6. Water Demand

This section focuses on the second regional water planning question: What is the region's current and projected future demand for water? To address this question, current and historical water uses within the Taos Water Planning Region have been evaluated and are presented in Section 6.1. In order to estimate future water demand, it is important to understand demographic and economic trends in the region, and these are presented in Section 6.2. Based on current and historical uses and demographic and economic trends, projected future water demands for the region are presented in Section 6.3.

6.1 Present Uses

Present and historical water use was determined based on information from the OSE, which tracks water use in New Mexico and reports the data every five years, supplemented with information contributed by water users within the region and other documents, such as those related to the Draft Abeyta Settlement Agreement (Section 4.5.3.1) and the Red River adjudication. Water use information includes information on total withdrawals or diversions from the systems, as well as on depletions or consumptive use (water that is completely used and does not return to the system). The OSE currently tracks water use in the following categories: public water supply, self-supplied domestic, self-supplied livestock, irrigated agriculture, self-supplied commercial, industrial, mining, and power, and reservoir evaporation.

Over the years, the OSE has made a few changes in the way that water demand is categorized and reported:

- Fish and wildlife and recreation uses were previously (1975 through 1985) reported as separate categories, but are now included in the commercial category.

- Rural, urban, and military uses were separate categories until 1990, when they were replaced with the public water supply and self-supplied domestic categories.

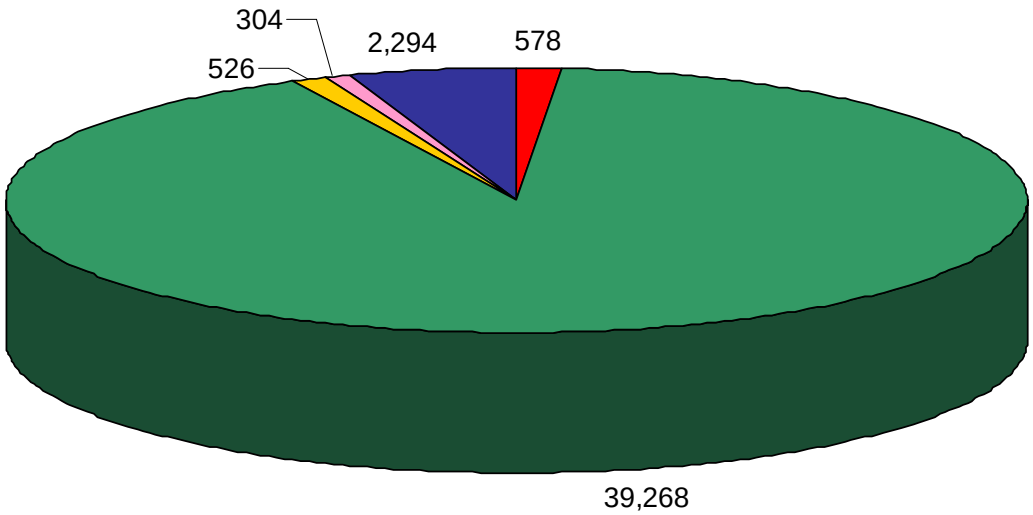
- The OSE stopped reporting stockpond evaporation (which was previously a separate category) after 1985.

- Since 1990, the reservoir evaporation category has included only reservoirs that store at least 5,000 acre-feet.

The OSE water use inventories include only the amounts of water used by people or used through a man-made structure (i.e., reservoir evaporation) and thus do not include natural riparian consumption. Estimates for riparian consumption are provided in the water budget discussed in Section 7. In addition, whereas the regional surface water has traditionally been used for recreation and instream flow to support aquatic species in the area, the OSE does not quantify instream flow used for recreation or wildlife.

Figure 6-1 shows water depletions for each category of use for the year 2000, and Table 6-1 and Figure 6-2 show water depletions and withdrawals in each category for the years 1975, 1980, 1985, 1990, 1995, and 2000 based on the OSE inventories for those years (Sorensen, 1976, 1981; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003, respectively). Appendix F1, Table F1-1 provides these data, as well as total withdrawals and return flows, by category, within each subregion for the year 2000. The subregion divisions that are shown on Table F1-1 were determined by separating water use in each category based on the location of use. Because the OSE inventories are by county, these figures and table for the most part do not include water use for the Rio Arriba portion of the planning region. The OSE does provide more location-specific information for agricultural use, so the estimates in this category for the South subregion do include the Rio Arriba portion of the region (Embudo and vicinity). More detailed information for each of the current OSE categories is summarized and discussed in Sections 6.1.1 through 6.1.5.

By far, the largest water depletion in the Taos Region is attributable to irrigated agriculture (Figures 6-1 and 6-2). The next largest water depletions are for public and self-supplied domestic use followed by mining.



Note: Depletion amounts are in acre-feet per year

Figure 6-1

TAOS REGIONAL WATER PLAN

Taos County
Water Depletions in 2000

Daniel B. Stephens & Associates, Inc.

11/20/07

Table 6-1. Water Use 1975 Through 2000, Taos Water Planning Region
Page 1 of 4

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Groundwater	Surface Water	Groundwater	Surface Water	Groundwater			
2000 Water Year									
Commercial (self-supplied)	206	204	25	176	180	28	410	201	209
Domestic (self-supplied)	0	1,376	0	1,376	0	0	1,376	1,376	0
Industrial (self-supplied)	0	3	0	3	0	0	3	3	0
Irrigated agriculture [a]	97,461	2,096	37,614	1,654	59,847	442	99,557	39,268	60,289
Livestock (self-supplied)	40	60	40	60	0	0	100	100	0
Mining (self-supplied)	515	2,579	88	438	427	2,140	3,094	526	2,568
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	91	2,134	16	901	75	1,232	2,225	917	1,308
Reservoir evaporation	578	0	578	0	0	0	578	578	0
Totals	98,891	8,451	38,361	4,608	60,530	3,843	107,342	42,969	64,373
1995 Water Year									
Commercial (self-supplied)	113	241	16	114	97	127	354	130	224
Domestic (self-supplied)	0	1,263	0	568	0	695	1,263	568	695
Industrial (self-supplied)	0	5	0	4	0	1	5	4	1
Irrigated agriculture [a]	102,584	2,022	39,361	1,592	63,223	430	104,606	40,953	63,653
Livestock (self-supplied)	66	86	66	86	0	0	152	152	0
Mining (self-supplied)	65	1,516	11	258	54	1,258	1,581	269	1,312
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	2,024	0	799	0	1,225	2,024	799	1,225
Reservoir evaporation	578	0	578	0	0	0	578	578	0
Totals	103,406	7,157	40,032	3,421	63,374	3,736	110,563	43,453	67,110

Sources: Sorensen, 1977, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

[a] Includes estimates of agricultural water use in Embudo and vicinity, which is in the Rio Arriba portion of the planning region.

Note: With the exception of the irrigated agriculture category, this table provides water use information for Taos County only; it does not include water use estimates for the small portion of Rio Arriba County that lies within the planning region.

Table 6-1. Water Use 1975 Through 2000, Taos Water Planning Region
Page 2 of 4

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Groundwater	Surface Water	Groundwater	Surface Water	Groundwater			
1990 Water Year									
Commercial (self-supplied)	45	133	9	60	36	74	178	69	110
Domestic (self-supplied)	0	1,066	0	480	0	586	1,066	480	586
Industrial (self-supplied)	0	92	0	27	0	64	92	27	64
Irrigated agriculture [a]	103,253	1,211	40,037	926	63,216	285	104,464	40,963	63,501
Livestock (self-supplied)	58	83	58	83	0	1	141	140	1
Mining (self-supplied)	908	3,029	154	515	754	2,514	3,937	669	3,268
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	1,676	0	621	0	1,055	1,676	621	1,055
Reservoir evaporation	63	0	63	0	0	0	63	63	0
Totals	104,327	7,291	40,321	2,712	64,006	4,579	111,618	43,033	68,585
1985 Water Year									
Commercial	0	41	0	22	0	19	41	22	19
Urban	0	795	0	358	0	437	795	358	437
Rural	0	1,768	0	793	0	975	1,768	793	975
Industrial	0	38	0	19	0	19	38	19	19
Irrigated agriculture [a]	122,788	263	36,834	171	85,954	92	123,051	37,005	86,046
Livestock	78	84	78	83	0	1	162	161	1
Minerals	2,229	3,743	379	636	1,850	3,107	5,972	1,015	4,957
Power	0	0	0	0	0	0	0	0	0
Stockpond evaporation	198	0	198	0	0	0	198	198	0

Sources: Sorensen, 1977, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

[a] Includes estimates of agricultural water use in Embudo and vicinity, which is in the Rio Arriba portion of the planning region.

Note: With the exception of the irrigated agriculture category, this table provides water use information for Taos County only; it does not include water use estimates for the small portion of Rio Arriba County that lies within the planning region.

Table 6-1. Water Use 1975 Through 2000, Taos Water Planning Region
Page 3 of 4

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Groundwater	Surface Water	Groundwater	Surface Water	Groundwater			
1985 Water Year (cont.)									
Military	0	0	0	0	0	0	0	0	0
Fish and wildlife	7	0	7	0	0	0	7	7	0
Recreation	0	40	0	40	0	0	40	40	0
Reservoir evaporation	295	0	295	0	0	0	295	295	0
Totals	125,595	6,772	37,791	2,122	87,804	4,650	132,367	39,913	92,454
1980 Water Year									
Commercial	0	34	0	20	0	14	34	20	14
Urban	0	976	0	439	0	537	976	439	537
Rural	0	988	0	445	0	543	988	445	543
Industrial	0	38	0	23	0	15	38	23	15
Irrigated agriculture [a]	93,230	5,450	44,220	3,430	49,010	2,020	98,680	47,650	51,030
Livestock	121	135	121	132	0	3	256	253	3
Minerals	2,229	3,743	379	637	1,850	3,106	5,972	1,016	4,956
Power	0	0	0	0	0	0	0	0	0
Stockpond evaporation	198	0	198	0	0	0	198	198	0
Military	0	0	0	0	0	0	0	0	0
Fish and wildlife	7	0	7	0	0	0	7	7	0
Recreation	0	119	0	119	0	0	119	119	0
Reservoir evaporation	295	0	295	0	0	0	295	295	0
Totals	96,080	11,483	45,220	5,245	50,860	6,238	107,563	50,465	57,098

Sources: Sorensen, 1977, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

[a] Includes estimates of agricultural water use in Embudo and vicinity, which is in the Rio Arriba portion of the planning region.

Note: With the exception of the irrigated agriculture category, this table provides water use information for Taos County only; it does not include water use estimates for the small portion of Rio Arriba County that lies within the planning region.

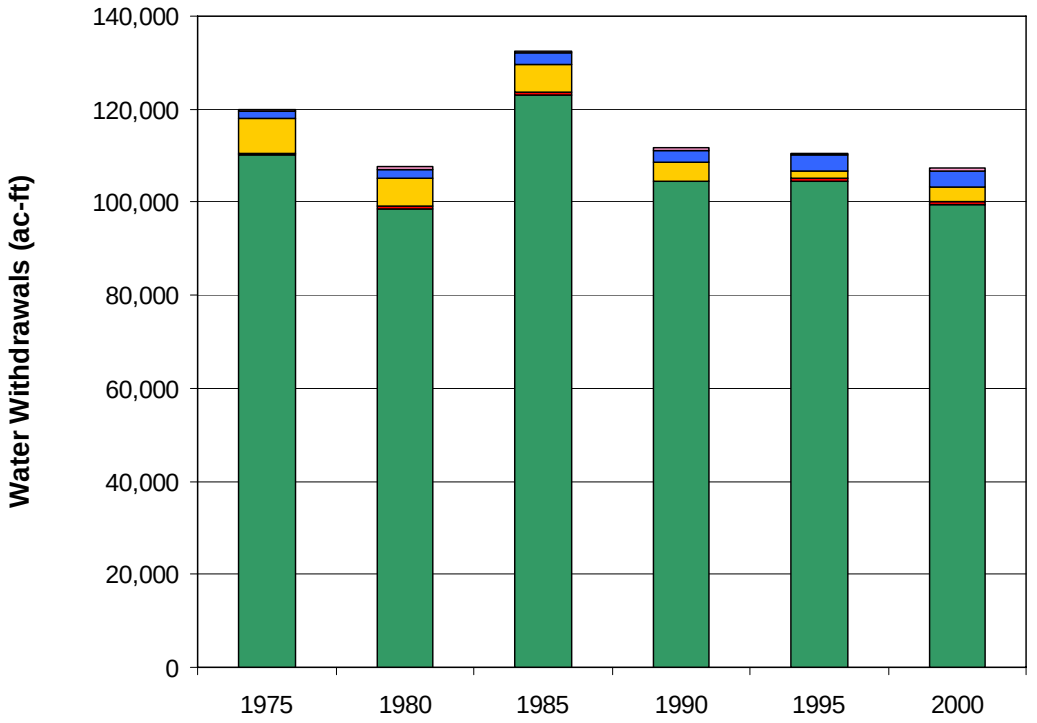
Table 6-1. Water Use 1975 Through 2000, Taos Water Planning Region
Page 4 of 4

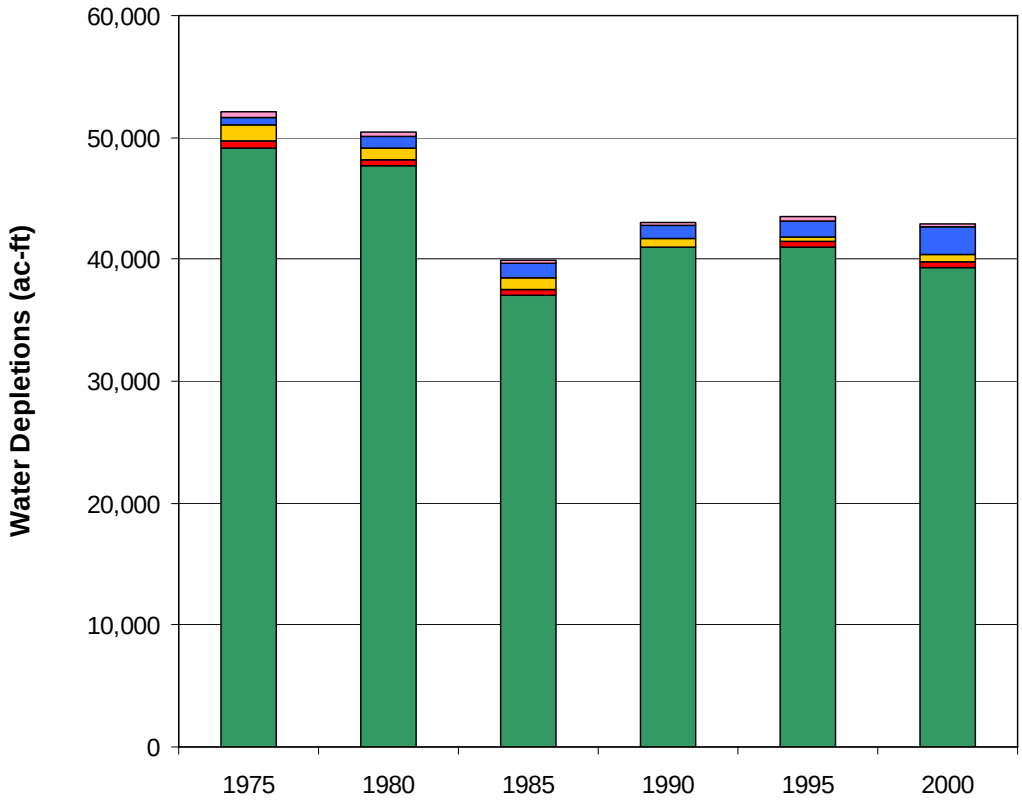
Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Groundwater	Surface Water	Groundwater	Surface Water	Groundwater			
1975 Water Year									
Manufacturing	0	72	0	43	0	29	72	43	29
Urban	0	659	0	297	0	362	659	297	362
Rural	35	827	16	372	19	455	862	388	474
Irrigated agriculture [a]	102,310	7,760	44,760	4,400	57,550	3,360	110,070	49,160	60,910
Livestock	120	120	120	120	0	0	240	240	0
Minerals	2,955	4,432	502	754	2,453	3,678	7,387	1,256	6,131
Power	0	0	0	0	0	0	0	0	0
Stockpond evaporation	162	0	162	0	0	0	162	162	0
Military	0	0	0	0	0	0	0	0	0
Fish and wildlife	64	0	64	0	0	0	64	64	0
Recreation	0	100	0	100	0	0	100	100	0
Reservoir evaporation	400	0	400	0	0	0	400	400	0
Playa lake evaporation	0	0	0	0	0	0	0	0	0
Totals	106,046	13,970	46,024	6,086	60,022	7,884	120,016	52,110	67,906

Sources: Sorensen, 1977, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

[a] Includes estimates of agricultural water use in Embudo and vicinity, which is in the Rio Arriba portion of the planning region.

Note: With the exception of the irrigated agriculture category, this table provides water use information for Taos County only; it does not include water use estimates for the small portion of Rio Arriba County that lies within the planning region.





Irrigated Agriculture Evaporation Mining Public & Self-Supplied Domestic Other

TAOS REGIONAL WATER PLAN

Historical Withdrawals and Depletions
1975 Through 2000

Daniel B. Stephens & Associates, Inc.

