

Oklahoma Comprehensive Water Plan 2011 Update

Water Demand Forecast Report

October 2009

This study was funded through an agreement with the Oklahoma Water Resources Board under its authority to update the Oklahoma Comprehensive Water Plan, the state's long-range water planning strategy, due for submittal to the State Legislature in 2012. Results from this and other studies have been incorporated where appropriate in the OCWP's technical and policy considerations.

The general goal of the OCWP is to ensure reliable water supplies for all Oklahomans through integrated and coordinated water resources planning and to provide information so that water providers, policy-makers, and water users can make informed decisions concerning the use and management of Oklahoma's water resources.

Oklahoma Comprehensive Water Plan

OCWP

*Prepared by CDM under a cooperative agreement between the
United States Army Corps of Engineers and the Oklahoma Water Resources Board*

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Acronyms

AEO	Annual Energy Outlook
AF	acre-feet
AFY	acre-feet per year
AHC	American Horse Council
BIA	Bureau of Indian Affairs
BLS	Bureau of Labor Statistics
BOR	Bureau of Reclamation
CDM	Camp Dresser & McKee Inc.
EIA	Energy Information Administration
ged	gallons per employee per day
ghd	gallons per head per day
GWh	gigawatt-hours
M&I	municipal and industrial
mgd	million gallons per day
MW	megawatts
MWh	megawatt-hour
NAICS	North American Industrial Classification System
NASS	National Agricultural Statistics Service
NRCS	National Resource Conservation Service
NRW	non-revenue water
OCC	Oklahoma Corporation Commission
OCWP	Oklahoma Comprehensive Water Plan
ODOC	Oklahoma Department of Commerce
OESC	Oklahoma Employment Security Commission
OGE	OGE Energy Corporation
OIPA	Oklahoma Independent Petroleum Association
OML	Oklahoma Municipal League
ORWA	Oklahoma Rural Water Association
OWRB	Oklahoma Water Resources Board
PT	provisional temporary
QCEW	Quarterly Census of Employment and Wages
rgpcd	residential gallons per-capita per day
SESAs	State Employment Security Agencies
SIC	Standard Industrial Code
UAW	unaccounted for water
UCFE	Unemployment Compensation for Federal Employees
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	U.S. Geological Survey
WFAE	weighted field application efficiencies

Section 1

Introduction

In 1974, the Oklahoma Legislature enacted 82 O.S. §1086.2(1), which requires that the Oklahoma Water Resources Board (OWRB) develop a strategic guide for managing the state's water resources over the next 50 years. The Oklahoma Comprehensive Water Plan (OCWP) was first published in 1974, with subsequent updates in 1980 and 1995. The Oklahoma Legislature appropriated funds for the current update due in 2011.

In accordance with Task 1A.8 of the OCWP Programmatic Work Plan (updated February 2009), a water demand forecast at the county level was prepared and is documented herein. This technical document describes the efforts undertaken to collect data needed for the demand forecast, the methodologies employed to produce a reliable county-level demand forecast, and the results of the county-level forecast.

Also required under Task 1 of the OCWP Programmatic Work Plan is a municipal and industrial (M&I) demand forecast estimated for water providers in Oklahoma. This report does not include information on the provider-level forecasts; those forecasts will be documented separately.

The demand forecast produced in Task 1 has been allocated to watershed basins to characterize any differences between water supply and water demand, thus identifying areas of potential water surplus and shortfalls, or gaps. This is in accordance with Task 2 of the OCWP Programmatic Work Plan. This report does not include information on the basin-level forecasts. Those forecasts are documented in the Demand/Supply Gap report.

1.1 General Methodology

Water demand projections for all major water users throughout the state were developed for the *base year*, or starting point of the forecast (generally 2007) and then at 10-year intervals from 2010 to 2060. Water users are grouped into four major categories—publically supplied M&I, self-supplied residential, self-supplied nonresidential, and agriculture. The demand forecast is estimated by sub-categories as follows:

- Publically-supplied M&I
 - Residential
 - Nonresidential
- Self-supplied residential
- Self-supplied nonresidential
 - Thermoelectric power
 - Oil and gas
 - Other large industries
- Agriculture
 - Livestock
 - Crop irrigation

The basic methodology is to estimate water demand separately for each water use category, also referred to as a water use sector. The methodology selected to forecast any demand is commonly determined by data availability. This is the case for all sectors of the OCWP forecast.

For each sector, the basic methodology for estimating water demand is the *driver times rate of use* approach. The *driver* is defined as a countable unit driving water demands up and down, which can be projected in future years, such as number of households and people, number of acres irrigated, number of employees in a business, etc. The *rate of use* is defined as the quantity of water used by the driving unit, such as gallons per household per day or acre-feet (AF) per irrigated acre.

As shown in Figure 1, the driver, or demographic unit, and the corresponding water use rate can be defined independently for each sector. The selection of the appropriate unit and the corresponding water use rate depends upon the data available for each sector.

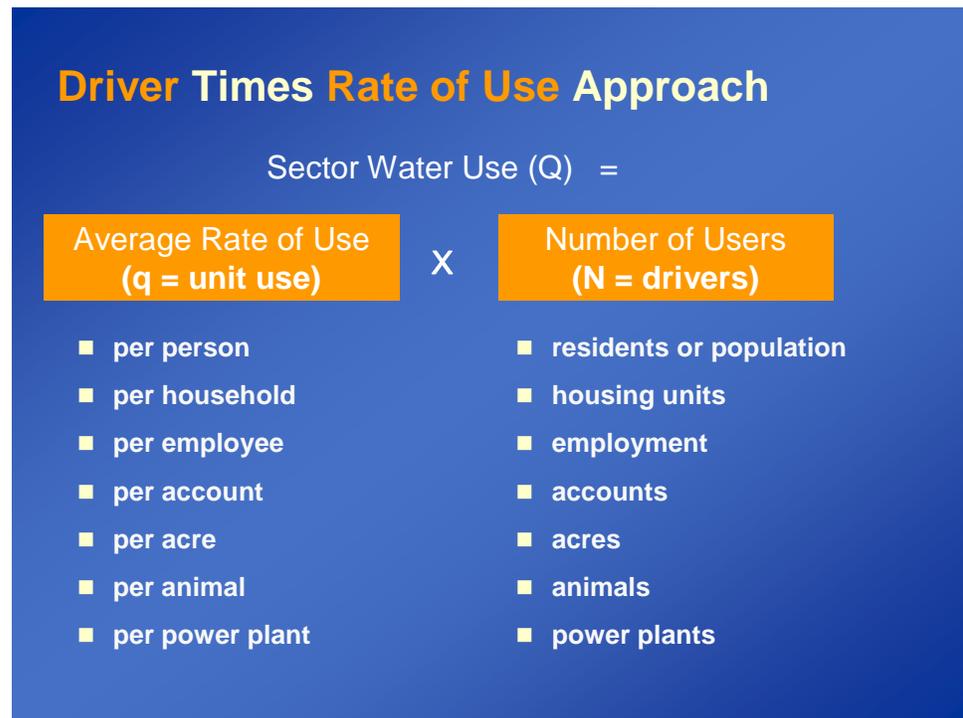


Figure 1 - Driver Times Rate of Use Approach

The per unit water use rate, or water use factor, can be developed for most sectors given historical or current water use data and a defined demographic unit. Projection of future water demand then requires having projected values of the defined demographic unit.

With this approach, the water use factor of each sector can be assumed to either remain constant into the future, decrease over time due to increases in water use efficiency, or increase over time due to more intensive water use. While trends in future water use can be difficult to know with certainty, reasonable assumptions can be made that provide the

foundation for estimating trends in the future and scenarios can be developed that consider demands under potential alternative conditions.

For all water users, total withdrawals or diversions are developed and presented in this report. *Total withdrawals* represents the amount of water pumped or diverted from the source to meet the needs of the user. In nearly all instances, some proportion of water is returned to the stream flow or released back into the ground. The difference between withdrawals and returns are referred to as *consumptive use*. For the thermoelectric power sector, consumptive demands are a small fraction of total withdrawals; thus, both sets of demands are provided in this report for that sector.

1.2 Document Organization

In order to collect data for both the demand projections and the supply gap analysis, a survey was distributed to water providers throughout the state, as discussed in Section 2. The data methodologies and results of the public supply forecast are discussed in Section 3. This is followed by a discussion of the self-supplied residential and self-supplied industrial forecasts in Section 4. This includes forecasts for thermoelectric power generation, oil and gas industry, and other self-supplied large industries. In Section 5, agriculture demands are discussed, including water demands for livestock and crop irrigation. Section 6 presents all forecast assumptions, the aggregated county forecast for all sectors, and a list of recommendations for future demand forecasts.

Finally, Appendix A contains a data log that summarizes the data sources used for the demand forecast. Appendix B contains the county-level demands with population and employment projections listed by county.

Section 2

Public Water Supplier Survey

For use in developing the OCWP, a statewide public water supply use and infrastructure survey was developed and distributed to public water systems (both municipal and rural) throughout the state. The purpose of the survey is to provide baseline information for characterizing existing conditions and future supply and infrastructure needs on an individual water provider basis. For each public water supplier, the survey identified the current service area population and demands, conservation activities, current sources of supply, existing and planned water supply and treatment infrastructure, and plans for future water supply sources, as well as other data.

The provider survey was created using SurveyMonkey.com, a powerful online survey software that allows surveys to be created, collected, and analyzed in a timely manner. The survey was created and distributed to water providers in May of 2008 through the OWRB, Oklahoma Rural Water Association (ORWA), and the Oklahoma Municipal League (OML). Results were collected through late November of 2008. Results were received online, via postal mail to the OWRB, and through the ORWA and OML.

Over 630 responses to the survey were received. While not all respondents fully completed the survey, significant data were received to provide a foundation for estimating current water demands. Responses were received from water providers representing 75 counties and 86 percent of the population across the state.

Results of the survey are used to develop the public-supply residential, public-supply nonresidential, and the self-supplied residential forecasts. Survey data used in each sector are discussed in the corresponding sections of this document. The survey is herein referenced as the 'Provider Survey.'

Section 3

Publically-Supplied Municipal and Industrial

3.1 Introduction

An important driver of water demand is population and employment. In Oklahoma, almost 92 percent of the population and nearly all commercial and light industrial establishments are serviced by public water systems. To forecast the publically-supplied M&I water demands with detail and accuracy at the county-level, this sector is grouped into two sub-sectors—public-supplied residential and public-supplied nonresidential. Each sub-sector is estimated separately because the household and businesses are driven by different water use patterns and water users.

This section describes the data, methodology, and results of the public-supply residential and nonresidential forecasts. Section 3.2 presents the public-supply residential forecast and the public-supply nonresidential forecast is discussed in Section 3.3. A summary of the publically-supplied M&I forecast is provided in Section 3.4.

3.2 Public-Supply Residential

Statewide in Oklahoma, an estimated 3.2 million people get their water from a public water supplier. The public-supplied residential demands represent the water provided to households that is used inside and outside the home for domestic activities. Indoor water uses include water for bathing, flushing, washing, drinking, etc., and capture all indoor water uses. Outdoor uses include water for landscape irrigation, car and home washing, recreation, domestic animal care, etc. Outdoor uses do not include water used for livestock or other agriculture needs, as these demands are included in the agriculture sector.

3.2.1 Methodology

For the public-supplied residential sector, the basic methodology developed for estimating future demands for each county is the average residential water use per capita times the projected population served within the county, as shown in Equation 1. Data are needed to estimate current and future water population serviced by water systems, the average per capita residential rate of use, and the percent of water lost during water production and transmission.

$$Q_{c,y}^{PSR} = [rgpcd_c \times P_{c,y}^{PSR}] \times [1 + (NRW_c / (1 - NRW_c))] \quad \text{Equation 1}$$

Where:

- $Q_{c,y}^{PSR}$ = Public-supplied residential water demand including system losses in county (c) in year (y)
- $rgpcd_c$ = Weighted average residential per capita in county (c)

- $P_{c,y}^{PSR}$ = Population supplied by public system in county (c) in year (y)
- NRW_c = Percent system losses in county (c)

3.2.2 Data

For the public-supply residential forecast, data were collected and derived for the *driver*, per unit use, and system loss percentage by county. Population projections are the primary source of the *driver*. Data collected from the Provider Survey are the basis for developing the per unit use and system loss percent.

Population

The Oklahoma Department of Commerce (ODOC) prepared a special tabulation of population projections for the OWRB in 2002 that estimates population to the year 2060 for each county, city, and town, and remaining rural area within each county. These county-level projections were calibrated by CDM to match 2007 Census estimates of population. This was done to capture changes in economic growth and demographic patterns since the 2002 release. The calibration adjusted the projections to align with the most recent available data.

Both the ODOC and Census data include military populations. However, the ODOC projections do not capture plans for future base-realignments within military installations. Data were provided by Fort Sill in Comanche County on future base-realignments. The base is expecting an increase of 5,550 in soldiers and 1,075 civilian personnel from 2007 to 2014. According to Fort Sill contacts, the average soldier has 0.978 dependents. Thus, population in Comanche County is expected to increase by 13,366 in 2014, in addition to the increase projected by the ODOC. The increase includes soldiers, civilians, and soldier families. The population projections for Comanche County were adjusted accordingly.

The ODOC and Census data also capture Tribal populations¹ but not specific plans for economic growth within Tribal Nations. For example, the Chickasaw Nation is planning expansion at two locations—one in Kingston in Marshall County and the other at Thackerville in Love County. The Love County WinStar Casino is expected to employ 6,000 persons and bring 13,970 additional people to the area by 2050. While the plan does not specify a completion date, the build date of the expansion was assumed to be complete between 2010 and 2020. The population projections for Love County were adjusted to capture the future growth of the WinStar Casino. For the Kingston Casino, the employment growth is less and is expected to be absorbed into the county, thus not expanding population projections. The employment projections for both counties were increased to capture the future expansion, as discussed in Section 3.3.

¹ Tribal populations do not represent tribal membership but rather the persons living in a given geography that may live on or off tribal lands. For purposes of the demand forecast, it is important that all persons living within a geographic area are counted and included in the forecast *driver*. ODOC projections of population and Census counts do include persons living on the tribal lands.

The resulting population projections, representing all persons living in the given county, are shown in Table 1. Statewide population is projected to increase by 33 percent from 2007 to 2060. The population projections shown in Table 1 are further identified as "self-supplied" and "public-supplied," as shown in Figure 2 and discussed below.

Table 1 - Total Population Projections by County

County	2007	2010	2020	2030	2040	2050	2060
Adair	21,902	22,962	26,773	30,585	34,396	38,301	42,205
Alfalfa	5,593	5,537	5,537	5,537	5,537	5,631	5,724
Atoka	14,512	15,036	16,879	18,722	20,565	22,602	24,639
Beaver	5,380	5,435	5,527	5,620	5,712	5,804	5,896
Beckham	19,700	20,212	22,015	23,913	25,811	27,709	29,797
Blaine	12,475	12,717	13,827	15,039	16,250	17,461	18,773
Bryan	39,563	40,827	45,040	49,353	53,667	57,980	62,394
Caddo	29,296	29,584	30,833	31,793	32,754	33,714	34,579
Canadian	103,559	106,854	117,286	125,413	132,441	138,921	145,510
Carter	47,582	48,254	51,104	53,853	56,500	59,350	62,404
Cherokee	45,393	47,663	54,755	61,753	68,846	75,750	82,842
Choctaw	15,011	15,127	15,515	15,806	16,194	16,582	16,970
Cimarron	2,664	2,664	2,831	2,914	2,914	2,997	3,080
Cleveland	236,452	243,459	261,555	276,180	287,858	296,065	304,061
Coal	5,709	5,869	6,758	7,648	8,626	9,693	10,760
Comanche	113,811	128,490	137,442	144,210	149,473	153,609	156,993
Cotton	6,299	6,357	6,453	6,549	6,646	6,838	6,935
Craig	15,195	15,650	17,358	18,970	20,772	22,574	24,471
Creek	69,073	70,543	75,441	79,262	82,888	86,513	90,432
Custer	26,111	26,571	27,818	28,970	30,121	30,984	31,751
Delaware	40,406	42,276	48,608	54,745	61,077	67,895	75,006
Dewey	4,338	4,338	4,244	4,244	4,244	4,338	4,432
Ellis	3,911	3,850	3,749	3,749	3,648	3,648	3,749
Garfield	57,657	58,128	59,896	61,369	62,743	63,823	65,100
Garvin	27,141	27,260	27,954	28,449	28,945	29,540	30,135
Grady	50,615	51,761	55,473	58,655	61,519	64,382	67,352
Grant	4,497	4,497	4,585	4,673	4,673	4,850	4,938
Greer	5,810	5,810	5,810	5,810	5,908	6,007	6,105
Harmon	2,837	2,890	2,890	2,977	3,065	3,152	3,240
Harper	3,254	3,198	3,198	3,198	3,198	3,292	3,292
Haskell	12,059	12,561	14,236	16,004	17,865	19,726	21,773
Hughes	13,680	14,167	15,792	17,416	19,130	21,025	22,920
Jackson	25,778	26,249	27,819	29,127	30,173	31,045	31,743
Jefferson	6,273	6,273	6,368	6,463	6,558	6,748	6,938
Johnston	10,402	10,735	12,031	13,419	14,807	16,288	17,861
Kay	45,638	45,975	47,567	48,784	49,908	51,031	52,249
Kingfisher	14,320	14,784	16,523	18,262	20,002	21,741	23,673
Kiowa	9,456	9,399	9,399	9,494	9,589	9,779	9,969
Latimer	10,508	10,624	11,107	11,686	12,362	13,038	13,811
Le Flore	49,715	50,780	54,724	58,274	61,823	65,373	69,120
Lincoln	32,272	33,073	36,027	38,505	41,079	43,747	46,607
Logan	36,435	37,843	42,537	46,742	50,946	55,053	59,454
Love	9,112	9,606	25,223	26,778	28,425	30,163	31,901
Major	7,190	7,132	7,229	7,229	7,325	7,421	7,518
Marshall	14,830	15,903	19,573	23,337	27,195	31,241	35,475
Mayes	39,627	40,790	44,859	48,734	52,804	56,970	61,233
McClain	31,849	33,434	39,024	44,206	49,389	54,775	60,263
McCurtain	33,539	33,939	35,465	36,704	37,753	38,897	39,946
McIntosh	19,709	20,385	22,828	25,364	28,183	31,377	34,758

Table 1 - Total Population Projections by County

County	2007	2010	2020	2030	2040	2050	2060
Murray	12,695	13,035	14,169	15,491	16,719	18,136	19,553
Muskogee	71,116	71,662	74,088	76,311	78,232	80,152	82,072
Noble	11,124	11,293	11,858	12,235	12,611	12,893	13,176
Nowata	10,723	11,170	12,752	14,335	15,917	17,592	19,361
Okfuskee	11,248	11,305	11,590	11,875	12,160	12,445	12,825
Oklahoma	701,807	713,774	748,374	779,107	802,309	819,202	835,892
Okmulgee	39,300	40,100	43,053	45,625	48,292	51,054	53,816
Osage	45,523	46,462	49,788	52,233	54,483	56,733	59,276
Ottawa	32,474	32,984	35,253	37,426	39,789	42,246	44,704
Pawnee	16,447	16,950	18,813	20,489	22,258	24,121	25,984
Payne	79,931	82,684	88,978	95,593	102,101	106,688	111,063
Pittsburg	44,711	45,190	47,285	49,080	51,175	53,569	56,163
Pontotoc	36,571	36,999	38,426	39,751	41,076	42,299	43,522
Pottawatomie	69,038	70,426	75,256	79,783	84,109	88,335	92,762
Pushmataha	11,666	12,055	13,632	15,116	16,692	18,454	20,216
Roger Mills	3,308	3,308	3,308	3,308	3,308	3,308	3,308
Rogers	83,105	86,272	96,934	106,089	114,598	123,322	132,261
Seminole	24,179	24,353	25,126	25,803	26,479	27,252	28,025
Sequoyah	41,024	42,368	46,946	51,231	55,419	59,705	63,990
Stephens	43,322	43,322	43,827	44,231	44,736	45,443	46,352
Texas	20,032	21,557	26,802	32,130	37,458	42,785	48,031
Tillman	8,148	8,148	8,325	8,502	8,679	8,857	9,122
Tulsa	585,068	595,326	627,632	654,571	673,557	687,970	701,986
Wagoner	67,239	69,679	77,814	84,557	90,765	96,866	103,288
Washington	49,888	50,130	51,240	51,744	52,450	53,156	53,963
Washita	11,667	11,786	12,182	12,479	12,677	12,974	13,172
Woods	8,319	8,374	8,374	8,465	8,556	8,647	8,829
Woodward	19,505	19,752	20,575	21,192	21,604	22,118	22,530
Statewide Total	3,617,316	3,707,936	3,977,882	4,205,238	4,410,513	4,601,768	4,796,019

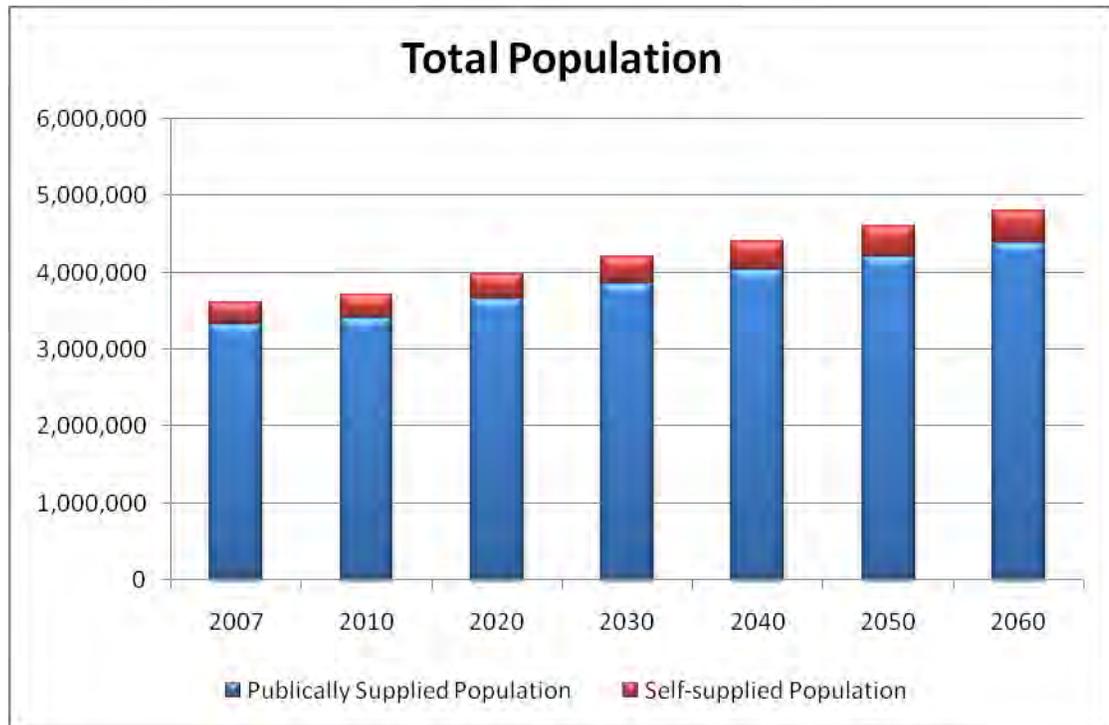


Figure 2 - Total Population

For the public-supplied residential forecast, the public-supplied portion of total county population projections is identified and only that portion is used in the forecast. Public-supplied population is the number of persons living in households that have water piped to their home from a water provider (versus households that have private wells). Population is split between public-supplied and self-supplied population using the U.S. Geological Survey (USGS) 2005 estimated population on private wells by county for Oklahoma. The USGS preliminary numbers were used to allocate the 2007 population projections between public-supplied and self-supplied. The ratio of public-supplied to self-supplied population for each county is assumed to remain constant into the future. The public-supplied population projections are shown in Table 2. Self-supplied population projections are presented in Section 4.2. Given these assumptions, the statewide public-supplied population is expected to increase by 32 percent from 2007 to 2060.

Table 2 - Public-Supplied Population Projections by County

County	2007	2010	2020	2030	2040	2050	2060
Adair	12,762	13,380	15,600	17,821	20,042	22,317	24,592
Alfalfa	4,733	4,685	4,685	4,685	4,685	4,765	4,844
Atoka	11,482	11,896	13,355	14,813	16,271	17,883	19,495
Beaver	2,760	2,788	2,836	2,883	2,930	2,977	3,025
Beckham	17,720	18,181	19,803	21,510	23,217	24,924	26,802
Blaine	11,345	11,565	12,575	13,676	14,778	15,879	17,073
Bryan	36,783	37,958	41,875	45,885	49,896	53,906	58,010
Caddo	17,566	17,739	18,487	19,063	19,639	20,215	20,734
Canadian	103,559	106,854	117,286	125,413	132,441	138,921	145,510
Carter	47,362	48,031	50,868	53,604	56,239	59,076	62,116
Cherokee	37,963	39,861	45,793	51,645	57,577	63,351	69,282
Choctaw	10,311	10,391	10,657	10,857	11,124	11,390	11,656
Cimarron	1,544	1,544	1,641	1,689	1,689	1,737	1,785
Cleveland	223,782	230,414	247,540	261,381	272,434	280,200	287,768
Coal	4,139	4,255	4,900	5,544	6,254	7,027	7,801
Comanche	111,621	126,017	134,797	141,435	146,597	150,653	153,972
Cotton	6,299	6,357	6,453	6,549	6,646	6,838	6,935
Craig	14,395	14,826	16,444	17,971	19,679	21,386	23,183
Creek	62,023	63,343	67,741	71,172	74,428	77,683	81,202
Custer	22,791	23,193	24,281	25,286	26,291	27,044	27,714
Delaware	28,906	30,244	34,774	39,164	43,693	48,572	53,659
Dewey	3,268	3,268	3,197	3,197	3,197	3,268	3,339
Ellis	2,531	2,492	2,426	2,426	2,361	2,361	2,426
Garfield	56,197	56,656	58,379	59,815	61,154	62,207	63,451
Garvin	22,991	23,092	23,680	24,099	24,519	25,023	25,527
Grady	34,875	35,664	38,222	40,415	42,388	44,361	46,407
Grant	3,847	3,847	3,922	3,998	3,998	4,149	4,224
Greer	5,810	5,810	5,810	5,810	5,908	6,007	6,105
Harmon	2,837	2,890	2,890	2,977	3,065	3,152	3,240
Harper	2,294	2,254	2,254	2,254	2,254	2,321	2,321
Haskell	6,779	7,061	8,003	8,997	10,043	11,089	12,240
Hughes	12,740	13,194	14,706	16,219	17,816	19,581	21,345
Jackson	24,698	25,149	26,653	27,906	28,909	29,745	30,413
Jefferson	6,133	6,133	6,226	6,319	6,412	6,598	6,783
Johnston	10,292	10,622	11,904	13,277	14,651	16,116	17,672
Kay	43,398	43,719	45,232	46,390	47,458	48,527	49,684
Kingfisher	10,310	10,644	11,896	13,148	14,401	15,653	17,044
Kiowa	9,456	9,399	9,399	9,494	9,589	9,779	9,969
Latimer	9,188	9,289	9,712	10,218	10,809	11,401	12,076
Le Flore	43,355	44,284	47,723	50,819	53,914	57,010	60,277
Lincoln	14,622	14,985	16,323	17,446	18,612	19,821	21,117
Logan	25,175	26,148	29,391	32,296	35,202	38,040	41,080
Love	8,802	9,279	24,365	25,867	27,458	29,137	30,816
Major	5,100	5,059	5,127	5,127	5,196	5,264	5,332
Marshall	14,180	15,206	18,715	22,314	26,003	29,872	33,920
Mayes	39,627	40,790	44,859	48,734	52,804	56,970	61,233
McClain	24,419	25,634	29,920	33,894	37,867	41,997	46,204
McCurtain	26,049	26,360	27,545	28,507	29,322	30,210	31,025
McIntosh	19,709	20,385	22,828	25,364	28,183	31,377	34,758
Murray	12,695	13,035	14,169	15,491	16,719	18,136	19,553
Muskogee	64,266	64,759	66,951	68,961	70,696	72,432	74,167
Noble	9,604	9,750	10,238	10,563	10,888	11,132	11,375
Nowata	10,033	10,451	11,932	13,412	14,893	16,460	18,115
Okfuskee	10,148	10,199	10,457	10,714	10,971	11,228	11,571
Oklahoma	687,767	699,495	733,403	763,521	786,259	802,814	819,169

Table 2 - Public-Supplied Population Projections by County

County	2007	2010	2020	2030	2040	2050	2060
Okmulgee	39,300	40,100	43,053	45,625	48,292	51,054	53,816
Osage	38,763	39,563	42,394	44,477	46,392	48,308	50,474
Ottawa	25,484	25,885	27,665	29,370	31,225	33,153	35,081
Pawnee	11,797	12,158	13,494	14,696	15,965	17,301	18,637
Payne	72,011	74,491	80,162	86,121	91,984	96,117	100,058
Pittsburg	44,711	45,190	47,285	49,080	51,175	53,569	56,163
Pontotoc	31,081	31,445	32,658	33,784	34,910	35,949	36,989
Pottawatomie	48,208	49,177	52,550	55,711	58,732	61,683	64,774
Pushmataha	10,126	10,464	11,832	13,120	14,489	16,018	17,547
Roger Mills	2,628	2,628	2,628	2,628	2,628	2,628	2,628
Rogers	77,525	80,479	90,426	98,966	106,903	115,042	123,381
Seminole	20,199	20,344	20,990	21,555	22,120	22,766	23,412
Sequoyah	40,204	41,521	46,007	50,207	54,312	58,512	62,711
Stephens	36,702	36,702	37,130	37,472	37,900	38,499	39,269
Texas	17,432	18,759	23,324	27,960	32,596	37,232	41,797
Tillman	7,478	7,478	7,641	7,803	7,966	8,128	8,372
Tulsa	576,128	586,230	618,042	644,569	663,265	677,458	691,260
Wagoner	67,239	69,679	77,814	84,557	90,765	96,866	103,288
Washington	49,888	50,130	51,240	51,744	52,450	53,156	53,963
Washita	9,467	9,563	9,885	10,126	10,287	10,528	10,689
Woods	7,209	7,256	7,256	7,335	7,414	7,493	7,651
Woodward	16,005	16,208	16,883	17,389	17,727	18,149	18,487
Statewide Total	3,322,626	3,405,974	3,651,204	3,856,335	4,039,962	4,209,587	4,381,585

Water Use and System Losses

The Provider Survey collected data on annual water demand, percent of that demand that services residential homes, and retail service area population for each provider for 2007. For each utility that responded to the survey, this information was used to derive an average residential per capita water use factor, or residential gallons per capita per day (rgpcd). A weighted average of the known rgpcd was calculated for each county based on serviced population. For the two counties with no utility participation in the Provider Survey, the weighted rgpcd from an adjacent county was assumed (implying similar regional water use patterns).

Additionally, the survey collected information on the amount of water lost through system leaks. This information allows for an adjustment to the county public supply forecast that includes water lost during water production and distribution to residential homes.

Specifically, the Provider Survey requested the non-revenue water (NRW) percentage for each provider. NRW is calculated as the difference between water produced and water sold as identified by billed sales. It is then divided by total water production to provide a measure of NRW as a percent of total production. The term "non-revenue water" has replaced the older term "unaccounted-for water" (UAW).

The difference between water produced and billed water sales includes authorized meter water usage that is not billed, unauthorized water use, billing errors, metering errors, line breaks, and system losses. NRW is often further separated to distinguish real water loss, such as line breaks, storage overflow, and system losses, from apparent loss, such as unmetered use, billing errors, and metering errors. Authorized unmetered water uses

include uses such as fire training, fire fighting, water line and reservoir flushing, and water used for street cleaning. Real loss as a percent of total production can usually be maintained at less than about 10 percent through system leak detection and line replacement programs.

Survey results for NRW ranged from 1 percent to over 40 percent. For purposes of the survey, any reported NRW over 15 percent was assumed to be un-metered consumption, thus the percentage was capped at 15 percent and referred to as system losses. Results of the rgpcd and system losses percentage for each county are shown in Table 3.

Table 3 - Provider Survey Results for Residential Gallons Per Capita Per Day and System Losses

County	Residential GPCD 2007	System Losses 2007
Adair	69	15%
Alfalfa	121	10%
Atoka	160	15%
Beaver	118	10%
Beckham	141	7%
Blaine	147	5%
Bryan	115	13%
Caddo	108	10%
Canadian	84	10%
Carter	90	14%
Cherokee	91	15%
Choctaw	62	15%
Cimarron	269	15%
Cleveland	91	14%
Coal	84	15%
Comanche	70	11%
Cotton	60	15%
Craig	75	15%
Creek	67	15%
Custer	118	13%
Delaware	74	15%
Dewey	219	13%
Ellis	176	15%
Garfield	114	15%
Garvin	100	15%
Grady	67	15%
Grant	107	15%
Greer	120	7%
Harmon	178	15%
Harper	253	15%
Haskell	76	15%
Hughes	79	15%
Jackson	91	15%
Jefferson	75	15%
Johnston	93	15%
Kay	73	15%
Kingfisher	119	15%
Kiowa	66	15%
Latimer	129	15%
Le Flore	76	15%
Lincoln	69	15%

Table 3 - Provider Survey Results for Residential Gallons Per Capita Per Day and System Losses

County	Residential GPCD 2007	System Losses 2007
Logan	110	15%
Love	78	15%
Major	89	13%
Marshall	78	15%
Mayes	73	15%
McClain	91	15%
McCurtain	83	15%
McIntosh	68	15%
Murray	114	14%
Muskogee	86	5%
Noble	74	13%
Nowata	63	15%
Okfuskee	77	15%
Oklahoma	69	13%
Okmulgee	177	15%
Osage	129	15%
Ottawa	88	15%
Pawnee	113	15%
Payne	73	15%
Pittsburg	89	15%
Pontotoc	92	11%
Pottawatomie	54	7%
Pushmataha	50	15%
Roger Mills	136	15%
Rogers	93	14%
Seminole	50	15%
Sequoyah	109	15%
Stephens	112	15%
Texas	117	15%
Tillman	106	13%
Tulsa	90	9%
Wagoner	80	15%
Washington	116	15%
Washita	58	11%
Woods	283	15%
Woodward	184	9%

3.2.3 Forecast

Results of the public-supplied residential forecast are shown in Table 4 for each county. Growth in counties is directly attributable to projected population growth. Statewide water demands from the public-supplied residential population are estimated to increase by 32 percent from 2007 to 2060, assuming per-capita usage and system losses remain constant for purposes of this baseline demand forecast.

Table 4 - Water Demands from Public-Supply Residential Sector Including System Losses (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Adair	1,153	1,209	1,409	1,610	1,811	2,016	2,222
Alfalfa	713	706	706	706	706	718	730
Atoka	2,424	2,512	2,820	3,128	3,436	3,776	4,116
Beaver	405	409	416	423	430	437	444
Beckham	3,001	3,079	3,354	3,643	3,932	4,222	4,540

Table 4 - Water Demands from Public-Supply Residential Sector Including System Losses (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Blaine	1,964	2,002	2,176	2,367	2,558	2,748	2,955
Bryan	5,439	5,613	6,192	6,785	7,378	7,971	8,577
Caddo	2,365	2,389	2,489	2,567	2,645	2,722	2,792
Canadian	10,892	11,239	12,336	13,191	13,930	14,612	15,305
Carter	5,514	5,592	5,922	6,241	6,547	6,878	7,231
Cherokee	4,429	4,651	5,343	6,026	6,718	7,391	8,084
Choctaw	834	840	862	878	899	921	942
Cimarron	547	547	581	598	598	615	632
Cleveland	26,529	27,315	29,345	30,986	32,296	33,217	34,114
Coal	461	473	545	617	696	782	868
Comanche	9,865	11,137	11,913	12,499	12,956	13,314	13,607
Cotton	502	507	514	522	530	545	553
Craig	1,429	1,472	1,632	1,784	1,954	2,123	2,302
Creek	5,510	5,627	6,018	6,323	6,612	6,901	7,214
Custer	3,463	3,525	3,690	3,843	3,995	4,110	4,212
Delaware	2,820	2,950	3,392	3,820	4,262	4,738	5,234
Dewey	928	928	907	907	907	928	948
Ellis	587	578	563	563	548	548	563
Garfield	8,423	8,492	8,750	8,965	9,166	9,324	9,511
Garvin	3,044	3,058	3,136	3,191	3,247	3,314	3,380
Grady	3,064	3,134	3,358	3,551	3,724	3,898	4,078
Grant	542	542	552	563	563	584	595
Greer	841	841	841	841	855	870	884
Harmon	667	679	679	700	721	741	762
Harper	765	752	752	752	752	774	774
Haskell	675	703	797	896	1,000	1,104	1,219
Hughes	1,327	1,374	1,531	1,689	1,855	2,039	2,223
Jackson	2,960	3,015	3,195	3,345	3,465	3,565	3,645
Jefferson	603	603	612	621	630	649	667
Johnston	1,264	1,305	1,462	1,631	1,799	1,979	2,171
Kay	4,203	4,234	4,381	4,493	4,597	4,700	4,812
Kingfisher	1,620	1,672	1,869	2,066	2,263	2,459	2,678
Kiowa	825	820	820	829	837	853	870
Latimer	1,558	1,576	1,647	1,733	1,833	1,934	2,048
Le Flore	4,342	4,435	4,779	5,089	5,399	5,709	6,037
Lincoln	1,325	1,358	1,479	1,581	1,687	1,797	1,914
Logan	3,651	3,792	4,263	4,684	5,106	5,517	5,958
Love	900	948	2,490	2,643	2,806	2,978	3,149
Major	580	576	584	584	591	599	607
Marshall	1,454	1,559	1,919	2,288	2,666	3,063	3,478
Mayes	3,788	3,899	4,288	4,658	5,047	5,445	5,853
McClain	2,925	3,071	3,584	4,060	4,536	5,031	5,535
McCurtain	2,841	2,875	3,004	3,109	3,198	3,295	3,384
McIntosh	1,768	1,829	2,048	2,276	2,529	2,815	3,119
Murray	1,883	1,933	2,102	2,298	2,480	2,690	2,900
Muskogee	6,483	6,533	6,754	6,957	7,132	7,307	7,482
Noble	914	928	974	1,005	1,036	1,059	1,082
Nowata	832	867	990	1,113	1,236	1,366	1,503
Okfuskee	1,028	1,034	1,060	1,086	1,112	1,138	1,173
Oklahoma	61,028	62,069	65,078	67,750	69,768	71,237	72,688
Okmulgee	9,176	9,363	10,053	10,653	11,276	11,921	12,566
Osage	6,595	6,731	7,213	7,567	7,893	8,219	8,587
Ottawa	2,949	2,996	3,202	3,399	3,614	3,837	4,060
Pawnee	1,764	1,818	2,018	2,198	2,388	2,587	2,787
Payne	6,935	7,174	7,720	8,294	8,858	9,256	9,636

Table 4 - Water Demands from Public-Supply Residential Sector Including System Losses (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Pittsburg	5,227	5,283	5,528	5,738	5,983	6,262	6,566
Pontotoc	3,605	3,647	3,787	3,918	4,049	4,169	4,290
Pottawatomie	3,129	3,191	3,410	3,616	3,812	4,003	4,204
Pushmataha	667	689	780	865	955	1,055	1,156
Roger Mills	473	473	473	473	473	473	473
Rogers	9,389	9,746	10,951	11,985	12,947	13,932	14,942
Seminole	1,331	1,341	1,383	1,420	1,458	1,500	1,543
Sequoyah	5,797	5,987	6,634	7,239	7,831	8,436	9,042
Stephens	5,435	5,435	5,498	5,549	5,612	5,701	5,815
Texas	2,678	2,882	3,583	4,295	5,007	5,719	6,421
Tillman	1,023	1,023	1,046	1,068	1,090	1,112	1,146
Tulsa	64,076	65,199	68,737	71,687	73,767	75,345	76,880
Wagoner	7,121	7,379	8,241	8,955	9,612	10,259	10,939
Washington	7,603	7,639	7,809	7,885	7,993	8,101	8,224
Washita	691	698	721	739	750	768	780
Woods	2,692	2,709	2,709	2,739	2,768	2,798	2,857
Woodward	3,617	3,663	3,815	3,930	4,006	4,101	4,178
Statewide Total	371,870	380,868	408,215	431,284	452,118	471,620	491,449

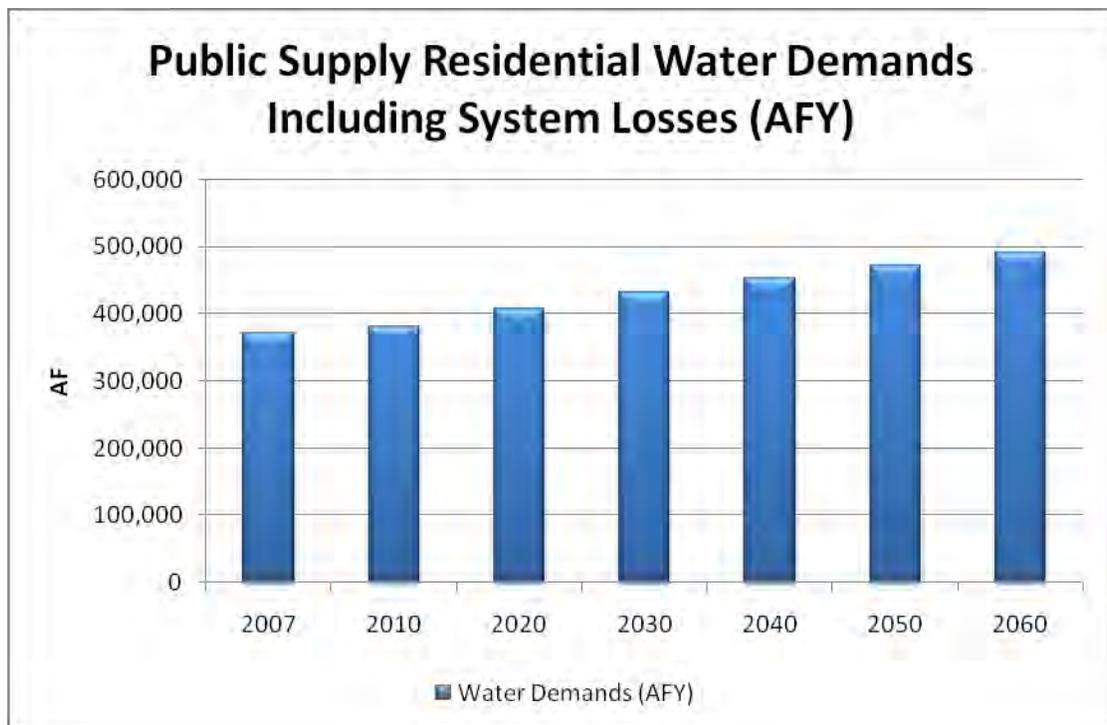


Figure 3 - Public Supply Residential Water Demands Including System Losses (AFY)

3.3 Public-Supply Nonresidential

Closely related to the public-supply residential forecast is the public-supply nonresidential forecast. Nonresidential refers to all properties other than residential housing such as office buildings, shopping centers, industrial parks, schools, churches, hotels, etc. Public-supply refers to establishments receiving water from public water systems. For purposes

of the OCWP water demand forecast, the public-supply nonresidential forecast captures water use from all nonresidential establishments other than those identified and represented in the self-supplied sector in Section 4.4. Establishments identified for the self-supplied industrial sector are removed from the public supply nonresidential forecast to avoid double-counting.

The public-supply nonresidential forecast relies on several data—employment by group and county, water use per employee by group, employment projections for Oklahoma, and the population projections previously discussed. The data, methodology, and results of the forecast are discussed in the following sections.

3.3.1 Methodology

County nonresidential water use is estimated by multiplying county employment by water use per employee. Projections of employment and water use are obtained at the most detailed level available. Both employment and water use per employee are available at the 2-digit North American Industrial Classification System (NAICS)² level. System loss percentages, as discussed in Section 3.2.2, are also captured in the forecast. Water use per employee is assumed to remain constant while employment grows in the future. Equation 2 provides the detailed formula for estimating water use for the public-supplied nonresidential sector.

$$Q_{c,y}^{PSNR} = \left[\sum (E_{c,y}^{NAICS} \times GBD_c^{NAICS}) \right] \times \left[1 + (NRW_c / (1 - NRW_c)) \right] \quad \text{Equation 2}$$

Where:

- $Q_{c,y}^{PSNR}$ = Public-supplied nonresidential water demand including system losses in county (c) in year (y)
- $E_{c,y}^{NAICS}$ = Employment by NAICS group in county (c) and year (y)
- GBD_c^{NAICS} = Water use per employee by NAICS group, which may be adjusted for a specific county (c)
- NRW_c = Percent system losses in county (c)

3.3.2 Data

The public-supply nonresidential forecast is driven by economic activity, which can be difficult to predict. Thus, a typical measure of nonresidential water use in forecasting is employment, which is more foreseeable. Employment projections were developed for Oklahoma by county and by employment group. The rate of water use per employee is unique to the type of establishment, e.g., water use per employee would be significantly

² NAICS is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

higher at a restaurant where water is being used to wash dishes and prepare food than at a bank where water use is for sanitary purposes. To account for this, per unit use factors were developed by employment group from an existing database.

Employment

County level employment data for 2006 were collected by NAICS levels from the Bureau of Labor Statistics (BLS). The BLS, along with the U.S. Department of Labor and the State Employment Security Agencies (SESAs), manage the Quarterly Census of Employment and Wages (QCEW) program. This program produces a comprehensive tabulation of employment and wage information for workers covered by state unemployment insurance laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. Publicly available files include data on the number of establishments, monthly employment, and quarterly wages, by NAICS industry, by county, by ownership sector, for the entire United States³. QCEW data include all government and private employees. These data were used as the starting point for the employment projections. A sample of the QCEW data used in the employment projections is shown in Table 5 for Beckham County.

Table 5 - Sample of QCEW Data, Beckham County, Oklahoma, 2006

Ownership Title	NAICS Description	Annual Average Establishment Count	Annual Average Employment
Total Covered	10 Total, all industries	767	8,599
Federal Government	10 Total, all industries	10	50
State Government	10 Total, all industries	10	156
Local Government	10 Total, all industries	32	917
Private	10 Total, all industries	715	7,476
Private	11 Agriculture, forestry, fishing and hunting	9	52
Private	21 Mining, quarrying, and oil and gas extraction	82	1,295
Local Government	22 Utilities	4	27
Private	22 Utilities	9	75
Local Government	23 Construction	2	a
Private	23 Construction	61	380
Private	31-33 Manufacturing	16	344
Private	42 Wholesale trade	31	336
Private	44-45 Retail trade	128	1,374
Federal Government	48-49 Transportation and warehousing	6	38
Private	48-49 Transportation and warehousing	30	347
Local Government	51 Information	1	a
Private	51 Information	11	70
Private	52 Finance and insurance	37	313
Private	53 Real estate and rental and leasing	28	276
Private	54 Professional and technical services	53	a
Private	55 Management of companies and enterprises	1	a
Local Government	56 Administrative and waste services	1	a
Private	56 Administrative and waste services	35	301
State Government	61 Educational services	1	0
Local Government	61 Educational services	5	560
Private	61 Educational services	1	a

³ <http://www.bls.gov/cew/cewover.htm>

Table 5 - Sample of QCEW Data, Beckham County, Oklahoma, 2006

Ownership Title	NAICS Description	Annual Average Establishment Count	Annual Average Employment
Private	62 Health care and social assistance	78	a
Local Government	71 Arts, entertainment, and recreation	1	a
Private	71 Arts, entertainment, and recreation	7	26
Private	72 Accommodation and food services	56	852
Private	81 Other services, except public administration	41	164
Federal Government	92 Public Administration	4	12
State Government	92 Public Administration	9	a
Local Government	92 Public Administration	18	233
Private	99 Unclassified	3	7

(a) Withheld to avoid disclosing data of individual companies; data are included in higher level totals

As shown in Table 5, not all of the QCEW data are released for public review. Some data are withheld to avoid disclosing data of individual companies. Thus, a methodology was developed to estimate the unknown employment numbers. The average number of employees per establishment type were developed for the state and used to fill in the gaps. Because the withheld data were included in the total employment count, estimated values were scaled up or down according to the ratio of the estimated total to the actual total.

Next, the employment counts for 2006 by NAICS and county were projected to 2060. The most recent available Oklahoma Employment Security Commission (OESC) 10-year projections of statewide employment by 2- and 3-digit NAICS were used to project demands to 2016. Specifically, the rate of change for each 2-digit NAICS level from the OESC state-level projections was applied to the BLS 2006 county employment to project employment by 2-digit NAICS to 2016 for each county. Beyond 2016 (to 2060), employment was assumed to grow in direct proportion to county population projections. That is, the ratio of 2-digit NAICS employment to county population remains constant after 2016.

When better information regarding the future employment of Oklahoma was available, it was used to adjust the employment projections. The only such information provided was from the Chickasaw Nation Report. The employment increases planned for both Love and Marshall Counties, as shown in Table 2.3 of the Chickasaw Report, were added to the employment growth for these counties to account for the future expansion.

Projections of total employment by county are shown in Table 6. Employment projections by 2-digit NAICS code for each county are presented in Appendix B. Statewide employment is estimated to increase by 31 percent from 2006 to 2060 as illustrated in Figure 4.

