City of Hanford

2005 Urban Water Management Plan

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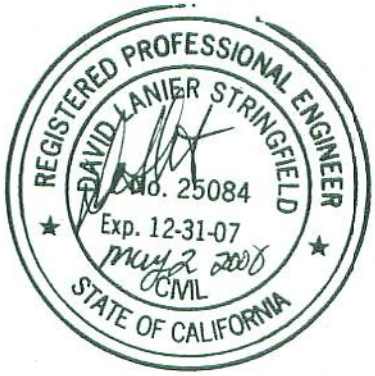

05/02/06

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2005 URBAN WATER MANAGEMENT PLAN

March 2006

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Dedicated to creative, responsive, quality solutions for those we serve.

May 2, 2006
6132J00

City of Hanford
900 South 10th Avenue
Hanford, California 93230

Attention: Mr. Lou Camara

Subject: 2005 Urban Water Management Plan

Dear Mr. Camera:

We are pleased to submit the City of Hanford 2005 Urban Water Management Plan. This document was adopted by the Hanford City Council on April 18, 2006.

The report is organized as follows:

Chapter 1 - Introduction
Chapter 2 - Service Area
Chapter 3 - Water Supply
Chapter 4 - Reliability Planning
Chapter 5 - Water Use
Chapter 6 - Supply and Demand Comparison
Chapter 7 - Water Demand Management Measures
Chapter 8 - Water Shortage Contingency Plan
Chapter 9 - Water Recycling

We would like to extend our thanks to you, and other City staff whose courtesy and cooperation were valuable components in completing this study and producing this report.

Sincerely,

CAROLLO ENGINEERS, P.C.

David L. Strinfield, P.E.
Partner

Tony A. Akel. P.E.
Project Manager

DLS:dlo

Enclosures: 2005 Urban Water Management Plan

7580 NORTH INGRAM AVENUE, SUITE 112 • FRESNO, CALIFORNIA 93711 • (559) 436-6616 • FAX (559) 436-1191

City of Hanford

2005 URBAN WATER MANAGEMENT PLAN

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DWR "Review for Completeness" Checklist
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City of Hanford
2005 Urban Water Management Plan

Contact Sheet

Date plan submitted to the Department of Water Resources: May 2, 2006

Name of person(s) preparing this plan:

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The Water supplier is a: **Municipality**

The Water supplier is a: **Retailer**

Utility services provided by the water supplier include: **Water, Sewer, Recycled Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**

Chapter 1

INTRODUCTION

1.1 PURPOSE

The California Water Code requires urban water suppliers within the state to prepare and adopt Urban Water Management Plans (UWMP) for submission to the Department of Water Resources (DWR). These plans, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 including amendments that have been made to the Act. The UWMPA requires urban water suppliers servicing 3,000 or more connections, or supplying more than 3,000 acre-feet (af) of water annually, to prepare an UWMP.

The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during water drought conditions. This report, which was prepared in compliance with the California Water Code, and as set forth in the guidelines and format established by the DWR, constitutes the City of Hanford (City) 2005 UWMP.

1.2 URBAN WATER MANAGEMENT PLANNING ACT

In 1983, State Assembly Bill 797 modified the California Water Code Division 6, by creating the UWMPA. Several amendments to the original UWMPA, which were introduced since 1983, have increased the data requirements and planning elements to be included in the 2005 plans.

Initial amendments to the UWMPA required that total projected water use be compared to water supply sources over the next 20 years, in 5-year increments. Recent DWR guidelines also suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has been completed.

Other amendments require that plans include provisions for recycled water use, demand management measures, and a water shortage contingency plan. The UWMPA requires inclusion of a Water Shortage Contingency Plan, which meets the specifications, set forth therein. Recycled water was added in the reporting requirements for water usage and figures prominently in the requirements for evaluation of alternative water supplies, when future projections predict the need for additional water supplies. Each urban water purveyor must coordinate the preparation of the Water Shortage Contingency Plan with other urban water purveyors in the area, to the extent practicable. Each water supplier must also describe their water demand management measures that are being implemented, or scheduled for implementation.

Amendments SB 610 (Costa, 2001), and AB 901 (Daucher, 2001), which became effective beginning January 1, 2002, require counties and cities to consider information relating to the availability of water to supply new large developments.

The most recent amendments include SB 318 (Alpert, 2004), which requires the plan to describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as long-term supply. AB 105 (Wiggins, 2004) requires urban water suppliers to submit their UWMPs to the California State Library.

1.3 PREVIOUS URBAN WATER MANAGEMENT PLANS

The City has previously prepared UWMPs. This section briefly describes the major recommendations of these plans.

1.3.1 1995 Plan Recommendations

The recommended urban water management program for the City described in the 1995 plan consisted of a combination of existing and proposed water conservation measures. The 1995 Plan recommended that the City continue with its existing activities as implemented at that time, with the exception of some proposed changes.

The conservation measures recommended in the 1995 Plan consisted of the following: Conservation, Education, Reclamation and Replenishment.

1.3.1.1 Conservation

The City, through adopted Water Conservation Ordinance limits the days and hours that landscape irrigation is allowed.

- The City shares equally with property owners who elect to have a water meter installed on an existing flat rate service (Since 1976, the City has been installing meters on all new customers).
- The City hires additional summer help to patrol the community to promote compliance with irrigation regulations.
- The City's water conservation program authorizes that City personnel adjust timers at the request of consumers.
- The City has a Landscape Ordinance for all new construction.
- In July 1992, the Hanford City Council passed an Ultra low-Flow Plumbing Fixture ordinance for all new construction. This Ordinance applies to all new construction and any replacement fixtures.

1.3.1.2 Education

The City is part of the Kings County Water Education Committee. The functions of this group include presentations regarding water safety and water conservation at public schools and civic groups.

There are water saving tips published in the local newspaper. The City has an information booth at the Kings District Fair, the City Street Party, and at four Town Hall meetings. Printed information is distributed pertaining to water conservation, water conservation is discussed, and water-saver kits are distributed.

1.3.1.3 Reclamation

- Continued use of reclamation area owned by the City
- The City will promote the use of reclaimed water on additional agricultural land including access through the adjacent irrigation district systems.
- The City will assist potential reclaimers to secure the necessary permits from the Regional Water Quality Control Board (RWQCB).
- Continue evaluation of the possibility of using reclaimed water for industrial use in non-food producing plants as development occurs in the City's Industrial Park.

1.3.1.4 Replenishment

The City maintains 164 acres of ponds, basins, slough remnants and five miles of the East branch of the Peoples Ditch. Through an agreement with the Kings County Water District (KCWD), these basins can be used as recharge basins, which have a storage capacity of approximately 900 acre-feet.

The following recommendations with regard to improving groundwater recharge in the Hanford area were listed by the 1995 UWMP:

- Plan for connections between the ditch company facilities and storm water basins to allow filling of basins during surplus water year for percolation.
- Encourage farmers to continue to utilize the upper groundwater instead of deeper groundwater (below 900 feet), which the City currently utilizes.
- Routinely meet with KCWD staff and Board to plan joint facilities and lobby for further allocation of surface water to KCWD. Possible ways that the City could help with the recharge/management of groundwater in the area:
  - Encourage the purchase of additional water stock shares from private owners to assist in preserving the water rights of the area.
  - Participate in the purchase of slough channels and other appropriate sites for use as recharge basins.
  - Construct future drainage basins with ties to Peoples Ditch Company Facilities.

- Participate in slough maintenance programs in conformance with executed agreements.
- Share data on yearly water pumping, water quality and water table depths in shallow and deep aquifers.
- Participate in lobbying for the Mid-Valley Canal project, of which the City has an allocation of 5,000 AFY. In 1979, the Bureau of reclamation made an allocation to KCWD of 77,000 AFY for delivery through the planned Mid-Valley Canal.

1.3.2 2000 Plan Recommendations

The recommended UWMP for the City described in the 2000 Plan, adopted January 2004, consisted of a combination of existing and proposed water conservation measures. The 2000 Plan recommended that the City continue with its existing activities as implemented at that time, with the exception of some proposed changes:

- Initiate a program offering free landscape audits to residential customers.
- Continue distribution of plumbing retrofit kits.
- Conduct a formal water audit and leak detection program.
- Continue billing of customers per 100 cubic feet of water consumed.
- Continue enforcement of Water Efficient Landscape Ordinance.
- Consider a High-Efficiency Washing Machine Rebate program.
- Continue distributing conservation information to the public through a variety of methods.
- Continue involvement with the school district regarding conservation education.
- Consider implementing a tiered water rate structure to promote conservation.
- Continue enforcement of the Water Waste Ordinance.
- Consider a Rebate Incentive Program for installation of Ultra-Low Flush Toilets.

1.4 PUBLIC PARTICIPATION AND PLAN ADOPTION

The UWMPA requires that the UWMP show the water agency solicited public participation.

Law

> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published … After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

In accordance with the UWMPA, the City held a public hearing and adopted the 2005 UWMP on April 18, 2006. A copy of the adopting resolution and resolution of intent to adopt are included in Appendix A. Two successive weeks prior to adoption; a notice of the public hearing was published in the local newspaper, notifying interested parties that the draft 2005 UWMP was available for review (Appendix B).

1.5 AGENCY COORDINATION

The UWMPA requires the UWMP identify the water agency's coordination with appropriate nearby agencies.

Law

> 10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

The City of Hanford 2005 UWMP is intended to address those aspects of the Act, which are under the control of the City, specifically water supply and water use. While preparing the 2005 UWMP, the City coordinated its efforts with relevant agencies to ensure that the data and issues are presented accurately.

The City contacted the Department of Water Resources (DWR) to discuss the requirements of the UWMPA and obtain electronic workbooks, checklists, and other developed guidelines to prepare this report.

KCWD, which was formed in 1954 under the County Water Act to provide a legal entity for water management in the northeast portion of Kings County, was also notified and provided access to the Public Review Document of the City's 2005 UWMP.

1.6 REPORT ORGANIZATION

This UWMP contains 9 chapters that were prepared to follow the outline requirements listed in the UWMPA. The chapters are briefly described below.

- Chapter 1 - Introduction
- Chapter 2 - Service Area
- Chapter 3 - Water Supply
- Chapter 4 - Reliability Planning
- Chapter 5 - Water Use
- Chapter 6 - Supply and Demand Comparison
- Chapter 7 - Water Demand Management Measures

- Chapter 8 - Water Shortage Contingency Plan
- Chapter 9 - Recycled Water

Additionally, the chapters are preceded with a separate section titled “DWR Review for Completeness Form”. This form is based on the 2005 UWMP Review Form and is provided to assist DWR staff during their review process.

1.7 ABBREVIATIONS

Abbreviations have been used in this report to improve readability. The abbreviations shown are each spelled out in the text the first time it is used and subsequently identified by abbreviation only. They are also summarized in Table 1.1 as a reference.

Table 1.1 Abbreviations and Definitions
2005 Urban Water Management Plan
City of Hanford

Abbreviation	Definition
1995 Plan	1995 City of Hanford Urban Water Management Plan
2000 Plan	2000 City of Hanford Urban Water Management Plan
AAWF	average annual water flow
af	acre-feet
AFY	acre-feet per year
Act	Urban Water Management Planning Act
BMPs	Best Management Practices
City	City of Hanford
Contingency Plan	Urban Water Shortage Contingency Plan
County	Kings County
CUWCC	California Urban Water Conservation Council
DHS	California Department of Health Services
DMMs	Demand Management Measures
DWR	California Department of Water Resources
EDU	Equivalent Dwelling Unit
EPA	U.S. Environmental Protection Agency

Table 1.1 Abbreviations and Definitions
2005 Urban Water Management Plan
City of Hanford

Abbreviation	Definition
ETo	Evapotranspiration
˚F	Degrees Fahrenheit
GMP	Groundwater Management Program
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GWR	Groundwater Rule
KCWEC	Kings County Water Education Committee
KCWD	Kings County Water District
MCL	Maximum Contaminant Limit
MDD	Maximum Day Demand
MG	million gallons
MGD	million gallons per day
MOU	Memorandum of Understanding
Plan	Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
taf	thousand acre-feet
UGB	Ultimate Growth Boundary
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act
ULFT	Ultra Low Flush Toilet
WMP	City of Hanford Water System Master Plan
WWTF	Waste Water Treatment Facility

SERVICE AREA

The UWMPA requires that the UWMP include a description of the water purveyor's service area and various aspects of the area served including climate, population, and other demographic factors.

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.1 LOCATION

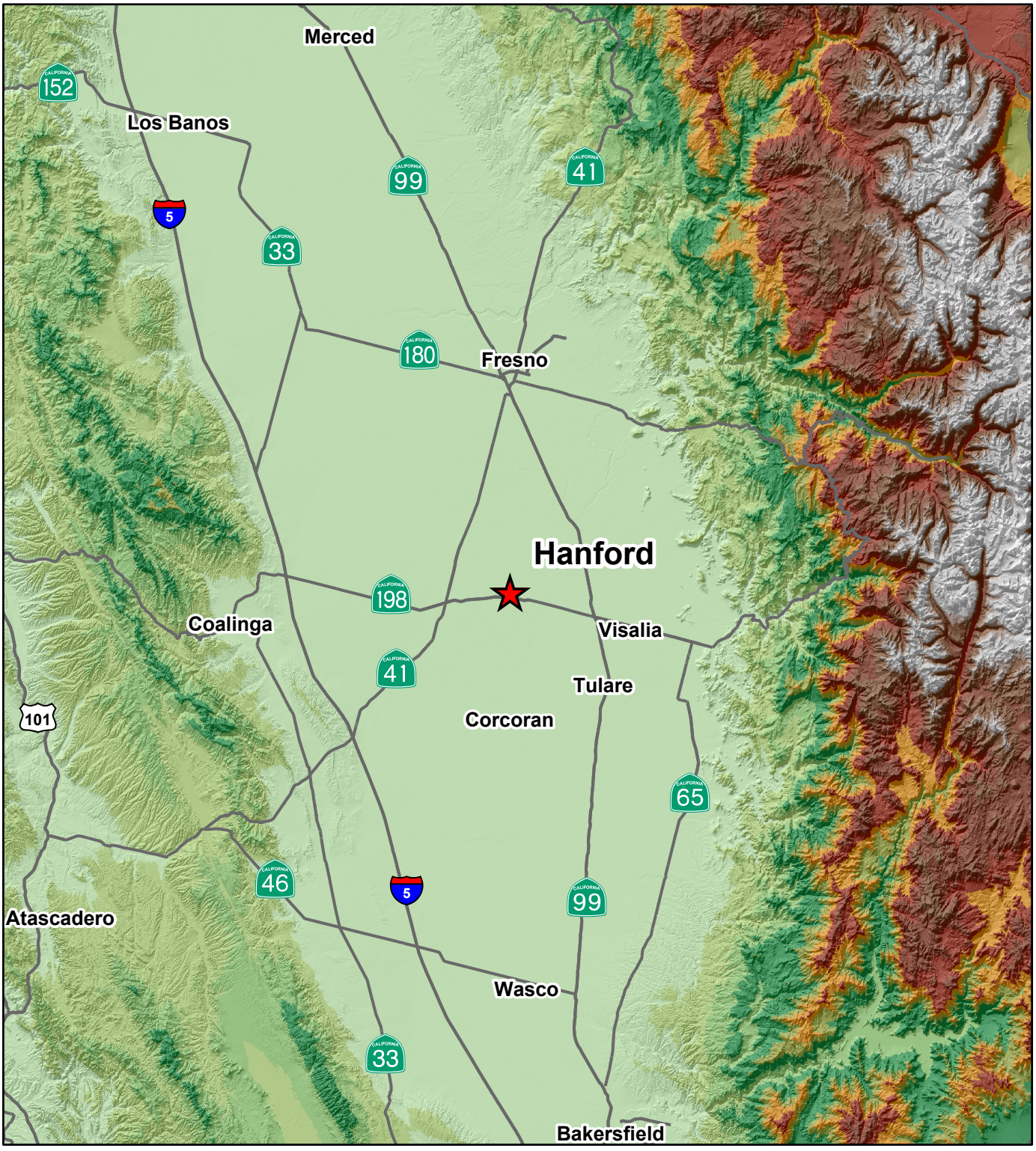
The City of Hanford (City) is located in Kings County, approximately 30 miles southwest of the City of Fresno and 195 miles north of the City of Los Angeles (Figure 2.1). The City's nearest neighbor, Lemoore, is approximately 10 miles west. State Highway 198 runs east and west through the City and State Highway 43 runs north and south along the easterly boundary of the City.

2.2 LAND USE

Located in the Central Valley of California, the City has a long history of agricultural land uses. Large agricultural corporations as well as many small private farms surround the City. These farms produce a variety of crops as well as dairy products from several large dairies in the area.

The General Plan, adopted in June 2002, identifies the current boundaries of the Ultimate Growth Boundary (UGB) (Figure 2.2). This UGB is recognized as the Ultimate City Growth Boundary over the life of the City's current General Plan. This UWMP assumes that the UGB describes the future water system service area.

In accordance with the general plan, the City's UGB comprises approximately 29.5 square miles (18,899 acres). There are approximately 6,284 acres of developed land in the City's metropolitan area including the industrial park area. The total developed area in the City, excluding the industrial park, is 5,758 acres. The predominant residential unit in Hanford is the single-family home with 82 percent of these homes in the low-density category, while the medium and high-density account for 16 percent and 2 percent, respectively. Table 2.1



Legend

Elevation

High :12,000 Feet

Low : 50 Feet

Major Roads

Miles

0 5 10 20

FIGURE 2.1
REGIONAL LOCATION MAP

2005 URBAN WATER MANAGEMENT PLAN
CITY OF HANFORD

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Updated: January 23, 2006

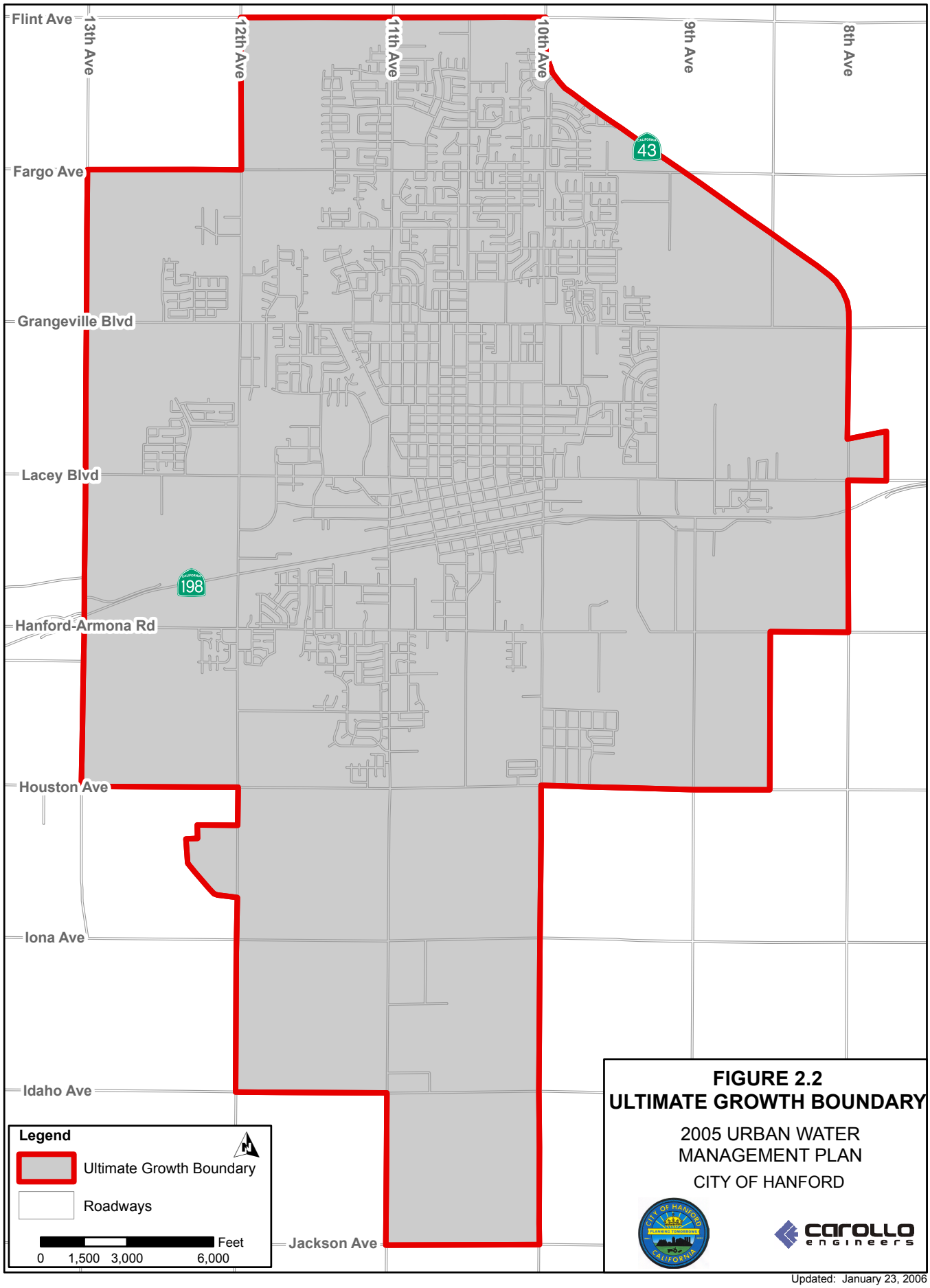


FIGURE 2.2
ULTIMATE GROWTH BOUNDARY

2005 URBAN WATER MANAGEMENT PLAN

CITY OF HANFORD

carollo engineers

Updated: January 23, 2006

summarizes the General Plan land use categories, as obtained from the 1996 Water System Master Plan (WMP).

Table 2.1 Land Use Categories
2005 Urban Water Management Plan
City of Hanford

Land Use	1996 WSMP		2005 Department of Public Works	
	Area (acres)	Percentage of Total	Area (acres)	Percentage of Total
Residential				
Low Density	2,594	51	3,555	57
Medium Density	664	13	698	11
High Density	55	1	70	1
Commercial	828	16	920	15
Industrial Within City	58	1	60	1
Industrial Park	496	10	526	8
Public				
Schools	229	5	275	4
Parks	145	3	180	3
Total	**5,069**	**100**	**6,284**	**100**

Notes:
1. Source: 1996 City of Hanford Water System Master Plan
2. Source: City of Hanford Department of Public Works, February 2006

2.3 CLIMATE

The climate in the City can be classified as Mediterranean with average rainfall rates of about 8-inches per year. Most of the annual precipitation occurs during the period from November through April. Table 2.2 summarizes monthly average evapotranspiration (ETo) rates, rainfall and temperature. The average annual temperature is 62.2 degrees Fahrenheit (° F), although it is not unusual for summer readings to reach well over 100° F. According to Western Regional Climate Center, the monthly average mean temperature in July is 80.0° F, with an average maximum of 97.4° F and an average minimum of 62.6°F. Extreme winter lows can reach into the teens with the first freeze usually coming in December, while the last comes usually in March.

During the winter, the relative humidity averages 91 percent, but 100 percent is not uncommon where persistent Tule fog can be present. Average winter daytime relative

humidities are 68 percent. In the summer and fall, humidity reaches 61 percent at night and 21 percent during the day. Winds are prevailing out of the northwest and average six miles per hour.

Table 2.2 Climate
2005 Urban Water Management Plan
City of Hanford

	Average ETo[1] (inches)	Average Rainfall[2] (inches)	Average Temperature[2] (ºF)
January	0.91	1.56	45.0
February	1.92	1.54	50.2
March	4.55	1.45	55.1
April	6.19	0.72	60.9
May	7.30	0.24	68.2
June	8.85	0.08	74.6
July	9.77	0.01	80.0
August	8.99	0.01	78.2
September	6.52	0.14	73.0
October	4.66	0.38	64.2
November	2.68	0.82	52.5
December	2.05	1.27	45.1
Annual	66.19	8.24	62.42

Notes:
1. DWR California Irrigation Management Information System website.
2. National Oceanic and Atmospheric Administration (NOAA) Western Regional Climate Center website.

2.4 PROJECTED POPULATION

The City was incorporated in 1891 and was primarily an agricultural settlement serving farmers. Hanford is a growing community with a population of approximately 48,070, as of January 1, 2005 according to the Department of Finance, and represents approximately 34 percent of Kings County. Please note that the population served the City's water system includes areas outside the city limits, and is estimated at 49,550 for 2005.

Population projections, shown in Table 2.3 and Figure 2.3, are used to forecast water requirements for the City. The 2002 City of Hanford General Plan (2002 General Plan), projects population through 2025. Population projections for 2030 were derived using the growth rate estimated in the 2002 General Plan. The 1996 City of Hanford Water System

Table 2.3 Historical and Projected Population
2005 Urban Water Management Plan
City of Hanford

2005 UWMP Projected Years[1]	2005	2010	2015	2020	2025	2030
City Population	48,070[2]	54,348[3]	62,395[3]	71,633[3]	82,239[3]	94,415[4]
Annual Increase over 5-year Period		2.6%	3.0%	3.0%	3.0%	3.0%
Population Served	49,550[5]	55,348	63,395	72,633	83,239	94,415
Annual Increase over 5-year Period		2.3%	2.9%	2.9%	2.9%	2.7%

Notes:
1. 2005 Urban Water Management Plan Projection Years are: 2010, 2015, 2020, 2025, 2030.
2. California Department of Finance, January 2005
3. City of Hanford 2002 General Plan
4. 2030 projection assumed similar growth rate as previous years' projections
5. City Utility Records, February 2006

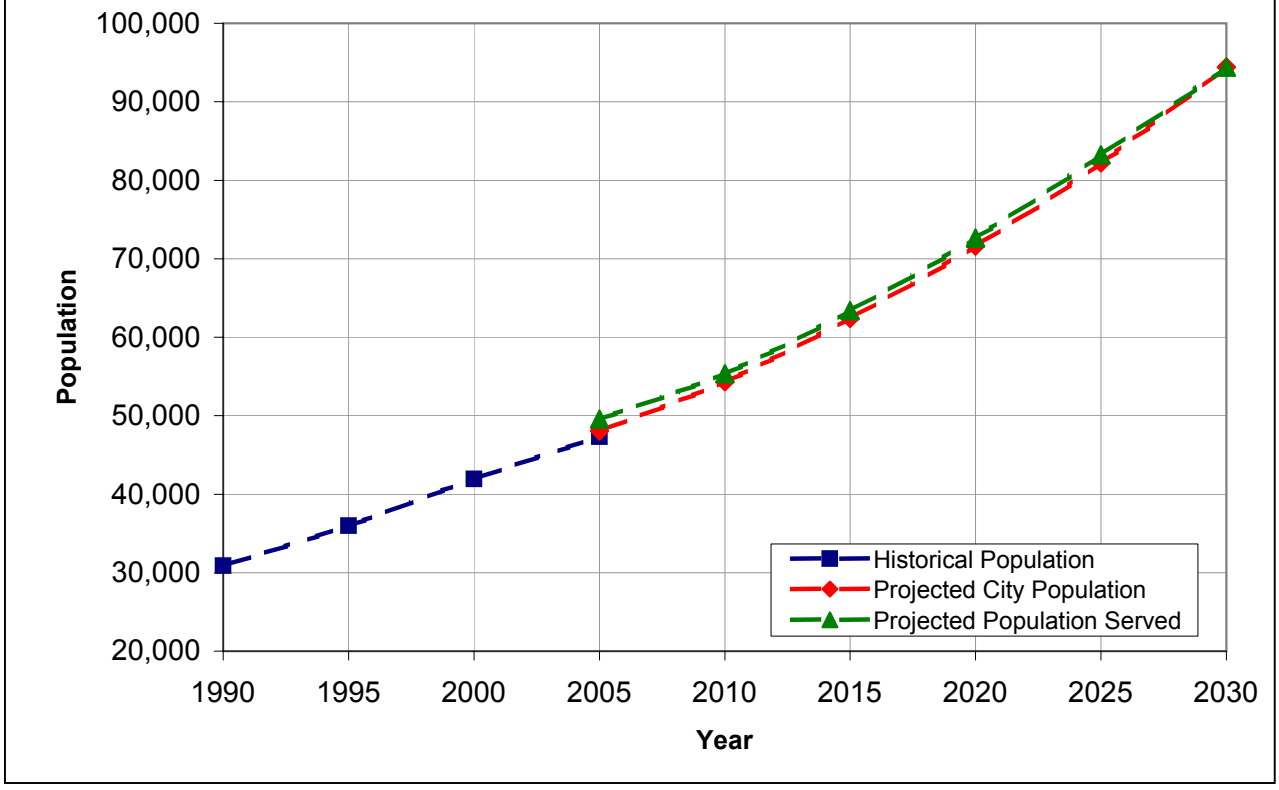


Figure 2.3
Historical and Projected Population
2005 Urban Water Management Plan
City of Hanford

Master Plan (1996 WMP) lists slightly higher projections as shown on Table 2.2. For the purpose of this report, the 2002 General Plan projections were used.

WATER SUPPLY

The UWMPA requires that the UWMP include a description of the agency's existing and future water supply sources for the next 20 years. The description of water supplies must include detailed information on the groundwater basin such as water rights, determination if the basin is in overdraft, adjudication decree, and other information from the groundwater management plan (if available).

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available.] (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
>
> 10631 (b) (1) A copy of any groundwater management plan adopted by the urban water supplier…
>
> 10631 (b) (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or board has adjudicated the rights to pump groundwater…For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted…

3.1 WATER SUPPLY FACILITIES

The City of Hanford (City) currently utilizes local groundwater, as it's sole source of supply. The City's municipal water system extracts its water supply from underground aquifers via 19 groundwater wells scattered throughout the City (Figure 3.1). Maps showing specific location of each well are included in Appendix C. The pumping capacities of the City wells are shown on Table 3.1. Water is conveyed from the wells to the consumers via a distribution system with pipe sizes ranging between 2- and 24-inches in diameter. The City currently maintains four storage reservoirs within the distribution system for a total capacity of 2.8 mg. These reservoirs include one small, elevated tank, one ground level storage reservoir and two one mg tanks recently constructed on Grangeville Boulevard.

3.1.1 Planned Capital Improvements

The City of Hanford (City) is implementing a plan for reducing Arsenic in its water supply system. The intent of the plan is to monitor and meet EPA's maximum contaminant levels (MCL) of 0.010 mg/L, which become effective on January 23, 2006. This plan, which is divided into three phases, includes abandonment of four wells, replacement of six wells and rehabilitation of three wells. When all phases are complete, the total supply capacity is expected to increase by 2,955 gpm to approximately 27,450 gpm. The proposed supply capacity for each well is also summarized in Table 3.1.

In October 2005, construction of Tank Site 5 on Grangeville Blvd. Consisting of two one mg tanks was completed. The City is planning to construct additional tanks on Fargo Avenue, which will increase storage capacity, as well as assisting in the reduction of the arsenic concentration in the water. This increase in supply and storage will enhance pressures in most areas of the distribution system and significantly enhance the City's ability to respond to short-term emergencies or unforeseen events.

3.2 GROUNDWATER BASIN

The groundwater basin underlying the City is the Tulare Lake Basin, which is part of the Tulare Lake Hydrologic Region (Figure 3.2). This region contains multiple interconnected subbasins that transmit, filter, and store water. These basins consist of the Kings, Kern, Kaweah, Tulare Lake, Tule, Westside, and Pleasant Valley groundwater basins.

The Tulare Lake Groundwater Basin is not an adjudicated groundwater basin, as defined by the California Water Plan Update, Bulletin 160-98, Figure 3-28 on page 3-54 and Table 316 page 3-55.

The California Water Plan Update, Bulletin 160-98 page 3-50, Table 3-15, lists the 1995 Level Overdraft for the Tulare Lake Region at 820 thousand acre-feet (taf). As shown in Table 3 15, groundwater overdraft is expected to decline to 670 taf during the 2020 average and drought years. During drought periods, water levels in these regions may decline.

However, during wet periods, most of these basins recover, thus making application of overdraft or perennial yield concepts difficult.

3.2.1 Basin Boundaries and Capacity

The Tulare Lake Subbasin is bounded on the south by the Kings-Kern county line, on the west by the California Aqueduct, the eastern boundary of Westside Groundwater Subbasin, and Tertiary marine sediment of the Kettleman Hills. It is bounded on the north by the southern boundary of the Kings Groundwater Subbasin, and on the east by the westerly boundaries of the Kaweah and Tule Groundwater Subbasins. The southern half of the Tulare Lake Subbasin consists of lands in the former Tulare Lakebed in Kings County.

According to DWR, estimations of the total storage capacity of the Tulare Lake Subbasin and the amount of water storage as of 1995 were calculated using an estimated specific yield of 8.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of the Tulare Lake Subbasin is estimated to be 17,100,000 af to a depth of 300 feet and 82,500,000 af to the base of fresh groundwater. These same calculations give an estimate of 12,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995. The amount of stored groundwater in this basin as of 1961 is 37,000,000 af to a depth of less than 1,000 feet. Kings County Water District's (KCWD's) Groundwater Management Plan (GMP) provides an estimate of 8,900,000 af for the district area.

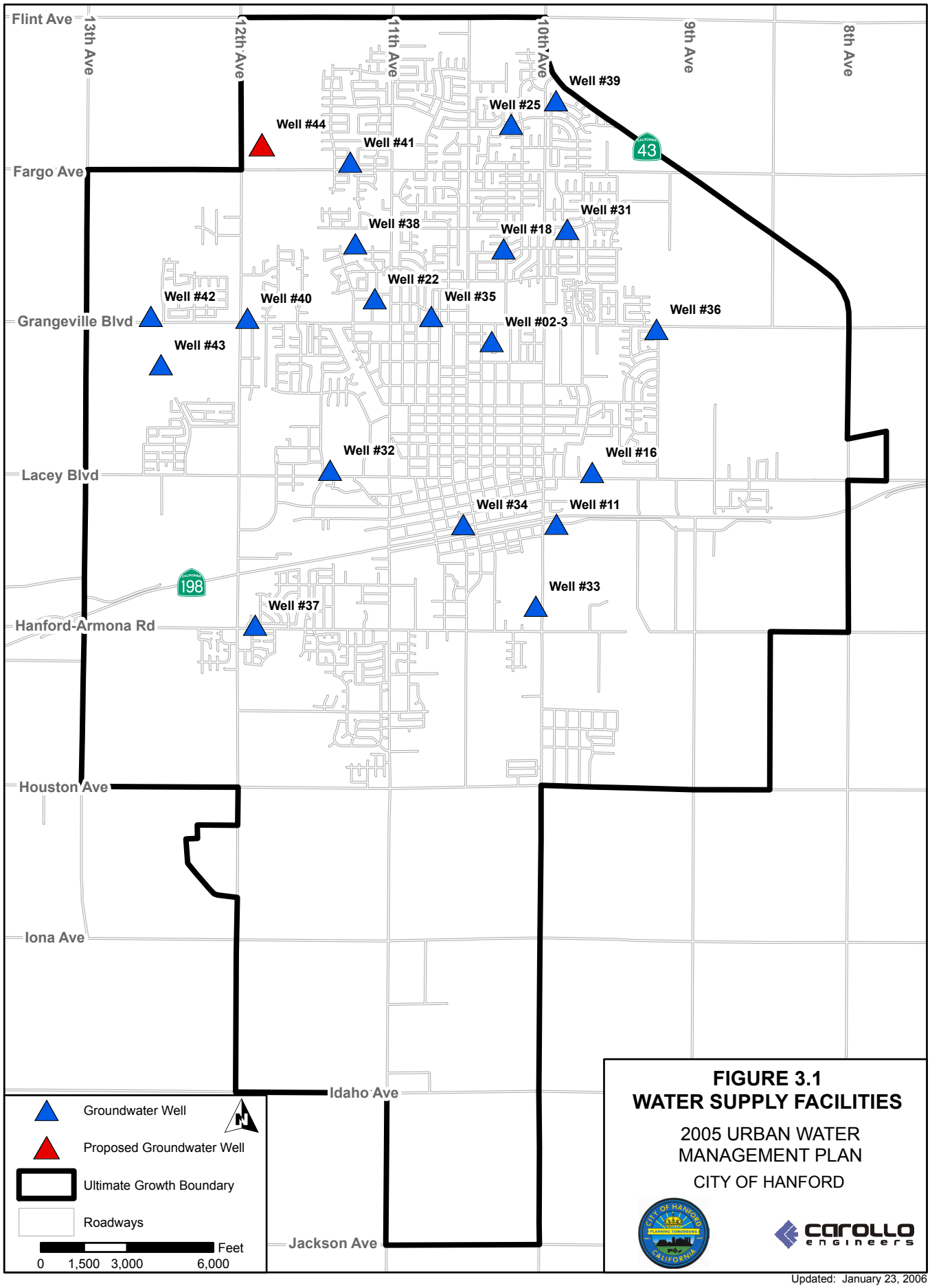


FIGURE 3.1
WATER SUPPLY FACILITIES

2005 URBAN WATER MANAGEMENT PLAN

CITY OF HANFORD

carollo engineers

Updated: January 23, 2006

Table 3.1 Water Supply Wells - Existing and Proposed Capacities
2005 Urban Water Management Plan
City of Hanford

Well No.	Existing Capacity (gpm)	Planned Improvement[1]	Phase No. 1 (gpm)	Phase No. 2 (gpm)	Phase No. 3 (gpm)
2	800	Yes	2,000	2,000	2,000
11	800	Yes	0	0	0
16	575	Yes	2,000	2,000	2,000
18	900	Yes	0	0	0
22	930	Yes	0	0	0
25	800	Yes	0	0	0
31	1,400	Yes	1,400	2,000	2,000
32	1,000	Yes	1,000	2,000	2,000
33	900	No	900	900	900
34	1,400	Yes	1,400	2,000	2,000
35	1,000	Yes	1,000	1,000	1,200
36	1,000	Yes	1,000	1,000	900
37	850	No	850	850	850
38	1,600	No	1,600	1,600	1,600
39	2,000	Yes	2,000	2,000	2,000
40	2,000	Yes	2,000	2,000	1,500
41	2,000	No	2,000	2,000	2,000
42	2,000	No	2,000	2,000	2,000
43	2,500	No	2,500	2,500	2,500
44	0	Yes	2,000	2,000	2,000
Total	**24,455**		**25,650**	**27,850**	**27,450**

Note:
1. May include abandonment, rehabilitation or replacement.

Legend

Tulare Lake Hydrologic Region

Groundwater Basin

- Brite Valley
- Castac Lake Valley
- Cuddy Canyon Valley
- Cuddy Ranch Area
- Cuddy Valley
- Cummings Valley
- Kern River Valley
- Mil Potrero Area
- Panoche Valley
- San Joaquin Valley
- Tehachapi Valley West
- Vallecitos Creek Valley
- Walker Basin Creek Valley

Text:

Tule -- Groundwater Subbasin

N

Miles

0 20 40

carollo engineers

FIGURE 3.2
TULARE LAKE HYDROLOGIC REGION

2005 URBAN WATER MANAGEMENT PLAN

CITY OF HANFORD

Groundwater Basin Source: California Department of Water Resources, February 2004

Updated: January 23, 2006

3.2.2 Groundwater Management Plan

The KCWD was formed in 1954 under the County Water District Act to provide a legal entity for water management in the Northeast portion of Kings County. KCWD prepared a GMP January 1993, with the date of last revision, November 2001 (Appendix D), which provides a clear understanding of KCWD groundwater management role within the County. It also documents the existing activities of KCWD and formalizes other proposed programs in a plan that will be used in implementing a monitoring and management program for conjunctive use, replenishment and preservation of groundwater of the basin.

Since its creation, KCWD has worked to minimize subsidence and protect the groundwater resources of the County under the direction of the District Act. KCWD's objectives related to groundwater management are to recharge the groundwater basins, conserve water, increase water supply, and to prevent waste or diminution of KCWD's water supply.

KCWD has effectively managed the groundwater basins to fulfill the objectives of the District Act and its mission. The goal of these groundwater management efforts has been, and continues to be, to ensure that groundwater resources are sustained and protected.

The Groundwater Management Program formally documents KCWD's groundwater management goals and describes programs in place that are designed to meet those goals. The following programs are documented in the plan:

- Conjunctive use of surface water and groundwater has been practiced within the KCWD since its formation in 1954. Through the purchase of slough channels and other appropriate sites for the use as recharge basins, and by the purchase and importation of available surplus water and flood release water, the KCWD has reduced the decline of groundwater levels within the District.
- Since 1963, the KCWD has engaged in a cooperative program with the State Department of Water Resources for the monitoring and sampling of groundwater in the District. Water level measurements are annually obtained from approximately 200 wells in both the spring and the fall. The data obtained in the spring (normally the last of January) reflects the "seasonal high" water table, as the measurements are made prior to pumping for pre-irrigation. The fall measurements (normally obtained in the first part of October) are taken after the season of crop irrigation pumping.
- The cooperative program between DWR and the KCWD was expanded to include monitoring of groundwater quality. Water samples from selected wells were collected in those years and delivered to the DWR and private laboratories for analysis.

3.3 GROUNDWATER STUDY

As part of the 1996 City of Hanford Water System Master Plan (1996 WMP) evaluation, local groundwater quality and subsurface geologic conditions were examined and

summarized. Additionally, KCWD continuously updates a Groundwater Management Plan within the study area. The latest update was completed in November 2001 (Appendix D).

3.3.1 Subsurface Geologic Conditions

The KCWD GMP provides the following overview of subsurface geological conditions.

“An enormous aquifer system lies beneath the District and extends the length and breadth of the San Joaquin Valley. The Valley is a broad structural trough, with the Sierra Nevada mountains on the east and the Coastal Range mountains on the west. The Sierra Nevada basement rock extends from the foothills on the east, sloping downward to the southwest at 4 to 6 degrees. Consolidated and unconsolidated continental and marine deposits from both the Sierra Nevada and the Coastal Range mountains overlie the basement complex. Unconsolidated Alluvial deposits make up most of the basin’s freshwater aquifer (USGS Water Supply Paper 1999-H, 1972).

Interspersed within the unconsolidated deposits that comprise the useable aquifer in the region are a number of clay layers that can act as confining beds. The confining bed that has greatest significance to the KCWD is known as the Corcoran Clay, or E-Clay.”

The 1996 WMP characterizes the local subsurface geologic conditions as Tertiary and Quaternary continental and marine deposits.

3.3.2 City Supply Wells

The City currently has 18 active and one standby groundwater wells. The wells are scattered throughout the City and have a total supply capacity of 35.2 million gallons per day (MGD) or 24,455 gallons per minute (gpm).

The City’s wells are monitored and operated by a SCADA radio telemetry system using a priority system based on water quality, system pressure, flow rate and power efficiencies. The SCADA system evaluates the criteria in the order of the priority logic and starts and stops well pumps as required to maintain adequate pressures in the distribution system. The order of priority is quality first, well efficiency second, and system pressure last. By adjusting the on/off pressure settings at the wells, the wells with high arsenic levels can be restricted to only operate during maximum water demands, thus taking advantage of maximum dilution with the low arsenic well water.

3.3.3 Groundwater Levels

According to the GMP, beginning in the mid-1970s and continuing to the present, there is a trend of much slower groundwater decline than experienced in previous years. Water levels have continued to fluctuate in response to drought and flood years, but have not exhibited nearly as strong a downward trend. This slowing in groundwater level decline probably resulted from increased groundwater inflow induced by the large cone of depression that

has formed in the region and by the activities to import other water and utilize floodwater for intentional groundwater recharge.

Information obtained from DWR indicates that on average, the Tulare Lake subbasin water levels have declined nearly 17 feet (ft.) from 1970 to 2000. The period from 1970 through 1978, showed moderate declines with many fluctuations, totaling about 12 ft. The ten-year period from 1978 to 1988 saw more fluctuations and a general increase of about 24 ft, bringing water levels up to 12 ft. above the 1970 water levels. 1988 through 1993 showed steep declines, bottoming out in 1993 at 23 ft. below the 1970 level. From 1999 to 2000, water levels dropped another 7 ft., bringing the water levels to about 17 ft., below the 1970 water levels. Fluctuations in water levels have been most exaggerated in the lakebed area of the subbasin. This area has the steepest decrease in water levels as well as some of the strongest increases in water levels.

Groundwater generally flows southwest, toward the Tulare Lakebed. Based on current and historical groundwater elevation maps (Appendix E), horizontal groundwater barriers do not appear to exist in the subbasin. Water-level maps obtained from DWR indicate a decline in groundwater elevations under the City. In 2004, groundwater was at approximately 135 ft above mean sea level, which is 115 ft below the ground surface (Figure 3.3).

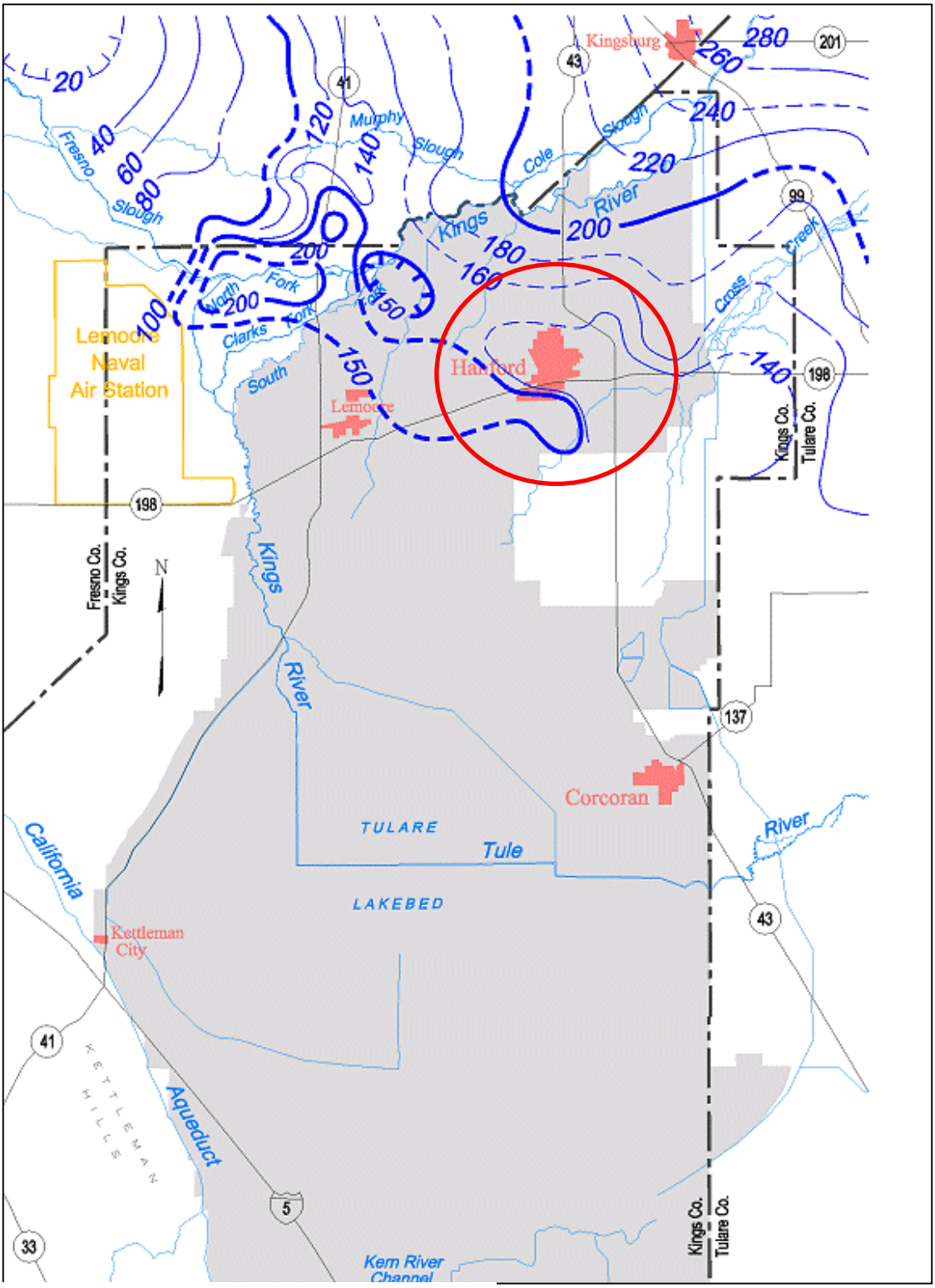
3.3.4 Sources of Recharge and Discharge

Groundwater recharge is primarily from stream recharge and from deep percolation of applied irrigation water.

The KCWD located in Hanford manages surface water supply in the area within and surrounding the City. The water utilized by the KCWD comes from a variety of sources. A major portion is obtained from the Kings River through ownership of shares of stock in the Peoples Ditch Company and the Last Chance Water Ditch Company. Water is also obtained from the Kaweah River through shares of Lakeside Ditch Company stock. Following are the basic programs of the KCWD:

- Protection, conservation, and stabilization of groundwater
- Negotiating and contracting for supplemental water
- Maintaining facilities for surface water distribution and groundwater recharge of irrigation water
- Preserving the benefit of existing surface water rights held by mutual water companies through a program of water stock acquisition and retention

Conjunctive use of surface water and groundwater has been practiced within the KCWD since its formation in 1954 through the purchase of slough channels and other sites for use as surface water recharge basins and by the importation of available surface water and flood release water. In and around the Hanford area the primary location of recharge areas has consisted of Mussel Slough and Sand Slough. The Storm Drainage Master Plan for



Source: DWR San Joaquin District website

Figure 3.3
Groundwater Elevation Contours - Spring 2004
2005 Urban Water Management Plan
City of Hanford

Hanford completed in 1995 has identified numerous future detention and retention basins and pump stations with which to accommodate surface water runoff. The majority of these future basins, as well as the City's existing basins (150 acres), are positioned along the Peoples Ditch facilities running north to south along the west and east sides of the City. These basins are planned to allow storm water to be either retained for disposal by percolation/evaporation or to be detained and later pumped to adjacent waterways for percolation or reuse down stream. The following recommendations were made in the 1996 WMP with regard to improving groundwater recharge in the Hanford area:

- Plan for connections between the ditch company facilities and storm water basins to allow filling of basins during surplus water years for percolation.
- Encourage farmers to continue to utilize the upper groundwater rather than the deeper groundwater below 900 feet, which the City currently utilizes.
- Routinely meet with KCWD staff and board to plan joint facilities and lobby for future allocation of surface water to KCWD.
- Construct future drainage basins with ties to Peoples Ditch company facilities.
- Participate in slough maintenance programs in conformance with executed agreements.
- Participate in the purchase of slough channels and other appropriate sites for use as recharge basins.

These facilities are anticipated to recharge the upper groundwater in the Hanford area and to the southeast. In addition, if these facilities were used in conjunction with the excess surface water supply from the KCWD during wet years, additional recharge could be accomplished.

3.3.5 Well Yields and Aquifer Characteristics

Pumping rates for the City wells range from 575 to 2,500 gpm. Pumping rates for eight of the 18 active wells exceed 1,400 gpm.

3.4 WATER SUPPLY PROJECTIONS

In determining the adequacy of the water supply facilities, the source must be large enough to meet the varying water demand conditions, as well as provide sufficient water during potential emergencies such as power outages and natural disasters.

3.4.1 Supply Capacity

In accordance with industry standard practices and the California Department of Health Services (DHS) criteria for "Adequate Source Capacity" on water supply, the source should be sized to serve the maximum day demand (MDD). On the day of maximum demand, it is

desirable to maintain a water supply rate equal to the MDD rate. Water required for peak hour demands (PHD) or for fire, flows would come from storage.

In accordance with industry standard practices and the DHS criteria for “Adequate Source Capacity” on water supply, the source should be sized to serve the MDD. On the day of maximum demand, it is desirable to maintain a water supply rate equal to the MDD rate. Water required for PHD or for fire, flows would come from storage.

Standby production capacity is required for system reliability. Under normal operating conditions, it is possible that one or two of the City’s wells can be placed out of service during MDD conditions due to equipment malfunction, for servicing, or for water quality concerns. The DHS criterion recommends counting the capacity of the largest well being out of service.

The City’s current MDD is around 17.0 MGD and City staff indicates the current supply availability is at 31.6 MGD. The City has increased the water supply facilities to include redundancy provisions for standby production and source reliability.

The adequate source of supply for the City will consist of groundwater wells with a combined production capacity that continues to meet the MDD (Table 3.2).

3.4.2 Groundwater Supply

The City’s current source of supply is groundwater, which is extracted from underground aquifers via 19 groundwater wells scattered throughout the city (Figure 3.1). The City’s current and projected supply was estimated and is summarized in Table 3.2, listed in 5-year increments, through the planning horizon of 2030.

Table 3.2 Current and Project Water Supply
2005 Urban Water Management Plan
City of Hanford

	2005	2010	2015	2020	2025	2030
Supply Capacity						
MGD	34.5	39.5	39.5	39.5	42.0	46.2
AFY	38,645	44,246	44,246	44,246	47,001	51,751
Groundwater Supply						
MGD	11.1	14.1	16.7	19.6	23.2	25.6
AFY	12,434	15,843	18,739	21,946	26,007	28,676

In order to optimize the utilization of this source, the City has been actively pursing supplemental programs. These programs include water banking and recycled water.

Water Banking

- The City is currently investigating the development of a water banking facility to capture and store additional surface water supply for use within the Kings County Water District. This facility could provide additional potable water to serve development within the City as well as other beneficial uses.

Recycled Water

- The City's wastewater, after it has been treated and disinfected, is reused by the Lakeside Irrigation Water District (LIWD) as stipulated in the Reclamation Project Agreement (Appendix F). The City pays $30 per acre-foot to LIWD, which allows LIWD to purchase additional surface water for agricultural irrigation, thus reducing the amount of groundwater used for current and future crop irrigation.

3.5 DESALINATED WATER

The UWMPA requires that the UWMP address the opportunities for development of desalinated water, including ocean water, brackish water and groundwater.

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long term supply.

3.5.1 Brackish Water and/or Groundwater Desalination

The groundwater that underlies the City is not brackish in nature and does not require desalination. However, the City could provide financial assistance to other purveyors in exchange for water supplies. Should the need arise; the City may consider this option.

3.5.2 Seawater Desalination

Because the City is not located in a coastal area, it is not practical nor economically feasible to implement a seawater desalination program. However, the City could provide financial assistance to other purveyors in exchange for water supplies. Should the need arise; the City may consider this option.

Chapter 4

RELIABILITY PLANNING

The UWMPA requires that the UWMP address the reliability of the agency's water supplies. This includes supplies that are vulnerable to seasonal or climatic variations. In addition, an analysis must be included to address supply availability in a single dry year and in multiple dry years.

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.
>
> 10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.
>
> 10631 (c) Provide data for each of the following: (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.
>
> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

4.1 WATER SUPPLY RELIABILITY

There are two aspects of supply reliability that can be considered. The first relates to immediate service needs and is primarily a function of the availability and adequacy of the supply facilities. The second aspect is climate-related, and involves the availability of water during mild or severe drought periods. This chapter considers the City's water supply reliability during three water scenarios: normal water year, single dry water year, and multiple dry water years. These scenarios are defined as follows:

- **Normal Year**: The normal year is a year in the historical sequence that most closely represents median runoff levels and patterns. The supply quantities for this condition are derived from historical average yields.
- **Single Dry Year**: This is defined as the year with the minimum useable supply. The supply quantities for this condition are derived from the minimum historical annual yield.
- **Multiple Dry Years**: This is defined as the three consecutive years with the minimum useable supply. Water systems are more vulnerable to these droughts of long duration, because they deplete water storage reserves in local and state reservoirs

and in groundwater basins. The supply quantities for this condition are derived from the minimum of historical three-year running average yields.

The City's water supply consists solely of groundwater.

4.1.1 Groundwater Reliability

Not all Hydrologic dry years lead to water supply shortages and groundwater overdraft. In an average or wet year, the water supply sources exceed the water needs. The annual quantity of groundwater available to the City is not expected to vary significantly in relation to wet or dry years, as shown in Table 4.1. This assumes that the groundwater yield is not reduced due to water quality issues. During extended drought periods, groundwater levels generally decline and will require more aggressive demand management practices and continued implementation of recycled water reuse for irrigation. The reliability and vulnerability of the water supply to seasonal or climatic shortages remains constant.

Groundwater pumping in the Tulare Lake Hydrologic Region continues to increase in response to growing urban and agricultural demands. Long-term groundwater overdraft can result in land subsidence, which also results in a loss of storage space. This has already caused some damage to canals, utilities, pipelines and roads in the region. However, some agencies within the Tulare Lake Hydrologic Region have adopted groundwater replenishment programs to ensure groundwater will continue to be a viable water supply.

4.2 GROUNDWATER QUALITY

Law

> 10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631 and the manner in which water quality affects management strategies and supply reliability.

The United States Environmental Protection Agency (EPA) is currently considering implementing several new or revised drinking water standards. The Ground Water Rule (GWR) contains measures to establish multiple barriers to further protect against bacteria and viruses in drinking water from the groundwater sources. The GWR will specify when corrective action is required to further protect consumers serviced by groundwater systems from bacteria and viruses. The City does not currently disinfect its supply water. In California, groundwater has long been considered free of sanitary contamination.

The City is faced with two water quality conditions that are the result of the natural deposition that formed the valley fill, arsenic and hydrogen sulfide. Each successive layer of material deposited on the valley floor carried with it a portion of the minerals that are present in the surrounding mountains and these became a part of the geology of the Valley. Many of these minerals contribute to the quality of the soils and to the quality of the groundwater. Most of the minerals are in concentrations that do not affect the suitability of

the water for domestic use. Arsenic however, is concentrated in the clay strata in the Hanford area in sufficient quantity that the use of the water for domestic consumption can be compromised.

Table 4.1 Water Supply Reliability
2005 Urban Water Management Plan
City of Hanford

Supply Units	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
2005					
MGD	11.1	11.1	11.1	11.1	11.1
AFY	12,434	12,434	12,434	12,434	12,434
2010					
MGD	14.1	14.1	14.1	14.1	14.1
AFY	15,843	15,843	15,843	15,843	15,843
2015					
MGD	16.7	16.7	16.7	16.7	16.7
AFY	18,739	18,739	18,739	18,739	18,739
2020					
MGD	19.6	19.6	19.6	19.6	19.6
AFY	21,946	21,946	21,946	21,946	21,946
2025					
MGD	23.2	23.2	23.2	23.2	23.2
AFY	26,007	26,007	26,007	25,007	25,007
2030					
MGD	25.6	25.6	25.6	25.6	25.6
AFY	28,676	28,676	28,676	28,676	28,676

Note: Supply projections through the planning horizon of 2030.

4.2.1 Local Groundwater Quality

According to the 1996 WMP, one of the minerals present in the ancient San Joaquin Valley was probably arsenic. Plants in deltaic and lacustrin environments utilized the mineral-rich water and bioaccumulated arsenic in the plant tissue. Over time, the accumulation of deadvegetative material in which the arsenic had bioaccumulated formed interbedded layers within the finer grained deposits.

