8 | 14 | 20 | 25 | 28 |
| Dickens | 12,339 | 12,339 | 12,339 | 12,121 | 12,121 | 11,594 | 98 | 88 | 78 | 69 | 59 | 50 | 2 | 14 | 25 | 36 | 47 | 57 |
| Ector | 8,665 | 8,026 | 7,730 | 7,171 | 7,135 | 6,727 | 98 | 88 | 78 | 69 | 61 | 52 | 1 | 5 | 9 | 13 | 17 | 21 |
| Floyd | 155,716 | 150,092 | 146,069 | 139,063 | 130,454 | 124,898 | 98 | 87 | 77 | 67 | 58 | 50 | 3 | 18 | 33 | 47 | 61 | 75 |
| Gaines | 353,065 | 281,111 | 223,440 | 165,602 | 103,410 | 55,452 | 93 | 63 | 41 | 24 | 12 | 6 | 5 | 28 | 49 | 70 | 89 | 106 |
| Garza | 22,551 | 22,390 | 22,265 | 22,127 | 21,197 | 18,624 | 97 | 84 | 71 | 58 | 46 | 35 | 2 | 14 | 25 | 36 | 47 | 57 |
| Glasscock | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 98 | 87 | 78 | 68 | 60 | 53 | 2 | 14 | 26 | 37 | 48 | 58 |
| Hale | 130,611 | 129,806 | 128,007 | 126,003 | 120,127 | 112,250 | 98 | 88 | 78 | 68 | 59 | 50 | 2 | 10 | 19 | 28 | 37 | 45 |
| Hockley | 96,973 | 93,370 | 89,259 | 85,148 | 77,288 | 67,042 | 98 | 87 | 76 | 66 | 57 | 49 | 1 | 9 | 15 | 22 | 28 | 32 |
| Howard | 4,653 | 4,647 | 4,617 | 4,595 | 4,585 | 4,563 | 100 | 99 | 98 | 96 | 95 | 94 | 0 | 1 | 1 | 2 | 2 | 3 |
| Lamb | 147,672 | 137,293 | 125,457 | 111,501 | 95,984 | 85,184 | 97 | 85 | 75 | 65 | 57 | 50 | 2 | 11 | 20 | 27 | 33 | 38 |
| Lubbock | 124,773 | 119,976 | 115,282 | 108,636 | 101,028 | 90,781 | 98 | 87 | 77 | 67 | 58 | 50 | 2 | 10 | 19 | 27 | 34 | 40 |
| Lynn | 105,723 | 105,456 | 104,657 | 101,804 | 94,100 | 84,618 | 98 | 87 | 76 | 66 | 56 | 48 | 1 | 9 | 16 | 22 | 28 | 33 |
| Martin | 8,062 | 8,062 | 8,040 | 8,003 | 8,003 | 7,990 | 100 | 99 | 98 | 97 | 96 | 94 | 0 | 1 | 1 | 3 | 4 | 5 |
| Midland | 39,227 | 38,309 | 36,824 | 34,623 | 33,222 | 31,696 | 98 | 87 | 78 | 68 | 60 | 51 | 2 | 9 | 16 | 23 | 30 | 37 |
| Motley | 9,936 | 9,936 | 9,936 | 9,936 | 9,936 | 9,576 | 98 | 88 | 79 | 69 | 59 | 50 | 2 | 13 | 24 | 35 | 45 | 56 |
| Oldham | 19,236 | 16,416 | 15,640 | 14,911 | 13,568 | 12,691 | 98 | 90 | 82 | 75 | 68 | 62 | 1 | 6 | 10 | 15 | 19 | 23 |
| Parmer | 68,909 | 63,072 | 56,590 | 52,156 | 45,954 | 40,986 | 97 | 86 | 75 | 65 | 57 | 50 | 1 | 6 | 11 | 15 | 18 | 21 |
| Potter | 6,290 | 4,173 | 2,591 | 1,769 | 1,769 | 1,468 | 96 | 78 | 66 | 59 | 53 | 47 | 3 | 13 | 19 | 22 | 27 | 31 |
| Randall | 72,963 | 70,696 | 69,626 | 64,546 | 59,098 | 49,709 | 97 | 85 | 73 | 61 | 51 | 42 | 2 | 10 | 18 | 25 | 32 | 38 |
| Swisher | 111,506 | 107,419 | 101,015 | 84,830 | 74,196 | 64,309 | 98 | 86 | 75 | 65 | 57 | 50 | 2 | 11 | 20 | 27 | 34 | 39 |
| Terry | 205,663 | 201,359 | 166,155 | 98,664 | 52,608 | 15,393 | 94 | 64 | 36 | 17 | 6 | 2 | 4 | 21 | 38 | 55 | 70 | 81 |
| Yoakum | 133,433 | 93,875 | 42,890 | 11,679 | 2,059 | 283 | 89 | 41 | 13 | 3 | 0 | 0 | 3 | 20 | 37 | 54 | 63 | 10 |

Table 6. Continued.