Table 6 - Projection of Total Employment for Oklahoma by County

County	2006	2010	2020	2030	2040	2050	2060
Adair	5,376	5,537	5,864	6,699	7,533	8,389	9,244
Alfalfa	1,237	1,286	1,359	1,359	1,359	1,382	1,405
Atoka	3,368	3,497	3,730	4,138	4,545	4,995	5,445
Beaver	1,425	1,484	1,579	1,605	1,631	1,658	1,684
Beckham	8,599	8,951	9,562	10,387	11,211	12,036	12,942

Table 6 - Projection of Total Employment for Oklahoma by County

County	2006	2010	2020	2030	2040	2050	2060
Blaine	3,094	3,228	3,453	3,756	4,058	4,361	4,688
Bryan	15,939	16,662	17,914	19,629	21,345	23,060	24,816
Caddo	6,988	7,286	7,766	8,008	8,250	8,492	8,710
Canadian	24,751	25,717	27,401	29,299	30,941	32,455	33,994
Carter	21,926	22,762	24,160	25,459	26,711	28,058	29,502
Cherokee	14,680	15,362	16,598	18,719	20,869	22,962	25,112
Choctaw	4,353	4,555	4,871	4,962	5,084	5,205	5,327
Cimarron	713	739	782	805	805	829	852
Cleveland	70,643	74,043	79,643	84,096	87,652	90,151	92,585
Coal	1,049	1,096	1,183	1,338	1,509	1,696	1,883
Comanche	40,220	41,929	44,742	46,946	48,659	50,006	51,107
Cotton	1,449	1,513	1,614	1,638	1,662	1,710	1,734
Craig	5,925	6,147	6,544	7,152	7,832	8,511	9,227
Creek	16,962	17,558	18,569	19,509	20,402	21,294	22,258
Custer	11,128	11,585	12,314	12,824	13,333	13,715	14,055
Delaware	7,900	8,276	8,954	10,084	11,250	12,506	13,816
Dewey	1,248	1,298	1,372	1,372	1,372	1,402	1,433
Ellis	1,007	1,050	1,109	1,109	1,079	1,079	1,109
Garfield	24,152	25,169	26,774	27,432	28,047	28,530	29,100
Garvin	9,007	9,334	9,844	10,019	10,193	10,403	10,612
Grady	12,885	13,352	14,145	14,956	15,687	16,417	17,174
Grant	1,105	1,148	1,217	1,241	1,241	1,288	1,311
Greer	1,492	1,557	1,655	1,655	1,683	1,711	1,739
Harmon	819	855	910	938	965	993	1,020
Harper	1,270	1,319	1,393	1,393	1,393	1,434	1,434
Haskell	3,714	3,895	4,216	4,740	5,291	5,842	6,449
Hughes	2,847	2,972	3,196	3,525	3,872	4,255	4,639
Jackson	10,886	11,293	11,972	12,535	12,985	13,361	13,661
Jefferson	1,249	1,299	1,377	1,398	1,418	1,459	1,501
Johnston	2,968	3,060	3,232	3,605	3,978	4,376	4,799
Kay	19,688	20,464	21,697	22,253	22,765	23,278	23,833
Kingfisher	5,908	6,090	6,431	7,108	7,785	8,462	9,215
Kiowa	2,429	2,540	2,706	2,733	2,760	2,815	2,870
Latimer	3,870	4,058	4,362	4,590	4,856	5,121	5,425
Le Flore	12,767	13,211	13,977	14,883	15,790	16,697	17,654
Lincoln	7,085	7,390	7,911	8,455	9,020	9,606	10,234
Logan	6,690	7,013	7,581	8,331	9,080	9,812	10,596
Love	3,370	3,531	3,875	4,284	4,759	5,209	5,649
Major	2,260	2,352	2,491	2,491	2,524	2,557	2,590
Marshall	4,308	4,426	4,790	5,230	5,646	6,034	6,407
Mayer	11,189	11,545	12,189	13,242	14,348	15,480	16,638
McClain	7,228	7,554	8,157	8,924	9,723	10,559	11,429
McCurtain	10,216	10,618	11,268	11,962	12,705	13,459	14,229
McIntosh	4,258	4,442	4,768	5,298	5,886	6,533	7,260
Murray	5,089	5,337	5,754	6,291	6,889	7,545	8,260
Muskogee	28,350	29,508	31,349	32,289	33,102	33,915	34,727
Noble	4,290	4,469	4,760	4,911	5,063	5,176	5,289
Nowata	1,788	1,852	1,974	2,219	2,464	2,723	2,997
Okfuskee	2,282	2,384	2,545	2,608	2,670	2,733	2,816
Oklahoma	420,127	438,854	469,036	488,298	502,840	513,427	523,887
Okmulgee	9,995	10,371	11,012	11,670	12,352	13,059	13,765
Osage	5,924	6,185	6,619	6,944	7,243	7,542	7,880
Ottawa	11,346	11,825	12,624	13,403	14,249	15,129	16,009
Pawnee	3,377	3,528	3,791	4,129	4,486	4,861	5,237
Payne	34,260	35,721	38,151	40,987	43,777	45,744	47,620

Table 6 - Projection of Total Employment for Oklahoma by County

County	2006	2010	2020	2030	2040	2050	2060
Pittsburg	16,912	17,570	18,643	19,351	20,177	21,121	22,144
Pontotoc	18,407	19,243	20,573	21,282	21,992	22,647	23,301
Pottawatomie	20,480	21,292	22,649	24,011	25,313	26,585	27,917
Pushmataha	3,127	3,266	3,513	3,895	4,301	4,755	5,209
Roger Mills	826	858	906	906	906	906	906
Rogers	23,822	24,667	26,219	28,695	30,996	33,356	35,774
Seminole	7,549	7,827	8,269	8,491	8,714	8,968	9,223
Sequoyah	9,156	9,577	10,306	11,247	12,167	13,108	14,048
Stephens	15,505	16,032	16,846	17,002	17,196	17,467	17,817
Texas	6,475	6,741	7,283	8,730	10,178	11,626	13,051
Tillman	2,173	2,259	2,393	2,444	2,495	2,546	2,622
Tulsa	341,500	355,930	379,487	395,775	407,255	415,969	424,444
Wagoner	6,804	7,057	7,512	8,163	8,763	9,352	9,972
Washington	19,510	20,352	21,659	21,872	22,170	22,469	22,810
Washita	2,287	2,380	2,528	2,589	2,630	2,692	2,733
Woods	3,110	3,242	3,439	3,477	3,514	3,552	3,626
Woodward	9,378	9,756	10,364	10,675	10,882	11,141	11,348
Statewide Total	1,477,489	1,540,129	1,652,122	1,736,384	1,809,199	1,873,906	1,939,148

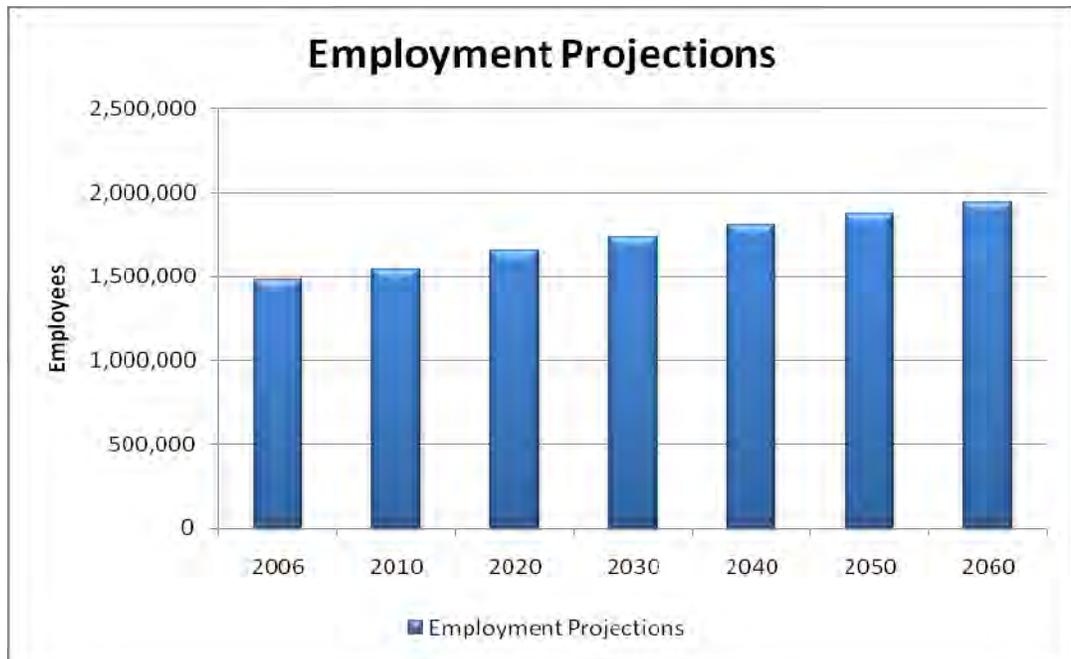


Figure 4 - Employment Projections

Water Use Coefficients

The per employee water use rates were developed from the IWR-MAIN Water Demand Management Software Nonresidential Database. IWR-MAIN is proprietary software developed by Camp Dresser & McKee Inc. (CDM) used in the development of water demand forecasts. The software is often used for planning by the U.S. Army Corps of Engineers (USACE). The nonresidential database contains average gallons of water use per employee per day (ged) at the 2-digit and 3-digit Standard Industrial Code (SIC). A

special tabulation was computed to transform the data to 2-digit NAICS code. The resulting water use factors are summarized by major employment groups in Table 7.

Table 7 - Nonresidential Water Use Coefficients from IWR-MAIN

NAICS	GED*
11 Agriculture, forestry, fishing and hunting	111.8
21 Mining, quarrying, and oil and gas extraction	488.4
22 Utilities	28.4
23 Construction	66.6
31-33 Manufacturing	144.5
42 Wholesale trade	44.1
44-45 Retail trade	46.4
48-49 Transportation and warehousing	57.2
51 Information	28.0
52 Finance and insurance	59.8
53 Real estate and rental and leasing	163.5
54 Professional and technical services	68.6
55 Management of companies and enterprises	64.0
56 Administrative and waste services	41.2
61 Educational services	103.6
62 Health care and social assistance	84.7
71 Arts, entertainment, and recreation	446.6
72 Accommodation and food services	185.5
81 Other services, except public administration	271.3
92 Public Administration	125.4
99 Unclassified	122.9

* GED-gallons per employee per day

The water use coefficients represent all water used at a given establishment on an average day divided by the number of employees. Establishments that generally only use water for sanitary use, such as retail trade shops and offices, have lower water use rates than establishments using water for additional services, such as for food preparation at schools or laundry washing at hotels.

Supplemental information for Pittsburg County was obtained and used to replace the standard employment water use factor for manufacturing through data collected from the McAlester Ammunition Plant⁴.

3.3.3 Forecast

Results of the public-supplied nonresidential forecast including system losses for each county are shown in Table 8. Growth in county water demand is directly attributable to projected employment growth. Statewide water demands from the public supplied nonresidential sector are estimated to increase by 33 percent from 2007 to 2060 as illustrated in Figure 5.

⁴ McAlester is included in the public supply nonresidential sector even though it is a self-supplied industrial establishment because McAlester provides water to rural water districts and experiences systems losses.

Table 8 – Public-Supply Nonresidential Water Demands Including System Losses (AFY)

County	2006	2010	2020	2030	2040	2050	2060
Adair	765	785	827	945	1,063	1,183	1,304
Alfalfa	160	167	176	176	176	179	182
Atoka	493	512	546	606	665	731	797
Beaver	293	305	324	329	335	340	346
Beckham	1,598	1,659	1,766	1,918	2,071	2,223	2,390
Blaine	453	473	506	551	595	639	688
Bryan	2,405	2,533	2,751	3,014	3,277	3,541	3,810
Caddo	876	916	981	1,011	1,042	1,072	1,100
Canadian	4,043	4,209	4,497	4,809	5,078	5,326	5,579
Carter	3,299	3,416	3,613	3,807	3,994	4,196	4,412
Cherokee	2,126	2,233	2,424	2,734	3,048	3,354	3,668
Choctaw	684	720	775	789	809	828	847
Cimarron	95	98	104	107	107	110	113
Cleveland	9,866	10,369	11,193	11,818	12,318	12,669	13,012
Coal	145	153	166	188	212	238	264
Comanche	5,313	5,545	5,926	6,218	6,445	6,623	6,769
Cotton	264	276	295	299	303	312	317
Craig	793	822	874	955	1,046	1,137	1,232
Creek	2,685	2,772	2,921	3,069	3,209	3,349	3,501
Custer	1,743	1,815	1,929	2,009	2,089	2,149	2,202
Delaware	1,208	1,273	1,389	1,564	1,745	1,940	2,143
Dewey	218	226	238	238	238	244	249
Ellis	151	158	167	167	163	163	167
Garfield	3,611	3,756	3,986	4,084	4,175	4,247	4,332
Garvin	1,646	1,702	1,791	1,822	1,854	1,892	1,930
Grady	1,986	2,055	2,172	2,297	2,409	2,521	2,638
Grant	168	175	185	188	188	196	199
Greer	187	195	208	208	212	215	219
Harmon	105	110	118	121	125	128	132
Harper	202	210	221	221	221	228	228
Haskell	595	621	669	753	840	928	1,024
Hughes	395	412	443	489	537	590	644
Jackson	1,545	1,605	1,704	1,784	1,848	1,902	1,945
Jefferson	167	173	183	186	189	194	200
Johnston	470	483	507	566	624	686	753
Kay	3,345	3,477	3,685	3,779	3,866	3,953	4,048
Kingfisher	1,219	1,255	1,324	1,463	1,603	1,742	1,897
Kiowa	408	426	454	459	463	472	481
Latimer	654	685	734	773	817	862	913
Le Flore	2,087	2,151	2,263	2,410	2,557	2,704	2,859
Lincoln	976	1,018	1,089	1,164	1,241	1,322	1,408
Logan	955	1,005	1,091	1,199	1,306	1,412	1,525
Love	548	576	2,648	2,811	2,984	3,166	3,349
Major	394	408	430	430	436	441	447
Marshall	679	698	1,715	2,044	2,382	2,737	3,108
Mayes	1,590	1,636	1,720	1,868	2,024	2,184	2,347
McClain	1,072	1,119	1,208	1,368	1,528	1,695	1,865
McCurtain	1,385	1,437	1,523	1,576	1,621	1,670	1,715
McIntosh	624	656	711	790	878	978	1,083
Murray	742	779	840	918	991	1,075	1,159
Muskogee	3,454	3,598	3,826	3,941	4,040	4,139	4,239
Noble	704	735	785	810	835	854	872
Nowata	242	250	266	299	333	368	405
Okfuskee	357	374	401	411	421	431	444
Oklahoma	59,203	61,862	66,147	68,863	70,914	72,407	73,882
Okmulgee	1,510	1,566	1,663	1,762	1,865	1,972	2,079

Table 8 – Public-Supply Nonresidential Water Demands Including System Losses (AFY)

County	2006	2010	2020	2030	2040	2050	2060
Osage	1,114	1,164	1,248	1,309	1,365	1,422	1,486
Ottawa	2,068	2,184	2,373	2,519	2,678	2,844	3,009
Pawnee	510	532	570	621	674	731	787
Payne	5,259	5,515	5,936	6,377	6,811	7,118	7,409
Pittsburg	3,088	3,162	3,288	3,412	3,558	3,725	3,905
Pontotoc	2,326	2,428	2,589	2,678	2,767	2,850	2,932
Pottawatomie	2,761	2,869	3,049	3,233	3,408	3,579	3,759
Pushmataha	405	424	457	507	560	619	678
Roger Mills	140	145	153	153	153	153	153
Rogers	3,503	3,630	3,862	4,227	4,566	4,914	5,270
Seminole	1,411	1,461	1,540	1,582	1,623	1,671	1,718
Sequoyah	1,325	1,393	1,509	1,647	1,782	1,919	2,057
Stephens	3,037	3,135	3,287	3,317	3,355	3,408	3,476
Texas	898	938	1,016	1,218	1,420	1,622	1,821
Tillman	309	322	343	350	357	364	375
Tulsa	43,051	44,846	47,779	49,830	51,275	52,372	53,439
Wagoner	987	1,023	1,088	1,182	1,269	1,354	1,444
Washington	4,136	4,300	4,556	4,600	4,663	4,726	4,798
Washita	391	406	430	440	447	458	465
Woods	433	452	480	485	490	496	506
Woodward	1,982	2,055	2,174	2,239	2,282	2,337	2,380
Statewide Total	212,031	221,023	238,823	251,108	261,864	271,539	281,325

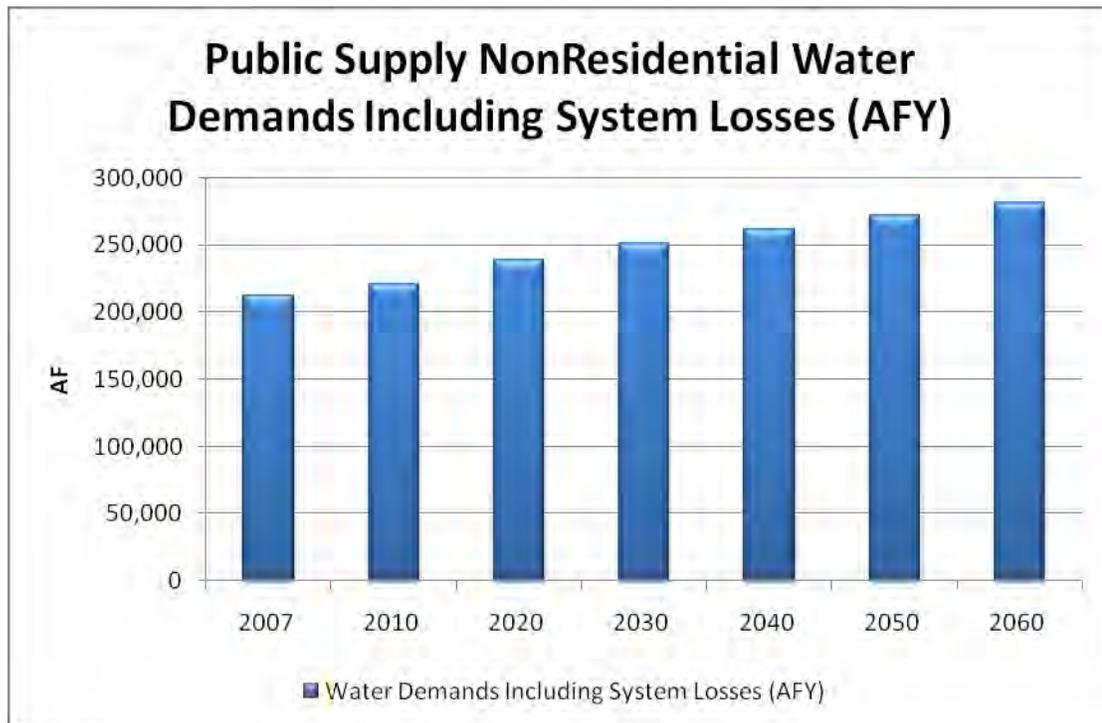


Figure 5 - Public Supply Nonresidential Water Demands Including System Losses (AFY)

3.4 Public-Supply M&I Summary

Table 9 provides a summary of the public-supplied M&I water demands by county that include residential demands, nonresidential demands, and system-losses.

Table 9 - Summary of Public-Supply M&I Demands Including System Losses (AFY)

COUNTY	2007	2010	2020	2030	2040	2050	2060
Adair	1,918	1,994	2,237	2,555	2,874	3,200	3,526
Alfalfa	873	873	882	882	882	897	912
Atoka	2,917	3,024	3,366	3,733	4,101	4,507	4,913
Beaver	698	714	740	752	765	777	789
Beckham	4,599	4,739	5,120	5,562	6,003	6,444	6,930
Blaine	2,416	2,474	2,683	2,918	3,153	3,388	3,642
Bryan	7,844	8,145	8,942	9,799	10,655	11,511	12,388
Caddo	3,242	3,305	3,470	3,578	3,686	3,794	3,892
Canadian	14,935	15,448	16,833	18,000	19,008	19,938	20,884
Carter	8,813	9,008	9,535	10,048	10,541	11,073	11,643
Cherokee	6,555	6,884	7,767	8,760	9,766	10,745	11,751
Choctaw	1,518	1,560	1,637	1,667	1,708	1,749	1,790
Cimarron	642	645	685	705	705	726	746
Cleveland	36,395	37,683	40,538	42,804	44,614	45,886	47,126
Coal	606	626	711	805	908	1,020	1,132
Comanche	15,177	16,682	17,839	18,717	19,400	19,937	20,376
Cotton	766	783	809	821	833	857	869
Craig	2,223	2,294	2,507	2,739	3,000	3,260	3,534
Creek	8,195	8,399	8,939	9,391	9,821	10,250	10,715
Custer	5,207	5,339	5,619	5,852	6,084	6,259	6,414
Delaware	4,027	4,223	4,781	5,384	6,007	6,678	7,377
Dewey	1,146	1,154	1,146	1,146	1,146	1,171	1,197
Ellis	738	736	730	730	711	711	730
Garfield	12,034	12,248	12,736	13,049	13,341	13,571	13,842
Garvin	4,690	4,760	4,926	5,014	5,101	5,206	5,311
Grady	5,050	5,188	5,531	5,848	6,133	6,419	6,715
Grant	710	716	737	752	752	780	794
Greer	1,028	1,037	1,049	1,049	1,067	1,085	1,103
Harmon	772	789	797	821	845	870	894
Harper	967	961	973	973	973	1,001	1,001
Haskell	1,270	1,324	1,466	1,648	1,840	2,032	2,243
Hughes	1,721	1,786	1,975	2,178	2,392	2,629	2,866
Jackson	4,505	4,619	4,899	5,129	5,314	5,467	5,590
Jefferson	769	776	795	807	819	843	866
Johnston	1,734	1,787	1,969	2,196	2,423	2,666	2,923
Kay	7,549	7,711	8,066	8,272	8,463	8,654	8,860
Kingfisher	2,839	2,928	3,193	3,529	3,865	4,202	4,575
Kiowa	1,233	1,247	1,274	1,287	1,300	1,326	1,351
Latimer	2,213	2,260	2,382	2,506	2,651	2,796	2,961
Le Flore	6,429	6,586	7,043	7,499	7,956	8,413	8,895
Lincoln	2,301	2,376	2,568	2,745	2,928	3,119	3,322
Logan	4,607	4,797	5,354	5,883	6,412	6,929	7,483
Love	1,447	1,524	5,138	5,455	5,790	6,144	6,498
Major	974	984	1,013	1,013	1,027	1,040	1,054
Marshall	2,133	2,257	3,634	4,333	5,049	5,800	6,586
Mayes	5,377	5,534	6,007	6,526	7,071	7,629	8,200
McClain	3,997	4,190	4,792	5,428	6,065	6,726	7,400
McCurtain	4,225	4,312	4,527	4,685	4,819	4,965	5,099
McIntosh	2,393	2,485	2,760	3,066	3,407	3,793	4,202
Murray	2,625	2,712	2,941	3,216	3,471	3,765	4,059

Table 9 - Summary of Public-Supply M&I Demands Including System Losses (AFY)

COUNTY	2007	2010	2020	2030	2040	2050	2060
Muskogee	9,937	10,130	10,580	10,898	11,172	11,446	11,720
Noble	1,617	1,662	1,759	1,815	1,871	1,913	1,955
Nowata	1,075	1,118	1,256	1,412	1,568	1,733	1,907
Okfuskee	1,385	1,408	1,461	1,497	1,533	1,569	1,616
Oklahoma	120,231	123,931	131,224	136,613	140,682	143,644	146,570
Okmulgee	10,686	10,930	11,716	12,415	13,141	13,893	14,645
Osage	7,708	7,895	8,460	8,876	9,258	9,640	10,073
Ottawa	5,017	5,179	5,575	5,918	6,292	6,681	7,069
Pawnee	2,274	2,350	2,588	2,818	3,062	3,318	3,574
Payne	12,193	12,688	13,656	14,671	15,670	16,374	17,045
Pittsburg	8,315	8,445	8,815	9,150	9,541	9,987	10,471
Pontotoc	5,931	6,074	6,376	6,596	6,816	7,019	7,222
Pottawatomie	5,890	6,060	6,460	6,848	7,220	7,583	7,963
Pushmataha	1,073	1,114	1,237	1,371	1,514	1,674	1,834
Roger Mills	613	618	626	626	626	626	626
Rogers	12,891	13,376	14,813	16,213	17,513	18,846	20,212
Seminole	2,742	2,801	2,923	3,002	3,081	3,171	3,261
Sequoyah	7,122	7,380	8,143	8,886	9,612	10,356	11,099
Stephens	8,472	8,570	8,785	8,866	8,967	9,109	9,291
Texas	3,576	3,819	4,599	5,513	6,427	7,342	8,242
Tillman	1,332	1,345	1,388	1,418	1,447	1,477	1,521
Tulsa	107,126	110,045	116,516	121,517	125,042	127,717	130,319
Wagoner	8,108	8,402	9,329	10,137	10,881	11,613	12,383
Washington	11,739	11,940	12,364	12,486	12,656	12,827	13,021
Washita	1,082	1,103	1,151	1,179	1,197	1,225	1,244
Woods	3,124	3,161	3,189	3,224	3,259	3,293	3,363
Woodward	5,599	5,718	5,989	6,169	6,288	6,438	6,558
Statewide Total	583,901	601,891	647,038	682,391	713,982	743,158	772,773

Section 4

Self-Supplied, Non-Agricultural Demands

The self-supplied sector represents establishments that obtain their water from privately owned sources, such as wells or surface diversions. This sector includes water use from self-supplied households, pulp mills, refineries, meat packing plants, thermoelectric power plants, and activities from oil and gas exploration and drilling, for example. While agriculture demands are often self-supplied, these demands are treated separately and are discussed in Section 5. Water demand sectors discussed here include self-supplied residential, oil and gas, thermoelectric power, and self-supplied large industries.

4.1 Self-Supplied Residential

The self-supplied residential sector captures water use from households not connected to a public water supply system. It is assumed that these households are located in rural areas of the state. While it may be true that some self-supplied residential homes use well water for livestock care, the demands for the self-supplied residential sector only represent water use inside the home and outside for gardening, car washing, domestic animal care, recreation, etc. Livestock demands are captured in the agriculture demands.

The basic methodology employed to estimate future water demands for the self-supplied residential sector is:

$$Q_{c,y}^{SSR} = [rgpcd_c \times P_{c,y}^{SSR}] \quad \text{Equation 3}$$

Where:

- $Q_{c,y}^{SSR}$ = Self-supplied residential water demand in county (c) in year (y) in acre-feet per year (AFY)
- $rgpcd_c$ = Weighted average residential per capita daily water use in county (c) from Provider Survey
- $P_{c,y}^{SSR}$ = Population self-supplied in county (c) in year (y)

The data used to develop the self-supplied residential forecast are similar to the data used in the public supply residential forecast, as discussed in Section 3.2.2. Population projections serve as a basis for the forecast. The population projections were allocated among public-supplied and self-supplied households using 2005 USGS estimates.

The USGS preliminary numbers were used to divide county population projections into public-supplied and self-supplied for 2007. The ratio of public-supplied to self-supplied for each county is assumed to remain constant into the future. The self-supplied population projections are shown in Table 10. As shown, some counties have no self-supplied households. Given the assumptions, the statewide population of self-supplied households is expected to increase almost 41 percent from 2007 to 2060, but remains less than a half million in 2060.

Table 10 - Self-Supplied Population Projections by County

County	2007	2010	2020	2030	2040	2050	2060
Adair	9,140	9,582	11,173	12,763	14,354	15,983	17,613
Alfalfa	860	851	851	851	851	866	880
Atoka	3,030	3,139	3,524	3,909	4,294	4,719	5,145
Beaver	2,620	2,647	2,692	2,737	2,782	2,826	2,871
Beckham	1,980	2,032	2,213	2,403	2,594	2,785	2,995
Blaine	1,130	1,152	1,253	1,362	1,472	1,582	1,700
Bryan	2,780	2,869	3,165	3,468	3,771	4,074	4,384
Caddo	11,730	11,845	12,345	12,730	13,115	13,499	13,845
Canadian	0	0	0	0	0	0	0
Carter	220	223	236	249	261	274	289
Cherokee	7,430	7,802	8,962	10,108	11,269	12,399	13,560
Choctaw	4,700	4,736	4,858	4,949	5,070	5,192	5,313
Cimarron	1,120	1,120	1,190	1,225	1,225	1,260	1,295
Cleveland	12,670	13,045	14,015	14,799	15,425	15,864	16,293
Coal	1,570	1,614	1,859	2,103	2,372	2,666	2,959
Comanche	2,190	2,236	2,388	2,518	2,619	2,699	2,764
Cotton	0	0	0	0	0	0	0
Craig	800	824	914	999	1,094	1,189	1,288
Creek	7,050	7,200	7,700	8,090	8,460	8,830	9,230
Custer	3,320	3,379	3,537	3,683	3,830	3,940	4,037
Delaware	11,500	12,032	13,834	15,581	17,383	19,324	21,348
Dewey	1,070	1,070	1,047	1,047	1,047	1,070	1,093
Ellis	1,380	1,359	1,323	1,323	1,287	1,287	1,323
Garfield	1,460	1,472	1,517	1,554	1,589	1,616	1,648
Garvin	4,150	4,168	4,274	4,350	4,426	4,517	4,608
Grady	15,740	16,096	17,251	18,240	19,131	20,021	20,945
Grant	650	650	663	675	675	701	714
Greer	0	0	0	0	0	0	0
Harmon	0	0	0	0	0	0	0
Harper	960	943	943	943	943	971	971
Haskell	5,280	5,500	6,233	7,007	7,822	8,637	9,533
Hughes	940	973	1,085	1,197	1,315	1,445	1,575
Jackson	1,080	1,100	1,165	1,220	1,264	1,301	1,330
Jefferson	140	140	142	144	146	151	155
Johnston	110	114	127	142	157	172	189
Kay	2,240	2,257	2,335	2,394	2,450	2,505	2,564
Kingfisher	4,010	4,140	4,627	5,114	5,601	6,088	6,629
Kiowa	0	0	0	0	0	0	0
Latimer	1,320	1,335	1,395	1,468	1,553	1,638	1,735
Le Flore	6,360	6,496	7,001	7,455	7,909	8,363	8,842
Lincoln	17,650	18,088	19,704	21,059	22,466	23,926	25,490
Logan	11,260	11,695	13,146	14,445	15,745	17,014	18,374
Love	310	327	901	954	1,010	1,069	1,129
Major	2,090	2,073	2,101	2,101	2,129	2,157	2,185
Marshall	650	697	858	1,023	1,192	1,369	1,555
Mayes	0	0	0	0	0	0	0
McClain	7,430	7,800	9,104	10,313	11,522	12,778	14,059
McCurtain	7,490	7,579	7,920	8,197	8,431	8,687	8,921
McIntosh	0	0	0	0	0	0	0
Murray	0	0	0	0	0	0	0
Muskogee	6,850	6,903	7,136	7,350	7,535	7,720	7,905
Noble	1,520	1,543	1,620	1,672	1,723	1,762	1,800
Nowata	690	719	821	922	1,024	1,132	1,246
Okfuskee	1,100	1,106	1,133	1,161	1,189	1,217	1,254
Oklahoma	14,040	14,279	14,972	15,586	16,051	16,389	16,722

Table 10 - Self-Supplied Population Projections by County

County	2007	2010	2020	2030	2040	2050	2060
Okmulgee	0	0	0	0	0	0	0
Osage	6,760	6,899	7,393	7,756	8,091	8,425	8,802
Ottawa	6,990	7,100	7,588	8,056	8,565	9,094	9,622
Pawnee	4,650	4,792	5,319	5,793	6,293	6,820	7,346
Payne	7,920	8,193	8,816	9,472	10,117	10,571	11,005
Pittsburg	0	0	0	0	0	0	0
Pontotoc	5,490	5,554	5,768	5,967	6,166	6,350	6,534
Pottawatomie	20,830	21,249	22,706	24,072	25,377	26,652	27,988
Pushmataha	1,540	1,591	1,800	1,995	2,203	2,436	2,669
Roger Mills	680	680	680	680	680	680	680
Rogers	5,580	5,793	6,509	7,123	7,695	8,280	8,881
Seminole	3,980	4,009	4,136	4,247	4,359	4,486	4,613
Sequoyah	820	847	938	1,024	1,108	1,193	1,279
Stephens	6,620	6,620	6,697	6,759	6,836	6,944	7,083
Texas	2,600	2,798	3,479	4,170	4,862	5,553	6,234
Tillman	670	670	685	699	714	728	750
Tulsa	8,940	9,097	9,590	10,002	10,292	10,512	10,727
Wagoner	0	0	0	0	0	0	0
Washington	0	0	0	0	0	0	0
Washita	2,200	2,222	2,297	2,353	2,390	2,447	2,484
Woods	1,110	1,117	1,117	1,129	1,142	1,154	1,178
Woodward	3,500	3,544	3,692	3,803	3,877	3,969	4,043
Statewide Total	294,690	301,725	326,721	348,946	370,595	392,224	414,477

Population projections are used as the driver of the self-supplied residential forecast. The average daily use of the self-supplied households is assumed to be similar to publically-supplied households in a given county. Thus, the rgpcd developed from the Provider Survey is used as the per unit use for the self-supplied residential sector.

4.1.1 Forecast

Results of the self-supplied residential forecast are shown in Table 11 for each county. Growth in county water demand is directly attributable to projected growth in self-supplied population. Figure 6 shows statewide water demands from the self-supplied residential sector, which are estimated to increase by 39 percent from 2007 to 2060.

Table 11 - Self-Supplied Residential Water Demands (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Adair	702	736	858	980	1,102	1,227	1,353
Alfalfa	117	115	115	115	115	117	119
Atoka	544	563	632	702	771	847	923
Beaver	346	350	355	361	367	373	379
Beckham	313	321	349	380	410	440	473
Blaine	186	189	206	224	242	260	280
Bryan	357	369	407	446	485	524	564
Caddo	1,422	1,436	1,496	1,543	1,589	1,636	1,678
Canadian	-	-	-	-	-	-	-
Carter	22	22	24	25	26	28	29
Cherokee	755	793	911	1,028	1,146	1,260	1,378
Choctaw	324	326	335	341	349	358	366
Cimarron	337	337	358	369	369	379	390
Cleveland	1,291	1,329	1,428	1,508	1,571	1,616	1,660

Table 11 - Self-Supplied Residential Water Demands (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Coal	148	153	176	199	224	252	280
Comanche	171	175	187	197	205	211	216
Cotton	-	-	-	-	-	-	-
Craig	68	70	77	84	92	100	109
Creek	532	544	581	611	639	667	697
Custer	440	447	468	488	507	522	535
Delaware	954	998	1,147	1,292	1,441	1,602	1,770
Dewey	263	263	257	257	257	263	269
Ellis	272	268	261	261	254	254	261
Garfield	186	188	193	198	202	206	210
Garvin	467	469	481	490	498	508	519
Grady	1,176	1,202	1,288	1,362	1,429	1,495	1,564
Grant	78	78	80	81	81	84	86
Greer	-	-	-	-	-	-	-
Harmon	-	-	-	-	-	-	-
Harper	272	267	267	267	267	275	275
Haskell	447	465	528	593	662	731	807
Hughes	83	86	96	106	116	128	139
Jackson	110	112	119	124	129	133	135
Jefferson	12	12	12	12	12	13	13
Johnston	11	12	13	15	16	18	20
Kay	184	186	192	197	202	206	211
Kingfisher	536	553	618	683	748	813	885
Kiowa	-	-	-	-	-	-	-
Latimer	190	192	201	212	224	236	250
Le Flore	541	553	596	635	673	712	753
Lincoln	1,360	1,393	1,518	1,622	1,731	1,843	1,964
Logan	1,388	1,442	1,621	1,781	1,941	2,097	2,265
Love	27	28	78	83	88	93	98
Major	208	206	209	209	212	215	217
Marshall	57	61	75	89	104	119	136
Mayes	-	-	-	-	-	-	-
McClain	757	794	927	1,050	1,173	1,301	1,432
McCurtain	694	703	734	760	782	805	827
McIntosh	-	-	-	-	-	-	-
Murray	-	-	-	-	-	-	-
Muskogee	658	663	686	706	724	742	759
Noble	126	128	134	138	143	146	149
Nowata	49	51	58	65	72	80	88
Okfuskee	95	95	98	100	102	105	108
Oklahoma	1,079	1,098	1,151	1,198	1,234	1,260	1,286
Okmulgee	-	-	-	-	-	-	-
Osage	978	998	1,069	1,122	1,170	1,218	1,273
Ottawa	688	698	746	792	842	895	947
Pawnee	591	609	676	736	800	867	934
Payne	648	671	722	775	828	865	901
Pittsburg	-	-	-	-	-	-	-
Pontotoc	565	572	594	615	635	654	673
Pottawatomie	1,253	1,279	1,366	1,449	1,527	1,604	1,684
Pushmataha	86	89	101	112	123	136	149
Roger Mills	104	104	104	104	104	104	104
Rogers	579	601	675	739	798	859	922
Seminole	223	225	232	238	244	251	258
Sequoyah	100	104	115	126	136	146	157
Stephens	833	833	843	851	860	874	892

Table 11 - Self-Supplied Residential Water Demands (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Texas	339	365	454	545	635	725	814
Tillman	80	80	81	83	85	87	89
Tulsa	903	919	969	1,010	1,040	1,062	1,084
Wagoner	-	-	-	-	-	-	-
Washington	-	-	-	-	-	-	-
Washita	142	144	148	152	154	158	161
Woods	352	355	355	358	362	366	374
Woodward	723	732	763	786	801	820	835
Statewide Total	29,543	30,236	32,636	34,799	36,897	39,013	41,193

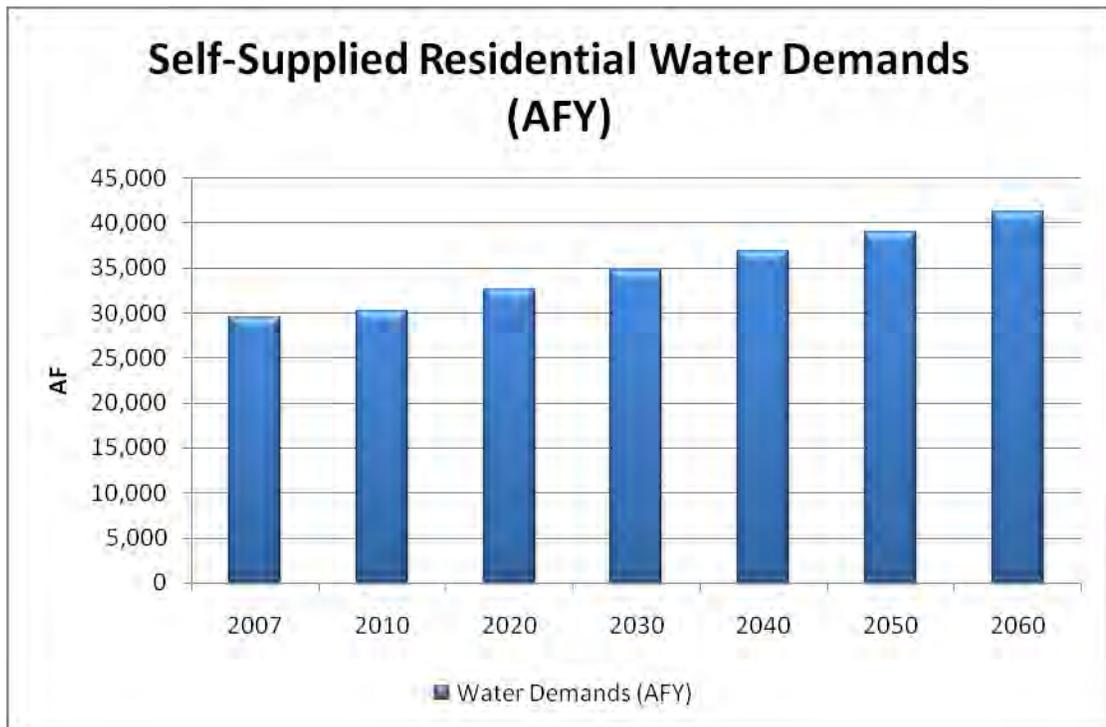


Figure 6 - Self-Supplied Residential Water Demands (AFY)

4.2 Oil and Gas

The oil and gas industry is a major contributor to the economic structure in Oklahoma. One in seven jobs in Oklahoma is directly or indirectly supported by the oil and natural gas industry⁵. Water availability is key to oil and gas drilling and exploration activities thus water use by this important sector is estimated for the OCWP.

Water is used in association with many oil and gas activities, including use as a supplemental fluid in enhanced recovery of petroleum resources; during drilling and

⁵ Oklahoma Corporation Commission, *2007 Report on Crude Oil and Natural Gas Activity within the State of Oklahoma*, August 2008.

completion of an oil or gas well; during workover of an oil or gas well; as rig wash water; as coolant for internal combustion engines for rigs, compressors, and other equipment; and for sanitary purposes. Unconventional drilling techniques require more water use per completion than conventional drilling techniques. Oil from shale deposits are often drilled using unconventional techniques and require even more water to penetrate through the shale deposits.

There are challenges in estimating both current and future water demands from the oil and gas industry. While Oklahoma law requires that oil and gas companies apply for a 90-day provisional temporary (PT) water use permit for oil and gas drilling activities, water amounts requested on the PT permit is not necessarily representative of actual use. Future trends in the oil and gas industry rely on many factors, such as economy, price, and technology. Future trends, if anything, are uncertain. Thus, the forecast for the oil and gas sector makes use of the best available data for both the present and future. Estimated water use per drilling activity has been increased to a level considered adequate to cover uncertainties related to future developments in technology and other contingencies that may require more water per activity.

4.2.1 Methodology

Given the statewide variance in recent drilling activities, water demands for the oil and gas industry are estimated by drilling type, or sub-sector: conventional, horizontal, and Woodford Shale. The basic methodology for estimating demands by drilling category is number of drilling activities times water used per activity in AF, as shown in Equation 4. Sub-sector demands are then summed to estimate total demands from all oil and gas activities.

$$Q_{s,c,y}^{O\&G} = [DA_{s,c,y} \times WU_{s,c,y}] \quad \text{Equation 4}$$

Where:

- $Q_{s,c,y}^{O\&G}$ = Oil and gas drilling water demand for sub-sector (s) in county (c) in year (y) in AFY
- $DA_{s,c,y}$ = Number of estimated drilling activities for sub-sector (s) in county (c) in year (y)
- $WU_{s,c,y}$ = Water use per drilling activity for sub-sector (s) in county (c) and in year (y) in AF

Two key pieces of information were developed for the oil and gas forecast by sub-sector: drilling activity and water use per activity.

4.2.2 Future Drilling Activity

For each sub-sector, an estimate of drilling activity in the future was developed using data collected from the Oklahoma Corporation Commission (OCC) website. Oil and gas drilling

data were collected from 1983 through 2008 for the entire State of Oklahoma by county. The data include oil, gas, dry and total wells, footage, average depth, and success ratio.

Additionally, conventional drilling data for Osage County, Oklahoma were provided by Oklahoma Independent Petroleum Association (OIPA) and Mid-Continent Oil and Gas Association from 1989–2003. These data were originally collected via permitting information by the Bureau of Indian Affairs (BIA). The data were used to replace the original OCC data because the BIA has well permitting authority in Osage County.

The OCC and BIA data were identified as conventional, horizontal, or Woodford Shale drilling and each dataset was stored in a separate database. Data from the following counties were considered to be Woodford Shale drilling—Atoka, Canadian, Carter, Coal, Hughes, Marshall, and Pittsburg. Because the Woodford Shale is a recent play, analysis was conducted on data for these counties from 2001–2008.

Linear regression analysis was conducted on the sum of statewide drilling data (by sub-sector) to estimate a trend in future drilling activities. For conventional drilling, statewide data were analyzed using linear regression from 1989–2008. Prior years were excluded to avoid a negative slope in the regression line. For horizontal and Woodford Shale drilling, data were analyzed using linear regressions from 2001–2008, as there was very little non-conventional drilling prior to 2001.

Results of the regression analysis were used to estimate statewide conventional drilling activities in 5 year increments to 2060. In order to develop a forecast representative of reasonable maximum future drilling activities, the standard error from the regression analysis was added to the model. This addition serves to address potential real-world variability associated with this industry. The statewide estimate of future conventional drilling activity was then allocated to counties based on the ratio of average county activity to statewide average activity during the historical dataset (1989–2008). This process was replicated to estimate future horizontal drilling activities statewide and for counties (county to state ratios were developed based on 2001–2008 dataset).

Slight but necessary alterations were made to the methodology for estimating Woodford Shale drilling activities in future years. Linear regression was conducted to estimate a trend line for future activity. Standard error was added to the resulting regression model to account for uncertainty. The regression model was used to estimate statewide totals for Woodford Shale drilling activity to 2020. Close coordination with industry leaders reveals that while Woodford Shale activity is expected to increase over the next decade, it is likely that drilling resources within the Woodford Shale will be exhausted following an estimated peak in activity near 2020. Thus, 2030 demands are assumed to decline to 2010 conditions and then decline to nearly zero from 2030 to 2060. Linear interpolation was used to estimate drilling from 2035 to 2060. The statewide estimate of future Woodford Shale drilling activity was allocated to counties based on the ratio of average county activity to total average activity during the historical dataset (2001–2008).

Estimates of future drilling activity by drilling type are provided in Table 12. Conventional and horizontal drilling is estimated to be 74 and 26 percent of 2060 drilling, respectively. Woodford Shale drilling peaks at about 1,600 activities in 2020.

Table 12 - Estimate of Future Drilling Activity by Drilling Type

County	Type	2008	2010	2020	2030	2040	2050	2060
Adair	<i>No drilling activity</i>							
Alfalfa	Conventional	23	31	35	40	45	50	54
	Horizontal	5	7	12	18	24	29	35
Atoka	Woodford Shale	19	27	43	27	18	9	0
Beaver	Conventional	114	153	177	201	225	248	272
	Horizontal	1	2	3	4	6	7	9
Beckham	Conventional	57	77	89	101	113	125	136
	Horizontal	1	2	3	4	6	7	9
Blaine	Conventional	50	67	77	88	98	108	119
	Horizontal	0	0	0	0	0	0	0
Bryan	Conventional	4	5	6	7	8	9	10
	Horizontal	0	0	0	0	0	0	0
Caddo	Conventional	64	86	100	113	127	140	153
	Horizontal	1	2	3	4	6	7	9
Canadian	Woodford Shale	112	156	255	156	105	53	2
Carter	Woodford Shale	111	156	253	156	104	53	2
Cherokee	Conventional	0	0	0	0	0	0	0
	Horizontal	0	0	0	0	0	0	0
Choctaw	<i>No drilling activity</i>							
Cimarron	Conventional	11	15	17	19	22	24	26
	Horizontal	0	0	0	0	0	0	0
Cleveland	Conventional	9	12	14	16	18	20	22
	Horizontal	1	2	3	4	6	7	9
Coal	Woodford Shale	55	76	124	76	51	26	1
Comanche	Conventional	9	12	14	16	18	19	21
	Horizontal	0	0	0	0	0	0	0
Cotton	Conventional	2	2	3	3	3	4	4
	Horizontal	0	0	0	0	0	0	0
Craig	Conventional	5	7	8	9	10	11	12
	Horizontal	0	0	0	0	0	0	0
Creek	Conventional	36	49	56	64	72	79	87
	Horizontal	0	0	0	0	0	0	0
Custer	Conventional	57	77	89	100	112	124	136
	Horizontal	2	3	6	9	12	15	17
Delaware	<i>No drilling activity</i>							
Dewey	Conventional	43	59	68	77	86	95	104
	Horizontal	2	3	5	7	9	11	13
Ellis	Conventional	50	68	78	89	99	110	120
	Horizontal	26	39	70	102	134	166	198
Garfield	Conventional	29	39	45	51	57	63	69
	Horizontal	1	2	3	4	6	7	9
Garvin	Conventional	81	109	126	143	160	177	194
	Horizontal	1	2	3	4	6	7	9
Grady	Conventional	94	127	147	166	186	206	225
	Horizontal	2	3	6	9	12	15	17
Grant	Conventional	27	36	42	47	53	58	64
	Horizontal	3	4	8	11	15	18	22
Greer	Conventional	1	1	1	2	2	2	2
	Horizontal	0	0	0	0	0	0	0

Table 12 - Estimate of Future Drilling Activity by Drilling Type

County	Type	2008	2010	2020	2030	2040	2050	2060
Harmon	Conventional	0	1	1	1	1	1	1
	Horizontal	0	0	0	0	0	0	0
Harper	Conventional	49	67	77	87	97	108	118
	Horizontal	3	5	9	13	18	22	26
Haskell	Conventional	50	67	78	88	99	109	119
	Horizontal	43	64	116	169	221	274	326
Hughes	Woodford Shale	108	151	245	151	101	51	2
Jackson	Conventional	1	2	2	3	3	3	3
	Horizontal	1	2	3	4	6	7	9
Jefferson	Conventional	6	8	10	11	12	13	15
	Horizontal	0	0	0	0	0	0	0
Johnston	Conventional	0	0	1	1	1	1	1
	Horizontal	5	8	14	20	26	33	39
Kay	Conventional	27	36	42	48	53	59	65
	Horizontal	0	0	0	0	0	0	0
Kingfisher	Conventional	33	44	51	58	65	72	79
	Horizontal	1	2	3	4	6	7	9
Kiowa	Conventional	7	9	10	12	13	14	16
	Horizontal	0	0	0	0	0	0	0
Latimer	Conventional	77	105	121	137	153	169	186
	Horizontal	3	5	9	13	17	21	25
Le Flore	Conventional	42	57	66	75	83	92	101
	Horizontal	39	58	107	155	203	251	299
Lincoln	Conventional	41	56	64	73	82	90	99
	Horizontal	13	20	36	53	69	86	102
Logan	Conventional	39	53	61	70	78	86	94
	Horizontal	9	13	24	35	45	56	67
Love	Conventional	7	10	11	13	14	16	17
	Horizontal	0	0	0	0	0	0	0
Major	Conventional	103	139	161	182	204	225	247
	Horizontal	1	2	3	4	6	7	9
Marshall	Woodford Shale	15	21	33	21	14	7	0
Mayes	Conventional	4	6	7	7	8	9	10
	Horizontal	0	0	0	0	0	0	0
McClain	Conventional	27	37	42	48	54	60	65
	Horizontal	1	2	3	4	6	7	9
McCurtain	Conventional	0	0	0	0	0	0	0
	Horizontal	0	0	0	0	0	0	0
McIntosh	Conventional	30	40	47	53	59	66	72
	Horizontal	24	35	64	93	122	150	179
Murray	Conventional	6	8	9	11	12	13	14
	Horizontal	0	0	0	0	0	0	0
Muskogee	Conventional	7	9	10	12	13	15	16
	Horizontal	2	3	6	9	12	15	17
Noble	Conventional	60	81	93	106	118	130	143
	Horizontal	2	2	4	6	8	10	12
Nowata	Conventional	67	90	104	118	132	145	159
	Horizontal	0	0	0	0	0	0	0
Okfuskee	Conventional	31	41	48	54	61	67	73
	Horizontal	4	6	10	15	20	24	29
Oklahoma	Conventional	39	52	61	69	77	85	93
	Horizontal	3	4	7	10	14	17	20
Okmulgee	Conventional	29	39	45	51	57	63	69

Table 12 - Estimate of Future Drilling Activity by Drilling Type

County	Type	2008	2010	2020	2030	2040	2050	2060
	Horizontal	1	2	3	4	6	7	9
Osage	Conventional	87	117	135	153	171	190	208
	Horizontal	0	0	0	0	0	0	0
Ottawa	<i>No drilling activity</i>							
Pawnee	Conventional	8	11	13	15	16	18	20
	Horizontal	1	2	3	4	6	7	9
Payne	Conventional	30	41	48	54	60	67	73
	Horizontal	3	5	8	12	16	20	24
Pittsburg	Woodford Shale	287	401	652	401	269	136	4
Pontotoc	Conventional	28	37	43	49	55	61	67
	Horizontal	1	2	3	4	6	7	9
Pottawatomie	Conventional	23	31	36	40	45	50	55
	Horizontal	10	15	27	40	52	64	77
Pushmataha	Conventional	2	3	4	4	5	5	6
	Horizontal	0	0	0	0	0	0	0
Roger Mills	Conventional	114	154	178	201	225	249	273
	Horizontal	5	7	12	18	24	29	35
Rogers	Conventional	18	25	29	32	36	40	44
	Horizontal	3	4	7	10	14	17	20
Seminole	Conventional	45	61	71	80	90	99	109
	Horizontal	9	14	25	36	47	58	69
Sequoyah	Conventional	10	13	15	17	19	21	23
	Horizontal	0	0	0	0	0	0	0
Stephens	Conventional	110	148	171	194	217	240	263
	Horizontal	3	4	8	11	15	18	22
Texas	Conventional	119	160	185	210	234	259	284
	Horizontal	9	13	24	35	46	57	68
Tillman	Conventional	3	4	5	6	7	7	8
	Horizontal	1	2	3	4	6	7	9
Tulsa	Conventional	15	21	24	27	30	33	37
	Horizontal	2	3	6	8	11	13	16
Wagoner	Conventional	13	17	20	23	25	28	31
	Horizontal	2	3	6	9	12	15	17
Washington	Conventional	57	77	89	101	113	124	136
	Horizontal	0	0	0	0	0	0	0
Washita	Conventional	45	61	70	80	89	99	108
	Horizontal	22	33	60	87	115	142	169
Woods	Conventional	82	111	128	145	162	179	196
	Horizontal	1	2	3	4	6	7	9
Woodward	Conventional	102	138	159	181	202	223	245
	Horizontal	0	0	0	0	0	0	0
Statewide Total	Conventional	2,459	3,320	3,834	4,349	4,863	5,378	5,892
	Horizontal	274	408	745	1,081	1,417	1,754	2,090
	Woodford Shale	706	987	1,606	987	661	336	10

4.2.3 Future Water Use per Activity

Estimates of water use per drilling activity by sub-sector were developed based on input from industry leaders at OIPA and Mid-Century Oil and Gas Association. Water use per activity captures water used for drilling and cementing as well as completion. Unique values are estimated for each county by sub-sector based on average well depth, i.e., deeper wells are assumed to require more water for drilling. Table 13 provides a summary

of estimated current water use per drilled well for conventional, horizontal, and Woodford Shale drilling.