These fine-grained deposits (usually silt and clays) became enriched in arsenic and were eventually buried. Chemical analysis of samples from these clays, collected during the drilling of the City's water supply wells, reported soluble arsenic concentrations of up to 11 mg/L. Therefore, it is possible that these arsenic-enriched clays contribute to the dissolved arsenic concentration in the City's drinking water supply.

Since the clays act as aquitards between aquifers, they also control certain chemical parameters in the aquifers they bound. These chemical parameters describe an overall chemical condition of these aquifers known as the geochemical environment. The geochemical environments will control the solubility of the arsenic.

The majority of the City's municipal wells are completed in aquifers that have a moderately reducing chemical environment. This explains the presence of arsenic, iron oxides and the activity of sulfate-reducing bacteria. The bacteria utilize subsurface organic matter, and cause the release of hydrogen sulfide gas, H_2S, which creates an odor. In addition, it is possible that the mixing of H_2S and soluble iron will form ferrous mono sulfide, which can create an "iced tea" colored water.

City wells completed after about 1980 are generally much deeper, averaging about 1,500 feet below grade. At this depth, the aquifers are strongly reducing. This further reduction of dissolved oxygen concentrations can create a geotechnical condition in which soluble iron and arsenic can precipitate out of solution. The precipitate will reduce the concentration of dissolved iron and arsenic in the groundwater.

In general, groundwater below 900 feet in the Hanford area has lower dissolved arsenic concentrations relative to shallower aquifers. Formation samples from below 900 feet collected during drilling of the City's water wells, report leachable arsenic concentrations less than the current state MCL of 0.05 mg/L. A copy of the City's 2003 Consumer Confidence Report is included in Appendix G.

4.2.2 Arsenic Removal Treatment

Because of the health concerns associated with arsenic, Congress has implemented the Safe Drinking Water Act (SDWA). In accordance with the SDWA, all community water systems are required to monitor the arsenic concentrations in their systems. The EPA mandated MCL is 0.010 mg/L. The compliance date is January 23, 2006, but the rule provides for compliance extension through the California Department of Health Services (CDHS) for up to three years, for systems that require significant capital improvements.

Arsenic has been a constituent of ongoing concern for the City. Some wells have been abandoned due to high arsenic concentrations, while others have been drilled to greater depths to obtain better quality water. The City has prepared several studies to determine the best methods for treating the arsenic in the water supply. The five most recent reports are:

- 1989 Water Quality Study (Carollo)
- 1996 Water System Master Plan (Boyle)
- 2005 Arsenic Reduction Study (Carollo)
- 2005 Water Supply and Distribution Capacity Analysis for the Arsenic Reduction Study (Carollo)

The 2005 Arsenic Reduction Study included an evaluation of the City's existing wells by Kenneth D. Schmidt and Associates (Appendix H) and recommended a non-treatment approach to bring the City's water system into compliance with the MCL. Non-treatment alternatives can be implemented at significantly lower capital costs and all of the annual operation and maintenance costs for treatment would be eliminated.

The proposed improvements, divided into three phases, include abandonment of ten wells, replacement of six wells and rehabilitation of three wells. When all phases are complete, the total supply capacity is expected to increase by 2,955 gpm to approximately 27,450 gpm. Five wells in the City do not need treatment, because their concentrations are below the MCL. Blending of Well 40 with Well 42 and 43 will be implemented at Tank Site 5 (Grangeville Blvd), which has recently been completed, to comply with the MCL. In addition, the City is also planning additional improvements to Tank Site 6, located on Fargo Avenue, which will increase the system's finished water storage.

The Water Supply and Distribution Capacity Analysis, completed by Carollo Engineers in October 2005, confirmed that after implementing these improvements, the water system will continue to provide enough water to meet the City's demands through the year 2010. The proposed increase in supply and storage capacity will enhance the City's abilities to respond to short-term emergencies or unforeseen events.

Chapter 5

WATER USE

The UWMPA requires that the UWMP identify the quantity of water supplied to the agency's customers including a breakdown by user classification.

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (b) (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic records.
>
> 10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the- following uses:
>
> A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.
>
> (2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

5.1 PAST, CURRENT, AND PROJECTED WATER USE

The City of Hanford's water customers include residential, commercial, industrial, and institutional groups. Though historically single-family residential and duplex dwellings were on a flat rate without meters, a City ordinance passed in 1976 dictated the installation of meters on all new customers. The City also meters all commercial and industrial users. Table 5.1 and Figure 5.1 show the distribution of users along with the distribution of water use.

5.1.1 Historical Water Use

The City provides potable water service to its residential, commercial, industrial, and institutional customers within the City limits and County "islands" within the boundaries of the City limits. In 2005, the City produced 3.6 billion gallons or 11,092 acre-feet (af) which is equivalent to 9.9 million gallons per day (MGD) of water servicing a population of approximately 49,550. Table 5.2 lists the available historical monthly and annual water production from 1992 to 2005.

Table 5.1 Water Use by Customer Type
2005 Urban Water Management Plan
City of Hanford

Customer Type	2004 Customers[1]	2004 Water Use[1] (gpm)
Residential		
Metered	10,235	-
Non-Metered	2,809	-
Sub Total	**13,044**	**5,109**
Public Authority		
Metered	301	-
Non-Metered	40	-
Sub Total	**341**	**942**
Industrial		
Metered	18	-
Non-Metered	0	-
Sub Total	**18**	**132**
Commercial		
Metered	988	-
Non-Metered	0	-
Sub Total	**988**	**797**
Total	**14,391**	**6,980**

Notes:
(1) Source: City of Hanford Utility Billing Division, Feb 2006

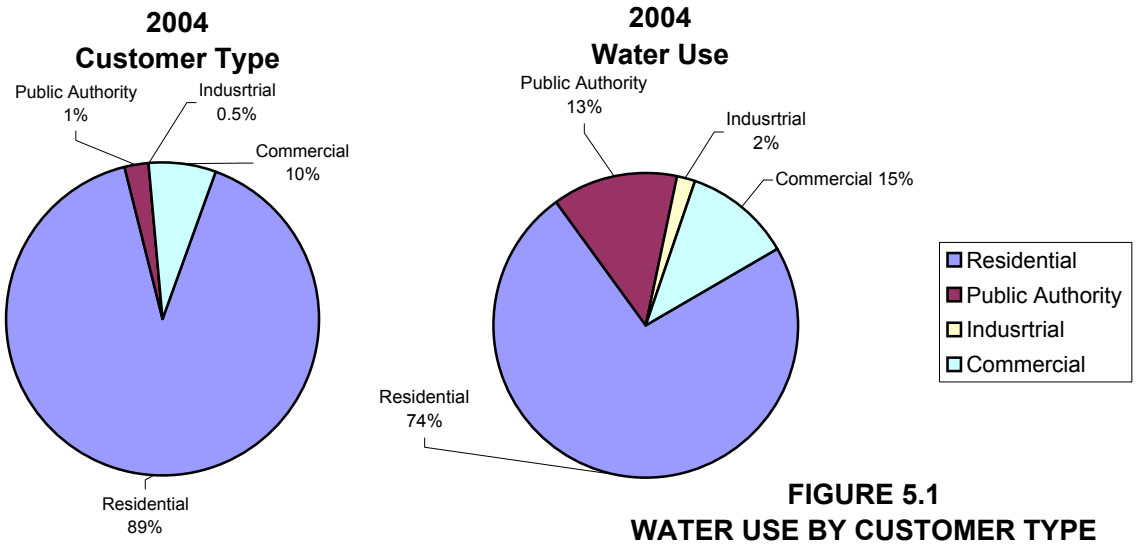


FIGURE 5.1
WATER USE BY CUSTOMER TYPE
2005 URBAN WATER MANAGEMENT PLAN
CITY OF HANFORD

Table 5.2 Historic Monthly Water Production
2005 Urban Water Management Plan
City of Hanford

Year	Monthly Water Production (MG)												Annual Water Production				Population			
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total Annual (MG)	Average Monthly (MG)	Average Daily (mgd)	**Annual Increase (%)**	Population	**Annual Growth (%)**	Per Capita Consumption (gpcd)	**Annual Increase (%)**
1984	-	-	-	-	-	-	-	-	-	-	-	-	2,631	219.3	7.2		23,657		305	
1985	-	-	-	-	-	-	-	-	-	-	-	-	2,534	211.2	6.9	**-3.8%**	24,412	**3.1%**	284	**-7.1%**
1986	-	-	-	-	-	-	-	-	-	-	-	-	2,700	225.0	7.4	**6.1%**	24,730	**1.3%**	299	**4.9%**
1987	-	-	-	-	-	-	-	-	-	-	-	-	2,921	243.4	8.0	**7.6%**	25,266	**2.1%**	317	**5.6%**
1988	-	-	-	-	-	-	-	-	-	-	-	-	2,826	235.5	7.7	**-3.4%**	25,886	**2.4%**	299	**-5.9%**
1989	-	-	-	-	-	-	-	-	-	-	-	-	2,760	230.0	7.6	**-2.4%**	27,459	**5.7%**	275	**-8.6%**
1990	-	-	-	-	-	-	-	-	-	-	-	-	2,689	224.1	7.4	**-2.6%**	30,897	**11.1%**	238	**-15.5%**
1991	-	-	-	-	-	-	-	-	-	-	-	-	2,574	214.5	7.1	**-4.5%**	31,987	**3.4%**	220	**-8.2%**
1992	126.1	119.6	149.9	224.3	348.4	370.4	371.8	375.2	312.9	244.2	156.0	136.2	2,935	244.6	8.0	**12.3%**	33,327	**4.0%**	241	**8.6%**
1993	128.6	155.2	168.8	212.6	317.1	347.9	396.1	390.9	343.7	265.6	190.3	148.6	3,065	255.4	8.4	**4.3%**	34,194	**2.5%**	246	**1.8%**
1994	132.2	132.0	177.7	236.1	318.9	370.3	414.5	389.6	315.8	221.8	160.7	144.3	3,014	251.2	8.3	**-1.7%**	35,083	**2.5%**	235	**-4.4%**
1995	137.7	125.7	146.2	205.3	256.6	345.9	401.3	389.0	325.0	280.1	210.9	172.8	2,997	249.7	8.2	**-0.6%**	37,400	**6.2%**	220	**-7.2%**
1996	149.5	127.2	160.8	221.7	329.5	385.2	419.1	402.6	323.0	240.4	143.6	143.3	3,046	253.8	8.3	**1.6%**	38,150	**2.0%**	219	**-0.4%**
1997	130.5	127.4	204.5	270.8	384.5	406.1	437.8	423.2	373.9	295.0	169.2	158.6	3,382	281.8	9.3	**9.9%**	39,300	**2.9%**	236	**7.2%**
1998	148.9	122.2	161.8	167.7	233.2	290.9	392.2	394.4	342.6	261.6	170.4	149.8	2,836	236.3	7.8	**-19.2%**	39,900	**1.5%**	195	**-21.1%**
1999	144.0	128.4	172.1	210.1	341.2	385.9	422.7	401.0	349.2	288.6	190.1	178.0	3,211	267.6	8.8	**11.7%**	40,350	**1.1%**	218	**10.7%**
2000	153.8	135.0	167.1	246.7	327.5	404.1	419.7	412.3	330.0	229.5	162.8	155.5	3,144	262.0	8.6	**-2.1%**	41,450	**2.7%**	208	**-4.9%**
2001	144.0	126.1	168.3	205.0	368.7	417.7	411.1	418.3	341.9	273.5	154.8	122.5	3,152	262.7	8.6	**0.3%**	43,000	**3.6%**	201	**-3.5%**
2002	123.1	133.9	180.6	277.0	393.1	436.0	473.1	442.3	350.1	283.2	177.8	151.7	3,422	285.2	9.4	**7.9%**	45,000	**4.4%**	208	**3.6%**
2003	152.7	139.0	206.4	221.0	239.5	439.9	496.1	453.9	390.3	326.4	191.2	157.7	3,414	284.5	9.4	**-0.2%**	45,515	**1.1%**	206	**-1.4%**
2004	144.0	130.1	212.5	323.3	442.2	460.1	505.9	486.7	399.6	265.5	148.7	150.0	3,669	305.7	10.1	**6.9%**	47,800	**4.8%**	210	**2.3%**
2005	152.8	143.6	171.1	252.8	333.5	435.4	521.6	487.2	388.1	313.7	238.3	176.2	3,614	301.2	9.9	**-1.5%**	49,550	**3.5%**	200	**-5.2%**
													Historical Average Annual Increase							
													1995-2005 Last 10 Yrs.			**1.5%**		**2.8%**		**-1.3%**
													2000-2005 Last 5 Yrs.			**2.7%**		**3.5%**		**-0.8%**
													2002-2005 Last 3 Yrs.			**1.7%**		**3.1%**		**-1.4%**

5.1.2 Maximum Day Demand

One of the water demand conditions that is of particular significance is the maximum day demand (MDD). This is the highest water demand during a 24-hour period of the year.

The MDD peaking factor is expressed as a multiplier applied to the average day demand (ADD). Water system sources are typically sized to meet the anticipated MDD of a water system.

Based on the 1996 WMP, a factor of 1.75 was used. A factor of 1.75 was also used to estimate future MDD.

5.1.3 Past, Current, and Projected Per-Capita Consumption

The per capita consumption rate is used for estimating the City's future water requirements, evaluating the adequacy of the supply source, and determining storage needs. The consumption rate, expressed in gallons per capita per day (gpcd), is applied to the projected population to yield future water requirements. Over the past 20 years, the consumption rate in the City has ranged between a low of 195 gpcd in 1998 and a high of 284 gpcd in 1985. For planning purposes, a consumption rate of 215 gpcd was used to estimate future water requirements of the City.

5.1.4 Projected Water Use

Based on the future trends in population obtained from the 2002 General Plan, and the established per capita water consumption rate of 215 gpcd, the City's future water requirements were estimated and summarized in Table 5.3 and Figure 5.2. In addition to the projected average demands, Table 5.3 includes annual estimates for the MDD, through the planning horizon year of 2030. Based on these projections, it is anticipated that the City's average day and maximum day requirements for 2030 will approach 25.6 MGD and 46.2 MGD, respectively.

5.2 EXPANSION PROJECTS

The UWMPA requires that the UWMP identify the major developments within the agency's service area that would require water supply planning.

Law

> 10910. (a) Any city or county that determines that a project, as defined in section 10912, is subject to the California Environmental Quality…
>
> 10912. For the purpose of this part, the following terms have the following meanings:
>
> 10912 (a) "Project" means any of the following:
> (1) A proposed residential development of more than 500 dwelling units.
> (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
> (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
> (4) A proposed hotel or motel, or both, having more than 500 rooms.
> (5) A proposed industrial, manufacturing or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
> (6) A mixed-use project that includes one or more of the projects specified in this subdivision.
> (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

There are two expansion projects being considered within the City boundaries, the Hanford Square Development and the Lone Oak (Live Oak) Development. Water supply assessments for these projects are included in Appendix I and J, respectively.

- The Hanford Square Development project is located within the western portion of the City of Hanford limits, just north of Highway 198. The project area is approximately 214 acres and proposes 936 dwelling units and 28 acres of commercial and industrial area. The water demands for this area have been previously accounted for in the City's 2000 UWMP.
- The Live Oak Development project, previously known as the Lone Oak Development, is located southwest of the City, but is included in the planning boundary of the 2002 General Plan. This project proposes 1,562 dwelling units and 8 acres designated for public facilities. As with the Hanford Square Development, the water demands for this project have been previously accounted for the in the City's 2000 UWMP.

Table 5.3	Projected Water Demand 2005 Urban Water Management Plan City of Hanford					
Year	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Population	**49,550**	**55,348**	**63,395**	**72,633**	**83,239**	**94,415**
Average Day Demand						
City (gpm)	6,240	8,264	9,465	10,845	12,428	14,097
Industrial Park (gpm)	657	1,558	2,152	2,761	3,695	3,695
Total (gpm)	6,897	9,822	11,617	13,606	16,123	17,792
(MGD)	9.9	14.1	16.7	19.6	23.2	25.6
(AFY)	11,092	15,843	18,739	21,946	26,007	28,698
Maximum Day Demand						
City (gpm)	10,919	14,462	16,564	18,978	21,749	24,669
Industrial Park (gpm)	1,314	3,116	4,304	5,522	7,390	7,390
Total (gpm)	12,233	17,578	20,868	24,500	29,139	32,059
(MGD)	17.6	25.3	30.1	35.3	42.0	46.2
(AFY)	19,732	28,353	33,660	39,518	47,001	51,712

Notes:

1. Population Projection Source: City of Hanford 2002 General Plan.
2. Demand projections are based on 215 gpdc and assume continued conservation practices.

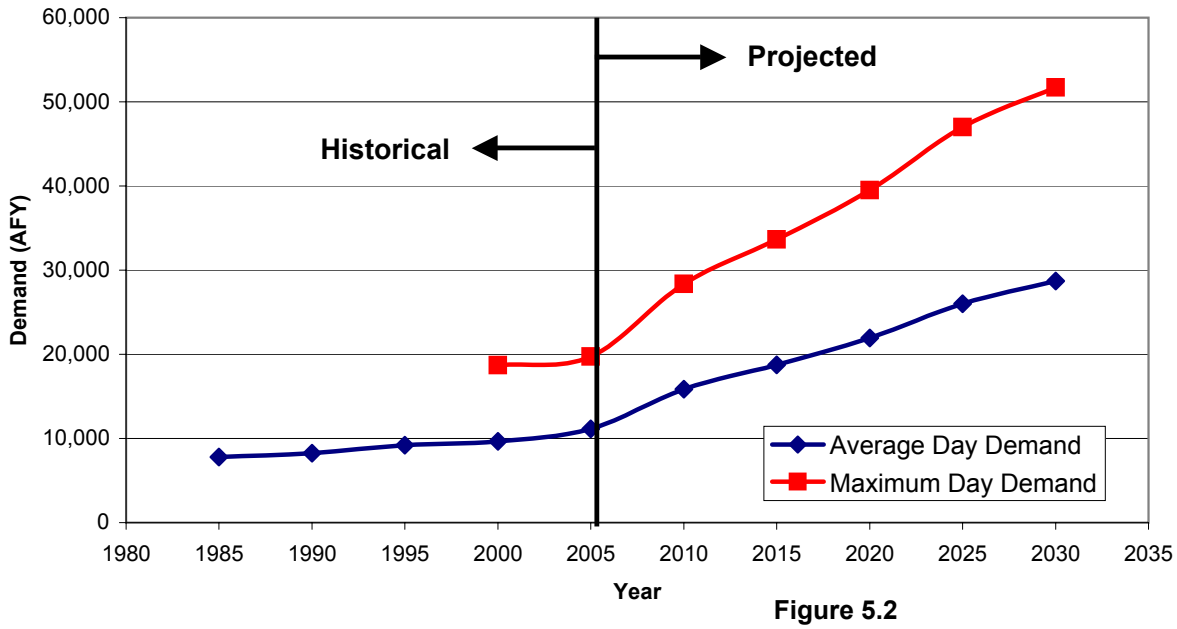


Figure 5.2
Historical and Projected Water Use
2005 Urban Water Management Plan
City of Hanford

SUPPLY AND DEMAND COMPARISON

The UWMPA requires that the UWMP demonstrate that sufficient water supplies will be available for the next 20 years of projected water demands. DWR guidelines suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has be completed.

Law

> 10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

6.1 SUPPLY AND DEMAND COMPARISON

Comparisons of projected supplies and demands are shown on Table 6.1 and on Figure 6.1. The City of Hanford (City) currently has the water supply capabilities to meet MDD and to provide standby production capabilities; the supply capacity will consistently meet the demand requirements for any given year.

Table 6.1 indicates a total demand of approximately 30,690 acre-feet (af) projected for year 2030, compared with a projected supply capability for that same year of 44,277 af.

Table 6.1 Projected Supply and Demand Comparison
2005 Urban Water Management Plan
City of Hanford

Condition	Average Annual Demand (AFY)	Average Annual Demand (MGD)	Supply Capacity (AFY)	Supply Capacity (MGD)	Groundwater Supply (AFY)	Groundwater Supply (MGD)	Supply Deficit (MGD)
2005							
Normal	12,434	11.1	38,645	34.5	12,434	11.1	none
Single Dry Year	12,434	11.1	38,645	34.5	12,434	11.1	none
Multi-year Drought							
Year 1	12,434	11.1	38,645	34.5	12,434	11.1	none
Year 2	12,434	11.1	38,645	34.5	12,434	11.1	none
Year 3	12,434	11.1	38,645	34.5	12,434	11.1	none
2010							
Normal	15,843	14.1	44,246	39.5	15,843	14.1	none
Single Dry Year	15,843	14.1	44,246	39.5	15,843	14.1	none
Multiple Dry Years							
Year 1	15,843	14.1	44,246	39.5	15,843	14.1	none
Year 2	15,843	14.1	44,246	39.5	15,843	14.1	none
Year 3	15,843	14.1	44,246	39.5	15,843	14.1	none
2015							
Normal	18,739	16.7	44,246	39.5	18,739	16.7	none
Single Dry Year	18,739	16.7	44,246	39.5	18,739	16.7	none
Multiple Dry Years							
Year 1	18,739	16.7	44,246	39.5	18,739	16.7	none
Year 2	18,739	16.7	44,246	39.5	18,739	16.7	none
Year 3	18,739	16.7	44,246	39.5	18,739	16.7	none
2020							
Normal	21,946	19.6	44,246	39.5	21,946	19.6	none
Single Dry Year	21,946	19.6	44,246	39.5	21,946	19.6	none
Multiple Dry Years							
Year 1	21,946	19.6	44,246	39.5	21,946	19.6	none
Year 2	21,946	19.6	44,246	39.5	21,946	19.6	none
Year 3	21,946	19.6	44,246	39.5	21,946	19.6	none
2025							
Normal	26,007	23.2	47,001	42.0	26,007	23.2	none
Single Dry Year	26,007	23.2	47,001	42.0	26,007	23.2	none
Multiple Dry Years							
Year 1	26,007	23.2	47,001	42.0	26,007	23.2	none
Year 2	26,007	23.2	47,001	42.0	26,007	23.2	none
Year 3	26,007	23.2	47,001	42.0	26,007	23.2	none
2030							
Normal	28,676	25.6	51,751	46.2	28,676	25.6	none
Single Dry Year	28,676	25.6	51,751	46.2	28,676	25.6	
Multiple Dry Years							
Year 1	28,676	25.6	51,751	46.2	28,676	25.6	none
Year 2	28,676	25.6	51,751	46.2	28,676	25.6	none
Year 3	28,676	25.6	51,751	46.2	28,676	25.6	none

Note:
1. Supply projections assume that groundwater yield is not being reduced due to water quality issues.

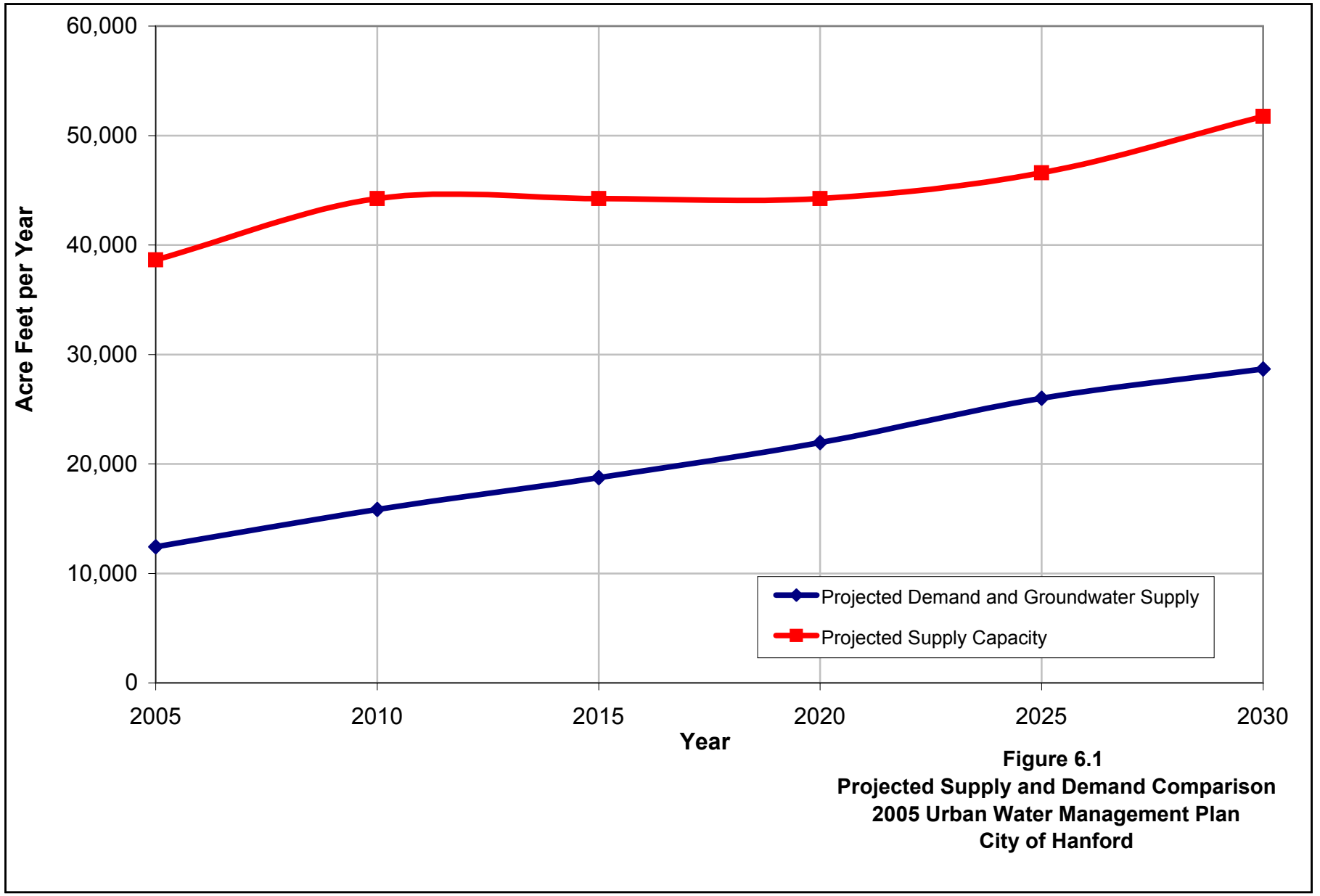


Figure 6.1
Projected Supply and Demand Comparison
2005 Urban Water Management Plan
City of Hanford

WATER DEMAND MANAGEMENT MEASURES

The UWMPA identifies fourteen Demand Management Measures (DMM) for urban water suppliers to address. These measures are derived from the original BMPs established in the UWMPA and the 1991 Memorandum of Understanding.

Law

> 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
>
> (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following…
>
> (A) Water survey programs for single-family residential and multifamily residential customers.
>
> (B) Residential plumbing retrofit.
>
> (C) System water audits, leak detection, and repair.
>
> (D) Metering with commodity rates for all new connections and retrofit of existing connections.
>
> (E) Large landscape conservation programs and incentives.
>
> (F) High-efficiency washing machine rebate programs.
>
> (G) Public information programs.
>
> (H) School education programs.
>
> (I) Conservation programs for commercial, industrial, and institutional accounts.
>
> (J) Wholesale agency programs.
>
> (K) Conservation pricing.
>
> (L) Water conservation coordinator.
>
> (M) Water waste prohibitions.
>
> (N) Residential ultra-low-flush toilet replacement programs.

In 1991, a Memorandum of Understanding (MOU) regarding Urban Water Conservation in California formed the California Urban Water Conservation Council (CUWCC). The City of Hanford (City) is not currently a signatory of the MOU and is therefore not a member of CUWCC.

However, the City realizes the importance of the Best Management Practices (BMPs) to ensure a reliable future water supply. The City is committed to implementing water conservation and water recycling programs to maximize sustainability in meeting future water needs for its customers. Due to the continued effective water conservation measures

implemented by the City, the current per-capita water use has dropped to approximately 208 gpcd, from 220 gpdc in 1995 and 289 gpdc in 1975.

The City's previous Urban Water Management Plan (2000 Plan) provided information regarding the City's conservation measures already in place and those that would improve the efficiency of water use within the City.

Table 7.1 Demand Management Measures 2005 Urban Water Management Plan City of Hanford

Demand Management Measure	Implemented	Planning to Implement	Not Applicable
DMM 1 - Water Survey Programs		√	
DMM 2 - Residential Plumbing Retrofit	√		
DMM 3 - Water System Audits	√		
DMM 4 - Metering with Commodity Rates	√		
DMM 5 - Landscape Irrigation Programs	√		
DMM 6 - Washing Machine Rebate Program		√	
DMM 7 - Public Information	√		
DMM 8 - School Education	√		
DMM 9 - Commercial, Industrial & Institutional Programs		√	
DMM 10 - Wholesale Agency Programs			√
DMM 11 - Conservation Pricing		√	
DMM 12 - Water Conservation Coordinator	√		
DMM 13 - Water Waste Prohibition	√		
DMM 14 - Ultra Low Flush Toilet Replacement		√	

The California Department of Water Resources (DWR) has assigned an enhanced terminology to the BMPs. Accordingly; this chapter will refer to them as Demand Management Measures (DMMs).

7.1 DMM 1 - WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTIFAMILY RESIDENTIAL CUSTOMERS

This program consists of offering water audits to residential customers. Audit components include reviewing water usage history with the customer, identifying leaks inside and outside, and recommending improvements.

The City is currently investigating the benefits of initiating a program that will offer free residential landscape audits. The program would target the top one to five percent of single-family residential users in the first two years. A similar program for multi-family residential users may be developed in future years. As an incentive to complete the audit, the City might consider providing free low-flow showerheads and kitchen/bathroom shut-off nozzles.

7.2 DMM 2 - RESIDENTIAL PLUMBING RETROFIT

This program consists of installing physical devices to reduce the amount of water used or to limit the amount of water, which can be served to the customer. In accordance with State Law, low flow fixtures have been required on all new construction since 1978. In addition, State legislation enacted in 1990 requires all new buildings after January 1, 1992 to install Ultra-Low Flush Toilets (ULFT).

Several studies suggest that savings resulting from miscellaneous interior retrofit fixtures can range between 25 and 65 gpd per housing unit. The studies also suggest that installation of retrofit fixtures in older single-family homes tend to produce more savings, while newer multi-family homes tend to produce fewer saving per housing unit.

Since 1986, the City has been displaying an informational booth at the Kings District Fair and at the Annual Street Party. Water saver kits have been distributed that contain low-flow plumbing fixtures, toilet dam, dye tablets, and water-saving tips.

7.3 DMM 3 - SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR

A water audit is a process of accounting for water use throughout a water system in order to quantify the unaccounted-for water. Unaccounted-for water is the difference between metered production and metered usage on a system-wide basis.

The City spends at least $150,000 per year replacing outdated, undersized, and leaking water mains in the distribution system. The City's capital improvement program provides funding for major water main replacement and installation of approximately one mile every three years. The City has not yet conducted a formal water audit and leak detection program at this time. Water losses due to pipe leakage are believed to be minimal.

The City Municipal Code includes guidelines and penalties to encourage customers to repair leaks. If the customer does not repair the leak within the ten-day period, the portion of the excess water usage that results form the leakage will be billed at two times the standard water rate until the leak is repaired.

7.4 DMM 4 - METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

This DMM requires water meters for all new constructions and billing by volume of use, as well as establishing a program for retrofitting any existing unmetered connections.

Since 1976, all new water service connections have been required to have water meters. Prior to 1976, single-family homes and duplex dwellings were charged according to a flat rate. Currently, all commercial, industrial, or multi-family dwellings are metered. Installation of 2,800 water meters on single-family homes was completed in 1997. All swimming pool installations require a water meter be installed. Any addition to an existing home valued in excess of $5,000 requires that the owner pay for installation of a water meter.

Water meters are read every month, and consumers are billed monthly at a rate per 100 cubic feet (cu ft) of water consumed. All non-metered residential customers are billed a flat rate per gross square foot of lot area.

7.5 DMM 5 - LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

This DMM calls for agencies to commence assigning reference evapotranspiration-based (ETo) water budgets to accounts with dedicated irrigation meters and provide water-use audits to accounts with mixed-use meters.

The City has adopted a Water Efficient Landscape Ordinance in accordance with Assembly Bill 325: The Water Conservation in Landscaping Act. This ordinance limits the amount of turf in landscaping, requires plant groupings according to water needs, and provides some flexibility to the landscape designer while promoting landscape water efficiency. The Parks Superintendent reviews all commercial landscaping plans for compliance prior to permits being issued. The City will assist with setting irrigation controller clocks for water efficiency landscape watering.

To ensure that the intent of these regulations is carried out, the applicant for a building permit is required to submit to the City, landscape plans for review by the City.

After the approved landscape is installed, it is the responsibility of the Public Works Department to inspect the project to confirm that the landscaping for the project was installed in accordance with the approved plans. The landscape designer shall certify that

the project is in compliance with these regulations by signing and submitting a completed certificate of compliance. The Director of Public Works, or designated representative, may authorize the deferral of landscape completion for good and valid reasons subject to the posting of appropriate security with the City.

7.6 DMM 6 - HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAM

This program generally provides a financial incentive (rebate offer) to qualifying customers who install a high efficiency washing machine in their home. Other regional municipalities that performed an economic analysis on this program concluded that it would have a low benefit-to-cost ratio. This program is not currently implemented in the City.

7.7 DMM 7 - PUBLIC INFORMATION PROGRAMS

This program consists of distributing information to the public through a variety of methods including brochures, radio and television, school presentations and videos, and web sites.

The City has embarked on numerous public information programs. The City participates in the Kings County Water Education Committee. Members of the committee make public presentations at local schools throughout the County. The City also participates in the Water Awareness Week campaign. Water-saving reminders are published in the local paper. Water-saving information, water saving tips, and outdoor water use restrictions are distributed periodically in the monthly bill stuffers. Water Conservation tips and regulations are posted on the City's internet web site:

www.ci.hanford.ca.us/publicworkswaterconservation.htm.

7.8 DMM 8 - SCHOOL EDUCATION PROGRAM

This DMM requires water supplier to implement a school education program that includes providing educational materials and instructional assistance.

Since 1986, the City has been displaying an informational booth at the Kings District Fair and at the Annual Street Party Water Saver kits have been distributed that on contain low-flow plumbing fixtures, toilet dam, dye tablets and water saving tips. The City is a member of the Kings County Water Education Committee (KCWEC). Representatives of the KCWEC go to the public schools and make presentations on water safety and water conservation. Information is published in the local newspaper reminding people to conserve water. Book covers that provide water conservation and water safety information are purchased and distributed to local schools.

7.9 DMM 9 - CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL ACCOUNTS

The City does not currently have a program for commercial, Industrial and Institutional accounts. These accounts are currently metered and charged in accordance with the quantity of used water.

7.10 DMM 10 - WHOLESALE AGENCY PROGRAMS

This DMM applies to wholesale agencies and defines a wholesaler's role in terms of financial, technical, and programmatic assistance to its retail agencies implementing DMMs.

7.11 DMM 11 - CONSERVATION PRICING

There are no seasonal rates and no declining rate structure. Water meters are read every month, and consumers are billed monthly, at a rate per 100 cu. ft of water consumed.

7.12 DMM 12 - WATER CONSERVATION COORDINATOR

The Utilities Superintendent and Parks Superintendent are responsible for coordinating and expanding the City's water conservation program and providing residents with useful water conservation information.

7.13 DMM 13 - WATER WASTE PROHIBITION

In 1976, the City added a Water Waste Ordinance (Appendix K). The City then started requiring all new connections to have a water meter. Citations were issued for water violations. If a consumer receives three citations, they were penalized $5.00. When they received their fourth citation, a water meter was installed, with all the costs borne by the consumer. The ordinance was revised in 1986 increasing the first penalty to $15.00, and each subsequent penalty was increased by $10.00 until a water meter would be required. If waste of water should continue, a flow restrictor is installed. If the customer continues to waste water, the meter and service are turned off and locked. When this happens, the offending consumer is required to pay all costs prior to having the water turned back on.

According to the City's Municipal Code Section 13.04.150 Water Use Unlawful Acts, in the use of water supplied by the City no person shall:

- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation except on the following designated days: Properties with even-numbered addresses, Tuesday, Thursday, and Saturday. Properties with odd-numbered address, Wednesday, Friday, and Sunday; or

- Sprinkle, irrigate or otherwise apply water to any yard, ground premises or vegetation or wash any type of vehicle, boat or trailer on Monday; or Sprinkle, irrigate or otherwise apply water to any yard ground, premises or vegetation on any day of the week between the hours of ten a.m. and six p.m. during periods designated as “daylight savings time” (generally occurring between April 15th and October 15th): or
- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation except by the use of a hand held hose, a sprinkler device or an approved sprinkler system; or
- Keep, maintain, operate or use any water connection, hose, faucet, hydrant, pipe, outlet or plumbing fixture which is not tight and free from leakage or dripping; or
- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation between the hours of twelve midnight and five a.m. unless the water device used to apply such water is controlled by an automatic shut-off device or a person is in immediate attention of the watering device; or
- Allow excessive water to run or waste from his property on to sidewalks, streets or adjoining or adjacent property; or
- Use water for sidewalk, driveway or walkway washing or cleaning, except that a business may apply water to paved areas of the business premises in order to maintain the same in a clear and sanitary condition; or
- Willfully or negligently, waste water in any manner.

Any person using water from the City water system in violation of any provision of the City Municipal Code shall pay, upon demand by the City, a penalty charge in an amount, which shall be determined by City Council Resolution.

7.14 DMM 14 - RESIDENTIAL ULTRA-LOW-FLUSH TOILET REPLACEMENT PROGRAMS

State legislation requires the installation of efficient plumbing in new construction, and effective 1994 requires that only ULFT be sold in California. Subsequently, homes constructed since 1994 in the City have ULFT. The City does not currently have a plan to implement a Rebate Incentive Program for replacements on homes built prior to 1994.

Chapter 8

WATER SHORTAGE CONTINGENCY PLAN

8.1 STAGES OF ACTIONS

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses specified issues.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

8.1.1 Water Shortage Stages and Reduction Objectives

Water agencies relying solely on groundwater, such as the City, are much less likely to experience water shortages than those agencies relying primarily on surface water.

The City has developed a three-stage rationing plan that will be invoked during declared water shortages. Each stage includes a water reduction objective, in percent of normal water demands. The rationing plan is dependent on the cause, severity and anticipated duration of the water supply shortage.

8.1.2 Water Reduction Stage Triggering Mechanisms

Emergency response stage actions become effective when the City Manager declares that the City is unable to provide sufficient water supply to meet ordinary demands, to the extent that insufficient supplies would be available for human consumption, sanitation and fire protection. The declaration will be based on his/her judgment as to the degree of the immediate or future supply deficiency. Table 8.1 provides guidelines to assist in declaring a water shortage stage.

Table 8.1	Guide for Declaring a Water Shortage Stage 2005 Urban Water Management Plan City of Hanford
Stage	**Condition**
1	• Below average rainfall in the previous 12-24 months • 10 percent or more of municipal wells out of service • Warm weather patterns typical of summer months
2	• Below average rainfall in the previous 24-36 months • Prolonged periods of low water pressure • 10 percent or more of municipal wells out of service • Warm weather typical of summer months
3	• Below average rainfall in the previous 36 months • Prolonged periods of low water pressure • 10 percent or more of municipal wells out of service • Warm weather patterns typical of summer months

A combination of voluntary and mandatory water conservation measures would be used to reduce water usage in the event of water shortages.

Table 8.2 outlines the stages of action to be undertaken for the following water use reduction programs.

Table 8.2	Water Shortage Stages and Reduction Objectives 2005 Urban Water Management Plan City of Hanford	
Stage	**Description**	**Reduction Objective**
1	Minor Shortage Potential	10-20% reduction in total water demands from baseline
2	Moderate Shortage Potential	20-35% reduction in total water demands from baseline
3	Critical Shortage Potential	35-50% reduction in total water demands from baseline

8.1.3 Administration of Water Shortage Program

The administration of a water shortage program as described in this section would involve coordination among a number of City departments. It is anticipated that the Public Works Department would have primary responsibility for managing the program, since it is responsible for the City's water system. An individual in the Public Works Department would be identified as the Program Manager and be the primary coordinator of water shortage activities.

An appropriate organizational structure for water shortage management team would be determined based on the actual situation. Figure 8.1 presents an example of a typical organizational structure. Specific individuals would be designated to fill the identified roles.

The City would probably not have to hire additional staff or outside contractors to implement the program.

The major elements to be considered in administering and implementing the program include:

- Identifying the City staff members to fill the key roles on the water shortage management team. It is anticipated that the Public Works Director would designate the appropriate individuals, including the Program Manager.
- Intensifying the public information program to provide comprehensive information on the water shortage as necessary actions that must be undertaken by the City and by the public. The scope of the public information program can be developed by reviewing published references, especially those published by DWR, and researching successful aspects of the current programs conducted by neighboring water agencies. A public information hotline may be advisable to answer any questions regarding the program.
- Monitoring program effectiveness. Ongoing monitoring will be needed to track supply availability and actual water user reductions. This procedure will allow the City to continuously re-evaluate the situation and make informal decisions as to whether another reduction level is needed.
- Enforcing program requirements. From the 35 to 50 percent reduction programs, enforcement of water use prohibitions and water use allocations will be more important in achieving the program goals. Inspectors and enforcement personnel could be identified among City staff that are in the community on other business, such as police, Parks Division, street maintenance, meter readers, etc.
- Dealing with equity issues that might arise from the mandatory restrictions or higher water rates. Depending on the level of restriction, there may be a greater need to address specific concerns of individual customers who might have special conditions or extenuating circumstances and are unduly affected by the program. A procedure should be identified for dealing with such special requests and/or for reviewing specific accounts.
- Coordinating with KCWD. Since the KCWD is the principal water management agency in the County and sets the countywide water use reduction goals, it is critical to have ongoing coordination with a specific contact person at the District who will be aware of the City's needs.
- Adjusting water rates. Revenues from water sales should be reviewed periodically to determine whether an increase in rates might be needed to cover revenue shortfalls due to the decrease in demand.

- Addressing new development proposals. During periods of severe water shortage, it may be necessary to impose additional requirements on new development to reduce new demand or to temporarily curtail new hook-ups.

It is required that the water shortage contingency plan undergoes a formal public review process including a public hearing. A thorough public review process will help minimize future objections when mandatory prohibitions are needed.

8.2 WATER SHORTAGE CONTINGENCY ORDINANCE/ RESOLUTION

According to the UWMPA, the UWMP is required to include an urban water shortage contingency analysis that includes a draft water shortage contingency resolution or ordinance.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (h) A draft water shortage contingency resolution or ordinance.

The City adopted its water shortage contingency plan on January 20, 2004. A copy of the adopting resolution is included in Appendix L.

8.3 PROHIBITIONS, CONSUMPTION REDUCTION METHODS, AND PENALTIES

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses methods to reduce consumption.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier…
>
> 10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
>
> 10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
> 10632 (f) Penalties or charges for excessive use, where applicable.

8.3.1 Mandatory Prohibitions on Water Wasting

Mandatory compliance measures enacted during a water shortage are more severe than voluntary measures, produce greater savings, and are less costly to the utility. The principal drawback to these measures is the customer resentment if the measures are not seen as equitable. Therefore, such measures need to be accompanied by a good public relations campaign.

Mandatory measures may include:

- Ordinances making water waste illegal
- Ordinances controlling landscape irrigation
- Ordinances restricting nonirrigation outdoor water uses
- Prohibitions on new connections or the incorporation of new areas
- Rationing

Prohibitions on new development may conflict with other policies and needs. However, if existing customers are called upon to make sacrifices during a drought period, they may feel that water agencies should concentrate on fulfilling current obligations rather than taking on new customers. Such prohibitions may need to be considered in the event of a critical shortage, such as the 50 percent reduction program. If necessary, an offset program might be considered whereby developers demonstrate that they will implement measures to conserve at least as much water in the existing community as their new project will use. In some cases, a two to one offset may be required of the new development.

The City currently enforces Municipal Code Section 13.04.150 Water Use Unlawful Acts. This code states that in the use of water supplied by the City no person shall:

Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation except on the following designated days: Properties ending with even-numbered addresses, Tuesday, Thursday and Saturday. Properties with odd-numbered addresses, Wednesday, Friday, and Sunday; or

- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation or wash any type of vehicle, boat, or trailer on Monday; or
- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation on any day of the week between the hours of ten a.m. and six p.m. during periods designated as “daylight savings time” (generally occurring between April 15th and October 15th);or
- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation except by the use of a hand held hose, a sprinkler device or an approved sprinkler system; or

- Keep, maintain, operate, or use any water connection, hose faucet, hydrant, pipe, outlet or plumbing fixture which is not tight and free from leakage or dripping; or
- Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation between the hours of twelve midnight and five a.m. unless the water device used to apply such water is controlled by an automatic shut-off device or a person is in immediate attendance of the watering device; or
- Allow excess water to run or waste from his or her property on to sidewalks, streets or adjoining or adjacent property; or
- Use water for side walk, driveway or walkway washing or cleaning, except that a business may apply water to paved areas of the business premises in order to maintain the same in a clear and sanitary condition; or
- Willfully or negligently, waste water in any manner.

8.3.2 Excessive Use Penalties

Customers violating the regulations and restrictions on water use set forth in the Water Code shall receive the following actions by the City:

(Flat Rate Customers)

- First Violation. A verbal warning of the violation shall be issued by the public works department personnel or police department to the respective water customer of the City.
- Second Violation. A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City.
- Third Violation. A written notice of the violation shall be issued by the public works department personnel or police department to the respective water customer of the City, and a charge of fifteen dollars ($15.00) shall be added to the next water bill of such customer as a one-time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.
- Fourth Violation. A written notice of the violation shall be issued by the public works department personnel or police department to the respective water customers of the City, and a water meter shall be installed by the City to meter all water use upon the real property where the violation occurred. All costs of the purchase and installation of the water meter including, without limitation, City overhead shall be billed to the respective water customer of the City, and the customer shall pay the full amount thereof within thirty (30) days of the date of billing.
- Fifth Violation. A written notice of the violation shall be issued by the public works department personnel or police department to the respective water customer of the

City, and a charge of fifty dollars ($50.00) shall be added to the next water bill of such customer as a one-time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.

(Metered Customers)

a. The notices and charges for metered water service shall be the same as flat rate water service with regards to violations as identified in subdivisions 1), 2), 3) and 5) of this subsection.

b. As regards a fourth violation by a customer with metered service, a written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a charge of twenty-five dollars ($25.00) shall be added to the next water bill of such customer as a one time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.

(As to Flat Rate and Metered Service)

- Sixth Violation. A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a water flow restricter shall be installed by the City to restrict water use upon the real property where the violation has occurred. All costs of purchase and installation of the water flow restricter including, without limitation, City overhead shall be billed to the customer, and the customer shall pay the full amount of such cost within thirty (30) days of the date of billing. The flow restricter shall remain installed until the customer has provided the City's public works department with evidence that the customer has modified its water use so that it will not again violate the ordinance codified in this section or the provisions of this policy.

8.3.3 Review Process

A customer that has been assessed a penalty for violating or exceeding the water use allocation will have the right to a review of the penalty by the City Manager. A customer notified that a flow restrictor will be installed for exceeding the water use allocation will have the right to a review by the City Manager.

These reviews will be held if the customer files a written request for review with the City within 15 days after receipt of notification. The review will be held within a reasonable time after receipt of the request thereof.

8.4 REVENUE AND EXPENDITURE IMPACTS/MEASURES TO OVERCOME IMPACTS

According to the UWMPA, the UWMP is required to include an urban water shortage contingency analysis that addresses the financial impacts from reduced water sales.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier…
>
> 10632 (g) [An analysis of the impacts of each of the proposed measures to overcome those [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.

The majority of operating costs for most water agencies are fixed rather than a function of the amount of water sold. As a result, when significant conservation programs are undertaken, it is frequently necessary to raise water rates because the revenue generated is based on lower total consumption while the revenue required is basically fixed. Typically, water rates need to be increased by the percentages listed in Table 8.3 when the indicated stages are implemented. However, reductions in water demands, especially peak demands, can delay the need to develop costly new water sources in growing communities.

The City does not currently have an Emergency Fund but maintains substantial reserve funds after consideration of operations and capital expenditures. The City will seriously be considering using these reserve funds to establish an emergency fund to mitigate the impacts of a water shortage. The emergency fund will then be used to stabilize water rates during periods of water shortage or disasters affecting the water supplies. Excess water revenues collected as a result of shortage rate adjustments will be used to enhance the Emergency Fund.

Table 8.3 Guide for Rate Adjustment
2005 Urban Water Management Plan
City of Hanford

Stage	Rate Adjustment
1	• 25 percent increase over pre-shortage rates
2	• 50 percent increase over pre-shortage rates
3	• 100 percent increase over pre-shortage rates
End of Water Shortage Emergency	• 15 percent increase over pre-shortage rates. This rate increase is implemented based on historical information from communities that experienced water shortage and found that consumption rate (gpcd) does not return to pre-shortage levels. In anticipation of reduced sales, the City rates should be set for one year at 115 percent of the pre-shortage rates. This rate increase should be re-evaluated every two years.

8.5 ACTIONS DURING A CATASTROPHIC INTERRUPTION

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that address a catastrophic interruption of water supplies.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier…
>
> 10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

During declared shortages, or when a shortage declaration appears imminent, the City Manager will activate a water shortage response team. The team includes: public works, water, fire, planning, health, and emergency services. Other actions and procedures to follow during catastrophic events will be developed.

8.6 REDUCTION MEASURING MECHANISM

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that identifies a mechanism to measure the actual water reductions.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

The City's water system is supplied by the groundwater wells. Each wells includes a flow monitoring devise that records the amount of water entering the City's distribution system. The City will use these devices to monitor the citywide actual reductions in water use.

WATER RECYCLING

The UWMPA requires that the UWMP include information on water recycling and potential uses for recycled water.

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
>
> 10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.
>
> 10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse determination with regard to the technical and economic feasibility of serving those uses, groundwater recharge, and other appropriate uses, and a
>
> 10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.
>
> 10633 (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
>
> 10633 (f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.

9.1 HANFORD WASTEWATER TREATMENT AND RECYCLING

The City of Hanford (City) provides wastewater services to its residential, commercial, and industrial users within the City limits and some unincorporated areas. The Wastewater Treatment Facility (WWTF) operates under Waste Discharge Requirements Order No. 5 01-153, issued by the RWQCB.

The WWTF is a two-stage trickling filter and extended aeration facility and was originally constructed in 1948 49. Five upgrades and expansions have occurred since then.

The existing facility has a design capacity of 8.0 million gallons per day (MGD), on an average annual wastewater flow basis (AAWF). The facility includes: a headworks: two primary clarifiers; two primary trickling filters; two secondary trickling filters; one oxidation ditch; four secondary clarifiers; three anaerobic digesters; one dissolved air flotation sludge thickener; sixteen sludge drying beds; one facultative sludge lagoon; one effluent

equalization basin; six effluent disposal/percolation ponds, and two emergency effluent storage ponds.

A 2.5 MGD capacity oxidation ditch facility has recently been constructed that will provide secondary treatment. Additionally, a new headworks has been installed with an influent pump station, a parshall flume, two mechanical bar screens, grit classifier/removal structure, and a two-way splitter box to deliver flows to both the trickling filter and oxidation ditch facilities. Secondary treated wastewater from the oxidation ditch facility is routed back to the trickling filter plant for chlorination prior to discharge to storage ponds.

If the population growth continues as expected, the capacity of the 8.0 MGD WWTF will be exceeded before the year 2025. Future upgrades will increase the capacity to 10.5 MGD.

9.2 EXISTING WATER RECYCLING FACILITIES

The WWTF recycled water system consists of:

- Two Primary Clarifiers
- Two Primary Trickling filters
- Two Secondary Trickling filters
- One Oxidation Ditch
- Four Secondary Clarifiers
- Three Anaerobic Digesters
- One Dissolved Air Floatation Sludge Thickener
- Sixteen Sludge Beds
- One Facultative Sludge Lagoon
- Effluent Pump Station
- Six Evaporation/Percolation Ponds
- Two Emergency Effluent Storage Ponds
- Effluent Distribution System with one existing booster pump station and a new (2003) irrigation pump station.
- 11,500 acres irrigated farmland

Chlorinated secondary-treated effluent is discharged to the equalization basin, then pumped to evaporation/percolation ponds or farmlands. The effluent pump station is set up for four pumps. Three pumps (30 hp, 3.0 MGD each) are currently installed.

Delivery of effluent to permitted lands is handled through two separate pump stations. For land west of the WWTF, flow is pumped from the WWTF effluent pump station through a

24-inch diameter reinforced concrete pipe (RCP) installed during the 1976 expansion. Effluent is delivered to property east and south of the WWTF by pumping flow through a City-owned 24 inch diameter PVC pipeline.

Effluent is used to irrigate crops on privately owned land. Reclamation sites are permitted under the City's two monitoring report programs (MRP) from the Regional Water Quality Control Board (RWQCB) (5 00 222 and 5-00-223). MRP 5-00 222 governs water recycling on the 11,500 acres of privately owned farmland within the Lakeside Irrigation Water District (LIWD). MRP 5-00-223 governs water recycling on a City-owned 1,600 acre site (for future use), plus several small privately-owned farms near the WWTF (current users).

Irrigation demand for the LIWD lands alone will exceed the amount of effluent discharged by the WWTF. Projections for annual recycled water use are shown on Table 9.1. Detail on the recycled water irrigation program is provided in the Recycled Water Engineering Report prepared by Carollo Engineers in February 2000 and MRP.

Table 9.1 Recycled Water Use Projections 2005 Urban Water Management Plan City of Hanford

	WWTF AAWF[1]		Irrigation Demand[2,3]
Year	(MGD)	(af/yr)	(af/yr)
2005	5.1	5,712	27,103
2010	5.8	6,493	27,103
2015	6.6	7,393	27,103
2020	7.5	8,401	27,103
2025	8.5	9,555	27,103
2030	9.7	10,868	27,103

Notes:
1. Source: City of Hanford Wastewater and Disposal Engineering Report (April 2000) Table 3.5.
2. Source: City of Hanford Recycled Water Engineering Report (February 2000) Appendix F.
3. Demands for LIWD lands only.

The City's 1,600-acre site is not currently irrigated with effluent and the pipeline has not been built. However, the land has been permitted in MRP 5-00-223 to provide reuse flexibility in the future. If in the future the LIWD demand for effluent reuse decreases, or additional land is needed to handle future flows, the 1,600-acre site would be placed into service for irrigation and the pipeline built. The system is described further in the Wastewater Treatment and Disposal Engineering Report (April 2000). Other lands along the route of the proposed pipeline and in the vicinity of the WWTF may be permitted as well.

The effluent/percolation ponds are typically in use for about one month out of the year (in December) when the LIWD ditch system is taken out of service for annual maintenance and flows are diverted to the pond system.

APPENDIX A – RESOLUTION TO ADOPT THE 2005 URBAN WATER MANAGEMENT PLAN

COPY

RESOLUTION NO. 06-34R

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF HANFORD ADOPTING THE 2005 URBAN WATER MANAGEMENT PLAN

At a regular meeting of the City Council of the City of Hanford duly called and held on the 18th day of April, 2006, it was moved by Council Member BUFORD, and seconded by Council Member GALLEGOS, and carried that the following resolution be adopted:

WHEREAS, pursuant to Assembly Bill 797, Water Code Section 10610 et. seq., the City of Hanford has prepared the 2005 Urban Water Management Plan; and

WHEREAS, at a regularly scheduled meeting on March 7, 2006, the City Council adopted a resolution declaring its intention to adopt the plan; and

WHEREAS, the resolution scheduled a public hearing for March 21, 2006, to accept testimony regarding the 2005 Urban Water Management Plan; and

WHEREAS, the Public Hearing was continued to the City Council meeting of April 3, 2006, and further continued to the City Council meeting of April 18, 2006; and

WHEREAS, the public hearing has been held and any and all testimony has been received and considered regarding the plan.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Hanford approves and adopts the 2005 Urban Water Management Plan.

Passed and Adopted at a regular meeting of the City Council of the City of Hanford held on the 18th day of April, 2006, by the following vote:

AYES:	Council Member	BUFORD
		GALLEGOS
		GONZALES
		AYERS
		CHIN
NOES:	Council Member	NONE

ABSTAIN: Council Member NONE

ABSENT: Council Member NONE

Dan Chin
Dan Chin, Mayor

ATTEST: Betty A. Venegas
Betty A. Venegas, Deputy City Clerk

STATE OF CALIFORNIA)
COUNTY OF KINGS) ss
CITY OF HANFORD)

I, Betty A. Venegas, Deputy City Clerk of the City of Hanford, do hereby certify the foregoing Resolution was duly passed and adopted by the City Council of the City of Hanford at a regular meeting thereof held on the 18th day of April, 2006.

Dated: April 20, 2006

Betty A. Venegas
Betty A. Venegas, Deputy City Clerk

RESOLUTION NO. 06-14-R

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF HANFORD DECLARING ITS INTENTION TO ADOPT AN UPDATED URBAN WATER MANAGEMENT PLAN

At a regular meeting of the City Council of the City of Hanford duly called and held on the 7th day of March, 2006, it was moved by Council Member BUFORD, and seconded by Council Member GONZALES, and carried that the following resolution be adopted:

WHEREAS, pursuant to Assembly Bill 797, Water Code Section 10610 et. seq., the City of Hanford has updated the City's Urban Water Management Plan; and

WHEREAS, it is necessary that the City Council declare its intention to adopt the plan; and

WHEREAS, the City Council is required to schedule and conduct a public hearing to accept and consider testimony regarding the plan.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Hanford will conduct a public hearing regarding adoption of the Urban Water Management Plan on March 21, 2006.

Passed and Adopted at a regular meeting of the City Council of the City of Hanford held on the 7th day of March ,2006, by the following vote:

AYES:	Council Member	BUFORD
		GONZALES
		AYERS
		GALLEGOS
		CHIN
NOES:	Council Member	NONE
ABSTAIN:	Council Member	NONE
ABSENT:	Council Member	NONE

Dan Chin

Dan Chin, Mayor

ATTEST: Karen McAlister
City Clerk

STATE OF CALIFORNIA)
COUNTY OF KINGS) ss
CITY OF HANFORD)

I, KAREN McALISTER, City Clerk of the City of Hanford, do hereby certify the foregoing Resolution was duly passed and adopted by the City Council of the City of Hanford at a regular meeting thereof held on the 7th day of March, 2006.

