City of Deming

40-Year Water Plan

July 20, 2009

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1. Introduction

Deming was founded in 1881 and was named after Mary Anne Deming who married Charles Crocker, a chief executive with the railroad. The U.S. Army had been active in the area since 1846 and established Ft. Cummins near the existing town site in 1860 in order to protect the route of settlers on their way to California. Population growth was spurred by the Southern Pacific Railroad when it located a train engine repair center in Deming, and the town became a major shipping point when the Atchison, Topeka, and Santa Fe Railway completed a junction with the Southern Pacific Railroad. Deming was incorporated in 1902 (City of Deming, 2003).

The town continued to grow in the early 1900s, due to the establishment of the Holy Cross Sanitarium, which became a major location for tuberculosis treatment. U.S. Army Camp Cody was established in Deming in 1916 in order to control Mexican raids, and the camp went on to become a training facility. The Works Progress Administration and Civilian Conservation Corps were active in Deming during the Great Depression and World War II, and Interstate 10 came to town in 1964, causing additional growth (City of Deming, 2003).

In 2000, the City of Deming had a total population of 14,116 people, and accounted for over half of the total population in Luna County (U.S. Census, 2000). The population in Deming grew by almost 21 percent between 1990 and 2000 (U.S. Census, 2000), and future growth is anticipated with further expansions of the employment base as well as in-migration of retirees (City of Deming, 1997).

To ensure that sufficient water is available to supply this growing population, the City of Deming prepared a 40-year water plan in 1997. The City has retained Daniel B. Stephens & Associates, Inc. (DBS&A) to update this plan to further facilitate long-range water resource planning for the City of Deming.

In addition to planning to meet future water demand, a 40-year water plan addresses several regulatory requirements regarding water rights and water conservation. In particular, a water plan allows certain organizations, including municipalities, to set aside water for use in the future. Although this notion is contrary to the well known “use it or lose it” concept of the prior

appropriation system, it is essential for long-term water planning. Section 72-1-9 (B) of the New Mexico Water Code allows covered entities such as the City of Deming to legally appropriate and reserve water that they cannot currently use, but will need in the future to meet projected water requirements for the City. To help determine these future needs, a 40-year water plan includes estimates of future water demand based on population projections. Municipalities and counties are specifically exempt from forfeiture of unused water rights if those rights have been appropriated for the implementation of a water development plan or for preservation of water supplies (NMSA 72-12-8 (F)). These provisions are the same for both surface water and groundwater (NMSA 72-5-28 (C)).

In addition to protecting water rights, Deming's 40-year water plan contains a conservation plan that addresses New Mexico Office of the State Engineer (OSE) requirements for conservation. The conservation plan also fulfills the statutory requirement (NMSA 1978 Section 72-14-3.2) that calls for conservation planning as a prerequisite for applying for funding from key state funding agencies. Specifically, ". . . any public supply system with diversions of at least 500 acre-feet annually for domestic, commercial, industrial, or government customers for other than agricultural purposes, may develop, adopt and submit to the State Engineer, by December 31, 2005, a comprehensive water conservation plan, including a drought management plan." The statute also specifies that after December 31, 2005, neither the Water Trust Board nor the New Mexico Finance Authority shall accept an application from a covered entity for financial assistance in the construction of any water diversion, storage, conveyance, water treatment or wastewater treatment facility unless the covered entity includes a copy of its water conservation plan" (NMSA 1978, Section 72-14-3.2(G). Deming addressed these requirements with the passage of its conservation ordinance in 2004 (Appendix A).

Accordingly, the remainder of this water plan synthesizes relevant information on the available water supply, the quality of that supply, and projected demand, summarizes the City's water conservation plan, and recommends measures the City of Deming may consider in planning for an adequate future water supply.

2. Water Supply

This section discusses the water resources in the vicinity of the City of Deming, including the sources of water, available water supply, reasonable projections of future availability, and current and anticipated future water quality. Water availability is defined in this section in the hydrologic rather than legal sense; availability of water from a water rights perspective is discussed in Section 3.2.

Sections 2.1 and 2.2 describe groundwater and surface water resources, respectively. Section 2.3 describes the quality of area groundwater, which is the current source of the City's supply.

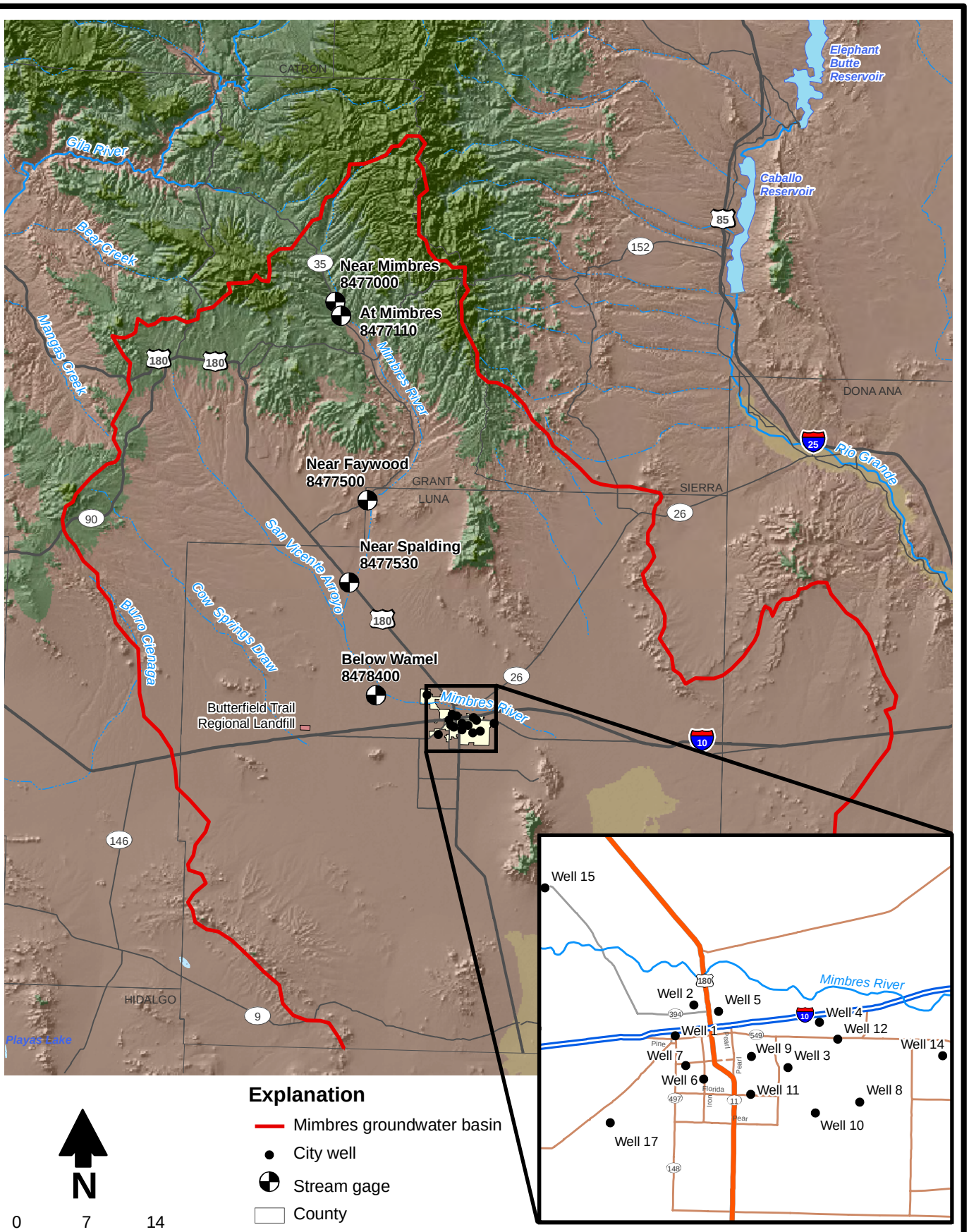
2.1 Groundwater

The City of Deming is located within the Mimbres Groundwater Basin (Figure 1), which provides the only water source for the City of Deming (City of Deming, 1997). The State Engineer's administratively defined limits for the declared Mimbres Groundwater Basin (Section 3.2.1) encompass parts of Grant, Sierra, Doña Ana, and Luna Counties.

2.1.1 Geography and Climate

The City of Deming is located in a valley between the Florida Mountains to the southeast and Cooke's Range to the north. Maximum elevations in these ranges are 7,295 feet above mean sea level (ft msl) at Florida Peak and 8,408 ft msl at Cooke's Peak (City of Deming, 2003).

The climate in Deming is characterized by large ranges in annual temperature, with low humidity and a high evaporation rate (City of Deming, 2003). Average total annual precipitation in Deming was 9.35 inches for the period of 1914 through 2005 (WRCC, 2007); most precipitation occurs as heavy thunderstorms during July through September (City of Deming, 2003).



Explanation

- Mimbres groundwater basin
- City well
- Stream gage
- County
- City
- Stream
- Highway

N

0 7 14 Miles

DEMING 40-YEAR WATER PLAN

City Wells and Site Geography

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Figure 1

S:/PROJECTS/WR07.0022_DEMING_40-YEAR_WATER_PLAN/GIS/MXDS/UPDATE_SPRING2009/FIG01_CITY_WELLS_AND_SITE_GEOGRAPHY.MXD 907140

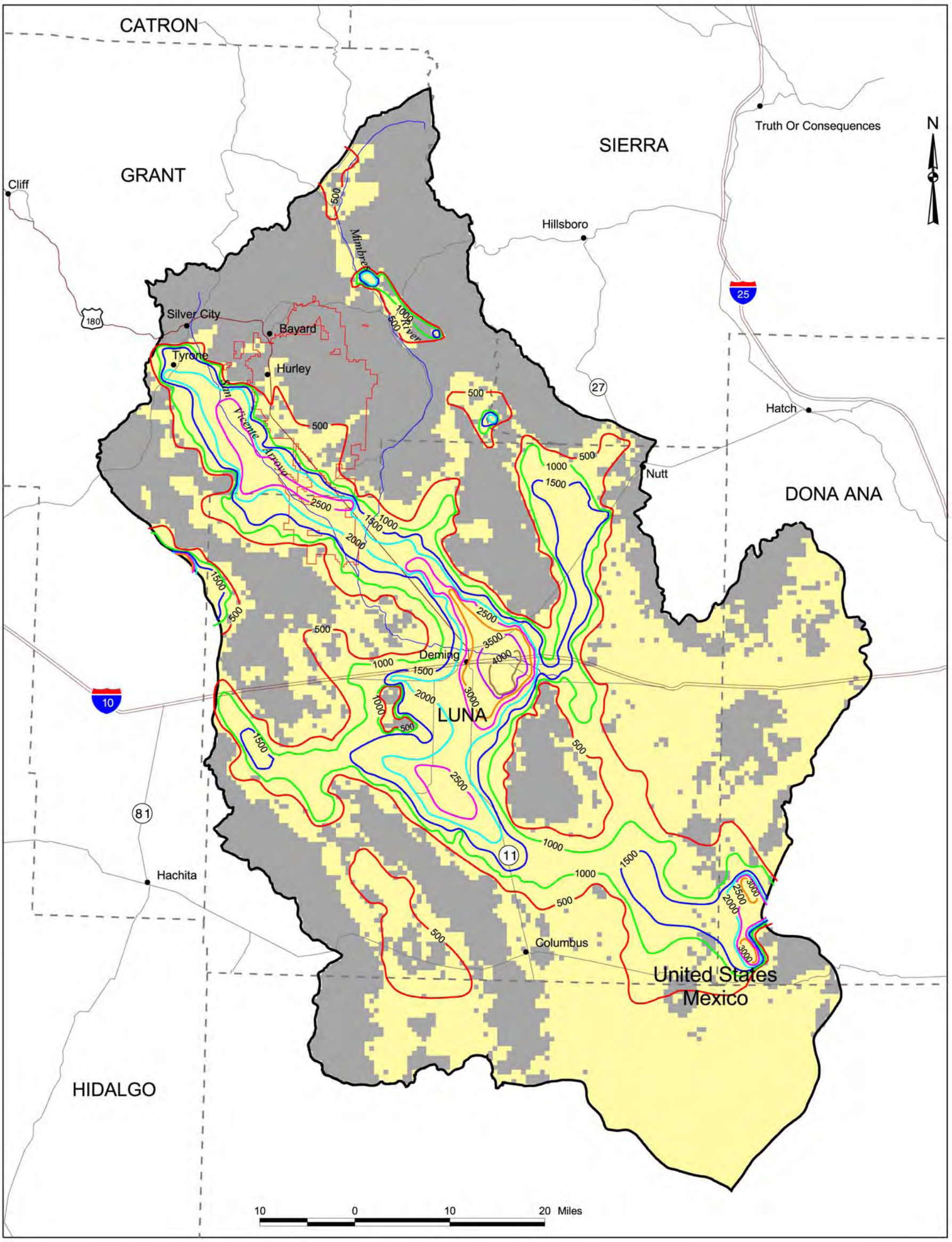
2.1.2 Hydrogeology

The City of Deming and the Mimbres Basin are located within the Mexican Highland Section of the Basin and Range province. The Basin and Range province is the result of extensional geotectonics that have occurred over the last 25 million years and is characterized by north-south trending mountain ranges separated by basins that have been partially filled with sediment eroded from the mountains. The mountains are comprised of bedrock and encompass approximately 20 percent of the Basin and Range province in New Mexico (Hawley et al., 2000). Basin fill includes several units of Quaternary alluvial and lacustrine deposits, as well as the Tertiary Gila Group. Within the Basin and Range province, the basin fill contains most of the readily available (i.e., economically viable) groundwater resources. The water table is generally within 200 feet of ground surface within the basin fill, aquifers are moderately to highly permeable, and the water is of good quality.

The Mimbres Basin is bounded on the north and west by the Continental Divide and on the east by the Lower Rio Grande Basin in Doña Ana County; to the south it extends into Mexico (Figure 2 [JSAI, 2006, Figure D7]). The only perennial stream reach in the basin is the Mimbres River, which drains the Cooke's Range in the north and whose entire flow either evaporates, is transpired by plants, or recharges the Mimbres Basin. Consequently, the river flows only ephemerally in the vicinity of Deming.

The overall province-scale geology of the Mimbres Basin is relatively complex (Figure 3); however, the geology that affects groundwater occurrence is limited mostly to near-surface basin fill. Intrabasin-scale structures divide the Mimbres Basin into seven different sub-basins that contain the vast majority of groundwater (Hawley et al., 2000):

- Upper Mimbres Sub-basin
- San Vicente Sub-basin
- Dwyer Sub-basin
- Florida Sub-basin
- Deming Sub-basin
- Hermanas Sub-basin



Source: JSAI, 2006, Figure D7

Figure 2

DEMING 40-YEAR WATER PLAN
Basin Fill Thickness
Mimbres Basin

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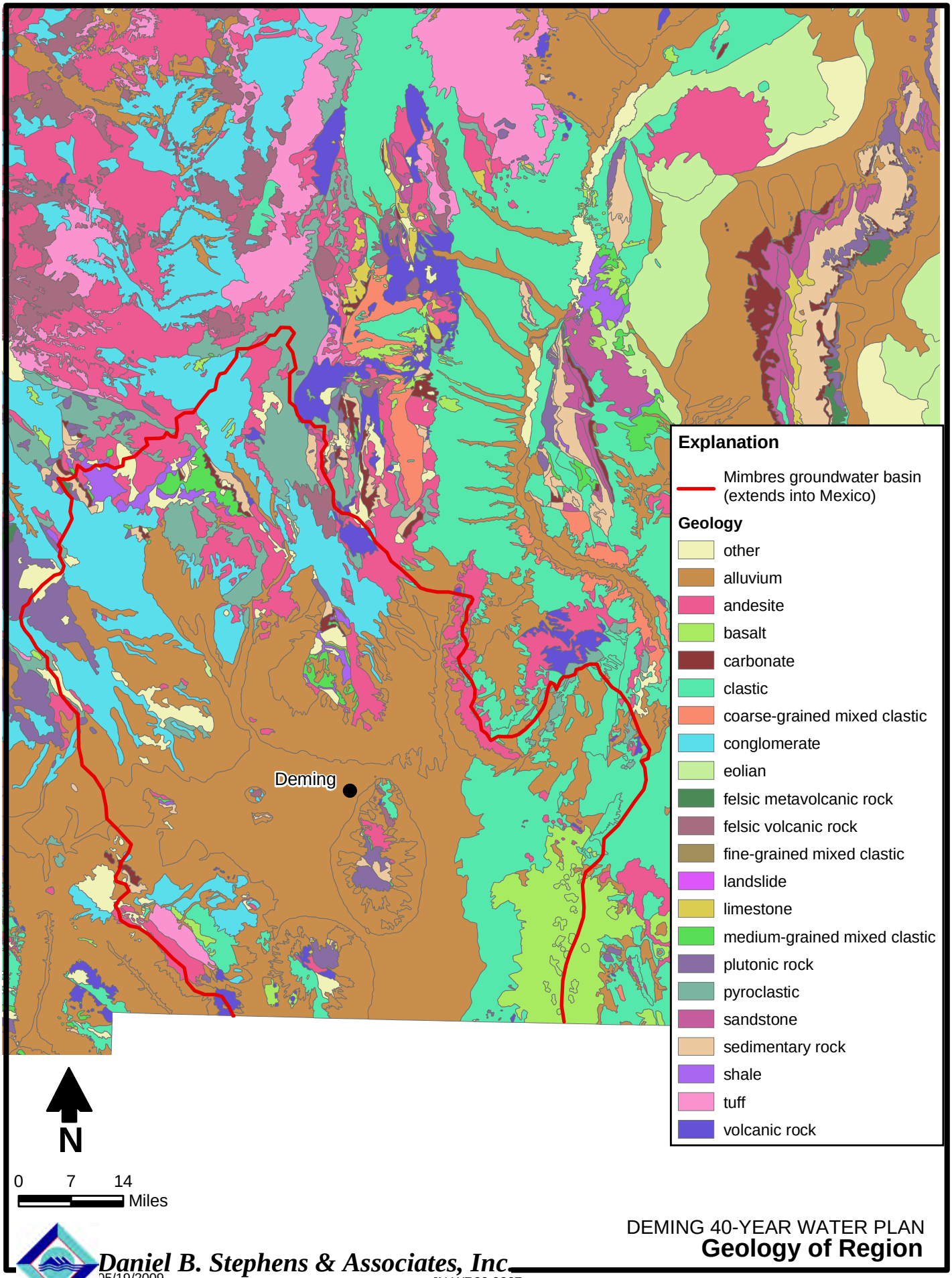

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DEMING 40-YEAR WATER PLAN

Geology of Region

Figure 3

- Columbus Sub-basin

In the seven identified sub-basins, groundwater occurs primarily within basin fill materials comprised of Quaternary alluvium and the Tertiary Gila Group. Basin fill is more than 1,000 feet thick in some areas, but the productive zone rarely exceeds 660 feet thick (Hawley et al., 2000) because sediments at greater depths become more compacted and possibly more indurated, which reduces the transmissivity of the formation. Basaltic volcanics interbedded with basin fill can be locally important aquifers, mostly in the Upper Mimbres, Columbus, and San Vicente sub-basins. Figure 2 shows that the basin fill near Deming is several thousand feet thick.

The Mimbres Basin system contains unconfined, semiconfined, and confined aquifers, depending on location. Inter-sub-basin hydrologic interactions are not well understood, but the general groundwater flow direction is from the northern highlands toward the U.S.-Mexico border. Pre-development discharge across the border is estimated to have been 6,500 acre-feet per year (ac-ft/yr) from the U.S. into Mexico (Hanson et al., 1994). Recharge from precipitation is estimated to be no more than 2 percent of the precipitation that falls across the area (Hawley et al., 2000).

Specific capacity data compiled by Hanson et al. (1994) for 278 wells completed in the basin fill indicate that the aquifer is highly productive but that the productivity of the aquifer decreases with depth. In general, specific capacities are between 13 and 17 gallons per minute per foot (gpm/ft) in wells completed within 330 feet of ground surface, between 8 and 12 gpm/ft in wells completed between 330 and 660 feet below ground surface (bgs), and between 7 and 9 gpm/ft in wells completed below 660 feet bgs. Transmissivities range from 75 to 375,000 gallons per day per foot (gpd/ft) (10 to 50,100 square feet per day [ft^2/d]), but the lower end of this range may reflect poor test conditions rather than actual aquifer characteristics (Hawley et al., 2000). Data from aquifer tests in Deming city wells indicate that the transmissivities of wells in the city well field are very high, ranging from 11,250 gpd/ft (1,500 ft^2/d) to 120,000 gpd/ft (16,000 ft^2/d) (Johnson et al., 2002).

A liberal estimate of available water of good quality remaining in the entire Mimbres Basin, without considering economic and legal constraints, is 30,060,000 acre-feet (Hawley et al., 2000).

2.1.3 Deming Well Field and Water Level Trends

The Deming well field has 15 active wells (Jenkins, 2008) and is located in the vicinity of some of the deepest basin fill deposits (over 4,200 feet) found in the Mimbres Basin (Johnson et al., 2002). Figure 4 shows the location of the wells within the City of Deming, and Table 1 lists the construction details of the wells. Most of the wells are about 500 feet deep with a depth to water of about 150 feet. Static depth to water in the Deming production wells ranges from 101 to 166 feet (Table 1), and pumping levels range from 135 to 277 feet (Jenkins, 2008). Yields for individual wells range from 300 to 650 gallons per minute (gpm), and the total well field yield is 5,900 gpm (Johnson et al., 2002).

The static depth to water measurements over the past 9 years (Table 2) do not reveal trends in water levels. However, USGS has eight monitor wells within 4 miles of Deming (Figure 5) with water level data starting in 1940. Water levels in these USGS-monitored wells have decreased at an average rate of 0.74 feet per year (ft/yr) (Table 3). Figure 6 shows the water level trend in one of monitor wells located within the City limits, with the historical water level decline projected to 2050. This projection shows that about 100 feet of water level thickness would remain in 2050 if the current trends continue.

A groundwater model developed by the OSE predicts much greater water level decline rates than those observed in the USGS monitor wells. The OSE model drawdown estimates for 2020, 2040, and 2060 indicate that the water table will decline on average approximately 1.75 ft/yr between 2000 and 2060 (Johnson et al., 2002). The model report concludes that estimated demand will exceed existing capacity of the Deming well field by the year 2015 and that Deming would therefore need to drill more wells to meet future demands. However, the OSE model simulated a higher rate of production than is currently predicted for future demand by the City of Deming: whereas the OSE model simulated well production of 16,442 ac-ft/yr in 2060, this planning document predicts a demand between 6,400 and 9,100 ac-ft/yr in 2050. Furthermore, since the release of the 2002 model report, the City of Deming has brought into production 3 more wells and now has 15 active wells

N

0 0.5 1 Miles

Explanation

- City well

DEMING 40-YEAR WATER PLAN

City Wells

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Figure 4

S:/PROJECTS/WR07.0022_DEMING_40-YEAR_WATER_PLAN/GIS/MXDS/UPDATE_SPRING2009/FIG04_CITY_WELLS.MXD 909150

Table 1. City of Deming Water Supply Wells

Well Number [a]	OSE File Number	Well Name	Address	Location	Year Drilled	Well Depth (feet	Depth to Water Measured 3/17/2009 (feet)	Water Column (feet)
Well 1	M-299-S-6	Water Plant	8th & Cedar	23.09.33.222	1966	569	154	415
Well 2	M-299-S-7	N. Zinc	North Zinc & 4th	23.09.27.134	1966	493	148	345
Well 3 [b]	M-299-S-2	Poplar	Poplar & Country Club	23.09.35.422	1966	571	148	423
Well 4	M-299-S-15	Donaldson	2901 Donalson Rd	23.09.25.324	1968	500	120	380
Well 5	M-299-S-5	Martin	Platinum & 2nd	23.09.27.412	1951	400	141	259
Well 6	M-299-S	S. Iron	Iron & Buckeye	23.09.34.324	1954	400	126	274
Well 7	M-299-S-8	Boy Scout	Granite & Ash	23.09.34.312	1966	500	147	353
Well 8	M-299-S-11	Fairground	Raymond Reed & D St	24.08.06.111	1985	597	125	472
Well 9	M-299-S-12	Ash & Grand	Ash & Grand	23.09.35.133	1980	500	155	345
Well 10	M-299-S-10	Swig	Atlantic & Cardenas	24.09.01.142	1960	500	149	351
Well 11	M-299-S-4	Florida	Florida & Santa Clara	23.09.35.343	1963	484	166	318
Well 12	M-299-S-13	Cemetery	3100 E. Pine	23.09.36.213	1951	445	133	312
Well 14	M-214	Luchsinger	El Portal Rd SE	23.08.32.1.2	1972	352	101	251
Well 15	M-271	Peru	Peru Mill	23.09.18.412	1961	525	115	410
Well 17	M-49 M-109 M-127	Bilbo	W. Ash St	24.9.8.2	1984	1500	130	1370

[a] Well 13 has been plugged and abandoned and disconnected from the system.
Well 16 contained elevated arsenic levels and was never connected to the municipal system or brought into production.

[b] Not part of municipal water system; used only for golf course watering.

Table 2. Deming Production Well Static Depth to Water Measurements

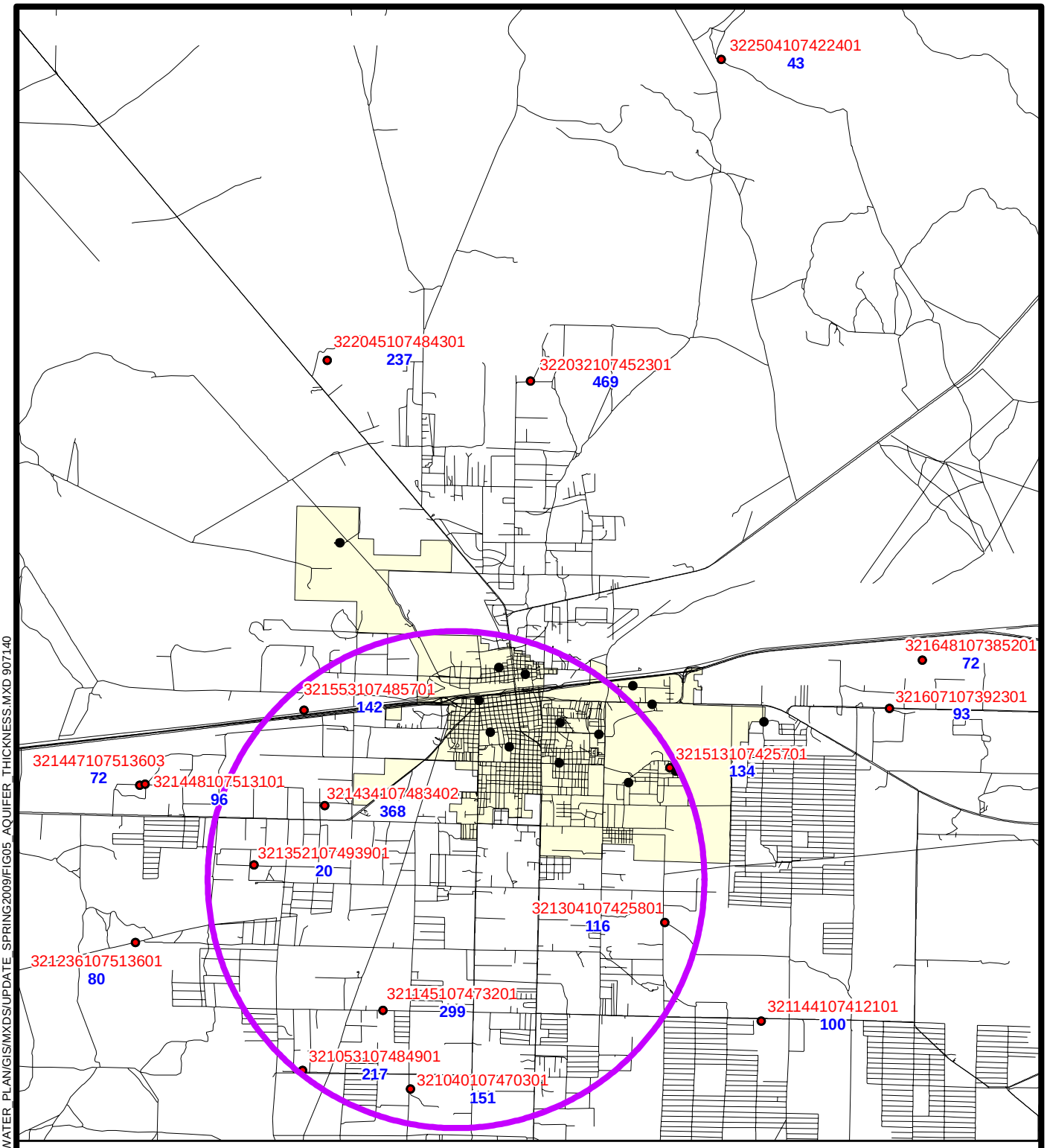
Well Number	Well Name	Static Depth to Water Measurement (feet below ground surface)					
		1998	7/12/2004	5/31/2005	7/19/2006	8/17/2007	3/17/2009
1	Water Plant	---	150	---	---	154	154
2	N. Zinc	155	---	---	152	142	148
3	Poplar	---	151	---	---	---	148
4	Donaldson	143			122	119	120
5	Martin	---	146	143	---	---	141
6	S. Iron	---	---	---	---	---	126
7	Boy Scout	---	158	149	---	---	147
8	Fairground	---	---	---	130	126	125
9	Ash & Grand	165	---	---	---	---	155
10	Swig	---	150	152	---	---	149
11	Florida	---	173	155	168	162	166
12	Cemetery	---	150	130	---	---	133
14	Luchsinger	---	101	---	---	---	101
15	Peru	---	---	128	---	---	115
17	Bilbo	140	---	---	---	---	130

Source: Jenkins, 2007, 2009 --- = Not available

Table 3. Change in Water Levels in USGS-Monitored Wells near Deming

Aquifer	Well ID	Change in Water Level			
		Period of Record		Amount [a] (feet)	Average Rate (ft/yr)
		Dates	No. of Years		
Alluvial	321145107473201	1958-1997	39	–36.20	–0.74
	321304107425801	1954-2002	48	–37.90	
	321352107493901	1939-2006	67	–34.63	
	321434107483402	1961-2002	41	–2.09	
	321513107425701	1942-2002	60	–48.59	
	321553107485701	1940-1997	57	–97.92	
	321607107392301	1931-2002	71	–46.02	
	321648107385201	1950-2002	52	–22.53	

Source: USGS, 2007 [a] Negative numbers signify a drop in water levels.


322504107422401
43
322045107484301
237
322032107452301
469
321648107385201
72
321553107485701
142
321607107392301
93
321513107425701
134
321447107513603
72
321448107513101
96
321434107483402
368
321352107493901
20
321304107425801
116
321236107513601
80
321145107473201
299
321144107412101
100
321053107484901
217
321040107470301
151
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N
0 1 2
Miles
Explanation
USGS monitor well
City well
Roads
134 Aquifer thickness
Four-mile radius
DEMING 40-YEAR WATER PLAN
City Wells, Monitor Wells, and Aquifer Thickness
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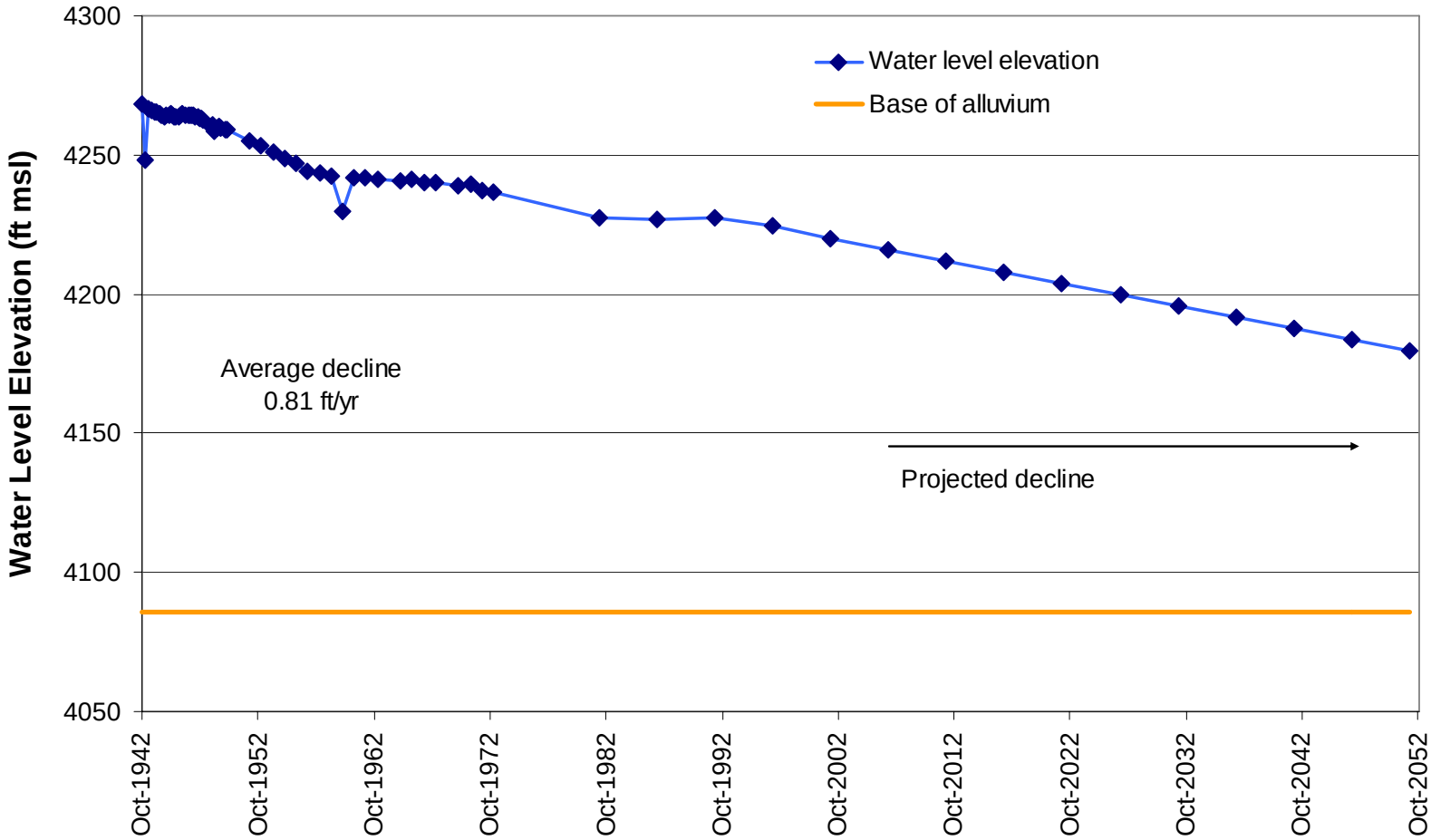
Figure 5



DEMING 40-YEAR WATER PLAN

Water Level Trends in
USGS Alluvial Well 321513107425701
T24S R09W 01.222

Figure 6

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5/21/09

Water levels in the vicinity of Deming are also impacted by local irrigation wells. Most of the wells in the vicinity of Deming are less than 500 feet deep (Figure 7). Wilson et al. (2003) reports that 25,631 acres are irrigated in the Mimbres Basin within Luna County, diverting more than 75,000 ac-ft/yr from the aquifer (with depletions of about 45,000 ac-ft/yr).

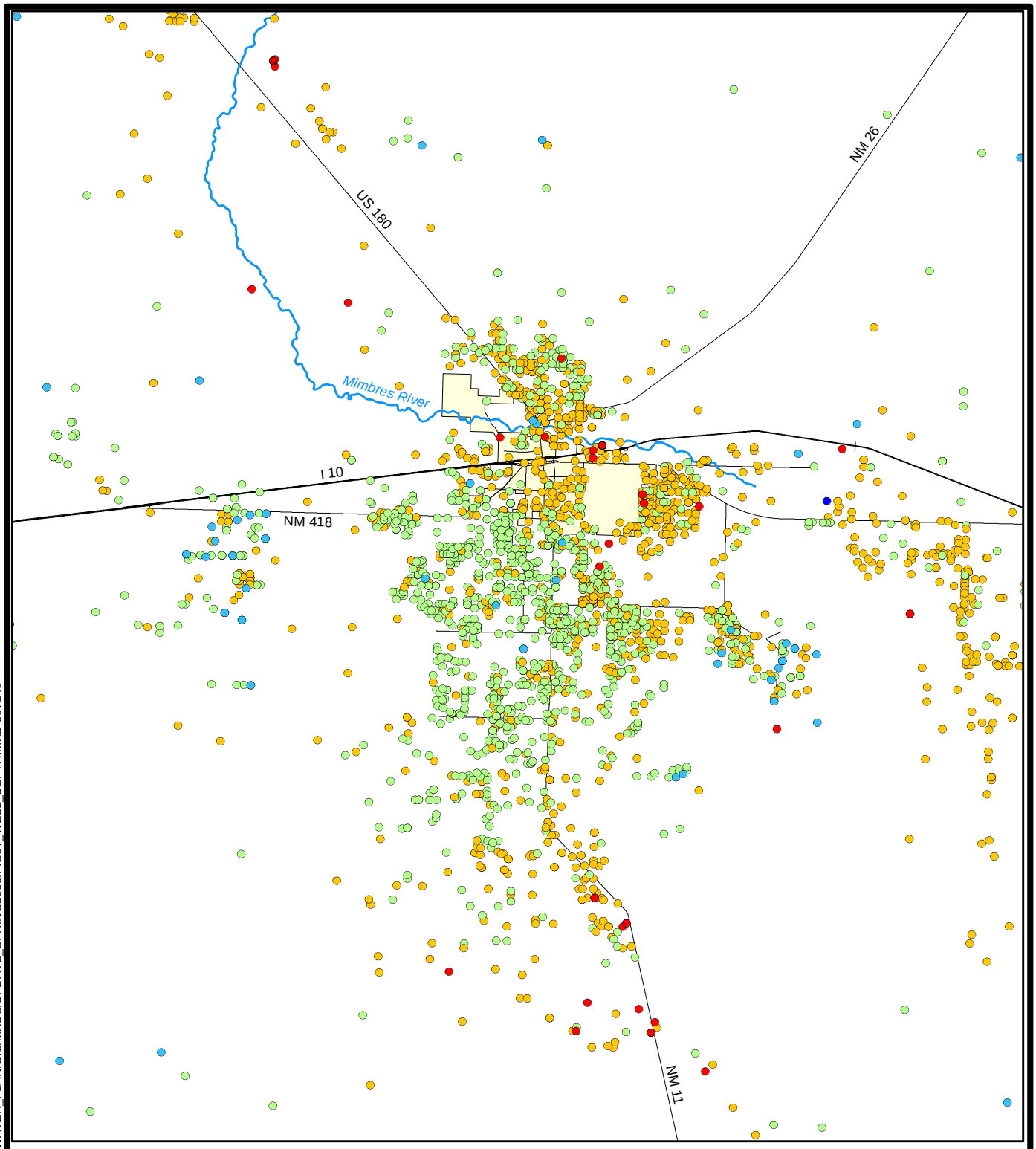
2.2 Surface Water

The City of Deming is located within the Mimbres River surface water basin. The Mimbres River is perennial only in its upper reaches; it is ephemeral below the USGS stream gage located at Faywood in northern Luna County, and surface water flow occurs in the Deming area (just north of Deming) only during periods of heavy rainfall. Mimbres River headwaters are located in Grant County, and the full river basin includes parts of Grant, Sierra, Doña Ana, and Luna Counties. The Mimbres River Basin is a closed basin, indicating that no surface water flows out from the basin.