| <i>Scenario 2:</i> <i>Ogallala Aquifer</i> | Pumping reduced by 8.7 percent correction factor | | | | | | Percent volume remaining | | | | | | Average drawdown | | | | | |
|-----------------------------------------------|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|--------------------------|------|------|------|------|------|------------------|------|------|------|------|------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| District | | | | | | | | | | | | | | | | | | |
| Garza County UWCD | 22,551 | 22,390 | 22,265 | 22,127 | 21,197 | 18,624 | 97 | 84 | 71 | 58 | 46 | 35 | 2 | 14 | 25 | 36 | 47 | 57 |
| Glasscock GCD | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 98 | 87 | 78 | 68 | 60 | 53 | 2 | 14 | 26 | 37 | 48 | 58 |
| High Plains UWCD No. 1 | 1,381,614 | 1,300,826 | 1,244,003 | 1,179,433 | 1,089,149 | 995,905 | 98 | 86 | 75 | 65 | 56 | 47 | 2 | 11 | 20 | 29 | 37 | 44 |
| Llano Estacado UWCD | 353,065 | 281,111 | 223,440 | 165,602 | 103,410 | 55,452 | 93 | 63 | 41 | 24 | 12 | 6 | 5 | 28 | 49 | 70 | 89 | 106 |
| Mesa UWCD | 226,777 | 223,172 | 207,547 | 178,367 | 107,946 | 51,990 | 95 | 71 | 49 | 30 | 15 | 8 | 5 | 28 | 50 | 72 | 91 | 104 |
| Panhandle GCD | 370 | 370 | 370 | 370 | 370 | 370 | 98 | 93 | 89 | 84 | 80 | 77 | 1 | 4 | 7 | 10 | 12 | 14 |
| Permian Basin UWCD | 12,629 | 12,623 | 12,570 | 12,512 | 12,502 | 12,466 | 100 | 99 | 98 | 97 | 95 | 94 | 0 | 1 | 1 | 2 | 3 | 4 |
| Sandy Land UWCD | 133,433 | 93,875 | 42,890 | 11,679 | 2,059 | 283 | 89 | 41 | 13 | 3 | 0 | 0 | 3 | 20 | 37 | 54 | 63 | 10 |
| South Plains UWCD | 206,300 | 201,995 | 166,791 | 99,300 | 53,244 | 16,029 | 94 | 65 | 38 | 18 | 8 | 3 | 4 | 21 | 38 | 53 | 67 | 72 |
| Management Area | | | | | | | | | | | | | | | | | | |
| Out-of-State | 76,546 | 65,044 | 55,688 | 48,572 | 43,017 | 39,786 | 100 | 98 | 97 | 95 | 95 | 94 | 0 | 1 | 1 | 1 | 1 | 2 |
| GMA 1 | 106,789 | 99,586 | 96,158 | 89,526 | 82,676 | 72,054 | 98 | 86 | 75 | 66 | 56 | 48 | 2 | 9 | 16 | 22 | 28 | 34 |
| GMA 2 | 2,451,937 | 2,241,461 | 2,012,461 | 1,743,907 | 1,455,067 | 1,210,890 | 97 | 84 | 72 | 61 | 53 | 46 | 2 | 12 | 20 | 28 | 32 | 36 |
| GMA 6 | 22,275 | 22,275 | 22,275 | 22,056 | 22,056 | 21,170 | 98 | 88 | 79 | 69 | 59 | 50 | 2 | 13 | 24 | 35 | 46 | 57 |
| GMA 7 | 69,665 | 67,657 | 65,429 | 61,883 | 57,756 | 53,620 | 98 | 87 | 78 | 68 | 60 | 52 | 2 | 9 | 17 | 24 | 31 | 37 |

Table 7. Pumping (acre-feet per year) and drawdown (feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model for the Edwards-Trinity (High Plains) Aquifer in Scenario 2. UWCD is Underground Water Conservation District.

| <i>Scenario 2: Edwards-Trinity (High Plains) Aquifer</i> | | Pumping | | | | | Average drawdown | | | | | | |
|--------------------------------------------------------------|-------------------------------|----------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | | |
| | Bailey | 279 | 279 | 279 | 279 | 279 | 279 | 0 | 1 | 2 | 4 | 4 | 5 |
| | Borden | 106 | 106 | 106 | 106 | 106 | 106 | 0 | 1 | 2 | 3 | 4 | 4 |
| | Cochran | 263 | 263 | 263 | 263 | 263 | 263 | -1 | 0 | 3 | 6 | 9 | 11 |
| | Dawson | 1,103 | 1,103 | 1,103 | 1,103 | 1,101 | 1,096 | 4 | 26 | 45 | 60 | 66 | 64 |
| | Floyd | 1,216 | 1,216 | 1,216 | 1,213 | 1,200 | 1,182 | 3 | 16 | 29 | 41 | 52 | 62 |
| | Gaines | 85,129 | 45,952 | 29,729 | 21,141 | 15,051 | 11,428 | 7 | 34 | 53 | 64 | 70 | 73 |
| | Garza | 18 | 18 | 18 | 18 | 18 | 18 | 2 | 12 | 21 | 31 | 41 | 49 |
| | Hale | 3,523 | 3,523 | 3,523 | 3,523 | 3,523 | 3,419 | 1 | 8 | 16 | 22 | 29 | 36 |
| | Hockley | 96 | 96 | 96 | 96 | 96 | 96 | 1 | 7 | 13 | 19 | 25 | 29 |
| | Lamb | 164 | 164 | 164 | 164 | 164 | 164 | 0 | 1 | 1 | 2 | 3 | 3 |
| | Lubbock | 689 | 689 | 689 | 689 | 689 | 689 | 1 | 8 | 14 | 20 | 25 | 29 |
| | Lynn | 230 | 230 | 230 | 230 | 230 | 230 | 0 | 7 | 15 | 23 | 29 | 33 |
| | Terry | 982 | 982 | 945 | 945 | 945 | 945 | 2 | 13 | 26 | 35 | 40 | 43 |
| | Yoakum | 2,532 | 1,893 | 1,757 | 1,642 | 1,638 | 1,524 | 1 | 9 | 14 | 16 | 18 | 18 |
| District | | | | | | | | | | | | | |
| | Garza County UWCD | 18 | 18 | 18 | 18 | 18 | 18 | 2 | 12 | 21 | 31 | 41 | 49 |
| | High Plains UWCD No. 1 | 6,415 | 6,415 | 6,415 | 6,412 | 6,399 | 6,277 | 1 | 6 | 12 | 17 | 22 | 26 |
| | Llano Estacado UWCD | 85,129 | 45,952 | 29,729 | 21,141 | 15,051 | 11,428 | 7 | 34 | 53 | 64 | 70 | 73 |
| | Mesa UWCD | 1,103 | 1,103 | 1,103 | 1,103 | 1,101 | 1,096 | 4 | 26 | 45 | 60 | 66 | 64 |
| | Sandy Land UWCD | 2,532 | 1,893 | 1,757 | 1,642 | 1,638 | 1,524 | 1 | 9 | 14 | 16 | 18 | 18 |
| | South Plains UWCD | 982 | 982 | 945 | 945 | 945 | 945 | 2 | 13 | 26 | 35 | 40 | 42 |
| Management Area | | | | | | | | | | | | | |
| | Out-of-State | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 3 |
| | GMA 2 | 96,331 | 56,514 | 40,119 | 31,412 | 25,304 | 21,440 | 1 | 10 | 18 | 24 | 28 | 31 |