Dated: March 8, 2006

Karen McAlister
Karen McAlister, City Clerk

APPENDIX B – ADVERTISEMENT

AFFIDAVIT OF PUBLICATION

ACCOUNT NUMBER 1330

AD NUMBER 0000052365-01

AD SIZE 2.0 X 1.69"

04-12-06A09:18 RCVD

AD AMOUNT $48.71

PLEASE RETURN SIGNED RECEIVING REPORT TO FINANCE DEPARTMENT

City of Hanford - Legal
317 N. Douty, ,
Hanford, CA 93230

PUBLICATION SENT

STATE OF CALIFORNIA

COUNTY OF KINGS

I AM A CITIZEN OF THE UNITED STATES AND A RESIDENT OF THE COUNTY FORESAID; I AM OVER THE AGE OF EIGHTEEN YEARS, AND NOT A PART TO OR INTERESTED IN THE ABOVE-ENTITLED MATTER. I AM THE PRINCIPAL CLERK OF HANFORD SENTINEL, INC., A NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED DAILY IN THE CITY OF HANFORD, COUNTY OF KINGS, AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATION BY THE SUPERIOR COURT OF THE COUNTY OF KINGS, STATE OF CALIFORNIA, UNDER THE DATE OF OCTOBER 23, 1951, CASE NUMBER 11623,

THAT I KNOW FROM MY OWN PERSONAL KNOWLEDGE THE NOTICE, OF WHICH THE ANNEXED IS A PRINTED COPY (SET IN TYPE NOT SMALLER THAN NONPAREIL), HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO WIT:

PUBLISHED ON: 4/2/2006, 4/10/2006

FILED ON: 04/10/2006

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

DATED AT KINGS COUNTY, CALIFORNIA,

THIS DAY 10 OF April 2006

SIGNATURE Alyssa B. Dew

AD#52365

NOTICE OF PUBLIC HEARING
CITY OF HANFORD

The City Council of the City of Hanford will conduct a Public Hearing to take testimony regarding the adoption of the updated 2005 Urban Water Management Plan for the City of Hanford. The hearing is scheduled for Tuesday, April 18, 2006, at 7:30 p.m. in the City Council Chambers in the Civic Auditorium, 400 N. Douty Street.

A copy of the 2005 Urban Water Management can be reviewed at the City Public Works Corporation Yard, 900 South 10th Avenue or accessed and printed off the City's web site at www.ci.hanford.ca.us/QuickLinks2.HTM

HANFORD DEPARTMENT OF PUBLIC WORKS
By Gary W. Misenhimer, Director of Public Works
Publish: Apr. 2, 10, 2006

201 PUBLIC NOTICES

AD#52365

NOTICE OF PUBLIC HEARING
CITY OF HANFORD

The City Council of the City of Hanford will conduct a Public Hearing to take testimony regarding the adoption of the updated 2005 Urban Water Management Plan for the City of Hanford. The hearing is scheduled for Tuesday, April 18, 2006, at 7:30 p.m. in the City Council Chambers in the Civic Auditorium, 400 N. Douty Street.

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HANFORD DEPARTMENT OF PUBLIC WORKS
By Gary W. Misenhimer, Director of Public Works
Publish: Apr 2, 10, 2006

Publish: Apr. 3, 10, 17, 24, 2006

Publish: Apr. 3, 10, 17, 24, 2006

AD#52365

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CITY OF HANFORD

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HANFORD DEPARTMENT OF PUBLIC WORKS
By Gary W. Misenhimer, Director of Public Works
Publish: Apr. 2, 10, 2006

AD#52794

NOTICE OF ASSESSMENT

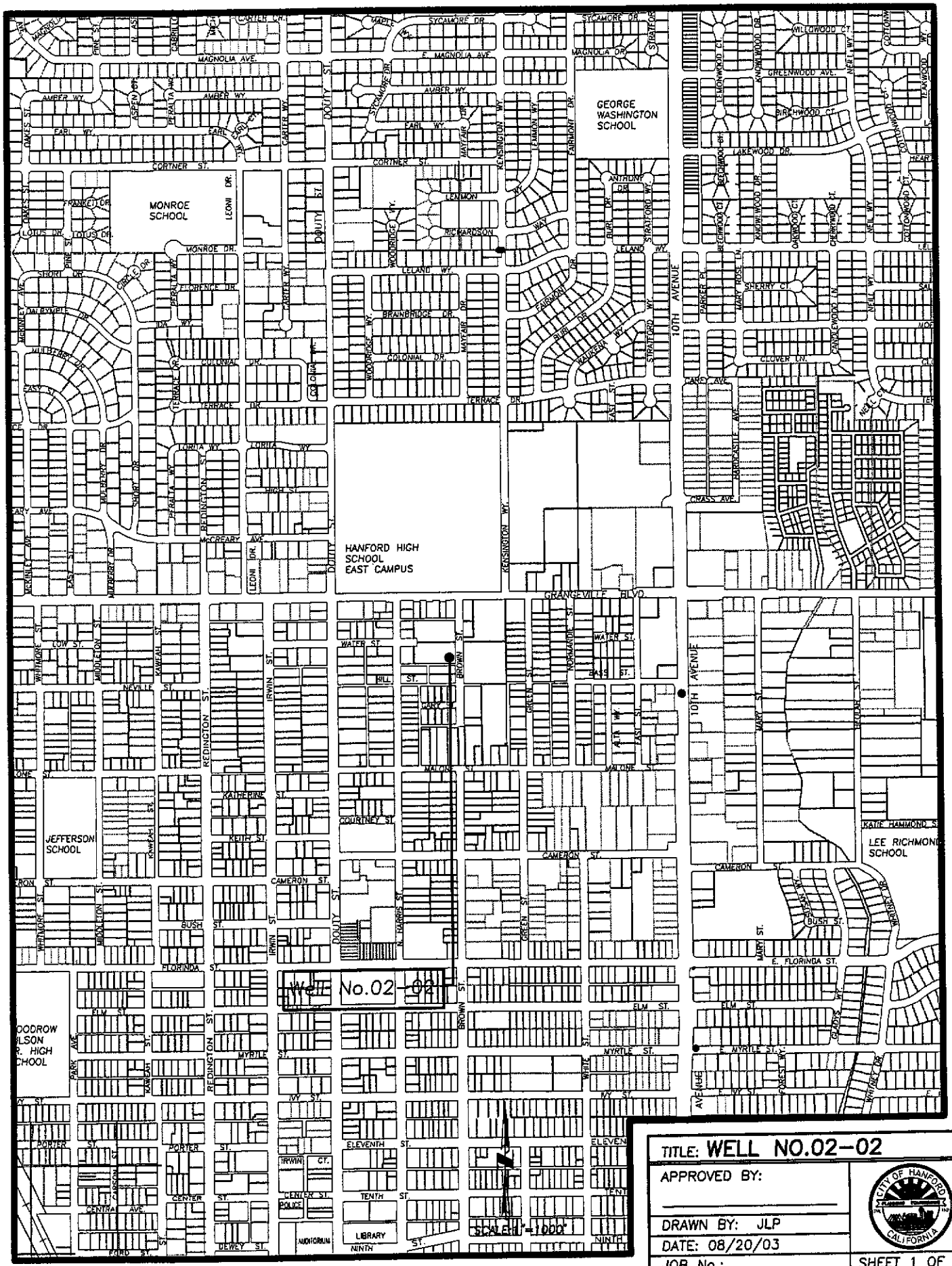
Office of First Side Ditch Company, Principal Place of Business, Hanford, Kings County, California

NOTICE IS HEREBY GIVEN that, at a Regular meeting of the directors held on the 21st of March, 2006, an assessment, 166 of $15.00 per share was levied upon the capital stock of the corporation, payable on or before the 21st of April, 2006, to First Side Ditch Company c/o James G. Dwyer, secretary of said company at 1483 Bailey Drive, Hanford in said County. Any stock upon which this assessment shall remain unpaid on the 21st of May, 2006 will be delinquent and advertised for sale at public auction and unless payment is made before, will be sold on 21st of June, 2006 at 2:00 o'clock P.M. to pay the delinquent assessment, together with the cost of advertising and expense of sale.

JAMES G. DWYER
Secretary
1483 Bailey Dr.
Hanford, California

$_____
Publish: Apr. 10, 17, 24; May 1, 2006

APPENDIX C – WELL LOCATION MAPS



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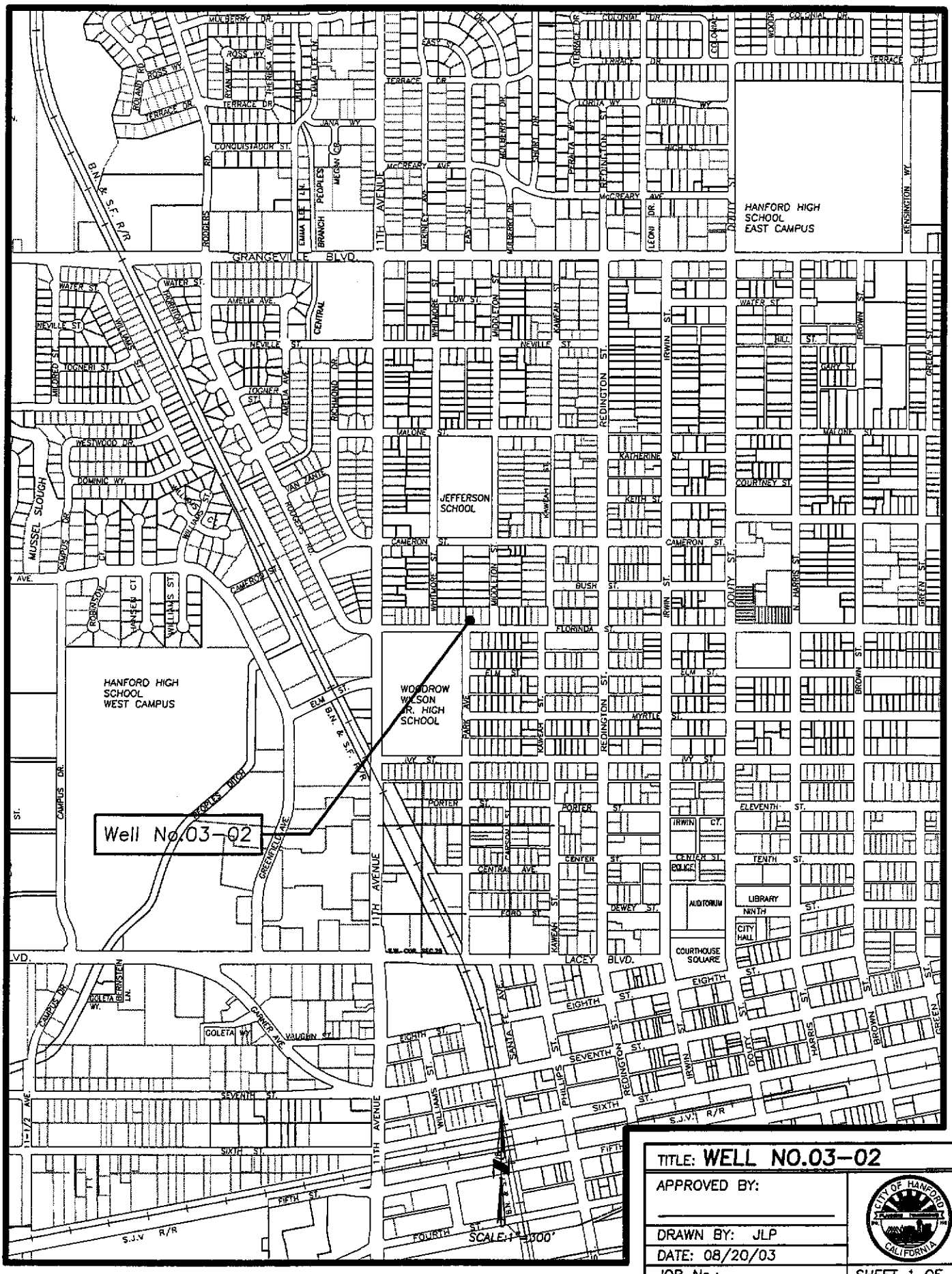
DRAWN BY: JLP	
DATE: 08/20/03	
JOB No.:	SHEET 1 OF 1



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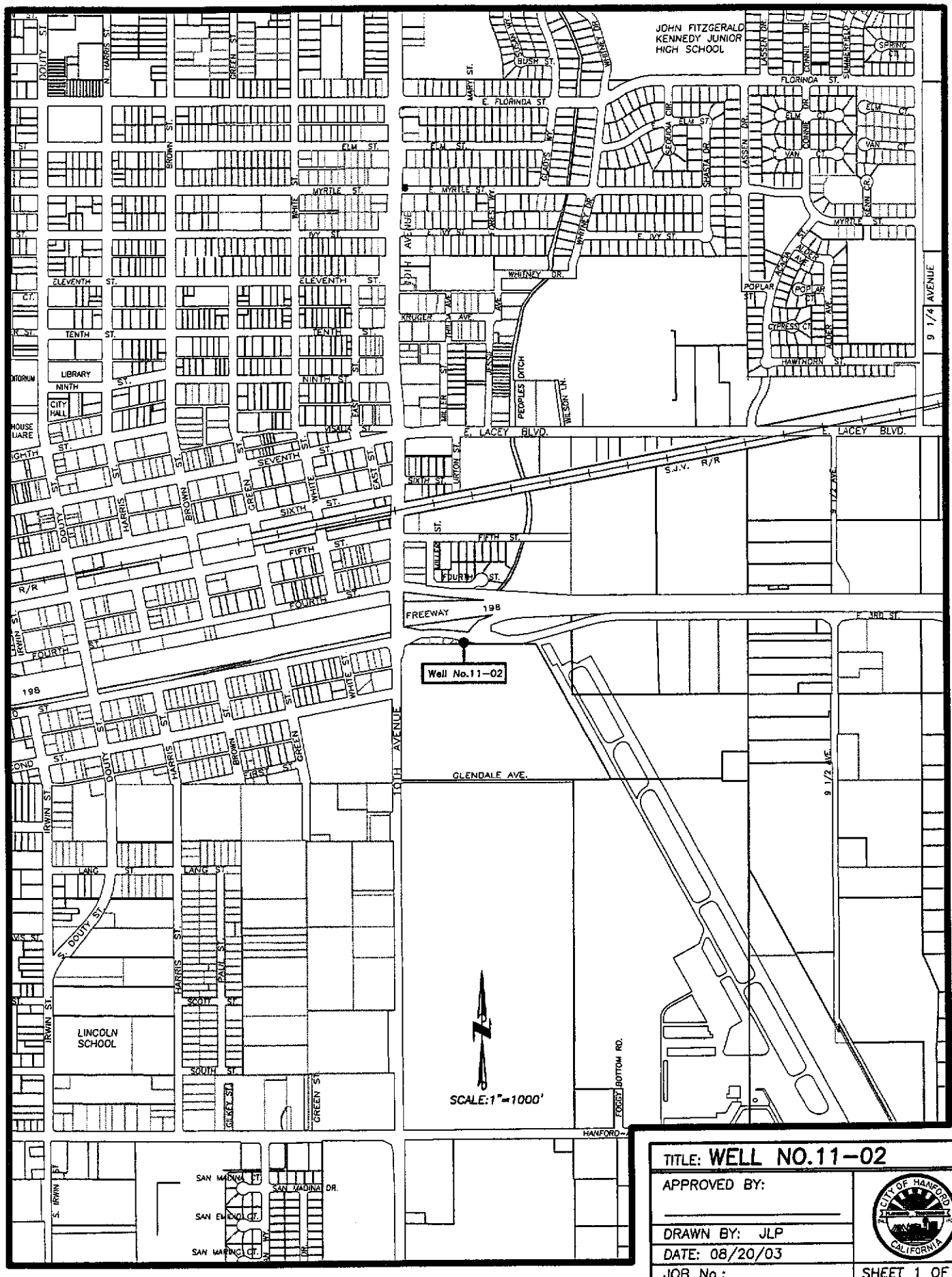

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DRAWN BY: JLP

DATE: 08/20/03

JOB No.:

CITY OF HANFORD CALIFORNIA

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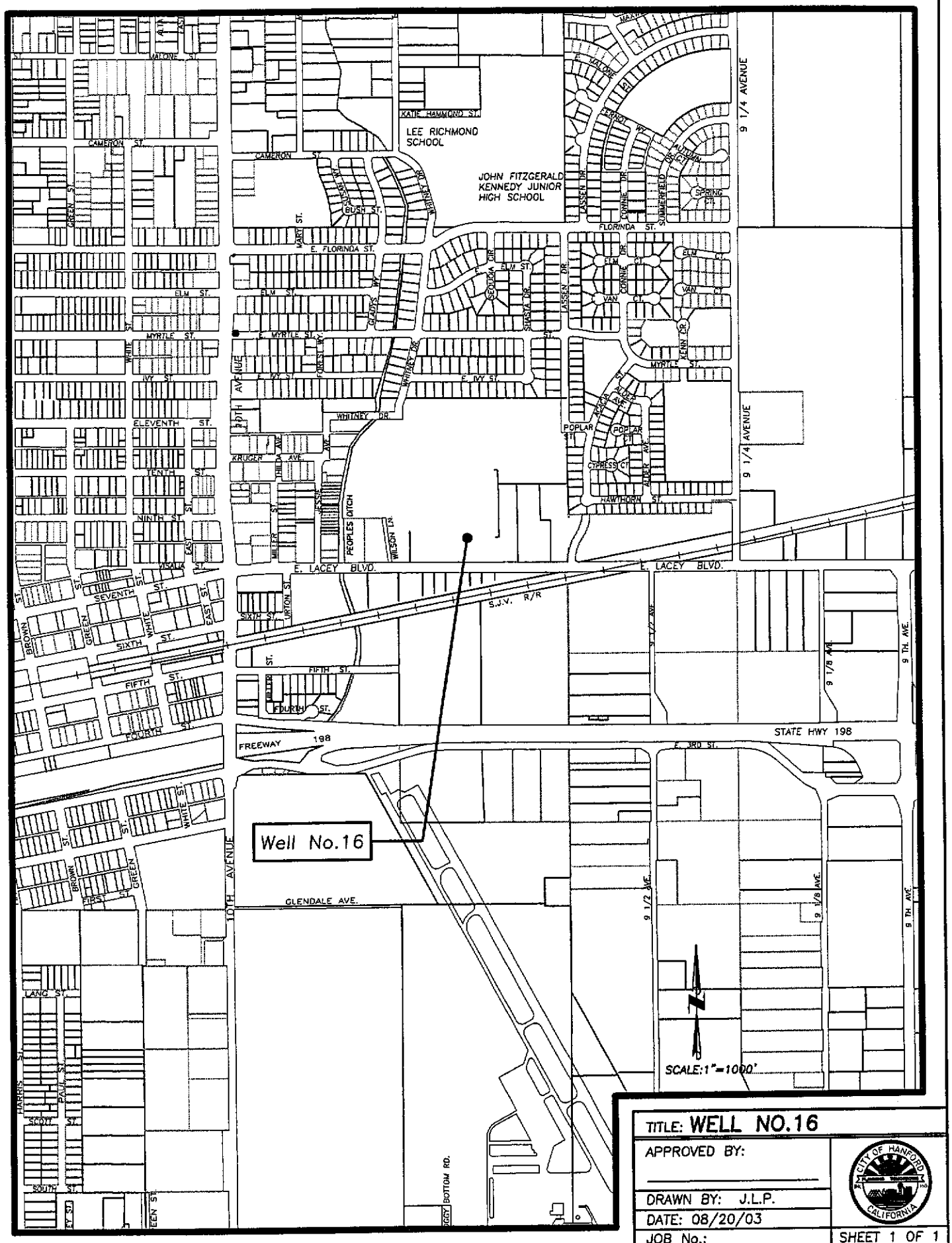

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APPROVED BY:

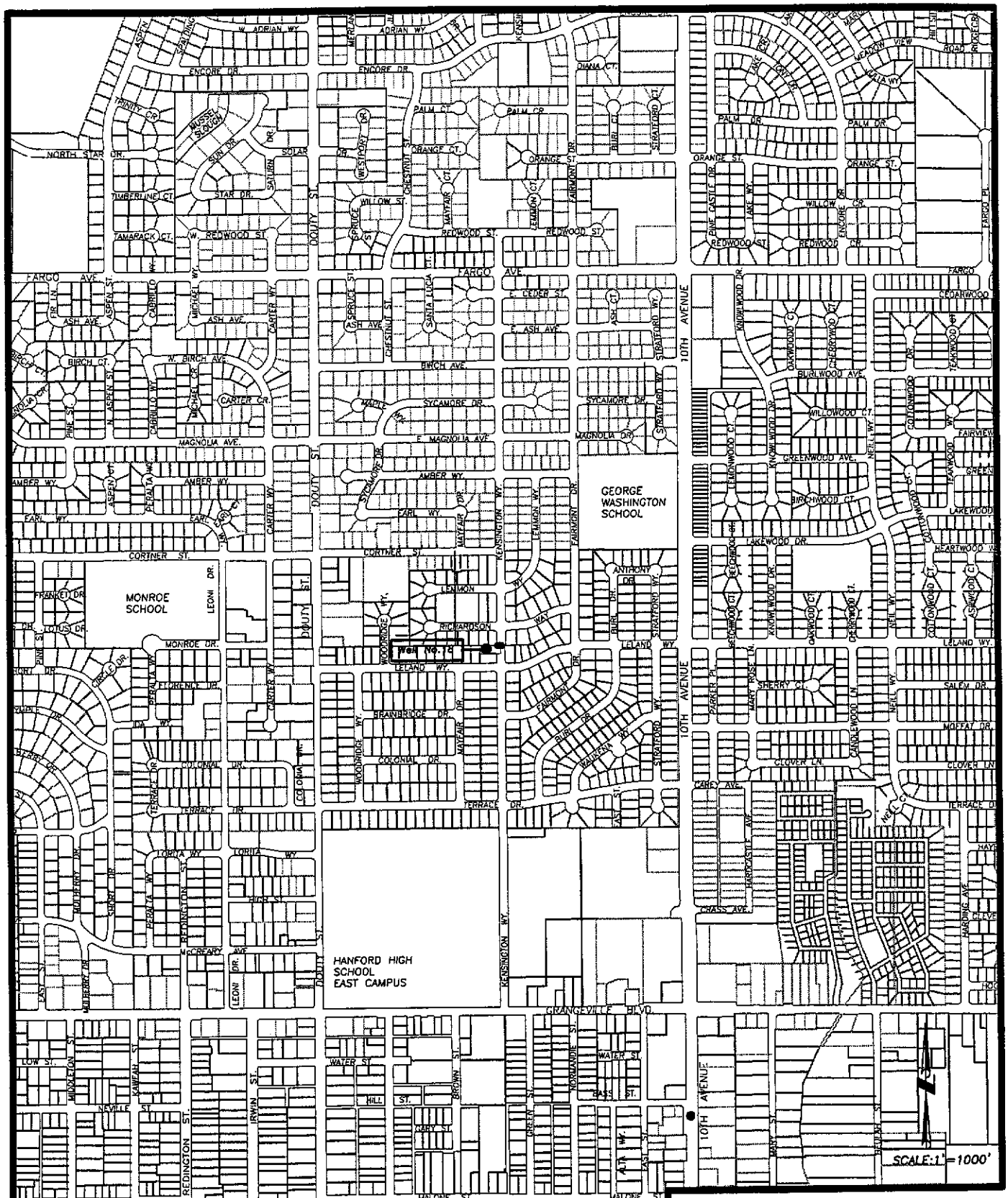
DRAWN BY: J.L.P.

DATE: 08/20/03

JOB No.:

CITY OF HANFORD CALIFORNIA

SHEET 1 OF 1



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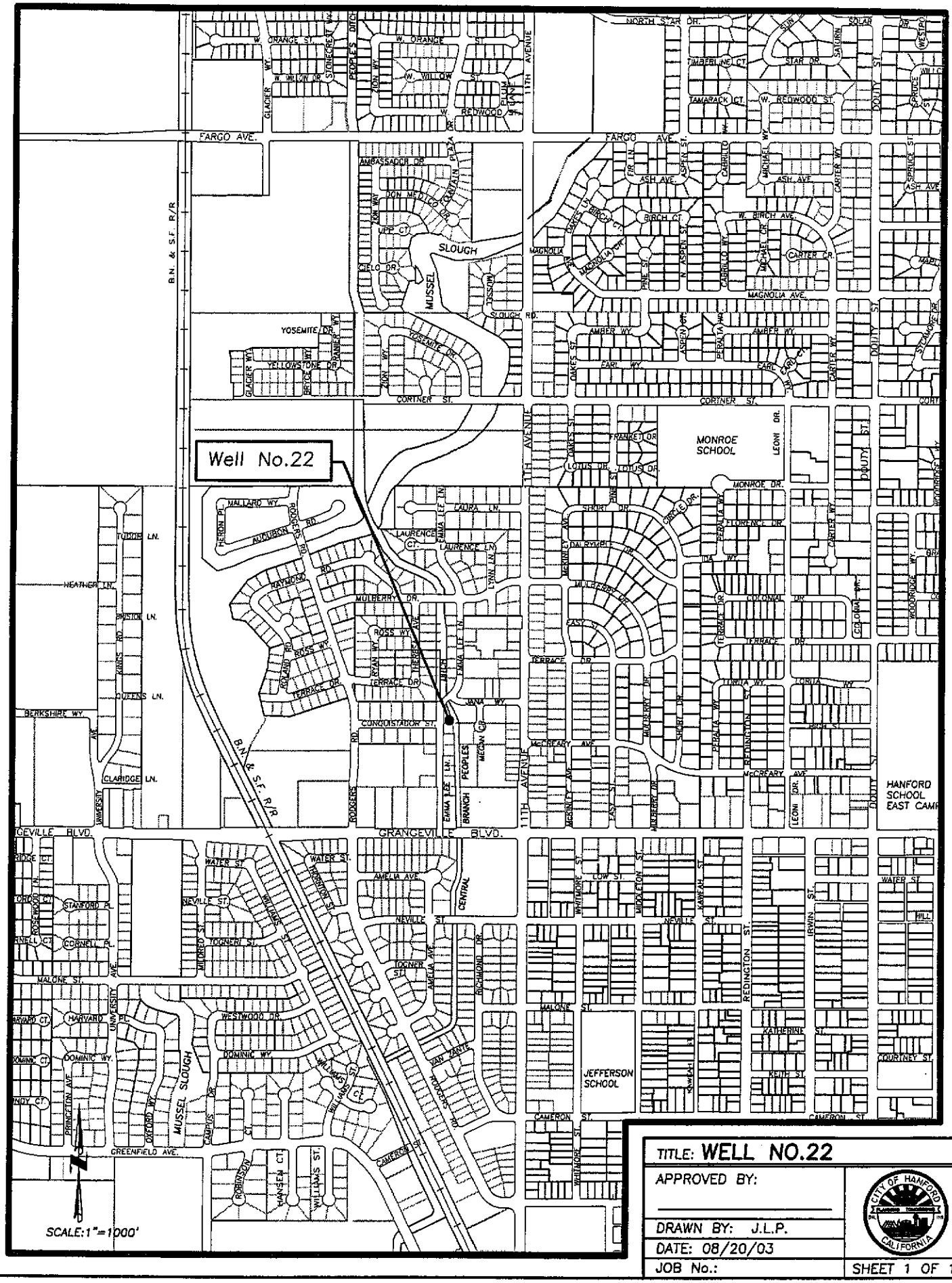
DRAWN BY: C.P.K.	
DATE: 08/20/03	
JOB No.:	SHEET 1 OF 1



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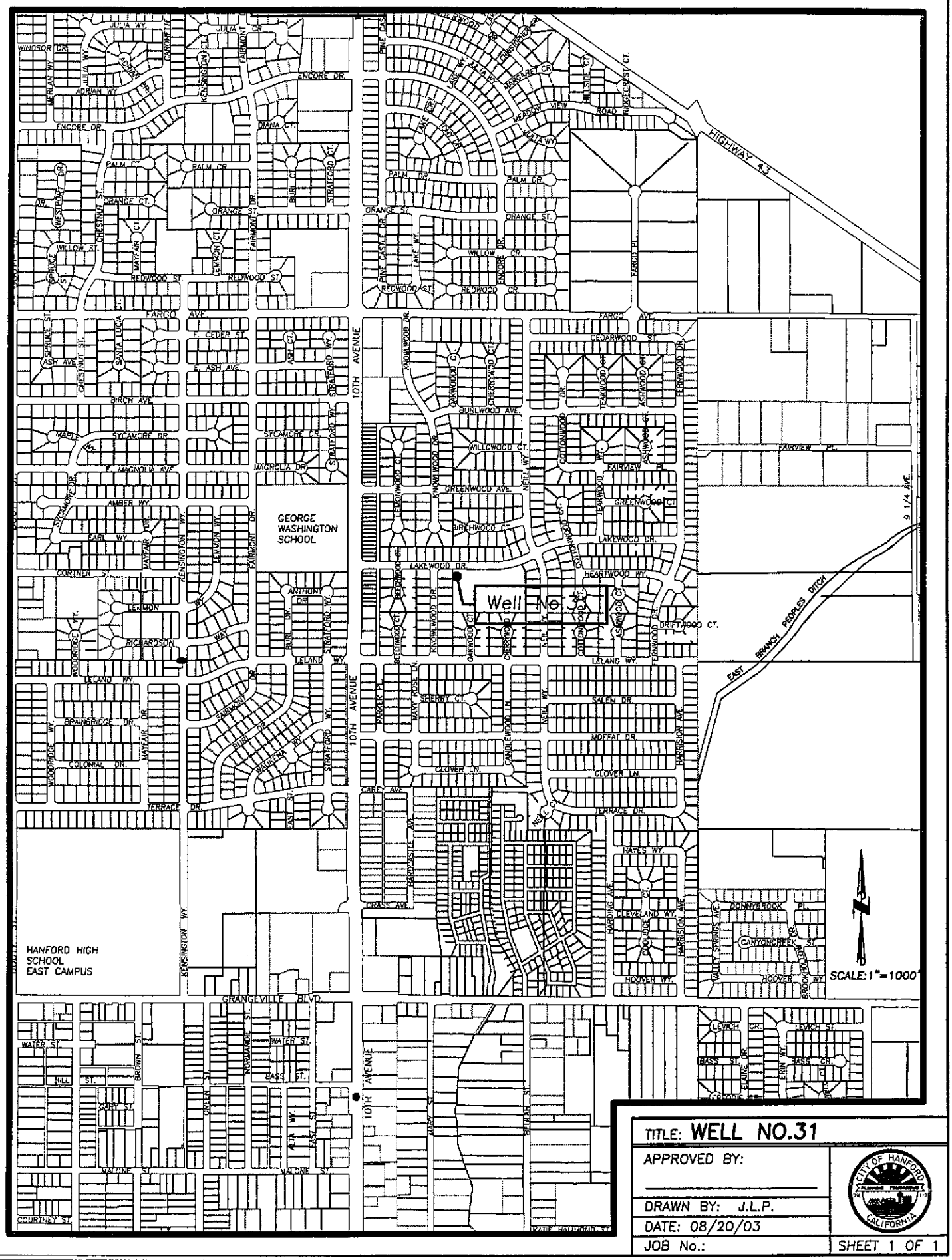
DATE: 08/20/03	
JOB No.:	SHEET 1 OF 1


Well No. 31
GEORGE WASHINGTON SCHOOL
HANFORD HIGH SCHOOL EAST CAMPUS
10TH AVENUE
HIGHWAY 43
LAKEWOOD DR
GREENWOOD AVE.
BURLWOOD AVE.
CEDARWOOD ST.
FAIRVIEW PL.
HEARTWOOD WY.
DRIFTWOOD CT.
LELAND WY.
SALEM DR
MOFFAT DR
CLOVER LN.
TERRACE DR.
HAYES WY.
CLEVELAND WY.
HOOVER WY.
GRANGEVILLE BLVD.
EAST BRANCH PEOPLES DITCH
9 1/4 AVE.
SCALE:1"=1000'
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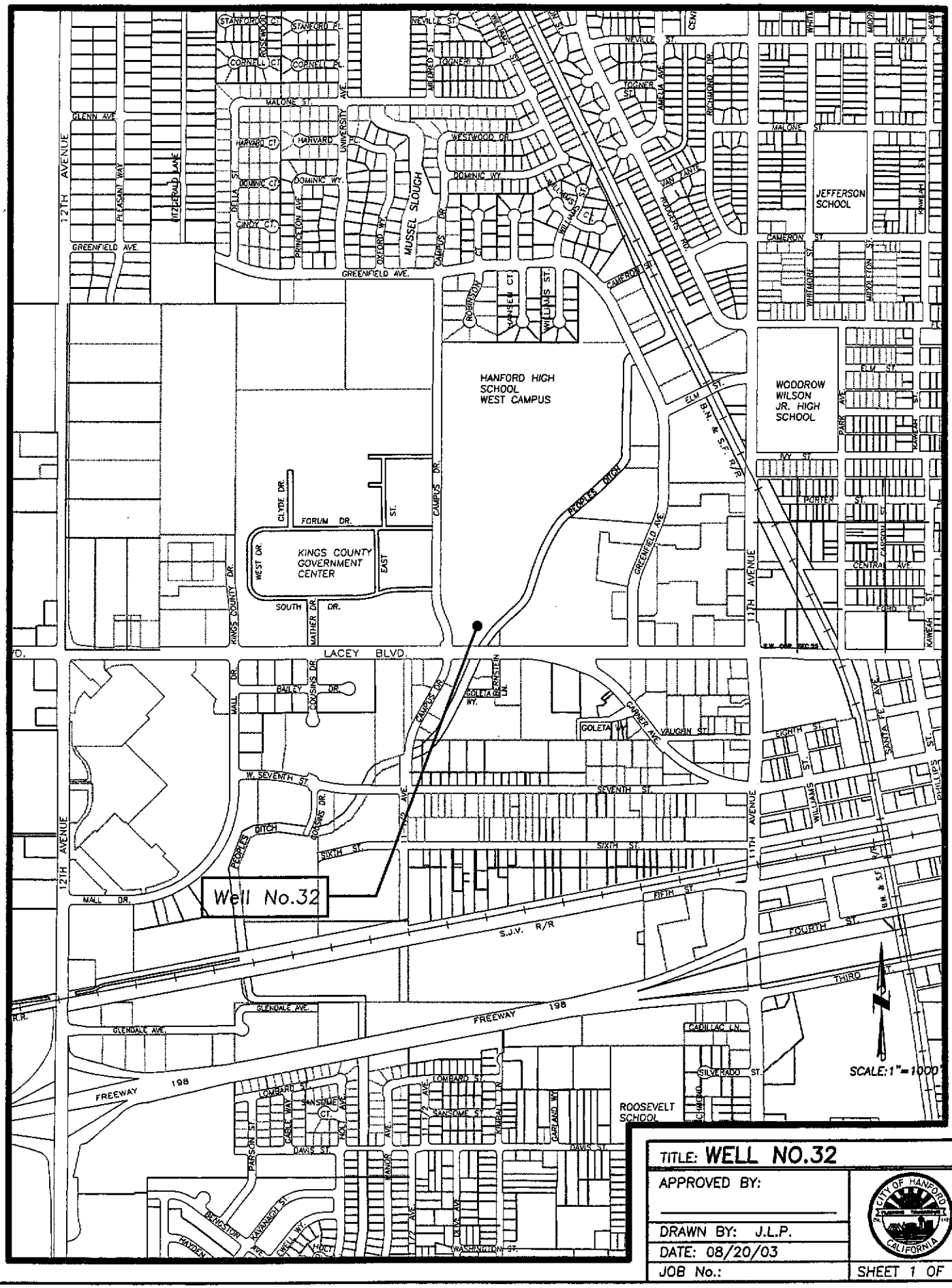
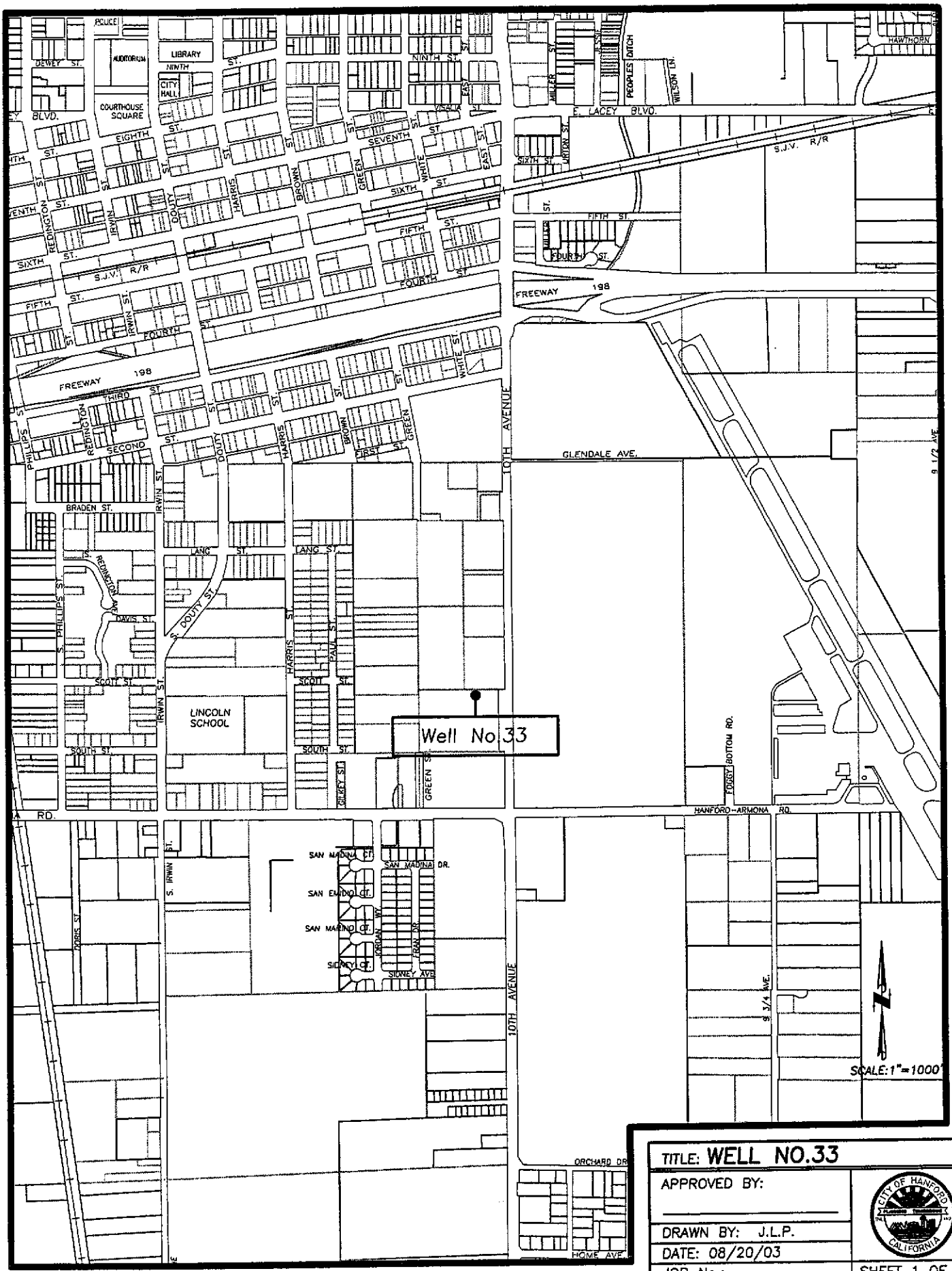
DRAWN BY: J.L.P.
DATE: 08/20/03
JOB No.:
SHEET 1 OF 1
CITY OF HANFORD CALIFORNIA


HANFORD HIGH SCHOOL WEST CAMPUS
KINGS COUNTY GOVERNMENT CENTER
WOODROW WILSON JR. HIGH SCHOOL
JEFFERSON SCHOOL
ROOSEVELT SCHOOL
Well No.32
12TH AVENUE
11TH AVENUE
LACEY BLVD.
GREENFIELD AVE.
MALONE ST.
NEVILLE ST.
TOGNER ST.
WESTWOOD DR.
DOMINIC WY.
FORUM DR.
CAMPUS DR.
MUSSEL SLOUGH
PEOPLES DITCH
B.N. & S.F. R/R
S.J.V. R/R
FREEWAY 198
SCALE:1"=1000'
TITLE: WELL NO.32
APPROVED BY:
DRAWN BY: J.L.P.
DATE: 08/20/03
JOB No.:
SHEET 1 OF 1
CITY OF HANFORD CALIFORNIA



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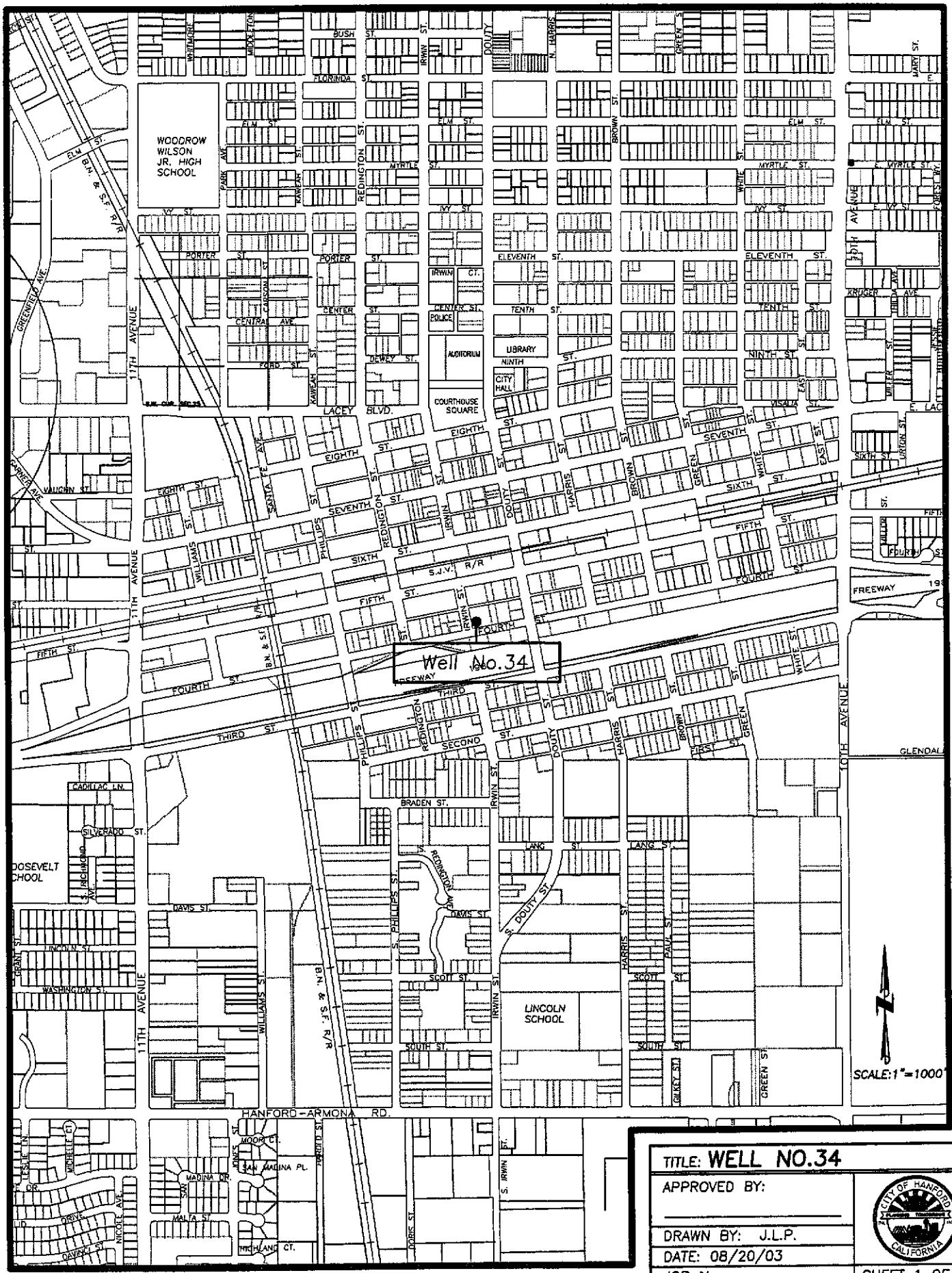

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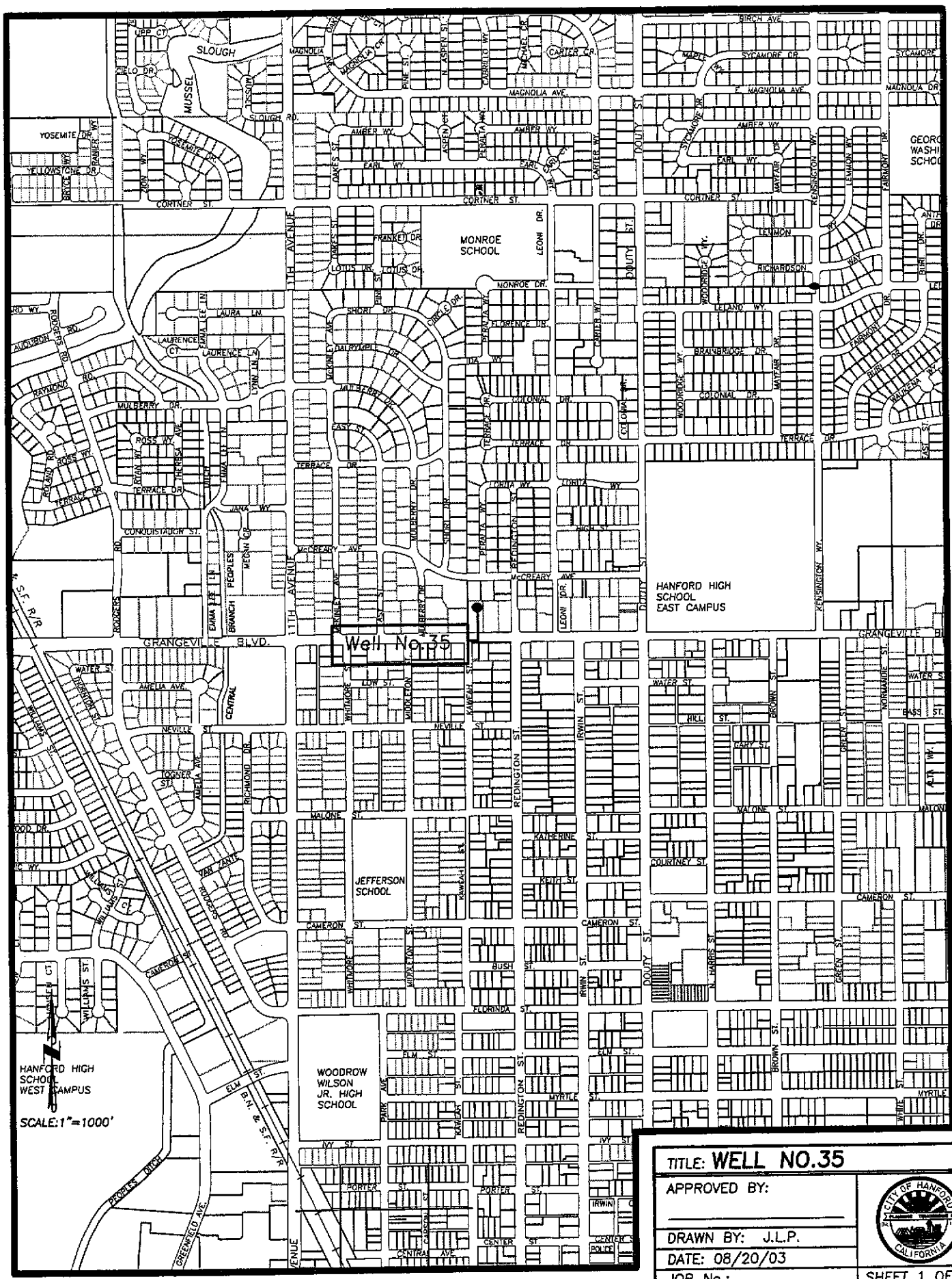
Well No.35
MONROE SCHOOL
HANFORD HIGH SCHOOL EAST CAMPUS
JEFFERSON SCHOOL
WOODROW WILSON JR. HIGH SCHOOL
HANFORD HIGH SCHOOL WEST CAMPUS
SCALE:1"=1000'
SLOUGH
MUSSEL
GRANGEVILLE BLVD.
11TH AVENUE
DOUTY ST.
IRWIN ST.
REDINGTON ST.
CENTRAL AVE.
GREENFIELD AVE.
S.F. R/R
B.N. & S.F. R/R
MONROE DR.
CORTNER ST.
MAGNOLIA AVE.
BIRCH AVE.
SYCAMORE DR.
MULBERRY DR.
TERRACE DR.
COLONIAL DR.
LELAND WY.
BRAINBRIDGE DR.
RICHARDSON
CONQUISTADOR ST.
McCREARY AVE.
WATER ST.
NEVILLE ST.
MALONE ST.
CAMERON ST.
BUSH ST.
FLORINDA ST.
ELM ST.
MYRTLE ST.
IVY ST.
PORTER ST.
CENTER ST.
COURTNEY ST.
KEITH ST.
KATHERINE ST.
HILL ST.
GARY ST.
TOGNER ST.
AMELIA AVE.
SLOUGH RD.
YOSEMITE DR.
YELLOWSTONE DR.
BRYCE WY.
ZION WY.
RANIER WY.
LAURENCE CT.
LAURENCE LN.
EMMA LEE LN.
LYNN LN.
RAYMOND RD.
AUDUBON RD.
RODGERS RD.
ROSS WY.
RYAN WY.
TERESA LN.
JANA WY.
PEOPLES BRANCH
MEGAN CT.
WILLIAMS ST.
VAN ANTE CT.
RODGERS DITCH
TITLE: WELL NO.35
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DRAWN BY: J.L.P.
DATE: 08/20/03
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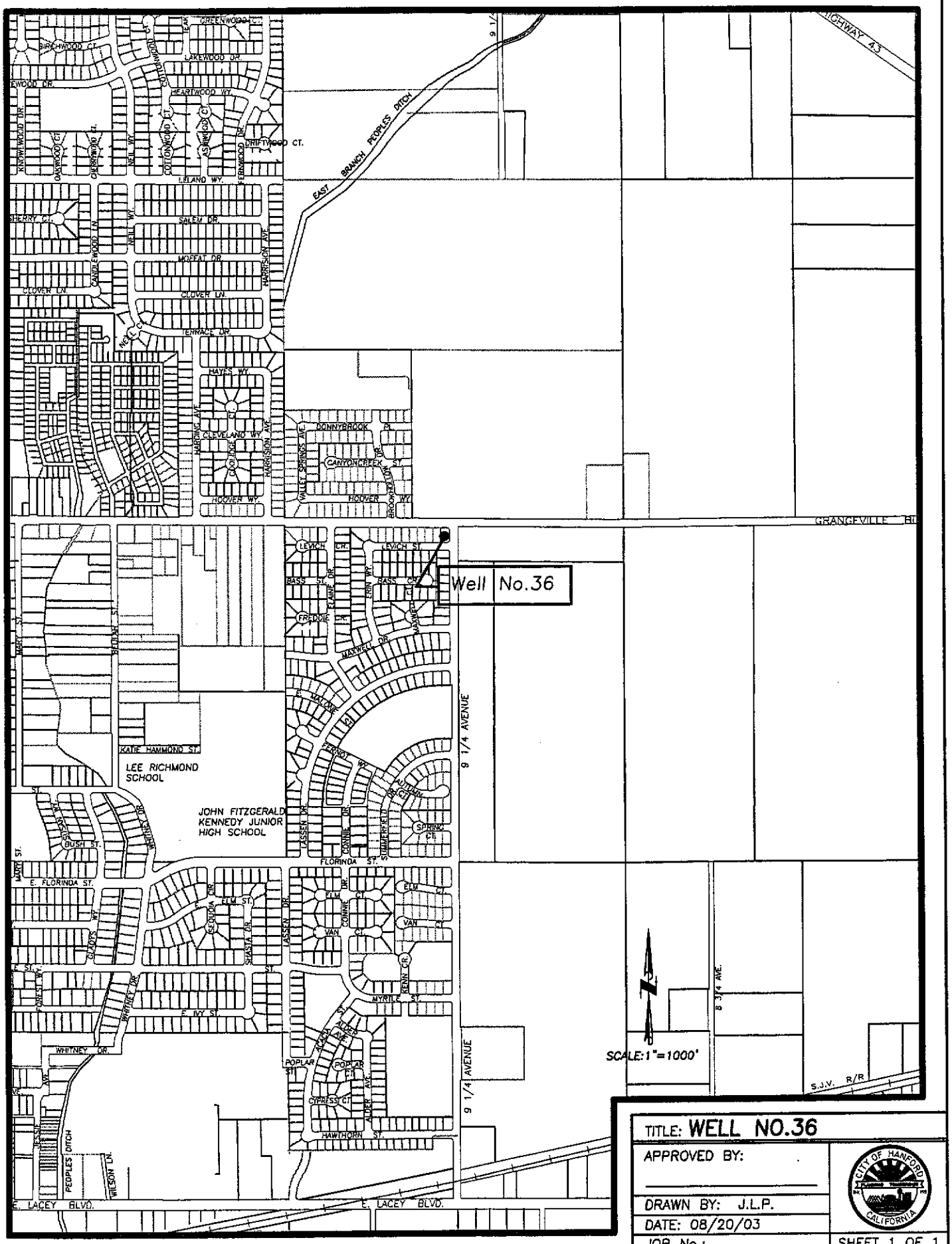
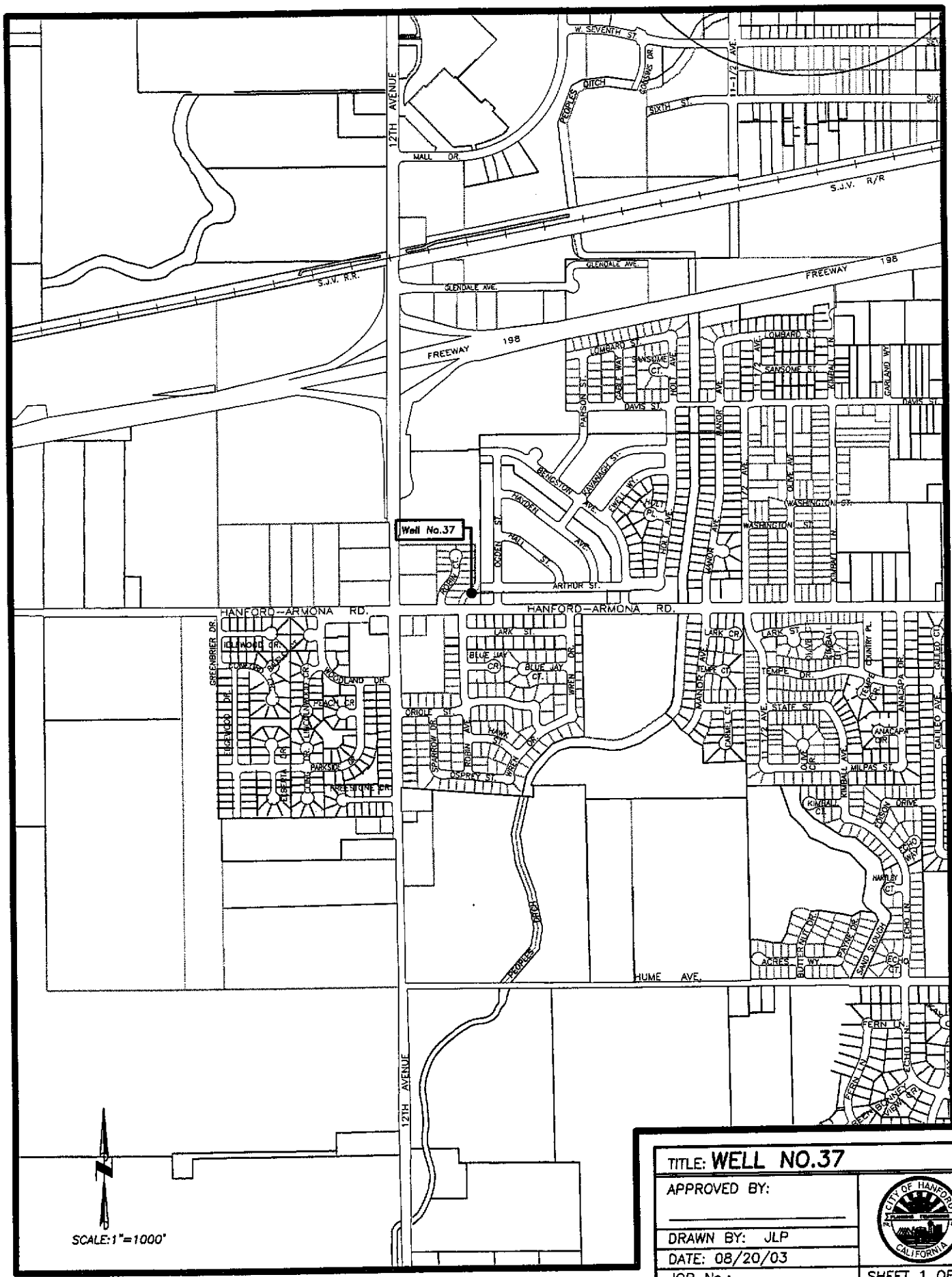
CITY OF HANFORD CALIFORNIA
SHEET 1 OF 1


Well No.36
EAST BRANCH PEOPLES DITCH
HIGHWAY 43
GRANGEVILLE
9 1/4 AVENUE
8 3/4 AVE.
S.J.V. R/R
LEE RICHMOND SCHOOL
JOHN FITZGERALD KENNEDY JUNIOR HIGH SCHOOL
E. LACEY BLVD.
PEOPLES DITCH
SCALE:1"=1000'
TITLE: WELL NO.36
APPROVED BY:
DRAWN BY: J.L.P.
DATE: 08/20/03
JOB No.:
CITY OF HANFORD CALIFORNIA
SHEET 1 OF 1