11/20/07

Figure 6-2

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6.1.1 Public Water Supply and Self-Supplied Domestic

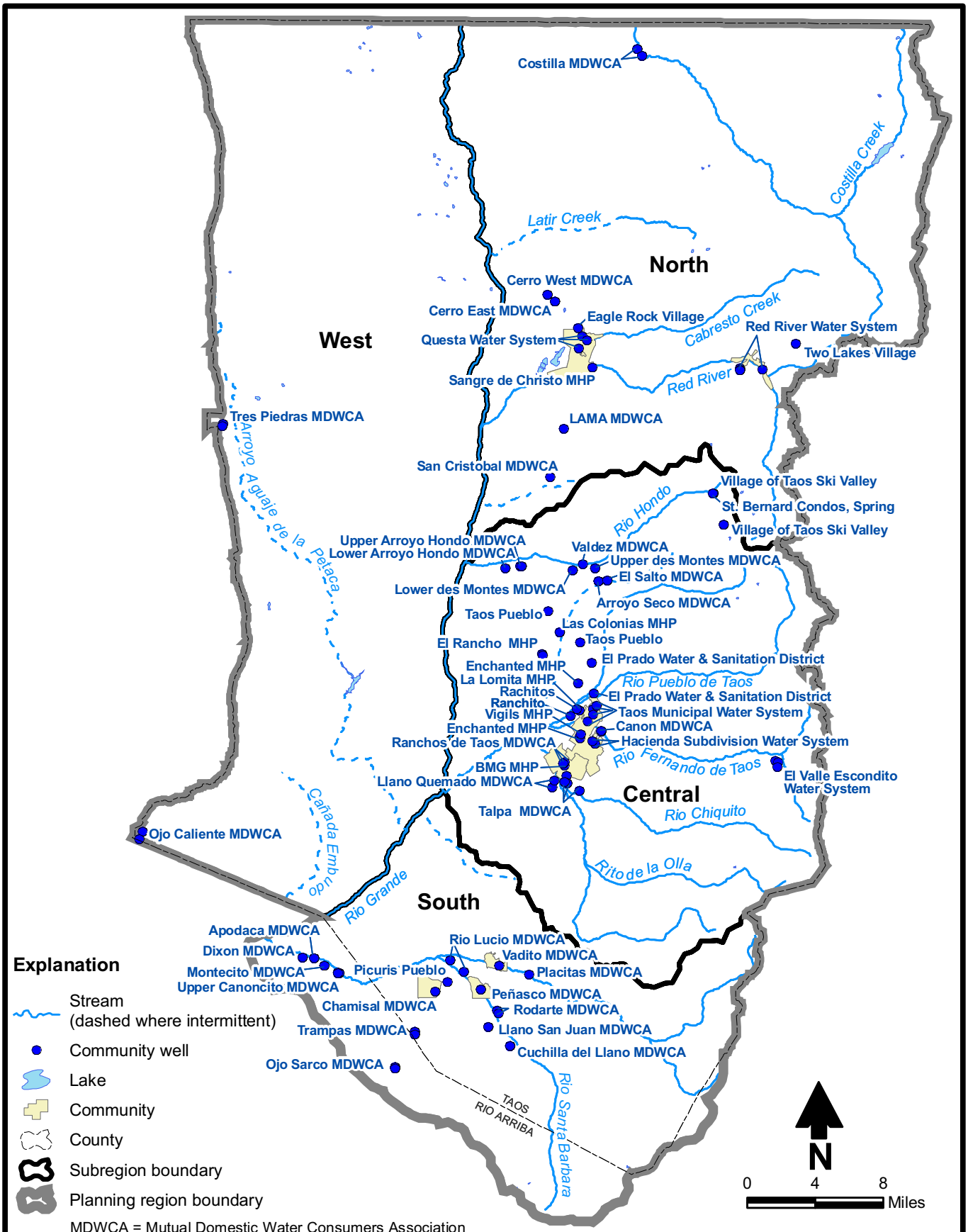
These two OSE categories include domestic use from public water supplies that serve whole communities and from private domestic wells that serve only one or a few residences, as discussed in Sections 6.1.1.1 and 6.1.1.2, respectively.

6.1.1.1 Public Water Supply

The public water supply category includes community water systems that consist of common collection (through surface water and/or groundwater diversions), treatment, storage, and distribution facilities operated for the delivery of water to multiple service connections (Wilson et al., 2003). Water used for the irrigation of self-supplied golf courses, playing fields, and parks or water used to maintain the water level in ponds and lakes owned and operated by a municipality or water utility is also included in this category. Inclusion of these uses allows comparison of the total amount of water used by the system to the water rights owned by these public water suppliers.

Information on public water systems in the planning region was compiled from the 2000 OSE water use report (Wilson et al., 2003), NMED Drinking Water Bureau database (NMED, 2005f), and data collected from public water suppliers. Information on 52 public water systems in the planning region, along with the methods for estimating population and water diversions, is provided in Appendix F1, Table F1-2 and their locations are shown in Figure 6-3. The public water systems listed in Table F1-2 include both incorporated municipalities and smaller mutual domestic associations, such as mobile home communities. The table does not include the West Rim Mutual Domestic Water Users Association (MDWUA) that was only recently formed and therefore was not included in the OSE's year 2000 assessment. The West Rim MDWUA, comprised of homeowners who were trucking water from the Pilar campground, drilled its own well to provide a backup supply to westside residents who rely solely on rainwater harvesting. Water from the well is not piped to homes; the well's sole purpose is to provide a location for residents to fill tanks.

Water diversions in recent years by the 52 public water systems in the Taos Region, along with per capita use, are summarized in Table 6-2. Most of the systems rely on groundwater; however, 2 of them (the Red River Water System and the San Cristobal MDWCA) divert a small amount of surface water.



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TAOS REGIONAL WATER PLAN

Public Water Systems

Daniel B. Stephens & Associates, Inc.

06/06/2007

JN WR05.0077

Figure 6-3

Table 6-2. Public Water System Demand and Water Rights, Taos Water Planning Region
Page 1 of 5

System Name	Population Served in 2000 [a]	Withdrawal [b] (ac-ft/yr)		Per Capita Total [c]		Water Rights [d] (ac-ft/yr)
		Surface Water	Ground-water	ac-ft/yr	gpcd	
North subregion						
Cerro East MDWCA [e]	81	0	9	*0.11*	*101*	---
Cerro West MDWCA [e]	130	0	15	*0.11*	*101*	---
Costilla MDWCA [e]	425	0	48	*0.11*	*101*	53.77
Eagle Rock Village [e]	120	0	14	*0.11*	*101*	---
Lama MDWCA [e]	80	0	9	*0.11*	*101*	---
Questa Water System	1,800	0	210	0.12	104	71
Red River Water System	350 1,281 [f]	87	487	0.35	314 [g]	259.19 (SW) 933.6 (GW)
San Cristobal MDWCA	139	4	0	0.03	28	---
Sangre de Cristo Mobile Home Park [e]	25	0	*3*	*0.13*	*113*	---
Two Lakes Village [e]	63	0	*7*	*0.11*	*101*	---
Total North	4,494	91	802	0.20	178	---
Central subregion						
Arroyo Seco MDWCA [e]	280	0	*36*	*0.13*	*113*	120.00
BMG Trailer Park [e]	40	0	*5*	*0.13*	*113*	---

Sources of information provided in Appendix F, Table F1-2

ac-ft/yr = Acre-feet per year
gpcd = Gallons per capita per day
MDWCA = Mutual domestic water consumers association
--- = Information not available
SW = Surface water
GW = Groundwater

[a] Population estimate from Wilson et al., 2003, or NMED, whichever is lower, except for Pueblos, in which case population is from the 2000 Census. NMED numbers obtained from Drinking Water Bureau website (NMED, 2005d) accessed in August 2005.

[b] Diversion estimates from Wilson et al. (2003) except where calculated

[c] Italicized rates estimated using assumptions established by Wilson (1996): Each person uses 60 gpcd for indoor use, and each home has 800 ft^2 of Kentucky bluegrass, 1,000 ft^2 of trees and shrubs, and 200 ft^2 of vegetables and herbs

[d] Water rights for MDWCA, page 38 of Abeyta Settlement (U.S. District Court, 2006b), in Red River adjudication (U.S. District Court, 2000), or in OSE WATERS database

[e] Additional systems identified by DBS&A (not on the OSE list)

[f] Transient population

[g] Does not include transient population

Table 6-2. Public Water System Demand and Water Rights, Taos Water Planning Region
Page 2 of 5

System Name	Population Served in 2000 [a]	Withdrawal [b] (ac-ft/yr)		Per Capita Total [c]		Water Rights [d] (ac-ft/yr)
		Surface Water	Ground-water	ac-ft/yr	gpcd	
Central subregion (cont.)						
Cañon MDWCA	600	0	53	0.09	79	58.34
Enchanted Mobile Home Park [e]	180	0	15	0.08	75	---
El Prado Water & Sanitation District	1,008	0	68	0.07	60	Varies depending on location of well
El Rancho Mobile Home Park [e]	72	0	*9*	*0.13*	*113*	---
El Salto MDWCA	216	0	18	0.08	73	16.33
El Valle Escondito Water System	300	0	23	0.08	67	---
Hacienda Subdivision Water System [e]	72	0	*9*	*0.13*	*113*	---
Las Colonias Mobile Home Park [e]	47	0	*6*	*0.13*	*113*	---
La Lomita Trailer Park	100	0	9	0.09	78	---
Llano Quemado MDWCA	650	0	40	0.06	54	42.11 (35.56 [h])
Lower Arroyo Hondo MDWCA	388	0	14	0.04	33	24.30
Lower Des Montes MDWCA [e]	300	0	*38*	*0.13*	*113*	21.59

Sources of information provided in Appendix F, Table F1-2

ac-ft/yr = Acre-feet per year
gpcd = Gallons per capita per day
MDWCA = Mutual domestic water consumers association
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SW = Surface water
GW = Groundwater

[a] Population estimate from Wilson et al., 2003, or NMED, whichever is lower, except for Pueblos, in which case population is from the 2000 Census. NMED numbers obtained from Drinking Water Bureau website (NMED, 2005d) accessed in August 2005.
[b] Diversion estimates from Wilson et al. (2003) except where calculated
[c] Italicized rates estimated using assumptions established by Wilson (1996): Each person uses 60 gpcd for indoor use, and each home has 800 ft^2 of Kentucky bluegrass, 1,000 ft^2 of trees and shrubs, and 200 ft^2 of vegetables and herbs
[d] Water rights for MDWCA, page 38 of Abeyta Settlement (U.S. District Court, 2006b), in Red River adjudication (U.S. District Court, 2000), or in OSE WATERS database
[e] Additional systems identified by DBS&A (not on the OSE list)
[f] Transient population
[g] Does not include transient population
[h] Number listed in WATERS database

Table 6-2. Public Water System Demand and Water Rights, Taos Water Planning Region
Page 3 of 5

System Name	Population Served in 2000 [a]	Withdrawal [b] (ac-ft/yr)		Per Capita Total [c]		Water Rights [d] (ac-ft/yr)
		Surface Water	Ground-water	ac-ft/yr	gpcd	
Central subregion (cont.)						
Ranchitos [e]	266	0	19	0.07	62	18.15
Ranchos de Taos MDWCA	1,100	0	50	0.05	40	105
St Bernard Condos Water System [e]	76	0	*10*	*0.13*	*113*	---
Talpa MDWCA	735	0	54	0.07	65	64.48 (46.23 [h])
Taos Municipal Water System	3,516	0	895	0.25	227	1,852.67
Taos Pueblo	1,264	---	---	---	---	---
Upper Arroyo Hondo MDWCA	150	0	9	0.06	52	26.60
Upper Des Montes MDWCA	280	0	64	0.23	205	9.07
Valdez MDWCA [e]	120	0	6	0.05	43	11.50
Vigils Trailer Park	93	0	9	0.10	87	---
Village of Taos Ski Valley (Twining)	40 610 [f]	0	104	0.16	143	---
Total Central (not including Taos Pueblo)	11,238	0	1,560	0.14	124	---

Sources of information provided in Appendix F, Table F1-2

ac-ft/yr = Acre-feet per year
gpcd = Gallons per capita per day
MDWCA = Mutual domestic water consumers association
--- = Information not available
SW = Surface water
GW = Groundwater

[a] Population estimate from Wilson et al., 2003, or NMED, whichever is lower, except for Pueblos, in which case population is from the 2000 Census. NMED numbers obtained from Drinking Water Bureau website (NMED, 2005d) accessed in August 2005.
[b] Diversion estimates from Wilson et al. (2003) except where calculated
[c] Italicized rates estimated using assumptions established by Wilson (1996): Each person uses 60 gpcd for indoor use, and each home has 800 ft^2 of Kentucky bluegrass, 1,000 ft^2 of trees and shrubs, and 200 ft^2 of vegetables and herbs
[d] Water rights for MDWCA, page 38 of Abeyta Settlement (U.S. District Court, 2006b), in Red River adjudication (U.S. District Court, 2000), or in OSE WATERS database
[e] Additional systems identified by DBS&A (not on the OSE list)
[f] Transient population
[g] Does not include transient population
[h] Number listed in WATERS database

Table 6-2. Public Water System Demand and Water Rights, Taos Water Planning Region
Page 4 of 5

System Name	Population Served in 2000 [a]	Withdrawal [b] (ac-ft/yr)		Per Capita Total [c]		Water Rights [d] (ac-ft/yr)
		Surface Water	Ground-water	ac-ft/yr	gpcd	
South subregion						
Apodaca MDWCA [e]	107	0	*13*	*0.12*	*108*	---
Chamisal MDWCA [e]	313	0	*38*	*0.12*	*108*	---
Cuchilla Del Llano MDWCA [e]	181	0	*22*	*0.12*	*108*	123.88 [h] (GW)
Dixon MDWCA	400	0	37	0.09	83	29.41 [h] (GW)
Llano San Juan MDWCA [e]	64	0	8	0.12	109	---
Montecito MDWCA [e]	60	0	*7*	*0.12*	*108*	---
Ojo Sarco MDWCA	116	0	11	0.09	84	24 [h]
Peñasco MDWCA	437	0	89	0.20	183	179.3 [h] (GW)
Picuris Pueblo [e]	86	---	---	---	---	---
Placitas MDWCA	220	0	13	0.06	54	---
Rio Lucio MDWCA	360	0	23	0.06	56	---
Rodarte MDWCA	120	0	*14*	*0.12*	*108*	---
Trampas MDWCA	120	0	6	0.05	43	12.82 [h]
Upper Cañoncito MDWCA	75	0	3	0.04	36	---

Sources of information provided in Appendix F, Table F1-2

ac-ft/yr = Acre-feet per year
gpcd = Gallons per capita per day
MDWCA = Mutual domestic water consumers association
--- = Information not available
SW = Surface water
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[a] Population estimate from Wilson et al., 2003, or NMED, whichever is lower, except for Pueblos, in which case population is from the 2000 Census. NMED numbers obtained from Drinking Water Bureau website (NMED, 2005d) accessed in August 2005.
[b] Diversion estimates from Wilson et al. (2003) except where calculated
[c] Italicized rates estimated using assumptions established by Wilson (1996): Each person uses 60 gpcd for indoor use, and each home has 800 ft^2 of Kentucky bluegrass, 1,000 ft^2 of trees and shrubs, and 200 ft^2 of vegetables and herbs
[d] Water rights for MDWCA, page 38 of Abeyta Settlement (U.S. District Court, 2006b), in Red River adjudication (U.S. District Court, 2000), or in OSE WATERS database
[e] Additional systems identified by DBS&A (not on the OSE list)
[f] Transient population
[g] Does not include transient population
[h] Number listed in WATERS database

Table 6-2. Public Water System Demand and Water Rights, Taos Water Planning Region
Page 5 of 5

System Name	Population Served in 2000 [a]	Withdrawal [b] (ac-ft/yr)		Per Capita Total [c]		Water Rights [d] (ac-ft/yr)
		Surface Water	Ground-water	ac-ft/yr	gpcd	
South subregion (cont.)						
Vadito MDWCA	180	0	*22*	*0.12*	*108*	---
Total South (not including Picuris Pueblo)	2,774	0	308	0.11	99	---
Rio Arriba total in South subregion	758	0	71	0.09	84	---
West subregion						
Ojo Caliente MDWCA	184	0	40	0.16	144	---
Tres Piedras MDWCA	117	0	13	0.11	95	40.3 [h]
Total West	301	0	53	0.14	129	---
Total Taos Region	18,807	91	2,724	0.14	129	---
Taos Region in Taos Co	18,049	0	2,652	0.15	131	---
Taos Region in Rio Arriba Co	758	0	71	0.09	84	---

Sources of information provided in Appendix F, Table F1-2

ac-ft/yr = Acre-feet per year
gpcd = Gallons per capita per day
MDWCA = Mutual domestic water consumers association
--- = Information not available
SW = Surface water
GW = Groundwater

