

City of Clovis

# 2005 Urban Water Management Plan



December 2005

2005 City of Clovis  
Urban Water Management Plan  
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## Section I Agency Coordination

The City of Clovis prepared this update of its Urban Water Management Plan during Fall 2005. The updated plan will be adopted by the City Council in February 2006, (see Appendix A) and will be submitted to the California Department of Water Resources within 30 days of Council approval.

### Urban Water Management Plan Coordination

The City coordinated development of the plan with other agencies within the metropolitan area that might have an interest in its preparation.

- \* City of Fresno Public Utilities Department
- \* County of Fresno Public Works Department
- \* Fresno Irrigation District
- \* Fresno Metropolitan Flood Control District

### Coordination with Appropriate Agencies (Table 1)

	Participated in UWMP development	Commented on the draft	Attended public meetings	Contacted for assistance	Received copy of draft	Sent notice of intention to adopt	Not Involved
City of Fresno Public Utilities	Yes			Yes	Yes		
County of Fresno Public Works		Yes			Yes	Yes	
Fresno Irrigation District	Yes	Yes		Yes	Yes		
Fresno Metropolitan Flood Control District					Yes		

### Urban Water Management Plan Preparation

This plan was prepared by City Staff in the Public Utilities Department.

### Resource Maximization/Import Minimization Plan

The City of Clovis utilizes many water management tools and options to maximize water resources and minimize the need to import water. The City has an existing Groundwater Management Plan dated November 17, 1997. The City is currently participating with the Fresno Irrigation District, City of Fresno, Fresno Metropolitan Flood Control District, County of Fresno, City of Kerman, Malaga County Water District, Pinedale County Water District and Bakman Water Company in the development of a Fresno-Area Regional Groundwater Management Plan. This Plan will be developed in compliance with California Senate Bill No. 1938.

The City is also participating as part of the Upper Kings River Forum on an Integrated Regional Water Management Plan funded by a Proposition 50 grant with local matching funds. The Kings River Conservation District is the lead agency on the project with a total of 15 water agencies including the City of Clovis participating. The major objectives of the Plan are to:

- Use the Kings Basin Water Forum to help:
  - Create a framework for ongoing regional collaboration and conflict resolution;
  - Coordinate the regional planning process to produce an IRWMP;
  - Define local and regional water management strategies;
  - Evaluate and compare alternatives;
  - Prioritize cost effective local and regional solutions; and
  - Increase public understanding of water management issues.
- Collect and compile water quality baseline data for the region and define opportunities to integrate existing local, state, and federal programs.
- Investigate and resolve legal and institutional issues that may affect project development.
- Identify and pursue sources of funding needed to support project development.
- Compile an inventory of existing water resources plans and policies for the region (including state agencies); include an inventory of local government and water district strategies and initiatives for dealing with water resources problems.
- Develop an integrated hydrologic model to determine regional water budgets, understand how the groundwater basin operates, evaluate and compare alternatives, and support decision making.
- Involve local water districts and land use agencies in generating and confirming the current and future water needs
- Seek to ensure compatibility and consistency with land use and water supply plans.
- Create and define opportunities to share data and information.
- Develop and implement a community affairs strategy to provide outreach and educate the public and decision makers on water management problems and solutions.
- Evaluate local and regional economic impacts and benefits of proposed projects.

- Identify potential environmental and ecosystem benefits associated with developing the IRWMP.
- Avoid environmental impacts during planning and project design where possible.
- Coordinate needed environmental review of the final alternative projects and programs.

The IRWMP is scheduled to be completed by the end of 2006.

## Section II City of Clovis Service Area Information

### History and Population

The City of Clovis was incorporated in 1912 and lies just west of the Sierra Nevada foothills and northeast of the City of Fresno. The City encompasses 19.94 square miles and is home to 86,015 residents (2005 data). The Clovis economy is healthy and expanding and is typical of many communities that are part of metropolitan areas. The economy depends heavily on retail and services along with small to medium sized manufacturing and electronics companies. The area, which at one time was predominantly agricultural, has become mostly residential. Housing is currently 60.4% owner occupied and 39.4% renter occupied. The average household size of owner-occupied units is 2.95 and 2.56 for renter-occupied units per the 2000 census data.

In 1989, the City of Clovis assumed the operation of a small water system, which serves an unincorporated county island called Tarpey Village. The unincorporated area is home to approximately 3,957 people. The area is almost entirely single family residential with a small commercial area. The area has no public landscaping, no parks and no institutional or government facilities. Tarpey Village is largely individually unmetered because of the agreement between the former County Waterworks District No. 8 and the City, which allowed them to stay unmetered. There are however currently 303 residential customers in Tarpey Village that have had meters installed at their request. Ten commercial customers are also metered.

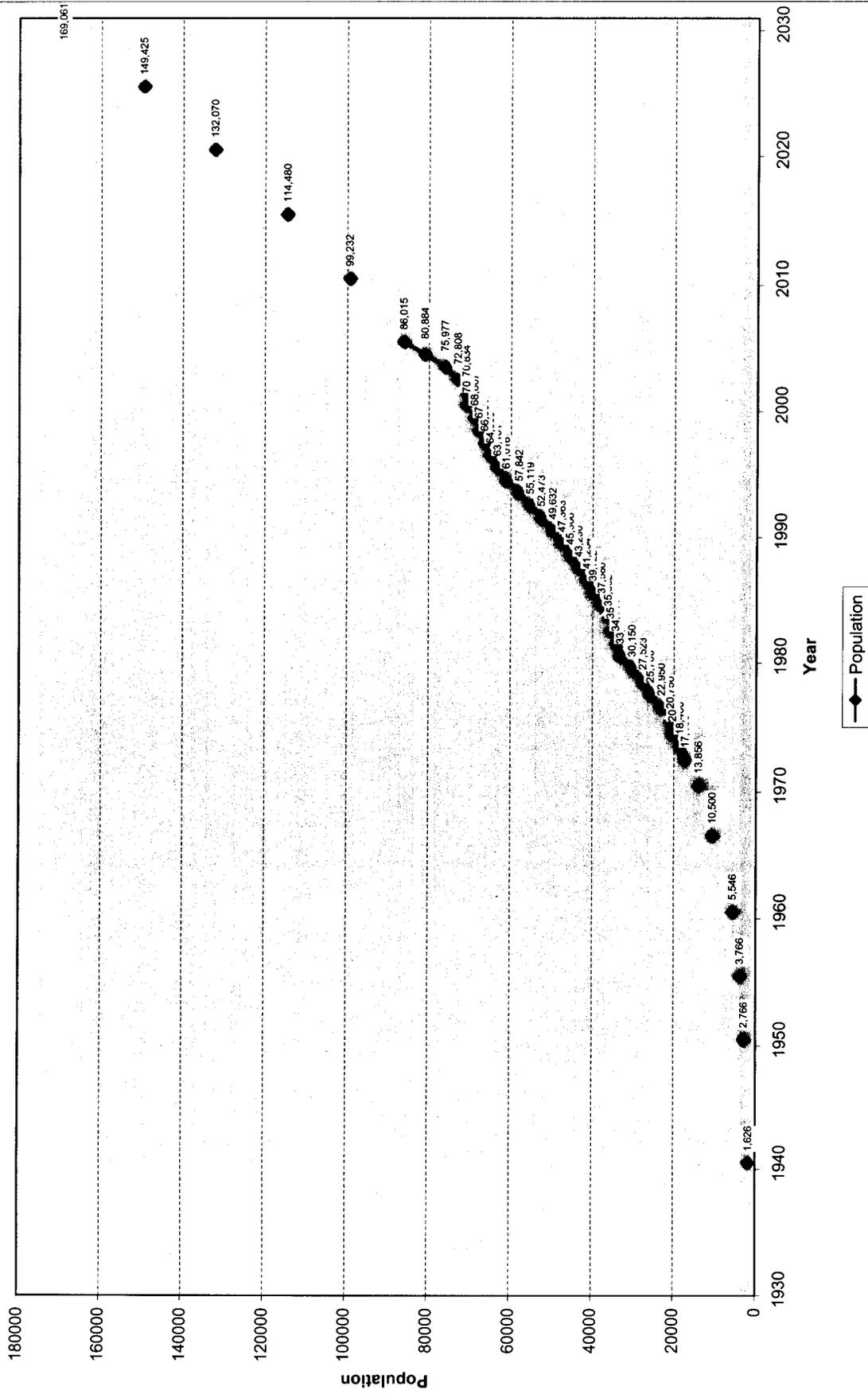
Population growth in the City of Clovis has averaged 4.0% over the past five years but has accelerated since 2003 along with the rest of the San Joaquin Valley. Population growth during the next five years is expected to average 2.9% annually and 2.5% thereafter through 2030. The Tarpey Village area is assumed to have a stagnant population because it is built out.

### Population - Current and Projected (Table 2)

	2005	2010	2015	2020	2025	2030
Service Area Population*	89,972	103,189	118,437	136,027	153,382	173,018

\* Includes City population and population of unincorporated areas served by City water.

Figure 1 - City of Clovis Population



## Climate

Clovis has a semi-arid climate with hot, dry summers and mild winters. Average daily temperatures vary from minimums of 37.0° F in December to 66.1° F in July and maximums of 53.4°F in December and 96.6°F in July. The area receives an average annual precipitation of 11.23 inches. The precipitation varies considerably year to year. During the past 50 years the smallest amount received was 6.07 inches and the largest 21.56 inches. Precipitation is largely confined to the late fall, winter and early spring months. Summer water consumption is three to five times winter consumption because of the lack of rainfall and the high temperatures.

**Climate (Table 3)**

Month	Average Eto*	Maximum Temperature	Minimum Temperature	Mean Temperature	Precipitation inches
January	0.85	54	38	46	2.16
February	1.63	61	41	51	2.12
March	3.23	66	45	56	2.20
April	5.23	74	48	61	0.76
May	6.96	83	55	69	0.39
June	7.97	91	61	76	0.23
July	8.65	97	66	81	0.01
August	7.64	95	65	80	0.01
September	5.41	89	60	75	0.26
October	3.59	78	52	65	0.65
November	1.68	63	42	53	1.10
December	0.85	53	37	45	1.34
Year	53.69	75.3	50.8	63.2	11.23

\* Eto is the amount of water evaporated and transpired on a monthly basis in inches.

## Demographic Changes

The City's adopted 1993 General Plan envisions a build out population of 182,775 in a gross area of 47,473 acres. That equates to an average density of 3.85 population per gross acre. The current developed density of the City is 6.74 population per gross acre. The General Plan concept includes three urban centers with open and rural residential areas transitioning between the centers and the existing City core. The Loma Vista Specific Plan, the first of the three urban centers, is now being developed in the southeast portion of the City. Once 60% of that area is developed the northwest urban center can begin development. If development follows the General Plan, the water demands for the area should be less on a per acre basis because of the lower densities.

**Dwelling Unit Demands (Table 4)**

Land Use	Dwelling Unit Range		ADD (afy/ac)	MDD (gpm/ac)	MDD (gpm/DU)	PKH (gpm/ac)	PKH (gpm/DU)
	Low (du/ac)	High (du/ac)					
<b>Very Low Density Residential</b>	0	2	3.1	4.04	4.04	6.15	6.15
<b>Low Density Residential</b>	2	4	2.1	2.73	0.91	4.17	1.39
<b>Medium Density Residential</b>	4	7	2.1	2.73	0.50	4.17	0.76
<b>Medium-High Density Residential</b>	7	15	3.4	3.58	0.33	5.06	0.46
<b>High Density Residential</b>	15	23	5.1	5.37	0.36	7.59	0.4
<b>Commercial</b>			1.8	1.9		2.68	
<b>Schools</b>			2.8	5.21		5.21	
Notes:							
(1) Max-day demand (MDD) per dwelling unit is equal to MDD per acre divided by the average dwelling unit for each land use							
(2) Peak-hour demand (PKH) per dwelling unit is determined by the same procedure used for MDD							
(3) Commercial and school water use is based on acreage and not connections							
(4) Unit water demands were taken from the 1999 WMP							

## **Section III Water Sources**

The City of Clovis currently has three sources of water available to it, groundwater, surface water and exchange water. Other planned future water sources are recycled water and additional exchange water.

### **Ground Water**

The City lies within the Kings Groundwater Sub-basin, which lies within the San Joaquin Basin Hydrologic Study Area. The Kings Sub-basin is also identified as sub-basin 5-22.08 of the Tulare Lake Hydrologic Basin in the Department of Water Resources Draft Bulletin 118-Update 2003. The Kings sub-basin has been identified as critically overdrafted. Total storage in the basin was estimated to be 93,000,000 acre-feet in 1961 (Williamson, 1989). The groundwater aquifer from which the City obtains its water is not adjudicated. There are however agencies within Fresno County which have adopted groundwater management plans in accordance with AB3030. Clovis, Fresno City, Fresno County and Fresno Irrigation District have all adopted Plans. Clovis' was adopted in November 1997. The City is participating in a regional groundwater management plan update which will be complete in 2006.

Up until July 2004, the City's sole source of drinking water was the groundwater aquifer underlying the community. The water system dates back to approximately 1913, when the first municipal well was installed. The City currently obtains approximately 18,060 acre-feet of water per year from its 40 wells. However, three of the wells are on standby status due to water quality issues (Wells 14, 20 and 41). Dibromochloropropane (DBCP) and high iron and manganese are the main water quality constraints in the Clovis area. A few of the wells are currently dry or producing too much sand. During the past year the City has abandoned three wells due to the dropping water table. During the next few years the City will be completing the installation of four new water wells located generally within the developed areas of the City.

Recharging the underground aquifer is a very important aspect in the use of groundwater for supply and is one of the means to address the basin overdraft. In order to effect recharge, a surface water supply is required. In drought conditions the City's ability to recharge water is reduced. During the drought year of 1977 recharge was only 2,845 AF compared to 6,397 AF the next year. This has a direct effect on the groundwater level. As can be seen on Table 5 and Chart 1, after heavy rainfall years, which correspond with high recharge years, the water table rebounds or holds steady. Because of the continual increase in the amount of water pumped and the cyclic drought conditions, the water table has dropped 103.4 feet in the past 54 years. In just the past 10 years, the water table has dropped 31 feet. Recharge efforts began in 1974, and in 2004 the City began utilizing surface water with the goal of reducing groundwater pumpage. Table 6 shows the amount of Groundwater pumped within the last 5 years.

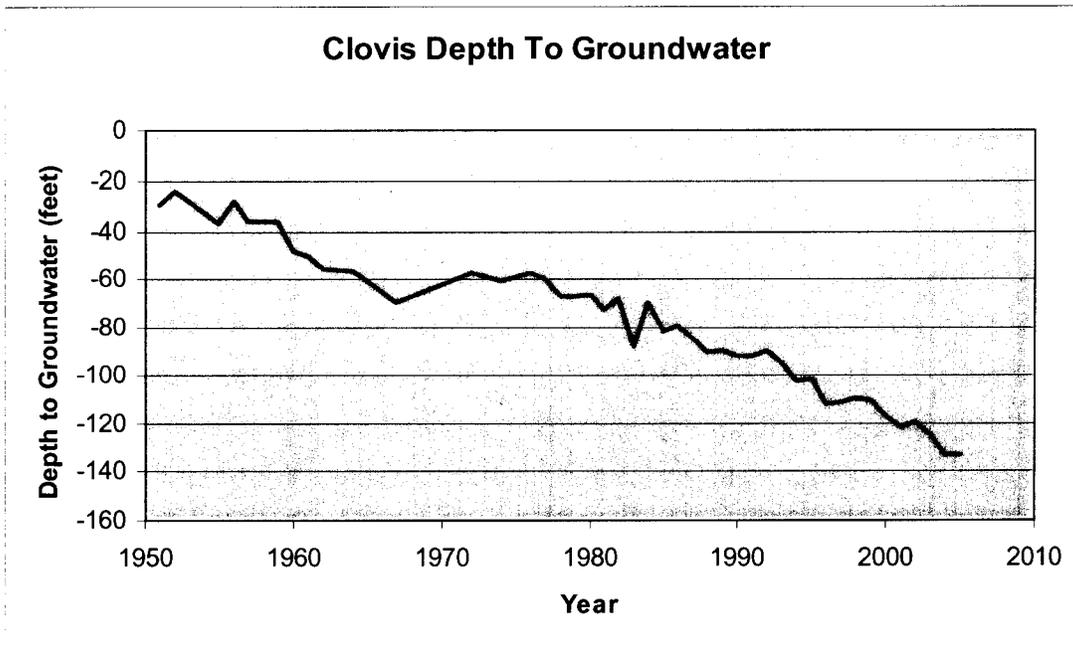
**Average Depth to Water, Recharge and Rainfall**

**Table 5**

<b>Year</b>	<b>Water Level (feet)</b>	<b>Total Intentional Recharge (AF)</b>	<b>Rainfall (inches)</b>	<b>Rain Year</b>
1951	29.95		10.30	50-51
1952	24.00		13.95	51-52
1953			9.70	52-53
1954			8.89	53-54
1955	37.55		10.28	54-55
1956	27.95		13.40	55-56
1957	36.20		8.20	56-57
1958			18.99	57-58
1959	36.30		6.87	58-59
1960	48.60		8.00	59-60
1961	50.00		6.87	60-61
1962	55.76		11.37	61-62
1963			11.59	62-63
1964	56.50		6.76	63-64
1965	60.36		11.20	64-65
1966			6.14	65-66
1967	69.60		14.99	66-67
1968			7.24	67-68
1969			22.98	68-69
1970			9.12	69-70
1971			8.53	70-71
1972	57.60		5.34	71-72
1973	59.22		13.94	72-73
1974	60.92	3,179	10.42	73-74
1975		5,021	7.69	74-75
1976	57.26	3,540	8.18	75-76
1977	60.02	2,845	7.61	76-77
1978	66.80	6,397	18.16	77-78
1979	67.10	6,952	10.65	78-79
1980	66.20	6,751	11.92	79-80
1981	72.95	4,930	8.23	80-81
1982	67.53	7,445	11.10	81-82
1983	88.20	6,475	23.57	82-83
1984	69.40	6,356	7.62	83-84
1985	81.58	5,817	7.94	84-85
1986	79.29	8,859	14.80	85-86
1987	85.08	3,349	9.32	86-87
1988	90.44	3,948	8.07	87-88
1989	89.80	6,668	8.73	88-89
1990	91.80	5,500	9.45	89-90
1991	92.00	7,369	9.77	90-91
1992	90.00	8,395	11.05	91-92
1993	95.00	9,224	16.53	92-93
1994	103.00	6,403	8.56	93-94
1995	102.00	8,751	19.03	94-95
1996	111.97	11,024	10.92	95-96
1997	111.58	8,591	11.99	96-97
1998	110.04	10,250	20.16	97-98
1999	110.50	9,076	7.01	98-99
2000	117.23	8,365	12.91	99-00
2001	122.12	9,141	10.56	00-01
2002	119.40	7,901	7.02	01-02
2003	124.97	6,661	9.76	02-03
2004	133.39	9,204	7.58	03-04
2005	133.35	9,808*	15.84	04-05

\* Data through October 2005

**Chart 1**



**Amount of Groundwater pumped - AF/Y (Table 6)**

Basin Name	2000	2001	2002	2003	2004
Kings Subbasin	19,354	20,196	21,277	22,600	23,035
% of Total Potable Water Supply	100%	100%	100%	100%	93%
Artificial Recharge	8,365	9,141	7,901	6,661	9,204

**Amount of Groundwater projected to be pumped - AF/Y (Table 7)**

Basin Name	2005	2010	2015	2020	2025	2030
Kings Sub-basin	18,060	15,610	14,323	17,237	12,557	13,092
% of Total Water Supply	41%	28%	24%	25%	19%	18%
Artificial Recharge	10,000	10,000	10,250	10,500	10,750	11,000

## Local Surface Water

The City of Clovis is presently located almost entirely within the Fresno Irrigation District (FID) except for the City center which is excluded from the District and some recently annexed areas which are northeast of the Enterprise Canal. The District obtains the majority of its water from the Kings River. FID is a member of the Kings River Water Association which holds water rights licenses for all of the Kings River and storage rights licenses on Kings River reservoirs. The District is entitled to water based upon a prorated monthly schedule determined by the natural flow of the Kings River as it would occur without reservoir storage above the historic Piedra gauging station. The FID is entitled to water at all flows but the percentage is higher at relatively low Kings River flows. If the snowmelt is slow, the District receives a greater entitlement. The FID average annual entitlement is 454,000 AF. An entitlement of 300,000 AF has occurred or been exceeded in 94 percent of the years of record. The smallest entitlement received was 174,000 AF and occurred in 1924. In the recent past only 197,000 AF was received in 1977. Figure 2 shows the Fresno Irrigation District Kings River Entitlement from 1896 to 2005.