The Mimbres River is a significant source of recharge for the shallow alluvial aquifer that supplies the City of Deming's wells. Annual discharge recorded at a series of gages (Table 4) on the Mimbres River from Mimbres to Deming (locations shown on Figure 1) illustrates the magnitude of flow and the significant losses that occur between Faywood and Deming.

Over this period an average of over 15,000 ac-ft/yr flowed past the Faywood gage and about 1,600 ac-ft/yr passed the Wamel gage just upstream of Deming (Figure 8). The long-term record of flow of the Mimbres River near Mimbres (Figure 9) shows the variability in discharge.

The only other significant surface water feature near Deming is Bear Canyon Reservoir, located near the confluence of the Mimbres River and Bear Canyon. This reservoir has a capacity of 700 acre-feet of water and is used for conservation storage and for recreation (City of Deming, 2003).



Explanation

Well depth (ft)

- 0 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,000
- Stream
- Road

N

0 2.5 5 Miles

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DEMING 40-YEAR WATER PLAN

Depths of Wells Near Deming

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Figure 7

Table 4. Annual Discharge in the Mimbres River for Water Years 1964-1968

Water Year [a]	Discharge (cfs)			
Gage Number	*8477000*	*8477500*	*8477530*	*8478400*
Gage Name	*Near Mimbres*	*Near Faywood*	*Near Spalding*	*Below Wamel*
Drainage Area (mi^2)	*152*	*440*	*472*	*1101*
Latitude	*32°52'28"*	*32°35'10"*	*32°27'55"*	*32°18'05"*
Longitude	*107°59'05"*	*107°55'10"*	*107°56'50"*	*107°53'45"*
Projection	*NAD 27*	*NAD 27*	*NAD 27*	*NAD 27*
1964	6.01	7.06	1.54	0.406
1965	8.57	6.26	5.3	1.47
1966	26.9	36.4	22	4.6
1967	11.1	20.3	13.1	3.26
1968	29.3	34.6	22.4	1.58
Average (cfs)	*16.4*	*20.9*	*12.9*	*2.3*
Average (ac-ft/yr)	*11,856*	*15,148*	*9,316*	*1,638*

[a] Data available only for water years 1964 to 1968

cfs = Cubic feet per second
mi^2 = Square miles
ac-ft/yr = Acre-feet per year

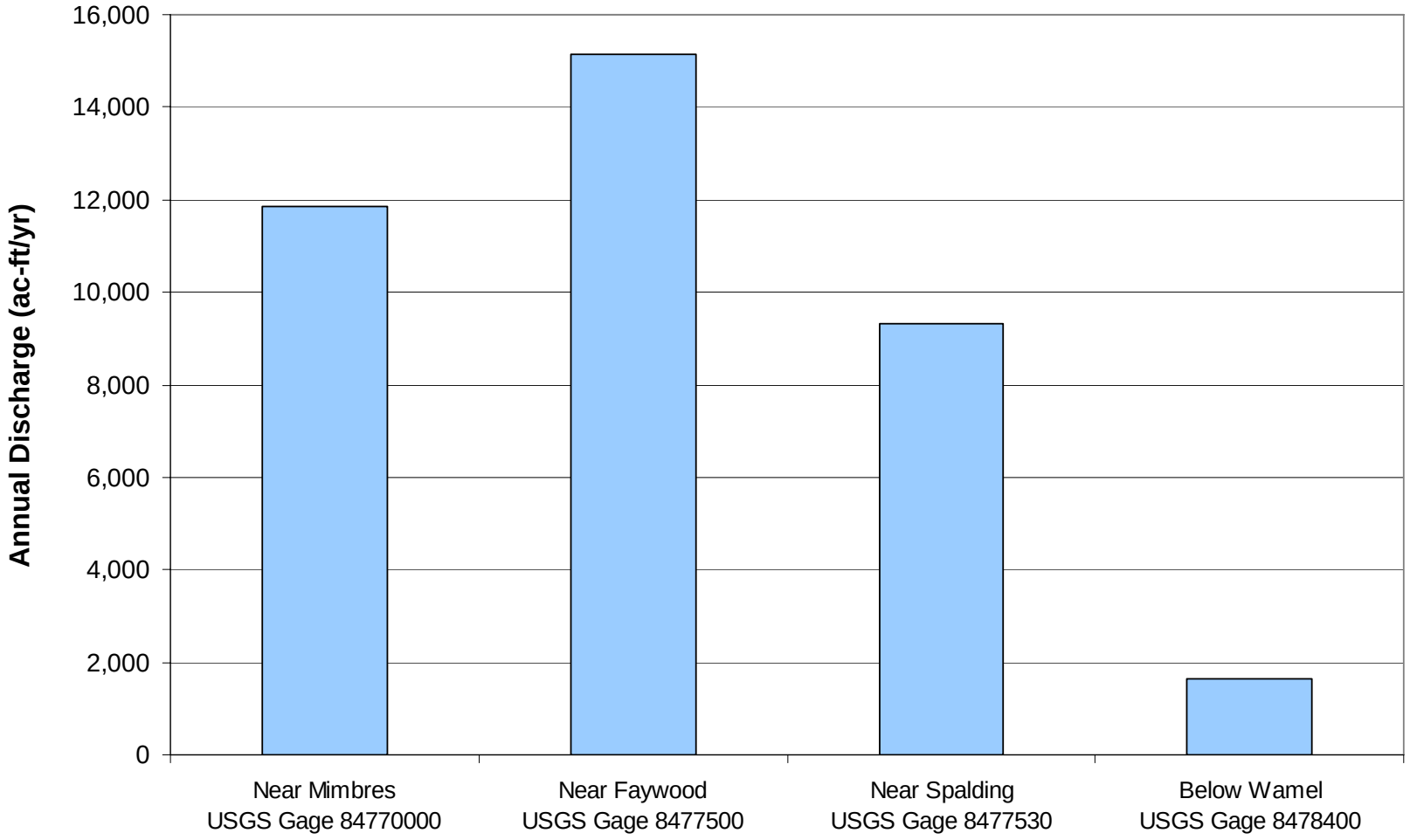
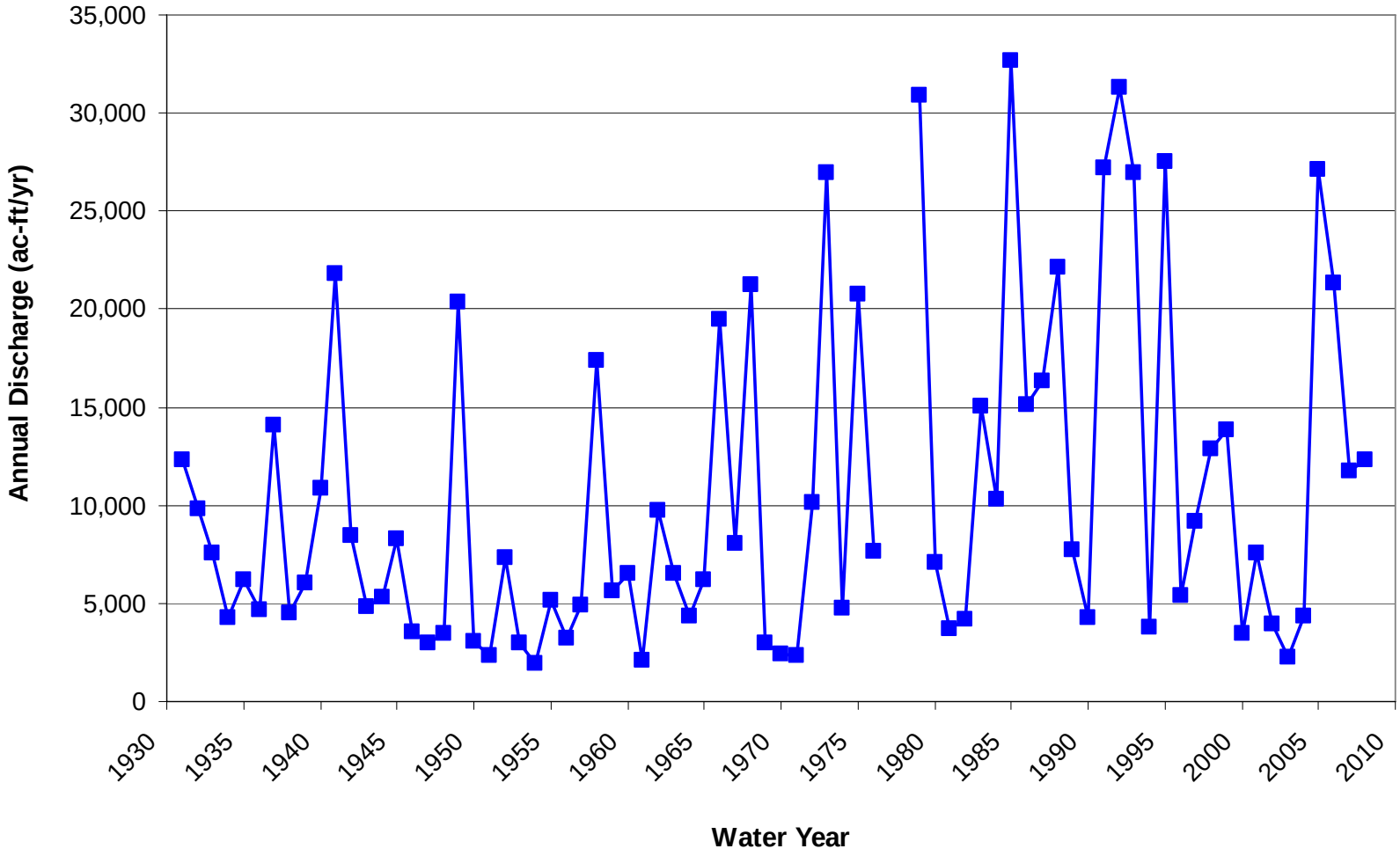


Figure 8

DEMING 40-YEAR WATER PLAN

Mimbres River Average Discharge at USGS Stream Gages (1964-1968)



Note: The Mimbres River Near Mimbres gage was discontinued in 1976 and replaced with the Mimbres River at Mimbres gage in 1978 (see Figure 1 for gage locations).

Figure 9

DEMING 40-YEAR WATER PLAN

Annual Discharge at Mimbres River Near Mimbres (1931-1976) and Mimbres River at Mimbres (1979-2008) Stream Gages

Daniel B. Stephens & Associates, Inc.

7/6/09

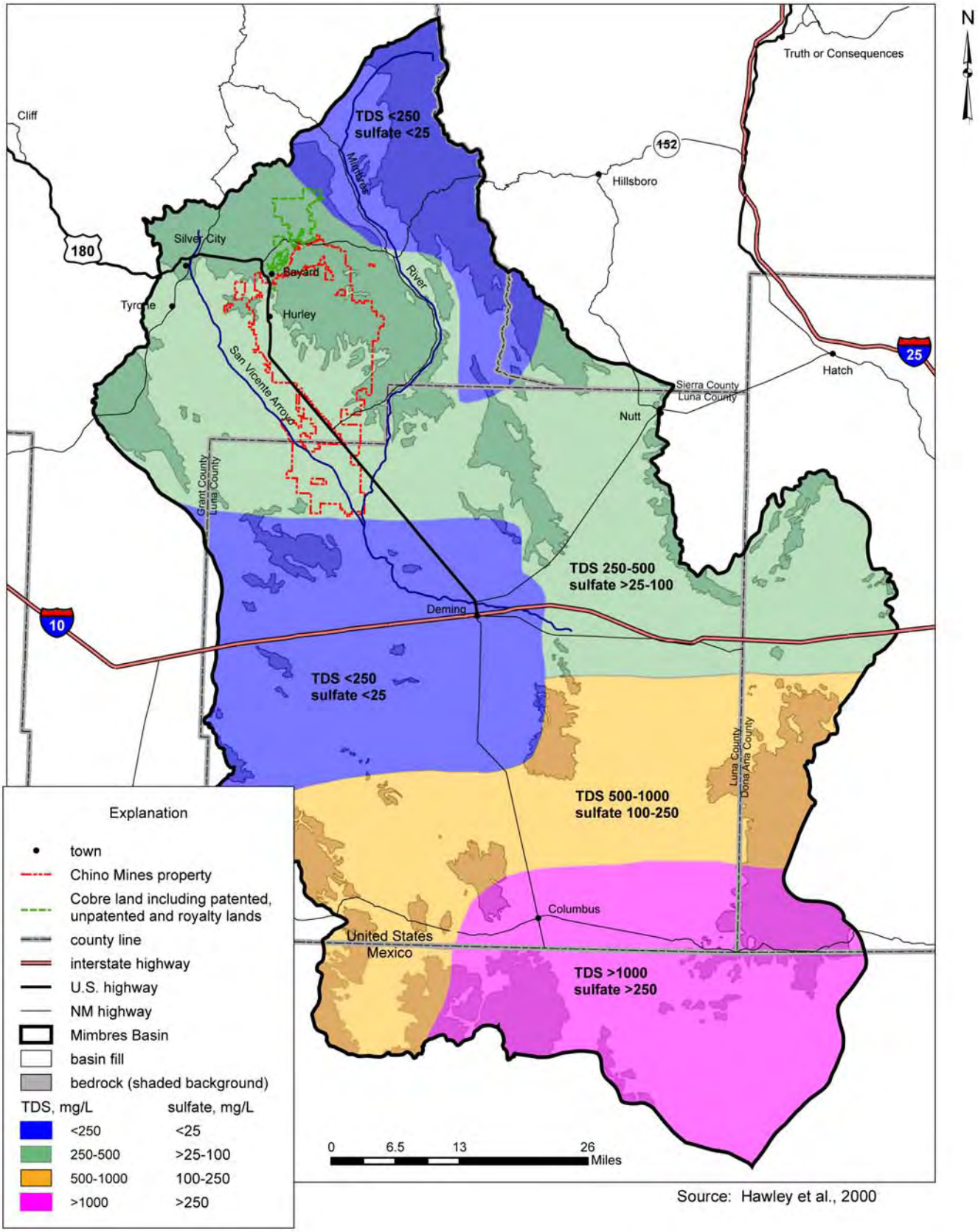
2.3 Water Quality

Current and potential uses of Deming's groundwater resources require that the groundwater be protected from contamination. Sources of contamination are of two types: (1) point sources, originating from a single location, or (2) nonpoint sources, originating over a more widespread or unspecified location. Additionally, there can be water quality issues due to naturally occurring constituents in the groundwater. Naturally occurring and anthropogenic contamination in Deming's city supply wells is discussed in Section 2.3.1; point and nonpoint contamination sources in the Deming vicinity are discussed in Sections 2.3.2 and 2.3.3, respectively.

2.3.1 Deming Drinking Water Quality

Deming production wells withdraw water from the Quaternary alluvium and Tertiary Gila Group in the Mimbres Groundwater Basin (Section 2.1). Hawley et al. (2000) show that the water quality of the alluvium in the vicinity of Deming is excellent, with total dissolved solids (TDS) values less than 250 milligrams per liter (mg/L) (aesthetic standard is 1,000 mg/L) and sulfate less than 25 mg/L (aesthetic standard is 600 mg/L) (Figure 10 [JSAI, 2006, Figure 11]). However, sources indicate that in the mid-1990s there were groundwater quality concerns due to septic tanks and salinity in the area north of Deming (Hanson et al., 1994). This problem was partially addressed by connecting this area to the County sewer system, but salinity is still present. In addition, as discussed in Section 2 3.2.3, operations at Highway 549 Solvents, 4 miles east of town, were suspected of contaminating groundwater with chlorinated solvents (NMWQCC, 2002). This site was investigated under the Superfund program, but due to the rural setting with a low population density, the site did not meet the criteria for remedial action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). NMED continues to monitor (as recently as September 2007) the area to determine if site conditions change such that additional action under CERCLA is warranted.

Water quality sample results are available from the New Mexico Environment Department (NMED) Drinking Water Bureau (DWB) for New Mexico water systems, and data available for the Deming Municipal System were reviewed. Table 5 summarizes the range of detections for water quality parameters in the NMED-DWB dataset, and Table 6 shows the parameters for



Source: JSAI, 2006, Figure 11

DEMING 40-YEAR WATER PLAN

Background TDS and Sulfate Concentrations in Mimbres Basin Groundwater

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5/19/09

Figure 10

P:_WR09-067\40-YrWtrPln.5-09\Figures\F10_JSAI Fig 11 TDS

Table 5. Deming Municipal Water System Water Quality Data Statistics
Page 1 of 2

Parameter	Unit	MCL [a]	Minimum	Maximum	Average
Alkalinity, bicarbonate	mg/L	---	167.1	212.9	182.5
Alkalinity, carbonate	mg/L	---	1.0	1.0	1.0
Alkalinity, total	mg/L	---	136.9	174.4	149.5
Antimony, total	µg/L	6	0.05	0.5	0.2
Arsenic	µg/L	10	0.8	16.5	4.6
Barium	µg/L	2,000	12.7	99.0	38.7
Bromochloroacetic acid	µg/L	---	1.1	1.1	1.1
Bromodichloromethane	µg/L	100	0.2	0.9	0.5
Bromoform	µg/L	100	0.3	6.2	1.2
Calcium	mg/L	---	11.8	48.8	25.6
Chloride	mg/L	250 [b]	7.0	42.4	12.5
Chloroform	µg/L	100	0.2	0.2	0.2
Chromium	µg/L	100	1.3	20.3	5.6
Coliform (TCR)	coliform/100 mL	0	1.0	1.0	1.0
Color	color units	15	1.0	5.0	4.9
Combined radium (Ra-226 / Ra-228)	pCi/L	5	0.03	0.3	0.2
Combined uranium	µg/L	30	2.8	6.0	3.3
Conductivity, 25 ºC	µmhos/cm	---	326	526	377.9
Copper, free	µg/L	20	0.001	134.9	7.8
Dibromoacetic acid	µg/L	---	0.1	0.6	0.4
Dibromochloromethane	µg/L	100	0.1	1.4	0.6
Dichloroacetic acid	µg/L	---	0.3	2.8	1.1
Fluoride	mg/L	4	0.4	2.2	0.7
Gross alpha particle activity	pCi/L	---	3.3	9.0	5.0
Gross alpha, excluding radon and uranium	pCi/L	15	1.3	8.4	4.3
Gross beta particle activity	pCi/L	4	0.5	6.1	3.2
Hardness	mg/L	---	33	154	80.1
Lead	µg/L	15	0.0001	13.6	0.4
Magnesium	mg/L	---	0.9	8.6	4.0
MBAS (foaming agents	mg/L	0.5	0.02	0.03	0.02

Source: Beezhold, 2007; NMED, 2009

[a] Maximum contaminant level specified in National Primary Drinking Water Regulations (40 CFR 141 (2008))

[b] National Secondary Drinking Water Regulations (40 CFR 143 (2008))

mg/L = Milligrams per liter
µg/L = Micrograms per liter
TCR = Total coliform rule
mL = Milliliters
pCi/L = picoCuries per liter
NTU = Nephelometric turbidity units

Table 5. Deming Municipal Water System Water Quality Data Statistics
Page 2 of 2

Parameter	Unit	MCL [a]	Minimum	Maximum	Average
[surfactants])					
Mercury	µg/L	2	0.3	0.3	0.3
Monobromoacetic acid	µg/L	---	0.2	0.8	0.4
Nickel	µg/L	100	0.0003	1.8	0.2
Nitrate-nitrite	mg/L	10	0.4	8.2	1.2
Odor	threshold odor number	3	1.0	2.0	1.1
pH	pH units	Between 6.5 and 8.5 [b]	7.6	8.2	7.9
Potassium	mg/L	---	1	3	2.2
Radium-226	pCi/L	5	0.01	0.3	0.05
Radium-228	pCi/L	5	0.04	0.3	0.2
Radon	pCi/L	---	322	739	501
Residue, total filterable	mg/L	500 [b]	148	293	216.5
Selenium	µg/L	50	0.9	16.2	1.8
Sodium	mg/L	---	33.8	63.1	47.6
Sulfate	mg/L	250 [b]	5.6	55.0	21.6
Thallium, total	µg/L	2	0.02	0.6	0.1
Total haloacetic acids (HAA5)	µg/L	60	0.4	2.8	1.3
Trichloroacetic acid	µg/L	---	0.3	0.3	0.3
1,2,4-Trimethylbenzene	µg/L	---	0.7	0.7	0.7
Total trihalomethanes (TTHM)	µg/L	80	0.4	6.9	1.9
Turbidity	NTU	1	0.03	7.8	0.7

Source: Beezhold, 2007; NMED, 2009

[a] Maximum contaminant level specified in National Primary Drinking Water Regulations (40 CFR 141 (2008))

[b] National Secondary Drinking Water Regulations (40 CFR 143 (2008))

mg/L = Milligrams per liter
µg/L = Micrograms per liter
TCR = Total coliform rule
mL = Milliliters
pCi/L = picoCuries per liter
NTU = Nephelometric turbidity units

Table 6. Deming Municipal Water System Water Quality Standard Exceedances

Parameter	Applicable Water Quality Standard	Standard Exceedances	Sample Collection Date	Location of Sample
Arsenic	0.010 mg/L (10 µg/L) [a]	16.47 µg/L 15.32 µg/L 14.67 µg/L	05/11/2006 06/02/2006 11/14/2006	Well 16 [b]
Fluoride	4.0 mg/L [a] 2.0 mg/L [c]	2.15 mg/L	05/11/2006	Well 16 [b]
Lead	0.015 mg/L (15 µg/L) [a]	24.2 µg/L 17.2 µg/L	06/19/1996 05/16/2000	Individual residences [d]
Turbidity	1 NTU	7.83 NTU 3.60 NTU 1.99 NTU 1.61 NTU	09/03/1996 05/20/1997 05/20/1997 09/03/1996	Well 9 Well 9 Well 13 Well 3

Source: Beezhold, 2007

[a] Maximum contaminant level specified in National Primary Drinking Water Regulations (40 CFR 141 (2008))

[b] This well was never connected to the City system and has never been used for municipal supply.

[c] National Secondary Drinking Water Regulations (40 CFR 143)

[d] The lead and copper rule (40 CFR 141.86) requires that samples be collected at older homes served by the water systems. These exceedances were at homes with lead pipes.

µg/L = Micrograms per liter
mg/L = Milligrams per liter
NTU = Nephelometric turbidity units (low NTU values indicate high water clarity, while high NTU values indicate low water clarity)

which applicable water quality standards have been exceeded in Deming Municipal System water samples.

Review of Deming water quality data indicates that water quality is good and water quality standard exceedances are rare. Salinity of groundwater near Deming is expected to increase as the depth to groundwater increases, so Deming could face water quality issues in the future if groundwater levels decline. In particular, arsenic, an inorganic constituent that occurs naturally in groundwater, may be of concern to Deming in the future because of a reduction in the U.S. Environmental Protection Agency (EPA) arsenic maximum contaminant level (MCL), to 10 micrograms per liter (µg/L) (0.010 mg/L), that became effective in January 2006. The most recent available data indicate that well 16 is the only well where the arsenic concentration has exceeded this drinking water quality standard (the standard for fluoride has also been exceeded in this well). This well, which was an old irrigation well purchased as part of a water right transaction, was never connected to the City system and has been abandoned.

The City of Deming has a source water protection plan that was recently updated (NMED, 2003) and should continue to use it to ensure the future safety of its water supply.

2.3.2 Point Sources of Groundwater Contamination

Within New Mexico, the New Mexico Water Quality Control Commission (NMWQCC) reports the following statewide frequency of groundwater impacts from various point sources:

- Underground (fuel) storage tanks (USTs) 58.5 percent
- Oil and gas 13.7 percent
- Miscellaneous industry 10.1 percent
- Centralized sewage works 4.5 percent
- Mining 3.7 percent
- Aboveground (fuel) storage tanks/pipelines 3.4 percent
- Dairies and meat packing 2.8 percent
- Landfills 0.8 percent
- Unknown/other 2.5 percent

The NMWQCC (2002) reports 15 cases of point source contamination of groundwater and 19 contaminated supply wells in Luna County. A review of NMED records of existing facilities that may have the potential to impact groundwater quality indicated that the majority of point source groundwater contamination concerns in Deming are from leaking USTs, metals from mineral leaching operations, and TDS, metals, and sulfates from mining operations (NMWQCC, 2002).

2.3.2.1 Underground Storage Tanks

Leaking USTs are one of the most significant point source contamination threats. As of September 2007, NMED had reported 40 leaking UST cases in Deming (Table 7), 11 of which were active (Mills, 2007) (active cases include those in the investigation, cleanup, and monitoring phases). These leaking USTs may represent releases of oil, gasoline, diesel, and aviation fuel containing petroleum constituents that are common groundwater contaminants, such as benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tertiary-butyl ether (MTBE).

Figure 11 shows the locations of all 40 UST cases, both active and inactive. Of those sites, 8 have contaminated groundwater and are in the vicinity of City wells 1, 2, 5, 6, 7, and 9. The most extensive contamination from USTs has occurred beneath the Triangle Truck Stop and the Save Gas No 3, both of which are located on Pine Street (Utz, 2007). Well 1 is within a half-mile of these sites.

Many additional facilities with registered USTs that are not leaking are included in the NMED UST database. These USTs present a potential for groundwater quality impacts that could affect available water resources in and near the population centers in the region. A list of these sites is available on the NMED web site (www.nmenv.state.nm.us/ust/leakcity.html).

2.3.2.2 Groundwater Discharge Plans

The NMED Ground Water Quality Bureau regulates facilities with wastewater discharges that have a potential to impact groundwater quality. These facilities must comply with NMWQCC regulations and obtain an approved discharge plan that stipulates measures to be taken to prevent, detect, and if necessary, remediate groundwater contamination.

Table 7. Leaking Underground Storage Tank Sites in Deming
Page 1 of 3

Name	Facility ID	Physical Address	Status [a]	Comments
Bowlins Akela Flats Store	984	20 Miles east of Deming, 21535 Frontage Rd.	ACC-RP	BTEX concentrations below standards for 2 years before monitor wells became dry. Wells being plugged and abandoned. Elevated levels of dissolved manganese not associated with petroleum degradation (Holmes, 2007)
Downtown Shell	1204	201 W Pine	ACC-RP	Groundwater contamination was in a perched zone and has naturally degraded; however, high levels of dissolved manganese will require monitoring (Mills, 2007)
Poplar Fina	30031	755 S Platinum	ACC-RP	MTBE, BTEX contamination below standards through natural attenuation; need to test for dissolved manganese (Utz, 2007)
SW Cotton Irrigator	30859	Corner of Cardenas and A St	ACC-RP	Plume cleaned up; site soon to be NFA (Utz, 2007)
Self Serve	31494	422 W Pine	C-RP	Groundwater contamination plume is attenuating; nonaqueous-phase liquid (NAPL) plume also present, still investigating (Mills, 2007)
Luna County Sheriff	29201	700 S Silver	C-RP	One well shows contamination of EDB, BTEX, both detected below standards (Utz, 2007)
On Sale Tire Co	27082	101 W Pine St	C-RP	Groundwater contamination; remediation system under development (Mills, 2007)
Save Gas - No3	27658	1312 W Pine	C-RP	Groundwater contamination plume has merged with Triangle Truck Stop plume; active remediation system under development (Mills, 2007)
Savoy Truck Stop	9762	I 10 and Exit 68, 14150 Hwy 418	C-RP	Groundwater contamination plume of diesel product, ethylene dichloride (EDC), and leaded gas is attenuating. Leaking tanks removed. (Holmes, 2007)
AT&SF Deming	30557	Unknown	NFA	

Source: NMED, 2007, updated with conversations with PSTB Bureau staff

[a] ACC-RP = Aggressive Cleanup Completed, Responsible Party
C-RP = Cleanup, Responsible Party
NFA = No Further Action Required
I-RP = Investigation, Responsible Party

BTEX = Benzene, toluene, ethylbenzene and toluenes
MTBE = Methyl tertiary-butyl ether
EDB = Ethylene dibromide

Table 7. Leaking Underground Storage Tank Sites in Deming
Page 2 of 3

Name	Facility ID	Physical Address	Status [a]	Comments
AT&T Deming	1197	Lat 32 09 22 Long 107 35 51	NFA	
AT&T-Gage	1274	Gage, NM	NFA	
Blacks Exxon	26967	Columbus at Florida	NFA	
Country Club Food Mart	51556	2319 E Motel Dr	NFA	
Deming Service Center	27655	201 N Airport Rd	NFA	
Deming Flying Service	27657	Deming Municipal Airport, Po Box 1293	NFA	
Deming Radiator Svc	27662	1721 E Spruce	NFA	
Deming Westside Conoco	27665	100 W Pine	NFA	
Diamond Shamrock #1286	27610	1246 Columbus Rd	NFA	
Elite Barber	30727	100 E Cedar	NFA	
Farmers Insurance Group	27968	122 E Spruce	NFA	
Farmers Mini-Mart	27969	501 N Gold St	NFA	
Firestone Bulk Plant	28040	1617 E Spruce	NFA	
Luna Cotton Cp	29199	State Rd 11south of Deming	NFA	
Luna County Road Dept	29200	2500 J St, Industrial Park	NFA	
Macias Auto Electric	29222	200 W Cedar	NFA	
Mcclains Truck Stop	29350	2200 E Pine	NFA	
NM State Highway Dept	29651	U.S. 70 and 80 1912 Hwy 80	NFA	
Old Mccauley Farm	29755	10 Miles south of Hermanos Hwy Rte 1 Po Box 104	NFA	

Source: NMED, 2007, updated with conversations with PSTB Bureau staff

[a] ACC-RP = Aggressive Cleanup Completed, Responsible Party
C-RP = Cleanup, Responsible Party
NFA = No Further Action Required
I-RP = Investigation, Responsible Party

BTEX = Benzene, toluene, ethylbenzene and toluenes
MTBE = Methyl tertiary-butyl ether
EDB = Ethylene dibromide

Table 7. Leaking Underground Storage Tank Sites in Deming
Page 3 of 3

Name	Facility ID	Physical Address	Status [a]	Comments
Rocky Mountain Transporters	54399	3105 Silver City Hwy 180 NW	NFA	
School Maintenance Yard	30512	501 W Florida	NFA	
Snappy Mart #1117	1799	1318 S Columbus Rd	NFA	
Sw Bottling Co	30703	330 N Gold	NFA	
Sunwest Food Mart	30835	4397 Motel Blvd	NFA	
USA Truckstop 801	31405	1310 W Spruce St	NFA	
Sav-O-Mat	30493	321 W Pine St	I-RP	Groundwater contamination plume about one-half acre in size (Utz, 2007)
Snappy-Mart #258	1805	306 E Pine	I-RP	Groundwater contamination plume; well 1 shows BTEX of 2,000 ppb.(Utz, 2007)
Stuckey's Deming	1843	15 Miles west of Deming on I-10	I-RP	Groundwater contamination plume (Holmes, 2007)
Triangle Truck Stop	31200	1300 W Pine	I-RP	Groundwater contamination with BTEX (Utz, 2007)

Source: NMED, 2007, updated with conversations with PSTB staff

[a] ACC-RP = Aggressive Cleanup Completed, Responsible Party
C-RP = Cleanup, Responsible Party
NFA = No Further Action Required
I-RP = Investigation, Responsible Party

BTEX = Benzene, toluene, ethylbenzene and toluenes
MTBE = Methyl tertiary-butyl ether
EDB = Ethylene dibromide

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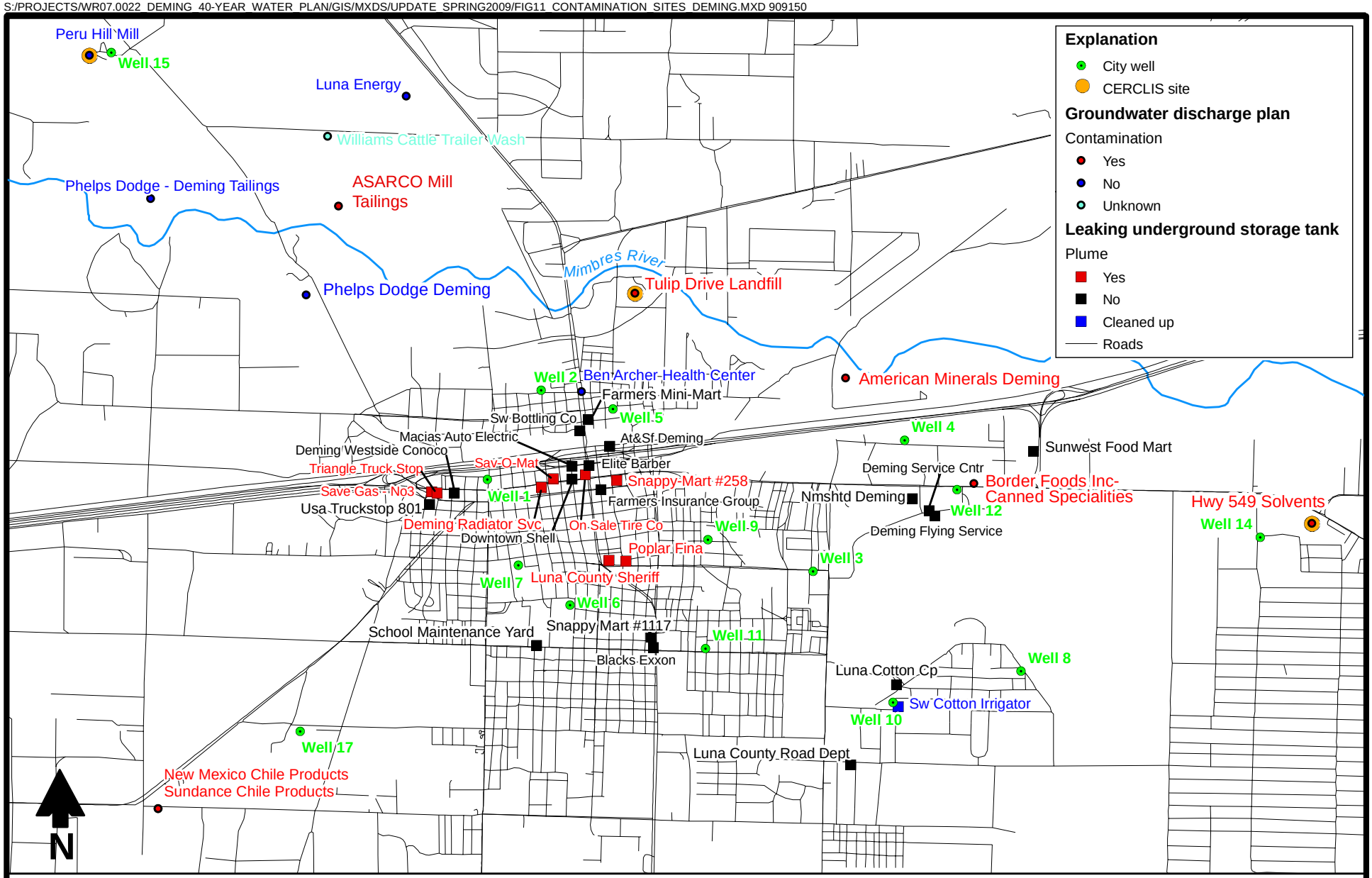


Figure 11

Daniel B. Stephens & Associates, Inc.
05/19/2009
JN WR09.0067

DEMING 40-YEAR WATER PLAN
Contamination Sites

Facilities that are required to obtain discharge plans include mines, sewage discharge facilities, dairies, food processors, sludge and septage disposal operations, and other industries.

A summary list of the discharge plans in Deming is provided in Table 8 (NMED, 2005); their locations are shown in Figures 11 and 12. Details indicating the status of discharge plans, waste type, and treatment for individual permittees can be obtained from the NMED web site (http://www.nmenv.state.nm.us/gwb/New_Pages/docs_policy/web_dp_list.xls).

Several mining sites with NMED groundwater discharge plans are located within a few miles of the City of Deming (Table 8). The most recently operating of these facilities was Deming Jigging Manganese Mill (DP-1234) (also known as the American Minerals Deming), located north of I-10 on the east side of town. The mill operated from 1993 to 2003 and was closed and reclaimed in 2005. A monitor well drilled in a groundwater mound beneath the pits showed elevated levels of cadmium (0.02 mg/L), iron (1.74 mg/L), lead (0.28 mg/L) and manganese (0.37 mg/L) before the monitor well became dry (Vollbrecht, 2007). Analysis of samples collected in 2008 show that levels have dropped for the constituents cadmium (0.0050 mg/L), iron (0.10 mg/L), lead (0.0050 mg/L), and manganese (0.010 mg/L) (Pinnacle, 2008).

An abandoned copper mill northwest of town on Peru Mill Road, Phelps Dodge Deming (DP-615) (also known as Cyprus Deming Concentrator), has a discharge plan for closure of the acid-generating tailings. The facility discharged to lined impoundments, and no groundwater contamination has been detected. Closure of the mine includes capping the site and monitoring by both NMED and Mining and Minerals Division (MMD) to ensure cap stability (Vollbrecht, 2007).