[a] Population estimate from Wilson et al., 2003, or NMED, whichever is lower, except for Pueblos, in which case population is from the 2000 Census. NMED numbers obtained from Drinking Water Bureau website (NMED, 2005d) accessed in August 2005.
[b] Diversion estimates from Wilson et al. (2003) except where calculated
[c] Italicized rates estimated using assumptions established by Wilson (1996): Each person uses 60 gpcd for indoor use, and each home has 800 ft^2 of Kentucky bluegrass, 1,000 ft^2 of trees and shrubs, and 200 ft^2 of vegetables and herbs
[d] Water rights for MDWCA, page 38 of Abeyta Settlement (U.S. District Court, 2006b), in Red River adjudication (U.S. District Court, 2000), or in OSE WATERS database
[e] Additional systems identified by DBS&A (not on the OSE list)
[f] Transient population
[g] Does not include transient population
[h] Number listed in WATERS database

In addition to total annual usage (Table 6-1), it is important to consider seasonal variations in usage as well as water rights. The Town of Red River and the Village of Taos Ski Valley (formerly called the Twining Water and Sanitation District) serve transient populations in addition to the populations recorded in the 2000 census. The estimated transient populations, based on the number of connections to the two water systems, are listed in Table 6-2. Figures 6-4 through 6-6 illustrate historical water use for three communities in the planning region:

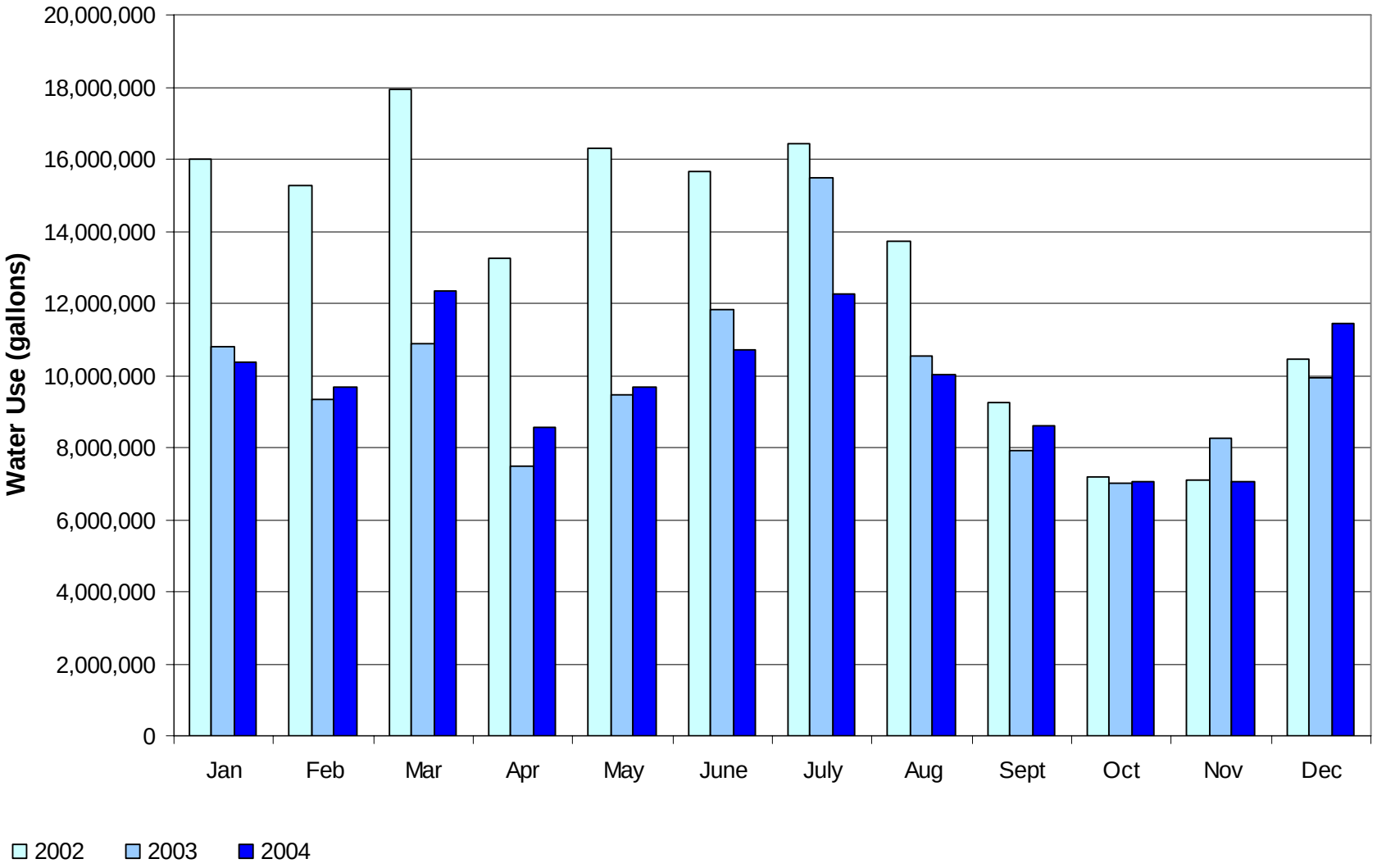
- Monthly water diversions for Red River from 2002 through 2004 (Figure 6-4) more than double during ski season and in summer months as compared to the off-season.

- Water use by the El Prado MDWCA has been steadily increasing (Figure 6-5).

- The historical water use and permitted water rights for the Town of Taos, the largest community in the planning region, are shown in Figure 6-6.

The amount of water diverted for each of the 52 systems and the population served was estimated based on information in the 2000 OSE water use report Wilson et al. (2003) and on the NMED Drinking Water Bureau website (http://eidea.state.nm.us/SDWIS) and further refined with information collected from personal contact with the owners of the public water supply systems. Most systems listed in the OSE inventory (Wilson et al., 2003) measure and report their water production. However, where the water diversions were not measured, quantities were estimated by multiplying the population times a calculated per capita demand rate. Where information on the population served was lacking, it was estimated by multiplying the number of service connections times the average household size, as determined from the 2000 U.S. Census (Section 6.2).

Both Picuris and Taos Pueblos have public water supply systems; however, the amount of water produced and the number of residents supplied have not been made public. The Draft Abeyta Settlement Agreement (Section 4.5.3.1) for the Central subregion allows for 224 ac-ft/yr from Taos Pueblo community wells and 76 ac-ft/yr from domestic wells, but the population served is not known, nor is it clear what the current depletions are. The populations of Taos and Picuris Pueblos were subtracted from the census population to determine the population that is self-supplied. Both pueblos have public water systems and domestic wells, but the population served by each is not known.



Source: Data provided by Red River Water System

Figure 6-4

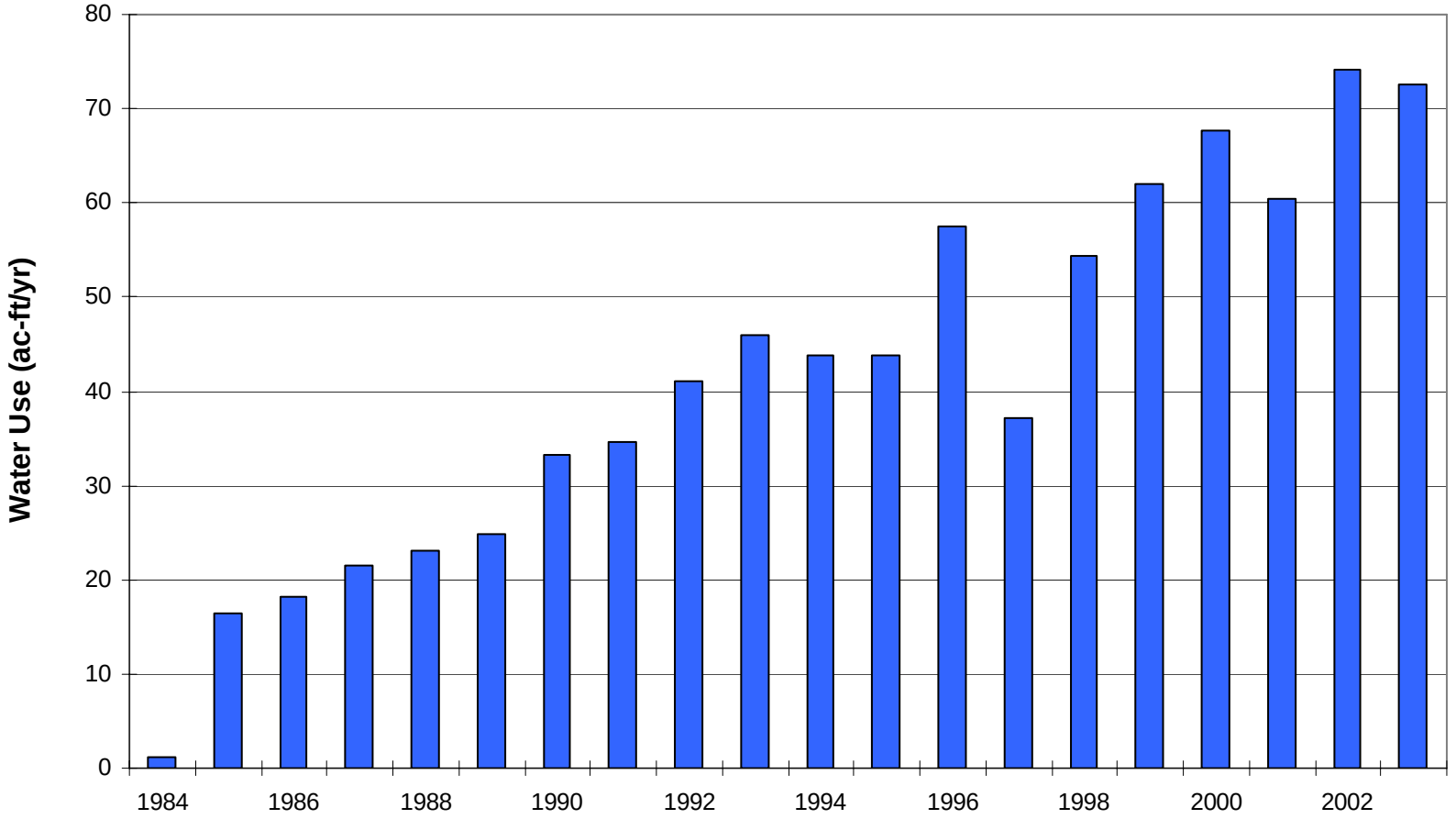
TAOS REGIONAL WATER PLAN

Red River Water System

Monthly Water Usage, 2002 Through 2004

Daniel B. Stephens & Associates, Inc.

11/20/07



Source: Hydroscience Associates, Inc. and EPWSD, 2004

Figure 6-5

TAOS REGIONAL WATER PLAN

El Prado Water and Sanitation District
Historical Water Usage

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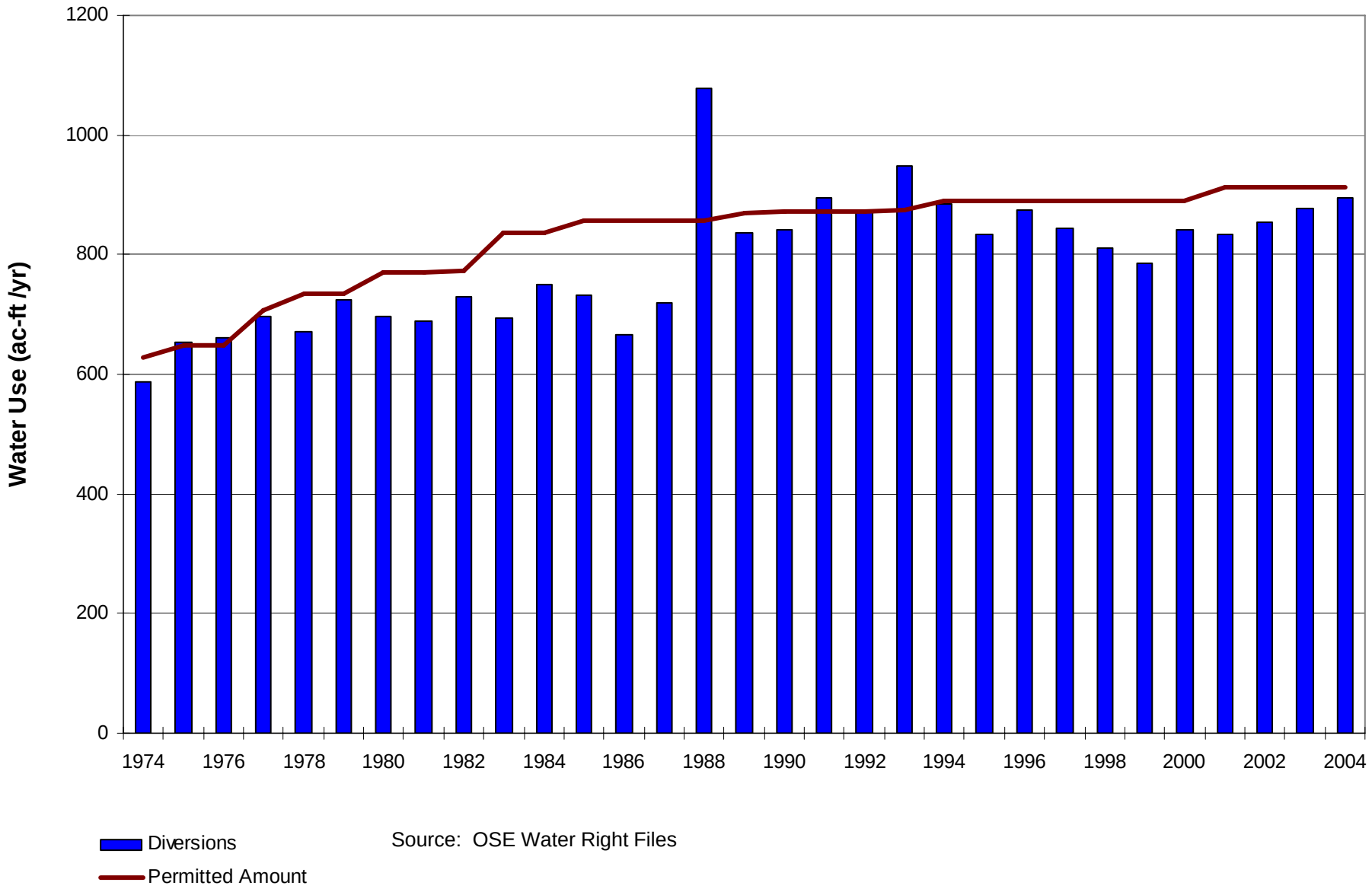
11/20/07



Source: OSE Water Right Files

Figure 6-6

TAOS REGIONAL WATER PLAN

Annual Water Diversions vs. Permitted Water Rights for the Town of Taos

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11/20/07

Return flow from public supply systems was estimated to be 50 percent of diversions based on the OSE water use report for 2000 (Wilson et al., 2003).

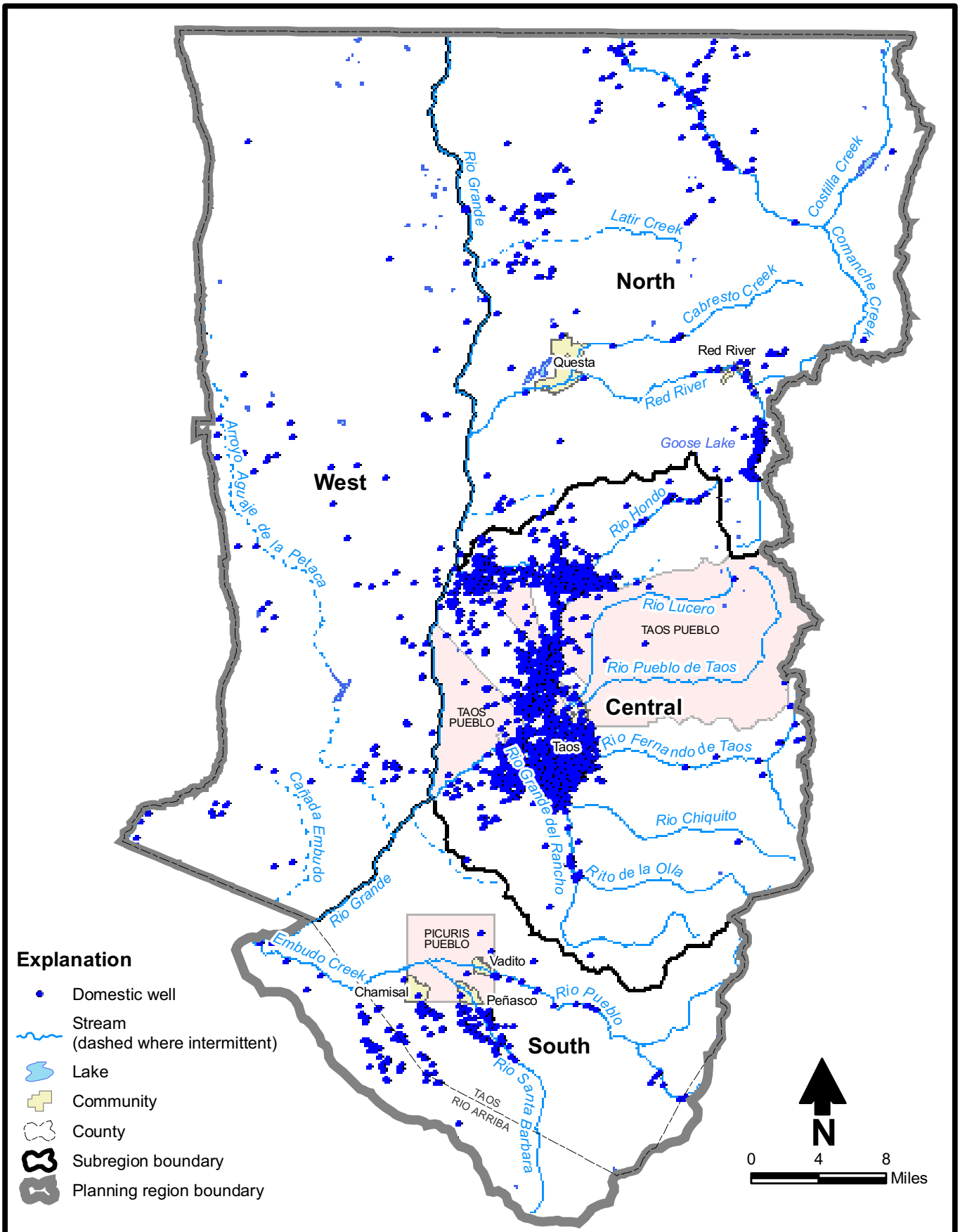
6.1.1.2 Self-Supplied Domestic Wells

This category includes self-supplied residences, which may be single-family or multi-family dwellings, with wells permitted by the OSE under NMSA Section 72-12-1 (Section 4.1.4; Appendix D).