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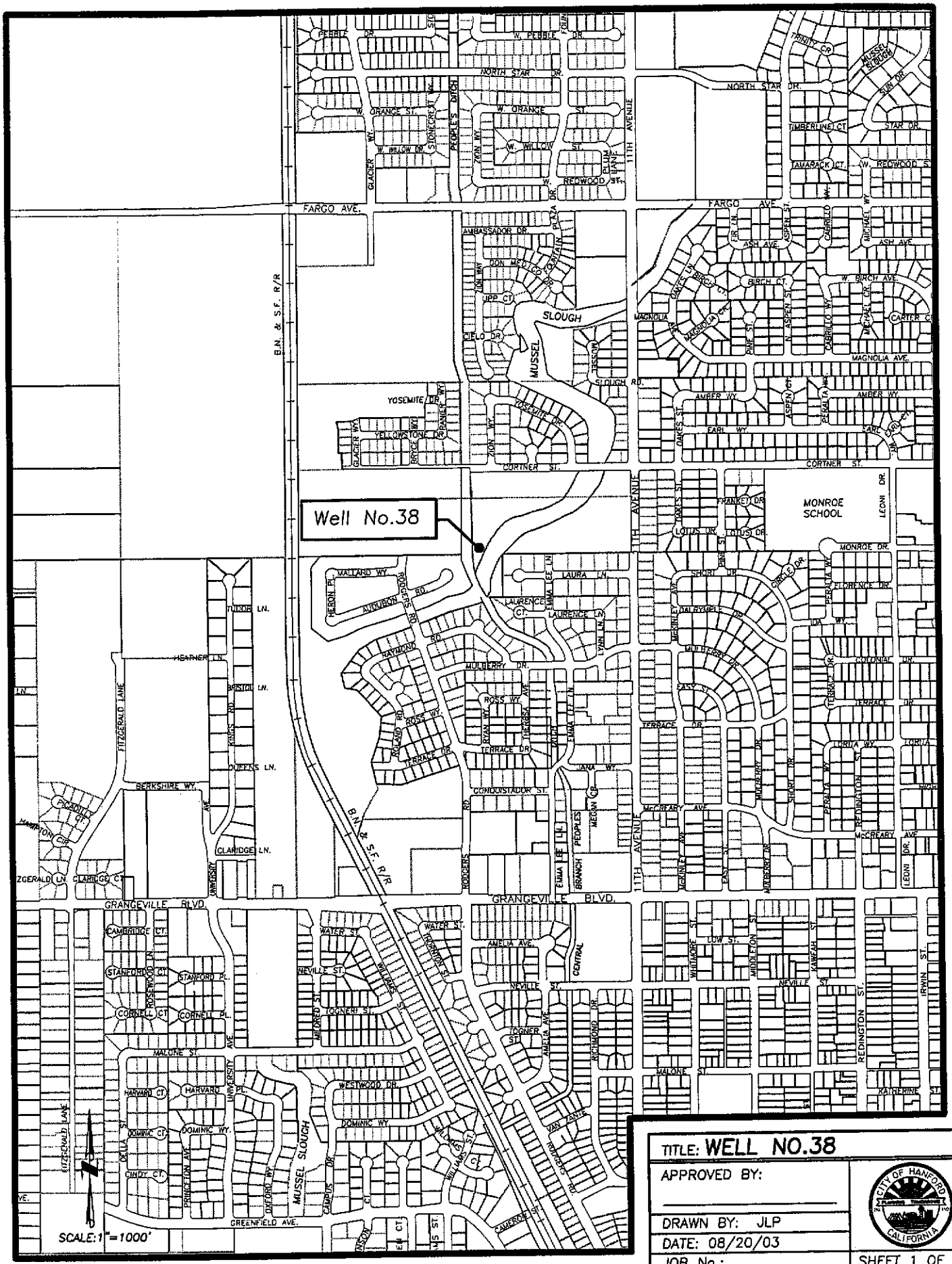

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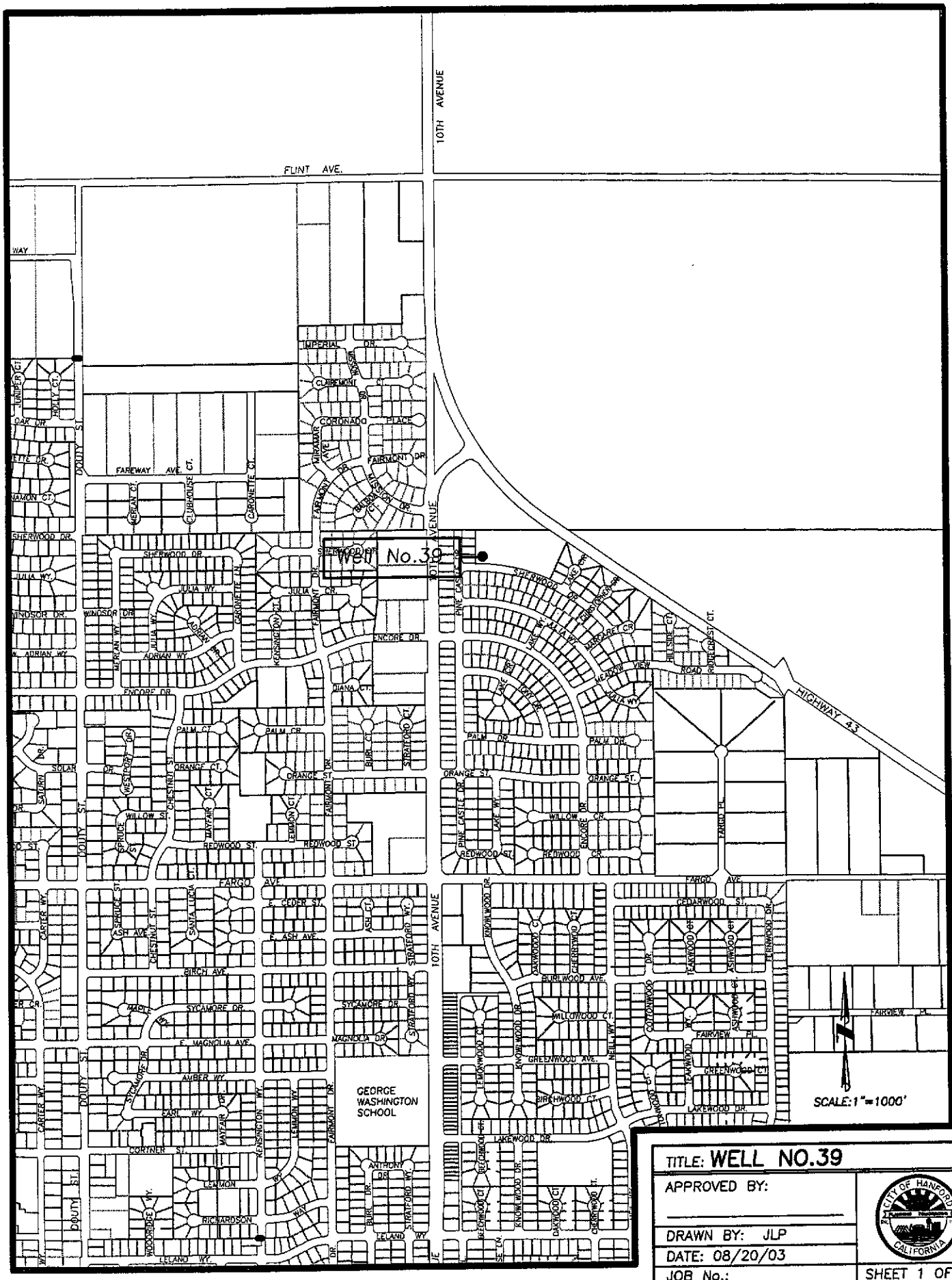
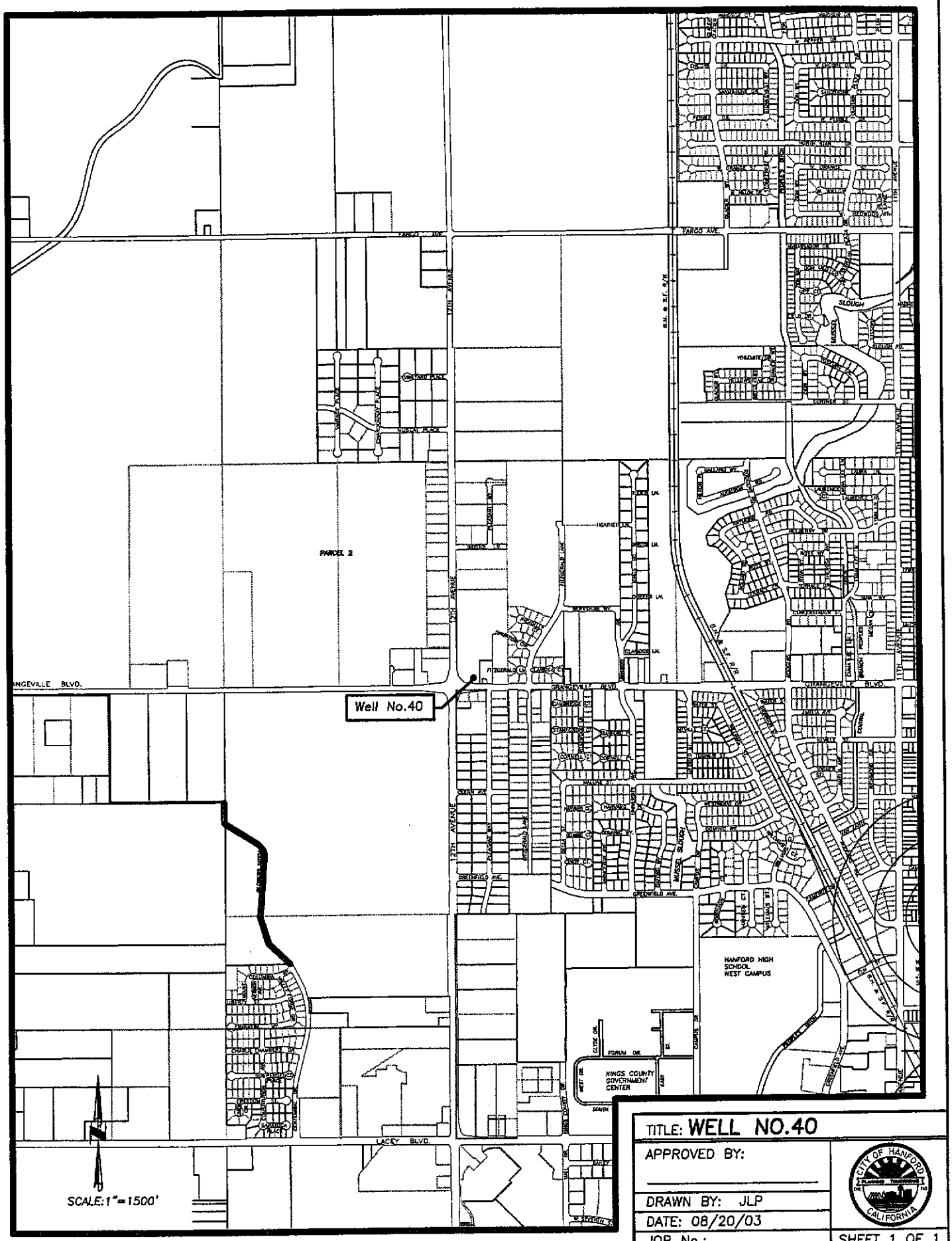

FLINT AVE.
10TH AVENUE
Well No.39
GEORGE WASHINGTON SCHOOL
HIGHWAY 43
SCALE:1"=1000'
TITLE: WELL NO.39
APPROVED BY:
DRAWN BY: JLP
DATE: 08/20/03
JOB No.:
CITY OF HANFORD CALIFORNIA
SHEET 1 OF 1



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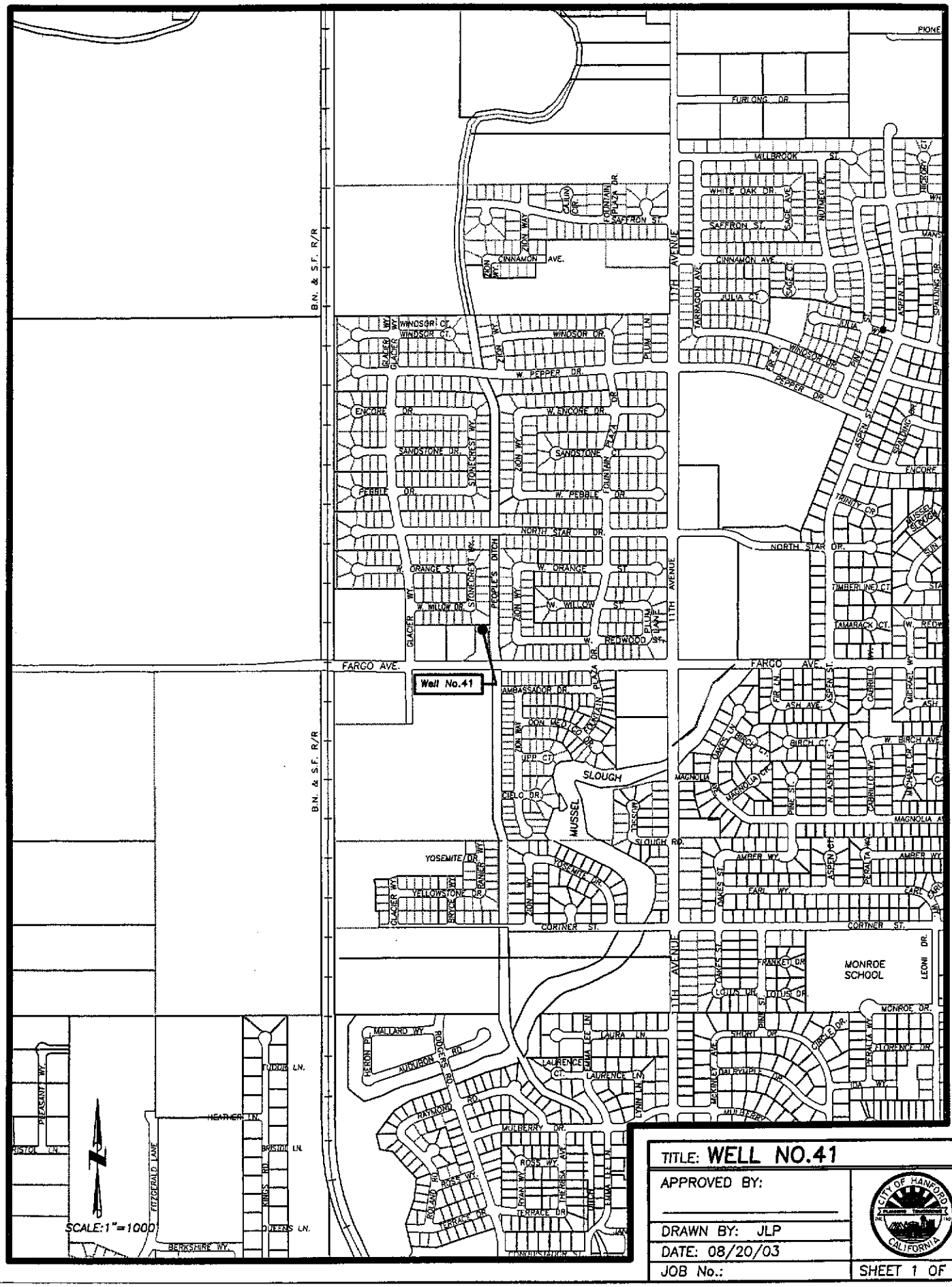

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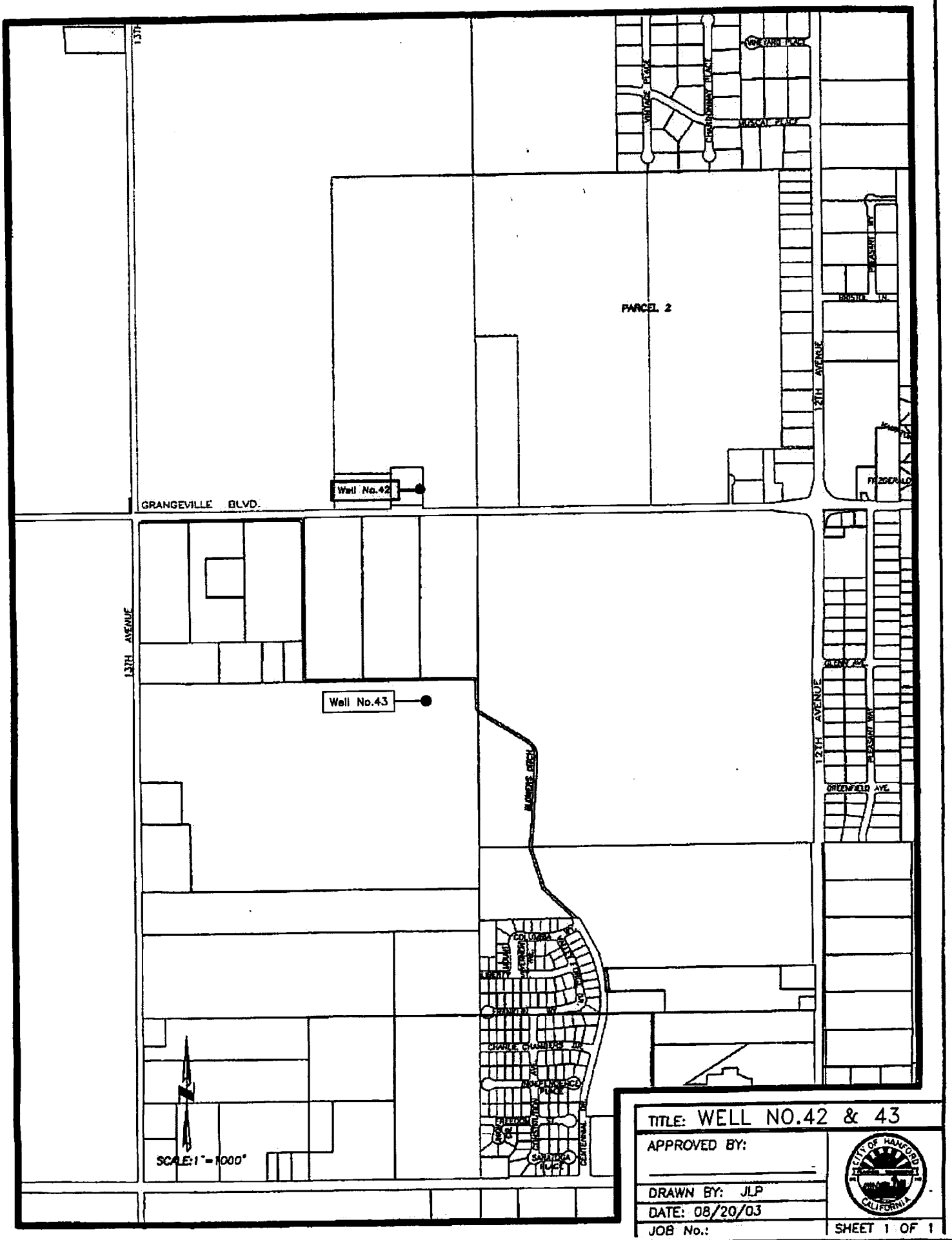
DRAWN BY: JLP	
DATE: 08/20/03	
JOB No.:	SHEET 1 OF 1


PARCEL 2
Well No.42
Well No.43
GRANGEVILLE BLVD.
13TH AVENUE
12TH AVENUE
SCALE: 1" = 1000'
TITLE: WELL NO.42 & 43
APPROVED BY:
DRAWN BY: JLP
DATE: 08/20/03
JOB No.:
SHEET 1 OF 1
CITY OF HANFORD CALIFORNIA

APPENDIX D – KCWD GROUNDWATER MANAGEMENT PLAN

KINGS COUNTY WATER DISTRICT

GROUNDWATER MANAGEMENT PLAN

DATE OF ENACTMENT:
JANUARY, 1993

DATE OF LAST REVISION:
NOVEMBER 2001

PREPARED IN COOPERATION WITH

EST. 1968
PROVOST & PRITCHARD
ENGINEERING GROUP

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I. INTRODUCTION

A. General

The State legislature enacted AB 255, (Costa), regarding Groundwater Management Programs, during the 1991 session. The Act was codified as Part 2.75, commencing with Section 10750 of Division 6 of the Water Code and became effective January 1, 1992.

The Act applies to local agencies whose jurisdiction includes groundwater basins subject to "a critical condition of groundwater overdraft" and covers the Kings Basin, Kaweah Basin and Tulare Lake Basin, all of which the lands of the Kings County Water District (District) are a part (Figure 1).

The Act provides that any district or other political subdivision of the State which is authorized to provide water service and is exercising that authority, may by ordinance or resolution adopt a program for the management of groundwater resources within the area in which water service is being provided in accordance with prescribed procedures.

The Act also authorizes a district to exercise specified powers of a water replenishment district subject to approval of the voters of the district. Realizing the importance of this action and its applicability to the underlying purpose of the District, the District initiated and adopted on December 15, 1992 the current groundwater management plan. More recently the State legislature passed similar legislation permitting districts in areas not subject to critical overdraft to practice groundwater management activities. This legislation known as AB 3030 was signed into law on January 1, 1993.

This report will review and revise specific activities identified in the District's 1992 groundwater management plan and be structured around the 1993 legislation to more closely relate to plans being prepared by other adjacent districts.

B. Purpose and Goal

The formation of the District was brought about because of the potential to export groundwater resources outside the area. During the ensuing years, the District has endeavored to practice sound water management practices by obtaining surface water rights as well as other practices with the intent of preserving the groundwater resources. As such, the District has been practicing groundwater management activities since its formation.

The purpose of this report is to document existing activities and formalize a management program. This program will consist of several elements and have the ability to direct staff with implementation priorities.

The goal of this Plan is to implement effective groundwater management that restores, where possible, and maintain a high quality and dependable groundwater resource.

Upon adoption of this Plan, actions on specific elements will be initiated within the management program to achieve the stated goal. As specific elements take effect, and/or other concerns arise, the management program may be revised to assure continued progress toward the management goal.

C. Powers of the District

The District, in addition to those powers enumerated in AB 3030 (codified at Water Code §§ 10750-10756), exercises all of the powers available to a county water district under the County Water District Law (the "Act"), set out at Water Code §§ 30000-33901.

The District enjoys the uncommon distinction of having successfully litigated the scope of its powers before the California Supreme Court. The general purposes for which the District was formed were clearly stated by the Supreme Court, as follows:

> The Kings County Water District was organized February 24, 1954, under the County Water District Law. It comprises approximately 150,000 acres. It was organized primarily to protect the underground water supplies of the area from excessive pumping and to guard against the transportation of the groundwater to areas outside the District. Its purposes and functioning generally have been in accordance with the aims and methods approved by law for such an organization. [. . .] The protection, conservation and replenishment of the underground water supplies is one of the main functions of the water district in question. Atchison, Topeka & Santa Fe Railway Co. v. Kings County Water District (1956) 47 Cal 2d 140, 143, 146 (citations omitted).

The District has all powers expressly granted or necessarily implied by the Act. Water Code § 31000. The District also has the power generally to perform all acts necessary to carry out fully the provisions of the Act. Water Code § 31001.

Among the District's specific powers are the following:

1. The District may do any act necessary to furnish sufficient water in the district for any present or future beneficial use. Water Code § 31020. For example, the District may, for the purpose of replenishing groundwater:

   (a) By and sell water (Water Code §§ 31021, 31042);
   (b) Distribute water to persons in exchange for ceasing or reducing groundwater extractions (Water Code §§ 31022-31023, 31047);

   (c) Spread, sink, and inject water in the underground (Water Code §§ 31021, 31047); and,

(d) Store, transport, capture, reclaim, purify, treat or otherwise manage and control water for the beneficial use of persons or property within the District and build the necessary works to achieve ground water replenishment (Water Code §§ 31021-31022, 31047).

2. The District may take action needed to protect or prevent interference with water, water quality, or water rights within the District. Water Code § 31080, 31081, 31082.

3. The District may take any action necessary to put water under its control to beneficial use. Water Code § 31020-31021, 31080-31082.

4. The District may take any action needed for and to preserve the water within the District for beneficial uses, to prevent contaminants from entering District groundwater supplies, removing contaminants within the District, identifying parties responsible for contamination of groundwater, and performing studies relative to water quality. Water Code § 31082.

5. The District may commence, maintain, intervene in, defend, and compromise actions and proceedings to prevent interference with or diminution of the natural flow of any stream or natural subterranean supply of waters which may (a) be used or be useful for any purpose of the district, (b) be of common benefit to the land or its inhabitants and (c) endanger the inhabitants or land. Water Code § 31082.

6. The District may commence, maintain, intervene in, compromise, and assume the costs of any action or proceeding involving or affecting the ownership or use of waters or water rights with the district used or useful for any purpose of the district or a benefit to any land, including actions to recover the cost of expenditures for groundwater quality protection from parties responsible for the contamination. Water Code § 31081.

7. The District has powers to:

(a) Acquire and operate facilities, water and water rights needed to replenish groundwater supplies (Water Code §§ 31020-31022, 31033, 31040-31042, 31047);

(b) Store water in groundwater basins, acquire water rights, import water into the District, and conserve water (Water Code 31020-31022, 31040-31042, 31047);

(c) Participate in legal proceedings as required to defend water rights, and water supplies and to prevent unlawful exportation of water from the District (Water Code § 31081-31082);1

(d) To exercise the right of eminent domain (Water Code §§ 31001, 31040, 31081-31082).

(e) Act jointly with other entities to perform its activities (Water Code § 31048, 31049, 31150-31153);

(f) Carry out investigations required to implement the Plan (Water Code § 3100-31001, 31011); and

(g) Fix rates for water replenishment purposes (Water Code §§ 31021-31022, 31024-31025).

8. The District may investigate and consider the use of existing facilities of other agencies to carry out the District's Groundwater Management Program, and if economically feasible and in the best interest of the District, an attempt shall be made to enter into a contract with the agency for use of their facility. See, Water Code §§ 31048-31049, 31150-31153.

The District may fix and collect fees for the extraction of groundwater to pay the expenses and costs associated with the acquisition of replenishment water. Water Code §§ 31024, 31025, 31031, 31032.1, 10754, 10754.2. The District may also levy a water replenishment assessment. Water Code § 10760. However, before any fees may be levied and collected for an assessment imposed under AB 3030, a majority of the voters in the District must ratify the fees. Water Code § 10754.3. The election rules of Kings County Water District would apply for said election.

Additionally, under AB 3030 the District may exercise those powers of a water replenishment district that are set out in Part 4 of Division 18 of the Water Code, §§ 60220-60232. See Water Code § 10754. The relevant powers of a water replenishment district largely parallel the powers of a county water district with respect to groundwater management.

1. The District may do any act necessary to replenish the groundwater of the District. Water Code §§ 60220, 60221. For example, the District may, for the purpose of replenishing groundwater:

1See also Atchison, supra, 47 Cal.2d at 143.

(a) By and sell water;

(b) Distribute water to persons in exchange for ceasing or reducing groundwater extractions;

(c) Spread, sink, and inject water in the underground; and,

(d) Store, transport, capture, reclaim, purify, treat or otherwise manage and control water for the beneficial use of persons or property within the District and build the necessary works to achieve ground water replenishment.

2. The District may take action needed to protect or prevent interference with water, water quality, or water rights within the District. Water Code § 60223.

3. The District may take any action necessary to put water under its control to beneficial use. Water Code § 60223.

4. The District may take any action needed for and to preserve the water within the District for beneficial uses and based on water quality goals to prevent contaminants from entering District groundwater supplies, removing contaminants within the District, identifying parties responsible for contamination of groundwater, and performing studies relative to the listed water quality goals. Water Code § 60224.

5. The District may take any action needed outside of the District if these actions are required to protect the District's groundwater supplies, and there is a relationship between the groundwater where the action is taken and the District's groundwater. Water Code § 60225.

6. The District may sue to recover the amount of District expenditures for groundwater quality protection parties responsible for the contamination. Water Code § 60226.

7. The District holds the additional powers of a water replenishment district, pursuant to Water Code § 60230, to:

(a) Acquire and operate facilities, water rights needed to replenish the groundwater supplies;

(b) Store water in groundwater basins, acquire water rights, import water into the District, and

conserve water;

(c) Participate in legal proceedings as required to defend water rights, and water supplies and to prevent unlawful exportation of water from the District;

(d) Under certain conditions, to exercise the right of eminent domain.

(e) Act jointly with other entities in order to perform required activities;

(f) Carry out investigations required to implement the program;

(g) Fix rates for water replenishment purposes; and,

(h) Fix the terms and conditions for contracts for use of surface water in lieu of groundwater.

8. The District must investigate and consider the use of existing facilities of other agencies to carry out the Plan if such other agency has available facilities adequate for the purposes of the District, and if economically feasible and in the best interest of the District, an attempt shall be made to enter into a contract with the agency for use of their facility. Water Code § 60231.

II. DESCRIPTION OF DISTRICT

A. Description of District Area

1) Location

The Kings County Water District was formed in 1954 under the County Water District Act to provide a legal entity for water management in the northeast portion of Kings County (Figure 2).

The District encompasses a land area of approximately 143,000 acres. The District includes portions of the service areas of three major mutual ditch companies: Peoples Ditch Company and Last Chance Water Ditch Company, which possess water rights on the Kings River, and the Lakeside Ditch Company, which holds water rights on the Kaweah River. In addition to the service areas of these ditch companies, the District boundary completely encompasses the area (31,845 acres) of the Lakeside Irrigation Water District, a California Water District formed to administer the water rights and distribution system of the Lakeside Ditch Company within the Lakeside Irrigation Water District. The District also includes an improvement district which was formed under the auspices of the Kings County Water District for the maintenance and operation of the Riverside Ditch, a conveyance system used to distribute a portion of the Peoples Ditch Company water.

These three major ditch companies were formed as mutual companies in the early 1870's, when this portion of the San Joaquin Valley was the focus of settlement. These private appropriations and diversions were among the earliest major irrigation projects in the San Joaquin Valley (Figure 2).

In addition to the ditch companies, the District also overlaps the Consolidated and Alta Irrigation Districts and the Kaweah Delta Water Conservation District.

Figure 3 depicts the boundaries of the various districts described above.

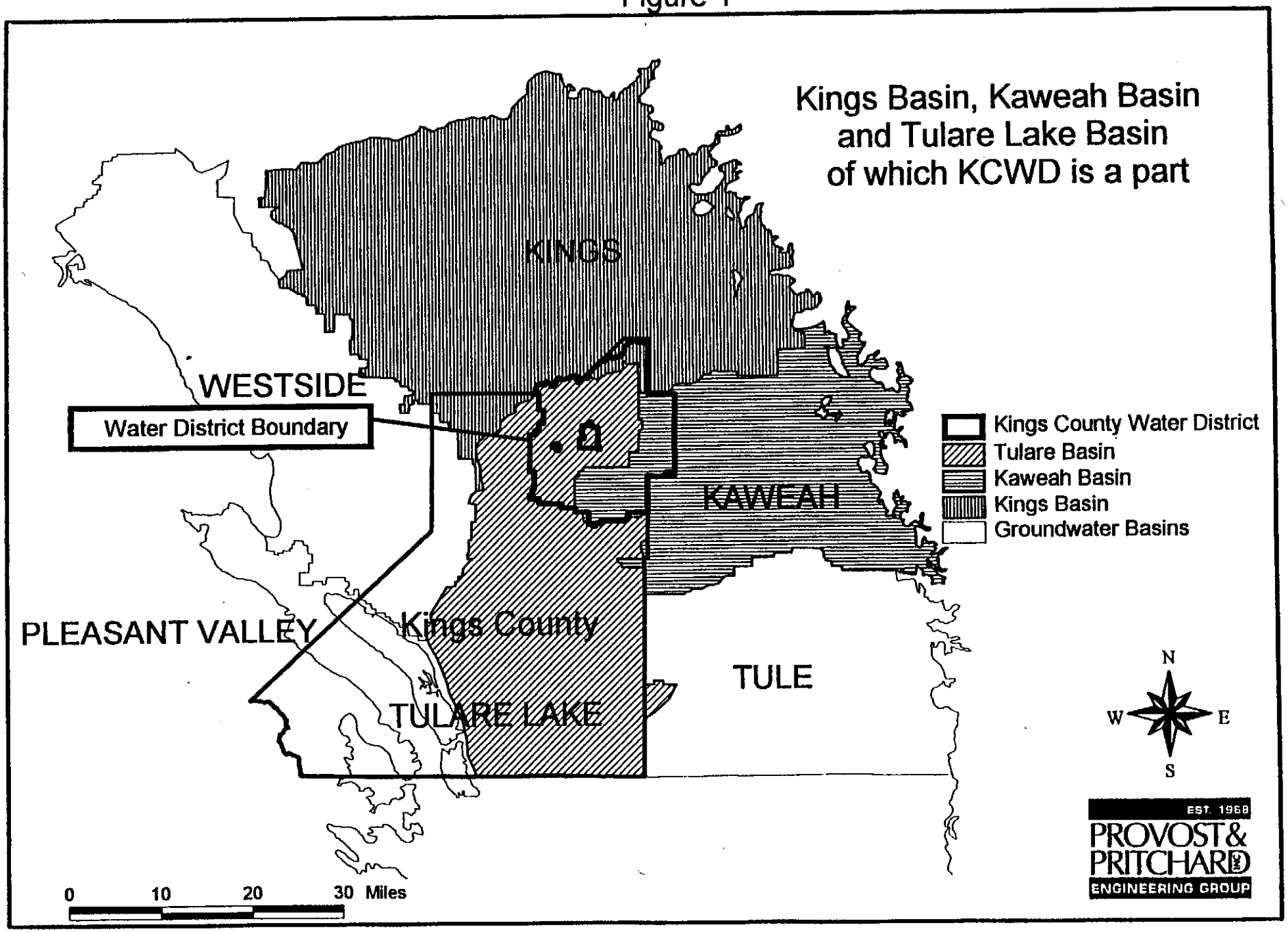
2) Topography

Land in the District generally slopes downward from the northeast to southwest at three to four feet per mile, with local variations caused by remnants of slough channels. Elevations range from 220 to 300 feet above sea level.

3) Climate

The climate of the District is characterized by cool, mild winters and hot, dry summers. Temperatures in the summer often exceed 100 degrees

Figure 1


Kings Basin, Kaweah Basin
and Tulare Lake Basin
of which KCWD is a part
KINGS
WESTSIDE
Water District Boundary
KAWEAH
PLEASANT VALLEY
Kings County
TULE
TULARE LAKE
Kings County Water District
Tulare Basin
Kaweah Basin
Kings Basin
Groundwater Basins
N
W
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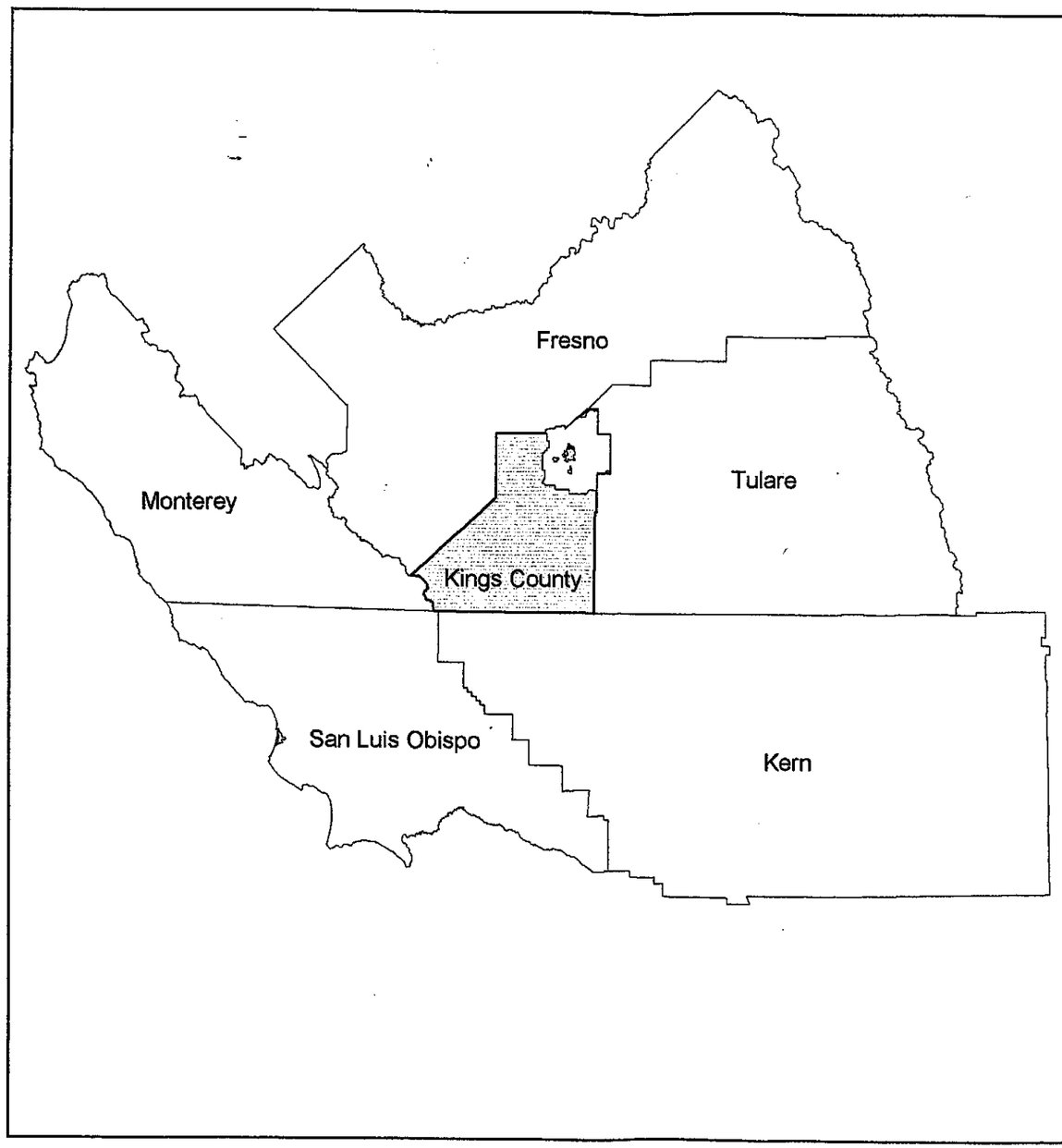
0
10
20
30 Miles
EST. 1968
PROVOST&
PRITCHARD
ENGINEERING GROUP

Regional Map

KCWD

KINGS COUNTY WATER DISTRICT



Legend

- KCWD Excluded
- Kings County Water District

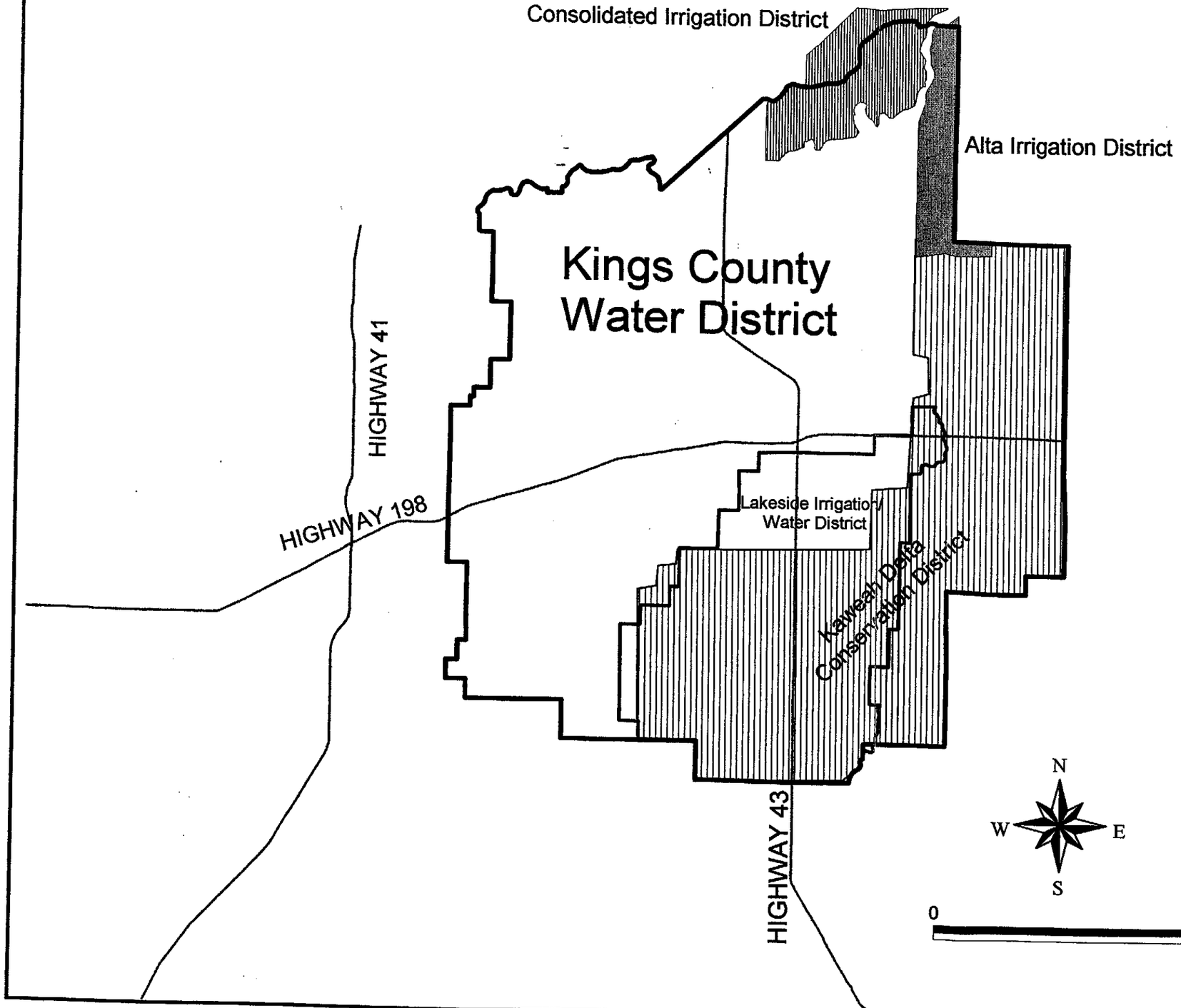
GROUNDWATER MANAGEMENT PLAN

N W E S 0 10 20 Miles

Figure 2

Geographic Boundaries of Agencies

KCWD



KINGS COUNTY WATER DISTRICT

Legend

- State Highways
- Kings County Water District Boundary
- Alta Irrigation District
- Consolidated Irrigation District
- Lakeside Irrigation District Boundary
- Kaweah Delta Conservation District

GROUNDWATER MANAGEMENT PLAN

Figure 3

Fahrenheit. Fog is experienced for long periods in the winter, with temperatures typically in the mid-30's. Winter temperatures occasionally drop into the 20's. Average annual precipitation is about 8.5 inches, with 80 percent of the rainfall occurring in the winter months. The frost-free growing season averages around 250 days per year.

B. Water Supply

1) Surface Water Quantity

The surface water supply of the District comes from various sources. A major portion is obtained from the Kings River through ownership of shares of stock in the Peoples Ditch Company and the Last Chance Water Ditch Company, and from the Kaweah River through ownership of shares of Lakeside Ditch Company stock. When the area's mutual water companies were first formed, the corporate stock was held in private ownership and the water was distributed to shareholders on an acreage basis to provide the landowner/shareholder with an assured surface water supply. However, the stock is transferable to anyone, even parties outside of the ditch companies historic service area. Prior to the formation of the District in 1954, a major portion of the stock of these ditch companies had been sold by the private owners to parties outside of the present District, creating an imbalance in the overall water supply of the area that manifested into a serious groundwater overdraft. The recognition of this situation was a major reason for the formation of the Kings County Water District.

The Kings County Water District has, since its formation, attempted to purchase all available water stock of these ditch companies to assist in preserving the water rights of the area.

In addition to the surface water distributed in the District from ditch companies, the District has purchased surplus surface water from the Central Valley Project made available through Short Term Contracts with the U.S. Bureau of Reclamation. The last Short Term Contract expired in October 1983; however, temporary contracts have been executed annually every year thereafter that CVP water has been available. The temporary CVP contracts have resulted in the delivery of San Joaquin River water into the basin.

The District has also endeavored to divert and recharge the basin with as much flood released water as is made available from the San Joaquin, Kings, and Kaweah Rivers. All of the imported supplies have either recharged the underground from the sinking basins or been diverted for direct surface irrigation within the District. Kings River water that is diverted is usually taken in high flows for short durations. The substitution of imported surface water supplies in place of groundwater extractions by the farmers is the key element in the District's conjunctive use program. Integrating the somewhat

uncertain surface water supplies of the District with groundwater pumping by individual farmers has resulted in an effective means of satisfying irrigation demands and the preservation of groundwater.

Table 1 shows the surface water supplies available to the District.

2) Surface Water Quality

Kings River water is of excellent quality for irrigation. Salt content, measured as total dissolved solids (TDS), typically runs around 50 parts per million (ppm) and boron content is generally less than 0.1 ppm. Infiltration problems sometimes occur due to the purity of the water.

3) Groundwater Quantity

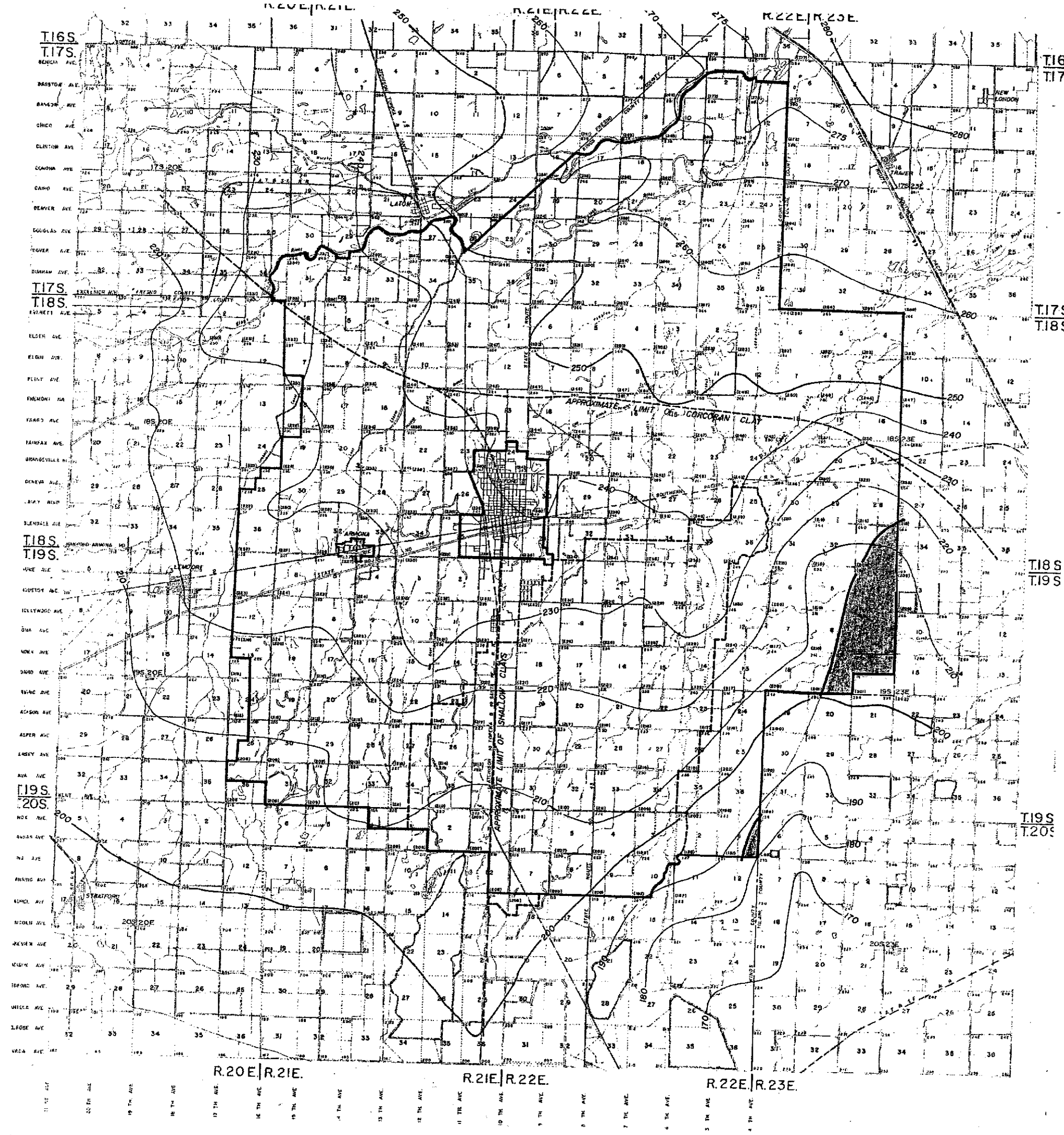
The groundwater beneath the Kings County Water District (which is extremely good quality for irrigation) is the only firm water supply available within the District. Agriculture, municipalities, and industry all regularly draw upon this valuable resource from individual wells, as surface water supplies are available only on an intermittent basis.

Conjunctive use of surface water and groundwater has been practiced within the District since its formation in 1954. Through the purchase of slough channels and other appropriate sites for use as recharge basins, and by the purchase and importation of available surplus water and flood released water, the Kings County Water District has reduced the decline of groundwater levels within the District.

The Kings County Water District has, since 1963, engaged in a cooperative program with the State Department of Water Resources for the monitoring and sampling of groundwater in the District. Water level measurements are annually obtained from approximately 200 wells in both the spring and fall. The data obtained in the spring (normally the last of January) reflects the "seasonal high" water table, as the measurements are made prior to pumping for pre-irrigation. The fall measurements (normally obtained in the first part of October) are taken after a full season of crop irrigation pumping.

Fall groundwater maps for 1940, 1950, 1960, 1970, 1977, 1980, 1990, and 2000, show the change in levels for successive ten year periods. The fall 1977 groundwater map has been included to reflect the conditions that prevailed following the two consecutive extremely dry years of 1976 and 1977 which resulted in all-time low groundwater levels within the District. Included as Figures 4, 5 and 6 are reproductions of the maps for 1940, 1977, and 2000, respectively. Table 2 provides a summary of depth to unconfined static groundwater for all years that measurements were made within the District. The average depth is computed from the elevations established from the lines of equal elevation of water in wells.

Table 1											
Surface Water Supplies within Kings County Water District											
Year	Peoples Ditch Co.(AF)	Last Chance Water Ditch Co. (AF)	Lakeside I.W.D.(AF)	Kings Flood Water (AF)	Kaweah Flood Water (AF)	CVP Water (AF)	Consolidated I.D.(AF)	Alta I.D. (AF)	City Effluent (AF)	Loss Water (AF)	Total (AF)
2000	37,328	41,252	18,812	1,297	20,804	12,994			1,951	11,647	146,085
1999											
1998											
1997											
1996											
1995											



LEGEND

- KINGS COUNTY WATER DISTRICT BOUNDARY
- LAKESIDE IRRIGATION WATER DISTRICT BOUNDARY
- 250 LINES OF EQUAL ELEVATION OF WATER IN AQUIFERS THAT ARE UNCONFINED OR SEMICONFINED, CONTOUR INTERVAL 10 FEET
- 200 GROUND SURFACE ELEVATION
- (150) GROUND WATER ELEVATION
- GREATER THAN 50' TO GROUND WATER

AVERAGE DEPTH OF UNCONFINED GROUND WATER LEVEL 14.5 FT.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SAN JOAQUIN DISTRICT

LINES OF EQUAL ELEVATION OF WATER IN WELLS UNCONFINED AQUIFERS

KINGS COUNTY WATER DISTRICT

FALL 1940

Figure 4

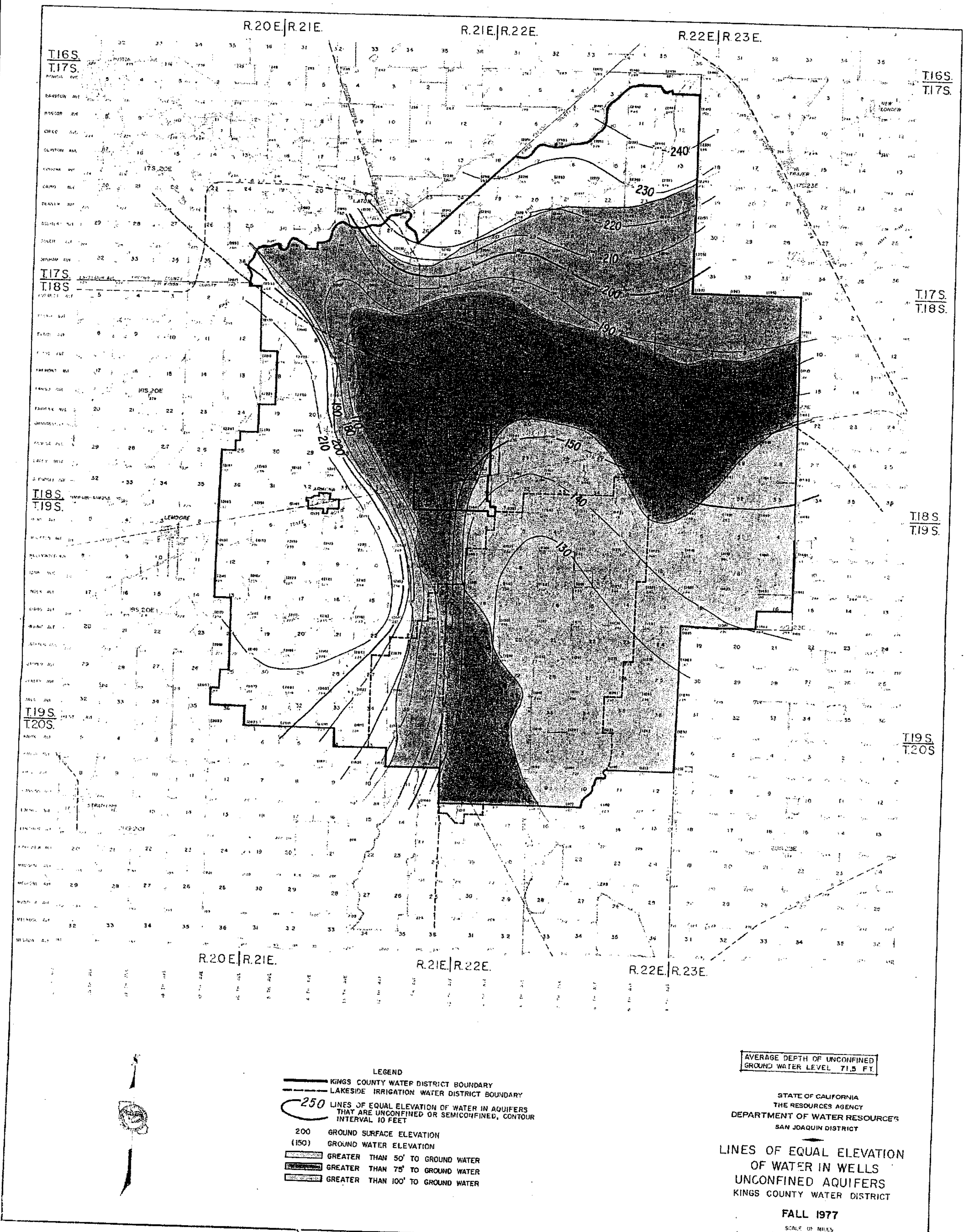
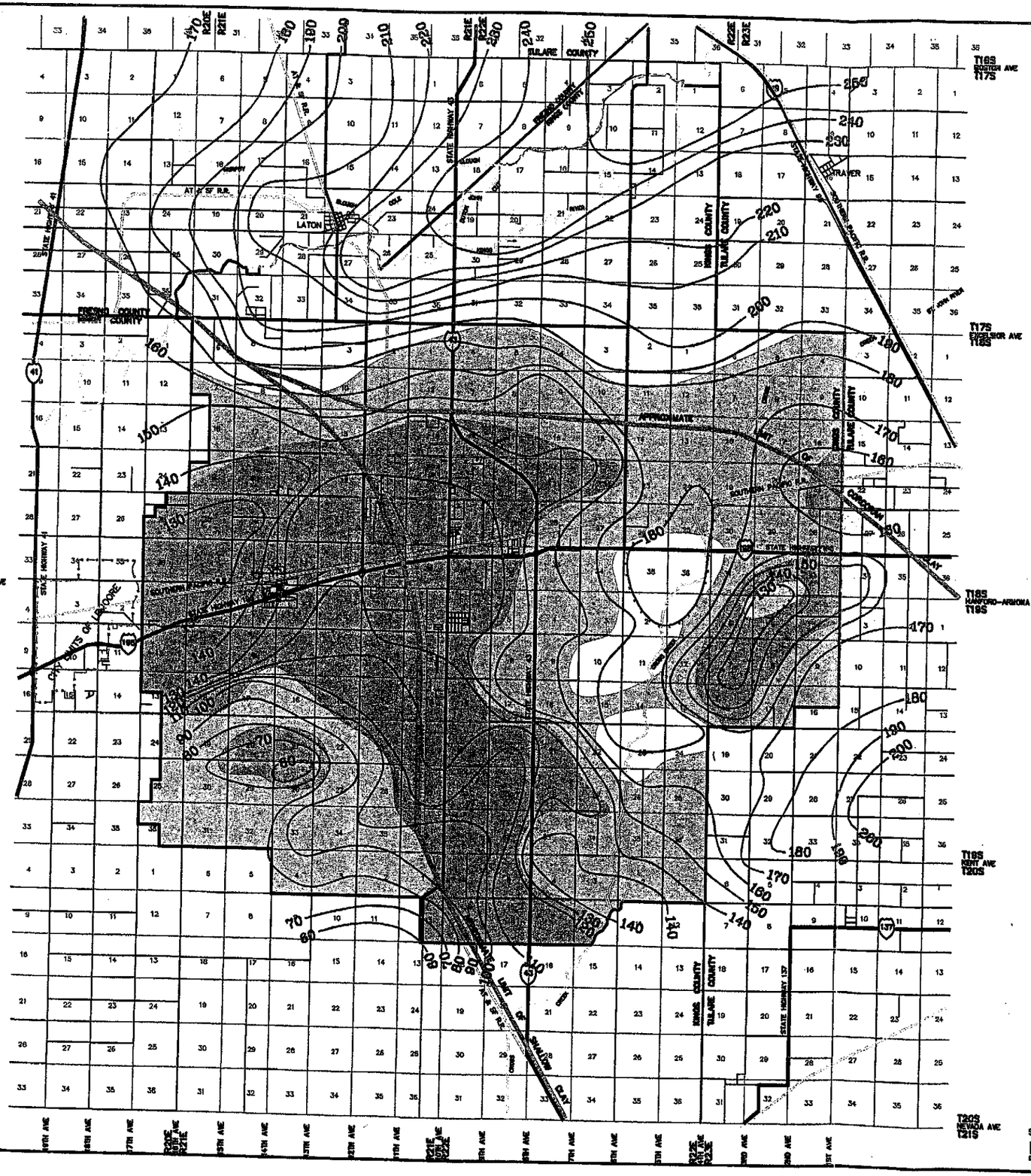

R.20E.|R.21E.
R.21E.|R.22E.
R.22E.|R.23E.
T.16S.
T.17S.
T.18S.
T.19S.
T.20S.
LATON
ARMONA
LEMOORE
STRATFORD
NEW LONDON
240
230
220
210
200
190
180
170
150
140
130
LEGEND
KINGS COUNTY WATER DISTRICT BOUNDARY
LAKESIDE IRRIGATION WATER DISTRICT BOUNDARY
250 LINES OF EQUAL ELEVATION OF WATER IN AQUIFERS THAT ARE UNCONFINED OR SEMICONFINED, CONTOUR INTERVAL 10 FEET
200 GROUND SURFACE ELEVATION
(150) GROUND WATER ELEVATION
GREATER THAN 50' TO GROUND WATER
GREATER THAN 75' TO GROUND WATER
GREATER THAN 100' TO GROUND WATER
AVERAGE DEPTH OF UNCONFINED GROUND WATER LEVEL 71.5 FT.
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SAN JOAQUIN DISTRICT
LINES OF EQUAL ELEVATION
OF WATER IN WELLS
UNCONFINED AQUIFERS
KINGS COUNTY WATER DISTRICT
FALL 1977
SCALE OF MILES

Figure 5

ELEVATION OF WATER IN WELLS
FALL 2000
(FOREBAY AND LOWER UNCONFINED AQUIFER)



KCWD

KINGS COUNTY WATER DISTRICT

AVERAGE DEPTH TO WATER IN WELLS:	89.8 FT

LEGEND

- KINGS COUNTY WATER DISTRICT BOUNDARY
- STATE HIGHWAYS
- MAIN ROADS
- STANDARD ROADS
- SECTION LINES
- RAILROAD TRACKS
- LINES OF EQUAL ELEVATION
- DEPTH TO GROUNDWATER GREATER THAN 50 FEET
- DEPTH TO GROUNDWATER GREATER THAN 75 FEET
- DEPTH TO GROUNDWATER GREATER THAN 100 FEET
- DEPTH TO GROUNDWATER GREATER THAN 125 FEET
- DEPTH TO GROUNDWATER GREATER THAN 150 FEET

N

SCALE 1" = 2.5 MILES

GROUNDWATER MANAGEMENT PLAN

FIGURE 6

PROVOST & PRITCHARD ENGINEERING GROUP
EST. 1956
286 WEST CROMWELL AVENUE
FRESNO, CALIFORNIA 93711-6162
559/449-2700 FAX 559/449-2715

Table 2

KINGS COUNTY WATER DISTRICT
SUMMARY OF DEPTH TO UNCONFINED GROUNDWATER

	SPRING					FALL				
			Average					Average		
Year	Deepest	Shallowest	Combined Aquifers	Upper Unconfined Aquifer	Lower Unconfined Aquifer	Deepest	Shallowest	Combined Aquifers	Upper Unconfined Aquifer	Lower Unconfined Aquifer
1940	-	-	-			56	0	15		
1950	-	-	-			77	12	30		
1956	93	5	32			-	-	-		
1957	84	4	29			-	-	-		
1958	88	4	34			-	-	-		
1959	80	2	30			-	-	-		
1960	89	6	38			110	13	47		
1961	104	3	46			-	-	-		
1962	116	3	51			-	-	-		
1963	112	5	48			-	-	-		
1964	107	9	47			131	11	58		
1965	102	5	50			135	8	61		
1966	99	6	51			137	10	65		
1967	101	8	54			115	5	56		
1968	97	3	47			131	5	55		
1969	102	3	49			105	2	44		
1970	84	1	41			96	6	47		
1971	94	1	45			104	2	53		
1972	100	4	50			146	3	62		
1973	103	5	54			105	7	56		
1974	94	3	50			96	1	52		
1975	97	3	49			98	5	55		
1976	101	4	52			121	3	65		
1977	106	8	60			117	10	72		
1978	116	6	66			116	6	64		
1979	98	4	56			109	7	61		
1980	99	6	57			102	6	56		
1981	97	2	50			109	7	61		
1982	102	6	56			100	6	57		
1983	88	3	44			87	1	40		
1984	89	1	36			82	1	36		
1985	77	1	36			101	1	42		
1986	77	5	41			86	1	39		
1987	76	2	37			96	4	47		
1988	78	4	39			88	6	48		
1989	82	2	45			104	4	55		
1990	95	4	54			109	7	67		
1991	113	6	65			117	12	72		
1992	123	8	67			189	8	82		
1993	169	9	-			167	8	85	25	109
1994	161	8	-	35	99	186	10	-	29	118
1995	183	8	-	27	107	156	5	-	22	102
1996	136	7	-	25	91	195	5	-	21	100
1997	134	5	-	20	84	183	6	-	18	99
1998	127	5	-	15	83	n/a	n/a	-	n/a	n/a
1999	129	4	-	13	75	155	6	-	18	89
2000	136	6	-	16	80	169	6	-	16	90

NOTE: Data prior to 1993 by others

The static confined groundwater levels within the District as of the fall of 2000 ranged from 55 feet near the Kings River in the north to 164 feet in the southeastern portion of the District.