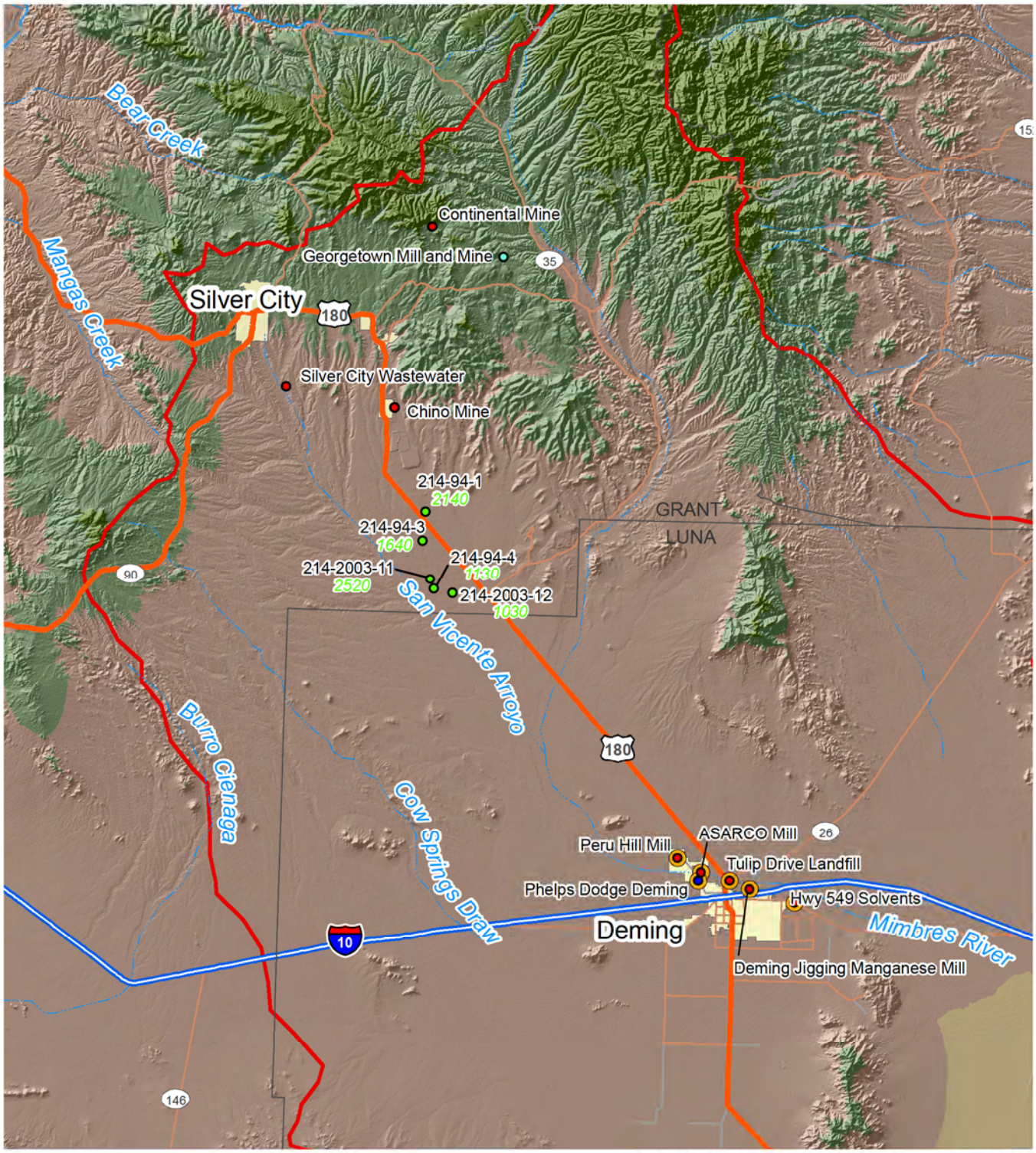
The ASARCO mill, located north of the Phelps Dodge Deming DP-615 site, is also being remediated through oversight from the NMED Ground Water Bureau, the Voluntary Remediation Program, and MMD. The ASARCO mill was a custom mill that processed a variety of ores, leaving tailings high in lead, zinc, arsenic, and manganese. The surface exposure from the tailings is being addressed through scraping of the “fugitive” tailings that breached the berms surrounding the piles and placing them back on the piles, then covering the piles with a 30-inch cover. Elevated levels of sulfate (289 mg/L) have been detected in a monitor well near the tailings (Vollbrecht, 2007).

Table 8. Groundwater Discharge Permits in Deming

Facility Name	Permit Number	Waste Type	Permit Activity Status
Pueblo De Luna Trailer Park	81	Domestic	Permit issued
Ben Archer Health Center (Deming)	1520	Domestic	Issued
Deming (City of) - Wastewater Treatment Plant	209	Domestic	Issued, groundwater contaminated with elevated levels of nitrate, TDS and Cl
New Mexico Chile Products	877	Agricultural	Issued
Low-Hi Ranch RV Park	1478	Domestic	Issued
M and I Portable Toilet Rental	783	Industrial	Inactive
American Minerals Deming	1234	Mining	Issued closure permit, continue groundwater monitoring
Savoy Truck Stop	1204	Domestic	in progress
New Mexico (State of) Highway and Transportation Dept - Yucca	1149	Domestic	Issued
New Mexico (State of) Highway and Transportation Dept - Gage Rest Area	1150	Domestic	Issued
Border Foods Inc - Canned Specialties	1058	Agriculture	Requirement letter sent, nitrate, TDS and Cl contamination migrating onto property
Butterfield Dairy Farm	1331	Agriculture	Issued
Luna Energy Facility - Duke	1305	Industrial	Issued
Ledesman's Septic Tank Service	985	Domestic	Issued
Sundance Chile Prod	842	Agriculture	Issued
Bowlin's Butterfield Station	610	Domestic	Issued
Phelps Dodge - Deming Tailings	615	Mining	Issued closure permit, continue groundwater monitoring
Amigo's Mexican Foods Inc	1119	Agricultural	In progress

Source: NMED, 2007

TDS = Total dissolved solids
Cl = Chloride



Explanation

- Mimbres groundwater basin
- City
- 1030 Total dissolved solids
- Monitor well
- CERCLIS site

Groundwater discharge plan

Contamination

- Yes
- No
- Unknown

N

0 5 10 Miles

Source: Report of elevated TDS counts submitted to Chino Mines Company by Golder Associates Inc., Tucson, Arizona

DEMING 40-YEAR WATER PLAN

Groundwater TDS Concentrations Associated with Mining Sites

Daniel B. Stephens & Associates, Inc.

04/17/2009 JN WR07.0022

Figure 12

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A number of mining sites in Grant County that have groundwater discharge plans have impacted water quality in the shallow aquifer along Whitewater Creek, a tributary to San Vicente Arroyo, which discharges to the Mimbres River. Whitewater Creek historically received mine dewatering discharges and, in times of high rainfall, large volumes of acidic (pH <1) water. Most of these flows would seep into the shallow aquifer near the confluence with San Vicente Arroyo (Myers, 2007). The extent of the groundwater contamination as defined in 2006 is indicated by the concentrations of TDS in monitor wells near the Grant/Luna County border (Figure 12). NMED is drilling 50 to 60 wells in the fall of 2007 to better define the extent of contamination (Myers, 2007).

While it appears that none of the City of Deming wells are currently threatened by the high TDS and sulfate water detected 30 miles northwest of town (Figure 12), the City may want to avoid purchasing water rights in the vicinity of this area (Appendix B) as part of its water rights acquisition plans. Chino Mines is proposing to commingle high-TDS and high-sulfate water with fresh water sources and apply it to land in an area 35 miles upgradient of the Deming well field (JSAI, 2006). While the proposed closure plan requires that groundwater be protected to keep concentrations below standards, this proposal projects a significant decline in water quality. Although the modeled scenarios do not indicate impacts to groundwater used by Deming, several of the scenarios show impacts to groundwater reaching I-10 west of Deming by the year 2104.

Several food processing facilities west of Deming have shown elevated levels of nitrate in monitor wells. This contamination could be associated with the intermittent land application of the wastewater effluent, but additional testing would be necessary to make such a determination. An upgradient well at Sundance Chile Products (DP-842) exhibits nitrate (NO_3-N) concentrations consistently above the standard of 10 mg/L, up to 14.5 mg/L in February 2006 (Knutson, 2007). New Mexico Chile Products (DP-877) monitor wells have also shown high levels of nitrate, up to 11.1 mg/L in 1999. Both of these facilities are near a new City of Deming supply well (well 17) that exhibited 3.6 mg/L of nitrate (as N) of in a sample collected in May 2006 by the NMED DWB.

Deming well 14 had nitrate concentrations that spiked up to 8 mg/L in 2003 and 2004. The only potential sources of this contamination are the three residential septic tanks within 500 feet of

the well that were noted by the NMED DWB in August 2006. Based on this finding, the NMED required that the City of Deming limit access to the well to prevent unauthorized access. The nitrate concentration in this well dropped to 2.4 mg/L in January 2005 and 1.25 mg/L in October 2006. Recent samples show the nitrate concentration fairly steady at about 1.5 mg/L, except for a 5.91-mg/L result in July 2008.

2.3.2.3 Superfund Sites

CERCLA was enacted by the U.S. Congress on December 11, 1980. This law created the Superfund program to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Information regarding the locations and status of EPA Superfund hazardous waste sites in Deming is provided in Figures 11 and 12 and Table 9. The EPA prepares a National Priorities List (NPL) that identifies, through a hazard ranking system, which Superfund sites warrant remedial action. Currently, no sites within Deming are included on the NPL (U.S. EPA, 2007c).

Table 9. Superfund Sites in Deming

EPA ID	Site Name	City	NPL Status
NM0000605167	Highway 549 Solvents	Deming	Not listed
NMD097119986	Peru Hill Mill	Deming	Not listed
NM0000605379	Tulip Drive Landfill [a]	Deming	Not listed

Source: U.S. EPA, 2007d
[a] Also known as the Old City Landfill (pre-1969)
EPA = U.S. Environmental Protection Agency
NPL = National Priorities List

Contamination at the Highway 549 Solvents site, located east of Deming near the junction of U.S. Highway 549 and State Road 377, was initially discovered in 1997 by a New Mexico Department of Health (DOH) water quality assessment of wells in southern New Mexico. Low levels of 1,1-dichloroethene (1,1-DCE) and 1,1,1-trichloroethane (1,1,1-TCA) were detected in samples collected from private domestic wells located approximately 2 miles east of the City. NMED confirmed the results of the DOH investigation in 1998 and continued the investigation, sampling 41 drinking water wells. This investigation detected 1,1,1-TCA and 1,1-DCE in 11 of the sampled wells, 2 of which were found to be contaminated at concentrations exceeding the NMWQCC standards and federal MCL. Deming's water supply line was extended to serve those properties, and the domestic wells were abandoned (Jenkins 2009). NMED's

investigation under Superfund found that the site did not warrant listing on the NPL, due to the rural setting with a low population density. NMED continues to monitor domestic wells to determine if site conditions change such that additional action under CERCLA is warranted. The solvent plume is estimated to be about ¼ mile long and is expanding toward the south (Pasteris, 2007).

Although no mining has occurred in Deming, mined material was milled in several locations north and west of town. The Peru Hill Mill site, located about 2 miles north of Deming, processed ore from a barite mine, leaving tailings with high concentrations of lead, arsenic, and zinc. Impacts to groundwater have not been detected, and the only concern with the site is the potential release of tailings to the Mimbres River or potential direct exposure to the tailings. The City of Deming became responsible for the cleanup of the site, which involved removal of wind-blown tailings that had migrated to ½ mile east of the mill site, capping the tailings with soil, and revegetating (Mariano, 2007). Buildings were also removed from the site, and the closure plan restricts future construction on the site. No water quality impacts as a result of this site have occurred (Jenkins, 2008).

2.3.2.4 Landfills

Landfills used for the disposal of municipal and industrial solid waste can contain a variety of potential contaminants that present concerns for water quality, because leachate, landfill gas, and stormwater runoff may transport those contaminants to groundwater. Landfills operated since 1989 have been regulated under the New Mexico Solid Waste Management Regulations. Many small landfills throughout New Mexico closed before the 1989 deadline to avoid more stringent final closure requirements. Deming is in the process of closing the City of Deming Landfill, which has interim status, and the new Butterfield Trail Regional Landfill (BTRL) is expected to open for solid waste disposal in 2009. In accordance with solid waste regulatory requirements, groundwater monitoring will be conducted at the City of Deming Landfill for 30 years after closure, ensuring that groundwater quality will be protected. The BTRL will open at a site approximately 15 miles west of Deming. The new landfill will use a liner to protect groundwater quality, and groundwater monitoring will also be conducted.

2.3.2.5 Hazardous Waste

The Resource Conservation and Recovery Act (RCRA) of 1976 gave the U.S. EPA the authority to control hazardous waste, including the generation, transportation, treatment, storage, and disposal of hazardous waste. Under RCRA, the NMED Hazardous Waste Bureau (HWB) provides regulatory oversight and technical guidance to hazardous waste generators and to treatment, storage, and disposal facilities in New Mexico. The objective of the HWB is to ensure protection of human health and the environment and to ensure that hazardous wastes are handled and disposed of and/or treated properly. No permitted hazardous waste facilities are located in the vicinity of Deming.

2.3.3 Nonpoint Sources of Groundwater Contamination

A primary water quality concern in New Mexico is shallow groundwater contamination due to septic systems (NMWQCC, 2002) which, because they are generally spread throughout rural and urban areas, are considered a nonpoint source. Most of the serious septic system impacts occur where groundwater is shallow. In these areas, septic system discharges can percolate rapidly to the underlying aquifer and increase concentrations of:

- Total dissolved solids (TDS)
- Iron, manganese, and sulfides (anoxic contamination)
- Nitrate
- Potentially toxic organic chemicals
- Bacteria, viruses, and parasites (microbiological contamination)

Collectively, septic systems and other on-site domestic wastewater disposal constitute the single largest known source of groundwater contamination in New Mexico (NMWQCC, 2002). Many of these occurrences are in the shallow water table areas.

Protection of shallow groundwater quality in the populous areas plays an important role in maintaining the available water resources in these areas. The NMED Liquid Waste (Septic Tank) Program regulates on-site disposal of liquid wastes, including septic tanks, under the Liquid Waste Disposal and Treatment Regulations, 20.7.3 NMAC (NMEIB, 2005). A list of permitted liquid waste systems in and around Deming can be found on the NMED Liquid Waste

(Septic Tank) Program web site (http://www.nmenv.state.nm.us/fod/LiquidWaste). More than 1,300 permitted septic tanks are present in and around Deming.

Other nonpoint sources of pollution include those associated with agriculture. The application of agricultural chemicals, such as pesticides and fertilizers, has led to the contamination of groundwater at various locations in New Mexico with trace concentrations of various pesticides and nitrate (NMWQCC, 2002, 2004-2006).

3. Water Demand

This section describes the City of Deming's existing water infrastructure and the City's historical, current, and future projected water use.

3.1 Water System Description

The City of Deming relies entirely on groundwater from the Mimbres Basin for its municipal water supply, and has been in the process of acquiring additional water rights (Jenkins, 2008). The Deming well field has 15 active wells (Jenkins, 2008) (Section 2). The City's water storage and distribution system includes two 500,000-gallon elevated storage tanks, one 3,000,000-gallon ground-level storage tank, and more than 150 miles of distribution pipeline of various materials, ranging in diameter from 2 to 12 inches (City of Deming, 2003). There is only one pressure zone in Deming, as there are minimal changes in elevation in the area. Accordingly, the City experiences no pressure problems in the system (Jenkins, 2008). System capacity averages 7500 gpm with a peak capacity of 10.8 million gallons per day (mgd). Winter use averages 2 mgd.

The *City of Deming Comprehensive Plan* describes the water system as lacking adequate production and storage capacity, especially for meeting peak and fire flow demands (City of Deming, 2003). At the time that the plan was prepared (2003), the City also needed to replace numerous older distribution lines. A preliminary engineering report completed in May 2002 recommended that two existing irrigation wells be converted to municipal use and that approximately 22,000 feet of new, 12-inch-diameter water transmission main be added to connect these two wells to a new 1,000,000-gallon storage tank (City of Deming, 2003). The well conversions and transmission lines were completed in 2008, and in 2009 the City completed construction of a 3,000,000-gallon storage tank that is now in use. These completed improvements are expected to ensure that sufficient water is available for peak and fire flow demands for the southern portion of the City (City of Deming, 2003).

The current City of Deming wastewater treatment plant was built in 1982 and is located 3 miles east-southeast of the City center (City of Deming, 2003). On average the wastewater treatment plant treats approximately 1 to 1.3 million gallons of wastewater per day (Jenkins, 2008).

During December, January, and February, treated wastewater is stored in lined lagoons at the treatment plant, which provide a storage capacity of 130 million gallons for this purpose. This stored (as well as newly generated) treated effluent is used for irrigation starting in March and extending into the fall (Jenkins, 2008). A portion of the treated effluent is contracted for use by Luna Energy; the remainder is being commingled with fresh water to irrigate the cemetery, golf course, and City-owned farm land (Jenkins, 2008).

3.2 Current and Historical Water Demand

The City of Deming incorporated in 1902 (City of Deming, 2003), and a water system was started in that same year to serve a subdivision developed by the Pacific Land and Improvement Company (City of Deming, 2003). By 1920, Deming had a population of just over 3,200 people (U.S. Census, 2000). The water system was expanded in 1935 to include a new well, a 500,000-gallon storage tank, and an expanded distribution system (City of Deming, 2003). Deming's population continued to grow, exceeding 5,600 people by 1950 (U.S. Census, 2000). Population in the City of Deming continued to grow at a rate of approximately 20 percent every ten years between 1960 and 2000 (U.S. Census, 2000). Table 10 shows total groundwater withdrawals by the City of Deming from 1975 through 2000 based on 5-year inventories of water use in New Mexico prepared by the OSE (Sorensen, 1977, 1982; Wilson, 1986, 1992; Wilson and Lucero, 1997; Wilson et al., 2003) and information for 2005 provided by the City of Deming. Figure 13 shows the annual diversions from 1988 through 2008. Increased diversions in 1996, 1998, 2003, 2005, and 2007 correlate with a decrease in precipitation; generally, more water is needed for outdoor watering during dry years, causing an increase in pumping.

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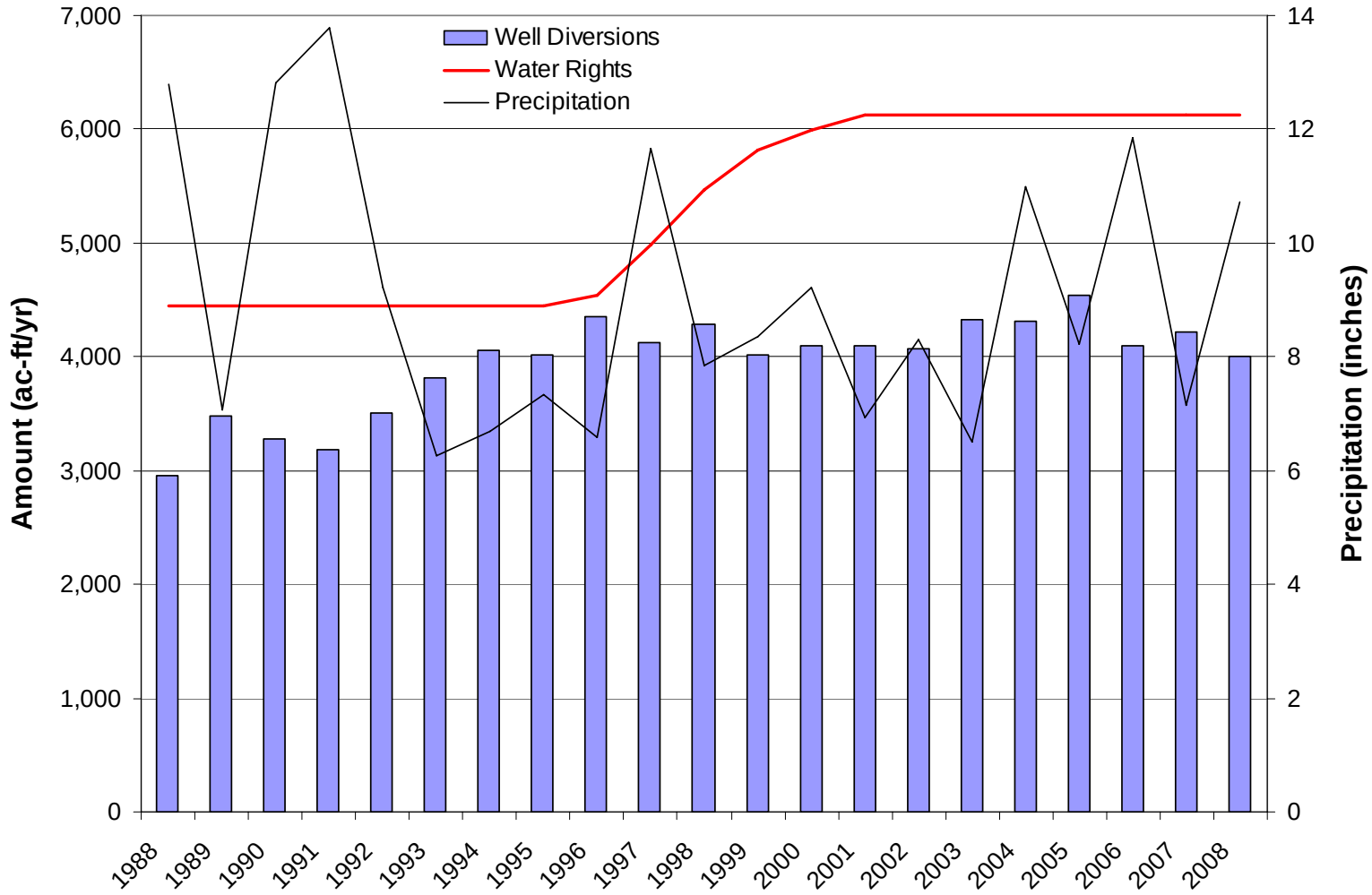

DEMING 40-YEAR WATER PLAN

City of Deming
Annual Diversions (1988-2008) and Water Rights

Figure 13

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Table 10. Historical Groundwater Withdrawals for the City of Deming, 1975-2005

Year	Groundwater Withdrawal (ac-ft/yr)
1975	2,954
1980	3,094
1985	3,196
1990	3,403
1995	4,012
2000	4,102
2005	4,543

ac-ft/yr = Acre-feet per year

The U.S. Census Bureau reported that 14,116 people lived in Deming in 2000, a 21 percent increase over the total population in 1990 (U.S. Census, 2000). The 2000 census listed 5,267 housing units in Deming, with an average household size of 2.63 people. In 2000, single family homes accounted for 55 percent of housing units in Deming, while multi-family housing (apartments, duplexes, and four-plexes) accounted for 15 percent and manufactured housing accounted for 27 percent of housing units in Deming (City of Deming, 2003).

The City of Deming water use data are reported for five sectors: residential, commercial, industrial, irrigation/bulk water sales, and golf course/cemetery. The commercial and industrial sectors were accounted for as one sector prior to 2000, but are now tracked independently. The majority of the water in the irrigation/bulk water sales sector is used by the City to irrigate parks, although this sector also includes water used by the fire department, in addition to water that is sold to contractors (Jenkins, 2008). Prior to 2003, the golf course and cemetery were irrigated using reclaimed water, but this practice was abandoned as a result of salt and odor problems (Jenkins, 2008). Chemical injection to neutralize the salt, initiated in late 2008, treats 400,000 gallons per day of reclaimed water, which is used to irrigate the golf course and cemetery.

Figure 14 shows annual billed water use for 1997 through 2008 for the residential, commercial, industrial, irrigation/bulk water sales, and golf course/cemetery sectors. Table 11 shows the totals for each sector, as well as annual production totals and non-revenue water for each year

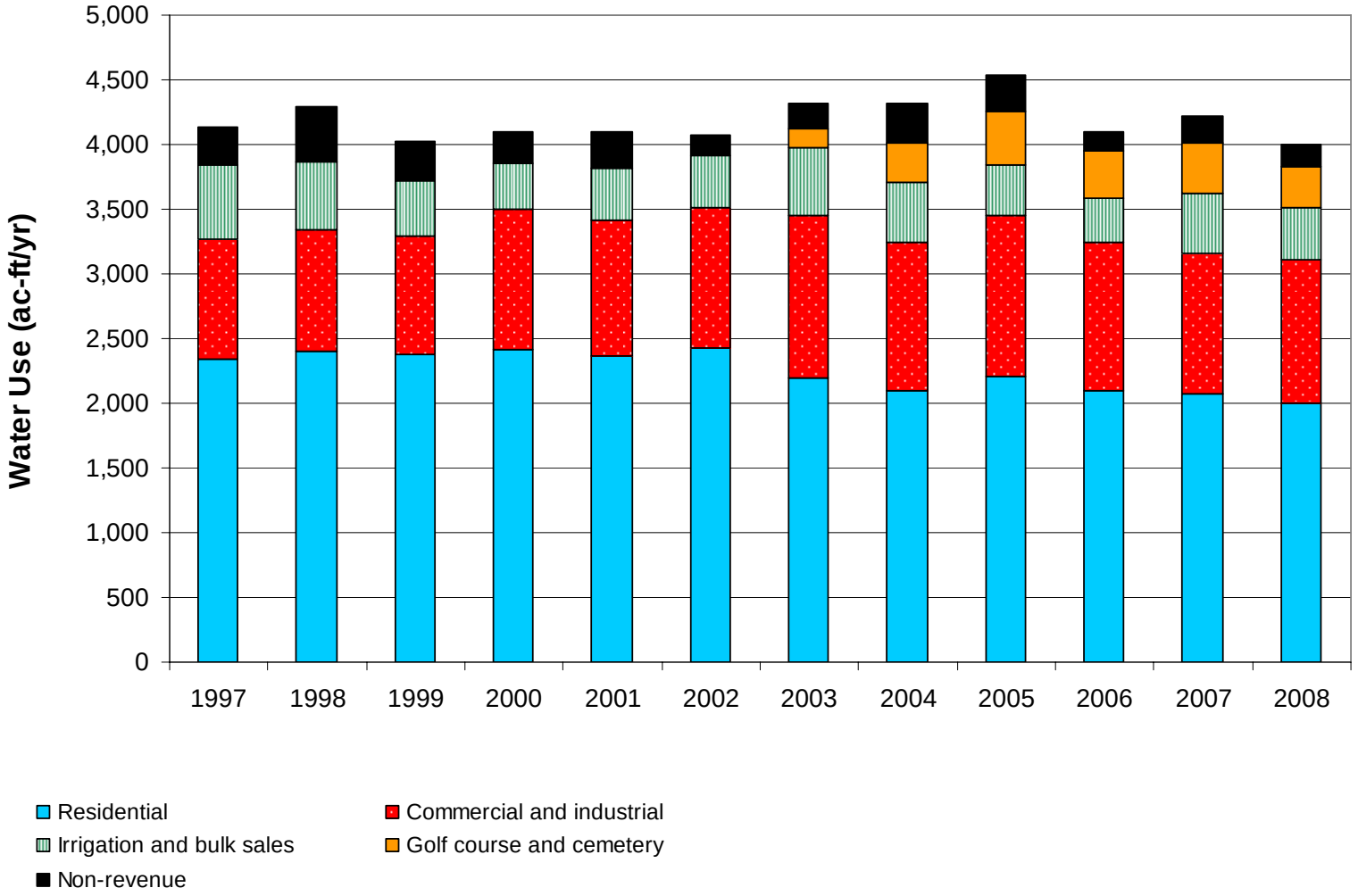

Figure 14

DEMING 40-YEAR WATER PLAN

City of Deming Water Use by Sector
1997 through 2008

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Table 11. City of Deming Annual Production
Billed and Non-Revenue Water, 1997 Through 2008

Year	Total Production (M gal)	Billed Water by Sector (million gallons)						Non-Revenue Water	
		Residential	Commercial	Industrial	Commercial & Industrial [a]	Irrigation & Bulk Water Sales	Golf Course & Cemetery [b]	Amount (M gal)	Percent of Total Production
1988	964.2	---	---	---	---	---	---	57.5	6.0
1989	1,134.3	---	---	---	---	---	---	30.7	2.7
1990	1,069.5	---	---	---	---	---	---	34.0	3.2
1991	1,038.1	---	---	---	---	---	---	65.0	6.3
1992	1,143.2	---	---	---	---	---	---	35.6	3.1
1993	1,245.0	---	---	---	---	---	---	98.0	7.9
1994	1,320.0	---	---	---	---	---	---	99.3	7.5
1995	1,307.5	---	---	---	---	---	---	105.6	8.1
1996	1,416.6	---	---	---	---	---	---	98.7	7.0
1997	1,346.0	762.6	---	---	303.0	186.0	---	94.4	7.0
1998	1,397.8	782.6	---	---	304.9	172.7	---	137.6	9.8
1999	1,310.5	773.6	---	---	300.9	135.9	---	100.1	7.6
2000	1,336.5	787.0	250.0	104.0	---	116.0	---	79.5	5.9
2001	1,336.1	771.0	234.0	107.0	---	132.0	---	92.1	6.9
2002	1,328.0	789.0	224.0	131.0	---	133.0	---	51.0	3.8
2003	1,408.0	717.0	206.0	201.0	---	170.0	48.0	66.0	4.7
2004	1,405.0	685.0	196.0	175.0	---	152.0	101.0	96.0	6.8
2005	1,480.0	719.0	216.0	188.0	---	129.0	136.0	92.0	6.2
2006	1,336.0	685.0	209.0	164.0	---	110.0	121.0	47.0	3.5
2007	1,376.0	677.0	222.0	132.0	---	150.0	126.0	69.0	5.0
2008	1,304.0	650.0	212.0	151.0	---	131.0	105.0	55.0	4.2

Source: Jenkins, 2007, 2009

[a] Prior to 2000, the commercial and industrial sectors were accounted for as one sector

[b] Prior to 2003, the golf course and cemetery were irrigated using reclaimed water

M gal = Million gallons

--- = Information not available

of the same period. Annual water use has decreased in the residential, commercial, and irrigation/bulk water sales sectors over the time periods shown, while annual water use in the industrial and golf course/cemetery sectors has increased. Total non-revenue water has fluctuated from year to year, but was at its lowest in 1989 (Table 11, Figure 15), when losses were 94 acre-feet or about 2.7 percent of the total metered production of 3,481 acre-feet. The highest rate of loss was almost 10 percent in 1998, when 422 acre-feet of water was unaccounted for. Non-revenue water was 4.2 percent of total production in 2008.

Figure 16 shows monthly billed totals for all sectors for 2000 through 2008. Monthly water use for the months of July and August 2008 was below previous years due to the above average rainfall (8.65 inches) for those two months. Water use in the summer months of 2007 (June through August) more than doubled over winter use, from a monthly average of about 65 million gallons in the winter months (December through February) to 144 million gallons in the summer months due to outdoor watering and evaporative cooler use.

Table 12 shows monthly billed water for 2008, by sector. The City billed customers for 1,249 million gallons of water in 2008 (Table 12), and per capita use for all sectors was 194 gallons per capita per day (gpcd) for a population of 18,391 (2008 population including transient population [Section 3.4.2]). Residential per capita use was 97 gpcd in 2008. Figure 17 illustrates the overall breakdown of the billed water sales in 2008. The bulk of Deming's 2008 billed water sales were for the residential sector (50 percent), while the commercial and industrial sectors accounted for 16 and 12 percent, respectively, of total billed water sales (Figure 17).

Figures 18 through 22 show monthly billed water totals for the residential, commercial, industrial, irrigation and bulk water sales, and golf course and cemetery sectors in 2008. Water use by the residential, irrigation/bulk water sales, and golf course/cemetery sectors was highest during the summer months in 2008, when outdoor water use was at its peak (Figures 18, 21, and 22). Use was also significant during the spring in the irrigation/bulk water sales and golf course/cemetery sectors, indicating that a significant amount of outdoor watering is occurring in these sectors during these months as well. Water use by the commercial sector was less variable in 2008 (Figure 19).

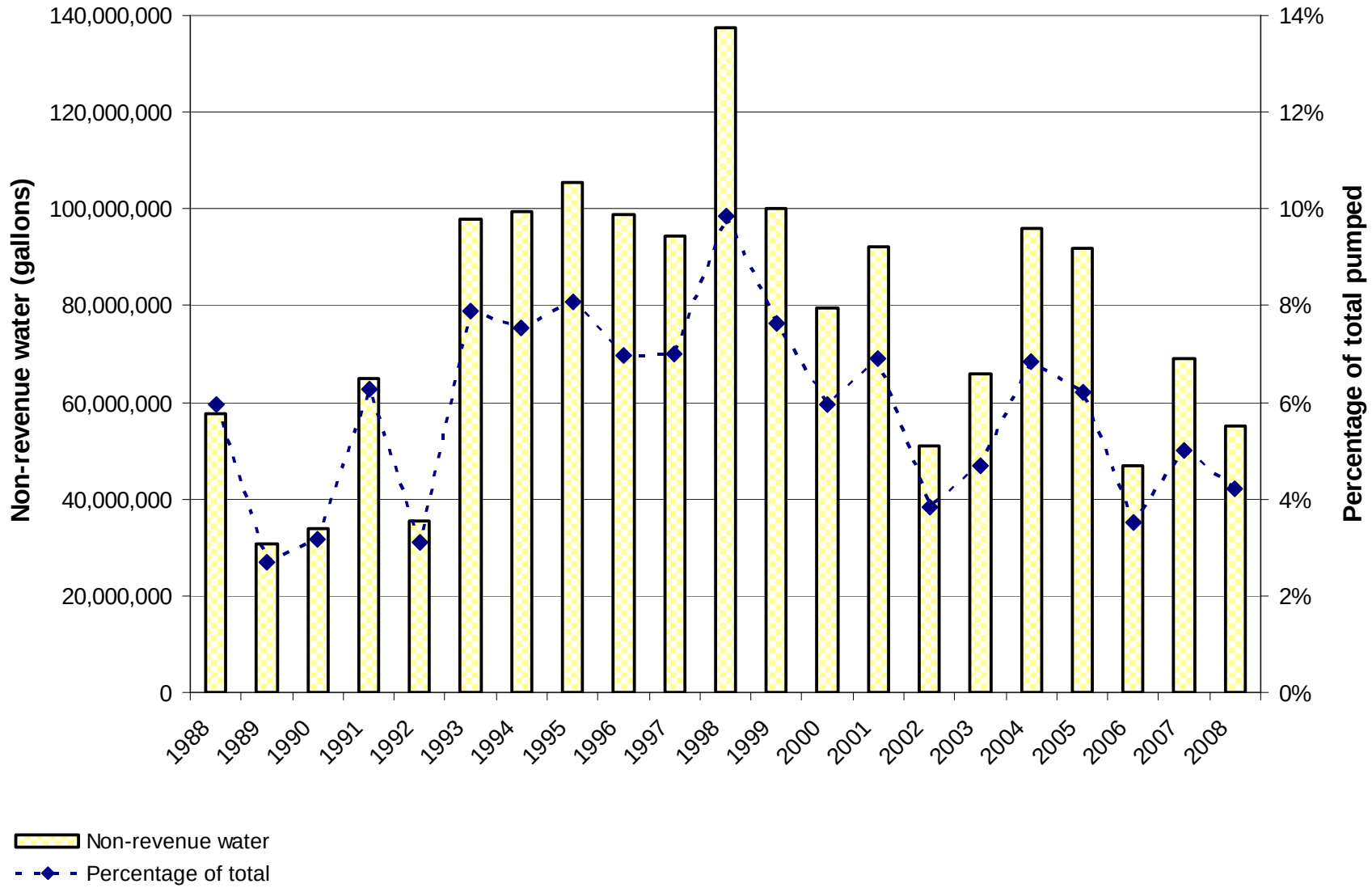

Figure 15

DEMING 40-YEAR WATER PLAN

City of Deming Non-Revenue Water
1997 through 2008

Daniel B. Stephens & Associates, Inc.

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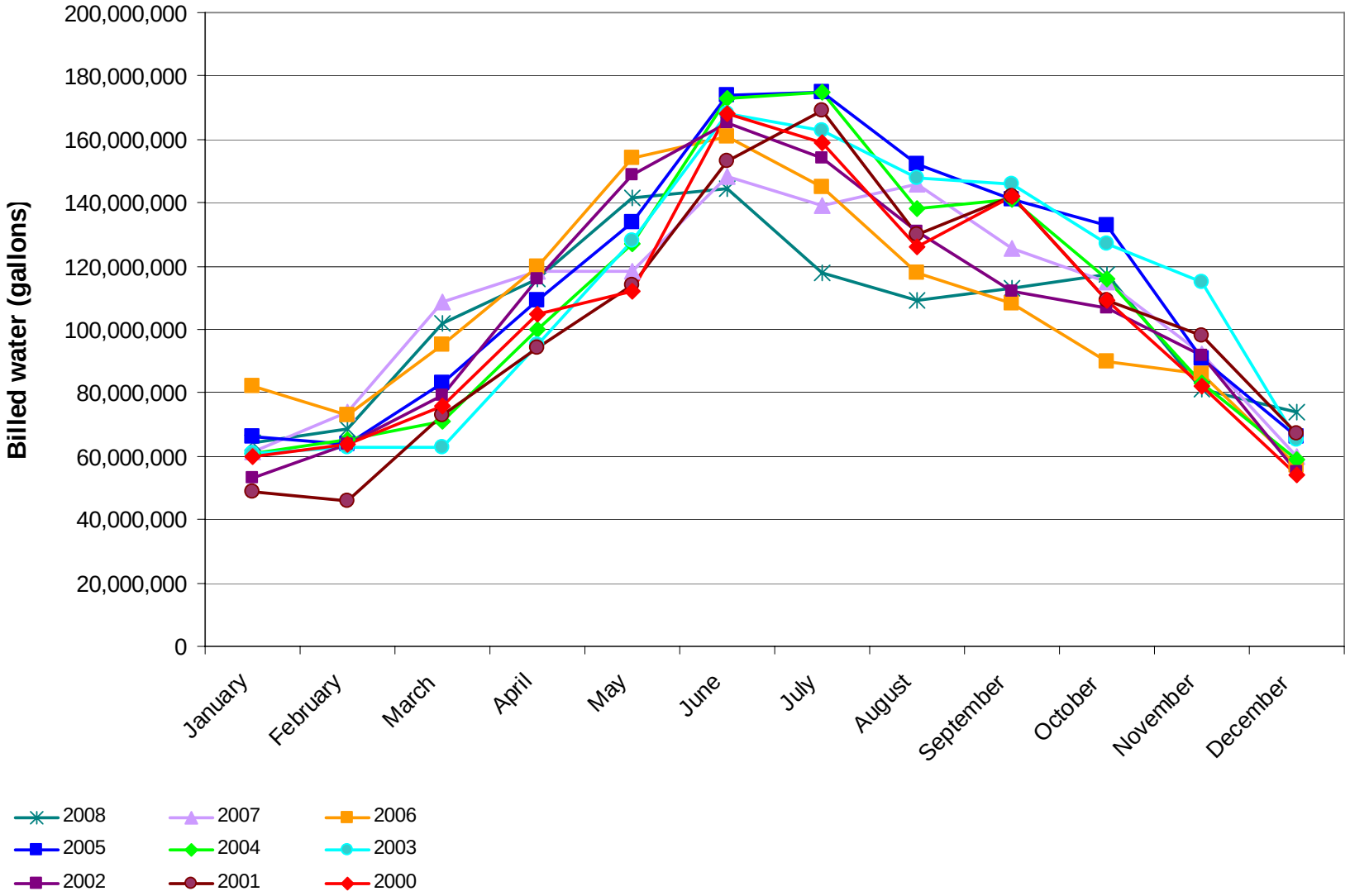

Figure 16

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Billed Totals
2000 through 2008

Daniel B. Stephens & Associates, Inc.