The Fresno Irrigation District has one other source of surface water from the Friant Division of the Central Valley Project. The water obtained from this source comes from the diversion and storage of water from the San Joaquin River behind Friant Dam. The total available water has been estimated at 2,150,000 acre-feet. Of that, 800,000 acre-feet have been designated as Class I supply. Class I supply is considered to be dependable in most years with shortages only in very dry years. Class II water is in excess of Class I and is therefore much less dependable. Class II allotment has averaged 38 percent since 1966. It has been 100 percent during 9 of the last 40 years and 0 percent in 10 of the last 40 years. The FID has a contract with the United States Bureau of Reclamation for 75,000 AF of Class II water from the Friant Division of the Central Valley Project.

The City has an existing agreement with the Fresno Irrigation District whereby the City receives and manages on behalf of the landowners within the urbanized lands, the Kings River water which would be available to those lands. The City's allocation is proportional to the total acreage of the City's included area to the total FID area receiving a surface water supply. Currently the City has 9,471 acres in the included area; the FID total area includes approximately 245,000 acres. However the acreage receiving water currently is now 198,906.5 acres. The City's current entitlement in an average year for Kings River water is 21,617 A-F. In addition approximately 1,357 AF is available from the Class II CVP water on average. The current agreement between the City and FID however limits the City to only receiving Kings River water. FID has therefore provided excess Kings River water in lieu of the Class II water.

Within the City's General Plan area are lands which are outside the Fresno Irrigation District. Some of this land is located within either the Garfield Irrigation District or the International Irrigation District. Fifty percent of the Garfield Irrigation District and all of the International Water District are within the City's planned urbanized areas. The

International Water District has a Class I CVP contract for 1,200 A-F per year. The Garfield Water District has a Class I CVP contract for 3,500 A-F per year. Since half of Garfield is within the City's 2000 sphere of influence, 1,750 A-F annually of supply could be expected to be added to the City's supply upon development. For this Plan 1,170 A-F is considered available for land likely to be developed. The remainder is within a rural residential area. The International Water District is within the City's General Plan area but not the current sphere of influence so its supply is not included in this Plan. The City needs to insure that the land is not annexed to the City without the water supply being assigned to the City.

Currently the City's supply of surface water is used to supply the surface water treatment plant, provide direct irrigation to Letterman Park and to the Reagan Educational Center and to recharge the ground water. The City utilizes flood control basins in the summer for recharge and one dedicated year round recharge facility. The recharge facility encompasses approximately 90 acres after recently being expanded. Fresno Metropolitan Flood Control District also has plans to utilize surface water to irrigate the turf at Basin 1 E. In addition to the City's artificial recharge activities the City has determined through master planning studies, that approximately 7,700 AF annually is the sustainable yield of the groundwater in the Clovis service area.

Table 8 shows how the City has historically utilized its surface water for recharge.

**TABLE 3  
Historical Deliveries for Recharge**

1974	3,179		3,179		3,179
1975	5,021		5,021		5,021
1976	3,540		3,540		3,540
1977	2,845		2,845		2,845
1978	6,397		6,397		6,397
1979	6,952		6,952		6,952
1980	6,751		6,751		6,751
1981	4,930		4,930		4,930
1982	4,521	1,606	6,127	1,318	7,445
1983	3,927	884	4,811	1,664	6,475
1984	3,427	1,491	4,918	1,438	6,356
1985	2,419	260	2,679	3,138	5,817
1986	3,146	1,252	4,398	4,461	8,859
1987	1,601	782	2,383	966	3,349
1988	1,490	1,130	2,620	1,328	3,948
1989	3,961	1,261	5,222	1,446	6,668
1990	2,156	1,335	3,491	2,009	5,500
1991	3,278	1,694	4,972	2,397	7,369
1992	3,208	1,583	4,791	3,604	8,395
1993	1,930	2,491	4,421	4,803	9,224
1994	1,545	2,236	3,781	2,622	6,403
1995	2,223	1,620	3,843	4,908	8,751
1996	3,864	3,160	7,024	4,000	11,024
1997	2,712	1,626	4,338	4,253	8,591
1998	3,483	1,713	5,196	5,054	10,250
1999	2,009	2,678	4,687	4,389	9,076
2000	1,740	2,202	3,942	4,423	8,365
2001	2,733	2,341	5,074	4,067	9,141
2002	2,139	1,725	3,864	4,037	7,901
2003	1,056	1,902	2,958	3,703	6,661
2004	3,661	2,147	5,808	3,396	9,204
2005*	4,370	2,045	6,415	3,393	9,808
Average	3,319	1,715	4,606	3,201	7,006

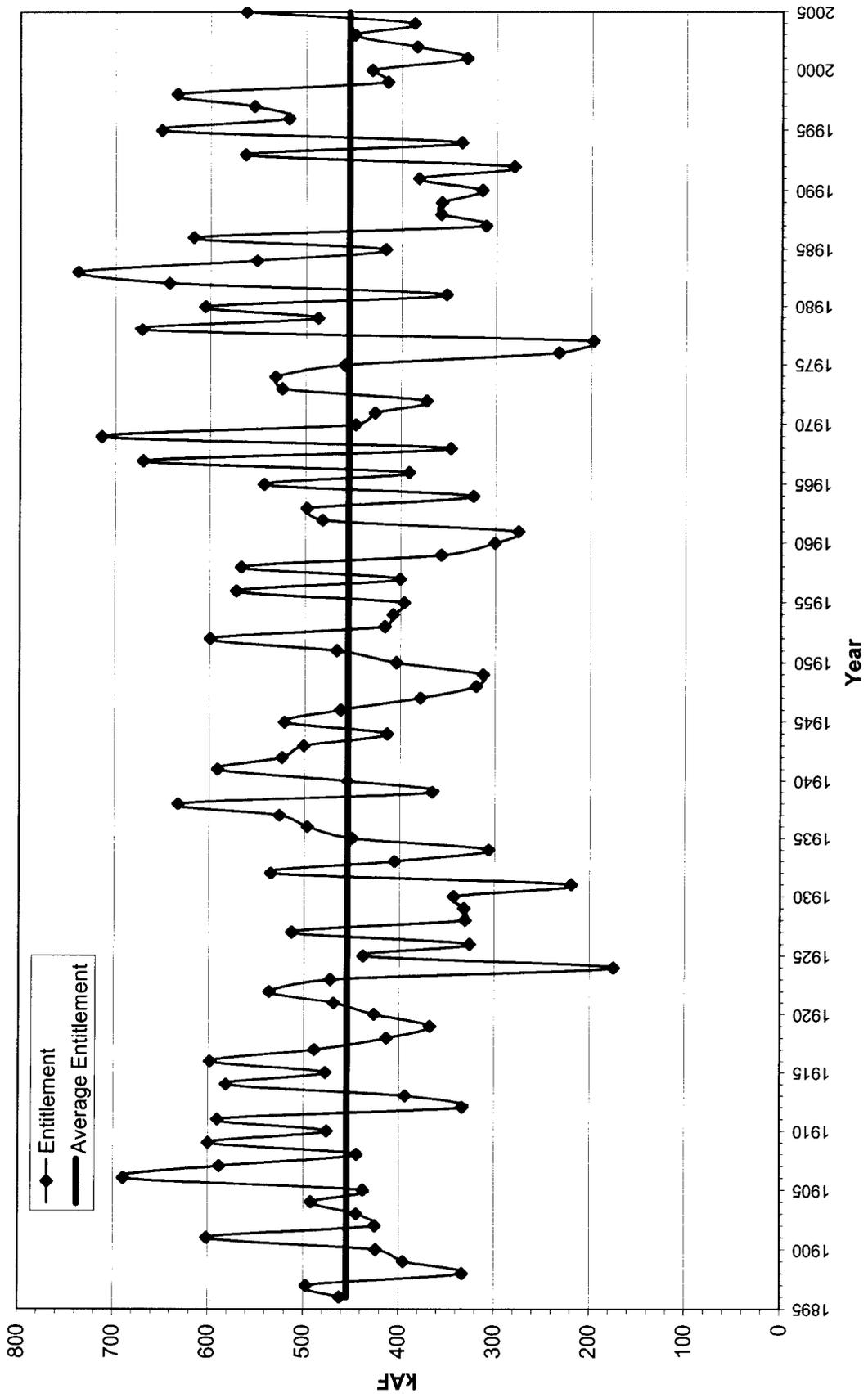
(1) FID Deliver Year March 1 - February 28.

(2) Basins Included: S, BW, CL, 2-D, 3-D, 3-F, 4-E, 5-B/5-C, 5-F, 6-D, 7-C.

(3) Creeks Included: Big Dry Creek, Redbanks Creek, Dog Creek

\* Through October 2005.

Figure 2  
FID Kings River Entitlement



## **Banked Water**

In 2004, the City entered into an agreement with the Fresno Irrigation District where the City would participate in the financing of the construction of a dedicated water banking facility called the Waldron Pond Banking Facility. The facility which will encompass around 225 acres of percolation facilities will produce an estimated 10,000 A-F of water annually. The City is entitled to receive 90% of the yield. The City plans on taking the water in water short years to augment supply. In years when the banking project's annual yield is less than the amount needed, the Fresno Irrigation District will acquire additional water supply from other sources to meet Clovis' needs. In the event Fresno Irrigation District is unable to acquire such additional water for Clovis, the District will make such water available to Clovis from the District's Kings River entitlements.

## **Recycled Water**

The City of Clovis' wastewater is treated at the Fresno-Clovis Regional Wastewater Treatment Plant, located southwest of the City of Fresno. It is approximately 16 miles by trunk sewer to the City of Clovis. Currently the water is treated to the secondary level and then some is spread in percolation ponds and some is used directly on non-food crops. The plant then uses wells on the treatment plant property to pump water in order to reduce groundwater mounding under the plant. The pumped water is then put into Dry Creek and the Houghton Canal for use by farmers downstream. The FID in exchange gives Fresno an additional one A-F of surface water for each two A-F of water pumped and put into the canals. Because Clovis contributes a percentage of the flow to the plant, Clovis is entitled to a proportionate share of any exchanged water. Currently approximately 26,000 A-F per year is being pumped from the reclamation wells. Clovis' percentage of the wastewater flow is 9.9743%. The City therefore is entitled to an additional 1,297 A-F per year.

The City is currently in the process of planning a new wastewater treatment plant within the City of Clovis which will produce Title 22 disinfected tertiary treated water. The plant will serve the new growth areas of the City in the Southeast, the Northwest and ultimately the Northeast Urban Centers. The plant will be located on Ashlan Avenue approximately 600 feet west of McCall Avenue. The plant is currently scheduled to be operational beginning in 2009. The first phase of the project will utilize wastewater flow from the Southeast Area and diverted flow from the Fowler Trunk Sewer that is currently being treated at the Regional Wastewater Treatment Plant for a total average daily flow of 2.8 million gallons per day. Ultimately the plant will treat 8.4 million gallons per day. The City is developing a recycled water master plan for the reuse of the treated wastewater.

**Current and Planned Water Supplies - AF/Y (Table 9)**

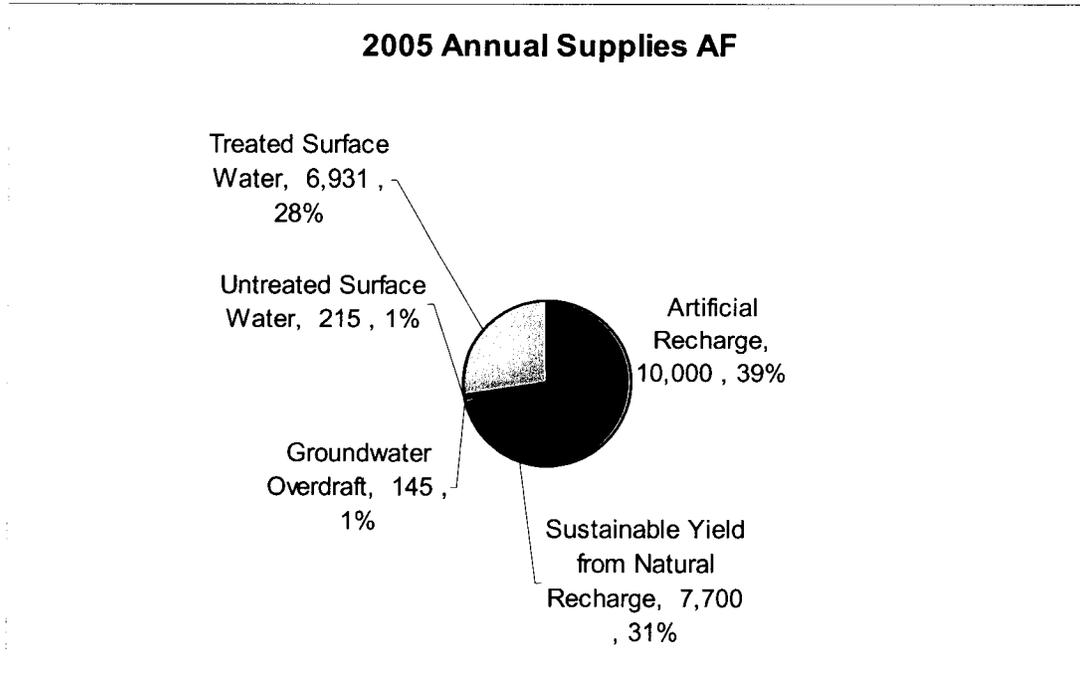
<b>Water Supply Sources</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Clovis produced groundwater</b>	18,060	15,610	14,323	17,237	12,557	13,092
<b>Supplier surface diversions</b>	24,976	26,704	31,780	34,594	37,628	39,828
<b>FID exchanged water for recycled</b>	1,297	1,031	1,174	880	1,054	871
<b>FID exchanged water for banked water</b>	-	9,000	9,000	9,000	9,000	9,000
<b>Recycled water</b>	-	2,913	2,913	6,273	6,273	9,410

Current and future supply projections through 2030 are shown in Table 9. The future supply projections assume normal surface water entitlements from the FID. The FID water exchanged for recycled water from the Fresno-Clovis Metropolitan Wastewater Treatment Plant is assumed to remain constant from 2010 on however the Clovis' share will fluctuate due to diversions off of the Fowler Trunk Sewer to serve the planned Clovis treatment plant. The quantity is constrained by the number of reclamation wells on the Plant property and by the seasonal demand for irrigation water. Additionally future effluent disposal may be by other means than percolation ponds. A new supply from recycled water is assumed beginning in the year 2010 from the planned Clovis facility. This amount will increase due to plant expansions in future years.

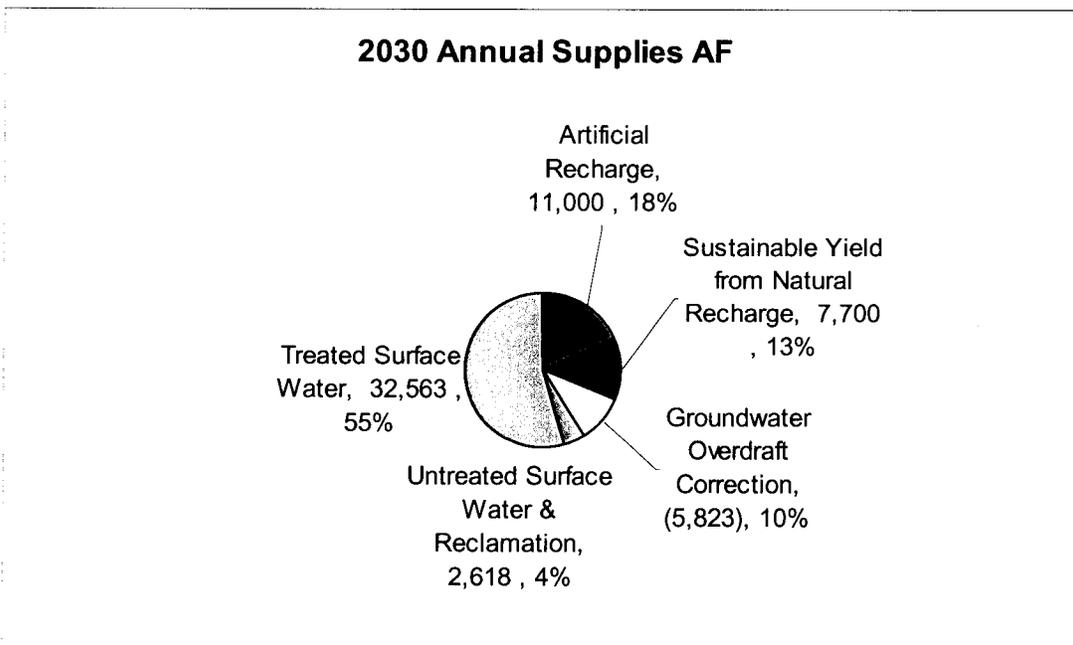
Figure 3 shows the planned surface water supplies in 2030 based on runoff availability during the years 1975 through 2005.



