

DRAFT TECHNICAL MEMORANDUM

To: Steve Walthour, General Manager, North Plains Groundwater Conservation District
From: Neil Deeds, INTERA
Date: April 6, 2016
RE: DRAFT GMA-1 Predictive Runs

1 INTRODUCTION

Four predictive runs were completed for GMA-1 with the TWDB High Plains Aquifer System GAM. These runs represent variations of the run described in the memo submitted to TWDB August 31st, 2015, titled “DRAFT GMA-1 Predictive Runs Performed Under TWDB Contract for Development of the High Plains Aquifer System Groundwater Availability Model.”

Two new runs were completed. The guidelines for these runs are provided by GMA-1 representatives. Run numbering starts at #5, to discriminate between these new runs and the four runs described in a previous memo of March 16. Variations in the scenarios are described below.

Run 2016.5: Initial pumping rates in the Ogallala Aquifer were set for all counties in North Plains GCD (NPGCD), along with target rates for year 2020 for four of the counties in NPGCD as follows (acre-feet per year):

| County | 2012 | 2013 | 2014 | 2015 | 2016 | 2020 |
|------------|---------|---------|---------|---------|---------|---------|
| Dallam | 371,965 | 399,272 | 393,624 | 314,899 | 400,000 | 390,000 |
| Hansford | 218,793 | 201,914 | 211,634 | 169,307 | 277,961 | |
| Hartley | 458,696 | 458,998 | 442,058 | 353,646 | 450,000 | 400,000 |
| Hutchinson | 72,230 | 69,716 | 73,992 | 59,194 | 74,000 | |
| Lipscomb | 55,572 | 42,519 | 48,791 | 39,033 | 55,000 | |
| Moore | 234,688 | 228,297 | 209,907 | 167,926 | 235,000 | 215,000 |
| Ochiltree | 109,213 | 98,280 | 106,278 | 85,022 | 115,000 | |
| Sherman | 348,012 | 346,685 | 361,336 | 289,069 | 365,000 | 400,000 |

Ogallala Aquifer. With the exception of High Plains Water District (HPWD), targets were based on fraction remaining after 50 years (in 2062), specifically NPGCD-west (0.40), NPGCD-east (0.50), Panhandle GCD (PGCD) (0.50), and Hemphill County Underground Water Conservation District (HCUWCD) (0.80). In HPWD, targets were based on average drawdown, corresponding to pumping rates set at 150% of 2012 pumping rates. The resulting drawdowns are provided in tables following this section.

Dockum Aquifer. As with the August 31st, 2015 run, the Dockum targets were set as a fraction of available drawdown in NPGCD-west (0.40). In the other districts, Dockum targets were based on average drawdown after 50 years (in 2062). Specifically, Panhandle GCD (30'), HPWD (40'), Oldham County-No GCD (30'), Randall County – No GCD (40').

In Run 2016.1, the saturated thickness where pumping was curtailed was set to 30 feet.

Run 2016.6: Same as 2016.5, except saturated thickness where pumping was curtailed was set to 10 feet.

For both of these runs, pumping in GMA-2 was set to the 2012 estimated rate, multiplied by a factor of 1.5. Limited sensitivity analyses indicated that GMA-1 results were not very sensitive to GMA-2 pumping rates.

2 RESULTS

The results are provided in the form of tables for each of the runs. Tables 1 – 6 for each run are identical in format and content to Tables 1 – 6 provided in the August 31, 2015 memo, with the exception that 2070 results are added to all tables. Note that tables are prefixed with the run number, e.g. Table 6, Run 5 is titled 2016.5.6. The run results are presented sequentially.

In all cases, District targets were met within 0.005 for fraction remaining, and 0.5 ft for drawdown.

The effect of decreasing the saturated thickness at which pumping was curtailed was to increase availability slightly in some counties. For example, in Dallam County in 2016 the target pumping was 400,000 acre-feet/year. When the minimum was 30', only 395,000 acre-feet/year was achieved (Table 2015.5.4), while a 10' minimum allowed the full 400,000 acre-feet/year to be achieved (Table 2016.6.4).

Table 2016.5.1: Groundwater in storage and fraction remaining by zone for the Ogallala Aquifer in GMA-1.

| Ogallala Zone | Groundwater In Storage (af) | | | | | | | Fraction Remaining from 2012 | | | | | |
|-------------------------|-----------------------------|------------|------------|------------|------------|------------|------------|------------------------------|------|------|------|------|------|
| | 2012 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | '20 | '30 | '40 | '50 | '62 | '70 |
| North Plains GCD - West | 58,258,886 | 48,599,829 | 39,195,551 | 32,014,723 | 26,925,644 | 23,344,959 | 22,225,821 | 0.84 | 0.67 | 0.55 | 0.46 | 0.40 | 0.38 |
| North Plains GCD - East | 68,850,807 | 64,397,228 | 57,006,628 | 49,791,550 | 42,758,214 | 34,550,322 | 29,206,785 | 0.94 | 0.83 | 0.72 | 0.62 | 0.50 | 0.42 |
| Hemphill County UWCD | 15,434,318 | 15,056,398 | 14,369,077 | 13,686,823 | 13,032,615 | 12,289,613 | 11,821,746 | 0.98 | 0.93 | 0.89 | 0.84 | 0.80 | 0.77 |
| Panhandle GCD | 76,865,219 | 71,216,151 | 62,071,200 | 53,719,244 | 46,241,251 | 38,427,583 | 33,892,620 | 0.93 | 0.81 | 0.70 | 0.60 | 0.50 | 0.44 |
| High Plains UWCD No. 1 | 3,073,984 | 2,860,686 | 2,542,905 | 2,254,864 | 2,017,547 | 1,785,576 | 1,657,118 | 0.93 | 0.83 | 0.73 | 0.66 | 0.58 | 0.54 |
| No GCD | 9,635,730 | 8,836,429 | 7,645,995 | 6,625,769 | 5,787,730 | 5,007,151 | 4,598,369 | 0.92 | 0.79 | 0.69 | 0.60 | 0.52 | 0.48 |

Table 2016.5.2: Fraction remaining by zone for the Dockum Aquifer in GMA-1.