5/21/09

Table 12. City of Deming Billed Water by Sector for 2008

Month	Billed Water (million gallons)					
	Residential	Commercial	Industrial	Irrigation / Bulk Water Sales	Golf Course / Cemetery	Monthly Totals
January	37	14	8	3	3	65
February	35	15	11	4	4	69
March	40	18	7	25	12	102
April	60	16	6	22	12	116
May	70	18	8	25	20	141
June	84	17	7	17	19	144
July	72	19	8	9	10	118
August	64	18	14	8	5	109
September	53	20	27	7	6	113
October	54	22	28	7	6	117
November	42	16	18	1	4	81
December	39	19	9	3	4	74
Total	650	212	151	131	105	1,249

Source: Jenkins, 2009

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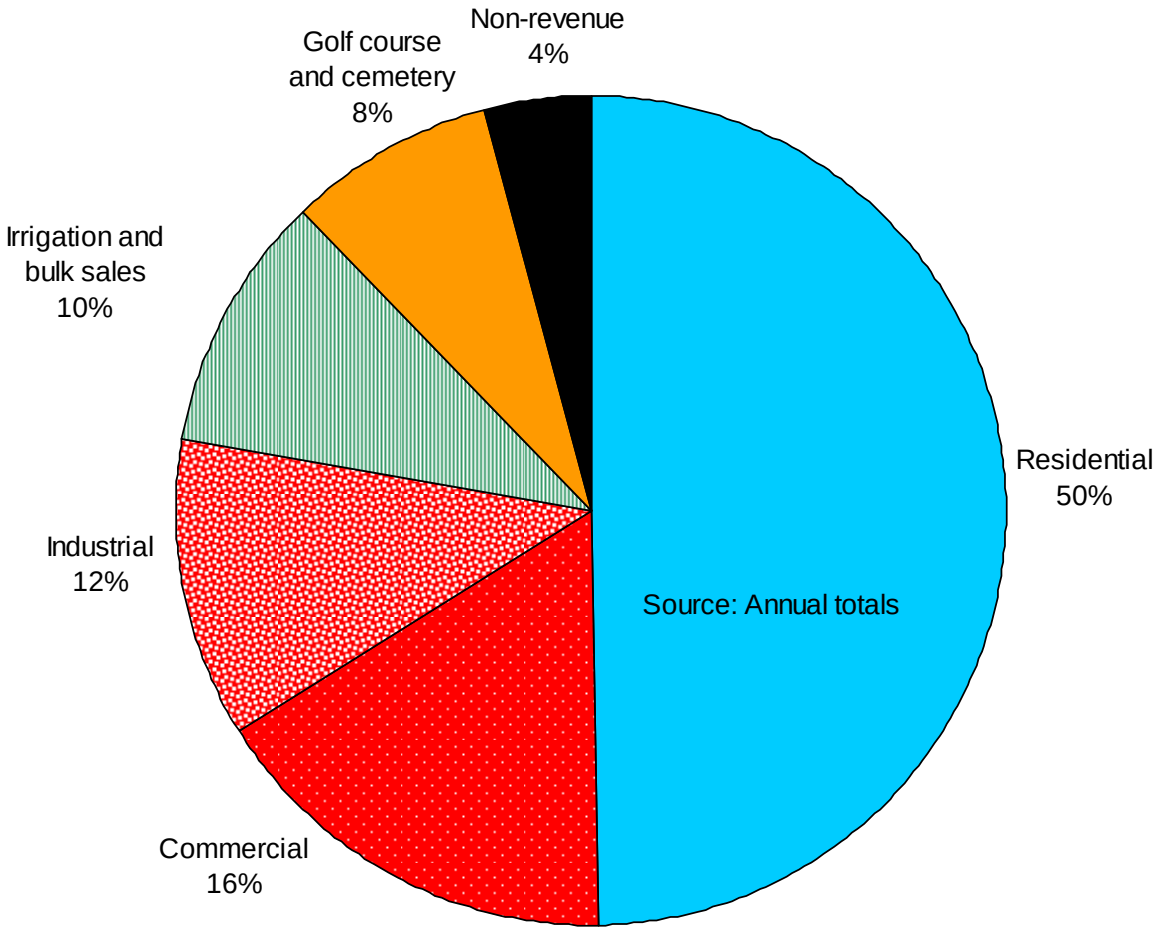

Figure 17

DEMING 40-YEAR WATER PLAN

City of Deming

Billed Water Use by Sector in 2008

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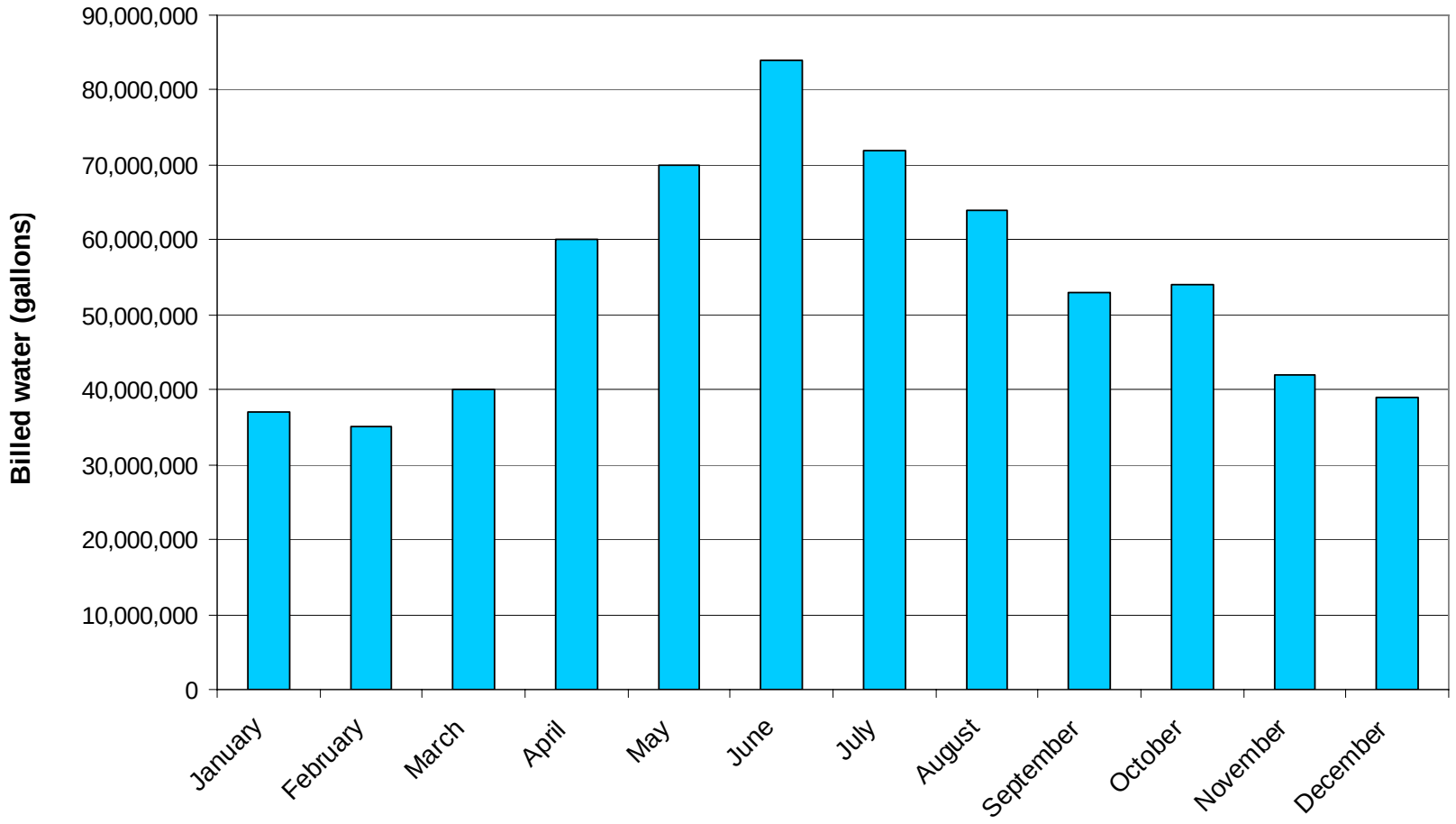

Figure 18

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Billed Water in 2008
Residential Sector

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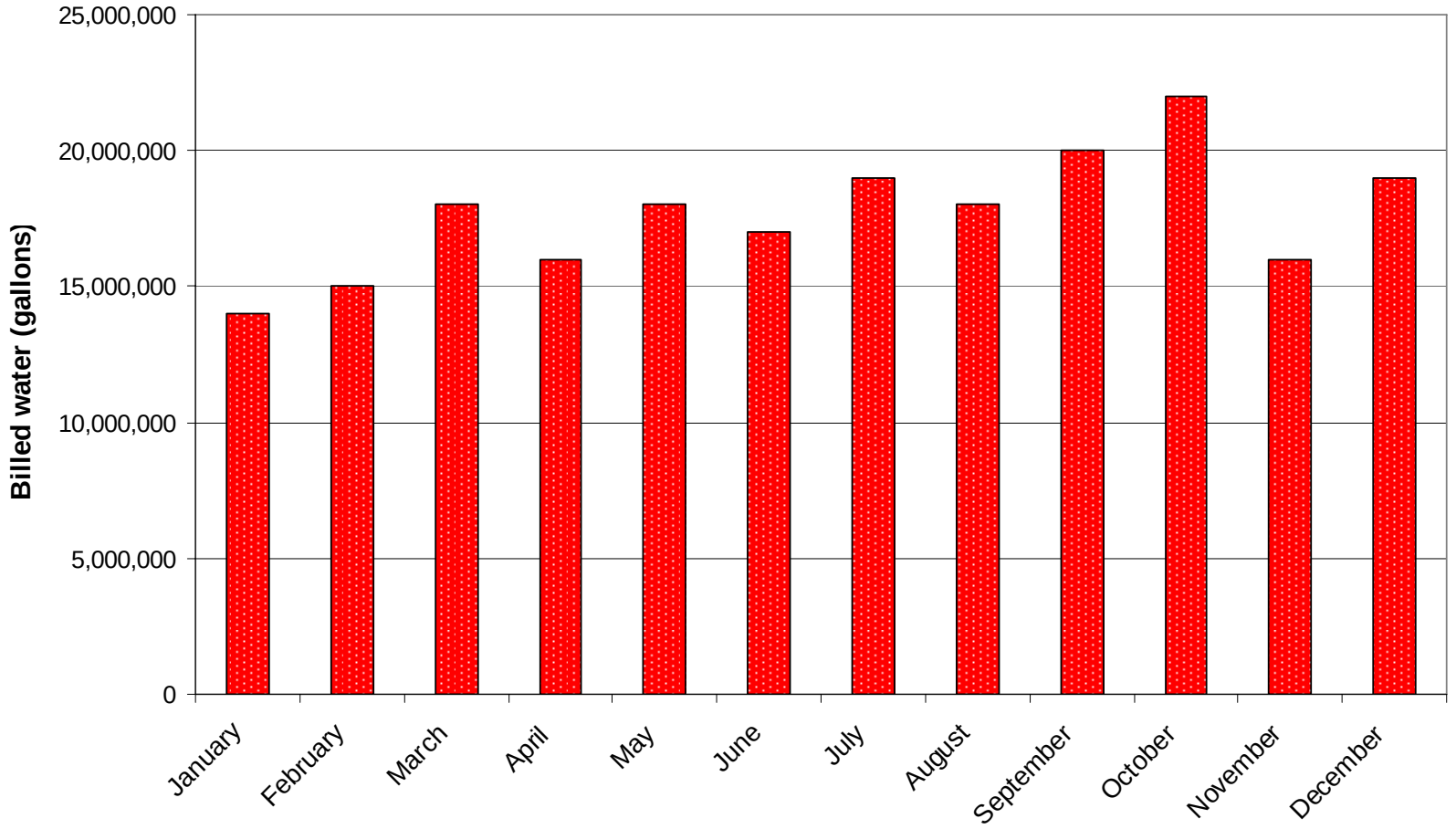

Figure 19

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Billed Water in 2008
Commercial Sector

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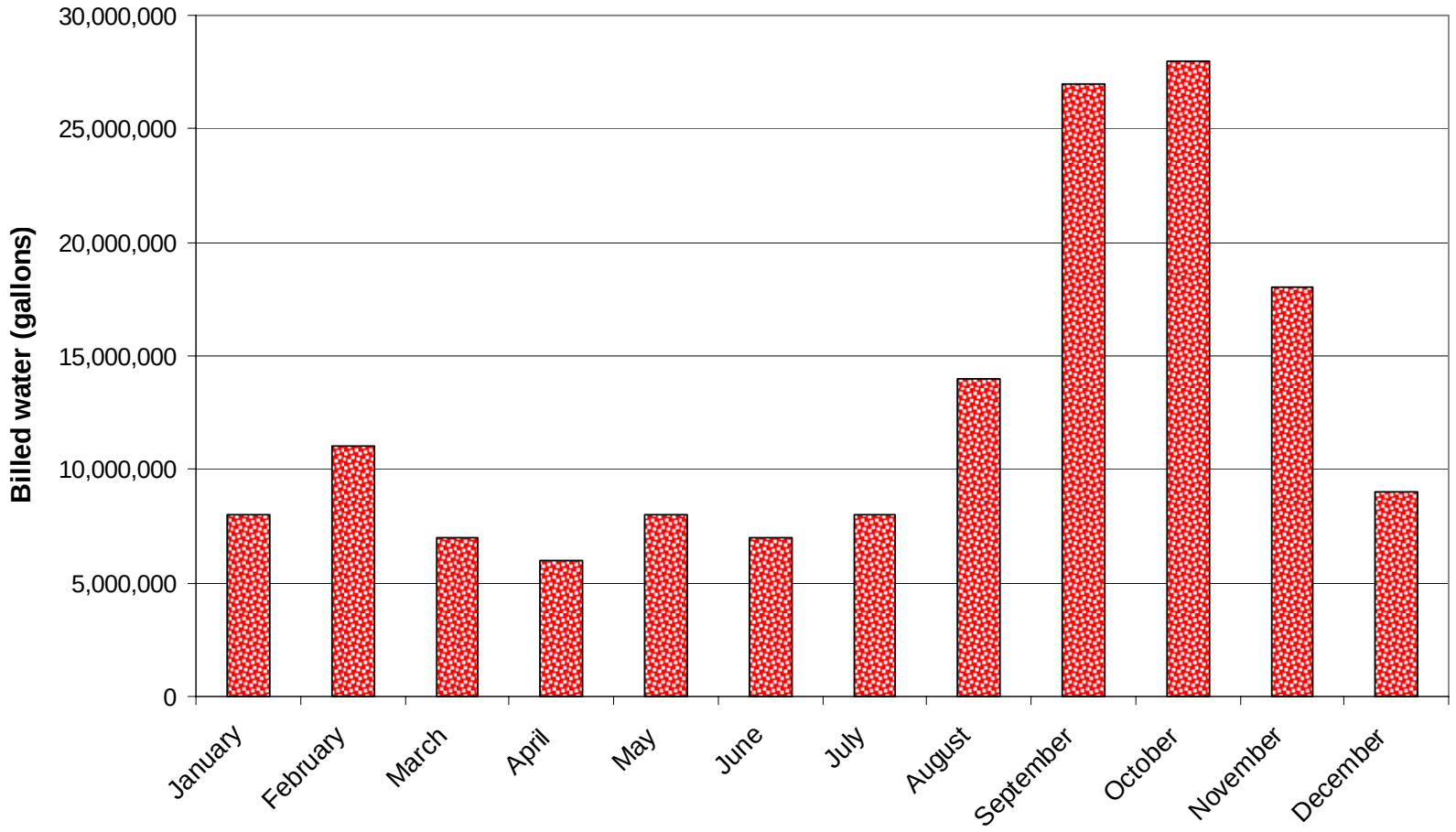

Figure 20

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Billed Water in 2008
Industrial Sector

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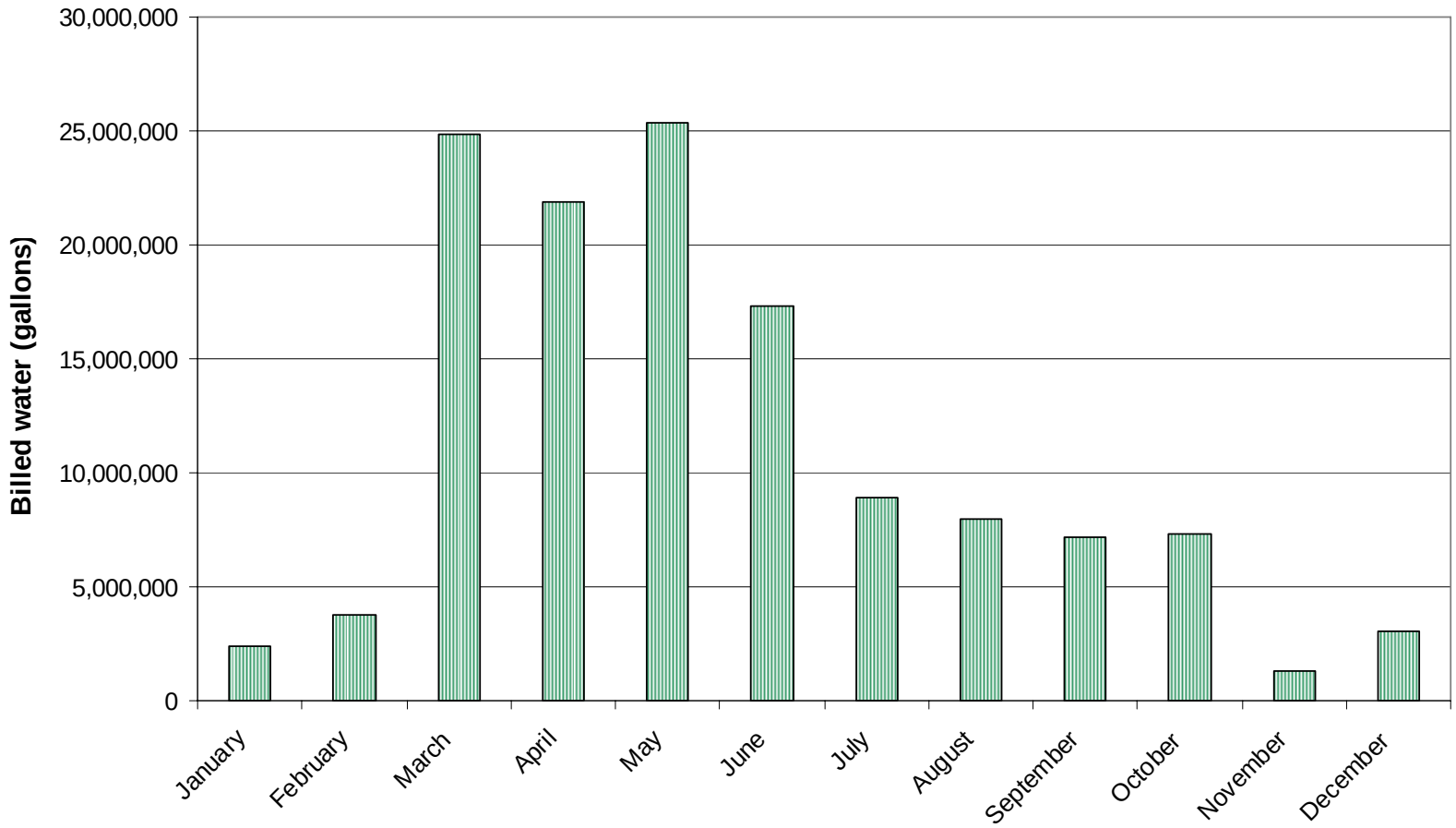

Figure 21

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Billed Water in 2008
Irrigation and Bulk Water Sales Sector

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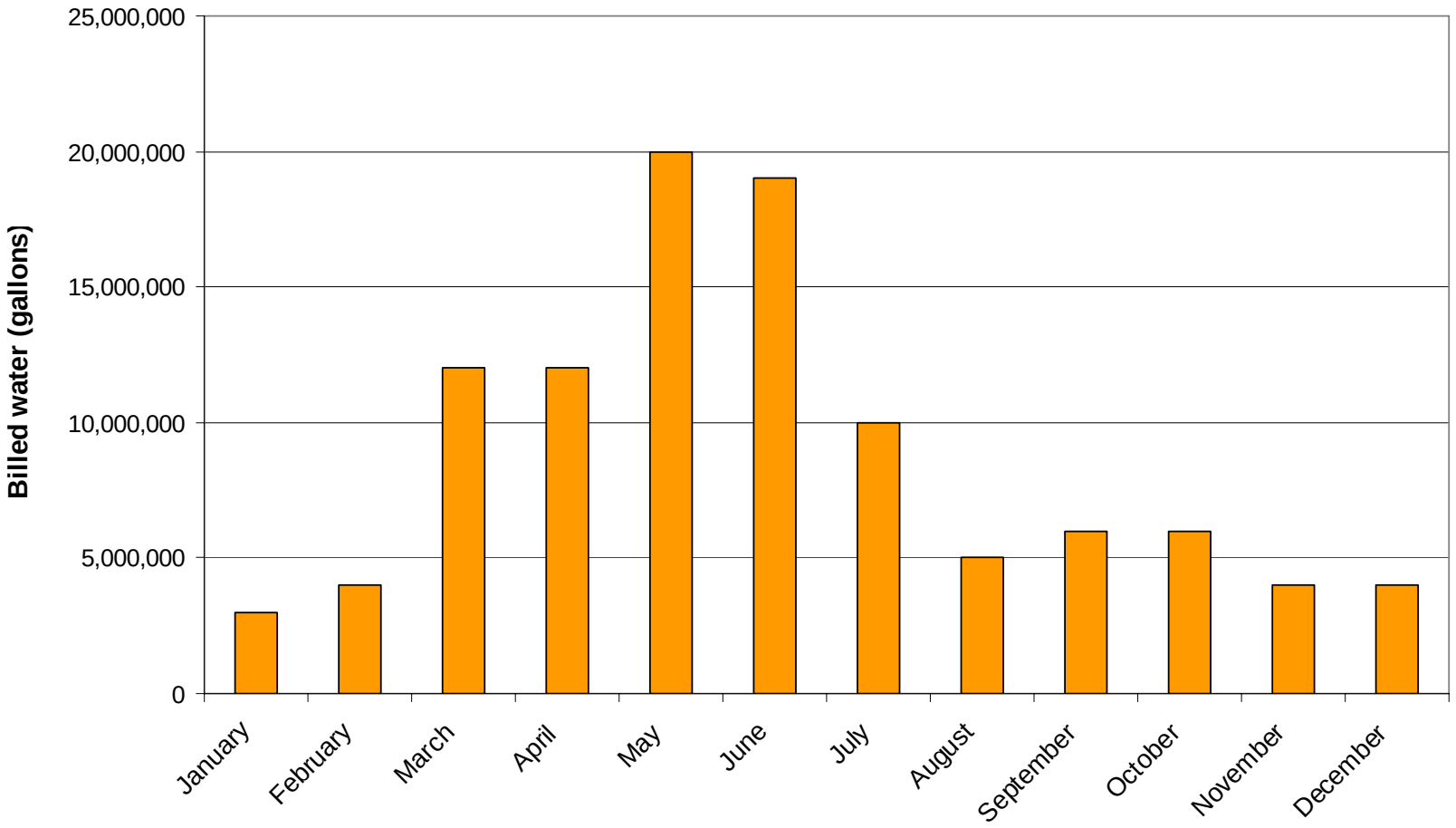

Figure 22

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Billed Water in 2008
Golf Course and Cemetery Sector

Daniel B. Stephens & Associates, Inc.

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Water use by the industrial sector peaked during September, October, and November of 2008 (Figure 20), due in part to the processing of chile during this period.

Outdoor water use was estimated by subtracting the mean billed winter (January, February, and December) water use times 12 months from the total annual water use for each sector (Table 13). Figure 23 shows average billed water sales by sector, broken into indoor and outdoor water use by calculating the difference between winter and summer use (thus also including use by evaporative coolers in the outdoor estimate). As expected, the residential sector uses the most water outdoors.

Table 13. Estimated Indoor and Outdoor Water Use for Deming in 2008

Sector	Estimated Water Use (million gallons)		Percent Indoor %
	Indoor	Outdoor [a]	
Residential	444	206	68
Commercial	192	20	91
Industrial	112	39	74
Irrigation and bulk water sales	37	95	28
Golf course and cemetery	0	105	0
Total	785	465	63

[a] Including evaporative coolers

Per capita demand in 2008 was approximately double during the summer months (June, July, and August) as compared to the winter months (December, January, and February). Total residential indoor water use, which on average accounts for 61 percent of annual water demand (Figure 24), was 68 percent in 2008.

Water use by the top water users (Table 14) accounted for about 35 percent of all water sold in 2006 (this information is not available for 2007 or 2008). Water use by food manufacturers (including Border Foods, Mimbres Valley Produce, and Joseph's Lite Cookies) accounted for 12 percent of all water sold in 2006. The top 26 individual residential customers use over 2 percent of total sales. Continued investigations into the cause of these high water usages should be conducted to determine if a leak is present or a meter reading error has occurred

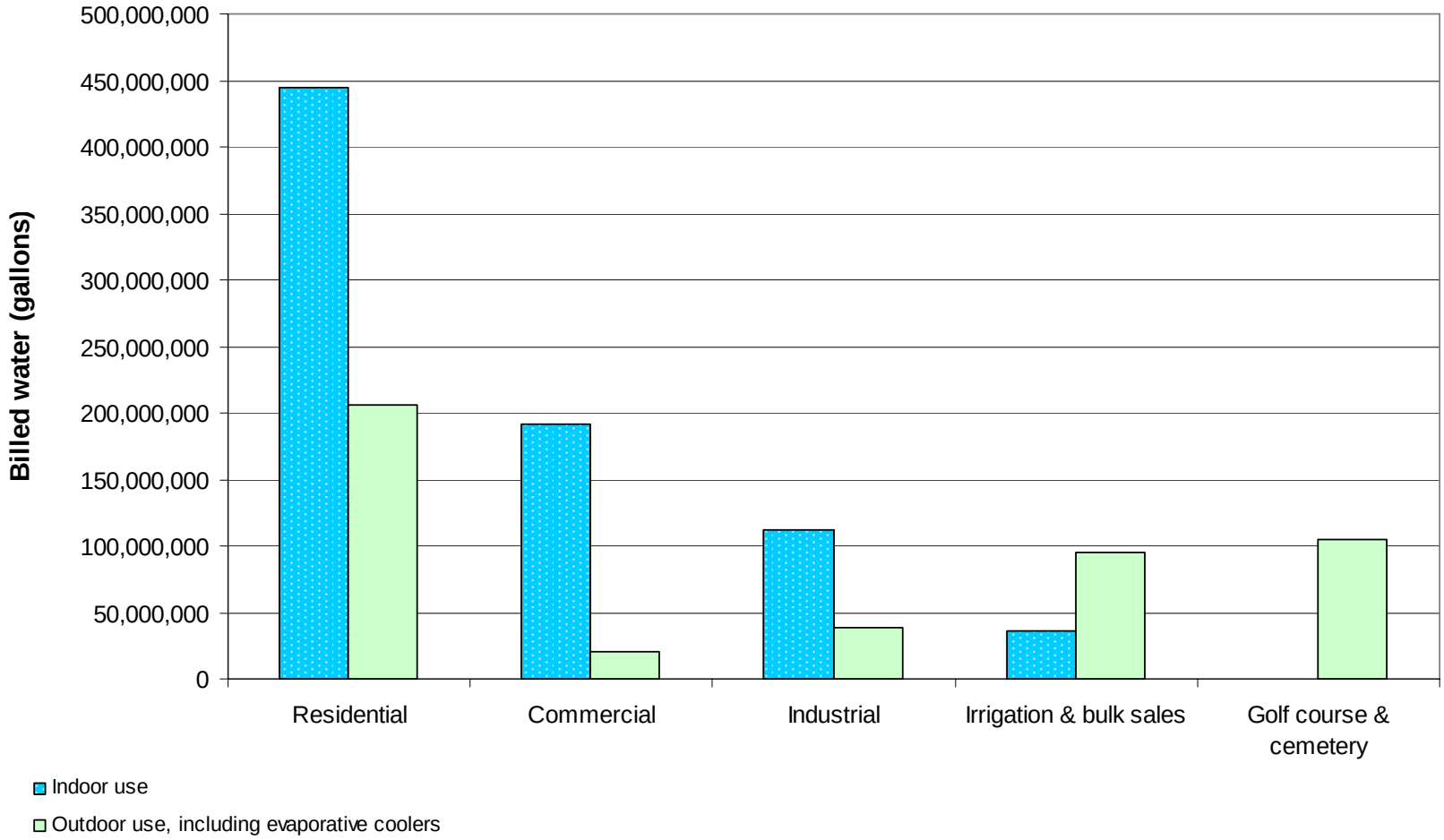

Figure 23

DEMING 40-YEAR WATER PLAN

City of Deming Monthly Total Water Use in 2008
Indoor and Outdoor Use by Sector

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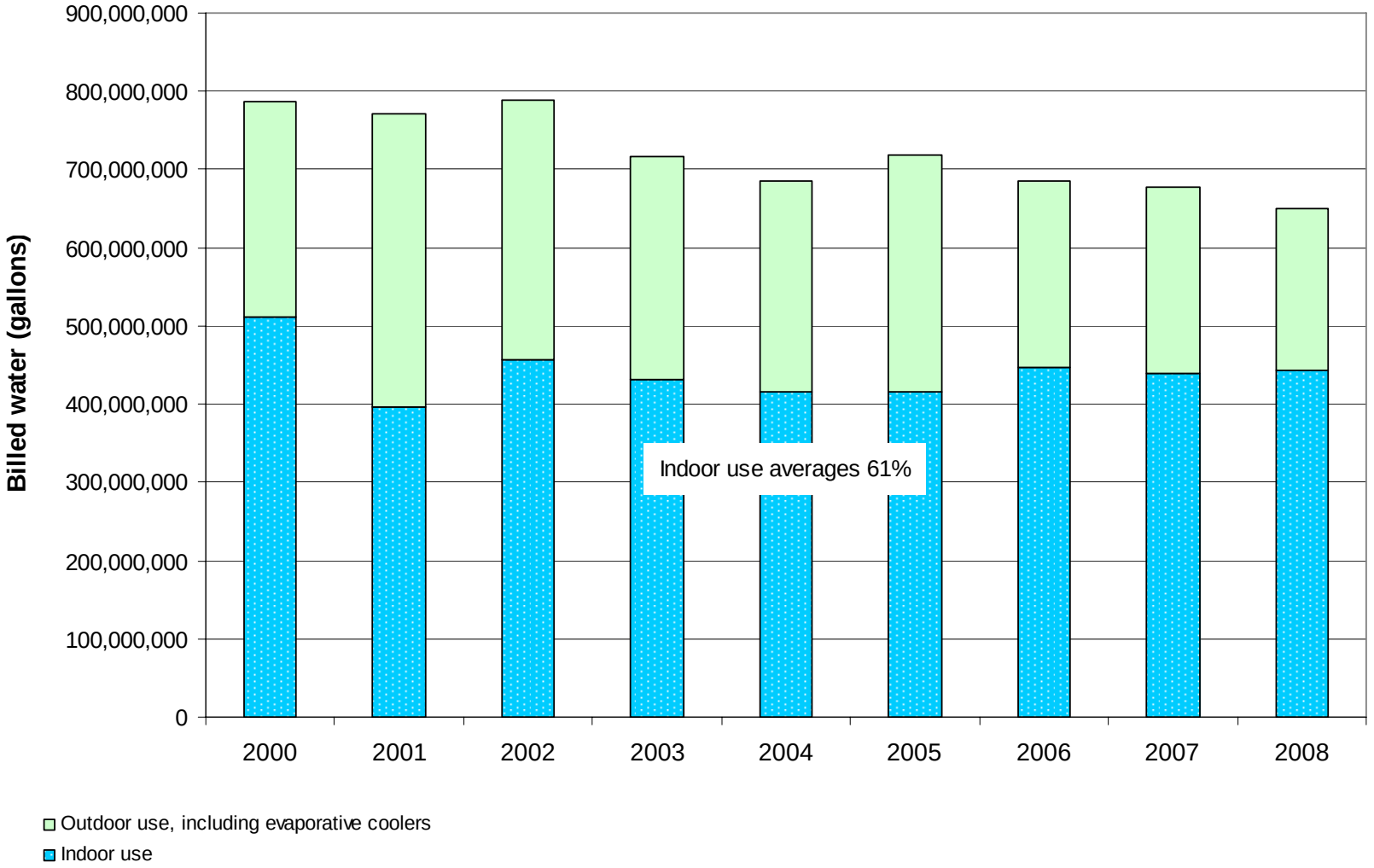

Figure 24

DEMING 40-YEAR WATER PLAN

Indoor and Outdoor Water Use 2000-2008
Residential Sector

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Table 14. Top Water Users in 2006

Water User	Water Use		Percentage of Total Billed
	gpd	ac-ft/yr	
Total water billed for all users in 2006		*4,002*	*100*
Residential Accounts			
Churches	59,244	66.4	1.66
Golf courses/fields	149,303	167.3	4.18
Apartments	52,616	58.9	1.47
Trailer parks	18,077	20.2	0.51
Top 26 residential/multi-family water users	72,251	81.0	2.02
Public schools	11,482	12.9	0.32
Other residential	21,475	24.1	0.60
Total top residential users	384,447	430.8	10.76
Commercial Accounts			
Luna County Rd Bulk Sales	105,820	119	2.96
Hotels and motels	82,118	92	2.30
Manufacturing	30,174	34	0.84
City facilities	18,475	21	0.52
Luna County Courthouse & Detention Center	18,673	21	0.52
Restaurants and bars	21,497	24	0.60
Public schools	19,456	22	0.54
Grocery and Walmart stores	14,833	17	0.42
RV parks	18,356	21	0.51
Rio Mimbres Country Club	10,197	11	0.29
Laundromats	9,115	10	0.26
City senior citizens center	4,269	5	0.12
Medical facilities	5,841	7	0.16
Other commercial	56,897	64	1.59
Total top commercial users	415,722	466	11.63
Industrial Accounts			
Food manufacturers	429,137	481.0	12.01
Beverage bottling	4,726	5.3	0.13
Energy/oil	6,564	7.4	0.18
Other industrial	9,613	10.8	0.27
Total top industrial users	450,040	504.5	12.59

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

before recommending an approach to reduce water demand. Hotels used 2.3 percent of the total water sales for the City of Deming, with water usage ranging from 0.09 acre-foot per room (80 gallons) to 0.24 acre-foot per room (214 gallons).

City water rates were last updated by an Ordinance No. 1185, passed April 16, 2009, and reflect monthly base fees plus commodity charges based on the quantity of water used for the residential and commercial sectors for 2009 (Table 15, Appendix A). Fees are higher for bulk and effluent water sales, and water is more expensive for accounts outside the City limits (City of Deming, 2009 [copy included in Appendix A]). The new rates will be phased in with a 10 percent increase per year for 2010 and 2011.

Table 15. Current Water Rates, Fees, and Charges

Range (cubic feet)	Fee Type [a]		Fee per 100 cubic feet ($)				Bulk Rate ($ per 1,000 gallons)	Effluent
			Residential		Commercial			
			ICL [b]	OCL [c]	ICL [b]	OCL [c]		
0 – 400	Base fee		7.50	11.25	12.00	18.00		50% of residential rates
> 400	Incremental fee per 100 cubic feet	W	0.99	1.48	1.32	1.98	3.84	
		S	1.19	1.78	1.58	2.37	4.61	

Source: City of Deming, 2009

[a] W = Winter rates (October 16 through May 14)
S = Summer rates (May 15 through October 15)

[b] Inside City limits

[c] Outside City limits

3.3 City of Deming Water Rights and State Engineer Groundwater Administration in the Mimbres Basin

The City of Deming owns a total of 6,102.92 acre-feet of municipal use water rights in the Mimbres Basin (Table 16) and an additional 3,054.32 acres of land with appurtenant irrigation rights (Table 17, Figure 25). Many of the irrigation rights have been purchased in the last few years and have not yet been transferred to municipal use. The Murdock rights appurtenant to 686 acres are located approximately 16 miles outside the City limits, too far to be piped into the City's municipal service area, and cannot be used to meet future demand within the City (Figure 26).

Table 16. City of Deming: Municipal Use Water Rights
Page 1 of 2

Well Number	OSE File Number	Previous Owner / Reference Name	Priority Date(s) [a]	Consumptive Use (ac-ft)	Comments
17	M-34-C	Merrill/Irani	1928	100.8	Converted to municipal use and transferred into M-109.
AM	M-47 & M-266 Combined A	American Minerals	1927	33.40	Change of ownership filed March 14, 2008. Can divert up to 80 ac-ft at the well, but only consumptively use 33.40 ac-ft. The May 1981 order lists this condition and states that "all diversion in excess of 33.40 acre-feet per annum shall be returned to the underground water basin as seepage and return flow." City cannot transfer this water into municipal system because of OSE administrative criteria, but in the future could use it for irrigation or consumptive use at the current place of use.
17	M-49 et al.	Bilbo	1926	566.34	M-49 et al includes M-49-S, M-109, M109-S, and M-127. Permit approving conversion to municipal use approved October 19, 2005 states, "total quantity of water to be transferred is 380.74 ac-ft."
	M-67 into M-49 acres		1918 1928 1942		M-67 & M-43S into M-49 et al. was approved in 2006, transferring 185.6 into M-49 et al.
14	M-214	Luchsinger	Between 1911 and 1945	477	The original right from this well was for irrigation use on 83.1 acres. Deming converted this to municipal use in 2003 for 132.96 ac-ft. Two additional transfers into M-214 increased the total consumptive use right to 409 ac-ft. The OSE approved the transfer of M-261-B (F. Hervol) for 160 ac-ft in June 2005. The OSE approved the transfer of M-110A and M110B (Ruebush) for 176 ac-ft in July 2005.
15	M-271	Peru Hill Mill	1928	441.9	Although originally a mining right, Deming may pump this water in the current place of use and physically move it into the municipal water system.

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

ac-ft = Acre-feet
NA = Not applicable

[a] Priority date as described in original right.

Table 16. City of Deming: Municipal Use Water Rights
Page 2 of 2

Well Number	OSE File Number	Previous Owner / Reference Name	Priority Date(s) [a]	Consumptive Use (ac-ft)	Comments
Multiple municipal wells	M-299	City of Deming	1913-1943	4,415	Original water rights for municipal system for a total of 4340 ac-ft. Various priority dates range from 1913 to 1943. Permit to commingle various water rights into M-299 approved July 31, 1992. Conditions include the following: (1) Maximum diversions from wells 1, 2, 4, 5, 6, 7, and 10 may not exceed 4,340 ac-ft per year. (2) Maximum diversion from any one well is not to exceed 1,210 ac-ft per year. This July 31, 1992 permit includes M-60-D for 75 ac-ft of municipal rights, bringing the total to 4415 ac-ft.
				28.48	The cemetery right (M-439) is also included on the permit, which states that a consumptive use right of 28.48 will be combined with the 4,415-ac-ft for municipal use, bringing the total consumptive use to 4443.48.
BTRL	M-328 into M-10346	City of Deming	1925 1943	40	For use at the City's Butterfield Trail Regional Landfill.
Total consumptive use water rights				6,102.92	

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

ac-ft = Acre-feet
NA = Not applicable

[a] Priority date as described in original right.