**Chart 2**



**Chart 3**



As can be seen from Chart 2 and Chart 3, the groundwater overdraft in the Clovis Service area has been addressed with the use of the surface water treatment plant. With continued expansions of the surface water treatment plant and the planned use of recycled water, further corrections in the overdraft situation and the restoration of the groundwater table can be assumed.

## **Section IV Reliability of Supply**

### **Frequency and Magnitude of Supply Deficiencies**

Because until very recently the City had relied entirely on groundwater for supply, an actual shortage of water has never been experienced. Today because the system now utilizes both surface water and groundwater there are two ways the system could have supply deficiencies. For the groundwater portion of the system, the most likely reasons the City would have a deficit are that wells could not be used because of contamination or repairs or an emergency occurs which limits the water system's ability to deliver the water. Another possibility is that eventually if not enough recharge is carried out there could be a shortage caused by falling water levels. Wells could dry up and in certain areas deeper wells may not be possible. Wells not being used because of contamination or repairs will be examined first.

There are three major types of contamination that cause problems for Clovis wells, bacteriological, organic and inorganic. Certain City wells have been affected by DBCP and high iron and manganese levels. The wells affected by DBCP are scattered throughout the City. Wells with high iron and manganese are located in the easterly portion of the City, east of Fowler Avenue. In the future pending regulations for currently unregulated contaminants such as TCP or Radon could impact some of the City's wells. All of these water quality problems can cause a well to be shut down temporarily or sometimes permanently.

When a well starts to exceed the State's Maximum Contaminant Level (MCL) for a primary standard, a six month period of monthly sampling is conducted before a decision is made to shut down the well or not. Unfortunately, six months is not an adequate time period to design and construct a treatment facility. Also unless the contaminant level is quite a bit above the MCL the City would not want to begin design of a treatment facility until all the water quality data was in.

Wells occasionally have to be shut down temporarily due to needed repairs. These can include electrical problems, pump bowls needing to be lowered, cla-valve repairs, pump motor repairs, etc. These can cause the well to be down for periods ranging from a day to several months.

An emergency situation in which the City could be hampered in delivering water might be as routine as power failures or as extraordinary as a severe earthquake which causes power failures and breaks water mains. Most power failures do not affect the entire City at one time; when it does happen, it usually lasts no more than two hours. However, the City has taken steps to prevent a prolonged power outage from disrupting service by the addition of permanent auxiliary power sources installed at 14 well locations and the three pump stations.

A shortage of surface water would affect the ability of the City to supply water for both the surface water treatment plant and for recharge activities. Obviously because of the need to

continue supplying potable water to the City's customers, the surface water treatment plant will have priority in deliveries. Recharge activities will get excess surface water.

### Surface Water Availability

There were two periods since 1895 which over a three-year period could be considered the driest. The first one was in 1929 - 1931 with three years of well below average surface water availability. The second one was in 1975 - 1977. For this second period, the first year was actually slightly above average, with the second and third years around half of average. Because long droughts of three years or more are more common and really more devastating, the 1929 - 1931 period will be used for worst case forecasting.

The City is not allowed to carry over any unused FID entitlement water from previous years. It therefore has no impact on the amount of water available the next year. The impact is felt in reduced groundwater recharge and perhaps increased groundwater pumping. It is not an immediate problem, but a long-term problem. Because of the limited availability of locations to recharge, deficits in recharge cannot be easily made up in wetter years. Table 10 shows how a three-year minimum water supply would affect overall supplies.

### Supply Reliability -AF Year (Table 10)

Sources of Supply	Normal Water year	Single Dry Year*	Multiple Dry Years**		
			Year 1	Year 2	Year 3
Ground Water	18,060	18,060	18,060	18,060	18,060
Surface Water	22,992	8,285	15,808	16,332	10,428
FID Exchange Water for Recycled Water	1,297	1,297	1,297	1,297	1,297
Recycled Water	0	0	0	0	0
Water Transfers or Purchases	0	0	0	0	0
Urban Storm Water Recharge	2,000	1,000	1,000	1,000	1,000
<b>Totals</b>	<b>44,349</b>	<b>28,642</b>	<b>36,165</b>	<b>36,689</b>	<b>30,784</b>
<b>Percent of Normal</b>	<b>100%</b>	<b>65%</b>	<b>82%</b>	<b>83%</b>	<b>69%</b>

\*Single driest year based on surface water supply in 1924

\*\*Multiple dry years based on surface water supply in 1929-1931

### Supplemental Water Sources

In the event of surface water shortages the City will order water from the Waldron Pond Banking Facility. It is currently estimated that the City can acquire 9,000 acre feet of water annually from the Facility. In the event of prolonged droughts, FID may not be able to recover the 9,000 acre feet of water from Waldron Pond. In that case FID will try to obtain the water elsewhere if possible.

### Fresno County Stream Group Water

Major streams upslope from the City of Clovis are the Big Dry, Dog, Redbank, Fancher, Alluvial Drain and Pup Creeks. These streams carry storm runoff from drainage areas east

of the City. Recently constructed Army Corps of Engineers' projects (Alluvial Detention Basin, Pup Creek Detention Basin, Redbank Reservoir, Fancher Creek Reservoir and Big Dry Creek Reservoir) detain the flows to reduce the possibility of flooding. The City of Clovis is a joint applicant with the City of Fresno, Fresno Metropolitan Flood Control District and Fresno Irrigation District in acquiring the rights to this water. If rights are obtained, the water could be used when available, for recharge. The Fresno Metropolitan Flood Control District now owns the Alluvial Detention Basin, the Pup Creek Detention Basin, the lands of the Fancher Creek Reservoir and the lower portion of the Big Dry Creek Reservoir. The District has indicated that these facilities may be available to the City to assist in the management of the City's surface water entitlements. Army Corps of Engineers requirements will need to be met in order to utilize these facilities.

### **Transfer and Exchange Opportunities**

Water transfers would necessitate the City purchasing water rights or land with associated water rights. The most logical choice for a potential water transfer would be from a contractor from the Friant unit of the CVP. If land can be found that does not have a permanent crop and is served by a Class I CVP contract, a fairly reliable source of water may be found. The cost of such water however may be high. It is estimated that with a minimum delivery of 75% of normal, in a drought year, 1.5 acre-feet per acre could be realized.

## Section V Past, Current and Projected Water Use

### Current Water Demand

Since 2000, new connections to the water system have been added at an annual rate of 4.9% with an overall increase in water demand of 5.2 % per year. The City has continued during the past 5 years to increase the amount of landscaped area in the City. This has contributed to an overall increase in per capita water consumption. Because the consumption of some users who do not contribute revenue to the enterprise fund is not monitored, the amount of losses cannot be determined exactly. However, governmental uses including construction water, main flushing, fire fighting, non metered landscaping and City building use, together with losses currently totals only 4.6% of production. Unaccounted for water is estimated at 2% of production.

Below is a listing of demands over the past 40 years.

**Demands 1965 - 2005 (Table 11)**

<b>Year</b>	<b>Demands AF</b>	<b>Year</b>	<b>Demands AF</b>
1965	2,265.3	1986	10,185.1
1966	2,919.9	1987	10,072.2
1967	2,807.3	1988	10,832.1
1968	3,037.5	1989	12,521.9*
1969	2,837.1	1990	13,568.6
1970	3,523.3	1991	13,388.3
1971	3,969.6	1992	14,157.2**
1972	4,379.0	1993	15,231.1 **
1973	4,301.6	1994	16,429.9**
1974	5,378.3	1995	15,892.5**
1975	5,001.1	1996	17,066.8**
1976	5,716.5	1997	18,779.2**
1977	4,557.3	1998	16,463.9**
1978	5,992.1	1999	18,652.9*
1979	7,428.1	2000	19,248.9**
1980	7,865.2	2001	20,195.7
1981	8,501.1	2002	21,335.6**
1982	8,409.9	2003	22,538.7**
1983	8,161.3	2004	24,653.2
1984	9,517.3	2005	24,991 est.
1985	9,428.9		

\*Tarpey Village was added to the City's system January 1, 1989.

\*\* Values were adjusted to a 365-day year.

Table 12 illustrates past, current and projected water demand from 2000 to 2030 in acre-feet per year and the number of customers for the same time period. In the table below the data for the year 2000 is actual data. The data for the year 2005 is estimated based on actual data through November 2005 with December 2005 data estimated. For future years the data is projected based on general plan land uses, the amount of undeveloped land within the current sphere of influence and the unit demands shown in Table 4. Some adjustments are made for public landscape that is included in all zone districts but is not included in deliveries to those classes of customers.

**Past, Current and Projected Water Deliveries (Table 12)**

Year		Water Use Sectors	Single family	Multi-family	Commercial	Industrial	Instit/gov	Landscape	Construction	Agricultural	Total
2000	metered	# of accounts	17,488	768	892	45	33	283	70	-	19,579
		Deliveries AF/Y	10,912	2,658	2,040	316	504	503	415	-	17,348
	unmetered	# of accounts	1,105	-	2	-	8	33	273	-	1,421
		Deliveries AF/Y	1,386	-	6	-	122	59	176	-	1,749
2005	metered	# of accounts	22,867	796	1,151	43	38	388	79	-	25,362
		Deliveries AF/Y	14,232	2,567	2,810	205	352	2,234	215	-	22,614
	unmetered	# of accounts	1,048	-	2	-	8	75	210	-	1,343
		Deliveries AF/Y	1,221	-	5	-	74	432	135	-	1,867
2010	metered	# of accounts	25,892	1,036	1,382	92	38	424	86	-	28,950
		Deliveries AF/Y	16,114	3,340	3,373	437	352	2,441	235	-	26,292
	unmetered	# of accounts	979	-	2	-	8	75	210	-	1,274
		Deliveries AF/Y	1,141	-	5	-	74	432	135	-	1,787
2015	metered	# of accounts	30,118	1,189	1,586	105	45	498	106	-	33,647
		Deliveries AF/Y	18,744	3,833	3,872	502	414	2,865	290	-	30,521
	unmetered	# of accounts	910	-	2	-	8	75	210	-	1,205
		Deliveries AF/Y	1,060	-	5	-	74	432	135	-	1,706
2020	metered	# of accounts	34,973	1,365	1,822	121	53	583	130	-	39,047
		Deliveries AF/Y	21,766	4,403	4,448	576	487	3,355	353	-	35,388
	unmetered	# of accounts	841	-	2	-	8	75	210	-	1,136
		Deliveries AF/Y	980	-	5	-	74	432	135	-	1,626
2025	metered	# of accounts	41,211	1,539	2,055	136	60	667	152	-	45,821
		Deliveries AF/Y	25,648	4,964	5,016	650	559	3,838	416	-	41,090
	unmetered	# of accounts	-	-	2	-	8	75	210	-	295
		Deliveries AF/Y	-	-	5	-	74	432	135	-	646
2030	metered	# of accounts	46,487	1,737	2,318	154	69	762	178	-	51,704
		Deliveries AF/Y	28,931	5,600	5,659	733	640	4,385	486	-	46,433
	unmetered	# of accounts	-	-	2	-	8	75	210	-	295
		Deliveries AF/Y	-	-	5	-	74	432	135	-	646



## **Residential Customer Class**

In the City of Clovis, single-family residential customers average 2.95 persons per household. Multiple family customers average 2.56 persons per unit. Total system per capita water production which includes the City and Tarpey Village averages 248 gallons per day for all uses, including residential, commercial, industrial, schools and governmental. For the City of Clovis without Tarpey Village, the per capita production averages 245 gallons per day. For Tarpey Village alone, the per capita production averages 320 gallons per day. For residential use only, consumption for Clovis alone averages 172 gallons per person per day and Tarpey alone averages 315 gallons per day. The significant difference in residential use in the two areas' consumption is partially attributable to the lack of meters and the large residential lots in Tarpey. Per capita residential consumption has decreased by 0.4% in Clovis and 6.3% in Tarpey over the past 5 years in large part because 2005 was a wet year, which reduces demand for landscape irrigation. The Tarpey consumption is projected to remain flat due to it being a built out area, whereas the Clovis residential consumption is expected to increase as additional customers are added. It also is expected that by 2025 all of the Tarpey unmetered customers will have had meters installed.

## **Commercial Customer Class**

The City has a wide variety of commercial customers, ranging from the downtown area which has antique shops, restaurants, beauty, printing, offices and other small shops to a regional shopping mall. The City also is host to several car dealerships, national chain retail stores and several new community shopping centers. The City also includes in its commercial customer class churches, hospitals and other governmental uses besides the City's. The growth in the consumption of this class of customer has exceeded the population growth of the City with an annual average of 6.6% over the last 5 years. The growth in the number of connections has also exceeded the population increase, averaging around 5.2%.

## **Industrial Customer Class**

The City has a small industrial customer class that has shrunk slightly in the last five years. There are currently 43 customers classed as industrial, a reduction of 2 since 2000. The customers are generally light industrial with a few exceptions. One food processing plant is an exceptionally heavy seasonal water user and there are a few other year round large water users. For the most part though, Clovis industrial customers do not put large demands on the system. Consumption over the past five years has decreased 35%. This customer class could either substantially decrease if the largest customer reduced or eliminated operations or it could increase as the City's new industrial technology park builds out. The industrial customer class' consumption is projected to increase as new industrial customers are added.

## **Institutional/Governmental Customer Class**

This customer class includes schools and City government buildings. It is expected to increase in proportion to the additional land area expected to be added in the future.

### Landscape Customer Class

This class includes all of the publicly maintained landscape in the City. This class has grown at an annual rate of 30% and has significantly contributed to the rise in the total per capita increase in demands over the past 5 years. The demands and customer counts are estimated for 2005 using 2004 data. These meters are only read once a year during January. In the future this class will continue to grow however it will grow more in line with population growth.

### Construction Water Customer Class

This class consists of two groups of users. One is customers who utilize hydrant water meters which are metered and the other is new connections to the system, prior to the meter being set. There will always be some of these new connections and their demand is not expected to increase. The use from hydrant meters will increase with the increase in population.

### Agricultural Customer Class

The City at this time has no agricultural customers and doesn't at this point have plans to add any. Eventually the City will have recycled water customers of which agricultural users may fall into this category.

### Sales to Other Agencies

Currently the City has no sales of water to other agencies. This is a distinct possibility in the future but the quantities of water are unknown at this time.

### Additional Water Uses and Losses - AF/Year (Table 13)

Water Use	2000	2005	2010	2015	2020	2025	2030
Groundwater recharge	8,365	10,000	10,000	10,250	10,500	10,750	11,000
Raw water	65	215	215	215	215	215	215
Unaccounted for & losses	257	509	583	670	769	867	978
Total	8,687	10,724	10,798	11,135	11,484	11,832	12,193

### Total Water Use - AF/Year (Table 14)

Water Use	2000	2005	2010	2015	2020	2025	2030
	27,784	35,204	38,877	43,362	48,498	53,568	59,272

## **Section VI Demand Management Measures**

The City of Clovis is committed to managing its water resources in the most responsible way possible while keeping costs to its customers to a minimum. To that end the City has for the past five years been actively trying to increase water conservation. Below are descriptions of current and future water management programs.

### **Water Survey Programs for Single Family, Multi-Family, Governmental and Institutional Customers**

This measure is currently being implemented. Customers are notified annually of the availability of surveys through their consumer confidence report. Additionally customers are asked if they would like a survey when they request a ultra low flow toilet rebate. Surveys include the following: check for leaks by using the meter; check the flowrate of shower heads and faucet aerators; supply replacements if necessary; check irrigation systems and timers; review the irrigation schedule; measure the landscape area and check the irrigation coverage. Customers are then provided with recommendations to make improvements. Copies of the surveys are kept. Response has been very poor to this measure since its beginning in 1997, however it will continue to be made available. The effectiveness of this measure can be evaluated by following up to see if based on meter records if there is a reduction in consumption. Due to the poor response, there have only been two surveys requested in the past 5 years, there is no quantifiable water savings at this point.

IMPLEMENTATION SCHEDULE: Ongoing.

### **Residential Plumbing Retrofits**

The City has approximately 12,729 single family and 740 pre-1992 water accounts. In order to get those customers to change over to low flow devices the City has made low flow shower heads and faucet aerators available to customers at no cost. These are distributed to customers at Clovis Farmer's Market, the Clovis Community Picnic in September and at other events such as the Lowe's Household Safety Fair held on June 4, 2005. They also are distributed to customers during toilet rebate inspections and during complaint responses. The program to distribute low flow devices began prior to 1995 with a distribution of over 4,000 shower heads which were provided to the City at no cost by P.G.& E. Since then approximately 800 additional showerheads and approximately 3300 aerators and numerous toilet dams have been distributed. Current plumbing standards are enforced by the Building Division. It is difficult to determine how effective these devices are in use however water savings can be estimated based on assumptions. The use of this demand reduction measure reduces the City's ability to make further long term reductions in the event of a water shortage. The City will continue to make these retrofit devices available for customers.

**Table 15**

Actual	1992-2001	2002	2003	2004	2005
# shower heads distributed	4200	150	150	175	125
# faucet aerators	1300	500	500	500	500
Actual expenditures	\$ 877.14	\$800	\$2,927.81		
Actual water savings - AF/Y	209	13	13	14	11

**Table 16**

Proposed	2006	2007	2008	2009	2010
# shower heads	150	150	150	150	150
# faucet aerators	500	500	500	500	500
Projected expenditures \$	\$522.10	\$522.10	\$522.10	\$522.10	\$522.10
Projected water savings - AF/Y	13	13	13	13	13

IMPLEMENTATION SCHEDULE: Ongoing.