The OSE Water Administration Technical Engineering Resource System (WATERS) database was used to estimate the number of domestic wells in the planning region (Figure 6-7). Although conversations with the OSE indicate that the database is incomplete at present, the number of domestic wells in Taos County listed in WATERS is 7,578 (NM OSE, 2003b). The WATERS database has location information for only 30 percent of these wells, which is insufficient to estimate the number of these wells that fall in each of the four subregions or to estimate the number of wells in the Rio Arriba County portion of the planning region.

For the entire Taos Region, the total withdrawals in 2000 for the self-supplied domestic well category were estimated at 1,638 ac-ft/yr. This estimate is based on the procedure defined by Wilson et al. (2003), which is to subtract the population served by public water supply systems from the total regional population and multiply the remainder (which is presumably self-supplied) by a reasonable per capita estimate. The per capita use for domestic wells was set the same as the per capita demand estimated for small public supply systems (Section 6.1.1.1).

DBS&A's self-supplied domestic well withdrawal estimate for the entire planning region is about 20 percent higher than the OSE estimate (Wilson et al., 2003) of 1,376 ac-ft/yr (Table 6-3). While DBS&A used the same procedure as the OSE, the DBS&A estimate includes the population for the entire planning region, which includes a portion of Rio Arriba County that was not included in the OSE estimate. Additionally, DBS&A used slightly different per capita water use and population numbers, primarily because DBS&A identified more public supply systems than the OSE did. The public supply systems identified by DBS&A that are not on the OSE list are indicated on Table 6-2.



Source: NM OSE WATERS database
(last updated 03/17/2003)

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11/14/2007 JN WR05.0235

TAOS REGIONAL WATER PLAN
Domestic Wells
Figure 6-7

Table 6-3. Comparison of Estimates of Domestic Well Diversions in 2000 by Subregion

Estimate Source	Estimated Domestic Well Diversions [a]								
	North Subregion		Central Subregion		South Subregion		West Subregion		Total
	ac-ft/yr	ac-ft/yr/cap	ac-ft/yr	ac-ft/yr/cap	ac-ft/yr	ac-ft/yr/cap	ac-ft/yr	ac-ft/yr/cap	ac-ft/yr
DBS&A [b]	195	0.11	1,135	0.13	223	0.12	85	0.12	1,638
OSE [c]	---	0.09	---	0.09	---	0.09	---	0.09	1,376

[a] Additional details of calculations provided in Section 6.3.1

[b] Based on population balance and average water diversions in the Taos Region

[c] Wilson et al., 2003 (Taos County only)

ac-ft/yr = Acre-feet per year
ac-ft/yr/cap = Acre-feet per year per capita
DBS&A = Daniel B. Stephens & Associates, Inc.
OSE = Office of the State Engineer

6.1.2 Irrigated Agriculture

As shown in Figures 6-1 and 6-2, irrigated agriculture is the largest water use in the Taos Region. Surface water is the primary source of irrigation water, accounting for 96 percent of irrigation depletions, with groundwater providing the remaining 4 percent. Table 6-4 shows the total irrigated acreage and associated water diversions and depletions in each subregion for the year 1999, as reported by OSE (Wilson et al., 2003) (OSE used the year 1999 instead of the year 2000 because 2000 was very dry). The OSE estimates of water use by category (Table 6-1) define irrigated agriculture use through estimates of acreage and diversions per acre (Wilson et al., 2003) rather than through measured diversions, and hence there is uncertainty in the estimates.

Table 6-4. Irrigation Water Use, by Subregion, in 1999

Subregion	Total Acres Irrigated	Withdrawals (acre-feet)			Depletions (acre-feet)		
		Surface Water	Ground-water	Total	Surface Water	Ground-water	Total
North	10,460	27,862	1,280	29,142	9,529	1,050	10,579
Central	13,940 [a]	52,755	350	53,105	21,271	222	21,493
South [b]	5,270	16,638	466	17,104	6,708	382	7,090
West	80	206	0	206	106	0	106
Total	29,750	97,461	2,096	99,557	37,614	1,654	39,268

Source: Wilson et al., 2003

[a] A total 14,171.15 acres of irrigation water rights (not including Taos Pueblo) were identified in the Abeyta adjudication database (McCall, 2005).

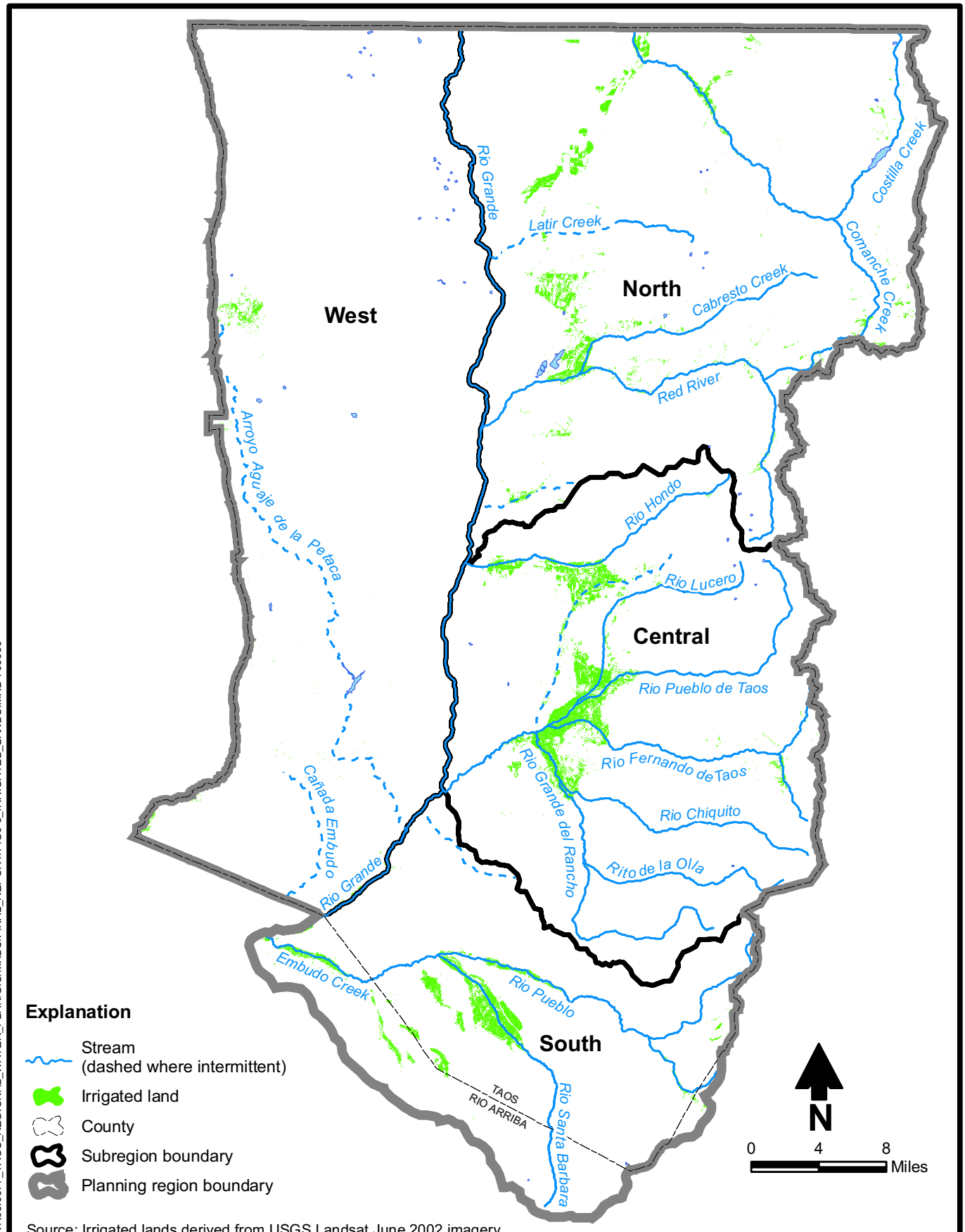
[b] Including estimates for the Rio Arriba portion of the planning region

OSE obtains their estimates of irrigated acres from the Farm Service Agency (FSA), which compiles acreage reported by farmers actively involved in FSA programs. However, because only about 80 percent of farmers in Taos County participate in FSA programs, the irrigated acreage reported by this method may be underestimated, although such underestimation may be offset somewhat by the fact that the acreage reported by farmers may include fallow lands. Both Taos and Picuris Pueblos have participated in FSA programs, and their acreage is included. Figure 6-8 shows the locations of irrigation in the planning region.

The majority of lands are irrigated with surface water from tributaries to the Rio Grande. No lands in the region were identified as irrigated directly from the main stem of the Rio Grande. Surface water is provided to farms through the approximately 300 acéquias that exist in the planning region; a list of those acéquias and the diversion amounts was compiled by Butchie Denver (2005) for the Taos County Planning Department by contacting individual acéquia owners in 2004 and 2005; this list is provided in Appendix F1, Table F1-3. DBS&A added information to the list from the database for the Abeyta adjudication (Section 4.5.3) in the Taos Valley (McCall, 2005), water rights from the Red River adjudication and Costilla Decree, and an OSE report on acéquia bylaws (NM OSE, 1987).

The water used for agriculture irrigates a variety of crops, including hay, corn, wheat, orchards, and vegetables (Table 6-5). The amount of water used per acre of irrigated land in each subregion is dependent on both the amount of water required to sustain the particular crops being grown (the CIR) and the method of irrigation. The irrigation methods currently used in the Taos Region are flood irrigation and sprinkler systems.

Sections 6.1.2.1 through 6.1.2.4 discuss the reported water use and irrigated acres by subregion in the planning region. Table 6-6 compares total irrigated crop acreage data from sources for irrigated agricultural data in Taos County: the OSE (Wilson et al., 2003), WRRI (Lansford et al., 1996), and the GIS coverage and irrigated acreage estimated from a tabulation of acéquias in the region. The total cropland acreage provided in the WRRI reports is based on the acreages reported by the U.S. Bureau of Indian Affairs (for Indian lands) and the U.S. Bureau of Reclamation (for Reclamation projects), acreages set forth in adjudications and court decrees and in State Engineer licenses and permits, and where these data are lacking, recent aerial photography.



Source: Irrigated lands derived from USGS Landsat June 2002 imagery

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TAOS REGIONAL WATER PLAN

Irrigated Lands

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06/06/2007

JN WR05.0235

Figure 6-8

Table 6-5. Crop Mix in the Taos Valley

Crop	Irrigated Acreage [a]
Alfalfa	4,900
Grain	55
Pasture (improved)	3,620
Native pasture	4,780
Vegetables	500
Orchards	35
Total	13,890

[a] Source: Unpublished OSE software for estimating CIR for Taos and vicinity based on cropping pattern and weather for 1999 (Wilson, undated)

Table 6-6. Estimates of Total Irrigated Acreage in Taos County

Time Frame	Estimate Source	Estimated Irrigated Acreage	Comments
Water rights	*See Appendix F1, Table F1-3*	*43,507* [a]	*Irrigated and fallow*
1999	OSE (Wilson et al., 2003)	29,750	Irrigated [b]
1995	OSE (Wilson and Lucero, 1997)	29,500	Irrigated [b]
1960-1996	WRRI (Lansford et al., 1996)	41,900	Irrigated and fallow
1999-2001	DBS&A GAP data (USGS, 2004a)	45,788	Irrigated and fallow
June 2002	DBS&A Landsat (USGS, 2004b)	27,616	Currently irrigated

[a] Based on the Draft Abeyta Settlement Agreement (U.S. District Court, 2006b), the Red River adjudication (U.S. District Court, 2000), NM OSE, 1987, and Lee Wilson & Associates, 1978
[b] Irrigated acreage reported by farmers to the Farm Service Agency may include some fallow land.

As shown in Table 6-6, the OSE and WRRI data for Taos County compare very well. The Landsat imagery for 2002 shows slightly less acreage, which may be due to the drought in 2002. Estimates of total acreage irrigated (fallow and currently irrigated) range from about 41,900 from the WRRI report (Lansford et al., 1996) to almost 45,800 based on GIS coverage of vegetation (USGS, 2004a).

6.1.2.1 North Subregion

Table 6-7 summarizes the irrigated acres and water use as reported by the OSE (Sorenson, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003) for the North subregion, specifically, areas identified by the OSE as Cerro-Questa and Costilla.

Table 6-7. Irrigation Water Use in the North Subregion

Reporting Year	Total Acres Irrigated	Total Withdrawal (acre-feet)	Total Depletion (acre-feet)
1975	NA [a]	NA [a]	NA [a]
1980	9,820	23,170	11,330
1985	8,030	30,917	NA
1990	9,555	34,687	12,325
1995	10,390	34,161	12,258
2000 [b]	10,460	29,142	10,579

[a] The OSE did not report irrigation data for 1975.

[b] OSE-reported irrigation data for the year 2000 are based on 1999 data because 2000 was a drought year and OSE water use reports are meant to represent average conditions

While the irrigated acreage reported by the OSE (Wilson et al., 2003) is about 10,500 acres (Tables 6-7 and 6-8), the tabulation of acéquia-irrigated acreage (Appendix F1, Table F1-3) totals 19,580 acres for the North subregion, which may be closer to the acreage with water rights. This includes more than 4,500 acres of groundwater irrigation rights (Red River adjudication), most of which have not been put to beneficial use. The OSE (Wilson et al., 2003) reports only 700 acres irrigated with groundwater in the North subregion. Crops are primarily irrigated with surface water from Costilla Creek, West Latir Creek, Cabresto Creek, and Red River.

Table 6-8. Estimates of Irrigated Acreage in the North Subregion

Time Frame	Estimate Source	Estimated Irrigated Acreage	Comments
Water rights	*See Appendix F1, Table F1-3*	*19,580*	*Irrigated and fallow*
1999	OSE (Wilson et al., 2003)	10,460	Irrigated [a]
1999-2001	DBS&A GAP data (USGS, 2004a)	15,560	Irrigated and fallow
June 2002	DBS&A Landsat (USGS, 2004b)	7,303	Currently irrigated

[a] Irrigated acreage reported by farmers to the Farm Service Agency may include some fallow land.

Land irrigated with surface water in the North subregion is flood irrigated, with a CIR ranging from 0.662 to 1.109 acre-feet per acre (ac-ft/ac), and land irrigated with groundwater is applied through sprinkler irrigation, with a CIR ranging from 1.182 to 1.228 ac-ft/ac (Wilson et al., 2003). Overall diversions are 2.85 ac-ft/ac for land irrigated with surface water and 1.83 ac-ft/ac for

land irrigated with groundwater. Numerous uncertainties exist in estimating irrigated acreage. Without evaluating infrared aerial photographs, the estimates are usually based on the acreage reported by farmers or the amount of production.

6.1.2.2 Central Subregion

Table 6-9 summarizes the irrigated acres and water use as reported by the OSE (Sorenson, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003) for the Central subregion, specifically, Taos and vicinity.

Table 6-9. Irrigation Water Use in the Central Subregion

Reporting Year	Total Acres Irrigated	Total Withdrawal (acre-feet)	Total Depletion (acre-feet)
1975	NA [a]	NA [a]	NA [a]
1980	16,490	54,280	24,590
1985	14,660	66,990	NA
1990	13,765	53,775	21,718
1995	13,805	53,375	21,602
2000 [b]	13,940	53,105	21,493

[a] The OSE did not report irrigation data for 1975.
[b] OSE-reported irrigation data for the year 2000 are based on 1999 data because 2000 was a drought year and OSE water use reports are meant to represent average conditions

The number of irrigated acres in the Central subregion likely ranges from about 13,000 (non-fallow acreage as reported by Bellinger [2004]) to about 16,700 acres (Table 6-10). The Abeyta adjudication database, which is based on the 1969 Hydrographic Survey and latest acreages in the ongoing adjudication (*State v. Abeyta*), lists 14,171.15 acres for the Central subregion (McCall, 2005). This database should provide the most accurate estimate of non-Pueblo lands that have water rights for irrigation, but it does not include Taos Pueblo irrigation rights, which currently total 2,322.45 acres (U.S. District Court, 2006b).

