

CLOVIS – HERNDON SHOPPING CENTER EIR WATER RESOURCES CUMULATIVE IMPACT INVESTIGATION

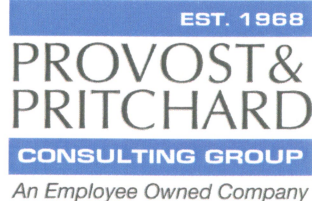
FOR

City of Clovis

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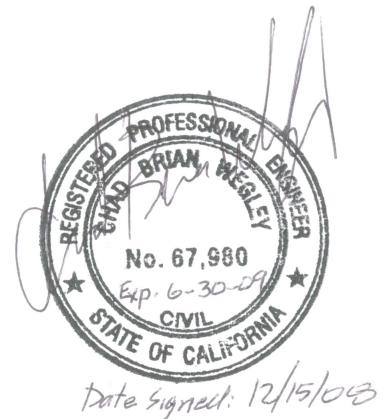
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December 2008



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**CLOVIS – HERNDON SHOPPING CENTER EIR
WATER RESOURCES CUMULATIVE
IMPACT INVESTIGATION**

CLOVIS, CA

DECEMBER 2008

Prepared for:

City of Clovis

Prepared by:

Provost & Pritchard Consulting Group
Clovis, California

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APPENDICES (See Attached CD)

A – Provost and Pritchard Statement of Qualifications

B – California’s Groundwater – Bulletin 118, Update 2003

C – Clovis Water Master Plan Update Phase II – Facilities Plan, July 1999

D – Clovis 2005 Urban Water Management Plan

E – October 6, 2008 Clovis City Council Staff Report: Workshop – Recycled Water Management and Use

F – Fresno 2008 Urban Water Management Plan

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ABBREVIATIONS

| | |
|--------|--|
| AB | Assembly Bill |
| ac | Acre(s) |
| AF | Acre-feet |
| AFY | Acre-feet per Year |
| CEQA | California Environmental Quality Act |
| CVP | Central Valley Project |
| DBCP | Dibromochloropropane |
| DPH | Department of Public Health |
| DWR | Department of Water Resources |
| EDB | Ethylene Dibromide |
| EIR | Environmental Impact Report |
| ESA | Endangered Species Act |
| FID | Fresno Irrigation District |
| FMFCD | Fresno Metropolitan Flood Control District |
| FWUA | Friant Water Users Authority |
| gpm | Gallons per Minute |
| GMP | Groundwater Management Plan |
| M&I | Municipal and Industrial |
| MCWD | Malaga County Water District |
| MG | Million Gallons |
| MGD | Million Gallons per Day |
| O&M | Operations and Maintenance |
| PCWD | Pinedale County Water District |
| RWQCB | Regional Water Quality Control Board |
| RWWTF | Regional Wastewater Treatment Facility |
| SB | Senate Bill |
| SOI | Sphere of Influence |
| ST-WRF | Sewage Treatment Water Reuse Facility |
| SWTP | Surface Water Treatment Plant |
| USACE | United States Army Corp of Engineers |
| USBR | United States Bureau of Reclamation |
| UWMP | Urban Water Management Plan |
| WMP | Water Master Plan |

ABBREVIATIONS (*continued*)

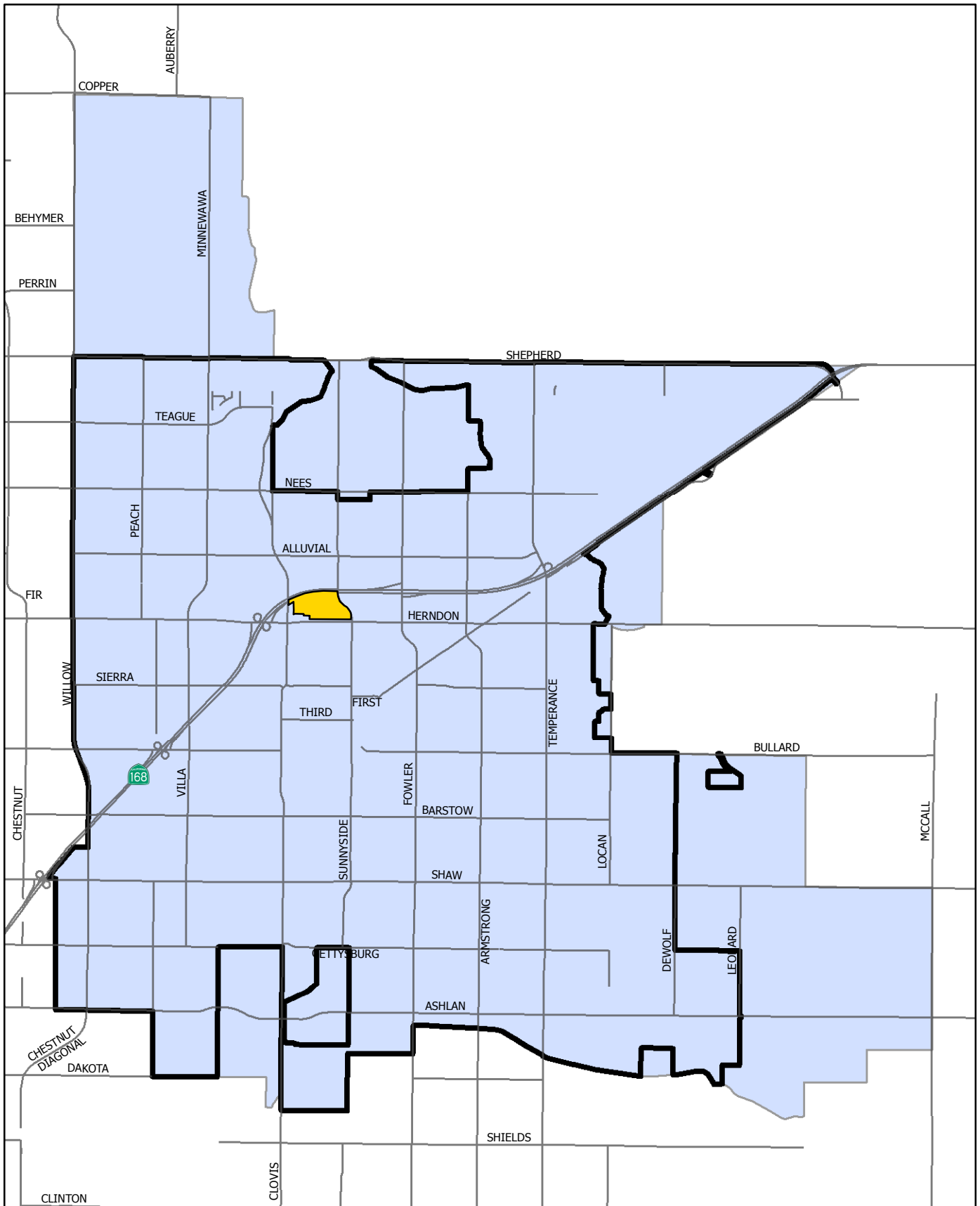
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|------|-------------------------------|
| WSA | Water Supply Assessment |
| WWD | Waterworks District |
| WWTF | Wastewater Treatment Facility |
| WWTP | Wastewater Treatment Plant |

1 INTRODUCTION


In *ASIP v. City of Clovis & Consolidated Actions*, Lead Case #03 CECG 01576, the Fresno County Superior Court found that the water supply-demand analysis section of the *Clovis-Herndon Shopping Center EIR* did not adequately address cumulative impacts to water resources from the shopping center and other reasonably foreseeable projects within and outside the City of Clovis (see **Figure 1-1**).