Table 8. Pumping (acre-feet per year) and drawdown (feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model for the Ogallala and Edwards-Trinity (High Plains) aquifers in Scenario 2. UWCD is Underground Water Conservation District.

| <i>Scenario 2: Ogallala and Edwards-Trinity (High Plains) Aquifers</i> | Pumping | | | | | | Average drawdown | | | | | |
|------------------------------------------------------------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | |
| Andrews | 17,639 | 15,135 | 13,718 | 12,054 | 10,572 | 8,079 | 0 | 2 | 3 | 4 | 5 | 6 |
| Armstrong | 8,301 | 8,301 | 8,301 | 8,301 | 8,241 | 8,186 | 2 | 13 | 23 | 32 | 42 | 52 |
| Bailey | 63,365 | 41,593 | 35,215 | 30,371 | 24,327 | 21,708 | 1 | 3 | 6 | 8 | 8 | 10 |
| Borden | 504 | 504 | 504 | 504 | 504 | 504 | 0 | 0 | 1 | 2 | 3 | 4 |
| Briscoe | 33,629 | 26,464 | 19,728 | 14,226 | 13,082 | 11,938 | 2 | 9 | 15 | 19 | 23 | 28 |
| Castro | 127,426 | 127,306 | 126,511 | 125,819 | 123,284 | 118,002 | 2 | 11 | 20 | 29 | 38 | 46 |
| Cochran | 48,609 | 36,472 | 33,906 | 30,960 | 28,527 | 25,635 | 0 | 1 | 5 | 8 | 11 | 13 |
| Crosby | 135,582 | 135,399 | 135,399 | 135,399 | 135,399 | 135,399 | 3 | 19 | 35 | 51 | 67 | 83 |
| Dawson | 227,881 | 224,275 | 208,650 | 179,470 | 109,047 | 53,085 | 4 | 27 | 47 | 65 | 74 | 71 |
| Deaf Smith | 129,744 | 118,133 | 106,838 | 97,043 | 81,080 | 65,913 | 1 | 8 | 14 | 20 | 25 | 28 |
| Dickens | 12,339 | 12,339 | 12,339 | 12,121 | 12,121 | 11,594 | 2 | 14 | 25 | 36 | 47 | 57 |
| Ector | 8,665 | 8,026 | 7,730 | 7,171 | 7,135 | 6,727 | 1 | 5 | 9 | 13 | 17 | 21 |
| Floyd | 156,932 | 151,308 | 147,284 | 140,276 | 131,653 | 126,080 | 3 | 17 | 31 | 45 | 57 | 69 |
| Gaines | 438,194 | 327,063 | 253,170 | 186,743 | 118,461 | 66,880 | 6 | 31 | 51 | 67 | 76 | 80 |
| Garza | 22,569 | 22,408 | 22,283 | 22,145 | 21,215 | 18,642 | 2 | 13 | 23 | 33 | 43 | 52 |
| Glasscock | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 2 | 14 | 26 | 37 | 48 | 58 |
| Hale | 134,135 | 133,329 | 131,530 | 129,526 | 123,651 | 115,669 | 2 | 10 | 18 | 27 | 35 | 43 |
| Hockley | 97,069 | 93,466 | 89,355 | 85,244 | 77,384 | 67,138 | 1 | 7 | 14 | 20 | 25 | 29 |
| Howard | 4,653 | 4,647 | 4,617 | 4,595 | 4,585 | 4,563 | 0 | 1 | 1 | 2 | 2 | 3 |
| Lamb | 147,836 | 137,457 | 125,621 | 111,665 | 96,148 | 85,348 | 1 | 7 | 12 | 16 | 19 | 21 |
| Lubbock | 125,462 | 120,665 | 115,972 | 109,325 | 101,717 | 91,470 | 1 | 9 | 15 | 22 | 28 | 32 |
| Lynn | 105,953 | 105,686 | 104,887 | 102,034 | 94,330 | 84,848 | 1 | 8 | 15 | 23 | 28 | 33 |
| Martin | 8,062 | 8,062 | 8,040 | 8,003 | 8,003 | 7,990 | 0 | 1 | 1 | 3 | 4 | 5 |
| Midland | 39,227 | 38,309 | 36,824 | 34,623 | 33,222 | 31,696 | 2 | 9 | 16 | 23 | 30 | 37 |
| Motley | 9,936 | 9,936 | 9,936 | 9,936 | 9,936 | 9,576 | 2 | 13 | 24 | 35 | 45 | 56 |
| Oldham | 19,236 | 16,416 | 15,640 | 14,911 | 13,568 | 12,691 | 1 | 6 | 10 | 15 | 19 | 23 |
| Parmer | 68,909 | 63,072 | 56,590 | 52,156 | 45,954 | 40,986 | 1 | 6 | 11 | 15 | 18 | 21 |
| Potter | 6,290 | 4,173 | 2,591 | 1,769 | 1,769 | 1,468 | 3 | 13 | 19 | 22 | 27 | 31 |
| Randall | 72,963 | 70,696 | 69,626 | 64,546 | 59,098 | 49,709 | 2 | 10 | 18 | 25 | 32 | 38 |
| Swisher | 111,506 | 107,419 | 101,015 | 84,830 | 74,196 | 64,309 | 2 | 11 | 20 | 27 | 34 | 39 |
| Terry | 206,645 | 202,341 | 167,100 | 99,609 | 53,553 | 16,337 | 2 | 15 | 29 | 38 | 43 | 44 |
| Yoakum | 135,965 | 95,768 | 44,647 | 13,321 | 3,697 | 1,808 | 2 | 11 | 16 | 17 | 18 | 18 |