Table 17. City of Deming Irrigation Water Rights
Page 1 of 5

Subfile	File No.	Acreage Amount	Previous Owner / Reference Name	Diversion	Consumptive Use [a]	Priority Date(s [b])		Comments
						Date	Amount (acres)	
25.9.10	M-4	73.64	Yates/Marcak	220.92	117.82	1940 1944	23.62 50.02	In Deming files M-4 (73.64 acres), M-128 (56.5 acres), and M-128A (71.7 acres) are all listed together for the 200.64 acres (referred to as Yates 1). All of this land is in the USDA/FSA Conservation Reserve program (weed control) and is fallow. Deming filed a notice to irrigate specific blocks for 2005. M-4, M-128, M-128A, and M-328 (Yates 1) were all purchased from Yates and are owned by City of Deming.
25.9.6A	M-128	56.5	Yates/Home	169.5	90.4	1938 1944	49.5 7.0	City filed notice to irrigate in 2004 and 2005. Change of Ownership filed in April 2003.
25.9.6B	M-128A	71.7	Yates/Home	215.10	114.72	1938	71.7	Change of Ownership filed in April 2003.
25.9.17	M-143	150.2	Yates/Drip	450.60	240.32	1939	150.2	City filed change of ownership in December 2008. Land is enrolled in USDA/NRCS Conservation Reserve program and is leased to Kevin Penn.
25.9.10	M-328	80.2	Yates/Sunshine	240.6	128.32	1925 1943	45 95.2	Change of ownership filed in June 2002. Permit M-328 into M-1526 moves 16 acre-feet appurtenant to 10 acres transferred for domestic, school use as well as landscape irrigation. Reverts to original place and purpose of use in December 2013. Original right was for 105.2 acres with a diversion right of 168.32 acres. In permit M-328 into M-10346, the City has transferred water rights appurtenant to 25 acres (40-acre-foot diversion) to Butterfield Trail Regional Landfill.

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

[a] Reflects the number of acre-feet the City would obtain if this water right is transferred to municipal use using a duty of 1.6 ac-ft per acre.

[b] Priority date as described in original right. Since the City did not always buy all the land or water rights adjudicated, the acreage listed may be higher than the amount of land or water right owned by the City.

ac-ft/yr = Acre-feet per year
OSE = New Mexico Office of the State Engineer
--- = Not available

Table 17. City of Deming Irrigation Water Rights
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Subfile	File No.	Acreage Amount	Previous Owner / Reference Name	Diversion	Consumptive Use [a]	Priority Date(s [b])		Comments
						Date	Amount (acres)	
25.9.19A	M-15	251.95	Marcak	755.85	403.12	1912 1939 1940 1945	45.70 65.08 15.52 125.65	Change of ownership filed in April 2001. Well M-15 T leased to Waterloo farms to irrigate land under M-225. Permit to allow drilling of supplemental well (S-15 T) M-225 approved August 2007, expires December 31, 2016 with a 5-year option to extend the lease to 2021. Diversions at the move-to point may not exceed the M-225 permit amount.
25.9.30A	M23-282 Combined	100.6	Wood I	301.8	160.96	1912 1929	60 40.6	Purchased from Wood in 2004. Change of ownership filed by the City in November 2008. Farm is leased to Zach Penn until 2018 with a 5-year renewal option to extend the lease to 2023.
25.9.30B	M196	100	Wood II	300	160.00	1942 1940	40 71.4	City purchased in 2005, but hasn't filed a change of ownership. Land is leased and enrolled in USDA/NRCS Conservation Reserve program (weed control).
24.9.20	M-47	136.40	Clary	409.20	218.24	1931 1936 1943	9.0 20.4 107	Change of ownership filed in August 2002. Well was cleaned out in 1997. Land is fallow.
24.8.7A	M152	147.02	Keeler (Hal)	441.06	235.23	1939 1944	108.8 114.66	Change of ownership to City of Deming filed in February 1993. Construction of pipeline near this farm is planned. The City will then apply to move water from another Keeler farm in Section 18 to one well in Section 7 and then convert to municipal use. Land is irrigated with wastewater as part of the City's land application permit for wastewater.

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

[a] Reflects the number of acre-feet the City would obtain if this water right is transferred to municipal use using a duty of 1.6 ac-ft per acre.

[b] Priority date as described in original right. Since the City did not always buy all the land or water rights adjudicated, the acreage listed may be higher than the amount of land or water right owned by the City.

ac-ft/yr = Acre-feet per year
OSE = New Mexico Office of the State Engineer
--- = Not available

Table 17. City of Deming Irrigation Water Rights
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Subfile	File No.	Acreage Amount	Previous Owner / Reference Name	Diversion	Consumptive Use [a]	Priority Date(s [b])		Comments
						Date	Amount (acres)	
24.8.7B	M-290	53	Keeler (Hal)	159	84.80	1912 1928 1943 1944	6 12 18 60	Change of ownership filed in 1993. Land is irrigated with wastewater as part of the City's land application permit for wastewater.
24.8.18	M-340	95.3	Keeler (Hal)	285.9	152.48	1944	95.3	Change of ownership to Deming filed in 1993, includes grant of right of way or easement to the Keelers dated April 28, 1994. Land is irrigated with wastewater as part of the City's land application permit for wastewater.
24.9.14A	M-157 A	50.05	Seybert	150.15	80.08	1913 1940 1942	9.5 37.1 43.9	Change of ownership from Laharca/Seybert to City of Deming filed in February 2006. Original right appears to have been 49.75 acres and 0.3 acre of reservoir. City bought only the water rights and the well.
25.9.19C	M-225	149.11	Keeler (Waterloo Farms)	447.33	238.57	1902 1939 1942 1945 1947	30.40 11.20 63.40 23.82 20.29	Change of ownership from Waterloo Farms (Keeler) to Deming filed May 7, 2007. Leased to Keeler. Water pumped from M-15-T is also used to irrigate this farm.
25.9.11B	M-190A	63	Bishop	189	100.8	1912 1941 1945	33 20 10	Purchased in May 2002. Change of ownership was filed in November 2008. Land is fallow.

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

[a] Reflects the number of acre-feet the City would obtain if this water right is transferred to municipal use using a duty of 1.6 ac-ft per acre.

[b] Priority date as described in original right. Since the City did not always buy all the land or water rights adjudicated, the acreage listed may be higher than the amount of land or water right owned by the City.

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Table 17. City of Deming Irrigation Water Rights
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Subfile	File No.	Acreage Amount	Previous Owner / Reference Name	Diversion	Consumptive Use [a]	Priority Date(s [b])		Comments
						Date	Amount (acres)	
23.9.31A	M-208	135.40	Diaz	406.2	216.24	1915 1944	94.4 41	Change of ownership filed from Terry to City of Deming in 1998. Irrigated acreage includes reservoirs. The City attempted to transfer these water rights into the municipal system in 2001. Application was protested and withdrawn. City has filed annual applications for extension of time; all have been approved by the State Engineer.
24.9.29	M-230	78.2	Hervol (Joe)	234.6	125.12	1942	78.2	Water rights and well only were recently purchased by the City. Change of ownership will be filed in February 2009.
25.9.19A	M-325	53	Graves	159	84.80	1947	53	City purchased water rights only.
25.9.30	M-326	99.50	Scott	298.50	159.20	1943	99.50	Change of ownership for land and water rights from Scott to City of Deming filed in May 2004. According to agreement between the City and the Scotts, "sellers will retain upland farm base." This land is fallow.
24.9.28B	M-333A	76.61	Lehman	229.83	122.58	1944	76.61	Change of ownership for land and water rights filed in April 2002. Land is fallow.
24.9.28A and B	M-333B	107.27	Lehman	321.81	171.63	1944	107.27	Change of ownership for land and water rights filed in April 2002. Land is fallow
25.10.13	M-352	160	Sweetser	480	256	1944 1943	153.1 (10.3)	City purchased this farm in 2006. Change of ownership filed in November 2008. The farm is enrolled in USDA/FSA Conservation Reserve program (weed control).

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

[a] Reflects the number of acre-feet the City would obtain if this water right is transferred to municipal use using a duty of 1.6 ac-ft per acre.

[b] Priority date as described in original right. Since the City did not always buy all the land or water rights adjudicated, the acreage listed may be higher than the amount of land or water right owned by the City.

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OSE = New Mexico Office of the State Engineer
--- = Not available

Table 17. City of Deming Irrigation Water Rights
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Subfile	File No.	Acreage Amount	Previous Owner / Reference Name	Diversion	Consumptive Use [a]	Priority Date(s [b])		Comments
						Date	Amount (acres)	
25.9.11C	M-388-S	72.12	Montano	216.36	115.39	1930 1945	36.7 35.42	City of Deming purchased the land and water rights in June 2001. Change of ownership was filed in November 2008. Land is fallow.
25.6.3B	M-514	305.15	Murdock	915.45	488.24	1950 1952-	450.6 464.7	Change of ownership filed in February 2000. All of this land is located several miles east of town and could be developed into an industrial park or used for industrial or commercial purposes. The OSE will not allow a transfer of these rights to the municipal system.
25.6.3A	M-811	304.4	Murdock	913.2	487.04	1954	304.4	
25.6.15	M-971	76	Murdock	228	121.6	1952	76	
23.9.34	M-1033	8.0	Luna County	24	12.8	1931	8.0	Purchased from the County in 1998
	Total	3054.32		9152.96	4874.82			

Note: All water rights in the Mimbres Basin have been adjudicated (see orders issued in Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County).

[a] Reflects the number of acre-feet the City would obtain if this water right is transferred to municipal use using a duty of 1.6 ac-ft per acre.

[b] Priority date as described in original right. Since the City did not always buy all the land or water rights adjudicated, the acreage listed may be higher than the amount of land or water right owned by the City.

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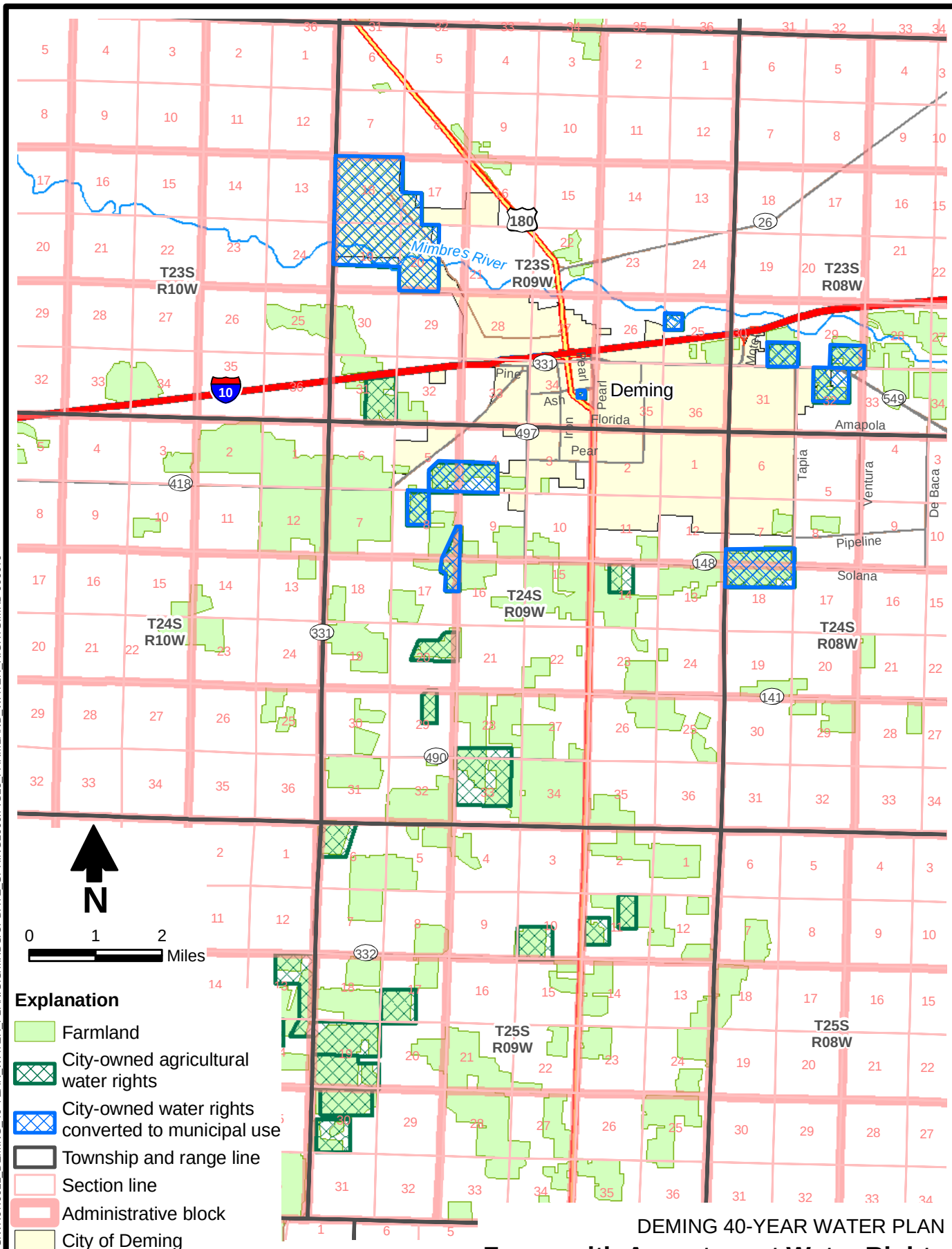

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DEMING 40-YEAR WATER PLAN

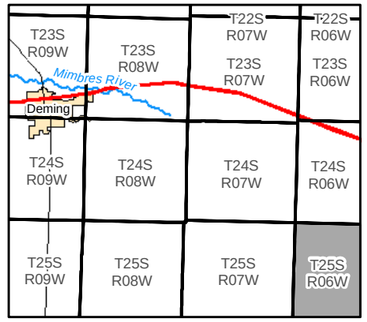
Farms with Appurtenant Water Rights Purchased by the City of Deming

Daniel B. Stephens & Associates, Inc.

07/06/2009

JN WR09.0067

Figure 25



Explanation

Water right (diversion in acre-feet)

- 15 - 100
- 100 - 500
- 500 - 1000
- 1000 - 1812

- Township and range line
- Section line
- Administrative block
- City of Deming
- Farmland
- City-owned agricultural water rights

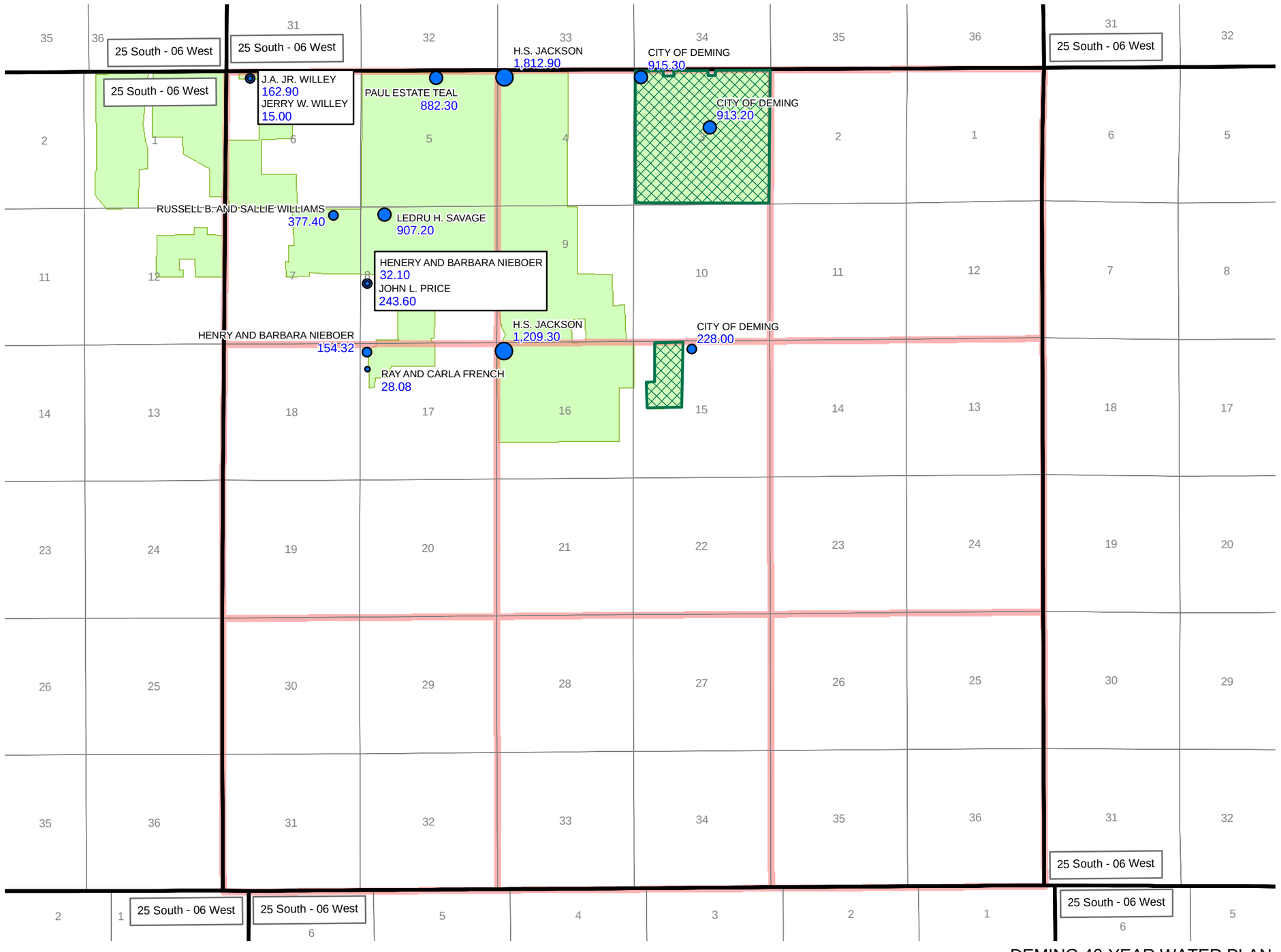
HENERY AND BARBARA NIEBOER
32.10
JOHN L. PRICE
243.60

Multiple owners in one box indicate that the OSE database lists the same location for these water rights. A review of the OSE file for each right would identify exact well and water right location information.

Source: Location data obtained from the OSE Water Administration Technical Engineering Resource System (WATERS) database.

N

0 2000 4000 Feet



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05/19/2009 JN WR09.0067

DEMING 40-YEAR WATER PLAN

City of Deming Water Rights Within OSE Administrative Blocks in T25S R06W

Figure 26

The City's options for water right transfers and use of its existing water rights are governed to a large extent by the OSE administrative criteria for the Mimbres Groundwater Basin (NMAC 19.27.43), in which all of the City's water rights are located (Gray, 1982). These criteria take into consideration the groundwater impacts to the Mimbres River. As part of its Active Water Resources Management program, the OSE recently created the upper Mimbres Water Master District for the upper Mimbres stream system, to which additional administrative policies apply (NM OSE, 2006). Although Deming is not located within this water master district, because most of Deming's water rights are located near the Mimbres River, surface water impacts could be of concern to the City. The State Engineer will require offsets to the river or will deny an application for new groundwater rights or new points of diversion if groundwater pumping will adversely affect the river.

The City benefits from the fact that the Mimbres Basin has been fully adjudicated, which means that the Adjudication Court has resolved all issues regarding water right ownership, priority date, and quantity for all surface and groundwater water rights in the basin (Final Decree in Cause No. 6326 entered May 26th 1993 in the Sixth Judicial District Court in Luna County) Adjudicated status finalizes the water rights and allows the City more certainty than most municipalities in New Mexico with respect to the validity of its water rights and their availability for future use. For example, the City of Las Vegas relied on unadjudicated claims to water for its supply, only to lose a portion of those rights when the New Mexico Supreme Court found that the basis of those claims was contrary to state water law (*State of New Mexico ex rel. Martinez v. City of Las Vegas,* 135 N.M. 375; 89 P.3d 47 (2004)).

The Mimbres Basin, however, is also a mined groundwater basin, which means it is subject to stringent criteria regarding water right applications and transfers. Thus there are fewer options for moving and transferring water rights in order to maximize the use of existing infrastructure and municipal supply wells. Mindful of those limitations, the City has drafted a water rights acquisition policy (Appendix B) to ensure that future water right purchases will present the greatest benefit to the City in terms of location and the ability to transfer the water right to existing facilities.

The Mimbres Basin encompasses 4,279 square miles, of which approximately 1,003 miles are closed to new appropriations (Gray, 1982, Section 1). The OSE administers the Mimbres Basin

in accordance with criteria issued in 1982, which are based on a hydrologic model developed in the 1970s (Hathaway, undated). The criteria divide the basin into administrative blocks, each of which encompasses four 1-square-mile sections (Plate 1). The criteria specify an allowable rate and cumulative amount of drawdown in each administrative block, determined as follows:

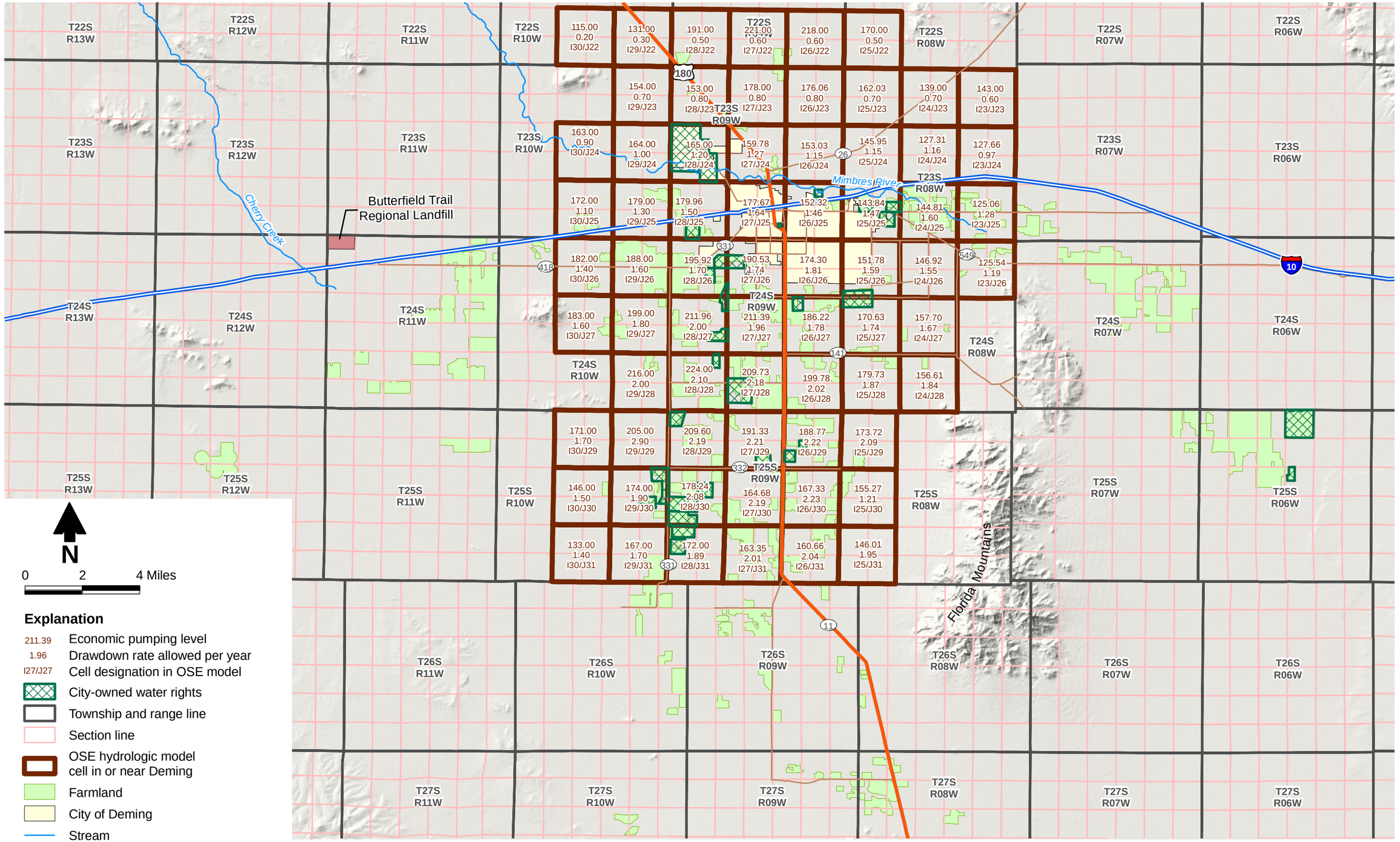
- Based on an inventory of all water rights existing in the basin at the time of model development, the model assumed that a cumulative drawdown of 102 feet from pumping those water rights would occur by 1994.

- The administrative criteria assume an allowable depth to groundwater of 230 feet projected to 1994.

- Based on this criterion and taking into consideration the pumping from existing rights, the allowable non-pumping water level for each administrative block may not exceed 128 feet (230 minus 102).

When the proposed groundwater appropriation causes the non-pumping water level to reach 128 feet or causes the annual water level decline to exceed 2.50 feet per year, the block will be labeled “critical” and no new groundwater appropriations will be granted in that block. If a new appropriation causes an adjoining block to become critical, further restrictions apply. A groundwater appropriation may be granted in a block that adjoins a critical block if the accumulated calculated effect of pumping does not exceed a water level decline rate of 2.0 feet per year in the critical block. Pumping levels and allowable rates of decline for the model cells in and around Deming are shown in Figure 27.

To determine impacts from a new application, the OSE centers the proposed pumping within a nine-block template area (36 sections) with the proposed point of diversion in the center or “subject” block. Impacts within the subject block as well as surrounding administrative blocks are evaluated. Generally, the OSE assumes that the well for a proposed appropriation will be located at least ¼ mile from any existing wells. If the calculations show that pumping will not impair existing rights or if the applicant successfully demonstrates that locating the new well ¼ mile from an existing well is not feasible, an exception is allowed.



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05/18/2009 JN WR09.0067

DEMING 40-YEAR WATER PLAN

Economic Pumping Levels

Figure 27

The actual volume of water allowed to be diverted from a proposed well will vary based the transmissivity of the aquifer in different parts of the basin. Table 18 summarizes the transmissivity, the production volume of the well, and listed allowable diversions for an application, which can be approved for irrigation or for other uses. The OSE will consider exceptions to these criteria if it can be demonstrated that the criteria do not apply at the place of use in the proposed application.

Table 18. Volumes and Acreage Allowed for Groundwater Appropriations

Transmissivity (ft^2/d)	Volume produced (gpm)	Acres Allowed for Irrigation	Acre-Feet Allowed for Uses Other than Irrigation
500	300	60	300
1500	500	100	500
2500	1000	200	1000

ft^2/d = Square feet per day gpm = Gallons per minute

3.4 Population Projections

Because future water use projections are derived from current and projected population data, an accurate population estimate is essential for the City's 40-year plan. No current comprehensive demographic study including population projections is available, so current and projected population was determined by considering historical population trends, population data gathered by the City of Deming, and all available published demographic studies and selecting the one that appears to be most accurate. Based on the evaluation of these sources and comparing this information with the City's current population estimates, the City selected the *Southwest New Mexico Regional Water Plan* (DBS&A, 2005) population projections to predict future water use.

According to the 2000 Census, the City of Deming had a total population of 14,116 people and accounted for over half of the total population in Luna County (U.S. Census, 2000). The population in Deming grew by 21 percent between 1990 and 2000 (U.S. Census, 2000), and future growth is anticipated due to further expansions of the employment base as well as the addition of retirees (City of Deming, 2003).

To identify the most accurate population projection for the City of Deming over the 40-year planning period, population trends were identified by examining historical growth data and current City population data (Section 3.4.1), economic factors that might contribute to population changes were discussed with multiple members of the community (Section 3.4.2), and existing population projections were reviewed (Section 3.4.3).

3.4.1 Historical Growth in the Region

Table 19 shows changes in population in the City of Deming and Luna County between 1970 and 2000. Deming's population increased by 69 percent between 1970 and 2000, while population in Luna County grew by 114 percent (Table 19). Deming's population increased by 21 percent between 1990 and 2000, while the population in Luna County increased by 38 percent (Table 20).

Table 19. Historical Population
City of Deming and Luna County
1970 through 2000

City/County	Population			
	1970	1980	1990	2000
City of Deming	8,343	9,964	11,672	14,116
Luna County	11,706	15,585	18,110	25,016

Source: U.S. Census, 2000

Table 20. Historical Population Growth Rates
City of Deming and Luna County, 1970 to 2000

City/County	Growth Rate (%)		
	1970-1980	1980-1990	1990-2000
City of Deming	19	17	21
Luna County	33	16	38

Source: U.S. Census, 2000

The percentage of Luna County residents who live in Deming has decreased over time. Deming accounted for 71 percent of the Luna County population in 1970 and 56 percent of the

population in 2000. Luna County population outside of Deming includes the residents of Columbus and unincorporated areas of the County.

The UNM Bureau of Business and Economic Research (BBER) estimates that population has grown in Deming and Luna County since 2000, with increases of about 8 and 7 percent in Deming and Luna County, respectively, between 2000 and 2007 (Table 21).

Table 21. Population Estimates
City of Deming and Luna County, 2000-2007

City/County	Estimated Population (July 1 of each year)							
	2000	2001	2002	2003	2004	2005	2006	2007
City of Deming	14,114	13,993	14,087	14,240	14,405	14,690	14,987	15,277
Luna County	24,978	24,840	25,051	25,337	25,561	26,010	26,427	26,805

Source: BBER, 2009

During the same time period, the municipal boundaries have increased with annexations of multiple tracts of land, from 4,960 acres to 10,400 acres, a 110 percent increase.

3.4.2 Current City Population Data

The City has gathered data to determine the increase in population served by the City Water Utility above and beyond the population counted by the Census in 2000 and estimated by BBER (Table 21). Several factors require an adjustment to the Census estimate for the population of Deming.

First, the City is host to a significant population that resides in Deming over the winter months (referred to as “snowbirds”) and would not be counted by the Census. To estimate the snowbird population, the seven recreational vehicle (RV) parks on the City of Deming’s water system were contacted to determine the number of RV sites, the percentage occupancy in winter and summer, and the number of people at each site. The total 525 RV sites in all of the RV parks on the City’s water system are occupied to a capacity of 79 percent in the winter and 35 percent in the summer. The average number of people at each RV site is about 1.9. By adding the

population present in winter and summer months and dividing by 2, the effective full-time equivalent population served by the water system is 576.

Migrant farm workers who reside in the City are also not counted by the Census. The population of migrant farm workers and their families was estimated by using the agricultural census for Luna County, which reported 864 farm workers in 2002. An NMSU study (Eastman, 1996) reported that 53 percent of the interviewed farm workers came with their families. One-quarter of the families had 5 to 6 members, and the other three-quarters had 4 family members. Using these statistics, a total of 2,466 farm workers and family members are living in the Deming area for 90 to 120 days a year. Prorated over the entire year, these would be an additional 608 to 810 potential full-time equivalent water customers. Some of these individuals may not reside in the City of Deming or may be included in the population counted in the RV parks over the summer months. Therefore, only half of the estimated farm worker population (prorated for the entire year) was used to adjust the census estimate.

A third population sector not included in the 2000 census is the water customers outside of the City limits. In 2007, 98 residential accounts were outside the City limits. Using the 2000 Census household size of 2.7 yields a total population of 265 served by the water utility outside the city limits. While this estimate is based on the number of accounts outside the City limits in 2007, it was assumed for the 40-year plan that this number has not changed from 2000 to the present (2009).

Table 22 summarizes the three population sectors not included in the 2000 census.

Table 22. Effective City of Deming Water Utility Customer Population Not Counted by 2000 Census

Transient Class	Effective Additional Customers
Snowbirds	576
Migrant farm workers	405
Customers outside city limits	265
Total additional customers	1,246

The City of Deming population estimates from the 2000 Census and those for each year since the census (Table 21; BBER, 2009) were adjusted by adding 1,246 of the additional full-time equivalent water customers as discussed above. It was assumed in making this adjustment that the additional water customer value is constant each year from 2000 to 2008. The revised population estimate is shown in the third column in Table 23. An alternative revised population estimate was also developed based on the adjusted 2000 Census population (15,362) and adding the new water accounts that have occurred each year through new water meters or annexation.

Table 23. Deming Water Utility Population Served Adjusted to Include Transient Population

Year	Existing Population Estimate [a]	Adjusted Population [b]	Annual Increase in Population Served		Revised Population Estimate
			Based on New Water Meters	New Annexed	
2000	14,116	15,362	246	87	15,695 [c]
2001	13,993	15,239	238	87	16,020 [d]
2002	14,087	15,333	278	87	16,386 [d]
2003	14,240	15,486	251	87	16,724 [d]
2004	14,405	15,651	267	87	17,079 [d]
2005	14,690	15,936	278	87	17,444 [d]
2006	15,987	16,233	356	87	17,888 [d]
2007	15,277	16,523	308	87	18,283 [d]
2008	NA	NA	108	0	18,391 [d]

[a] 2000 Census population for Deming and BBER estimates for July of each year (not available for 2008)
[b] Added population for seasonal (winter) residents, migrant farm workers, and customers outside city limits
[c] Adjusted population for 2000 plus new population served through new meters and annexation during 2000
[d] Previous years revised population plus new population served through new meters and annexation for that year

Based on these data, the City estimates that the population served by the City of Deming water system in 2008 was 18,391. This number is about 3,000 higher than the BBER 2007 estimate, but is within the range of the low and high 2010 population estimates for Deming in the *Southwest New Mexico Regional Water Plan* (DBS&A, 2005, Appendix E4).

3.4.3 Factors That Could Impact Future Growth

The current population growth in the City of Deming (Table 21) can be attributed to many factors, including natural growth, creation of more employment opportunities in the agricultural and interstate construction sectors, in-migration of retirees and "snowbirds," and the influx of people from Mexico either to work as seasonal employees in the agricultural industry or for other job opportunities (City of Deming, 2003). The *Southwest New Mexico Regional Water Plan* indicates that industrial and retirement community development will be the primary drivers for growth going forward (DBS&A, 2005).

The 2000 Census indicates that the City of Deming has a high number of people under the age of 19 (33 percent) and age 65 and older (19 percent) relative to other communities (City of Deming, 2003). The large number of young and older people may impact future growth in Deming, as people in each of these age groups grow older.

Although unemployment, under-employment, and seasonal employment have historically been issues in the City of Deming and Luna County, the City is in need of more residential development in order to keep up with the rapid growth rate (City of Deming, 2003). As of 2008, there were approximately 5,585 residential water accounts in Deming (Jenkins, 2009). As of the date of this plan, two new subdivisions are under construction. The first will include 300 homes and is already 50 percent complete. The second will include 700 homes and will be built out in the next 10 years. Although water and wastewater facilities do not currently serve the area where this second subdivision will be built (Jenkins, 2008), extensions of City services are planned. Another 1,000 homes in three other development areas are also being planned, but have not been submitted for approval by the planning department (Jenkins, 2009).

The City has multiple large industrial water users, including Luna Energy, Solitaire Mobile Homes, and Border Foods, and growth by these users will continue to impact Deming's water demand. The Luna Energy facility opened in the spring of 2006 and has 25 employees. The facility is at full production and has no plans for expansion (Jenkins, 2008). The Solitaire Mobile Homes plant has 300 employees and is also at full production with no plans for expansion (Jenkins, 2008). Border Foods has been expanding and is now the largest chile processor in New Mexico, with 766 year-round employees (City of Deming, 2003). Another factor that is

impacting water demand in Deming is the presence of the U.S. Border Patrol (Jenkins, 2008). Currently, 250 border patrol agents are based in Deming, and that number is expected to grow to 450 by 2010. These agents generally live in rental units in Deming and the surrounding area (Jenkins, 2008). Several multi-unit housing complexes are being built to house these agents, and it is expected that by 2010, the majority of these agents and their families will live in Deming.

3.4.4 Previous Population Projections

Previously existing population projections include projections made by the BBER and projections provided in the *Southwest New Mexico Regional Water Plan.* Potential growth is also discussed in the *City of Deming Comprehensive Plan.* The potential growth identified by each of these documents is discussed below.

BBER has projected the Luna County population through 2035 (Table 24), although their projections do not estimate what percentage of the total population will be living in Deming. BBER projected growth rates range from 0.78 to 1.23 percent per year, with growth rates in general declining over time (Table 25).

Table 24. BBER Population Projections for Luna County, 2005 through 2035

	Population (as of July 1 of each year)						
County	2005	2010	2015	2020	2025	2030	2035
Luna County	26,394	27,985	29,755	31,479	32,919	34,231	35,647

Source: BBER, 2009

Table 25. BBER Projected Population Growth for Luna County, 2005 to 2035

	Growth Rate (%)					
County/City	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Luna County	1.17	1.23	1.13	0.89	0.78	0.81

Source: BBER, 2009

The *Southwest New Mexico Regional Water Plan*, completed in 2005, includes low- and high-growth scenario population projections for Luna County and Deming through 2040 (Table 26). These population projections were based upon historical population growth, existing growth forecasts, trends in land use and water demand sectors, and proposed and projected future development (DBS&A, 2005).

Table 26. Southwest New Mexico Regional Water Plan Population Projections for City of Deming and Luna County, 2000 through 2040

County	Growth Scenario	Population				
		2000	2010	2020	2030	2040
Deming	Low	14,116	16,363	18,524	20,405	22,027
	High	14,116	18,927	24,190	29,291	34,074
Luna County	Low	25,189	28,493	31,598	34,253	36,510
	High	25,189	32,181	39,499	46,339	52,572

Source: DBS&A, 2005

The *City of Deming Comprehensive Plan* includes population projections for the City of Deming that are based on the BBER projections for Luna County. The projections presented in the comprehensive plan were calculated by assuming that the City of Deming will continue to account for 56 percent of the Luna County population through 2030. The projected population calculated based on this assumption is shown in Table 27.

Table 27. Population Projections for the City of Deming 2000 through 2030

City	Population			
	2000	2010	2020	2030
Deming	14,116	18,048	22,143	25,962

Source: City of Deming, 2003

The Deming Public Schools conducted an analysis in 2006 to study the district's growth issues and project enrollment (ARC, 2006). The Deming Public School district includes all of Luna County and includes seven elementary schools (one of which is in Columbus), two middle

schools, one mid-high school, and one high school. Population within the school district grew at an average rate of 3.3 percent per year between 1990 and 2000 (ARC, 2006).

Based on the population data gathered by the City of Deming and the fact that it corresponds closely to the high-growth population projection in the *Southwest New Mexico Regional Water Plan* (DBS&A, 2005), and the City of Deming projections shown in Table 27, this 40-year water plan relies on the high-growth population projections in the *Southwest New Mexico Regional Water Plan* to estimate future water demand.

3.5 Future Water Demand

Future water demand was projected through 2050 for the City of Deming using projections developed for the *Southwest New Mexico Regional Water Plan* (DBS&A, 2005). Calculated projected demand ranges from 3,775 ac-ft/yr (low projection for 2010) to 9,119 ac-ft/yr (high projection for 2050) (Table 28, Figure 28). Total production by the City of Deming has ranged between approximately 4,000 and 4,550 ac-ft/yr during the last five years (Jenkins, 2009). By 2050, water demand in Deming is projected to increase by 1,387 ac-ft/yr under the low projection or 5,017 ac-ft/yr under the high projection.