Table 6-10. Estimates of Irrigated Acreage in the Central Subregion

Time Frame	Estimate Source	Estimated Irrigated Acreage	Comments
Water rights	*See Appendix F1, Table F1-3*	*16,495*	*Irrigated and fallow*
	McCall, 2005	*14,171.15*	*Irrigated and fallow* [a]
	Draft Abeyta Settlement Agreement (Taos Pueblo)	*2,322.45 (5,712.78* [b]*)*	*Irrigated and fallow*
1969	Bellinger, 2004	12,956.87	Irrigated
1999	OSE (Wilson et al., 2003)	13,940	Irrigated [a]
1999-2001	DBS&A GAP data (USGS, 2004a)	16,658	Irrigated and fallow
June 2002	DBS&A Landsat (USGS, 2004b)	12,097	Currently irrigated

[a] Water rights included in Abeyta adjudication database; does not include Taos Pueblo
[b] Future Taos Pueblo

Land irrigated with surface water in the Central subregion is flood irrigated, with a CIR of 1.338 ac-ft/ac, and land irrigated with groundwater is applied through both flood and sprinkler irrigation, with a CIR ranging from 1.338 to 1.419 ac-ft/ac (Wilson et al., 2003). Overall diversions are 3.86 ac-ft/ac for land irrigated with surface water and 2.5 ac-ft/ac for land irrigated with groundwater. The 1969 Hydrographic Survey assigned a CIR of 1.26 ac-ft/ac to lands irrigated with surface water on the Rio Hondo, and that is likely to increase to 1.38 ac-ft/ac in the final adjudication (U.S. District Court, 2006b).

For the OSE model (Barroll and Burck, 2006; Bellinger, 2004), which covers all of the tributaries located in the Central subregion (Rio Hondo, Arroyo Seco, Rio Pueblo de Taos, Rio Lucero, Rio Fernando, and Rio Grande del Rancho), surface water diversions for irrigation were estimated to be 41,053.6 ac-ft/yr. This estimate is about 23 percent less than the estimate in the 2000 OSE water use report (Wilson et al., 2003) (a small part of that difference is due to the inclusion of 350 ac-ft/yr of groundwater diversions in the water use report estimate). Bellinger (2004) cites the 1969 hydrographic survey as the source for non-fallow irrigated lands. The Wilson et al. (2003) estimate is based on 1999 irrigated acreage estimates from the FSA, which may include some fallow lands. However, FSA only includes lands of farmers participating in their program and thus may also underestimate the acreage irrigated.

6.1.2.3 South Subregion

Table 6-11 summarizes the irrigated acres and water use as reported by the OSE (Sorenson, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003) for the South subregion, specifically, areas identified by the OSE as Embudo and vicinity.

Table 6-11. Irrigation Water Use in the South Subregion

Reporting Year	Total Acres Irrigated	Total Withdrawal (acre-feet)	Total Depletion (acre-feet)
1975	NA [a]	NA [a]	NA [a]
1980	7,000	20,580	11,410
1985	5,205	24,784	NA
1990	5,145	15,915	6,875
1995	5,225	16,926	7,019
2000 [b]	5,270	17,104	7,090

[a] The OSE did not report irrigation data for 1975.
[b] OSE-reported irrigation data for the year 2000 are based on 1999 data because 2000 was a drought year and OSE water use reports are meant to represent average conditions

Whereas the number of irrigated acres in the South subregion is estimated at 5,270 (actual irrigated acreage as reported by the OSE [Wilson et al., 2003]) (Table 6-12), the acéquia list (Appendix F1, Table F1-3) shows about 6,805 acres. Land in the South subregion that is irrigated with surface water is flood irrigated, with a CIR of 1.16 ac-ft/ac, and land irrigated with groundwater is applied through sprinkler irrigation, with a CIR of 1.212 ac-ft/ac (Wilson et al., 2003). Overall diversions are 3.314 ac-ft/ac for land irrigated with surface water and 1.864 ac-ft/ac for land irrigated with groundwater.

Table 6-12. Estimates of Irrigated Acreage in the South Subregion

Time Frame	Estimate Source	Estimated Irrigated Acreage	Comments
Water rights	*Appendix F1, Table F1-3*	*6,805*	*Irrigated and fallow*
1999	OSE (Wilson et al., 2003)	5,270	Irrigated [a]
1999-2001	DBS&A GAP data (USGS, 2004a)	8,984	Irrigated and fallow
June 2002	DBS&A Landsat (USGS, 2004b)	7,278	Currently irrigated

[a] Irrigated acreage reported by farmers to the Farm Service Agency may include some fallow land.

6.1.2.4 West Subregion

Table 6-13 summarizes the irrigated acres and water use as reported by the OSE (Sorenson, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003) for the West subregion, specifically, the areas identified by the OSE as Pilar and Ojo Caliente.

Table 6-13. Irrigation Water Use in the West Subregion

Reporting Year	Total Acres Irrigated	Total Withdrawal (acre-feet)	Total Depletion (acre-feet)
1975	NA [a]	NA [a]	NA [a]
1980	190	650	320
1985	120	360	NA
1990	35	87	45
1995	80	144	74
2000 [b]	80	206	106

[a] The OSE did not report irrigation data for 1975.
[b] OSE-reported irrigation data for the year 2000 are based on 1999 data because 2000 was a drought year and OSE water use reports are meant to represent average conditions

As shown in Table 6-14, the estimates of irrigated acreage in the West subregion vary widely. Land in the West subregion is irrigated solely with surface water through flood irrigation, with a CIR of 1.159 ac-ft/ac according to Wilson et al. (2003). Overall diversions are 2.575 ac-ft/ac to account for conveyance losses.

Table 6-14. Estimates of Irrigated Acreage in the West Subregion

Time Frame	Estimate Source	Estimated Irrigated Acreage	Comments
Water rights	*See Appendix F1, Table F1-3*	*627*	*Irrigated and fallow*
1999	OSE (Wilson et al., 2003)	80	Irrigated [a]
1999-2001	DBS&A GAP data (USGS, 2004a)	4,586	Irrigated and fallow
June 2002	DBS&A Landsat (USGS, 2004b)	938	Currently irrigated

[a] Irrigated acreage reported by farmers to the Farm Service Agency may include some fallow land.

6.1.3 Self-Supplied Livestock

Livestock use represents a small proportion (about 0.25 percent) of the total depletions in Taos County (information on livestock use in the portion of the planning region in Rio Arriba County was not available). The total depletions for self-supplied livestock in Taos County, as presented in the last three OSE water use reports (Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003), are provided in Table 6-15. About 40 percent of the water for livestock use is derived from surface water and 60 percent from groundwater. Details for subregions within the planning region (and for the Rio Arriba County portion) are not available from OSE reports, but for purposes of estimating water use in each subregion, it was assumed that 30 percent of the livestock is present in each of the North, Central, and South subregions, and the remaining 10 percent is within the West subregion.

Table 6-15. Livestock Water Use in Taos County

Reporting Year	Total Depletion [a] (acre-feet)
1990	140.13
1995	152.05
2000	99.83

Sources: Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003
[a] Including both surface water and groundwater

Wilson et al. (2003) estimated the total water diversions and depletions based on the population of livestock and the per capita water use, where diversions are fully consumed (Table 6-16).

Table 6-16. Livestock Population and Water Use in Taos County in 2000

Animal	Population	Water Use	
		gpcd	ac-ft/yr
Cattle	7,000	10	78
Chickens	21,000	0.08	2
Horses	1,190	13	17
Sheep	900	2.2	2
		Total	99

Source: Wilson et al., 2003

gpcd = Gallons per capita per day
ac-ft/yr = Acre-feet per year

The total numbers of cattle and sheep in Taos County for 1990, 1995, 2000, and 2005 were obtained from the New Mexico Agriculture Statistics (NMAS) (USDA NASS, 2006b) and are presented in Table 6-17. These estimates show a declining livestock population. As both the NMAS and OSE report water use by county, it was not possible to determine the livestock use for the small portion of Rio Arriba that lies within the planning region.

Table 6-17. Estimated Number of Livestock in Taos County

	Reporting Year			
Animal	1990	1995	2000	2005
Cattle	9,000	9,000	7,000	4,000
Sheep	6,000	1,600	2,000	400
Total	15,000	10,600	9,000	4,400

Source: USDA NASS, 2006b

Based on an estimated water consumption of approximately 5 gallons per day per animal (Alberta Agriculture, Food and Rural Development, 2004) and an estimated elk population of 40,000 (New Mexico Department of Game and Fish, 2006), water use by elk in Taos County in 1992 is estimated to be about 224 ac-ft/yr.

6.1.4 Self-Supplied Commercial, Industrial, Mining, and Power

Wilson et al. (2003) define these categories as follows:

- Commercial includes self-supplied businesses (e.g., motels, restaurants, recreational resorts, and campgrounds) and institutions. Self-supplied golf courses that are not watered by a public water supply are also included, as are off-stream fish hatcheries engaged in the production of fish for release.

- Industrial includes self-supplied enterprises engaged in the processing of raw materials or the manufacturing of durable or non-durable goods. Water used for the construction of highways, subdivisions, and other construction projects is also included.

- Mining includes self-supplied enterprises engaged in the extraction of minerals occurring naturally in the earth's crust, including (1) solids, such as Molycorp's molybdenum ores, (2) liquids, such as crude petroleum, and (3) gases, such as natural gas. Water used for drilling and/or processing at a mine site is also included.

- Power includes all self-supplied power-generating facilities. Water used in conjunction with coal mining operations that are contiguous with a power-generating facility that owns and/or operates the mines is also included.

As shown in Table 6-1, the self-supplied commercial category is a very small part of the planning region's water demand; the highest depletion in this category is 20 ac-ft/yr for snow-making at Taos Ski Valley. The commercial sector uses both surface water and groundwater. Historical water depletions have varied from about 20 ac-ft/yr in 1980 to 201 ac-ft/yr in 2000. Appendix F1, Table F1-4 lists the withdrawals and depletions from the self-supplied commercial enterprises in the planning region.

The mining category in the Taos Region has historically accounted for less than 3 percent of total depletions. Mining activity occurs primarily in the North subregion, where in 2000 Molycorp's molybdenum mine accounted for 2,578.6 ac-ft/yr of groundwater withdrawals and 515 ac-ft/yr of surface water withdrawals with a return flow rate of 83 percent. The 83 percent return flow rate was derived from Wilson et al. (2003) to be consistent with other water use calculations in this plan, though Molycorp has indicated that they believe their return flow rate is 88 percent (Molycorp Inc., 2007). An estimated 0.04 ac-ft of groundwater diversion for gravel washing occurs in the Central subregion (NM OSE, 2005). As shown in Figure 6-9, water use in this category reflects the fluctuation in mining activity since 1975, which varies as the price of molybdenum fluctuates.

Industrial water depletions have varied from 3 ac-ft/yr in 2000 to 43 ac-ft/yr in 1975, for small operations such as concrete mixing. No water use for the power sector has been identified by OSE from 1975 through 2000.

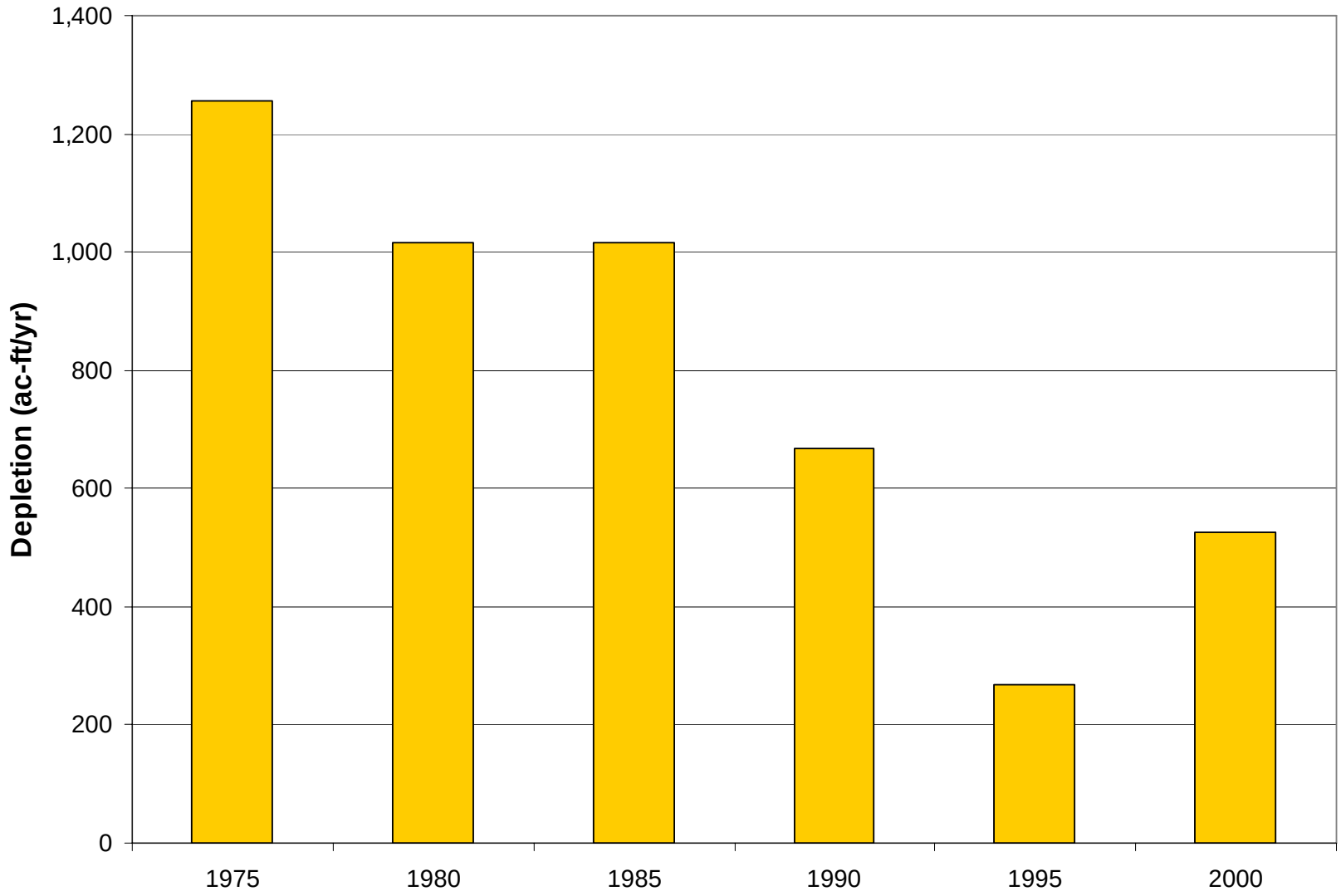

Figure 6-9

TAOS REGIONAL WATER PLAN

Historical Water Depletions by the Mining Sector in Taos County

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6.1.5 Reservoir Evaporation

The OSE-reported depletions of surface water resulting from evaporation fluctuated from 1975 to 2000 (Table 6-1); however, these fluctuations are due in part to a change in the way the OSE reports evaporation data. As noted in Section 5, whereas the reservoir evaporation category for 1975 included playa lake and stockpond evaporation, these types of evaporation were not inventoried after 1975 and 1985, respectively. In addition, since 1990 the OSE has reported reservoir evaporation only for reservoirs with 5,000 or more acre-feet of storage, and Costilla Reservoir is the only reservoir of this size used for irrigation in the Taos Region. The OSE-reported depletion for 1990 (the first year that evaporation was reported only for larger-capacity reservoirs) is only 63 acre-feet (Table 6-18). Costilla Reservoir was drained in 1990 for repairs (Pacheco, 2006), and the depletions reported for 1995 and 2000 are considered more representative, but apply only to Costilla Reservoir.

Table 6-18. Total Depletions Attributed to Evaporation in the Taos Water Planning Region, 1975-2000

Reporting Year	Total Depletion (acre-feet)
1975 [a]	562
1980 [a]	493
1985 [a]	493
1990	63
1995	578
2000	578

Source: OSE water use reports (Sorenson, 1977, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003)
[a] Includes stockpond evaporation

Carson Reservoir, built in 1935 and located in the West subregion, is included in the National Dam Inventory, which shows that it has a maximum capacity of up to 7,622 acre-feet and a surface area of 390 acres. This reservoir is built on basalts, which do not retain water, and the reservoir therefore is normally dry (Pacheco, 2006). DBS&A's GIS coverage for open water shows 219 acres of perennial open water in the West subregion, with 603 acre-feet of evaporation. To obtain an estimate of reservoir evaporation for all lakes, reservoirs, and stockponds, DBS&A used GIS coverage for intermittent and perennial open water obtained from

the National Hydrography Dataset (USGS, 2005a). Table 6-19 summarizes the total open water from perennial and intermittent lakes, reservoirs, ponds, and marshes identified in this dataset.

All reservoir evaporation is a consumptive use; there is no return flow in this category.