Table 13 – Estimates of Current Water Use per Well (in Barrels)

Operation		Conventional	Horizontal	Woodford Shale
Drilling & Cementing	≤ 12,000 feet	8,000	12,000 (incl. horizontal and vertical sections)	8,000
	>12,000 feet	21,000	23,000 (incl. horizontal and vertical sections)	21,000
Completion		25,000	78,000	150,000

Unconventional drilling techniques require more water use per well. Hydraulic fracturing ("fracing") is reported to require substantially more water per well. This technique is common in the Woodford Shale region of the state, resulting in higher water use factors and therefore higher water demand for drilling activities in these counties. Based on the above table, water use for conventional drilling ranges from 4.3–5.9 AF per well, horizontal drilling ranges from 12–13 AF per well, and drilling in the Woodford Shale region ranges from 20–22 AF per well.

To account for uncertainty in future water use per drilled well, an increasing trend is applied to the water use per well from 2010 to 2060. This is based on the assumption that the accessibility of remaining oil and gas deposits in the future will decline. For conventional and Woodford Shale drilling, water use factors are multiplied by a factor of 2 in 2060, moving linearly from current values to the 2060 value. For horizontal drilling, water use factors are multiplied by a factor of 2.5 in 2060, moving linearly from current values to the 2060 value.

4.2.4 Forecast

Results of the oil and gas forecast are provided in Table 14 for each county. Figure 7 shows the increase in statewide oil demand from 2008-2060. In the base year, water demands from the oil and gas industry are estimated at 29,107 AF, representing 1.6 percent of the total water used in Oklahoma. Under the conditions outlined herein, statewide demands are estimated to reach 115,570 AF by 2060, or 4.8 percent of total demands from all sectors.

Table 14 – Estimated Demand from Oil and Gas Activities by Drilling Type (AFY)

County	Drilling Type	Estimated Water Demand (AFY)						
		2008	2010	2020	2030	2040	2050	2060
Adair	<i>No drilling activity</i>							
Alfalfa	Conventional	96	135	185	242	308	381	462
	Horizontal	53	83	193	340	525	747	1,006
Atoka	Woodford Shale	420	610	1,177	836	636	361	12
Beaver	Conventional	483	677	927	1,215	1,543	1,909	2,314
	Horizontal	13	21	48	85	131	187	252
Beckham	Conventional	338	473	648	850	1,079	1,335	1,618
	Horizontal	15	23	54	95	147	210	282
Blaine	Conventional	211	296	405	531	674	834	1,011
	Horizontal							

Table 14 – Estimated Demand from Oil and Gas Activities by Drilling Type (AFY)

County	Drilling Type	Estimated Water Demand (AFY)						
		2008	2010	2020	2030	2040	2050	2060
Bryan	Conventional	17	24	33	43	54	67	82
	Horizontal							
Caddo	Conventional	380	532	729	956	1,213	1,501	1,820
	Horizontal	15	23	54	95	147	210	282
Canadian	Woodford Shale	2,466	3,581	6,905	4,908	3,733	2,120	70
Carter	Woodford Shale	2,266	3,291	6,344	4,509	3,430	1,948	64
Cherokee	Conventional	1	1	1	1	2	2	3
	Horizontal							
Choctaw	Conventional	0	0	0	0	0	0	0
	Horizontal							
Cimarron	Conventional	47	65	90	117	149	185	224
	Horizontal							
Cleveland	Conventional	39	54	74	97	124	153	185
	Horizontal	13	21	48	85	131	187	252
Coal	Woodford Shale	1,206	1,750	3,375	2,399	1,825	1,036	34
Comanche	Conventional	38	53	73	95	121	150	181
	Horizontal							
Cotton	Conventional	7	10	14	18	23	28	34
	Horizontal							
Craig	Conventional	21	30	41	54	68	84	102
	Horizontal							
Creek	Conventional	154	216	295	387	492	608	737
	Horizontal							
Custer	Conventional	337	472	647	848	1,076	1,332	1,615
	Horizontal	30	47	108	191	295	419	565
Delaware	<i>No drilling activity</i>							
Dewey	Conventional	185	259	355	465	590	731	886
	Horizontal	20	31	72	128	197	280	377
Ellis	Conventional	214	300	410	538	683	845	1,025
	Horizontal	301	474	1,101	1,940	2,992	4,257	5,736
Garfield	Conventional	122	172	235	308	391	484	586
	Horizontal	13	21	48	85	131	187	252
Garvin	Conventional	345	483	662	868	1,101	1,363	1,652
	Horizontal	13	21	48	85	131	187	252
Grady	Conventional	558	782	1,070	1,403	1,781	2,204	2,672
	Horizontal	30	47	108	191	295	419	565
Grant	Conventional	113	159	217	285	362	448	543
	Horizontal	33	52	121	213	328	467	629
Greer	Conventional	4	6	8	10	13	16	19
	Horizontal							
Harmon	Conventional	2	3	4	5	6	8	9
	Horizontal							
Harper	Conventional	210	294	402	528	670	829	1,005
	Horizontal	40	62	145	255	394	560	755
Haskell	Conventional	212	297	407	534	677	838	1,016
	Horizontal	496	783	1,816	3,201	4,938	7,025	9,465
Hughes	Woodford Shale	2,194	3,185	6,141	4,365	3,320	1,886	62
Jackson	Conventional	6	8	12	15	19	24	29
	Horizontal	13	21	48	85	131	187	252
Jefferson	Conventional	26	36	50	65	83	103	125
	Horizontal							

Table 14 – Estimated Demand from Oil and Gas Activities by Drilling Type (AFY)

County	Drilling Type	Estimated Water Demand (AFY)						
		2008	2010	2020	2030	2040	2050	2060
Johnston	Conventional	2	2	3	4	5	6	8
	Horizontal	59	94	217	383	591	840	1,132
Kay	Conventional	115	161	220	289	366	453	550
	Horizontal							
Kingfisher	Conventional	140	196	268	351	446	552	669
	Horizontal	13	21	48	85	131	187	252
Kiowa	Conventional	39	55	75	99	125	155	188
	Horizontal							
Latimer	Conventional	329	462	632	829	1,052	1,302	1,578
	Horizontal	38	59	138	243	375	533	719
Le Flore	Conventional	179	251	344	451	573	709	859
	Horizontal	455	718	1,665	2,935	4,527	6,442	8,679
Lincoln	Conventional	176	246	337	442	561	694	841
	Horizontal	155	244	567	1,000	1,542	2,194	2,956
Logan	Conventional	168	235	322	422	536	663	804
	Horizontal	102	160	372	656	1,012	1,440	1,941
Love	Conventional	30	43	58	77	97	120	146
	Horizontal							
Major	Conventional	438	614	841	1,102	1,399	1,732	2,099
	Horizontal	13	21	48	85	131	187	252
Marshall	Woodford Shale	299	434	836	594	452	257	8
Mayes	Conventional	18	25	34	45	57	71	86
	Horizontal							
McClain	Conventional	116	162	222	291	370	458	555
	Horizontal	13	21	48	85	131	187	252
McCurtain	Conventional	0	0	1	1	1	1	1
	Horizontal							
McIntosh	Conventional	128	179	245	321	407	504	611
	Horizontal	273	430	998	1,758	2,712	3,859	5,199
Murray	Conventional	26	36	49	65	82	102	123
	Horizontal							
Muskogee	Conventional	29	40	55	72	91	113	137
	Horizontal	26	42	97	170	262	373	503
Noble	Conventional	254	356	487	639	811	1,003	1,216
	Horizontal	18	28	64	113	175	249	335
Nowata	Conventional	283	397	543	712	904	1,118	1,356
	Horizontal							
Okfuskee	Conventional	130	183	250	328	417	516	625
	Horizontal	44	69	161	284	437	622	839
Oklahoma	Conventional	165	232	317	416	528	654	792
	Horizontal	31	49	113	199	306	436	587
Okmulgee	Conventional	123	173	237	310	394	488	591
	Horizontal	13	21	48	85	131	187	252
Osage	Conventional	369	517	708	928	1,178	1,458	1,767
	Horizontal							
Ottawa	<i>No drilling activity</i>							
Pawnee	Conventional	35	49	67	89	112	139	169
	Horizontal	13	21	48	85	131	187	252
Payne	Conventional	130	182	249	326	414	513	621
	Horizontal	36	56	131	231	356	507	683
Pittsburg	Woodford Shale	5,838	8,477	16,343	11,617	8,836	5,019	165
Pontotoc	Conventional	118	166	227	297	377	467	566

Table 14 – Estimated Demand from Oil and Gas Activities by Drilling Type (AFY)

County	Drilling Type	Estimated Water Demand (AFY)						
		2008	2010	2020	2030	2040	2050	2060
	Horizontal	13	21	48	85	131	187	252
Pottawatomie	Conventional	97	136	187	245	311	385	467
	Horizontal	117	184	426	752	1,159	1,649	2,222
Pushmataha	Conventional	10	14	19	25	32	39	48
	Horizontal							
Roger Mills	Conventional	675	947	1,296	1,700	2,157	2,670	3,236
	Horizontal	59	93	217	382	589	838	1,129
Rogers	Conventional	78	109	150	196	249	308	374
	Horizontal	31	49	113	199	306	436	587
Seminole	Conventional	193	271	371	486	617	764	926
	Horizontal	106	166	386	681	1,050	1,494	2,012
Sequoyah	Conventional	40	57	78	102	129	160	194
	Horizontal							
Stephens	Conventional	467	655	896	1,175	1,492	1,846	2,237
	Horizontal	33	52	121	213	328	467	629
Texas	Conventional	504	707	967	1,269	1,611	1,993	2,416
	Horizontal	103	163	378	666	1,028	1,463	1,971
Tillman	Conventional	14	20	27	36	45	56	68
	Horizontal	13	21	48	85	131	187	252
Tulsa	Conventional	65	91	124	163	207	256	311
	Horizontal	24	37	87	153	236	336	453
Wagoner	Conventional	54	76	104	137	174	215	260
	Horizontal	26	42	97	170	262	373	503
Washington	Conventional	242	339	464	609	773	957	1,160
	Horizontal							
Washita	Conventional	267	375	513	673	854	1,057	1,282
	Horizontal	289	455	1,056	1,862	2,872	4,086	5,505
Woods	Conventional	348	488	668	876	1,113	1,377	1,669
	Horizontal	13	21	48	85	131	187	252
Woodward	Conventional	434	609	834	1,093	1,388	1,717	2,081
	Horizontal							
Statewide Total	Conventional	11,192	15,691	21,479	28,168	35,758	44,248	53,640
	Horizontal	3,226	5,086	11,803	20,805	32,090	45,660	61,514
	Woodford Shale	14,689	21,329	41,120	29,229	22,231	12,627	416
	Total All Drilling	29,107	42,107	74,403	78,202	90,080	102,536	115,570

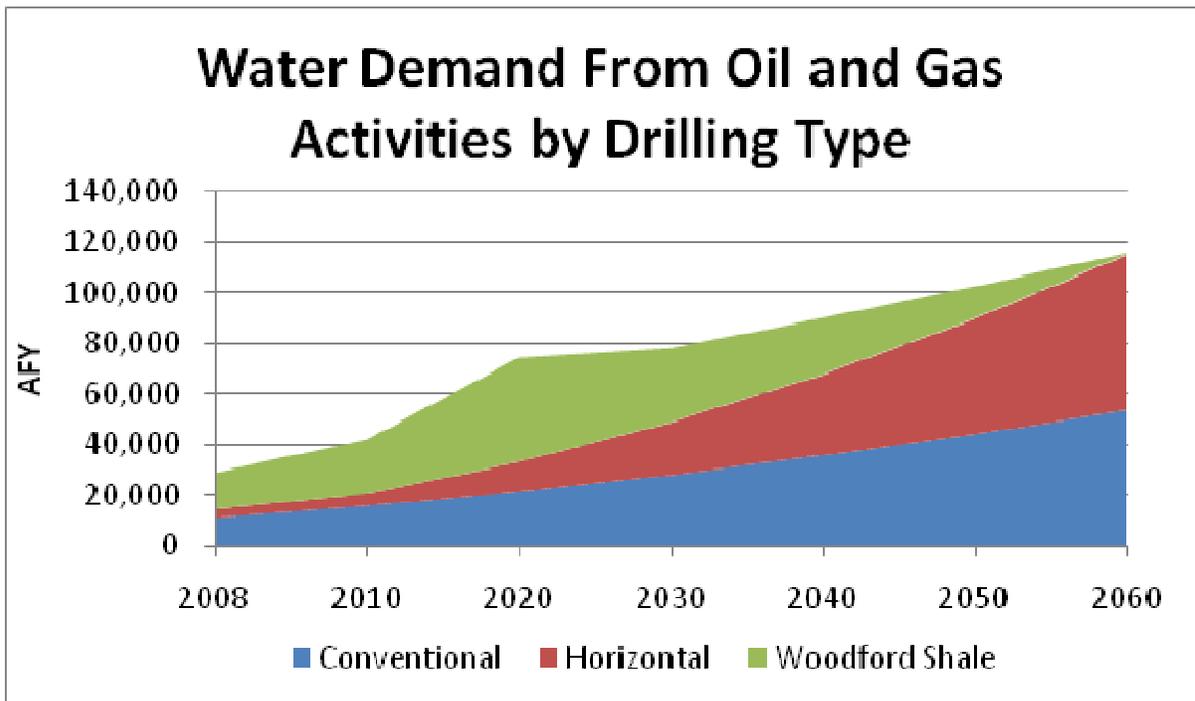


Figure 7 - Water Demands from Oil and Gas Activities by Drilling Type

4.3 Thermoelectric Power

The generation of electricity at thermoelectric power plants requires the use of water for cooling the equipment and condensing steam. Both withdrawal and consumption rates vary by plant because of variations in heat source, prime mover, cooling system type, evaporation rates, and thermal efficiency⁶. For example, close-looped cooling systems require less water to be withdrawn than what is required for once-through cooling; however, nearly all water is consumed in the close-looped process and very little withdrawn water is consumed in once-through cooling.

For completeness in the OCWP, all thermoelectric power plants are included in this sector, even though several power plants receive water from municipal sources. The M&I forecast does not include water provided to thermoelectric power plants, as water use factors for NAICS code 22 (Utilities) captures water used for employee sanitary purposes only. See Section 3.3 for additional information on the nonresidential M&I forecast.

Several data sources were combined to produce the thermoelectric power water demand forecast for Oklahoma, as discussed in the following sections.

⁶ Source: Chicago Metropolitan Agency for Planning, *Regional Water Demand Scenarios for Northeastern Illinois*, Chapter 3, June 2008.

4.3.1 Methodology

Estimates of the gallons per day needed by thermoelectric power plants per megawatt-hour (MWh) are developed for both consumptive use and total withdrawal. The unit use (gallons per MWh) is multiplied by the MWh generated to provide an estimate of water needs for power generation for those counties with power generating facilities.

The Department of Energy, Energy Information Administration (EIA), 2008 Annual Energy Outlook (AEO) estimates that U.S. electric consumption will increase at a rate of 1.1 percent per year to the year 2030. "In comparison, electricity consumption grew by annual rates of 4.2 percent, 2.6 percent, and 2.3 percent in the 1970s, 1980s, and 1990s, respectively. The reduced rate of growth in the AEO 2008 results from slower economic growth, the imposition of new efficiency standards in EISA2007, and higher electricity prices" (AEO 2008, pg 11).

CDM assumed (1) a linear relationship between the amount of electricity generated and the amount of water used (i.e., the rate of water use will be constant) and (2) an annual growth rate of 1.1 percent to project future water use from thermoelectric power plants in Oklahoma.

4.3.2 Data

In Oklahoma, there are 58 power-producing plants—11 hydroelectric, 5 wind, 26 natural gas, 6 distillate fuels, 7 coal, and 3 miscellaneous (municipal solid waste, black liquor, and wood). Net electricity generation from natural gas-fired and coal-fired plants is nearly 95 percent of the total generation⁷.

Information obtained from the Oklahoma Office of the Secretary of Energy (<http://energy.ok.gov>) included the plant name, owning utility, and rated generating capacity in megawatts (MW). Information obtained from the U.S. Department of Energy, (EIA) included the plant name, location, 2004 net MWh generated, and 2007 net MWh generated. Comparison of the 2004 generated MWh with the rated generating capacity of each plant indicated a statewide weighted-average operation at 24.8 percent of rated capacity. Comparison of the 2007 generated MWh indicated an average operation of facilities at 34.2 percent of capacity.

EIA information also included the water source and the operating status (i.e., retired, pending) of each facility. OWRB permit data for power generation (purpose code 04) included plant name, county, operating status (i.e., active, inactive), water code (i.e., groundwater, surface water source) and permitted water withdrawal in AF for 2004 through 2007. In addition, USGS 2005 data provides estimates of water use for thermoelectric power which includes surface water million gallons per day (mgd), groundwater mgd, total mgd withdrawals, and gigawatt hours (GWh) generated by county.

⁷ Obtained from the EIA website: http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=OK#related_reports

Power plants were grouped by county in order to provide a county-level estimate of water demand for power generation. Information for retired facilities was included in the computation of average rate of water use per MWh generated but not in projected water use. Data for two facilities included permitted water withdrawals from different counties. The Seminole plant located in Seminole County also has permit rights to withdraw water from Pontotoc County and Atoka County. However, the permitted withdrawal amounts for Pontotoc and Atoka Counties are minimal. Thus, these withdrawals were combined and listed collectively under Seminole County. The Sooner plant in Noble County draws water from Sooner Lake in Pawnee County and is listed under Pawnee County.

A recent study on water needs for energy development in northwest Colorado (Energy Development Water Needs Assessment, Phase I Report, URS Corporation, September 2008) identifies a unit water demand of 0.48 gallons per kilowatt hour (or 480 gallons per MWh) for electric power generation. This estimate represents the water demand for consumptive water use in a power facility. A study by LimnoTech, Inc. (John R. Wolfe, presented at Hydrovison 2008 Conference, Sacramento, California) also reported that water consumption for cooling towers at fossil-fuel thermoelectric power facilities was 480 gallons per MWh.

A review of the mgd withdrawal per gigawatt generated as estimated by the USGS 2005 data for Oklahoma indicates a statewide average of 773 gallons per MWh. CDM assumed 775 gallons per MWh for total water withdrawal for all facilities except for OGE Energy Corporation's (OGE) facilities in Muskogee, Pawnee, and Seminole Counties. OGE requested that annual water use reported to the OWRB be used in order to include water used to maintain lake levels and for cleaning purposes at these facilities. Due to substantial fluctuations in reported water use for years 2005 through 2008, the average of these years was used for purposes of this report.

4.3.3 Forecast

Results by county for water withdrawals and water consumption by thermoelectric power plants are shown in Table 15 and Table 16, respectively. Statewide water withdrawals and consumption are estimated to increase by 79 percent over the forecast period. The statewide totals are shown in Figure 8. It should be noted that this forecast does not include water demands for three pending power facilities. The generating capacity of these facilities is not known at this time. These facilities are located in Grady County, Stephens County, and Pittsburg County.

Table 15 - Estimated Total Withdrawals from Thermoelectric Power Generation (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Caddo	5,010	5,178	5,776	6,444	7,189	8,020	8,947
Canadian	2,288	2,364	2,637	2,942	3,282	3,662	4,085
Choctaw	7,069	7,304	8,149	9,091	10,142	11,314	12,623
Comanche	2,484	2,566	2,863	3,194	3,563	3,975	4,435
Le Flore	5,695	5,885	6,565	7,324	8,171	9,116	10,170
Logan	242	250	279	312	348	388	433
Mayes	4,346	4,491	5,010	5,589	6,236	6,956	7,761
McClain	6,329	6,540	7,296	8,139	9,080	10,130	11,301

Table 15 - Estimated Total Withdrawals from Thermoelectric Power Generation (AFY)

County	2007	2010	2020	2030	2040	2050	2060
McCurtain	956	988	1,103	1,230	1,372	1,531	1,708
Muskogee	100,057	103,395	115,348	128,683	143,560	160,157	178,672
Oklahoma	9,727	10,051	11,213	12,510	13,956	15,569	17,369
Pawnee	36,650	37,872	42,251	47,135	52,584	58,663	65,445
Pittsburg	12,886	13,316	14,855	16,572	18,488	20,626	23,010
Rogers	22,905	23,669	26,405	29,458	32,863	36,662	40,901
Seminole	17,320	17,898	19,967	22,275	24,851	27,723	30,929
Tulsa	13,071	13,507	15,069	16,811	18,754	20,922	23,341
Wagoner	4,580	4,733	5,280	5,891	6,572	7,332	8,179
Woodward	514	531	593	661	738	823	918
Statewide Total	252,127	260,539	290,660	324,262	361,750	403,571	450,227

Table 16 - Estimated Consumptive Use from Thermoelectric Power Generation (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Caddo	3,103	3,207	3,578	3,991	4,453	4,967	5,542
Canadian	1,417	1,464	1,633	1,822	2,033	2,268	2,530
Choctaw	4,378	4,524	5,047	5,631	6,281	7,008	7,818
Comanche	1,538	1,590	1,773	1,978	2,207	2,462	2,747
Le Flore	3,527	3,645	4,066	4,536	5,061	5,646	6,299
Logan	150	155	173	193	215	240	268
Mayes	2,692	2,782	3,103	3,462	3,862	4,309	4,807
McClain	3,920	4,051	4,519	5,041	5,624	6,274	7,000
McCurtain	592	612	683	762	850	948	1,058
Muskogee	61,970	64,038	71,441	79,701	88,915	99,194	110,661
Oklahoma	6,024	6,225	6,945	7,748	8,644	9,643	10,758
Pawnee	22,699	23,456	26,168	29,193	32,568	36,334	40,534
Pittsburg	7,981	8,247	9,201	10,264	11,451	12,775	14,251
Rogers	14,186	14,659	16,354	18,245	20,354	22,707	25,332
Seminole	10,727	11,085	12,367	13,796	15,391	17,171	19,156
Tulsa	8,096	8,366	9,333	10,412	11,615	12,958	14,456
Wagoner	2,837	2,932	3,270	3,648	4,070	4,541	5,066
Woodward	318	329	367	410	457	510	569
Statewide Total	156,156	161,366	180,022	200,833	224,051	249,953	278,850

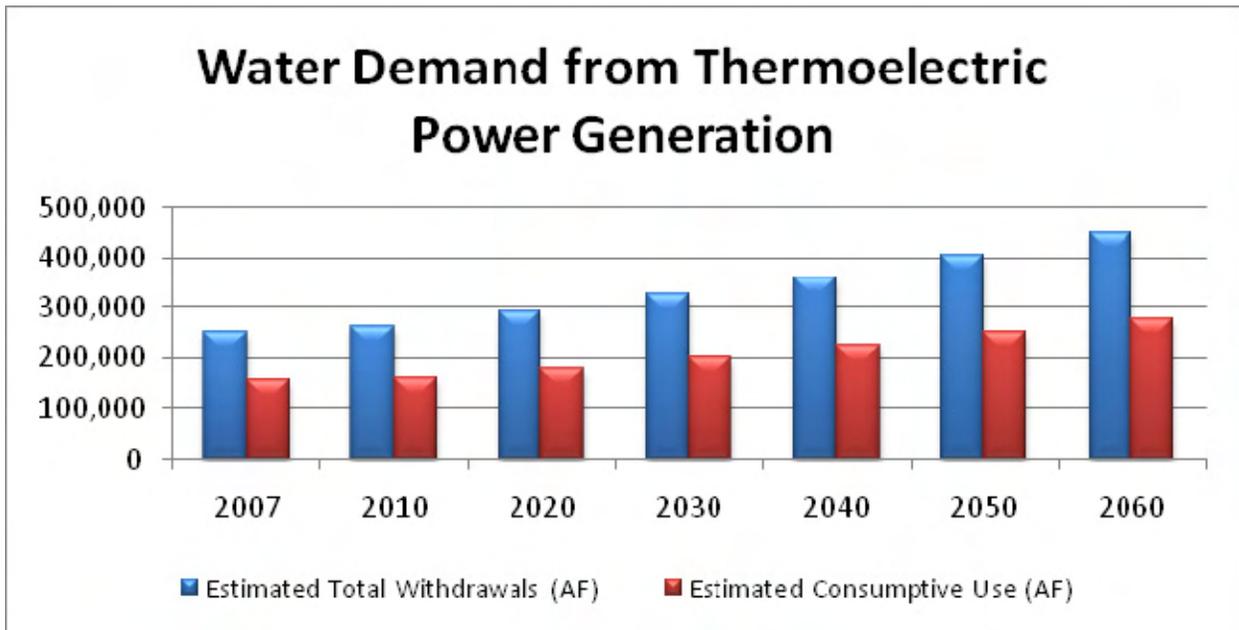


Figure 8 - Water Demand from Thermoelectric Power Generation

4.4 Other Large Industry

A sector was added to the OCWP demand forecast to represent water use from large self-supplied industrial users, such as sand companies, gypsum production plants, quarry mines, concrete producing plants, petroleum refineries, paper mills, sawmills, bottling and distributing plants, chemical plants, tire manufacturing plants, lime production, natural gas plants, and meat packing plants. The data used in this sector were obtained from OWRB annual surface and groundwater reports. Two pieces of information were needed to include a large industry in this forecast sector—water use and employment. Water use reporting was needed to have an accurate estimate of current use at the given establishment. Employment numbers were needed in order to subtract employment from the employment projections used in the public-supply nonresidential forecast, to avoid double-counting.

Twenty-seven industries reported the needed data to the OWRB and are included in this forecast sector. In order to maintain privacy of these establishments, individual information is withheld in this report.

Because future conditions at these establishments is unknown, this sector was forecasted into the future using the growth rates of the employment projections developed for the public supply nonresidential forecast. Growth rates were specified by industry type. Results of the demand forecast are shown in Table 17 and illustrated in Figure 9. Water use among these large industries is projected to increase by 20 percent by 2060.

Table 17 - Selected Self-Supply Large Industry Water Demand Forecast (AFY)

County	2006	2010	2020	2030	2040	2050	2060
Beaver	364	375	393	400	406	413	419
Blaine	317	311	304	330	357	383	412
Canadian	118	115	113	121	127	134	140
Carter	61	63	66	70	73	77	81
Choctaw	92	95	99	101	104	101	99
Comanche	362	355	346	365	380	392	401
Custer	47	46	45	47	49	50	51
Garvin	230	225	219	223	227	232	236
Jackson	613	601	586	614	636	654	669
Johnston	1,425	1,397	1,359	1,380	1,400	1,440	1,481
Kay	11,004	11,340	11,880	12,184	12,465	12,746	13,050
Logan	1,200	1,176	1,154	1,268	1,382	1,493	1,612
McCurtain	1,743	1,709	1,665	1,723	1,772	1,826	1,875
Muskogee	15,465	15,184	14,812	15,256	15,640	16,024	16,408
Oklahoma	178	175	170	177	182	186	190
Osage	567	556	543	569	594	618	646
Pottawatomie	651	639	623	661	697	732	768
Sequoyah	1,656	1,624	1,590	1,735	1,877	2,022	2,168
Texas	5,940	5,825	5,765	6,910	8,056	9,202	10,330
Woodward	3,159	3,097	3,016	3,106	3,167	3,242	3,303
Statewide Total	45,192	44,906	44,748	47,238	49,587	51,962	54,334

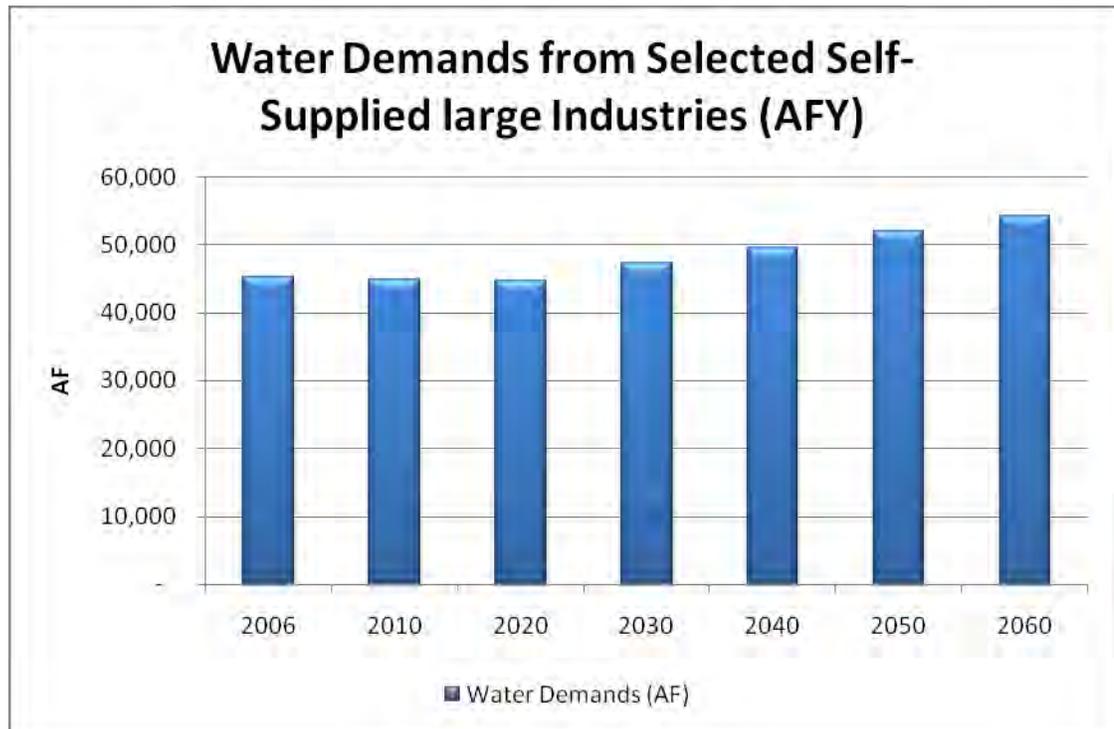


Figure 9 - Water Demands from Selected Self-Supplied Large Industries (AFY)

Section 5

Agriculture

Oklahoma is the fifth largest cattle producing state in the nation and the third largest producer of wheat. In recent years, crops and livestock that were once relatively small in terms of production have grown dramatically, such as poultry and swine (Oklahoma Department of Agriculture). Agricultural water demands represent a significant percent of statewide water withdrawals and support an important economic sector. For the OCWP, current and future agriculture demands are estimated by county for two sub-sectors: livestock and crop irrigation.

The forecast presented in this chapter represent the **base** agriculture forecast. That is, a forecast that represents current water use patterns and attitudes, current market conditions, and average weather from the base year throughout the forecast. The 2060 demands represent a reasonable maximum estimate of water requirements under base conditions.

Alterations in the base conditions have the potential to greatly impact the future of agriculture water requirements. Conservation practices that replace inefficient irrigation systems with low-waste irrigation systems can reduce irrigation water demands. Potential climate change can alter the type of crops irrigated, reduce or increase rainfall amounts, and affect crop yields. Future energy policies may encourage a switch to biofuel crops that require varying amounts of irrigation water and bring new industries that use high volumes of water. An impact assessment of conservation, climate change, and other factors on the base forecast will be addressed for the OCWP in a later task.

The Census of Agriculture (Ag Census) is the main source of data utilized for the agriculture water demand forecast. Taken every 5 years by the United States Department of Agriculture (USDA), the Ag Census is a complete count of U.S. farms and ranches and the people who operate them. The most recent Ag Census was conducted in 2007 and reports on land use and ownership; operator characteristics; production practices including irrigation, income, and expenditures; livestock counts; and many other areas.

5.1 Livestock

Livestock require water for animal nutrition, animal cooling, sanitation, and waste removal. Oklahoma ranks 13th in the U.S. for live animal and meat exports and produces 5 percent of U.S. cattle and calves inventory (United 2008). Poultry and swine, respectively, are Oklahoma's second and third largest agricultural industries and Oklahoma is now one of the top states in poultry and swine production (Oklahoma 2009).

Current estimates of livestock water demands were developed based on the major livestock groups in Oklahoma and their respective daily water requirements. Major

livestock groups evaluated are: cattle, dairy cows, sheep, hogs, horses, and poultry.⁸ The annual livestock water demand was calculated by multiplying the daily water requirement for each group by the number of livestock and then the number of days in a year. The annual demand in gallons is then converted to AFY. This computation is shown in Equation 5.

$$QLS_{c,y}^{AFY} = [\sum(LSC_{c,y}^n \times DWR^n \times 365)] / 321,851 \quad \text{Equation 5}$$

Where:

- $QLS_{c,y}^{AFY}$ = Livestock water demand in AFY in county (c) in year (y)
- $LSC_{c,y}^n$ = Livestock count for animal group (n) in county (c) and year (y)
- DWR^n = Daily water requirement per animal (n)

5.1.1 Livestock Inventories

Base year livestock numbers at the county level were obtained from the 2007 Ag Census.

Due to disclosure obligations in hog data, some county hog numbers were not reported in the Ag Census. In these instances, 2007 National Agricultural Statistics Service (NASS) district values were used to determine hog numbers. These 2007 district values were distributed to withheld counties by using the county ratios from 1992 to determine 2007 county/district ratios. 1992 ratios were used as 1992 was the last census to contain a data set with no undisclosed data.

It should be noted that 2007 is the first year for horse counts in the Ag Census and the values are known to be low. The American Horse Council (AHC) reports a statewide total nearly three times what is reported in the Ag Census and is considered to have greater accuracy. However, the AHC does not provide horse estimates by county, as needed for the OCWP. Through contact with the Oklahoma State University horse specialist, it was determined that the 2007 Ag Census was the best source for county horse counts.

Also, because cattle for beef and dairy cows have differing water requirements, these livestock groups were estimated separately. Dairy cow inventory estimates were subtracted from total cattle counts to obtain the estimated beef cattle inventory. Therefore, beef cattle values in this analysis represent all cattle other than dairy cows.

Once current livestock inventories by county were collected, a methodology was developed to project livestock inventories by county to 2060. In order to estimate a reasonable maximum projection for livestock, an analysis was conducted from the three most recent Ag Census years. The Ag Census data from 1997, 2002, and 2007 were analyzed to obtain the highest reported number of livestock by livestock group in each county. It is

⁸ Poultry includes: broilers, layers, and pullets for replacement.

believed that using the highest reported number allows for maximum future fluctuations due to unforeseen circumstances. The historical maximum was then assumed to be the build-out inventory for 2060. Linear interpolation was applied to obtain the inventory for forecast years between 2007 and 2060. In some instances, 2007 represents the highest livestock count for a given county and animal group, in which case no growth is assumed.

A modified methodology was used to estimate the build-out inventory for poultry because many county values were withheld in the three census datasets. For instance, in the 1997 census, data on layers were withheld totaling 1.8 million birds across 15 counties. In general, the highest poultry count by type was obtained for these counties and used as build-out. Overall, data problems experienced in the chicken livestock group has little effect on the livestock water demand forecast due to the low water requirement for chickens.

Also, 2007 was the first year that data were collected on equine, thus no historical maximum data exist to estimate future build-out inventories for horses. To project the number of horses into the future, a 2 percent growth rate over the study period was assumed.

Results of the 2007 Ag Census and the 2060 build-out assumptions for each livestock group are shown in Table 18. Statewide, growth in cattle and hog production could potentially increase by 5.8 and 6.3 percent, respectively. Growth in dairy cows has the potential to increase by 65.3 percent. The poultry and sheep/goat livestock groups could increase by 5.0 and 10.1 percent by 2060, respectively. The horse inventory shows the assumed 2 percent growth.

Table 18 - Projected Livestock Inventory

County	CATTLE		DAIRY COWS		SHEEP & GOATS		HOGS		CHICKEN		HORSES	
	2007	2060	2007	2060	2007	2060	2007	2060	2007	2060	2007	2060
Adair	57,391	57,650	3,541	7,526	2,103	2,103	372	406	4,789,544	5,029,021	2,330	2,377
Alfalfa	91,893	103,937	632	632	934	1,703	469	8,154	440	462	810	826
Atoka	80,155	79,988	167	221	2,354	2,354	91	341	1,447	2,315	1,954	1,993
Beaver	101,119	120,597	70	430	545	729	332,088	332,088	207	403	1,085	1,107
Beckham	53,256	63,154	632	632	1,054	1,518	365	390	456	479	1,271	1,296
Blaine	112,977	112,112	865	865	1,323	1,323	65	507	0	0	742	757
Bryan	100,684	101,561	4,080	4,188	4,087	5,455	926	926	1,571	2,705	2,616	2,668
Caddo	141,988	141,725	263	355	3,807	3,807	65,162	65,162	2,090	2,195	1,851	1,888
Canadian	106,430	107,208	322	1,361	2,486	3,402	3,476	8,772	2,491	2,616	2,898	2,956
Carter	53,862	60,442	58	124	2,213	2,213	520	748	4,067	4,270	2,948	3,007
Cherokee	47,048	46,612	2,436	2,528	3,862	3,862	266	901	527,221	548,214	2,803	2,859
Choctaw	70,402	70,338	64	242	1,696	1,696	243	383	158,038	165,940	2,966	3,025
Cimarron	126,552	134,887	632	2,318	445	445	32,309	32,309	166	174	523	533
Cleveland	24,481	26,938	231	410	5,141	5,141	2,584	6,498	3,863	4,172	4,077	4,159
Coal	39,788	47,032	684	961	1,252	2,670	2,101	4,098	1,309	1,460	1,072	1,093
Comanche	70,163	71,747	583	2,759	2,420	2,420	293	551	1,527	1,603	2,168	2,211
Cotton	67,183	69,983	632	632	443	443	31	298	228	239	832	849
Craig	108,594	109,030	764	1,081	10,606	10,606	592	592	1,267,182	1,330,541	2,880	2,938
Creek	42,372	44,655	113	926	4,886	4,886	926	3,274	27,441	36,441	4,267	4,352
Custer	85,940	101,660	663	683	1,942	2,386	8,492	8,492	707	1,050	1,019	1,039
Delaware	80,997	81,066	2,131	3,727	4,064	4,064	445	37,477	10,634,551	11,166,279	2,791	2,847
Dewey	51,588	62,153	11	248	519	968	366	366	685	719	571	582
Ellis	62,396	65,421	304	859	449	938	102,233	102,233	269	282	769	784
Garfield	97,462	99,394	719	851	2,535	4,010	315	1,096	1,144	1,324	962	981
Garvin	83,643	83,918	225	946	3,677	3,677	502	663	2,546	2,673	3,754	3,829
Grady	100,915	112,979	14,930	21,226	6,586	6,586	32,024	32,024	1,882	1,976	2,981	3,041
Grant	47,705	59,328	632	632	2,460	2,460	175	1,576	523	549	560	571
Greer	32,033	32,033	0	52	1,903	1,903	65	214	156	164	475	485
Harmon	39,558	38,926	632	2,318	621	621	201	1,461	0	0	206	210
Harper	90,331	93,146	632	632	921	1,391	37,371	37,371	63	66	678	692
Haskell	59,074	59,060	14	554	396	786	9,190	14,565	2,982,125	3,131,231	1,531	1,562
Hughes	70,781	70,643	138	207	3,187	3,187	130,744	149,488	1,386	1,419	1,929	1,968
Jackson	41,434	56,101	40	2,318	2,018	2,018	117	362	184	193	903	921
Jefferson	94,869	94,684	185	749	1,082	1,931	55	145	163	304	792	808
Johnston	42,655	43,722	24	865	5,476	5,476	3,018	3,018	1,240	1,302	1,276	1,302
Kay	42,818	46,077	12	997	7,014	7,014	488	2,384	1,325	3,864	1,335	1,362
Kingfisher	115,341	121,549	1,631	1,750	2,800	2,943	110,302	110,302	553	1,098	1,202	1,226

Table 18 - Projected Livestock Inventory

County	CATTLE		DAIRY COWS		SHEEP & GOATS		HOGS		CHICKEN		HORSES	
	2007	2060	2007	2060	2007	2060	2007	2060	2007	2060	2007	2060
Kiowa	78,546	81,706	7	129	1,679	2,460	2,115	2,115	371	390	672	685
Latimer	37,028	36,995	33	102	2,869	2,869	3,557	7,260	250,752	263,290	1,595	1,627
Leflore	85,463	85,212	251	281	3,974	3,974	7,609	14,262	12,309,329	12,924,795	3,516	3,586
Lincoln	70,357	69,912	2,245	2,324	5,932	5,932	785	2,601	4,760	4,998	4,902	5,000
Logan	49,120	66,483	215	529	4,852	5,854	296	454	3,572	3,751	3,479	3,549
Love	46,133	46,083	50	50	1,526	1,526	136	144	418	439	2,150	2,193
Major	83,158	91,763	715	885	2,318	2,318	153,345	153,345	1,485	1,559	960	979
Marshall	20,939	25,102	44	749	1,990	1,990	295	295	2,080	2,184	1,320	1,346
Mayes	80,162	79,427	4,335	5,415	2,626	2,626	676	2,127	1,859,844	1,952,836	3,251	3,316
McClain	58,933	58,434	1,399	2,007	1,762	2,827	2,265	5,485	2,713	2,849	3,519	3,589
McCurtain	68,314	78,240	198	777	2,916	2,916	8,354	39,720	9,999,815	10,444,351	3,877	3,955
McIntosh	43,835	50,058	54	532	772	772	6,943	6,943	76,734	80,571	2,440	2,489
Murray	26,199	32,017	632	2,586	1,149	2,748	57	320	1,912	2,008	865	882
Muskogee	73,887	74,249	1,138	1,798	5,894	5,894	421	662	325,373	341,642	3,833	3,910
Noble	63,398	63,314	84	242	1,902	2,409	181	1,139	525	580	960	979
Nowata	78,177	77,545	632	632	1,034	1,950	52	302	37,665	39,549	1,998	2,038
Okfuskee	43,122	46,120	26	52	1,593	1,593	24,280	24,280	2,023	5,248	1,392	1,420
Oklahoma	20,668	21,713	632	632	4,005	4,005	721	847	4,446	4,668	4,028	4,109
Okmulgee	51,310	51,820	11	180	2,406	2,406	604	802	3,781	3,970	3,287	3,353
Osage	165,776	172,283	383	663	2,931	3,575	273	1,441	2,199	3,320	4,858	4,955
Ottawa	58,393	58,489	404	1,911	2,325	2,325	513	2,707	2,163,029	2,271,180	1,781	1,817
Pawnee	43,444	43,383	61	61	2,585	3,336	150	1,145	1,204	2,220	1,673	1,706
Payne	53,024	53,368	1,290	2,244	5,101	5,101	1,821	2,397	4,511	4,576	3,243	3,308
Pittsburg	82,079	87,266	416	416	3,416	3,416	485	713	53,476	56,150	3,080	3,142
Pontotoc	53,585	58,836	544	953	4,663	4,663	8,410	8,410	3,358	3,526	3,962	4,041
Pottawatomie	56,897	57,151	746	1,086	3,426	3,426	18,556	18,556	6,171	6,480	3,724	3,798
Pushmataha	33,664	36,212	60	81	1,392	1,392	166	1,002	33,725	35,411	2,263	2,308
Roger Mills	62,516	67,821	193	1,740	886	886	239	395	596	626	886	904
Rogers	76,585	76,794	391	1,300	4,162	4,162	304	609	4,292	4,507	4,489	4,579
Seminole	36,895	39,965	209	644	1,883	1,883	16,964	20,680	2,738	2,875	2,125	2,168
Sequoyah	40,701	51,266	632	632	2,424	2,424	2,024	3,017	876,386	920,205	3,361	3,428
Stephens	71,412	78,530	105	895	2,604	2,604	888	1,298	1,938	2,079	2,797	2,853
Texas	246,850	282,969	90	276	1,294	1,294	1,145,999	1,145,999	509	701	2,362	2,409
Tillman	47,919	49,859	5,890	5,890	849	1,837	310	310	308	372	683	697
Tulsa	20,681	21,727	100	117	2,792	2,792	91	791	3,215	3,376	3,545	3,616
Wagoner	42,537	42,247	690	1,072	2,952	2,952	290	420	7,809	8,199	2,353	2,400
Washington	34,980	35,920	67	101	1,597	1,597	1,527	1,527	1,665	1,748	3,762	3,837

Table 18 - Projected Livestock Inventory

County	CATTLE		DAIRY COWS		SHEEP & GOATS		HOGS		CHICKEN		HORSES	
	2007	2060	2007	2060	2007	2060	2007	2060	2007	2060	2007	2060
Washita	107,650	107,318	632	632	1,085	2,253	5,473	5,473	273	287	664	677
Woods	96,714	107,181	632	632	826	826	201	504	301	316	869	886
Woodward	85,708	85,617	91	112	1,819	2,966	134,826	134,826	490	1,084	1,204	1,228
State Total	5,332,637	5,641,850	66,023	109,168	201,518	221,914	2,431,185	2,584,958	48,474,581	50,856,658	165,555	168,866

*(D) indicates data withheld due to privacy agreements.

** Indicated data available only for broilers

5.1.2 Livestock Water Requirements

To complete the livestock water demand projections, data on daily animal water requirements were assumed from USGS Method for Estimating Water Withdrawals for Livestock in the U.S. (USGS 2005). Daily water requirements for each livestock group include that used for drinking water, cooling, and sanitation and waste removal requirements. A literature review was also conducted to verify the USGS water requirements, as discussed below. A summary of daily animal water requirements selected for the OCWP are presented in Table 19.

Table 19 - Average Daily Water Requirement per Animal by Livestock Group (gallons)

Cattle	Dairy Cows	Sheep/Goats	Hogs	Chickens	Horses
12.0	35.0	2.0	4.5	0.1	12.0

For cattle, feedlots provide drinking water 24 hours a day in water troughs placed in each pen. Water use at feedlots for beef cattle includes drinking water, trough overflow, trough cleaning, evaporation, and feedmill usage. Parker et al. (2000) performed a 2-year study at a 50,000 head beef cattle feed yard in the Texas High Plains. Flowmeters were installed at the incoming water supply and was monitored daily from November 1995 through October 1997. The average daily water use over the 2 year study period was 10.8 gallons per head per day (ghd), with variation in the summer and winter months. This average water use observed in the Parker et al. study is consistent with other literature reviewed (AGRI-FACTS 2008, Martin et al. 2001, and Ontario 2007). The USGS estimated water requirements for cattle at 12 ghd. Thus, the USGS value is assumed reasonable for the OCWP.

Milk cow operations require water to meet the nutritional needs of the animals and for cleaning the milking parlor and equipment. Brugger and Dorsey (2006) conducted a study in Ohio using 13 water meters to monitor water flows on a 1,000 cow dairy. The meters were used to monitor cow drinking water, plate cooler water, and parlor wash water as well as sanitation of the milking equipment. Cow drinking water varied monthly from 12.0 to 32.4 ghd, with a yearly average of 20.5 ghd. In all, an average of 29.8 ghd was used for drinking and sanitation purposes on the dairy farm. The Brugger and Dorsey study was the only resource found that metered actual water use. Other resources report higher average drinking requirements for dairy cows ranging from 30 to 40 ghd (AGRI-FACTS 2008, Ontario 2007, and Martin et al. 2001) based on estimates of usage. According to the USGS, dairy cows require an average of 35 ghd. Thus for the OCWP, the USGS value is assumed reasonable.

Grazing sheep and goats, particularly in the cooler seasons of the year, can require relatively little additional water beyond what they receive through forage. Ministry (2007) indicates that sheep require 2.6 ghd. According to the USGS, sheep and goats require an average of 2 ghd. This rate of use is assumed as the daily requirement for sheep and goats for the OCWP.

Hog farms require water for animal drinking, cooling, and washing, and for waste disposal. Estimates of drinking water requirements for swine range from 4 to 20 ghd (AGRI-FACTS

2008, and Martin et al. 2001). The USGS reports average daily water demand per hog to 4.5 gallons. This rate of use is assumed as the daily requirement for hogs for the OCWP.

While water demand at poultry facilities can vary depending on individual cleaning programs, water requirements per animal are seemingly low. According to several resources, chickens require 0.1 gallons of water per day (AGRI-FACTS 2008, Bell et al. 2002, and Martin et al. 2001). This is in agreement with the USGS suggested values and assumed to be sufficient for planning purposes.

On average, horses require 12 ghd (AGRI-FACTS 2008, American 2000, Ministry 2007, and Martin 2001). The USGS also reports that horses require 12 ghd. Horses at rest in a moderate climate will generally consume between 4 to 9 gallons for a 1,100-pound horse. Heat and humidity increase water requirements, especially in exercising horses. For the OCWP, 12 gallons per day is assumed for horses in Oklahoma.

5.1.3 Livestock Water Demands

Results of the water demand forecast for livestock are shown in Table 20. Under the assumptions described above, water demand under reasonable maximum conditions grows by 7.4 percent from 2007 to 2060. The highest percent of growth can occur in Jackson, Logan, and Murray Counties, although these counties have relatively low water demands. The highest water demand for livestock (about ten percent of the state total) occurs in Texas County, due to the high numbers of beef cattle and hog farms. Figure 10 shows the statewide demands by livestock group. As shown, cattle and hog operations constitute the majority of the current and future water demands.