### **System Water Audits, Leak Detection and Repair**

The City has quantified that it's unaccounted for water is approximately 2.1% of the total production. Included in that number is hydrant flushing, sewer cleaning and other unmetered City uses. All leaks on the City's side of the meter are repaired. Customers are notified to make repairs when leaks are discovered on their side of the meter. The City follows up to make sure that necessary repairs are made by the customer. A leak detection survey was conducted in January 2002 on 42 miles of water mains in older areas of the City. 6 small leaks were found, two at valves, 2 at hydrants and 2 at curb stops. The estimated losses were 4,320 gallons per day or 4.84 AF per year. The leaks were repaired. The City proposes to do another limited leak detection survey on the distribution system in one of the older areas of the City to determine if there are losses that are not showing up. Depending on the result of that survey additional leak detection may be done. The use of this demand reduction measure reduces the City's ability to make further long term reductions in the event of a water shortage.

IMPLEMENTATION SCHEDULE: Limited leak detection survey will be conducted during 2006-2007.

### **Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections.**

The City is fully metered for all customer classes, including separate meters for single family residential (except for Tarpey Village which is metered on gross consumption), commercial, industrial and schools. Multiple family customers are metered but not necessarily individually by living unit. Tarpey Village residential customers who are not individually metered are charged a flat rate which varies upward depending on the gross consumption of all of the unmetered customers. This has provided an incentive for individually unmetered customers to conserve water and has encouraged some of these customers to request meters. Since 2000, 61 unmetered Tarpey customers have requested the installation of a meter. There currently are 1048 customers that are still individually unmetered. The City

offers an incentive to these customers to have meters installed by charging them a discounted cost to have the meter installed and allowing the meter to be paid for over a two year period at no interest. The City has been offering this program since 1994 and has installed a total of 314 meters.

The amount of water saved by installing meters at unmetered customers can be estimated by comparing the average consumption of the metered customers in Tarpey to the average consumption of the unmetered customers in Tarpey. The implementation of this demand reduction measure makes it easier to implement additional measures to reduce consumption in the future because the effects can be more easily determined with a meter.

For the City's individually metered residential customers, the City has an inclining block rate structure. There is a base charge which includes a minimum amount of water allowance. Consumption over the minimum allowance is billed per 1,000 gallons at a cost 7.7% higher than the minimum for consumption up to an average consumption level. Consumption over the average consumption level is billed at a rate 25% higher than the average consumption level cost.

Metered customers other than residential also have a minimum charge which includes a minimum water allowance. All consumption over the minimum is billed per 1,000 gallons at a constant rate. Because commercial, industrial and school customers are so diverse in size and water needs, no average consumption level could be determined which would not be grossly unfair to some customers, so there is no block rate higher than the cost to provide sufficient revenue. Alternate rate structures that provide an incentive to reduce consumption can be evaluated during the next rate adjustment.

**Table 17**

Actual	2001	2002	2003	2004	2005
# of unmetered accounts*	1097	1083	1074	1059	1048
# of retrofit meters installed	12	14	9	15	11
# of accounts without commodity rates*	2	2	2	2	2
Actual expenditures	\$7,380	\$8,610	\$5,535	\$9,225	\$6,765
Actual water savings - AF/Y	4.93	5.75	3.70	6.16	4.5

\* doesn't include non revenue generating accounts or short term construction water accounts.

**Table 18**

Planned	2006	2007	2008	2009	2010
# of unmetered accounts*	1032	1016	1000	984	967
# of retrofit meters installed	16	16	16	16	17
# of accounts without commodity rates*	2	2	2	2	2
Projected expenditures	\$9,840	\$9,840	\$9,840	\$9,840	\$10,455
Projected water savings - AF/Y	6.57	6.57	6.57	6.57	6.57

\* doesn't include non revenue generating accounts or short term construction water accounts.

**IMPLEMENTATION SCHEDULE:** The City will continue to install and read meters on all new services. The City will continue to retrofit existing services as requested by Tarpey residents.

### **Large Landscape Conservation Programs and Incentives**

Aside from City maintained landscape areas there are very few landscapes in the City which would qualify as large (currently 3 acres or greater). There is one regional shopping center, a cemetery and 24 schools (3 of these schools irrigate their landscape by private wells). One of the educational school complexes uses surface water to irrigate its landscape. The City has 9 parks which are 3 acres or greater and a large trail system. The cemetery is not currently served by the City's system; they have their own well. The City has soil moisture sensing equipment installed at Gettysburg Park, San Gabriel Park and in Old Town landscape areas. This equipment senses the amount of moisture in the soil and then allows the controllers to turn on the valves when the moisture is low enough. The City also has installed a centralized sprinkler control system which allows irrigation systems to be operated centrally based on current weather data. In 2005, a weather station was added in Railroad Park so that the system will automatically adjust the sprinkler controllers based on current evapotranspiration rates. The system currently is operating at the Civic Center, Sierra Bicentennial Park, Letterman Park, Cottonwood Park, Railroad Park, Rotary Park, Basin S Park, Thurburn Park, the Surface Water Treatment Plant and Stanford/El Paso Park. Future parks to be added to the system are Basin 1E Park, Gettysburg Park, and San Gabriel Park. All new large landscape areas constructed will be added to the system as they are constructed. Currently including new sites, there are a total of 93 controllers which are tied into the central irrigation system. The cost to add each site varies between \$5,000 and \$10,000. This program began in 2001. The magnitude of the effectiveness of this measure is difficult to determine because of the variability in the weather year to year, however it is definitely effective by not irrigating during wet weather. This measure of course will reduce the ability of the City to have further reductions in the event of water shortages.

The City adopted a water efficient landscape ordinance in 1993. It applies to most large landscape projects in the City and requires certification of landscape designs. See Appendix C.

Landscape surveys are available to City water customers. The surveys include a measurement of the landscape area, a review of the irrigation system controller type, the current watering schedule, a review of the irrigation coverage, the amount of sprays, bubblers and drip. Customers are provided information on scheduling, water efficiency, plants, and assistance with setting controllers. Customers are provided with rain gauges to assist in determining how much to irrigate. New developments are advised during the planning phase for their projects that it is recommended that they install separate water services for landscape irrigation. Currently there are separate landscape services for 144 commercial customers, 1 industrial customer, 10 multiple family customers, 42 single family customers and 20 school customers. The cost to provide a landscape survey is approximately \$75. This measure has been offered since 1997. The effectiveness of this measure can be determined for individual customers by comparing meter readings. This measure also will reduce the ability of the City to have further reductions in the event of water shortages.

**Table 19**

Actual	2001	2002	2003	2004	2005
# of large landscape sites converted to central irrigation system	1	2	2	2	0
Actual expenditures	\$9,995	\$9,322	\$17,686	\$19,505	\$1,480

**Table 20**

Planned	2006	2007	2008	2009	2010
# of large landscape sites converted to central irrigation system	2	2	2	1	0
Proposed expenditures	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000

IMPLEMENTATION SCHEDULE: Each year City landscape areas will be added to the central control system and newly constructed landscapes added as they are constructed. Surveys will continue to be offered to customers.

### High - Efficiency Washing Machine Rebate Programs.

Previously the City has not offered a rebate for high - efficiency washing machines. Through the end of 2005, Pacific Gas and Electric Company is providing a \$35 or \$75 rebate on washers that have a water usage of 9.5 gallons per cubic foot of laundry and 8.5 gallons per cubic foot of laundry respectively. With standard washing machines using water in the range of 12.5 to 15.6 gallons per cubic foot of laundry it appears to be marginally cost effective to provide a rebate for low water using washers. The effectiveness of this measure can be determined individually through meter records. This measure will reduce the ability of the City to have further reductions in the event of water shortages.

**Table 21**

Planned	2006	2007	2008	2009	2010
\$ per rebate	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50
# of rebates to be paid	50	100	100	100	100
Projected expenditures	\$2,500	\$5,000	\$5,000	\$5,000	\$5,000
Projected water savings - AF/Y	0.85	1.71	1.71	1.71	1.71

The City proposes to begin implementation of a high -efficiency washing machine rebate program in 2006-2007.

### Public Information Programs

The City promotes water conservation through its participation in the Central Valley Water Awareness Committee (CVWAC) and on its own. The City distributes public information through bill inserts, brochures, and booths or activities at special events. At these events the City has distributed leaflets, magnets, stickers, litter bags, pencils, pens, hose nozzles

and rulers which all carry the water conservation message. During 2005 the City initiated a City sponsored magazine which is delivered to all of the City's customers on a quarterly basis. In each issue the City discusses water issues. Several of these articles discuss water conservation. Since 2004, the City's website has included a page which discusses water conservation. It was recently upgraded in 2005 to include a link to the Central Valley Water Awareness Committee's web site.

The City has leased land, at no cost to a non-profit group, at one of its park sites for a botanical garden. The emphasis of the garden is native, low water using plants. Initially the garden was one acre in size. It will be expanded to approximately 6 acres.

City water bills show each customer's current usage and also show last year's consumption so that they may compare their usage.

Some of these measures have been in effect since 1990. The effectiveness of these measures can be determined based on overall per capita water use however since there are many measures being implemented it is impossible to determine how much can be attributed to this measure by itself. This measure will reduce the ability of the City to have further reductions in the event of water shortages.

**Table 22**

Actual	2001	2002	2003	2004	2005
Bill Inserts/newsletters	20,432	21,026	44,720	22,977	24,000
Connecting with Clovis Magazine					105,000
Bill showing water usage in comparison to previous year's usage	122,592	126,156	134,160	137,862	144,000
Demonstration Garden acres				1.1	1.1
Special Events	2	2	1	2	2
Participation in CVWAC	Yes	Yes	Yes	Yes	Yes
Website information				Yes	Yes
Actual expenditures \$	\$2,218.69	\$1,375.65	\$1,772.13	\$363.72	\$2,080.45

**Table 23**

Planned	2006	2007	2008	2009	2010
Bill Inserts/newsletters	24,589	25,302	26,036	26,791	27,568
Connecting with Clovis Magazine	140,000	140,000	140,000	140,000	140,000
Bill showing water usage in comparison to previous year's usage	147,534	151,812	156,216	160,746	165,408
Demonstration Garden acres	6	6	6	6	6
Special Events	2	2	2	2	2
Participation in CVWAC	Yes	Yes	Yes	Yes	Yes
Website information	Yes	Yes	Yes	Yes	Yes
Projected expenditures \$	\$9,230	\$9,230	\$9,230	\$9,230	\$9,230

**IMPLEMENTATION SCHEDULE:** The City will continue to provide public information to remind the public about water issues. This effort will continue as above.

## School Education

The City has participated in many activities which promote water conservation and awareness to school children. Since 1990 with the CVWAC, the City has sponsored activities such as tours of water facilities for school groups, teacher training workshops, science fair awards for water related projects and water awareness contests. The CVWAC has a mascot, Bubbles Beaver, who is used at many events to pique children's' interest in water. During 2004 and 2005, the City conducted tours of its new Surface Water Treatment Plant for several school groups. Additionally City staff participated in judging of Fresno County School science fair projects that were water related. Staff also participated in school presentations.



This measure can not be evaluated for effectiveness specifically however on a long term basis it can reduce future consumption as children mature and make water use decisions in their own homes. This measure will eventually affect the ability to further reduce demands assuming that children implement what they are taught. Having an educated future consumer should make it easier to implement other demand reduction methods in the future.

**IMPLEMENTATION SCHEDULE:** The City will continue to implement this program at the levels described.

## **Conservation Programs for Commercial, Industrial and Institutional Accounts**

Commercial, industrial and institutional customers are treated the same as residential customers. Therefore any demand reduction measures which are available and marketed to residential customers are also available for commercial, industrial and institutional customers. For example surveys, plumbing retrofits, toilet replacements and public information programs are equally available to these customers and are not tracked separately. All commercial and industrial projects are reviewed by the City for conformance with the City's water efficient landscape ordinance. Separate water meters are always recommended for landscape uses at commercial, industrial and institutional sites. The effectiveness of these measures can be determined based on per account water use however since there are many measures being implemented it is impossible to determine how much can be attributed to this measure by itself. This measure will reduce the ability of the City to have further reductions in the event of water shortages.

**IMPLEMENTATION SCHEDULE:** The City will continue to implement this program at the levels described.

## **Wholesale Agency Programs**

The City is not a wholesale agency.

## **Conservation Pricing**

As described under Metering with Commodity Rates, the City of Clovis has an inclining block rate structure for metered residential water customers and a uniform rate structure for commercial, industrial, institutional, and irrigation water customers. All water customers have a minimum billing which allows the customer 5,000 gallons of water per month. Because the agreement with the former Waterworks District 8 precludes the City from requiring individual water meters in the Tarpey Village area, another approach was used to provide a water conservation incentive. A rate structure was set up where the unmetered customers are charged a flat rate when their total production, divided by the total number of unmetered customers, is equal to or less than the year round average consumption. In billing periods where the average unmetered consumption is greater than the year round average, every unmetered customer is charged an excess consumption charge. That charge is based on every 1,000 gallons over the average and is charged at a rate that is higher than the base flat rate's equivalent per 1,000 gallon charge. A copy of the City's current rate ordinance is included in the Appendix B.

Sewer rates for residential customers are currently flat. Commercial and industrial customers, for the most part are charged a uniform rate based on water consumption with a minimum monthly charge. Industrial customers are billed a metered rate either on water consumption or actual sewage effluent and certain high strength customers are billed based on sewage strength also.

The current rate structures was adopted in 2004, but a similar rate structure has been in effect since 1991. This rate structure is very effective in reducing demand. This is apparent when you compare the per capita consumption of Clovis customers to customers in nearby communities that have water rates based on lot size. It is estimated that overall demands

are reduced by approximately 25%. It does however limit the ability of the City to further reduce demands.

**Water Conservation Coordinator**

The City added a full time staff person in November 2000 to act as the water conservation coordinator for the City. The position is filled by a Junior Engineer who now has been in the position for 5 years. Approximately 30% of his time is spent on water conservation activities. This has resulted in increased effectiveness of the water conservation program with respect to implementation. It in itself does not affect water consumed but allows the individual measures to be implemented. It does not affect the ability to further reduce demand.

**Table 24**

Actual	2001	2002	2003	2004	2005
# of full-time positions	1	1	1	1	1
Actual expenditures \$	\$19,500	\$21,000	\$22,200	\$25,200	\$26,400

**Table 25**

Planned	2006	2007	2008	2009	2010
# of full-time positions	1	1	1	1	1
Projected expenditures \$	\$27,324	\$28,280	\$29,129	\$30,003	\$30,903

IMPLEMENTATION SCHEDULE: Ongoing.

**Water Waste Prohibition**

The City established a water waste prohibition ordinance in 1983 and actively enforces it. In 1991, the City adopted an ordinance which levies fines and penalties for non compliance with the City's water conservation program or water wastage. The penalties include flow restrictors, termination of water service for exterior use or complete termination of water service. The City routinely patrols the City looking for violators during the summer months and also responds to complaints and issues citations when violations are noticed by City employees. Another staff person was hired in April 2003 to assist with the water patrolling. See in Appendix B for copies of the ordinance and a sample citation in Appendix E. For all customers including single family customers, the City currently restricts outside water use to three days a week. This has been a part of the City's water conservation program since 1987 and has been mandatory since 1991. Water softeners are not included in the ordinance currently.

This program is determined to be effective because the compliance with the rules is generally good. This measure does reduce the ability to further reduce demands in the future.

**Table 26**

Actual	2001	2002	2003	2004	2005
Waste ordinance in effect	Yes	Yes	Yes	Yes	Yes
# of citations issued	514	114	1227	271	203
Actual expenditures - \$			\$17,435	\$29,796	\$30,090

**Table 27**

Planned	2006	2007	2008	2009	2010
Waste ordinance in effect	Yes	Yes	Yes	Yes	Yes
# of citations issued	200	200	200	200	200
Actual expenditures - \$	\$32,658	\$35,423	\$36,485	\$37,580	\$38,707

IMPLEMENTATION SCHEDULE: The City has permanently incorporated this program into its ordinances.

### Residential Ultra-low Flush Toilet Replacement

The City offers a rebate program for toilet replacement with ultra-low flush toilets. A rebate or account credit of up to \$75 is made to customers who replace old higher flow toilets with new ultra-low flow models. Since beginning this program in 1997, 203 toilets have been replaced. This equates to a water savings of approximately 7.7 AF per year assuming 10 flushes per day per toilet replaced with 3.4 gallons per flush savings. This measure will reduce the ability of the City to further reduce demands in the future.

**Table 28**

Actual	2001	2002	2003	2004	2005
# of ULF rebates	21	42	30	23	19
Actual expenditures \$	\$1,541.27	\$2,972.63	\$2,250	\$2,474.28	\$1,345.07
Actual water savings AF/Y	0.80	1.60	1.14	0.88	0.72

**Table 29**

Planned	2006	2007	2008	2009	2010
# of ULF rebates	25	25	25	25	25
Projected expenditures \$	\$1,875	\$1,875	\$1,875	\$1,875	\$1,875
Projected water savings AF/Y	0.95	0.95	0.95	0.95	0.95

A toilet retrofit on resale ordinance is not in effect in the City of Clovis.

IMPLEMENTATION SCHEDULE: The City will continue to implement this program.

## Section VII Planned Water Supply Projects and Programs

In normal water supply years, the City should have adequate surface water to meet its needs through 2030. To augment lower than normal surface water delivery years, the City will utilize its banked water project, Waldron Pond. Because this is a banking project where water is banked during above normal supply years, the quantity that can be generated in dry years should not vary. The project is under construction now and should be complete and begin taking water by 2006, with reclamation wells ready by 2007. The project is estimated to produce 9,000 AF reliably. The project may be expanded beyond the 9,000 AF per year and the City may wish to participate in the expansion. Another source of water to meet lower than normal surface water deliveries will be the utilization of additional groundwater.

### Future Water Supply Projects (Table 30)

Project Name	Normal-year AF	Single-Dry AF/Year	Multiple-Dry AF Years		
			Year 1	Year 2	Year 3
Waldron Pond	9,000	9,000	9,000	9,000	9,000
Waldron Pond Expansion	3,000	3,000	3,000	3,000	3,000

### Development of Desalinated Water

Because the City of Clovis is located in the Central San Joaquin Valley, there are no opportunities to develop desalination of ocean water or brackish ocean water. In addition the groundwater is of adequate quality and desalination is not necessary.

### Wholesale Water

Currently the City does not receive any wholesale water.

## **Section VIII Water Shortage Contingency Plan**

### **City of Clovis Water Shortage Response**

#### **Water Shortage Mitigation Options**

Water shortages may be mitigated by either increasing supply or reducing demand. Increasing supply for Clovis includes the following possible methods: drilling more wells; providing treatment facilities for DBCP contaminated wells that exceed the Maximum Contaminant Level; rehabilitating wells to increase production; building more water storage reservoirs; creating banking facilities and by purchasing additional surface water supplies. Each of these methods requires a long lead time before operational capability. This minimizes their usefulness in a drought situation where a solution may be needed immediately. They are however useful as a long term supply augmentation plan.