Table 6-19. Estimated Evaporation from Perennial and Intermittent Open Water in the Taos Region

Subregion	Perennial and Intermittent Open Water Acreage [a]	Net Evaporation Rate [b] (ft/yr)	Evaporation from Open Water (ac-ft/yr)
North	1,109	1.59 [c]	1,764
Central	348	2.75 [d]	956
South	91	2.75	251
West	603	2.75	1,657
Total	2,151	NA	4,628

[a] Estimated based on Taos County water bodies included in National Hydrography Dataset (USGS, 2005a)

[b] Wilson et al, 2003

[c] Based on Cabresto Reservoir gross evaporation and Cerro precipitation in Wilson et al. (2003) supporting database (NM OSE, 2005)

[d] Based on Talpa Lake gross evaporation minus precipitation measured at Cerro climate station in Wilson et al. (2003) supporting database (NM OSE, 2005)

ft/yr = Feet per year
ac-ft/yr = Acre-feet per year

6.2 Projected Demographics

Future water demand in the Taos Region depends on the future growth of the region's population. Accordingly, Southwest Planning & Marketing (SWPM) projected population growth in 10-year increments from 2000 to 2050, based on information from interviews with selected community representatives, from historical population trends, and from Bureau of Business & Economic Research (BBER) population projections. Because of inherent uncertainty in projecting population growth, the projections were based on two different growth scenarios: a low-growth scenario and a high-growth one. The results of SWPM's analysis are provided in Appendix F2 and summarized below.

The population projections developed by SWPM under both low- and high-growth scenarios are summarized in Table 6-20 and depicted in Figure 6-10 for the entire region; projected growth in each of the subregions is shown on Figure 6-11 . The population projections for the entire planning region under the low-growth scenario (Table 6-20) show an increase of 19,062 residents. Under the high-growth scenario (Table 6-20), the increase is projected to be 41,663. Currently the Central subregion has the majority of the population (Figure 6-12) and will maintain that majority under both the high and low projections.

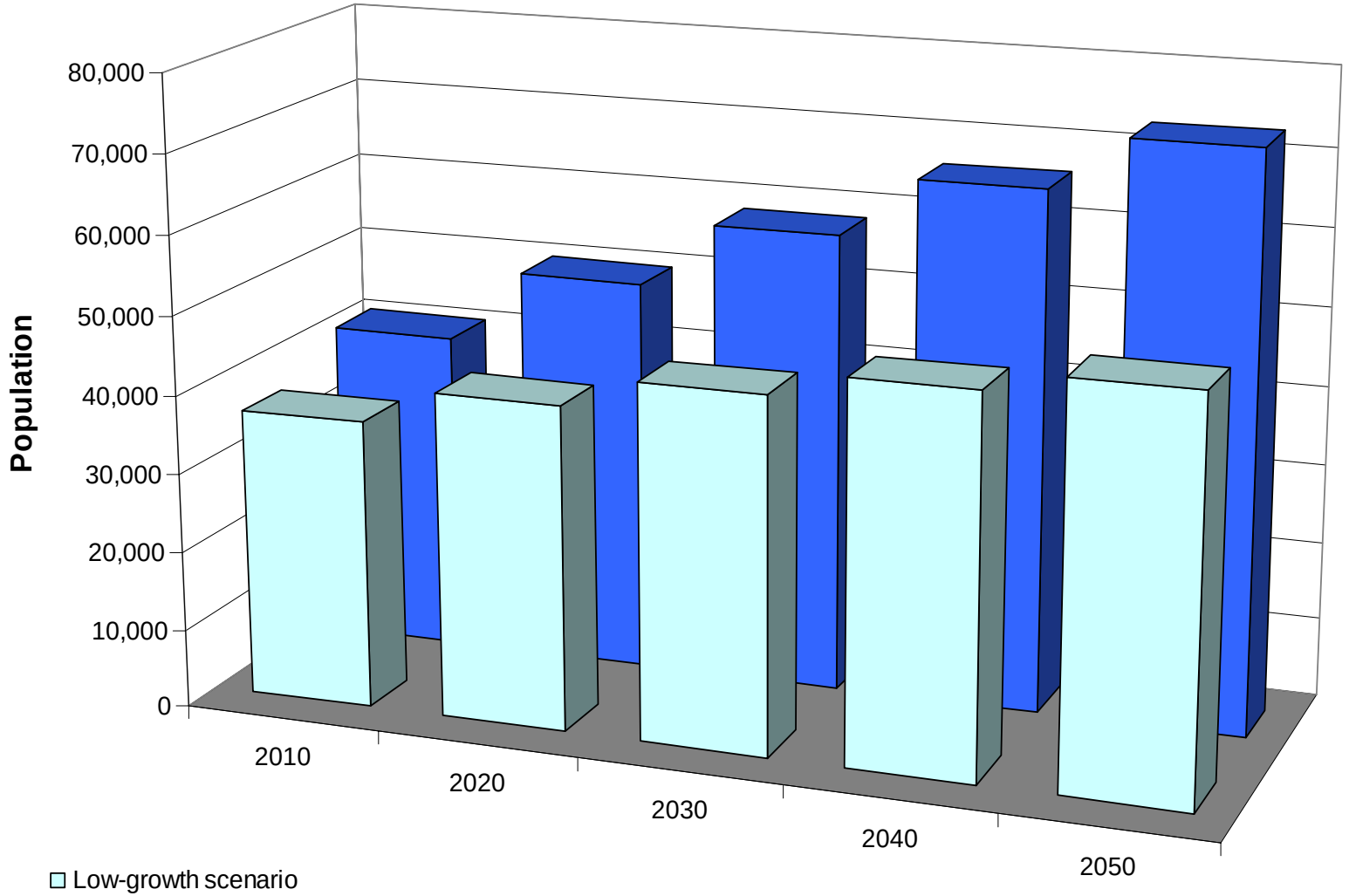
The projected population changes from the year 2000 to 2050 for each subregion are illustrated in Figure 6-11 and summarized below:

- The population of the *North subregion* is expected to increase under both the low and the high projections, with an increase of almost 2,700 people under the low projection and more than 7,700 people under the high projection.

- The population of the *Central subregion* is projected to increase under both the high- and low-growth scenarios. Under the low projection, population would increase by 15,000 people from a 2000 census count of 20,800. Under the high projection, that increase could be as high as 30,000 people, for a total population of more than 50,000 in 2050.

- Population projections for the *South subregion* show an increase for both the low- and high-growth scenarios, with an increase of more than 700 people under the low projection and more than 2,400 under the high.

- The *West subregion* is expected to experience the greatest percentage increase in population; however, due to its current relatively low population, the projected numbers of additional residents are not as high as in the other subregions. The total increase from 2000 to 2050 is about 600 people under the low projection and as high as 1,500 people under the high projection.



Source: SWPM, 2006 (Appendix F2)

Figure 6-10

TAOS REGIONAL WATER PLAN

Population Projections

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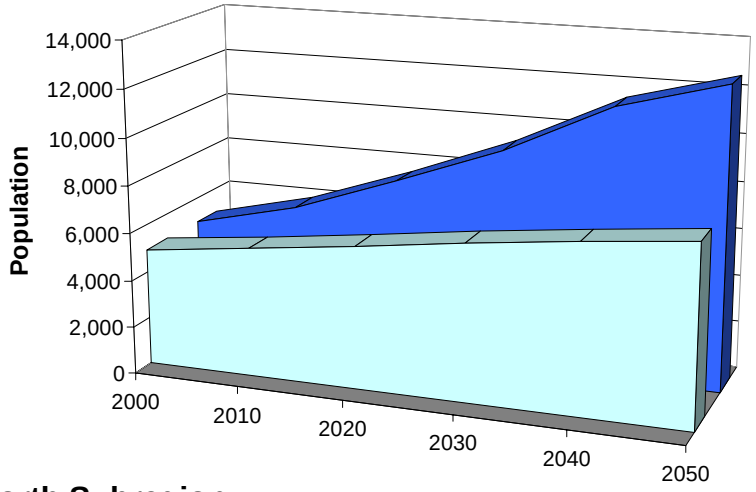
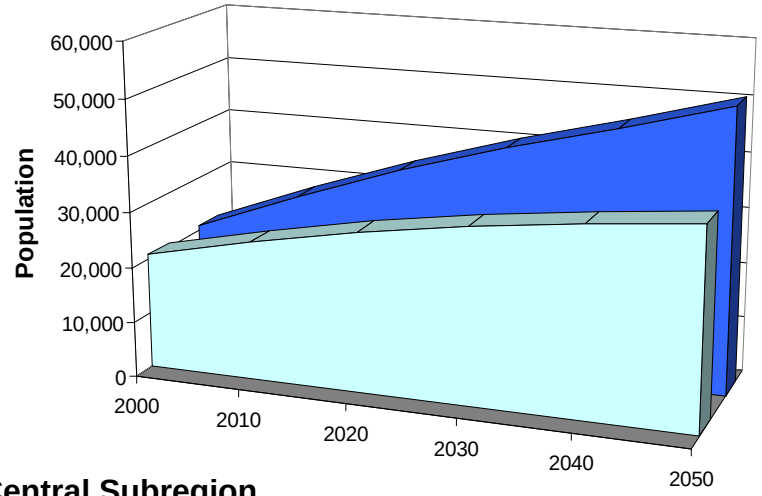
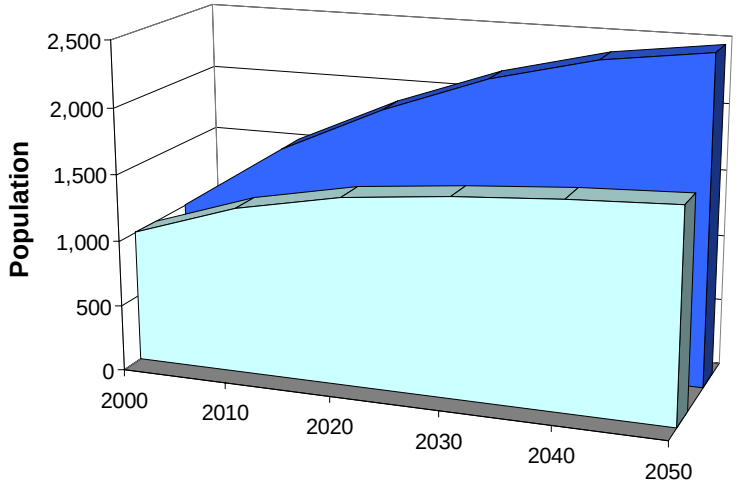


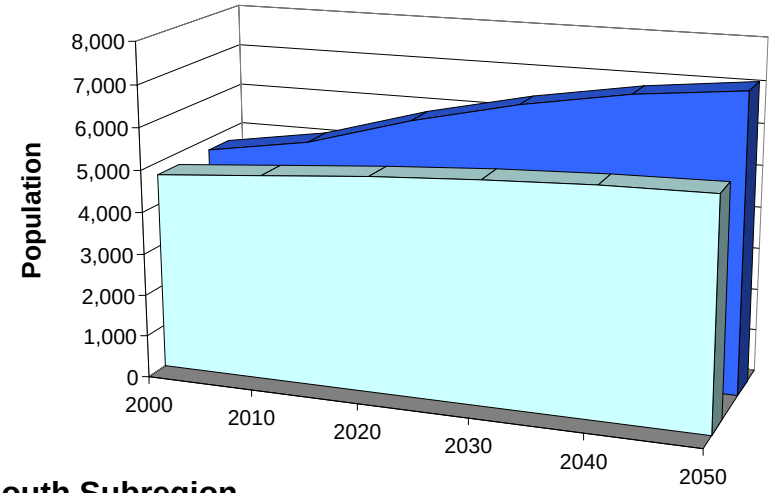
North Subregion



Central Subregion



West Subregion



South Subregion

Low-growth scenario

High-growth scenario

Source: SWPM, 2006 (Appendix F2)

Figure 6-11

TAOS REGIONAL WATER PLAN

Population Projections by Subregion

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Table 6-20. Taos Region Population Projections

Subregion	1990	2000	Growth Scenario	2010	2020	2030	2040	2050
North	4,299	4,940	Low	5,456	6,004	6,622	7,134	7,602
			High	6,008	7,574	9,283	11,449	12,661
Central	15,227	20,834	Low	25,016	28,665	31,667	34,015	35,909
			High	28,207	34,838	40,590	45,541	50,876
South	4,508	4,707	Low	4,914	5,119	5,273	5,379	5,440
			High	5,119	5,843	6,427	6,852	7,129
West	453	1,003	Low	1,261	1,421	1,498	1,558	1,595
			High	1,523	1,891	2,183	2,376	2,480
Total	24,487	31,484	Low	36,647	41,208	45,070	48,087	50,546
			High	40,936	50,146	58,483	66,219	73,147

Source: SWPM, 2006 (Appendix F2)

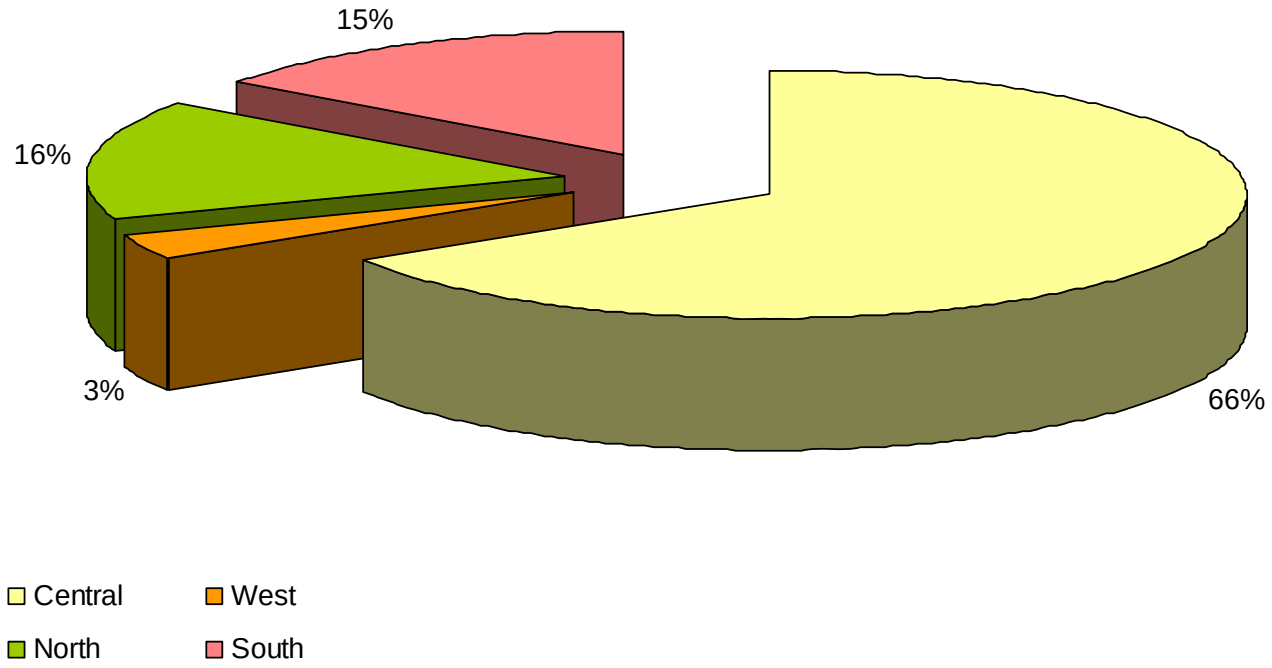


Figure 6-12

TAOS REGIONAL WATER PLAN

2000 Population Percentage by Subregion

6.3 Projected Water Use for 40-Year Planning Horizon

This section provides estimates of future water diversions in the region. To assist in bracketing the uncertainty of the projections, low and high water use estimates were developed, based on growth projections for the various water use categories (Section 6.2; Appendix F2) and input from the steering committee. The projected growth in population will affect water use in eight use categories (the reservoir evaporation water use category is not driven by population growth):

- Municipal water supply
- Residential (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)
- Commercial (self-supplied)
- Industrial (self-supplied)
- Power (self-supplied)
- Mining (self-supplied)

Future water demand in the residential, commercial, and municipal sectors depends in large part on the degree of population growth and therefore varies throughout the Taos Region. Growth in these sectors will likely be driven by tourism and in-migration of residents and the trend for businesses and self-employed individuals to relocate to rural communities with high quality of life. For the most part, the irrigated agriculture and livestock sectors are projected to either remain constant or increase slightly. Demand may decrease in these sectors, but for the purposes of this plan, was projected to remain constant or increase in order to ensure that projections for these sectors are high enough. The industrial, mining, and power sectors may increase by a small amount.

A detailed discussion of the projected water use in each sector, including the methods or assumptions used in projecting future water diversions, is provided in Sections 6.3.1 through 6.3.8.

6.3.1 Public Water Supply and Self-Supplied Domestic

The public water supply projections are based on the subregion population growth estimates developed by SWPM (Section 6.2; Appendix F2). The per capita use (diversions), based on pumping and population records, for individual communities varies from about 30 gpcd for several mutual domestic well associations to more than 300 gpcd in Red River, where the seasonal tourist population increases water use during ski season and for summer recreation (Table 6-2). Regional average per capita use rates vary from 99 gpcd in the South subregion to 178 gpcd in the North subregion (Table 6-21). The average per capita public water system use for all of the Taos Region, including the Town of Taos, is 149 gpcd.

Future water use was projected as follows:

- *High water use projection:* The total current water diversion for public water systems in each subregion was multiplied by the high projected population growth rate to estimate the future public supplied water use. The projected water use for the rural self-supplied population was calculated by multiplying the current self-supplied water use by the high projected population growth rate. The water use was based on a calculated domestic demand ranging from 101 to 113 gpcd (Appendix F3).