| Zone | Fraction Remaining from 2012 | | | | | |
|-------------------------|------------------------------|------|------|------|------|------|
| | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| North Plains GCD - West | 0.89 | 0.75 | 0.62 | 0.51 | 0.40 | 0.33 |
| Panhandle GCD | 0.93 | 0.82 | 0.72 | 0.65 | 0.57 | 0.53 |
| High Plains UWCD No. 1 | 0.86 | 0.72 | 0.60 | 0.51 | 0.41 | 0.36 |
| No GCD | 0.94 | 0.86 | 0.79 | 0.73 | 0.68 | 0.65 |

Table 2016.5.3: Available groundwater and average drawdown in the Rita Blanca Aquifer for the Dallam County in GMA-1.

| Rita Blanca County | Available Groundwater (afy) | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------|-----------------------------|-------|-------|-------|-------|-------|-------|-----------------------|------|------|------|------|------|
| | 2015 ¹ | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| Dallam | 6,197 | 6,207 | 6,197 | 6,177 | 6,145 | 6,151 | 5,914 | 13 | 27 | 39 | 47 | 53 | 57 |

¹2015 rates are identical to the last year of the calibrated model (2012) except in NPGCD where other rates were provided by NPGCD staff.

Table 2016.5.4: Available groundwater and average drawdown in the Ogallala Aquifer for the counties comprising GMA-1.

| Ogallala | Available Groundwater (afy) | | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|------|------|------|------|------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| North Plains GCD | | | | | | | | | | | | | | |
| Dallam | 305,394 | 395,833 | 382,325 | 281,007 | 220,013 | 160,745 | 97,105 | 65,036 | 15 | 29 | 40 | 47 | 52 | 54 |
| Hansford | 169,191 | 276,822 | 275,769 | 272,655 | 271,968 | 270,280 | 269,478 | 269,128 | 17 | 41 | 66 | 89 | 116 | 134 |
| Hartley | 353,307 | 450,493 | 398,674 | 271,523 | 212,902 | 154,432 | 90,842 | 58,539 | 20 | 37 | 49 | 58 | 64 | 65 |
| Hutchinson | 59,153 | 74,151 | 62,975 | 64,522 | 65,831 | 66,075 | 65,956 | 64,791 | 13 | 33 | 53 | 73 | 95 | 110 |
| Lipscomb | 39,006 | 55,112 | 267,540 | 266,710 | 267,370 | 266,591 | 266,556 | 266,546 | 12 | 34 | 55 | 75 | 99 | 115 |
| Moore | 167,811 | 235,480 | 215,441 | 172,620 | 139,703 | 105,016 | 67,650 | 47,446 | 20 | 41 | 57 | 69 | 77 | 80 |
| Ochiltree | 84,963 | 115,225 | 244,446 | 243,931 | 244,670 | 244,050 | 244,085 | 244,094 | 13 | 37 | 61 | 84 | 112 | 130 |
| Sherman | 288,843 | 364,947 | 399,146 | 348,894 | 282,462 | 212,744 | 136,775 | 93,843 | 24 | 53 | 75 | 91 | 104 | 108 |
| District Total | 1,467,668 | 1,968,063 | 2,246,316 | 1,921,862 | 1,704,919 | 1,479,933 | 1,238,447 | 1,109,423 | | | | | | |
| Hemphill County UWCD | | | | | | | | | | | | | | |
| Hemphill | 21,935 | 55,176 | 52,338 | 52,217 | 52,409 | 52,305 | 52,340 | 52,358 | 4 | 11 | 18 | 25 | 32 | 37 |
| Panhandle GCD | | | | | | | | | | | | | | |
| Armstrong | 7,495 | 57,669 | 58,142 | 53,413 | 48,302 | 43,461 | 38,080 | 34,782 | 6 | 16 | 25 | 34 | 42 | 47 |
| Carson | 129,714 | 181,368 | 192,661 | 184,263 | 170,395 | 153,767 | 134,054 | 121,448 | 12 | 29 | 44 | 57 | 71 | 79 |
| Donley | 39,476 | 69,404 | 75,012 | 76,288 | 73,162 | 67,872 | 60,901 | 56,275 | 5 | 13 | 21 | 27 | 33 | 37 |
| Gray | 41,540 | 171,475 | 181,601 | 175,267 | 163,099 | 148,713 | 131,744 | 121,136 | 9 | 25 | 40 | 53 | 66 | 74 |
| Hutchinson | 74 | 10,106 | 15,777 | 16,740 | 15,197 | 13,324 | 11,454 | 10,171 | 14 | 41 | 67 | 91 | 115 | 129 |
| Potter | 7,349 | 15,775 | 17,015 | 15,820 | 14,480 | 13,162 | 11,609 | 10,644 | 3 | 7 | 11 | 14 | 17 | 19 |
| Roberts | 79,284 | 359,716 | 431,798 | 455,129 | 428,388 | 390,246 | 342,747 | 311,054 | 20 | 55 | 87 | 117 | 148 | 166 |
| Wheeler | 13,534 | 114,844 | 130,782 | 138,810 | 137,761 | 132,311 | 123,308 | 116,837 | 8 | 23 | 35 | 47 | 59 | 66 |
| District Total | 318,466 | 980,357 | 1,102,788 | 1,115,730 | 1,050,784 | 962,856 | 853,897 | 782,347 | | | | | | |

¹2015 rates are identical to the last year of the calibrated model (2012) except in NPGCD where other rates were provided by NPGCD staff.