Table 20 - Oklahoma: Projected Livestock Water Demand - AFY (All Cattle, Dairy Cows, Sheep/Goats, Chickens, Hogs, and Horses)

County	2007	2010	2020	2030	2040	2050	2060
Adair	1,431	1,441	1,476	1,511	1,546	1,581	1,616
Alfalfa	1,275	1,287	1,326	1,365	1,404	1,442	1,481
Atoka	1,116	1,116	1,117	1,117	1,117	1,118	1,118
Beaver	3,052	3,067	3,120	3,172	3,224	3,276	3,328
Beckham	762	770	795	820	846	871	897
Blaine	1,566	1,565	1,564	1,562	1,560	1,558	1,557
Bryan	1,562	1,564	1,567	1,571	1,575	1,579	1,582
Caddo	2,281	2,281	2,281	2,281	2,281	2,281	2,282
Canadian	1,506	1,510	1,525	1,541	1,556	1,571	1,586
Carter	774	779	797	814	832	849	867
Cherokee	829	829	830	830	831	832	833
Choctaw	1,010	1,010	1,012	1,013	1,015	1,016	1,018
Cimarron	1,897	1,907	1,940	1,974	2,008	2,041	2,075
Cleveland	418	421	433	444	456	467	479
Coal	590	596	619	642	665	688	711
Comanche	1,002	1,008	1,029	1,049	1,070	1,090	1,111
Cotton	940	942	950	957	965	972	979
Craig	1,683	1,684	1,689	1,694	1,699	1,703	1,708
Creek	650	654	668	683	697	712	726
Custer	1,242	1,254	1,294	1,335	1,375	1,415	1,455
Delaware	2,293	2,310	2,368	2,425	2,483	2,540	2,598
Dewey	705	713	742	771	800	828	857
Ellis	1,377	1,381	1,393	1,405	1,417	1,429	1,441

Table 20 - Oklahoma: Projected Livestock Water Demand - AFY (All Cattle, Dairy Cows, Sheep/Goats, Chickens, Hogs, and Horses)

County	2007	2010	2020	2030	2040	2050	2060
Garfield	1,359	1,361	1,368	1,375	1,383	1,390	1,397
Garvin	1,195	1,197	1,203	1,209	1,216	1,222	1,228
Grady	2,158	2,181	2,259	2,336	2,413	2,491	2,568
Grant	680	689	720	751	782	813	843
Greer	442	442	442	443	443	444	444
Harmon	562	565	577	589	602	614	626
Harper	1,439	1,441	1,448	1,456	1,463	1,470	1,478
Haskell	1,163	1,167	1,179	1,191	1,203	1,215	1,227
Hughes	1,649	1,654	1,673	1,691	1,709	1,727	1,745
Jackson	576	592	646	701	755	809	864
Jefferson	1,296	1,297	1,301	1,305	1,310	1,314	1,318
Johnston	619	622	631	640	649	658	667
Kay	612	618	635	652	670	687	705
Kingfisher	2,193	2,198	2,215	2,231	2,248	2,265	2,282
Kiowa	1,080	1,082	1,092	1,101	1,110	1,119	1,129
Latimer	570	571	576	580	584	588	593
LeFlore	2,494	2,499	2,517	2,535	2,553	2,571	2,588
Lincoln	1,117	1,118	1,119	1,121	1,122	1,124	1,125
Logan	728	742	789	837	884	931	978
Love	655	655	655	655	655	655	655
Major	1,937	1,944	1,967	1,990	2,013	2,036	2,060
Marshall	307	312	328	344	359	375	391
Mayes	1,488	1,491	1,500	1,510	1,519	1,529	1,538
McClain	910	912	919	926	933	940	947
McCurtain	2,035	2,055	2,123	2,191	2,259	2,327	2,395
McIntosh	836	844	868	892	916	939	963
Murray	392	401	431	461	491	521	552
Muskogee	1,137	1,139	1,146	1,152	1,159	1,166	1,172
Noble	874	874	876	879	881	883	885
Nowata	1,109	1,109	1,108	1,107	1,106	1,105	1,104
Okfuskee	726	728	736	744	752	760	768
Oklahoma	370	371	374	377	380	383	386
Okmulgee	743	744	747	750	753	756	759
Osage	2,317	2,323	2,343	2,363	2,384	2,404	2,424
Ottawa	1051	1055	1071	1086	1102	1118	1133
Pawnee	616	616	617	618	620	621	622
Payne	828	831	839	848	856	865	874
Pittsburg	1,176	1,181	1,194	1,208	1,221	1,235	1,248
Pontotoc	848	853	870	886	903	919	936
Pottawatomie	946	947	950	954	957	960	964
Pushmataha	493	495	502	510	518	525	533
Roger Mills	863	871	896	921	946	971	996
Rogers	1,116	1,119	1,127	1,134	1,142	1,150	1,158
Seminole	623	627	642	656	671	686	700
Sequoyah	721	730	758	787	816	845	873
Stephens	1,012	1,019	1,044	1,068	1,093	1,117	1,142
Texas	9,133	9,161	9,254	9,347	9,440	9,533	9,626
Tillman	888	889	895	900	905	911	916
Tulsa	337	338	341	345	349	352	356
Wagoner	639	640	642	645	647	649	652
Washington	535	536	539	541	544	547	550
Washita	1,511	1,511	1,510	1,510	1,510	1,509	1,509
Woods	1,339	1,347	1,374	1,401	1,428	1,455	1,482
Woodward	1,856	1,856	1,856	1,857	1,857	1,858	1,858
State Total	94,087	94,480	95,793	97,106	98,418	99,731	101,043

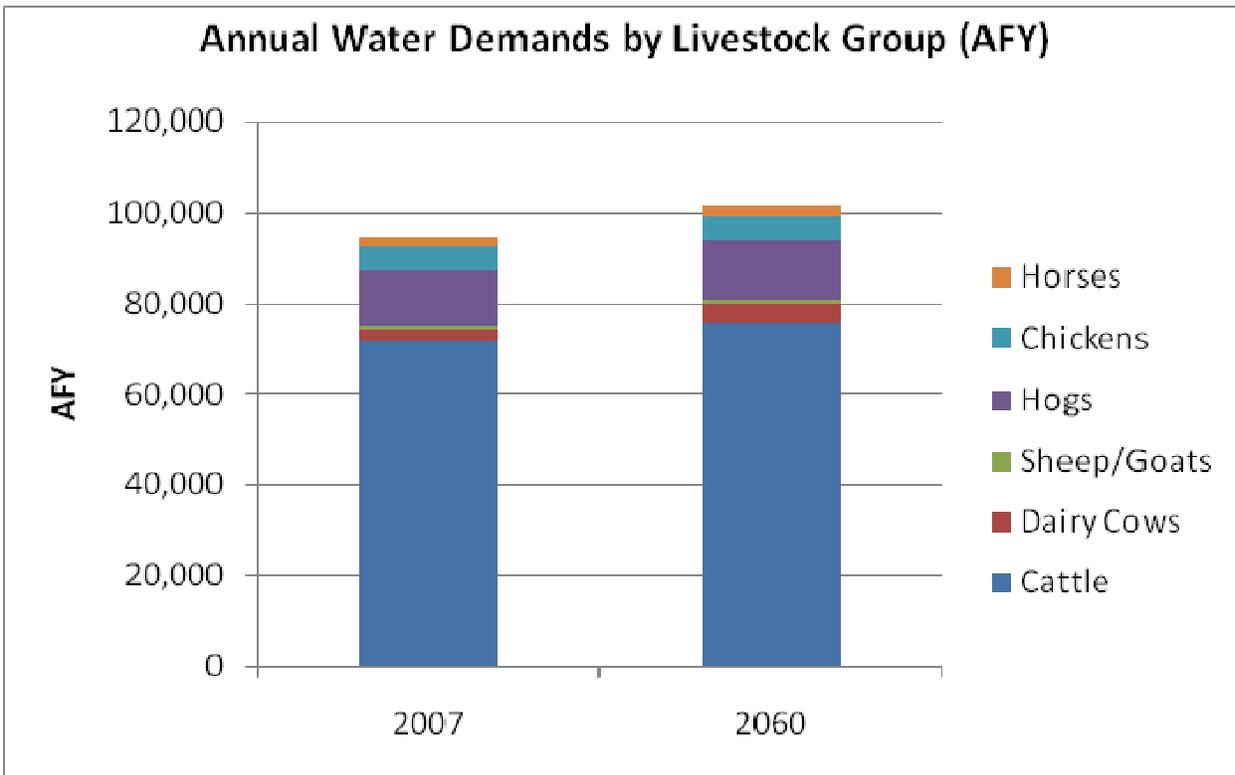


Figure 10 - Annual Water Demands by Livestock Group (AFY)

5.2 Crop Irrigation

Accurately forecasting irrigation water demands in the future for a specific period in time is a challenging task. Variation in weather, politics, and socioeconomic forces cause significant swings in cropping patterns, irrigation use, and ultimately water demand for irrigation. Numerous alternative scenarios could be developed as indicative of future crop irrigation patterns in Oklahoma for the next 50 years. Nonetheless, it is necessary to adopt plausible guidelines to be used in planning for future demands for irrigation water. The demands developed for 2060 under this task represent a reasonable maximum demand for each county under average weather and current economic conditions (i.e., base scenario) that is a useful input into the planning process.

Crop irrigation water demand for a given county is driven by the type of crops planted, irrigation water required for those crops, number of acres planted, and type of irrigation system utilized. A basic methodology was developed based on the best available data to estimate irrigation water demands now and in the future. The methodology is total irrigated acres times the weighted average crop irrigation water requirement (WCIR) per irrigated acre by county, as shown in Equation 6 and 7 and further discussed below.

$$Q_{c,y} = IA_{c,y} \times WCIR_{c,b} \quad \text{Equation 6}$$

$$WCIR_{c,b} = \left(\sum_i (IA_{c,b}^{Crop_i} \times CIR_c^{Crop_i}) \right) / IA_{c,b} \quad \text{Equation 7}$$

Where:

- $Q_{c,y}$ = Total crop irrigation requirements in AFY in county (c) in year (y)
- $IA_{c,y}$ = Total irrigated acres in county (c) in year (y)
- $WCIR_{c,b}$ = Weighted crop irrigation requirement in county (c) in base year (b) (2007)
- $IA_{c,b}^{Crop_i}$ = Irrigated acres in crop (i) in county (c) in base year (b) (2007)
- $CIR_c^{Crop_i}$ = Irrigation water required per acre in AFY for crop (i) in county (c)
- $IA_{c,b}$ = Total irrigated acres in county (c) in the base year (b) (2007)

Determining the WCIR for each county requires several data sources. 2007 Ag Census provides data for irrigated acres by commodity type and county (variable $IA_{c,b}^{Crop_i}$ in Equation 6). The commodities include corn for grain and silage, cotton, barley, edible beans, forage, orchards, oats, peanuts, potatoes, rice, sod, sorghum, soybeans, sunflowers, watermelons, and wheat.⁹ In some instances, irrigated acres by crop type were withheld due to privacy agreements. The undisclosed values were estimated by comparing the statewide irrigated acres for a given commodity and evenly distributing the difference between the known values and unknown values to the undisclosed counties.

Total irrigated land by county for 2007 (variable $IA_{c,y}$ in Equation 5) was also obtained from the Ag Census. This Ag Census category includes all land watered by any artificial or controlled means, such as sprinklers, flooding, furrows or ditches, sub-irrigation, and spreader dikes. The Ag Census category irrigated lands is more accurate for total irrigated acres when compared to the sum of irrigated acres by commodity type, which has withheld county data.

Crop irrigation water requirements (variable $CIR_c^{Crop_i}$ in Equation 6) were obtained for most of the crops from the Natural Resource Conservation Service (NRCS) Irrigation Guide Report, Oklahoma Supplement (USDA NRCS 1997). The Irrigation Guide provides monthly crop irrigation water requirements at 11 locations in Oklahoma: Altus, Ardmore, Chickasha, Elk City, Goodwell, Hugo, Muskogee, Oklahoma City, Ponca City, Tulsa, and Woodward. Crop types include: alfalfa, corn for silage, corn for grain, cotton, grain for sorghum, peanuts,

⁹ "Forage" includes land used for all hay and all haylage, grass silage, and greenchop. "Orchards" includes land in bearing age and nonbearing age fruit trees, citrus or other groves, vineyards, and nut trees. Potatoes, watermelons, and sod are not included in the irrigated commodity table of the Ag Census; these crops are assumed to be irrigated and the data were extracted from the "Planted Acres" table of the Ag Census.

pasture grasses, potatoes, soybeans, spinach, sunflowers, watermelons, and wheat. Irrigation requirements were provided by crop type for both average and dry years. The normal year is for 50 percent chance of effective rainfall and the dry year is for 80 percent chance of effective rainfall. For use in the baseline forecast presented herein, average year requirements were utilized. Crop types from the Ag Census data by county were matched with irrigation requirements in the Irrigation Guide for one of the 11 reporting locations based on distance and rainfall zone. County assignment to location is shown in Figure 11.

The Irrigation Guide did not provide a water requirement for sod. A Bureau of Reclamation (BOR) study completed for the OWRB provided estimates of sod irrigation water requirements.

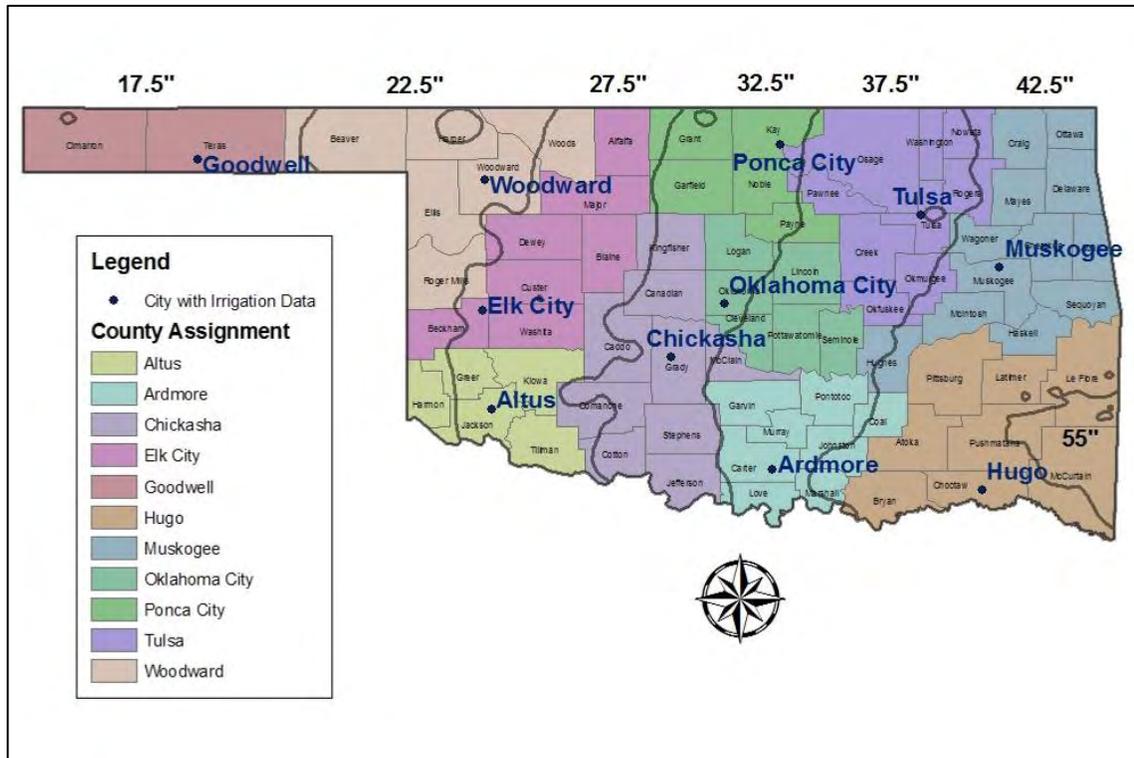


Figure 11 - Assignment of Irrigation Data to County Based on Average Annual Precipitation

Once the irrigated crop and water requirement data were collected and processed, the WCIR was calculated for each county, as shown in Table 21. The WCIR captures annual water demands for irrigation considering the unique mix of crop type, crop irrigation requirements, and precipitation zone for each county. The estimated WCIRs range in value from 0.59 AF per acre in Washita County up to 1.82 AF per acre in Carter County. The WCIR for each county is assumed to remain constant in the future. That is, the mix of crops planted and irrigated, as well as the water required for these plants, is assumed to remain the same in future years for each county as it is in the base year.

Table 21 - Weighted Crop Irrigation Requirement By County In Total AFY Acre-Feet Per Irrigated Acre

County	WCIR (AF/Acre)	County	WCIR (AF/Acre)	County	WCIR (AF/Acre)
Adair	1.26	Grant	1.04	Nowata	1.35
Alfalfa	1.59	Greer	1.31	Okfuskee	1.21
Atoka	1.32	Harmon	1.06	Oklahoma	1.59
Beaver	0.95	Harper	1.36	Okmulgee	1.17
Beckham	1.07	Haskell	1.26	Osage	0.96
Blaine	0.95	Hughes	1.13	Ottawa	1.33
Bryan	1.53	Jackson	1.20	Pawnee	1.68
Caddo	0.79	Jefferson	0.91	Payne	1.26
Canadian	1.35	Johnston	1.55	Pittsburg	1.39
Carter	1.82	Kay	1.11	Pontotoc	1.56
Cherokee	1.29	Kingfisher	1.20	Pottawatomie	1.14
Choctaw	1.31	Kiowa	1.29	Pushmataha	1.32
Cimarron	1.12	Latimer	1.35	Roger Mills	1.58
Cleveland	0.81	Le Flore	0.74	Rogers	1.54
Coal	1.15	Lincoln	1.39	Seminole	1.36
Comanche	1.54	Logan	1.06	Sequoyah	1.13
Cotton	1.41	Love	1.20	Stephens	1.45
Craig	1.28	Major	1.35	Texas	1.07
Creek	0.90	Marshall	1.75	Tillman	1.15
Custer	0.96	Mayes	1.25	Tulsa	1.62
Delaware	1.29	McClain	1.45	Wagoner	1.36
Dewey	1.29	McCurtain	1.10	Washington	0.91
Ellis	1.47	McIntosh	1.01	Washita	0.59
Garfield	0.99	Murray	1.02	Woods	1.41
Garvin	1.20	Muskogee	0.91	Woodward	0.89
Grady	1.13	Noble	1.25		

Estimation of future water requirements for irrigation is based upon the projection of future irrigated acres within each county. Thus, estimates were developed to project the total number of irrigated acres by county through 2060. Historical levels of irrigated acres by county as reported in the Ag Census were reviewed. The maximum number of acres irrigated from 1987 to 2007 is assumed to represent the build-out irrigated acres in 2060. For a number of counties, irrigated acres were highest in 2007 in comparison to that time period thus resulting in "no growth" in the forecast. For these counties, the maximum from 1977 to 2007 was assumed instead of the 1987 to 2007 period. For a few counties, irrigated acres is currently at its highest, even since 1977. For these counties, no growth is assumed.

The number of irrigated acres per forecast year is interpolated from the 2007 current acreage to the 2060 build-out maximum using linear interpolation. Thus, crop irrigation demand will show a linear growth from 2007 to 2060. Projection of irrigated acres for each county through 2060 is shown in Table 22. Statewide, the estimated 2060 irrigated acreage is 22 percent more than the 2007 irrigated acreage.

Table 22 - Projection of Irrigated Acres by County

County	2007*	2010	2020	2030	2040	2050	2060**
Adair	672	718	873	1,027	1,181	1,300	1,490
Alfalfa	2,617	2,689	2,928	3,167	3,406	3,589	3,884
Atoka	743	787	932	1,077	1,222	1,333	1,512
Beaver	28,512	28,763	29,598	30,434	31,269	31,910	32,940
Beckham	6,895	6,895	6,895	6,895	6,895	6,895	6,895
Blaine	5,845	5,845	5,845	5,845	5,845	5,845	5,845
Bryan	9,492	9,528	9,647	9,766	9,886	9,977	10,124
Caddo	33,152	34,028	36,950	39,871	42,793	45,035	48,636
Canadian	3,954	3,996	4,134	4,273	4,412	4,518	4,689
Carter	1,276	1,281	1,297	1,314	1,330	1,343	1,363
Cherokee	972	986	1,033	1,080	1,127	1,163	1,221
Choctaw	527	556	651	747	842	915	1,033
Cimarron	45,513	46,800	51,091	55,383	59,674	62,967	68,256
Cleveland	1,139	1,202	1,410	1,619	1,827	1,987	2,244
Coal	469	470	471	473	475	477	479
Comanche	1,449	1,482	1,592	1,702	1,812	1,896	2,032
Cotton	331	350	414	478	541	590	669
Craig	0	98	424	749	1,075	1,325	1,727
Creek	319	331	371	411	451	482	531
Custer	4,137	4,161	4,241	4,321	4,400	4,462	4,560
Delaware	624	624	624	624	624	624	624
Dewey	3,129	3,129	3,129	3,129	3,129	3,129	3,129
Ellis	12,829	13,256	14,680	16,105	17,529	18,622	20,377
Garfield	5,359	5,359	5,359	5,359	5,359	5,359	5,359
Garvin	812	909	1,234	1,559	1,884	2,134	2,534
Grady	8,465	8,465	8,465	8,465	8,465	8,465	8,465
Grant	1,473	1,473	1,473	1,473	1,473	1,473	1,473
Greer	3,442	3,860	5,255	6,649	8,043	9,113	10,832
Harmon	17,805	17,955	18,455	18,955	19,454	19,838	20,454
Harper	6,206	6,331	6,748	7,165	7,582	7,902	8,416
Haskell	1,703	1,745	1,886	2,027	2,167	2,276	2,449
Hughes	2,244	2,479	3,262	4,045	4,829	5,430	6,395
Jackson	55,120	55,455	56,572	57,689	58,806	59,663	61,040
Jefferson	330	339	369	399	428	451	488
Johnston	692	760	989	1,217	1,445	1,621	1,902
Kay	3,569	3,569	3,569	3,569	3,569	3,569	3,569
Kingfisher	5,527	5,611	5,891	6,170	6,450	6,664	7,009
Kiowa	2,615	2,637	2,709	2,782	2,854	2,910	2,999
Latimer	439	533	847	1,161	1,474	1,715	2,102
Le Flore	9,398	9,398	9,398	9,398	9,398	9,398	9,398
Lincoln	2,191	2,191	2,191	2,191	2,191	2,191	2,191
Logan	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Love	1,838	1,940	2,280	2,619	2,959	3,219	3,638
Major	8,169	8,177	8,205	8,233	8,261	8,282	8,316
Marshall	2,254	2,276	2,348	2,421	2,493	2,549	2,638
Mayer	791	813	886	960	1,033	1,090	1,180
McClain	1,674	1,683	1,713	1,742	1,772	1,794	1,831
McCurtain	421	500	762	1,025	1,287	1,489	1,812

Table 22 - Projection of Irrigated Acres by County

County	2007*	2010	2020	2030	2040	2050	2060**
McIntosh	572	572	574	575	576	577	579
Murray	0	36	156	276	397	489	637
Muskogee	8,154	8,154	8,154	8,154	8,154	8,154	8,154
Noble	833	833	833	833	833	833	833
Nowata	131	165	276	388	500	585	723
Okfuskee	1,282	1,322	1,455	1,588	1,721	1,823	1,987
Oklahoma	2,935	2,935	2,935	2,935	2,935	2,935	2,935
Okmulgee	860	860	860	860	860	860	860
Osage	435	476	611	746	881	984	1,151
Ottawa	287	300	342	384	426	458	510
Pawnee	37	44	67	90	114	131	160
Payne	898	899	903	906	910	913	917
Pittsburg	1,671	1,710	1,842	1,973	2,105	2,206	2,368
Pontotoc	788	916	1,341	1,767	2,192	2,519	3,043
Pottawatomie	1,403	1,477	1,723	1,968	2,214	2,403	2,706
Pushmataha	524	525	527	530	533	535	538
Roger Mills	4,605	4,607	4,615	4,622	4,630	4,636	4,645
Rogers	811	833	904	976	1,048	1,103	1,191
Seminole	782	831	993	1,155	1,317	1,441	1,641
Sequoyah	1,622	1,649	1,740	1,831	1,921	1,991	2,103
Stephens	1,194	1,312	1,703	2,095	2,487	2,788	3,271
Texas	156,026	156,340	157,386	158,431	159,477	160,280	161,569
Tillman	12,974	13,028	13,206	13,385	13,563	13,700	13,920
Tulsa	3,901	3,941	4,075	4,208	4,342	4,444	4,609
Wagoner	5,226	5,226	5,226	5,226	5,226	5,226	5,226
Washington	497	538	675	812	950	1,055	1,224
Washita	7,300	7,396	7,714	8,033	8,351	8,595	8,988
Woods	1,984	2,023	2,154	2,285	2,416	2,517	2,678
Woodward	7,565	7,565	7,565	7,565	7,565	7,565	7,565
State Total	534,030	540,542	562,250	583,958	605,666	622,325	649,081

*Data from 2007 Ag Census

**Represent reasonable maximum irrigated acres. Obtained from analysis of 1987 to 2007 Ag Census data

BOLD indicates 2060 value was obtained from analysis of 1977 to 2007 Ag Census dataset

A final step is taken to adjust the irrigation water demands to capture on-farm losses from irrigation distribution systems. These losses need to be considered when estimating total irrigation water withdrawals. In order to adjust preliminary irrigation water demands to account for these losses, a field application efficiency factor was applied as a function of irrigation methods (surface, sprinkler or drip irrigation), as described below.

Field application efficiencies were determined following an extensive literature review by OWRB and CDM. Due to recent improvements in irrigation efficiency over the past decade, sources were limited to the past decade. Surface irrigation efficiency is reported as high as 95 percent and as low as 35 percent. Sprinkler irrigation efficiency values were as high as 98 percent and as low as 60 percent, depending on the type of system used. Drip irrigation efficiencies ranged from 70 percent to 95 percent (Vickers, 2001; Washington State Department of Ecology, 2005). For the OCWP, data were extracted from the Oklahoma 2003 Farm and Ranch Irrigation Survey to determine ratios of irrigation types to overall farm acreage. These ratios were multiplied by nationwide average field application

efficiency values determined from the extensive literature search. Values assumed in the OCWP for the field application efficiency by irrigation method are shown in Table 23.

Table 23 - Field Application Efficiency by Irrigation Method

Irrigation Method	Field Application Efficiency
Surface Irrigation	64%
Sprinkler Irrigation	85%
Drip Irrigation	89%

The percentage of acres irrigated by each irrigation method by county was calculated from 2005 USGS data, as shown in Table 24. For counties without available data, values were assumed from adjacent counties. These percentages by irrigation method were weighted to determine an overall weighted field application efficiency for each county. The applicable weighted field application efficiencies (WFAE) were used to adjust the preliminary estimates of water demand for irrigation, as shown in Equation 8. The gross irrigation water requirement, or the amount of water to be withdrawn and applied to the irrigation scheme, was calculated as:

Table 24 - Irrigation Methods by County

County	Sprinkler	Drip	Surface	County	Sprinkler	Drip	Surface
Adair	100%	0%	0%	Le Flore	28%	0%	72%
Alfalfa	100%	0%	0%	Lincoln	100%	0%	0%
Atoka	100%	0%	0%	Logan	100%	0%	0%
Beaver	93%	0%	7%	Love	100%	0%	0%
Beckham	100%	0%	0%	Major	99%	0%	1%
Blaine	100%	0%	0%	Marshall	92%	8%	0%
Bryan	100%	0%	0%	Mayes	100%	0%	0%
Caddo	100%	0%	0%	McClain	99%	1%	0%
Canadian	99%	0%	1%	McCurtain	0%	0%	100%
Carter	100%	0%	0%	McIntosh	100%	0%	0%
Cherokee	100%	0%	0%	Murray	100%	0%	0%
Choctaw	100%	0%	0%	Muskogee	92%	0%	8%
Cimarron	98%	0%	2%	Noble	100%	0%	0%
Cleveland	93%	0%	7%	Nowata	100%	0%	0%
Coal	100%	0%	0%	Okfuskee	100%	0%	0%
Comanche	100%	0%	0%	Oklahoma	98%	0%	2%
Cotton	98%	2%	0%	Okmulgee	80%	0%	20%
Craig	100%	0%	0%	Osage	100%	0%	0%
Creek	100%	0%	0%	Ottawa	100%	0%	0%
Custer	95%	0%	5%	Pawnee	100%	0%	0%
Delaware	100%	0%	0%	Payne	100%	0%	0%
Dewey	100%	0%	0%	Pittsburg	92%	0%	8%
Ellis	99%	1%	0%	Pontotoc	96%	0%	4%
Garfield	22%	77%	1%	Pottawatomie	100%	0%	0%
Garvin	84%	0%	16%	Pushmataha	100%	0%	0%
Grady	100%	0%	0%	Roger Mills	69%	0%	31%
Grant	100%	0%	0%	Rogers	100%	0%	0%
Greer	93%	0%	7%	Seminole	100%	0%	0%
Harmon	38%	0%	62%	Sequoyah	68%	21%	11%
Harper	90%	0%	10%	Stephens	100%	0%	0%
Haskell	100%	0%	0%	Texas	95%	0%	5%
Hughes	100%	0%	0%	Tillman	87%	0%	13%
Jackson	6%	0%	93%	Tulsa	100%	0%	0%
Jefferson	85%	11%	4%	Wagoner	100%	0%	0%

Table 24 - Irrigation Methods by County

County	Sprinkler	Drip	Surface	County	Sprinkler	Drip	Surface
Johnston	79%	0%	21%	Washington	100%	0%	0%
Kay	97%	0%	3%	Washita	100%	0%	0%
Kingfisher	100%	0%	0%	Woods	100%	0%	0%
Kiowa	50%	0%	50%	Woodward	93%	1%	6%
Latimer	100%	0%	0%				

*Bold values indicate no data available so closest county data assigned

$$GrossQ_{c,y} = Q_{c,y} / WFAE_{c,b} \quad \text{Equation 8}$$

Where:

- $GrossQ_{c,y}$ = Gross water requirement for irrigation in AF in county (c) in year (y)
- $Q_{c,y}$ = Total crop irrigation requirements in AF in county (c) in year (y) (Equation 5)
- $WFAE_{c,b}$ = Weighted field application efficiency in county (c) in base year (b)

The gross irrigation water requirement thus includes the estimated crop irrigation water requirement plus water losses. The weighted field application efficiency for each county is assumed to remain constant over time. This assumption may produce over-estimate crop irrigation water requirements, with all else being equal, as future irrigation methods become more water efficient. This potential over-estimation of irrigation water demand could be compounded, or offset, by any number of possible future scenarios related to cropping patterns and irrigation requirements as indicated at the beginning of this section.

The above methodology was used to compute and aggregate crop irrigation water demands for each county. The results are shown in Table 25. The 2060 water demand estimate represents the maximum likely irrigation demand under base conditions and assumptions as outlined above. This estimated build-out demand of 907,891 AFY for crop irrigation water is 22 percent greater than the 2007 demand, as illustrated in Figure 12. The highest water demands for crop irrigation can occur in Texas, Jackson, and Cimarron Counties.

Table 25 - Gross Annual Water Demands from Crop Irrigation including Irrigation System Losses (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Adair	993	1,062	1,290	1,518	1,746	1,922	2,203
Alfalfa	4,909	5,043	5,492	5,940	6,389	6,733	7,285
Atoka	1,150	1,217	1,441	1,666	1,890	2,063	2,339
Beaver	32,357	32,642	33,590	34,538	35,486	36,214	37,383
Beckham	8,718	8,718	8,718	8,718	8,718	8,718	8,718
Blaine	6,517	6,517	6,517	6,517	6,517	6,517	6,517
Bryan	17,044	17,108	17,322	17,536	17,750	17,915	18,178
Caddo	30,829	31,644	34,361	37,078	39,794	41,879	45,228
Canadian	6,309	6,376	6,597	6,818	7,040	7,210	7,482
Carter	2,732	2,742	2,777	2,812	2,847	2,874	2,918
Cherokee	1,480	1,501	1,573	1,644	1,716	1,770	1,859
Choctaw	815	859	1,007	1,154	1,302	1,415	1,597
Cimarron	60,416	62,125	67,821	73,517	79,214	83,585	90,606

Table 25 - Gross Annual Water Demands from Crop Irrigation including Irrigation System Losses (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Cleveland	1,106	1,166	1,369	1,571	1,773	1,929	2,178
Coal	637	637	640	643	645	647	650
Comanche	2,630	2,690	2,890	3,089	3,289	3,442	3,688
Cotton	549	581	687	793	898	980	1,110
Craig	0	147	638	1,128	1,618	1,995	2,599
Creek	336	349	391	433	475	508	560
Custer	4,746	4,774	4,865	4,957	5,048	5,119	5,232
Delaware	949	949	949	949	949	949	949
Dewey	4,752	4,752	4,752	4,752	4,752	4,752	4,752
Ellis	22,201	22,940	25,405	27,870	30,334	32,225	35,263
Garfield	6,029	6,029	6,029	6,029	6,029	6,029	6,029
Garvin	1,197	1,340	1,819	2,298	2,777	3,144	3,734
Grady	11,291	11,291	11,291	11,291	11,291	11,291	11,291
Grant	1,801	1,801	1,801	1,801	1,801	1,801	1,801
Greer	5,407	6,064	8,255	10,445	12,636	14,317	17,016
Harmon	26,234	26,455	27,191	27,927	28,664	29,229	30,137
Harper	10,185	10,391	11,075	11,759	12,444	12,969	13,813
Haskell	2,526	2,589	2,798	3,006	3,215	3,375	3,633
Hughes	2,973	3,285	4,323	5,360	6,398	7,195	8,474
Jackson	101,101	101,716	103,765	105,813	107,862	109,434	111,960
Jefferson	354	363	395	427	459	484	523
Johnston	1,333	1,464	1,904	2,344	2,783	3,121	3,662
Kay	4,690	4,690	4,690	4,690	4,690	4,690	4,690
Kingfisher	7,808	7,926	8,321	8,716	9,111	9,415	9,902
Kiowa	4,525	4,563	4,688	4,813	4,939	5,035	5,190
Latimer	698	848	1,347	1,846	2,346	2,729	3,344
Le Flore	9,985	9,985	9,985	9,985	9,985	9,985	9,985
Lincoln	3,575	3,575	3,575	3,575	3,575	3,575	3,575
Logan	1,991	1,991	1,991	1,991	1,991	1,991	1,991
Love	2,593	2,737	3,216	3,695	4,174	4,542	5,133
Major	13,020	13,033	13,078	13,122	13,166	13,200	13,254
Marshall	4,611	4,655	4,804	4,952	5,100	5,214	5,397
Mayes	1,163	1,196	1,303	1,411	1,519	1,602	1,735
McClain	2,853	2,868	2,918	2,969	3,019	3,058	3,120
McCurtain	721	856	1,306	1,756	2,205	2,550	3,105
McIntosh	682	682	684	685	687	688	690
Murray	0	43	188	332	476	587	765
Muskogee	8,882	8,882	8,882	8,882	8,882	8,882	8,882
Noble	1,223	1,223	1,223	1,223	1,223	1,223	1,223
Nowata	208	261	438	616	793	929	1,148
Okfuskee	1,830	1,887	2,077	2,267	2,457	2,602	2,836
Oklahoma	5,537	5,537	5,537	5,537	5,537	5,537	5,537
Okmulgee	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Osage	492	538	691	843	996	1,113	1,302
Ottawa	447	467	533	598	664	714	795
Pawnee	73	87	133	179	225	260	317
Payne	1,332	1,333	1,339	1,344	1,349	1,353	1,360
Pittsburg	2,793	2,859	3,079	3,299	3,519	3,687	3,958
Pontotoc	1,465	1,702	2,493	3,284	4,075	4,682	5,657
Pottawatomie	1,881	1,980	2,309	2,639	2,969	3,222	3,628
Pushmataha	814	816	820	824	828	831	836
Roger Mills	9,262	9,266	9,281	9,296	9,312	9,323	9,342
Rogers	1,470	1,509	1,639	1,769	1,900	1,999	2,160
Seminole	1,250	1,328	1,587	1,847	2,106	2,305	2,624
Sequoyah	2,184	2,221	2,343	2,465	2,587	2,681	2,832

Table 25 - Gross Annual Water Demands from Crop Irrigation including Irrigation System Losses (AFY)

County	2007	2010	2020	2030	2040	2050	2060
Stephens	2,031	2,231	2,898	3,564	4,231	4,742	5,564
Texas	199,312	199,713	201,049	202,385	203,721	204,747	206,393
Tillman	18,089	18,163	18,412	18,661	18,910	19,101	19,408
Tulsa	7,427	7,503	7,757	8,012	8,266	8,461	8,775
Wagoner	8,392	8,392	8,392	8,392	8,392	8,392	8,392
Washington	530	574	721	867	1,014	1,126	1,306
Washita	5,063	5,130	5,350	5,571	5,792	5,962	6,234
Woods	3,288	3,353	3,570	3,787	4,005	4,171	4,439
Woodward	8,026	8,026	8,026	8,026	8,026	8,026	8,026
State Total	736,074	745,210	775,661	806,112	836,562	859,932	897,464

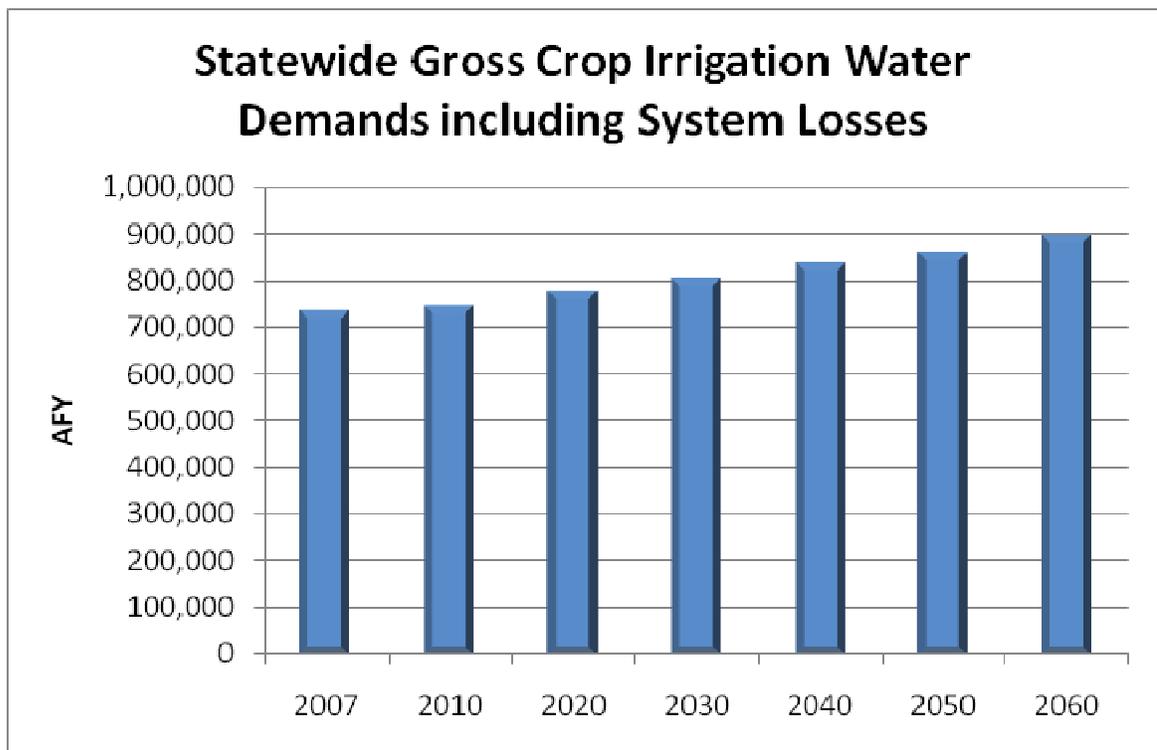


Figure 12 - Statewide Gross Crop Irrigation Water Demands including System Losses

5.3 Combined Agricultural Water Demands

Table 26 shows the aggregated livestock and crop irrigation water demands by county. Under the base conditions and assumptions outlined herein, agriculture demands are estimated to increase by 20.3 percent to a maximum estimated 2060 volume of nearly 1 million AFY. Livestock and crop irrigation requirements constitute 10 and 90 percent of the total demand, respectively, as shown in Figure 13. The proportion of livestock to crop irrigation water demand is not estimated to change over the planning period.

Table 26 - Total Agriculture Water Demands including Crop Irrigation and Livestock Requirements

County	2007	2010	2020	2030	2040	2050	2060
Adair	2,424	2,503	2,766	3,029	3,292	3,502	3,818
Alfalfa	6,184	6,330	6,818	7,305	7,792	8,175	8,767
Atoka	2,266	2,333	2,558	2,783	3,008	3,180	3,457
Beaver	35,409	35,709	36,710	37,710	38,710	39,490	40,711
Beckham	9,480	9,488	9,513	9,538	9,564	9,589	9,615
Blaine	8,082	8,082	8,080	8,078	8,077	8,075	8,073
Bryan	18,606	18,671	18,889	19,107	19,325	19,493	19,761
Caddo	33,110	33,925	36,642	39,359	42,076	44,161	47,509
Canadian	7,815	7,886	8,122	8,359	8,596	8,781	9,069
Carter	3,505	3,521	3,574	3,627	3,679	3,724	3,785
Cherokee	2,308	2,330	2,402	2,474	2,547	2,602	2,691
Choctaw	1,824	1,869	2,018	2,168	2,317	2,432	2,615
Cimarron	62,313	64,032	69,762	75,491	81,221	85,626	92,681
Cleveland	1,523	1,588	1,801	2,015	2,229	2,396	2,657
Coal	1,226	1,234	1,259	1,285	1,311	1,335	1,362
Comanche	3,632	3,698	3,918	4,139	4,359	4,532	4,799
Cotton	1,489	1,523	1,637	1,750	1,863	1,952	2,089
Craig	1,683	1,831	2,327	2,822	3,317	3,698	4,307
Creek	986	1,003	1,060	1,116	1,173	1,220	1,286
Custer	5,988	6,028	6,160	6,292	6,423	6,534	6,687
Delaware	3,243	3,260	3,317	3,375	3,432	3,490	3,547
Dewey	5,456	5,465	5,494	5,522	5,551	5,580	5,609
Ellis	23,578	24,321	26,798	29,274	31,751	33,654	36,704
Garfield	7,388	7,390	7,397	7,405	7,412	7,419	7,427
Garvin	2,391	2,537	3,022	3,507	3,992	4,366	4,963
Grady	13,449	13,473	13,550	13,627	13,705	13,782	13,859
Grant	2,481	2,490	2,521	2,552	2,583	2,614	2,645
Greer	5,849	6,506	8,697	10,888	13,079	14,761	17,461
Harmon	26,795	27,020	27,768	28,517	29,265	29,843	30,762
Harper	11,624	11,832	12,523	13,215	13,907	14,439	15,290
Haskell	3,689	3,755	3,976	4,197	4,418	4,591	4,860
Hughes	4,622	4,939	5,995	7,051	8,107	8,921	10,219
Jackson	101,677	102,308	104,411	106,514	108,617	110,244	112,823
Jefferson	1,650	1,660	1,697	1,733	1,769	1,798	1,841
Johnston	1,952	2,086	2,535	2,983	3,432	3,778	4,329
Kay	5,303	5,308	5,325	5,343	5,360	5,378	5,395
Kingfisher	10,001	10,124	10,536	10,948	11,360	11,680	12,183
Kiowa	5,605	5,645	5,780	5,914	6,049	6,155	6,318
Latimer	1,268	1,419	1,923	2,426	2,930	3,317	3,937
Le Flore	12,479	12,485	12,502	12,520	12,538	12,556	12,574
Lincoln	4,692	4,693	4,694	4,696	4,697	4,699	4,700
Logan	2,719	2,733	2,780	2,827	2,874	2,922	2,969
Love	3,248	3,392	3,871	4,350	4,829	5,197	5,788
Major	14,957	14,977	15,045	15,112	15,179	15,236	15,314
Marshall	4,918	4,967	5,131	5,295	5,460	5,589	5,788
Mayes	2,651	2,686	2,804	2,921	3,038	3,131	3,273
McClain	3,763	3,780	3,837	3,895	3,952	3,998	4,067
McCurtain	2,756	2,912	3,429	3,947	4,464	4,878	5,500
McIntosh	1,518	1,526	1,552	1,577	1,603	1,627	1,653
Murray	392	444	618	793	968	1,108	1,317
Muskogee	10,020	10,022	10,028	10,035	10,041	10,048	10,055
Noble	2,096	2,097	2,099	2,101	2,103	2,105	2,107
Nowata	1,317	1,370	1,546	1,723	1,899	2,034	2,252
Okfuskee	2,556	2,615	2,813	3,011	3,208	3,362	3,604
Oklahoma	5,907	5,908	5,911	5,914	5,917	5,920	5,923
Okmulgee	1,994	1,994	1,997	2,000	2,003	2,006	2,009

Table 26 - Total Agriculture Water Demands including Crop Irrigation and Livestock Requirements

County	2007	2010	2020	2030	2040	2050	2060
Osage	2,809	2,861	3,034	3,207	3,380	3,517	3,726
Ottawa	1,498	1,522	1,604	1,684	1,766	1,832	1,928
Pawnee	689	703	750	797	844	881	939
Payne	2,160	2,164	2,178	2,192	2,206	2,219	2,234
Pittsburg	3,970	4,040	4,273	4,506	4,740	4,922	5,207
Pontotoc	2,313	2,555	3,362	4,170	4,977	5,601	6,592
Pottawatomie	2,827	2,927	3,260	3,593	3,926	4,182	4,592
Pushmataha	1,307	1,310	1,322	1,334	1,345	1,356	1,369
Roger Mills	10,125	10,137	10,177	10,217	10,257	10,294	10,338
Rogers	2,587	2,628	2,766	2,904	3,042	3,149	3,317
Seminole	1,873	1,955	2,229	2,503	2,777	2,990	3,324
Sequoyah	2,905	2,950	3,101	3,252	3,403	3,526	3,705
Stephens	3,043	3,250	3,941	4,632	5,324	5,860	6,706
Texas	208,445	208,874	210,303	211,732	213,161	214,280	216,020
Tillman	18,976	19,053	19,307	19,561	19,815	20,012	20,324
Tulsa	7,763	7,841	8,099	8,357	8,615	8,813	9,130
Wagoner	9,031	9,032	9,034	9,037	9,039	9,041	9,044
Washington	1,065	1,110	1,259	1,409	1,558	1,673	1,856
Washita	6,574	6,640	6,861	7,081	7,302	7,471	7,743
Woods	4,628	4,701	4,945	5,189	5,433	5,626	5,920
Woodward	9,881	9,881	9,882	9,882	9,883	9,883	9,884
State Total	830,329	839,859	871,628	903,395	935,164	959,849	998,698

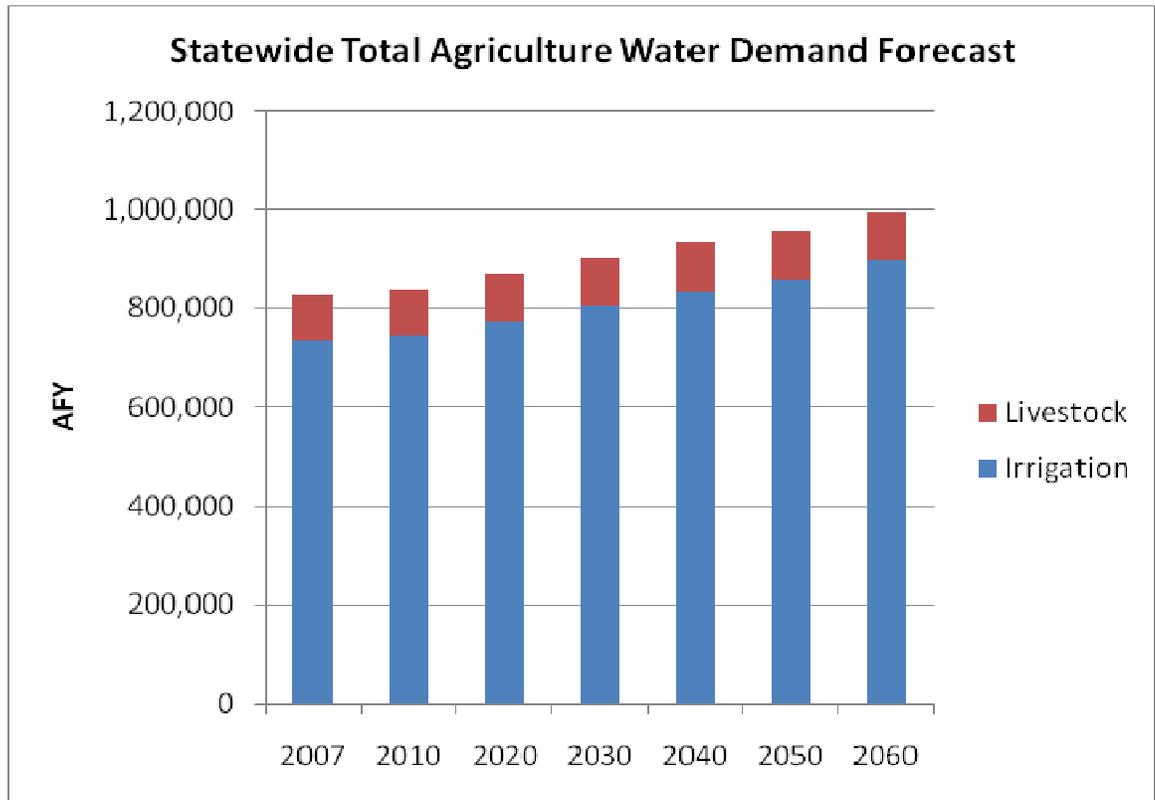


Figure 13 - Statewide Total Agriculture Water Demand Forecast

Section 6

Summary

6.1 Forecast Assumptions

The county-level water demand forecasts presented in this report are contingent upon a number of assumptions. These assumptions include the following:

- Population by county will increase to 2060 as projected by ODOC.
- Residential water use in each county will maintain the current average rate of water use per capita.
- Self-supplied residential water use is the same per capita rate of use as publically-supplied residential users within the same county.
- The ratio of self-served population to system-served population will remain constant at current levels for each county.
- State-wide employment will increase to 2016 as projected by OESC, and as extrapolated to 2060.
- Future county employment growth will maintain the current proportion by NAICS classifications.
- Water use per employee will maintain the current average rate of use per employee per NAICS group.
- System losses among public and rural water district systems will maintain the current average rate of loss per county, and not exceed 15 percent real system loss.
- Average water use per well for oil and gas drilling is expected to increase over time. All future oil and gas wells will be in counties where present wells are located.
- Water use for thermoelectric power generation will maintain the current average water use per MWh.
- Power generation per county will increase to 2060 at a rate of 1.1 percent annually. All future power production will be in counties with present power facilities, except where noted.
- Water use among significant large users will increase from the current rate of use at the rate of growth for the corresponding NAICS employment group in the respective county.
- Water use for livestock will remain at current levels per animal.
- Water use per crop type will remain at current levels per acre.