Demand reduction is the quickest and least costly method of addressing supply shortages caused by a drought, emergency or other unforeseen events. They should not be used for expected consumption increases such as population growth however, because when an actual emergency or drought induced supply shortage occurs there is no quick way to reduce demand.

Techniques for demand reduction which could be used are as follows: water surveys; leak detection; plumbing fixture replacement and retrofit; irrigation restrictions; information programs; specific use restrictions; new connection restrictions; plumbing Code changes; New development restrictions on landscaping and pools; new development offset programs; rationing; and price restructuring. Any one or a combination of these could be used depending on the severity of the shortage.

#### **Evaluation of Supply Shortage Mitigation Measures**

##### **Supply Augmentation Measures**

Drilling new wells requires a minimum of one year to become operational, from drilling the test hole to installing the pump and motor. This measure therefore, can not be used as a quick response to an emergency supply deficit. A new well can provide between 400 and 2200 gallons per minute. The cost can vary between \$200,000 and \$300,000 depending on size and location. If the quality of the well does not meet State standards, which often is not known until after the well has been in production for a minimum of 6 months, then the well may need treatment. This can take up to a year to design and build and cost approximately \$500,000. Drilling a well and treating a well both require amendments to the City's Water System Permit from the State Department of Health Services. An environmental review is also required. Depending on the type of treatment required however, environmental clearance could become more difficult and time consuming. The operation and maintenance cost of a treated well is higher than an untreated one. The drilling of new wells is a measure that should be undertaken as growth requires. It is not a measure that can be taken quickly enough to solve an immediate shortage problem. Treatment facilities also can not be installed quickly and so should be viewed as a long term supply enhancement.

Rehabilitation of a well can take many forms, from drilling deeper, replacing the pump and motor, slipping a new casing or screening inside of the existing casing, redeveloping open bottom wells, lowering the pump bowls, and swabbing and jetting the casing. The cost therefore can vary considerably depending on what process is used and the size and depth of the well. It could be \$5,000 or as much as \$20,000 or more. If the well was not operational previously then the yield may be between 400 gallons per minute up to 2200 gallons per minute depending on the well's original production. If the well is operational and it is just being enhanced, the yield may be increased 100 gallons per minute or more. Normally the quality of water from a rehabilitated well is not changed from the previous quality unless old strata are sealed or new strata tapped. The time needed to rehabilitate a well averages 3 months and does not require any environmental review or water permit amendments. This measure is cost effective in the case of a well which is not operational and can be completed in a short time. It should be utilized as good candidates for well rehabilitation come up, but can not be counted upon when an unplanned shortage occurs.

Any of the above methods which increase the amount of water pumped from the underground aquifer will ultimately require increased recharge efforts. If recharge is not increased to meet withdrawals, the groundwater table will continue to lower and the cost to pump the water goes up.

Building more storage reservoirs takes a minimum of one year and can be very expensive. The cost of the City's 2 million gallon reservoir was approximately 2 million dollars. It requires an environmental evaluation and an amendment to the City's water permit. This measure does not actually increase the amount of water available but provides additional supply during peak periods. The water quality is not affected by reservoir storage. Building more storage reservoirs is not cost effective in areas where new wells can be drilled, but for instance, where the quality of the well water is poor or in low quantity, a reservoir is effective in providing additional pressure and supply during peak demand periods.

Expanding the City's surface water treatment plant is generally a long term enhancement of the City's ability to provide water. It can be expanded from its current 15 mgd capacity up to 22.5 mgd by adding additional membrane feed pumping capacity and additional membrane racks. This could probably be accomplished in 6 months to a year. Expansion beyond 22.5 mgd would require an extensive expansion project which would probably take at least 2 years to design and construct. Of course if the surface water supply is reduced during drought conditions treatment capacity will not be a help. This measure has the benefit of reducing the need for recharge facilities, which are expensive to acquire and construct.

### **Demand Reduction Measures**

Water audits and fixture leak detection and repair are measures that go hand in hand. They however are not quickly implemented. It could take months or years to survey all of the City's accounts and unless these measures were done in conjunction with rationing or price restructuring, customers would have little incentive to follow through with repairs or change their habits. The cost of conducting water surveys and fixture leak repair are high relative to the amount of water savings. These measures require significant staff time to implement.

Plumbing fixture replacement with ultra low flow toilets costs approximately \$9.00 per 1,000 gallons saved. This program would have to be in place a lengthy period before significant savings are realized and would probably require more than two months to set up. This measure has the potential of saving 10,000 to 20,000 gallons per year per toilet replaced.

Information programs are low cost and are required to be used if mandatory conservation programs are implemented. It can take as little as a week or as much as two months to get information to the customers depending on cost and the urgency of the information.

New development requirements, restrictions, offset programs and plumbing code changes do not have any significant direct costs. However, restrictions on connections can have significant indirect costs to the City in the form of lost revenues.

Irrigation restrictions are fair to all customers. They can be the most effective way to reduce consumption. They also have the advantage of spreading out demands. The only problem is enforcement. If it is done in conjunction with price restructuring and rationing, it is most effective. The only lead time required is for notifying customers. There is a cost associated with enforcement, but this could be offset with fines collected for noncompliance.

Rationing is the most effective way to reduce demand. The water savings will be dependent on the level of the rationing but can be predicted easily. The lead-time required for a rationing program is limited to the time necessary to get the information out to the public. If the rationing is based upon past consumption there will be time needed to calculate every customer's allowance. This method is not equitable because it penalizes customers who were conserving in the past. A fixed allotment rationing establishes a customer's water consumption goal on a unit basis. This is easier to determine and can be varied by customer type. The cost to the City of a rationing plan will include information dissemination, staff time and the cost of any incentives the City chooses to offer to make the rationing easier to comply with.

Price changes can reduce consumption but the reduction amount is not easy to estimate. Excess use charges or increasing block rates charge a higher rate at higher levels of consumption. The amount of water saved can vary between 0.2 and 0.5 times the percentage price increase. So for example, if the rate increase is 100%, the savings could vary between 20% and 50%. A rate increase necessitates an ordinance change and can take effect 5 days after Council action in an emergency.

### **Stages of Action**

The City of Clovis has four triggering levels which correspond to four water shortage stages. The water shortage stages have reduction in consumption goals varying from 10% to 50%. Stage 1, with a target of 10% reduction, is effective whenever there is an overdraft of the groundwater table or when available water production is within plus 10% of estimated monthly peak hourly demands. Overdraft is defined as a decline in the water table as determined by the average of the depth to water in all of the City's wells from the previous year. Stage 2, with a target of between 10% and 20% reduction, is effective whenever overdraft of the groundwater table is in its second or more consecutive year or the available water production is 10% less than the estimated monthly peak hourly demands. Stage 3, with a target of between 20% and 35% reduction, is effective whenever the available water

production is 20% less than the estimated monthly peak hourly demand. Stage 4, with a target of between 35% and 50% reduction, is effective whenever the available water production is 35% less than the estimated monthly peak hourly demand or surface water supplies are 50% less than required. All reductions will be from 1984 consumption records. Each week the available supply and estimated demand is compared. When it is determined by the Director of Public Utilities that a change in stage is required, the City Council will be notified at the next Council meeting. However, the requirements for the declared stage are effective immediately upon the Director of Public Utilities determination and customer notification for Stage 3 and Stage 4 if the ordinance establishing the water shortage plan has been previously adopted. Table 31 shows the shortage stages, the initiating conditions and the reduction goals.

**Water Supply Shortage Stages and Conditions (Table 31)**

Stage No.	Water Supply Conditions	% Shortage
1 Minor (voluntary)	Groundwater in overdraft or available production within plus 10% of peak hour demands	10%
2 Moderate (mandatory)	Groundwater in overdraft in second consecutive year or available water production is 10% less than the peak hour demands	10% to 20%
3 Severe (mandatory)	Available water production is 20% less than peak hour demands	20% to 35%
4 Critical (mandatory)	Available water production is 35% less than peak hour demands or surface water supply is 50% of required.	35% to 50%

**Estimate of Minimum Supply for Next Three Years**

The driest three year historic sequence in the Kings River watershed occurred during the 1928-1929 through 1930-1931 water years. The FID entitlement from those years was 332,000 AF, 343,000 AF and 219,000 AF respectively. The normal FID entitlement from the Kings River is 454,000 AF. As of the 2006 year, the City’s acreage of land within the Fresno Irrigation District will total 9,954 Acres of a total of 198,906.5 acres receiving water. As City annexations occur the City’s percentage will increase and is estimated to increase by 2.5% annually between 2006 and 2010. The Cities associated share of FID entitlement would therefore be 5.0% in 2006, 5.13% in 2007 and 5.26% in 2008. Class II CVP water is not expected to be available during dry years. The table below shows the estimated minimum supply for the next three years.

**Three-Year Estimated Minimum Water Supply - AF/Year (Table 32)**

Source	Year 1 2006	Year 2 2007	Year 3 2008	Normal
FID Entitlement	16,614	17,600	11,521	24,165
Groundwater	13,273	14,019	14,786	13,273
Recycled water exchange	1,297	1,297	1,297	1,297
Urban storm water recharge	1,000	1,000	1,000	2,000
Banked water			9,000	
<b>Total</b>	<b>32,185</b>	<b>33,915</b>	<b>28,604</b>	<b>40,735</b>

**Catastrophic Supply Interruption Plan**

In the event of non-drought related events that interrupt the City’s ability to provide water immediate measures need to be planned that will allow the City to provide a minimum amount of water to customers. Possible catastrophes include a regional power outage, terrorism event at selected locations or a natural disaster which affects selected facilities. The City is working with the City of Fresno to provide an intertie connection between the two systems which during certain service interruptions would provide an emergency backup supply.

**Preparation Actions for a Catastrophe (Table 33)**

Possible Catastrophe	Summary of Actions
Regional power outage	Utilize emergency backup power at selected facilities and provide public notice through broadcasts of emergency and ask customers to reduce consumption to essential uses.
Terrorism event at selected locations	Make use of alternate production facilities as available and make use of planned intertie connection with City of Fresno system.
Natural disaster	Utilize emergency backup power if utility provided power is interrupted. Utilize intertie connection if available. Immediately implement Stage 3 or Stage 4 demand reduction program.

**Prohibitions, Penalties and Consumption Reduction Methods**

The first step in a demand reduction program is to prohibit wasteful practices and provide enforcement methods. The current City ordinance regulates wastage of water and provides penalties for wastage and failure to comply with any water conservation program the City enacts. The penalties range from a warning, to fines, to flow restrictors or discontinuance of service.

### **Mandatory Prohibitions (Table 34)**

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Using a hose without a nozzle	Stage 1
Outdoor water use on a non-watering day	Stage 2
Broken sprinklers or other leaks	Stage 1
Excessive runoff from property	Stage 1
Evaporative cooler overflowing	Stage 1

Stage 1, minor water shortage, requires a voluntary demand reduction effort. It consists of enforcement of the water waste ordinance with the City Council determining what is considered wasting water. A public information campaign is initiated. The water shortage situation, other stages of the water shortage, and what could be expected in the future are explained. Voluntary conservation is requested. Additional information about ways to save water is sent to customers. The City participates in committees which promote water conservation through their activities.

Stage 2, moderate water shortage, requires a mandatory demand reduction effort. The public information program and participation in water conservation committees is continued. Customers are asked to conserve between 10% and 20%. Rate changes may be adopted which promote conservation by lowering the threshold for the higher user rate for excess consumption from current levels (35,000 gallons in Clovis and 70,100 gallons in Tarpey Village) to a volume indicated by the needed reduction for residential customers. Unmetered customers are all charged an excess consumption charge based upon the production of the wells which serve them. These new rates are explained to customers. The City evaluates its water use for main flushing, street cleaning and landscaping to see if reductions are possible. The number of meters tested and repaired is increased. Outdoor water use is restricted to three days a week for all customers. Landscape watering may be restricted to outside peak demand hours. Hoses without self closing nozzles are not allowed. Enforcement of the water waste and water conservation ordinance is continued.

Stage 3, severe water shortage, requires mandatory reductions in consumption through a rationing program. The rationing program includes fixed allotments for residential customers and percent reductions for commercial and industrial customers. For single family residential customers the allotment is 75% of the 1984 monthly average per capita consumption x 3 persons per household. For multiple family customers the allotment is 75% of the 1984 monthly average per capita consumption X 2.5 persons per unit. Allotments can be appealed by customers if they can demonstrate that occupancy is greater than that assumed. For commercial, institutional and industrial customers the percent reduction is 15% from average consumption for the previous two years in the same billing period. Landscaping-only accounts are allotted 70% of the previous 2-year average in the same billing period. The fixed allotments are also applied to all residential unmetered accounts with the average consumption for the entire unmetered service area being the basis for comparison of consumption. Rate changes are implemented to penalize use over allotment. Main flushing is only done on a sand, odor, or taste complaint basis or due to contamination and public health reasons. Outdoor water use is limited to two days a week for all customers. Landscape watering time restrictions are continued. Water waste patrols must be used in this stage and Stage 4 to patrol during the evenings and early mornings. Pool covers are encouraged. No draining and refilling of pools is allowed. No new

connections are allowed unless the developer can offset the new expected water use by a two to one water savings in existing development.

Stage 4, critical water shortage, requires drastic reductions in water usage. All of the Stage 3 steps apply but the allotments are smaller and percentage reductions are larger. Single family residential customers have an allotment of 60% of the monthly 1984 average per capita consumption x 3 persons per household. Multiple family residential customers have an allotment of 60% of the monthly 1984 average per capita consumption x 2.5 persons per unit. Commercial, institutional and industrial customers are required to reduce consumption by 20% from the average monthly consumption for the previous 2 years. Landscape-only accounts, are entitled to 50% of the previous average monthly consumption for the previous 2 years. Outdoor water use is restricted to once a week except for drip irrigation systems. No new connections are allowed. Construction water usage is limited or prohibited for dust control, new main disinfection and new home construction. For Stage 3 or 4 implementation, an ordinance which provides for a rationing program and revised water rates is adopted.

### Consumption Reduction Methods (Table 35)

Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction %
Customer allotments/Rate Changes	3 and 4	25% to 40%
No refilling of pools	3 and 4	1%
Irrigation reduced to 2 or 1 day per week	3 and 4	18% to 35%
No new connections w/o offsets	3	None but no increase
No new connections	4	None but no increase
Main flushing only on complaint basis	3 and 4	<1%

### Penalties and Charges (Table 36)

Penalty or Charge	Stage When Penalty Takes Effect
Penalty rate of 4 times cost of production for use over allotment.	Stage 3.
Flow restrictors for waste	Stage 2 after 4 violation in 2 years.
Fines for waste	Stage 2 after 2 violations in 2 years

### Analysis of Revenue Impacts of Reduced Sales During Shortages

As consumption drops so does revenue. Current City water rates were developed assuming a conservation realization of 10% from 1990 levels for residential customers. However, if a Stage 3 or Stage 4 level of conservation is required, additional revenue is needed to fund the existing utility functions and also fund the extra expenses involved with the conservation program. Additionally, to make the rationing programs of these stages effective, there has to be a penalty for excess consumption beyond the allotment amounts. The rates the City presently has can support Stage 1 and Stage 2. If Stage 3 were implemented, residential consumption would drop by an estimated 30% from 1984 per capita levels. Commercial, industrial and institutional consumption would drop by 15% from present levels. The corresponding drop in revenue would be approximately 33% from current revenue projections. To offset this loss and pay for an estimated Stage 3 shortage plan cost of

\$200,000 the rates will need to be adjusted to \$2.08 for every 1,000 gallons under the allotment and over the minimum billed amount and \$4.40 for every 1,000 gallons over the allotment (four times the cost of production).

At Stage 4 it is estimated that consumption will drop by 45% for residential customers from 1984 levels. Commercial, industrial and institutional consumption will drop by 20% from present levels. The associated loss in revenue would be approximately 42% from current projected revenue. The Stage 4 shortage plan will cost approximately the same as Stage 3 (\$200,000). The rates will need to be adjusted to \$2.78 for every 1,000 gallons under the allotment and over the minimum billed amount and \$4.40 for every 1,000 gallons over the allotment (four times the cost of production). Revenues will need to be monitored monthly with adjustments made no more frequently than every 6 months.

ORDINANCE NO. 06-

**AN ORDINANCE ADDING SECTION 6-5.113 TO THE CLOVIS MUNICIPAL CODE TO ESTABLISH A WATER SHORTAGE CONTINGENCY PLAN, AUTHORIZE THE DIRECTOR OF PUBLIC UTILITIES TO IMPLEMENT PLAN UNDER CERTAIN CONDITIONS, PROVIDE RATES AND CHARGES FOR SERVICE UNDER CERTAIN CONDITIONS AND TO DECLARE AN EMERGENCY**

THE CITY COUNCIL OF THE CITY OF CLOVIS DOES ORDAIN AS FOLLOWS:

Section 1: The following section shall be added to the Clovis Municipal Code and shall read as follows:

“Section 6-5.113. Water shortage contingency plan.

“The following water shortage contingency plan shall be effective upon the declaration of the Public Utilities Director that a water shortage exists. The Public Utilities Director shall follow guidelines established in the 2005 Urban Water Management Plan as required by the State of California, when declaring a particular water shortage stage.

(a) Water Conservation Stages. No customer shall make, cause, use or permit the use of water supplied by the City, for any purpose in a manner contrary to any provisions of this section, or in an amount in excess of that use permitted by the water shortage stage in effect, pursuant to action taken by the Public Utilities Director in accordance with the provisions of this section.

(1) Stage1, minor water shortage. Customers of the City of Clovis Water Section of the Department of Public Utilities are requested to voluntarily limit the amount of water used to that amount absolutely necessary for health, business and irrigation.

(2) Stage 2, moderate water shortage. Upon declaration by the Public Utilities Director and notification of customers, by mail or publication, the following

restrictions shall apply to all persons, customers and property served water by the City of Clovis:

(a) Outside water use shall be limited to three (3) days per week and not during peak demand hours; particular days and hours as designated by the Public Utilities Director. The following uses shall be excepted from the restrictions: Irrigation by drip system, commercial nurseries, commercial sod farmers, construction dust control, other construction water uses and commercial car washing. Additionally vehicle or equipment washing is exempted from these regulations if the health, safety, and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles which transport food.