To address this issue, Provost & Pritchard prepared an in-depth investigation into the cumulative impact to water resources necessary to serve the proposed Clovis-Herndon Shopping Center project as well as the impact from reasonably foreseeable future users. This report provides background information about regional water supplies of the Central Valley, followed by a discussion of the various agencies responsible for administering these supplies to end users, including the proposed project. The discussion will quantify the amount of water available from each purveyor and its long-term reliability. In addition, the report discusses the major users of these resources and provides background information about each user. This report concludes with an evaluation of the potential cumulative impacts the Clovis-Herndon shopping center and all reasonably foreseeable future projects will have on local and regional water resources.

This report represents one of many water resources analyses Provost & Pritchard has prepared for, or in conjunction with, the City of Clovis over the past 10 years. Together Provost & Pritchard and the City of Clovis have worked on water master plans, groundwater recharge investigations, well site investigations, regional groundwater management plans, and drafted water supply agreements. In addition to the experiences with the City of Clovis, Provost & Pritchard has similar water resources experiences with local water districts in the Central Valley and developers looking to resolve similar issues. For specific examples of Provost & Pritchard's water resources experience see the Statement of Qualifications in **Appendix A**.



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Legend





-  PROJECT SITE
-  CITY BOUNDARY
-  SPHERE OF INFLUENCE

Figure 1-1
Project Study Area



*Clovis Herndon Shopping Center
 Water Resources Report*

2 REGIONAL WATER SUPPLIES

This section summarizes the various water supplies in the Central Valley that satisfy urban and agricultural demands. The three major water sources for the Central Valley are (1) precipitation, (2) groundwater, and (3) surface water. Refer to Section 6 for additional information about water supplies available to the City of Clovis and the Clovis-Herndon Shopping Center.

2.1 Precipitation

Annual rainfall in the Clovis area varies from approximately 6 inches in a dry year to more than 21 inches in a wet year. The average annual precipitation is approximately 11 inches. The amount of precipitation captured and stored in the water table depends upon the soil conditions, slopes, and duration of storm events. Most natural seepage of precipitation occurs in drainage courses that meander from east to the west.

2.2 Groundwater

Department of Water Resources (DWR) report titled *California's Groundwater – Bulletin 118, Update 2003* describes regional groundwater conditions for the Central Valley. A copy of this report is in **Appendix B**. The Tulare Lake hydrologic region (Tulare HR) consists of 12 distinct groundwater basins and covers approximately 17,000 square miles from the San Joaquin River to the Tehachapi Mountains. Clovis resides in the Kings Subbasin, one of seven subbasins in the San Joaquin Valley Groundwater Basin.

The Kings Subbasin is located in the northern third of the San Joaquin Valley Groundwater Basin and covers approximately 1,500 square miles (one million acres). The San Joaquin River, western boundaries of the Westside and Mendota Subbasins, southern fork of the Kings River, southern boundary of Alta Irrigation District and the alluvium-granitic rock interface of the Sierra Nevada foothills form the boundary for this subbasin.

Groundwater is the primary water source for agricultural and urban users in the Tulare Lake HR, as it accounts for 41 percent of the total water supply in the hydrologic region (DWR 2003). When comparing recorded groundwater use within the Tulare Lake HR to statewide records of groundwater use, DWR discovered that groundwater use in this region accounts for just over one-third of the total groundwater use in the State (DWR 2003). Well yields in the Tulare Lake HR typically range from 200 to 2,500 gpm. Thick sections of the aquifer made of unconsolidated continental deposits generally result in higher water yield than other soil deposits. As one moves toward the eastern boundary of the basin, near the interface of the valley floor and foothills, the aquifer thins which results in soil formations with lower yields (less than 300 gpm).

Water levels in most of the subbasins within the San Joaquin Valley Groundwater Basin have declined steadily as users increase their reliance on groundwater. In *Bulletin 118*, five of the seven subbasins were identified as being in a condition of critical overdraft.

According to DWR, critical overdraft is defined as the continuation of present water management practices that would probably result in significant adverse overdraft-related environmental, social, or economic impacts (DWR, 2003). In order to offset the impact of declining groundwater levels, many water purveyors within these basins import surface water to augment their supplies.

Groundwater plays a key supply in the water budgets of agricultural and urban users across the Central Valley. However, the ability to utilize this resource depends on the types of surface and subsurface conditions present at the point of use. Those regions with permeable soil conditions and a thick aquifer tend to rely on groundwater more than an user located in the foothills where depth of the aquifer is shallow and soils have lower permeability (high clay content). Although poor subsurface conditions can produce enough water to meet the needs of a few individual residences these formations cannot support a large community.

2.3 Surface Water

State and Federal governments constructed numerous water conveyance and storage facilities throughout California to develop water supplies for its residents. Major statewide water projects are the State Water Project (state control) and the Central Valley Project (federal control). In addition to these major facilities, numerous local water projects were constructed to convey water to clusters of rural users across the state.

Friant Dam (Millerton Reservoir) is located on the main stream of the San Joaquin River about 25 miles northeast of Fresno and functions as the principal storage facility in the Friant Division of the CVP system. Water from the San Joaquin River was diverted into the Madera Canal in 1944 and to the Friant-Kern Canal in 1951. Although Friant Dam was completed in 1947, the Friant-Kern Canal was not operational until 1951 when the Delta-Mendota Canal was finished. Exchange contract holders are users who have a legal right to use water from the San Joaquin River; however, instead of using this resource these users exchanged their rights to use the natural runoff from the San Joaquin River for a substitute supply from the Delta-Mendota Canal.

Total water supply from stored water within the CVP Friant Division is approximately 2,150,000 AF. Water made available from the Friant Division of the CVP is assigned one of the three possible classifications depending on hydrologic conditions. These classifications include:

- Class 1 – water supply considered dependable in practically every year with deficiencies only in occasional very dry years. Annual commitment is 800,000 AF.
- Class 2 – water available in excess of Class 1 supplies and because of this condition it is considered a much less dependable in terms of quantity and time of occurrence. Annual commitments are 1,400,000 AF.

SECTION TWO

- Section 215 – water released into the San Joaquin River during flood conditions in order to help regulate storage within the lake. This water source is not constant and thus varies from year-to-year.

USBR provides Section 215 water only during “flood” releases from Millerton Lake. Flood releases on this system occur more frequently than other large reservoirs in the state because of limited storage capacity, 540,000 AF, compared to the annual runoff of approximately 1.5 million AF. According to historical data, annual flood releases for Millerton Lake average 465,000 AF.