Current estimates of usable storage is 9 million AF.

4) Groundwater Quality

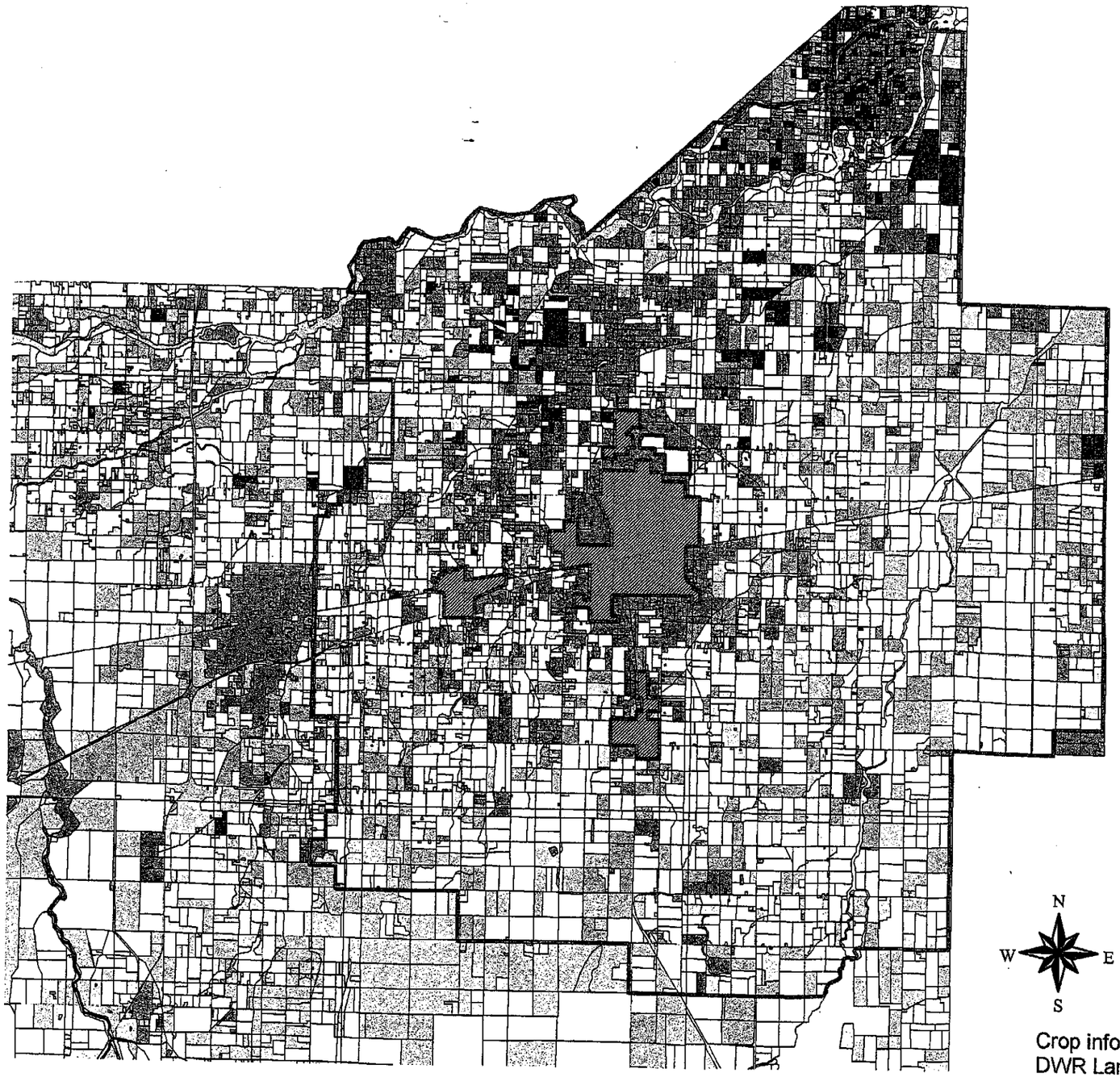
The cooperative program between the State and the District was expanded to include monitoring of groundwater quality which was conducted in years 1970, 1975, 1978, 1987, and 1991. Water samples from selected wells were collected in those years and delivered to the State and private laboratories for analysis. In 1997 the wells were surveyed and measurements of electrical conductivity were made.

C. Land Use

From historical accounts, it appears that as of the 1950's, all of the current acreage of the District was developed, with the exception of 20,000 acres. These same accounts estimated that as of 1970, all the lands within the District would be developed (Figure 7). Recent statistics identified by the 1996 DWR land use survey are as follows:

Crops	Gross Acres
Citrus	421
Deciduous Fruit & Nuts	18,022
Field Crops	78,925
Grain & Hay	4,575
Idle	799
Pasture	16,418
Truck Crops	1,491
Vineyard	3,592
Riparian Veg.	0
Native Veg.	3,407
Water	281
Semi Ag	6,519
Urban	5,629
Other	2
	140,083

Kings County Water District
1996 Crop Map



KCWD

KINGS COUNTY WATER DISTRICT

LEGEND

- Citrus
- Deciduous Fruits and Nuts
- Field Crops
- Grain and Hay
- Idle
- Pasture
- Truck, Nursery and Berry Crops
- Vineyards
- Riparian Vegetation
- Native Vegetation
- Water Surface
- Semiagricultural
- Non Ag
- Not Surveyed
- KCWD Boundary

GROUNDWATER MANAGEMENT PLAN

N
W E
S

Crop information from 1996
DWR Land Use Survey

0 2.5 5 Miles

Figure 7

D. Water Demand

The water demand for crops grown within the Kings County Water District is estimated to range from 1.30 acre-feet per acre for grain to 5.00 acre-feet per acre for irrigated pasture, with an average annual use in the District from 2.8 to 3.1 acre-feet per acre, depending on crop patterns and double cropping. The municipal demand within the District has also been approximated by the two municipal suppliers as 1.81 and 0.35 acre-feet per acre for Hanford and Armona, respectively.

A summary of the Water Demand and Supply Inventory for the District had been tabulated for the years 1970 through 1986 and is set forth as Table 3. This is dated information and should be updated. As shown in column 9, the average annual groundwater "draft" was estimated at approximately 126,600 acre-feet for the District.

During the 17-year period (1970-1986) the total water demands within the District versus the total water supply (surface water and groundwater) indicates that the area was near a water balance. Evaluating the sources of the surface supply for the study period reveals that an average yield of about 150,000 acre-feet per year may be anticipated by the District from the ditch company rights under normal hydrologic conditions on the Kings and Kaweah Rivers. The data also revealed that during the same period the Kings County Water District purchased an average surface supply of approximately 30,500 acre-feet per year and the Lakeside Irrigation Water District purchased an additional 15,000 acre-feet per year. It is anticipated that the District will collect the needed information to prepare a water budget and compare the data from the budget with results from well measurements.

E. Water Related Facilities

1) District System Inventory

The District owns and operates numerous intentional recharge basins that are located throughout the District. In addition, the District operates the 10 mile Riverside Ditch for direct delivery of surface water for agricultural production and the 10 mile Old River channel for intentional groundwater recharge activities. These are shown on Figure 8.

2) Other Facilities

Other facilities for the conveyance and recharge of surface water are numerous. These consist of the canal delivery system for the Last Chance Water Ditch Company, the Peoples Ditch Company, the Lakeside Water Irrigation District, Kaweah-Delta Water Conservation District, Consolidated

and Alta Irrigation Districts, and several private ditches used for conveyance of water through the District. These facilities are shown in Figure 8.

Kings County Water District
Facilities and Distribution System

KCWD

Legend

- Highway
- Street
- Boswell canal
- Lakeside canal
- Last Chance canal
- Peoples canal
- Riverside canal
- Settlers canal
- KCWD Basins
- Excluded land
- Kings County Water District

GROUNDWATER MANAGEMENT PLAN

N
W E
S

0 2.5 5 Miles

Figure 8

Table 3

KINGS COUNTY WATER DISTRICT

WATER DEMAND AND SUPPLY INVENTORY

Water Year	Irrigated Crop Acreage	WATER DEMANDS			SURFACE WATER SUPPLY			Gross Groundwater Pumped (Col.4 - Col.5)	(b) Net Groundwater Draft Within District	(c) Annual Change In Depth to Groundwater	(d) Groundwater Depletion or Replinishment	Groundwater Yield (Col.9 +/- Col.11)	Kings River Runoff
		Irrigated (FDR) (a)	Urban	Total	Farm Deliveries	Percolation & Evaporation Losses	Total						
	Acres (1)	A.F. (2)	A.F. (3)	A.F. (4)	A.F. (5)	A.F. (6)	A.F. (7)	A.F. (8)	A.F. (9)	Ft. (10)	A.F. (11)	A.F. (12)	M.A.F. (13)
1970	121,000	363,000	6,500	369,500	122,182	97,047	219,229	247,318	104,551	-2.9	-41,470	63,081	1.33
1971	121,500	364,500	6,600	371,100	83,904	61,877	145,781	287,196	175,842	-5.9	-84,370	91,472	1.17
1972	122,500	367,500	6,700	374,200	54,897	43,038	97,935	319,303	224,439	-8.5	-121,550	102,889	0.86
1973	126,000	378,000	6,800	384,800	163,727	107,022	270,749	221,073	67,033	5.6	80,080	147,113	2.13
1974	125,000	375,000	6,900	381,900	145,374	133,579	278,953	236,526	59,020	3.6	51,480	110,500	2.10
1975	127,000	381,000	7,000	388,000	92,737	71,138	163,875	295,263	173,039	-2.8	-40,040	132,999	1.58
1976	127,500	382,500	7,100	389,600	29,047	26,622	55,669	360,553	278,153	-9.4	-134,420	143,733	0.54
1977	128,500	385,500	7,200	392,700	9,714	20,277	29,991	382,986	305,832	-7.0	-100,100	205,732	0.39
1978	126,000	378,000	7,300	385,300	173,174	114,438	287,612	212,126	51,337	7.8	111,540	162,877	3.45
1979	125,500	376,500	7,400	383,900	152,965	98,153	251,118	230,935	85,012	2.5	35,750	120,762	1.73
1980	125,000	375,000	7,500	382,500	161,216	94,733	255,949	221,284	78,649	4.8	68,640	147,289	3.05
1981	127,500	382,500	8,000	390,500	83,767	56,267	140,034	306,733	197,518	-4.3	-61,490	136,028	1.04
1982	126,500	379,500	8,500	388,000	195,515	115,363	310,878	192,485	30,458	3.9	55,770	86,228	3.11
1983	122,500	367,500	9,000	376,500	214,843	111,866	326,709	161,657	4,502	17.2	245,960	250,462	4.48
1984	129,000	387,000	9,500	396,500	172,879	92,132	265,011	223,621	81,227	3.6	51,480	132,707	1.97
1985	127,500	382,500	10,000	392,500	95,594	66,933	162,527	296,906	177,791	-6.4	-91,520	86,271	1.25
1986	128,500	385,500	10,500	396,000	178,655	111,163	289,818	217,345	57,898	3.1	44,330	102,228	3.26
17 Year Total	2,137,000	6,411,000	132,500	6,543,500	2,130,190	1,421,648	3,551,838	4,413,310	2,152,301	4.9	70,070	2,222,371	33.44
Average	125,706	377,118	7,794	384,912	125,305	83,626	208,932	259,606	126,606	0.2882	4,122	130,728	1.97 (e)

Footnotes:

(a) Annuan Farm Delivery Requirement (FDR) computed as 3.0 AF/acre times irrigated acreage.
(b) Column (8) minus [15% of Column (4) plus 90% of Column (6)].
(c) Obtained from DWR Fall Groundwater Maps.
(d) Computed using 10% average specific yield, resulting in 14,300 AF for each foot of change in depth.
(e) Seventeen year average 117 percent of normal.

Table 3

F. Institutional Programs

1) Groundwater Monitoring Programs

Well Water Levels

The USBR and DWR act as clearing houses to gather well water-level data from agencies and organizations in the local area. The District has been a participant for many years and shares information with these and other agencies.

III. HYDROGEOLOGIC CHARACTERISTICS

A. Groundwater Basin Description

San Joaquin Basin Hydrologic Study Area

As stated in DWR's bulletin 118-80 the San Joaquin Valley is divided into 15 separate basins, largely based on political considerations. Division into these basins is essential for groundwater management, since management of the San Joaquin Valley as a whole is impractical. Division along existing water agency boundaries would result in basins with technical problems in conducting of management activities. As such, the District lies in three basin designations including the Kings, Kaweah, and Tulare Lake; the majority of the land is included in the Tulare Lake Basin.

B. Local - Aquifer Characteristics

1) Geology - Overview

An enormous aquifer system lies beneath the District and extends the length and breadth of the San Joaquin Valley. The valley is a broad structural trough, with the Sierra Nevada mountains on the east and the Coast Range mountains on the west. The Sierra Nevada basement rock extends from the foothills on the east, sloping downward to the southwest at 4° - 6°. Consolidated and unconsolidated continental and marine deposits from both the Sierra Nevada and the Coast Range mountains overlie the basement complex. Unconsolidated alluvial deposits make up most of the basin's freshwater aquifer (USGS Water Supply Paper 1999-H, 1972).

Interspersed within the unconsolidated deposits that comprise the useable aquifer in the region are a number of clay layers that can act as confining beds. The confining bed that has greatest significance to Kings County Water District is known as the Corcoran Clay, or E-Clay. The E-Clay is thought to underlie most of the District; information from drilling of wells indicates the E-Clay terminates in a line trending from near Laton to the

intersection of State Highway 198 and the County line. One other significant clay layer that also partially underlies Kings County Water District is the A-Clay. This clay lens can pose problems along the western boundary of the District by limiting the vertical movement of water in the aquifer. In a series of wetter years, this can pose a significant impact on farming activities in this area. Figure 9 shows the horizontal extent of the major confining clay layers in the area. Figure 10 shows a generalized geologic cross section of the District .

Soils

Soils in the District and vicinity range from coarse sands to heavy clays. In the central and western portions of Kings County Water District the soils generally have a higher clay content. These soils were deposited in the valley trough during flood periods and are derived from mixed granitic and sedimentary rocks from both the Sierra Nevada and Coast Range Mountains. Soils in the eastern portion of the District generally have higher sand content and are derived mostly from granitic Sierra Nevada sediments deposited on alluvial fans.

Soils throughout the vicinity of Kings County Water District are stratified, with interspersed sandy and clayey streaks. Figure 11 is a composite of USDA soil survey maps which cover the District.

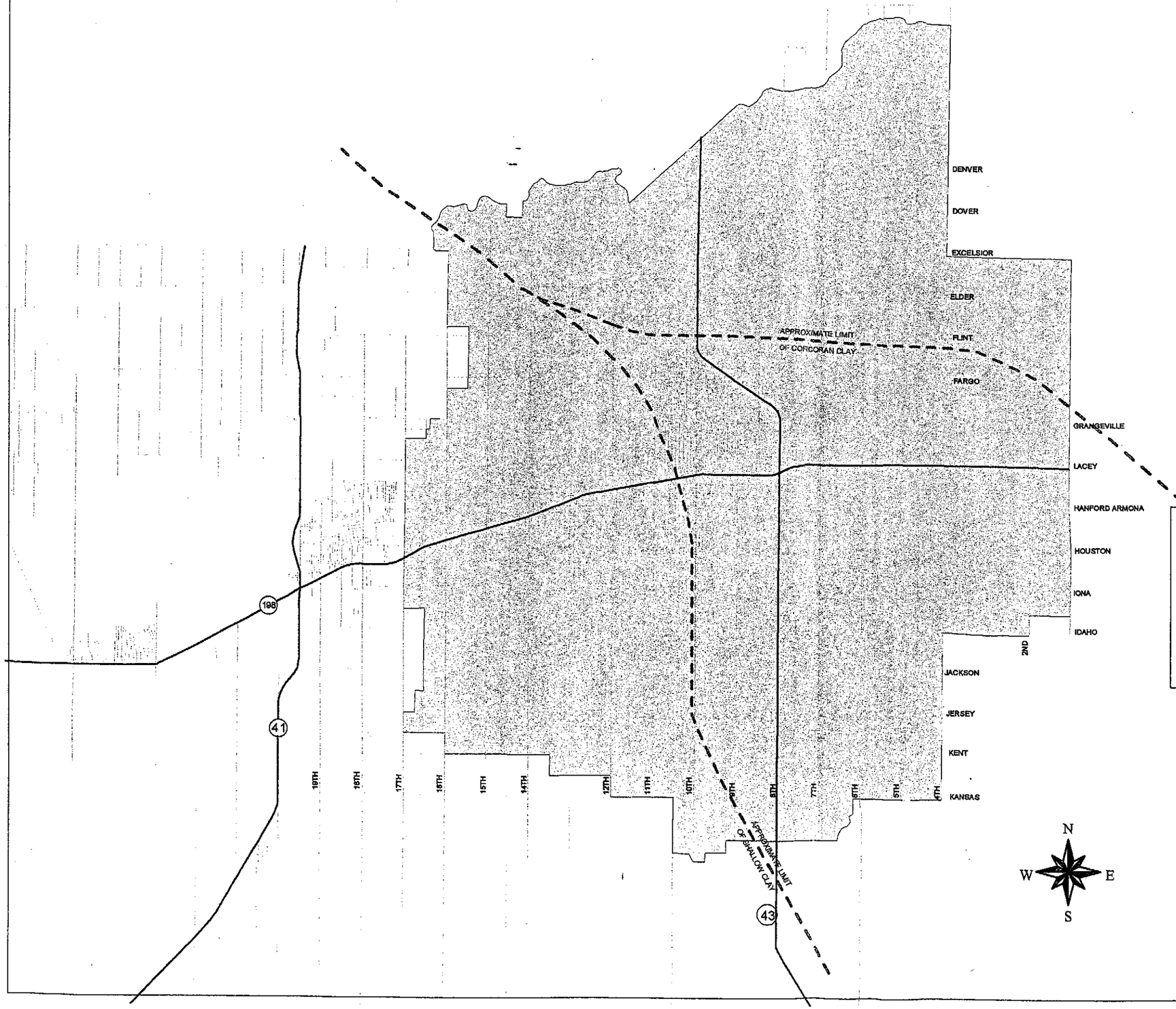
2) Well Yields

Well yields within the District range from about 400 to over 3,000 gallons per minute (gpm), with most wells producing 1,500 to 2,000 gpm.

3) Storage Capacity

Defining the useable groundwater reservoir as the unconfined aquifer lying above the E-Clay, an estimated groundwater storage capacity can be calculated. The elevation of the base of the E-Clay averages about 400 feet below sea-level within the District, with an average thickness of around 80 feet. The average ground surface elevation in the District is about 260 feet, resulting in an average total depth for the unconfined aquifer of about 580 feet. Assuming that it is undesirable to have the water table less than ten feet from the ground surface, the average thickness of the useable aquifer is around 570 feet. Applying an average specific yield of 0.11, and multiplying by the total District area of 143,000 acres results in an estimated total unconfined aquifer storage capacity of 8,900,000 AF.

Kings County Water District
General Extent of A and E Clays



KCWD

KINGS COUNTY WATER DISTRICT

Legend

- Clay layer
- Highway
- Street
- Kings County Water District

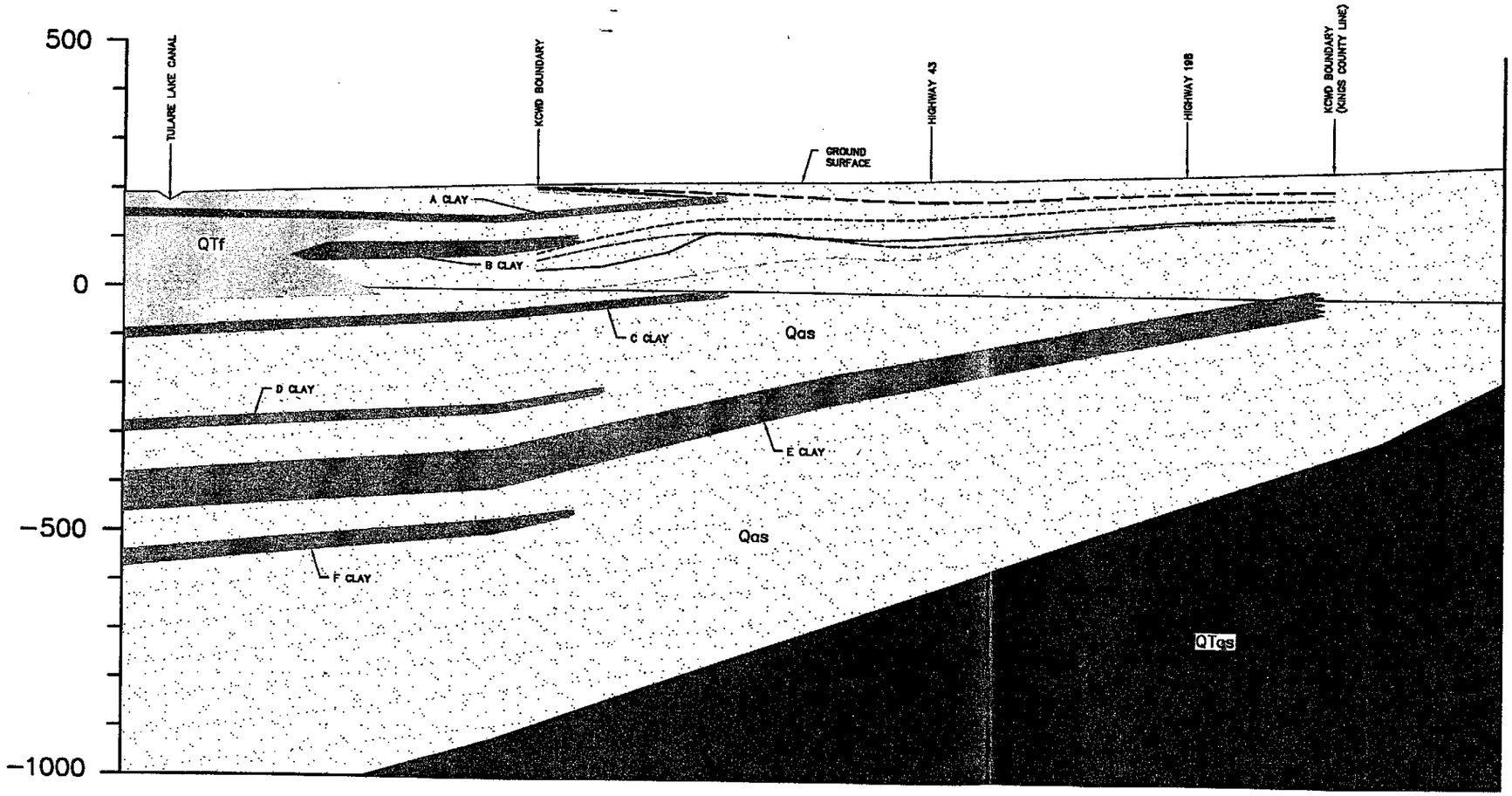
GROUNDWATER MANAGEMENT PLAN

N
W E
S

0 2.5 5 Miles

Figure 9

KINGS COUNTY WATER DISTRICT



LEGEND

Qas – QUATERNARY ALLUVIUM – SIERRA NEVADA ORIGIN
Qtf – TERTIARY AND QUATERNARY FLOOD BASIN, LACUSTRINE AND MARSH DEPOSITS
Qtas – TERTIARY AND QUATERNARY CONTINENTAL DEPOSITS

REF: U.S.G.S. WATER SUPPLY PAPER 1999–H (1959)

SIMPLIFIED GEOLOGIC CROSS–SECTION

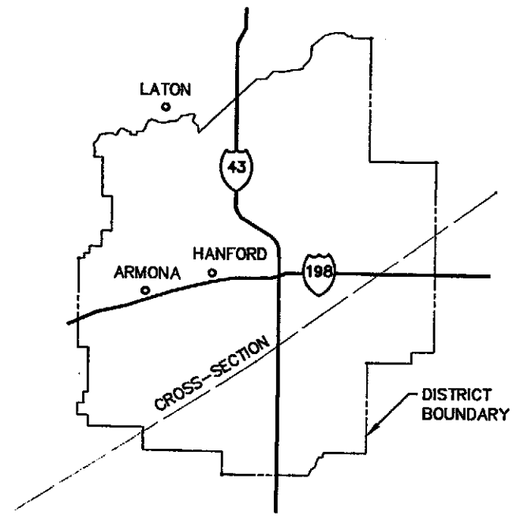


FIGURE 10

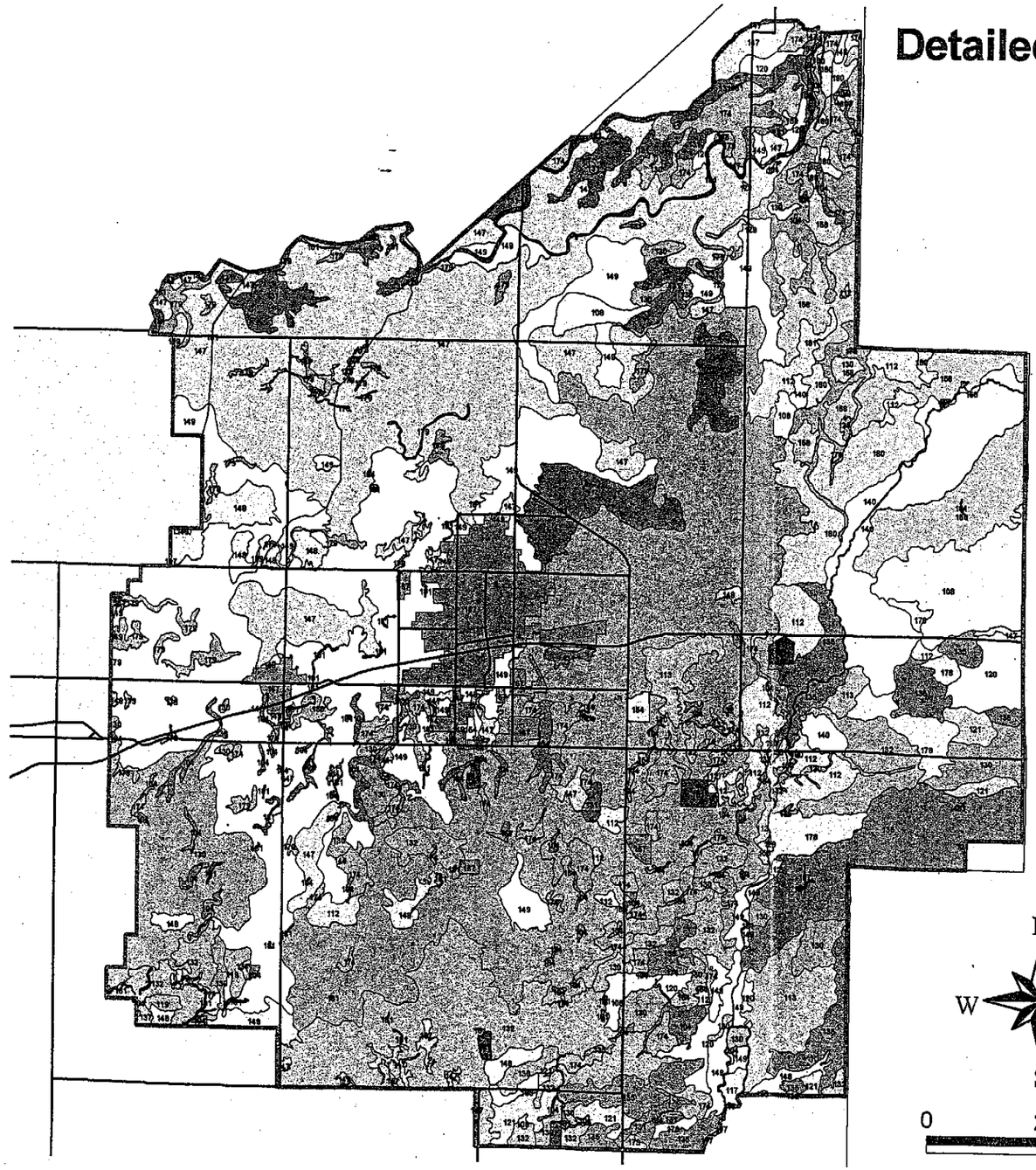
WATER SURFACE ELEVATIONS

- 1963 – SPRING
- 1970 – FALL
- 1994 – SPRING
- 1994 – FALL
- 1995 – SPRING

EST. 1958
PROVOST & PRITCHARD ENGINEERING GROUP
286 WEST CROMWELL AVENUE
FRESNO, CALIFORNIA 93711–6162
559/448–2700 FAX 559/449–2715

Job No. 21920101–G
Dwg. No. 94–0063

Detailed Soil Map



KCWD

KINGS COUNTY WATER DISTRICT

Detailed Soil Map-Wide Coverage

Kcwd Boundary

Kcwd Soil Types

- 104 Cajon Sandy Loam
- 108 Corona Silt Loam
- 112 Excelsior Sandy Loam
- 113 Garces Loam
- 117 Goldberg Loam, Drained
- 119 Grangeville Sandy Loam, Saline-Alkali
- 120 Grangeville Fine Sandy Loam, Partially Drained
- 121 Grangeville Fine Sandy Loam, Saline Alkali, Partlily Drained
- 130 Kimberlina Fine Sandy Loam, Saline Alkali
- 131 Kimberlina Fine Sandy Loam, Sandy Substratum
- 132 Kimberlina Saline Alkali-Garces Complex
- 134 Lakeside Loam, Partially Drained
- 135 Lakeside Clay Loam, Drained
- 137 Lemoore Sandy Loam, Partially Drained
- 140 Melga Silt Loam
- 147 Nord Fine Sandy Loam
- 148 Nord Fine Sandy Loam, Saline-Alkali
- 149 Nord Complex
- 154 Pits and Dumps
- 158 Remnoy Very Fine Sandy Loam
- 167 Urban Land
- 174 Wasco Sandy Loam 0 to 5% Slopes
- 178 Westhaven Clay Loam, Saline-Alkali, 0 to 2% Slopes
- 179 Whitewolf Coarse Sandy Loam
- 180 Youd Fine Sandy Loam
- 181 Water Surface

N

W E

S

0 2 4 Miles

Ref. - USDA Soil Survey Map

GROUNDWATER MANAGEMENT PLAN

Figure 11

IV. GROUNDWATER CONDITIONS

A. Historical Conditions

1) Groundwater Levels

Prior to development of the Kings County Water District, regional groundwater levels were typically within ten feet of the ground surface. As land was brought into agricultural production, and with the advent of deep well turbine pumps, groundwater levels began to decline. By 1950, water levels had begun a sharp decline that continued into the mid-1970's. In this period a significant portion of the unconfined aquifer was dewatered and a large cone of depression centered on lands south of the District.

Beginning in the mid-1970's and continuing to the present, is a trend of much slower groundwater decline. Water levels have continued to fluctuate in response to drought and flood years, but have not exhibited nearly as strong a downward trend. This slowing in groundwater level decline probably resulted from increased groundwater inflow induced by the large cone of depression that has formed in the region and by the activities to import other water and utilize flood water for intentional groundwater recharge.

Water levels in wells tapping the confined aquifer in the region, (below the E-Clay) also declined precipitously through the 1950's and 60's. However, due to the confined nature of the aquifer, these declines track the piezometric or pressure surface of the groundwater, and therefore do not indicate a physical reduction of water in storage in the confined aquifer. This downward trend reversed dramatically in the mid-1960's in response to initiation of delivery of imported surface water from the USBR's Central Valley Project (CVP). This surface water supply resulted in decreased pumping from beneath the E-Clay in regions west of Kings County Water District. Water levels in wells pumping from the confined aquifer once again began to decline steeply in the early 1990's when imported water supplies declined as a result of an extended drought and the restrictions that the 1992 CVPIA imposed on Delta exports.

2) Groundwater Quality

Overall groundwater quality has not appeared to change significantly over the years. As discussed previously, groundwater quality is generally better on the east side of the District.

B. Current Conditions

1) Groundwater Levels

The most recent period for which well water level contour maps have been prepared for the Kings County Water District is spring 2000. In the spring of 2000 water levels in wells pumping from the unconfined aquifer ranged from about 220 feet in elevation in the northwest corner of the District to near sea-level on the District's southern edge. Direction of groundwater flow in the District, for the unconfined aquifer (above the E-Clay), is generally from northwest to southeast.

a) Estimated Pump Lift

Depth to standing water in wells in Kings County Water District ranged from about 55 feet to 164 feet in spring 2000. These data were gathered prior to the start of the pumping season.

C. Groundwater Overdraft

The approach to estimate overdraft involves using historical well water-level measurements during a hydrological base period. The base period must extend for a long enough time that both wet periods and droughts are covered, and the water supply conditions approximate the average. The term overdraft is used in this report to indicate a long-term water level decline within an area during an average hydrologic base period. It is not used to describe short-term water level declines during periods of drought.

The procedure to estimate overdraft from well water level measurements uses many measurements over a long period of time. In the Kings County Water District region, measurements are made in the winter or early spring, following a period of minimal pumping, and again in the fall, following a period of heavy pumping. The complete water level data record can be used to prepare well water level hydrographs and to determine long-term water level changes. A well water level hydrograph is a plot of depth to water versus time for a particular well. After the well water level hydrographs were prepared, the trends in the water levels in the base period were closely examined. As expected, in most agricultural areas the annual low values are in the late summer or early fall, at the end of a long irrigation season, and annual high values are in the winter or early spring, just before pumping begins for the next growing season.

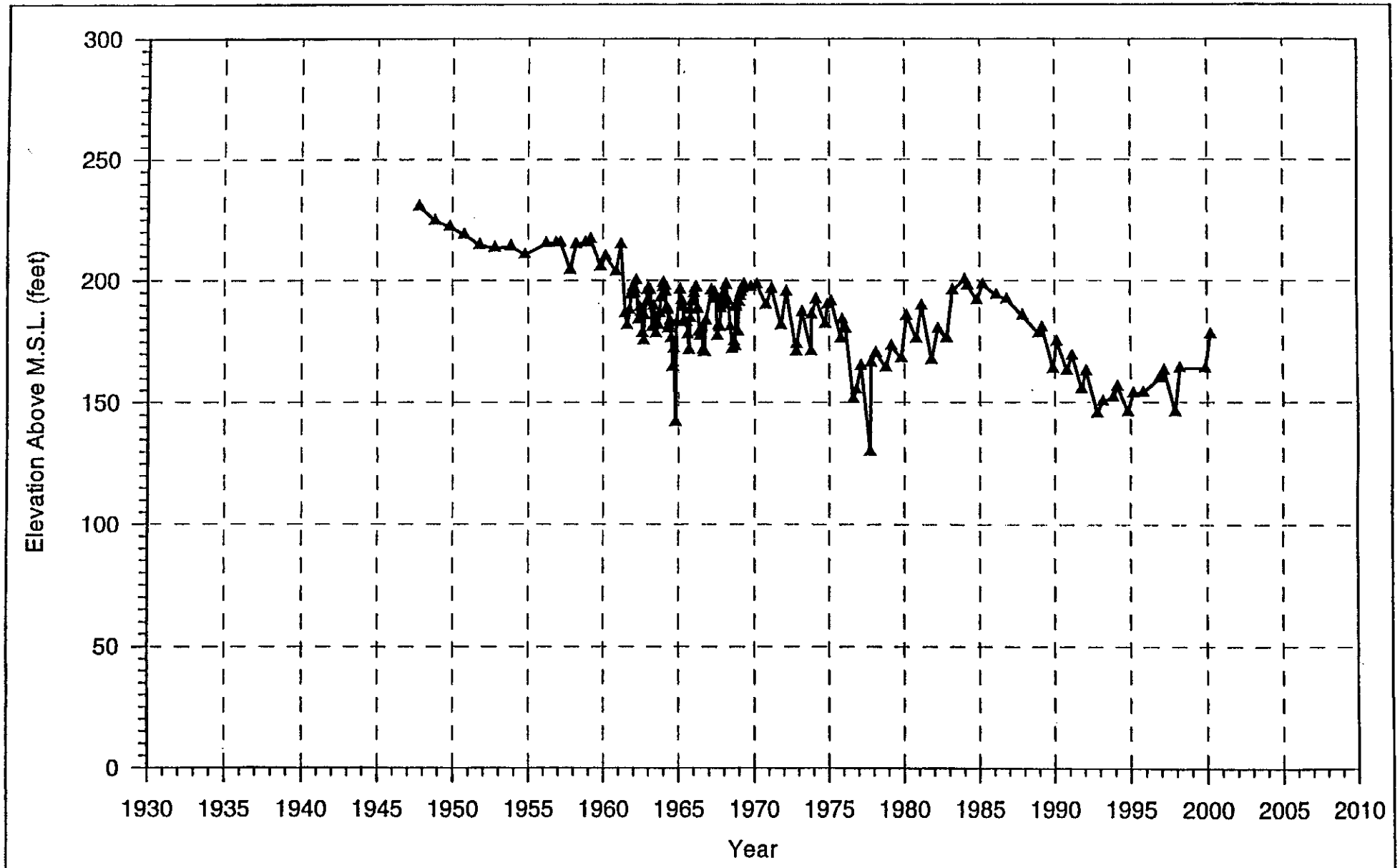


Figure 12-1

Kings County Water District
Groundwater Management Plan

Water Level Hydrograph
Well 18S 21E 10R1

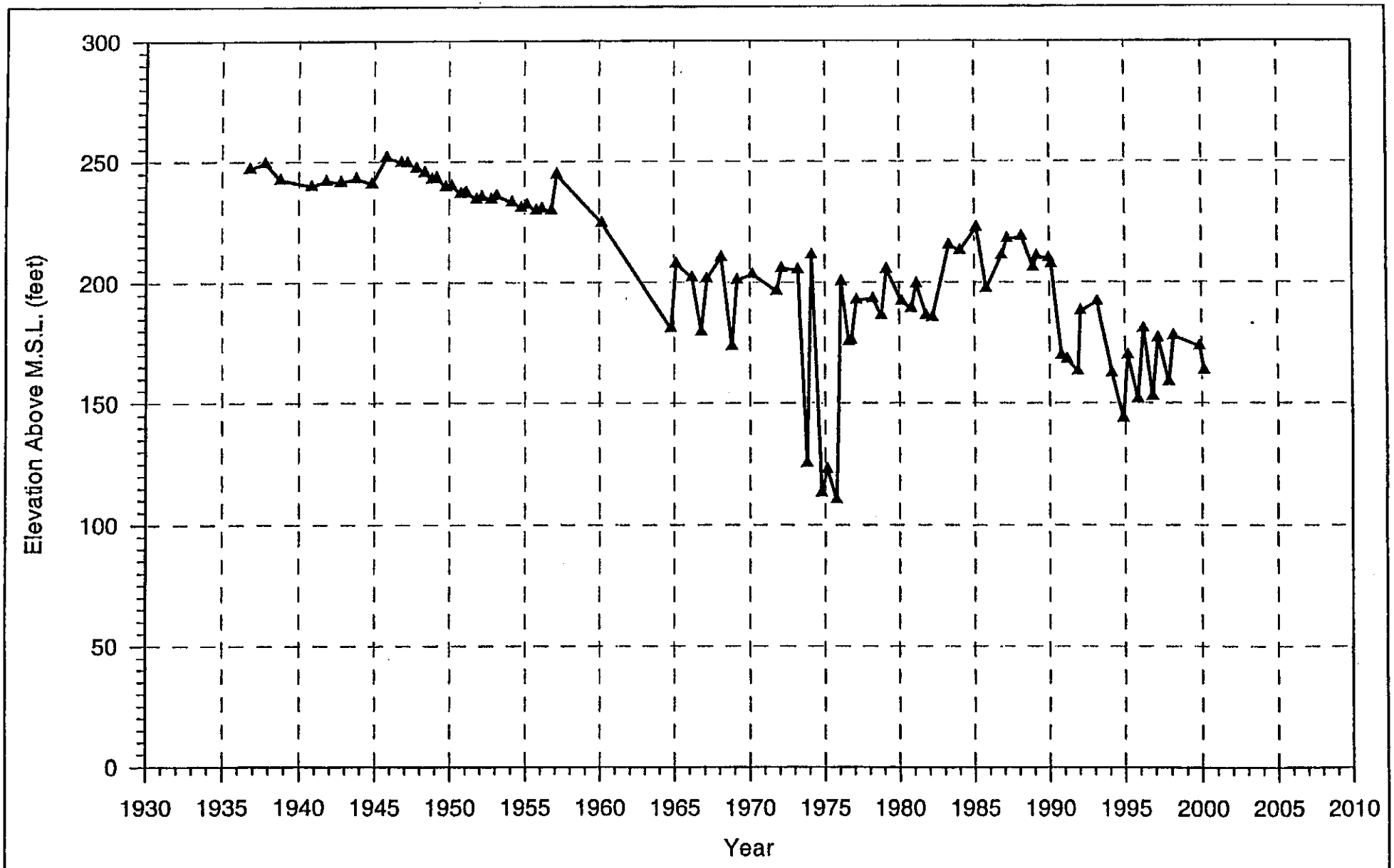


Figure 12-2

Kings County Water District
Groundwater Management Plan

Water Level Hydrograph
Well 18S 23E 15A1

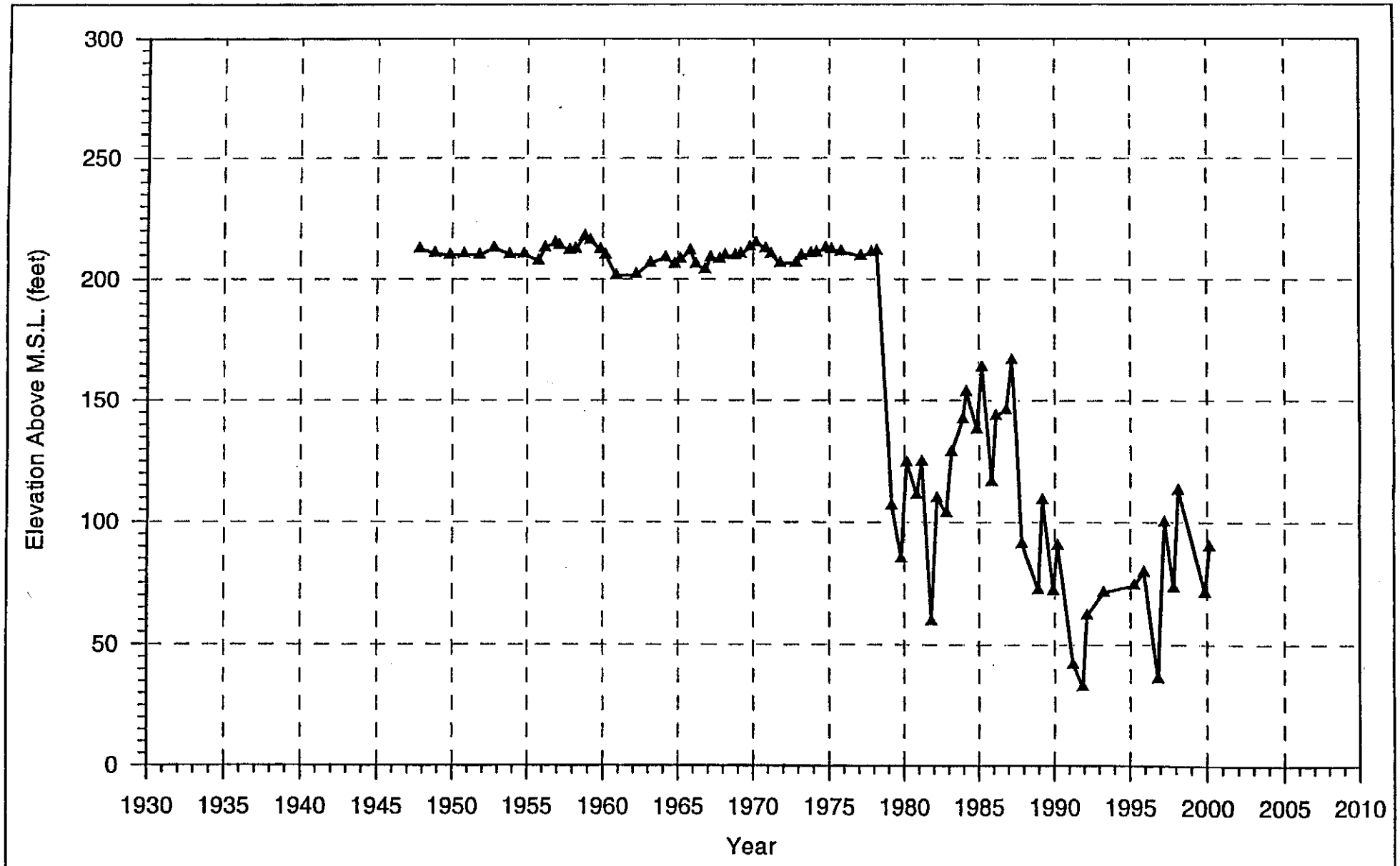


Figure 12-3

Kings County Water District
Groundwater Management Plan

Water Level Hydrograph
Well 19S 21E 30A1

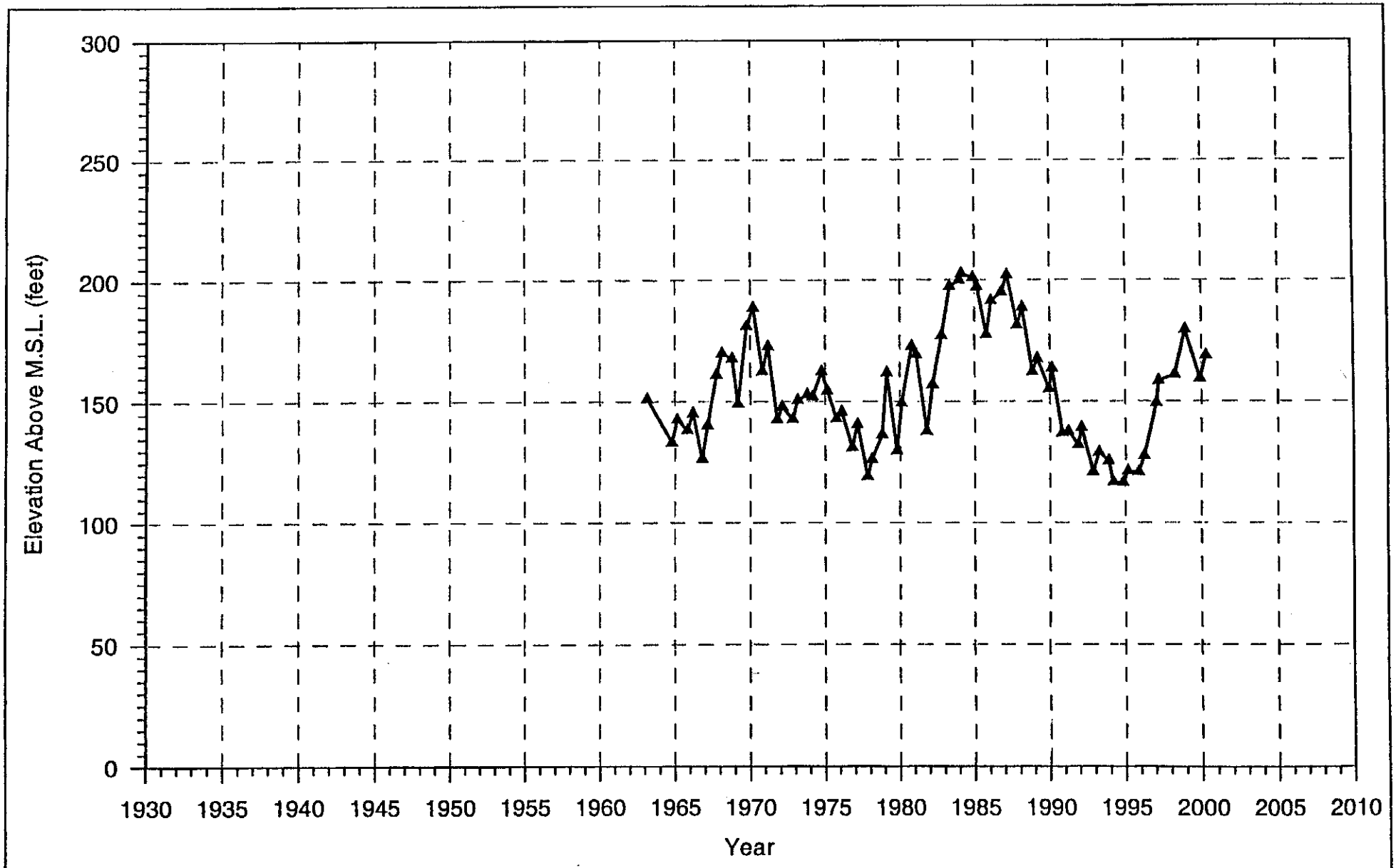


Figure 12-4

Kings County Water District
Groundwater Management Plan

Water Level Hydrograph
Well 19S 22E 15M1

Linear regressions were performed on the data within the base period that appeared valid and representative of the water level conditions. The slope of these "best-fit" lines were used as the long-term average annual changes in groundwater level.

The base period for this analysis was taken to be from 1975 to 1993. The wells pumping from above the E-Clay all show a consistent trend through this period. The Kings River, the major hydrological factor in the area with respect to groundwater replenishment, was also a near-average period (105% of long-term average runoff) with respect to both flood and drought episodes. Four representative hydrographs showing depth to water in wells in the District are provided on Figures 12-1 through 12-4.

The hydrographs indicate gradual, long-term water level declines in the District for the chosen hydrologic base period. To determine the change in groundwater storage, a parameter known as "specific yield" is multiplied by the average water level change during the period evaluated. Specific yield is the ratio of the volume of water which will drain freely from a material to the total volume of the formation. Based upon estimates of specific yield by the USGS and the DWR, the average specific yield of the unconfined aquifer was estimated to be about eleven percent for the District. Using these specific yields, the District's groundwater overdraft is calculated to be about 12,000 AF per year for the chosen hydrologic base period. During this same period, additional water supplies were brought into the District through various programs that amounted to 20,000 AF/yr, indicating that overdraft could be as much as 32,000 AF/yr.

D. Extraction and Perennial Yield

Groundwater extractions by Kings County Water District was covered previously. Perennial yield, or sustained yield, is difficult to quantify because of the shared nature of the aquifer and uncertainty in defining the term. In this analysis, perennial yield is defined as the maximum quantity of water that can be withdrawn annually from a groundwater resource under a given set of conditions without causing an undesirable result.

One factor complicating the estimate of perennial yield for Kings County Water District is that the region is not a "closed" groundwater basin. That is, groundwater in the region is hydraulically connected to groundwater in adjacent areas within both the Kings Basin and the Kaweah Basin. If groundwater management activities substantially raised static water levels, subsurface inflow would decrease, subsequently decreasing perennial yield.

Based on the period of 1970 to 1994 the estimated overdraft for the Kings

County Water District is approximately 32,000 af per year. Also according to district records the average ground water pumped per year over the period of 1970 to 1986 was 259,607 af per year. This period (1970-1986) relates to above average hydrologic conditions. Therefore in order to normalize the value for average groundwater pumped per year the average pumpage is reduced by 13%. Subtracting the overdraft from the normalized average pumping results in an estimate of the perennial yield of 193,339 af per year.

V. MANAGEMENT PLAN ELEMENTS

As identified in the AB 3030 Ground Water Management Act of 1992, 12 elements may be included in a ground water management plan. These elements play a role in evaluating or operating a ground water basin so that ground water can be managed to maximize the total water supply while protecting ground water quality. They form a basic list of data collection and operation of facilities that may be undertaken by an agency operating under this act. The 12 elements are addressed in this ground water management plan.

A. Control of Saline Water Intrusion

Water supplies both surface and groundwater are of excellent quality. There is no known area of saline water.

B. Identification and Management of Wellhead Protection Areas and Recharge Areas

The Federal Wellhead Protection Program was established by Section 1428 of the Safe Drinking Water Act Amendments of 1986. The purpose of the program is to protect groundwater sources of public drinking water supplies from contamination, thereby eliminating the need for costly treatment to meet drinking water standards. The program is based on the concept that the development and application of land use controls, usually applied at the local level in California, and other preventative measures can protect groundwater.

A Wellhead Protection Area (WHPA), as defined by the 1986 Amendments, is "the surface and subsurface area surrounding a water well or wellfield supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield". The WHPA may also be defined as the recharge area that provides the water to a well or wellfield. Unlike surface watersheds that can be easily determined from topography, WHPA's vary in size and shape depending on subsurface geologic conditions, the direction of groundwater flow, pumping rates, and aquifer characteristics. There are several different methods typically used to delineate the lateral boundaries of a WHPA.

Under the 1986 Amendments, states are required to develop an EPA-approved Wellhead Protection Program. To date, California has no state-mandated program, but instead relies on local agencies to plan and implement programs. This is one of the factors that prompted the State Legislature to enact AB 3030. Wellhead Protection Programs are not regulatory in nature, nor do they address specific sources. They are designed to focus on the management of the resource, rather than control a limited set of activities or contaminant sources.

As Kings County Water District does not provide drinking water to the public, Wellhead Protection Areas are not currently applicable to this plan. Depending on the relationship developed with the City of Hanford and Armona Community

Services District (see item K of this section), delineation of WHPA's may be addressed at a later date.

C. Regulation of the Migration of Contaminated Groundwater

Groundwater contamination can originate from many sources or activities. Clean-up of contaminated groundwater is a complex and expensive task, generally involving a number of organizations. Agencies with roles to play in mitigating groundwater contamination include the California Regional Water Quality Control Board (RWQCB), the California Department of Toxic Substances Control (DTSC), and the U.S. Environmental Protection Agency (EPA). Each agency has its own set of regulatory authorities and expertise to contribute. The degree to which they participate depends on the nature and magnitude of the problem. If Kings County Water District identifies a groundwater contamination problem, the District would refer the information to the appropriate regulatory agency.

D. Administration of a Well Abandonment and Well Destruction Program

Existing State and Kings County law requires that owners or lessees properly destroy their abandoned wells. Proper destruction of abandoned wells is necessary to protect groundwater resources; abandoned or improperly destroyed wells can result in water of different chemical qualities from different strata mixing, and degrading groundwater. The responsibility for administration and enforcement of the County well ordinance will remain with Kings County.

E. Mitigation of Conditions of Overdraft

Overdraft of the groundwater supply can lead to a variety of problems, including subsidence and increased pumping costs. Additionally, if overdraft continues unchecked, the groundwater supply may not be reliable when surface water is scarce, as in a time of extended drought.