(b) All hoses used for outside water purposes shall have a self closing nozzle attached to the free end during use.

(c) Fountains, fish ponds, artificial streams and other water features shall utilize a water recirculation system.

(d) Restaurants shall not serve water to its customers unless requested to do so by the customer.

(e) The following uses of water are specifically defined as “water wasting” and are prohibited:

1. failure to repair a controllable leak;
2. washing sidewalks, driveways, parking areas, tennis courts, patios, or other paved areas, except as to maintain the health, safety and welfare of the public;
3. excessive water runoff to a gutter, ditch or storm drain.

(3) Stage 3, severe water shortage. Upon declaration of the Public Utilities Director and customer notification by mail or publication, the following restrictions

shall apply to all persons, customers and property served water by the City of Clovis. All elements of Stage 2 shall remain in effect except that:

(a) Outdoor water use will be limited to two (2) days per week and not during peak demand hours, particular days and hours as designated by the Public Utilities Director.

(b) No customer shall use water for permitted uses in excess of the following amounts:

1. Single family residential customers shall not use more than 8,000 gallons in January, 8,000 gallons in February, 8,000 gallons in March, 9,000 gallons in April, 12,000 gallons in May, 15,000 gallons in June, 22,000 gallons in July, 20,000 gallons in August, 19,000 gallons in September, 19,000 gallons in October, 10,000 gallons in November and 8,000 gallons in December.

2. Multiple family residential customers shall not use per unit more than 6,667 gallons in January, 6,667 gallons in February, 6,667 gallons in March, 6,667 gallons in April, 8,000 gallons in May, 10,000 gallons in June, 15,000 gallons in July, 14,000 gallons in August, 13,000 gallons in September, 12,000 gallons in October, 7,000 gallons in November and 6,667 gallons in December.

3. All other metered customers shall not use more than eighty-five percent (85%) of the customer's average consumption over the same billing period for the previous two (2) years. Landscaping only accounts shall not use more than seventy percent (70%) of the customer's average consumption over the same billing period for the previous two (2) years.

4. Unmetered customers shall be allowed the same limits of consumption as single family residential customers. The individual customer's

consumption shall be the average consumption for all unmetered customers, based upon water production figures for the unmetered area.

(c) Each customer's allotment of water shall be calculated by the Finance Department and each customer notified by mail.

(d) Any customer may appeal their customer classification on the basis of use or the calculated allotment on the basis of hardship or incorrect calculation.

(e) Appeals shall be in writing and directed to the Public Utilities Director. The appeal shall be reviewed by the Department of Public Utilities and a site visit scheduled if required. A condition of approval of any appeal shall be that all applicable plumbing fixtures or irrigation systems be replaced or modified for maximum water conservation if feasible. Decisions on the granting of the appeal will be made by the Public Utilities Director. If an applicant disagrees with the decision, the request may be appealed to the City Manager. The City Manager's decision is final.

(f) New connections are prohibited to the water system unless the developer or builder of the new connection offsets by a factor of two (2) the expected water consumption from the new connection by installing water conservation devices in existing developments within the water service area.

(d) Draining and refilling of swimming pools, artificial water features or ponds is prohibited.

(4) Stage 4, critical water shortage. Upon declaration of the Public Utilities Director and customer notification by mail or publication, the following restrictions shall apply to all persons, customers and property served water by the City of Clovis. All elements of Stage 3 shall remain in effect except that:

(a) Outdoor water use will be limited to one (1) day per week and not during peak demand hours, the particular day and hours as designated by the Public Utilities Director.

(b) No customer shall use water for permitted uses in excess of the following amounts:

1. Single family residential customers shall not use more than 8,000 gallons in January, 8,000 gallons in February, 8,000 gallons in March, 8,000 gallons in April, 10,000 gallons in May, 12,000 gallons in June, 18,000 gallons in July, 16,000 gallons in August, 15,000 gallons in September, 15,000 gallons in October, 8,000 gallons in November and 8,000 gallons in December.

2. Multiple family residential customers shall not use per unit more than 6,667 gallons in January, 6,667 gallons in February, 6,667 gallons in March, 6,667 gallons in April, 8,000 gallons in May, 10,000 gallons in June, 12,000 gallons in July, 11,000 gallons in August, 10,000 gallons in September, 10,000 gallons in October, 6,667 gallons in November and 6,667 gallons in December.

3. All other metered customers shall not use more than eighty percent (80%) of the customer's average consumption over the same billing period for the previous two (2) years. Landscaping only accounts shall not use more than seventy percent (50%) of the customer's average consumption over the same billing period for the previous two (2) years.

4. Unmetered customers shall be allowed the same limits of consumption as single family residential customers. The individual customer's consumption shall be the average consumption for all unmetered customers, based upon water production figures for the unmetered area.

(c) New water connections are prohibited.

(b) Rates and charges under Stage 3 shall be as follows:

(1) For single-family living units; multiple-family units; two (2) or more living units with separate toilet, kitchen or washroom facilities situated on the same lot; hotels; motels; and auto courts or mobile home parks wherein individual units or cabins are provided with kitchen facilities the minimum charge to each customer shall be four and 88/100ths dollars (\$4.88) per month per unit. Such minimum charge shall be for five thousand (5,000) gallons of water or less per month per unit, and for amounts in excess of five thousand (5,000) gallons but no more than the per month allotment per unit, the customer shall pay at the rate of two and 08/100ths dollars (\$2.08) per one thousand (1,000) gallons of water used. For amounts of water used in excess of the allotment per month per unit, the customer shall pay, in addition, the rate of four and 40/100ths dollars (\$4.40) per one thousand (1,000) gallons of water used over the allotment per month. For individually unmetered residential customers these rates shall apply with consumption determined based on average water production in the area served.

(2) For customers with landscape only meters, the charge for water consumption of such landscape meters shall be at the minimum of the commercial rate provided in subsection (3) of this section plus one and 05/100ths (\$1.05) per one thousand (1,000) gallons used in excess of the usage included with the minimum charge as provided in subsection (b) of this section but no more than seventy percent (70%) of the customer's average usage for the same billing period for the previous two (2) years. For the amount of water in excess of the seventy (70%) of the customer's previous usage, the customer shall pay in addition, the rate of four and 40/100ths dollars (\$4.40) per one thousand (1,000) gallons of water used.

(3) For all other customers; commercial uses, industrial uses, schools and churches, wherein water service is provided, the minimum charge shall be four and

88/100ths dollars (\$4.88) per account per month for water services one inch (1") or smaller in size. For water services one and one-half inches (1-1/2") in size, the minimum charge shall be seven and 99/100ths dollars (\$7.99) per account per month. For water services two inches (2") in size, the minimum charge shall be eleven and 74/100ths dollars (\$11.74) per account per month. For water services three inches (3") in size, the minimum charge shall be twenty-one and 09/100ths dollars (\$21.09) per account per month. For services four inches (4") in size, the minimum charge shall be thirty-two and 94/100ths dollars (\$32.94) per account per month. For services six inches (6") in size, the minimum charge shall be sixty-four and 12/100ths dollars (\$64.12) per account per month. Such minimum charge shall be for five thousand (5,000) gallons of water or less per month per account, and for amounts in excess of five thousand (5,000) gallons per months, the customer shall pay, at the rate of one and 05/100ths dollars (\$1.05) per one thousand (1,000) gallons of water used for amounts up to Eighty-five percent (85%) of the customer's average usage for the same billing period for the previous two (2) years. For the amount of water in excess of the Eighty-five (85%) of the customer's previous usage, the customer shall pay in addition, the rate of four and 40/100ths dollars (\$4.40) per one thousand (1,000) gallons of water used.

"Account" as used in this subsection shall mean each meter connection whether serving one (1) business or multiple businesses under one (1) or multiple ownership.

(c) Rates and charges under Stage 4 shall be as follows:

(1) For single-family living units; multiple-family units; two (2) or more living units with separate toilet, kitchen or washroom facilities situated on the same lot; hotels; motels; and auto courts or mobile home parks wherein individual units or cabins are provided with kitchen facilities the minimum charge to each customer shall be four and 88/100ths dollars (\$4.88) per month per unit. Such minimum charge shall be for five

thousand (5,000) gallons of water or less per month per unit, and for amounts in excess of five thousand (5,000) gallons but no more than the per month allotment per unit, the customer shall pay at the rate of two and 78/100ths dollars (\$2.78) per one thousand (1,000) gallons of water used. For amounts of water used in excess of the allotment per month per unit, the customer shall pay, in addition, the rate of four and 40/100ths dollars (\$4.40) per one thousand (1,000) gallons of water used over the allotment per month. For individually unmetered residential customers these rates shall apply with consumption determined based on average water production in the area served.

(2) For customers with landscape only meters, the charge for water consumption of such landscape meters shall be at the minimum of the commercial rate provided in subsection (3) of this section plus one and 12/100ths dollars (\$1.12) per one thousand (1,000) gallons used in excess of the usage included with the minimum charge as provided in subsection (b) of this section but no more than fifty percent (50%) of the customer's average usage for the same billing period for the previous two (2) years. For the amount of water in excess of the fifty (50%) of the customer's previous usage, the customer shall pay in addition, the rate of four and 40/100ths dollars (\$4.40) per one thousand (1,000) gallons of water used.

(3) For all other customers; commercial uses, industrial uses, schools and churches, wherein water service is provided, the minimum charge shall be four and 88/100ths dollars (\$4.88) per account per month for water services one inch (1") or smaller in size. For water services one and one-half inches (1-1/2") in size, the minimum charge shall be seven and 99/100ths dollars (\$7.99) per account per month. For water services two inches (2") in size, the minimum charge shall be eleven and 74/100ths dollars (\$11.74) per account per month. For water services three inches (3") in size, the minimum charge shall be twenty-one and 09/100ths dollars (\$21.09) per account per month. For services four

inches (4") in size, the minimum charge shall be thirty-two and 94/100ths dollars (\$32.94) per account per month. For services six inches (6") in size, the minimum charge shall be sixty-four and 12/100ths dollars (\$64.12) per account per month. Such minimum charge shall be for five thousand (5,000) gallons of water or less per month per account, and for amounts in excess of five thousand (5,000) gallons per months, the customer shall pay, at the rate of one and 12/100ths dollars (\$1.12) per one thousand (1,000) gallons of water used for amounts up to Eighty percent (80%) of the customer's average usage for the same billing period for the previous two (2) years. For the amount of water in excess of the Eighty (80%) of the customer's previous usage, the customer shall pay in addition, the rate of four and 40/100ths dollars (\$4.40) per one thousand (1,000) gallons of water used.

"Account" as used in this subsection shall mean each meter connection whether serving one (1) business or multiple businesses under one (1) or multiple ownership.

(d) Rates and charges in Stage 1 and Stage 2 shall be per Section 6.5.103 and Section 6.5.104.

Section 2: That an emergency exists and in order to protect the health, safety, and general welfare of the public this ordinance shall be in full force and effect immediately.

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Mayor

City Clerk

The foregoing ordinance was introduced and read at a regularly adjourned meeting of the City Council of the City of Clovis held on \_\_\_\_\_, and was adopted at a regular meeting of said Council held on \_\_\_\_\_, by the following vote to wit:

AYES:

NOES:

ABSENT:

DATED:

---

City Clerk

## **Water Use Monitoring**

In the spring of each year the City projects peak demands and anticipated supply. All wells are sounded for depth in February. A preliminary schedule of shortage stages is determined. During the months of April, May, June, July, August, and September, each week the water production figures are compared to the projected production figures to determine if conservation goals are being met. Projected available supply for the next week is also compared to the previous week's production, adjusted for the next weeks expected weather. This indicates whether a change in stage, increase in public information or increased enforcement is necessary.

## **Implementing Steps**

1. By the first City Council meeting in April of each year City staff will project demands and supplies for the year. At that time a schedule of water shortage stages will be determined.
2. If a Stage 3 or Stage 4 level is anticipated, the draft ordinance will be adopted by the Council for implementation of the required measures.
3. The stages will be declared by the Public Utilities Director and shall be effective immediately upon publication. Each stage shall be effective until a new stage is declared or the stage has been declared ended and so published.

## Section IX Recycled Water Plan

### Coordination

The City is in the process of developing a comprehensive Recycled Water Master Plan. The Plan is in the draft stage and will be completed in conjunction with the development of the City wastewater treatment plant.

### Participating Agencies (Table 37)

Participating agencies	Role in Plan Development
California Department of Health Services	Guidance and review of water reuse regulations
Fresno Irrigation District	Guidance on conveyance and use of recycled water
Fresno Metropolitan Flood Control District	Guidance on storm impacts on reuse options
Regional Water Quality Control Board	Review of reuse locations and setting of quality guidelines
Clovis Planning and Development Services	Land use and environmental review

### Wastewater Quantity, Quality and Current Uses

All of the City's current wastewater flow is treated at the Fresno/Clovis Regional Wastewater Treatment Plant located approximately 16 miles by trunkline southwest of Clovis. The City currently has four trunk sewers which collect the wastewater and transport it to the treatment plant; the Fowler Trunk, Peach Trunk, Sierra Trunk and the Herndon Trunk. The total current flow averages 7.02 million gallons per day (MGD). The level of treatment at the plant is non-disinfected secondary. As was indicated in Section III, the treated wastewater is presently put into percolation ponds. Reclamation wells located on the treatment plant property are used to pump groundwater out from below the percolation ponds and then discharge the reclaimed water to irrigation canals. Some of the effluent is used to directly irrigate non food crops. The total amount of wastewater treated at the plant is averaging 70.34 MGD. Of that, on a yearly basis, approximately 23.21 MGD (26,000 AF) was reclaimed and reused in 2005 downstream of the wastewater treatment plant. None is currently being reused within the City of Clovis' service area.

### Potential and Projected Uses of Recycled Water, Optimization Plan with Incentives

As was identified in Section III, the City of Clovis is in the process of planning and building a wastewater treatment plant within the Clovis service area. The plant will produce Title 22 disinfected tertiary treated water which will have unrestricted uses. The potential uses of the water include agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and water features.

Agricultural irrigation is a likely use of the water. The California State University, Fresno, (CSUF) located just west of Clovis and Freeway 168 north of Shaw Avenue has expressed interest in utilizing the recycled water. They grow a variety of crops. In addition the Fresno Irrigation District has indicated it can also use the water to distribute to

agricultural customers downstream from Clovis. The water will be discharged to Fancher Creek and conveyed through irrigation canals to agricultural lands southwest of Clovis.

Landscape irrigation is projected to be a major use of the water. All of the public landscaped areas in the Southeast Specific Plan area and in Harlan Ranch will be irrigated with the reclaimed water. Other large landscape areas such as schools, parks and Freeway 168 are anticipated uses.

There are currently no wildlife habitat areas or wetlands within the Clovis service area. Potentially the water discharged to the Fresno Irrigation District could be used for wetlands or wildlife habitat enhancement areas.

The water could potentially be used by industrial customers planned for the new growth areas in the City. It will depend on their needs and their proximity to the recycled water transmission and distribution lines. At this point none have been identified. CSUF has indicated the potential of using the water for their cooling towers.

At this point even though the water is permitted to be used for groundwater recharge, the regulatory agencies have been discouraging regarding this use. If in the future the use of the recycled water for groundwater recharge is more accepted by the regulatory agencies, the City will definitely pursue this use. Recharge however may occur outside the Clovis Service area with an exchange of water with the Fresno Irrigation District.

It is expected that a large development in the Southeast Specific Plan area will incorporate into its design a large water feature. Recycled water will be used for this feature.

Regarding the regional wastewater treatment plant the City of Fresno who is the responsible manager of the Plant is currently reviewing the proposed reuse options for the plant. It is very doubtful based on the cost, that any reuse from the existing plant will be proposed within the City of Clovis' service area.

**Recycled Water Uses - Potential AF/Y (Table 38)**

Type of Use	Treatment Level	2010	2015	2020	2025	2030
Agriculture	Disinfected Tertiary	2,913	2,913	6,273	6,273	9,410
Landscape	Disinfected Tertiary	609	1,219	1,679	2,280	2,280
Industrial	Disinfected Tertiary	0	10	20	30	40
Groundwater Recharge	Disinfected Tertiary	2,913	2,913	6,273	6,273	9,410
Water Feature	Disinfected Tertiary	0	0	123	123	123
<b>Total *</b>		<b>6,435</b>	<b>7,055</b>	<b>14,368</b>	<b>14,979</b>	<b>21,263</b>

\* Total is more than is projected to be available because potential uses are maximum values assuming all of the recycled water went to that use.

**Projected Future Use of Recycled Water in Service Area - AF/Y (Table 39)**

Type of Use	2010	2015	2020	2025	2030
Agriculture *	2,304	1,684	4,451	3,840	3,504
Landscape	609	1,219	1,679	2,280	2,280
Industrial	0	10	20	30	40
Groundwater Recharge *	0	0	0	0	3,463
Water Feature	0	0	123	123	123
Total	2,913	2,913	6,293	6,303	9,410

\* Use is likely to be outside the City's service area.

**Proposed Actions to Encourage Use of Recycled Water**

Because the future areas of the City where recycled water is proposed to be used are not in existence yet, it will be much easier to encourage the use of recycled water. The City is requiring that new development install purple pipe to supply recycled water to landscape areas. The City will be able to guarantee availability to customers even during water shortages that are not disaster related. Aside from the increased capital cost of installing a dual distribution system, the operations and maintenance costs should be slightly reduced because the water would not need to be treated further and there should be very little quality monitoring that wouldn't already be done at the treatment plant. Additionally, because the water will already be at the surface, the energy costs for pumping should be less. The consumption rates for the use of recycled water should be less than potable water, making it an attractive alternative for customers.

**Plan for Optimizing the Use of Recycled Water**

Ordinances may be adopted which require the use of recycled water when available for non potable uses for large customers. Customers will be educated about the uses of recycled water and the need for its reuse. A rate structure will be adopted which takes into account the cost of delivering recycled water and the avoided cost of disposing of the water to the wastewater customers. Potential customers will be educated about the merits of using recycled water for recirculation uses. During the development process, the City will utilize its Development Review Committee to promote and encourage potential developments to include ways to use recycled water.