Table 28. Projected City of Deming Water Demand

Year	City of Deming Population [a]		Projected Water Use [b] (acre-ft/yr)	
	Low	High	Low	High
2010	16,363	18,927	3,775	4,367
2020	18,524	24,190	4,274	5,581
2030	20,405	29,291	4,708	6,758
2040	22,027	34,074	5,082	7,861
2050	23,789 [c]	39,526 [c]	5,489	9,119

[a] Source: *Southwest New Mexico Regional Water Plan* (DBS&A, 2005)
[b] Based on per capita demand of 0.23 ac-ft/yr (206 gpcd), the Deming 2007 per capita demand for all sectors. Significant decreases in demand in July and August of 2008 can be attributed to unusually heavy rainfall during those two months, and 2008 data were therefore not used for the projections.
[c] The regional water plan projected population only to 2040; this 2050 projected population has been calculated assuming that population grows at the same rate between 2040 and 2050 as between 2030 and 2040.

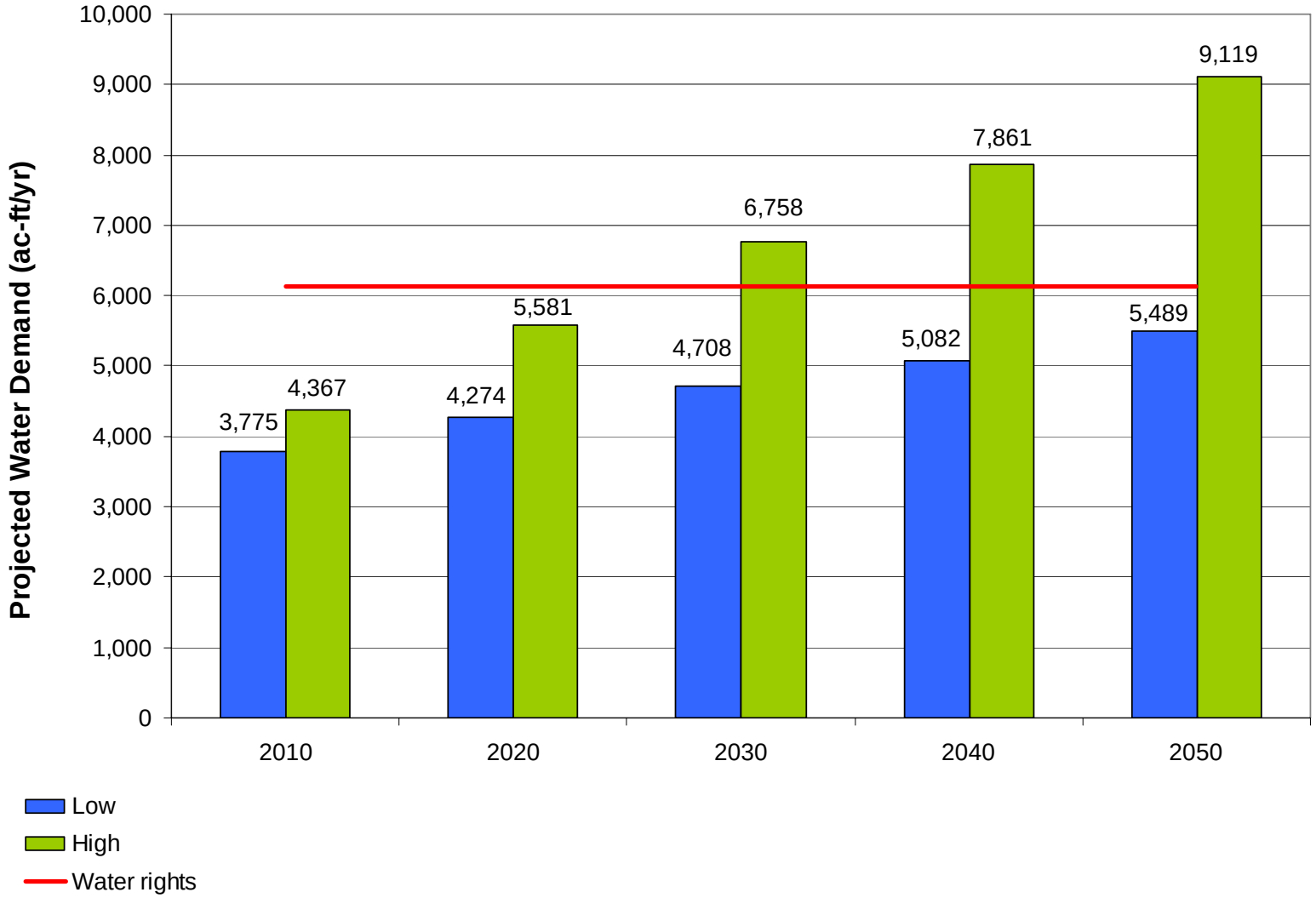

Figure 28

DEMING 40-YEAR WATER PLAN

City of Deming

Projected Water Demand

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Currently, the City of Deming has sufficient municipal water rights to meet the high growth projection in 2020. Conversion of the City's existing irrigation water rights may allow the City to meet projected water demand to 2050, but two issues may affect the City's ability to do so:

- It may not be economically feasible to convert some of the irrigation rights located several miles southeast of the City due to the distance the water would have to be piped.

- The City may encounter difficulty converting irrigation water rights to municipal use due to protests from existing users and to limitations placed by the OSE in applying the Mimbres Basin administrative criteria. A recent attempt by the City to convert one of its water rights to municipal use was protested and the City subsequently withdrew the application.

Therefore, it cannot be assumed that all the City's irrigation water rights will be converted and available for future municipal use. Applying to the OSE for return flow credit for water returned to the aquifer from irrigation with treated effluent could allow the city to meet a small portion of projected demand. However, the population projections demonstrate that the City of Deming clearly needs the water rights it has already acquired and will need additional accessible water rights for future use. Consequently, the City will continue to acquire water rights in anticipation of future growth.

4. Water Conservation Plan

The City of Deming recognizes that water is a limited resource in New Mexico As the City continues to grow and water demand increases, water conservation can play an important role in ensuring that the available supplies will meet future demand. The City passed its current water conservation ordinance in 2004, recognizing that water conservation can prevent or delay the need for expensive capital expenditures to develop new water supplies and acquire additional water rights. The water conservation plan presented herein is an important part of the City's water supply management strategy and will allow for efficient use of and conservation of existing resources.

This document, along with the City's existing conservation ordinances, addresses the conservation requirements under the New Mexico 40-year water planning statute as well as Section 72-14-3.2 of NMSA 1978, which calls for conservation planning as a prerequisite for funding from key state funding agencies. Specifically, "any public supply system with diversions of at least 500 acre-feet annually for domestic, commercial, industrial, or government customers for other than agricultural purposes, may develop, adopt and submit to the State Engineer, by December 31, 2005, a comprehensive water conservation plan, including a drought management plan, and that after December 31, 2005, neither the Water Trust Board nor the New Mexico Finance Authority shall accept an application from a covered entity for financial assistance in the construction of any water diversion, storage, conveyance, water treatment or wastewater treatment facility unless the covered entity includes a copy of its water conservation plan." The City has submitted its existing conservation ordinances (including the drought management plan [ordinance 9-4-8]) with its applications for funding.

Water conservation is an important component of the City's water planning because the OSE evaluates water rights transactions (including changes in point of diversion or place or purpose of use, as well as new permit applications) with respect to whether the transaction will impair existing water rights and whether it is consistent with public welfare and conservation. For example, water suppliers with large losses in their system, high per capita water use rates, or other indicators of high water use may be required to address these issues before the OSE will approve an application to appropriate additional water. This requirement is part of an overall

strategy by the State to ensure that water is being used wisely before additional water rights are permitted.

4.1 Existing Conservation Practices

The City of Deming implemented comprehensive water conservation and drought management ordinances in 2004 (Appendix A). Likewise, the City has already implemented a number of water conservation-related activities, including an increasing block water rate structure, automated billing system, customer water meter replacement, production management using a system control and data acquisition (SCADA) system, leak surveys and standards for water line construction and wastewater reuse. Sections 4.1.1 through 4.1.7 summarize the City's existing programs.

4.1.1 Water Rates

City water rates were last updated by an Ordinance No. 1185, passed April 16, 2009 (City of Deming, 2009). The updated water rates have an increasing block rate structure; that is, as water consumption increases, so does the cost to the customer, thus creating an incentive to reduce consumption. In addition, water rates are higher from May 15 to October 15 of each year.

Deming water rates were compared to the water rates in other New Mexico communities of similar size. An analysis of 2006 water rates by the NMED Construction Programs Bureau indicates that the charge for 6,000 gallons of water in the residential sector ranged from a minimum of $6.75 (Artesia) to a maximum of $50.00 (San Ysidro). Average and median residential water rates for New Mexico communities of similar size to Deming (Table 29) were $13.51 and 14.08, respectively, per 6,000 gallons in 2006; Deming's summer rate was $11.16 per 6,000 gallons. Under the new residential rates, the cost for 6,000 gallons is $12.26 for 2009, $13.42 for 2010, and $14.84 for 2011.

The charge for 6,000 gallons of water in the commercial sector ranged from a minimum of $8.50 (Tatum) to a maximum of $140.79 (Albuquerque Bernalillo County Water Utility Authority) for the 101 New Mexico municipalities that were included in the survey. New Mexico communities of

similar size to Deming had average and median commercial water rates of $17.45 and 14.61, respectively, per 6,000 gallons in 2006. Under the new commercial rates for Deming, the cost for 6,000 gallons is $18.32 for 2009, $21.56 for 2010, and $25.76 for 2011.

Table 29. Municipal Water Rates in Comparable New Mexico Municipalities

Municipality	Residential		Commercial	
	Number of Connections	Monthly Charge for 6,000 Gallons ($)	Number of Connections	Monthly Charge for 6,000 Gallons ($)
Artesia	3,979	6.75	551	13.50
Carlsbad	9,195	10.53	1,480	12.46
Deming	5,730	12.26 [a]	596	18.32 [a]
Gallup	5,977	20.92	1,257	33.72
Hobbs	9,320	11.03	1,463	11.03
Portales	3,995	14.41	731	14.41
Raton	3,591	15.55	570	20.56
Silver City	5,603	14.80	575	14.80
Socorro	3,345	14.23	361	14.23
Sunland Park	4,002	13.92	345	20.32
Average		13.44		17.34
Median		14.08		14.61

Source: NMED, 2007a, unless otherwise noted [a] Current summer rate

4.1.2 Automated Billing System

The City of Deming uses the Itron system for billing its customers, and billing is done twice a month (Jenkins, 2008). The Itron billing system is an electronic read system in which data are collected by meter readers using handheld units. Data are automatically entered and downloaded from the handheld units into the billing system (Jenkins, 2008). The system flags accounts when the current reading is out of range for historical readings, and the meter reader gets an error signal and is immediately asked to re-read the meter if use is extremely high or low. If the repeat reading is correct, it is followed up with a field check (Jenkins, 2009).

4.1.3 Customer Water Meter Replacement Program

The City of Deming has a 10-year customer water meter replacement program (Jenkins, 2009).

4.1.4 Production Management

In July 2007, the City installed a SCADA system, which is being used to control the four largest production wells. Additional wells will be added over time. This system controls when each well is being pumped, helping the City to keep the optimal amount of water in storage and preventing overflows (Jenkins, 2008). The system limits are set to trigger increased production whenever the storage tanks are less than half full and to shut off all pumps when the storage tanks are three-quarters full. Having the SCADA system in place allows the system to respond more efficiently to fluctuations in demand (Jenkins, 2009).

In 2009 the City brought online a 3,000,000-gallon ground-level water storage tank. Five 600-gpm booster pumps are SCADA-controlled to supply water from this new tank to the distribution system. The pumps are controlled by the level of water in the two overhead water storage tanks (Section 3.1) to maintain a much more constant level in the overhead tanks.

4.1.5 Leak Surveys and Standards for Water Line Construction

The City of Deming follows American Water Works Association (AWWA) water line construction standards and performs leak surveys every five years as required. Leak detection companies are hired to perform these surveys, and the City decides when a survey is necessary based on the volume of non-revenue water for the year. In 2008, non-revenue water accounted for 4 percent of total production (Jenkins, 2009).

Meter readers are trained to look for leaks, and when leaks are apparent, meter reading staff attempt to inform the customer and may turn off the water if no one is home (Jenkins, 2008). The City also often receives phone calls reporting wet spots or water leaks that result in field surveys and leak repair (Jenkins, 2008). The Public Works and Utilities Department analyzes the previous year of water use data by account each January and, based on this review, investigates individual accounts with higher than normal use (Jenkins, 2008).

4.1.6 Wastewater Reuse

The wastewater treatment plant treats an average of approximately 1 to 1.3 million gallons of wastewater per day (Jenkins, 2008). During December, January, and February, treated wastewater is stored in lined lagoons at the treatment plant, where the City has 130,000,000 gallons storage capacity. This stored effluent is currently used for irrigation from March through the fall (Jenkins, 2008); however, since early 2008, approximately 300,000 gallons of treated effluent has been contracted for use by Luna Energy. This reuse of city effluent reduces diversions from the Mimbres groundwater basin by an equivalent amount. The remaining 1 million gallons of treated effluent are commingled with water from the City system to supplement irrigation of the municipal cemetery and golf course, reducing system diversions by 336 ac-ft/yr (Jenkins, 2008). The balance of municipal wastewater not used to directly offset these system diversions is applied as irrigation to City-owned farms, increasing return flow to the aquifer by up to 1,120 ac-ft/yr.

4.1.7 Outdoor Water Conservation Ordinance

The City of Deming passed its water conservation ordinance effective June 2004 (Deming Municipal Code 9-4-8). The ordinance mandates turf and landscape irrigation conservation measures, including irrigation day restrictions (even-numbered addresses may irrigate on Mondays, Wednesdays, Fridays, and Sundays; odd-numbered addresses may irrigate on Tuesdays, Thursdays, Saturdays, and Sundays) and time of day irrigation restrictions (all outdoor irrigation is prohibited between the hours of 10:00 a.m. and 6:00 p.m. from April 1 through September 30) (D.M.C. 9-4-8 C). The outdoor water conservation provisions restrict nonessential water use and require that all home and/or automobile washing be done using a handheld bucket or handheld hose with a shutoff nozzle (D.M.C. 9-4-8(D)).

The ordinance prohibits water waste, defined as follows:

- Causing water to discharge onto any street, alley, gutter, ditch, drain, or public right of way

- Failing to repair a leak in a system within 10 days of discovery

- Washing any outdoor impervious surface, except in emergencies or where mandated by federal, state, or local law

- Serving drinking water in local restaurants except on request

The code also mandates that any swimming pools constructed after the effective date of the outdoor conservation code be equipped with filtration, pumping, and recirculation systems (D.M.C. 9-4-8(E)).

Requests for variances from the requirements set out by conservation ordinance are reviewed by the planning and zoning commission on the basis of hardship or special cases, and the commission makes recommendations to the city council if it feels a variance should be approved. Inconvenience and/or the potential for damages to landscaping do not justify a request for a variance (D.M.C. 9-4-8 (F)). Exceptions to enforcement include water used for firefighting purposes, inspection and pressure testing of fire hydrants, street sweeping, sewer maintenance, or other established utility and public works practices, and water used to establish newly seeded or sodded turf grass and landscaping (D.M.C. 9-4-8 (G)).

To implement additional water use restrictions, the Deming City Council has the authority to declare a water emergency, on the advice of the city administrator and/or director of public works. The city council may, by resolution, restrict or prohibit use of water for irrigation, residential home and/or car washing, swimming pool filling and refilling, operation of ornamental fountains, or any other use deemed unappropriate given the circumstances (D.M.C. 9-4-8 (H)). Variances may not be issued during this time. The maximum penalty for violation of any of the outdoor water conservation code provisions is a fine of $500, imprisonment for up to 90 days, or both (D.M.C. 9-4-8 (I)).

4.1.8 Landscape Requirements for New Development

In addition to its water conservation ordinance, the City of Deming has passed landscape standards to encourage water conservation by preserving native vegetation and encouraging the use of low-water-use and drought-tolerant plants (D.M.C 12-18-2). General design standards mandate the use of low-water-use plants and limit the amount of surface area that

may be planted in turf for single family and multifamily dwellings and for commercial sites (D.M.C. 12-18-2 (D), (E), and (F)). Modifications may be allowed if a compelling case can be made before the City Council. Financial hardship is not a basis for granting a modification request (D.M.C. 12-18-2).

4.2 Conservation Goals and Measures

Improving customer and public awareness of the need to conserve water is one of the main goals of this water conservation planning document (Jenkins, 2008). Continued implementation and future expansion of a public education program that focuses both on water waste and indoor and outdoor water use in all sectors is a priority, in addition to continued implementation of the City's existing programs. Continued promotion of xeriscaping, landscape requirements for new development, and an indoor water conservation ordinance are measures under consideration.

4.2.1 Conservation Goals

Conservation activities are generally implemented either by the water supplier or the water customer, and improvement in customer and public awareness is likely to lead to the implementation of conservation measures by customers. Important components of the City of Deming water conservation public education program include:

- Providing the rationale for conservation and demonstrating that the City is already addressing water conservation in its system management before asking customers to change how they use water. Customers will be more willing to voluntarily change their behaviors/habits that lead to excess water use if they understand why it's important and if they know that all water users are also doing the same.

- Addressing the obvious forms of water waste first, targeting the most wasteful practices before asking individual users to change the ways that they use water.

- Educating customers about what they can do to reduce their use.

The most common types of water waste are over watering (applying more water than is needed to keep landscapes green), which results in higher outdoor water use due to increased evaporation and evapotranspiration, and fugitive water, which can be seen in the form of runoff. Fugitive water is not a large problem in Deming. As described in Section 4.1.7, the City can assess fines for water waste, although the issuance of warnings along with public education has resolved all water waste issues to date (Jenkins, 2008). Water waste fines go through the municipal courts, as do fines for any code violation (Jenkins, 2008).

4.2.2 Conservation Measures

The Department of Public Works and Utilities has an existing public education program, which involves speaking to several different groups each year (Jenkins, 2008). The City of Deming has an outdoor water conservation code that went into effect in June 2004, setting watering days and times and prohibiting water waste (Section 4.1.7). The City does not currently offer rebates for the removal or replacement of high-water-use plants, nor does it have a rebate program for the replacement of high-water-use appliances (Jenkins, 2008).

The measures that the City of Deming plans to implement to continue to meet its conservation goals are outlined in Sections 4.2.2.1 through 4.2.2.3.

4.2.2.1 Public Education Program for Residential and Commercial Users

A number of tools can be used to share water conservation tips with customers and the general public, including bill inserts, feature articles and announcements in the news media, workshops, booklets, posters, and bumper stickers. Public school education is also an important means for instilling water conservation awareness.

The City of Deming's public education efforts already include speaking to different groups each year, and the number of presentations made will be increased to reach more members of the general public (Jenkins, 2009). In addition, the City will include water conservation materials in customer mailings and make water conservation literature available online and at public locations. The City will also contact Deming Public Schools to begin bringing water conservation lessons to the classroom. Children who learn about conservation in the classroom will take that information home and educate their own families.

4.2.2.2 Evaluation of Rebate Programs for Replacement of High-Water-Use Appliances

The City will evaluate implementing a rebate program for replacing high-water-use appliances with approved lower-water-use models, similar to existing programs in many other New Mexico communities. Such a program can reduce indoor and per capita demand.

4.2.3 Evaluation of Existing Use and Implementation of Conservation Measures

Potential savings from implementation of conservation measures are discussed in Sections 4.2.3.1 and 4.2.3.2. Figure 29 shows the net and residential per capita water demands for Deming from 2000 to 2008. While the net rate has varied, the residential per capita demand has steadily declined, from 137 gpcd in 2000 to 97 gpcd in 2008, a 29.5 percent reduction. Some of the decline is likely a result of the conservation efforts initiated by the City of Deming.

4.2.3.1 Residential Sector

Residential sector demand reductions can be achieved through improving efficiency of indoor plumbing and reducing use for outdoor irrigation. In 2008, residents of the City of Deming (including the transient population) used 97 gpcd for residential use (use by all sectors brought the total per capita demand to 194 gpcd). The amount of indoor residential use was estimated by multiplying the average monthly winter use, when outdoor watering is at a minimum, times 12 months to obtain an annual indoor use. This amount does not include the water used by evaporative coolers over the warmer months. Of the 97 gpcd, approximately 61 percent (59 gpcd) was used indoors in 2008, while the remaining 38 percent (37 gpcd) is estimated to have been used for outdoor irrigation and/or evaporative coolers. Average evaporative cooler demand is estimated to be 14.4 gpcd (39 gallons per day per house or 66 gallons per day over the 214-day cooling season) (Vickers, 2001). With 2.68 people per household in Deming in 2000 (U.S. Census, 2000), the overall annual indoor use can be estimated at 73.4 gpcd.

An indoor water use of 73.4 gpcd is less than the 1999 national average of 94.3 gpcd (Vickers, 2001) for non-conserving homes with evaporative coolers (Table 30). Vickers (2001) estimates that homes with low-water-use fixtures and with non-circulating evaporative coolers can reduce indoor demand to 70.5 gpcd. A reduction of this magnitude would be a 4 percent reduction in indoor demand. A 5 percent reduction in the residential sector's 2008 water demand, from 97 to 92 gpcd, would result in an overall 3 percent reduction in the total Deming water sales.

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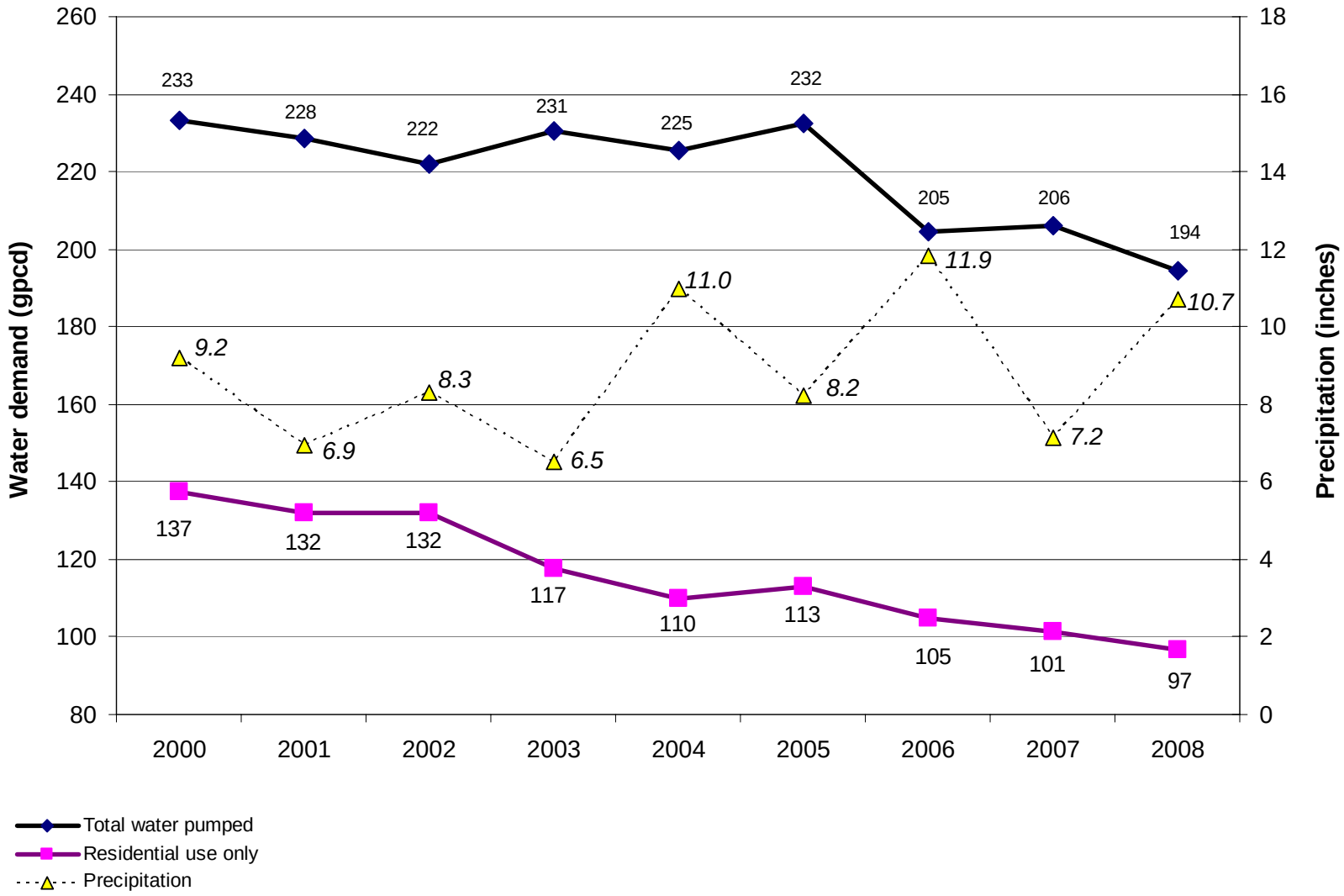

DEMING 40-YEAR WATER PLAN

City of Deming
Per Capita Water Demands and Precipitation

Figure 29

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Table 30. Indoor Water Demand Estimates

Scenario	Per Capita Indoor Demand (gpcd)
City of Deming indoor use, including 14.4 gpcd for evaporative coolers	73.4
National average for non-conserving household with evaporative cooler in 1999 [a]	94.3
Water-conserving households with evaporative coolers [a]	70.5

[a] Vickers, 2001 gpcd = Gallons per capita per day

Average outdoor residential water demand was estimated to be 23 gpcd in Deming in 2008 and averaged 30 gpcd from 2000 to 2008. Table 31 shows the estimated outdoor water demand in Deming for different landscaping types and irrigation methods, assuming an average landscaped area (Wilson, 1996). If each household were to irrigate an 800-square-foot (ft^2) lawn of Kentucky bluegrass, 1,000 ft^2 of trees and 200 ft^2 of garden by conventional methods, annual water demand would be 78,040 gallons per household.

Table 31. Potential Demand for Outdoor Use

Outdoor Use	Irrigation Requirement ($gal/ft^2/yr$) [a]	Area (ft^2)	Demand (gal/yr)
Kentucky bluegrass [b]	53.42	800	42,736
Bermuda grass [b]	40.59	800	32,472
Buffalo grass [b]	28.60	800	22,880
Trees [b]	30.06	1,000	30,060
Horticultural plants (herbs and gardens) [b]	26.22	200	5,244
Trees [c]	17.68	1,000	17,680
Horticultural plants (herbs and gardens) [c]	15.42	200	3,084

Source: Wilson, 1996
$gal/ft^2/yr$ = Gallons per square foot per year
gal/yr = Gallons per year
[a] Luna County irrigation requirement
[b] Sprinkler or flood irrigation
[c] Drip irrigation

Average City of Deming house size was 2.68 people in 2000 (U.S. Census, 2000), so a household use of 78,040 gallons per year would yield an outdoor per capita demand of 80 gallons. If buffalo grass were used for lawn, and trees and gardens were irrigated using drip irrigation, outdoor demand would be 43,644 gallons, or 44.6 gpcd. Both of these examples are

more than the average City of Deming resident uses for outdoor watering, suggesting that outdoor water use is already at reasonable levels.

Top users in the residential sector included golf course and the Country Club Garden Mobile Home Park accounts (Table 14), which accounted for almost 3 percent of total Deming water sales in 2006. Other top users included individual, apartment, church, and public school accounts.

4.2.3.2 Commercial and Industrial Sectors

Use in the commercial and industrial sectors accounted for about 28 percent of the total water sales by the City of Deming in 2008.

- The top commercial users in 2006 included highway, hotel and motel, manufacturing, and restaurant and bar accounts. Use by these top commercial users collectively accounted for about 12 percent of total water sales in 2006.

- Top users in the industrial sector include food and drink manufacturers (Border Foods, Deming Coca Cola, Mimbres Valley Produce, and Joseph's Lite Cookies), energy/oil, construction, and wastewater and septic tank manufacturing accounts. Border Foods is the single top industrial user and accounted for almost 12 percent of total water sales in 2006. Use by the top industrial users collectively accounted for approximately 13 percent of total sales in 2006.

Vickers (2001) cites typical conservation savings in the commercial sector as ranging from 15 to 35 percent. A 15 percent reduction in the commercial sector's 2008 water demand would result in an overall 2.4 percent reduction in total Deming water sales, reducing the per capita use of 194 gallons for all sectors to 190 gpcd. A 15 percent reduction in the industrial sector's 2008 water demand would result in an overall 1.7 percent reduction in total Deming water sales, from 194 gpcd for all sectors to 191 gpcd. Reducing the commercial and industrial demands by 15 percent each in 2008 would result in an overall 4.2 percent reduction in total Deming water sales, from 194 gpcd to 186 gpcd.

4.2.4 Summary of Conservation Potential

The City of Deming has already significantly reduced per capita demand in the residential sector; however, if all residents implement indoor conservation efforts, the residential indoor demand can be further reduced. Conservation efforts by commercial and industrial users must be investigated on an individual basis, but a goal of 15 percent reduction is reasonable for these sectors. If the efforts outlined in Sections 4.2.1 through 4.2.3 are realized, an overall demand reduction of 7 percent could be achieved. Figure 30 shows the reduction in predicted future water demand if the overall demand can be reduced by 10 percent.

4.2.5 Funding and Implementation of Deming's Water Conservation Plan

The City of Deming can increase its water conservation efforts using existing staff and funding. However, to implement all phases of the conservation effort and to continually monitor demand data and improve conservation efforts, the City will need to obtain and dedicate additional sources of funding. In addition to potential grant funding (e.g., federal drought programs, community development block grants), technical assistance may be available from state or federal agencies.

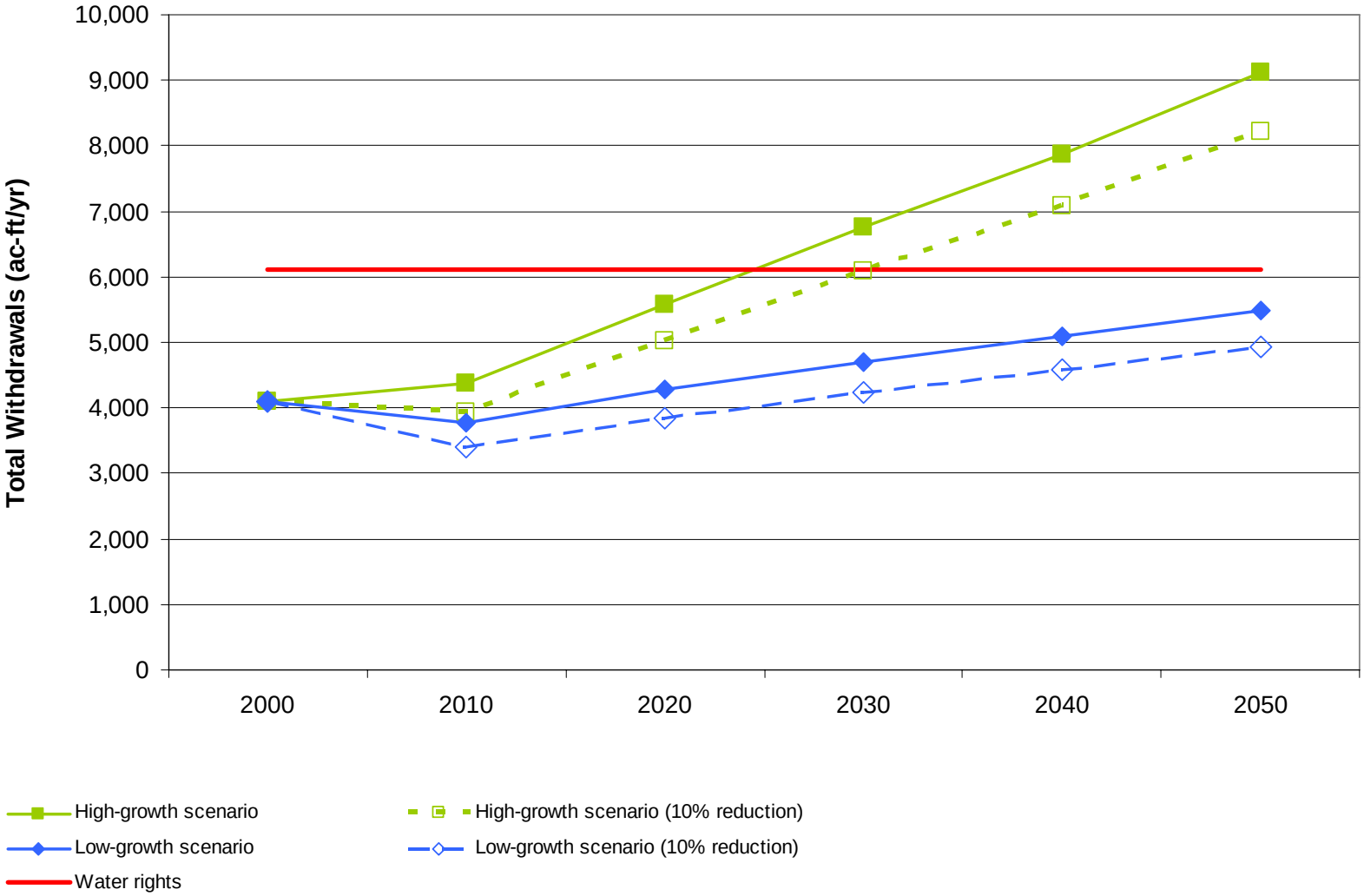

Figure 30

DEMING 40-YEAR WATER PLAN

Potential Effects of Conservation on City of Deming Projected Water Demand

Daniel B. Stephens & Associates, Inc.

5/21/09

5. Summary and Recommendations

Based on the analysis provided in Sections 2 through 4, DBS&A recommends that the City of Deming consider the actions detailed below.

Water Supply and Quality

- Continue collecting depth to water measurements to monitor any changes in water supply.

- Continue collecting water quality samples, paying particular attention to the levels of arsenic, fluoride, nitrate, TDS, sulfate, and volatile organic compounds (VOCs) in the Deming drinking water supply.

- Continue implementing the City's wellhead protection program to ensure the future safety of the City's water supply.

Future Water Demand

- Review population projections every 5 years to determine if the projections in the current plan are still valid.

- Evaluate and revise per capita demand every 5 years based on conservation measures that are implemented and water use of expanded or new use in the commercial and industrial sectors.

Water Rights

- Continue to evaluate and purchase additional agricultural water rights for future municipal use in Deming, in accordance with the Deming Water Rights Acquisition Policy (Appendix B).

- Document all water rights that have been evaluated for purchase, even if the City opted not to purchase the water right.

- Update existing municipal records for existing water rights.

- Implement the recently developed tracking system for all paperwork submissions required annually by the State Engineer for each water right as applicable. For example, the City may be required to file requests for extensions of time to prove beneficial use and, for certain rights, notices of intent to irrigate. This system should also document which water rights require other paperwork preparation such as change of ownership forms.

- Maintain copies of the City's water rights files in the City's records.

Conservation

- Continue the current program management and staffing by the Public Works Department.

- Expand the existing public education component to support the City's water conservation goals.

- Make residential water conservation a priority, since the majority of use occurs in this sector and the potential savings are higher than in other sectors.

- Work with the largest users in the commercial and industrial sectors to identify how water can be conserved by those customers.

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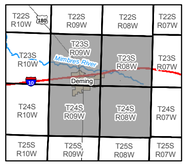
Plate



Explanation

Water right

- 10 - 50
- 50 - 100
- 100 - 200
- > 200
- City well
- Township and range line
- Section line
- Farmland
- City-owned agricultural water rights
- City-owned water rights converted to municipal use
- Administrative block
- City of Deming

E. Vocale —— Owner
M-101 —— State Engineers water rights file number
152.00 ac —— Water right

Source: Ownership and location data obtained from the OSE Water Administration Technical Engineering Resource System (WATERS) database.

N

0 4000 8000 Feet

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Daniel B. Stephens & Associates, Inc.

05/19/2009 JN WR09.0067

DEMING 40-YEAR WATER PLAN

Water Rights and Farmland In and Around Deming

PLATE 1

Appendix A

City of Deming
Water Use Ordinances

Water Use Ordinances

Ordinance pertaining to	Code Section	Ordinance #
Water Rates	9-3-1	1185 pgs. 5-9
Outdoor Water Conservation & Drought Contingency Plan	9-4-8	1088 & 1139
Indoor Water Conservation	11-1-5	1087 pg. 1
Water Conservation; Use of Gray Water	11-1-6	1087 pg. 2
Landscape Standards	12-18-2	1086

ORDINANCE NO. 1185

AN ORDINANCE AMENDING TITLE 9 OF THE DEMING CITY CODE, NEW MEXICO

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF DEMING, NEW MEXICO:

1. Title 9, Chapter 1, Sections 9-1-4, 9-1-4 A, 9-1-4 B and 9-1-4 C of the Deming City Code are hereby amended by deleting said Sections 9-1-4, 9-1-4 A, 9-1-4 B and 9-1-4 C in their entirety and replacing them with the following:

"9-1-4: GARBAGE COLLECTION FEES: Garbage collections fees payable to the city are established and identified in Sections 9-1-4 A, 9-1-4 B and 9-1-4 C of this Ordinance and shall be phased-in over a three (3) year period. The specific rates for each of the next three (3) years are identified in the tables that appear in each of Sections 9-1-4 A, 9-1-4 B and 9-1-4 C of this Ordinance. The garbage collection fee for the first year shall be effective on the effective date of this Ordinance and the first year fee shall be calculated for the first full billing cycle immediately following the effective date of this Ordinance. The second and third years' fees shall be effective on the annual anniversary of the first full billing cycle following the effective date of this Ordinance.

A. Residences:

1. General: The garbage collection fees set out in this Section 9-1-4 A shall be included within the water or gas utility bill to each water or gas user monthly, and the city shall not accept payment of the water, sewer or the gas utility bill unless the appropriate garbage fee is paid therewith. Owners or occupants of premises which do not use city water and city gas shall be billed monthly by separate billing for the appropriate garbage fee for their premises

2. Residences: Garbage Collection Fees: Garbage collection fees per household for residences shall be in accordance with the payment schedule set out in the table below:

Solid Waste Category	Fee: First Year	Fee: Second Year	Fee: Third Year
Residential Fee: Minimum per household	$10.23 per month	$12.72 per month	$14.86 per month

B. Businesses, High Volume Residences:

1. General: The garbage collection fees set out in this Section 9-1-4 B shall be included within the water or gas utility bill to each water or gas user monthly, and the city shall not accept payment of the water, sewer or the gas utility bill unless the appropriate garbage fee is paid therewith. Commercial owners or owners of high volume residences or occupants of any of these premises which do not use city water and city gas shall be billed monthly by separate billing for the appropriate garbage fees for their premises.