Table 2016.5.4 continued: Available groundwater and average drawdown in the Ogallala Aquifer for the counties comprising GMA-1.

| Ogallala | Available Groundwater (afy) | | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|------|------|------|------|------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| High Plains Water District | | | | | | | | | | | | | | |
| Armstrong | 1,073 | 1,484 | 1,289 | 1,048 | 868 | 722 | 591 | 521 | 2 | 5 | 8 | 10 | 12 | 13 |
| Potter | 149 | 225 | 225 | 224 | 225 | 223 | 220 | 218 | 2 | 4 | 7 | 9 | 12 | 14 |
| Randall | 26,175 | 39,322 | 39,190 | 37,987 | 32,566 | 28,333 | 24,458 | 22,482 | 4 | 9 | 14 | 18 | 22 | 24 |
| District Total | 27,397 | 41,031 | 40,704 | 39,259 | 33,659 | 29,278 | 25,269 | 23,221 | | | | | | |
| No GCD | | | | | | | | | | | | | | |
| Hartley | 240 | 18,432 | 19,581 | 17,638 | 14,566 | 11,147 | 7,457 | 5,246 | 5 | 12 | 18 | 22 | 24 | 24 |
| Hutchinson | 5,643 | 18,853 | 16,492 | 14,432 | 13,390 | 12,973 | 13,170 | 14,395 | 6 | 16 | 25 | 34 | 44 | 51 |
| Moore | 2,237 | 8,167 | 8,956 | 8,597 | 7,612 | 6,186 | 4,532 | 3,585 | 5 | 11 | 15 | 18 | 20 | 21 |
| Oldham | 13,775 | 40,879 | 44,721 | 40,203 | 33,513 | 26,206 | 18,617 | 16,165 | 3 | 7 | 10 | 12 | 13 | 14 |
| Randall | 18,039 | 23,890 | 24,894 | 23,944 | 21,923 | 19,471 | 16,541 | 14,684 | 3 | 8 | 12 | 16 | 20 | 22 |
| Total | 39,934 | 110,221 | 114,644 | 104,814 | 91,004 | 75,983 | 60,317 | 54,075 | | | | | | |
| GMA-1 Total | 1,875,400 | 3,154,848 | 3,556,790 | 3,233,882 | 2,932,775 | 2,600,355 | 2,230,270 | 2,021,424 | | | | | | |

¹2015 rates are identical to the last year of the calibrated model (2012) except in NPGCD where other rates were provided by NPGCD staff.

Table 2016.5.5: Available groundwater and average drawdown in the Dockum Aquifer for the counties comprising GMA-1.

| Dockum | Available Groundwater (afy) | | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|-----------|-----------|------------|------------|------------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| North Plains GCD | | | | | | | | | | | | | | |
| Dallam | 2,755 | 14,234 | 14,231 | 14,188 | 14,224 | 14,184 | 14,183 | 14,183 | 30 | 78 | 119 | 156 | 194 | 217 |
| Hartley | 1,793 | 13,063 | 11,633 | 10,766 | 10,552 | 10,559 | 10,895 | 11,326 | 21 | 51 | 77 | 101 | 127 | 144 |
| Moore | 1,604 | 5,072 | 4,814 | 4,531 | 4,505 | 4,416 | 4,261 | 4,158 | 9 | 21 | 31 | 39 | 48 | 52 |
| Sherman | 484 | 127 | 127 | 127 | 127 | 127 | 92 | 87 | 16 | 36 | 51 | 62 | 70 | 73 |
| District Total | 6,636 | 32,496 | 30,805 | 29,612 | 29,408 | 29,286 | 29,431 | 29,754 | 24 | 60 | 92 | 120 | 150 | 168 |
| Panhandle GCD | | | | | | | | | | | | | | |
| Armstrong | 138 | 5,658 | 7,150 | 9,023 | 9,614 | 9,704 | 9,493 | 9,270 | 5 | 13 | 20 | 27 | 34 | 38 |
| Carson | 29 | 53 | 68 | 108 | 140 | 169 | 203 | 225 | 6 | 15 | 23 | 30 | 37 | 42 |
| Potter | 914 | 32,021 | 38,909 | 39,112 | 37,037 | 34,504 | 31,557 | 29,665 | 4 | 10 | 16 | 21 | 26 | 29 |
| District Total | 1,081 | 37,732 | 46,127 | 48,243 | 46,791 | 44,377 | 41,253 | 39,160 | 4 | 11 | 18 | 24 | 30 | 34 |
| High Plains Water District | | | | | | | | | | | | | | |
| Armstrong | 33 | 166 | 96 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 7 | 10 | 15 | 18 |
| Potter | 434 | 29 | 21 | 0 | 0 | 0 | 0 | 0 | 3 | 9 | 16 | 24 | 32 | 37 |
| Randall | 1,597 | 1,575 | 2,195 | 2,714 | 2,961 | 3,111 | 3,228 | 3,289 | 9 | 19 | 28 | 36 | 45 | 50 |
| District Total | 2,064 | 1,770 | 2,312 | 2,714 | 2,961 | 3,111 | 3,228 | 3,289 | 8 | 16 | 25 | 32 | 40 | 45 |
| No GCD | | | | | | | | | | | | | | |
| Hartley | 226 | 42,620 | 43,766 | 44,269 | 44,525 | 44,303 | 43,941 | 43,521 | 9 | 27 | 44 | 59 | 78 | 89 |
| Moore | 0 | 230 | 419 | 575 | 528 | 509 | 497 | 481 | 5 | 13 | 19 | 25 | 30 | 33 |
| Oldham | 1,128 | 111,290 | 129,354 | 128,828 | 120,848 | 111,196 | 99,735 | 92,701 | 4 | 11 | 18 | 24 | 30 | 34 |
| Randall | 1,006 | 6,320 | 9,007 | 11,302 | 11,941 | 12,002 | 11,806 | 11,555 | 7 | 16 | 24 | 32 | 40 | 45 |
| Total | 2,360 | 160,460 | 182,546 | 184,974 | 177,842 | 168,010 | 155,979 | 148,258 | 5 | 14 | 22 | 30 | 38 | 42 |
| GMA-1 Total | 12,141 | 232,458 | 261,790 | 265,543 | 257,002 | 244,784 | 229,891 | 220,461 | | | | | | |

Table 2016.5.6: Groundwater in storage and fraction remaining from 2012 in the Ogallala Aquifer for counties comprising GMA-1.