**Methods to Encourage Recycled Water Use (Table 40)**

Actions	AF of use projected to result from this action				
	2010	2015	2020	2025	2030
Lower cost of water	112	233	303	403	386
Dual distribution system	21	41	55	73	72
Customer education	62	124	164	219	215
Promotion of recirculating uses	5	5	5	5	5
Development review committee	8	10	20	30	40
Total	208	414	547	730	718

## Section X Water Quality Impacts on Reliability

The quality of the City's water supply is generally good. The Kings River water is low in contaminants and usually easy to treat. Following heavy rain events the turbidity levels can increase significantly. The City's treatment plant can usually handle the increases but it may also be shut down during the spike to save on chemical costs. This is not a concern from a supply standpoint because storm events normally occur during low demand periods. The delivery mechanism for the Kings River water, the Enterprise Canal, is patrolled by City staff six days a week, and by a Fresno City staff member one day a week. This helps to insure that the quality of the water stays high.

Groundwater quality is fairly consistent. The only thing that changes are regulations. The City has a number of wells that are treated to remove dibromochloropropane (DBCP). The level of DBCP though appears to be decreasing in older wells. With the unregulated contaminant monitoring it was discovered that some of those same wells also have 1,2,3-Trichloropropane. A maximum contaminant level has not been adopted yet, but it may require additional treatment at these wells. In general as testing methods become more discerning and regulations become more stringent, it can be expected that sources will need additional treatment to stay in compliance.

### Current & projected water supply changes due to water quality - percentage (Table 41)

Water source	2005	2010	2015	2020	2025	2030
Surface water	No change					
Groundwater	No change	-10%	+10%	No change	No change	No change

## Section XI Water Service Reliability

### Projected Normal Water Year Supply and Demand

During normal years the supply of water will include surface water diversions, groundwater, regional wastewater treatment plant exchange water and an amount of recycled water equal to the City recycled water demand plus an exchange amount for the remainder of the recycled water.

#### Projected Normal Water Year Supply - AF/Y (Table 42)

	2010	2015	2020	2025	2030
Supply*	45,106	49,343	56,748	55,578	59,697
% of Normal Year	100%	100%	100%	100%	100%

\* from Table 9 without use of banked water which is for dry years.

#### Projected Normal Water Year Demand - AF/Y (Table 43)

	2010	2015	2020	2025	2030
Demand	28,662	32,897	37,783	42,603	48,057
% of year 2005	114.7%	131.6%	151.2%	170.5%	192.3%

#### Projected Normal Year Supply and Demand Comparison - AF/Y (Table 44)

	2010	2015	2020	2025	2030
Supply totals	45,106	49,343	56,748	55,578	59,697
Demand totals	28,662	32,897	37,783	42,603	48,057
Difference (supply minus demand)	16,445	16,446	18,965	12,975	11,640
Difference as % of Supply	36%	33%	33%	23%	19%
Difference as % of Demand	57%	50%	50%	30%	24%

## Projected Single-Dry-Year Supply and Demand Comparison

During the single dry year scenario it is assumed that groundwater pumping will be increased to compensate for less than normal surface water deliveries and that banked water will be utilized to supplement supply. Demands are assumed to increase due to irrigation needs.

### Projected single dry year Water Supply - AF/Y (Table 45)

	2010	2015	2020	2025	2030
Supply	37,055	38,075	43,710	45,159	50,941
% of projected normal	82%	77%	77%	81%	85%

### Projected single dry year Water Demand - AF/Y (Table 46)

	2010	2015	2020	2025	2030
Demand	30,381	34,871	40,050	45,159	50,941
% of projected normal	106%	106%	106%	106%	106%

### Projected single dry year Supply and Demand Comparison -AF/Y (Table 47)

	2010	2015	2020	2025	2030
Supply totals	37,055	38,075	43,710	45,159	50,941
Demand totals	30,381	34,871	40,050	45,159	50,941
Difference (supply minus demand)	6,674	3,204	3,660	0	0
Difference as % of Supply	18%	8%	8%	0%	0%
Difference as % of Demand	22%	9%	9%	0%	0%

## Projected Multiple-Dry-Year Supply and Demand Comparison

The surface water supplies in the multiple dry year supply and demand comparison are based on the period from 1926/27 through 1930/31. Banked water is included in the supplies during the dry years after 2007. Demands are expected to increase during dry years.

### Projected supply during multiple dry year period ending in 2010 - AF/Y (Table 48)

	2006	2007	2008	2009	2010
Supply	40,943	34,160	44,438	45,788	41,233
% of projected normal	105%	85%	106%	107%	91%

### Projected demand multiple dry year period ending in 2010 - AF/Y (Table 49)

	2006	2007	2008	2009	2010
Demand	25,715	28,049	28,862	29,699	30,381
% of projected normal	100%	106%	106%	106%	106%

### Projected Supply and Demand Comparison during multiple dry year period ending in 2010 - AF/Y (Table 50)

	2006	2007	2008	2009	2010
Supply totals	40,943	34,160	44,438	45,788	41,233
Demand totals	25,715	28,049	28,862	29,699	30,381
Difference (supply minus demand)	15,228	6,111	15,576	16,089	10,852
Difference as % of Supply	37%	18%	35%	35%	26%
Difference as % of Demand	59%	22%	54%	54%	36%

### Projected supply during multiple dry year period ending in 2015 - AF/Y (Table 51)

	2011	2012	2013	2014	2015
Supply	44,204	45,627	47,286	49,612	42,950
% of projected normal	105%	104%	103%	104%	87%

### Projected demand multiple dry year period ending in 2015 - AF/Y (Table 52)

	2011	2012	2013	2014	2015
Demand	29,493	32,169	33,102	34,062	34,871
% of projected normal	100%	106%	106%	106%	106%

### Projected Supply and Demand Comparison during multiple dry year period ending in 2015 - AF/Y (Table 53)

	2011	2012	2013	2014	2015
Supply totals	44,204	45,627	47,286	49,612	42,950
Demand totals	29,493	32,169	33,102	34,062	34,871
Difference (supply minus demand)	14,711	13,458	14,183	15,550	8,079
Difference as % of Supply	33%	29%	30%	31%	19%
Difference as % of Demand	50%	42%	43%	46%	23%

**Projected supply during multiple dry year period ending in 2020 - AF/Y (Table 54)**

	2016	2017	2018	2019	2020
Supply	52,005	51,695	54,417	56,660	49,111
% of projected normal	105%	101%	101%	102%	87%

**Projected demand multiple dry year period ending in 2020 - AF/Y (Table 55)**

	2016	2017	2018	2019	2020
Demand	33,851	36,923	37,993	39,095	40,050
% of projected normal	100%	106%	106%	106%	106%

**Projected Supply and Demand Comparison during multiple dry year period ending in 2020 - AF/Y (Table 56)**

	2016	2017	2018	2019	2020
Supply totals	52,005	51,695	54,417	56,660	49,111
Demand totals	33,851	36,923	37,993	39,095	40,050
Difference (supply minus demand)	18,154	14,772	16,424	17,565	9,061
Difference as % of Supply	35%	29%	30%	31%	18%
Difference as % of Demand	54%	40%	43%	45%	23%

**Projected supply during multiple dry year period ending in 2025 - AF/Y (Table 57)**

	2021	2022	2023	2024	2025
Supply	52,166	51,044	52,562	54,876	46,572
% of projected normal	106%	100%	100%	101%	84%

**Projected demand multiple dry year period ending in 2025 - AF/Y (Table 58)**

	2021	2022	2023	2024	2025
Demand	38,728	42,077	43,129	44,208	45,159
% of projected normal	100%	106%	106%	106%	106%

**Projected Supply and Demand Comparison during multiple dry year period ending in 2025 - AF/Y (Table 59)**

	2021	2022	2023	2024	2025
Supply totals	52,166	51,044	52,562	54,876	46,572
Demand totals	38,728	42,077	43,129	44,208	45,159
Difference (supply minus demand)	13,438	8,966	9,433	10,668	1,412
Difference as % of Supply	26%	18%	18%	19%	3%
Difference as % of Demand	35%	21%	22%	24%	3%

**Projected supply during multiple dry year period ending in 2030 - AF/Y (Table 60)**

	2026	2027	2028	2029	2030
Supply	55,208	54,653	56,343	58,861	50,941
% of projected normal	106%	99%	100%	101%	85%

**Projected demand multiple dry year period ending in 2030 - AF/Y (Table 61)**

	2026	2027	2028	2029	2030
Demand	43,668	47,446	48,632	49,848	50,941
% of projected normal	100%	106%	106%	106%	106%

**Projected Supply and Demand Comparison during multiple dry year period ending in 2030 - AF/Y (Table 62)**

	2026	2027	2028	2029	2030
Supply totals	55,208	54,653	56,343	58,861	50,941
Demand totals	43,668	47,446	48,632	49,848	50,941
Difference (supply minus demand)	11,540	7,207	7,711	9,013	0
Difference as % of Supply	21%	13%	14%	15%	0%
Difference as % of Demand	26%	15%	16%	18%	0%

**RESOLUTION NO 06-25****A RESOLUTION ADOPTING THE CITY OF CLOVIS 2005 URBAN WATER  
MANAGEMENT PLAN**

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-84 Regular Session, and as amended subsequently, which requires all urban water suppliers providing municipal water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, to prepare and submit an Urban Water Management Plan (Plan), the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the City of Clovis (City) is an urban supplier of water providing water to over 26,000 customers; and

WHEREAS, the Plan shall be periodically reviewed at least once every five years, and that the City shall make any amendments or changes to its plan which are indicated by the review; and

WHEREAS, the Plan must be adopted after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the City has therefore, prepared and circulated for public review a draft Urban Water Management Plan, and a properly noticed public hearing regarding said Plan was held by the City Council on February 6, 2006; and

WHEREAS, the City of Clovis did prepare and shall file said Plan with the California Department of Water Resources within 30 days of adoption.

NOW, THEREFORE, BE IT RESOLVED as follows:

1. The Clovis City Council does hereby adopt the 2005 Urban Water Management Plan (Plan) as presented to this Council on February 6, 2006.
2. That copies of said Plan be forwarded to the State of California, Department of Water Resources for filing within 30 days of this date.
3. The Public Utilities Director is hereby authorized and directed to implement the demand management measures as set forth in the 2005 Urban Water Management Plan, which includes water shortage contingency analysis and recommendations to the City Council regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation and water recycling programs.
4. In a water shortage, the Public Utilities Director is hereby authorized to declare a Water Shortage Emergency according to the Stages of Actions indicated in the Plan and implement necessary elements of the Plan.

5. The Public Utilities Director shall recommend to the City Council additional procedures, rules, and regulations to carry out effective and equitable allocation of water resources.

\* \* \* \* \*  
\*

The foregoing resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on February 6, 2006, by the following vote, to wit:

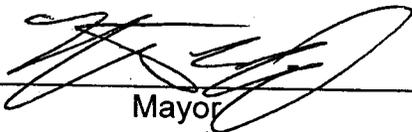
AYES: Councilmembers Armstrong, Ashbeck, Flores, Whalen, Mayor Magsig

NOES: None

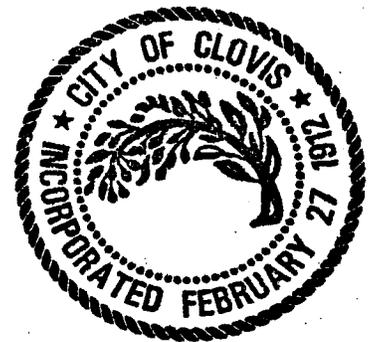
ABSENT: None

ABSTAIN: None

DATED: February 6, 2006

  
\_\_\_\_\_  
Mayor

  
\_\_\_\_\_  
City Clerk



## **Appendix B**

### **Water Rates and Regulations Ordinance**

#### 6.5.103 Water rates inside the City.

Each customer connected to the City's water system shall pay, as a condition of water service, the following rates for one (1) month of service:

(a) For single-family living units; multiple-family units; two (2) or more living units with separate toilet, kitchen or washroom facilities situated on the same lot; hotels; motels; and auto courts or mobile home parks wherein individual units or cabins are provided with kitchen facilities the minimum charge to each customer shall be four and 88/100ths dollars (\$4.88) per month per unit. Such minimum charge shall be for five thousand (5,000) gallons of water or less per month per unit, and for amounts in excess of five thousand (5,000) gallons but no more than seventeen thousand five hundred (17,500) gallons per month per unit, the customer shall pay at the rate of one and 05/100ths dollars (\$1.05) per one thousand (1,000) gallons of water used. For amounts of water used in excess of seventeen thousand five hundred (17,500) gallons per month per unit, the customer shall pay, in addition, the rate of one and 31/100ths dollars (\$1.31) per one thousand (1,000) gallons of water used over seventeen thousand five hundred (17,500) gallons per month.

(1) For residential customers with landscape meters, the charge for water consumption of such landscape meters shall be at the minimum of the commercial rate provided in subsection (b) of this section plus eighty-eight cents (\$0.88) per one thousand (1,000) gallons used in excess of the usage included with the minimum charge as provided in subsection (b) of this section.

(b) For all other customers; commercial uses, industrial uses, schools and churches, wherein water service is provided, the minimum charge shall be four and 88/100ths dollars (\$4.88) per account per month for water services one inch (1") or smaller in size. For water services one and one-half inches (1-1/2") in size, the minimum charge shall be seven and 99/100ths dollars (\$7.99) per account per month. For water services two inches (2") in size, the minimum charge shall be eleven and 74/100ths dollars (\$11.74) per account per month. For water services three inches (3") in size, the minimum charge shall be twenty-one and 09/100ths dollars (\$21.09) per account per month. For services four inches (4") in size, the minimum charge shall be thirty-two and 94/100ths dollars (\$32.94) per account per month. For services six inches (6") in size, the minimum charge shall be sixty-four and 12/100ths dollars (\$64.12) per account per month. Such minimum charge shall be for five thousand (5,000) gallons of water or less per month per account, and for amounts in excess of five thousand (5,000) gallons per month, the customer shall pay, at the rate of eighty-eight cents (\$0.88) per one thousand (1,000) gallons of water used. "Account" as used in this subsection shall mean each meter connection whether serving one (1) business or multiple businesses under one (1) or multiple ownership.

(c) For any standby service, including fire sprinkler systems, the availability charge to each customer shall be thirty-two and 94/100ths dollars (\$32.94) per month per account.

(d)As a condition of and prior to the issuance of any building permit for the construction of a building where water service is to be utilized, but where no water meter has been installed, the person to whom such permit is issued shall pay an on-site construction water charge for each service of thirty-three and 25/100ths dollars (\$33.25) per building per two (2) months, for a period of time not to exceed six (6) months provided the permittee installs, at his cost, an approved spacer. At the conclusion of said six (6) months, water service will only be provided after the installation of a water meter in accordance with the regulations and rates set forth in this article. The spacer shall become the property of the City.

(e)Any person receiving a permit to take water from a fire hydrant shall pay a minimum fee of twenty-one and 09/100ths dollars (\$21.09) per months, or portion thereof, under such permit, plus the amount of water used in excess of five thousand (5,000) gallons per two (2) months at the rate of eighty-eight cents (\$0.88) per one thousand (1,000) gallons of water used. (§ 1, Ord. 82-30, eff. January 12, 1983; as amended by § 2, Ord. 91-26, eff. July 1, 1991; § 1, Ord. 92-16, eff. May 6, 1992; § 3, Ord. 04-26, eff. September 1, 2004)

#### 6.5.104 Water rates outside the City.

(a)The charge for each outside the City water system user shall be at the rate paid by inside the City water system users established by this article except as otherwise provided by this article or by resolution adopted by the City Council.

(b)Each customer located within the former Fresno County Waterworks District No. 8, now called Tarpey Village, connected to the City's water system shall pay, as a condition of water service, the following rates for two (2) months.

(1)For each unmetered customer occupying up to a seventeen-thousand-five-hundred (17,500) square-foot lot and utilizing a one inch (1") service connection the customer shall pay forty-seven and 70/100ths dollars (\$47.70) per service connection per two (2) months. For each seven thousand five hundred (7,500) square feet in excess of seventeen thousand five hundred (17,500) square feet per lot, the customer shall pay an additional two and 22/100ths dollars (\$2.22) per two (2) months. An additional charge of two and 22/100ths dollars (\$2.22) shall be paid for every one-quarter inch (1/4") in excess of a one inch (1") service per two (2) months. For system-wide water production in excess of seventy thousand one hundred (70,100) gallons per service connection per two (2) months, each customer shall pay an additional eighty-five cents (\$0.85) per one thousand (1,000) gallons produced per service connection.

(2)For the use of water-cooled air conditioning in a building the customer shall pay eight and 43/100ths dollars (\$8.43) per ton of cooling capacity per two (2) months. For the use of cooling towers, the customer shall pay one and 33/100ths dollars (\$1.33) per ton of cooling capacity or per horsepower per two (2) months. For the use of heat pumps, the customer shall pay eleven and 09/100ths dollars (\$11.09) per ton of cooling capacity or per horsepower per two (2) months.

(3)For any standby service, including fire sprinklers, the customer shall pay an availability charge of sixty-five and 88/100ths dollars (\$65.88) per two (2) months.

(4) Any metered Tarpey Village customer shall pay the same rates as customers located within the City. (§ 1, Ord. 82-30, eff. January, 12, 1983; as amended by § 1, Ord. 88-41, eff. January 4, 1989; § 3, Ord. 91-26, eff. July 1, 1991; § 4, Ord. 04-26, eff. September 1, 2004)

#### 6.5.110 Other regulations.

(a) Only City may turn water on. No person shall tap, open, or connect any water service, and no person shall cause, permit, or allow any water main to be turned on or connected after the water service has been turned off by the City. In the event any person turns on or connects water service after it has been turned off or disconnected by the City, the City shall again turn off or disconnect the water service, and lock or remove the water meter from the premises, and charge and collect Ten and no/100ths (\$10.00) Dollars, in addition to all other charges under and penalties, before water service is restored.

(b) Water service penalties for waste or violations. For any water supplied by the City which is wasted by a customer a fee shall be charged to the customer and added to the customer's account. For the first violation, a written warning will be given to the customer. For the second violation, a fee of Thirty and no/100ths (\$30.00) Dollars shall be charged. For the third violation, a fee of Sixty and no/100ths Dollars (\$60.00) shall be charged. For the fourth and subsequent violations, a fee of Ninety and no/100ths (\$90.00) Dollars shall be charged. Additionally, any unmetered customer shall have a meter installed after the fourth violation at the customer's expense. The cost of the meter installation shall be added to the customer's account and paid over a maximum six (6) month period. For any customer who incurs within a two (2) year period four (4) or more water waste violations or does not comply with the water efficient landscape requirements, the City may implement any or all of the following measures:

(1) Require a customer to get a landscape evaluation, lawn water audit, and water budget, as appropriate, in order to learn efficient water use. This work would be completed at customer expense;

(2) Require a customer to repair any defects in the watering system of such customer within fourteen (14) days notice by the City to repair;

(3) Require installation by the City of flow restrictors or termination of water service for exterior use;

(4) Termination of all water service to a customer.