According to delivery records from the USBR, average allotment for Class 1 and 2 waters from Friant, 1965 to 2002, were 94 percent and 45 percent of normal, respectively. During the same period, contractors received their full allotment of Class 1 water in 27 of the 38 past years. In a critical dry year such as 1977, Class 1 water delivery was 25 percent of normal.

The other major water course near the Fresno-Clovis metropolitan area is the Kings River, located approximately 30 miles east. Pine Flat Dam is the primary storage facility on the Kings River with a capacity of 1 million AF. Kings River Water Association and the Kings River Conservation District are the agencies responsible for the management and operations of the Kings River water system. Kings River Water Association acts as the trustee for all the 28 member agencies and holds water rights licenses for all of the Kings River and storage right licenses on Kings River Reservoirs. Kings River Conservation District oversees flood control, power, on-farm water management and does not have water entitlement or supply.

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3 AGENCIES RESPONSIBLE FOR ADMINISTERING WATER SOURCES

Numerous agencies in the local area oversee or influence the water supply and water management decisions of Clovis (see **Figure 3-1**). Water supply resources available from these agencies consist primarily of imported surface water supplies from the Kings River and San Joaquin River. For example, Fresno Irrigation District (FID) provides banked groundwater (from surface water supplies) and surface water while Fresno Metropolitan Flood Control District (FMFCD) manages storm water for the Fresno-Clovis metropolitan area and surrounding areas.

The following section provides a brief description of the local agencies that have water supply resources, water management policies or both that can influence the City's decision making process. Each section presents a brief synopsis of the history, water supply, facilities, and purpose of each agency. A detailed explanation of the water supplies available from these agencies is provided later in Section 4.

3.1 Kings River Water Association










Kings River Water Association (KRWA) is a private entity that was formed in 1927 and consists of 28-member agencies (also referred to as "units"). These units consist of thirteen public districts and fifteen mutual water companies. KRWA is responsible for entitlements and delivery of Kings River water for beneficial use on irrigated agricultural farmland. FID is a member of the KRWA.

The KRWA service area boundary extends from the San Joaquin River and Enterprise Canal south to the Tulare Lake Bed; the western boundary generally heads north from Kettleman City up to the South Fork and then continues northeast to an area in the vicinity of the community of Tranquility, extending to Laton and terminating at the San Joaquin River west of Kerman. This service area covers nearly one million acres of farmland, including the Clovis and Fresno metropolitan areas.

3.2 Bureau of Reclamation

The United States Bureau of Reclamation (USBR) holds the sole water right permit for stored San Joaquin River Water impounded by, diverted, and released from Friant Dam. USBR provides service contracts for use of the stored water from the CVP Friant Division to 31 water agencies known as the "CVP Friant Division Long-Term Contractors." Existing long-term service contracts issued by USBR are available for viewing at www.usbr.gov.



-  PROJECT SITE
-  FRESNO I.D.
-  INTERNATIONAL W.D.
-  CITY OF KERMAN
-  BAKMAN W.D.
-  GARFIELD W.D.
-  MALAGA C.W.D.
-  PINEDALE W.D.
-  FMFCD Boundary

*Annexed lands do not have rights to Kings River surface water.

FID's Kings River water entitlement is only permitted for use on lands located between the Enterprise and Gould Canals.

FID's CVP Class II water is permitted for use on annexed lands located north of the Enterprise Canal.

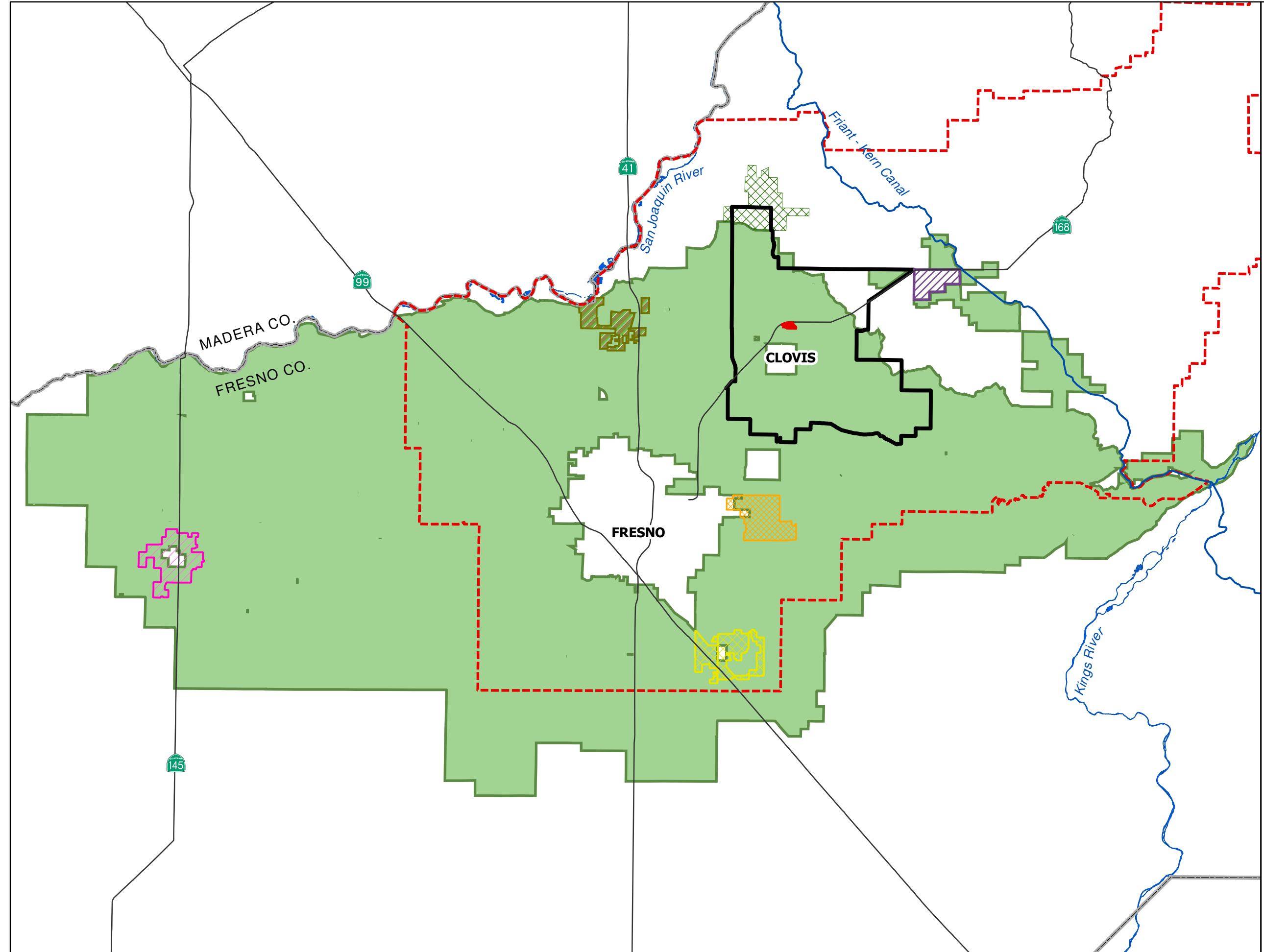
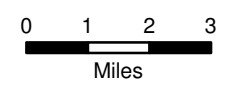


Figure 3-1

Agencies

*Clovis Herndon Shopping Center
Water Resources Report*



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SECTION THREE

3.3 Fresno Irrigation District

Fresno Irrigation District (FID) is a public irrigation district formed under the California Irrigation District Law in 1920 and succeeded the privately owned Fresno Canal and Land Company. FID manages and protects water supplies (groundwater and surface water) of the district to ensure availability for current and future users.