| Ogallala | Groundwater In Storage (af) | | | | | | | | Fraction Remaining from 2012 | | | | | |
|-----------------------------|-----------------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------------------|-------------|-------------|-------------|-------------|-------------|
| County | 2012 | 2015 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | '20 | '30 | '40 | '50 | '62 | '70 |
| North Plains GCD | | | | | | | | | | | | | | |
| Dallam | 14,671,925 | 13,780,883 | 12,194,020 | 9,809,884 | 8,032,927 | 6,809,253 | 6,002,926 | 5,786,218 | 0.83 | 0.67 | 0.55 | 0.46 | 0.41 | 0.39 |
| Hansford | 23,999,740 | 23,499,747 | 22,254,715 | 19,723,282 | 17,226,621 | 14,796,746 | 11,980,003 | 10,161,126 | 0.93 | 0.82 | 0.72 | 0.62 | 0.50 | 0.42 |
| Hartley | 16,109,356 | 14,899,515 | 12,934,097 | 10,350,950 | 8,422,325 | 7,085,680 | 6,205,561 | 5,984,848 | 0.80 | 0.64 | 0.52 | 0.44 | 0.39 | 0.37 |
| Hutchinson | 6,283,204 | 6,138,287 | 5,856,123 | 5,224,580 | 4,564,721 | 3,918,708 | 3,183,164 | 2,722,310 | 0.93 | 0.83 | 0.73 | 0.62 | 0.51 | 0.43 |
| Lipscomb | 17,979,150 | 17,880,482 | 16,931,575 | 14,901,570 | 13,007,153 | 11,180,008 | 9,041,619 | 7,637,255 | 0.94 | 0.83 | 0.72 | 0.62 | 0.50 | 0.42 |
| Moore | 9,531,217 | 9,010,018 | 8,062,267 | 6,603,420 | 5,452,356 | 4,616,877 | 3,997,676 | 3,781,750 | 0.85 | 0.69 | 0.57 | 0.48 | 0.42 | 0.40 |
| Ochiltree | 20,588,713 | 20,348,826 | 19,354,815 | 17,157,196 | 14,993,055 | 12,862,752 | 10,345,536 | 8,686,094 | 0.94 | 0.83 | 0.73 | 0.62 | 0.50 | 0.42 |
| Sherman | 17,946,388 | 17,048,100 | 15,409,445 | 12,431,297 | 10,107,115 | 8,413,834 | 7,138,796 | 6,673,005 | 0.86 | 0.69 | 0.56 | 0.47 | 0.40 | 0.37 |
| Dist. Total | 127,109,693 | 122,605,858 | 112,997,057 | 96,202,179 | 81,806,273 | 69,683,858 | 57,895,281 | 51,432,606 | 0.89 | 0.76 | 0.64 | 0.55 | 0.46 | 0.40 |
| Hemphill County UWCD | | | | | | | | | | | | | | |
| Hemphill | 15,434,318 | 15,372,022 | 15,056,398 | 14,369,077 | 13,686,823 | 13,032,615 | 12,289,613 | 11,821,746 | 0.98 | 0.93 | 0.89 | 0.84 | 0.80 | 0.77 |
| Panhandle GCD | | | | | | | | | | | | | | |
| Armstrong | 4,418,838 | 4,390,635 | 4,103,026 | 3,568,023 | 3,089,254 | 2,665,255 | 2,226,578 | 1,974,621 | 0.93 | 0.81 | 0.70 | 0.60 | 0.50 | 0.45 |
| Carson | 14,900,617 | 14,533,317 | 13,644,675 | 11,911,925 | 10,332,170 | 8,928,035 | 7,476,078 | 6,642,625 | 0.92 | 0.80 | 0.69 | 0.60 | 0.50 | 0.45 |
| Donley | 4,372,716 | 4,295,059 | 4,022,028 | 3,503,564 | 3,038,977 | 2,634,834 | 2,226,949 | 1,998,735 | 0.92 | 0.80 | 0.69 | 0.60 | 0.51 | 0.46 |
| Gray | 13,723,357 | 13,607,295 | 12,765,180 | 11,144,776 | 9,666,585 | 8,347,418 | 6,971,180 | 6,173,121 | 0.93 | 0.81 | 0.70 | 0.61 | 0.51 | 0.45 |
| Hutchinson | 877,413 | 870,844 | 820,953 | 715,416 | 614,210 | 521,737 | 426,395 | 372,014 | 0.94 | 0.82 | 0.70 | 0.59 | 0.49 | 0.42 |
| Potter | 1,610,450 | 1,579,081 | 1,482,291 | 1,299,978 | 1,141,001 | 1,005,837 | 870,404 | 794,515 | 0.92 | 0.81 | 0.71 | 0.62 | 0.54 | 0.49 |
| Roberts | 29,922,260 | 29,671,432 | 27,858,805 | 24,289,080 | 20,980,905 | 17,982,690 | 14,810,631 | 12,948,403 | 0.93 | 0.81 | 0.70 | 0.60 | 0.49 | 0.43 |
| Wheeler | 7,039,568 | 7,014,771 | 6,519,193 | 5,638,438 | 4,856,142 | 4,155,445 | 3,419,368 | 2,988,586 | 0.93 | 0.80 | 0.69 | 0.59 | 0.49 | 0.42 |
| Dist. Total | 76,865,219 | 75,962,434 | 71,216,151 | 62,071,200 | 53,719,244 | 46,241,251 | 38,427,583 | 33,892,620 | 0.93 | 0.81 | 0.70 | 0.60 | 0.50 | 0.44 |

Table 2016.5.6 continued: Groundwater in storage and fraction remaining from 2012 in the Ogallala Aquifer for counties comprising GMA-1.