Table 8. Continued.

| <i>Scenario 2: Ogallala and Edwards- Trinity (High Plains) Aquifers</i> | Pumping | | | | | | Average drawdown | | | | | |
|-----------------------------------------------------------------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| District | | | | | | | | | | | | |
| Garza County UWCD | 22,569 | 22,408 | 22,283 | 22,145 | 21,215 | 18,642 | 2 | 13 | 23 | 33 | 43 | 52 |
| Glasscock GCD | 21,773 | 21,322 | 20,875 | 20,089 | 17,398 | 15,197 | 2 | 14 | 26 | 37 | 48 | 58 |
| High Plains UWCD No. 1 | 1,388,029 | 1,307,241 | 1,250,417 | 1,185,845 | 1,095,548 | 1,002,181 | 1 | 8 | 16 | 23 | 29 | 34 |
| Llano Estacado UWCD | 438,194 | 327,063 | 253,170 | 186,743 | 118,461 | 66,880 | 6 | 31 | 51 | 67 | 76 | 80 |
| Mesa UWCD | 227,881 | 224,275 | 208,650 | 179,470 | 109,047 | 53,085 | 4 | 27 | 47 | 65 | 74 | 71 |
| Panhandle GCD | 370 | 370 | 370 | 370 | 370 | 370 | 1 | 4 | 7 | 10 | 12 | 14 |
| Permian Basin UWCD | 12,629 | 12,623 | 12,570 | 12,512 | 12,502 | 12,466 | 0 | 1 | 1 | 2 | 3 | 4 |
| Sandy Land UWCD | 135,965 | 95,768 | 44,647 | 13,321 | 3,697 | 1,808 | 2 | 11 | 16 | 17 | 18 | 18 |
| South Plains UWCD | 207,281 | 202,977 | 167,736 | 100,245 | 54,189 | 16,973 | 2 | 15 | 28 | 37 | 42 | 43 |
| Management Area | | | | | | | | | | | | |
| Out-of-State | 76,547 | 65,045 | 55,689 | 48,573 | 43,018 | 39,787 | 0 | 1 | 1 | 2 | 2 | 2 |
| GMA 1 | 106,789 | 99,586 | 96,158 | 89,526 | 82,676 | 72,054 | 2 | 9 | 16 | 22 | 28 | 34 |
| GMA 2 | 2,548,268 | 2,297,975 | 2,052,580 | 1,775,319 | 1,480,371 | 1,232,330 | 2 | 11 | 19 | 26 | 30 | 33 |
| GMA 6 | 22,275 | 22,275 | 22,275 | 22,056 | 22,056 | 21,170 | 2 | 13 | 24 | 35 | 46 | 57 |
| GMA 7 | 69,665 | 67,657 | 65,429 | 61,883 | 57,756 | 53,620 | 2 | 9 | 17 | 24 | 31 | 37 |

Table 9. Pumping (in acre-feet per year), remaining volume, and drawdown (in feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model by decade for the Ogallala Aquifer in Scenario 3. UWCD is Underground Water Conservation District.