FID is located within Fresno County and covers approximately 245,000 acres, which includes Clovis and Fresno metropolitan areas. FID delivers water to agricultural and urban customers from the Kings River and the Friant-Kern Canal through a complex infrastructure made up of canals and pipelines.

In the late 1960s, FID approved the subordinate annexation of Dog Mountain, Table Mountain and other properties to the District. Generally these properties are east of the original district boundary, along the Friant-Kern Canal. These annexed lands are not within the primary district boundary and thus do not have a Kings River water entitlement.

In a normal year, FID delivers approximately 455,000 AF of water; most goes to agricultural users, although an increasing share of this supply is used to recharge groundwater in the Fresno-Clovis urban areas and to supply the two cities' surface water treatment facilities. FID continues to work with the City of Fresno, the City of Clovis, the County of Fresno, and the Fresno Metropolitan Flood Control District on comprehensive surface water and groundwater management programs to ensure reliability of water supplies for users within the Central Valley.

The City of Clovis has worked with FID to improve reliability of water supplies for the city's users. For example, the City of Clovis entered into an agreement with FID to finance and construct the Waldron Banking facility. This banking facility is located east of the City of Kerman, between Bishop Avenue to west, Belmont Avenue to the north, State Route 180 to the south, and Floyd Avenue and an irrigation canal to the south. When fully constructed the Waldron Banking facility will encompass 225 acres of percolation basins and include eight recovery wells for groundwater extraction. This facility allows FID to percolate water into the underlying groundwater table where it is stored for future use.

According to the *Water Banking and Reliability Agreement*, the City of Clovis is entitled to 90 percent of the annual yield and will use this source of water to augment their water supply during dry hydrological periods. With a projected annual yield of 10,000 AF the City of Clovis would receive 9,000 AF of water from FID. If the annual yield from this banking facility is less than the volume required by the City of Clovis, FID will acquire additional supply to make up the shortfall. In the event FID is not able to acquire additional water, FID will make water available from its Kings River entitlement. Actions like these confirm Clovis' proactive approach to improving the reliability of the water supplies for its existing and future residents.

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3.4 International Water District

Established in 1963, International Water District (IWD) delivers both surface water and groundwater to approximately 500 acres of farmland. IWD is located in the northeastern corner of the Clovis General Plan boundary and entirely within the Northeast Growth Area. Shepherd Avenue to the north, Thompson Avenue to the west, Del Rey Avenue to the east, and from Del Rey Avenue along the Pup Creek alignment to Thompson Avenue form the southern boundary for this district.

A contract with the USBR provides IWD with a CVP water supply from the San Joaquin River. In January 2001, IWD renewed its Long-Term Renewal contract with the United States of America for Project Water Service from the Friant Division of the CVP. This contract provides IWD with 1,200 AF of Class 1 water for agricultural and municipal and industrial (M&I) purposes.

3.5 Garfield Water District

Garfield Water District (GWD), formed in 1961, is located in the northern third of the City's Northwest Growth Area. GWD has a total area of 1,750 acres, of which 875 acres are within the Northwest Growth Area; the district delivers water to approximately 1,300 acres of farmland. In January 2001, GWD renewed its Long-Term Renewal Contract with the United States of America for Project Water Service from the Friant Division of the CVP. The contract provides 3,500 AF of Class 1 water for agricultural purposes.

3.6 Fresno Metropolitan Flood Control District

Fresno Metropolitan Flood control district (FMFCD) is a local governmental agency formed to limit flood damage in the metropolitan areas of Fresno and Clovis. The service area for FMFCD, including watersheds of urban areas and rural foothills, totals nearly 400 square miles.

Within the Clovis sphere of influence, FMFCD has a total of 25 basins. Most of these basins are located west of the Enterprise Canal. These basins are used in a variety of ways that benefit both the aquifer (dedicated recharge basin) and the community (combination recharge basin and park). FID and FMFCD infrastructures are responsible for conveying irrigation and storm waters to these basins.

4 WATER SUPPLIES AND RELIABILITY

Clovis relies on two water sources – groundwater and surface water - to meet the needs of existing users. There will also be a supply of recycled water upon completion of the Sewage Treatment Water Reuse Facility. Clovis operates its water system in a manner whereby over half of its surface water entitlement is intentionally recharged in order to boost groundwater supplies. According to historic well pumpage records from Clovis, groundwater serves as an important source of water for the City. Intentional recharge is the mechanism used by Clovis to sustain water production from local groundwater wells. As Clovis grows, surface water will increasingly become a greater portion of the water budget.

Groundwater discussion in this report will only focus on that portion of the aquifer underlying the Fresno-Clovis metropolitan area. This region was selected based on the fact that Fresno, Clovis, and the Fresno Irrigation District are the principle agencies using groundwater, managing groundwater, or both. Any changes in use and/or management philosophy will impact the local aquifer more than users in other parts of the Kings Subbasin. Also, since the aquifer thins along the eastern edge of the Central Valley and foothills, water levels are sensitive to changes which means the rate of decline is more pronounced in wells located in the eastern portion of Clovis.

4.1 Groundwater

Groundwater serves as an important water supply source for Clovis as well as a majority of other cities, towns, and communities in the Central Valley. The ability of Clovis to continue to utilize groundwater to meet urban demands depends on many factors, the most important include: natural and artificial recharge, aquifer characteristics, water level trends and geologic conditions and water quality. In order to obtain a sustainable groundwater supply, the total of natural and intentional recharge must equal well pumpage (sustained yield).

Clovis is located on the fringe (eastside) of a depression in the groundwater table that underlies the Fresno-Clovis metropolitan area. As a result of historical groundwater pumping in this metropolitan area, water levels within the Clovis Sphere of Influence (SOI) have declined, although the rate of decline has varied over the years, since the 1950s. Groundwater flow within the Clovis SOI generally moves from northeast to the southwest. This flow direction is influenced by the shape of the depression in the metropolitan area.

Water levels stabilize and recover during wet periods of the hydrologic cycle and when major changes are made in the management of local water resources. According to historic groundwater level data, the most significant decline occurred from 1952 to 1967, prior to operation of major recharge facilities. During a 10-year period from 1967 to 1977, water levels remained nearly constant varying from 60 to 69 feet. After 1977 (driest rainfall year for the Central Valley), water levels continued to decline. The recent housing boom between 2004 and 2007 led to further declines. However, beginning in

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2005, Clovis slowed groundwater level decline by operation of its surface water treatment plant. Production from that facility was sufficient to reduce groundwater extraction to pre-2000 production. With the pending improvements to the Surface Water Treatment Plant (SWTP), Clovis expects surface water treatment production to increase and the groundwater level further to stabilize.