| Ogallala | Groundwater In Storage (af) | | | | | | | | Fraction Remaining from 2012 | | | | | |
|-----------------------------------|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------|------|------|------|------|
| County | 2012 | 2015 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | '20 | '30 | '40 | '50 | '62 | '70 |
| High Plains Water District | | | | | | | | | | | | | | |
| Armstrong | 169,520 | 164,755 | 154,467 | 135,707 | 119,559 | 106,032 | 92,818 | 85,496 | 0.91 | 0.80 | 0.71 | 0.63 | 0.55 | 0.50 |
| Potter | 334,379 | 331,599 | 325,365 | 310,868 | 295,212 | 279,313 | 260,975 | 249,542 | 0.97 | 0.93 | 0.88 | 0.84 | 0.78 | 0.75 |
| Randall | 2,570,085 | 2,523,203 | 2,380,854 | 2,096,330 | 1,840,093 | 1,632,202 | 1,431,783 | 1,322,080 | 0.93 | 0.82 | 0.72 | 0.64 | 0.56 | 0.51 |
| Dist. Total | 3,073,984 | 3,019,557 | 2,860,686 | 2,542,905 | 2,254,864 | 2,017,547 | 1,785,576 | 1,657,118 | 0.93 | 0.83 | 0.73 | 0.66 | 0.58 | 0.54 |
| No GCD | | | | | | | | | | | | | | |
| Hartley | 908,097 | 899,854 | 801,455 | 638,348 | 518,298 | 438,390 | 388,804 | 378,468 | 0.88 | 0.70 | 0.57 | 0.48 | 0.43 | 0.42 |
| Hutchinson | 3,937,385 | 3,879,960 | 3,676,579 | 3,241,343 | 2,810,387 | 2,400,962 | 1,946,585 | 1,669,519 | 0.93 | 0.82 | 0.71 | 0.61 | 0.49 | 0.42 |
| Moore | 492,564 | 478,653 | 428,082 | 344,643 | 285,201 | 244,850 | 217,139 | 208,926 | 0.87 | 0.70 | 0.58 | 0.50 | 0.44 | 0.42 |
| Oldham | 2,031,746 | 1,998,077 | 1,813,872 | 1,510,905 | 1,287,630 | 1,141,056 | 1,054,733 | 1,031,801 | 0.89 | 0.74 | 0.63 | 0.56 | 0.52 | 0.51 |
| Randall | 2,265,938 | 2,221,861 | 2,116,441 | 1,910,756 | 1,724,253 | 1,562,472 | 1,399,890 | 1,309,655 | 0.93 | 0.84 | 0.76 | 0.69 | 0.62 | 0.58 |
| Total | 9,635,730 | 9,478,405 | 8,836,429 | 7,645,995 | 6,625,769 | 5,787,730 | 5,007,151 | 4,598,369 | 0.92 | 0.79 | 0.69 | 0.60 | 0.52 | 0.48 |
| GMA-1 Tot. | 232,118,944 | 226,438,276 | 210,966,721 | 182,831,356 | 158,092,973 | 136,763,001 | 115,405,204 | 103,402,459 | 0.91 | 0.79 | 0.68 | 0.59 | 0.50 | 0.45 |

Table 2016.6.1: Groundwater in storage and fraction remaining by zone for the Ogallala Aquifer in GMA-1.

| Ogallala | Groundwater In Storage (af) | | | | | | | Fraction Remaining from 2012 | | | | | |
|-------------------------|-----------------------------|------------|------------|------------|------------|------------|------------|------------------------------|------|------|------|------|------|
| Zone | 2012 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | '20 | '30 | '40 | '50 | '62 | '70 |
| North Plains GCD - West | 58,258,886 | 48,547,509 | 39,237,159 | 32,082,294 | 26,966,459 | 23,318,033 | 22,149,904 | 0.83 | 0.68 | 0.55 | 0.46 | 0.40 | 0.38 |
| North Plains GCD - East | 68,850,807 | 64,397,228 | 57,006,623 | 49,791,522 | 42,758,130 | 34,550,162 | 29,206,570 | 0.94 | 0.83 | 0.72 | 0.62 | 0.50 | 0.42 |
| Hemphill County UWCD | 15,434,318 | 15,055,885 | 14,367,965 | 13,685,507 | 13,031,217 | 12,288,167 | 11,820,281 | 0.98 | 0.93 | 0.89 | 0.84 | 0.80 | 0.77 |
| Panhandle GCD | 76,865,219 | 71,198,396 | 62,035,499 | 53,673,892 | 46,189,911 | 38,370,446 | 33,831,038 | 0.93 | 0.81 | 0.70 | 0.60 | 0.50 | 0.44 |
| High Plains UWCD No. 1 | 3,073,984 | 2,855,265 | 2,527,302 | 2,217,579 | 1,961,756 | 1,705,250 | 1,562,905 | 0.93 | 0.82 | 0.72 | 0.64 | 0.55 | 0.51 |
| No GCD | 9,635,730 | 8,818,135 | 7,607,435 | 6,566,130 | 5,705,232 | 4,894,588 | 4,471,862 | 0.92 | 0.79 | 0.68 | 0.59 | 0.51 | 0.47 |

Table 2016.6.2: Fraction remaining by zone for the Dockum Aquifer in GMA-1.

| Zone | Fraction Remaining from 2012 | | | | | |
|-------------------------|------------------------------|------|------|------|------|------|
| | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| North Plains GCD - West | 0.89 | 0.75 | 0.62 | 0.51 | 0.40 | 0.33 |
| Panhandle GCD | 0.93 | 0.82 | 0.72 | 0.65 | 0.57 | 0.53 |
| High Plains UWCD No. 1 | 0.86 | 0.72 | 0.60 | 0.51 | 0.41 | 0.36 |
| No GCD | 0.94 | 0.86 | 0.79 | 0.73 | 0.68 | 0.65 |

Table 2016.6.3: Available groundwater and average drawdown in the Rita Blanca Aquifer for the Dallam County in GMA-1.

| Rita Blanca | Available Groundwater (afy) | | | | | | | Average Drawdown (ft) | | | | | | |
|-------------|-----------------------------|-------|-------|-------|-------|-------|-------|-----------------------|------|------|------|------|------|------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| Dallam | 6,197 | 6,191 | 6,207 | 6,197 | 6,214 | 6,159 | 6,168 | 5,916 | 14 | 28 | 39 | 47 | 53 | 58 |

¹2015 rates are identical to the last year of the calibrated model (2012) except in NPGCD where other rates were provided by NPGCD staff.

Table 2016.6.4: Available groundwater and average drawdown in the Ogallala Aquifer for the counties comprising GMA-1.