- Water use efficiency and irrigation type by county will remain at current levels.
- Future weather conditions will be similar to conditions associated with current rates of water use.
- The rates of water use per unit for each sector do not account for future improvements in water use efficiency (i.e., water conservation) beyond current levels.

6.2 Forecast by County for the State

Table 27 summarizes statewide demands by sector and Table 28 summarizes all sector demands by county through the forecast period. Total water demand is projected to increase from nearly 1.8 million AFY in 2007 to over 2.4 million AFY in 2060. In the base year, crop irrigation accounts for nearly half (41 percent) of total water demand and M&I Public-Supply accounts for 33 percent of total water demand. The percentages remain relatively the same throughout the forecast period. The demands in the summary tables include system losses from the public-supply sectors and include total withdrawals for thermoelectric power generation.

Table 27 - Summary of Sector Demands, Statewide (AFY)

SECTOR	2007	2010	2020	2030	2040	2050	2060
M&I Public-Supply*	583,901	601,891	647,038	682,391	713,982	743,158	772,773
Self-Supplied Rural Residential	29,524	30,217	32,610	34,770	36,863	38,978	41,155
Self-Supplied Industrial	45,192	44,906	44,748	47,238	49,587	51,962	54,334
Thermoelectric Power**	252,127	260,539	290,660	324,262	361,750	403,571	450,227
Livestock	94,087	94,480	95,792	97,104	98,416	99,728	101,040
Irrigation	736,074	745,210	775,661	806,112	836,562	859,932	897,464
Oil and Gas Activities	29,107	42,107	74,403	78,202	90,080	102,536	115,570
Total All Sectors	1,770,012	1,819,350	1,960,911	2,070,079	2,187,239	2,299,866	2,432,563

*Including system losses

**Total withdrawals

Table 28 - Summary of Water Demands by County, All Sectors (AFY)*

County	2007	2010	2020	2030	2040	2050	2060
Adair	5,465	5,844	7,038	7,401	7,904	8,291	8,709
Alfalfa	7,323	7,536	8,192	8,884	9,620	10,314	11,262
Atoka	5,726	5,920	6,556	7,218	7,879	8,534	9,294
Beaver	37,314	37,846	39,173	40,524	41,923	43,149	44,865
Beckham	14,744	15,044	15,685	16,425	17,202	18,018	18,918
Blaine	11,212	11,352	11,677	12,081	12,502	12,940	13,418
Bryan	26,824	27,209	28,271	29,395	30,519	31,596	32,794
Caddo	43,178	44,399	48,167	51,975	55,901	59,322	64,128
Canadian	27,622	29,394	34,610	34,329	34,746	34,634	34,247
Carter	14,668	15,905	19,542	18,278	17,750	16,850	15,602
Cherokee	9,601	9,988	11,059	12,238	13,432	14,579	15,790

Table 28 - Summary of Water Demands by County, All Sectors (AFY)*

County	2007	2010	2020	2030	2040	2050	2060
Choctaw	10,827	11,155	12,238	13,368	14,620	15,954	17,493
Cimarron	63,338	65,080	70,895	76,683	82,445	86,916	94,040
Cleveland	39,261	40,675	43,889	46,510	48,670	50,238	51,879
Coal	3,186	3,763	5,521	4,687	4,267	3,644	2,808
Comanche	21,864	23,548	25,246	26,726	28,045	29,213	30,424
Cotton	2,263	2,316	2,459	2,589	2,719	2,837	2,993
Craig	3,994	4,225	4,951	5,699	6,477	7,142	8,052
Creek	9,867	10,161	10,875	11,506	12,124	12,745	13,435
Custer	12,048	12,380	13,047	13,717	14,434	15,115	15,866
Delaware	8,224	8,481	9,245	10,051	10,881	11,770	12,694
Dewey	7,069	7,172	7,324	7,518	7,741	8,025	8,337
Ellis	25,103	26,099	29,300	32,744	36,391	39,721	44,456
Garfield	19,744	20,018	20,610	21,045	21,478	21,867	22,317
Garvin	8,137	8,496	9,358	10,186	11,051	11,862	12,932
Grady	20,262	20,691	21,547	22,432	23,343	24,320	25,375
Grant	3,415	3,496	3,676	3,883	4,106	4,392	4,696
Greer	6,881	7,548	9,754	11,947	14,159	15,861	18,582
Harmon	27,569	27,812	28,569	29,343	30,117	30,720	31,665
Harper	13,112	13,416	14,311	15,238	16,210	17,105	18,326
Haskell	6,114	6,625	8,193	10,174	12,535	15,217	18,391
Hughes	8,620	9,997	14,207	13,700	13,935	13,564	13,286
Jackson	106,924	107,669	110,075	112,482	114,846	116,708	119,498
Jefferson	2,457	2,484	2,553	2,617	2,683	2,756	2,845
Johnston	5,183	5,378	6,097	6,961	7,867	8,749	9,893
Kay	24,155	24,705	25,684	26,285	26,856	27,436	28,065
Kingfisher	13,528	13,821	14,663	15,597	16,550	17,433	18,564
Kiowa	6,877	6,946	7,129	7,300	7,474	7,635	7,857
Latimer	4,038	4,393	5,276	6,216	7,232	8,185	9,445
Le Flore	25,779	26,477	28,716	31,365	34,439	37,947	41,929
Lincoln	8,684	8,953	9,685	10,505	11,459	12,549	13,783
Logan	10,425	10,794	11,882	13,149	14,505	15,932	17,506
Love	4,753	4,987	9,142	9,961	10,801	11,551	12,526
Major	16,591	16,802	17,156	17,522	17,949	18,410	18,936
Marshall	7,406	7,719	9,676	10,312	11,064	11,765	12,518
Mayes	12,392	12,736	13,855	15,082	16,402	17,787	19,319
McClain	14,974	15,487	17,122	18,889	20,771	22,799	25,006
McCurtain	10,376	10,624	11,458	12,345	13,210	14,005	15,010
McIntosh	4,143	4,450	5,380	6,544	7,946	9,597	11,474
Murray	3,043	3,192	3,609	4,074	4,521	4,975	5,499
Muskogee	136,191	139,476	151,605	165,820	181,491	198,903	218,254
Noble	4,111	4,270	4,544	4,807	5,102	5,416	5,763
Nowata	2,723	2,935	3,403	3,912	4,443	4,966	5,603
Okfuskee	4,210	4,370	4,782	5,219	5,698	6,174	6,792
Oklahoma	137,319	141,443	150,099	157,027	162,805	167,668	172,717
Okmulgee	12,816	13,118	13,998	14,811	15,670	16,573	17,496
Osage	12,431	12,826	13,813	14,701	15,580	16,452	17,484
Ottawa	7,203	7,400	7,925	8,396	8,900	9,407	9,944
Pawnee	40,252	41,604	46,380	51,661	57,534	64,055	71,313
Payne	15,167	15,761	16,935	18,195	19,474	20,477	21,484
Pittsburg	31,008	34,277	44,287	41,846	41,605	40,553	38,853
Pontotoc	8,941	9,388	10,608	11,763	12,937	13,928	15,305
Pottawatomie	10,835	11,225	12,322	13,547	14,839	16,134	17,695
Pushmataha	2,476	2,527	2,679	2,842	3,015	3,206	3,400
Roger Mills	11,576	11,899	12,419	13,028	13,734	14,532	15,433
Rogers	39,070	40,432	44,922	49,708	54,771	60,261	66,312
Seminole	22,457	23,316	26,108	29,185	32,619	36,393	40,710

Table 28 - Summary of Water Demands by County, All Sectors (AFY)*

County	2007	2010	2020	2030	2040	2050	2060
Sequoyah	11,824	12,114	13,027	14,101	15,158	16,210	17,322
Stephens	12,848	13,360	14,586	15,737	16,971	18,155	19,755
Texas	218,908	219,753	222,466	226,636	230,918	235,004	239,792
Tillman	20,415	20,518	20,852	21,183	21,524	21,818	22,254
Tulsa	128,952	132,440	140,864	148,011	153,893	159,107	164,638
Wagoner	21,800	22,285	23,844	25,371	26,928	28,574	30,369
Washington	13,046	13,389	14,088	14,503	14,987	15,456	16,037
Washita	8,354	8,717	9,729	10,947	12,380	13,998	15,934
Woods	8,466	8,726	9,205	9,733	10,297	10,849	11,577
Woodward	20,310	20,568	21,076	21,697	22,264	22,923	23,579
Grand Total	1,770,012	1,819,350	1,960,911	2,070,079	2,187,239	2,299,866	2,432,563

*Including system losses for M&I Public-Supply and total withdrawals for Thermoelectric Power

Section 7

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Appendices

Appendix A Data Log

Data	Description	Source
Bureau of Labor Statistics (BLS) QCEW	County level employment data for 2006	http://www.bls.gov/cew/
Census 2007 Estimates	Estimates of population for 2007	http://www.census.gov/
Chickasaw Nation Report	Supplemental population and employment data	
Department of Energy (DOE) Energy Information Administration (EIA) From 906	Thermoelectric facility information	http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=OK#related_reports
Ft. Sill Base Realignment data	Future numbers of soldiers and civilians employed at Ft. Sill	Steve Hankins DPW/OMD Ft. Sill, Ok. 73503 Office: 580-442-3608
IWR-MAIN software	Per employee water use factors developed from non-residential database	CDM
Natural Resource Conservation Service (NRCS) Irrigation Guide Report, Oklahoma Supplement	Provides technical information and procedures that can be used for successful planning, design, and management of irrigation systems	http://www.wsi.nrcs.usda.gov/products/w2q/water_mgt/Irrigation/irrig-handbooks.html
Oklahoma Department of Commerce (ODOC)	Population projections by City by County, special run of extra years completed in November 2002	www.okcommerce.gov
Oklahoma Department of Environmental Quality (ODEQ) Safe Drinking Water Information System (SDWIS) database	Public water supplier information	OWRB
Oklahoma Employment Security Commission (OESC)	10-year projections of state-wide employment by 2- and 3-digit NAICS	http://www.oesc.state.ok.us/lmi/
Oklahoma Office of the Secretary of Energy	Thermoelectric facility information	http://energy.ok.gov/general.asp?id=174



Data	Description	Source
OWRB Water Rights Database	Large Industry data, oil and gas permitting data,	OWRB
Provider Survey	Used to develop the public-supply residential, public-supply nonresidential, and the self-supplied residential forecast	CDM / OWRB
U.S. Environmental Protection Agency eGrid	Thermoelectric facility information	http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html
U.S. Geological Survey Preliminary Water Use Reports for 2005	Used to split the population projections into public supplied and self-supplied, used source water for irrigation, used irrigation methods by county	Bob Tortorelli at USGS, Office: 405-810-4404
U.S. Geological Survey, 2005, <i>Method for Estimating Water Withdrawals for Livestock in the United States, Scientific Investigations Report 2009-5041</i>	Water per day requirements for livestock	Downloadable at: http://pubs.usgs.gov/sir/2009/5041/
USDA's National Agricultural Statistics Service (NASS)	County level agricultural data	http://www.nass.usda.gov/Data_and_Statistics/index.asp
Department of Energy (DOE) Energy Information Administration (EIA) Annual Energy Outlook (AEO) Report	Projection of future electricity production	www.eia.doe.gov/oiaf/aeo/pdf/earlyrelease.pdf
Energy Development Water Needs Assessment, Draft Report, prepared for Colorado and Yampa/White Rivers Roundtable Committees by URS	Thermoelectric power consumption and withdrawal rates	

Appendix B

County Demands and Supporting Data



Adair	2007	2010	2020	2030	2040	2050	2060
Population, Total	21,902	22,962	26,773	30,585	34,396	38,301	42,205
Public-Supplied Population	12,762	13,380	15,600	17,821	20,042	22,317	24,592
Self-Supplied Population	9,140	9,582	11,173	12,763	14,354	15,983	17,613
Employment, Total	5,376	5,537	5,864	6,699	7,533	8,389	9,244
11 Agriculture, forestry, fishing and hunting	31	31	33	37	42	47	51
21 Mining, quarrying, and oil and gas extraction	12	12	13	15	16	18	20
22 Utilities	75	77	81	92	104	116	127
23 Construction	208	222	245	280	315	350	386
31-33 Manufacturing	1,525	1,495	1,472	1,682	1,891	2,106	2,321
42 Wholesale trade	76	78	82	94	106	118	130
44-45 Retail trade	549	560	586	670	753	839	924
48-49 Transportation and warehousing	156	161	171	196	220	245	270
51 Information	27	28	30	34	38	42	47
52 Finance and insurance	123	126	134	153	172	191	211
53 Real estate and rental and leasing	16	17	18	21	24	26	29
54 Professional and technical services	54	59	68	77	87	97	107
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	514	553	622	711	799	890	981
61 Educational services	882	924	1,001	1,143	1,286	1,432	1,578
62 Health care and social assistance	453	482	534	610	686	764	842
71 Arts, entertainment, and recreation	75	83	96	110	124	138	152
72 Accommodation and food services	243	257	282	322	362	404	445
81 Other services, except public administration	61	63	67	77	87	96	106
92 Public Administration	293	304	326	372	419	466	514
99 Unclassified	2	2	2	2	3	3	3
Public-Supply Nonresidential Including System Losses (AFY)	765	785	827	945	1,063	1,183	1,304
Public-Supply Residential Including System Losses (AFY)	1,153	1,209	1,409	1,610	1,811	2,016	2,222
Self-Supply Residential (AFY)	702	736	858	980	1,102	1,227	1,353
Projection of Irrigated Lands (in Acres)	672	718	873	1,027	1,181	1,300	1,490
Crop Irrigation (AFY)	993	1,062	1,290	1,518	1,746	1,922	2,203
Livestock (AFY)	1,431	1,441	1,476	1,511	1,546	1,581	1,616
Oil and Gas Drilling (AFY)	420	610	1,177	836	636	361	12
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	5,465	5,844	7,038	7,401	7,904	8,291	8,709

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Alfalfa	2007	2010	2020	2030	2040	2050	2060
Population, Total	5,593	5,537	5,537	5,537	5,537	5,631	5,724
Public-Supplied Population	4,733	4,685	4,685	4,685	4,685	4,765	4,844
Self-Supplied Population	860	851	851	851	851	866	880
Employment, Total	1,237	1,286	1,359	1,359	1,359	1,382	1,405
11 Agriculture, forestry, fishing and hunting	14	14	15	15	15	15	15
21 Mining, quarrying, and oil and gas extraction	35	37	38	38	38	39	39
22 Utilities	24	25	26	26	26	26	27
23 Construction	52	55	60	60	60	61	62
31-33 Manufacturing	30	29	29	29	29	29	29
42 Wholesale trade	132	135	141	141	141	143	146
44-45 Retail trade	137	140	144	144	144	147	149
48-49 Transportation and warehousing	61	63	66	66	66	68	69
51 Information	10	10	11	11	11	11	11
52 Finance and insurance	62	64	67	67	67	68	69
53 Real estate and rental and leasing	5	6	6	6	6	6	6
54 Professional and technical services	41	45	51	51	51	52	53
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	8	9	10	10	10	10	10
61 Educational services	180	189	201	201	201	205	208
62 Health care and social assistance	106	113	123	123	123	125	127
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	48	51	55	55	55	56	57
81 Other services, except public administration	33	34	36	36	36	37	37
92 Public Administration	254	264	278	278	278	283	288
99 Unclassified	2	2	2	2	2	2	2
Public-Supply Nonresidential Including System Losses (AFY)	160	167	176	176	176	179	182
Public-Supply Residential Including System Losses (AFY)	713	706	706	706	706	718	730
Self-Supply Residential (AFY)	117	115	115	115	115	117	119
Projection of Irrigated Lands (in Acres)	2,617	2,689	2,928	3,167	3,406	3,589	3,884
Crop Irrigation (AFY)	4,909	5,043	5,492	5,940	6,389	6,733	7,285
Livestock (AFY)	1,275	1,287	1,325	1,363	1,402	1,440	1,478
Oil and Gas Drilling (AFY)	149	218	378	583	833	1,128	1,468
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	7,323	7,536	8,192	8,884	9,620	10,314	11,262

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Atoka	2007	2010	2020	2030	2040	2050	2060
Population, Total	14,512	15,036	16,879	18,722	20,565	22,602	24,639
Public-Supplied Population	11,482	11,896	13,355	14,813	16,271	17,883	19,495
Self-Supplied Population	3,030	3,139	3,524	3,909	4,294	4,719	5,145
Employment, Total	3,368	3,497	3,730	4,138	4,545	4,995	5,445
11 Agriculture, forestry, fishing and hunting	7	7	7	8	8	9	10
21 Mining, quarrying, and oil and gas extraction	25	25	27	30	33	36	39
22 Utilities	34	35	36	40	44	48	53
23 Construction	84	89	98	109	120	132	143
31-33 Manufacturing	329	323	316	351	385	423	462
42 Wholesale trade	36	37	39	43	47	52	57
44-45 Retail trade	443	453	471	523	574	631	688
48-49 Transportation and warehousing	112	116	123	136	150	164	179
51 Information	41	42	44	49	53	59	64
52 Finance and insurance	99	102	107	119	131	143	156
53 Real estate and rental and leasing	17	18	20	22	24	26	28
54 Professional and technical services	33	36	41	46	50	55	60
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	14	15	17	19	21	23	25
61 Educational services	410	429	463	513	564	620	676
62 Health care and social assistance	658	701	773	857	941	1,035	1,128
71 Arts, entertainment, and recreation	29	33	38	42	46	51	55
72 Accommodation and food services	155	164	179	198	218	239	261
81 Other services, except public administration	137	142	151	167	184	202	220
92 Public Administration	704	731	780	865	950	1,044	1,138
99 Unclassified	2	2	2	2	2	3	3
Public-Supply Nonresidential Including System Losses (AFY)	493	512	546	606	665	731	797
Public-Supply Residential Including System Losses (AFY)	2,424	2,512	2,820	3,128	3,436	3,776	4,116
Self-Supply Residential (AFY)	544	563	632	702	771	847	923
Projection of Irrigated Lands (in Acres)	743	787	932	1,077	1,222	1,333	1,512
Crop Irrigation (AFY)	1,150	1,217	1,441	1,666	1,890	2,063	2,339
Livestock (AFY)	1,116	1,116	1,117	1,117	1,117	1,118	1,118
Oil and Gas Drilling (AFY)	0	0	0	0	0	0	0
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	5,726	5,920	6,556	7,218	7,879	8,534	9,294

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Beaver	2007	2010	2020	2030	2040	2050	2060
Population, Total	5,380	5,435	5,527	5,620	5,712	5,804	5,896
Public-Supplied Population	2,760	2,788	2,836	2,883	2,930	2,977	3,025
Self-Supplied Population	2,620	2,647	2,692	2,737	2,782	2,826	2,871
Employment, Total	1,425	1,484	1,579	1,605	1,631	1,658	1,684
11 Agriculture, forestry, fishing and hunting	86	87	89	91	92	94	95
21 Mining, quarrying, and oil and gas extraction	224	231	242	246	250	254	258
22 Utilities	27	28	29	29	30	30	31
23 Construction	108	115	125	127	129	132	134
31-33 Manufacturing	56	55	53	54	55	56	57
42 Wholesale trade	40	41	43	44	44	45	46
44-45 Retail trade	90	92	95	97	98	100	101
48-49 Transportation and warehousing	83	85	90	91	93	94	96
51 Information	9	9	9	9	10	10	10
52 Finance and insurance	45	46	48	49	50	51	51
53 Real estate and rental and leasing	6	6	7	7	7	7	7
54 Professional and technical services	64	70	79	80	82	83	84
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	18	19	22	22	22	23	23
61 Educational services	240	251	269	274	278	283	287
62 Health care and social assistance	92	97	107	108	110	112	114
71 Arts, entertainment, and recreation	32	35	40	41	42	42	43
72 Accommodation and food services	76	80	87	88	90	91	93
81 Other services, except public administration	26	27	28	29	29	30	30
92 Public Administration	105	109	115	117	119	121	123
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	293	305	324	329	335	340	346
Public-Supply Residential Including System Losses (AFY)	405	409	416	423	430	437	444
Self-Supply Residential (AFY)	346	350	355	361	367	373	379
Projection of Irrigated Lands (in Acres)	28,512	28,763	29,598	30,434	31,269	31,910	32,940
Crop Irrigation (AFY)	32,357	32,642	33,590	34,538	35,486	36,214	37,383
Livestock (AFY)	3,052	3,067	3,120	3,172	3,224	3,276	3,328
Oil and Gas Drilling (AFY)	496	698	975	1,300	1,674	2,096	2,566
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	364	375	393	400	406	413	419
Total Water Demand, All Sectors (AFY)*	37,314	37,846	39,173	40,524	41,923	43,149	44,865

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Beckham	2007	2010	2020	2030	2040	2050	2060
Population, Total	19,700	20,212	22,015	23,913	25,811	27,709	29,797
Public-Supplied Population	17,720	18,181	19,803	21,510	23,217	24,924	26,802
Self-Supplied Population	1,980	2,032	2,213	2,403	2,594	2,785	2,995
Employment, Total	8,599	8,951	9,562	10,387	11,211	12,036	12,942
11 Agriculture, forestry, fishing and hunting	52	53	54	59	64	68	74
21 Mining, quarrying, and oil and gas extraction	1,295	1,334	1,406	1,527	1,648	1,769	1,903
22 Utilities	102	104	109	118	127	137	147
23 Construction	385	410	450	489	528	567	609
31-33 Manufacturing	344	337	330	358	387	415	447
42 Wholesale trade	336	345	361	393	424	455	489
44-45 Retail trade	1,374	1,403	1,458	1,584	1,710	1,836	1,974
48-49 Transportation and warehousing	385	398	421	457	494	530	570
51 Information	72	74	78	85	91	98	105
52 Finance and insurance	313	322	338	367	396	426	458
53 Real estate and rental and leasing	276	291	316	343	371	398	428
54 Professional and technical services	123	135	153	167	180	193	208
55 Management of companies and enterprises	5	5	5	5	6	6	6
56 Administrative and waste services	305	328	367	398	430	462	496
61 Educational services	608	637	686	745	804	863	928
62 Health care and social assistance	1,276	1,359	1,496	1,625	1,754	1,883	2,024
71 Arts, entertainment, and recreation	32	36	41	45	49	52	56
72 Accommodation and food services	852	901	982	1,067	1,151	1,236	1,329
81 Other services, except public administration	164	170	180	196	211	227	244
92 Public Administration	292	304	323	351	379	407	437
99 Unclassified	7	7	7	8	8	9	10
Public-Supply Nonresidential Including System Losses (AFY)	1,598	1,659	1,766	1,918	2,071	2,223	2,390
Public-Supply Residential Including System Losses (AFY)	3,001	3,079	3,354	3,643	3,932	4,222	4,540
Self-Supply Residential (AFY)	313	321	349	380	410	440	473
Projection of Irrigated Lands (in Acres)	6,895	6,895	6,895	6,895	6,895	6,895	6,895
Crop Irrigation (AFY)	8,718	8,718	8,718	8,718	8,718	8,718	8,718
Livestock (AFY)	762	770	795	820	846	871	897
Oil and Gas Drilling (AFY)	352	497	702	945	1,226	1,544	1,900
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	14,744	15,044	15,685	16,425	17,202	18,018	18,918

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Blaine	2007	2010	2020	2030	2040	2050	2060
Population, Total	12,475	12,717	13,827	15,039	16,250	17,461	18,773
Public-Supplied Population	11,345	11,565	12,575	13,676	14,778	15,879	17,073
Self-Supplied Population	1,130	1,152	1,253	1,362	1,472	1,582	1,700
Employment, Total	3,094	3,228	3,453	3,756	4,058	4,361	4,688
11 Agriculture, forestry, fishing and hunting	35	36	37	40	43	46	50
21 Mining, quarrying, and oil and gas extraction	142	146	154	167	181	194	209
22 Utilities	35	36	37	41	44	47	51
23 Construction	132	141	154	168	182	195	210
31-33 Manufacturing	141	138	135	147	159	171	183
42 Wholesale trade	147	151	158	172	186	199	214
44-45 Retail trade	282	288	299	325	351	377	406
48-49 Transportation and warehousing	172	177	187	204	220	237	254
51 Information	65	66	70	76	82	88	95
52 Finance and insurance	124	128	134	145	157	169	182
53 Real estate and rental and leasing	52	55	59	65	70	75	81
54 Professional and technical services	62	68	77	84	91	97	105
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	116	125	140	152	164	177	190
61 Educational services	399	418	449	489	528	568	610
62 Health care and social assistance	392	417	459	499	539	579	623
71 Arts, entertainment, and recreation	45	50	58	63	68	73	79
72 Accommodation and food services	326	344	375	408	440	473	509
81 Other services, except public administration	107	111	117	128	138	148	159
92 Public Administration	320	332	353	384	415	446	480
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	453	473	506	551	595	639	688
Public-Supply Residential Including System Losses (AFY)	1,964	2,002	2,176	2,367	2,558	2,748	2,955
Self-Supply Residential (AFY)	186	189	206	224	242	260	280
Projection of Irrigated Lands (in Acres)	5,845	5,845	5,845	5,845	5,845	5,845	5,845
Crop Irrigation (AFY)	6,517	6,517	6,517	6,517	6,517	6,517	6,517
Livestock (AFY)	1,566	1,565	1,564	1,562	1,560	1,558	1,557
Oil and Gas Drilling (AFY)	211	296	405	531	674	834	1,011
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	317	311	304	330	357	383	412
Total Water Demand, All Sectors (AFY)*	11,212	11,352	11,677	12,081	12,502	12,940	13,418

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Bryan	2007	2010	2020	2030	2040	2050	2060
Population, Total	39,563	40,827	45,040	49,353	53,667	57,980	62,394
Public-Supplied Population	36,783	37,958	41,875	45,885	49,896	53,906	58,010
Self-Supplied Population	2,780	2,869	3,165	3,468	3,771	4,074	4,384
Employment, Total	15,939	16,662	17,914	19,629	21,345	23,060	24,816
11 Agriculture, forestry, fishing and hunting	195	198	204	224	243	263	283
21 Mining, quarrying, and oil and gas extraction	12	12	13	14	16	17	18
22 Utilities	110	112	117	128	140	151	162
23 Construction	331	352	387	424	461	498	536
31-33 Manufacturing	1,386	1,359	1,331	1,458	1,585	1,713	1,843
42 Wholesale trade	675	693	726	796	866	935	1,006
44-45 Retail trade	1,467	1,498	1,558	1,708	1,857	2,006	2,159
48-49 Transportation and warehousing	229	237	251	275	299	323	347
51 Information	339	348	366	401	436	471	507
52 Finance and insurance	459	472	496	544	591	639	687
53 Real estate and rental and leasing	100	105	115	126	137	148	159
54 Professional and technical services	601	658	749	821	893	965	1,038
55 Management of companies and enterprises	79	79	79	86	94	101	109
56 Administrative and waste services	1,323	1,425	1,593	1,746	1,899	2,051	2,207
61 Educational services	1,881	1,970	2,124	2,327	2,530	2,734	2,942
62 Health care and social assistance	1,905	2,029	2,235	2,449	2,663	2,877	3,096
71 Arts, entertainment, and recreation	863	956	1,107	1,213	1,319	1,425	1,533
72 Accommodation and food services	1,212	1,281	1,397	1,531	1,665	1,799	1,936
81 Other services, except public administration	232	240	255	280	304	328	353
92 Public Administration	2,540	2,637	2,810	3,079	3,348	3,617	3,893
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	2,405	2,533	2,751	3,014	3,277	3,541	3,810
Public-Supply Residential Including System Losses (AFY)	5,439	5,613	6,192	6,785	7,378	7,971	8,577
Self-Supply Residential (AFY)	357	369	407	446	485	524	564
Projection of Irrigated Lands (in Acres)	9,492	9,528	9,647	9,766	9,886	9,977	10,124
Crop Irrigation (AFY)	17,044	17,108	17,322	17,536	17,750	17,915	18,178
Livestock (AFY)	1,562	1,564	1,567	1,571	1,575	1,579	1,582
Oil and Gas Drilling (AFY)	17	24	33	43	54	67	82
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	26,824	27,209	28,271	29,395	30,519	31,596	32,794

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Caddo	2007	2010	2020	2030	2040	2050	2060
Population, Total	29,296	29,584	30,833	31,793	32,754	33,714	34,579
Public-Supplied Population	17,566	17,739	18,487	19,063	19,639	20,215	20,734
Self-Supplied Population	11,730	11,845	12,345	12,730	13,115	13,499	13,845
Employment, Total	6,988	7,286	7,766	8,008	8,250	8,492	8,710
11 Agriculture, forestry, fishing and hunting	187	190	195	201	207	213	218
21 Mining, quarrying, and oil and gas extraction	148	153	160	165	170	175	179
22 Utilities	391	400	415	428	441	454	465
23 Construction	251	267	292	301	311	320	328
31-33 Manufacturing	52	51	50	51	53	54	56
42 Wholesale trade	259	266	277	286	295	303	311
44-45 Retail trade	989	1,010	1,045	1,078	1,110	1,143	1,172
48-49 Transportation and warehousing	88	91	96	99	102	105	107
51 Information	99	102	107	110	113	117	120
52 Finance and insurance	254	261	273	282	290	299	306
53 Real estate and rental and leasing	33	35	37	39	40	41	42
54 Professional and technical services	128	140	159	163	168	173	178
55 Management of companies and enterprises	7	7	7	7	8	8	8
56 Administrative and waste services	212	228	254	261	269	277	284
61 Educational services	1,103	1,155	1,239	1,277	1,316	1,354	1,389
62 Health care and social assistance	1,005	1,070	1,173	1,210	1,246	1,283	1,316
71 Arts, entertainment, and recreation	78	86	99	102	105	108	111
72 Accommodation and food services	279	295	320	330	340	350	359
81 Other services, except public administration	50	52	55	56	58	60	61
92 Public Administration	1,375	1,428	1,513	1,561	1,608	1,655	1,697
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	876	916	981	1,011	1,042	1,072	1,100
Public-Supply Residential Including System Losses (AFY)	2,365	2,389	2,489	2,567	2,645	2,722	2,792
Self-Supply Residential (AFY)	1,422	1,436	1,496	1,543	1,589	1,636	1,678
Projection of Irrigated Lands (in Acres)	33,152	34,028	36,950	39,871	42,793	45,035	48,636
Crop Irrigation (AFY)	30,829	31,644	34,361	37,078	39,794	41,879	45,228
Livestock (AFY)	2,281	2,281	2,281	2,281	2,281	2,281	2,282
Oil and Gas Drilling (AFY)	395	556	783	1,051	1,360	1,711	2,102
Thermoelectric, Withdrawals (AFY)	5,010	5,178	5,776	6,444	7,189	8,020	8,947
Thermoelectric, Consumptive Use (AFY)	3,103	3,207	3,578	3,991	4,453	4,967	5,542
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	43,178	44,399	48,167	51,975	55,901	59,322	64,128

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Canadian	2007	2010	2020	2030	2040	2050	2060
Population, Total	103,559	106,854	117,286	125,413	132,441	138,921	145,510
Public-Supplied Population	103,559	106,854	117,286	125,413	132,441	138,921	145,510
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	24,751	25,717	27,401	29,299	30,941	32,455	33,994
11 Agriculture, forestry, fishing and hunting	156	158	163	174	184	193	202
21 Mining, quarrying, and oil and gas extraction	1,221	1,258	1,325	1,417	1,497	1,570	1,644
22 Utilities	360	368	383	410	433	454	475
23 Construction	2,017	2,145	2,356	2,519	2,661	2,791	2,923
31-33 Manufacturing	3,147	3,085	3,019	3,228	3,409	3,576	3,745
42 Wholesale trade	695	713	747	799	844	885	927
44-45 Retail trade	2,983	3,045	3,166	3,386	3,576	3,750	3,928
48-49 Transportation and warehousing	867	897	949	1,014	1,071	1,124	1,177
51 Information	218	224	235	251	265	278	291
52 Finance and insurance	719	739	777	831	877	920	964
53 Real estate and rental and leasing	486	512	557	595	629	659	691
54 Professional and technical services	672	735	837	895	946	992	1,039
55 Management of companies and enterprises	60	60	60	64	67	71	74
56 Administrative and waste services	912	983	1,098	1,174	1,240	1,301	1,363
61 Educational services	2,722	2,851	3,071	3,283	3,467	3,637	3,809
62 Health care and social assistance	1,928	2,053	2,260	2,416	2,552	2,676	2,803
71 Arts, entertainment, and recreation	694	769	890	951	1,005	1,054	1,104
72 Accommodation and food services	2,191	2,316	2,525	2,700	2,851	2,991	3,133
81 Other services, except public administration	611	633	671	718	758	795	833
92 Public Administration	2,088	2,168	2,308	2,468	2,606	2,734	2,863
99 Unclassified	4	4	4	4	5	5	5
Public-Supply Nonresidential Including System Losses (AFY)	4,043	4,209	4,497	4,809	5,078	5,326	5,579
Public-Supply Residential Including System Losses (AFY)	10,892	11,239	12,336	13,191	13,930	14,612	15,305
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	3,954	3,996	4,134	4,273	4,412	4,518	4,689
Crop Irrigation (AFY)	6,309	6,376	6,597	6,818	7,040	7,210	7,482
Livestock (AFY)	1,506	1,510	1,525	1,541	1,556	1,571	1,586
Oil and Gas Drilling (AFY)	2,466	3,581	6,905	4,908	3,733	2,120	70
Thermoelectric, Withdrawals (AFY)	2,288	2,364	2,637	2,942	3,282	3,662	4,085
Thermoelectric, Consumptive Use (AFY)	1,417	1,464	1,633	1,822	2,033	2,268	2,530
Self-Supply Large Industry (AFY)	118	115	113	121	127	134	140
Total Water Demand, All Sectors (AFY)*	27,622	29,394	34,610	34,329	34,746	34,634	34,247

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Carter	2007	2010	2020	2030	2040	2050	2060
Population, Total	47,582	48,254	51,104	53,853	56,500	59,350	62,404
Public-Supplied Population	47,362	48,031	50,868	53,604	56,239	59,076	62,116
Self-Supplied Population	220	223	236	249	261	274	289
Employment, Total	21,926	22,762	24,160	25,459	26,711	28,058	29,502
11 Agriculture, forestry, fishing and hunting	20	20	21	22	23	24	25
21 Mining, quarrying, and oil and gas extraction	976	1,006	1,057	1,114	1,168	1,227	1,290
22 Utilities	229	234	243	256	269	282	297
23 Construction	943	1,002	1,098	1,157	1,214	1,275	1,341
31-33 Manufacturing	3,142	3,080	3,006	3,168	3,323	3,491	3,671
42 Wholesale trade	1,125	1,155	1,207	1,272	1,334	1,401	1,474
44-45 Retail trade	2,396	2,447	2,537	2,673	2,805	2,946	3,098
48-49 Transportation and warehousing	1,594	1,648	1,739	1,832	1,923	2,020	2,123
51 Information	195	200	210	221	232	244	256
52 Finance and insurance	652	671	702	740	777	816	858
53 Real estate and rental and leasing	278	293	318	335	351	369	388
54 Professional and technical services	707	774	879	926	971	1,020	1,073
55 Management of companies and enterprises	35	35	35	37	38	40	42
56 Administrative and waste services	1,286	1,386	1,544	1,627	1,707	1,793	1,886
61 Educational services	1,616	1,692	1,817	1,915	2,009	2,111	2,219
62 Health care and social assistance	3,352	3,569	3,918	4,129	4,332	4,551	4,785
71 Arts, entertainment, and recreation	142	158	182	191	201	211	222
72 Accommodation and food services	1,737	1,836	1,996	2,104	2,207	2,319	2,438
81 Other services, except public administration	505	523	553	583	612	642	675
92 Public Administration	987	1,025	1,088	1,147	1,203	1,264	1,329
99 Unclassified	10	10	10	11	11	12	12
Public-Supply Nonresidential Including System Losses (AFY)	3,299	3,416	3,613	3,807	3,994	4,196	4,412
Public-Supply Residential Including System Losses (AFY)	5,514	5,592	5,922	6,241	6,547	6,878	7,231
Self-Supply Residential (AFY)	22	22	24	25	26	28	29
Projection of Irrigated Lands (in Acres)	1,276	1,281	1,297	1,314	1,330	1,343	1,363
Crop Irrigation (AFY)	2,732	2,742	2,777	2,812	2,847	2,874	2,918
Livestock (AFY)	774	779	797	814	832	849	867
Oil and Gas Drilling (AFY)	2,266	3,291	6,344	4,509	3,430	1,948	64
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	61	63	66	70	73	77	81
Total Water Demand, All Sectors (AFY)*	14,668	15,905	19,542	18,278	17,750	16,850	15,602

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Cherokee	2007	2010	2020	2030	2040	2050	2060
Population, Total	45,393	47,663	54,755	61,753	68,846	75,750	82,842
Public-Supplied Population	37,963	39,861	45,793	51,645	57,577	63,351	69,282
Self-Supplied Population	7,430	7,802	8,962	10,108	11,269	12,399	13,560
Employment, Total	14,680	15,362	16,598	18,719	20,869	22,962	25,112
11 Agriculture, forestry, fishing and hunting	171	174	180	203	226	249	272
21 Mining, quarrying, and oil and gas extraction	108	111	117	132	147	162	177
22 Utilities	213	218	228	257	286	315	345
23 Construction	372	396	436	492	549	604	660
31-33 Manufacturing	183	179	176	199	222	244	267
42 Wholesale trade	412	423	445	502	559	616	673
44-45 Retail trade	1,557	1,590	1,660	1,872	2,087	2,296	2,511
48-49 Transportation and warehousing	87	90	96	108	120	132	145
51 Information	126	129	136	154	171	189	206
52 Finance and insurance	327	336	355	400	446	491	537
53 Real estate and rental and leasing	87	92	100	113	126	138	151
54 Professional and technical services	147	161	184	207	231	254	278
55 Management of companies and enterprises	85	85	85	96	107	118	129
56 Administrative and waste services	1,080	1,163	1,305	1,472	1,641	1,806	1,975
61 Educational services	3,082	3,227	3,491	3,937	4,389	4,829	5,281
62 Health care and social assistance	1,832	1,951	2,157	2,432	2,712	2,983	3,263
71 Arts, entertainment, and recreation	323	357	415	468	522	574	628
72 Accommodation and food services	1,101	1,164	1,274	1,437	1,602	1,763	1,928
81 Other services, except public administration	301	312	332	375	418	459	502
92 Public Administration	3,079	3,197	3,418	3,855	4,298	4,728	5,171
99 Unclassified	8	8	8	9	10	11	12
Public-Supply Nonresidential Including System Losses (AFY)	2,126	2,233	2,424	2,734	3,048	3,354	3,668
Public-Supply Residential Including System Losses (AFY)	4,429	4,651	5,343	6,026	6,718	7,391	8,084
Self-Supply Residential (AFY)	737	774	889	1,002	1,118	1,230	1,345
Projection of Irrigated Lands (in Acres)	972	986	1,033	1,080	1,127	1,163	1,221
Crop Irrigation (AFY)	1,480	1,501	1,573	1,644	1,716	1,770	1,859
Livestock (AFY)	829	829	830	830	831	832	833
Oil and Gas Drilling (AFY)	1	1	1	1	2	2	3
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	9,601	9,988	11,059	12,238	13,432	14,579	15,790

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Choctaw	2007	2010	2020	2030	2040	2050	2060
Population, Total	15,011	15,127	15,515	15,806	16,194	16,582	16,970
Public-Supplied Population	10,311	10,391	10,657	10,857	11,124	11,390	11,656
Self-Supplied Population	4,700	4,736	4,858	4,949	5,070	5,192	5,313
Employment, Total	4,353	4,555	4,871	4,962	5,084	5,205	5,327
11 Agriculture, forestry, fishing and hunting	30	31	32	32	33	34	35
21 Mining, quarrying, and oil and gas extraction	70	72	75	77	79	81	83
22 Utilities	187	191	198	202	207	212	217
23 Construction	173	184	201	205	210	215	220
31-33 Manufacturing	128	125	122	124	127	130	133
42 Wholesale trade	105	108	112	114	117	120	123
44-45 Retail trade	477	487	504	513	526	538	551
48-49 Transportation and warehousing	147	152	160	163	167	171	175
51 Information	25	26	27	27	28	29	29
52 Finance and insurance	110	113	118	120	123	126	129
53 Real estate and rental and leasing	37	39	42	43	44	45	46
54 Professional and technical services	104	114	129	131	134	138	141
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	62	67	74	76	77	79	81
61 Educational services	928	972	1,040	1,060	1,086	1,112	1,138
62 Health care and social assistance	831	885	968	986	1,010	1,034	1,058
71 Arts, entertainment, and recreation	153	169	194	198	203	208	213
72 Accommodation and food services	275	291	315	321	329	337	345
81 Other services, except public administration	272	281	297	302	310	317	324
92 Public Administration	239	248	263	267	274	281	287
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	684	720	775	789	809	828	847
Public-Supply Residential Including System Losses (AFY)	834	840	862	878	899	921	942
Self-Supply Residential (AFY)	324	326	335	341	349	358	366
Projection of Irrigated Lands (in Acres)	527	556	651	747	842	915	1,033
Crop Irrigation (AFY)	815	859	1,007	1,154	1,302	1,415	1,597
Livestock (AFY)	1,010	1,010	1,012	1,013	1,015	1,016	1,018
Oil and Gas Drilling (AFY)	0	0	0	0	0	0	0
Thermoelectric, Withdrawals (AFY)	7,069	7,304	8,149	9,091	10,142	11,314	12,623
Thermoelectric, Consumptive Use (AFY)	4,378	4,524	5,047	5,631	6,281	7,008	7,818
Self-Supply Large Industry (AFY)	92	95	99	101	104	101	99
Total Water Demand, All Sectors (AFY)*	10,827	11,155	12,238	13,368	14,620	15,954	17,493

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Cimarron	2007	2010	2020	2030	2040	2050	2060
Population, Total	2,664	2,664	2,831	2,914	2,914	2,997	3,080
Public-Supplied Population	1,544	1,544	1,641	1,689	1,689	1,737	1,785
Self-Supplied Population	1,120	1,120	1,190	1,225	1,225	1,260	1,295
Employment, Total	713	739	782	805	805	829	852
11 Agriculture, forestry, fishing and hunting	37	37	38	40	40	41	42
21 Mining, quarrying, and oil and gas extraction	0	0	0	0	0	0	0
22 Utilities	21	22	23	23	23	24	25
23 Construction	21	22	25	25	25	26	27
31-33 Manufacturing	58	57	55	57	57	59	60
42 Wholesale trade	30	31	32	33	33	34	35
44-45 Retail trade	87	89	92	95	95	98	100
48-49 Transportation and warehousing	30	31	33	34	34	35	36
51 Information	5	5	5	6	6	6	6
52 Finance and insurance	39	40	42	43	43	44	46
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	10	11	12	13	13	13	14
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	0	0	0	0	0	0	0
61 Educational services	140	147	158	162	162	167	172
62 Health care and social assistance	79	85	93	96	96	98	101
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	66	70	76	78	78	80	83
81 Other services, except public administration	17	18	19	19	19	20	20
92 Public Administration	72	75	79	82	82	84	86
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	95	98	104	107	107	110	113
Public-Supply Residential Including System Losses (AFY)	547	547	581	598	598	615	632
Self-Supply Residential (AFY)	337	337	358	369	369	379	390
Projection of Irrigated Lands (in Acres)	45,513	46,800	51,091	55,383	59,674	62,967	68,256
Crop Irrigation (AFY)	60,416	62,125	67,821	73,517	79,214	83,585	90,606
Livestock (AFY)	1,897	1,907	1,940	1,974	2,008	2,041	2,075
Oil and Gas Drilling (AFY)	47	65	90	117	149	185	224
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	63,338	65,080	70,895	76,683	82,445	86,916	94,040

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Cleveland	2007	2010	2020	2030	2040	2050	2060
Population, Total	236,452	243,459	261,555	276,180	287,858	296,065	304,061
Public-Supplied Population	223,782	230,414	247,540	261,381	272,434	280,200	287,768
Self-Supplied Population	12,670	13,045	14,015	14,799	15,425	15,864	16,293
Employment, Total	70,643	74,043	79,643	84,096	87,652	90,151	92,585
11 Agriculture, forestry, fishing and hunting	73	74	76	80	84	86	89
21 Mining, quarrying, and oil and gas extraction	211	217	229	241	251	259	266
22 Utilities	776	794	825	871	908	934	959
23 Construction	3,941	4,190	4,593	4,850	5,055	5,199	5,339
31-33 Manufacturing	3,542	3,473	3,390	3,579	3,731	3,837	3,941
42 Wholesale trade	1,677	1,721	1,799	1,900	1,980	2,037	2,092
44-45 Retail trade	8,467	8,644	8,967	9,468	9,868	10,150	10,424
48-49 Transportation and warehousing	659	681	719	759	791	814	836
51 Information	781	803	840	887	925	951	977
52 Finance and insurance	2,051	2,109	2,210	2,334	2,433	2,502	2,570
53 Real estate and rental and leasing	1,162	1,225	1,328	1,402	1,461	1,503	1,543
54 Professional and technical services	3,323	3,636	4,131	4,362	4,547	4,676	4,803
55 Management of companies and enterprises	234	233	232	245	256	263	270
56 Administrative and waste services	5,027	5,415	6,037	6,374	6,644	6,833	7,018
61 Educational services	12,628	13,226	14,210	15,005	15,639	16,085	16,520
62 Health care and social assistance	9,865	10,504	11,536	12,181	12,696	13,058	13,411
71 Arts, entertainment, and recreation	1,438	1,594	1,839	1,941	2,023	2,081	2,137
72 Accommodation and food services	8,263	8,734	9,500	10,031	10,455	10,754	11,044
81 Other services, except public administration	1,609	1,666	1,763	1,862	1,941	1,996	2,050
92 Public Administration	4,880	5,067	5,382	5,683	5,923	6,092	6,256
99 Unclassified	36	36	36	38	40	41	42
Public-Supply Nonresidential Including System Losses (AFY)	9,866	10,369	11,193	11,818	12,318	12,669	13,012
Public-Supply Residential Including System Losses (AFY)	26,529	27,315	29,345	30,986	32,296	33,217	34,114
Self-Supply Residential (AFY)	1,291	1,329	1,428	1,508	1,571	1,616	1,660
Projection of Irrigated Lands (in Acres)	1,139	1,202	1,410	1,619	1,827	1,987	2,244
Crop Irrigation (AFY)	1,106	1,166	1,369	1,571	1,773	1,929	2,178
Livestock (AFY)	418	421	433	444	456	467	479
Oil and Gas Drilling (AFY)	52	75	122	182	255	340	437
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	39,261	40,675	43,889	46,510	48,670	50,238	51,879

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Coal	2007	2010	2020	2030	2040	2050	2060
Population, Total	5,709	5,869	6,758	7,648	8,626	9,693	10,760
Public-Supplied Population	4,139	4,255	4,900	5,544	6,254	7,027	7,801
Self-Supplied Population	1,570	1,614	1,859	2,103	2,372	2,666	2,959
Employment, Total	1,049	1,096	1,183	1,338	1,509	1,696	1,883
11 Agriculture, forestry, fishing and hunting	15	15	16	18	20	22	25
21 Mining, quarrying, and oil and gas extraction	19	19	20	23	26	29	32
22 Utilities	26	26	27	31	35	39	44
23 Construction	51	55	60	68	77	86	96
31-33 Manufacturing	26	25	25	28	32	36	40
42 Wholesale trade	12	12	13	15	17	19	21
44-45 Retail trade	145	148	155	175	197	222	246
48-49 Transportation and warehousing	31	32	34	38	43	49	54
51 Information	0	0	0	0	0	0	0
52 Finance and insurance	46	47	50	56	64	72	79
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	16	18	20	23	26	29	32
55 Management of companies and enterprises	11	11	11	12	14	16	18
56 Administrative and waste services	16	17	19	22	25	28	31
61 Educational services	216	226	245	277	312	351	390
62 Health care and social assistance	225	240	265	300	338	380	422
71 Arts, entertainment, and recreation	30	33	38	43	49	55	61
72 Accommodation and food services	20	21	24	27	30	34	37
81 Other services, except public administration	6	6	6	7	8	9	10
92 Public Administration	139	144	154	175	197	221	246
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	145	153	166	188	212	238	264
Public-Supply Residential Including System Losses (AFY)	461	473	545	617	696	782	868
Self-Supply Residential (AFY)	148	153	176	199	224	252	280
Projection of Irrigated Lands (in Acres)	469	470	471	473	475	477	479
Crop Irrigation (AFY)	637	637	640	643	645	647	650
Livestock (AFY)	590	596	619	642	665	688	711
Oil and Gas Drilling (AFY)	1,206	1,750	3,375	2,399	1,825	1,036	34
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	3,186	3,763	5,521	4,687	4,267	3,644	2,808