Water service shall be turned off and discontinued to any premises on or from which water supplied by the City is being disposed or used in violation of any law of the City other than wasting or noncompliance with water efficient landscape requirements. Water service shall not be restored to any premises until the owner and the occupant thereof terminate any violation or waste and agree not to continue to repeat such violation or waste. Such agreement shall be guaranteed by a cash bond in such sum as the Director of Finance shall fix, not to exceed One Hundred and no/100ths (\$100.00) Dollars.

## **Appendix C**

### **Water Efficient Landscape Ordinance**

#### Article 5. Water Efficient Landscape Requirements\*

\*Article 5, added by Ordinance No. 92-42, effective January 21, 1993, contained two sections numbered 6.5.503. The second and subsequent sections were renumbered by codifier.

##### 6.5.501 Applicability.

(a) Except as provided in subsection (b) of this section the requirements herein shall apply to:

(1) The landscaping of all new industrial, commercial, institutional, public, multi-family and residential common areas of Planned Unit Developments;

(2) All new landscaping and rehabilitated landscaping for projects requiring a site plan review, conditional use permit or final map approval;

(3) All landscape plans submitted after the effective date of the ordinance codified in this article.

(b) This section shall not apply to:

(1) Single-family landscaping and homeowner-provided landscaping for multifamily projects;

(2) Cemeteries;

(3) Registered historical sites;

(4) Ecological restoration projects that do not require a permanent irrigation system;

(5) Mined-land reclamation projects that do not require a permanent irrigation system; or

(6) Any project with a landscaped area less than 2,500 square feet. (§ 1, Ord. 92-42 eff. January 21, 1993)

##### 6.5.502 Turf selection and limitation.

(a) The combined turf and/or water area (i.e., pools, ponds and fountains) shall be limited to twenty (20%) percent of landscaped areas if a cool season turf is used. If a warm season turf is used the combined turf and/or water area shall be limited to thirty-five (35%) percent of landscaped areas. This requirement does not apply if the water used is from a surface source, is untreated and is used for artificial recharge of the groundwater aquifer. For the purposes of this article in the calculation of landscaped area, the parcel shall be defined to include the right-of-way behind the curb area and any easements. Turf allowances may be increased in steps of five (5%) percent of the area for each of the following water conserving

practices which are implemented or other conservation practices approved by the Director of Public Works:

(1) No planting of winter annual rye grasses;

(2) Incorporation of three (3") inches of organic wood based material into the top six (6") inches of native soil;

(3) Low flow irrigation only, (heads that put out less than sixteen (16) gallons per hour used for shrubs and trees);

(4) Turf area is without mounding, and has slopes less than eight (8%) percent;

(5) Rain gauges are used for automatic shut-off during periods of rain;

(6) Soil moisture sensors are used to activate and/or deactivate valves watering shrubs and lawns. Landscaped areas are defined as the parcel area, less building pad(s), driveway(s) and parking areas. Examples include: planted areas, sidewalks, water bodies, and natural areas. Turf limitation is waived for public park recreation areas, active open space recreation areas, golf courses, cemeteries and school recreation areas.

(b) No turf shall be allowed in median or traffic islands, parking lot islands, or in areas less than eight (8') feet wide. Turf shall be excluded from non-pedestrian areas difficult to irrigate such as slopes of more than eight (8%) percent and narrow pathways. (Except for parkways where pedestrian access is required turf will be allowed). (§ 1, Ord. 92-42 eff. January 21, 1993)

6.5.503 Plan and design of efficient irrigation systems.

(a) Specifications.

(1) Specifications for the irrigation system in new construction shall include a watering schedule with adjustments for seasonal changes in the evapotranspiration rate and/or City of Clovis Monthly Lawn Watering Chart. Water used for irrigation shall be limited to the amount needed to maintain adequate plant health and growth with a minimum of waste or over spray on adjoining areas.

(2) All parks, median strips, landscaped public areas, landscaped areas in and surrounding residential, institutional and commercial developments and industrial parks shall have automatic irrigation systems designed or approved by a registered landscape architect, certified irrigation designer, or other landscape professional determined to be competent by the City.

(b) Operation.

(1) All irrigation systems shall be operated to comply with one of the following:

(i) Evapotranspiration data;

(ii) Monthly Lawn Watering Chart.

Customers shall use the Monthly Lawn Watering Chart to determine lawn watering times. Longer watering times are permitted provided it can be shown necessary by calculations based on the evapotranspiration rate and sprinkler precipitation rates. For customers who use the Monthly Lawn Watering Chart, each area of the lawn shall receive no more than the maximum number of minutes per week allowed in the monthly lawn watering chart. For customers with automatic systems, this means no more than the maximum number of minutes per week per lawn valve. For customers who water manually, this means no more than the maximum number of minutes per week for any one area of lawn.

(2) Irrigation system operation shall comply with City of Clovis Water Conservation Program.

(3) The customer shall modify watering duration and frequency schedules so that the sprinkler's application does not exceed the irrigated area's absorption rate and generate any surface runoff.

(c) Minimum standards for new automatic irrigation system.

(1) Design standards.

(i) Backflow prevention devices must be used for protection at the connection to all irrigation systems.

(aa) Surface irrigation. Irrigation systems, including micro-irrigation, that do not have any subsurface emitters or other outlets can use atmospheric or pressure vacuum breakers, providing they are installed at the proper height (as defined below). Irrigation systems, including micro-irrigation, that have subsurface emitters or other outlets must use a reduced pressure backflow preventer at the connection to the service line.

(ab) Chemical injection into irrigation systems. Irrigation systems, including micro-irrigation, that do not have any type of chemical injection into the system can use atmospheric or pressure vacuum breakers, providing they are installed at the proper height (as defined below). Irrigation systems, including micro-irrigation, that have any type of chemical injection into the system must use a reduced pressure backflow preventer at the connection to the service line.

(ac) Criteria for Backflow Preventer Selection: Atmospheric vacuum breaker (or anti-siphon valve) must be at least six (6") inches higher than any downstream outlets or piping. There can be no chemical injection of any type into the irrigation system. There must be no downstream shutoff device after the Vacuum breaker. Pressure Vacuum Breaker (PVB) must be at least twelve (12") inches higher than any downstream outlets or piping. Reduced Pressure Backflow Preventer (RP) may be installed at a lower point than the irrigation system and may have shutoff valves after the device. A chemical injector system may be installed on the irrigation line after an RP backflow device.

(ii) An automatic controlled irrigation system shall be provided.

(aa) Tuff and shrub areas shall be separated into different watering zones.

(ab)Sprinkler heads shall be spaced to provide head to head coverage.

(ac)Sprinklers with the same application rate (gallons per square foot per minute) shall be used on the same irrigation valve circuit.

(ad)Overspray shall be minimized by utilizing proper sprinkler spray pattern.

(2)Irrigation equipment standards.

(i)All pop up spray heads shall be a minimum of four (4") inches (nominal) in pop up height.

(ii)Sprinkler heads shall incorporate check valves to prevent low head drainage.

(iii)Swing joints or flex risers shall be used on all installed sprinklers to minimize potential breakage.

(iv)Automatic irrigation controller shall have the following features:

(aa)Multiple start times;

(ab)Dual programming capability;

(ac)Programmable to comply with day of week and time of day watering hours per Clovis watering regulations as set by the City Council;

(ad)City of Clovis Monthly Lawn Watering Chart mounted on controller by contractor or installer.

(d)Standards of implementation.

(1)The contractor/owner shall obtain a landscape/sprinkler permit from the Building Division of the Planning and Development Services Department.

(i)No special plan check will be required. (Landscaping plans will be approved through the conditional use permit, site plan review and final map processes).

(ii)A copy of the ordinance codified in this article or a water efficient landscape guidelines sheet will be given to each permit applicant.

(2)An inspection will be made by the appropriate City inspector(s) upon completion of the landscape and sprinkler system.

(i)The inspector(s) will inspect the water connection, controller, back flow prevention device, valves, and that the time clock has the seasonal watering schedule enclosed within the controller cabinet.

(ii)On the permit all certifications shall be signed by the owner or authorized representative and given to the inspector(s) prior to City approval.

(e) Process of implementation.

(1) All landscape plans submitted for a site plan review, final map or conditional use permit subject to this section shall be designed in accordance with the City of Clovis Water Efficient Landscape Standards.

(2) A note shall be placed on the plans stating: "I hereby certify this landscaping and irrigation system is designed in accordance with the City of Clovis Water Efficient Landscape Standards," and signed by the plan designer.

(3) For all projects requiring a landscape plan there shall be a "Hold on Occupancy" until Items #1 and #2 of the Standards of Implementation are completed.

(4) A certification of landscaping signed by the landscape professional and owner or authorized representative stating that the landscaping and irrigation systems have been installed per the approved plans shall be returned to the Planning and Development Services Department.

(5) A cash deposit may be posted for the value of the landscaping if occupancy is necessary prior to completion of the landscape installation. (§ 1, Ord. 92-42 eff. January 21, 1993)

#### 6.5.504 Site preparation.

(a) Soil type and infiltration rates shall be considered when designing slope irrigation. To avoid runoff, irrigation systems shall be installed so that the precipitation rate shall be less than the infiltration rate or that the irrigation system shall be able to repeal cycles for "back-to-back" irrigation. If the soil type is unknown, consult with the United States Soil Conservation Service Soil Survey of Eastern Fresno County, 1968.

(b) All landscape areas shall be ripped and/or tilled to six (6") inches. Landscape areas subject to compaction shall be ripped and/or tilled to twelve (12") inches. (§ 1, Ord. 92-42 eff. January 21, 1993)

#### 6.5.505 Mulch.

A minimum of two (2") inches of organic mulch shall be placed on non-turf irrigated surface areas to the soil surface after planting. Non-porous material shall not be placed under the mulch. (§ 1, Ord. 92-42 eff. January 21, 1993)

#### 6.5.506 Plant selection.

The planted area shall consist of plant material well-suited to the climate of the region and require low to moderate water use once established. It is recommended that these plants be chosen from the "low and medium" water use categories on the plant list provided with the Water Efficient Landscape Guidelines. (§ 1, Ord. 92-42 eff. January 21, 1993)

#### 6.5.507 Maintenance.

It is the owner's responsibility to maintain the irrigation system by checking, adjusting sprinklers, repairing or replacing defective equipment and modifying the watering times to ensure efficient use of water. The customer is responsible for any wastage of water which originates on the customer's property. (§ 1, Ord. 92-42 eff. January 21, 1993)

#### 6.5.508 Water features.

(a) Definition. Water features are manmade, open to the atmosphere bodies of water containing 500 gallons of water or more and in the case of swimming pools are more than eighteen (18") inches in depth. Examples are manmade lakes, streams, ponds, fountains, and swimming pools.

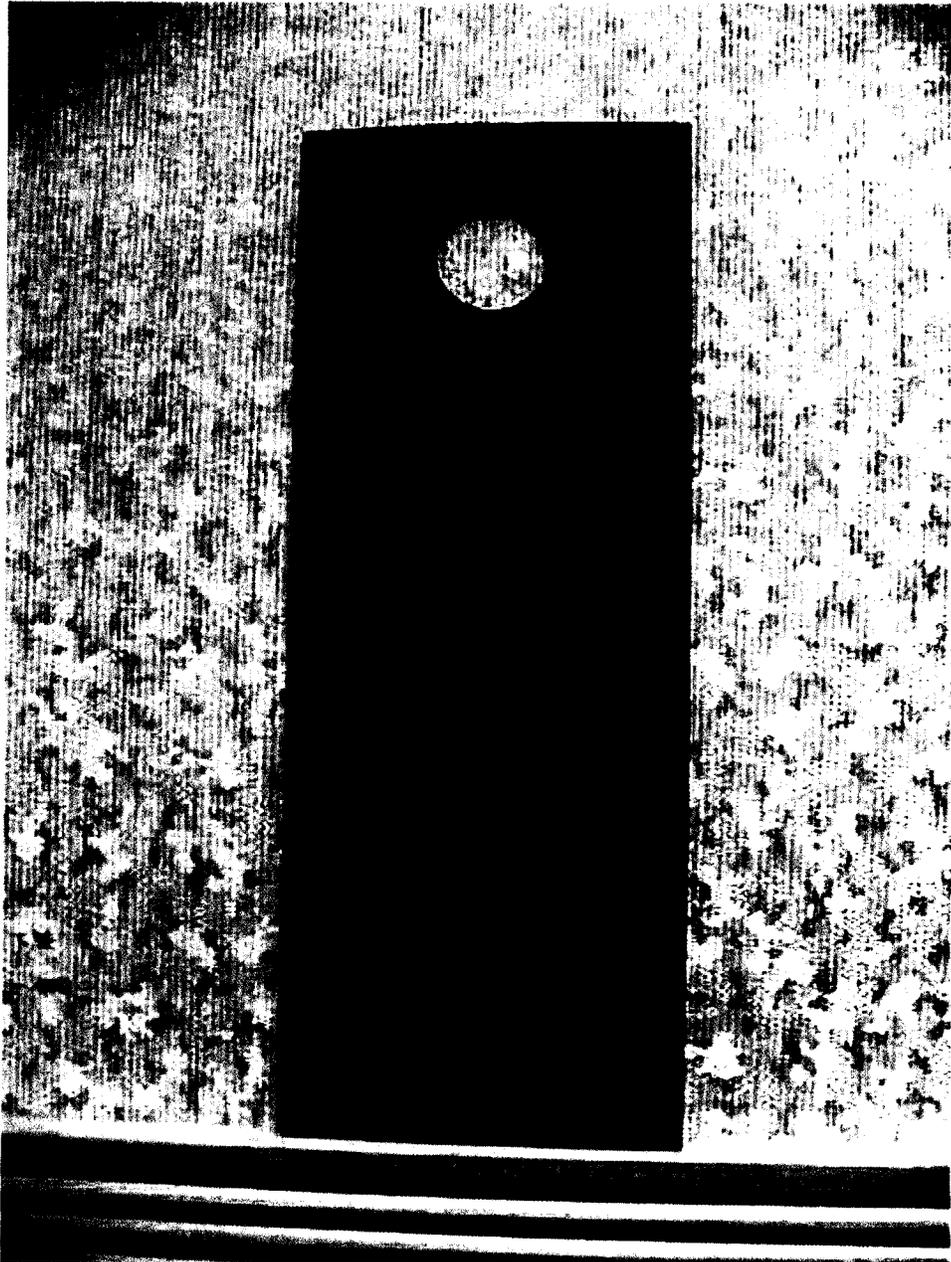
(b) Recirculating water. All water features shall use recirculating water or the water shall be reused for landscape irrigation. If untreated surface water or reclaimed water is used and is used for artificial recharge of the groundwater aquifer, recirculating water is not required.

(c) Permits required. No water feature shall be constructed or installed within the City by any person without first securing a permit therefor from the Building Division of the Planning and Development Services Department in accordance with Title 8, Building Regulations.

(d) Management Plan. All persons applying for a permit to construct or install a water feature shall prior to permit issuance provide a management plan prepared by a registered engineer or other professional determined to be competent by the City for the water feature. The management plan shall indicate how the water feature will be maintained and shall be reviewed by the City Water Division prior to permit issuance.

(e) Seepage. All water features, unless filled with reclaimed or untreated surface water, shall not lose more than one inch per year in water depth due to seepage. The applicant shall by calculations based on the type of material used for the water feature lining, determine the expected water loss due to seepage prior to permit approval. (§ 1, Ord. 92-42 eff. January 21, 1993)

Appendix D  
Sample Water Citation



## Appendix E Comments

Comments from the County of Fresno were addressed in the plan as approved.



# County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING  
ALAN WEAVER, DIRECTOR

January 26, 2006

Ms. Lisa Koehn  
155 N. Sunnyside  
Clovis, CA 93611

Dear Ms. Koehn: *Lisa*

Subject: City of Clovis Urban Water Management Plan

Thank you for the opportunity to review the draft City of Clovis Urban Water Management Plan. I found it to be very thorough and clearly stated. I offer the following observations for your consideration:

- In Figure 3 due to similar colors used for Reclaimed and Purchased water it was difficult to distinguish between the two. It is suggested that the color of either recycled or purchased water be changed for ease of identification.
- Under the Supplemental Water Sources section the report indicates that the City can receive about 9,000 AF of water each year from Waldron Pond. That is generally true except for prolonged drought years. It is our understanding that in the event that FID hasn't been able to recharge at least 10,000 AF in the Waldron Pond facility the previous year they won't be able to extract 9,000 AF the subsequent year. It is our understanding that if that situation occurs, FID will then be required to try and obtain the water elsewhere if possible and that the City will pay whatever the market rate is for the water obtained.
- On Page 34, there is a statement that "Because commercial, industrial and school customers are so diverse in size and water needs, no average consumption level could be determined which would not be grossly unfair to some customers, so no block rate higher than the cost to provide sufficient revenue." This is understandable, but it basically means that there is no financial incentive for those institutions to conserve until the rates are increased due to shortage events. Since water is simply a cost of business it would seem that a tiered rate system should be considered where practical to provide incentive to conserve.

Possible methods that may be utilized to establish standard tiered rates for school usage could be based on gallons per acre of landscaping and/or gallons per student. Industrial and commercial entities could also use gallons/acre of

landscaping for a portion of the site and could be segregated into two classes, those that use water in the production of their product/service and those that only use water for janitorial and employee purposes. The latter could be placed in a tiered system that considers gallons/plumbing fixture within the facility. It is recognized that the creation of a tiered rate for industrial and commercial entities that use water in the production of their product/service could be problematic and that perhaps these are entities where the City should provide enhanced education and cooperative efforts to enhance the awareness of the proprietor and encourage appropriate conservation strategies. Good faith conservation goals could be established through consultation with the City that could encourage the proprietor to conserve.

- On Page 48, near the end of the last paragraph the report states "Main flushing is only done on a sand, odor, or taste complaint basis." It would seem that flushing should also be allowed in the event there is a failure during normal testing and for public health reasons portions of the system need to be flushed.
- On Page 48, near the end of the last paragraph it would seem that there should be something that limits or prohibits construction water usage during this period for dust control, new main disinfection, new home constructions etc?

Thank you again for the opportunity to review the draft report and comment. Please feel free to contact me if you have any questions regarding the provided comments.

Sincerely,



Alan Weaver  
Director