| Ogallala | Available Groundwater (afy) | | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|------|------|------|------|------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| North Plains GCD | | | | | | | | | | | | | | |
| Dallam | 312,426 | 400,754 | 390,609 | 280,186 | 222,651 | 165,147 | 101,646 | 68,996 | 15 | 29 | 40 | 48 | 53 | 55 |
| Hansford | 169,191 | 276,822 | 275,769 | 272,655 | 271,968 | 270,280 | 269,478 | 269,128 | 17 | 41 | 66 | 89 | 116 | 134 |
| Hartley | 353,403 | 450,899 | 400,792 | 265,158 | 209,317 | 153,198 | 91,355 | 59,454 | 20 | 37 | 49 | 57 | 63 | 65 |
| Hutchinson | 59,153 | 74,151 | 62,975 | 64,522 | 65,831 | 66,075 | 65,956 | 64,791 | 13 | 33 | 53 | 73 | 95 | 110 |
| Lipscomb | 39,006 | 55,112 | 267,540 | 266,710 | 267,370 | 266,591 | 266,556 | 266,547 | 12 | 34 | 55 | 75 | 99 | 115 |
| Moore | 167,811 | 235,482 | 215,441 | 172,621 | 139,709 | 105,042 | 67,695 | 47,491 | 20 | 41 | 57 | 69 | 77 | 80 |
| Ochiltree | 84,963 | 115,225 | 244,446 | 243,931 | 244,670 | 244,050 | 244,085 | 244,094 | 13 | 37 | 61 | 84 | 112 | 130 |
| Sherman | 288,843 | 364,947 | 399,146 | 348,920 | 282,538 | 212,885 | 136,920 | 93,946 | 24 | 53 | 75 | 91 | 104 | 108 |
| District Total | 1,474,796 | 1,973,392 | 2,256,718 | 1,914,703 | 1,704,054 | 1,483,268 | 1,243,691 | 1,114,447 | | | | | | |
| Hemphill County UWCD | | | | | | | | | | | | | | |
| Hemphill | 21,935 | 55,302 | 52,549 | 52,432 | 52,600 | 52,474 | 52,490 | 52,498 | 4 | 11 | 18 | 25 | 32 | 37 |
| Panhandle GCD | | | | | | | | | | | | | | |
| Armstrong | 7,495 | 57,976 | 58,602 | 53,821 | 48,653 | 43,765 | 38,353 | 35,069 | 6 | 16 | 26 | 34 | 42 | 47 |
| Carson | 129,825 | 181,423 | 192,719 | 184,317 | 170,443 | 153,808 | 134,089 | 121,481 | 12 | 29 | 44 | 57 | 71 | 79 |
| Donley | 39,491 | 70,819 | 76,925 | 78,237 | 74,944 | 69,493 | 62,383 | 57,704 | 5 | 14 | 21 | 27 | 33 | 37 |
| Gray | 41,540 | 171,664 | 182,087 | 175,968 | 163,729 | 149,267 | 132,280 | 121,649 | 9 | 25 | 40 | 53 | 66 | 74 |
| Hutchinson | 74 | 10,106 | 15,777 | 16,740 | 15,197 | 13,324 | 11,454 | 10,171 | 14 | 41 | 67 | 91 | 115 | 129 |
| Potter | 7,789 | 16,399 | 17,742 | 16,538 | 15,142 | 13,794 | 12,209 | 11,220 | 3 | 7 | 11 | 14 | 17 | 19 |
| Roberts | 79,284 | 359,716 | 431,798 | 455,129 | 428,388 | 390,246 | 342,747 | 311,054 | 20 | 55 | 87 | 117 | 148 | 166 |
| Wheeler | 13,711 | 116,334 | 133,554 | 141,727 | 140,359 | 134,609 | 125,426 | 119,017 | 9 | 23 | 36 | 47 | 59 | 66 |
| District Total | 319,209 | 984,437 | 1,109,204 | 1,122,477 | 1,056,855 | 968,306 | 858,941 | 787,365 | | | | | | |

¹2015 rates are identical to the last year of the calibrated model (2012) except in NPGCD where other rates were provided by NPGCD staff.

Table 2016.6.4 continued: Available groundwater and average drawdown in the Ogallala Aquifer for the counties comprising GMA-1.

| Ogallala | Available Groundwater (afy) | | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|------|------|------|------|------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| High Plains Water District | | | | | | | | | | | | | | |
| Armstrong | 1,202 | 1,808 | 1,679 | 1,387 | 1,113 | 827 | 601 | 493 | 3 | 6 | 9 | 12 | 14 | 15 |
| Potter | 149 | 225 | 225 | 224 | 225 | 224 | 224 | 224 | 2 | 4 | 7 | 9 | 12 | 14 |
| Randall | 26,384 | 39,617 | 39,534 | 39,227 | 34,400 | 30,138 | 26,580 | 24,404 | 4 | 9 | 15 | 19 | 23 | 26 |
| District Total | 27,735 | 41,650 | 41,438 | 40,838 | 35,738 | 31,189 | 27,405 | 25,121 | | | | | | |
| No GCD | | | | | | | | | | | | | | |
| Hartley | 240 | 19,027 | 20,442 | 18,744 | 15,877 | 12,554 | 8,686 | 6,192 | 5 | 13 | 19 | 23 | 25 | 26 |
| Hutchinson | 5,643 | 19,203 | 17,190 | 15,352 | 14,243 | 13,792 | 13,909 | 15,059 | 6 | 16 | 25 | 35 | 45 | 51 |
| Moore | 2,287 | 8,733 | 9,577 | 9,185 | 8,126 | 6,638 | 4,908 | 3,903 | 5 | 11 | 16 | 19 | 21 | 22 |
| Oldham | 15,466 | 42,643 | 47,439 | 43,228 | 36,677 | 29,681 | 22,426 | 19,470 | 3 | 7 | 11 | 13 | 14 | 15 |
| Randall | 18,143 | 23,890 | 24,894 | 23,950 | 21,969 | 19,529 | 16,578 | 14,711 | 3 | 8 | 12 | 16 | 20 | 22 |
| Total | 41,779 | 113,496 | 119,542 | 110,459 | 96,892 | 82,194 | 66,507 | 59,335 | | | | | | |
| GMA-1 Total | 1,885,454 | 3,168,277 | 3,579,451 | 3,240,909 | 2,946,139 | 2,617,431 | 2,249,034 | 2,038,766 | | | | | | |

¹2015 rates are identical to the last year of the calibrated model (2012) except in NPGCD where other rates were provided by NPGCD staff.