Clovis currently has 32 active wells, of which 7 are equipped with a wellhead treatment process to remove organic (DBCP and EDB) and/or inorganic (iron and manganese) contaminants from groundwater (email correspondence with Clovis Public Utilities Staff). Water production from these wells totals approximately 28 percent of the total well production for Clovis.

4.2 Surface Water

Existing surface water supplies within the Clovis Sphere of Influence include Kings River water from FID, and surface water from CVP contract holders of the Friant Division. In addition to identifying the major purveyor and reliability of these supplies, how the City of Clovis benefits from these supplies is also included.

4.2.1 Kings River

Fresno Irrigation District holds "low flow" rights to the Kings River. While the District is entitled to water at nearly all flows, the percentage of total flow FID may divert is higher at relatively low Kings River flows. Therefore, for a given water year, FID will receive a greater entitlement if the snow pack melts slowly than if the runoff occurs rapidly. Average annual entitlement for FID from the Kings River is approximately 455,000 AF and in any given year there is 94 percent chance that FID's entitlement will be at least 300,000 AF.

The District's annual entitlement varies widely for similar type water years because of the variability in precipitation and snowmelt. The widest scatter of runoff occurs in water years with yields that range from 60 percent to 90 percent of the historical mean. During these conditions annual runoff varies from 305,000 AF to 420,000 AF.

As member of the Kings River Water Association, FID is entitled to water from the Kings River, which they distribute to its members. Within FID the amount of Kings River water each member receives is based on the percentage of landownership within the district. The basis for water entitlement from the Kings River (in 2008) was determined by dividing the annual Kings River runoff, 452,700 AF, by the served area within the district, 199,441 acres, which results in a unit entitlement of 2.27 AF/ac.

4.2.2 San Joaquin River

As Clovis continues to grow into new planning areas in the northwest and northeast, additional water supplies will become available. Some properties within these two planning areas are within the boundaries of water districts with contracts for water from the CVP. Regardless of the location of a development, projects must demonstrate that

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adequate water supplies are available to satisfy projected demands. Developments that occur on land within the water districts will not be granted entitlement unless the available water supply is sufficient to offset anticipated demand. IWD and GWD, CVP contract holders, are the only districts with water contracts for land within new growth areas, outside (north) of the Enterprise Canal. Based on the amount of district area within Clovis, these new growth areas may receive nearly 1,200 AFY and 1,750 AFY respectively from each district. Water from these agencies is vital to the water supply to the area in which they are located since it is considered reliable.

International Water District (IWD) has a Bureau contract for Friant Division CVP water, not to exceed on an annual basis 1200 AFY. In January 2001, IWD renewed its long-term contract to include provisions that permit the district to use Class 1 water source from the San Joaquin River for agricultural and municipal and industrial (M&I) purposes. The *Water Master Plan Update Phase II – Facilities Plan* (Provost & Pritchard, 1999) assumed that water from this district would be used to support urban users.

In January 2001, Garfield Water District (GWD) renewed (25 year period) its long-term Class 1 contract, 3500 AF, with the Bureau. However, during the last renewal period GWD did not renegotiate a change to allow M&I use of this water supply, so its water is only permitted for agricultural uses. The *Water Master Plan Update Phase II – Facilities Plan* (Provost & Pritchard, 1999) assumed that Clovis would be entitled to the water supply from those lands within the district that lie within the City's growth areas. Prior to development of lands within the GWD, adequate water supplies must be acquired.

In addition to Kings River water, FID has a contract with the United States Bureau of Reclamation (Bureau) for 75,000 AF of Class 2 water from the Friant Division of the Central Valley Project (CVP). The contract was executed on July 20, 1964, with a 30-year term that expired on February 28, 1995. On January 20, 2001, FID renegotiated a long-term agreement with the Bureau, which extended the contract to February 28, 2026. The FID/Clovis conveyance agreement recognized that Clovis has a proportionate share of this water, which FID elects to deliver to Clovis in the form of Kings River water.

FID annexed lands are served by CVP Class 2 water supply. Annexed lands are a collection of rural properties in the County of Fresno that are located east of the original boundary for FID, along the Friant-Kern Canal. According to historic delivery records from FID, average water delivery of Class 2 water to annexed lands is 200 AFY. Historically, FID annexed lands in Clovis' General Plan boundary that have used this water source are located northeast of Clovis near the intersection of State Route 168 and Shepherd Avenue; annual delivery to that region is 105 AF.

4.3 Other Supplies

4.3.1 Exchange Water

Exchange water is defined as groundwater that is pumped from reclamation wells and delivered to downstream FID users in exchange for Kings River surface water at

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upstream locations. Since Clovis participates in the Regional Wastewater Treatment Facility (RWWTF) with the City of Fresno, it is entitled to a share of water recovered by the reclamation wells. At the RWWTF, percolated effluent is exchanged by FID to the City of Fresno and City of Clovis through an agreement between FID and the City of Fresno. In return for the exchanged water, FID provides surface water supplies to Clovis and Fresno.

According to the *Water Master Plan Update Phase II – Facilities Plan* (Provost & Pritchard, 1999), pumping of reclamation wells at the RWWTF was approximately 10,000 AFY. Currently, the existing reclamation pumpage averages 26,000 AFY (2005 UWMP). Wastewater flows from Clovis represent ten percent of the inflow at the RWWTF and with a “one for two” exchange rate Clovis is entitled to 1,300 AFY. Historically, this supply source has never been used by Clovis.

4.3.2 Recycled Water

Recycled water, as it applies to Clovis, is Title 22 disinfected tertiary treated water that will be produced from a new sewage treatment-water reuse facility (ST-WRF), serving growth areas in Clovis. The initial capacity of this plant is 2.8 million gallons per day (MGD) with a build out capacity of 8.3 MGD. This facility is scheduled to start-up the first part of 2009.

When operating at its rated initial capacity, this plant will produce 3100 AFY of high quality recycled water. Since water from the ST-WRF will comply with the California Department of Public Health (DPH) water quality standards for “unrestricted use,” this resource is ideally suited for use on large, public landscaped areas irrigated with potable water. For additional information about the use of recycled water in Clovis consult the October 6, 2008, City Council staff report entitled *Workshop – Recycled Water Management and Use*.

5 MAJOR USERS OF REGIONAL WATER SUPPLIES

This section provides detailed discussions about primary water users in the Fresno-Clovis metropolitan area and surrounding regions. Primary users include both public agencies and private water companies that rely on groundwater, surface water or both to meet the potable water needs of their users (see **Figure 3-1**). Agencies listed below were included in this analysis since they are within close proximity to each other and their actions will have the greatest impact on the aquifer, and are within the boundaries of a major surface water purveyor (Fresno Irrigation District). Clovis was intentionally excluded from this list since in-depth discussions about its water system, available water supplies, and water use appear in Section 6.

5.1 City of Fresno

Incorporated in 1885, the City of Fresno has grown to over 480,000 people with more to come as undeveloped land in the sphere of influence and city limit are converted to urban uses. The sphere of influence and existing city limit cover 100,200 acres and 79,500 acres, respectively. However, only 42,000 acres within the city limit receive potable water service from the City.