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Comanche	2007	2010	2020	2030	2040	2050	2060
Population, Total	113,811	128,490	137,442	144,210	149,473	153,609	156,993
Public-Supplied Population	111,621	126,017	134,797	141,435	146,597	150,653	153,972
Self-Supplied Population	2,190	2,472	2,645	2,775	2,876	2,956	3,021
Employment, Total	40,220	41,929	44,742	46,946	48,659	50,006	51,107
11 Agriculture, forestry, fishing and hunting	75	76	78	82	85	87	89
21 Mining, quarrying, and oil and gas extraction	129	133	140	146	152	156	159
22 Utilities	321	328	341	358	371	381	389
23 Construction	1,573	1,673	1,832	1,922	1,993	2,048	2,093
31-33 Manufacturing	3,614	3,543	3,456	3,626	3,759	3,863	3,948
42 Wholesale trade	609	625	653	685	710	730	746
44-45 Retail trade	5,714	5,834	6,047	6,345	6,576	6,758	6,907
48-49 Transportation and warehousing	1,246	1,288	1,359	1,426	1,478	1,519	1,552
51 Information	555	570	597	626	649	667	682
52 Finance and insurance	1,777	1,827	1,914	2,008	2,081	2,139	2,186
53 Real estate and rental and leasing	513	541	586	614	637	654	669
54 Professional and technical services	1,193	1,305	1,482	1,555	1,612	1,656	1,693
55 Management of companies and enterprises	68	68	67	71	73	75	77
56 Administrative and waste services	2,225	2,397	2,671	2,802	2,904	2,985	3,051
61 Educational services	4,537	4,752	5,102	5,354	5,549	5,703	5,828
62 Health care and social assistance	6,635	7,066	7,754	8,136	8,433	8,667	8,857
71 Arts, entertainment, and recreation	528	585	675	708	734	754	771
72 Accommodation and food services	3,812	4,029	4,380	4,595	4,763	4,895	5,003
81 Other services, except public administration	888	920	973	1,021	1,058	1,087	1,111
92 Public Administration	4,204	4,365	4,633	4,861	5,039	5,178	5,292
99 Unclassified	3	3	3	3	3	3	3
Public-Supply Nonresidential Including System Losses (AFY)	5,313	5,545	5,926	6,218	6,445	6,623	6,769
Public-Supply Residential Including System Losses (AFY)	9,865	11,137	11,913	12,499	12,956	13,314	13,607
Self-Supply Residential (AFY)	171	193	207	217	225	231	236
Projection of Irrigated Lands (in Acres)	1,449	1,482	1,592	1,702	1,812	1,896	2,032
Crop Irrigation (AFY)	2,630	2,690	2,890	3,089	3,289	3,442	3,688
Livestock (AFY)	1,002	1,008	1,029	1,049	1,070	1,090	1,111
Oil and Gas Drilling (AFY)	38	53	73	95	121	150	181
Thermoelectric, Withdrawals (AFY)	2,484	2,566	2,863	3,194	3,563	3,975	4,435
Thermoelectric, Consumptive Use (AFY)	1,538	1,590	1,773	1,978	2,207	2,462	2,747
Self-Supply Large Industry (AFY)	362	355	346	363	377	387	396
Total Water Demand, All Sectors (AFY)*	21,864	23,548	25,246	26,726	28,045	29,213	30,424

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Cotton	2007	2010	2020	2030	2040	2050	2060
Population, Total	6,299	6,357	6,453	6,549	6,646	6,838	6,935
Public-Supplied Population	6,299	6,357	6,453	6,549	6,646	6,838	6,935
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	1,449	1,513	1,614	1,638	1,662	1,710	1,734
11 Agriculture, forestry, fishing and hunting	9	9	10	10	10	10	10
21 Mining, quarrying, and oil and gas extraction	104	108	113	114	116	119	121
22 Utilities	27	28	29	29	29	30	31
23 Construction	15	16	17	18	18	18	19
31-33 Manufacturing	13	13	12	13	13	13	13
42 Wholesale trade	34	35	36	37	37	38	39
44-45 Retail trade	113	115	119	121	122	126	128
48-49 Transportation and warehousing	28	29	30	31	31	32	33
51 Information	10	10	11	11	11	11	11
52 Finance and insurance	46	47	49	50	51	52	53
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	8	9	10	10	10	11	11
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	32	34	38	39	39	40	41
61 Educational services	316	331	354	359	365	375	381
62 Health care and social assistance	179	190	208	211	214	221	224
71 Arts, entertainment, and recreation	28	31	35	36	36	38	38
72 Accommodation and food services	114	121	131	133	135	139	141
81 Other services, except public administration	21	22	23	24	24	25	25
92 Public Administration	353	366	388	394	399	411	417
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	264	276	295	299	303	312	317
Public-Supply Residential Including System Losses (AFY)	502	507	514	522	530	545	553
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	331	350	414	478	541	590	669
Crop Irrigation (AFY)	549	581	687	793	898	980	1,110
Livestock (AFY)	940	942	950	957	965	972	979
Oil and Gas Drilling (AFY)	7	10	14	18	23	28	34
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	2,263	2,316	2,459	2,589	2,719	2,837	2,993

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Craig	2007	2010	2020	2030	2040	2050	2060
Population, Total	15,195	15,650	17,358	18,970	20,772	22,574	24,471
Public-Supplied Population	14,395	14,826	16,444	17,971	19,679	21,386	23,183
Self-Supplied Population	800	824	914	999	1,094	1,189	1,288
Employment, Total	5,925	6,147	6,544	7,152	7,832	8,511	9,227
11 Agriculture, forestry, fishing and hunting	167	170	175	192	210	228	247
21 Mining, quarrying, and oil and gas extraction	53	54	57	63	68	74	81
22 Utilities	255	261	272	298	326	354	384
23 Construction	177	188	207	226	248	269	292
31-33 Manufacturing	683	670	656	717	785	853	925
42 Wholesale trade	219	225	236	258	282	307	332
44-45 Retail trade	609	622	647	707	775	842	913
48-49 Transportation and warehousing	189	195	207	226	247	269	291
51 Information	89	91	96	105	115	125	136
52 Finance and insurance	215	221	233	254	278	302	328
53 Real estate and rental and leasing	26	27	30	33	36	39	42
54 Professional and technical services	261	286	326	356	390	424	459
55 Management of companies and enterprises	94	93	93	102	112	122	132
56 Administrative and waste services	162	175	195	213	234	254	275
61 Educational services	802	840	906	990	1,084	1,178	1,277
62 Health care and social assistance	804	857	944	1,032	1,130	1,228	1,331
71 Arts, entertainment, and recreation	19	21	24	27	29	32	34
72 Accommodation and food services	473	500	546	596	653	710	769
81 Other services, except public administration	102	106	112	123	134	146	158
92 Public Administration	525	545	581	635	695	756	819
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	793	822	874	955	1,046	1,137	1,232
Public-Supply Residential Including System Losses (AFY)	1,429	1,472	1,632	1,784	1,954	2,123	2,302
Self-Supply Residential (AFY)	68	70	77	84	92	100	109
Projection of Irrigated Lands (in Acres)	0	98	424	749	1,075	1,325	1,727
Crop Irrigation (AFY)	0	147	638	1,128	1,618	1,995	2,599
Livestock (AFY)	1,683	1,684	1,689	1,694	1,699	1,703	1,708
Oil and Gas Drilling (AFY)	21	30	41	54	68	84	102
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	3,994	4,225	4,951	5,699	6,477	7,142	8,052

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Creek	2007	2010	2020	2030	2040	2050	2060
Population, Total	69,073	70,543	75,441	79,262	82,888	86,513	90,432
Public-Supplied Population	62,023	63,343	67,741	71,172	74,428	77,683	81,202
Self-Supplied Population	7,050	7,200	7,700	8,090	8,460	8,830	9,230
Employment, Total	16,962	17,558	18,569	19,509	20,402	21,294	22,258
11 Agriculture, forestry, fishing and hunting	26	26	27	28	29	31	32
21 Mining, quarrying, and oil and gas extraction	819	844	887	932	974	1,017	1,063
22 Utilities	178	182	189	199	208	217	227
23 Construction	1,617	1,719	1,884	1,980	2,070	2,161	2,259
31-33 Manufacturing	3,331	3,266	3,188	3,349	3,502	3,655	3,821
42 Wholesale trade	779	800	836	878	918	958	1,002
44-45 Retail trade	1,889	1,929	2,000	2,102	2,198	2,294	2,398
48-49 Transportation and warehousing	650	672	709	745	779	813	850
51 Information	143	147	154	161	169	176	184
52 Finance and insurance	562	578	606	636	665	695	726
53 Real estate and rental and leasing	75	79	86	90	94	98	103
54 Professional and technical services	703	769	874	918	960	1,002	1,048
55 Management of companies and enterprises	29	28	28	30	31	33	34
56 Administrative and waste services	633	682	760	799	835	872	911
61 Educational services	1,140	1,193	1,282	1,347	1,409	1,470	1,537
62 Health care and social assistance	2,100	2,236	2,455	2,580	2,698	2,815	2,943
71 Arts, entertainment, and recreation	200	222	256	269	281	294	307
72 Accommodation and food services	982	1,038	1,129	1,186	1,240	1,295	1,353
81 Other services, except public administration	334	346	366	384	402	419	438
92 Public Administration	767	796	846	889	929	970	1,014
99 Unclassified	7	7	7	7	8	8	8
Public-Supply Nonresidential Including System Losses (AFY)	2,685	2,772	2,921	3,069	3,209	3,349	3,501
Public-Supply Residential Including System Losses (AFY)	5,510	5,627	6,018	6,323	6,612	6,901	7,214
Self-Supply Residential (AFY)	532	544	581	611	639	667	697
Projection of Irrigated Lands (in Acres)	319	331	371	411	451	482	531
Crop Irrigation (AFY)	336	349	391	433	475	508	560
Livestock (AFY)	650	654	668	683	697	712	726
Oil and Gas Drilling (AFY)	154	216	295	387	492	608	737
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	9,867	10,161	10,875	11,506	12,124	12,745	13,435

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Custer	2007	2010	2020	2030	2040	2050	2060
Population, Total	26,111	26,571	27,818	28,970	30,121	30,984	31,751
Public-Supplied Population	22,791	23,193	24,281	25,286	26,291	27,044	27,714
Self-Supplied Population	3,320	3,379	3,537	3,683	3,830	3,940	4,037
Employment, Total	11,128	11,585	12,314	12,824	13,333	13,715	14,055
11 Agriculture, forestry, fishing and hunting	37	38	38	40	42	43	44
21 Mining, quarrying, and oil and gas extraction	458	472	495	515	536	551	565
22 Utilities	140	143	148	155	161	165	169
23 Construction	659	701	766	798	829	853	874
31-33 Manufacturing	1,184	1,161	1,130	1,177	1,223	1,258	1,290
42 Wholesale trade	429	440	459	478	497	511	524
44-45 Retail trade	1,533	1,565	1,619	1,686	1,753	1,803	1,848
48-49 Transportation and warehousing	254	263	276	288	299	308	315
51 Information	143	147	153	160	166	171	175
52 Finance and insurance	354	364	380	396	412	424	434
53 Real estate and rental and leasing	184	194	210	218	227	233	239
54 Professional and technical services	322	352	399	416	432	445	456
55 Management of companies and enterprises	9	9	9	9	10	10	10
56 Administrative and waste services	182	196	217	226	235	242	248
61 Educational services	417	436	468	487	506	521	534
62 Health care and social assistance	2,486	2,647	2,899	3,019	3,139	3,229	3,309
71 Arts, entertainment, and recreation	155	172	198	206	215	221	226
72 Accommodation and food services	1,140	1,205	1,307	1,361	1,415	1,456	1,492
81 Other services, except public administration	371	384	405	422	439	452	463
92 Public Administration	652	677	717	747	776	799	818
99 Unclassified	19	19	19	20	21	21	22
Public-Supply Nonresidential Including System Losses (AFY)	1,743	1,815	1,929	2,009	2,089	2,149	2,202
Public-Supply Residential Including System Losses (AFY)	3,463	3,525	3,690	3,843	3,995	4,110	4,212
Self-Supply Residential (AFY)	440	447	468	488	507	522	535
Projection of Irrigated Lands (in Acres)	4,137	4,161	4,241	4,321	4,400	4,462	4,560
Crop Irrigation (AFY)	4,746	4,774	4,865	4,957	5,048	5,119	5,232
Livestock (AFY)	1,242	1,254	1,294	1,335	1,375	1,415	1,455
Oil and Gas Drilling (AFY)	367	519	755	1,039	1,371	1,751	2,179
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	47	46	45	47	49	50	51
Total Water Demand, All Sectors (AFY)*	12,048	12,380	13,047	13,717	14,434	15,115	15,866

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Delaware	2007	2010	2020	2030	2040	2050	2060
Population, Total	40,406	42,276	48,608	54,745	61,077	67,895	75,006
Public-Supplied Population	28,906	30,244	34,774	39,164	43,693	48,572	53,659
Self-Supplied Population	11,500	12,032	13,834	15,581	17,383	19,324	21,348
Employment, Total	7,900	8,276	8,954	10,084	11,250	12,506	13,816
11 Agriculture, forestry, fishing and hunting	17	17	18	20	23	25	28
21 Mining, quarrying, and oil and gas extraction	6	7	7	8	9	10	11
22 Utilities	54	55	58	65	72	80	89
23 Construction	548	583	643	725	808	899	993
31-33 Manufacturing	486	476	468	527	588	654	722
42 Wholesale trade	99	102	107	120	134	149	165
44-45 Retail trade	1,218	1,244	1,298	1,462	1,631	1,814	2,004
48-49 Transportation and warehousing	109	113	120	135	150	167	184
51 Information	91	94	99	111	124	138	152
52 Finance and insurance	219	225	238	268	299	332	367
53 Real estate and rental and leasing	77	81	89	100	111	124	137
54 Professional and technical services	174	190	218	245	274	304	336
55 Management of companies and enterprises	15	15	15	17	19	21	24
56 Administrative and waste services	171	184	206	232	259	288	318
61 Educational services	429	449	486	547	611	679	750
62 Health care and social assistance	2,068	2,202	2,435	2,742	3,059	3,401	3,757
71 Arts, entertainment, and recreation	306	339	394	444	495	551	608
72 Accommodation and food services	982	1,038	1,137	1,280	1,428	1,587	1,754
81 Other services, except public administration	309	320	341	384	428	476	526
92 Public Administration	521	541	578	651	727	808	892
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,208	1,273	1,389	1,564	1,745	1,940	2,143
Public-Supply Residential Including System Losses (AFY)	2,820	2,950	3,392	3,820	4,262	4,738	5,234
Self-Supply Residential (AFY)	954	998	1,147	1,292	1,441	1,602	1,770
Projection of Irrigated Lands (in Acres)	624	624	624	624	624	624	624
Crop Irrigation (AFY)	949	949	949	949	949	949	949
Livestock (AFY)	2,293	2,310	2,368	2,425	2,483	2,540	2,598
Oil and Gas Drilling (AFY)	0	0	0	0	0	0	0
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	8,224	8,481	9,245	10,051	10,881	11,770	12,694

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Dewey	2007	2010	2020	2030	2040	2050	2060
Population, Total	4,338	4,338	4,244	4,244	4,244	4,338	4,432
Public-Supplied Population	3,268	3,268	3,197	3,197	3,197	3,268	3,339
Self-Supplied Population	1,070	1,070	1,047	1,047	1,047	1,070	1,093
Employment, Total	1,248	1,298	1,372	1,372	1,372	1,402	1,433
11 Agriculture, forestry, fishing and hunting	10	11	11	11	11	11	11
21 Mining, quarrying, and oil and gas extraction	147	151	158	158	158	162	165
22 Utilities	45	46	48	48	48	49	50
23 Construction	36	38	41	41	41	42	43
31-33 Manufacturing	47	46	45	45	45	46	47
42 Wholesale trade	13	13	14	14	14	14	14
44-45 Retail trade	201	205	212	212	212	216	221
48-49 Transportation and warehousing	67	69	73	73	73	74	76
51 Information	21	21	22	22	22	23	23
52 Finance and insurance	54	56	58	58	58	59	61
53 Real estate and rental and leasing	3	3	3	3	3	4	4
54 Professional and technical services	29	31	35	35	35	36	37
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	18	19	21	21	21	22	22
61 Educational services	180	189	201	201	201	206	210
62 Health care and social assistance	217	231	252	252	252	258	263
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	42	44	48	48	48	49	50
81 Other services, except public administration	33	34	36	36	36	37	38
92 Public Administration	86	89	94	94	94	96	98
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	218	226	238	238	238	244	249
Public-Supply Residential Including System Losses (AFY)	928	928	907	907	907	928	948
Self-Supply Residential (AFY)	263	263	257	257	257	263	269
Projection of Irrigated Lands (in Acres)	3,129	3,129	3,129	3,129	3,129	3,129	3,129
Crop Irrigation (AFY)	4,752	4,752	4,752	4,752	4,752	4,752	4,752
Livestock (AFY)	705	713	742	771	800	828	857
Oil and Gas Drilling (AFY)	205	290	427	593	787	1,011	1,263
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	7,069	7,172	7,324	7,518	7,741	8,025	8,337

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Ellis	2007	2010	2020	2030	2040	2050	2060
Population, Total	3,911	3,850	3,749	3,749	3,648	3,648	3,749
Public-Supplied Population	2,531	2,492	2,426	2,426	2,361	2,361	2,426
Self-Supplied Population	1,380	1,359	1,323	1,323	1,287	1,287	1,323
Employment, Total	1,007	1,050	1,109	1,109	1,079	1,079	1,109
11 Agriculture, forestry, fishing and hunting	37	38	38	38	37	37	38
21 Mining, quarrying, and oil and gas extraction	32	33	34	34	33	33	34
22 Utilities	7	7	7	7	7	7	7
23 Construction	15	16	17	17	17	17	17
31-33 Manufacturing	14	14	13	13	13	13	13
42 Wholesale trade	32	33	34	34	33	33	34
44-45 Retail trade	118	120	124	124	120	120	124
48-49 Transportation and warehousing	119	123	128	128	125	125	128
51 Information	4	4	4	4	4	4	4
52 Finance and insurance	35	36	37	37	36	36	37
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	38	42	47	47	45	45	47
55 Management of companies and enterprises	8	8	8	8	8	8	8
56 Administrative and waste services	19	21	23	23	22	22	23
61 Educational services	172	180	191	191	186	186	191
62 Health care and social assistance	116	124	134	134	131	131	134
71 Arts, entertainment, and recreation	23	25	29	29	28	28	29
72 Accommodation and food services	47	49	53	53	52	52	53
81 Other services, except public administration	26	27	28	28	27	27	28
92 Public Administration	145	151	158	158	154	154	158
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	151	158	167	167	163	163	167
Public-Supply Residential Including System Losses (AFY)	587	578	563	563	548	548	563
Self-Supply Residential (AFY)	272	268	261	261	254	254	261
Projection of Irrigated Lands (in Acres)	12,829	13,256	14,680	16,105	17,529	18,622	20,377
Crop Irrigation (AFY)	22,201	22,940	25,405	27,870	30,334	32,225	35,263
Livestock (AFY)	1,377	1,381	1,393	1,405	1,417	1,429	1,441
Oil and Gas Drilling (AFY)	515	774	1,511	2,478	3,675	5,103	6,760
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	25,103	26,099	29,300	32,744	36,391	39,721	44,456

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Garfield	2007	2010	2020	2030	2040	2050	2060
Population, Total	57,657	58,128	59,896	61,369	62,743	63,823	65,100
Public-Supplied Population	56,197	56,656	58,379	59,815	61,154	62,207	63,451
Self-Supplied Population	1,460	1,472	1,517	1,554	1,589	1,616	1,648
Employment, Total	24,152	25,169	26,774	27,432	28,047	28,530	29,100
11 Agriculture, forestry, fishing and hunting	91	92	95	97	99	101	103
21 Mining, quarrying, and oil and gas extraction	819	844	884	906	926	942	961
22 Utilities	222	227	236	241	247	251	256
23 Construction	929	988	1,079	1,106	1,130	1,150	1,173
31-33 Manufacturing	2,777	2,723	2,649	2,714	2,775	2,822	2,879
42 Wholesale trade	1,024	1,051	1,095	1,122	1,147	1,167	1,190
44-45 Retail trade	3,154	3,220	3,329	3,411	3,487	3,547	3,618
48-49 Transportation and warehousing	891	921	969	993	1,015	1,032	1,053
51 Information	309	318	331	340	347	353	360
52 Finance and insurance	779	801	837	857	877	892	909
53 Real estate and rental and leasing	448	472	510	523	534	544	554
54 Professional and technical services	1,782	1,949	2,208	2,262	2,313	2,352	2,399
55 Management of companies and enterprises	62	62	62	63	65	66	67
56 Administrative and waste services	1,605	1,729	1,921	1,968	2,012	2,047	2,088
61 Educational services	1,617	1,693	1,813	1,858	1,900	1,932	1,971
62 Health care and social assistance	3,418	3,640	3,984	4,082	4,173	4,245	4,330
71 Arts, entertainment, and recreation	284	315	362	371	379	386	393
72 Accommodation and food services	1,815	1,918	2,080	2,131	2,179	2,216	2,260
81 Other services, except public administration	753	780	823	843	862	876	894
92 Public Administration	1,373	1,426	1,509	1,546	1,581	1,608	1,640
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	3,611	3,756	3,986	4,084	4,175	4,247	4,332
Public-Supply Residential Including System Losses (AFY)	8,423	8,492	8,750	8,965	9,166	9,324	9,511
Self-Supply Residential (AFY)	186	188	193	198	202	206	210
Projection of Irrigated Lands (in Acres)	5,359	5,359	5,359	5,359	5,359	5,359	5,359
Crop Irrigation (AFY)	6,029	6,029	6,029	6,029	6,029	6,029	6,029
Livestock (AFY)	1,359	1,361	1,368	1,375	1,383	1,390	1,397
Oil and Gas Drilling (AFY)	136	192	283	393	522	671	838
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	19,744	20,018	20,610	21,045	21,478	21,867	22,317

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Garvin	2007	2010	2020	2030	2040	2050	2060
Population, Total	27,141	27,260	27,954	28,449	28,945	29,540	30,135
Public-Supplied Population	22,991	23,092	23,680	24,099	24,519	25,023	25,527
Self-Supplied Population	4,150	4,168	4,274	4,350	4,426	4,517	4,608
Employment, Total	9,007	9,334	9,844	10,019	10,193	10,403	10,612
11 Agriculture, forestry, fishing and hunting	68	69	71	72	73	75	76
21 Mining, quarrying, and oil and gas extraction	957	986	1,032	1,050	1,069	1,091	1,113
22 Utilities	152	155	161	164	167	170	173
23 Construction	506	538	587	598	608	621	633
31-33 Manufacturing	988	969	942	958	975	995	1,015
42 Wholesale trade	297	305	317	323	329	335	342
44-45 Retail trade	1,522	1,554	1,605	1,634	1,662	1,696	1,730
48-49 Transportation and warehousing	227	235	247	251	255	261	266
51 Information	41	43	44	45	46	47	48
52 Finance and insurance	248	255	266	271	276	281	287
53 Real estate and rental and leasing	42	44	48	49	49	50	52
54 Professional and technical services	155	170	192	195	199	203	207
55 Management of companies and enterprises	7	7	7	7	7	7	8
56 Administrative and waste services	133	143	158	161	164	167	171
61 Educational services	329	344	369	375	382	389	397
62 Health care and social assistance	1,515	1,613	1,764	1,795	1,827	1,864	1,902
71 Arts, entertainment, and recreation	34	37	43	44	44	45	46
72 Accommodation and food services	647	684	741	754	767	783	799
81 Other services, except public administration	115	119	126	128	130	133	135
92 Public Administration	1,023	1,062	1,123	1,143	1,163	1,187	1,211
99 Unclassified	1	1	1	1	2	2	2
Public-Supply Nonresidential Including System Losses (AFY)	1,646	1,702	1,791	1,822	1,854	1,892	1,930
Public-Supply Residential Including System Losses (AFY)	3,044	3,058	3,136	3,191	3,247	3,314	3,380
Self-Supply Residential (AFY)	467	469	481	490	498	508	519
Projection of Irrigated Lands (in Acres)	812	909	1,234	1,559	1,884	2,134	2,534
Crop Irrigation (AFY)	1,197	1,340	1,819	2,298	2,777	3,144	3,734
Livestock (AFY)	1,195	1,197	1,203	1,209	1,216	1,222	1,228
Oil and Gas Drilling (AFY)	358	504	710	953	1,233	1,550	1,904
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	230	225	219	223	227	232	236
Total Water Demand, All Sectors (AFY)*	8,137	8,496	9,358	10,186	11,051	11,862	12,932

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Grady	2007	2010	2020	2030	2040	2050	2060
Population, Total	50,615	51,761	55,473	58,655	61,519	64,382	67,352
Public-Supplied Population	34,875	35,664	38,222	40,415	42,388	44,361	46,407
Self-Supplied Population	15,740	16,096	17,251	18,240	19,131	20,021	20,945
Employment, Total	12,885	13,352	14,145	14,956	15,687	16,417	17,174
11 Agriculture, forestry, fishing and hunting	276	280	288	305	319	334	350
21 Mining, quarrying, and oil and gas extraction	364	375	394	417	437	458	479
22 Utilities	173	177	184	194	204	213	223
23 Construction	888	945	1,036	1,095	1,149	1,202	1,257
31-33 Manufacturing	1,924	1,886	1,842	1,947	2,042	2,137	2,236
42 Wholesale trade	517	531	555	587	615	644	674
44-45 Retail trade	1,749	1,786	1,853	1,959	2,055	2,150	2,249
48-49 Transportation and warehousing	366	378	399	422	443	463	485
51 Information	95	98	103	109	114	119	125
52 Finance and insurance	385	396	415	439	460	482	504
53 Real estate and rental and leasing	146	154	167	176	185	194	203
54 Professional and technical services	258	282	321	339	356	372	390
55 Management of companies and enterprises	19	19	19	20	21	22	23
56 Administrative and waste services	733	790	881	931	976	1,022	1,069
61 Educational services	1,299	1,360	1,462	1,546	1,621	1,697	1,775
62 Health care and social assistance	1,167	1,243	1,366	1,444	1,514	1,585	1,658
71 Arts, entertainment, and recreation	88	98	113	119	125	131	137
72 Accommodation and food services	1,387	1,466	1,595	1,687	1,769	1,851	1,937
81 Other services, except public administration	483	500	530	560	587	615	643
92 Public Administration	567	589	625	661	694	726	759
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,986	2,055	2,172	2,297	2,409	2,521	2,638
Public-Supply Residential Including System Losses (AFY)	3,064	3,134	3,358	3,551	3,724	3,898	4,078
Self-Supply Residential (AFY)	1,176	1,202	1,288	1,362	1,429	1,495	1,564
Projection of Irrigated Lands (in Acres)	8,465	8,465	8,465	8,465	8,465	8,465	8,465
Crop Irrigation (AFY)	11,291	11,291	11,291	11,291	11,291	11,291	11,291
Livestock (AFY)	2,158	2,181	2,259	2,336	2,413	2,491	2,568
Oil and Gas Drilling (AFY)	587	828	1,178	1,594	2,076	2,623	3,237
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)		0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	20,262	20,691	21,547	22,432	23,343	24,320	25,375

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Grant	2007	2010	2020	2030	2040	2050	2060
Population, Total	4,497	4,497	4,585	4,673	4,673	4,850	4,938
Public-Supplied Population	3,847	3,847	3,922	3,998	3,998	4,149	4,224
Self-Supplied Population	650	650	663	675	675	701	714
Employment, Total	1,105	1,148	1,217	1,241	1,241	1,288	1,311
11 Agriculture, forestry, fishing and hunting	16	16	17	17	17	18	18
21 Mining, quarrying, and oil and gas extraction	70	72	76	77	77	80	81
22 Utilities	26	27	28	28	28	29	30
23 Construction	62	65	71	73	73	76	77
31-33 Manufacturing	14	14	13	14	14	14	14
42 Wholesale trade	94	96	101	103	103	106	108
44-45 Retail trade	96	98	101	103	103	107	109
48-49 Transportation and warehousing	155	160	169	172	172	178	182
51 Information	11	11	12	12	12	12	13
52 Finance and insurance	67	69	72	73	73	76	77
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	25	27	31	32	32	33	33
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	4	4	5	5	5	5	5
61 Educational services	179	187	201	205	205	213	216
62 Health care and social assistance	61	65	71	73	73	75	77
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	52	55	60	61	61	63	64
81 Other services, except public administration	43	45	47	48	48	50	51
92 Public Administration	131	136	144	147	147	152	155
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	168	175	185	188	188	196	199
Public-Supply Residential Including System Losses (AFY)	542	542	552	563	563	584	595
Self-Supply Residential (AFY)	78	78	80	81	81	84	86
Projection of Irrigated Lands (in Acres)	1,473	1,473	1,473	1,473	1,473	1,473	1,473
Crop Irrigation (AFY)	1,801	1,801	1,801	1,801	1,801	1,801	1,801
Livestock (AFY)	680	689	720	751	782	813	843
Oil and Gas Drilling (AFY)	146	211	338	498	690	915	1,172
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	3,415	3,496	3,676	3,883	4,106	4,392	4,696

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Greer	2007	2010	2020	2030	2040	2050	2060
Population, Total	5,810	5,810	5,810	5,810	5,908	6,007	6,105
Public-Supplied Population	5,810	5,810	5,810	5,810	5,908	6,007	6,105
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	1,492	1,557	1,655	1,655	1,683	1,711	1,739
11 Agriculture, forestry, fishing and hunting	13	13	13	13	14	14	14
21 Mining, quarrying, and oil and gas extraction	36	38	39	39	40	41	41
22 Utilities	24	25	26	26	26	26	27
23 Construction	25	27	29	29	29	30	30
31-33 Manufacturing	46	46	44	44	45	46	46
42 Wholesale trade	24	24	25	25	26	26	27
44-45 Retail trade	176	180	185	185	188	191	195
48-49 Transportation and warehousing	144	149	156	156	159	161	164
51 Information	21	21	22	22	23	23	23
52 Finance and insurance	55	57	59	59	60	61	62
53 Real estate and rental and leasing	7	8	9	9	9	9	9
54 Professional and technical services	14	15	17	17	18	18	18
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	44	48	53	53	54	55	56
61 Educational services	147	154	164	164	167	170	173
62 Health care and social assistance	375	399	436	436	443	450	458
71 Arts, entertainment, and recreation	19	21	25	25	25	25	26
72 Accommodation and food services	39	41	45	45	45	46	47
81 Other services, except public administration	23	24	25	25	25	26	26
92 Public Administration	259	268	283	283	288	293	298
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	187	195	208	208	212	215	219
Public-Supply Residential Including System Losses (AFY)	841	841	841	841	855	870	884
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	3,442	3,860	5,255	6,649	8,043	9,113	10,832
Crop Irrigation (AFY)	5,407	6,064	8,255	10,445	12,636	14,317	17,016
Livestock (AFY)	442	442	442	443	443	444	444
Oil and Gas Drilling (AFY)	4	6	8	10	13	16	19
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	6,881	7,548	9,754	11,947	14,159	15,861	18,582

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Harmon	2007	2010	2020	2030	2040	2050	2060
Population, Total	2,837	2,890	2,890	2,977	3,065	3,152	3,240
Public-Supplied Population	2,837	2,890	2,890	2,977	3,065	3,152	3,240
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	819	855	910	938	965	993	1,020
11 Agriculture, forestry, fishing and hunting	55	56	57	59	60	62	64
21 Mining, quarrying, and oil and gas extraction	0	0	0	0	0	0	0
22 Utilities	20	20	21	22	22	23	24
23 Construction	52	55	60	62	64	66	67
31-33 Manufacturing	21	20	20	20	21	21	22
42 Wholesale trade	21	22	23	23	24	25	25
44-45 Retail trade	66	67	69	72	74	76	78
48-49 Transportation and warehousing	28	29	31	32	33	33	34
51 Information	12	13	13	14	14	14	15
52 Finance and insurance	61	63	65	67	69	71	73
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	9	10	11	11	12	12	12
55 Management of companies and enterprises	13	13	13	13	13	14	14
56 Administrative and waste services	30	32	35	36	38	39	40
61 Educational services	66	69	73	76	78	80	82
62 Health care and social assistance	199	212	231	238	245	253	260
71 Arts, entertainment, and recreation	17	19	22	23	23	24	25
72 Accommodation and food services	36	38	41	42	43	44	46
81 Other services, except public administration	13	14	14	15	15	16	16
92 Public Administration	101	104	110	114	117	120	124
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	105	110	118	121	125	128	132
Public-Supply Residential Including System Losses (AFY)	667	679	679	700	721	741	762
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	17,805	17,955	18,455	18,955	19,454	19,838	20,454
Crop Irrigation (AFY)	26,234	26,455	27,191	27,927	28,664	29,229	30,137
Livestock (AFY)	562	565	577	589	602	614	626
Oil and Gas Drilling (AFY)	2	3	4	5	6	8	9
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	27,569	27,812	28,569	29,343	30,117	30,720	31,665

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Harper	2007	2010	2020	2030	2040	2050	2060
Population, Total	3,254	3,198	3,198	3,198	3,198	3,292	3,292
Public-Supplied Population	2,294	2,254	2,254	2,254	2,254	2,321	2,321
Self-Supplied Population	960	943	943	943	943	971	971
Employment, Total	1,270	1,319	1,393	1,393	1,393	1,434	1,434
11 Agriculture, forestry, fishing and hunting	287	291	298	298	298	306	306
21 Mining, quarrying, and oil and gas extraction	63	65	68	68	68	70	70
22 Utilities	15	15	16	16	16	16	16
23 Construction	37	40	43	43	43	44	44
31-33 Manufacturing	10	10	10	10	10	10	10
42 Wholesale trade	28	29	30	30	30	31	31
44-45 Retail trade	106	108	112	112	112	115	115
48-49 Transportation and warehousing	50	51	54	54	54	55	55
51 Information	6	6	6	6	6	7	7
52 Finance and insurance	25	25	26	26	26	27	27
53 Real estate and rental and leasing	2	2	2	2	2	2	2
54 Professional and technical services	23	25	28	28	28	29	29
55 Management of companies and enterprises	6	6	6	6	6	7	7
56 Administrative and waste services	15	16	18	18	18	18	18
61 Educational services	99	103	110	110	110	114	114
62 Health care and social assistance	269	286	312	312	312	321	321
71 Arts, entertainment, and recreation	9	10	11	11	11	11	11
72 Accommodation and food services	18	19	20	20	20	21	21
81 Other services, except public administration	47	49	51	51	51	53	53
92 Public Administration	156	162	171	171	171	176	176
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	202	210	221	221	221	228	228
Public-Supply Residential Including System Losses (AFY)	765	752	752	752	752	774	774
Self-Supply Residential (AFY)	272	267	267	267	267	275	275
Projection of Irrigated Lands (in Acres)	6,206	6,331	6,748	7,165	7,582	7,902	8,416
Crop Irrigation (AFY)	10,185	10,391	11,075	11,759	12,444	12,969	13,813
Livestock (AFY)	1,439	1,441	1,448	1,456	1,463	1,470	1,478
Oil and Gas Drilling (AFY)	249	356	547	783	1,064	1,389	1,760
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	13,112	13,416	14,311	15,238	16,210	17,105	18,326

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Haskell	2007	2010	2020	2030	2040	2050	2060
Population, Total	12,059	12,561	14,236	16,004	17,865	19,726	21,773
Public-Supplied Population	6,779	7,061	8,003	8,997	10,043	11,089	12,240
Self-Supplied Population	5,280	5,500	6,233	7,007	7,822	8,637	9,533
Employment, Total	3,714	3,895	4,216	4,740	5,291	5,842	6,449
11 Agriculture, forestry, fishing and hunting	56	57	59	66	74	81	90
21 Mining, quarrying, and oil and gas extraction	322	332	351	394	440	486	536
22 Utilities	58	59	62	70	78	86	95
23 Construction	265	282	311	349	390	430	475
31-33 Manufacturing	44	43	42	48	53	59	65
42 Wholesale trade	94	96	101	114	127	141	155
44-45 Retail trade	438	447	466	524	585	646	713
48-49 Transportation and warehousing	94	97	103	116	129	143	158
51 Information	24	25	26	29	33	36	40
52 Finance and insurance	63	65	68	77	85	94	104
53 Real estate and rental and leasing	3	3	4	4	5	5	6
54 Professional and technical services	70	77	88	98	110	121	134
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	117	126	141	159	177	196	216
61 Educational services	386	404	437	491	548	605	668
62 Health care and social assistance	1,271	1,353	1,495	1,680	1,876	2,071	2,286
71 Arts, entertainment, and recreation	25	28	32	36	40	45	49
72 Accommodation and food services	119	126	138	155	173	191	210
81 Other services, except public administration	24	25	26	30	33	37	40
92 Public Administration	240	249	266	299	334	369	407
99 Unclassified	1	1	1	1	1	1	2
Public-Supply Nonresidential Including System Losses (AFY)	595	621	669	753	840	928	1,024
Public-Supply Residential Including System Losses (AFY)	675	703	797	896	1,000	1,104	1,219
Self-Supply Residential (AFY)	447	465	528	593	662	731	807
Projection of Irrigated Lands (in Acres)	1,703	1,745	1,886	2,027	2,167	2,276	2,449
Crop Irrigation (AFY)	2,526	2,589	2,798	3,006	3,215	3,375	3,633
Livestock (AFY)	1,163	1,167	1,179	1,191	1,203	1,215	1,227
Oil and Gas Drilling (AFY)	708	1,080	2,223	3,735	5,615	7,864	10,481
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	6,114	6,625	8,193	10,174	12,535	15,217	18,391

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Hughes	2007	2010	2020	2030	2040	2050	2060
Population, Total	13,680	14,167	15,792	17,416	19,130	21,025	22,920
Public-Supplied Population	12,740	13,194	14,706	16,219	17,816	19,581	21,345
Self-Supplied Population	940	973	1,085	1,197	1,315	1,445	1,575
Employment, Total	2,847	2,972	3,196	3,525	3,872	4,255	4,639
11 Agriculture, forestry, fishing and hunting	37	38	39	43	47	52	56
21 Mining, quarrying, and oil and gas extraction	60	62	65	72	79	87	95
22 Utilities	28	28	30	33	36	40	43
23 Construction	74	79	87	96	105	116	126
31-33 Manufacturing	224	220	215	238	261	287	313
42 Wholesale trade	53	54	57	63	69	76	83
44-45 Retail trade	316	323	336	371	408	448	488
48-49 Transportation and warehousing	116	120	127	140	154	169	185
51 Information	42	43	46	50	55	61	66
52 Finance and insurance	94	97	102	112	123	136	148
53 Real estate and rental and leasing	59	62	68	75	82	90	98
54 Professional and technical services	23	25	29	32	35	38	42
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	251	270	302	334	366	403	439
61 Educational services	411	430	465	513	563	619	675
62 Health care and social assistance	584	622	687	757	832	914	996
71 Arts, entertainment, and recreation	47	52	61	67	74	81	88
72 Accommodation and food services	130	137	150	165	182	200	218
81 Other services, except public administration	9	9	10	11	12	13	14
92 Public Administration	289	300	321	354	388	427	465
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	395	412	443	489	537	590	644
Public-Supply Residential Including System Losses (AFY)	1,327	1,374	1,531	1,689	1,855	2,039	2,223
Self-Supply Residential (AFY)	83	86	96	106	116	128	139
Projection of Irrigated Lands (in Acres)	2,244	2,479	3,262	4,045	4,829	5,430	6,395
Crop Irrigation (AFY)	2,973	3,285	4,323	5,360	6,398	7,195	8,474
Livestock (AFY)	1,649	1,654	1,673	1,691	1,709	1,727	1,745
Oil and Gas Drilling (AFY)	2,194	3,185	6,141	4,365	3,320	1,886	62
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	8,620	9,997	14,207	13,700	13,935	13,564	13,286

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Jackson	2007	2010	2020	2030	2040	2050	2060
Population, Total	25,778	26,249	27,819	29,127	30,173	31,045	31,743
Public-Supplied Population	24,698	25,149	26,653	27,906	28,909	29,745	30,413
Self-Supplied Population	1,080	1,100	1,165	1,220	1,264	1,301	1,330
Employment, Total	10,886	11,293	11,972	12,535	12,985	13,361	13,661
11 Agriculture, forestry, fishing and hunting	494	501	515	539	558	575	587
21 Mining, quarrying, and oil and gas extraction	40	42	44	46	48	49	50
22 Utilities	108	111	115	120	125	128	131
23 Construction	165	175	192	201	208	214	219
31-33 Manufacturing	901	883	862	902	935	962	983
42 Wholesale trade	264	271	283	296	307	315	323
44-45 Retail trade	1,425	1,455	1,508	1,579	1,636	1,683	1,721
48-49 Transportation and warehousing	618	639	674	706	731	752	769
51 Information	100	102	107	112	116	119	122
52 Finance and insurance	236	243	254	266	276	284	290
53 Real estate and rental and leasing	68	72	78	81	84	87	89
54 Professional and technical services	159	174	197	207	214	220	225
55 Management of companies and enterprises	106	105	105	110	114	117	120
56 Administrative and waste services	386	416	463	485	502	517	529
61 Educational services	1,530	1,602	1,721	1,802	1,866	1,920	1,963
62 Health care and social assistance	952	1,014	1,113	1,165	1,207	1,242	1,270
71 Arts, entertainment, and recreation	74	82	95	99	103	106	108
72 Accommodation and food services	1,178	1,245	1,354	1,417	1,468	1,510	1,544
81 Other services, except public administration	179	185	196	205	213	219	224
92 Public Administration	1,903	1,976	2,097	2,196	2,275	2,341	2,393
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,545	1,605	1,704	1,784	1,848	1,902	1,945
Public-Supply Residential Including System Losses (AFY)	2,960	3,015	3,195	3,345	3,465	3,565	3,645
Self-Supply Residential (AFY)	110	112	119	124	129	133	135
Projection of Irrigated Lands (in Acres)	55,120	55,455	56,572	57,689	58,806	59,663	61,040
Crop Irrigation (AFY)	101,101	101,716	103,765	105,813	107,862	109,434	111,960
Livestock (AFY)	576	592	646	701	755	809	864
Oil and Gas Drilling (AFY)	19	29	60	100	151	211	280
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	613	601	586	614	636	654	669
Total Water Demand, All Sectors (AFY)*	106,924	107,669	110,075	112,482	114,846	116,708	119,498

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Jefferson	2007	2010	2020	2030	2040	2050	2060
Population, Total	6,273	6,273	6,368	6,463	6,558	6,748	6,938
Public-Supplied Population	6,133	6,133	6,226	6,319	6,412	6,598	6,783
Self-Supplied Population	140	140	142	144	146	151	155
Employment, Total	1,249	1,299	1,377	1,398	1,418	1,459	1,501
11 Agriculture, forestry, fishing and hunting	42	43	44	44	45	46	48
21 Mining, quarrying, and oil and gas extraction	12	12	13	13	13	14	14
22 Utilities	0	0	0	0	0	0	0
23 Construction	35	38	41	42	42	44	45
31-33 Manufacturing	79	77	75	76	78	80	82
42 Wholesale trade	55	56	59	60	61	62	64
44-45 Retail trade	160	163	169	171	174	179	184
48-49 Transportation and warehousing	59	61	64	65	66	68	70
51 Information	11	11	12	12	12	13	13
52 Finance and insurance	81	83	87	88	90	92	95
53 Real estate and rental and leasing	6	6	7	7	7	7	7
54 Professional and technical services	32	35	39	40	40	41	43
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	6	6	7	7	7	8	8
61 Educational services	197	206	220	224	227	234	240
62 Health care and social assistance	240	256	280	284	289	297	305
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	58	61	66	67	68	70	72
81 Other services, except public administration	46	48	50	51	52	53	55
92 Public Administration	130	135	143	145	147	151	156
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	167	173	183	186	189	194	200
Public-Supply Residential Including System Losses (AFY)	603	603	612	621	630	649	667
Self-Supply Residential (AFY)	12	12	12	12	12	13	13
Projection of Irrigated Lands (in Acres)	330	339	369	399	428	451	488
Crop Irrigation (AFY)	354	363	395	427	459	484	523
Livestock (AFY)	1,296	1,297	1,301	1,305	1,310	1,314	1,318
Oil and Gas Drilling (AFY)	26	36	50	65	83	103	125
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	2,457	2,484	2,553	2,617	2,683	2,756	2,845

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Johnston	2007	2010	2020	2030	2040	2050	2060
Population, Total	10,402	10,735	12,031	13,419	14,807	16,288	17,861
Public-Supplied Population	10,292	10,622	11,904	13,277	14,651	16,116	17,672
Self-Supplied Population	110	114	127	142	157	172	189
Employment, Total	2,968	3,060	3,232	3,605	3,978	4,376	4,799
11 Agriculture, forestry, fishing and hunting	15	15	16	18	19	21	23
21 Mining, quarrying, and oil and gas extraction	105	108	114	127	141	155	170
22 Utilities	33	33	35	39	43	47	52
23 Construction	21	22	24	27	30	33	36
31-33 Manufacturing	717	703	689	769	848	933	1,023
42 Wholesale trade	154	158	166	185	204	225	246
44-45 Retail trade	234	239	249	278	307	337	370
48-49 Transportation and warehousing	55	56	60	67	74	81	89
51 Information	19	20	21	23	25	28	31
52 Finance and insurance	28	29	31	34	38	42	46
53 Real estate and rental and leasing	4	5	5	6	6	7	7
54 Professional and technical services	37	41	46	52	57	63	69
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	32	35	39	43	48	53	58
61 Educational services	378	395	427	476	525	578	634
62 Health care and social assistance	698	744	820	915	1,010	1,111	1,218
71 Arts, entertainment, and recreation	11	13	15	16	18	20	22
72 Accommodation and food services	77	82	89	100	110	121	133
81 Other services, except public administration	59	61	65	72	80	88	96
92 Public Administration	290	301	321	358	395	435	477
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	470	483	507	566	624	686	753
Public-Supply Residential Including System Losses (AFY)	1,264	1,305	1,462	1,631	1,799	1,979	2,171
Self-Supply Residential (AFY)	11	12	13	15	16	18	20
Projection of Irrigated Lands (in Acres)	692	760	989	1,217	1,445	1,621	1,902
Crop Irrigation (AFY)	1,333	1,464	1,904	2,344	2,783	3,121	3,662
Livestock (AFY)	619	622	631	640	649	658	667
Oil and Gas Drilling (AFY)	61	96	220	387	596	846	1,140
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	1,425	1,397	1,359	1,380	1,400	1,440	1,481
Total Water Demand, All Sectors (AFY)*	5,183	5,378	6,097	6,961	7,867	8,749	9,893

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Kay	2007	2010	2020	2030	2040	2050	2060
Population, Total	45,638	45,975	47,567	48,784	49,908	51,031	52,249
Public-Supplied Population	43,398	43,719	45,232	46,390	47,458	48,527	49,684
Self-Supplied Population	2,240	2,257	2,335	2,394	2,450	2,505	2,564
Employment, Total	19,688	20,464	21,697	22,253	22,765	23,278	23,833
11 Agriculture, forestry, fishing and hunting	8	8	8	9	9	9	9
21 Mining, quarrying, and oil and gas extraction	1,107	1,141	1,195	1,226	1,254	1,282	1,313
22 Utilities	239	245	253	260	266	272	278
23 Construction	1,058	1,125	1,229	1,261	1,290	1,319	1,350
31-33 Manufacturing	2,807	2,752	2,678	2,746	2,810	2,873	2,941
42 Wholesale trade	543	557	581	596	609	623	638
44-45 Retail trade	2,211	2,257	2,334	2,394	2,449	2,504	2,564
48-49 Transportation and warehousing	694	718	755	775	793	810	830
51 Information	398	409	426	437	447	458	468
52 Finance and insurance	480	494	516	529	541	553	566
53 Real estate and rental and leasing	220	232	251	257	263	269	276
54 Professional and technical services	746	816	925	948	970	992	1,016
55 Management of companies and enterprises	99	98	98	101	103	105	108
56 Administrative and waste services	1,398	1,506	1,673	1,716	1,756	1,795	1,838
61 Educational services	1,853	1,940	2,078	2,131	2,180	2,229	2,283
62 Health care and social assistance	2,188	2,330	2,551	2,616	2,676	2,736	2,802
71 Arts, entertainment, and recreation	460	510	586	601	615	629	644
72 Accommodation and food services	1,490	1,575	1,708	1,751	1,792	1,832	1,876
81 Other services, except public administration	589	610	644	660	675	690	707
92 Public Administration	1,084	1,126	1,192	1,222	1,250	1,279	1,309
99 Unclassified	16	16	16	16	17	17	18
Public-Supply Nonresidential Including System Losses (AFY)	3,345	3,477	3,685	3,779	3,866	3,953	4,048
Public-Supply Residential Including System Losses (AFY)	4,203	4,234	4,381	4,493	4,597	4,700	4,812
Self-Supply Residential (AFY)	184	186	192	197	202	206	211
Projection of Irrigated Lands (in Acres)	3,569	3,569	3,569	3,569	3,569	3,569	3,569
Crop Irrigation (AFY)	4,690	4,690	4,690	4,690	4,690	4,690	4,690
Livestock (AFY)	612	618	635	652	670	687	705
Oil and Gas Drilling (AFY)	115	161	220	289	366	453	550
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	11,004	11,340	11,880	12,184	12,465	12,746	13,050
Total Water Demand, All Sectors (AFY)*	24,155	24,705	25,684	26,285	26,856	27,436	28,065

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Kingfisher	2007	2010	2020	2030	2040	2050	2060
Population, Total	14,320	14,784	16,523	18,262	20,002	21,741	23,673
Public-Supplied Population	10,310	10,644	11,896	13,148	14,401	15,653	17,044
Self-Supplied Population	4,010	4,140	4,627	5,114	5,601	6,088	6,629
Employment, Total	5,908	6,090	6,431	7,108	7,785	8,462	9,215
11 Agriculture, forestry, fishing and hunting	41	42	43	47	52	57	62
21 Mining, quarrying, and oil and gas extraction	750	773	816	902	987	1,073	1,169
22 Utilities	54	55	57	63	69	75	82
23 Construction	329	349	385	425	466	506	551
31-33 Manufacturing	1,145	1,123	1,100	1,216	1,332	1,448	1,577
42 Wholesale trade	237	243	255	282	309	336	366
44-45 Retail trade	627	640	667	737	807	877	955
48-49 Transportation and warehousing	250	259	274	303	332	361	393
51 Information	77	79	83	92	101	110	119
52 Finance and insurance	185	190	200	221	242	263	287
53 Real estate and rental and leasing	70	74	80	89	97	106	115
54 Professional and technical services	114	125	142	157	172	187	204
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	105	113	126	140	153	166	181
61 Educational services	637	667	719	795	871	947	1,031
62 Health care and social assistance	442	470	519	573	628	683	743
71 Arts, entertainment, and recreation	48	53	62	68	75	81	88
72 Accommodation and food services	394	417	455	503	551	599	652
81 Other services, except public administration	177	183	195	215	236	256	279
92 Public Administration	227	236	251	278	304	331	360
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,219	1,255	1,324	1,463	1,603	1,742	1,897
Public-Supply Residential Including System Losses (AFY)	1,620	1,672	1,869	2,066	2,263	2,459	2,678
Self-Supply Residential (AFY)	536	553	618	683	748	813	885
Projection of Irrigated Lands (in Acres)	5,527	5,611	5,891	6,170	6,450	6,664	7,009
Crop Irrigation (AFY)	7,808	7,926	8,321	8,716	9,111	9,415	9,902
Livestock (AFY)	2,193	2,198	2,215	2,231	2,248	2,265	2,282
Oil and Gas Drilling (AFY)	153	217	316	436	577	739	921
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	13,528	13,821	14,663	15,597	16,550	17,433	18,564