| <i>Scenario 3:</i> <i>Ogallala Aquifer</i> | Pumping reduced by 8.7 percent correction factor | | | | | | Percent volume remaining | | | | | | Average drawdown | | | | | | |
|-----------------------------------------------|--------------------------------------------------|---------|---------|---------|---------|---------|--------------------------|------|------|------|------|------|------------------|------|------|------|------|------|--|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| County | | | | | | | | | | | | | | | | | | | |
| Andrews | 17,639 | 15,135 | 13,718 | 12,054 | 10,057 | 7,418 | 99 | 96 | 93 | 90 | 87 | 85 | 0 | 2 | 3 | 4 | 5 | 6 | |
| Armstrong | 8,301 | 8,301 | 8,301 | 8,301 | 8,241 | 8,186 | 98 | 87 | 76 | 66 | 56 | 46 | 2 | 13 | 23 | 32 | 42 | 52 | |
| Bailey | 62,538 | 41,283 | 34,907 | 30,064 | 24,021 | 21,429 | 96 | 82 | 71 | 62 | 56 | 50 | 1 | 6 | 10 | 13 | 15 | 17 | |
| Borden | 398 | 398 | 398 | 398 | 398 | 398 | 101 | 103 | 103 | 102 | 101 | 101 | -1 | -2 | -1 | -1 | 0 | 0 | |
| Briscoe | 33,622 | 26,457 | 19,722 | 14,220 | 13,037 | 11,933 | 97 | 82 | 71 | 63 | 56 | 50 | 2 | 9 | 15 | 19 | 23 | 28 | |
| Castro | 127,422 | 127,302 | 126,508 | 125,815 | 123,281 | 117,998 | 98 | 88 | 78 | 69 | 59 | 50 | 2 | 11 | 20 | 29 | 38 | 46 | |
| Cochran | 48,345 | 36,208 | 33,641 | 30,696 | 28,084 | 25,371 | 97 | 85 | 75 | 66 | 57 | 50 | 1 | 6 | 11 | 15 | 18 | 22 | |
| Crosby | 134,863 | 134,682 | 134,682 | 134,682 | 134,682 | 134,682 | 98 | 88 | 79 | 69 | 60 | 50 | 3 | 19 | 35 | 51 | 67 | 83 | |
| Dawson | 201,610 | 198,109 | 185,882 | 161,615 | 135,454 | 93,779 | 96 | 76 | 57 | 40 | 26 | 16 | 4 | 23 | 42 | 58 | 74 | 87 | |
| Deaf Smith | 129,167 | 118,165 | 106,868 | 97,057 | 80,382 | 65,931 | 97 | 86 | 75 | 65 | 56 | 50 | 1 | 8 | 15 | 20 | 24 | 28 | |
| Dickens | 12,339 | 12,339 | 12,339 | 12,121 | 12,121 | 11,594 | 98 | 88 | 78 | 69 | 59 | 50 | 2 | 14 | 25 | 36 | 47 | 57 | |
| Ector | 9,024 | 8,382 | 8,075 | 7,508 | 7,470 | 7,050 | 98 | 87 | 77 | 68 | 59 | 50 | 1 | 5 | 10 | 14 | 18 | 22 | |
| Floyd | 154,970 | 149,366 | 145,361 | 138,382 | 129,809 | 124,361 | 98 | 87 | 77 | 67 | 58 | 50 | 3 | 18 | 32 | 47 | 60 | 74 | |
| Gaines | 350,369 | 240,110 | 175,175 | 130,951 | 97,498 | 71,544 | 93 | 65 | 46 | 32 | 23 | 16 | 5 | 25 | 41 | 54 | 66 | 75 | |
| Garza | 19,203 | 19,073 | 18,942 | 18,812 | 18,032 | 17,121 | 98 | 88 | 78 | 68 | 58 | 50 | 2 | 11 | 19 | 28 | 35 | 42 | |
| Glasscock | 22,776 | 22,304 | 21,835 | 21,012 | 17,749 | 14,945 | 98 | 87 | 76 | 66 | 58 | 50 | 3 | 15 | 27 | 39 | 50 | 61 | |
| Hale | 130,622 | 129,816 | 128,017 | 126,013 | 120,137 | 112,259 | 98 | 88 | 78 | 68 | 59 | 50 | 2 | 10 | 19 | 28 | 37 | 45 | |
| Hockley | 95,968 | 92,382 | 88,289 | 84,417 | 76,769 | 67,780 | 98 | 87 | 77 | 67 | 58 | 50 | 1 | 8 | 15 | 22 | 27 | 32 | |
| Howard | 3,076 | 3,076 | 2,731 | 2,731 | 2,731 | 2,704 | 100 | 100 | 100 | 99 | 99 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Lamb | 147,369 | 137,304 | 125,467 | 111,510 | 95,696 | 85,191 | 97 | 85 | 75 | 65 | 57 | 50 | 2 | 11 | 20 | 27 | 33 | 38 | |
| Lubbock | 124,519 | 120,044 | 115,348 | 108,699 | 100,762 | 91,073 | 98 | 87 | 77 | 67 | 58 | 50 | 2 | 10 | 19 | 27 | 34 | 40 | |
| Lynn | 104,023 | 103,760 | 102,975 | 100,620 | 92,966 | 84,468 | 98 | 87 | 77 | 67 | 58 | 50 | 1 | 8 | 15 | 21 | 27 | 31 | |
| Martin | 13,570 | 13,570 | 13,570 | 13,140 | 12,299 | 12,277 | 100 | 98 | 97 | 95 | 93 | 91 | 0 | 1 | 3 | 4 | 6 | 8 | |
| Midland | 40,161 | 39,116 | 37,687 | 35,376 | 33,556 | 32,310 | 98 | 87 | 77 | 67 | 59 | 50 | 2 | 9 | 17 | 24 | 31 | 38 | |
| Motley | 9,936 | 9,936 | 9,936 | 9,936 | 9,936 | 9,576 | 98 | 88 | 79 | 69 | 59 | 50 | 2 | 13 | 24 | 35 | 45 | 56 | |
| Oldham | 19,198 | 16,416 | 15,640 | 14,911 | 13,530 | 12,691 | 98 | 90 | 82 | 75 | 68 | 62 | 1 | 6 | 10 | 15 | 19 | 23 | |
| Parmer | 68,695 | 63,065 | 56,583 | 52,150 | 45,620 | 40,981 | 97 | 86 | 75 | 65 | 57 | 50 | 1 | 6 | 11 | 15 | 18 | 21 | |
| Potter | 6,290 | 4,173 | 2,591 | 1,769 | 1,769 | 1,468 | 96 | 78 | 66 | 59 | 53 | 47 | 3 | 13 | 19 | 22 | 27 | 31 | |
| Randall | 72,963 | 70,696 | 69,626 | 64,546 | 59,098 | 49,709 | 97 | 85 | 73 | 61 | 51 | 42 | 2 | 10 | 18 | 25 | 32 | 38 | |
| Swisher | 110,925 | 107,405 | 101,002 | 84,818 | 73,848 | 64,298 | 98 | 86 | 75 | 65 | 57 | 50 | 2 | 11 | 20 | 27 | 34 | 39 | |
| Terry | 205,658 | 196,222 | 134,609 | 87,098 | 53,904 | 33,647 | 94 | 64 | 40 | 24 | 14 | 8 | 4 | 21 | 35 | 45 | 53 | 60 | |
| Yoakum | 82,297 | 59,745 | 43,575 | 33,882 | 26,717 | 20,040 | 94 | 68 | 51 | 38 | 28 | 21 | 2 | 9 | 15 | 20 | 24 | 27 | |