2. Businesses, High Volume Residences: Garbage Collection Fees:

a. Minimum Monthly Fee: Businesses, high volume residences shall pay a minimum monthly fee in accordance with the payment schedule set out in the table below:

Solid Waste Category	Minimum Fee: First Year	Minimum Fee: Second Year	Minimum Fee: Third Year
Commercial Fee: Minimum	$13.64 per month	$16.96 per month	$19.82 per month

b. Dumpster, Special Dumpster Pick-up and Special Trash Pick-up Fees: Businesses or residences as determined by the director of public works determines shall be charged fees, including special container/dumpster pick-up and special trash pick-up fees, in accordance with the payment schedule set out in the table below:

Times per week pick-up	1.5 CUBIC YARD CONTAINER/DUMPSTER			3 CUBIC YARD CONTAINER/DUMPSTER			4 CUBIC YARD CONTAINER/DUMPSTER		
	FEES			FEES			FEES		
	First Year	Second Year	Third Year	First Year	Second Year	Third Year	First Year	Second Year	Third Year
1	$32.74	$40.69	$47.56	$45.02	$55.95	$65.39	$54.57	$67.82	$79.27
2	$51.84	$64.43	$75.30	$72.31	$89.87	$105.03	$95.50	$118.69	$138.71
3	$72.31	$89.87	$105.03	$102.32	$127.17	$148.62	$136.43	$169.56	$198.16
4	$91.41	$113.60	$132.77	$130.98	$162.78	$190.24	$177.36	$220.43	$257.61
5	$109.15	$135.65	$158.53	$159.63	$198.38	$231.85	218.29	$271.29	$317.06

SPECIAL CONTAINER/DUMPSTER PICK-UP FEES		
FEE: FIRST YEAR	FEE: SECOND YEAR	FEE:THIRD YEAR
$20.46 per container/dumpster	$25.43 per container/dumpster	29.72 per container/dumpster

SPECIAL GARBAGE PICK-UP FEES		
FEE: FIRST YEAR	FEE: SECOND YEAR	FEE: THIRD YEAR
$20.46 minimum plus $20.46 per one half hour labor	$25.43 minimum plus $25.43 per one half hour labor	$29.72 minimum plus $29.72 per one half hour labor

C. Roll Out Containers:

1. General: The garbage collection fees set out in this Section 9-1-4 C shall be included within the water or gas utility bill to each water or gas user monthly, and the city shall not accept payment of the water or the gas utility bill unless the appropriate garbage fee is paid therewith. Users of Roll-out containers which do not use city water and city gas shall be billed monthly by separate billing for the appropriate garbage fee for their premises.

2. Roll Out Container Fee: For individual roll out containers, where the majority of subdivision residents have agreed to such services or where the director of public works

determines such roll-out container service to be necessary and appropriate, the fee shall be in accordance with the payment schedule set out in table below:

Solid Waste Category	New Minimum Fee: First Year	New Minimum Fee: Second Year	New Minimum Fee: Third Year
Roll-Out Container-Minimum Fee	$16.31 per month per container	$20.27 per month per container	$23.69 per month per container

2. Title 9, Chapter 1, Sections 9-1-6 C.4 of the Deming City Code is hereby amended by deleting said Sections 9-1-6 C.4 in its entirety and replacing it with the following:

"9-1-6 C.4: Fees Established: Special waste fees shall be in accordance with the payment schedule set out in the table below:

Special Waste Fees	Minimum Fees: First Year	Minimum Fees: Second Year	Minimum Fees: Third Year
Car Tires	$1.25 per tire	$1.50 per tire	$1.75 per tire
Truck and Other Equipment Tires	$6.20 per tire	$7.75 per tire	$9.00 per tire
Landfill Solid Waste Inside Luna County	$4.09 per cubic yard	$5.10 per cubic yard	$6.00 per cubic yard
Landfill Solid Waste Outside Luna County	$54.50 per cubic yard	$67.75 per cubic yard	$79.00 per cubic yard
Large Animals	$13.65 per animal	$17.00 per animal	$20.00 per animal

"

3. Title 9, Chapter 3, Section 9-3-1 A of the Deming City Code is hereby amended by deleting said Section 9-3-1 A in its entirety and replacing it with the following:

"**9-3-1 A:** Water Rates, Fees and Charges:

1. General: Water use rates payable to the city are established and identified in the Section 9-3-1 A.2 of this Ordinance shall be phased-in over a three (3) year period. The specific rates for each of the next three (3) years are identified in the table that appears in Section 9-3-1 A.2 of this Ordinance. The water use rates for the first year shall be effective on the effective date of this Ordinance and the first year fee shall be calculated for the first full billing cycle immediately following the effective date of this Ordinance. The second and third years' fees shall be effective on the annual anniversary date of the first full billing cycle following the effective date of this Ordinance.

Starting with the first year of the phase-in of the new water use rates, the quantity of water included in the base rates shall be four hundred (400) cubic feet. In the second year of the phase-in of the new water use rates, the quantity of water in included in the base rates shall be two hundred (200) cubic feet. In the third year of the phase-in of the new water use rates, the quantity of water in included in the base rates shall be zero (0) cubic feet.

2. Water User Rates: Water user rates shall be in accordance with the time period schedule and the payment schedule set out in the tables below:

Time Period	**Rates: First Year** (Base Rate Includes 400 cubic feet of water)		**Rates; Second Year** (Base Rate Includes 200 cubic feet of water)		**Rates: Third Year** (Base Rate Includes 0 cubic feet of water)	
May 15 to October 15	Base Rate	Incremental Rate per 100 cubic feet	Base Rate	Incremental Rate per 100 cubic feet	Base Rate	Incremental Rate per 100 cubic feet
Residential-inside City	$7.50	$1.19	$5.50	$1.32	$3.00	$1.48
Residential-outside City	$11.25	$1.78	$8.25	$1.98	$4.50	$2.22
Commercial-inside City	$12.00	$1.58	$11.00	$1.76	$10.00	$1.97
Commercial-outside City	$18.00	$2.37	$16.50	$2.63	$15.00	$2.96
Bulk Rate (meter deposit required)	--	$4.61/1,000 gallons	--	$5.12/1,000 gallons	--	$5.76/1,000 gallons

Time Period	Rates: First Year (Base Rate Includes 400 cubic feet of water)		Rates: Second Year. (Base Rate Includes 200 cubic feet of water)		Rates; Third Year. (Base Rate Includes 0 cubic feet of water)	
October 15 to May 15	Base Rate	Incremental Rate per 100 cubic feet	Base Rate	Incremental Rate per 100 cubic feet	Base Rate	Incremental Rate per 100 cubic feet
Residential-inside City	$7.50	$0.99	$5.50	$1.10	$3.00	$1.23
Residential-outside City	$11.25	$1.48	$8.25	$1.65	$4.50	$1.85
Commercial-inside City	$12.00	$1.32	$11.00	$1.46	$10.00	$1.64
Commercial-outside City	$18.00	$1.98	$16.50	$2.19	$15.00	$2.47
Bulk Rate (meter deposit required)	--	$3.84/1,000 gallons	--	$4.27/1,000 gallons	--	$4.80/1,000 gallons
Effluent from Wastewater Treatment Plant	Fee is fifty percent (50%) of water rates charged to residential users, inside the city or outside the city, as applicable and as seasonably adjusted.					

3. Water User Billings: Water user rates for residential and commercial users and bulk Rate both inside city limits and outside city limits shall be billed on a monthly basis, along with gas, sewer and garbage collection fees where applicable and the city shall not accept payment of the garbage, sewer or the gas utility bill unless the appropriate water fee is paid therewith. Water users who do not use city garbage collection or city sewers or city gas shall be billed monthly by separate billing for the appropriate water fees for their premises."

4. Title 9, Chapter 5 (Sewer Use Regulations), Sections 9-5-8 A and 9-5-8 B of the Deming City Code are amended by deleting the said Sections 9-5-8 A and 9-5-8 B in their entirety and replacing it with the following:

"9-5-8 A: Formula For Computation Of Residential User Fees:

UC = A + (K) (V), where

UC = Monthly user charge fee in dollars per month per hookup.

A = Fixed charge, by user class, made for being connected to the sewer system in dollars per month per hookup, base upon fixed costs.

K = Basic charge made per 1000 gallons of wastewater discharged in dollars per month per hookup.

V = Volume of waste discharged in thousands of gallons per month based on an average of the lowest three (3) monthly consumptions for November, December, January and February, with the following exceptions and conditions:

1. Water consumption to be actual if data is available to the city thirty (30) days prior to billing. If water consumption data is not available, billing is to be based upon estimates of the director of public works.

2. The director of public works, or his designee, may review water consumption quantities at any time and make necessary adjustments based on most recent data available.

9-5-8 B: Formula For Computation Of Commercial User Fees:

UC = A + (K) (V), where

UC = Monthly user charge fee in dollars per month per hookup.

A = Fixed charge, by user class, made for being connected to the sewer system in dollars per month per hookup, base upon fixed costs.

K = Basic charge made per 1000 gallons of wastewater discharged in dollars per month per hookup.

V = Volume of wastewater discharged in thousands of gallons per month based on actual water usage, with the following exceptions and conditions:

1. Water consumption to be actual if data is available to the city thirty (30) days prior to billing. If water consumption data is not available, billing is to be based upon estimates of the director of public works.

2. The director of public works, or his designee, may review water consumption quantities at any time and make necessary adjustments based on most recent data available."

5. Title 9, Chapter 6 of the Deming City Code is amended by deleting the said Chapter 6 in its entirety and replacing it with the following:

"CHAPTER 6

CITY DEPOSIT FEES; UTILITY CHARGES

SECTION:

9-6-1: DEPOSIT REQUIRED:

A. Fee Imposed on Residential Users: The director of public works shall require any residential user of a city utility presently indebted or who may become indebted to the city, whether for services, water, gas, garbage disposal, sewer disposal, occupation tax, paving lien, or otherwise, to pay a deposit fee of not less than seventy five dollars ($75.00) nor more than five hundred dollars ($500.00) to the designated fund to secure payment of any indebtedness due the city by the depositor.

B. Collection: The director of public works is hereby authorized to collect such deposit of not less than seventy five dollars ($75.00) nor more than five hundred dollars ($500.00) from any and all persons who are now, or hereafter may become, indebted to the city, the amount of such deposit to be determined by the director of public works according to the service to be rendered and the indebtedness to be incurred.

C. Ensure Payment Of Indebtedness: All such deposits shall be held by the director of public works to ensure payment of indebtedness owed by any such depositor to the city without interest.

D Deposit Applied Toward Delinquency: Should any customer fail to meet their scheduled payments for any one month, the deposit shall be applied to the delinquent account and an additional fifty dollars ($50.00) shall be added to the required deposit prior to the time that the gas or water service is recommenced to the customer.

9-6-2: DEPOSIT REFUND: Upon completion of thirteen (13) months of continuous timely payments for residential services, any such deposit that exceeds seventy-five dollars ($75.00) shall be returned to such depositor upon demand. A seventy-five dollar ($75.00) deposit shall remain on account for utility services until services are discontinued and all payments have been made. There shall be no refunds of any deposits for commercial services until such services have been discontinued and all payments have been made.

9-6-3: TRANSFER OF DELINQUENT ACCOUNTS: Should any customer owe any amount for any city utilities at the time utility services are discontinued and move to another location within the city where additional services are required by such customer, all such delinquent charges owed by the customer shall be paid in full prior to new utility services being placed in customer's name. In the event a closed account is found with an outstanding balance and the responsible customer is found to have an active account, the delinquent account's charges shall be transferred to the customer's active account.

9-6-4: DISCONNECTION AND RECONNECTION FEES: The following Schedule shall apply when service is turned off for nonpayment of utility bills:

A. Service Turned Off for Nonpayment: The service user shall pay the bill plus a reconnect fee of thirty-five dollars ($35.00) for each utility that was turned off.

Service Turned Off for Nonpayment and Deposit or Portion of Deposit Applied to Account: The service user shall pay the bill plus the reconnection fee plus replace all or that portion of the original deposit that was applied to the account plus pay an additional deposit of fifty dollars ($50.00)."

PASSED, ADOPTED, AND APPROVED, this 16th Day of April, 2009

CITY COUNCIL, CITY OF DEMING, NEW MEXICO

CITY OF DEMING INCORPORATED 1902 SEAL LUNA CO. NEW MEXICO

Andres Z. Silva, Mayor

ATTEST:

Richard F. McInturff, Administrator/Clerk

9-4-8: OUTDOOR WATER CONSERVATION:

A. Definition: For purposes of this section "irrigation" means the watering of turf, trees, shrubs, flowers, ornamental grasses, plants, native plant material or other vegetation through overhead spray heads, handheld hose, bubblers, drip emitters or other similar devices for delivering water.

The definitions contained in section 12-2-1 of this code are incorporated into this section by reference.

B. Water Conservation Compliance: No person who uses water from the city of Deming water supply system shall make, cause, use or permit the use of water received from the city water supply system for residential, commercial, industrial, agricultural, institutional, governmental or any other purposes in a manner contrary to any of the provisions of this section.

C. Turf And Landscape Irrigation: The following mandatory water conservation measures shall apply to all customers of, or persons that use or receive water from the city water supply system: (Ord. 1088, 6-14-2004)

1. All outdoor irrigation of turf, trees, shrubs, flowers, ornamental grasses, plants, native plant material or other vegetation on residential, industrial and commercial property with even numbered addresses may irrigate on Mondays, Wednesdays, and Fridays; and for odd numbered addresses, such vegetation may be irrigated only on Tuesdays, Thursdays, and Saturdays; and on Sundays, properties with either odd or even addresses may irrigate. Provisions of this subsection shall apply during the entire calendar year. (Ord. 1139, 5-8-2006)

2. From April 1 through September 30 of each calendar year all outdoor irrigation of turf and other vegetation is prohibited between the hours of ten o'clock (10:00) A.M. and six o'clock (6:00) P.M.

3. The city planning and zoning commission shall have the authority to review variance requests upon written application of any person and shall make a recommendation to the city council who shall make the final decision.

D. Nonessential Water Use Restrictions: The following restrictions shall apply to all customers of, or persons who use or receive water from the city of Deming water supply system:

1. The washing of houses, or automobiles, trucks, trailers, recreational vehicles, boats, airplanes or any other type of mobile equipment shall be done only with a handheld bucket or pail, or a handheld hose equipped with a shutoff nozzle that completely shuts off the flow of water. This restriction does not apply to commercial car washes or a commercial service station. When used in this section, "bucket" or "pail" means a container holding five (5) gallons or less.

2. After the effective date hereof, no building permit for a commercial car wash or service station shall be issued until the applicant for such permit provides to the city building inspector a certification that the car wash will use no more than fifty (50) gallons of water per vehicle washed or integrate a water reclamation system. Existing commercial car wash establishments that upgrade their facilities shall upgrade to the extent that the car wash will use no more than fifty (50) gallons of water per vehicle washed or an integrated water reclamation system.

E. Wasting Water Prohibited: The following uses of water are considered wasting water and are prohibited:

1. Irrigating any vegetation, or otherwise using water from the city of Deming water supply system to permit or cause water to pond, or to flow, spray or otherwise move or be discharged from the premises of any person who receives water from the city of Deming to or upon any street, alley, gutter, ditch, drain or other public right of way.

2. Failing to repair a leak in a system that delivers or discharges water within ten (10) working days of discovering or being informed of such leak.

3. Washing of sidewalks, streets, driveways, parking lots, service station aprons, exteriors of homes or apartments, commercial or industrial buildings, government or institutional buildings, or any other impervious outdoor surface with a hose, or a pressure washer except in emergencies, or in construction preparation, or where such cleaning is mandated by federal, state or local law.

4. In this section a "swimming pool" means any portable or permanent structure containing water twenty four inches (24") in depth and containing one thousand one hundred twenty two (1,122) gallons of water and intended for recreational purposes. All swimming pools constructed after the effective date hereof must be equipped with filtration, pumping and recirculation systems. It is unlawful to drain swimming pools into the street, alley, gutter, ditch, drain or any other public right of way. Swimming pools may be drained into the sanitary sewer system.

5. The serving of drinking water in restaurants except upon request of the customer.

F. Variances And Permits: The following procedure shall apply for those persons seeking a variance from the provisions of this section:

1. The planning and zoning commission shall review hardship or special cases of persons, groups, organizations or corporations who cannot fully comply with the provisions of this section. The planning and zoning commission shall review written applications from persons, groups, organizations and corporations who claim some hardship or special circumstances. The planning and zoning commission shall recommend approval to the city council of an application only for reasons of economic hardship or medical hardship, or if there is a legitimate public health or safety concern. An "economic hardship" is defined as a threat to an individual's or business' primary source of income. A "medical hardship" is defined as a situation where it is determined that a person's ill health or medical condition requires a dependency upon others to irrigate or water. Under no

circumstances shall inconvenience or the potential for damages to landscaping be considered an economic hardship, which justifies a variance. The decision of the city council is final and binding. The prescribed fee for such variance applications shall be twenty five dollars ($25.00) or as otherwise prescribed by the city council.

2. A variance or permit granted by the city council expires under its own terms and conditions, but in no case shall a variance be granted or a permit issued for a period greater than three (3) years. Any person issued a variance or permit shall provide proof of such variance or permit upon demand of any person authorized to enforce this section.

G. Exceptions To Enforcement: The following shall constitute exceptions from compliance with the provisions of this section:

1. The water is the result of natural events such as rain or snow.

2. The flow of water is the result of temporary failures or malfunctions of the water system.

3. The flow of water is the result of water used for firefighting purposes including the inspection and pressure testing of fire hydrants or the use of water for firefighting training activities.

4. The use of water is required for the control of dust or the compaction of soil as may be required by law.

5. The water is used to wash down areas where flammable or otherwise hazardous substances have been spilled and creates a dangerous situation.

6. The water is used to prevent or abate public health, safety or accident hazards when alternate methods are not available.

7. The water is used for routine inspection or maintenance of the water supply system.

8. The water is used to facilitate construction within public rights of way in accordance with the requirements of the city and good construction practices.

9. The use of water is permitted under the terms of a variance or permit granted by the city council.

10. The water is used for street sweeping, sewer maintenance or other established utility and public works practices.

11. Watering contrary to the provisions of subsection C of this section may be permissible for one day only where application of chemicals requires immediate watering to preserve an existing lawn. In cases of commercial application, a receipt from a commercial lawn treatment company indicating the date of treatment, the address of the property treated, the name and address of the commercial contractor and the chemical treatment required shall constitute evidence that the owner or person responsible for the property is entitled to this exception. Where treatment with a noncommercial application of chemicals requires immediate watering to preserve an existing lawn, the owner or person

responsible for the property must contact the city code enforcement officer prior to application of the chemicals and provide evidence satisfactory to the code enforcement officer for approval of this exception.

12. Outdoor irrigation necessary for the establishment of newly seeded or sodded turf grass and landscaping in new residential and nonresidential developments.

H. Water Emergency, Restriction Of Water Use: The city council, on the advice of the city administrator and the director of public works, may declare a water emergency in case of severe drought, any condition that interrupts the ability of the city to supply water such as loss of a major water transmission line, loss of, or damage to the water treatment facility, or extended periods of high consumer demand, or where restriction on the use of water is necessary because of natural disaster, or war, or to protect the public health, safety and welfare, or to preserve the water supply. Where a water emergency is declared, the city council may restrict or prohibit, by resolution, any or all of the following uses, or any uses not specified, of water from the city water system:

1. Irrigation of lawns, trees, shrubs, or any other outdoor vegetation.

2. The washing of all motor vehicles and other equipment, except in commercial car wash facilities.

3. The filling or refilling of, or addition of water to swimming pools.

4. The issuance or granting of any variances to the provisions of this section.

5. The operation of any ornamental fountain or other similar structure.

6. Any other use deemed appropriate by the city council in the circumstances.

I. Penalty: Any person violating any of the provisions of this section, shall be punished as provided in section 1-4-1 of this code, and a separate offense shall be deemed committed on each day during or on which a violation occurs or continues. (Ord. 1088, 6-14-2004)

11-1-5: INDOOR WATER CONSERVATION:

The following regulations shall apply to promote indoor water conservation:

A. Definition: "Water conservation" means any beneficial reduction in water use or water loss.

B. Indoor Plumbing Fixtures:

1. All new residential buildings and all new nonresidential buildings, including all additions and renovations to existing residential and nonresidential buildings that involve either the installation of new toilets or the replacement of existing toilets, shall install low flush toilets which use no more than 2.0 gallons per flush (gpf).

2. All new residential buildings and all new nonresidential buildings, including all additions and renovations to existing residential and nonresidential buildings that involve either the installation of new showerheads or the replacement of existing showerheads, shall install showerheads with a maximum flow rate that does not exceed 2.5 gallons per minute (gpm).

3. All new residential buildings and all new nonresidential buildings, including all additions and renovations to existing residential and nonresidential buildings that involve either the installation of new faucets or the replacement of existing faucets, shall install faucets with a maximum flow rate that does not exceed 1.5 gallons per minute (gpm).

C. Indoor Appliances:

1. It is recommended, but not mandatory that all new residential buildings and all new nonresidential buildings, including all additions and renovations to existing residential and nonresidential buildings that involve either the installation of new dishwashers or the replacement of existing dishwashers, to install low water use dishwashers which require no more than thirteen (13) gallons of water in the regular cycle and have a cycle adjustment that reduces the water used for small loads.

2. It is recommended, but not mandatory that all new residential buildings and all new nonresidential buildings, including all additions and renovations to existing residential and nonresidential buildings that involve either the installation of new clothes washing machines or the replacement of existing clothes washing machines, to install low water use clothes washing machines which require no more than forty three (43) gallons of water in the regular cycle and no more than fifty three (53) gallons of water in the permanent press cycle, and have a cycle or water level adjustment that reduces the water used for small loads.

3. It is recommended, but not mandatory that all new residential buildings and all new nonresidential buildings, to install a hot water recirculation system approved by Underwriters Laboratories or other similar, nationally accepted approval agency. Alternatively, a "demand water heater" system, installed centrally or at the point of use, may be used if such system is approved by Underwriters Laboratories, or other similar,

nationally accepted approval agency.

D. Outdoor Appliances:

1. It is recommended, but not mandatory that all new residential buildings and all new nonresidential buildings, including all additions and renovations to existing residential and nonresidential buildings that involve either the installation of new evaporative coolers or the replacement of existing evaporative coolers, to install manufactured coolers with certified water conservative features.

E. Penalty: Any person violating any of the provisions of this section, shall be punished as provided in section 1-4-1 of this code, and a separate offense shall be deemed committed on each day during or on which a violation occurs or continues. (Ord. 1087, 6-14-2004)

11-1-6: WATER CONSERVATION; USE OF GRAY WATER:

The following regulations shall apply to the use of gray water for residential landscape purposes:

A. Definitions:

GRAY WATER: Untreated household wastewater that has not come in contact with toilet waste and includes wastewater from bathtubs, showers, washbasins, clothes washing machines and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers or laundry water from the washing of material soiled with human excreta, such as diapers.

B. Use Of Gray Water For Residential Landscape Purposes:

1. Under sections 74-6-2 and 74-6-4, New Mexico Statutes Annotated 1978, as amended, a resident, without a permit from the New Mexico environmental department, may apply less than two hundred fifty (250) gallons per day of private residential gray water originating from his/her residence for the resident's household gardening, composting or landscape irrigation if:

a. A constructed gray water distribution system provides for overflow into the sewage collection or on site wastewater treatment and disposal system;

b. A gray water storage tank is covered to restrict access and to eliminate habitat for mosquitoes or other vectors;

c. A gray water system is sited outside of a floodway;

d. Gray water is vertically separated at least five feet (5') above the ground water table. Gray water shall not be applied within one hundred feet (100') of a domestic well or within two hundred feet (200') of a public water well;

e. Gray water pressure piping is clearly identified as a nonpotable water conduit;

f. Gray water is used on the site where it is generated and does not run off the property lines;

g. Gray water is applied in a manner that minimizes the potential for contact with people or domestic pets. Gray water application methods that reduce contact include drip irrigation, shallow piping systems, or mulch trenches;

h. Ponding of gray water is prohibited and application of gray water must be managed to minimize standing water and to prevent saturation of the soil;

i. Gray water is not sprayed;

j. Gray water is not discharged to a watercourse. Discharge of gray water must be at

least one hundred feet (100') from streams or lakes or twenty five feet (25'), plus the depth of the arroyo, from an arroyo; and

k. Gray water use within municipalities or counties complies with all applicable municipal or county ordinances enacted pursuant to chapter 3, article 53, New Mexico Statutes Annotated 1978.

2. A gray water system that is designed to discharge more than two hundred fifty (250) gallons per day from a private residence requires a permit from the New Mexico environment department.

3. Notwithstanding that a permit from the New Mexico environment department is not required in order to apply less than two hundred fifty (250) gallons per day of private water, any resident who wishes to apply less than two hundred fifty (250) gallons per day of private residential gray water, and who wishes to construct, install, or alter, or cause to be constructed, installed or altered any gray water system, shall first obtain a plumbing permit, from the construction industries division of the regulation and licensing department of the state of New Mexico, and such gray water system shall comply with all standards for gray water systems set out in appendix G of the uniform plumbing code, 1997 edition as adopted by the city of Deming, or such later editions, as may be adopted, from time to time, by the city of Deming. The installation of a gray water system shall be done or supervised by a licensed plumber, and such licensed plumber shall certify that such installation complies with the standards of the uniform building code.

C. Penalty: Any person violating any of the provisions of this section, shall be punished as provided in section 1-4-1 of this code, and a separate offense shall be deemed committed on each day during or on which a violation occurs or continues. (Ord. 1087, 6-14-2004)

12-2-1: DEFINITIONS:

For the purposes of this title, certain words and terms are hereby defined. Words used in the present tense shall include the future; and the singular number shall include the plural; and the plural, the singular; the word "building" shall include the word "structure"; the word "lot" shall include the word "plot"; and the word "shall" is mandatory and not directory.

Whenever used in this title the following words shall have the meanings herein ascribed:

ACCESSORY BUILDING: A subordinate building or a portion of the main building, the use of which is incidental to that of the dominant use of the building or premises.

ALLEY: A public thoroughfare which affords only a secondary means of access to abutting property.

APARTMENT HOUSE: See definition of Dwelling, Multiple.

AUCTION HOUSE: A building and appurtenant lands, or a property, where antiques, and/or property, and/or objects of art, furniture, equipment, and other goods are offered for sale to persons who bid on the object in competition with one another.

AUTOMATIC IRRIGATION SYSTEM: A complete set of system components that includes the water source, the water distribution network, and the general irrigation equipment. The system operates in accordance to a preset program within a controller.

BACKFILL: Soil that is used to fill a planting hole after a plant's roots have been positioned in the planting hole.

BASEMENT: A story having part but not more than one-half ($^1/_2$) of its height below grade. A basement is counted as a story for the purpose of height regulations, if subdivided and used for business or dwelling purposes by others than a janitor employed on the premises.

BERM: Graded mounds of soil used to create a screen, buffer, or a landscape design element.

BOARDING HOUSE: A building other than a hotel where, for compensation and by prearrangement for definite periods, meals, or lodging and meals, are provided for three (3) or more persons, but not exceeding twenty (20) persons.

BUILDING: Any structure for the shelter, support or enclosure of persons, animals, chattels or property of any kind; and when separated by dividing walls without openings, each portion of said building, so separated, shall be deemed a separate building.

BUILDING, HEIGHT OF: The vertical distance from the grade to the highest point of the coping of a flat roof or to the deck line of a mansard roof, or to the average height of the highest gable of a pitch or hip roof.

CELLAR: A story having more than one-half ($^1/_2$) of its height below grade.

DECIDUOUS SHADE TREE: A tree that sheds all its leaves every year at a certain season.

DEVELOPMENT: The use of any land, the carrying out of any building activity, the making of any material change in the use, or intensity of use, or appearance of any building, structure or land, or the dividing of land into lots, blocks or parcels.

DISTRICT: Any section of the city for which the regulations governing the use of buildings and premises or the height and area are uniform.

DRIP EMITTER: A low volume emission device that delivers water at low rates. Drip emitters are used to apply water directly to an individual plant root system.

DROUGHT TOLERANT PLANTS: Low water use plants that, after they are established, can survive with little or no supplemental watering.

DWELLING: Any building or portion thereof, which is designed or used exclusively for residential purposes.

DWELLING, MULTIPLE: A building or portion thereof designed for occupancy by three (3) or more families.

DWELLING, SINGLE-FAMILY: A building designed for occupancy by one family.

DWELLING, TWO-FAMILY: A building designed for occupancy by two (2) families.

DWELLING UNIT: A room or group of rooms for the domestic use of one or more individuals living as a single, independent housekeeping unit, occupied or intended for occupancy by one household or family with cooking (not more than 1 kitchen), eating, sleeping, living, and sanitary facilities.

EROSION: The detachment and movement of soil particles or fragments by water, wind, ice, and/or gravity.

EVERGREEN TREE: A tree, either broadleaf or conifer, which maintains at least a portion of its leaves or needles throughout the year.

FAMILY: One or more persons occupying a premises and living as a single housekeeping unit as distinguished from a group occupying a "boarding house", "lodging house", or "hotel" as herein defined.

FENCE OR WALL: Any structure used to enclose all or part of a property for the purpose of security, privacy or aesthetics.

FILLING STATION: Any building or premises used principally for the storing, dispensing, sale, or offering for sale at retail of automobile fuels, or oils.

FRONTAGE: Property on one side of a street measured along the line of the street.

GARAGE, PRIVATE: An accessory building designed or used for the storage of not more than three (3) motor driven vehicles owned and used by the occupants of the building to which it is accessory. Not more than one of the vehicles may be a commercial motor vehicle of not more than two (2) tons' capacity.

GARAGE, PUBLIC: A building, or portion thereof, other than a private or storage garage, designed or used for servicing, repairing, equipping, hiring, selling or storing motor driven vehicles.

GARAGE, STORAGE: A building or portion thereof designed or used exclusively for housing four (4) or more motor driven vehicles.

GRADE: A. For buildings having walls adjoining one street only, the elevation of the sidewalk at the center of the wall adjoining the street.

B. For buildings having walls adjoining more than one street, the average of the elevation of the sidewalk at the center of all walls adjoining the streets.

C. For buildings having no wall adjoining the street, the average level for the finished surface of the ground adjacent to the exterior walls of the building.

Any wall approximately parallel to and not more than five feet (5') from a street line is to be considered as adjoining the street.

GROUND COVER: Plants grown for their low spreading capabilities for the protection of soils, to prevent growth of weeds, and for aesthetic purposes.

HOME OCCUPATION: Any occupation or profession carried on by a member of a family residing on the premises, in connection with which there is used no sign other than one nonilluminated nameplate attached to the building entrance which is not more than one square foot in area; provided, that no commodity is sold upon the premises, except that which is prepared upon the premises; provided, that no person is employed other than a member of the immediate family residing on the premises; provided, that no mechanical equipment is installed or used except such that is normally used for domestic or household purposes.

HOTEL: A building used as an abiding place of more than twenty (20) persons who are lodged with or without meals for compensation.

INSTITUTION: A building occupied by a nonprofit corporation or nonprofit establishment for public use.

INTERIOR COURT: An open space that is more than one-half ($^1/_2$) surrounded by a single building.

INTERIOR LANDSCAPE BORDERS: A landscaped buffer located along common side and rear property lines between two (2) similar or different land uses.

IRRIGATION SYSTEM: The combination of elements such as automatic controllers, meters, pressure vacuum breakers, pipes, valves, emitters, bubblers, spray heads, tubing and other materials designed for the purpose of transporting water to landscape areas.

LANDSCAPING: The combination of elements such as trees, shrubs, ground covers, vines and other organic material for the express purpose of creating an attractive and pleasing environment. Plazas, patios, art, decorative courtyards, decorative walkways, decorative

lighting and decorative furniture may also be considered landscape elements.

LODGING HOUSE: A building where lodging only is provided for compensation to three (3) or more, but not exceeding twenty (20), persons, in contradistinction to hotels open to transients.

LOT: A parcel of land occupied or intended for occupancy by one main building, together with its accessory buildings, and uses customarily incidental to it, including the open spaces required by this title.

LOT, CORNER: A lot adjoining two (2) or more streets at their intersection.

LOT, DEPTH OF: The mean horizontal distance between the front and rear lot lines.

LOT, DOUBLE FRONTAGE: A lot having a frontage on two (2) nonintersecting streets as distinguished from a corner lot.

LOT, INTERIOR: A lot other than a corner lot.

LOT LINES: The lines bounding a lot.

LOT OF RECORD: A lot which is part of a subdivision, the map of which has been recorded in the office of the county clerk of Luna County, or a lot described by metes and bounds, the description of which has been recorded in the office of the county clerk of Luna County.

MOBILE HOMES AND HOUSE TRAILERS[1]: A dwelling unit, built and assembled, designed for conveyance after fabrication, on streets and highways on its own wheels, or on flatbed or other trailers, and arriving at the site where it is to be occupied as a dwelling unit complete and ready for occupancy, except for minor and incidental unpacking and assembly operations such as locating on jacks or other foundation, or connections to utilities. A prefabricated house or structure shall not be included in this definition.

NONCONFORMING USE: The use of any premises contrary to the use provisions of this title for the district in which the premises is located.

OVERHEAD SPRAY HEADS: An irrigation method that delivers water to the landscape materials in a spray or stream like manner from aboveground spray heads (including pop ups, impulse sprinklers, rotors, micromisters, etc.).

PARKING LOT: A parcel of land devoted to unenclosed parking spaces.

PARKING SPACE: A surfaced area, enclosed or unenclosed, sufficient in size to store one automobile, together with a surfaced driveway connecting the parking space with a street or alley and permitting ingress and egress of an automobile.

PLACE: An open unoccupied space other than a street or alley permanently reserved as the principal means of access to adjoining property.

PLANNED UNIT DEVELOPMENT: A land development concept that provides greater design flexibility by allowing deviations from the typical development standards required by the zoning ordinance. A planned unit development may be of a single residential type or a combination of

residential types; or it may be a diverse mix of residential, commercial and recreational uses all contained in one development and/or subdivision. A planned unit development views the entire tract of land rather than each individual lot to take advantage of design and other opportunities such as land features or vegetation to create more attractive and creative projects than would otherwise be possible under standard zoning regulations.

ROCK MULCH: A nonsoluble protective covering that includes rock, gravel, decomposed granite, or crushed rock applied to the soil surface to reduce weed growth, reduce evaporation of moisture from the soil surface, maintain even temperature around plant roots, and slow erosion.

RUNOFF: Irrigation water that is not absorbed by the soil to which it is applied and which flows onto other areas. Runoff may result from water that is applied at too great a rate (application exceeds infiltration rates) or where a severe slope exists.

SITE: A parcel of land or several contiguous parcels of land used or occupied, or to be used or occupied, by a building and accessory buildings and the area belonging to such buildings, bounded by a property line or a designated portion of a public street.

SMALL BUSINESS: As defined by the U.S. department of commerce.

SOIL: All unconsolidated mineral and organic material of whatever origin that overlies bedrock and can be readily excavated.

SPECIAL USE: A use of land permitted within a particular use district, that, because of inherent special characteristics, or possible impact on adjacent properties or possible impact on the integrity of the particular zone in which it is located, requires a higher and a stricter level of review.

STORM WATER DETENTION: A system, method or facility used for the on site temporary storage of storm water runoff for subsequent release, at controlled rates, into downstream conveyance systems.

STORM WATER RETENTION: A system, method, or facility for the on site storage of storm water runoff which is not subsequently discharged into a downstream conveyance system; but, rather may be consumed by evapotranspiration, domestic reuse, or drained into the subsurface through infiltration.

STORY: That portion of a building, other than a basement, included between the surface of the floor next above it, or, if there be no floor above it, then the space between the floor and the ceiling next above it.

STORY, HALF: A space under a sloping roof which has the line of intersection of roof decking and wall face not more than three feet (3') above the top floor level, and in which space not more than two-thirds ($^2/_3$) of the floor area is finished off for use. A half story containing independent apartment or living quarters shall be counted as a full story.

STREET: All property dedicated or intended for public or private street purposes or subject to public easements therefor.

STREET LANDSCAPE BORDER: A required landscaped area adjacent to urban principal arterial streets, urban minor arterial streets and urban collector streets as categorized in the city of Deming comprehensive plan, January 2003. This includes any street so classified at present and in the future by city council.

STREET LINE: A dividing line between a lot, tract or parcel of land and a contiguous street.

STRUCTURAL ALTERATIONS: Any change in the supporting members of a building, such as bearing walls or partitions, columns, beams or girders, or any substantial change in the roof or in the exterior walls.

STRUCTURE: Anything constructed or erected, the use of which has a permanent location on the ground or is attached to something having a permanent location on the ground, including, but without limiting the generality of the foregoing, advertising signs, billboards, backstops for tennis courts and pergolas.

SWALE: A depression in grade that controls and directs the flow of surface water.

TOURIST OR TRAILER CAMP OR COURT: An area containing one or more structures designed to be used as temporary living facilities of two (2) or more families and intended primarily for automobile transients, or providing space where two (2) or more ten foot (10') trailers can be parked.

TURF: Any grassy area maintained by frequent mowing, fertilization and watering used for lawns and playing fields.

WATER HARVESTING: A system, and/or facilities for the collection of rain and storm water for reuse for landscape irrigation and other purposes. For large scale water harvesting projects, the proponent shall contact the office of the state engineer for New Mexico to ensure that the project will not inappropriately affect rainwater runoff so as to negatively impact a public water supply.

XERISCAPE: A creative method of landscaping that emphasizes water conservation. This is accomplished by following sound landscaping practices such as planning and design, soil improvements, limited turf areas, use of mulches, use of low water demand plants, efficient irrigation, and appropriate and regular maintenance. When combined, these practices can produce an attractive, efficient, sustainable landscaping arrangement for all residential, commercial, industrial, public and institutional developments.

YARD: An open space at grade between a building and the adjoining lot lines, unoccupied and unobstructed by any portion of a structure from the ground upward, except as otherwise provided herein. In measuring a yard for the purpose of determining the width of a side yard, the depth of a front yard, or the depth of a rear yard, the minimum horizontal distance between the lot line and the building shall be used.

YARD, FRONT: A yard extending across the front of a lot between the side yard lines and being the minimum horizontal distance between the street line or another lot line and the main building or any projection thereof, other than steps, unenclosed balconies and unenclosed porches.

YARD, REAR: A yard extending across the rear of a lot measured between lot lines and being

the minimum horizontal distance between the rear lot line and the rear of the main building or any projections other than steps, unenclosed balconies or unenclosed porches. On corner lots, the rear yard shall be considered as parallel to the street upon which the lot has its least dimension. On both corner lots and interior lots, the rear yard shall in all cases be at the opposite end of the lot from the front yard.