- *Low water use projection:* The total current water diversion for public water systems in each subregion was multiplied by the low population growth estimates to obtain the low water use projection. Strategies such as improved water conservation for new development or other growth management initiatives, if adopted, would result in even lower water use, as discussed in Section 8.7.

Under the high water use projection, the domestic and municipal demand for water withdrawals would increase by about 6,060 ac-ft/yr by the year 2050, as compared to an increase of about 2,700 ac-ft/yr under the low water use projection. More than half of the projected growth in demand is expected to occur in the Central subregion, where the projected increase by 2050 is 3,880 ac-ft/yr under the high-growth scenario. Return flow from these diversions is estimated by Wilson et al. (2003) to be 50 percent, except for Red River where they estimate a return flow rate of 84 percent for municipal systems and 0 for self-supplied homes.

Table 6-21. Public and Domestic Water Diversions Projections for the Taos Water Planning Region, 2000 to 2050

Subregion/Category	Per Capita Demand		Population Served in 2000 [a]	Growth Scenario	Water Demand in 2000	Projected Water Diversions (ac-ft/yr)				
	gpcd	ac-ft/yr				2010	2020	2030	2040	2050
Taos Region total public	149	0.17	16,916	Low	2,820	3,250	3,640	3,990	4,270	4,510
				High	2,820	3,620	4,460	5,260	6,060	6,700
Taos Region self-supplied	111	0.12	13,218	Low	1,640	1,920	2,160	2,360	2,520	2,650
				High	1,640	2,150	2,630	3,070	3,460	3,820
Central public systems [b]	131	0.15	10,630	Low	1,560	1,870	2,150	2,370	2,550	2,690
				High	1,560	2,110	2,610	3,040	3,410	3,810
Central self-supplied	113	0.13	8,942	Low	1,140	1,360	1,560	1,730	1,850	1,960
				High	1,140	1,540	1,900	2,210	2,480	2,770
West public systems [c]	157	0.18	301	Low	50	70	80	80	80	80
				High	50	80	100	120	130	130
West self-supplied	108	0.12	702	Low	90	110	120	130	130	130
				High	90	130	160	180	200	210
North public systems [d]	178	0.20	3,213	Low	890	990	1,090	1,200	1,290	1,380
				High	890	1,090	1,370	1,680	2,070	2,290
North self-supplied	101	0.11	1,727	Low	200	220	240	260	280	300
				High	200	240	300	370	450	500
South public systems [e]	99	0.11	2,774	Low	310	320	340	350	350	360
				High	310	340	380	420	450	470
South self-supplied	108	0.12	1,847	Low	220	230	240	250	260	260
				High	220	240	280	300	320	340

[a] Wilson et al., 2003, NMED Drinking Water Bureau, and contact with water suppliers. Population does not include transient residents or residents residing outside the region but served by the region; Taos and Picuris Pueblos population and water use also not included because this information was not available.

[b] Not including transient population of 610 for Taos Ski Valley or Taos Pueblo population of 1,264

[c] Not including population of 66 residents outside the planning region that served by Ojo Caliente

[d] Not including transient population of 1,281 for Red River

[e] Not including Picuris population of 86

gpcd = Gallons per capita per day
ac-ft/yr = Acre-feet per year

6.3.2 Irrigated Agriculture

OSE records indicate that about 30,000 acres in the region have been irrigated for the last 25 years (Table 6-6). (As noted in Section 6.1.2, the OSE estimates of water use by category [Table 6-1] define irrigated agriculture use through estimates of acreage and diversions per acre [Wilson et al., 2003] rather than through measured diversions, and hence there is uncertainty in the estimates.) Under the low projection, irrigated acreage was assumed to remain at current levels, except in the Central subregion, where the diversions under the low projection were based on OSE's estimate of water diversions (Wilson et al., 2003). For the high projections, irrigated acreage was estimated to increase in the Central subregion to the amount of water rights identified in the Draft Abeyta Settlement Agreement, including Taos Pueblo water rights. Although the Draft Abeyta Settlement Agreement involves expansion of irrigation by Taos Pueblo, the increase would come from existing irrigation rights within the Central Subregion (U.S. District Court, 2006b, Articles 5.1.1.2.2.1 and 5.1.1.2.2.3). Under the high-growth scenario, the total water diversions in 2050 for irrigated agriculture are projected to be about 111,500 ac-ft/yr on 32,300 acres of irrigated land (Table 6-22).

Although the estimates of current withdrawals in the Central subregion range from 41,400 ac-ft/yr (41,054 ac-ft/yr surface water [Bellinger, 2004, Tables 12 and 13] and 350-ac-ft/yr groundwater [Wilson et al., 2003]) to 53,000 ac-ft/yr (Wilson et al., 2003), the potential demand could be much greater if the water supply is available and economic factors are favorable. Taos Water Planning Steering Committee members from the Central subregion thought it was important to show the potential demand and were concerned that OSE had underestimated the irrigation diversions for the Central subregion. Therefore, the high projection is based on the total irrigated acreage estimated by Karla McCall for the Draft Abeyta Settlement Agreement of 16,494 acres (14,171.15 acres non-Pueblo and 2,322 acres for Taos Pueblo). Assuming a CIR of 1.38 ac-ft/ac, an on-farm efficiency of 50 percent, and an off-farm efficiency of 70 percent on this acreage results in a potential demand of 65,032 ac-ft/yr. This would be the highest demand for irrigation because it assumes no fallow land.

6.3.3 Livestock

Under the low water use projection, no change in livestock use is projected (Appendix F3). For the high water use projection, the livestock water use is projected to double (Table 6-23).

Several slaughterhouses are projected to be developed in the region, which may encourage an increase in the number of livestock. While the amount of increase is not known, the total water use for this sector is very small, estimated at 115 ac-ft/yr in 2000. If that doubles, the amount may increase to 230 ac-ft/yr.

Table 6-22. Projected Water Diversions for the Irrigated Agriculture Sector by Subregion

Subregion	1999 Total Withdrawal [a] (ac-ft)	Growth Scenario	Projected Water Diversions (ac-ft/yr)				
			2010	2020	2030	2040	2050
North	29,142	Low	29,142	29,142	29,142	29,142	29,142
		High	29,142	29,142	29,142	29,142	29,142
Central	41,400	Low	53,105	53,105	53,105	53,105	53,105
		High	65,032	65,032	65,032	65,032	65,032
South	17,104	Low	17,104	17,104	17,104	17,104	17,104
		High	17,104	17,104	17,104	17,104	17,104
West	206	Low	206	206	206	206	206
		High	206	206	206	206	206
Total	87,900	Low	99,557	99,557	99,557	99,557	99,557
		High	111,484	111,484	111,484	111,484	111,484

[a] Based on estimates of acreage and diversions per acre (Wilson et al., 2003)

Table 6-23. Projected Water Diversions (and Depletions) for the Livestock Sector by Subregion

Subregion	2000 Total Withdrawal (ac-ft)	Growth Scenario	Projected Diversions/Depletions [a] (ac-ft/yr)				
			2010	2020	2030	2040	2050
North	30	Low	30	30	30	30	30
		High	60	60	60	60	60
Central [b]	45	Low	45	45	45	45	45
		High	90	90	90	90	90
South	30	Low	30	30	30	30	30
		High	60	60	60	60	60
West	10	Low	10	10	10	10	10
		High	20	20	20	20	20
Total	115	Low	115	115	115	115	115
		High	230	230	230	230	230

[a] Wilson et al. (2003) shows depletions and diversions as equivalent, with no return flow from this water use sector.
[b] Includes 15 ac-ft/yr for Taos Pueblo livestock water use

6.3.4 Commercial

Commercial use is primarily from hotels, restaurants, and recreational activities associated with the tourism industry, which was one of the factors considered in projecting growth rates (Appendix F2). It represents a very small portion of the overall water use in the region. The low and high projections for this sector (Table 6-24) were developed by multiplying the year 2000 commercial water withdrawals by the projected population growth rates for each subregion (Section 6.2; Appendix F2). Table 6-24 shows that the Central subregion has the greatest potential growth in the commercial sector, with a projected increase ranging from about 250 ac-ft/yr to 500 ac-ft/yr under the low and high projections, respectively.

Table 6-24. Projected Water Diversions for the Commercial Sector by Subregion

Subregion	2000 Total Withdrawal (ac-ft)	Growth Scenario	Projected Water Diversions [a] (ac-ft/yr)				
			2010	2020	2030	2040	2050
North	41	Low	45	50	55	59	63
		High	50	62	77	94	104
Central	349	Low	419	480	530	570	601
		High	472	583	680	763	852
South	19	Low	20	20	21	21	22
		High	20	23	26	27	28
West	28	Low	35	39	41	43	44
		High	42	52	60	66	68
Total [b]	436	Low	518	589	647	693	730
		High	584	721	842	950	1,053

[a] Wilson et al. (2003) shows depletions and diversions as equivalent, with no return flow from this water use sector.
[b] Totals may reflect rounding errors.

6.3.5 Industrial

An estimated approximately 2.5-ac-ft/yr diversion and consumptive use was attributed to the industrial sector in 2000, all in the Central subregion. Although no specific plans for industrial development in the region were identified, some water use was projected to account for potential unplanned industrial uses. Under the low projection, the industrial sector is estimated to remain zero in the North, South and West subregions, but grow at a rate proportional to the

low-growth population projections for the Central subregion. Under the high projection, the industrial sector is estimated to grow annually at a rate proportional to the high-growth population projection for all subregions (Table 6-25) (to project growth of the industrial sector in the three subregions with no current self-supplied industrial use, a small use of 5 or 10 ac-ft/yr was assumed). By the year 2050, the water use (diversions) for the industrial sector under the high-growth scenario is projected to be 47 ac-ft/yr for the entire planning region.

Table 6-25. Projected Water Diversions for the Industrial Sector by Subregion

Subregion	2000 Total Withdrawal (ac-ft)	Growth Scenario	Projected Water Diversions (ac-ft/yr)				
			2010	2020	2030	2040	2050
North	0.00	Low	0	0	0	0	0
		High	5	6	8	10	11
Central	2.54	Low	3	3	4	4	4
		High	3	4	5	6	6
South	0.00	Low	0	0	0	0	0
		High	10	11	13	13	14
West	0.00	Low	0	0	0	0	0
		High	10	12	14	16	16
Total	2.54	Low	3	3	4	4	4
		High	28	33	40	45	47

6.3.6 Power

No water is currently used for power generation according to the OSE (Wilson et al., 2003). For the low water use estimate, no change is projected to occur in the region. Under the high projection, a small amount of water was assumed to be used for alternative fuel sources, with an annual increase at the rate of the high-growth population rate (Table 6-26).

6.3.7 Mining

The only significant diversion of water for mining is by the Molycorp molybdenum mine in Questa. Molycorp has reduced the magnitude of its operations since the 1970s and currently does not anticipate that production will increase above historical highs (Molycorp Inc., 2007). The low water diversion projections therefore show no expected change from the current mining

industry use of water (Table 6-1). To allow for unanticipated circumstances such as increases in molybdenum prices, the high projection set Molycorp water diversions at the high level in 1975, when the mine operated 24 hours a day, 7 days a week (Table 6-27). A small amount of water use is also projected for the other subregions, with growth set equal to the high projected population growth rate.

Table 6-26. Projected Water Diversions (and Depletions) of Power by Subregion

Subregion	2000 Total Withdrawal (ac-ft)	Growth Scenario	Projected Diversions/Depletions [a] (ac-ft/yr)				
			2010	2020	2030	2040	2050
North	0	Low	0	0	0	0	0
		High	10	13	15	19	21
Central	0	Low	0	0	0	0	0
		High	10	12	14	16	18
South	0	Low	0	0	0	0	0
		High	5	6	6	7	7
West	0	Low	0	0	0	0	0
		High	5	6	7	8	8
Total [b]	0	Low	0	0	0	0	0
		High	30	37	43	50	54

[a] Wilson et al. (2003) shows depletions and diversions as equivalent, with no return flow from this water use sector.
[b] Totals may reflect rounding errors.

Table 6-27. Projected Water Diversions of Mining by Subregion

Subregion	2000 Total Withdrawal (ac-ft)	Growth Scenario	Projected Diversions (ac-ft/yr)				
			2010	2020	2030	2040	2050
North	3,094	Low	3,094	3,094	3,094	3,094	3,094
		High	7,387	7,387	7,387	7,387	7,387
Central	0.04	Low	0	0	0	0	0
		High	10	12	14	16	18
South	0.00	Low	0	0	0	0	0
		High	5	6	6	7	7
West	0.00	Low	0	0	0	0	0
		High	5	6	7	8	8
Total [a]	3,094	Low	3,094	3,094	3,094	3,094	3,094
		High	7,407	7,411	7,414	7,418	7,420

[a] Totals may reflect rounding errors.

6.3.8 Reservoir Evaporation

Estimates of historical depletions from reservoirs in the Taos Region are shown in Table 6-1, and year 2000 depletions are included on Table 6-28. The depletions shown on Table 6-1 are based on OSE estimates, which in more recent years included only Costilla Reservoir. The projections of reservoir evaporation shown in Table 6-28 were based on GIS coverage for intermittent and perennial open water obtained from the National Hydrography Dataset (USGS, 2005a). This coverage includes the 114 acre-feet of evaporation from stockponds on Taos Pueblo (in the Central subregion) identified in the Draft Abeyta Settlement Agreement (U.S. District Court, 2006b; Section 4.5.3.1). The amount of evaporation from these features will fluctuate depending on the amount of water in storage and climatic conditions. To show a range of evaporation, the low estimate represents areas of open water from perennial sources only, while the high estimate is based on both perennial and intermittent open water sources. A net evaporation rate of 19 inches in the North subregion to 33 inches in the Central, South, and West subregions was based on estimates provided by Wilson et al. (2003).

Table 6-28. Projected Reservoir Evaporation Estimates

Subregion	2000 Total Withdrawal (ac-ft)	Growth Scenario	Estimated Evaporation Depletions (ac-ft/yr) [a]				
			2010	2020	2030	2040	2050
North	1,610	Low	1,610	1,610	1,610	1,610	1,610
	1,764	High	1,764	1,764	1,764	1,764	1,764
Central	804	Low	804	804	804	804	804
	956	High	956	956	956	956	956
South	229	Low	229	229	229	229	229
	251	High	251	251	251	251	251
West	603	Low	603	603	603	603	603
	1,657	High	1,657	1,657	1,657	1,657	1,657
Total	3,246	Low	3,246	3,246	3,246	3,246	3,246
	4,628	High	4,628	4,628	4,628	4,628	4,628

[a] There is no return flow in the reservoir evaporation category; withdrawals are equal to depletions.

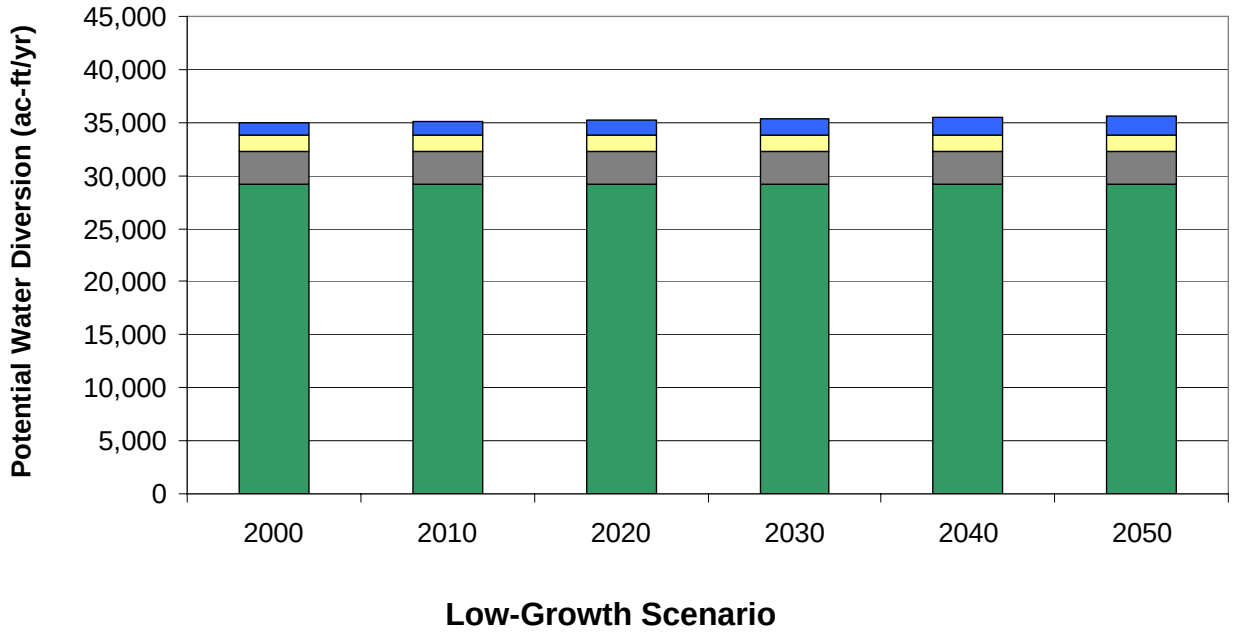
6.3.9 Summary of Present and Future Water Demand

Estimates of projected future water diversions in all sectors in the entire region are shown on Table 6-29. Projections of future water diversions for each sector, segregated by the four subregions and showing the growth rates and assumptions used are included in Appendix F3.