Table 9. Continued.

| <i>Scenario 3:</i> <i>Ogallala Aquifer</i> | Pumping reduced by 8.7 percent correction factor | | | | | | Percent volume remaining | | | | | | Average drawdown | | | | | |
|-----------------------------------------------|---------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| District | | | | | | | | | | | | | | | | | | |
| Garza County UWCD | 19,203 | 19,073 | 18,942 | 18,812 | 18,032 | 17,121 | 98 | 88 | 78 | 68 | 58 | 50 | 2 | 11 | 19 | 28 | 35 | 42 |
| Glasscock GCD | 22,776 | 22,304 | 21,835 | 21,012 | 17,749 | 14,945 | 98 | 87 | 76 | 66 | 58 | 50 | 3 | 15 | 27 | 39 | 50 | 61 |
| High Plains UWCD No. 1 | 1,375,817 | 1,297,038 | 1,240,261 | 1,176,448 | 1,084,619 | 995,814 | 98 | 86 | 76 | 65 | 56 | 48 | 2 | 11 | 20 | 29 | 36 | 44 |
| Llano Estacado UWCD | 350,369 | 240,110 | 175,175 | 130,951 | 97,498 | 71,544 | 93 | 65 | 46 | 32 | 23 | 16 | 5 | 25 | 41 | 54 | 66 | 75 |
| Mesa UWCD | 201,610 | 198,109 | 185,882 | 161,615 | 135,454 | 93,779 | 96 | 76 | 57 | 40 | 26 | 16 | 4 | 23 | 42 | 58 | 74 | 87 |
| Panhandle GCD | 370 | 370 | 370 | 370 | 370 | 370 | 98 | 93 | 89 | 84 | 80 | 77 | 1 | 4 | 7 | 10 | 12 | 14 |
| Permian Basin UWCD | 16,404 | 16,404 | 16,099 | 15,669 | 14,828 | 14,796 | 100 | 99 | 97 | 96 | 94 | 93 | 0 | 1 | 2 | 3 | 4 | 5 |
| Sandy Land UWCD | 82,297 | 59,745 | 43,575 | 33,882 | 26,717 | 20,040 | 94 | 68 | 51 | 38 | 28 | 21 | 2 | 9 | 15 | 20 | 24 | 27 |
| South Plains UWCD | 206,274 | 196,837 | 135,225 | 87,713 | 54,520 | 34,263 | 94 | 65 | 41 | 25 | 16 | 10 | 4 | 21 | 34 | 44 | 52 | 58 |
| Management Area | | | | | | | | | | | | | | | | | | |
| Out-of-State | 76,367 | 64,788 | 55,688 | 48,572 | 43,177 | 39,786 | 100 | 98 | 97 | 95 | 95 | 94 | 0 | 1 | 1 | 1 | 1 | 2 |
| GMA 1 | 106,751 | 99,586 | 96,158 | 89,526 | 82,639 | 72,054 | 98 | 86 | 75 | 66 | 56 | 48 | 2 | 9 | 16 | 22 | 28 | 34 |
| GMA 2 | 2,366,866 | 2,132,678 | 1,907,968 | 1,699,823 | 1,496,184 | 1,306,684 | 97 | 85 | 73 | 64 | 55 | 48 | 2 | 11 | 19 | 26 | 32 | 37 |
| GMA 6 | 22,275 | 22,275 | 22,275 | 22,056 | 22,056 | 21,170 | 98 | 88 | 79 | 69 | 59 | 50 | 2 | 13 | 24 | 35 | 46 | 57 |
| GMA 7 | 71,962 | 69,802 | 67,597 | 63,896 | 58,775 | 54,304 | 98 | 87 | 77 | 67 | 58 | 50 | 2 | 10 | 18 | 25 | 32 | 38 |

Table 10. Pumping (acre-feet per year) and drawdown (feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model for the Edwards-Trinity (High Plains) Aquifer in Scenario 3. UWCD is Underground Water Conservation District.