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Kiowa	2007	2010	2020	2030	2040	2050	2060
Population, Total	9,456	9,399	9,399	9,494	9,589	9,779	9,969
Public-Supplied Population	9,456	9,399	9,399	9,494	9,589	9,779	9,969
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	2,429	2,540	2,706	2,733	2,760	2,815	2,870
11 Agriculture, forestry, fishing and hunting	29	29	30	30	30	31	31
21 Mining, quarrying, and oil and gas extraction	151	156	163	164	166	169	172
22 Utilities	37	38	39	40	40	41	42
23 Construction	68	73	79	80	81	82	84
31-33 Manufacturing	76	75	72	73	74	75	77
42 Wholesale trade	100	103	107	108	109	111	113
44-45 Retail trade	247	252	260	263	265	270	276
48-49 Transportation and warehousing	75	78	81	82	83	85	86
51 Information	28	29	30	30	30	31	32
52 Finance and insurance	88	90	94	95	96	98	100
53 Real estate and rental and leasing	8	8	9	9	9	9	10
54 Professional and technical services	47	51	58	59	59	60	62
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	13	14	16	16	16	16	17
61 Educational services	201	211	225	227	229	234	238
62 Health care and social assistance	765	815	889	898	907	925	943
71 Arts, entertainment, and recreation	42	47	54	54	55	56	57
72 Accommodation and food services	94	100	108	109	110	112	114
81 Other services, except public administration	120	124	131	132	133	136	139
92 Public Administration	239	248	262	264	267	272	278
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	408	426	454	459	463	472	481
Public-Supply Residential Including System Losses (AFY)	825	820	820	829	837	853	870
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	2,615	2,637	2,709	2,782	2,854	2,910	2,999
Crop Irrigation (AFY)	4,525	4,563	4,688	4,813	4,939	5,035	5,190
Livestock (AFY)	1,080	1,082	1,092	1,101	1,110	1,119	1,129
Oil and Gas Drilling (AFY)	39	55	75	99	125	155	188
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	6,877	6,946	7,129	7,300	7,474	7,635	7,857

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Latimer	2007	2010	2020	2030	2040	2050	2060
Population, Total	10,508	10,624	11,107	11,686	12,362	13,038	13,811
Public-Supplied Population	9,188	9,289	9,712	10,218	10,809	11,401	12,076
Self-Supplied Population	1,320	1,335	1,395	1,468	1,553	1,638	1,735
Employment, Total	3,870	4,058	4,362	4,590	4,856	5,121	5,425
11 Agriculture, forestry, fishing and hunting	15	15	16	17	18	18	20
21 Mining, quarrying, and oil and gas extraction	285	294	308	324	343	362	383
22 Utilities	83	85	88	93	98	103	110
23 Construction	205	218	238	251	265	280	296
31-33 Manufacturing	136	134	130	137	145	153	162
42 Wholesale trade	82	84	88	92	98	103	109
44-45 Retail trade	248	254	263	276	292	308	327
48-49 Transportation and warehousing	31	32	34	36	38	40	42
51 Information	16	17	17	18	19	21	22
52 Finance and insurance	52	53	56	59	62	66	70
53 Real estate and rental and leasing	43	45	49	52	55	58	61
54 Professional and technical services	22	24	27	29	30	32	34
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	105	113	126	133	140	148	157
61 Educational services	690	723	776	816	863	910	964
62 Health care and social assistance	1,231	1,311	1,438	1,513	1,600	1,688	1,788
71 Arts, entertainment, and recreation	68	76	87	92	97	102	108
72 Accommodation and food services	156	165	179	188	199	210	223
81 Other services, except public administration	7	7	8	8	9	9	10
92 Public Administration	391	406	431	453	479	505	535
99 Unclassified	3	3	3	4	4	4	4
Public-Supply Nonresidential Including System Losses (AFY)	654	685	734	773	817	862	913
Public-Supply Residential Including System Losses (AFY)	1,558	1,576	1,647	1,733	1,833	1,934	2,048
Self-Supply Residential (AFY)	190	192	201	212	224	236	250
Projection of Irrigated Lands (in Acres)	439	533	847	1,161	1,474	1,715	2,102
Crop Irrigation (AFY)	698	848	1,347	1,846	2,346	2,729	3,344
Livestock (AFY)	570	571	576	580	584	588	593
Oil and Gas Drilling (AFY)	367	521	770	1,072	1,427	1,836	2,297
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	4,038	4,393	5,276	6,216	7,232	8,185	9,445

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Le Flore	2007	2010	2020	2030	2040	2050	2060
Population, Total	49,715	50,780	54,724	58,274	61,823	65,373	69,120
Public-Supplied Population	43,355	44,284	47,723	50,819	53,914	57,010	60,277
Self-Supplied Population	6,360	6,496	7,001	7,455	7,909	8,363	8,842
Employment, Total	12,767	13,211	13,977	14,883	15,790	16,697	17,654
11 Agriculture, forestry, fishing and hunting	116	118	121	129	137	145	153
21 Mining, quarrying, and oil and gas extraction	774	798	839	893	948	1,002	1,060
22 Utilities	115	118	122	130	138	146	155
23 Construction	441	469	514	548	581	614	649
31-33 Manufacturing	2,324	2,278	2,226	2,371	2,515	2,659	2,812
42 Wholesale trade	196	201	210	224	238	251	266
44-45 Retail trade	1,563	1,596	1,657	1,764	1,872	1,979	2,093
48-49 Transportation and warehousing	284	294	310	330	350	371	392
51 Information	71	73	76	81	86	91	97
52 Finance and insurance	364	374	393	418	444	469	496
53 Real estate and rental and leasing	47	50	54	57	61	64	68
54 Professional and technical services	258	282	321	342	362	383	405
55 Management of companies and enterprises	25	25	25	27	29	30	32
56 Administrative and waste services	570	614	685	730	774	819	865
61 Educational services	1,628	1,705	1,833	1,952	2,071	2,190	2,316
62 Health care and social assistance	2,259	2,406	2,645	2,816	2,988	3,159	3,340
71 Arts, entertainment, and recreation	35	39	45	47	50	53	56
72 Accommodation and food services	596	630	686	730	775	819	866
81 Other services, except public administration	195	202	214	228	242	256	270
92 Public Administration	904	939	998	1,063	1,127	1,192	1,260
99 Unclassified	2	2	2	2	2	2	3
Public-Supply Nonresidential Including System Losses (AFY)	2,087	2,151	2,263	2,410	2,557	2,704	2,859
Public-Supply Residential Including System Losses (AFY)	4,342	4,435	4,779	5,089	5,399	5,709	6,037
Self-Supply Residential (AFY)	541	553	596	635	673	712	753
Projection of Irrigated Lands (in Acres)	9,398	9,398	9,398	9,398	9,398	9,398	9,398
Crop Irrigation (AFY)	9,985	9,985	9,985	9,985	9,985	9,985	9,985
Livestock (AFY)	2,494	2,499	2,517	2,535	2,553	2,571	2,588
Oil and Gas Drilling (AFY)	634	969	2,009	3,386	5,100	7,151	9,538
Thermoelectric, Withdrawals (AFY)	5,695	5,885	6,565	7,324	8,171	9,116	10,170
Thermoelectric, Consumptive Use (AFY)	3,527	3,645	4,066	4,536	5,061	5,646	6,299
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	25,779	26,477	28,716	31,365	34,439	37,947	41,929

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Lincoln	2007	2010	2020	2030	2040	2050	2060
Population, Total	32,272	33,073	36,027	38,505	41,079	43,747	46,607
Public-Supplied Population	14,622	14,985	16,323	17,446	18,612	19,821	21,117
Self-Supplied Population	17,650	18,088	19,704	21,059	22,466	23,926	25,490
Employment, Total	7,085	7,390	7,911	8,455	9,020	9,606	10,234
11 Agriculture, forestry, fishing and hunting	8	8	8	9	10	10	11
21 Mining, quarrying, and oil and gas extraction	91	94	99	106	113	120	128
22 Utilities	14	14	15	16	17	18	19
23 Construction	514	547	600	642	684	729	777
31-33 Manufacturing	566	555	543	580	619	659	702
42 Wholesale trade	143	147	154	165	176	187	199
44-45 Retail trade	632	645	670	717	764	814	867
48-49 Transportation and warehousing	440	455	481	515	549	585	623
51 Information	35	36	37	40	43	45	48
52 Finance and insurance	513	528	554	592	631	672	716
53 Real estate and rental and leasing	51	54	58	62	67	71	76
54 Professional and technical services	137	150	171	182	195	207	221
55 Management of companies and enterprises	9	9	9	10	10	11	12
56 Administrative and waste services	118	127	142	152	162	172	183
61 Educational services	782	819	881	942	1,005	1,070	1,140
62 Health care and social assistance	1,562	1,663	1,830	1,956	2,086	2,222	2,367
71 Arts, entertainment, and recreation	49	54	63	67	72	76	81
72 Accommodation and food services	581	614	669	715	763	812	866
81 Other services, except public administration	101	105	111	119	126	135	143
92 Public Administration	734	763	811	867	925	985	1,050
99 Unclassified	4	4	4	4	4	4	5
Public-Supply Nonresidential Including System Losses (AFY)	976	1,018	1,089	1,164	1,241	1,322	1,408
Public-Supply Residential Including System Losses (AFY)	1,325	1,358	1,479	1,581	1,687	1,797	1,914
Self-Supply Residential (AFY)	1,360	1,393	1,518	1,622	1,731	1,843	1,964
Projection of Irrigated Lands (in Acres)	2,191	2,191	2,191	2,191	2,191	2,191	2,191
Crop Irrigation (AFY)	3,575	3,575	3,575	3,575	3,575	3,575	3,575
Livestock (AFY)	1,117	1,118	1,119	1,121	1,122	1,124	1,125
Oil and Gas Drilling (AFY)	331	491	904	1,442	2,103	2,888	3,797
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	8,684	8,953	9,685	10,505	11,459	12,549	13,783

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals

Logan	2007	2010	2020	2030	2040	2050	2060
Population, Total	36,435	37,843	42,537	46,742	50,946	55,053	59,454
Public-Supplied Population	25,175	26,148	29,391	32,296	35,202	38,040	41,080
Self-Supplied Population	11,260	11,695	13,146	14,445	15,745	17,014	18,374
Employment, Total	6,690	7,013	7,581	8,331	9,080	9,812	10,596
11 Agriculture, forestry, fishing and hunting	119	121	125	137	149	161	174
21 Mining, quarrying, and oil and gas extraction	102	105	111	122	133	144	155
22 Utilities	44	45	47	51	56	60	65
23 Construction	506	538	593	652	710	768	829
31-33 Manufacturing	309	303	297	327	356	385	415
42 Wholesale trade	139	143	150	165	179	194	209
44-45 Retail trade	809	826	861	946	1,031	1,114	1,203
48-49 Transportation and warehousing	397	411	436	479	522	564	609
51 Information	36	37	39	43	47	51	55
52 Finance and insurance	227	233	246	270	294	318	344
53 Real estate and rental and leasing	68	72	78	86	94	101	109
54 Professional and technical services	439	481	549	603	657	710	767
55 Management of companies and enterprises	26	25	25	28	31	33	36
56 Administrative and waste services	317	341	382	420	458	495	534
61 Educational services	651	682	736	809	881	952	1,029
62 Health care and social assistance	1,176	1,253	1,382	1,519	1,656	1,789	1,932
71 Arts, entertainment, and recreation	188	209	242	266	290	313	338
72 Accommodation and food services	525	555	607	666	726	785	848
81 Other services, except public administration	137	142	151	166	181	195	211
92 Public Administration	472	490	523	575	626	677	731
99 Unclassified	2	2	2	2	2	3	3
Public-Supply Nonresidential Including System Losses (AFY)	955	1,005	1,091	1,199	1,306	1,412	1,525
Public-Supply Residential Including System Losses (AFY)	3,651	3,792	4,263	4,684	5,106	5,517	5,958
Self-Supply Residential (AFY)	1,388	1,442	1,621	1,781	1,941	2,097	2,265
Projection of Irrigated Lands (in Acres)	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Crop Irrigation (AFY)	1,991	1,991	1,991	1,991	1,991	1,991	1,991
Livestock (AFY)	728	742	789	837	884	931	978
Oil and Gas Drilling (AFY)	269	396	694	1,078	1,548	2,103	2,744
Thermoelectric, Withdrawals (AFY)	242	250	279	312	348	388	433
Thermoelectric, Consumptive Use (AFY)	150	155	173	193	215	240	268
Self-Supply Large Industry (AFY)	1,200	1,176	1,154	1,268	1,382	1,493	1,612
Total Water Demand, All Sectors (AFY)*	10,425	10,794	11,882	13,149	14,505	15,932	17,506

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Love	2007	2010	2020	2030	2040	2050	2060
Population, Total	9,112	9,606	25,223	26,778	28,425	30,163	31,901
Public-Supplied Population	8,802	9,279	24,365	25,867	27,458	29,137	30,816
Self-Supplied Population	310	327	858	911	967	1,026	1,085
Employment, Total	3,370	3,531	9,875	10,484	11,129	11,809	12,490
11 Agriculture, forestry, fishing and hunting	56	57	66	70	75	79	84
21 Mining, quarrying, and oil and gas extraction	106	110	130	138	146	155	164
22 Utilities	98	100	117	124	132	140	148
23 Construction	273	290	358	380	404	428	453
31-33 Manufacturing	254	249	274	291	309	328	347
42 Wholesale trade	140	144	169	180	191	202	214
44-45 Retail trade	150	153	779	827	877	931	985
48-49 Transportation and warehousing	58	60	71	76	80	85	90
51 Information	36	37	44	47	49	52	55
52 Finance and insurance	40	41	49	52	55	58	61
53 Real estate and rental and leasing	55	58	71	75	80	85	89
54 Professional and technical services	23	25	32	34	36	38	41
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	8	9	11	11	12	13	14
61 Educational services	387	405	490	520	552	586	620
62 Health care and social assistance	1,094	1,165	1,440	1,529	1,623	1,722	1,822
71 Arts, entertainment, and recreation	127	141	2,183	2,318	2,461	2,611	2,762
72 Accommodation and food services	291	307	3,376	3,585	3,805	4,038	4,271
81 Other services, except public administration	25	26	31	33	35	37	39
92 Public Administration	148	154	184	195	207	220	232
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	548	576	2,648	2,811	2,984	3,166	3,349
Public-Supply Residential Including System Losses (AFY)	900	948	2,490	2,643	2,806	2,978	3,149
Self-Supply Residential (AFY)	27	28	75	79	84	89	94
Projection of Irrigated Lands (in Acres)	1,838	1,940	2,280	2,619	2,959	3,219	3,638
Crop Irrigation (AFY)	2,593	2,737	3,216	3,695	4,174	4,542	5,133
Livestock (AFY)	655	655	655	655	655	655	655
Oil and Gas Drilling (AFY)	30	43	58	77	97	120	146
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	4,753	4,987	9,142	9,961	10,801	11,551	12,526

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Major	2007	2010	2020	2030	2040	2050	2060
Population, Total	7,190	7,132	7,229	7,229	7,325	7,421	7,518
Public-Supplied Population	5,100	5,059	5,127	5,127	5,196	5,264	5,332
Self-Supplied Population	2,090	2,073	2,101	2,101	2,129	2,157	2,185
Employment, Total	2,260	2,352	2,491	2,491	2,524	2,557	2,590
11 Agriculture, forestry, fishing and hunting	58	59	60	60	61	62	63
21 Mining, quarrying, and oil and gas extraction	283	291	304	304	308	312	316
22 Utilities	40	41	43	43	43	44	44
23 Construction	148	157	171	171	173	176	178
31-33 Manufacturing	104	102	99	99	100	102	103
42 Wholesale trade	118	121	126	126	127	129	131
44-45 Retail trade	280	286	295	295	299	303	306
48-49 Transportation and warehousing	106	110	115	115	116	118	120
51 Information	10	10	11	11	11	11	11
52 Finance and insurance	88	90	94	94	96	97	98
53 Real estate and rental and leasing	11	12	12	12	13	13	13
54 Professional and technical services	62	68	77	77	78	79	80
55 Management of companies and enterprises	19	19	18	18	19	19	19
56 Administrative and waste services	143	154	171	171	173	176	178
61 Educational services	190	199	213	213	215	218	221
62 Health care and social assistance	302	321	351	351	355	360	365
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	113	119	129	129	131	133	134
81 Other services, except public administration	30	31	33	33	33	34	34
92 Public Administration	151	157	165	165	168	170	172
99 Unclassified	4	4	4	4	4	4	4
Public-Supply Nonresidential Including System Losses (AFY)	394	408	430	430	436	441	447
Public-Supply Residential Including System Losses (AFY)	580	576	584	584	591	599	607
Self-Supply Residential (AFY)	208	206	209	209	212	215	217
Projection of Irrigated Lands (in Acres)	8,169	8,177	8,205	8,233	8,261	8,282	8,316
Crop Irrigation (AFY)	13,020	13,033	13,078	13,122	13,166	13,200	13,254
Livestock (AFY)	1,937	1,944	1,967	1,990	2,013	2,036	2,060
Oil and Gas Drilling (AFY)	451	635	889	1,187	1,531	1,918	2,351
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	16,591	16,802	17,156	17,522	17,949	18,410	18,936

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Marshall	2007	2010	2020	2030	2040	2050	2060
Population, Total	14,830	15,903	19,573	23,337	27,195	31,241	35,475
Public-Supplied Population	14,180	15,206	18,715	22,314	26,003	29,872	33,920
Self-Supplied Population	650	697	858	1,023	1,192	1,369	1,555
Employment, Total	4,308	4,426	7,490	8,930	10,406	11,954	13,575
11 Agriculture, forestry, fishing and hunting	8	8	8	10	11	13	15
21 Mining, quarrying, and oil and gas extraction	43	45	47	57	66	76	86
22 Utilities	27	27	29	34	40	46	52
23 Construction	53	56	62	74	87	100	113
31-33 Manufacturing	1,303	1,277	1,262	1,505	1,754	2,015	2,288
42 Wholesale trade	284	292	308	368	429	492	559
44-45 Retail trade	430	439	761	908	1,058	1,215	1,380
48-49 Transportation and warehousing	65	67	72	85	100	114	130
51 Information	8	8	9	11	12	14	16
52 Finance and insurance	194	200	212	252	294	338	384
53 Real estate and rental and leasing	40	42	46	55	64	74	84
54 Professional and technical services	59	65	74	89	103	119	135
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	45	48	54	65	75	87	98
61 Educational services	175	183	199	237	277	318	361
62 Health care and social assistance	802	854	950	1,132	1,319	1,516	1,721
71 Arts, entertainment, and recreation	109	121	1,141	1,360	1,585	1,821	2,068
72 Accommodation and food services	291	308	1,839	2,192	2,555	2,935	3,333
81 Other services, except public administration	31	32	34	40	47	54	61
92 Public Administration	342	355	382	455	530	609	692
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	679	698	1,715	2,044	2,382	2,737	3,108
Public-Supply Residential Including System Losses (AFY)	1,454	1,559	1,919	2,288	2,666	3,063	3,478
Self-Supply Residential (AFY)	57	61	75	89	104	119	136
Projection of Irrigated Lands (in Acres)	2,254	2,276	2,348	2,421	2,493	2,549	2,638
Crop Irrigation (AFY)	4,611	4,655	4,804	4,952	5,100	5,214	5,397
Livestock (AFY)	307	312	328	344	359	375	391
Oil and Gas Drilling (AFY)	299	434	836	594	452	257	8
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	7,406	7,719	9,676	10,312	11,064	11,765	12,518

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Mayes	2007	2010	2020	2030	2040	2050	2060
Population, Total	39,627	40,790	44,859	48,734	52,804	56,970	61,233
Public-Supplied Population	39,627	40,790	44,859	48,734	52,804	56,970	61,233
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	11,189	11,545	12,189	13,242	14,348	15,480	16,638
11 Agriculture, forestry, fishing and hunting	29	29	30	32	35	38	41
21 Mining, quarrying, and oil and gas extraction	54	55	58	63	69	74	80
22 Utilities	352	360	375	407	441	476	512
23 Construction	659	700	770	836	906	977	1,051
31-33 Manufacturing	2,793	2,738	2,680	2,912	3,155	3,404	3,659
42 Wholesale trade	257	264	277	300	325	351	377
44-45 Retail trade	1,487	1,518	1,579	1,716	1,859	2,006	2,156
48-49 Transportation and warehousing	233	241	255	278	301	324	349
51 Information	96	99	104	113	122	132	142
52 Finance and insurance	280	288	303	329	356	384	413
53 Real estate and rental and leasing	55	58	63	68	74	80	86
54 Professional and technical services	628	687	783	850	921	994	1,068
55 Management of companies and enterprises	21	21	21	23	25	27	29
56 Administrative and waste services	543	585	654	711	770	831	893
61 Educational services	997	1,044	1,125	1,223	1,325	1,429	1,536
62 Health care and social assistance	862	918	1,011	1,098	1,190	1,283	1,379
71 Arts, entertainment, and recreation	107	118	137	149	161	174	187
72 Accommodation and food services	972	1,027	1,121	1,217	1,319	1,423	1,530
81 Other services, except public administration	208	215	229	248	269	290	312
92 Public Administration	551	572	609	662	717	773	831
99 Unclassified	6	6	6	7	7	8	8
Public-Supply Nonresidential Including System Losses (AFY)	1,590	1,636	1,720	1,868	2,024	2,184	2,347
Public-Supply Residential Including System Losses (AFY)	3,788	3,899	4,288	4,658	5,047	5,445	5,853
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	791	813	886	960	1,033	1,090	1,180
Crop Irrigation (AFY)	1,163	1,196	1,303	1,411	1,519	1,602	1,735
Livestock (AFY)	1,488	1,491	1,500	1,510	1,519	1,529	1,538
Oil and Gas Drilling (AFY)	18	25	34	45	57	71	86
Thermoelectric, Withdrawals (AFY)	4,346	4,491	5,010	5,589	6,236	6,956	7,761
Thermoelectric, Consumptive Use (AFY)	2,692	2,782	3,103	3,462	3,862	4,309	4,807
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	12,392	12,736	13,855	15,082	16,402	17,787	19,319

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



McClain	2007	2010	2020	2030	2040	2050	2060
Population, Total	31,849	33,434	39,024	44,206	49,389	54,775	60,263
Public-Supplied Population	24,419	25,634	29,920	33,894	37,867	41,997	46,204
Self-Supplied Population	7,430	7,800	9,104	10,313	11,522	12,778	14,059
Employment, Total	7,228	7,554	8,157	9,240	10,323	11,449	12,596
11 Agriculture, forestry, fishing and hunting	77	78	81	92	102	114	125
21 Mining, quarrying, and oil and gas extraction	365	376	398	451	504	559	615
22 Utilities	25	26	27	30	34	38	41
23 Construction	993	1,056	1,166	1,321	1,476	1,637	1,801
31-33 Manufacturing	260	255	251	284	317	352	387
42 Wholesale trade	127	130	137	155	173	192	211
44-45 Retail trade	1,350	1,378	1,441	1,632	1,824	2,023	2,225
48-49 Transportation and warehousing	171	177	188	213	238	264	290
51 Information	114	117	124	140	156	174	191
52 Finance and insurance	311	320	338	383	428	474	522
53 Real estate and rental and leasing	37	39	43	48	54	60	66
54 Professional and technical services	220	241	276	312	349	387	426
55 Management of companies and enterprises	8	8	8	9	10	11	12
56 Administrative and waste services	207	223	251	284	317	352	387
61 Educational services	431	452	489	554	619	687	756
62 Health care and social assistance	1,226	1,306	1,445	1,637	1,829	2,029	2,232
71 Arts, entertainment, and recreation	55	61	71	81	90	100	110
72 Accommodation and food services	721	762	835	946	1,057	1,173	1,290
81 Other services, except public administration	126	130	139	158	176	195	215
92 Public Administration	403	418	448	507	567	629	692
99 Unclassified	1	1	1	1	1	1	2
Public-Supply Nonresidential Including System Losses (AFY)	1,072	1,119	1,208	1,368	1,528	1,695	1,865
Public-Supply Residential Including System Losses (AFY)	2,925	3,071	3,584	4,060	4,536	5,031	5,535
Self-Supply Residential (AFY)	757	794	927	1,050	1,173	1,301	1,432
Projection of Irrigated Lands (in Acres)	1,674	1,683	1,713	1,742	1,772	1,794	1,831
Crop Irrigation (AFY)	2,853	2,868	2,918	2,969	3,019	3,058	3,120
Livestock (AFY)	910	912	919	926	933	940	947
Oil and Gas Drilling (AFY)	129	183	270	376	501	644	806
Thermoelectric, Withdrawals (AFY)	6,329	6,540	7,296	8,139	9,080	10,130	11,301
Thermoelectric, Consumptive Use (AFY)	3,920	4,051	4,519	5,041	5,624	6,274	7,000
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	14,974	15,487	17,122	18,889	20,771	22,799	25,006

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



McCurtain	2007	2010	2020	2030	2040	2050	2060
Population, Total	33,539	33,939	35,465	36,704	37,753	38,897	39,946
Public-Supplied Population	26,049	26,360	27,545	28,507	29,322	30,210	31,025
Self-Supplied Population	7,490	7,579	7,920	8,197	8,431	8,687	8,921
Employment, Total	10,216	10,618	11,268	11,662	11,995	12,359	12,692
11 Agriculture, forestry, fishing and hunting	262	266	273	282	291	299	307
21 Mining, quarrying, and oil and gas extraction	32	33	34	36	37	38	39
22 Utilities	110	112	117	121	124	128	131
23 Construction	1,129	1,200	1,313	1,359	1,398	1,440	1,479
31-33 Manufacturing	1,485	1,456	1,418	1,468	1,510	1,556	1,598
42 Wholesale trade	179	184	192	198	204	210	216
44-45 Retail trade	1,069	1,091	1,130	1,169	1,203	1,239	1,273
48-49 Transportation and warehousing	481	497	524	542	558	575	590
51 Information	142	146	153	158	163	167	172
52 Finance and insurance	236	243	254	263	270	278	286
53 Real estate and rental and leasing	76	80	87	90	92	95	98
54 Professional and technical services	417	456	517	535	551	567	583
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	339	365	406	420	432	445	457
61 Educational services	1,545	1,618	1,735	1,796	1,847	1,903	1,954
62 Health care and social assistance	1,239	1,320	1,446	1,497	1,540	1,586	1,629
71 Arts, entertainment, and recreation	136	151	173	179	185	190	195
72 Accommodation and food services	508	537	583	603	621	639	657
81 Other services, except public administration	209	216	229	237	243	251	258
92 Public Administration	622	646	685	709	729	751	771
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,385	1,437	1,523	1,576	1,621	1,670	1,715
Public-Supply Residential Including System Losses (AFY)	2,841	2,875	3,004	3,109	3,198	3,295	3,384
Self-Supply Residential (AFY)	694	703	734	760	782	805	827
Projection of Irrigated Lands (in Acres)	421	500	762	1,025	1,287	1,489	1,812
Crop Irrigation (AFY)	721	856	1,306	1,756	2,205	2,550	3,105
Livestock (AFY)	2,035	2,055	2,123	2,191	2,259	2,327	2,395
Oil and Gas Drilling (AFY)	0	0	1	1	1	1	1
Thermoelectric, Withdrawals (AFY)	956	988	1,103	1,230	1,372	1,531	1,708
Thermoelectric, Consumptive Use (AFY)	592	612	683	762	850	948	1,058
Self-Supply Large Industry (AFY)	1,743	1,709	1,665	1,723	1,772	1,826	1,875
Total Water Demand, All Sectors (AFY)*	10,376	10,624	11,458	12,345	13,210	14,005	15,010

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



McIntosh	2007	2010	2020	2030	2040	2050	2060
Population, Total	19,709	20,385	22,828	25,364	28,183	31,377	34,758
Public-Supplied Population	19,709	20,385	22,828	25,364	28,183	31,377	34,758
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	4,258	4,442	4,768	5,298	5,886	6,553	7,260
11 Agriculture, forestry, fishing and hunting	13	13	14	15	17	19	21
21 Mining, quarrying, and oil and gas extraction	30	31	33	36	40	45	50
22 Utilities	66	68	71	79	87	97	108
23 Construction	111	118	130	145	161	179	198
31-33 Manufacturing	274	269	263	293	325	362	401
42 Wholesale trade	48	49	52	58	64	71	79
44-45 Retail trade	883	901	939	1,044	1,160	1,291	1,430
48-49 Transportation and warehousing	184	190	202	224	249	277	307
51 Information	26	27	28	31	35	39	43
52 Finance and insurance	139	143	150	167	186	207	229
53 Real estate and rental and leasing	21	22	24	27	30	33	37
54 Professional and technical services	131	143	164	182	202	225	249
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	34	37	41	46	51	56	62
61 Educational services	477	500	539	599	666	741	821
62 Health care and social assistance	806	858	947	1,052	1,169	1,301	1,442
71 Arts, entertainment, and recreation	154	171	198	220	244	272	301
72 Accommodation and food services	445	470	514	571	634	706	782
81 Other services, except public administration	76	79	84	93	103	115	127
92 Public Administration	339	352	376	418	464	517	572
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	624	656	711	790	878	978	1,083
Public-Supply Residential Including System Losses (AFY)	1,768	1,829	2,048	2,276	2,529	2,815	3,119
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	572	572	574	575	576	577	579
Crop Irrigation (AFY)	682	682	684	685	687	688	690
Livestock (AFY)	669	674	694	713	733	753	772
Oil and Gas Drilling (AFY)	400	609	1,242	2,079	3,120	4,363	5,810
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	4,143	4,450	5,380	6,544	7,946	9,597	11,474

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Murray	2007	2010	2020	2030	2040	2050	2060
Population, Total	12,695	13,035	14,169	15,491	16,719	18,136	19,553
Public-Supplied Population	12,695	13,035	14,169	15,491	16,719	18,136	19,553
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	5,089	5,337	5,754	6,291	6,789	7,365	7,940
11 Agriculture, forestry, fishing and hunting	102	103	107	117	126	136	147
21 Mining, quarrying, and oil and gas extraction	213	219	231	253	273	296	319
22 Utilities	72	74	77	84	90	98	106
23 Construction	185	196	216	236	254	276	298
31-33 Manufacturing	146	143	140	153	165	179	193
42 Wholesale trade	145	149	156	170	184	199	215
44-45 Retail trade	572	584	607	663	716	776	837
48-49 Transportation and warehousing	155	161	170	186	200	217	234
51 Information	62	64	67	74	79	86	93
52 Finance and insurance	119	122	128	140	152	164	177
53 Real estate and rental and leasing	25	26	29	31	34	37	39
54 Professional and technical services	164	180	205	224	242	262	283
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	57	62	69	75	81	88	95
61 Educational services	284	298	320	350	378	410	442
62 Health care and social assistance	1,931	2,056	2,262	2,473	2,669	2,896	3,122
71 Arts, entertainment, and recreation	80	89	102	112	121	131	141
72 Accommodation and food services	264	279	304	333	359	389	420
81 Other services, except public administration	71	74	78	85	92	100	108
92 Public Administration	437	454	483	528	570	618	666
99 Unclassified	4	4	4	4	4	5	5
Public-Supply Nonresidential Including System Losses (AFY)	742	779	840	918	991	1,075	1,159
Public-Supply Residential Including System Losses (AFY)	1,883	1,933	2,102	2,298	2,480	2,690	2,900
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	0	36	156	276	397	489	637
Crop Irrigation (AFY)	0	43	188	332	476	587	765
Livestock (AFY)	392	401	431	461	491	521	552
Oil and Gas Drilling (AFY)	26	36	49	65	82	102	123
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	3,043	3,192	3,609	4,074	4,521	4,975	5,499

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Muskogee	2007	2010	2020	2030	2040	2050	2060
Population, Total	71,116	71,662	74,088	76,311	78,232	80,152	82,072
Public-Supplied Population	64,266	64,759	66,951	68,961	70,696	72,432	74,167
Self-Supplied Population	6,850	6,903	7,136	7,350	7,535	7,720	7,905
Employment, Total	28,350	29,508	31,349	32,289	33,102	33,915	34,727
11 Agriculture, forestry, fishing and hunting	151	153	157	162	166	170	174
21 Mining, quarrying, and oil and gas extraction	51	53	55	57	58	60	61
22 Utilities	433	443	459	473	484	496	508
23 Construction	1,451	1,542	1,686	1,736	1,780	1,824	1,867
31-33 Manufacturing	3,675	3,603	3,506	3,612	3,703	3,793	3,884
42 Wholesale trade	570	585	610	628	644	660	675
44-45 Retail trade	3,675	3,752	3,880	3,997	4,097	4,198	4,298
48-49 Transportation and warehousing	934	965	1,016	1,046	1,072	1,099	1,125
51 Information	370	380	397	409	419	429	440
52 Finance and insurance	681	700	732	754	773	792	811
53 Real estate and rental and leasing	203	214	231	238	244	250	256
54 Professional and technical services	558	611	692	712	730	748	766
55 Management of companies and enterprises	17	17	17	17	18	18	19
56 Administrative and waste services	2,082	2,243	2,492	2,567	2,632	2,696	2,761
61 Educational services	3,419	3,581	3,836	3,951	4,050	4,150	4,249
62 Health care and social assistance	4,674	4,977	5,449	5,613	5,754	5,895	6,037
71 Arts, entertainment, and recreation	522	578	665	685	703	720	737
72 Accommodation and food services	2,168	2,292	2,485	2,560	2,624	2,688	2,753
81 Other services, except public administration	477	494	521	537	550	564	577
92 Public Administration	2,235	2,321	2,457	2,531	2,595	2,659	2,722
99 Unclassified	5	5	5	5	5	5	6
Public-Supply Nonresidential Including System Losses (AFY)	3,454	3,598	3,826	3,941	4,040	4,139	4,239
Public-Supply Residential Including System Losses (AFY)	6,483	6,533	6,754	6,957	7,132	7,307	7,482
Self-Supply Residential (AFY)	658	663	686	706	724	742	759
Projection of Irrigated Lands (in Acres)	8,154	8,154	8,154	8,154	8,154	8,154	8,154
Crop Irrigation (AFY)	8,882	8,882	8,882	8,882	8,882	8,882	8,882
Livestock (AFY)	1,137	1,139	1,146	1,152	1,159	1,166	1,172
Oil and Gas Drilling (AFY)	55	82	151	242	354	487	640
Thermoelectric, Withdrawals (AFY)	100,057	103,395	115,348	128,683	143,560	160,157	178,672
Thermoelectric, Consumptive Use (AFY)	61,970	64,038	71,441	79,701	88,915	99,194	110,661
Self-Supply Large Industry (AFY)	15,465	15,184	14,812	15,256	15,640	16,024	16,408
Total Water Demand, All Sectors (AFY)*	136,191	139,476	151,605	165,820	181,491	198,903	218,254

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Noble	2007	2010	2020	2030	2040	2050	2060
Population, Total	11,124	11,293	11,858	12,235	12,611	12,893	13,176
Public-Supplied Population	9,604	9,750	10,238	10,563	10,888	11,132	11,375
Self-Supplied Population	1,520	1,543	1,620	1,672	1,723	1,762	1,800
Employment, Total	4,290	4,469	4,760	4,911	5,063	5,176	5,289
11 Agriculture, forestry, fishing and hunting	12	12	12	12	13	13	13
21 Mining, quarrying, and oil and gas extraction	175	181	189	195	201	206	211
22 Utilities	181	185	192	198	205	209	214
23 Construction	300	319	349	360	371	379	388
31-33 Manufacturing	503	493	480	496	511	522	534
42 Wholesale trade	106	109	114	117	121	123	126
44-45 Retail trade	295	301	312	322	332	339	347
48-49 Transportation and warehousing	174	180	190	196	202	206	211
51 Information	25	26	27	28	29	30	30
52 Finance and insurance	141	145	152	157	161	165	169
53 Real estate and rental and leasing	19	20	22	22	23	24	24
54 Professional and technical services	217	238	270	278	287	293	300
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	100	108	120	124	127	130	133
61 Educational services	530	555	596	615	634	648	662
62 Health care and social assistance	445	474	520	536	553	565	578
71 Arts, entertainment, and recreation	140	155	179	184	190	194	198
72 Accommodation and food services	383	405	440	454	468	478	489
81 Other services, except public administration	54	56	59	61	63	64	66
92 Public Administration	488	506	537	554	571	584	597
99 Unclassified	1	1	1	1	1	1	1
Public-Supply Nonresidential Including System Losses (AFY)	704	735	785	810	835	854	872
Public-Supply Residential Including System Losses (AFY)	914	928	974	1,005	1,036	1,059	1,082
Self-Supply Residential (AFY)	126	128	134	138	143	146	149
Projection of Irrigated Lands (in Acres)	833	833	833	833	833	833	833
Crop Irrigation (AFY)	1,223	1,223	1,223	1,223	1,223	1,223	1,223
Livestock (AFY)	874	874	876	879	881	883	885
Oil and Gas Drilling (AFY)	271	384	551	752	986	1,252	1,552
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	4,111	4,270	4,544	4,807	5,102	5,416	5,763

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Nowata	2007	2010	2020	2030	2040	2050	2060
Population, Total	10,723	11,170	12,752	14,335	15,917	17,592	19,361
Public-Supplied Population	10,033	10,451	11,932	13,412	14,893	16,460	18,115
Self-Supplied Population	690	719	821	922	1,024	1,132	1,246
Employment, Total	1,788	1,852	1,974	2,219	2,464	2,723	2,997
11 Agriculture, forestry, fishing and hunting	14	14	15	17	18	20	22
21 Mining, quarrying, and oil and gas extraction	12	12	13	15	16	18	20
22 Utilities	42	43	45	51	57	63	69
23 Construction	130	138	152	171	190	210	231
31-33 Manufacturing	288	282	278	312	346	383	421
42 Wholesale trade	110	113	119	134	148	164	180
44-45 Retail trade	154	157	164	185	205	227	249
48-49 Transportation and warehousing	66	68	72	81	90	100	110
51 Information	11	11	11	13	14	16	17
52 Finance and insurance	71	73	77	87	96	106	117
53 Real estate and rental and leasing	21	22	24	27	30	33	37
54 Professional and technical services	26	28	33	37	41	45	49
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	25	27	30	34	38	42	46
61 Educational services	298	312	338	380	421	466	513
62 Health care and social assistance	273	291	321	361	401	443	488
71 Arts, entertainment, and recreation	15	16	19	21	24	26	29
72 Accommodation and food services	81	85	94	105	117	129	142
81 Other services, except public administration	25	26	28	31	35	38	42
92 Public Administration	127	132	141	159	176	195	214
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	242	250	266	299	333	368	405
Public-Supply Residential Including System Losses (AFY)	832	867	990	1,113	1,236	1,366	1,503
Self-Supply Residential (AFY)	49	51	58	65	72	80	88
Projection of Irrigated Lands (in Acres)	131	165	276	388	500	585	723
Crop Irrigation (AFY)	208	261	438	616	793	929	1,148
Livestock (AFY)	1,109	1,109	1,108	1,107	1,106	1,105	1,104
Oil and Gas Drilling (AFY)	283	397	543	712	904	1,118	1,356
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	2,723	2,935	3,403	3,912	4,443	4,966	5,603

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Okfuskee	2007	2010	2020	2030	2040	2050	2060
Population, Total	11,248	11,305	11,590	11,875	12,160	12,445	12,825
Public-Supplied Population	10,148	10,199	10,457	10,714	10,971	11,228	11,571
Self-Supplied Population	1,100	1,106	1,133	1,161	1,189	1,217	1,254
Employment, Total	2,282	2,384	2,545	2,608	2,670	2,733	2,816
11 Agriculture, forestry, fishing and hunting	46	47	48	49	50	51	53
21 Mining, quarrying, and oil and gas extraction	70	72	76	77	79	81	84
22 Utilities	30	31	32	33	33	34	35
23 Construction	69	73	80	82	84	86	88
31-33 Manufacturing	90	88	86	88	90	92	95
42 Wholesale trade	45	46	48	49	51	52	53
44-45 Retail trade	222	227	234	240	246	252	259
48-49 Transportation and warehousing	36	37	39	40	41	42	43
51 Information	11	12	12	12	13	13	13
52 Finance and insurance	80	82	86	88	90	92	95
53 Real estate and rental and leasing	12	13	14	14	14	15	15
54 Professional and technical services	40	44	50	51	53	54	56
55 Management of companies and enterprises	12	12	12	12	12	13	13
56 Administrative and waste services	24	26	29	29	30	31	32
61 Educational services	420	440	471	483	494	506	521
62 Health care and social assistance	485	516	565	579	593	607	625
71 Arts, entertainment, and recreation	63	70	81	83	85	87	89
72 Accommodation and food services	87	92	99	102	104	107	110
81 Other services, except public administration	21	22	23	23	24	25	25
92 Public Administration	419	435	461	472	483	495	510
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	357	374	401	411	421	431	444
Public-Supply Residential Including System Losses (AFY)	1,028	1,034	1,060	1,086	1,112	1,138	1,173
Self-Supply Residential (AFY)	95	95	98	100	102	105	108
Projection of Irrigated Lands (in Acres)	1,282	1,322	1,455	1,588	1,721	1,823	1,987
Crop Irrigation (AFY)	1,830	1,887	2,077	2,267	2,457	2,602	2,836
Livestock (AFY)	726	728	736	744	752	760	768
Oil and Gas Drilling (AFY)	174	252	411	612	854	1,138	1,464
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	4,210	4,370	4,782	5,219	5,698	6,174	6,792

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Oklahoma	2007	2010	2020	2030	2040	2050	2060
Population, Total	701,807	713,774	748,374	779,107	802,309	819,202	835,892
Public-Supplied Population	687,767	699,495	733,403	763,521	786,259	802,814	819,169
Self-Supplied Population	14,040	14,279	14,972	15,586	16,051	16,389	16,722
Employment, Total	420,127	438,854	469,036	488,298	502,840	513,427	523,887
11 Agriculture, forestry, fishing and hunting	199	202	207	216	222	227	231
21 Mining, quarrying, and oil and gas extraction	10,310	10,624	11,145	11,603	11,949	12,200	12,449
22 Utilities	3,270	3,344	3,469	3,612	3,719	3,797	3,875
23 Construction	18,598	19,774	21,635	22,523	23,194	23,682	24,165
31-33 Manufacturing	28,349	27,793	27,081	28,193	29,032	29,644	30,248
42 Wholesale trade	19,460	19,975	20,841	21,697	22,343	22,814	23,278
44-45 Retail trade	46,613	47,589	49,273	51,297	52,824	53,936	55,035
48-49 Transportation and warehousing	13,932	14,402	15,176	15,799	16,269	16,612	16,950
51 Information	12,177	12,515	13,079	13,616	14,022	14,317	14,609
52 Finance and insurance	18,074	18,588	19,444	20,243	20,846	21,285	21,718
53 Real estate and rental and leasing	9,495	10,009	10,829	11,273	11,609	11,854	12,095
54 Professional and technical services	21,916	23,979	27,196	28,313	29,156	29,770	30,376
55 Management of companies and enterprises	4,551	4,527	4,512	4,697	4,837	4,939	5,040
56 Administrative and waste services	36,205	39,006	43,401	45,183	46,529	47,508	48,476
61 Educational services	27,496	28,797	30,884	32,153	33,110	33,807	34,496
62 Health care and social assistance	54,290	57,810	63,373	65,976	67,940	69,371	70,784
71 Arts, entertainment, and recreation	6,374	7,064	8,134	8,468	8,721	8,904	9,086
72 Accommodation and food services	35,785	37,825	41,068	42,754	44,027	44,954	45,870
81 Other services, except public administration	11,258	11,660	12,317	12,823	13,205	13,483	13,757
92 Public Administration	41,635	43,232	45,832	47,714	49,135	50,170	51,192
99 Unclassified	139	139	140	145	150	153	156
Public-Supply Nonresidential Including System Losses (AFY)	59,203	61,862	66,147	68,863	70,914	72,407	73,882
Public-Supply Residential Including System Losses (AFY)	61,028	62,069	65,078	67,750	69,768	71,237	72,688
Self-Supply Residential (AFY)	1,079	1,098	1,151	1,198	1,234	1,260	1,286
Projection of Irrigated Lands (in Acres)	2,935	2,935	2,935	2,935	2,935	2,935	2,935
Crop Irrigation (AFY)	5,537	5,537	5,537	5,537	5,537	5,537	5,537
Livestock (AFY)	370	371	374	377	380	383	386
Oil and Gas Drilling (AFY)	196	280	430	615	834	1,089	1,379
Thermoelectric, Withdrawals (AFY)	9,727	10,051	11,213	12,510	13,956	15,569	17,369
Thermoelectric, Consumptive Use (AFY)	6,024	6,225	6,945	7,748	8,644	9,643	10,758
Self-Supply Large Industry (AFY)	178	175	170	177	182	186	190
Total Water Demand, All Sectors (AFY)*	137,319	141,443	150,099	157,027	162,805	167,668	172,717

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Okmulgee	2007	2010	2020	2030	2040	2050	2060
Population, Total	39,300	40,100	43,053	45,625	48,292	51,054	53,816
Public-Supplied Population	39,300	40,100	43,053	45,625	48,292	51,054	53,816
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	9,995	10,371	11,012	11,670	12,352	13,059	13,765
11 Agriculture, forestry, fishing and hunting	20	20	21	22	23	25	26
21 Mining, quarrying, and oil and gas extraction	181	187	196	208	220	233	245
22 Utilities	83	85	89	94	99	105	111
23 Construction	204	217	238	252	267	282	297
31-33 Manufacturing	1,435	1,407	1,374	1,457	1,542	1,630	1,718
42 Wholesale trade	151	155	162	172	182	192	203
44-45 Retail trade	1,283	1,310	1,360	1,441	1,525	1,612	1,700
48-49 Transportation and warehousing	241	249	263	279	295	312	329
51 Information	76	78	82	87	92	97	103
52 Finance and insurance	324	333	349	370	392	414	437
53 Real estate and rental and leasing	64	68	74	78	83	87	92
54 Professional and technical services	162	177	202	214	226	239	252
55 Management of companies and enterprises	94	94	93	99	105	111	117
56 Administrative and waste services	166	179	200	212	224	237	250
61 Educational services	1,120	1,173	1,261	1,337	1,415	1,496	1,577
62 Health care and social assistance	2,175	2,316	2,545	2,697	2,855	3,018	3,181
71 Arts, entertainment, and recreation	106	118	136	144	152	161	170
72 Accommodation and food services	860	909	990	1,049	1,110	1,173	1,237
81 Other services, except public administration	218	226	239	254	268	284	299
92 Public Administration	1,031	1,071	1,138	1,206	1,276	1,350	1,423
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,510	1,566	1,663	1,762	1,865	1,972	2,079
Public-Supply Residential Including System Losses (AFY)	9,176	9,363	10,053	10,653	11,276	11,921	12,566
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	860	860	860	860	860	860	860
Crop Irrigation (AFY)	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Livestock (AFY)	743	744	747	750	753	756	759
Oil and Gas Drilling (AFY)	137	194	285	395	525	674	843
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	12,816	13,118	13,998	14,811	15,670	16,573	17,496

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Osage	2007	2010	2020	2030	2040	2050	2060
Population, Total	45,523	46,462	49,788	52,233	54,483	56,733	59,276
Public-Supplied Population	38,763	39,563	42,394	44,477	46,392	48,308	50,474
Self-Supplied Population	6,760	6,899	7,393	7,756	8,091	8,425	8,802
Employment, Total	5,924	6,185	6,619	6,944	7,243	7,542	7,880
11 Agriculture, forestry, fishing and hunting	64	65	67	70	73	76	79
21 Mining, quarrying, and oil and gas extraction	477	492	517	542	565	589	615
22 Utilities	42	43	45	47	49	51	53
23 Construction	291	310	340	356	372	387	404
31-33 Manufacturing	236	231	226	237	247	257	269
42 Wholesale trade	79	81	85	89	93	97	101
44-45 Retail trade	690	704	731	767	800	833	870
48-49 Transportation and warehousing	80	83	87	92	96	99	104
51 Information	37	38	40	42	44	45	47
52 Finance and insurance	203	209	219	230	239	249	260
53 Real estate and rental and leasing	31	33	36	37	39	41	42
54 Professional and technical services	163	179	203	213	222	231	242
55 Management of companies and enterprises	8	8	8	9	9	9	10
56 Administrative and waste services	237	256	285	299	312	325	339
61 Educational services	764	800	860	902	941	980	1,024
62 Health care and social assistance	649	691	759	796	831	865	904
71 Arts, entertainment, and recreation	181	201	232	243	254	264	276
72 Accommodation and food services	394	416	453	475	496	516	539
81 Other services, except public administration	135	140	148	155	162	169	176
92 Public Administration	1,161	1,206	1,280	1,343	1,401	1,459	1,524
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	1,114	1,164	1,248	1,309	1,365	1,422	1,486
Public-Supply Residential Including System Losses (AFY)	6,595	6,731	7,213	7,567	7,893	8,219	8,587
Self-Supply Residential (AFY)	978	998	1,069	1,122	1,170	1,218	1,273
Projection of Irrigated Lands (in Acres)	435	476	611	746	881	984	1,151
Crop Irrigation (AFY)	492	538	691	843	996	1,113	1,302
Livestock (AFY)	2,317	2,323	2,343	2,363	2,384	2,404	2,424
Oil and Gas Drilling (AFY)	369	517	708	928	1,178	1,458	1,767
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	567	556	543	569	594	618	646
Total Water Demand, All Sectors (AFY)*	12,431	12,826	13,813	14,701	15,580	16,452	17,484

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Ottawa	2007	2010	2020	2030	2040	2050	2060
Population, Total	32,474	32,984	35,253	37,426	39,789	42,246	44,704
Public-Supplied Population	25,484	25,885	27,665	29,370	31,225	33,153	35,081
Self-Supplied Population	6,990	7,100	7,588	8,056	8,565	9,094	9,622
Employment, Total	11,346	11,825	12,624	13,403	14,249	15,129	16,009
11 Agriculture, forestry, fishing and hunting	486	493	507	538	572	608	643
21 Mining, quarrying, and oil and gas extraction	35	36	38	40	43	45	48
22 Utilities	104	106	110	117	124	132	140
23 Construction	229	244	267	284	302	320	339
31-33 Manufacturing	1,768	1,733	1,692	1,797	1,910	2,028	2,146
42 Wholesale trade	301	309	323	343	365	387	410
44-45 Retail trade	1,148	1,172	1,216	1,291	1,372	1,457	1,542
48-49 Transportation and warehousing	204	211	223	237	252	267	283
51 Information	84	86	90	96	102	108	115
52 Finance and insurance	310	319	335	355	378	401	424
53 Real estate and rental and leasing	85	90	97	103	110	117	123
54 Professional and technical services	353	386	439	466	495	526	557
55 Management of companies and enterprises	93	93	92	98	104	111	117
56 Administrative and waste services	407	439	489	520	552	587	621
61 Educational services	904	946	1,017	1,080	1,148	1,219	1,290
62 Health care and social assistance	1,894	2,017	2,215	2,352	2,500	2,655	2,809
71 Arts, entertainment, and recreation	1,156	1,281	1,478	1,569	1,668	1,771	1,874
72 Accommodation and food services	671	709	772	819	871	925	978
81 Other services, except public administration	203	210	223	236	251	267	282
92 Public Administration	869	902	959	1,018	1,082	1,149	1,215
99 Unclassified	41	41	41	44	47	49	52
Public-Supply Nonresidential Including System Losses (AFY)	2,068	2,184	2,373	2,519	2,678	2,844	3,009
Public-Supply Residential Including System Losses (AFY)	2,949	2,996	3,202	3,399	3,614	3,837	4,060
Self-Supply Residential (AFY)	688	698	746	792	842	895	947
Projection of Irrigated Lands (in Acres)	287	300	342	384	426	458	510
Crop Irrigation (AFY)	447	467	533	598	664	714	795
Livestock (AFY)	1,051	1,055	1,071	1,086	1,102	1,118	1,133
Oil and Gas Drilling (AFY)	0	0	0	0	0	0	0
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	7,203	7,400	7,925	8,396	8,900	9,407	9,944