Table 2016.6.5: Available groundwater and average drawdown in the Dockum Aquifer for the counties comprising GMA-1.

| Dockum | Available Groundwater (afy) | | | | | | | | Average Drawdown (ft) | | | | | |
|-----------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|-----------|-----------|------------|------------|------------|
| County | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 |
| North Plains GCD | | | | | | | | | | | | | | |
| Dallam | 2,755 | 14,234 | 14,231 | 14,188 | 14,224 | 14,184 | 14,183 | 14,183 | 30 | 78 | 119 | 156 | 195 | 217 |
| Hartley | 1,793 | 13,063 | 11,633 | 10,766 | 10,552 | 10,559 | 10,895 | 11,326 | 21 | 51 | 77 | 101 | 127 | 144 |
| Moore | 1,604 | 5,072 | 4,814 | 4,531 | 4,505 | 4,416 | 4,261 | 4,158 | 9 | 21 | 31 | 39 | 48 | 52 |
| Sherman | 484 | 127 | 127 | 127 | 127 | 127 | 92 | 87 | 16 | 36 | 51 | 62 | 70 | 73 |
| District Total | 6,636 | 32,496 | 30,805 | 29,612 | 29,408 | 29,286 | 29,431 | 29,754 | 24 | 60 | 92 | 120 | 150 | 168 |
| Panhandle GCD | | | | | | | | | | | | | | |
| Armstrong | 138 | 5,658 | 7,150 | 9,032 | 9,628 | 9,718 | 9,507 | 9,283 | 5 | 13 | 20 | 27 | 34 | 38 |
| Carson | 29 | 53 | 68 | 108 | 140 | 169 | 203 | 225 | 6 | 15 | 23 | 30 | 38 | 42 |
| Potter | 914 | 32,028 | 38,915 | 39,118 | 37,041 | 34,507 | 31,560 | 29,667 | 4 | 10 | 16 | 21 | 26 | 29 |
| District Total | 1,081 | 37,739 | 46,133 | 48,258 | 46,809 | 44,394 | 41,270 | 39,175 | 4 | 11 | 18 | 24 | 30 | 34 |
| High Plains Water District | | | | | | | | | | | | | | |
| Armstrong | 33 | 166 | 96 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 7 | 11 | 15 | 18 |
| Potter | 434 | 29 | 21 | 0 | 0 | 0 | 0 | 0 | 3 | 9 | 16 | 24 | 32 | 37 |
| Randall | 1,597 | 1,575 | 2,195 | 2,714 | 2,961 | 3,111 | 3,228 | 3,289 | 9 | 19 | 28 | 37 | 45 | 50 |
| District Total | 2,064 | 1,770 | 2,312 | 2,714 | 2,961 | 3,111 | 3,228 | 3,289 | 8 | 17 | 25 | 32 | 40 | 45 |
| No GCD | | | | | | | | | | | | | | |
| Hartley | 226 | 42,620 | 43,766 | 44,269 | 44,525 | 44,303 | 43,941 | 43,521 | 9 | 27 | 44 | 59 | 78 | 89 |
| Moore | 0 | 230 | 419 | 575 | 533 | 509 | 497 | 481 | 5 | 13 | 19 | 25 | 30 | 33 |
| Oldham | 1,128 | 111,301 | 129,364 | 128,837 | 120,854 | 111,201 | 99,739 | 92,704 | 4 | 11 | 18 | 24 | 30 | 34 |
| Randall | 1,006 | 6,320 | 9,007 | 11,302 | 11,941 | 12,002 | 11,806 | 11,555 | 7 | 16 | 24 | 32 | 40 | 45 |
| Total | 2,360 | 160,471 | 182,556 | 184,983 | 177,853 | 168,015 | 155,983 | 148,261 | 5 | 14 | 22 | 30 | 38 | 42 |
| GMA-1 Total | 12,141 | 232,476 | 261,806 | 265,567 | 257,031 | 244,806 | 229,912 | 220,479 | | | | | | |

Table 2016.6.6: Groundwater in storage and fraction remaining from 2012 in the Ogallala Aquifer for counties comprising GMA-1.