YARD, SIDE: A yard between the building and the side line of the lot and extending from the front line to the rear yard line. (Ord. 252, 12-7-1955; amd. Ord. 501, 7-2-1973; Ord. 983, 11-9-1998; Ord. 1069, 1-13-2003; Ord. 1080, 11-10-2003; Ord. 1086, 6-14-2004)

12-18-1: GENERAL PROVISIONS:

The development standards and design guidelines articulate community design principles, standards and guidelines for development within the city of Deming, in order to assist planners, designers and developers in understanding the city's minimum development and design standards. These development standards and design guidelines are intended to enhance the city's overall value and appearance, and to achieve creative, well designed and interesting projects. In addition, these standards are explicitly intended to promote water conservation measures through the requirement of low water use and drought tolerant plant material. The standards and guidelines set out herein are minimum requirements and, therefore, are not intended to restrict creative alternate solutions. (Ord. 1086, 6-14-2004)

12-18-2: LANDSCAPE STANDARDS:

A. Purpose And Intent: These standards are intended to be applied throughout the city as specified in the subsections that follow. These standards are provided for the general health and welfare of the citizens of Deming through the conservation of water, reduction of air pollution, and public safety. The intent is to achieve a high quality of appearance, to assure design compatibility, to promote character and form, to promote water conservation, and to enhance the overall value of development to the community.

The conservation of water is deemed to be a key purpose to be achieved through the application of these landscape standards. The standards set out in this section are designed to encourage the preservation of desirable native vegetation and the use of low water use and drought tolerant plant material.

B. Applicability:

1. All City Development: The landscape standards specified in this section, unless otherwise excepted, shall apply to all development in all use districts in the city of Deming.

2. New Uses, Buildings And Additions: Unless otherwise excepted, all new land uses, developments, buildings, structures, and all additions to land uses, developments, buildings or structures of twenty five percent (25%) or more in terms of additional dwelling units, gross floor area, building perimeter, either with a single addition or cumulative additions subsequent to the effective date hereof, shall meet the requirements of this section.

3. Government Development: The landscape standards specified in this section do not apply to any government development and/or uses.

4. Variance, Waiver: The city council, with the advice of the planning and zoning commission or city staff, may vary or waive any of the standards set out in this section.

C. General Design Standards:

1. Landscape Plans:

a. Required; Specifications: Landscape plans are required by the city building inspector for parking areas and for all street landscape borders, all interior landscape borders, and all vehicular entrances, as described in the subsections that follow, unless specifically excepted by the planning and zoning commission or the city council. When required, the landscape plan submitted shall be drawn at a legible scale, satisfactory to the city building inspector. The plan shall clearly describe the location, type, size and spacing of all plant materials. The plan shall also indicate the height and canopy size of trees at maturity, and the height and spread of shrubs at maturity. Other landscape features such as walls, fences, and pedestrian or bicycle walkways or trails shall also be shown. Landscape plans are not required for individual single-family or two-family lots.

b. Land Devoted To Plant Material: The landscape plan shall clearly set out the area of a lot or block or other division of land that will be devoted to plant material, such as turf, that is not a low water use/drought tolerant plant according to the "Low Water Use/Drought Tolerant Plant List", published by the Arizona department of water resources-Tucson active management area (March 2002, or any later edition), and the plants listed for New Mexico climate area 3-south, in the publication entitled "The Enchanted Xeriscape" available from the office of the state engineer, New Mexico (no date specified, but most recent edition is to be used).

c. Grading Information: Dependent upon the size and complexity of the proposed project and its potential impact upon neighboring land uses, the city building inspector, or the planning and zoning commission, or the city council may require that the landscape plan include necessary grading information such as, but not limited to:

(1) Grade changes across the site indicated at one foot (1') intervals;

(2) Percent slope across the site and the direction of the slope of paved areas;

(3) Existing grades on adjacent rights of way or site (where possible). If an adjacent right of way or site is under construction, the proposed finished grades are to be shown.

2. Landscaping:

a. Water Conservation: All landscape plant material shall be low water use and drought tolerant except as specified in subsections D2, D3 and E2 of this section. The following documents will be used by the city of Deming as accepted guidelines for low water use/drought tolerant plants:

(1) "Low Water Use/Drought Tolerant Plant List", Arizona department of water resources-Tucson active management area, (March 2002 or any later editions).

(2) "The Enchanted Xeriscape, A Guide To Water-Wise Landscaping In New Mexico", office of the state engineer (no date specified, but most recent edition at time of application of the provisions in this section is to be used).

b. Prohibited Plants: The following plants are prohibited in all developments in the city of Deming:

(1) European olive trees, all fruiting varieties.

(2) Fruitless mulberry trees.

(3) Salt cedar.

(4) Any plant listed on the "New Mexico Noxious Weed List" (September 20, 1999, as amended from time to time), published by the New Mexico department of agriculture.

c. Installation: All required or proposed landscaping shall be installed as soon as practical and as soon as permitted by standard seasonal planting practices.

d. Additional Landscaping Required By Building Inspector: The city building inspector, in approving plans for development, may require additional landscaping in specific situations when additional landscaping is necessary to maintain an established pattern created by other existing landscaping in the surrounding area, or is necessary to provide a buffer between land uses or parts of land uses, or is necessary to promote aesthetically pleasing, orderly, and harmonious development of the city.

e. Additional Landscaping Required By Planning And Zoning Commission: The city planning and zoning commission, when considering a zoning ordinance amendment or variance, or a plan of subdivision, may recommend to city council, with the advice of city staff, any additional landscaping it believes is necessary to maintain an established pattern created by other existing landscaping in the surrounding area, or is necessary to provide a buffer between land uses or parts of land uses, or is necessary to promote aesthetically pleasing, orderly, and harmonious development of the city.

3. Turf: Turf areas are generally prohibited in public street medians and boulevards. Turf is prohibited in street landscape borders (subsections D5, E4 and F3 of this section), and in any required interior landscape border (subsections D6, E5 and F4 of this section). Turf is prohibited as a landscape material in all new commercial and industrial developments and in any commercial or industrial development where there is proposed an addition of twenty five percent (25%) or more in terms of gross floor area of buildings or structures, and/or building perimeter, including additions that increase the total number of required parking spaces by twenty five percent (25%) or more, either with a single addition or cumulative additions subsequent to the effective date hereof.

4. Irrigation:

a. Dependent upon the size and complexity of the proposed project and its potential impact on neighboring properties, an irrigation plan may be required along with any landscape plan, required in subsection C1 of this section. The irrigation plan may include, but shall not be limited to, such matters as:

(1) Type, size, and location of piping;

(2) Type, size, and location of irrigation heads;

(3) Type and location of backflow prevention devices, valves and controllers;

(4) Source of irrigation water, whether potable or reclaimed; and

(5) Calculations demonstrating the matching of application rates with infiltration rates as required in subsection C4d of this section.

b. An automatic irrigation system is required for all planting areas.

c. All irrigation water shall be retained on site.

d. The design of irrigation systems and irrigation schedules shall attempt to match application rates with infiltration rates in order to minimize runoff and reduce evaporation.

e. Rain sensing and moisture sensing devices are encouraged.

5. Vehicle Parking Areas: All parking areas, excluding parking structures, with twenty five (25) or more parking spaces associated with new construction, and all additions of twenty five (25) or more parking spaces to existing parking areas, excluding parking structures, in all developments in all use districts shall be landscaped. Industrial developments may be exempted by application of the developer, unless required by the city council.

a. Minimum Number Of Trees Required: All parking areas as described in this subsection C5 shall provide a minimum of one deciduous or evergreen shade tree, six (6) to eight feet (8') in height with a minimum trunk caliper of one inch (1") for every ten (10) uncovered parking spaces or any fraction thereof. Trees must be evenly distributed throughout the parking area. Figure 1 of this section illustrates how the trees may be arranged.

b. Landscape Islands: Landscape islands are required at the end of each and all parking rows and each island shall contain a minimum of one shade tree per island pair with specifications as set out in subsection C5a of this section. Fifty percent (50%) of the trees provided in such islands can be counted toward the minimum tree requirement. The length of the planter island shall be equal to the length of the adjacent parking space. All planter islands shall be contained by concrete curbing a minimum of six inches (6") above the elevation of the final layer of surrounding asphalt. Figure 1 of this section illustrates calculations for tree requirements using the islands.

c. Ground Cover And/Or Rock Mulch Required: In addition to the shade trees required in subsection C5b of this section, all landscape islands shall be landscaped as follows:

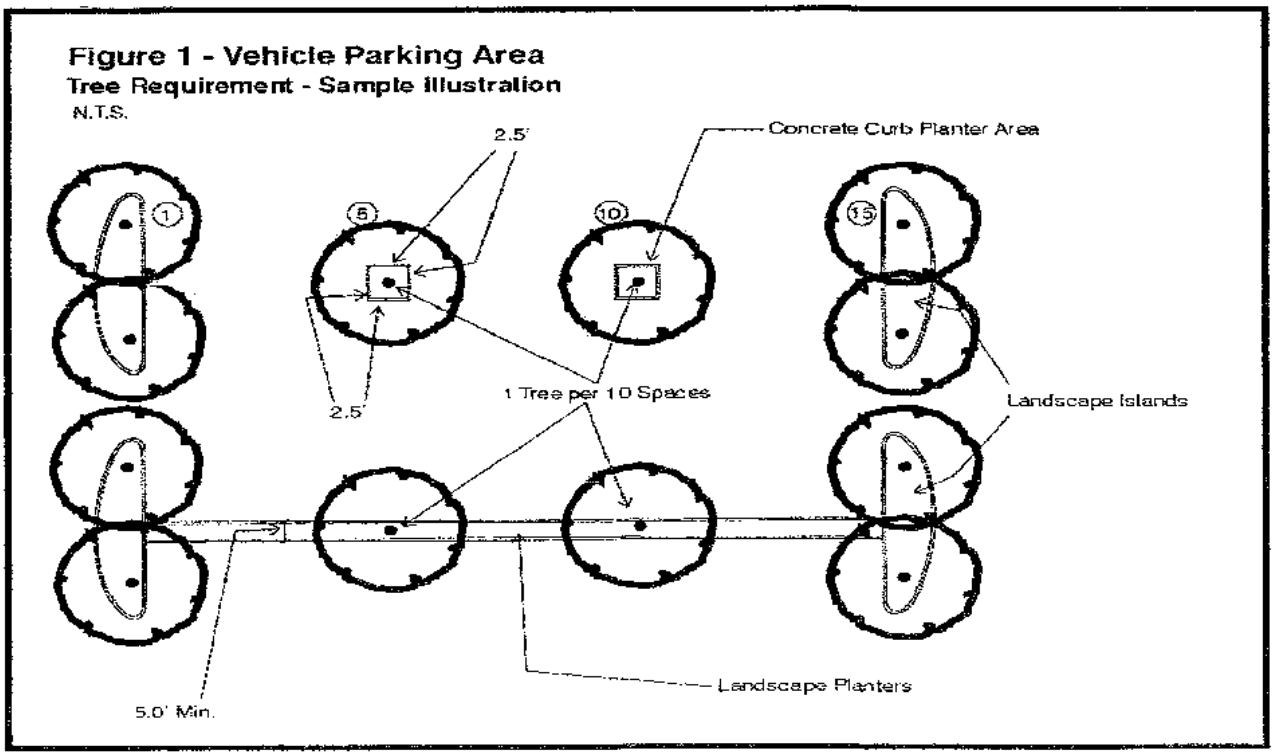
(1) A two inch (2") layer of low water use and drought tolerant ground cover, or rock mulch, or both.

d. Planter Islands Or Boxes: Where planter islands or planter boxes are used to separate two (2) rows of parking, or to separate a row of parking from an aisle or driveway, the length of the planter shall be equal to the length of the parking row. Landscape planters shall have a minimum width of five feet (5'). Such planter islands or planter boxes shall comply with the minimum number of trees required in subsection C5a of this section, and shall include a two inch (2") layer of low water use and drought tolerant ground cover or rock mulch. See figure 1 of this section.

e. Wheel Stops: Except as provided in subsection C5f of this section, wheel stops shall be used at every parking space that fronts a landscape area or a pedestrian walkway. Wheel stops shall be installed a minimum of two and one-half feet (2.5') from the face of any curb and shall be securely anchored to the surface of the parking area.

f. Location Of Trees: Parking spaces may be designed so that the front of a vehicle overhangs into the planter island separating two (2) rows of parking. In such cases, the required trees shall be located at the edge and between vehicle spaces such as the common corner of four (4) perpendicular parking spaces that face each other. For a sample illustration of this, see figure 1 of this section.

g. Drip Irrigation: Parking lot planter islands and planter boxes shall be irrigated with drip irrigation only.



6. Existing Plant Materials:

a. The preservation and retention of existing plant material within vehicle parking areas, street landscape borders, interior landscape borders, planting islands, and on site landscaping is encouraged provided such plant material is material specified in the guideline documents described in subsection C2a of this section, and provided such plant material is not prohibited material as described in subsection C2b of this section.

b. Credit for the preservation and retention of existing plant material may be given, at the sole discretion of city staff, the planning and zoning commission or the city council, as appropriate. Credit may be given on an equal one to one basis for shade trees, shrubs, and ground cover.

c. In order that city staff may make an informed decision with respect to giving a credit for the retention of existing plant material, the landscape plan required by subsections C1a and C1b of this section shall include the type, location, size, and an opinion as to the general health of the plants to be retained. Such opinion is to be provided by a person acceptable to city staff.

7. Storm Water Detention/Retention Ponds:

a. A storm water detention/retention pond is required for any new development, and for all plans of subdivision, or any addition or expansion to any existing development that creates a need for a storm water detention/retention pond. The proponent of the development shall be required to have a professional engineer, licensed by the state of New Mexico, prepare, submit to and have approved by the planning and zoning commission a drainage study, and based on that study, the said professional engineer shall prepare, submit to, and have approved by the planning and zoning commission the drainage plan and the design for any detention/retention pond.

b. The drainage study referenced in subsection C7a of this section shall comply with the requirements of subsections 13-5-1B5 and B6

of this code.

c. A drainage study and a drainage plan are required for all proposed plans of subdivision. The requirements for the drainage study and the drainage plan are set out in subsections 13-5-1B5 and B6 of this code.

d. Upon completion of construction, the proponent shall have his/her professional engineer certify that the work was done in accordance with the approved design.

e. Where an on site detention/retention pond is to be used as part of a recreational space for a project, or where such pond is to be located adjacent to and/or is visible from a public street, or where there is risk of soil erosion, the city may require that on site detention/retention basins be landscaped. The proponent shall be required to prepare or have prepared a landscape plan that shall be acceptable to city council, or the planning and zoning commission and/or the city building inspector. Some or all of the following matters may be considered:

(1) To the extent possible, existing vegetation shall be retained, provided such vegetation is not plant material prohibited by subsection C2b of this section.

(2) All plant material shall be low water use and drought tolerant and shall be plants listed in the guideline documents specified in subsection C2a of this section.

(3) Credit for existing plant material shall be allowed in accordance with the provisions of subsections C6a through C6c of this section.

(4) Ground cover may be required where the basin has slide slopes equal to or greater than two to one (2:1) (horizontal to vertical distance), in order to minimize erosion.

8. Maintenance:

a. Maintenance of all required landscaping shall be the responsibility of the owner, lessee, heirs, assigns, agent, homeowners' association, or other liable entity of the property, and shall consist of regular watering, pruning, mowing (where turf is allowed), fertilizing, weed removal, and maintenance of the irrigation system and any landscape architectural features such as walls, fences, planter boxes, and planter island curbs, and any seating areas. Such maintenance shall include landscaping that may be approved for any part of a public right of way.

b. Dead vegetation shall be promptly replaced based on standard seasonal planting practices with healthy living plants in all required landscaping areas.

D. Landscape Design Standards For Single-Family And Two-family Dwelling Developments: All new single-family and/or two-family developments shall comply with the following standards:

1. Plant Material: Each new single-family or two-family dwelling lot shall employ only low water use and drought tolerant plant material as specified in the guideline documents described in subsection C2a of this section.

2. Turf On Single- Or Two-Family Lot: Turf is permitted as a landscape material on any single-family or two-family lot, provided no more than fifty percent (50%) of the remaining lot area (excluding concreted areas), to a maximum of three thousand (3,000) square feet is planted in turf.

3. Turf On Common Areas: Where a common area (clubhouse, swimming pool or other recreational activities) is provided for use of all residents in a plan of subdivision, a maximum of fifteen percent (15%) of the area actually devoted to the common area may be in turf.

4. Purchaser Notification Of Landscape Requirements: The landscape plans and grading information specified in subsections C1a, C1b, and C1c of this section, and the irrigation plan specified in subsection C4 of this section are not required for individual lots in single-family and two-family developments; however, the owner or subdivider of land proposed for subdivision shall be required to include in any agreement of purchase and sale for any lot in the subdivision, a clause notifying the purchaser of the landscaping requirements of subsections D1 and D2 of this section.

5. Street Landscape Borders: Street landscape borders are required for all new subdivisions or for any replat of existing subdivisions. The following provisions shall apply:

a. Street landscape borders are required adjacent to urban principal arterial streets, or urban minor arterial streets or urban collector streets, as designated by the city of Deming for all single-family and/or two-family developments in all new plans of subdivision, and in existing plans of subdivision, where through an amendment to the subdivision plan and/or the zoning ordinance there is an increase in the number of dwelling units of twenty five percent (25%) or more, either with a single increase or a cumulative increase subsequent to the effective date hereof.

b. The street landscape border minimum width is ten feet (10') (see figure 2 of this section). The street landscape border is to be located on site and measured from the street property line. Covered parking canopies or other structural canopies shall not overhang into the street landscape border.

c. Within the street landscape border, deciduous or evergreen shade trees shall be provided in number equal to or greater than an average of one shade tree per fifty (50) lineal feet, on center, of the site frontage length along the street. See figure 2 of this section.

d. All plant material shall be low water use and drought tolerant and such material shall be taken from the guideline documents listed in subsection C2a of this section.

e. All shade trees shall be six (6) to eight feet (8') in height with a minimum trunk caliper of one inch (1"). Clustering of trees is allowed. Figure 2 of this section illustrates one possible clustering alternative.

f. A minimum of two (2) shrubs per each required shade tree is recommended in the street landscape border.

g. The street landscape border area shall contain a two inch (2") layer of low water use and drought tolerant ground cover, or rock mulch, or both.

h. Existing drought tolerant material within the street landscape border area may be used to fulfill the landscape requirements in accordance with the provisions of subsection C6 of this section.

i. Street landscape borders shall be irrigated with drip irrigation only.

6. Interior Landscape Border: An interior landscape border may be required by the city along the outer perimeter of a subdivision. The width of such area shall be such that it maintains compatibility with existing adjacent area setbacks, and such that it provides adequate separation between different land uses. Where such an interior landscape border is required it shall comply with the requirements of subsections D5c through and including D5i of this section. Turf may be permitted in any interior landscape border.

Figure 2 - Single Family and 2 Family
Street Landscaping Border - Sample Illustration
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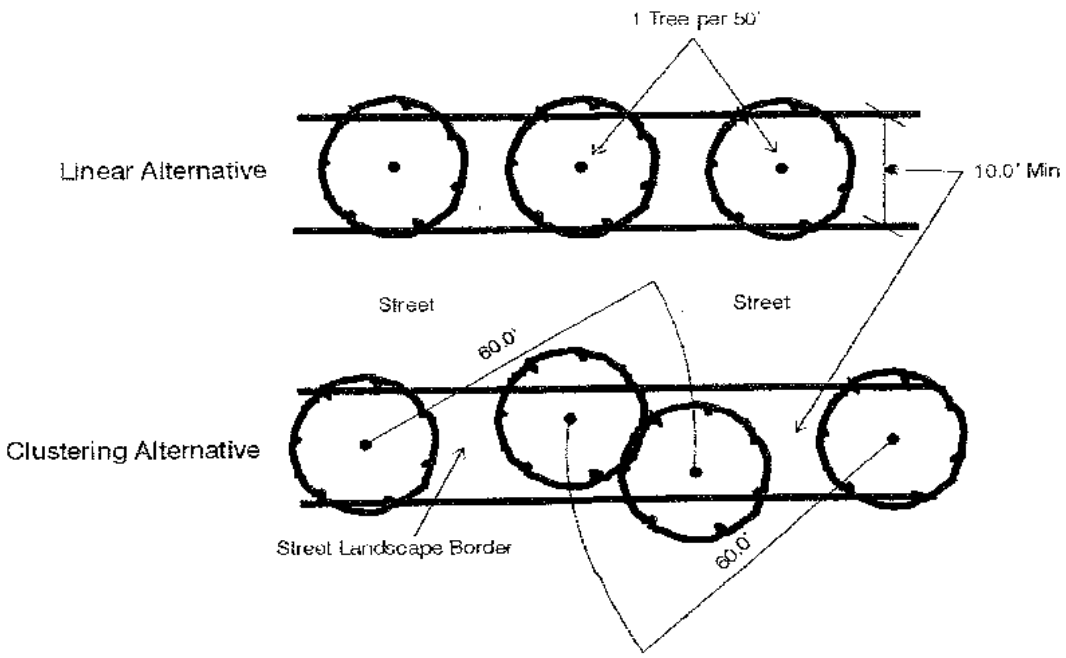


E. Landscape Design Standards For Multiple Dwelling, Mobile Home Parks, Recreational Vehicle Parks, Tourist Or Trailer Camps, And Institutional Developments:

1. Plant Material; Minimum Landscape Area: All multiple-dwelling developments, either in a plan of subdivision or on a parcel of land outside of a plan of subdivision, all mobile home parks, all recreational vehicle parks, all tourist or trailer camps, and all institutional developments shall employ only low water use and drought tolerant plant material in accordance with the guideline documents specified in subsection C2a of this section. All of the aforementioned developments shall landscape a minimum of twenty five percent (25%) of their lot or site area.

2. Turf On Lots: Turf is permitted as a landscape material provided that no more than twenty percent (20%) of the remaining lot area (excluding concreted and paved areas) is planted in turf.

3. Turf On Common Areas: In addition to the provisions of subsection E2 of this section, where a common area (clubhouse, swimming pool or other recreational activities) is provided for use of all residents in a multiple-family development, a maximum of fifteen percent (15%) of the area actually devoted to the common area may be in turf.

4. Street Landscape Borders:

a. Street landscape borders are required adjacent to urban principal arterial streets, or urban minor arterial streets or urban collector streets as designated by the city of Deming, for all multiple-dwelling developments, either in a new plan of subdivision or a replat of an existing subdivision, or on a parcel of land outside of a plan of subdivision, all mobile home parks, all recreational vehicle parks, all tourist or trailer camps, and all institutional developments, and all additions to foregoing developments, of twenty five percent (25%) or more in terms of additional dwelling units, gross floor area, building perimeter, mobile home park spaces, recreational vehicle spaces, tourist or trailer camp spaces, either with a single addition or cumulative additions subsequent to the effective date hereof.

b. The street landscape border shall have a minimum width of ten feet (10'). The street landscape border is to be located on site and measured from the street property line. Covered parking canopies or other structural canopies shall not overhang into the street landscape border. See figure 3 of this section.

c. Within the street landscape border, deciduous or evergreen shade trees shall be provided in number equal to or greater than an average of one shade tree per forty (40) lineal feet, on center, of the site frontage length along the street. See figure 3 of this section.

d. All plant material shall be low water use and drought tolerant and such material shall be taken from the guideline documents listed in subsection C2a of this section.

e. All shade trees shall be six (6) to eight feet (8') in height with a minimum trunk caliper of one inch (1"). Clustering of trees is allowed. Figure 3 of this section illustrates one possible clustering alternative.

f. A minimum of two (2) shrubs per each required shade tree is recommended in the street landscape border.

g. The street landscape border area shall contain a two inch (2") layer of low water use and drought tolerant ground cover, or rock mulch, or both.

h. Existing drought tolerant material within the street landscape border area may be used to fulfill the landscape requirements in accordance with the provisions of subsection C6 of this section.

i. Street landscape borders shall be irrigated with drip irrigation only.

j. Where a row of parking in a vehicle parking area abuts the street landscape border, the landscape requirements of subsections E4b through E4i of this section shall govern.

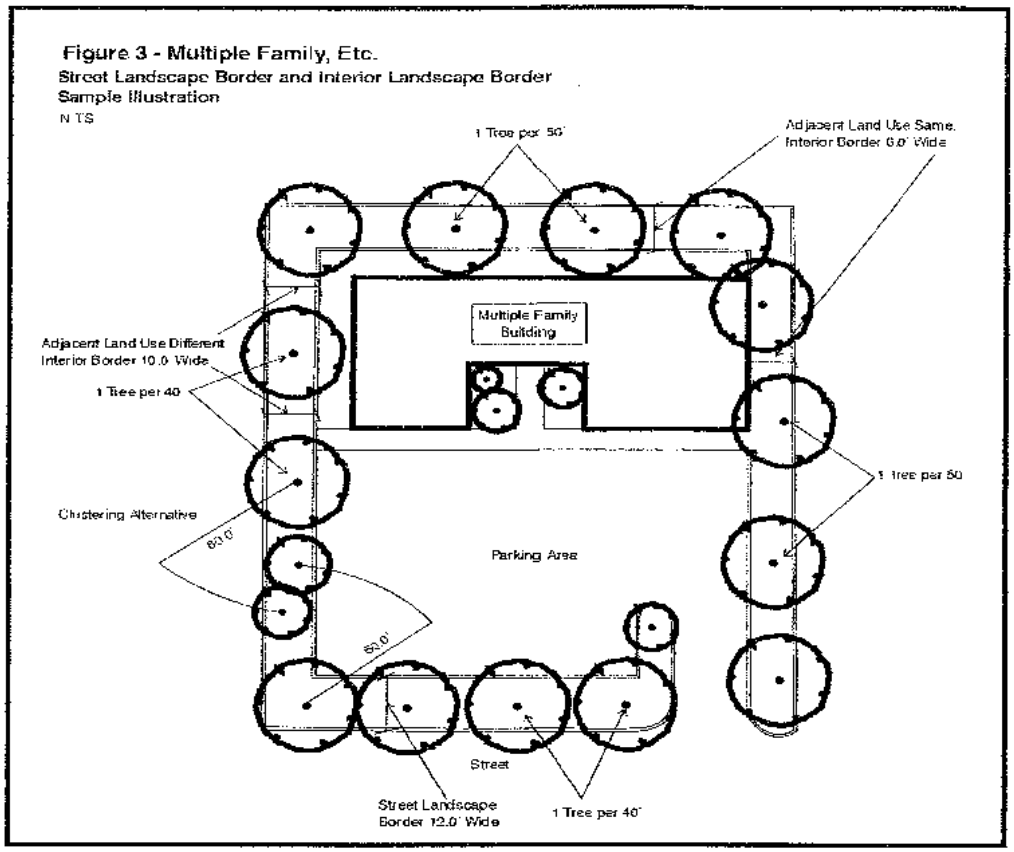
5. Interior Landscape Borders:

a. Interior landscape borders are not mandatory for multiple-dwelling developments, mobile home parks, recreational vehicle parks, tourist or trailer camps, and institutional developments, but may be required by city council with the advice of the planning and zoning commission or the city staff in situations where adjacent land uses may be impacted negatively by a proposed multiple-dwelling development, mobile home park, recreational vehicle park, tourist or trailer camp, and institutional developments, or where some landscape screening is deemed necessary. Where an interior landscape border is required, such borders shall be provided in accordance with the following standards:

(1) Figure 3 of this section shall serve only as an example and recommendation of the manner in which interior borders might be landscaped with regard to spacing of trees, clustering of trees, width of the border where adjacent land uses are the same, and width of the border where adjacent land uses are different.

(2) Where interior landscape borders are required, such borders shall comply with the provisions of subsections E4d and E4f through E4i inclusive of this section shall apply.

(3) All shade trees shall be six (6) to eight feet (8') in height with a minimum trunk caliper of one inch (1").



F. Landscape Design Standards For Commercial And Industrial Development:

1. Minimum Landscape Area; Plant Material: All commercial and industrial development shall landscape a minimum of twenty percent (20%) of their lot or site area. All commercial and industrial development shall use only low water use and drought tolerant plant material in accordance with the guideline documents described in subsection C2a of this section.

2. Turf: Turf is not a permitted landscape material for any commercial or industrial development.

3. Street Landscape Borders:

   a. A street landscape border shall be provided by all commercial development and all industrial development, and all additions to commercial or industrial developments of twenty five percent (25%) or more in terms of gross floor area, building perimeter, either with a single addition or cumulative additions subsequent to the effective date hereof, adjacent to any urban principal arterial streets, or urban minor arterial streets, or urban collector streets as designated by the city of Deming.

   b. The street landscape border shall have a minimum width of ten feet (10'). The street landscape border is to be located on site and measured from the street property line. Covered parking canopies or other structural canopies shall not overhang into the street landscape border. See figure 4 of this section.

   c. Within the street landscape border, deciduous or evergreen shade trees shall be provided in number equal to or greater than an average of one shade tree per thirty five (35) lineal feet, on center, of the site frontage length along the streets. See figure 4 of this section.

   d. All plant material shall be low water use and drought tolerant and such material shall be taken from the guideline documents listed in subsection C2a of this section.

   e. All shade trees shall be six (6) to eight feet (8') in height with a minimum trunk caliper of one inch (1"). Clustering of trees is permitted. Figure 4 of this section illustrates one possible clustering alternative.

   f. A minimum of two (2) shrubs per each required shade tree is recommended in the street landscape border.

   g. The street landscape border area shall contain a two inch (2") layer of low water use and drought tolerant ground cover, or rock mulch, or both.

h. Existing drought tolerant material within the street landscape border area may be used to fulfill the landscape requirements in accordance with the provisions of subsection C6 of this section.

i. Street landscape borders shall be irrigated with drip irrigation only.

j. Where a row of parking in a vehicle parking area abuts the street landscape border, the landscape requirements of subsections F3b through F3i of this section shall govern.

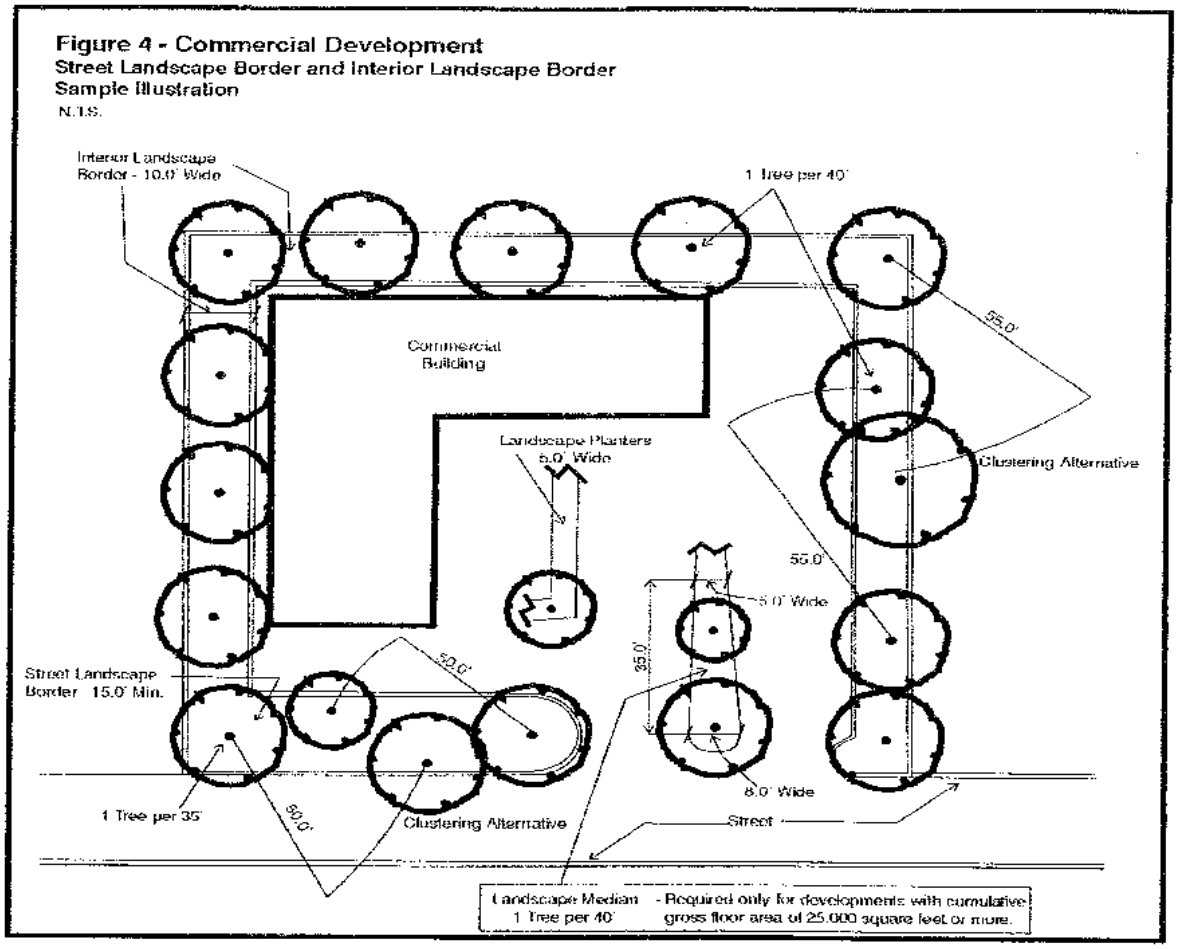
4. Interior Landscape Borders:

a. Interior landscape borders for commercial and industrial development are not mandatory, but may be required by city council with the advice of the planning and zoning commission or city staff in situations where adjacent land uses may be impacted negatively by a commercial or industrial development, or by additions to commercial or industrial developments, or where some landscape screening is deemed necessary. Where an interior landscape border is required, such borders shall be provided in accordance with the following provisions:

(1) Figure 4 of this section shall serve only as an example and recommendation of the manner in which interior borders may be landscaped with regard to spacing of trees, clustering of trees, and the width of the border.

(2) Where interior landscape borders are required, such borders shall comply with the provisions of subsections F3d and F3f through F3i inclusive of this section.

(3) All shade trees shall be six (6) to eight feet (8') in height with a minimum trunk caliper of one inch (1").



5. Vehicular Entrance Standards:

a. Generally, there shall be no design standards applicable to vehicular entrances for commercial or industrial developments. Such design requirements shall only be considered for commercial or industrial developments with a gross floor area of twenty five thousand (25,000) square feet or greater, or where any addition to existing commercial or industrial uses either a single addition or cumulative additions subsequent to the effective date hereof results in a gross floor area of twenty five thousand (25,000) square feet or more. In this situation, city council, on the advice of the planning and zoning commission, or city staff, may require the application of design standards where some degree of compatibility with adjacent developments is desirable, or where such standards will help implement an established or desired development theme, or where it is deemed necessary or desirable in the public interest. Where it is determined that such vehicular design standards are necessary, the following provisions and considerations may be used as

general design guidelines:

(1) A landscaped median shall be provided for the full length of the vehicular entrance and driveway.

(2) Figure 4 of this section shall serve only as an example of the manner in which commercial and industrial vehicular entrances may be designed with regard to median location, provision of a tapered median with suggested length and width. The spacing of trees as suggested for the interior borders on figure 4 of this section may be considered for the landscaping of the vehicular entrances.

(3) All shade trees should be six (6) to eight feet (8') in height and one inch (1") in caliper. The provisions of subsections F3d and F3f through F3i inclusive of this section may be considered for the landscape treatment of the entrance.

G. Modification Procedure: If an owner, authorized agent of the owner, or any other legal entity believes that strict conformance to the landscape standards cannot be met because of some unique or unusual hardship or circumstance, the owner, authorized agent or other legal entity may apply, in writing, to the city council for a waiver, or submit an alternative design. The owner, authorized agent or other legal entity must demonstrate clearly and satisfactorily to the city council why compliance is not possible and how the proposed alternative meets the intent of the regulations. Financial hardship shall not be considered a reason to waive the landscape standards. The city council may seek the advice of the planning and zoning commission and/or city staff. The city council may deny, approve, or approve with conditions or modifications, in writing, the request for waiver within thirty (30) days of the receipt of the request by the city. (Ord. 1086, 6-14-2004)

Appendix B

City of Deming
Water Rights
Acquisition Policy

City of Deming Water Rights Acquisition Policy

1. Background

Whereas, the City of Deming needs additional water rights to meet increased demand resulting from population growth and the expansion of municipal, commercial, industrial, and other beneficial uses within and adjacent to the City limits;

Whereas, the City of Deming lies within the Office of the State Engineer Declared Mimbres Underground Water Basin, (19.27.43 NMAC), which is closed to new appropriations and where water rights transfers are limited;

Whereas, acquisition of water rights in the administrative blocks surrounding the City is in the best interest of the City and its residents;

Whereas, economic and engineering efficiencies are best served by having water supply available from multiple locations within and around the City limits rather than in only one location, which would require the City to pump water longer distances through the City's distribution system;

Whereas, the City receives offers to purchase water rights from water rights holders on an annual basis;

Whereas, the City will use an approved procurement process to identify and purchase water rights to develop a water rights portfolio for future use;

Whereas the City has the discretion to reserve water rights in its water right portfolio for future use; the City may require new customers that propose to purchase significant amounts of water from the City to either purchase water rights in an equivalent amount or pay a fee to offset the cost for the City to purchase and replace those water rights in order to preserve the water rights portfolio for future use.

Therefore, this Water Rights Acquisition Policy is part of the City's 40-Year Water Plan, which allows the City to reserve water rights for future use.

2. Purpose

This policy establishes a framework to assist the City in identifying, selecting, and acquiring water rights in the most efficient manner, and to meet the City's goals and objectives in developing a water rights portfolio that will best meet future water demand.

3. Goals and Objectives

The City of Deming has identified the following goals and objectives for its water rights acquisition policy and will acquire water rights:

- on a periodic basis in order to develop and maintain a water rights portfolio that best meets future water demand
- that are within the same administrative block as existing municipal water supply and distribution infrastructure (e.g. wells or supply lines) if possible
- that will not cause water quality impacts should the City choose to pump water at the existing water right well location
- within the administrative blocks that include and surround the City, ensuring that water rights will be available in all areas of the City where future growth may occur (Plate 1)
- that are concentrated in areas where future growth is expected to occur
- that have a municipal, commercial, industrial purpose or agricultural purpose of use
- that have the most senior priority date
- that have the lowest purchase price and the lowest associated engineering and construction costs, unless other compelling factors provide the basis for purchasing a water right with higher costs
- through purchases, options or right of first refusal agreements with water rights holders who are not yet willing to sell, but who own water rights that meet the goals and objectives of this policy

4. Water Rights to be Acquired

City staff has the discretion to identify and select water rights for purchase or reservation, and must do so in accordance with the goals and objectives set forth in Section 3 taking into consideration market factors such as availability and price.

5. Determination of Annual Number Water Rights to be Acquired

The City will periodically purchase sufficient water rights to meet additional demand as identified by the City's 40-year water plan demand projections. The City has the discretion to determine the rate of water right acquisition based on the water right offers received as well as funds available to the City for water rights acquisitions.

6. Water Acquisition and Management Fund

The City will use the Water Utilities fund for water right purchases. Purchases of water rights may be budgeted on an annual basis and shall be included in any water rate analysis.