Groundwater overdraft is due to an imbalance in the rates of extractions and replenishment. There are several methods to correct this imbalance. The first is to decrease the extraction to match the rate of replenishment. The second is to increase groundwater replenishment to match the extraction rate. The third method is a combination of the first two, to balance replenishment and extraction. Each of the methods are applied over an extended period, making use of the storage capacity of the aquifer. Extractions can exceed replenishment in drought periods as long as replenishment equally exceeds extractions in wetter periods.

The overdraft has been estimated to average around 12,000 AF per year in the District. Factors that will affect the future rate of overdraft include:

1. The surface water supplies available to Kings County Water District through the Kings and Kaweah Rivers.

2. The surface water supplies available to Kings County Water District through the major statewide projects consisting of the Central Valley Project and State Water Project.

3. Future water demand in the District.

Overdraft could be a significant concern if any activities were to result in increased pumping, reduced recharge, and/or increased groundwater outflow. Periodic analyses of groundwater overdraft, perhaps every five years, are needed to reassess the need for mitigation of overdraft.

Possible mitigative measures include reducing groundwater pumping by reducing District water demand and increasing the District's surface water supply. Demand reduction can be effected by cropping changes or land fallowing. Increasing Kings County Water District's surface water supply would rely on improving the District's ability to use excess Kings River and Kaweah River flows. Flood water appears adequate on the Kings River to mitigate the overdraft condition if sufficient recharge capacity can be developed.

F. Replenishment of Groundwater Extracted by Water Producers

Replenishment of groundwater is an important technique to manage a groundwater supply and mitigate a condition of overdraft. The estimated overdraft for the District may likely be offset with currently proposed recharge projects using excess Kings River flows (flood releases from Pine Flat Reservoir).

G. Monitoring of Groundwater Levels and Storage

The purpose of a groundwater level monitoring program is to provide information that will allow computation of the change in groundwater storage. Kings County Water District will continue their current program of measuring well water levels in the spring and fall, in cooperation with the USBR and DWR. Contour maps depicting levels of water in wells within the District and surrounding area will be prepared on an annual basis, along with estimates of changes in groundwater storage.

H. Facilitating Conjunctive Use Operations

Conjunctive operation of a groundwater basin is defined in DWR Bulletin 118-80 as:

"Operation of a groundwater basin in coordination with a surface water reservoir system. The basin is intentionally recharged in years of above average precipitation so groundwater can be extracted in years of below average precipitation when surface water supplies are below normal."

Such management results in the groundwater storage being reduced in dry periods and increased in wetter periods. To avoid a condition of overdraft, replenishment must balance extraction over the long-term.

A conjunctive use program requires:

- A source of surface water in years of high surface water supply.
- Recharge facilities.
- Conveyance facilities to import and export water to and from the groundwater storage area.
- Available storage capacity in the aquifer.
- Extraction facilities.
- Distribution facilities for surface and groundwater.

Kings County Water District currently has facilities in place to operate a conjunctive use program, and in fact, has been operating in such a manner for some time. Additional measures proposed in this plan are hoped to provide a greater capacity for using excess Kings River flows, and hopefully a long-term groundwater balance can be obtained.

I. Identification of Well Construction Policies

Improperly constructed wells may result in contaminated groundwater by establishing a pathway for pollutants entering a well through drainage from the surface, allowing mixing between aquifers of varying water quality, or the unauthorized disposal of waste into the well. Kings County has enacted and is responsible for enforcing a County Well Ordinance that regulates well construction.

J. Construction and Operation of Groundwater Management Facilities

Effectively managing a groundwater supply requires facilities that protect the quality and assure that the quantity of groundwater in storage is sufficient to meet long-term operational goals. Kings County Water District currently has facilities in place to meet these management requirements.

K. Development of Relationships with Federal, State, and Local Regulatory Agencies

The development of relationships among the groundwater management district and the various regulatory agencies is an important part of an effective groundwater management plan. This plan will be submitted to DWR and the District will continue to work with KRCD, DWR, and USBR to monitor and report groundwater conditions within and around the District. Groundwater management activities will be coordinated with surrounding groundwater management agencies as opportunities exist.

L. Review of Land Use Plans and Coordination with Land Use Planning Agencies

An important component of developing a groundwater management plan is the review of land use plans for the surrounding area or basin, and coordinating efforts with regional and local land use planning agencies. Land use planning activities in unincorporated areas of Kings County are performed by the County of Kings' Department of Public Works planning division, and overseen by the Kings County Planning Commission and the Board of Supervisors. Responsibility for land use planning in incorporated areas lies with each community's planning staff. The City of Hanford's staff, planning commission and City Council are responsible for land use planning within the City's Sphere of Influence.

VI. GROUND WATER MANAGEMENT PROGRAM

It is recognized that the District has undertaken many aspects of groundwater management over past years. Of the potential management plan elements, the most critical items to the success of the program will be actions that lead to stabilization of groundwater levels. Groundwater quality is not a major issue due to the excellent current water quality and no known areas of quality impairment or areas of contamination. Additionally, it should be noted that the District has limited conveyance facilities and accordingly, will endeavor to pursue favorable activities through the ditch companies, water and irrigation districts, County, and the water conservation district.

The historical information previously cited is useful in understanding the goals and purpose for establishment of the District. It is planned that this information will be updated as needed, but is not expected to be more often than every five to ten years.

It is expected that the program as outlined here will be evaluated and modified yearly to identify and document changes due to hydrologic conditions and to identify the elements being implemented.

A. Program Components

This part of the plan lists the specific activities that will be taken to embark on working with others to assure the continued success of current programs and identify additional elements that may be added.

The program has been divided into four parts. Within these subdivisions, certain elements have been identified that may be implemented as part of the program. The program will be evaluated annually in the fall to determine and define the specific elements that will be undertaken in the following year and to evaluate the effects of programs from the previous year.

1) Monitoring and evaluation
2) Develop Memorandum of Understanding
3) Activities to increase conjunctive use
4) Purchase of water supplies

1) MONITORING AND EVALUATION OF EXISTING PROGRAMS

To identify the results of activities in the District and basin, it is important to continue these activities. Of the on-going program, the following are the proposed activities:

a. Groundwater Mapping

i. Continue the semi-annual groundwater level measurements,

preparation of maps of Lines of Equal Elevation of Water in Wells for the Unconfined Aquifers, and tabulate the annual groundwater level change.

ii. Prepare a water quality map of electrical conductivity for 1997 .

iii. Prepare results of electrical conductivity for wells at 5-year intervals starting in 2005.

b. Tabulate the change in groundwater storage on an annual basis.

c. District facilities

i. Basins: evaluate basin configuration, capacity, percolation rate, and local impacts.

ii. Old River: evaluate the same information as for basins. Review need for additional dams.

d. Tabulate water supplies

e. Calculate water demands

f. Prepare water budget

2) DEVELOP MEMORANDUM OF UNDERSTANDING WITH LOCAL AGENCIES AND DITCH COMPANIES

As discussed previously, there are many systems within the District that may be operated or utilized differently to augment water supplies. Possibilities include:

a. Dual use of storm drain basins with the City of Hanford for intentional recharge

b. Construction of laterals for direct use of flood water from the existing canal system

c. Construction of intentional recharge facilities

d. Purchase and delivery of other available water supplies.

All of these actions require working with other local agencies and an agreement to utilize or operate facilities for an extended time. Memorandums of understanding should be executed in the immediate future with Peoples Ditch Company, Last Chance Water Ditch Company, Lakeside Irrigation Water District, Lakeside Ditch Company, and the City of Hanford to examine the potential for alternate operation and use. Examples of potential project

elements are provided in Appendix C.

3) INCREASED CONJUNCTIVE USE CAPACITY

To correctly evaluate the programs currently in place, several activities are recommended. The first is to evaluate the potential benefits of intentional recharge basins throughout the District. It is expected that many of the basins on the western edge of the District are of minor value due to the limiting nature of the A-clay. When an average or wet season presents itself, it is recommended that recharge records be kept and the affect on the local aquifer be evaluated.

It is also of important to identify the water supply required to bring the District overdraft in balance. Recent analysis suggests a groundwater deficit of 12,000 AF/y. However, this includes approximately 20,000 AF/y of water purchased, on average, through the CVP system. With the enactment of the Central Valley Project Improvement Act (CVPIA), surface water costs from the CVP are significantly increased. Impact to the historical average annual quantity may be reduced.

Also, studies should be performed that identify potential new recharge areas. It is thought that potential recharge areas may be present north and east of the limit of the Corcoran clay (E-clay). This needs to be verified.

4) PURCHASE OF WATER SUPPLIES

In addition to facilities, it is also imperative to identify potential sources of water and their cost. This will allow a more informed decision and structured program to determine when water supplies should be purchased. This will include supplies both from within the service area as well as new water supplies.

An evaluation of the financial requirements to acquire potential water supplies available for purchase from ditch companies with the KRWA needs to be accomplished. This will enable the District to determine the financial requirements of the current program and verify its financial value.

B. Program Costs, Funding, and Potential Fees

Establishment of this program and associated elements does not commit the District to spend dollars on any specific subject. Rather as money is available, it allows the District to follow a framework that as opportunities arrive, they may be systematically evaluated and decisions may be made easier and quicker.

C. Implementation Schedule

Upon adoption of the Groundwater Management Plan, the program will be implemented on the following schedule:

1. Immediate data acquisition
2. Evaluation of water demand
3. Tabulation of water supplies

Programs

A. Monitoring and evaluation:

Evaluate the Old River, each recharge basin configuration, capacity, percolation rate, and local impacts. Continue on-going groundwater data acquisition, monitoring, mapping and evaluation. Water levels will be acquired and reviewed semi-annually. Water quality to be acquired and reviewed every five years. Identify water supplies required to bring District into balance.

B. Other agency relationships: Formalize with MOU (complete by 12/02)

Execute Memorandums of Understanding with the City of Hanford, Peoples Ditch Company, Last Chance Water Ditch Company and Lakeside Irrigation Water District. Immediately begin developing relationships with Kaweah Delta Water Conservation District, and Tulare, Alta, and Consolidated Irrigation Districts.

C. Increase conjunctive use: Initiate in 1/02

Review and understand canal capacities
Identify constraints
Investigate potential for increased intentional recharge
Investigate potential for new subsurface laterals.

D. Purchase water supplies: Initiate in 6/02
Review assessment program
Review availability and cost for State Water Project, Central Valley Project, and Kings River Water

APPENDIX A

Kings County Water District Resolution

Resolution No. 2001-7

On December 6, 2001, the Board of Directors of the District adopted Resolution No. 2001-7, entitled "Resolution of the Board of Directors of the Kings County Water District Revising Groundwater Management Plan." This resolution adopted the District's revised Plan. A copy of Resolution No. 2001-7 is enclosed.

Resolution No. 1993-1

On January 7, 1993, the Board of Directors of the District adopted Resolution No. 1993-1, entitled "Kings County Water District Board of Directors Resolution Adopting a Groundwater Management Program." This resolution adopted the District's existing Plan. A copy of Resolution No. 1993-1 is also enclosed.

RESOLUTION NO. 2001-7

RESOLUTION OF THE BOARD OF DIRECTORS OF THE KINGS COUNTY WATER DISTRICT REVISING GROUNDWATER MANAGEMENT PLAN

The Board of Directors of the Kings County Water District does hereby find:

WHEREAS, on January 7, 1993, the Board of Directors of the Kings County Water District ("District") adopted Resolution No. 1993-1, entitled "Kings County Water District Board of Directors Resolution Adopting a Groundwater Management Program;" and

WHEREAS, the Groundwater Management Plan ("Plan") adopted by Resolution No. 1993-1 has not been revised; and

WHEREAS, given the time since the adoption of the District's Plan in 1993, the Board directed the District's Consulting Engineer to review the Plan and propose appropriate revisions; and

WHEREAS, the District's Consulting Engineer has reviewed the Plan and presented his recommendations and proposed revisions thereof at the District's Regular Meetings held on October 4, 2001, November 8, 2001, and December 6, 2001; and

WHEREAS, the purposes for which the District was formed were stated by the Supreme Court of the State of California, as follows:

> The Kings County Water District was organized February 24, 1954, under the County Water District Law. It comprises approximately 150,000 acres. It was organized primarily to protect the underground water supplies of the area from excessive pumping and to guard against the transportation of the groundwater to areas outside the District. Its purposes and functioning generally have been in accordance with the aims and methods approved by law for such an organization. [. . .] ***The protection, conservation and replenishment of the underground water supplies is one of the main functions of the water district in question.*** Atchison, Topeka & Santa Fe Railway Co. v. Kings County Water District (1956) 47 Cal 2d 140, 143, 146 (emphasis added; citations omitted).

WHEREAS, the District has the power to and may do any act necessary to furnish sufficient water in the District for any present or future beneficial use; and

WHEREAS, the District may store water for the benefit of the District, conserve water for future use, and appropriate, acquire, and conserve water and water rights for any useful purpose, including groundwater banking of surface waters, the reclaiming of the return flow of imported waters and other waters which would not otherwise be present in the underground water bearing

formations, and the management of such waters; and

WHEREAS, the District may operate water rights, works, property, rights, and privileges useful or necessary to convey, supply, store, or make use of water for any purpose authorized by the County Water District Law; and

WHEREAS, the District may sell water or the use thereof for any useful purpose and whenever there is a surplus, may dispose of the surplus to municipalities, public agencies, or consumers, including farmers, located within or without the District; and

WHEREAS, upon review of the District's Plan and upon receipt of recommendations, ideas and suggestions from the District's Consulting Engineer, the Board of Directors finds that it is in the best interests of the District, and the present and future owners of land and users of water within the District, to revise the Plan.

NOW, THEREFORE, the Board of Directors of the Kings County Water District does hereby resolve and adopt the revised groundwater management plan prepared by the District's Consulting Engineer in the form attached hereto as Exhibit A, entitled "Kings County Water District Groundwater Management Plan Date of Enactment: January, 1993-Date of Last Revision: November 2001."

WHEREFORE, the foregoing Resolution was passed and adopted at a regular meeting of the Board of Directors of the Kings County Water District held this 6 day of December, 2001, at Hanford, California, by the following vote:

AYES:	Steven P. Dias, Michael Murray, Ernest Taylor and Barry McCutcheon
NOES:	-0-
ABSENT:	Joe Freitas, Jr.
ABSTAIN:	-0-

By: _____
STEVEN P. DIAS, PRESIDENT

ATTEST:

_____
DON MILLS, SECRETARY

CERTIFICATE OF SECRETARY

I, Don Mills, the duly appointed Secretary of the Kings County Water District, declare that the foregoing Resolution was passed and adopted at a Regular Meeting of the Board of Directors of the Kings County Water District held on December 6, 2001.

DATED: December 6, 2001.

[DISTRICT SEAL]

Don Mills

DON MILLS, SECRETARY

D:\WP61\KCWD\2001-07.RES

KINGS COUNTY WATER DISTRICT

BOARD OF DIRECTORS RESOLUTION ADOPTING A GROUNDWATER MANAGEMENT PROGRAM

RESOLUTION NO: 1993-1

WHEREAS, Kings County Water District ("District") is located within a overdrafted groundwater basin as per Water Resources Bulletin, 118-80 entitled Groundwater Basins in California; and

WHEREAS, District is authorized, pursuant to AB 255 codified as Part 2.75, commencing with Section 10750 of Division 6 of the Water Code, to adopt a Groundwater Management Program ("Program"); and

WHEREAS, the District has held a duly noticed public meeting at 10:00 a.m. on October 27, 1992, with relevant materials made available to the public for the purpose of considering comments concerning the Program; and

WHEREAS, the Board of Directors of the District at the first public meeting, passed a Resolution of Intention to Adopt the Program, no adverse comments having been received; and

WHEREAS, the Program was circulated to owners of water extraction facilities as well as others within the District prior to a Second Public Hearing; and

WHEREAS, at the time of the duly noticed Second Public Hearing to consider protests held at 10:00 a.m. on December 15, 1992 no majority protest was registered; and

WHEREAS, the Board has made a finding that the Groundwater Management Program is not a project for purposes of California Environmental Quality Act ("C.E.Q.A.") or benefits form a

categorical exemption as it consists of the operation, repair, maintenance, or minor alterations of existing public or private structures, involving negligible or no expansion of use beyond the previously existing facilities involved in the Program or involve joint projects with other public entities as identified in the Plan which are already engaged in the CEQA process; and

THEREFORE, no environmental impact report or negative declaration under CEQA was required; and

WHEREAS, the Board of Directors has directed staff to prepare a Notice of Exemption with a brief description of the Groundwater Management Program and existing facilities that comprise parts of the Program, said Notice to be filed with the County Clerk of Kings County with copies of the Notice made available for public inspection, the Notice to be posted on a weekly basis in the office of the County Clerk for thirty (30) days.

NOW, THEREFORE, BE IT RESOLVED:

Pursuant to the original purposes for which Kings County Water District was formed, the District hereby reaffirms those purposes herein summarized in a quote from the Supreme Court of the State of California which reads as follows:

> "The Kings County Water District was organized February 24, 1954, under the County Water District Law. (Water Code, §§ 30000 - 33901) It comprises approximately 150,000 acres. It was organized primarily to protect the underground water supplies of the area from excessive pumping and to guard against the transportation of the groundwater to areas outside the district. Its purposes and functioning generally have been in accordance with the aims and methods approved by law for such an organization. . . . The protection, conservation and replenishment of the underground water supplies is one of the main functions of the water district in question.

OLD, LASALLE
DOWD & CIN
TH DOUTY STREET
O. BOX 330
ORD, CA 93232-0330

(Water Code § 31082)" Atchison, Topeka & Santa Fe Railway Co. (a corporation), Respondent, v. Kings County Water District, et al., appellants (1956) 47 Cal2d 140, 302 P2d 1.

and

BE IT FURTHER RESOLVED, In order to continue to achieve its goals Kings County Water District hereby adopts the Groundwater Management Program attached hereto as Exhibit "A".

WHEREFORE, this Resolution was passed and adopted this 7th day of January, 1993, by the following vote:

AYES: Vierra, Mills, Holsonbake, Bairstow, Dias.

NOES: None

ABSENT: None

KINGS COUNTY WATER DISTRICT

By: Frank R. Vierra
President of the Board

ATTEST:

Cheryl Lehr
Cheryl Lehr, Secretary/Manager

c:\wp5\kcwd\1993-1.res\ty

APPENDIX B
Monitoring Program Data/Evaluation

Existing Intentional Recharge Facilities

During the next events when flood or recharge water is available, information will be obtained including flow rate, percolation rate, and maximum water level such that a determination of effective recharge can be obtained.

In the area overlying the A-Clay, information on groundwater levels will be obtained adjacent to the recharge basins so that the effectiveness of the basins can be determined.

APPENDIX C

DRAFT MEMORANDUM OF UNDERSTANDING

BETWEEN

KINGS COUNTY WATER DISTRICT

AND

XXXXXXXXXXXXXX

ARTICLE I - AGREEMENT

The articles and provisions contained herein constitute a bilateral and binding agreement by and between KINGS COUNTY WATER DISTRICT, a California County Water District ("District") and _____ ("Agency").

ARTICLE II - RECOGNITION

The District has developed a groundwater Management Plan ("Plan"). Agency consents to the Plan, pursuant to Water Code section 10750.8. It is the intent of District to allow and encourage such agencies to coordinate efforts and be a part of the District's Plan by means of a separate Memorandum of Understanding ("MOU") between the Agency and the District.

ARTICLE III - PURPOSE

It is the purpose of this MOU, entered willingly, between District and Agency, to document the interests and responsibilities of both parties in the adoption and implementation of a coordinated Plan. It is also the intent that this MOU will promote and provide a means to establish an orderly process to share information, develop a course of action, and resolve any misunderstandings or differences that may arise.

ARTICLE IV - COORDINATION

There shall be an annual coordinating meeting ("Meeting") between the District and the Agency. District shall give notice to the Agency thirty (30) days prior to date of the Meeting. If there are concerns or questions regarding the Plan, Agency shall transmit its concerns in writing to District seven (7) days prior to the Meeting.

ARTICLE V - OBJECTIONS

The Plan shall be binding on the parties hereto unless superseded by the MOU or amendment thereto.

ARTICLE VI - AREA OF PLAN

The Plan shall be effective in all areas within the Agency boundaries. The Plan shall also be effective in any area annexed to the Agency subsequent to the adoption of the Plan.

ARTICLE VII - TERM

The initial term of the MOU shall commence on the date hereof and continue for five (5) years, and shall continue year to year thereafter, unless terminated by written notice given by either party at least one (1) year prior to such termination.

ARTICLE VIII - CLARIFICATIONS

In order to avoid disputes regarding various provisions of the Plan, Agency and District agree with respect to the following such provisions:

"DISTRICT"

KINGS COUNTY WATER DISTRICT, a
California Irrigation District

by _____
, President

by _____
, Secretary

"AGENCY"

XXXXXXXXXXXXXXXXXXX

by _____

APPENDIX D

POTENTIAL CONJUNCTIVE USE ELEMENTS

1) CONSTRUCTION OF GROUNDWATER MANAGEMENT FACILITIES

Apex Ranch– Groundwater Storage Program

The objective of the Apex Ranch Groundwater Storage Project (Project) is to provide additional water supply to the Kings County Water District (KCWD). The Project seeks to develop a banking program to store available Kings River flows for extraction at a later time. The Project would increase water supply by capturing and storing water that would otherwise be lost from the KCWD.

Apex Ranch (Ranch) is a 400-acre plum, nectarine, peach and walnut ranch located between the Peoples Ditch and an old Kings River channel in the northeast corner of Kings County. The Project involves the purchase of the Ranch and construction of new facilities to allow for excess Kings River flows to be percolated into the ground.

Peoples Ditch Company - Regulation Basin

Peoples Ditch Company is the largest purveyor of water within the District. Its distribution system is strategically located as to afford the potential to both recharge additional water as well as provide flexibility in deliveries. This project envisions a regulation basin located at the junction of the Main Canal and the Settlers Canal. It would function as a regulation facility that would allow temporary excess flows to be captured in the central portion of the system. Currently, surges in the canal cause water to pass through the system and be conveyed past the boundaries to ditches outside the District. Deficiencies are also a problem in that the canal starts to dry up causing growers problems with maintaining uniform flow conditions as well as forcing some to opt for using groundwater.

Peoples Ditch Company - Upgrade Control Structures

In an attempt to allow for increased deliveries in the system it is suggested that a review of the distribution system be made with the intent of identifying improvements that could be made such that increased flows could be experienced with the same canal system. The existing system consists of check structures spaced at approximately 3 miles that are operated manually. Due to the possible water level fluctuations, the canal is operated at times below what may be possible with a more flexible control system.

Riverside Ditch - Martin Ditch

Several years ago, the Martin Basin was purchased to contain and recharge excessive flows on the Riverside Ditch. The basin is located in Section __ T __ S, R__ E, MDB&M at the end of the Riverside Ditch. The basin is approximately 4,000 feet long and 50 feet wide. To maximize the operational and recharge potential, the basin should be excavated 5 to 10 feet with a low flow channel extending throughout its length. The most westerly portion of the

basin has been identified as the area with soil conditions most conducive to intentional recharge of surface waters and should be excavated to maximize this potential.

Riverside Ditch - Excelsior Basin

In 1998, a potential recharge site was located near Excelsior and 11th Avenue which is depressed from the adjacent properties. It was known that this area used to be a slough channel area and the present leasee was approached about leasing the site for intentional spreading of surface water. The 40 acre parcel was leased by the District. Intentional surface spreading of Kings River flood water was performed for the months of December through May. A total of 330 AF of water was recharged. Communication with the existing leasor should continue for potential recharge activities in future years.

Old River

During the past several wet years, the last two retention dams have been washed out. For additional area to be utilized for intentional recharge, the two dams should be replaced.

Peoples Ditch - Construction of Laterals

In an effort to encourage growers to utilize flood water when available, construction of short laterals off of the Main Canal from the headworks to Highway 43 should be considered.

Kaweah Delta Water Conservation District - Flood Basin

Discussions with the KDWCD should continue to establish a new flood basin in the northeastern portion of the District. It would be situated to allow Kings River flood water to be diverted into the District. There is still some open and untilled ground in the Cross Creek area. Opportunities may exist as a result of mitigation for lining canals in other areas of the KDWCD.

2) INSTITUTIONAL PROGRAMS

Similar to a program discussed for Lakeside Water ID, a program will be initiated that will identify farmers that are willing to allow their property to be flooded during the months of January to March when flood water is available in exchange for payment.

3) FACILITATING CONJUNCTIVE USE

Kaweah Delta Water Conservation District - Importation of CVP Water

This past year there was an opportunity to purchase water from the CVP that was being carried into the winter season. Through agreements with Tulare ID, Lakeside Water ID, KDWCD, and KCWD, these districts were able to share costs for the water and seepage losses so that the project would operate in the fall. Conversations should continue and determine if this could result in an annual operation.

Develop the Cross Creek Recharge Basin project and the Kaweah River flood water agreement to help with groundwater replenishment along Cross Creek.

Tulare Lake Basin Water Storage District

Negotiate with the Tulare Lake Basin Water Storage District to allow an exchange of State interruptible water for Kings River water.

City of Hanford

Meet with the City to gain approval to utilize their storm drainage basins for intentional recharge activities where possible. The goal would be to establish criteria and design parameters to be used by the City when constructing basins.

Corcoran I.D.

Discussion should be initiated with the CID on the potential utilization of the Lakelands Canal to be utilized for intentional recharge activities when it is not in use and flood water is available.

APPENDIX E

WATER PURCHASE POTENTIAL/ASSESSMENT/ASSUMPTION PROGRAM

1) Evaluate the effectiveness and cost of the share assumption program.

   Continue the purchase of mutual ditch company stock within the District for preservation of the existing surface water rights.

   Continue the Share Assessment Agreement with stockholders of the mutual ditch companies to insure acquisition of the existing water stock within the District.

2) Review potential of purchase of other supplies.

Kings River

Implement the Kings River Flood Water Agreement through the Peoples Ditch Company and the Last Chance Water Ditch Company.

Review the potential of acquiring additional Kings River supplies

Central Valley Project

Negotiate a Section 215 contract with the U.S. Bureau of Reclamation for the acquisition of surplus San Joaquin River water.

Review the potential to acquire additional water from the Kings River, CVP, Kaweah River, Tule River, Kern River, Cross Valley Water.

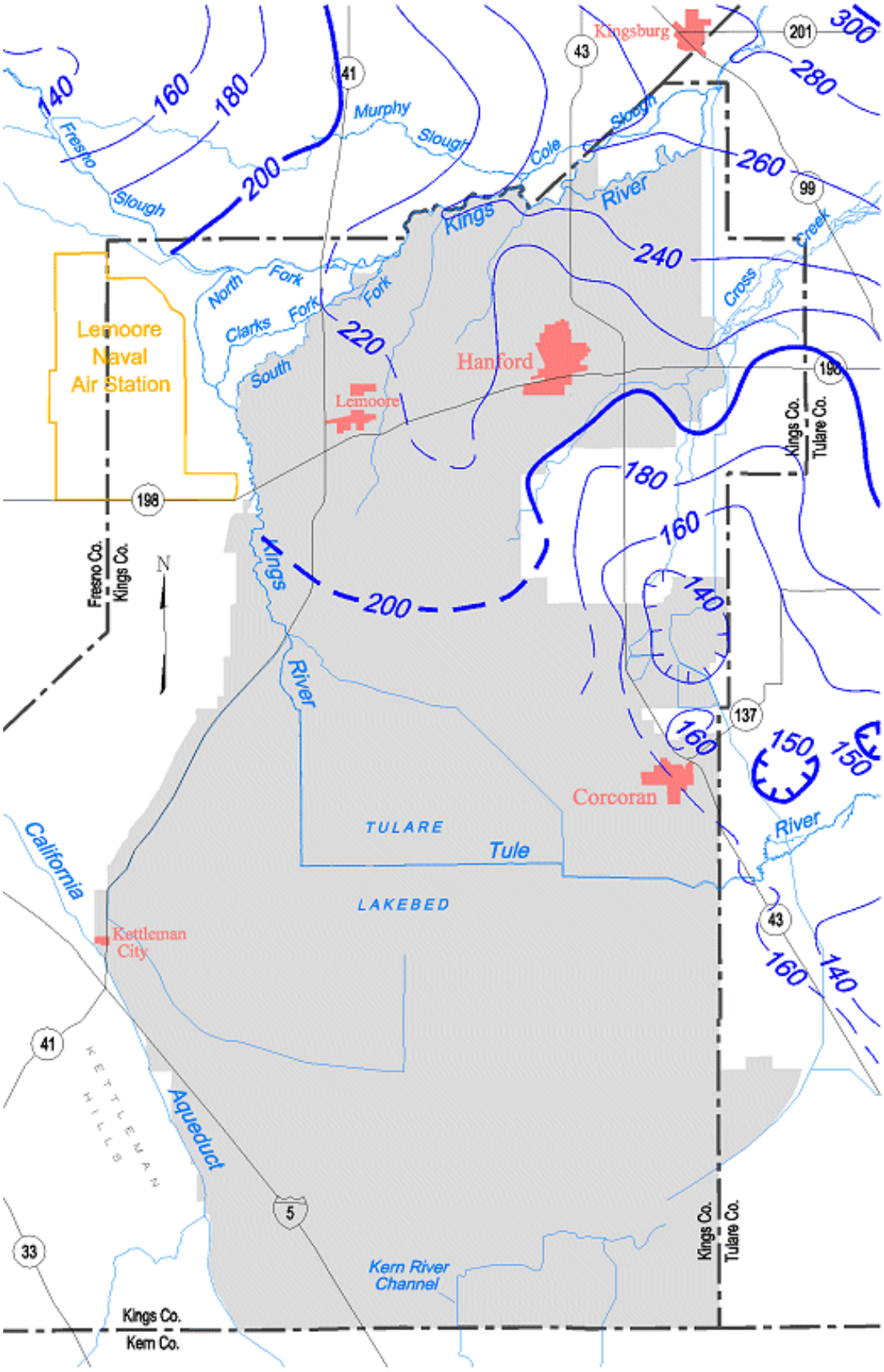
APPENDIX E – DWR GROUNDWATER ELEVATION CONTOURS

Tulare Lake Groundwater Basin

Spring 1958, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles
2 0 2 4 6

Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



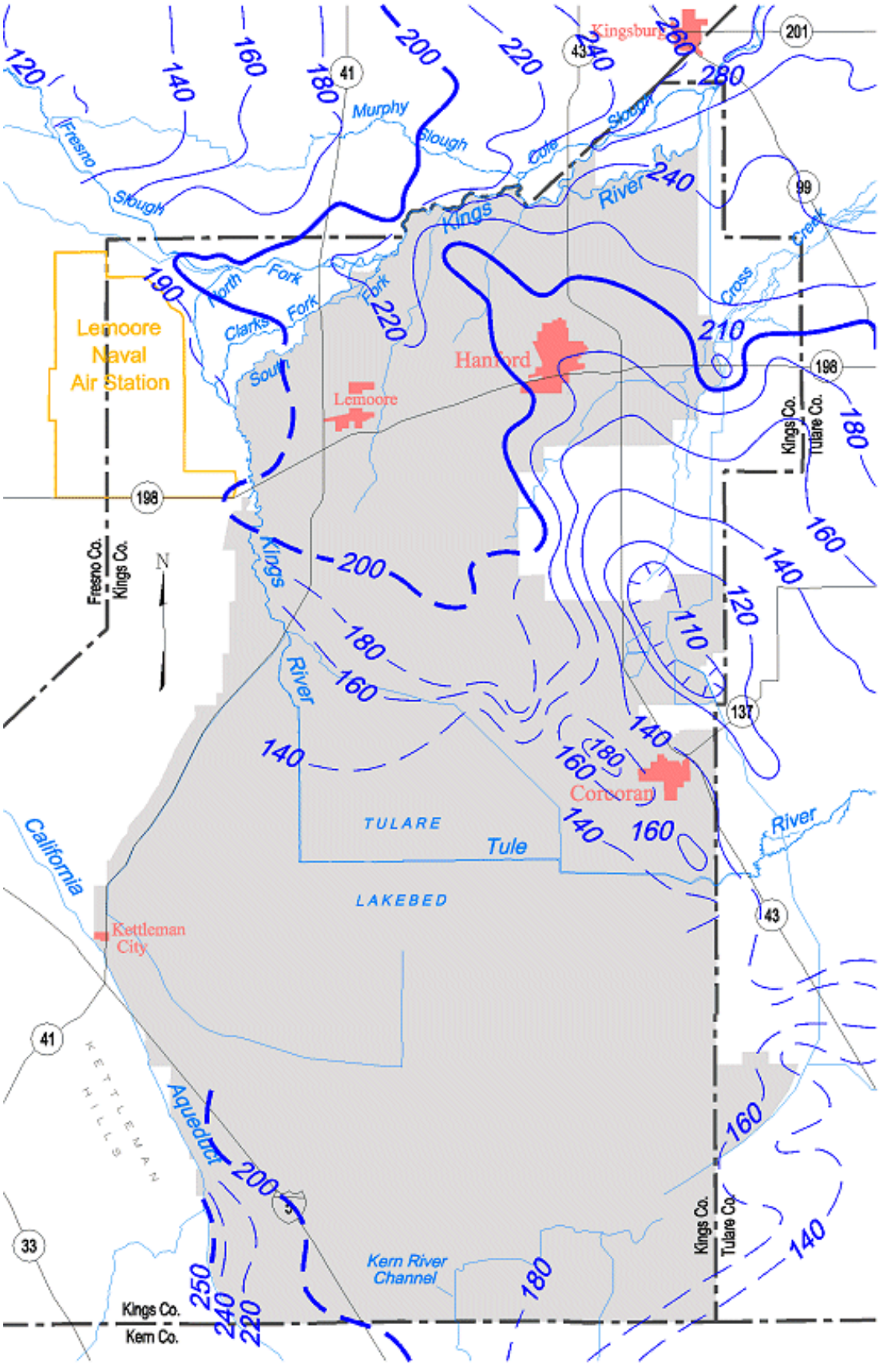
Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

Spring 1962, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles
2 0 2 4 6

Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



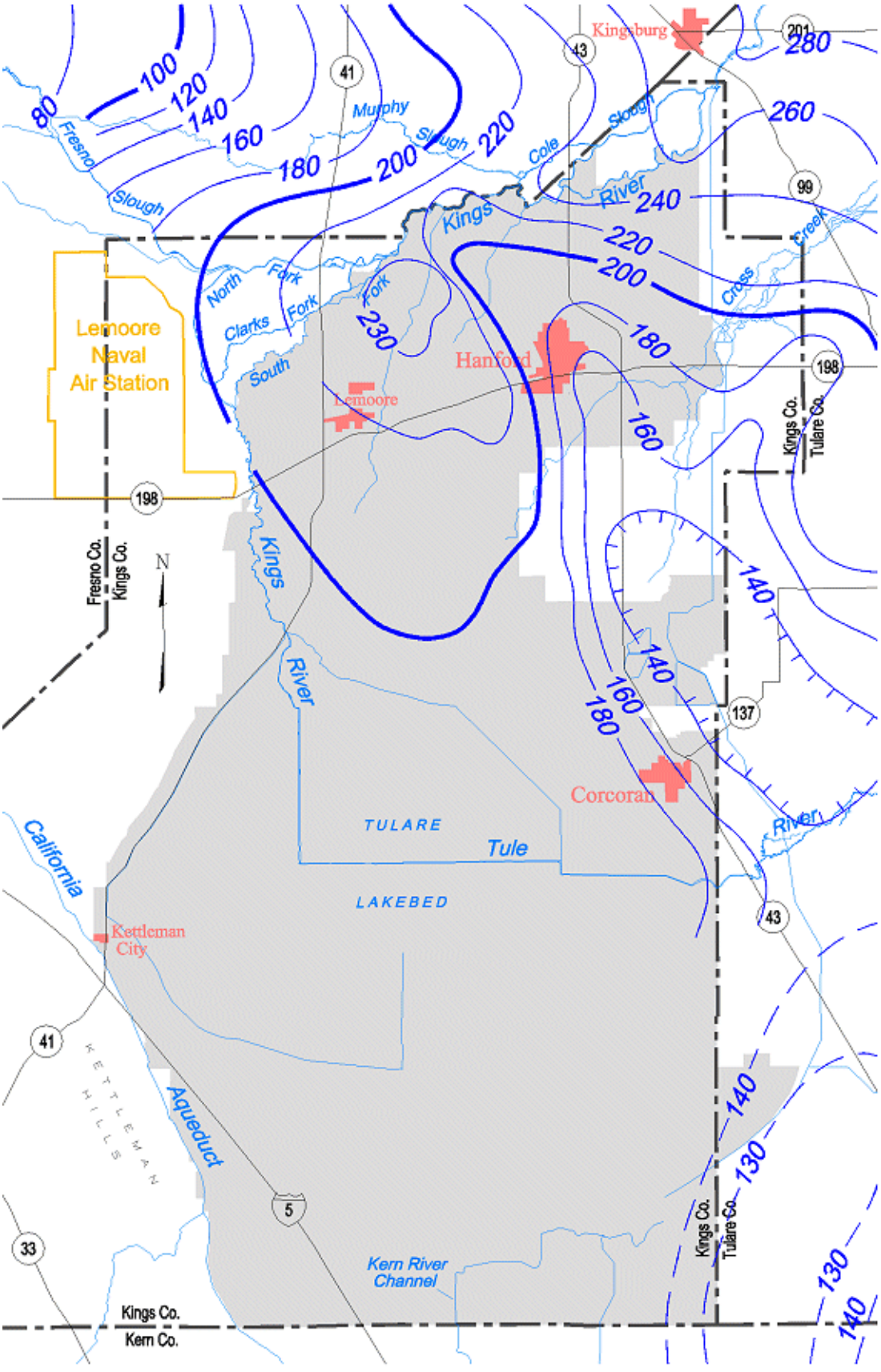
Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

Spring 1969, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles
2 0 2 4 6

Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



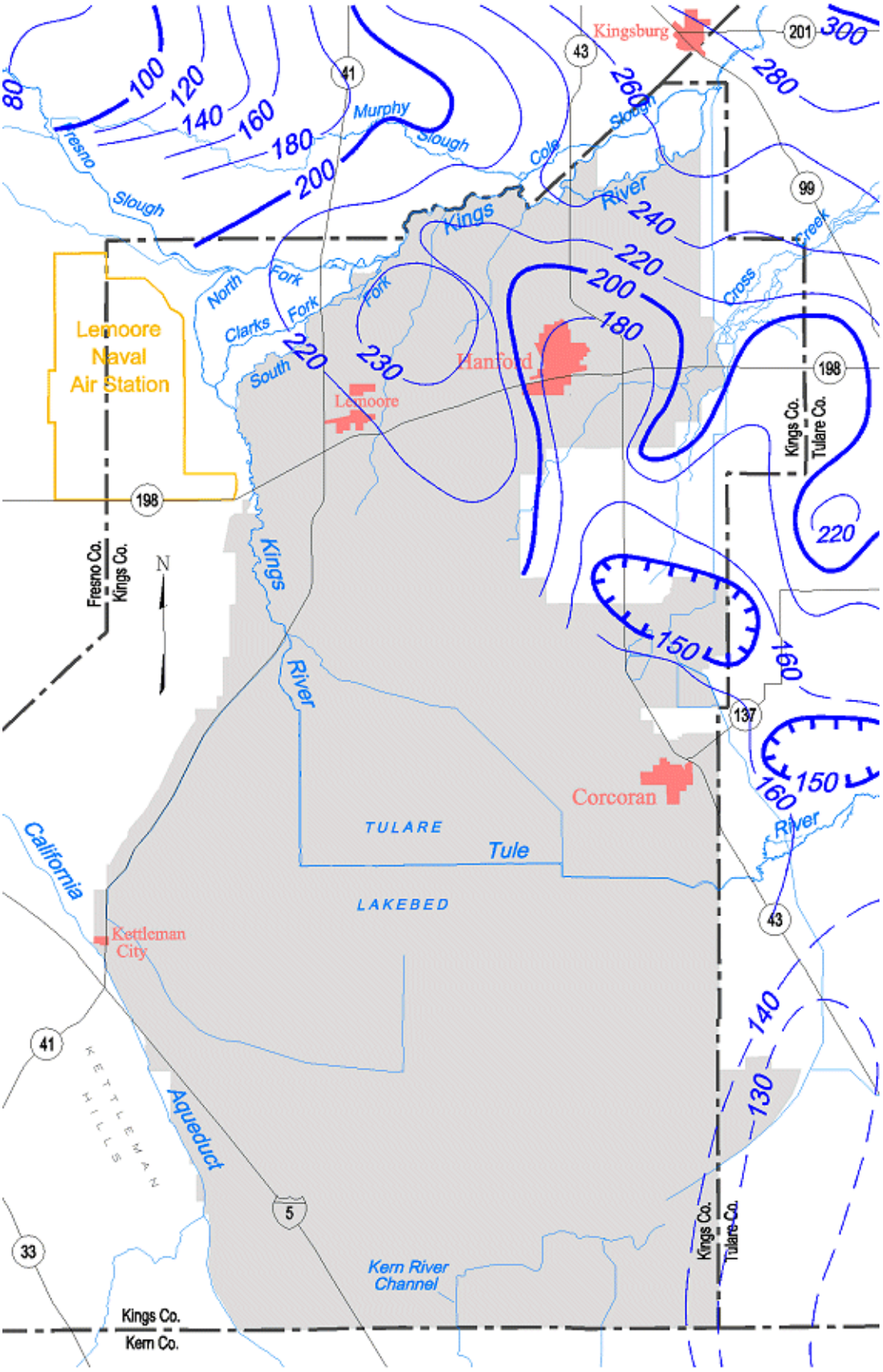
Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

Spring 1970, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles
2 0 2 4 6

Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



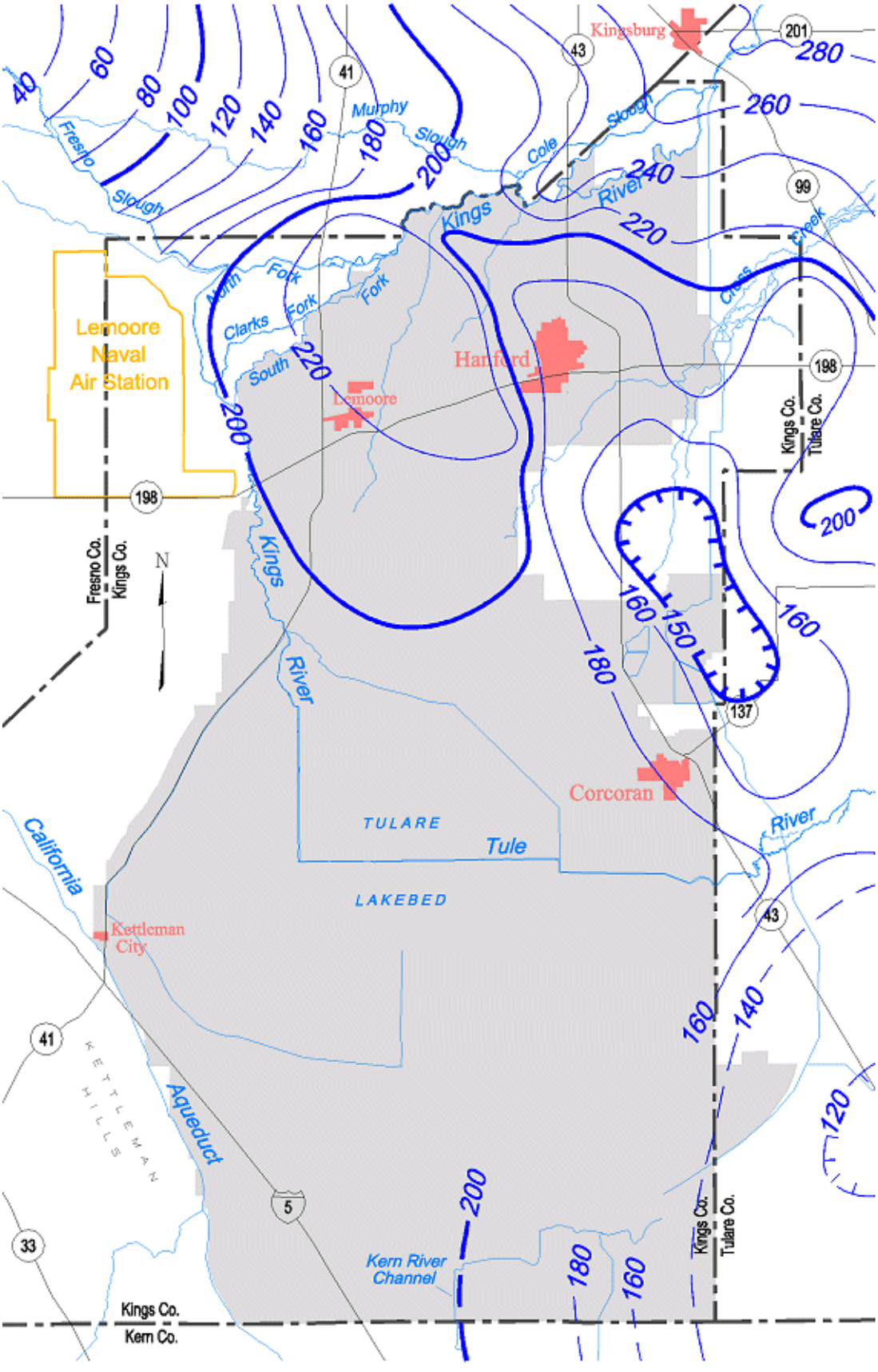
Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

Spring 1976, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles
2 0 2 4 6

Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



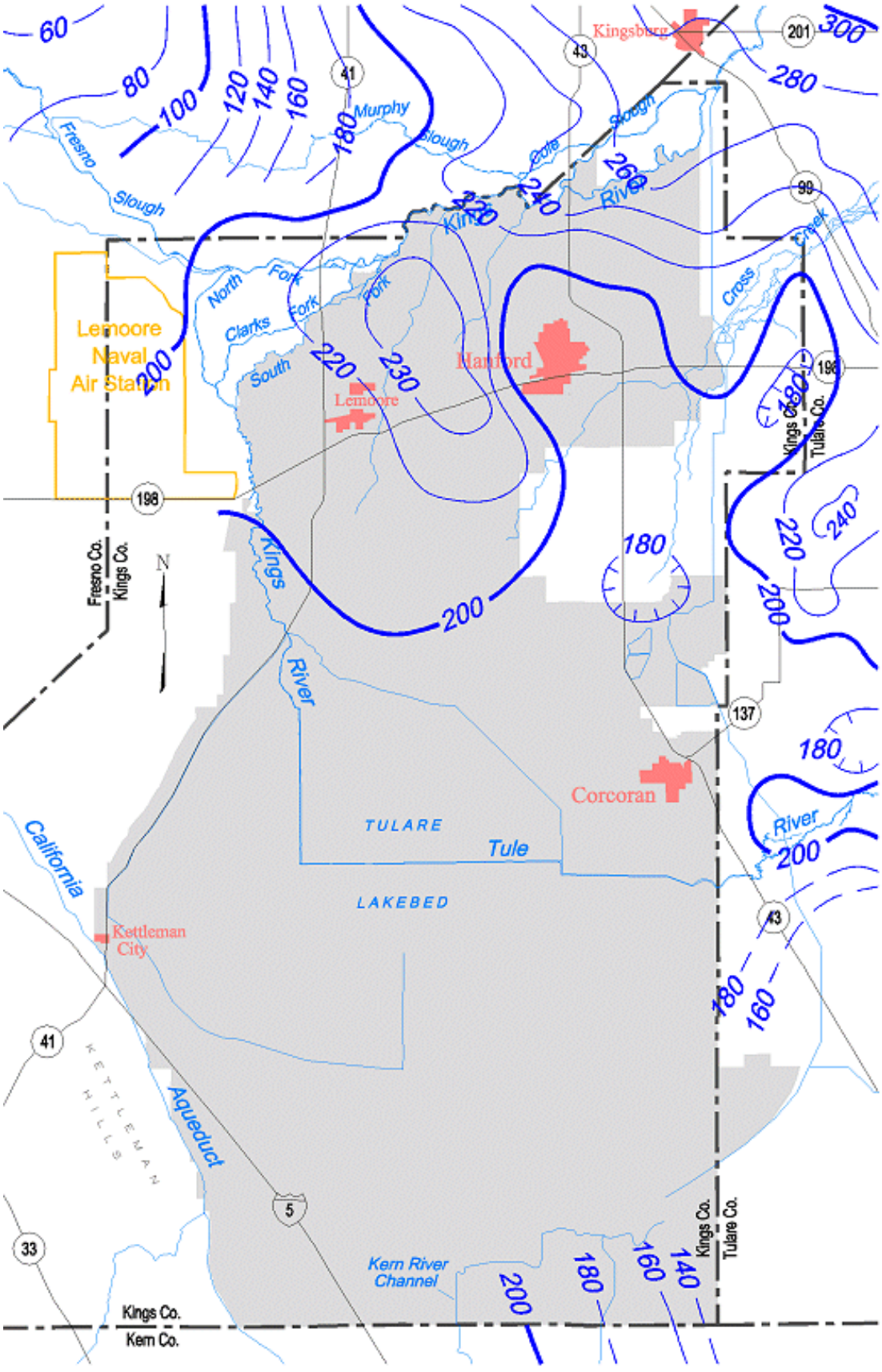
Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

Spring 1984, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles
2 0 2 4 6

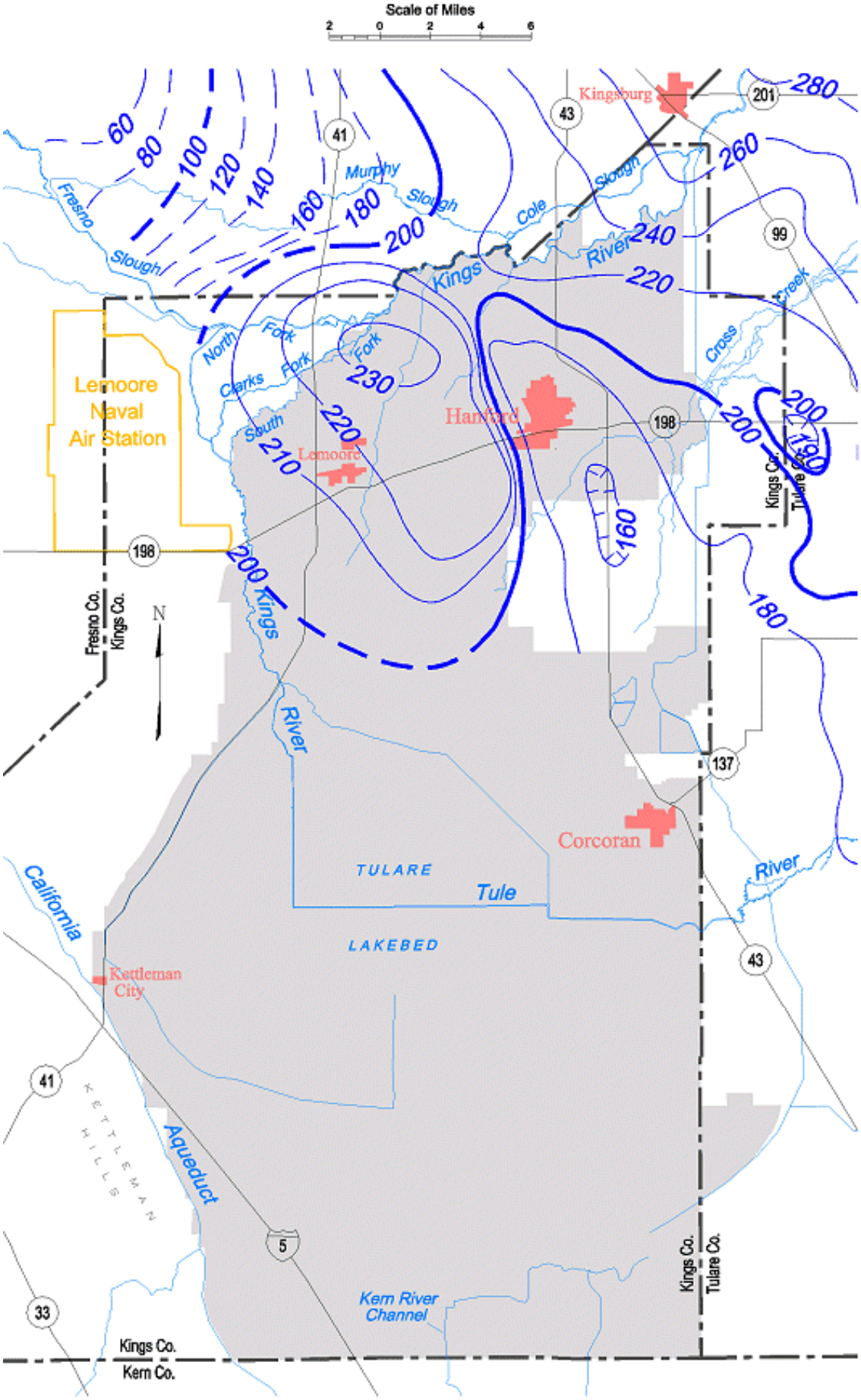
Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

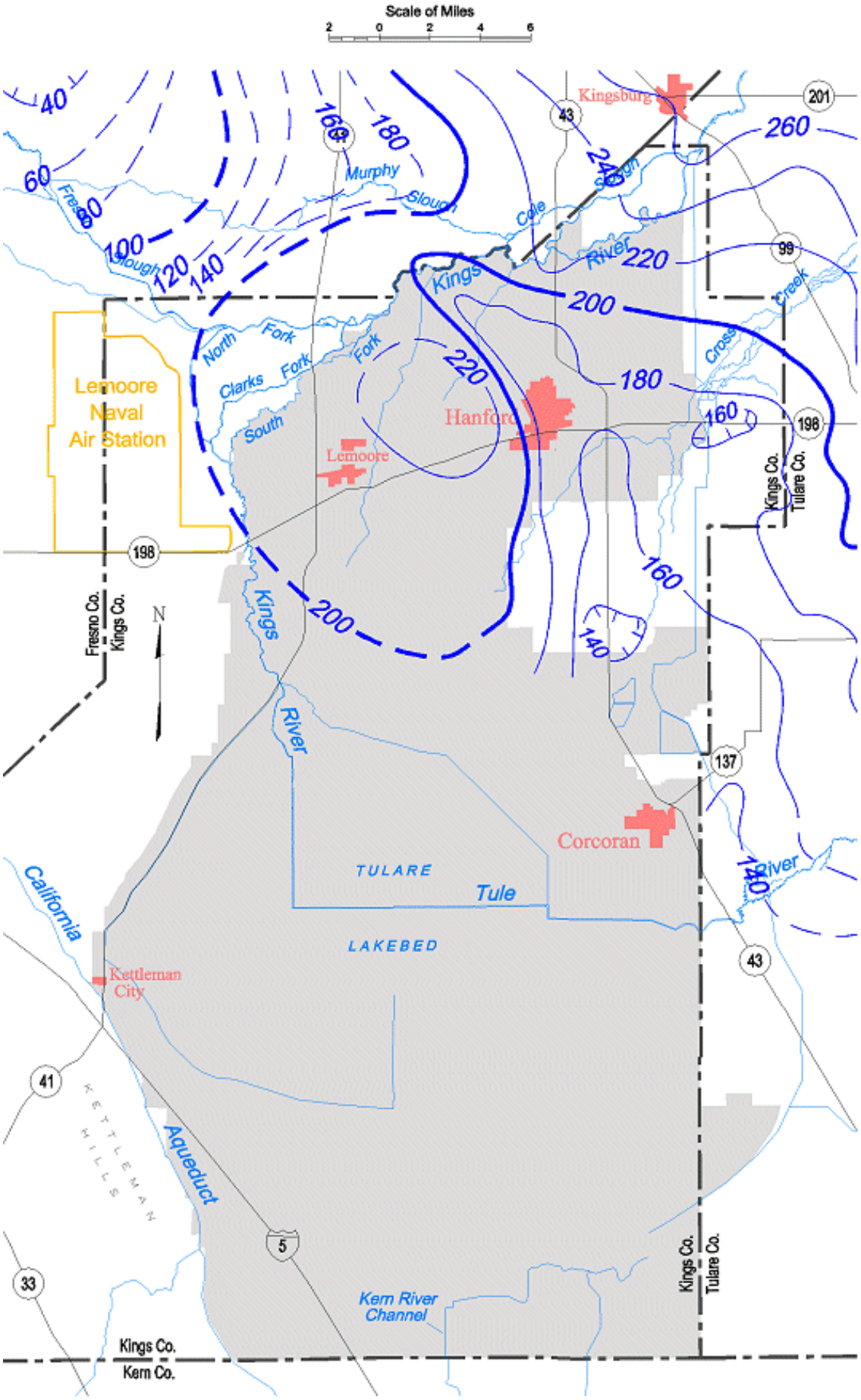
Spring 1989, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

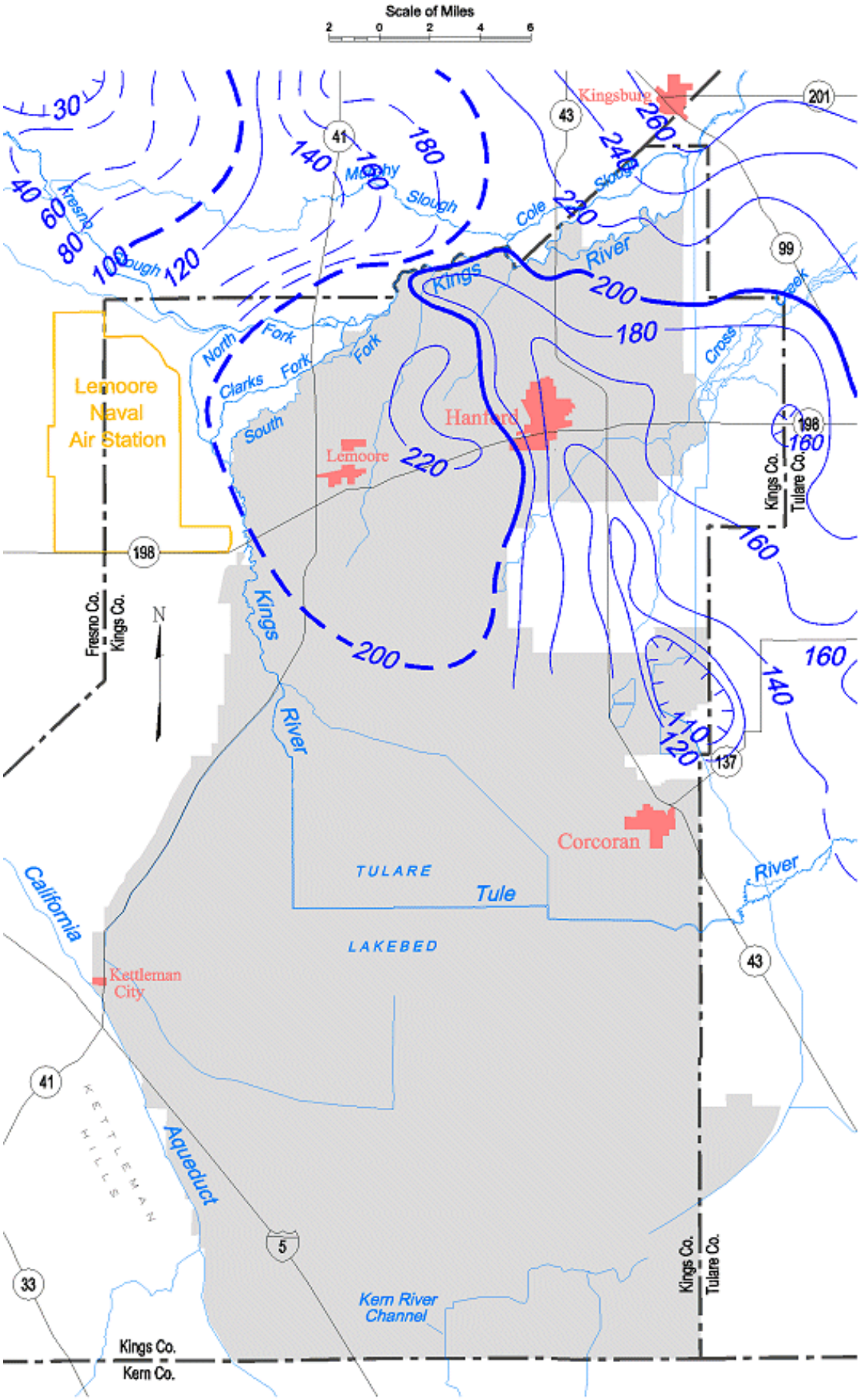
Spring 1990, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 20 feet.