The City of Fresno provides its urban customers with treated surface water and groundwater. Of these two water supplies, groundwater remains the primary water source, supplying approximately 90 percent of Fresno's demand. Groundwater is pumped from the aquifer by 250 wells, of which 32 require wellhead treatment to remove inorganic and organic contaminants. Surface water sources include waters from the Central Valley Project and Kings River. See Section 4 for in-depth discussions on water supplies.

According to the City of Fresno's *Urban Water Management Plan* (West-Yost, 2008), the water demand in 2007 was 165,000 AF, which was met by a water supply of 145,150 AF from groundwater and 20,650 AF from treated surface water. Fresno estimates the normal water year supply at build out for the city in 2030 to be 249,000 AF. This total includes 100,600 AF of groundwater, 123,400 AF of treated surface water, and 25,000 AF of recycled water. The projected build out demand in year 2030 is 249,000 AF. Demand is projected to decrease to 211,600 AF during a single dry year and to 211,700 AF during a multiple dry period. The 2030 projected water supply for both of these dry period scenarios is projected is 222,400 AF.

To ensure availability of water supplies for future users, Fresno will implement numerous water conservation measures to balance groundwater use by year 2025. There will include plans reduce demand incrementally with a 5 percent reduction starting in year 2010 and 10 percent reduction starting in year 2020. Additional restrictions are planned for critical and multi-dry years.

Of all the agencies discussed in this section, the City of Fresno is the largest user of groundwater with usage 20 times greater than cumulative demand of the other agencies. Therefore, how the City of Fresno chooses to manage their groundwater and surface water resources has a greater influence on the local groundwater basin than all

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the other agencies combined. Even a small percentage reduction in groundwater use by the City of Fresno will have a greater impact than the other users because of the sheer volume of water it uses.

5.2 Bakman Water Company

Established in 1948, Bakman Water Company (Bakman), a private utility, provides water service to residents and businesses in southwest Fresno. With a service area of approximately 1,600 acres, Bakman consists of 1,800 connections serving 10,000 customers. Although Bakman has 16 wells, only 10 wells are in service with the remaining 6 wells on standby or inactive. In 2003, groundwater pumpage totaled 3,900 AF. Water quality concerns in Bakman are the result of two principal contaminants in the groundwater – nitrates and dibromochloropropane. To comply with water quality regulations, pumped groundwater is either blended or treated with a granular activated carbon system.

5.3 Pinedale County Water District

Pinedale County Water District (PCWD) was formed in 1954 and provides water to rural residents in Fresno County. The PCWD service area encompasses nearly 1,270 acres or 2 square miles, in both the City of Fresno and unincorporated Fresno County. PCWD provides water to 2,400 residential and 550 commercial accounts.

PCWD delivers water through wells dispersed across the district. Presently, demands only require the district to run three wells of the five wells; the other two are on standby. PCWD does have other wells; however, these wells are currently offline because of trichloroethylene contamination. As undeveloped lands within the district urbanize one of the standby wells will serve as the water source for the added demand.

5.4 Malaga County Water District

Malaga County Water District (MCWD) is a water and wastewater utility agency located just south of the City of Fresno. This district has a service area that covers 2.3 square miles and serves a population of approximately 1,500 people. Water service began in 1965 and now the District has 224 residential connections and 220 industrial/commercial connections.

The District relies solely upon groundwater pumped from local wells to satisfy the demands of its uses. Although the District does have a total of six wells only three are in use; the remaining wells have water quality issues. Annual water demand for the District is 600 million gallons or 1,850 AF. To improve the reliability of groundwater supplies, MCWD is discussing, with neighboring agencies, the potential for teaming up and participating in a groundwater recharge project. In addition to the potable water system, MCWD operates a 1.2 MGD wastewater treatment plant. Effluent produced by this facility is delivered to onsite percolation ponds.

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5.5 City of Kerman

The City of Kerman (Kerman) was incorporated in 1949 and presently provides utility service, including but not limited to water and sewer, to over 13,500 people. Kerman is located in the northwestern corner of the County of Fresno, approximately 15 miles west of downtown Fresno, and encompasses 2.5 square miles.

Kerman relies entirely on groundwater to satisfy the potable water needs of its 2,420 connections. Water is provided by five wells dispersed throughout the City and conveyed to users through a complex network of pipelines crisscrossing the service area; two 750,000 gallon water storage tanks provide storage during daily non-peak demand periods. In 2005, Kerman delivered 3,100 AF from its wells. To help ensure the reliability of its groundwater supplies, Kerman is working to develop a groundwater recharge partnership with FID.

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6 CITY OF CLOVIS

This section provides a brief summary of existing and future demands of the City, and how these demands will affect its ability to meet the demand of the Clovis-Herndon Shopping Center, as well as demands of reasonably foreseeable future users. For additional information about existing and future demands for the City refer to the following reports: *Water Master Plan Update Phase II – Facilities Plan, 2005 Urban Water Management Plan*, and the *Clovis-Herndon Shopping Center EIR*.

6.1 Existing Demands

The general boundary for the present water service area of the City of Clovis is formed by Willow Avenue to the west, Shepherd Avenue to the north, State Route 168 and Locan Avenue to the east, and Ashlan Avenue to the south. The present water service area for Clovis encompasses nearly 14,500 acres or 70 percent of the total area within the sphere of influence. Also included in this service area is Tarpey Village – a former Fresno County water system – which Clovis now operates. Tarpey Village only accounts for 500 acres or 2 percent of the service area.

According to water production records obtained from the City of Clovis, approximately 25,000 AF was delivered to users in the City of Clovis and Tarpey Village during 2005. Of this yearly production, approximately 17,300 AF was pumped from Clovis' wells with 6,900 AF from the surface water treatment plant. Wells in Tarpey Village pumped 900 AF. In 2005 groundwater production represented 70 percent of the total water delivered while the surface water treatment plant accounted for 30 percent of the water delivered.

The SWTP not only allows Clovis to provide its users with water from another source of supply it also mitigates groundwater decline. In 2005 and 2006, the SWTP provided water to approximately 30 percent of the users in Clovis, which reduced the volume of water pumped from existing wells and in turn groundwater levels stabilized. With the pending improvements at the SWTP, Clovis expects surface water treatment production to increase and the groundwater level to stabilize.

6.2 Future Demands

To estimate potable water demands for future users the City of Clovis was split into five areas – Loma Vista, Clovis, Northern Rural, Northeast Triangle, and the Northwest – to maintain consistency with past water resources investigations. In order to assess the cumulative impact to water resources from reasonably foreseeable future users, demands were based on population projections and per capita usage. Since the population projection method relies on per capita water usage, which incorporates water demands from all land use types and the population associated with that water use, future demands may be determined from population. A key assumption with this methodology is that the land use distribution at existing conditions will be the same at build out. Additional discussions on population projections and per capita usage are presented below.