| <i>Scenario 3: Edwards-Trinity (High Plains) Aquifer</i> | | Pumping | | | | | Average drawdown | | | | | | |
|--------------------------------------------------------------|-------------------------------|----------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | | |
| | Bailey | 279 | 279 | 279 | 279 | 279 | 279 | 0 | 1 | 2 | 4 | 4 | 5 |
| | Borden | 106 | 106 | 106 | 106 | 106 | 106 | 0 | 1 | 1 | 2 | 3 | 4 |
| | Cochran | 263 | 263 | 263 | 263 | 263 | 263 | -1 | 0 | 3 | 6 | 9 | 11 |
| | Dawson | 1,103 | 1,103 | 1,103 | 1,103 | 1,103 | 1,103 | 3 | 21 | 37 | 50 | 60 | 67 |
| | Floyd | 1,216 | 1,216 | 1,216 | 1,213 | 1,200 | 1,182 | 3 | 16 | 29 | 41 | 52 | 61 |
| | Gaines | 85,058 | 46,202 | 30,316 | 22,998 | 16,524 | 12,904 | 6 | 28 | 42 | 53 | 61 | 67 |
| | Garza | 18 | 18 | 18 | 18 | 18 | 18 | 2 | 10 | 18 | 26 | 33 | 40 |
| | Hale | 3,523 | 3,523 | 3,523 | 3,523 | 3,523 | 3,419 | 1 | 8 | 15 | 22 | 29 | 36 |
| | Hockley | 96 | 96 | 96 | 96 | 96 | 96 | 1 | 7 | 13 | 19 | 24 | 28 |
| | Lamb | 164 | 164 | 164 | 164 | 164 | 164 | 0 | 1 | 1 | 2 | 3 | 3 |
| | Lubbock | 689 | 689 | 689 | 689 | 689 | 689 | 1 | 8 | 14 | 20 | 25 | 29 |
| | Lynn | 230 | 230 | 230 | 230 | 230 | 230 | 0 | 7 | 14 | 21 | 27 | 32 |
| | Terry | 982 | 982 | 945 | 945 | 945 | 945 | 2 | 14 | 25 | 32 | 37 | 40 |
| | Yoakum | 2,532 | 1,893 | 1,757 | 1,642 | 1,642 | 1,524 | 1 | 6 | 10 | 13 | 15 | 17 |
| District | | | | | | | | | | | | | |
| | Garza County UWCD | 18 | 18 | 18 | 18 | 18 | 18 | 2 | 10 | 18 | 26 | 33 | 40 |
| | High Plains UWCD No. 1 | 6,415 | 6,415 | 6,415 | 6,412 | 6,399 | 6,277 | 1 | 5 | 11 | 17 | 21 | 25 |
| | Llano Estacado UWCD | 85,058 | 46,202 | 30,316 | 22,998 | 16,524 | 12,904 | 6 | 28 | 42 | 53 | 61 | 67 |
| | Mesa UWCD | 1,103 | 1,103 | 1,103 | 1,103 | 1,103 | 1,103 | 3 | 21 | 37 | 50 | 60 | 67 |
| | Sandy Land UWCD | 2,532 | 1,893 | 1,757 | 1,642 | 1,642 | 1,524 | 1 | 6 | 10 | 13 | 15 | 17 |
| | South Plains UWCD | 982 | 982 | 945 | 945 | 945 | 945 | 2 | 13 | 25 | 32 | 37 | 40 |
| Management Area | | | | | | | | | | | | | |
| | Out-of-State | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 3 |
| | GMA 2 | 96,260 | 56,765 | 40,706 | 33,269 | 26,782 | 22,923 | 1 | 9 | 16 | 22 | 26 | 30 |

Table 11. Pumping (acre-feet per year) and drawdown (feet) for each county, groundwater conservation district (GCD), and groundwater management area (GMA) in the model for the Ogallala and Edwards-Trinity (High Plains) aquifers in Scenario 2. UWCD is Underground Water Conservation District.