Tulare Lake Groundwater Basin

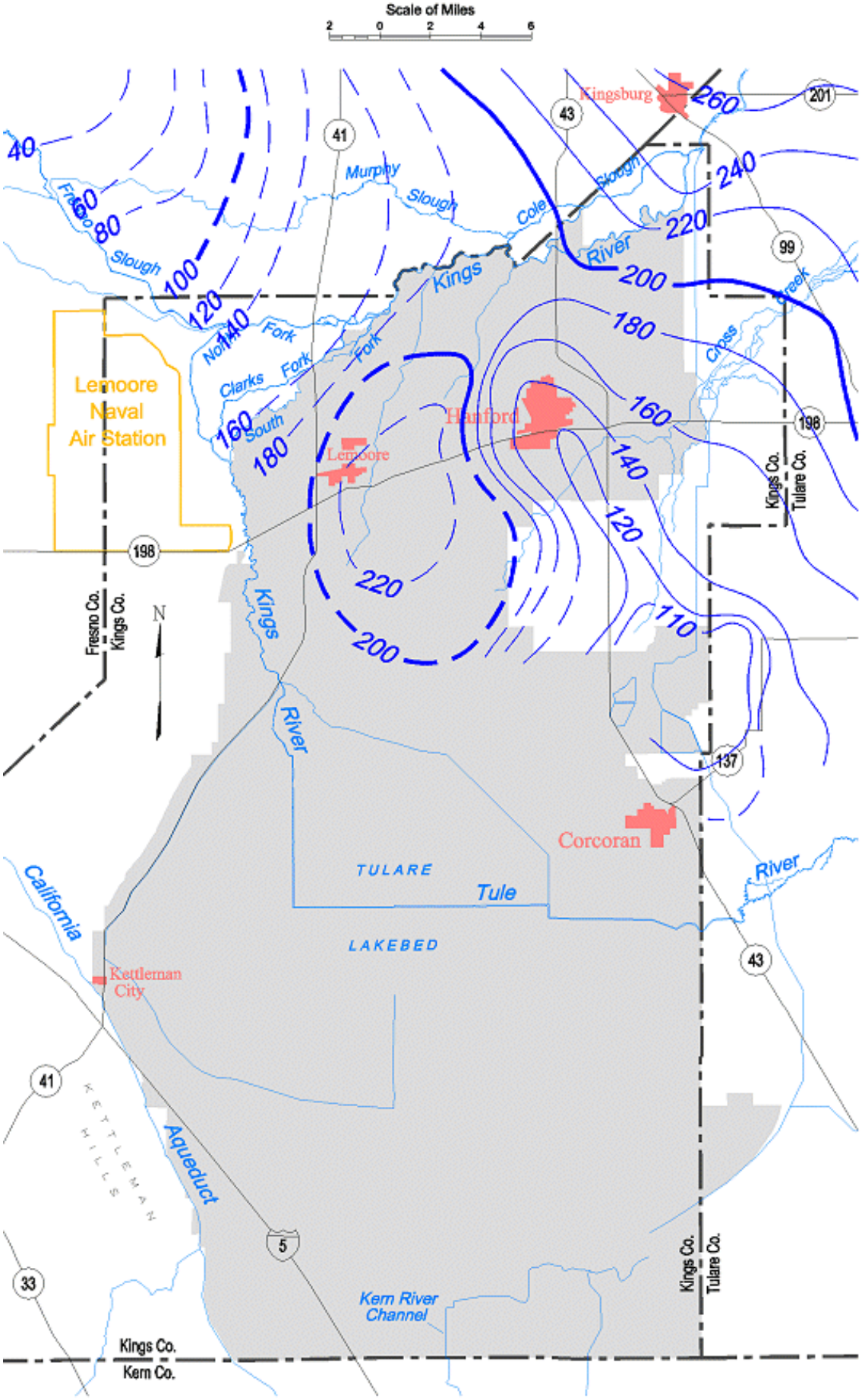
Spring 1991, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

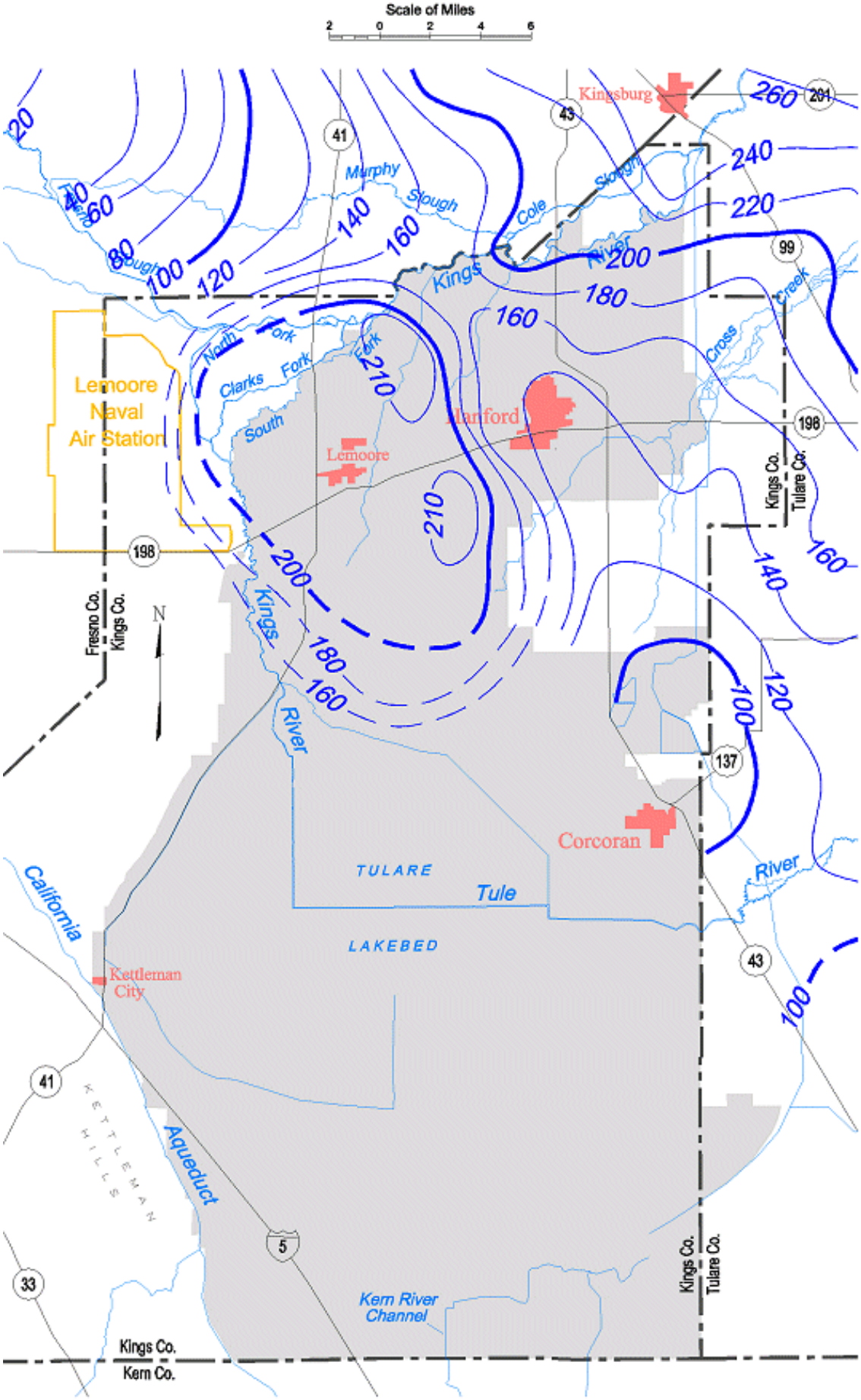
Spring 1992, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

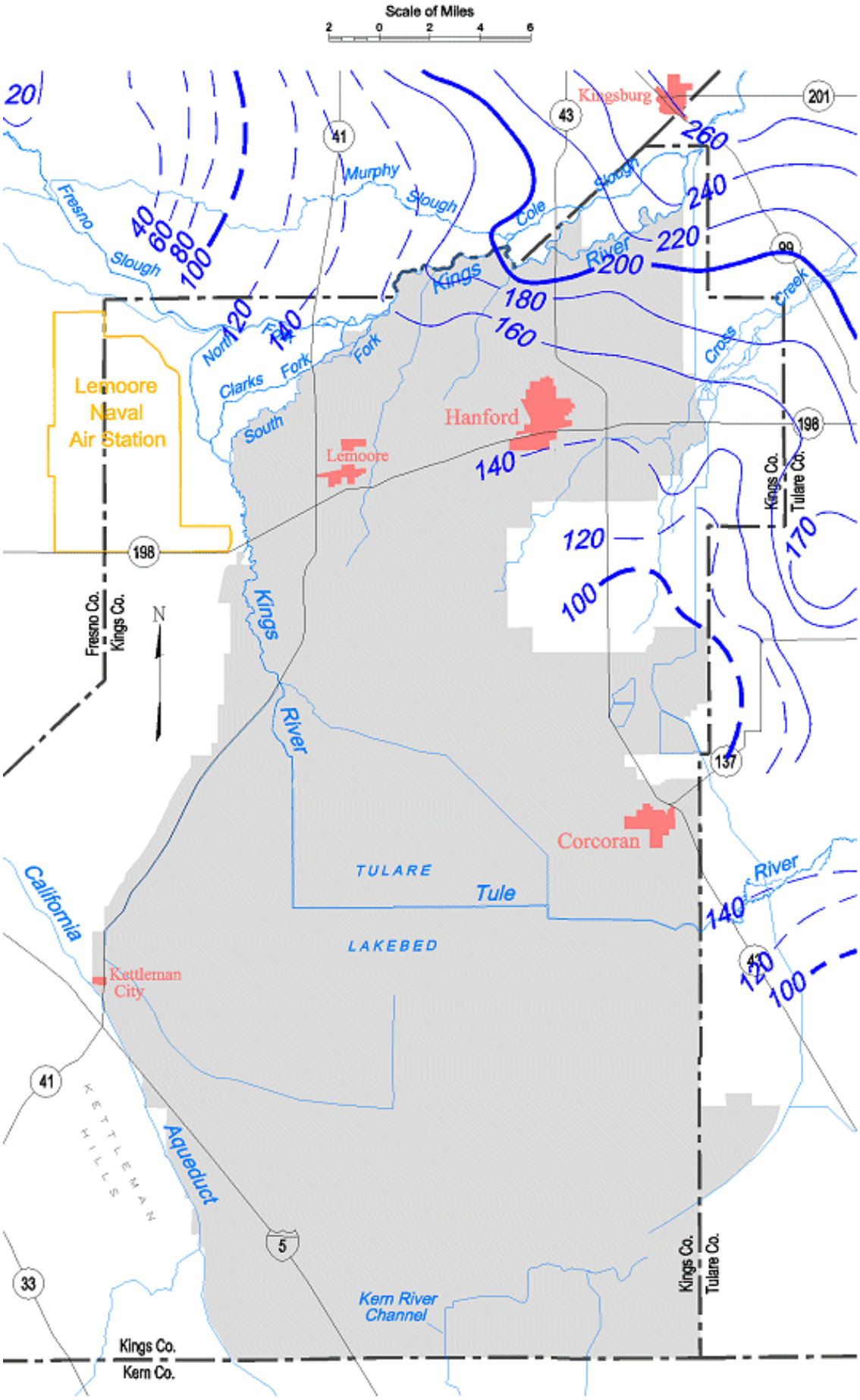
Spring 1993, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

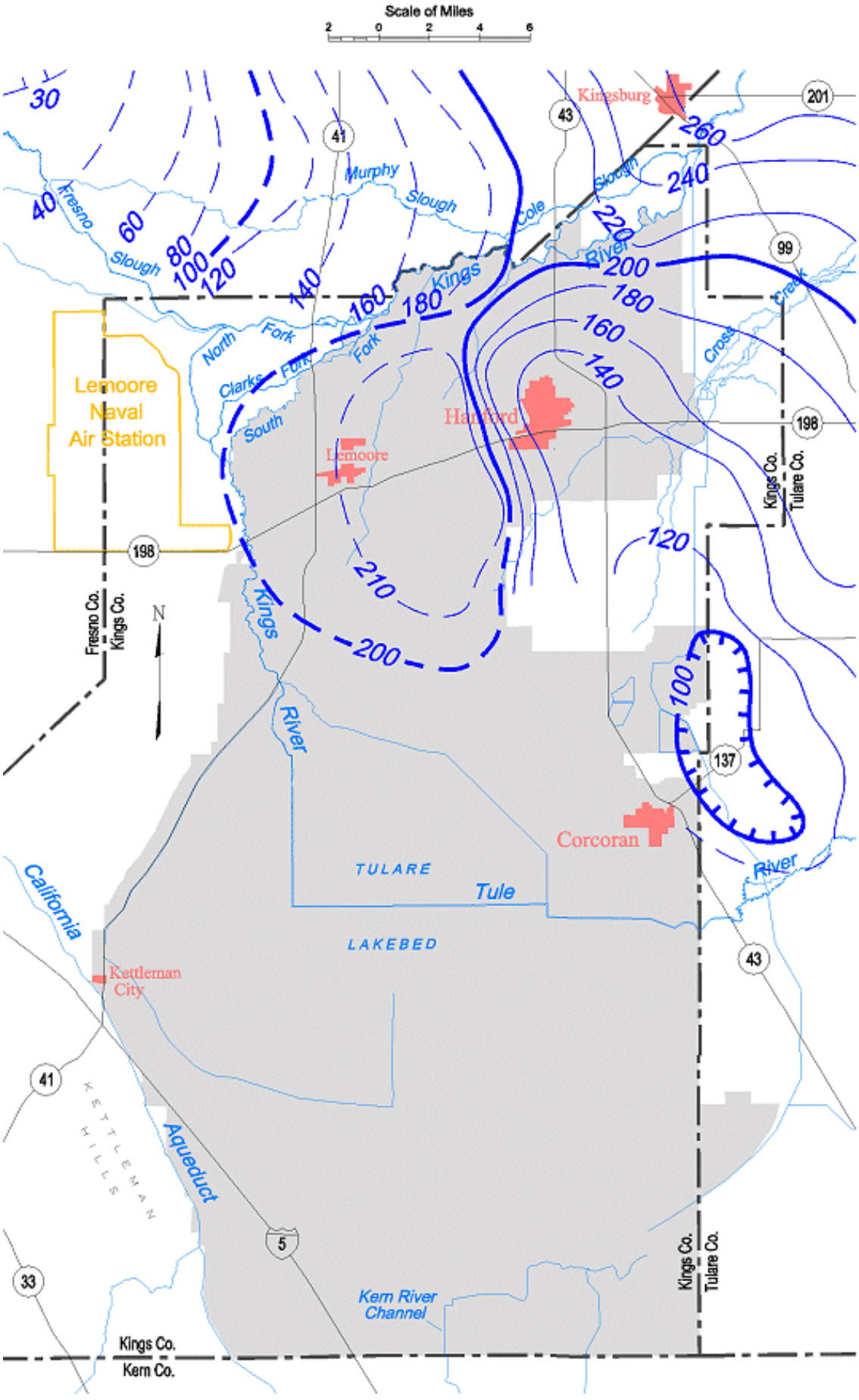
Spring 1994, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 20 feet.

Tulare Lake Groundwater Basin

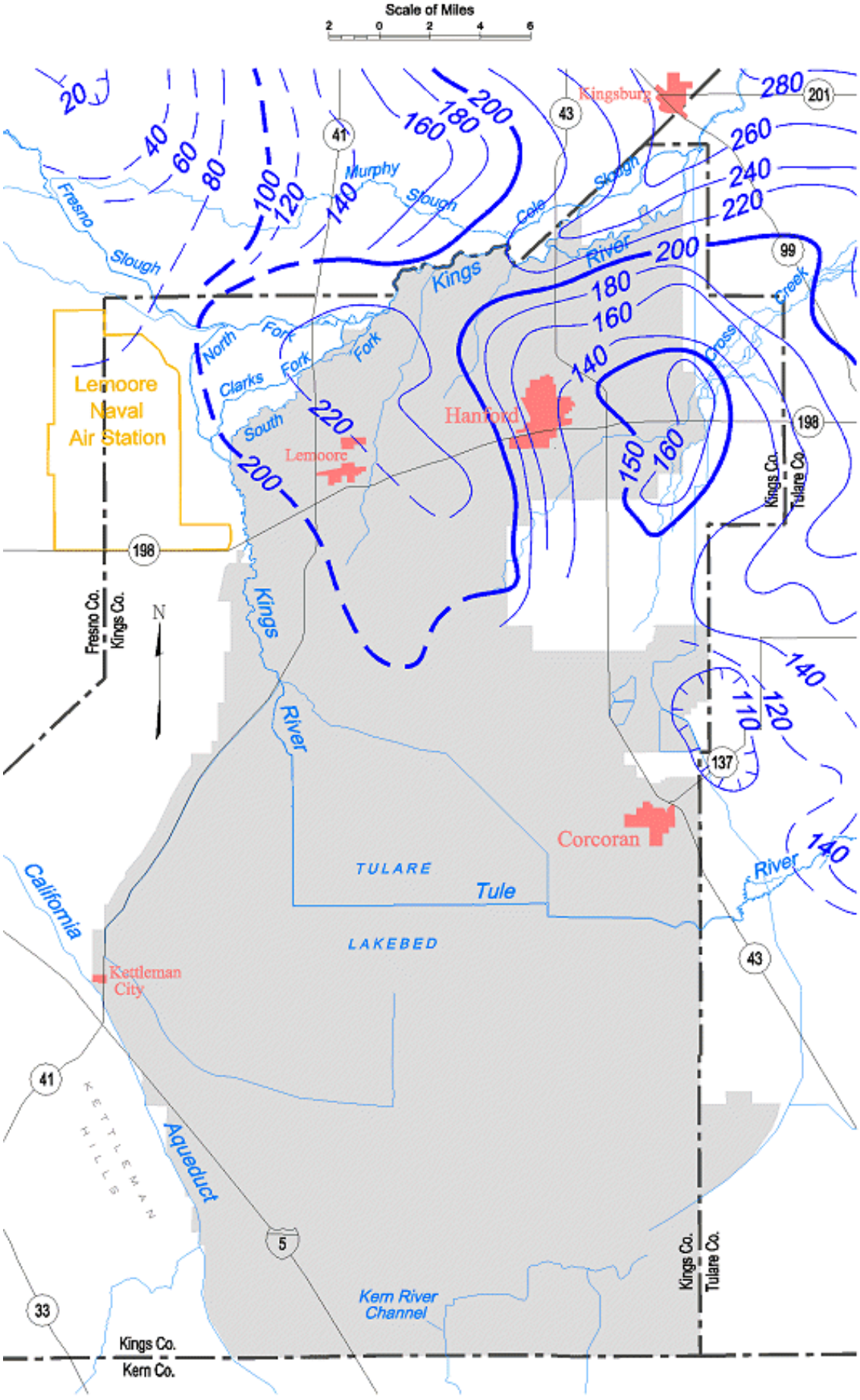
Spring 1995, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

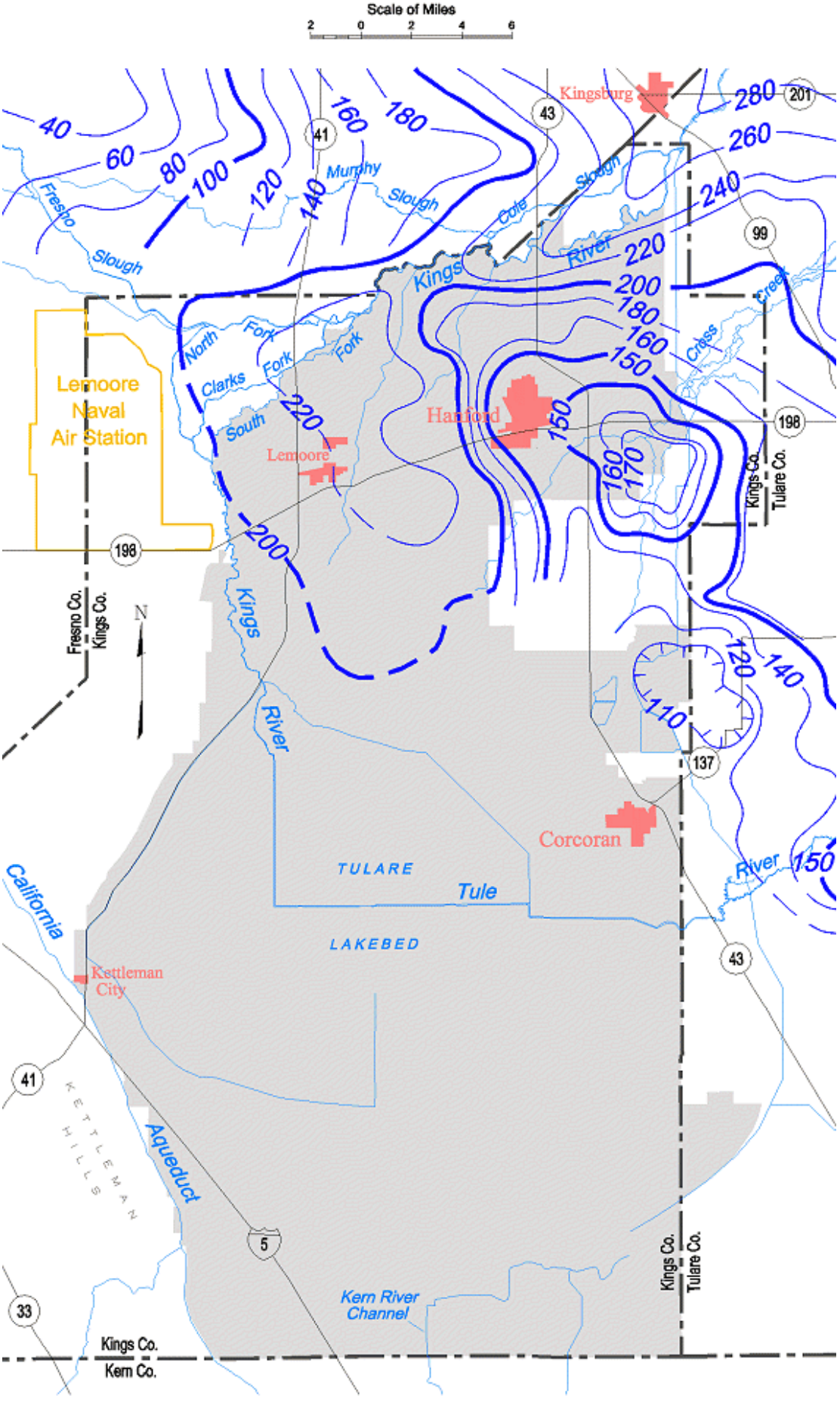
Spring 1996, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

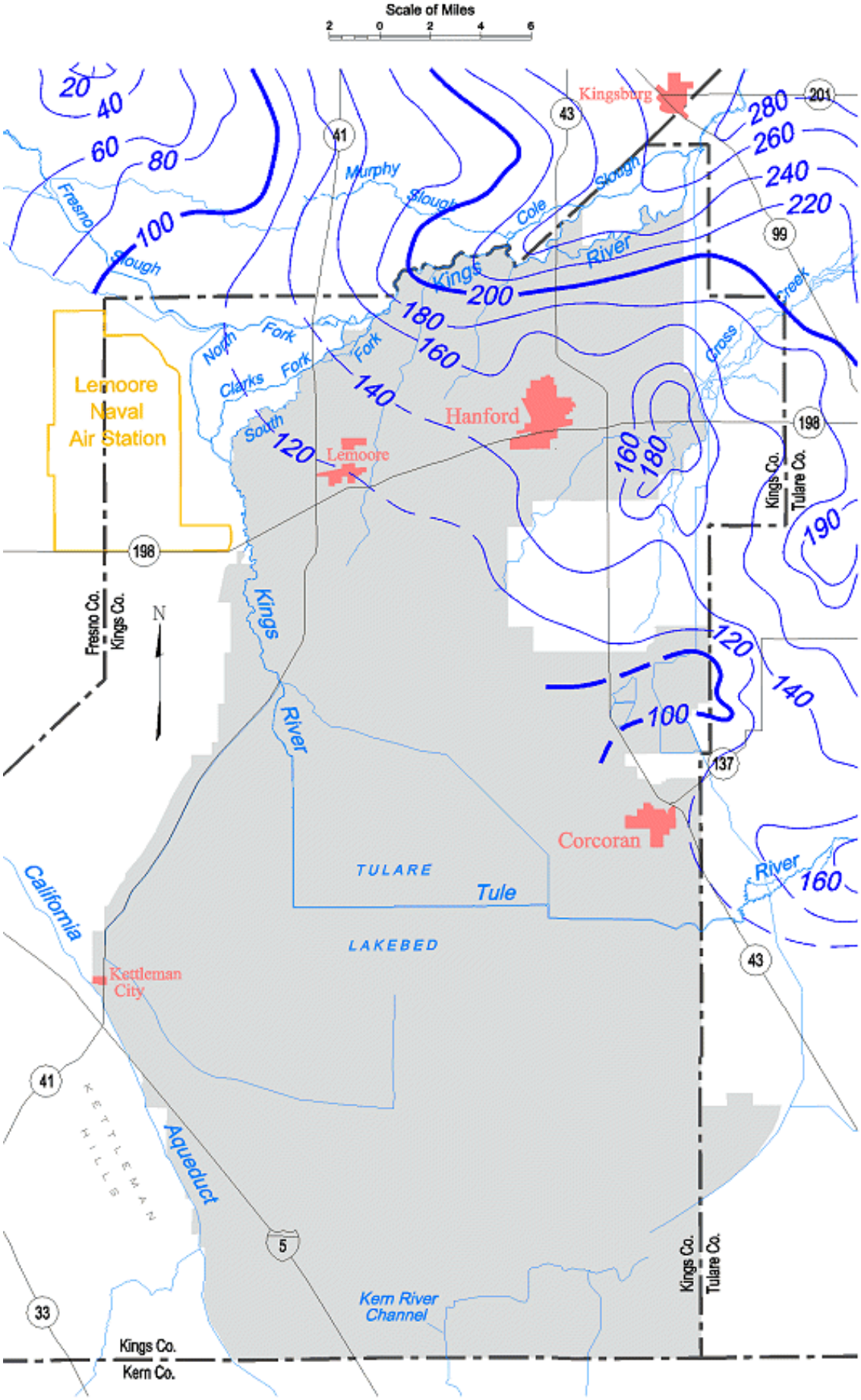
Spring 1997, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

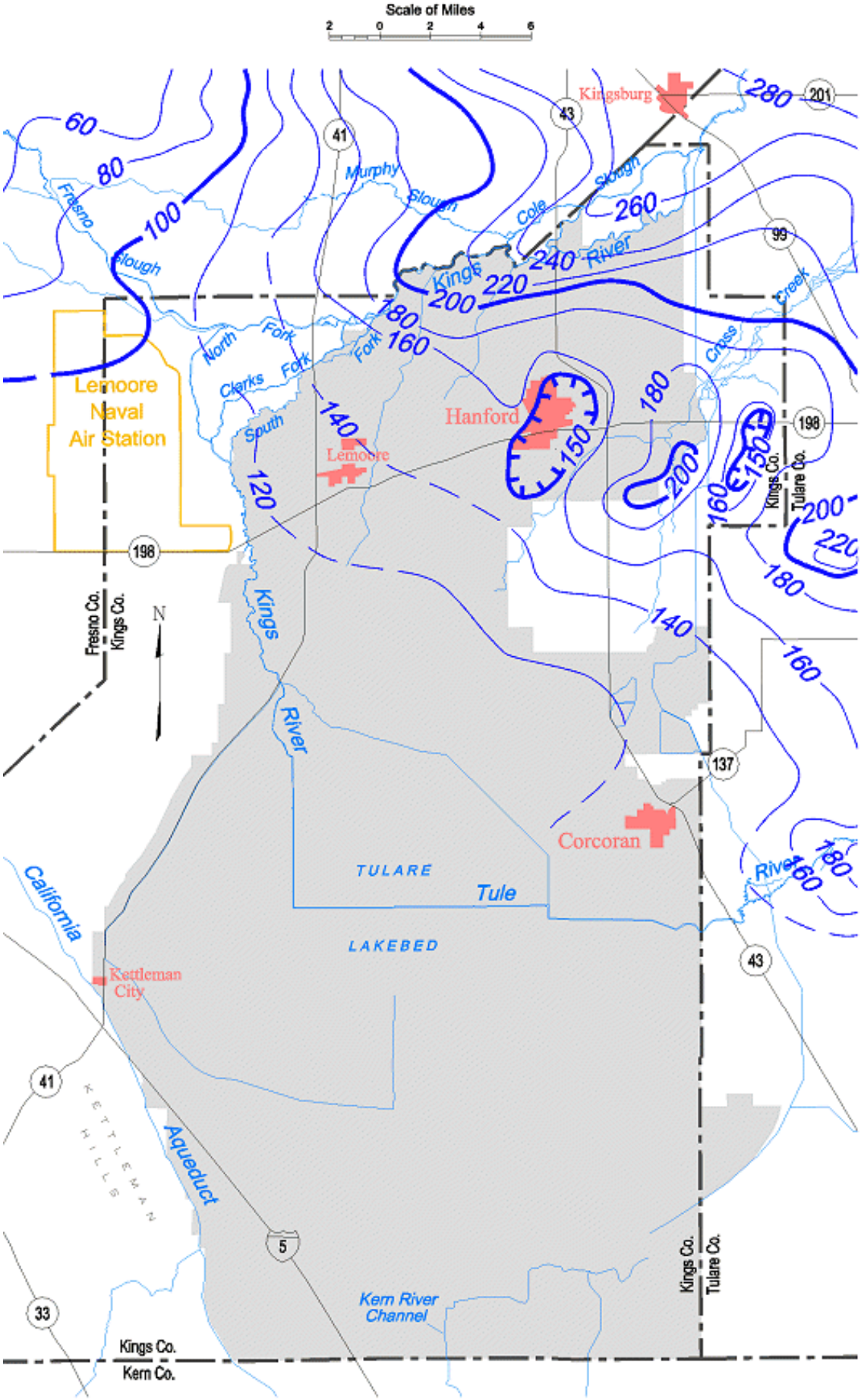
Spring 1998, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

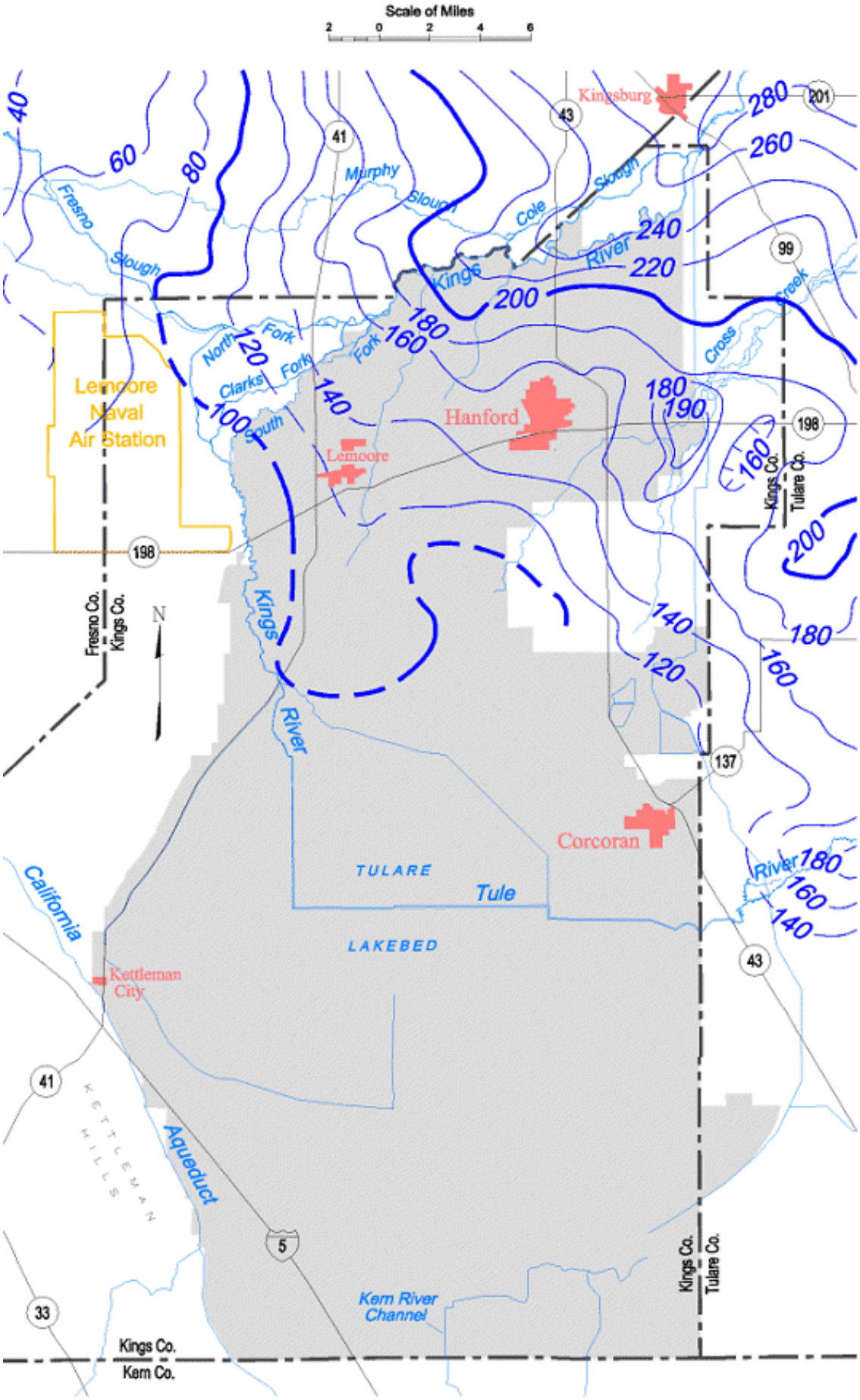
Spring 1999, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

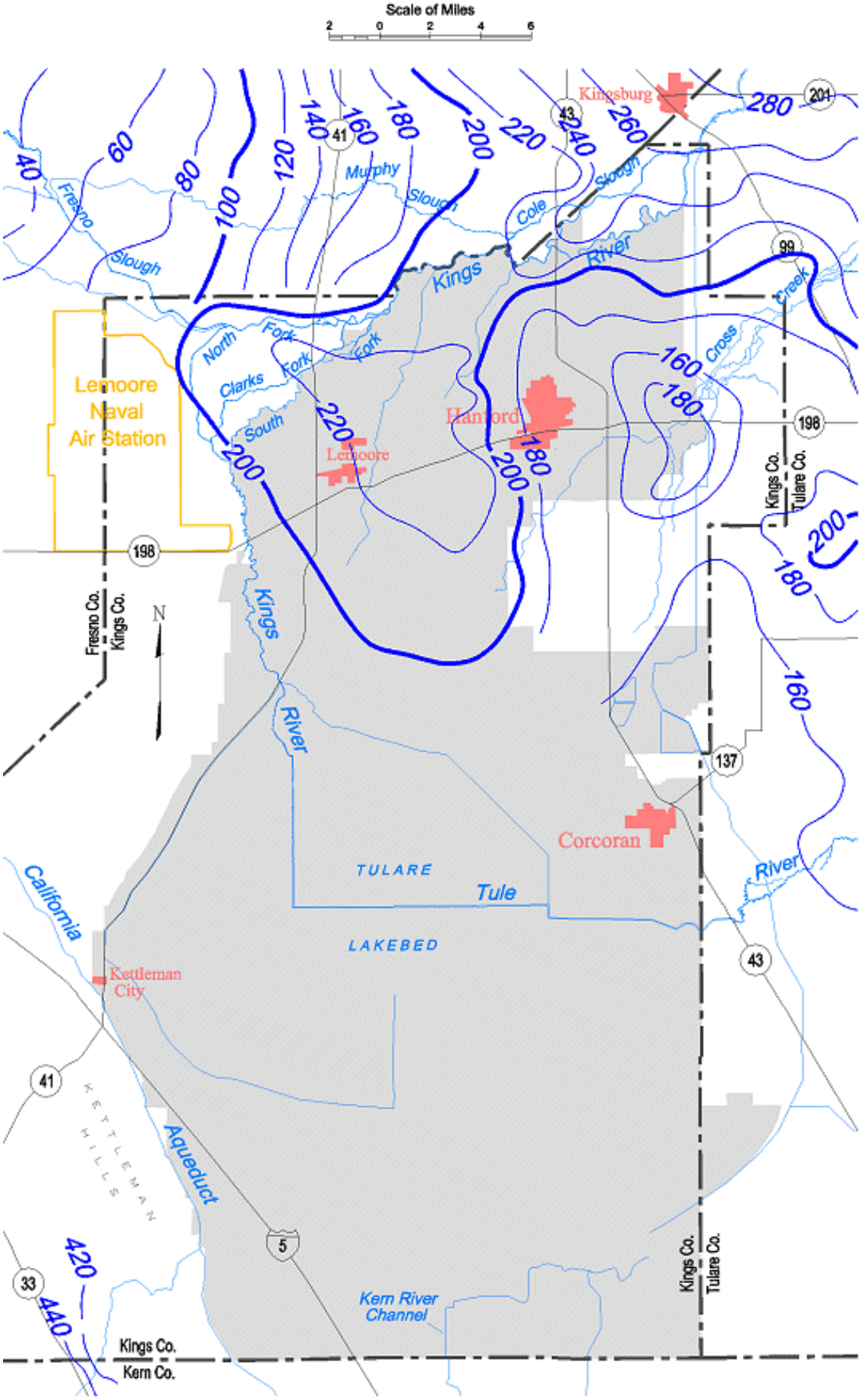
Spring 2000, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

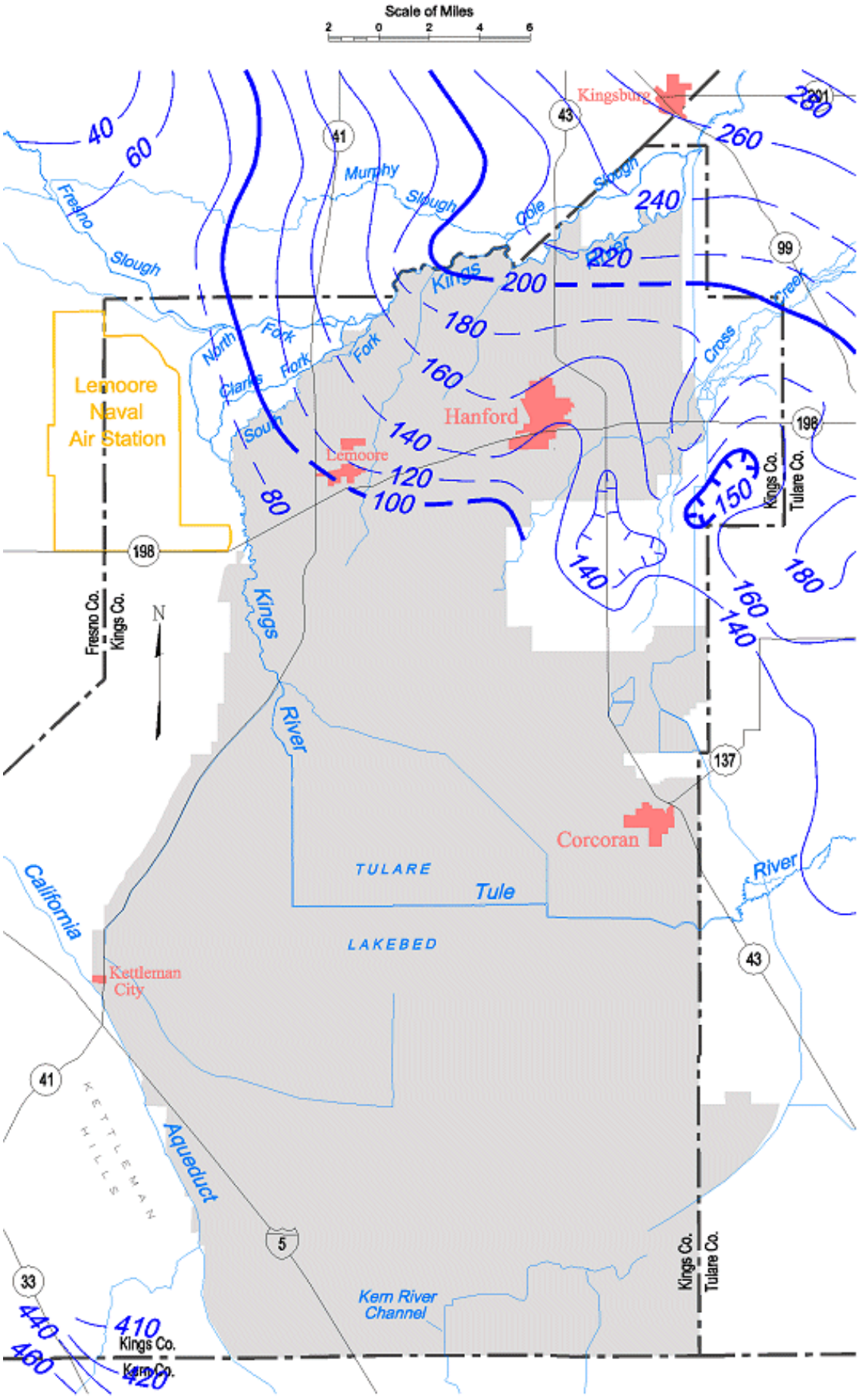
Spring 2001, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 20 feet.

Tulare Lake Groundwater Basin

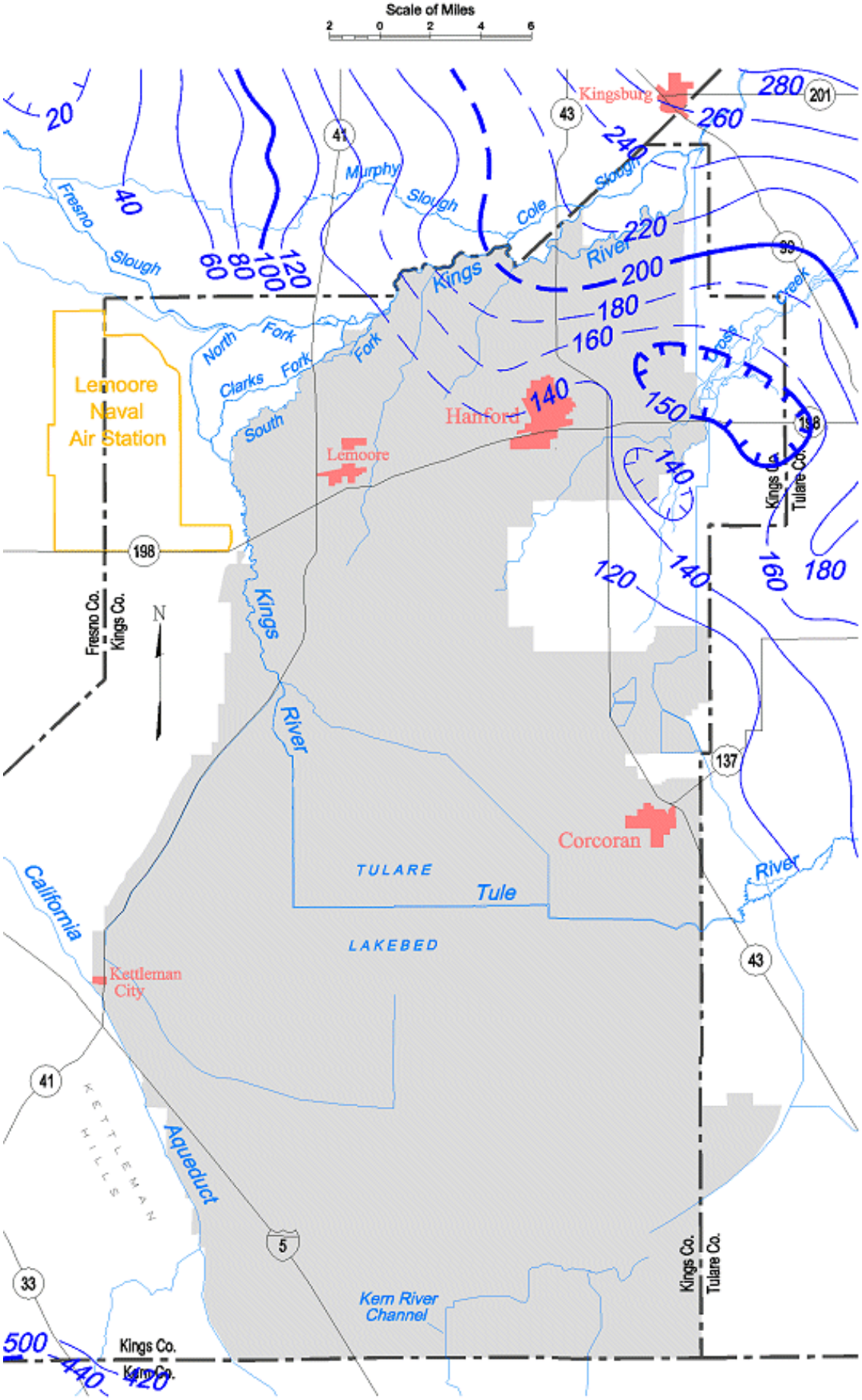
Spring 2002, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

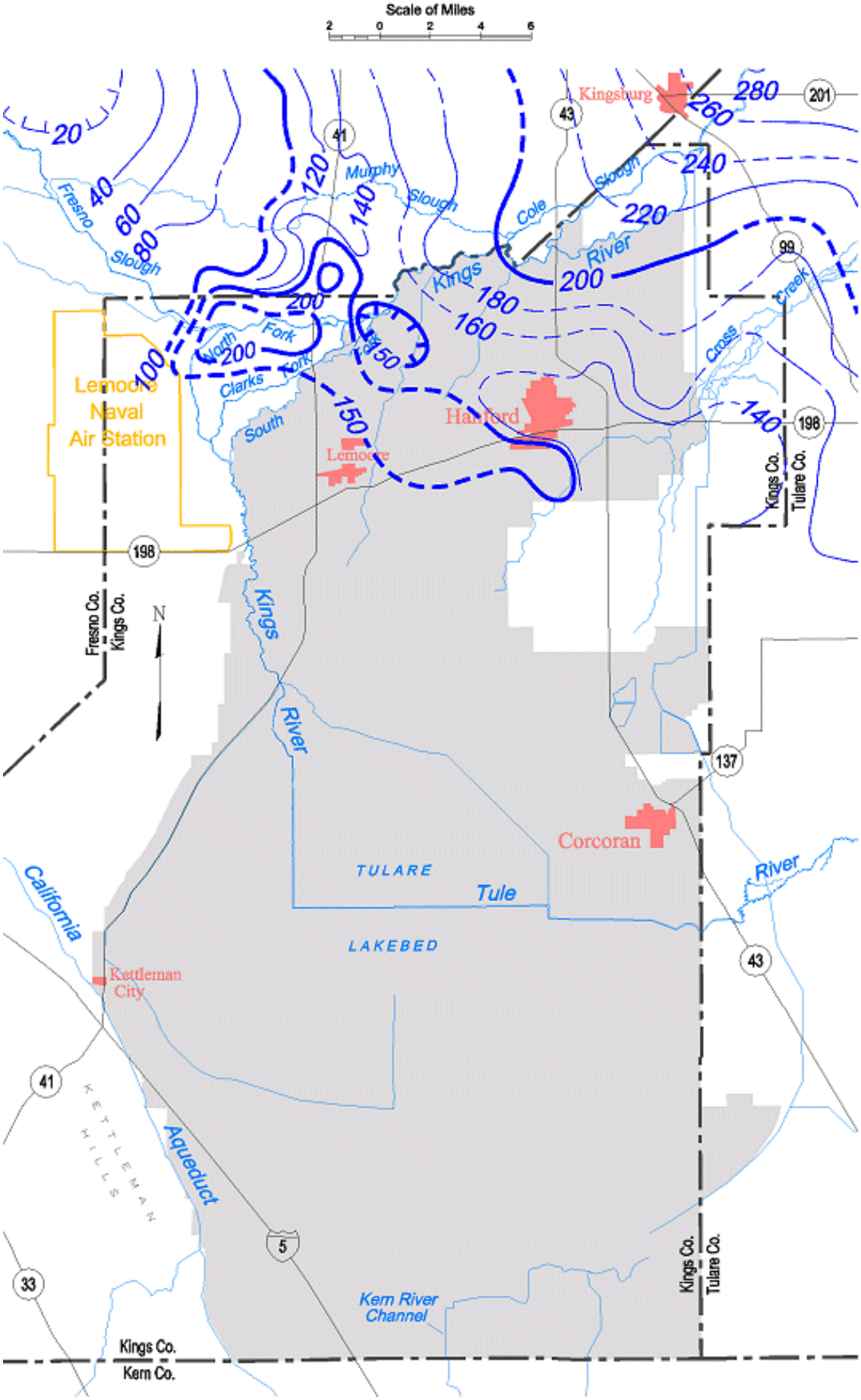
Spring 2003, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 and 20 feet.

Tulare Lake Groundwater Basin

Spring 2004, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10, 20 and 50 feet.

APPENDIX F - RECLAMATION PROJECT AGREEMENT

RECLAMATION PROJECT AGREEMENT

This Reclamation Project Agreement ("Agreement") is made and entered into the 6th day of August, 2001, by and between the LAKESIDE IRRIGATION WATER DISTRICT, a California Water District ("Lakeside"), and the CITY OF HANFORD, a municipal corporation ("City").

WHEREAS, the City is in need of access to the Lakeside Ditch for the purpose of discharging disinfected secondary treated effluent from the City of Hanford Wastewater Treatment Facility and its holding ponds ("Treated Effluent"), and

WHEREAS, Lakeside owns water conveyance and distribution facilities and utilizes other such facilities owned by the Lakeside Ditch Company pursuant to a master agreement with the Company, and

WHEREAS, Lakeside has demand for additional water for crop irrigation and other beneficial uses throughout its service area, and

WHEREAS, the City and Lakeside jointly and cooperatively prepared and submitted an application for issuance of a Master Reclamation Permit by the California Regional Water Quality Control Board, Central Valley Region ("Regional Board") for the Lakeside and City Reclamation Project, and

WHEREAS, on October 27, 2000, the Regional Board approved and issued Order Number 5-00-222, Waste Discharge Requirements Master Reclamation Permit for Lakeside and City Reclamation Project ("Reclamation Permit") and

WHEREAS, the City and Lakeside wish to enter into this Agreement in order to implement the Lakeside and City Reclamation Project in accordance with the provisions of the Reclamation Permit.

NOW THEREFORE, in consideration of the mutual covenants herein contained and for other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged by the parties hereto, it is agreed as follows:

1. City, as the producer under the Reclamation Permit and Lakeside as the Distributor under the Reclamation Permit each agree to comply with their respective obligations, conditions and requirements identified in the Reclamation Permit. A true and correct copy of the Reclamation Permit is attached to this Agreement as Exhibit "A".

2. Lakeside shall construct, at its sole cost and expense, all the mitigation projects required and approved by the Regional Board as identified in the Reclamation Permit attached to this Agreement as Exhibit "A" (collectively "Mitigation Projects").

3. In consideration of the City's right to discharge Treated Effluent into the Lakeside Ditch in accordance with the provisions of the Reclamation Permit, City shall pay to Lakeside a one-time mitigation fee ("Mitigation Fee"). The Mitigation Fee shall be equal to 50% of the actual costs paid by Lakeside for the construction of the Mitigation Projects. Upon the completion of construction of the Mitigation Projects, Lakeside shall submit certified invoices/contracts identifying all of the actual costs paid by Lakeside for the construction of the Mitigation Projects. The City shall pay the Mitigation Fee to Lakeside within 60 days of receipt and validation of such invoices/contracts by the City.

4. The initial term of this Agreement shall be five (5) years, commencing on the date of this Agreement as set forth above. This Agreement shall automatically renew for successive terms of two (2) years each, unless terminated as provided in Paragraph 5 of this Agreement.

5. This Agreement may not be terminated during the initial five (5) year term. Thereafter, either party may terminate this Agreement by delivering written notice of termination to the other party two (2) years prior to the effective date of the termination.

6. The right of the City to discharge Treated Effluent into the Ditch shall be subject to all of the following conditions:

a. Subject to any legal obligations of the City regarding the delivery, use or storage of the Treated Effluent existing on the effective date of this Agreement, Lakeside shall have the first right to receive any available Treated Effluent.

b. The City shall make no discharge of Treated Effluent into the Ditch, which would violate any term, or condition of Waste Discharge Order No. 91-164 or future orders as may be issued by the Regional Board for operation of the City's Wastewater Treatment Facility or any term or condition contained in the Reclamation Permit which relates to the discharge of the Treated Effluent into the Ditch.

c. The City shall cease all discharges of Treated Effluent into the Ditch at any time there is evidence that such discharge is in violation of the provisions of Paragraph 6.b. of this Agreement, including without limitation, receipt of written notice from the Regional Board of such violation(s). Upon curing any such violation, the City may again commence discharging Treated Effluent into the Ditch.

d. The City shall develop facilities enabling discharge into the Ditch at the maximum capacity of the conveyance pipeline existing on the effective date of this Agreement. Except as provided herein, the rate of discharge into the Ditch shall be determined by Lakeside. Upon at least seventy-two hours notice to Lakeside, the City shall have the right to discharge up to twenty (20) cubic feet per second into the Ditch when the City's Treated Effluent storage basins are at or near capacity.

e. The City shall pay Lakeside a "Discharge Fee" of thirty dollars ($30.00) per acre foot of discharge into the Ditch. .

Payment of the Discharge Fee shall be made to Lakeside on or before the 25th of each month for all Treated Effluent discharged into the Ditch the previous month.

f. The maximum Discharge Fee paid by the City during any one-year period of the initial five-year term of this Agreement shall not exceed $125,000.00. After the expiration of the initial five-year term, the maximum Discharge Fee paid by the City for any one-year period during subsequent two-year renewal periods, shall not exceed $150,000.00 per year. For renewal periods beyond the third two-year renewal period (i.e. six years) the maximum Discharge Fee paid by the City for each year during each successive two-year renewal period shall not exceed an amount mutually agreed to by the Parties.

7. Subject to the rate of discharge limitation contained in 6(d) hereof, City shall have the right to discharge into the Ditch each year during the initial term and any successive term of this Agreement a minimum of 70% of the City's annual production of Treated Effluent. The City's annual production of Treated Effluent is currently estimated to be approximately 5000 acre-feet. Each January the City will provide written notification to Lakeside of the estimated volume of Treated Effluent to be delivered to the Ditch for that year.

8. Lakeside shall take immediate action to correct and/or eliminate any violation of the Reclamation Permit, Waste Discharge Order No. 91-164 or any other permit or order issued by the Regional Board and regarding the Treated Effluent, by Lakeside, its officers, directors, employees, agents, contractors, or landowners within the Lakeside service area. The City shall take immediate action to correct and or eliminate any violation of the Reclamation Permit, Waste Discharge Order No. 91-164 or any other permit or order issued by the Regional Board and regarding the Treated Effluent, by the City, its officers, directors, employees, agents, or contractors.

9. To provide for effective and efficient storage of the increasing production of Treated Effluent by the City and the use thereof for crop irrigation and other beneficial uses by Lakeside and the landowners within the Lakeside Service Area, Lakeside and the City will develop/construct projects to store, transport and distribute such Treated Effluent pursuant to mutually satisfactory agreements.

10. Lakeside and the City shall each designate a person who shall represent that party regarding its responsibilities under this Agreement. The representatives shall meet at least annually to review the user permit, irrigation water use, discharge needs, schedules, and anticipated capital improvements needs. The representatives shall also meet when necessary to address problems or complaints that may arise during the course of the year.

11. The City shall provide Lakeside a copy of all reports required by the monitoring and reporting requirements included in Waste Discharge Order No. 90-164. Notwithstanding the frequency of reporting requirements contained therein, the City shall provide Lakeside a general mineral constituent analysis of Treated Effluent discharged into the Ditch at least monthly. Such analysis shall conform to the constituents and testing methods specified in Exhibit "B".

12. City agrees to defend, indemnify and hold Lakeside, its officers, directors, employees and agents and landowners within the Lakeside water service area completely free and harmless from any and all claims, suits, losses, injuries, damages and costs, including attorney's fees occasioned or arising out of or in any way related to delivery of the Treated Effluent to the Lakeside Ditch System or any violation by the City of the provisions of the Reclamation Permit, Waste Discharge Order 91-164 or any other permit or order issued by the Regional Board and regarding Treated Effluent delivered to the Lakeside Ditch System.

13. Lakeside agrees to defend, indemnify and hold the City, its officials, employees and agents, completely free and harmless from any and all claims, suits, losses, injuries, damages and costs, including attorney's fees, occasioned or arising out of or in any way related to transportation of the Treated Effluent through the Lakeside Ditch System, maintenance of the Lakeside Ditch System and appurtenances thereto, and any violation by Lakeside or landowners within the Lakeside water service area of the provisions of the Reclamation Permit, Waste Discharge Order 91-164 or any other permit or order issued by the Regional Board and regarding Treated Effluent delivered to the Lakeside Ditch System.