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Basing future demands off population and not a specific project list allows Clovis to evaluate the impacts of future users and provides a way to link this investigation to past water resources planning reports. Since the City of Fresno just completed their Urban Water Management Plan, which explains how Fresno will provide water to satisfy demands associated with build out of their general plan and how water supplies will be balanced,

Relying on a project specific list will not allow Clovis to adequately assess impacts of future growth areas since a project list will only identify pending and future projects located along the city limit. Clovis is required to consider a much larger area when planning and evaluating the impacts from future users and a population based demand is one method that allows Clovis to adequately evaluate and assess such concerns. The other reason for using a population based approach is to maintain consistency and connectivity to other documents such as, a general plan, urban water management plan, or specific plan.

The population based demand method is one of many ways to efficiently and effectively assess impacts of future users. Future demand is based on a build out population which links this investigation to other approved planning documents (general plan and urban water management plans). The population based demand method then allows for the use of per capita demand which accounts for demands from all users within the City. The per capita demand factor is determined by dividing total water production by population served by that water. One of the key assumptions in using per capita demand is that future growth areas will have a similar water use distribution as existing users. This is not an issue for Clovis since residential users are and will continue to be the predominate water users.

The Northeast Growth Area was not included in this report since key urbanization parameters (population, land uses, planning boundary, etc.) are not defined at this time. Even though this region is within the General Plan boundary, development will not occur until reliable water source(s) are identified. Developers of lands within this region will be required to demonstrate that reliable water source(s) are available for a development project and permitted for use in this region. Development within the Northeast growth area will also require water supply verification before a project is allowed to move forward.

Annual water demands for each region were determined using data from the *Water Master Plan Phase II – Facilities Plan* (Provost & Pritchard, 1999) and the *2005 Urban Water Management Plan* (adopted by Clovis City Council in February 2006). **Table 6.2-1** summarizes projected demands for each region.

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Table 6.2-1: Summary of Build Out Water Demands by City Growth Areas

| City Growth Areas | Population | Annual Demand (AF) |
|--------------------|----------------|--------------------|
| Clovis | 112,700 | 28,700 |
| Loma Vista | 22,000 | 5,500 |
| Northern Rural | 100 | 0 |
| Northeast Triangle | 9,200 | 2,300 |
| Northwest Village | 29,000 | 7,300 |
| Total | 173,000 | 43,800 |

Notes:

- (1) All values rounded to the nearest hundred.
- (2) Population data was obtained from page 9 of the 2005 UWMP.
- (3) Annual demand is based on a per capita demand value of 226 gallons per day. Per capita demand is determined by dividing the total water production for a city by the population served by that demand.
- (4) Per capita demand is a single demand factor that accounts for demands for all land use types within a city.

6.3 Water Supplies

6.3.1 Groundwater

Groundwater is a vital resource to Clovis because it is a major resource used to satisfy demands. With the influx of surface water into the heart of the metropolitan area from the SWTP, Clovis may use groundwater to satisfy demands of users not located within the service area of a surface water source.

Groundwater for Clovis is provided by wells dispersed across the metropolitan area. In 2006, groundwater pumpage from 30 wells totaled 18,500 AF. As Clovis continues to grow, new wells will only be added to the system as a replacement of an existing well. Thus, well production at build out should remain similar to present day production.

6.3.2 Surface Water

With completion of the SWTP in 2004, Clovis was able to provide treated surface water directly to its customers. In prior years, surface water was delivered indirectly to users by recharging it at spreading basins across the City. Because of poor subsurface soil conditions in the remaining growth areas, new spreading basins are not expected to be feasible, which will require recharge of surplus water supplies to occur outside of the City.

Water from the Kings River is used by Clovis to augment demands of its users. As agricultural lands within International and Garfield Water Districts are converted to urban use, Clovis will also rely upon San Joaquin River water available to

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those districts, in order to satisfy demands. Use of these supplies is made possible by the following agreements:

- Cooperative Agreement
- Water Banking and Reliability Agreement
- CVP Contract No. 14-06200-585A-LTR1
- CVP Contract No. 14-06-200-9421-LTR1

The *Cooperative Agreement* between Clovis and FID, signed August 7, 1972, discusses conveyance of Kings River and other waters, water entitlements, and Clovis' payments to FID. The amount of Kings River water Clovis receives from FID is based on its pro rata share of land within the District. Clovis will continue to receive additional Kings River water until all city land within FID is developed.

The *Water Banking and Reliability Agreement* allows Clovis to receive 90 percent of the yield from the Waldron Pond groundwater banking facility. Preliminary studies estimated that this facility will produce 10,000 AF, annually, which means Clovis would receive 9,000 AF. If the banking project is not able to meet the projected annual yield, FID will acquire additional water supplies for Clovis.

CVP contracts identified above are held by IWD and GWD, and were renewed in 2001 for a 25-yr period with provisions for one renewal for another period of 25-yrs. CVP Contract No. 14-06200-585A-LTR1 entitles IWD to 1,200 AF of Class 1 water that is designated for irrigation and municipal and industrial purposes. CVP Contract No. 14-06-200-9421-LTR1 provides GWD with 3,500 AF of Class 1 water designated for agricultural use; a contract amendment is required to permit municipal and industrial uses.

Surface water supplies are not constant and fluctuate from year-to-year, so supplies were evaluated at key hydrologic conditions. The conditions of the most concern include critical and multi-dry years because yields during these periods may be as low as 20 to 30 percent of normal.

6.3.3 Effluent Exchange

Effluent exchange represents a water source whose availability is a function of the fraction of inflow at the RWWTF that is from Clovis, the volume of water pumped from wells adjacent to seepage ponds at the RWWTF, and the surface water exchange rate (one for two) with FID. Approximately 1300 AF of water is available from this source with no change anticipated as Clovis grows since most wastewater flows from new growth areas will be diverted to the ST-WRF.

6.3.4 Recycled Water

Once the ST-WRF is complete, Clovis will be able to generate 3,100 AF of additional supply at "startup" with annual production increasing to 9,400 AF at build out. Since this

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water source will comply with water quality standards for “unrestricted use,” this resource is permitted for use on large landscaped areas in the metropolitan area. In order to claim credit for this resource in the local water budget, water must either be recharged or used in place of treated water. Since this supply is derived from indoor domestic water use it is not influenced by changing hydrologic conditions like outdoor use and is therefore a reliable constant supply.

6.3.5 Summary

Clovis will rely on groundwater, surface water, and recycled water to satisfy demands at build out. Utilization of these resources will be influenced by changing hydrologic conditions. For example, supplies could be as little as 39,800 AF during a multi-year drought to as much as 58,900 AF during normal hydrologic conditions. A shortfall in supply during a critical dry year can be offset with the purchase of additional surface water from FID, as allowed within the existing water supply agreement. **Table 6.3.5-1** presents a summary of the City’s water supplies at key hydrologic conditions.