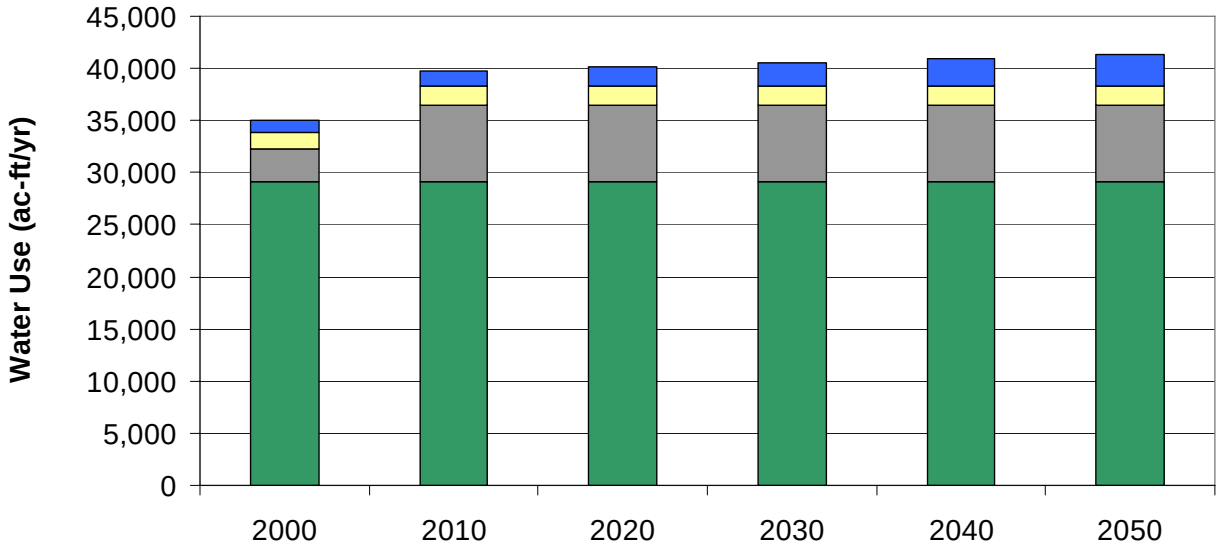
The projected water use (withdrawals) by subregion for the high- and low-growth scenarios in each water use sector is shown in Figures 6-13 through 6-16. As shown in these graphs, agriculture dominates the water use in each subregion. Water use in this sector is dependent on the amount of surface water available in any given year.

Table 6-29. Projected Water Diversions in the Taos Water Planning Region

	2000 Total Withdrawal (ac-ft)	Growth Scenario	2010	2020	2030	2040	2050
Commercial	440	Low	520	590	650	690	730
		High	580	720	840	950	1,050
Domestic	1,640	Low	1,920	2,160	2,360	2,520	2,650
		High	2,150	2,630	3,070	3,460	3,820
Industrial	2.5	Low	3	3	4	4	4
		High	28	34	40	44	47
Irrigated agriculture	87,900	Low	99,600	99,600	99,600	99,600	99,600
		High	111,500	111,500	111,500	111,500	111,500
Livestock	115	Low	115	115	115	115	115
		High	230	230	230	230	230
Mining	3,100	Low	3,100	3,100	3,100	3,100	3,100
		High	7,410	7,410	7,415	7,420	7,420
Power	0	Low	0	0	0	0	0
		High	30	37	43	50	54
Municipal/public	2,815	Low	3,250	3,640	3,990	4,270	4,510
		High	3,620	4,460	5,260	6,060	6,700
Reservoir evaporation	4,600	Low	3,200	3,200	3,200	3,200	3,200
		High	4,600	4,600	4,600	4,600	4,600
Total	100,600	Low	111,700	112,400	113,000	113,500	113,900
		High	130,000	132,000	133,000	134,000	135,000



Low-Growth Scenario



High-Growth Scenario

Irrigated agriculture
Mining
Reservoir evaporation
Livestock
Commercial, domestic, industrial, public water supply, power

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TAOS REGIONAL WATER PLAN

Projected Water Demand for the North Subregion, 2000 Through 2050

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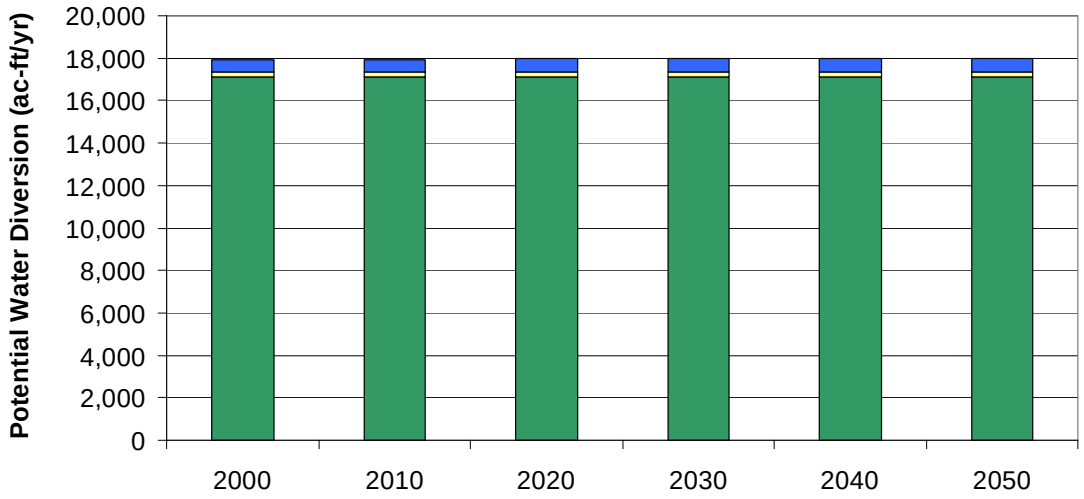
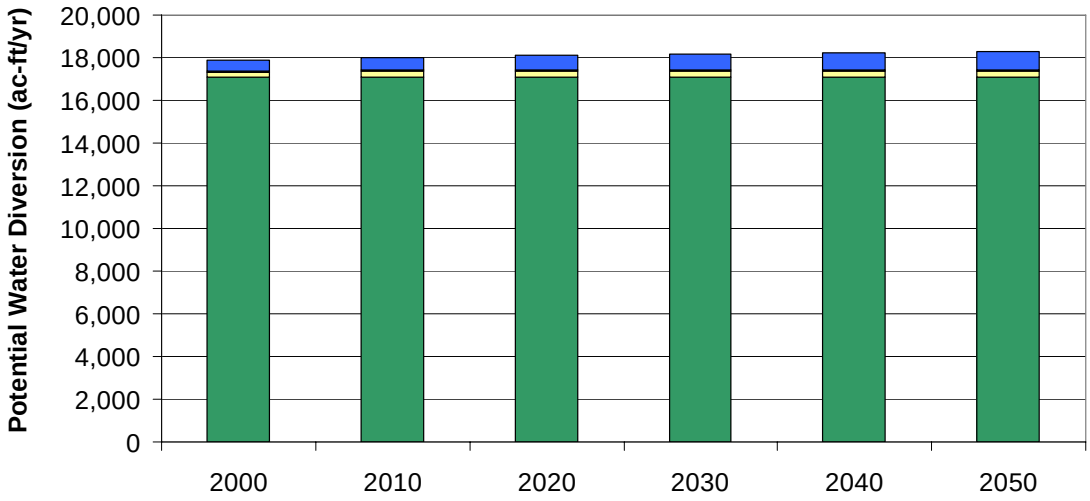
Figure 6-13



Low-Growth Scenario



High-Growth Scenario

Irrigated agriculture
Mining
Reservoir evaporation
Livestock
Commercial, domestic, industrial, public water supply, power

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TAOS REGIONAL WATER PLAN

Projected Water Demand for the South Subregion, 2000 Through 2050

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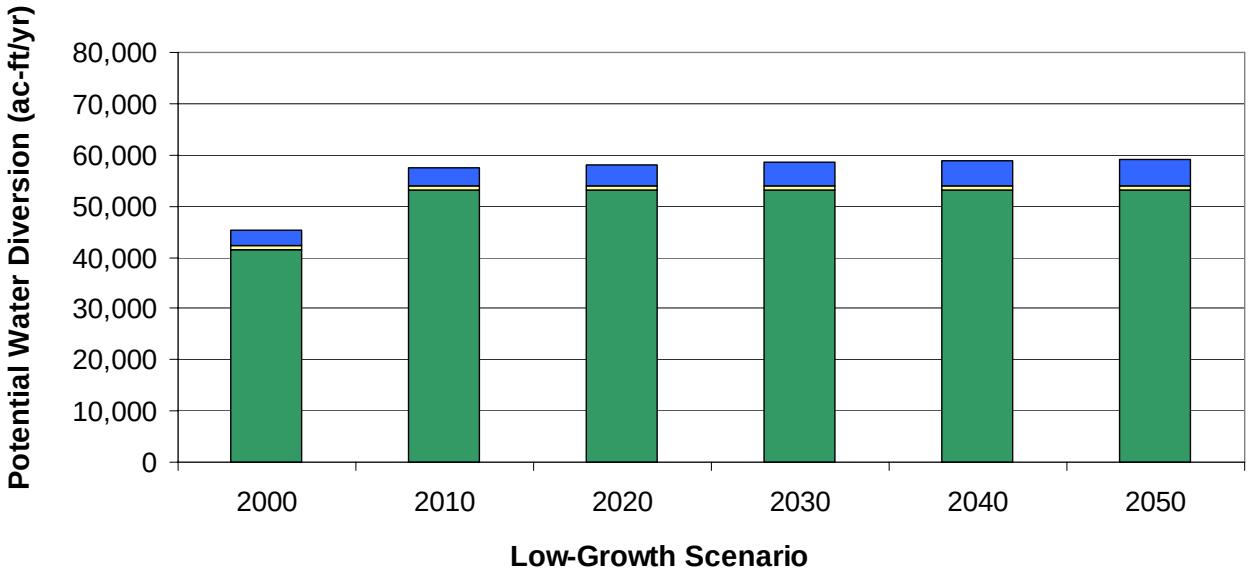
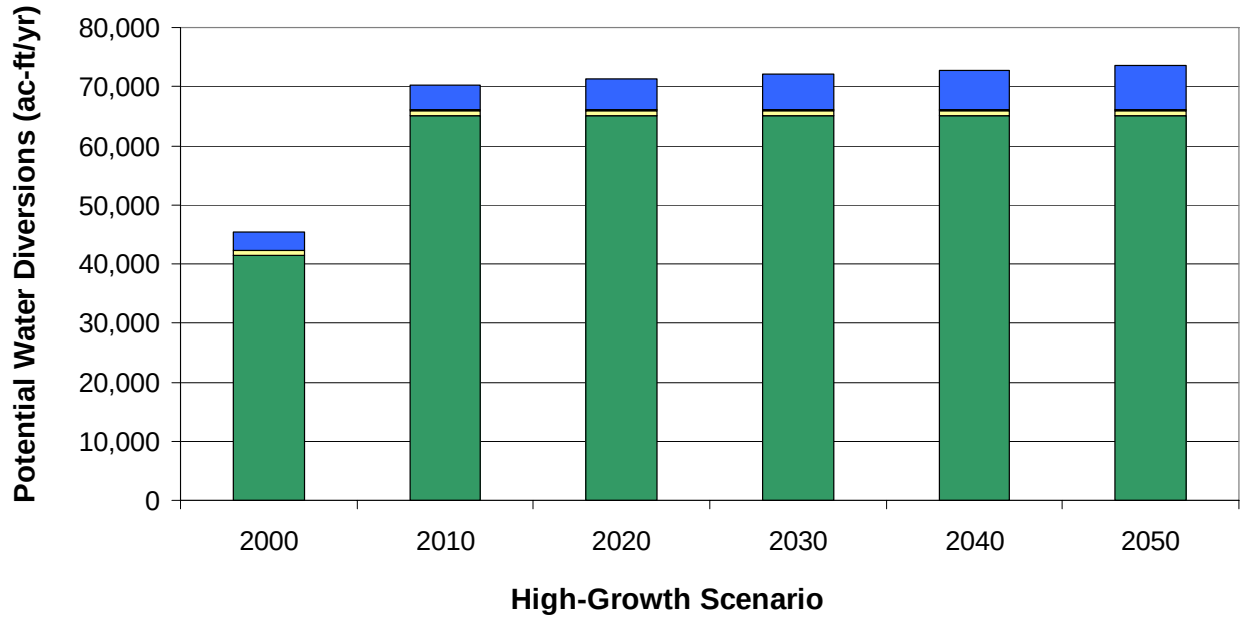
Figure 6-14





Irrigated agriculture
Mining
Reservoir evaporation
Livestock
Commercial, domestic, industrial, public water supply, power

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TAOS REGIONAL WATER PLAN

Projected Water Demand for the Central Subregion, 2000 Through 2050

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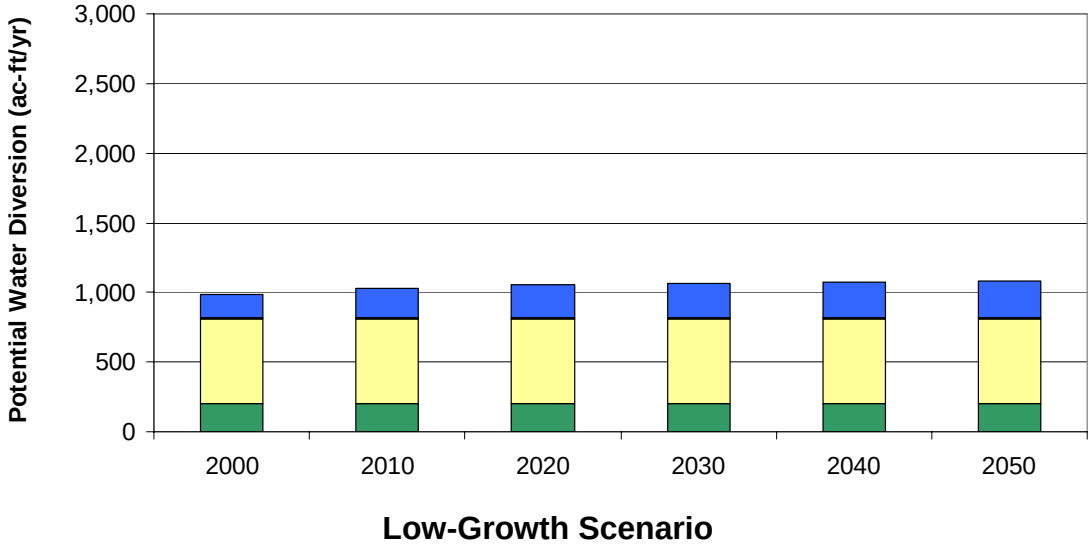
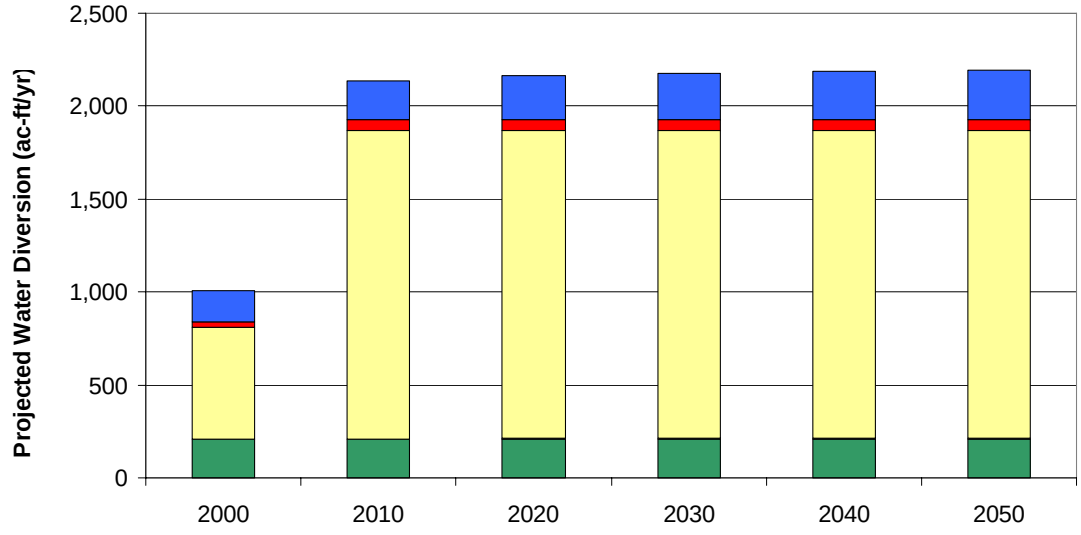
Figure 6-15



Low-Growth Scenario



High-Growth Scenario

Irrigated agriculture
Mining
Reservoir evaporation
Livestock
Commercial, domestic, industrial, public water supply, power

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TAOS REGIONAL WATER PLAN

Projected Water Demand for the West Subregion, 2000 Through 2050

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Figure 6-16