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Pawnee	2007	2010	2020	2030	2040	2050	2060
Population, Total	16,447	16,950	18,813	20,489	22,258	24,121	25,984
Public-Supplied Population	11,797	12,158	13,494	14,696	15,965	17,301	18,637
Self-Supplied Population	4,650	4,792	5,319	5,793	6,293	6,820	7,346
Employment, Total	3,377	3,528	3,791	4,129	4,486	4,861	5,237
11 Agriculture, forestry, fishing and hunting	4	5	5	5	6	6	6
21 Mining, quarrying, and oil and gas extraction	177	182	192	209	227	246	265
22 Utilities	120	123	128	139	151	164	177
23 Construction	115	122	134	146	159	172	185
31-33 Manufacturing	136	133	131	142	155	167	180
42 Wholesale trade	74	76	80	87	94	102	110
44-45 Retail trade	391	399	416	453	492	533	574
48-49 Transportation and warehousing	60	62	66	72	78	85	91
51 Information	22	23	24	26	28	30	33
52 Finance and insurance	131	135	142	154	168	182	196
53 Real estate and rental and leasing	24	25	27	29	32	35	37
54 Professional and technical services	137	150	172	187	203	220	237
55 Management of companies and enterprises	20	20	20	22	24	26	28
56 Administrative and waste services	92	99	111	121	131	142	153
61 Educational services	408	427	461	502	545	591	636
62 Health care and social assistance	749	798	879	957	1,040	1,127	1,214
71 Arts, entertainment, and recreation	9	10	12	13	14	15	16
72 Accommodation and food services	237	251	273	298	324	351	378
81 Other services, except public administration	35	36	39	42	46	49	53
92 Public Administration	435	452	481	524	569	617	665
99 Unclassified	1	1	1	1	1	1	1
Public-Supply Nonresidential Including System Losses (AFY)	510	532	570	621	674	731	787
Public-Supply Residential Including System Losses (AFY)	1,764	1,818	2,018	2,198	2,388	2,587	2,787
Self-Supply Residential (AFY)	591	609	676	736	800	867	934
Projection of Irrigated Lands (in Acres)	37	44	67	90	114	131	160
Crop Irrigation (AFY)	73	87	133	179	225	260	317
Livestock (AFY)	616	616	617	618	620	621	622
Oil and Gas Drilling (AFY)	48	70	116	174	244	326	420
Thermoelectric, Withdrawals (AFY)	36,650	37,872	42,251	47,135	52,584	58,663	65,445
Thermoelectric, Consumptive Use (AFY)	22,699	23,456	26,168	29,193	32,568	36,334	40,534
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	40,252	41,604	46,380	51,661	57,534	64,055	71,313

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Payne	2007	2010	2020	2030	2040	2050	2060
Population, Total	79,931	82,684	88,978	95,593	102,101	106,688	111,063
Public-Supplied Population	72,011	74,491	80,162	86,121	91,984	96,117	100,058
Self-Supplied Population	7,920	8,193	8,816	9,472	10,117	10,571	11,005
Employment, Total	34,260	35,721	38,151	40,987	43,777	45,744	47,620
11 Agriculture, forestry, fishing and hunting	57	58	59	64	68	71	74
21 Mining, quarrying, and oil and gas extraction	837	863	906	974	1,040	1,087	1,131
22 Utilities	3,453	3,530	3,669	3,942	4,210	4,400	4,580
23 Construction	2,186	2,325	2,548	2,737	2,924	3,055	3,180
31-33 Manufacturing	2,657	2,605	2,543	2,732	2,918	3,049	3,174
42 Wholesale trade	422	433	453	486	520	543	565
44-45 Retail trade	3,823	3,903	4,048	4,349	4,645	4,854	5,053
48-49 Transportation and warehousing	804	831	877	943	1,007	1,052	1,095
51 Information	605	622	651	699	747	780	812
52 Finance and insurance	778	800	838	901	962	1,005	1,047
53 Real estate and rental and leasing	579	610	662	711	759	793	826
54 Professional and technical services	864	945	1,074	1,154	1,232	1,288	1,341
55 Management of companies and enterprises	48	48	48	51	55	57	60
56 Administrative and waste services	1,888	2,035	2,268	2,436	2,602	2,719	2,831
61 Educational services	5,629	5,896	6,334	6,805	7,268	7,595	7,906
62 Health care and social assistance	2,929	3,119	3,425	3,680	3,930	4,107	4,275
71 Arts, entertainment, and recreation	1,282	1,421	1,639	1,761	1,881	1,965	2,046
72 Accommodation and food services	2,984	3,154	3,431	3,686	3,937	4,113	4,282
81 Other services, except public administration	992	1,027	1,087	1,168	1,248	1,304	1,357
92 Public Administration	1,434	1,489	1,581	1,699	1,815	1,896	1,974
99 Unclassified	8	8	8	9	9	10	10
Public-Supply Nonresidential Including System Losses (AFY)	5,259	5,515	5,936	6,377	6,811	7,118	7,409
Public-Supply Residential Including System Losses (AFY)	6,935	7,174	7,720	8,294	8,858	9,256	9,636
Self-Supply Residential (AFY)	648	671	722	775	828	865	901
Projection of Irrigated Lands (in Acres)	898	899	903	906	910	913	917
Crop Irrigation (AFY)	1,332	1,333	1,339	1,344	1,349	1,353	1,360
Livestock (AFY)	828	831	839	848	856	865	874
Oil and Gas Drilling (AFY)	165	238	380	557	770	1,019	1,304
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	15,167	15,761	16,935	18,195	19,474	20,477	21,484

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Pittsburg	2007	2010	2020	2030	2040	2050	2060
Population, Total	44,711	45,190	47,285	49,080	51,175	53,569	56,163
Public-Supplied Population	44,711	45,190	47,285	49,080	51,175	53,569	56,163
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	16,912	17,570	18,643	19,351	20,177	21,121	22,144
11 Agriculture, forestry, fishing and hunting	26	26	27	28	29	31	32
21 Mining, quarrying, and oil and gas extraction	369	380	399	414	432	452	474
22 Utilities	169	173	179	186	194	203	213
23 Construction	657	699	764	793	827	866	908
31-33 Manufacturing	2,353	2,307	2,248	2,334	2,433	2,547	2,670
42 Wholesale trade	282	289	302	314	327	342	359
44-45 Retail trade	2,092	2,136	2,212	2,296	2,394	2,506	2,627
48-49 Transportation and warehousing	568	587	619	642	670	701	735
51 Information	162	166	174	181	188	197	207
52 Finance and insurance	420	432	452	469	489	512	537
53 Real estate and rental and leasing	174	183	198	206	215	225	236
54 Professional and technical services	340	372	421	437	456	478	501
55 Management of companies and enterprises	10	9	9	10	10	11	11
56 Administrative and waste services	1,238	1,333	1,484	1,540	1,606	1,681	1,762
61 Educational services	873	915	981	1,018	1,062	1,112	1,165
62 Health care and social assistance	3,096	3,297	3,615	3,752	3,912	4,095	4,294
71 Arts, entertainment, and recreation	80	88	102	105	110	115	121
72 Accommodation and food services	1,058	1,118	1,214	1,261	1,314	1,376	1,442
81 Other services, except public administration	311	322	340	353	368	386	404
92 Public Administration	2,635	2,736	2,901	3,011	3,140	3,287	3,446
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	3,088	3,162	3,288	3,412	3,558	3,725	3,905
Public-Supply Residential Including System Losses (AFY)	5,227	5,283	5,528	5,738	5,983	6,262	6,566
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	1,671	1,710	1,842	1,973	2,105	2,206	2,368
Crop Irrigation (AFY)	2,793	2,859	3,079	3,299	3,519	3,687	3,958
Livestock (AFY)	1,176	1,181	1,194	1,208	1,221	1,235	1,248
Oil and Gas Drilling (AFY)	5,838	8,477	16,343	11,617	8,836	5,019	165
Thermoelectric, Withdrawals (AFY)	12,886	13,316	14,855	16,572	18,488	20,626	23,010
Thermoelectric, Consumptive Use (AFY)	7,981	8,247	9,201	10,264	11,451	12,775	14,251
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	31,008	34,277	44,287	41,846	41,605	40,553	38,853

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Pontotoc	2007	2010	2020	2030	2040	2050	2060
Population, Total	36,571	36,999	38,426	39,751	41,076	42,299	43,522
Public-Supplied Population	31,081	31,445	32,658	33,784	34,910	35,949	36,989
Self-Supplied Population	5,490	5,554	5,768	5,967	6,166	6,350	6,534
Employment, Total	18,407	19,243	20,573	21,282	21,992	22,647	23,301
11 Agriculture, forestry, fishing and hunting	39	40	41	42	43	45	46
21 Mining, quarrying, and oil and gas extraction	247	255	267	276	285	294	302
22 Utilities	199	203	211	218	225	232	239
23 Construction	619	658	720	744	769	792	815
31-33 Manufacturing	1,707	1,674	1,629	1,686	1,742	1,794	1,846
42 Wholesale trade	578	593	619	640	661	681	701
44-45 Retail trade	1,796	1,834	1,898	1,963	2,028	2,089	2,149
48-49 Transportation and warehousing	356	368	388	401	415	427	439
51 Information	138	142	148	153	158	163	168
52 Finance and insurance	1,378	1,417	1,481	1,532	1,584	1,631	1,678
53 Real estate and rental and leasing	114	120	130	134	139	143	147
54 Professional and technical services	1,930	2,112	2,393	2,476	2,558	2,634	2,711
55 Management of companies and enterprises	150	150	149	154	159	164	169
56 Administrative and waste services	1,331	1,434	1,594	1,649	1,704	1,755	1,806
61 Educational services	2,155	2,257	2,419	2,502	2,586	2,663	2,740
62 Health care and social assistance	2,518	2,681	2,937	3,038	3,139	3,233	3,326
71 Arts, entertainment, and recreation	185	205	236	244	252	259	267
72 Accommodation and food services	1,150	1,216	1,319	1,364	1,410	1,452	1,494
81 Other services, except public administration	238	246	260	269	278	286	295
92 Public Administration	1,573	1,633	1,730	1,790	1,850	1,905	1,960
99 Unclassified	5	5	5	5	5	6	6
Public-Supply Nonresidential Including System Losses (AFY)	2,326	2,428	2,589	2,678	2,767	2,850	2,932
Public-Supply Residential Including System Losses (AFY)	3,605	3,647	3,787	3,918	4,049	4,169	4,290
Self-Supply Residential (AFY)	565	572	594	615	635	654	673
Projection of Irrigated Lands (in Acres)	788	916	1,341	1,767	2,192	2,519	3,043
Crop Irrigation (AFY)	1,465	1,702	2,493	3,284	4,075	4,682	5,657
Livestock (AFY)	848	853	870	886	903	919	936
Oil and Gas Drilling (AFY)	131	186	275	382	509	654	818
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	8,941	9,388	10,608	11,763	12,937	13,928	15,305

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Pottawatomie	2007	2010	2020	2030	2040	2050	2060
Population, Total	69,038	70,426	75,256	79,783	84,109	88,335	92,762
Public-Supplied Population	48,208	49,177	52,550	55,711	58,732	61,683	64,774
Self-Supplied Population	20,830	21,249	22,706	24,072	25,377	26,652	27,988
Employment, Total	20,480	21,292	22,649	24,011	25,313	26,585	27,917
11 Agriculture, forestry, fishing and hunting	22	22	23	24	26	27	28
21 Mining, quarrying, and oil and gas extraction	180	185	195	207	218	229	240
22 Utilities	201	206	214	226	239	251	263
23 Construction	846	899	986	1,045	1,101	1,157	1,215
31-33 Manufacturing	2,721	2,668	2,604	2,760	2,910	3,056	3,209
42 Wholesale trade	344	353	369	391	412	433	455
44-45 Retail trade	2,533	2,586	2,682	2,843	2,998	3,148	3,306
48-49 Transportation and warehousing	398	411	434	460	485	510	535
51 Information	309	318	332	352	372	390	410
52 Finance and insurance	515	530	555	588	620	651	684
53 Real estate and rental and leasing	169	178	193	205	216	227	238
54 Professional and technical services	736	806	915	970	1,023	1,074	1,128
55 Management of companies and enterprises	49	49	49	51	54	57	60
56 Administrative and waste services	1,135	1,222	1,362	1,444	1,523	1,599	1,679
61 Educational services	2,474	2,591	2,784	2,951	3,111	3,267	3,431
62 Health care and social assistance	2,368	2,522	2,769	2,935	3,095	3,250	3,413
71 Arts, entertainment, and recreation	206	228	263	279	294	309	324
72 Accommodation and food services	2,296	2,427	2,639	2,798	2,950	3,098	3,253
81 Other services, except public administration	470	487	515	546	576	605	635
92 Public Administration	2,507	2,603	2,764	2,930	3,089	3,244	3,407
99 Unclassified	2	2	2	2	2	2	2
Public-Supply Nonresidential Including System Losses (AFY)	2,761	2,869	3,049	3,233	3,408	3,579	3,759
Public-Supply Residential Including System Losses (AFY)	3,129	3,191	3,410	3,616	3,812	4,003	4,204
Self-Supply Residential (AFY)	1,253	1,279	1,366	1,449	1,527	1,604	1,684
Projection of Irrigated Lands (in Acres)	1,403	1,477	1,723	1,968	2,214	2,403	2,706
Crop Irrigation (AFY)	1,881	1,980	2,309	2,639	2,969	3,222	3,628
Livestock (AFY)	946	947	950	954	957	960	964
Oil and Gas Drilling (AFY)	214	320	613	997	1,470	2,034	2,689
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	651	639	623	661	697	732	768
Total Water Demand, All Sectors (AFY)*	10,835	11,225	12,322	13,547	14,839	16,134	17,695

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Pushmataha	2007	2010	2020	2030	2040	2050	2060
Population, Total	11,666	12,055	13,632	15,116	16,692	18,454	20,216
Public-Supplied Population	10,126	10,464	11,832	13,120	14,489	16,018	17,547
Self-Supplied Population	1,540	1,591	1,800	1,995	2,203	2,436	2,669
Employment, Total	3,127	3,266	3,513	3,895	4,301	4,755	5,209
11 Agriculture, forestry, fishing and hunting	40	40	42	46	51	56	62
21 Mining, quarrying, and oil and gas extraction	0	0	0	0	0	0	0
22 Utilities	60	62	64	71	79	87	95
23 Construction	236	251	277	307	339	375	410
31-33 Manufacturing	200	196	192	213	235	260	285
42 Wholesale trade	57	59	61	68	75	83	91
44-45 Retail trade	365	373	388	431	476	526	576
48-49 Transportation and warehousing	62	64	68	75	83	92	101
51 Information	48	49	52	58	64	70	77
52 Finance and insurance	83	85	90	100	110	122	133
53 Real estate and rental and leasing	13	14	15	17	18	20	22
54 Professional and technical services	27	30	34	37	41	46	50
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	3	3	4	4	4	5	5
61 Educational services	518	542	585	649	717	793	868
62 Health care and social assistance	909	968	1,068	1,184	1,308	1,446	1,584
71 Arts, entertainment, and recreation	34	38	44	49	54	59	65
72 Accommodation and food services	140	148	162	180	199	220	240
81 Other services, except public administration	68	70	75	83	92	101	111
92 Public Administration	263	273	292	324	357	395	433
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	405	424	457	507	560	619	678
Public-Supply Residential Including System Losses (AFY)	667	689	780	865	955	1,055	1,156
Self-Supply Residential (AFY)	86	89	101	112	123	136	149
Projection of Irrigated Lands (in Acres)	524	525	527	530	533	535	538
Crop Irrigation (AFY)	814	816	820	824	828	831	836
Livestock (AFY)	493	495	502	510	518	525	533
Oil and Gas Drilling (AFY)	10	14	19	25	32	39	48
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	2,476	2,527	2,679	2,842	3,015	3,206	3,400

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Roger Mills	2007	2010	2020	2030	2040	2050	2060
Population, Total	3,308	3,308	3,308	3,308	3,308	3,308	3,308
Public-Supplied Population	2,628	2,628	2,628	2,628	2,628	2,628	2,628
Self-Supplied Population	680	680	680	680	680	680	680
Employment, Total	826	858	906	906	906	906	906
11 Agriculture, forestry, fishing and hunting	12	12	12	12	12	12	12
21 Mining, quarrying, and oil and gas extraction	75	77	80	80	80	80	80
22 Utilities	7	7	7	7	7	7	7
23 Construction	26	27	30	30	30	30	30
31-33 Manufacturing	43	42	41	41	41	41	41
42 Wholesale trade	15	15	16	16	16	16	16
44-45 Retail trade	103	105	108	108	108	108	108
48-49 Transportation and warehousing	115	119	125	125	125	125	125
51 Information	13	13	14	14	14	14	14
52 Finance and insurance	32	33	34	34	34	34	34
53 Real estate and rental and leasing	0	0	0	0	0	0	0
54 Professional and technical services	20	22	25	25	25	25	25
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	0	0	0	0	0	0	0
61 Educational services	136	142	152	152	152	152	152
62 Health care and social assistance	92	98	107	107	107	107	107
71 Arts, entertainment, and recreation	6	7	8	8	8	8	8
72 Accommodation and food services	40	42	46	46	46	46	46
81 Other services, except public administration	7	7	8	8	8	8	8
92 Public Administration	86	89	94	94	94	94	94
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	140	145	153	153	153	153	153
Public-Supply Residential Including System Losses (AFY)	473	473	473	473	473	473	473
Self-Supply Residential (AFY)	104	104	104	104	104	104	104
Projection of Irrigated Lands (in Acres)	4,605	4,607	4,615	4,622	4,630	4,636	4,645
Crop Irrigation (AFY)	9,262	9,266	9,281	9,296	9,312	9,323	9,342
Livestock (AFY)	863	871	896	921	946	971	996
Oil and Gas Drilling (AFY)	734	1,040	1,513	2,081	2,747	3,508	4,366
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	11,576	11,899	12,419	13,028	13,734	14,532	15,433

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Rogers	2007	2010	2020	2030	2040	2050	2060
Population, Total	83,105	86,272	96,934	106,089	114,598	123,322	132,261
Public-Supplied Population	77,525	80,479	90,426	98,966	106,903	115,042	123,381
Self-Supplied Population	5,580	5,793	6,509	7,123	7,695	8,280	8,881
Employment, Total	23,822	24,667	26,219	28,695	30,996	33,356	35,774
11 Agriculture, forestry, fishing and hunting	57	58	60	65	71	76	82
21 Mining, quarrying, and oil and gas extraction	206	212	224	245	265	285	306
22 Utilities	302	309	322	353	381	410	440
23 Construction	1,934	2,057	2,265	2,479	2,677	2,881	3,090
31-33 Manufacturing	4,932	4,835	4,742	5,190	5,606	6,033	6,470
42 Wholesale trade	1,025	1,052	1,105	1,209	1,306	1,406	1,508
44-45 Retail trade	2,176	2,222	2,315	2,534	2,737	2,945	3,159
48-49 Transportation and warehousing	1,240	1,281	1,359	1,487	1,607	1,729	1,854
51 Information	189	194	204	223	241	259	278
52 Finance and insurance	494	508	535	585	632	681	730
53 Real estate and rental and leasing	217	229	249	273	294	317	340
54 Professional and technical services	500	547	625	683	738	795	852
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	1,360	1,465	1,641	1,795	1,939	2,087	2,238
61 Educational services	3,120	3,267	3,527	3,860	4,170	4,487	4,812
62 Health care and social assistance	2,126	2,264	2,498	2,734	2,953	3,178	3,408
71 Arts, entertainment, and recreation	617	684	792	867	937	1,008	1,081
72 Accommodation and food services	1,584	1,674	1,830	2,002	2,163	2,328	2,496
81 Other services, except public administration	363	376	400	437	473	509	545
92 Public Administration	1,350	1,402	1,496	1,637	1,768	1,903	2,041
99 Unclassified	31	31	31	34	37	40	43
Public-Supply Nonresidential Including System Losses (AFY)	3,503	3,630	3,862	4,227	4,566	4,914	5,270
Public-Supply Residential Including System Losses (AFY)	9,389	9,746	10,951	11,985	12,947	13,932	14,942
Self-Supply Residential (AFY)	579	601	675	739	798	859	922
Projection of Irrigated Lands (in Acres)	811	833	904	976	1,048	1,103	1,191
Crop Irrigation (AFY)	1,470	1,509	1,639	1,769	1,900	1,999	2,160
Livestock (AFY)	1,116	1,119	1,127	1,134	1,142	1,150	1,158
Oil and Gas Drilling (AFY)	109	158	262	395	555	744	961
Thermoelectric, Withdrawals (AFY)	22,905	23,669	26,405	29,458	32,863	36,662	40,901
Thermoelectric, Consumptive Use (AFY)	14,186	14,659	16,354	18,245	20,354	22,707	25,332
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	39,070	40,432	44,922	49,708	54,771	60,261	66,312

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Seminole	2007	2010	2020	2030	2040	2050	2060
Population, Total	24,179	24,353	25,126	25,803	26,479	27,252	28,025
Public-Supplied Population	20,199	20,344	20,990	21,555	22,120	22,766	23,412
Self-Supplied Population	3,980	4,009	4,136	4,247	4,359	4,486	4,613
Employment, Total	7,549	7,827	8,269	8,491	8,714	8,968	9,223
11 Agriculture, forestry, fishing and hunting	28	28	29	30	31	32	32
21 Mining, quarrying, and oil and gas extraction	727	749	785	806	827	851	875
22 Utilities	184	188	195	200	205	211	217
23 Construction	350	372	407	418	428	441	453
31-33 Manufacturing	1,048	1,027	1,000	1,027	1,054	1,084	1,115
42 Wholesale trade	153	157	164	168	172	177	183
44-45 Retail trade	802	819	847	869	892	918	944
48-49 Transportation and warehousing	235	243	256	263	269	277	285
51 Information	51	53	55	57	58	60	62
52 Finance and insurance	189	194	203	209	214	220	226
53 Real estate and rental and leasing	45	48	51	53	54	56	57
54 Professional and technical services	83	91	103	106	108	112	115
55 Management of companies and enterprises	0	0	0	0	0	0	0
56 Administrative and waste services	63	68	76	78	80	82	84
61 Educational services	700	733	785	806	827	851	876
62 Health care and social assistance	1,529	1,628	1,782	1,830	1,878	1,933	1,988
71 Arts, entertainment, and recreation	85	94	108	111	114	117	120
72 Accommodation and food services	486	514	557	572	587	604	621
81 Other services, except public administration	121	125	132	136	139	143	147
92 Public Administration	660	685	726	745	765	787	809
99 Unclassified	10	10	10	10	11	11	11
Public-Supply Nonresidential Including System Losses (AFY)	1,411	1,461	1,540	1,582	1,623	1,671	1,718
Public-Supply Residential Including System Losses (AFY)	1,331	1,341	1,383	1,420	1,458	1,500	1,543
Self-Supply Residential (AFY)	223	225	232	238	244	251	258
Projection of Irrigated Lands (in Acres)	782	831	993	1,155	1,317	1,441	1,641
Crop Irrigation (AFY)	1,250	1,328	1,587	1,847	2,106	2,305	2,624
Livestock (AFY)	623	627	642	656	671	686	700
Oil and Gas Drilling (AFY)	299	437	757	1,167	1,667	2,257	2,938
Thermoelectric, Withdrawals (AFY)	17,320	17,898	19,967	22,275	24,851	27,723	30,929
Thermoelectric, Consumptive Use (AFY)	10,727	11,085	12,367	13,796	15,391	17,171	19,156
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	22,457	23,316	26,108	29,185	32,619	36,393	40,710

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Sequoyah	2007	2010	2020	2030	2040	2050	2060
Population, Total	41,024	42,368	46,946	51,231	55,419	59,705	63,990
Public-Supplied Population	40,204	41,521	46,007	50,207	54,312	58,512	62,711
Self-Supplied Population	820	847	938	1,024	1,108	1,193	1,279
Employment, Total	9,156	9,577	10,306	11,247	12,167	13,108	14,048
11 Agriculture, forestry, fishing and hunting	61	62	64	69	75	81	87
21 Mining, quarrying, and oil and gas extraction	57	59	62	68	73	79	85
22 Utilities	93	95	99	108	117	126	135
23 Construction	204	217	239	260	282	303	325
31-33 Manufacturing	646	633	620	677	732	789	845
42 Wholesale trade	118	121	127	139	150	162	173
44-45 Retail trade	1,164	1,188	1,237	1,350	1,460	1,573	1,686
48-49 Transportation and warehousing	343	355	376	410	443	478	512
51 Information	64	66	69	75	82	88	94
52 Finance and insurance	364	374	394	430	465	501	537
53 Real estate and rental and leasing	52	55	60	65	70	76	81
54 Professional and technical services	237	259	296	323	349	376	403
55 Management of companies and enterprises	23	23	23	25	27	29	31
56 Administrative and waste services	435	469	524	572	619	667	715
61 Educational services	1,386	1,451	1,565	1,707	1,847	1,990	2,133
62 Health care and social assistance	1,998	2,128	2,344	2,558	2,767	2,981	3,195
71 Arts, entertainment, and recreation	292	323	374	409	442	476	510
72 Accommodation and food services	938	991	1,082	1,181	1,277	1,376	1,475
81 Other services, except public administration	83	86	91	100	108	116	124
92 Public Administration	597	620	661	721	780	841	901
99 Unclassified	1	1	1	1	1	1	1
Public-Supply Nonresidential Including System Losses (AFY)	1,325	1,393	1,509	1,647	1,782	1,919	2,057
Public-Supply Residential Including System Losses (AFY)	5,797	5,987	6,634	7,239	7,831	8,436	9,042
Self-Supply Residential (AFY)	100	104	115	126	136	146	157
Projection of Irrigated Lands (in Acres)	1,622	1,649	1,740	1,831	1,921	1,991	2,103
Crop Irrigation (AFY)	2,184	2,221	2,343	2,465	2,587	2,681	2,832
Livestock (AFY)	721	730	758	787	816	845	873
Oil and Gas Drilling (AFY)	40	57	78	102	129	160	194
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	1,656	1,624	1,590	1,735	1,877	2,022	2,168
Total Water Demand, All Sectors (AFY)*	11,824	12,114	13,027	14,101	15,158	16,210	17,322

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Stephens	2007	2010	2020	2030	2040	2050	2060
Population, Total	43,322	43,322	43,827	44,231	44,736	45,443	46,352
Public-Supplied Population	36,702	36,702	37,130	37,472	37,900	38,499	39,269
Self-Supplied Population	6,620	6,620	6,697	6,759	6,836	6,944	7,083
Employment, Total	15,505	16,032	16,846	17,002	17,196	17,467	17,817
11 Agriculture, forestry, fishing and hunting	16	16	17	17	17	17	18
21 Mining, quarrying, and oil and gas extraction	1,863	1,920	2,008	2,026	2,049	2,082	2,123
22 Utilities	107	109	113	114	115	117	120
23 Construction	836	889	970	978	990	1,005	1,025
31-33 Manufacturing	2,562	2,512	2,440	2,462	2,490	2,530	2,580
42 Wholesale trade	396	406	423	427	432	438	447
44-45 Retail trade	2,098	2,142	2,211	2,231	2,257	2,292	2,338
48-49 Transportation and warehousing	686	709	745	751	760	772	787
51 Information	134	138	144	145	147	149	152
52 Finance and insurance	585	602	627	633	640	651	664
53 Real estate and rental and leasing	84	89	96	96	97	99	101
54 Professional and technical services	340	371	420	424	429	435	444
55 Management of companies and enterprises	42	42	41	42	42	43	44
56 Administrative and waste services	570	614	681	688	695	706	720
61 Educational services	1,284	1,345	1,438	1,451	1,468	1,491	1,521
62 Health care and social assistance	1,802	1,919	2,097	2,116	2,140	2,174	2,218
71 Arts, entertainment, and recreation	168	186	214	216	218	222	226
72 Accommodation and food services	965	1,020	1,104	1,114	1,127	1,145	1,168
81 Other services, except public administration	320	331	349	352	356	362	369
92 Public Administration	643	668	706	712	720	732	746
99 Unclassified	5	5	5	5	5	5	5
Public-Supply Nonresidential Including System Losses (AFY)	3,037	3,135	3,287	3,317	3,355	3,408	3,476
Public-Supply Residential Including System Losses (AFY)	5,435	5,435	5,498	5,549	5,612	5,701	5,815
Self-Supply Residential (AFY)	833	833	843	851	860	874	892
Projection of Irrigated Lands (in Acres)	1,194	1,312	1,703	2,095	2,487	2,788	3,271
Crop Irrigation (AFY)	2,031	2,231	2,898	3,564	4,231	4,742	5,564
Livestock (AFY)	1,012	1,019	1,044	1,068	1,093	1,117	1,142
Oil and Gas Drilling (AFY)	500	707	1,017	1,388	1,820	2,313	2,866
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	12,848	13,360	14,586	15,737	16,971	18,155	19,755

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Texas	2007	2010	2020	2030	2040	2050	2060
Population, Total	20,032	21,557	26,802	32,130	37,458	42,785	48,031
Public-Supplied Population	17,432	18,759	23,324	27,960	32,596	37,232	41,797
Self-Supplied Population	2,600	2,798	3,479	4,170	4,862	5,553	6,234
Employment, Total	6,475	6,741	7,283	8,730	10,178	11,626	13,051
11 Agriculture, forestry, fishing and hunting	635	644	671	805	938	1,072	1,203
21 Mining, quarrying, and oil and gas extraction	107	110	117	141	164	187	210
22 Utilities	157	161	170	203	237	271	304
23 Construction	552	587	652	782	911	1,041	1,168
31-33 Manufacturing	200	196	194	233	271	310	348
42 Wholesale trade	296	304	322	386	450	514	577
44-45 Retail trade	744	760	799	957	1,116	1,275	1,431
48-49 Transportation and warehousing	139	144	154	184	215	245	276
51 Information	227	234	248	297	347	396	444
52 Finance and insurance	230	237	251	301	351	401	450
53 Real estate and rental and leasing	37	39	43	51	60	68	77
54 Professional and technical services	181	198	228	273	319	364	409
55 Management of companies and enterprises	35	35	35	42	49	56	63
56 Administrative and waste services	240	258	292	350	408	466	523
61 Educational services	976	1,022	1,113	1,335	1,556	1,777	1,995
62 Health care and social assistance	417	444	494	592	690	788	885
71 Arts, entertainment, and recreation	70	78	91	109	127	145	163
72 Accommodation and food services	706	746	822	986	1,149	1,313	1,473
81 Other services, except public administration	120	124	133	160	186	213	239
92 Public Administration	401	416	448	537	626	716	803
99 Unclassified	5	5	5	6	7	8	9
Public-Supply Nonresidential Including System Losses (AFY)	898	938	1,016	1,218	1,420	1,622	1,821
Public-Supply Residential Including System Losses (AFY)	2,678	2,882	3,583	4,295	5,007	5,719	6,421
Self-Supply Residential (AFY)	339	365	454	545	635	725	814
Projection of Irrigated Lands (in Acres)	156,026	156,340	157,386	158,431	159,477	160,280	161,569
Crop Irrigation (AFY)	199,312	199,713	201,049	202,385	203,721	204,747	206,393
Livestock (AFY)	9,133	9,161	9,254	9,347	9,440	9,533	9,626
Oil and Gas Drilling (AFY)	607	870	1,346	1,935	2,639	3,456	4,387
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	5,940	5,825	5,765	6,910	8,056	9,202	10,330
Total Water Demand, All Sectors (AFY)*	218,908	219,753	222,466	226,636	230,918	235,004	239,792

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Tillman	2007	2010	2020	2030	2040	2050	2060
Population, Total	8,148	8,148	8,325	8,502	8,679	8,857	9,122
Public-Supplied Population	7,478	7,478	7,641	7,803	7,966	8,128	8,372
Self-Supplied Population	670	670	685	699	714	728	750
Employment, Total	2,173	2,259	2,393	2,444	2,495	2,546	2,622
11 Agriculture, forestry, fishing and hunting	105	107	109	111	114	116	119
21 Mining, quarrying, and oil and gas extraction	26	27	28	29	30	30	31
22 Utilities	86	88	91	93	95	97	100
23 Construction	108	115	126	129	131	134	138
31-33 Manufacturing	151	149	144	147	151	154	158
42 Wholesale trade	79	81	84	86	88	90	92
44-45 Retail trade	176	180	186	190	194	197	203
48-49 Transportation and warehousing	64	66	69	71	72	74	76
51 Information	42	43	45	45	46	47	49
52 Finance and insurance	106	109	114	117	119	121	125
53 Real estate and rental and leasing	4	4	5	5	5	5	5
54 Professional and technical services	32	35	40	40	41	42	43
55 Management of companies and enterprises	16	16	16	16	16	16	17
56 Administrative and waste services	48	52	58	59	60	61	63
61 Educational services	320	335	358	366	373	381	392
62 Health care and social assistance	246	262	286	292	298	304	313
71 Arts, entertainment, and recreation	42	47	54	55	56	57	59
72 Accommodation and food services	173	183	198	203	207	211	217
81 Other services, except public administration	39	40	43	43	44	45	47
92 Public Administration	309	321	339	347	354	361	372
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	309	322	343	350	357	364	375
Public-Supply Residential Including System Losses (AFY)	1,023	1,023	1,046	1,068	1,090	1,112	1,146
Self-Supply Residential (AFY)	80	80	81	83	85	87	89
Projection of Irrigated Lands (in Acres)	12,974	13,028	13,206	13,385	13,563	13,700	13,920
Crop Irrigation (AFY)	18,089	18,163	18,412	18,661	18,910	19,101	19,408
Livestock (AFY)	888	889	895	900	905	911	916
Oil and Gas Drilling (AFY)	27	41	75	121	177	243	319
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	20,415	20,518	20,852	21,183	21,524	21,818	22,254

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Tulsa	2007	2010	2020	2030	2040	2050	2060
Population, Total	585,068	595,326	627,632	654,571	673,557	687,970	701,986
Public-Supplied Population	576,128	586,230	618,042	644,569	663,265	677,458	691,260
Self-Supplied Population	8,940	9,097	9,590	10,002	10,292	10,512	10,727
Employment, Total	341,500	355,930	379,487	395,775	407,255	415,969	424,444
11 Agriculture, forestry, fishing and hunting	419	425	437	455	469	479	488
21 Mining, quarrying, and oil and gas extraction	4,681	4,824	5,063	5,281	5,434	5,550	5,663
22 Utilities	3,224	3,296	3,422	3,569	3,672	3,751	3,828
23 Construction	17,565	18,676	20,445	21,322	21,941	22,410	22,867
31-33 Manufacturing	38,052	37,306	36,371	37,932	39,032	39,867	40,679
42 Wholesale trade	15,705	16,121	16,829	17,552	18,061	18,447	18,823
44-45 Retail trade	37,377	38,160	39,533	41,229	42,425	43,333	44,216
48-49 Transportation and warehousing	17,931	18,536	19,543	20,382	20,973	21,422	21,858
51 Information	9,914	10,189	10,655	11,112	11,434	11,679	11,917
52 Finance and insurance	14,720	15,138	15,845	16,525	17,004	17,368	17,722
53 Real estate and rental and leasing	7,525	7,932	8,587	8,955	9,215	9,412	9,604
54 Professional and technical services	19,196	21,004	23,835	24,858	25,579	26,127	26,659
55 Management of companies and enterprises	5,901	5,870	5,854	6,105	6,282	6,417	6,547
56 Administrative and waste services	33,682	36,288	40,400	42,134	43,356	44,284	45,186
61 Educational services	21,953	22,991	24,672	25,731	26,478	27,044	27,595
62 Health care and social assistance	41,810	44,521	48,833	50,929	52,406	53,528	54,618
71 Arts, entertainment, and recreation	4,751	5,265	6,067	6,327	6,511	6,650	6,785
72 Accommodation and food services	27,964	29,558	32,111	33,489	34,460	35,198	35,915
81 Other services, except public administration	9,395	9,730	10,285	10,726	11,037	11,274	11,503
92 Public Administration	9,525	9,890	10,491	10,942	11,259	11,500	11,734
99 Unclassified	210	210	211	220	227	231	236
Public-Supply Nonresidential Including System Losses (AFY)	43,051	44,846	47,779	49,830	51,275	52,372	53,439
Public-Supply Residential Including System Losses (AFY)	64,076	65,199	68,737	71,687	73,767	75,345	76,880
Self-Supply Residential (AFY)	903	919	969	1,010	1,040	1,062	1,084
Projection of Irrigated Lands (in Acres)	3,901	3,941	4,075	4,208	4,342	4,444	4,609
Crop Irrigation (AFY)	7,427	7,503	7,757	8,012	8,266	8,461	8,775
Livestock (AFY)	337	338	341	345	349	352	356
Oil and Gas Drilling (AFY)	89	128	211	316	443	592	763
Thermoelectric, Withdrawals (AFY)	13,071	13,507	15,069	16,811	18,754	20,922	23,341
Thermoelectric, Consumptive Use (AFY)	8,096	8,366	9,333	10,412	11,615	12,958	14,456
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	128,952	132,440	140,864	148,011	153,893	159,107	164,638

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Wagoner	2007	2010	2020	2030	2040	2050	2060
Population, Total	67,239	69,679	77,814	84,557	90,765	96,866	103,288
Public-Supplied Population	67,239	69,679	77,814	84,557	90,765	96,866	103,288
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	6,804	7,057	7,512	8,163	8,763	9,352	9,972
11 Agriculture, forestry, fishing and hunting	67	68	70	76	82	87	93
21 Mining, quarrying, and oil and gas extraction	17	18	18	20	22	23	25
22 Utilities	33	34	35	38	41	44	47
23 Construction	603	641	705	766	823	878	936
31-33 Manufacturing	1,226	1,202	1,178	1,280	1,374	1,466	1,564
42 Wholesale trade	154	158	166	180	193	206	220
44-45 Retail trade	782	798	831	903	970	1,035	1,104
48-49 Transportation and warehousing	107	111	117	127	137	146	156
51 Information	39	40	42	46	49	52	56
52 Finance and insurance	208	214	225	245	263	280	299
53 Real estate and rental and leasing	49	52	56	61	66	70	75
54 Professional and technical services	226	247	282	307	329	351	374
55 Management of companies and enterprises	5	5	5	5	6	6	6
56 Administrative and waste services	149	161	180	195	210	224	239
61 Educational services	1,002	1,050	1,132	1,230	1,321	1,409	1,503
62 Health care and social assistance	886	943	1,040	1,130	1,213	1,294	1,380
71 Arts, entertainment, and recreation	85	94	109	119	127	136	145
72 Accommodation and food services	641	678	740	804	863	921	982
81 Other services, except public administration	142	147	156	170	182	195	207
92 Public Administration	373	388	413	449	482	515	549
99 Unclassified	10	10	10	11	12	13	13
Public-Supply Nonresidential Including System Losses (AFY)	987	1,023	1,088	1,182	1,269	1,354	1,444
Public-Supply Residential Including System Losses (AFY)	7,121	7,379	8,241	8,955	9,612	10,259	10,939
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	5,226	5,226	5,226	5,226	5,226	5,226	5,226
Crop Irrigation (AFY)	8,392	8,392	8,392	8,392	8,392	8,392	8,392
Livestock (AFY)	639	640	642	645	647	649	652
Oil and Gas Drilling (AFY)	81	118	201	307	436	588	763
Thermoelectric, Withdrawals (AFY)	4,580	4,733	5,280	5,891	6,572	7,332	8,179
Thermoelectric, Consumptive Use (AFY)	2,837	2,932	3,270	3,648	4,070	4,541	5,066
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	21,800	22,285	23,844	25,371	26,928	28,574	30,369

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Washington	2007	2010	2020	2030	2040	2050	2060
Population, Total	49,888	50,130	51,240	51,744	52,450	53,156	53,963
Public-Supplied Population	49,888	50,130	51,240	51,744	52,450	53,156	53,963
Self-Supplied Population	0	0	0	0	0	0	0
Employment, Total	19,510	20,352	21,659	21,872	22,170	22,469	22,810
11 Agriculture, forestry, fishing and hunting	12	12	12	13	13	13	13
21 Mining, quarrying, and oil and gas extraction	3,155	3,251	3,402	3,436	3,482	3,529	3,583
22 Utilities	268	274	284	286	290	294	299
23 Construction	589	626	684	690	700	709	720
31-33 Manufacturing	740	725	705	712	722	732	743
42 Wholesale trade	277	284	296	299	303	307	312
44-45 Retail trade	3,518	3,592	3,709	3,746	3,797	3,848	3,907
48-49 Transportation and warehousing	249	257	271	273	277	281	285
51 Information	159	164	171	172	175	177	180
52 Finance and insurance	648	666	695	702	712	721	732
53 Real estate and rental and leasing	184	194	209	211	214	217	220
54 Professional and technical services	620	678	767	775	786	796	808
55 Management of companies and enterprises	100	99	99	100	101	103	104
56 Administrative and waste services	1,410	1,519	1,686	1,703	1,726	1,749	1,776
61 Educational services	1,571	1,645	1,760	1,777	1,802	1,826	1,854
62 Health care and social assistance	2,954	3,146	3,440	3,474	3,521	3,569	3,623
71 Arts, entertainment, and recreation	222	246	283	285	289	293	298
72 Accommodation and food services	1,691	1,787	1,936	1,955	1,982	2,008	2,039
81 Other services, except public administration	710	735	775	782	793	804	816
92 Public Administration	431	448	474	478	485	491	499
99 Unclassified	1	1	1	1	1	1	1
Public-Supply Nonresidential Including System Losses (AFY)	4,136	4,300	4,556	4,600	4,663	4,726	4,798
Public-Supply Residential Including System Losses (AFY)	7,603	7,639	7,809	7,885	7,993	8,101	8,224
Self-Supply Residential (AFY)	0	0	0	0	0	0	0
Projection of Irrigated Lands (in Acres)	497	538	675	812	950	1,055	1,224
Crop Irrigation (AFY)	530	574	721	867	1,014	1,126	1,306
Livestock (AFY)	535	536	539	541	544	547	550
Oil and Gas Drilling (AFY)	242	339	464	609	773	957	1,160
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	13,046	13,389	14,088	14,503	14,987	15,456	16,037

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Washita	2007	2010	2020	2030	2040	2050	2060
Population, Total	11,667	11,786	12,182	12,479	12,677	12,974	13,172
Public-Supplied Population	9,467	9,563	9,885	10,126	10,287	10,528	10,689
Self-Supplied Population	2,200	2,222	2,297	2,353	2,390	2,447	2,484
Employment, Total	2,287	2,380	2,528	2,589	2,630	2,692	2,733
11 Agriculture, forestry, fishing and hunting	27	27	28	29	29	30	30
21 Mining, quarrying, and oil and gas extraction	242	249	261	268	272	278	283
22 Utilities	25	26	27	27	28	29	29
23 Construction	193	205	224	229	233	238	242
31-33 Manufacturing	60	59	57	59	60	61	62
42 Wholesale trade	108	111	116	118	120	123	125
44-45 Retail trade	242	247	255	262	266	272	276
48-49 Transportation and warehousing	71	74	78	79	81	83	84
51 Information	31	32	34	35	35	36	36
52 Finance and insurance	106	109	114	117	119	121	123
53 Real estate and rental and leasing	100	105	114	117	119	121	123
54 Professional and technical services	42	46	52	53	54	55	56
55 Management of companies and enterprises	13	13	13	13	13	14	14
56 Administrative and waste services	25	27	30	31	31	32	33
61 Educational services	431	451	484	495	503	515	523
62 Health care and social assistance	175	186	204	209	212	217	221
71 Arts, entertainment, and recreation	0	0	0	0	0	0	0
72 Accommodation and food services	72	76	83	85	86	88	90
81 Other services, except public administration	28	29	31	31	32	33	33
92 Public Administration	295	306	324	332	338	345	351
99 Unclassified	0	0	0	0	0	0	0
Public-Supply Nonresidential Including System Losses (AFY)	391	406	430	440	447	458	465
Public-Supply Residential Including System Losses (AFY)	691	698	721	739	750	768	780
Self-Supply Residential (AFY)	142	144	148	152	154	158	161
Projection of Irrigated Lands (in Acres)	7,300	7,396	7,714	8,033	8,351	8,595	8,988
Crop Irrigation (AFY)	5,063	5,130	5,350	5,571	5,792	5,962	6,234
Livestock (AFY)	1,511	1,511	1,510	1,510	1,510	1,509	1,509
Oil and Gas Drilling (AFY)	556	830	1,569	2,535	3,726	5,143	6,786
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	8,354	8,717	9,729	10,947	12,380	13,998	15,934

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Woods	2007	2010	2020	2030	2040	2050	2060
Population, Total	8,319	8,374	8,374	8,465	8,556	8,647	8,829
Public-Supplied Population	7,209	7,256	7,256	7,335	7,414	7,493	7,651
Self-Supplied Population	1,110	1,117	1,117	1,129	1,142	1,154	1,178
Employment, Total	3,110	3,242	3,439	3,477	3,514	3,552	3,626
11 Agriculture, forestry, fishing and hunting	45	46	47	47	48	48	49
21 Mining, quarrying, and oil and gas extraction	73	75	79	79	80	81	83
22 Utilities	26	27	28	28	28	28	29
23 Construction	89	95	103	104	105	106	109
31-33 Manufacturing	186	182	177	179	181	183	186
42 Wholesale trade	94	96	100	101	102	103	106
44-45 Retail trade	466	476	490	496	501	506	517
48-49 Transportation and warehousing	91	94	98	99	100	101	104
51 Information	64	66	68	69	70	71	72
52 Finance and insurance	166	171	178	180	182	184	187
53 Real estate and rental and leasing	24	25	27	28	28	28	29
54 Professional and technical services	56	61	69	70	71	71	73
55 Management of companies and enterprises	10	10	10	10	10	11	11
56 Administrative and waste services	56	60	67	67	68	69	70
61 Educational services	317	332	354	358	362	366	374
62 Health care and social assistance	790	841	918	928	938	948	968
71 Arts, entertainment, and recreation	32	35	41	41	42	42	43
72 Accommodation and food services	225	238	257	260	263	265	271
81 Other services, except public administration	50	52	54	55	56	56	57
92 Public Administration	245	255	269	272	275	278	284
99 Unclassified	5	5	5	5	5	5	5
Public-Supply Nonresidential Including System Losses (AFY)	433	452	480	485	490	496	506
Public-Supply Residential Including System Losses (AFY)	2,692	2,709	2,709	2,739	2,768	2,798	2,857
Self-Supply Residential (AFY)	352	355	355	358	362	366	374
Projection of Irrigated Lands (in Acres)	1,984	2,023	2,154	2,285	2,416	2,517	2,678
Crop Irrigation (AFY)	3,288	3,353	3,570	3,787	4,005	4,171	4,439
Livestock (AFY)	1,339	1,347	1,374	1,401	1,428	1,455	1,482
Oil and Gas Drilling (AFY)	361	509	717	962	1,244	1,563	1,921
Thermoelectric, Withdrawals (AFY)	0	0	0	0	0	0	0
Thermoelectric, Consumptive Use (AFY)	0	0	0	0	0	0	0
Self-Supply Large Industry (AFY)	0	0	0	0	0	0	0
Total Water Demand, All Sectors (AFY)*	8,466	8,726	9,205	9,733	10,297	10,849	11,577

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals



Woodward	2007	2010	2020	2030	2040	2050	2060
Population, Total	19,505	19,752	20,575	21,192	21,604	22,118	22,530
Public-Supplied Population	16,005	16,208	16,883	17,389	17,727	18,149	18,487
Self-Supplied Population	3,500	3,544	3,692	3,803	3,877	3,969	4,043
Employment, Total	9,378	9,756	10,364	10,675	10,882	11,141	11,348
11 Agriculture, forestry, fishing and hunting	167	169	174	179	183	187	190
21 Mining, quarrying, and oil and gas extraction	1,848	1,904	1,997	2,057	2,097	2,147	2,187
22 Utilities	230	235	243	251	256	262	267
23 Construction	663	705	771	794	809	829	844
31-33 Manufacturing	327	321	312	322	328	336	342
42 Wholesale trade	336	345	360	370	378	387	394
44-45 Retail trade	1,186	1,211	1,253	1,291	1,316	1,347	1,372
48-49 Transportation and warehousing	402	415	437	450	459	470	479
51 Information	84	87	91	93	95	97	99
52 Finance and insurance	394	405	424	436	445	455	464
53 Real estate and rental and leasing	126	133	144	148	151	154	157
54 Professional and technical services	179	196	222	229	233	239	243
55 Management of companies and enterprises	43	43	43	44	45	46	47
56 Administrative and waste services	382	411	458	471	480	492	501
61 Educational services	561	587	629	648	661	677	689
62 Health care and social assistance	1,042	1,109	1,215	1,252	1,276	1,307	1,331
71 Arts, entertainment, and recreation	63	70	80	83	84	86	88
72 Accommodation and food services	690	729	791	815	831	851	867
81 Other services, except public administration	298	309	326	336	342	350	357
92 Public Administration	356	370	392	403	411	421	429
99 Unclassified	2	2	2	2	2	2	2
Public-Supply Nonresidential Including System Losses (AFY)	1,982	2,055	2,174	2,239	2,282	2,337	2,380
Public-Supply Residential Including System Losses (AFY)	3,617	3,663	3,815	3,930	4,006	4,101	4,178
Self-Supply Residential (AFY)	723	732	763	786	801	820	835
Projection of Irrigated Lands (in Acres)	7,565	7,565	7,565	7,565	7,565	7,565	7,565
Crop Irrigation (AFY)	8,026	8,026	8,026	8,026	8,026	8,026	8,026
Livestock (AFY)	1,856	1,856	1,856	1,857	1,857	1,858	1,858
Oil and Gas Drilling (AFY)	434	609	834	1,093	1,388	1,717	2,081
Thermoelectric, Withdrawals (AFY)	514	531	593	661	738	823	918
Thermoelectric, Consumptive Use (AFY)	318	329	367	410	457	510	569
Self-Supply Large Industry (AFY)	3,159	3,097	3,016	3,106	3,167	3,242	3,303
Total Water Demand, All Sectors (AFY)*	20,310	20,568	21,076	21,697	22,264	22,923	23,579

*Total includes system losses for public-supply forecast and thermoelectric power withdrawals