| <i>Scenario 3: Ogallala and Edwards-Trinity (High Plains) Aquifers</i> | Pumping | | | | | | Average drawdown | | | | | |
|------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|------------------|------|------|------|------|------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| County | | | | | | | | | | | | |
| Andrews | 17,639 | 15,135 | 13,718 | 12,054 | 10,057 | 7,418 | 0 | 2 | 3 | 4 | 5 | 6 |
| Armstrong | 8,301 | 8,301 | 8,301 | 8,301 | 8,241 | 8,186 | 2 | 13 | 23 | 32 | 42 | 52 |
| Bailey | 62,816 | 41,562 | 35,185 | 30,342 | 24,299 | 21,708 | 1 | 3 | 6 | 8 | 8 | 9 |
| Borden | 504 | 504 | 504 | 504 | 504 | 504 | 0 | 0 | 1 | 2 | 3 | 3 |
| Briscoe | 33,622 | 26,457 | 19,722 | 14,220 | 13,037 | 11,933 | 2 | 9 | 15 | 19 | 23 | 28 |
| Castro | 127,422 | 127,302 | 126,508 | 125,815 | 123,281 | 117,998 | 2 | 11 | 20 | 29 | 38 | 46 |
| Cochran | 48,608 | 36,472 | 33,905 | 30,959 | 28,347 | 25,634 | 0 | 1 | 5 | 8 | 11 | 13 |
| Crosby | 134,863 | 134,682 | 134,682 | 134,682 | 134,682 | 134,682 | 3 | 19 | 35 | 51 | 67 | 83 |
| Dawson | 202,713 | 199,212 | 186,985 | 162,718 | 136,557 | 94,882 | 4 | 22 | 39 | 54 | 66 | 74 |
| Deaf Smith | 129,167 | 118,165 | 106,868 | 97,057 | 80,382 | 65,931 | 1 | 8 | 15 | 20 | 24 | 28 |
| Dickens | 12,339 | 12,339 | 12,339 | 12,121 | 12,121 | 11,594 | 2 | 14 | 25 | 36 | 47 | 57 |
| Ector | 9,024 | 8,382 | 8,075 | 7,508 | 7,470 | 7,050 | 1 | 5 | 10 | 14 | 18 | 22 |
| Floyd | 156,186 | 150,582 | 146,577 | 139,595 | 131,008 | 125,544 | 3 | 17 | 31 | 44 | 57 | 69 |
| Gaines | 435,427 | 286,312 | 205,491 | 153,949 | 114,022 | 84,448 | 5 | 27 | 41 | 53 | 63 | 70 |
| Garza | 19,221 | 19,091 | 18,960 | 18,830 | 18,050 | 17,139 | 2 | 10 | 18 | 27 | 34 | 40 |
| Glasscock | 22,776 | 22,304 | 21,835 | 21,012 | 17,749 | 14,945 | 3 | 15 | 27 | 39 | 50 | 61 |
| Hale | 134,145 | 133,340 | 131,540 | 129,536 | 123,660 | 115,678 | 2 | 10 | 18 | 27 | 35 | 43 |
| Hockley | 96,064 | 92,478 | 88,385 | 84,513 | 76,865 | 67,876 | 1 | 7 | 13 | 20 | 25 | 29 |
| Howard | 3,076 | 3,076 | 2,731 | 2,731 | 2,731 | 2,704 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lamb | 147,533 | 137,468 | 125,631 | 111,674 | 95,860 | 85,355 | 1 | 7 | 12 | 16 | 19 | 21 |
| Lubbock | 125,209 | 120,733 | 116,037 | 109,388 | 101,451 | 91,762 | 1 | 9 | 16 | 22 | 27 | 32 |
| Lynn | 104,253 | 103,990 | 103,205 | 100,850 | 93,196 | 84,698 | 1 | 7 | 14 | 21 | 27 | 32 |
| Martin | 13,570 | 13,570 | 13,570 | 13,140 | 12,299 | 12,277 | 0 | 1 | 3 | 4 | 6 | 8 |
| Midland | 40,161 | 39,116 | 37,687 | 35,376 | 33,556 | 32,310 | 2 | 9 | 17 | 24 | 31 | 38 |
| Motley | 9,936 | 9,936 | 9,936 | 9,936 | 9,936 | 9,576 | 2 | 13 | 24 | 35 | 45 | 56 |
| Oldham | 19,198 | 16,416 | 15,640 | 14,911 | 13,530 | 12,691 | 1 | 6 | 10 | 15 | 19 | 23 |
| Parmer | 68,695 | 63,065 | 56,583 | 52,150 | 45,620 | 40,981 | 1 | 6 | 11 | 15 | 18 | 21 |
| Potter | 6,290 | 4,173 | 2,591 | 1,769 | 1,769 | 1,468 | 3 | 13 | 19 | 22 | 27 | 31 |
| Randall | 72,963 | 70,696 | 69,626 | 64,546 | 59,098 | 49,709 | 2 | 10 | 18 | 25 | 32 | 38 |
| Swisher | 110,925 | 107,405 | 101,002 | 84,818 | 73,848 | 64,298 | 2 | 11 | 20 | 27 | 34 | 39 |
| Terry | 206,640 | 197,203 | 135,554 | 88,043 | 54,849 | 34,592 | 2 | 15 | 27 | 34 | 39 | 42 |
| Yoakum | 84,829 | 61,638 | 45,331 | 35,523 | 28,359 | 21,564 | 1 | 7 | 11 | 14 | 16 | 18 |

Table 11. Continued.

| <i>Scenario 3: Ogallala and Edwards- Trinity (High Plains) Aquifers</i> | Pumping | | | | | | Average drawdown | | | | | |
|-----------------------------------------------------------------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| District | | | | | | | | | | | | |
| Garza County UWCD | 19,221 | 19,091 | 18,960 | 18,830 | 18,050 | 17,139 | 2 | 10 | 18 | 27 | 34 | 40 |
| Glasscock GCD | 22,776 | 22,304 | 21,835 | 21,012 | 17,749 | 14,945 | 3 | 15 | 27 | 39 | 50 | 61 |
| High Plains UWCD No. 1 | 1,382,231 | 1,303,453 | 1,246,676 | 1,182,860 | 1,091,017 | 1,002,090 | 1 | 8 | 15 | 22 | 28 | 33 |
| Llano Estacado UWCD | 435,427 | 286,312 | 205,491 | 153,949 | 114,022 | 84,448 | 5 | 27 | 41 | 53 | 63 | 70 |
| Mesa UWCD | 202,713 | 199,212 | 186,985 | 162,718 | 136,557 | 94,882 | 4 | 22 | 39 | 54 | 66 | 74 |
| Panhandle GCD | 370 | 370 | 370 | 370 | 370 | 370 | 1 | 4 | 7 | 10 | 12 | 14 |
| Permian Basin UWCD | 16,404 | 16,404 | 16,099 | 15,669 | 14,828 | 14,796 | 0 | 1 | 2 | 3 | 4 | 5 |
| Sandy Land UWCD | 84,829 | 61,638 | 45,331 | 35,523 | 28,359 | 21,564 | 1 | 7 | 11 | 14 | 16 | 18 |
| South Plains UWCD | 207,256 | 197,819 | 136,170 | 88,658 | 55,465 | 35,208 | 2 | 15 | 27 | 34 | 38 | 41 |
| Management Area | | | | | | | | | | | | |
| Out-of-State | 76,368 | 64,789 | 55,689 | 48,573 | 43,178 | 39,787 | 0 | 1 | 1 | 2 | 2 | 2 |
| GMA 1 | 106,751 | 99,586 | 96,158 | 89,526 | 82,639 | 72,054 | 2 | 9 | 16 | 22 | 28 | 34 |
| GMA 2 | 2,463,126 | 2,189,443 | 1,948,674 | 1,733,092 | 1,522,966 | 1,329,607 | 2 | 10 | 17 | 24 | 29 | 33 |
| GMA 6 | 22,275 | 22,275 | 22,275 | 22,056 | 22,056 | 21,170 | 2 | 13 | 24 | 35 | 46 | 57 |
| GMA 7 | 71,962 | 69,802 | 67,597 | 63,896 | 58,775 | 54,304 | 2 | 10 | 18 | 25 | 32 | 38 |