| Ogallala | Groundwater In Storage (af) | | | | | | | | Fraction Remaining from 2012 | | | | | |
|-----------------------------|-----------------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------------------|-------------|-------------|-------------|-------------|-------------|
| County | 2012 | 2015 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | '20 | '30 | '40 | '50 | '62 | '70 |
| North Plains GCD | | | | | | | | | | | | | | |
| Dallam | 14,671,925 | 13,764,050 | 12,148,376 | 9,785,245 | 7,990,600 | 6,725,500 | 5,862,949 | 5,613,373 | 0.83 | 0.67 | 0.54 | 0.46 | 0.40 | 0.38 |
| Hansford | 23,999,740 | 23,499,747 | 22,254,715 | 19,723,282 | 17,226,621 | 14,796,740 | 11,980,000 | 10,161,111 | 0.93 | 0.82 | 0.72 | 0.62 | 0.50 | 0.42 |
| Hartley | 16,109,356 | 14,899,163 | 12,928,113 | 10,417,096 | 8,531,215 | 7,211,298 | 6,326,636 | 6,095,378 | 0.80 | 0.65 | 0.53 | 0.45 | 0.39 | 0.38 |
| Hutchinson | 6,283,204 | 6,138,287 | 5,856,123 | 5,224,575 | 4,564,693 | 3,918,630 | 3,183,018 | 2,722,128 | 0.93 | 0.83 | 0.73 | 0.62 | 0.51 | 0.43 |
| Lipscomb | 17,979,150 | 17,880,482 | 16,931,575 | 14,901,570 | 13,007,153 | 11,180,008 | 9,041,608 | 7,637,238 | 0.94 | 0.83 | 0.72 | 0.62 | 0.50 | 0.42 |
| Moore | 9,531,217 | 9,010,017 | 8,062,143 | 6,603,965 | 5,454,025 | 4,619,384 | 4,000,310 | 3,783,925 | 0.85 | 0.69 | 0.57 | 0.48 | 0.42 | 0.40 |
| Ochiltree | 20,588,713 | 20,348,826 | 19,354,815 | 17,157,196 | 14,993,055 | 12,862,752 | 10,345,536 | 8,686,093 | 0.94 | 0.83 | 0.73 | 0.62 | 0.50 | 0.42 |
| Sherman | 17,946,388 | 17,048,016 | 15,408,877 | 12,430,853 | 10,106,454 | 8,410,277 | 7,128,138 | 6,657,228 | 0.86 | 0.69 | 0.56 | 0.47 | 0.40 | 0.37 |
| Dist. Total | 127,109,693 | 122,588,588 | 112,944,737 | 96,243,782 | 81,873,816 | 69,724,589 | 57,868,195 | 51,356,474 | 0.89 | 0.76 | 0.64 | 0.55 | 0.46 | 0.40 |
| Hemphill County UWCD | | | | | | | | | | | | | | |
| Hemphill | 15,434,318 | 15,372,022 | 15,055,885 | 14,367,965 | 13,685,507 | 13,031,217 | 12,288,167 | 11,820,281 | 0.98 | 0.93 | 0.89 | 0.84 | 0.80 | 0.77 |
| Panhandle GCD | | | | | | | | | | | | | | |
| Armstrong | 4,418,838 | 4,390,635 | 4,102,197 | 3,566,408 | 3,087,197 | 2,662,895 | 2,223,786 | 1,971,374 | 0.93 | 0.81 | 0.70 | 0.60 | 0.50 | 0.45 |
| Carson | 14,900,617 | 14,533,005 | 13,644,285 | 11,911,477 | 10,331,684 | 8,927,497 | 7,475,483 | 6,641,990 | 0.92 | 0.80 | 0.69 | 0.60 | 0.50 | 0.45 |
| Donley | 4,372,716 | 4,295,022 | 4,017,354 | 3,494,304 | 3,027,511 | 2,622,148 | 2,213,257 | 1,984,546 | 0.92 | 0.80 | 0.69 | 0.60 | 0.51 | 0.45 |
| Gray | 13,723,357 | 13,607,295 | 12,764,118 | 11,141,346 | 9,661,878 | 8,342,006 | 6,965,408 | 6,167,144 | 0.93 | 0.81 | 0.70 | 0.61 | 0.51 | 0.45 |
| Hutchinson | 877,413 | 870,844 | 820,948 | 715,369 | 614,095 | 521,569 | 426,200 | 371,818 | 0.94 | 0.82 | 0.70 | 0.59 | 0.49 | 0.42 |
| Potter | 1,610,450 | 1,576,900 | 1,478,246 | 1,294,423 | 1,134,241 | 998,567 | 862,864 | 786,960 | 0.92 | 0.80 | 0.70 | 0.62 | 0.54 | 0.49 |
| Roberts | 29,922,260 | 29,671,432 | 27,858,805 | 24,289,067 | 20,980,860 | 17,982,558 | 14,810,391 | 12,948,052 | 0.93 | 0.81 | 0.70 | 0.60 | 0.49 | 0.43 |
| Wheeler | 7,039,568 | 7,014,285 | 6,512,443 | 5,623,105 | 4,836,426 | 4,132,671 | 3,393,057 | 2,959,154 | 0.93 | 0.80 | 0.69 | 0.59 | 0.48 | 0.42 |
| Dist. Total | 76,865,219 | 75,959,418 | 71,198,396 | 62,035,499 | 53,673,892 | 46,189,911 | 38,370,446 | 33,831,038 | 0.93 | 0.81 | 0.70 | 0.60 | 0.50 | 0.44 |

Table 2016.6.6 continued: Groundwater in storage and fraction remaining from 2012 in the Ogallala Aquifer for counties comprising GMA-1.

| Ogallala | Groundwater In Storage (af) | | | | | | | | Fraction Remaining from 2012 | | | | | |
|-----------------------------------|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------|------|------|------|------|
| County | 2012 | 2015 | 2020 | 2030 | 2040 | 2050 | 2062 | 2070 | '20 | '30 | '40 | '50 | '62 | '70 |
| High Plains Water District | | | | | | | | | | | | | | |
| Armstrong | 169,520 | 164,173 | 151,345 | 128,316 | 108,347 | 92,553 | 77,853 | 70,229 | 0.89 | 0.76 | 0.64 | 0.55 | 0.46 | 0.41 |
| Potter | 334,379 | 331,599 | 325,357 | 310,824 | 295,109 | 279,105 | 260,463 | 248,790 | 0.97 | 0.93 | 0.88 | 0.83 | 0.78 | 0.74 |
| Randall | 2,570,085 | 2,522,531 | 2,378,563 | 2,088,162 | 1,814,123 | 1,590,098 | 1,366,934 | 1,243,886 | 0.93 | 0.81 | 0.71 | 0.62 | 0.53 | 0.48 |
| Dist. Total | 3,073,984 | 3,018,303 | 2,855,265 | 2,527,302 | 2,217,579 | 1,961,756 | 1,705,250 | 1,562,905 | 0.93 | 0.82 | 0.72 | 0.64 | 0.55 | 0.51 |
| No GCD | | | | | | | | | | | | | | |
| Hartley | 908,097 | 899,854 | 799,203 | 631,878 | 506,733 | 420,801 | 365,091 | 353,079 | 0.88 | 0.70 | 0.56 | 0.46 | 0.40 | 0.39 |
| Hutchinson | 3,937,385 | 3,879,951 | 3,675,073 | 3,237,360 | 2,805,526 | 2,395,676 | 1,941,072 | 1,664,052 | 0.93 | 0.82 | 0.71 | 0.61 | 0.49 | 0.42 |
| Moore | 492,564 | 478,587 | 425,912 | 339,662 | 278,442 | 236,870 | 208,436 | 200,204 | 0.86 | 0.69 | 0.57 | 0.48 | 0.42 | 0.41 |
| Oldham | 2,031,746 | 1,992,342 | 1,801,834 | 1,488,514 | 1,253,284 | 1,092,885 | 985,032 | 950,699 | 0.89 | 0.73 | 0.62 | 0.54 | 0.48 | 0.47 |
| Randall | 2,265,938 | 2,221,549 | 2,116,113 | 1,910,021 | 1,722,145 | 1,559,000 | 1,394,957 | 1,303,828 | 0.93 | 0.84 | 0.76 | 0.69 | 0.62 | 0.58 |
| Total | 9,635,730 | 9,472,283 | 8,818,135 | 7,607,435 | 6,566,130 | 5,705,232 | 4,894,588 | 4,471,862 | 0.92 | 0.79 | 0.68 | 0.59 | 0.51 | 0.46 |
| GMA-1 Tot. | 232,118,944 | 226,410,614 | 210,872,418 | 182,781,983 | 158,016,924 | 136,612,705 | 115,126,646 | 103,042,560 | 0.91 | 0.79 | 0.68 | 0.59 | 0.50 | 0.44 |