Table 6.3.5-1: Summary of Water Supplies Available at Build Out (AF)

| Supply | Normal | Critical Dry | Multi-Dry | | |
|----------------|---------------|---------------|---------------|---------------|---------------|
| | | | Year 1 | Year 2 | Year 3 |
| Surface Water | 40,500 | 9,400 | 20,100 | 16,620 | 15,300 |
| Waldron Pond | 0 | 9,000 | 9,000 | 9,000 | 9,000 |
| Recycled Water | 9,400 | 9,400 | 9,400 | 9,400 | 9,400 |
| Exchange Water | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 |
| Groundwater | 7,700 | 7,700 | 7,700 | 7,700 | 7,700 |
| Other Supply | 0 | 3,000 | 3,000 | 3,000 | 3,000 |
| Total | 58,900 | 39,800 | 50,500 | 47,000 | 45,700 |

Notes:

- (1) All values rounded to the nearest hundred acre-feet.
- (2) Surface water includes water from the Kings and San Joaquin Rivers.
- (3) Waldron Pond use is set to zero during normal conditions since this source is not needed.
- (4) A multi-dry year is defined as three consecutive years with the lowest cumulative runoff volume and a critical dry year is single year event with the lowest runoff volume.
- (5) Other supply represents water that is acquired by FID on behalf of the City of Clovis.

Within the SOI, Clovis only needs 36,000 AF of Kings River water from FID. So, even at build out of the SOI, FID commits less than nine percent of its Kings River supply to Clovis. By using recycled and exchange waters to their fullest extent, Clovis would reduce the amount of Kings River water supplied by FID to 25,400 AF.

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7 CLOVIS-HERNDON SHOPPING CENTER

The Clovis-Herndon Shopping Center is a proposed commercial development located along Herndon Avenue between Clovis Avenue and Sunnyside Avenue. A Wal-Mart Superstore will serve as the main tenant for this Shopping Center with space for nine other major stores and six pads for future commercial businesses. This shopping center encompasses 44 acres and is located adjacent to six acres of existing commercial development.

7.1 Demands and Infrastructure

Water demands for commercial retail properties place the least amount of demand on a system because most of the area is dedicated to non-watering features, such as parking lots and open floor space. Using unit water demands from the *Water Master Plan Phase II – Facilities Plan* (Provost & Pritchard, 1999), the anticipated annual demand for the Project is 80 acre-feet per year (AFY). For comparison sake, a residential property with the same area would have an annual demand that varies from 92 to 180 AF, depending on dwelling unit density, which is greater than the anticipated demand for the Project. As the data clearly shows, the Project will use less water than a typical residential development.

Water demand for the Project will vary with hydrologic conditions. For example, when Clovis declares a Stage 4 (critical water shortage) drought all commercial users are required to reduce their consumption by 20 percent from the average monthly consumption of the two previous years (City of Clovis, 2005). Enforcement of this program will cause the annual water demand for the Project to decrease to 64 AF.

The City will rely on water transmission mains extending out from the surface water treatment plant (SWTP) and local distribution mains to convey water to the Project from the water distribution system. Water for the Project will be provided by an existing well near the intersection of Sunnyside Avenue and Herndon Avenue and the SWTP. The water distribution grid in Herndon Avenue and Sunnyside Avenue will convey water to the Project. Since the Project is consistent with approved planning documents, local water system infrastructure already accommodates the demands from this site; therefore, no improvements are required.

7.2 Supply

Water from the Kings River is available as a source of supply for the Project since it is located within that portion of FID's service area that also lies within the boundary for the Kings River service area. The amount of Kings River water available from FID is a function of the volume of runoff and the area within FID taking water. The unit entitlement for Kings River water may be as low as 1.85 acre-feet per acre per year (AFY/ac) or as high as 2.27 AFY/ac, depending on hydrologic conditions and the number of acres of land taking water. Due to the uncertainties associated with forecasting the future volume and availability of runoff from the Kings River, water for

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the Project was based off the lower unit entitlement, 1.85 AFY/ac, a conservative approach. Using the lower Kings River entitlement, the annual water supply available for the Project is 81 AFY. During a critical dry period, the amount of water available for the Project will decrease to 20 AF. To help offset the supply shortfall that occurs during dry hydrologic periods, the City of Clovis will rely on the Waldron banking facility and other water supply from FID.

7.3 Cumulative Impact

Demands associated with the Project are consistent with demands contemplated in the City's approved land use and water system facility planning documents. The City does not need to modify its water supply and infrastructure systems to support demand from this project. The Project is entitled to FID Kings River Water of 81 AF annually and its annual water demand will be 80 AF. Therefore, the Project will not have a cumulative impact on water supplies.

With a normal year runoff volume for the Kings River of 455,000 AF and a water entitlement of 81 AF for the Project, less than 0.02 percent of Kings River water is allocated to the Project. Even during a critical dry year when Project demand is reduced to 64 AF (assumes Clovis declares a Stage 4 drought) and FID's Kings River entitlement decreases to 200,000 AF, Project demand represents less than 0.03 percent of FID's Kings River entitlement. The Project will not impact FID's ability to meet other contractual obligations of its Kings River water.

As previously discussed, the Fresno Urban Water Management Plan indicates that Fresno, the major water user in the region, will have adequate water supplies with implementation of the Urban Water Management Plan for their build out. The Plan indicates they will balance their groundwater use by year 2025. The Project will not result in impacts to water delivery to Fresno.

Since the Project will demand less water than it is allocated by water entitlement, will not impact FID's ability to meet its other contractual obligations and will not impact water deliveries to other users, the Project will not result in significant cumulative impacts to the regional water supplies.

8 CONCLUSION

As shown throughout this report, the City of Clovis has sufficient water supplies available to satisfy water needs of the Clovis-Herndon Shopping Center as well as all reasonably foreseeable future users. The Shopping Center represents the ideal development project from a water supply/demand standpoint since it is entitled to a source of supply greater than demand. Also, the volume of water required from FID to support the Clovis-Herndon Shopping Center is negligible compared to FID's Kings River entitlement. Even after expanding the water resources analysis to include the Clovis SOI, the Kings River water supply needs from FID are still negligible compared to the total Kings River entitlement and will not hinder FID's ability to meet other contractual obligations of its Kings River water.

The key results from this investigation are (1) The land on which the Clovis-Herndon Shopping Center is proposed to be built has an entitlement of surface water supply that is greater than anticipated water demand of the proposed Project, (2) The Project and any foreseeable projects will not significantly impact FID's contractual obligations, and (3) Clovis will be able to balance groundwater levels with the SWTP.

9 REFERENCES

- Clovis, City of. (October 6, 2008). *Clovis City Council Staff Report: Workshop – Recycled Water Management and Use.*
- Clovis, City of. (February 2006). *The City of Clovis 2005 Urban Water Management Plan.*
- Clovis, City of. (December 2000). *The City of Clovis 2000 Urban Water Management Plan.*
- Department of Water Resources. (October 2003), *California's Groundwater Bulletin 118.*
- Empleo, Rey (ReyE@ci.clovis.ca.us), "Wellhead Treatment," email message, December 17, 2008.
- West Yost Associates. (August 2008). *City of Fresno Urban Water Management Plan.*
- Planning Center. (December 2002). *Southeast Urban Center Specific Plan, City of Clovis, Public Hearing Draft.*
- Provost & Pritchard Engineering Group, Inc. (July 1999). *Water Master Plan Update Phase II – Facilities Plan, City of Clovis.* Fresno, CA: Provost and Pritchard

Appendices