14. Prior to instituting any actions to enforce the terms and conditions of this Agreement pursuant to Paragraph 15 hereof, a party shall notify the other party in writing of any alleged breach or default of any obligation arising under this Agreement ("Notice of Default"). The other party shall have 15 days to respond in writing to the Notice of Default ("Default Response") or to cure the alleged breach or default identified in the Notice of Default. If the other party fails to provide a Default Response to the other party within said 15 day period, the alleged breach or default identified in the Notice of Default shall be deemed admitted by the non-responding party. If the Default Response disputes the allegations in the Notice of Default, the parties shall meet and confer in good faith to attempt resolve the dispute. Such meeting shall take place within 15 days of the date of the Default Response. An alleged breach or default of any provision of this Agreement which would support a request for a temporary restraining order and preliminary injunction may be initiated without first complying with the provisions of this paragraph 14.

15. If, after meeting and conferring in good faith pursuant to Paragraph 14 hereof, the parties are unable to resolve the dispute, either party may initiate any action at law or in equity necessary to enforce or interpret the terms of this Agreement. If such action is initiated, the prevailing party shall be entitled to reasonable attorneys' fees, costs and necessary disbursements in addition to any other reasonable relief to which he may be entitled. With respect to any

suit, action or proceeding arising out of or related to this Agreement, or the documentation related hereto, the parties hereby submit to the jurisdiction and venue of the Superior Court, whichever is applicable, in the County of Kings, State of California for any proceeding arising hereunder.

16. This Agreement shall be binding on the successors and assigns of the parties.

17. This Agreement and the Exhibits attached hereto supersedes any and all other agreements, either oral or in writing, between the parties hereto with respect to the matters set forth herein and contains all of the covenants and agreements between the parties regarding said matters. Each party to this Agreement acknowledges that no representations, inducements, promises or agreements, orally or in writing, have been made by any party or anyone acting on behalf of any party which are not embodied in this Agreement and no other agreement, statement or promise shall be valid or binding.

18. Except as otherwise expressly provided herein, any notice, consent, authorization or other communication to be given hereunder shall be in writing and shall be deemed duly given and received when delivered personally, when transmitted by facsimile or e-mail if receipt is acknowledged by the addressee, one business day after being deposited for next-day delivery with a nationally recognized overnight delivery service, or three business days after being mailed by first class mail, charges and postage prepaid, properly addressed to the party to receive such notice at the last address furnished for such purpose by the party to whom notice is directed and addressed as follows:

Lakeside Irrigation Water District
9304 Houston Avenue
Hanford, CA 93230

City of Hanford
Attn: Director of Public Works
900 S. 10th Avenue
Hanford, CA 93230

19. If any provision of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nevertheless continue in full force and effect without being impaired or invalidated in any way.

20. No change, amendment or modification of this Agreement shall be valid unless the same is in writing and signed by the parties hereto.

21. No waiver or any breach of any terms, condition or provision of this Agreement shall constitute a waiver of any other breach of any other term, condition or provision and no consent of one party to any departures by the other shall be effective unless such waiver shall be in writing and shall be signed by the non-waiving party or a duly authorized agent thereof and the same shall be effective only for a period, on the conditions and for the specific instances and purposes specified in such writing. No notice to or demand on the non-waiver party in any case shall entitle the non-waiving party to any other or further notice or demand in similar or other circumstances.

22. This Agreement shall be construed and governed pursuant to the laws of the State of California.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed on the date and year first above written.

CITY OF HANFORD

BY: _____
Jan E. Reynolds, City Manager

LAKESIDE IRRIGATION WATER DISTRICT

BY: _____
Don Mills, President

BY: _____
Ken Cartwright, Secretary

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APPENDIX G - CONSUMER CONFIDENCE REPORT

Consumer Confidence Report (CCR)
2004

Este informe contiene informacion muy importante sobre su agua beber. Traduzcalo o hable con alguien que lo entienda bien.

The City of Hanford Public Works Department Water Division is pleased to present to you this year's Consumer Confidence Report (formerly Annual Water Quality Report). This report is designed to inform you about the quality of water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve water quality and protect our water resources. We are committed to ensuring the quality of your water.

If you have any questions about this report or your water utility, please contact Utilities Superintendent Terry Carr at 585-2560 or Public Works Director Gary Misenhimer at 585-2567. We want our valued customers to be informed about their water quality.

The City Council of the City of Hanford meets on the first and third Tuesdays of the month at 7:30 PM in the council chambers located in the Civic Auditorium, 400 N. Douty Street to discuss and/or take action on various matters that affect the community. At times issues regarding water system improvements or quality are on the agenda. Public input is also appreciated and is taken into consideration during the discussions and formal actions.

Our water source is strictly ground water taken from wells. The wells pump water into an intricate network of water mains and services from aquifers deep beneath the city. The City of Hanford system has 17 active well sources and 1 standby well source. A ground water protection assessment of our source water was completed May 2003. A copy of the complete assessment report is available for review at the Department of Health Services, Southern California Drinking Water Field Operations Branch, 1040 E. Herndon Avenue, Suite 205, Fresno, CA or the Department of Public Works office, 900 S. 10th Avenue. You may request a copy of the assessment be sent to you by contacting the DHS district engineer at (559) 447-3300 or the Utilities Superintendent at (559) 585-5260. In general, the city's sources were most vulnerable to the following activities "not associated with any detected contaminants": sewer collection/septic systems, agricultural/irrigation wells, and gas stations/auto repair processes. There have been no contaminants detected in the water supply that exceed current Maximum Contaminant Levels (MCLs), however the source may still be considered vulnerable to activities located near the drinking water sources. The City of Hanford Public Works Department Water Division will continue to monitor the quality and integrity of its source water and distribution system in accordance with current federal and state regulations, and continue to utilize the most stringent regulations in the construction of new water wells to protect the source aquifers from any possible contamination.

Special Health Information

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the United States Environmental Protection Agency's (USEPA) Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Additional General Information on Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- ***Microbial contaminants***, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- ***Inorganic contaminants***, such as salts and metals, that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- ***Pesticides and herbicides***, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.
- ***Organic chemical contaminants***, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production and can also come from gas stations, urban storm water runoff and septic systems.
- ***Radioactive contaminants***, which can be naturally occurring or be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, USEPA and the California Department of Health Services (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

The City of Hanford routinely monitors your drinking water for over 105 drinking water contaminants in conformance with Federal and State laws. This report shows the results of our monitoring for the period of January 1, 2004 to December 31, 2004. The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some contaminants. It's important to remember that the presence of these contaminants does not necessarily pose a health risk.

TABLE DEFINITIONS and ABREVIATIONS

In this report you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we have provided the following definitions:

Non-Detects (ND) – Laboratory analysis indicates that the constituent is not present at testing limit.

Detection Limits for purposes of Reporting (DLR) – The minimum quantification or detection level of a constituent's presence.

Parts per million (ppm) or Milligrams per liter (mg/l) – One part per million corresponds to one minute in two years or a single penny in $10,000.

Parts per billion (ppb) or Micrograms per liter (mg/l) – One part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.

Parts per trillion (ppt) or Nanograms per liter (nanograms/l) – One part per trillion corresponds to one minute in 2,000,000 years, or a single penny in $10,000,000,000.

Parts per quadrillion (ppq) or Picograms per liter (picograms/l) – One part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in $10,000,000,000,000.

Picocuries per liter (pCi/L) – Picocuries per liter is a measure of the radioactivity in water.

Nephelometric Turbidity Unit (NTU) – Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Regulatory Action Level (AL) – The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

TABLE DEFINITIONS and ABREVIATIONS (Continued)

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG) – The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Public Health Goal (PHG) – The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Primary Drinking Water Standards (PDWS) – MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS) – MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect health at the MCL levels.

In accordance with the "Primary Drinking Water Standards", the following tables (tables 1 through 5) list contaminants that were detected during the most recent testing:

Table 1 - Lead and Copper

Contaminant	Year Sampled	Action Level	PHG (MCLG)	No. of Samples Collected	90th Percentile Level Detected	No. of Sites Exceeding Action Level	Violation	Typical Source of Contaminant
Lead (ppb)	2002	15	2	40	ND	0	No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm)	2002	1.3	0.17	40	25	1 site above AL out of 40 sites	No	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives

NOTE: Action levels for copper and lead, which are to be met at customer tap, are used to determine the treatment requirements that a water system is required to complete. The "90th Percentile Level Detected" is based on the sample results for highest 10 percent of the tap water samples collected during any monitoring period.

Table 2 - Radioactive Contaminants

Contaminant	Year Sampled	Unit Measurement	MCL	PHG	MCLG	DLR	Average Level Detected	Range	Violation	Typical Source of Contaminant
Alpha Activity, Gross	2000-2004	pCi/L	15	N/A	N/A	3	2.85	ND – 12.0	No	Erosion of natural deposits
Uranium	2003-2004	pCi/L	20	0.43	0.43	2	4.35	ND – 10.1	No	Erosion of natural deposits

Table 3 - Arsenic										
Contaminant	**Year Sampled**	**Unit Measurement**	**MCL**	**PHG**	**MCLG**	**DLR**	**Average Level Detected**	**Range**	**Violation**	**Typical Source of Contaminant**
Arsenic	2004	ppb	50	0.004	0.004	2	24.9	4 - 76	No	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes

NOTE: The "Average Level Detected" is the annual average of the 17 active well sources. The 1 standby well source sometimes exceed the MCL based on the annual average and are only used in case of a water shortage emergency.

"While your drinking water meets USEPA's current standard for arsenic, it does contain arsenic. Arsenic is a naturally occurring mineral and at high concentrations is known to cause cancer in humans. Some people who drink water-containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer."

Table 4 - Inorganic Contaminant										
Contaminant	**Year Sampled**	**Unit Measurement**	**MCL**	**PHG**	**MCLG**	**DLR**	**Average Level Detected**	**Range**	**Violation**	**Typical Source of Contaminant**
Aluminum	2003	ppb	1000	600	600	50	51.8	0 – 270	No	Erosion of natural deposits; residue from some surface water treatment processes
Fluoride	2003	ppb	2000	1000	1000	100	941	200 - 1500	No	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

Table 5 - Unregulated at this Time, No "MCL"										
Contaminant	**Year Sampled**	**Unit Measurement**	**MCL**	**PHG**	**MCLG**	**DLR**	**Average Level Detected**	**Range**	**Violation**	**Typical Source of Contaminant**
Boron	2002	ppb	None	N/A	N/A	100	765	0 - 1400	No	Naturally-occurring element found in soil and water
Vanadium	2002	ppb	None	N/A	N/A	3	1	ND – 11	No	Naturally-occurring element found in soil
1,2,3-Trichloropropane (TCP)	2002	ppb	None	N/A	N/A	0.005	ND	ND – 0.0079	No	Discharge from industrial uses and historic pesticide uses
Radon [1]	1999-2000	pCi/L	None	N/A	N/A	100	644	327 – 1157	No	Erosion of natural deposits

NOTE: Unregulated contaminant monitoring helps the USEPA and the California Department of Health Services to determine where certain contaminants occur and whether the contaminants need to be regulated.

[1] *RADON:* We constantly monitor the water supply for various contaminants. We have detected radon in the finished water supply. There are no federal regulations for radon levels in drinking water. The results shown above for radon will be combined with others nationwide to develop a new compliance level

TABLE 5 – Radon NOTE (Continued)

(MCL). Radon is a radioactive gas that you can't see, taste or smell. It is found throughout the U.S. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 picocuries per liter of air (pCi/L) or higher. There are simple ways to fix a radon problem that aren't to costly. For additional information, call your State radon program or call USEPA's Radon Hotline (800-SOS-RADON).

In accordance with the "Secondary Drinking Water Standards", the following table (table 6) list contaminants that were detected during the most recent testing:

Table 6 - Secondary Standards Contaminants

Contaminant	Year Sampled	Unit Measurement	Secondary MCL	PHG	MCLG	Average Level Detected	Range	Violation	Typical Source of Contaminant
Aluminum	2003	ppb	200	N/A	N/A	51.8	ND – 270	No	Erosion of natural deposits; residual from some surface water treatment processes
Chloride	2003	ppm	500	N/A	N/A	91	6 - 180	No	Runoff/leaching from natural deposits; seawater influence
Copper	2003	ppb	1000	N/A	N/A	4	ND – 60	No	Leaching from natural deposits; discharge from mining and industrial waste; leaching from copper pipies
Iron	2003	ppb	300	N/A	N/A	5.9	ND - 100	No	Leaching from natural deposits; industrial wastes
Manganese	2003	ppb	50	N/A	N/A	10.0	ND – 30	No	Leaching from natural deposits
Color	2003	Units	15	N/A	N/A	5.3	ND – 45	No	Naturally-occurring organic materials
Odor--Threshold	2003	Units	3	N/A	N/A	1	1	No	Naturally-occurring organic materials
Specific Conductance	2003	micromhos	1600	N/A	N/A	547.1	200 - 810	No	Substances that form ions when in water; seawater influence
Sulfate	2003	ppm	500	N/A	N/A	3	ND - 14	No	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids (TDS)	2003	ppm	1000	N/A	N/A	325.3	140 - 450	No	Runoff/leaching from natural deposits
Turbidity	2003	NTU	5	N/A	N/A	0.8	0.1 – 3.9	No	Soil runoff

Table 6 - Secondary Standards Contaminants (*Continued*)									
Contaminant	**Year Sampled**	**Unit Measurement**	**Secondary MCL**	**PHG**	**MCLG**	**Average Level Detected**	**Range**	**Violation**	**Typical Source of Contaminant**
Bicarbonate	2003	ppm	None	N/A	N/A	122	82 – 180	No	Generally found in ground and surface water
Calcium	2003	ppm	None	N/A	N/A	4.6	2.3 – 8.9	No	Generally found in ground and surface water
Carbonate	2003	ppm	None	N/A	N/A	7	ND – 20	No	Generally found in ground and surface water
Hardness	2003	ppm	None	N/A	N/A	12.6	6.2 – 23	No	Generally found in ground and surface water
Alkalinity	2003	ppm	None	N/A	N/A	128	88 - 180	No	Generally found in ground and surface water
Magnesium	2003	ppb	None	N/A	N/A	288.2	ND – 700	No	Generally found in ground and surface water
pH	2003	Units	None	N/A	N/A	8.4	7.5 – 9.8	No	Generally found in ground and surface water
Sodium	2003	ppm	None	N/A	N/A	112.4	44 - 160	No	Generally found in ground and surface water

NOTE: There are no PHGs or MCLGs for constituents with secondary drinking water standards because these are not health-based levels, but set on the basis of aesthetics.

UNITS – Minimum testing dilution value.

In accordance with the "Primary Drinking Water Standards", the following table (table 7) list contaminants that were not detected during the most recent testing:

Table 7 - Microbiological Contaminants					
Contaminant	**MCL**	**MCLG**	**Highest Percentage Detected in A Month**	**Number of Months in Violation**	**Typical Source of Contaminant**
Total Coliform Bacteria	Presence of coliform bacteria in more than 5% of monthly samples.	0	0	**0**	Naturally present in the environment
Fecal coliform and *E.coli*	A routine sample and a repeat sample are total coliform positive, and one of these is also fecal coliform or *E. coli* positive.	0	0	**0**	Human and animal fecal waste

NOTE: Water systems are required to meet a strict standard for coliform bacteria. **Coliform bacteria are usually harmless**, but their presence in water can be an indication of disease-causing bacteria. When coliform bacteria are found, special follow-up tests are done to determine if harmful bacteria are present in the water supply. If the standard is exceeded, the water supplier must notify the public by newspaper, television or radio.

ANSWERS TO FREQUENTLY ASKED QUESTIONS

WHAT ABOUT SAND IN THE WATER?

Sand and debris, which may appear in your faucet aerator screen, are most often caused by mineral deposits in your household system, plumbing repairs or sand produced by wells. There are no health impacts associated with this debris, but it can be a nuisance. A persistent sand or debris problem should be reported to the Water Division.

WHAT CAUSES THE ODOR IN MY WATER?

The odor is caused by the presence of hydrogen sulfide gas entrained in the groundwater. This is a natural occurring phenomenon and does not pose any health risks. The hotter the water, the stronger the odor. Place a container in the refrigerator for drinking water, and the odor will not be noticeable.

IS OUR WATER CHLORINATED?

No! Chlorine is used mostly in surface water systems to control bacteria. Currently, no chemicals are used or added to the City water supply.

WHY IS MY WATER SOMETIMES CLOUDY?

Cloudy or milky appearance is usually caused by air bubbles in the water, which pose no health risk. If the water is allowed to sit for 10 to 20 seconds, the air will dissipate and the water will clear. If the cloudiness does not disappear, please call the Water Division so that we may investigate.

WHAT CAUSES LOW WATER PRESSURE?

Low water pressure can be caused by either a home's gate valve not being fully opened, recent repairs to existing plumbing or too great a demand on the available water supply. The City's water pumping equipment is controlled through a computerized management system to operate between 40 and 55 PSI pressure.

WHY DO WATER EMPLOYEES OCCASIONALLY OPEN FIRE HYDRANTS?

This is a process known as "flushing", which is done periodically to remove sediment or sand from the water lines and ensure that water circulates adequately throughout the system. Fire hydrants may also be opened to conduct fire-flow capability tests.

Information On The Internet

The USEPA Office of Water (http://www.epa.gov/safewater/) and the Centers for Disease Control and Prevention (http://www.cdc.gov) Web sites provide a substantial amount of information on many issues relating to water resources, water conservation, and public health. Also, the California Department of Health Services hosts a Web site (http://www.dhs.ca.gov/ps/ddwem/) that provides complete and current information on water issues in our own state.

As the City and valley population continues to grow the need for water conservation awareness is always with us.

As Daylight Savings Time has arrived again, we will be stepping up enforcement of the watering regulations effective April 3, 2005. Monday being a NO watering day, you should continue with the alternate day usage for outside watering. The watering days for addresses ending with 0, 2, 4, 6 or 8 are Tuesday, Thursday or Saturday, watering days for addresses ending with 1, 3, 5, 7 or 9 are Wednesday, Friday or Sunday. There will be no watering on your allocated day between 10:00 A.M. and 6:00 P.M. As with any program the cooperation and participation of everyone is the only way the program can work well.

As usual, the City of Hanford encourages water conservation both inside and outside the home.

Thank you for allowing us to continue providing your family with clean, quality water this year. In order to maintain a safe and dependable water supply we sometimes need to make improvements that will benefit all of our customers. These improvements are sometimes reflected as rate structure adjustments. Thank you for understanding. In order to ensure good clean water in all areas of the system, Water Division personnel will be flushing water lines at various times. Employees will request that young children not play in the water for safety reasons. If you have a problem or complaint regarding water quality, please call the Water Division at 585-2560. All water delivered meets the primary drinking water standards established by the California Department of Health Services and the United States Environmental Protection Agency.

We at the City of Hanford work around the clock to provide top quality water to every residence and business. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life and our children's future.

Sincerely,

Terry Carr
Utilities Superintendent

DMR/dmr
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APPENDIX H – LETTER FROM KENNETH D. SCHMIDT AND ASSOCIATES

KENNETH D. SCHMIDT AND ASSOCIATES
GROUNDWATER QUALITY CONSULTANTS
600 WEST SHAW, SUITE 250
FRESNO, CALIFORNIA 93704
TELEPHONE (559) 224-4412

October 4, 2005

Mr. David Stringfield
Carollo Engineers
7580 North Ingram Avenue
Suite 112
Fresno, CA 93711

Re: City of Hanford
Arsenic Evaluation

Dear Dave:

Following are the results of my evaluation of information on arsenic concentrations in water from City of Hanford wells. Pursuant to your request, I have evaluated whether wells with arsenic concentrations exceeding 0.01 mg/l could be modified to produce water with arsenic concentrations below 0.01 mg/l. Information on well construction and pilot hole sampling for wells drilled since 1982 are particularly important in this evaluation.

Shallow Wells

Wells No. 2, 11, 16, 18, 22, and 25 range in depth from about 400 to 665 feet. Arsenic concentrations ranging from about 0.04 to 0.05 mg/l have been found in water from these wells. These wells are too shallow to tap low arsenic groundwater (less than 0.01 mg/l). These wells couldn't feasibly be deepened and adequately sealed off to tap low arsenic groundwater, which is generally indicated to be below about 950 feet in depth beneath most of the City.

Deep Wells

Deep wells discussed in this section are 34-37, and 39-40. City wells with low arsenic concentrations (No. 33, 38, 41, 42, and 43) are generally perforated below 950 feet in depth and the deepest perforations range from about 1,300 to 1,360 feet deep. Arsenic concentrations in Hanford are generally low in strata between about 900 and 1,350 feet at most sites that have been tested. However, at Well No. 31, low arsenic concentrations were not reported at any depths between 720 and 1,360 feet.

Except for this well, experiences at other deep City wells where data are available indicates low arsenic concentrations in water below a depth of about 950 feet. Most of the pilot holes for deep wells have been drilled to about 1,400 feet in depth, and for original Well No. 37 (GWF), to a depth of about 2,100 feet. At this latter site, low arsenic concentrations were found in all water samples below a depth of 1,340 feet.

Besides arsenic, two other important constituents are fluoride and color, both of which tend to generally be present at higher levels in groundwater below a depth of about 1,350 feet. However, the present fluoride MCL of 2.0 mg/l can apparently be met when wells are not drilled deeper than about 1,500 feet. Care needs to be taken when well modifications are made, so as to not produce water with color levels exceeding the MCL of 15 picocuries per liter.

Most of the deep wells with high arsenic concentrations have perforations extending up about 100 to 150 feet too shallow to produce low arsenic groundwater. Two of these wells (No. 39 and No. 40) don't have continuous annular seals, which could be a problem as discussed later. Additional considerations in modifying deep wells are casing reductions at depth, which are common, if smaller diameter liners have been placed in the wells (i.e. Well No. 32); and the straightness of some wells.

Recommendations for Deep Wells

Well No. 31 Assuming that the results of the pilot hole sampling are correct, low arsenic groundwater is not present at the site above a depth of about 1,400 feet. I don't recommend attempting to modify this well.

Well No. 32 Low arsenic groundwater is indicated to be present below a depth of about 1,200 feet at this site. Unfortunately, this Well has a 12-inch liner that was placed, along with a gravel pack, inside the original casing to control sand. A deeper perforated interval is needed (the liner is perforated from 900 to 1,470 feet in depth), along with a deep annular seal. I don't recommend attempting to modify this well because of the small diameter of the liner and the continuous gravel pack that was placed. Both wells No. 31 and No. 32 could be destroyed and replaced by new wells either on site or on another lot.

Well No. 34 Low arsenic groundwater is indicated from 1,230 to 1,430 feet in depth at the site. The 16-inch diameter casing is perforated from 846 to 1,432 feet in depth. A blank liner and annular seal could be installed to a depth of 1,200 feet. Recent pump tests indicate a pumping rate of about 1,200 gpm. Since 1998, the specific capacity has decreased from about 34 gpm per foot to 20 gpm per foot, indicative of perforation plugging. According to the City, well modifications below a depth of 436 feet are not possible due to casing breaks and other factors.

Well No. 35 Low arsenic groundwater is indicated from 830 to 1,450 feet in depth. The 20-inch diameter casing is perforated from 710 to 1,452 feet in depth. A 16-inch diameter blank liner and annular seal could be installed to a depth of 900 feet. Recent pump tests have indicated a pumping rate of about 800 gpm. Since 1998, specific capacities have decreased from about 21 to 13 gpm per foot, indicative of perforation plugging. The well would first be televised, and perforations cleaned as necessary. Also, a gyroscope alignment test should be done to determine the casing orientation and deviation. A yield of about 750 to 1,200 gpm is predicted after well modification.

Well No. 36 Low arsenic groundwater is indicated from 1,040 to 1,410 feet in depth. The 20-inch diameter casing is perforated from 824 to 1,414 feet in depth. A 16-inch diameter blank liner and annular seal could be installed to a depth of 950 feet. Recent pump tests have indicated a pumping rate if about 850 gpm. Since 1999, the specific capacity has stayed relatively constant, indicating no significant plugging of the perforations. First, the well should be televised and a gyroscope survey performed to determine the casing alignment, and the well cleaned if necessary. A yield of about 650 to 900 gpm is projected after well modification.

New Well No. 37 When the well was first constructed, high arsenic concentrations were reported. The uppermost perforated interval (970 to 1,050 feet) was then sealed off. Subsequently, a color of 35, exceeding the MCL of 15, was obtained. At this site, low arsenic groundwater was only indicated in the deepest perforated section (1,650 to 1,690 feet in depth). Arsenic concentrations ranging from 0.09 to 0.11 mg/l were reported in samples between 1,110 and 1,420 feet in depth. A 20-inch dia-

meter casing was installed to a depth of 949 feet, a 16-inch diameter casing is present to a depth of 1,089 feet, and a 14-inch diameter casing is present to the total depth of 1,710 feet. This well cannot be modified to produce water to meet the MCLs.

Well No. 39 The well is perforated from 945 to 1,389 feet in depth. The 18-inch diameter casing extends to 1,050 feet, the 16-inch diameter casing to 1,207 feet in depth, and the 14-inch diameter casing to 1,389 feet in depth. Pilot hole sampling indicated that only one sampled interval (1,260 to 1,360 feet in depth) had an arsenic concentration less than the new MCL. The relatively high fluoride concentration (1.5 mg/l) now pumped may be problematic, if the well is modified, because the fluoride concentrations would likely increase. A liner and annular seal could be placed to a depth of 1,050 feet. Recent pump tests indicate a pumping rate of about 2,000 gpm, and fairly stable specific capacities. The required well modification would probably reduce this rate to about 600 to 700 gpm.

Well No. 40 Low arsenic groundwater was indicated from 956 to 1,524 feet in depth. The casing was perforated from 950 to 1,300 feet in depth. The 20-inch diameter casing extends to 800 feet, the 18-inch diameter casing to 1,050 feet, and the 16-inch diameter casing to the total depth. The well has an annular seal from 880 to 950 feet in depth. If the results of the depth sampling in the pilot hole are correct, then either this annular seal is ineffective, or there are openings in the casing above the seal, to allow the higher arsenic groundwater to enter the well. A liner and annular seal could be placed to a depth of 950 feet. The same preliminary work would need to be done as for Well No. 35. If the well has functioned as a conduit, once the well modification is completed, water would probably have to be pumped to waste for a week or longer before acceptable arsenic concentrations would be obtained. Recent pump tests indicate a pumping rate of about 2,000 gpm, and stable specific capacities. It may be necessary to pump the well at a lower rate (i.e. 1,200 to 1,500 gpm), in order to obtain low arsenic concentrations. A television survey and alignment test would first be necessary.

New Wells

New wells can likely be drilled at Well sites No. 2 and No. 16 and other sites to produce low arsenic water. First, a pilot hole should be drilled and depth sampling conducted. Pumping rates of 1,500 to 2,000 gpm can probably be obtained.

Estimated Costs

The estimated cost for a new deep well (construction and development and not including pump or ancillary equipment) is $450,000. The estimated cost for cleaning and rehabilitation of an existing deep well is $175,000. The estimated cost to properly destroy a deep well is about $15,000.

Sincerely Yours,

K D Schmidt

Kenneth D. Schmidt

KDS:jh

APPENDIX I - WATER SUPPLY ASSESSMENT PROVISIONS OF SB 610 HANFORD SQUARE DEVELOPMENT

City of Hanford

Water Supply Assessment
Provisions of SB 610

HANFORD SQUARE DEVELOPMENT PROJECT

FINAL
October 2005

7580 NORTH INGRAM AVENUE, SUITE 112 • FRESNO, CALIFORNIA 93711 • (559) 436-6616 • FAX (559) 436-1191
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CITY OF HANFORD

WATER SUPPLY ASSESSMENT
PROVISIONS OF SB 610

HANFORD SQUARE DEVELOPMENT PROJECT

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WATER SUPPLY ASSESSMENT - PROVISIONS OF SB 610 HANFORD SQUARE DEVELOPMENT PROJECT

1.0 PURPOSE

This Water Supply Assessment (WSA) was prepared to assist the City of Hanford (City) in satisfying the requirements of Senate Bill 610 (SB 610). This WSA is specific to the Hanford Square Development Project (Project) and addresses the potential impact of the Project's water requirements on the Citywide water supply conditions. This WSA includes the following:

- Information on the City's water supplies consistent with Water Code Sections 10620 et. seq. (the Urban Water Management Planning Act) and 10910 et. seq. (Water Supply Planning to Support Existing and Planned Future Users)
- Information on current water demands and projected water demands, based on the City's adopted General Plan and specific project proposals currently under review by the City
- Comparison of water supplies and water demands for normal, single dry and multiple dry years
- Information to make the sufficiency findings required by the California Environment Quality Act (CEQA)

The City has commissioned the preparation of this WSA in its role as the lead agency under CEQA for various planned development projects.

2.0 APPROVAL PROCESS

The City Council may approve the WSA, after hearing testimony and evidence presented at a hearing. Upon conclusion of the hearing, the City Council may determine whether the projected water supplies will be sufficient to satisfy the proposed project demands. The City must include the assessment in the environmental documents prepared for the designated project pursuant to CEQA requirements.

3.0 SENATE BILL 610

Senate Bill 610 (SB 610) became effective January 1, 2002. SB 610 amended the California Public Resources Code to incorporate Water Code findings within the CEQA process for certain types of projects. SB 610 amended the Water Code to broaden the types of information included in Urban Water Management Plans (Water Code Section

10620 et. seq.) and to add Water Code part 2.10 Water Supply Planning to Support Existing and Planned Future Uses (Section 10910 et. seq.).

Water Code part 2.10 clarifies the roles and responsibilities of the Lead Agency under CEQA and the "water supplier" with respect to describing current and future supplies compared to current and future demands.

Part 2.10 also defines the "Projects" that are subject to a WSA and the Lead Agency's responsibilities related to the WSA. A WSA is required for the following:

- A proposed residential development of more than 500 dwelling units.
- A proposed shopping center or business establishment employing more than 1,000 people or having more than 500,000 square feet of floor space.
- A proposed commercial office building employing more than 1,000 people or having more than 250,000 square feet of floor space.
- A proposed hotel or motel, or both, having more than 500 rooms.
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 people, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
- A mixed-use development that includes one or more of the uses described above.
- A development that would demand an amount of water equivalent to or greater than the amount of water required by a 500-dwelling unit project.
- For Lead Agencies with fewer than 5,000 water service connections, any new development that will increase the number of water service connections in the service area by ten percent or more.

Under Part 2.10, the Lead Agency must identify the affected water supplier and research whether the new demands are included in the suppliers' UWMP. If the UWMP includes the demands it may be incorporated by reference. If not the Lead Agency must prepare the WSA (Water Code Section 10912(c)).

4.0 URBAN WATER MANAGEMENT PLANNING ACT

The Urban Water Management Planning Act requires the supplier to document water supplies available during normal, single dry, and multiple dry water years during a 20-year projection. The Act requires that the projected supplies and demands be presented in 5-year increments for the 20-year projection.

5.0 2000 URBAN WATER MANAGEMENT PLAN

The 2000 Urban Water Management Plan (UWMP), which was prepared by the City of Hanford after the adoption of SB 610, includes information required by SB 610, including the City's groundwater and recycled water supplies. The 2000 UWMP was adopted by the City of Hanford on January 20, 2004 and approved by the Department of Water Resources (DWR) on January 23, 2004. A correspondence dated January 23, 2004, indicates that it has completed the review of the City of Hanford 2000 UWMP and that it deemed it complete.

The 2000 UWMP includes the following elements: existing and future water demand projections, existing and future water supply facilities, existing and future demand versus supply comparison, groundwater basin conditions, water supply reliability, water demand management measures, water recycling, and water shortage contingency plan.

In order to comply with SB 610 requirements, the 2000 UWMP includes the following:

- A description of the water service area including climate, current and projected population and other demographic factors that affect water management planning. Demographic data is presented in 5-year increments for 20-years.
- A description and quantification of the existing and planned water sources.
- A description of the reliability and vulnerability of the water supply to seasonable or climatic shortages in the average water year, single dry water year and multiple dry water year. Contingency plans including demand management and conjunctive use potential are discussed.
- A description of current and projected water demands among all user classes in 5-year increments.
- A description of all water supply projects and water supply programs that may be undertaken by the City, the Agency and the Subregional Water Reclamation Project to meet the total projected water use.
- A description of demand management measures employed and scheduled to be employed.
- A description of any groundwater basin (or basins) from which the City pumps groundwater.
- Information that characterizes the condition of the groundwater basin and a description of the measures currently being taken by the City to minimize any potential for overdraft conditions occurring.

- A detailed description and analysis of the amount and location of groundwater pumped by the City for the past five years from any groundwater basin from which the proposed project will be supplied.

- An analysis of the location, amount, and sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed projects.

A copy of the City of Hanford 2000 UWMP can be obtained by contacting City staff.

6.0 WATER SYSTEM MASTER PLAN

The City's Water System Master Plan (WSMP), which was completed and adopted in 1996, presents historical and existing water demands, defines the criteria for projecting water demands through the year 2020, identifies existing and future water system capacity deficiencies, recommends projects to correct these deficiencies, and identifies major water facilities for servicing future developments. The WSMP also addresses the supply facilities, groundwater conditions, and includes a capital improvement program. This WSA extracts relevant information presented in the City's WSMP.

7.0 PROJECT DESCRIPTION

The Hanford Square Development Project (Project) is located within the western portion of the City of Hanford limits. The Project is located just north of Highway 198 between 12th and 13th Avenue (Figure 1). The Project area is approximately 214 acres in size.

The Project area contains eight land use designations that can be grouped into four primary designations: residential, commercial, industrial, and open space. Table 1 includes a breakdown of acreage contained within each land use designation. The Project proposes a total of 936 dwelling units within the residential land use designations. Maximum buildable area within the commercial and industrial land use designations is 75 percent of the 37 gross acres within these designations or approximately 28 acres.

8.0 PROJECT WATER REQUIREMENTS

Under Water Code Part 2.10, the Lead Agency must identify the affected water supplier and research whether the new demands are included in the suppliers' UWMP. If the UWMP includes the demands, then it may be incorporated by reference.

The subject Project site has been within the City's boundary since the 2000 UWMP was completed and adopted in January 2004. The projected water demands in the 2000 UWMP were based on assumptions documented in the City's Water System Master Plan. The 2000 UWMP, therefore, addressed the water supplies required for development on this property, based on the City's projected population element of the General Plan.

Table 1 Proposed Project by Land Use Designation Water Supply Assessment - Provisions of SB 610 Hanford Square Development Project City of Hanford		
Land Use	**Total Units (DU)**	**Acreage (Acres)**
Residential		
Low Density	452	79.2
High Density	441	28.7
Commercial		
Planned Commercial	--	15.0
Campus Office	--	16.4
Planned Office	--	18.5
Industrial		
Light Industrial	--	16.8
Open Space		
Basin A&B	--	17.7
Mixed Use		
Mixed Use	43	21.4
Total Project Area	**936**	**213.7**
Source: Hanford Development, Inc. February 2005		

The land use designations for the subject Project, summarized in Table 1, are similar to the land uses identified in the 2002 General Plan. These land uses included a mix of: very low, low and high density residential, planned commercial, office and public facilities uses.

The methodology used in projecting water demands in the 2000 UWMP were based on future trends in population obtained from the 2002 General Plan, and the established per-capita consumption rate of 215 gallons per day per capita (gpdc). The 2000 UWMP lists Citywide water requirements for 2005 at 11.1 MGD.

This analysis further evaluated the impact of the proposed Project to the Citywide water requirements. The methodology for estimating and projecting water demands in the 1996 WMP is typical of water master plans and was based on water demand coefficients. These coefficients are factors that vary depending on the land use types and are higher for land uses requiring larger amounts of water. The coefficients, which are usually expressed in gallons per day per acre, are applied to acres (based on their land use designation) for calculating the average water demands. This Project's water requirements are estimated at 0.40 MGD.

This WSA considers that the water demands associated with this Project have already been accounted for in the 2000 UWMP.

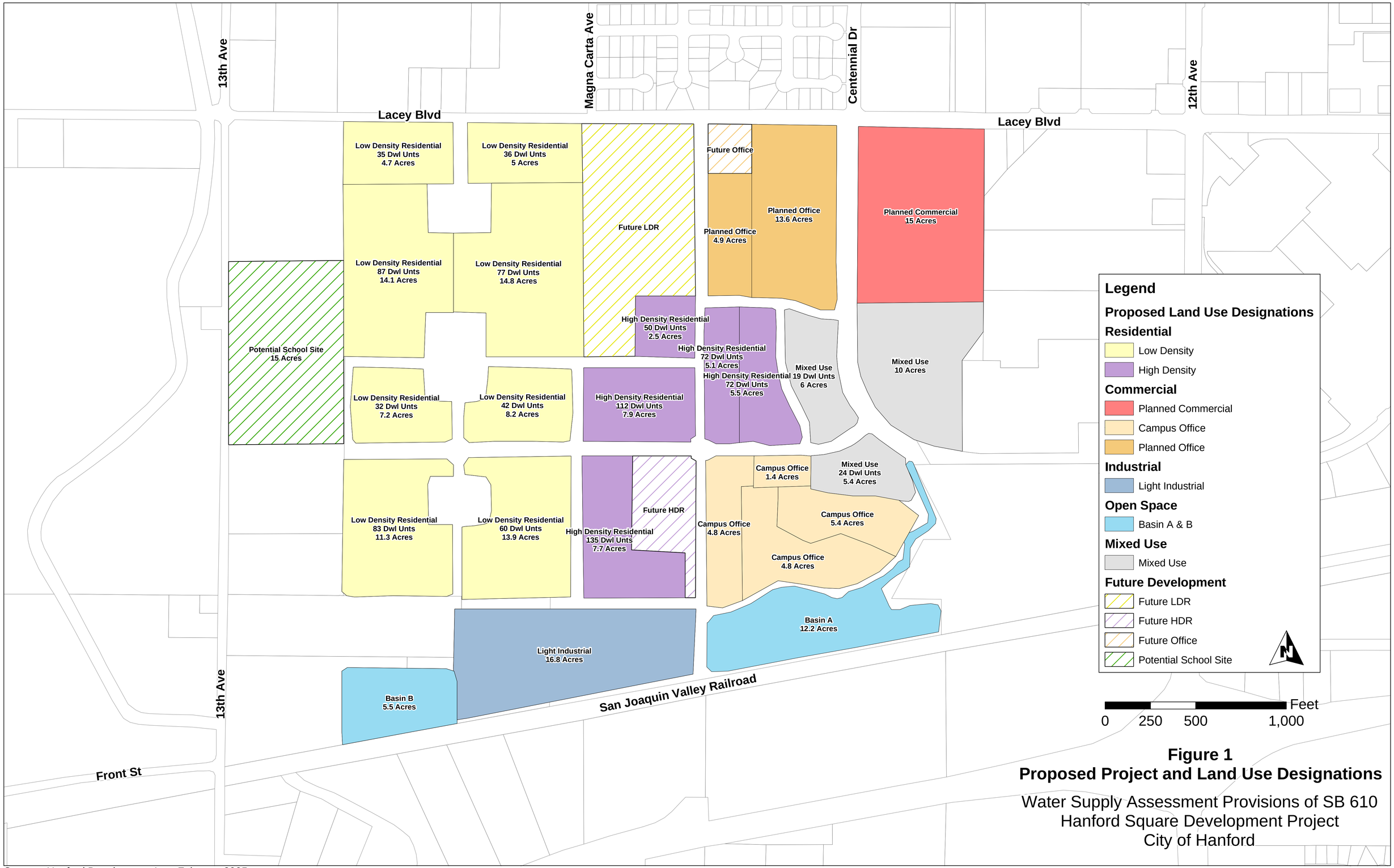

Figure 1
Proposed Project and Land Use Designations

Water Supply Assessment Provisions of SB 610
Hanford Square Development Project
City of Hanford

Source: Hanford Development Inc., February 2005

9.0 GROUNDWATER SUPPLY

The City currently utilizes local groundwater as its sole source of supply. The City's municipal water system extracts its water supply from underground aquifers via 17 active and one standby groundwater well scattered throughout the City. The total pumping capacity of the City wells is 31.6 million gallons per day (MGD) (21,955 gem). Water is conveyed from the wells to the consumers via a distribution system with pipe sizes ranging between 2- and 24-inches in diameter. The City maintains two storage reservoirs within the distribution system. There is one small-elevated tank and one ground level storage reservoir with a total capacity of 800,000 gallons.

10.0 GROUNDWATER BASIN

The groundwater basin underlying the City is the Tulare Lake Basin, which is part of the Tulare Lake Hydrologic Region. This region contains multiple interconnected subbasins that transmit, filter, and store water. These basins consist of the Kings, Kern, Kaweah, Tulare Lake, Tule, Westside, and Pleasant Valley groundwater basins.

The Tulare Lake Groundwater Basin is not an adjudicated groundwater basin, as defined by the California Water Plan Update, Bulletin 160-98, Figure 3-28 on page 3-54 and Table 316 on page 3-55.

The California Water Plan Update, Bulletin 160-98 page 3-50, Table 3-15, lists the 1995 Level Overdraft for the Tulare Lake Region at 820 thousand acre-feet (taf). As shown in Table 3-15, groundwater overdraft is expected to decline to 670 taf during the 2020 average and drought years. During drought periods, water levels in these regions may decline. However, during wet periods, most of these basins recover, thus making application of overdraft or perennial yield concepts difficult.

The Tulare Lake Subbasin is bounded on the south by the Kings-Kern county line, on the west by the California Aqueduct, the eastern boundary of Westside Groundwater Subbasin, and Tertiary marine sediment of the Kettleman Hills. It is bounded on the north by the southern boundary of the Kings Groundwater Subbasin, and on the east by the westerly boundaries of the Kaweah and Tule Groundwater Subbasins. The southern half of the Tulare Lake Subbasin consists of lands in the former Tulare Lakebed in Kings County.

According to DWR, estimations of the total storage capacity of the Tulare Lake Subbasin and the amount of water storage as of 1995 were calculated using an estimated specific yield of 8.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of the Tulare Lake Subbasin is estimated to be 17,100,000 af to a depth of 300 feet and 82,500,000 af to the base of fresh groundwater. These same calculations give an estimate of 12,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995. The amount of stored groundwater in this basin as of 1961 is 37,000,000 af to a depth of less than 1,000 feet. Kings County Water District's

(KCWD's) Groundwater Management Plan (GMP) provides an estimate of 8,900,000 af for the District area.

11.0 WATER SUPPLY RELIABILITY

The supply reliability is considered for the near-term needs (present to 2010) and the long term needs (beyond 2010). There are two aspects of supply reliability to be considered. The first relates to immediate service needs and is primarily a function of the availability and adequacy of the supply facilities. This aspect is considered for emergency reliability. The second aspect is climate-related, and involves the availability of water during mild or severe drought periods.

The annual quantity of available groundwater in the City is not expected to vary significantly in relation to wet or dry years, as shown in Table 2 for the estimated year 2020 Citywide supplies. This assumes that groundwater yield is not reduced due to water quality issues. During extended drought periods, groundwater levels generally decline and will require more aggressive demand management practices and continued implementation of recycled water. The reliability and vulnerability of the water supply to seasonal or climatic shortages remains constant.

Table 2 Water Supply Reliability
Water Supply Assessment - Provisions of SB 610
Hanford Square Development Project
City of Hanford

Supply Units	Average/Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
MGD	31.62	31.62	31.62	31.62	31.62
AFY	35,419	35,419	35,419	35,419	35,419

Note: Supply projections through the planning horizon of 2020.
Source: City of Hanford 2000 Urban Water Management Plan

12.0 SUPPLY AND DEMAND COMPARISON

Citywide comparisons of projected supplies and demands are shown on Table 3. The City currently has the water supply capabilities to meet MDD and to provide standby production capabilities, the supply capacity will consistently meet the demand requirements for any given year. Table 3 indicates a total demand of approximately 21,731 af projected for year 2020, compared with a projected supply capability for that same year of 58,023 af.

13.0 SUMMARY AND CONCLUSION

This water supply assessment (WSA) was prepared to assist the City of Hanford in satisfying the requirements of SB 610. The WSA included a review of the City's Urban

Water Management Plan, Water System Master Plan, and the Project's water requirements.

In accordance with this review, and supported by the conclusion drawn in Section 8, this WSA considers that the water demands associated with this project have already been accounted for in the 2000 UWMP.

Table 3 Projected Supply and Demand Comparison
Water Supply Assessment - Provisions of SB 610
Hanford Square Development Project
City of Hanford

Condition	Demand		Available Supply		Supply Deficit
	(AF)	(MGD)	(AF)	(MGD)	(MGD)
Near-Term					
Normal	10,641	9.5	35,397	31.6	none
Multi-year Drought					
Year 1	10,641	9.5	35,397	31.6	none
Year 2	10,641	9.5	35,397	31.6	none
Year 3	10,641	9.5	35,397	31.6	none
2005					
Normal	12,434	11.1	38,645	34.5	none
Multi-year Drought					
Year 1	12,434	11.1	38,645	34.5	none
Year 2	12,434	11.1	38,645	34.5	none
Year 3	12,434	11.1	38,645	34.5	none
2010					
Normal	15,570	13.9	45,142	40.3	none
Multi-year Drought					
Year 1	15,570	13.9	45,142	40.3	none
Year 2	15,570	13.9	45,142	40.3	none
Year 3	15,570	13.9	45,142	40.3	none
2015					
Normal	18,482	16.5	51,527	46.0	none
Multi-year Drought					
Year 1	18,482	16.5	51,527	46.0	none
Year 2	18,482	16.5	51,527	46.0	none
Year 3	18,482	16.5	51,527	46.0	none
2020					
Normal	21,731	19.4	58,023	51.8	none
Multi-year Drought					
Year 1	21,731	19.4	58,023	51.8	none
Year 2	21,731	19.4	58,023	51.8	none
Year 3	21,731	19.4	58,023	51.8	none

Note: Supply projections assume that groundwater yield is not being reduced due to water quality issues.
Source: City of Hanford 2000 Urban Water Management Plan

APPENDIX J - WATER SUPPLY ASSESSMENT PROVISIONS OF SB 610 LONE OAK (LIVE OAK) DEVELOPMENT

City of Hanford

Water Supply Assessment
Provisions of SB 610

LONE OAK DEVELOPMENT PROJECT

REVISED FINAL

May 2005

7580 NORTH INGRAM AVENUE, SUITE 112 • FRESNO, CALIFORNIA 93711 • (559) 436-6616 • FAX (559) 436-1191
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CITY OF HANFORD

WATER SUPPLY ASSESSMENT
PROVISIONS OF SB 610

LONE OAK DEVELOPMENT PROJECT

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WATER SUPPLY ASSESSMENT - PROVISIONS OF SB 610 LONE OAK DEVELOPMENT PROJECT

1.0 PURPOSE

This Water Supply Assessment (WSA) was prepared to assist the City of Hanford (City) in satisfying the requirements of Senate Bill 610 (SB 610). This WSA is specific to the Lone Oak Development Project (Project) and addresses the potential impact of the Project's water requirements on the citywide water supply conditions. This WSA includes the following:

- Information on the City's water supplies consistent with Water Code Sections 10620 et. seq. (the Urban Water Management Planning Act) and 10910 et. seq. (Water Supply Planning to Support Existing and Planned Future Users)
- Information on current water demands and projected water demands, based on the City's adopted General Plan and specific project proposals currently under review by the City
- Comparison of water supplies and water demands for normal, single dry and multiple dry years
- Information to make the sufficiency findings required by the California Environment Quality Act (CEQA)

The City has commissioned the preparation of this WSA in its role as the lead agency under CEQA for various planned development projects.

2.0 APPROVAL PROCESS

The City Council may approve the WSA, after hearing testimony and evidence presented at a hearing. Upon conclusion of the hearing, the City Council may determine whether the projected water supplies will be sufficient to satisfy the proposed project demands. The City must include the assessment in the environmental documents prepared for the designated project pursuant to CEQA requirements.

3.0 SENATE BILL 610

Senate Bill 610 (SB 610) became effective January 1, 2002. SB 610 amended the California Public Resources Code to incorporate Water Code findings within the CEQA process for certain types of projects. SB 610 amended the Water Code to broaden the types of information included in Urban Water Management Plans (Water Code

Section 10620 et. seq.) and to add Water Code part 2.10 Water Supply Planning to Support Existing and Planned Future Uses (Section 10910 et. seq.).

Water Code part 2.10 clarifies the roles and responsibilities of the Lead Agency under CEQA and the "water supplier" with respect to describing current and future supplies compared to current and future demands.

Part 2.10 also defines the "Projects" that are subject to a WSA and the Lead Agency's responsibilities related to the WSA. A WSA is required for the following:

- A proposed residential development of more than 500 dwelling units.
- A proposed shopping center or business establishment employing more than 1,000 people or having more than 500,000 square feet of floor space.
- A proposed commercial office building employing more than 1,000 people or having more than 250,000 square feet of floor space.
- A proposed hotel or motel, or both, having more than 500 rooms.
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 people, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
- A mixed-use development that includes one or more of the uses described above.
- A development that would demand an amount of water equivalent to or greater than the amount of water required by a 500-dwelling unit project.
- For Lead Agencies with fewer than 5,000 water service connections, any new development that will increase the number of water service connections in the service area by ten percent or more.

Under Part 2.10, the Lead Agency must identify the affected water supplier and research whether the new demands are included in the suppliers' Urban Water Management Plan (UWMP). If the UWMP includes the demands it may be incorporated by reference. If not the Lead Agency must prepare the WSA (Water Code Section 10912(c)).

4.0 URBAN WATER MANAGEMENT PLANNING ACT

The Urban Water Management Planning Act requires the supplier to document water supplies available during normal, single dry, and multiple dry water years during a 20-year projection. The Act requires that the projected supplies and demands be presented in 5-year increments for the 20-year projection.

5.0 2000 URBAN WATER MANAGEMENT PLAN

The 2000 Urban Water Management Plan (UWMP), which was prepared by the City after the adoption of SB 610, includes information required by SB 610, including the City's groundwater and recycled water supplies. The 2000 UWMP was adopted by the City on January 20, 2004 and approved by the Department of Water Resources (DWR) on January 23, 2004. A correspondence dated January 23, 2004, indicates that it has completed the review of the City of Hanford 2000 UWMP and that it deemed it complete.

The 2000 UWMP includes the following elements: existing and future water demand projections, existing and future water supply facilities, existing and future demand versus supply comparison, groundwater basin conditions, water supply reliability, water demand management measures, water recycling, and water shortage contingency plan.

In order to comply with SB 610 requirements, the 2000 UWMP includes the following:

- A description of the water service area including climate, current and projected population and other demographic factors that affect water management planning. Demographic data is presented in 5-year increments for 20-years.
- A description and quantification of the existing and planned water sources.
- A description of the reliability and vulnerability of the water supply to seasonable or climatic shortages in the average water year, single dry water year and multiple dry water year. Contingency plans including demand management and conjunctive use potential are discussed.
- A description of current and projected water demands among all user classes in 5-year increments.
- A description of all water supply projects and water supply programs that may be undertaken by the City, the Agency and the Subregional Water Reclamation Project to meet the total projected water use.
- A description of demand management measures employed and scheduled to be employed.
- A description of any groundwater basin (or basins) from which the City pumps groundwater.
- Information that characterizes the condition of the groundwater basin and a description of the measures currently being taken by the City to minimize any potential for overdraft conditions occurring.
- A detailed description and analysis of the amount and location of groundwater pumped by the City for the past five years from any groundwater basin from which the proposed project will be supplied.

- An analysis of the location, amount, and sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed projects.

A copy of the City of Hanford 2000 UWMP can be obtained by contacting City staff.

6.0 WATER SYSTEM MASTER PLAN

The City's Water System Master Plan (WSMP), which was completed and adopted in 1996, presents historical and existing water demands, defines the criteria for projecting water demands through the year 2020, identifies existing and future water system capacity deficiencies, recommends projects to correct these deficiencies, and identifies major water facilities for servicing future developments. The WSMP also addresses the supply facilities, groundwater conditions, and includes a capital improvement program. This WSA extracts relevant information presented in the City's WSMP.

7.0 PROJECT DESCRIPTION

The Project is located southwest of the City, north of the Houston Avenue and 12th Avenue intersection (Figure 1). The Peoples Ditch crosses through the property and divides the project site east and west. The project site is contained within the Planning Boundary of the 2002 General Plan. The Project area contains five land use designations that can be grouped into two primary designations: residential and public facilities. Table 1 includes a breakdown of acreage contained within each land use designation. The Project proposes a total of 1,561 dwelling units within the residential and 40.1 acres of public facilities land use designation.

Table 1 Proposed Project by Land Use Designation
Water supply Assessment - Provisions of SB 610
Lone Oak Development Project
City of Hanford

Land Use	Total Units (DU)	Acreage (Acres)
Residential		
Very Low Density	82	55.8
Low Density	1,432	306.0
Medium Density	47	5.2
Public Facilities		
Parks	-	17.4
Open space	-	22.7
Total Project Area	**1,561**	**407.1**

Source: RRM Design Group, May 2005

Hanford-Armona Rd

Legend

NTS

City Limits

Sphere of Influence

General Plan Land Use

Residential

Very Low Density

Low Density

Medium Density

Public

Public Facility

Lone Oak Development

Feet

0 250 500 1,000

12th Ave

Hanford-Armona Rd

11th Ave

Medium Density Residential (MD)
5.2 Acres
47 Dwl Unts

Hume Ave

Lone Oak Slough

Low Density Residential (LDR)
306.0 Acres
1,432 Dwl Unts

People's Ditch

Sand Slough

11th Ave

Public Facility (PF)
40.1 Acres

Very Low Density Residential (VLD)
55.8 Acres
82 Dwl Unts

Houston Ave

Houston Ave

12th Ave

Figure 1
Proposed Project and General Plan Land Use Designations

Water Supply Assessment Provisions of SB 610
Lone Oak Development Project
City of Hanford

Sources: RRM Design Group & City of Hanford General Plan

8.0 PROJECT WATER REQUIREMENTS

Under Water Code Part 2.10, the Lead Agency must identify the affected water supplier and research whether the new demands are included in the suppliers' UWMP. If the UWMP includes the demands, then it may be incorporated by reference.

The subject Project site has been within the City's boundary since the 2000 UWMP was completed and adopted in January 2004. The projected water demands in the 2000 UWMP were based on assumptions documented in the City's Water System Master Plan. The 2000 UWMP, therefore, addressed the water supplies required for development on this property, based on the City's projected population element of the General Plan.

The land use designations for the subject Project, summarized in Table 1, are similar to the land uses identified in the 2002 General Plan. These land uses included a mix of: very low, low and medium density residential, parks and open space uses.

The methodology used in projecting water demands in the 2000 UWMP were based on future trends in population obtained from the 2002 General Plan, and the established per-capita consumption rate of 215 gallons per day per capita (gpdc). The 2000 UWMP lists City-wide water requirements for 2005 at 11.1 million gallons per day (MGD).

This analysis further evaluated the impact of the proposed Project to the City-wide water requirements. The methodology for estimating and projecting water demands in the 1996 WMP is typical of water master plans and was based on water demand coefficients. These coefficients are factors that vary depending on the land use types and are higher for land uses requiring larger amounts of water. The coefficients, which are usually expressed in gallons per day per acre, are applied to acres (based on their land use designation) for calculating the average water demands. This Project's water requirements are estimated at 0.61 MGD (425 gpm).

This WSA considers that the water demands associated with this Project have already been accounted for in the 2000 UWMP.

9.0 GROUNDWATER SUPPLY

The City currently utilizes local groundwater as its sole source of supply. The City's municipal water system extracts its water supply from underground aquifers via 17 active and one standby groundwater well scattered throughout the City. The total pumping capacity of the City wells is 31.6 MGD (21,955 gpm). Water is conveyed from the wells to the consumers via a distribution system with pipe sizes ranging between 2- and 24-inches in diameter. The City maintains two storage reservoirs within the distribution system. There is one small-elevated tank and one ground level storage reservoir with a total capacity of 800,000 gallons.

10.0 GROUNDWATER BASIN

The groundwater basin underlying the City is the Tulare Lake Basin, which is part of the Tulare Lake Hydrologic Region. This region contains multiple interconnected subbasins that transmit, filter, and store water. These basins consist of the Kings, Kern, Kaweah, Tulare Lake, Tule, Westside, and Pleasant Valley groundwater basins.

The Tulare Lake Groundwater Basin is not an adjudicated groundwater basin, as defined by the California Water Plan Update, Bulletin 160-98, Figure 3-28 on page 3-54 and Table 316 on page 3-55.

The California Water Plan Update, Bulletin 160-98 page 3-50, Table 3-15, lists the 1995 Level Overdraft for the Tulare Lake Region at 820 thousand acre-feet (taf). As shown in Table 3-15, groundwater overdraft is expected to decline to 670 taf during the 2020 average and drought years. During drought periods, water levels in these regions may decline. However, during wet periods, most of these basins recover, thus making application of overdraft or perennial yield concepts difficult.

The Tulare Lake Subbasin is bounded on the south by the Kings-Kern county line, on the west by the California Aqueduct, the eastern boundary of Westside Groundwater Subbasin, and Tertiary marine sediment of the Kettleman Hills. It is bounded on the north by the southern boundary of the Kings Groundwater Subbasin, and on the east by the westerly boundaries of the Kaweah and Tule Groundwater Subbasins. The southern half of the Tulare Lake Subbasin consists of lands in the former Tulare Lakebed in Kings County.

According to DWR, estimations of the total storage capacity of the Tulare Lake Subbasin and the amount of water storage as of 1995 were calculated using an estimated specific yield of 8.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of the Tulare Lake Subbasin is estimated to be 17,100,000 af to a depth of 300 feet and 82,500,000 af to the base of fresh groundwater. These same calculations give an estimate of 12,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995. The amount of stored groundwater in this basin as of 1961 is 37,000,000 af to a depth of less than 1,000 feet. Kings County Water District's (KCWD's) Groundwater Management Plan (GMP) provides an estimate of 8,900,000 af for the District area.

11.0 WATER SUPPLY RELIABILITY

The supply reliability is considered for the near-term needs (present to 2010) and the long-term needs (beyond 2010). There are two aspects of supply reliability to be considered. The first relates to immediate service needs and is primarily a function of the availability and adequacy of the supply facilities. This aspect is considered for emergency reliability. The second aspect is climate-related, and involves the availability of water during mild or severe drought periods.

The annual quantity of available groundwater in the City is not expected to vary significantly in relation to wet or dry years, as shown in Table 2 for the estimated year 2020 citywide supplies. This assumes that groundwater yield is not reduced due to water quality issues. During extended drought periods, groundwater levels generally decline and will require more aggressive demand management practices and continued implementation of recycled water. The reliability and vulnerability of the water supply to seasonal or climatic shortages remains constant.

Table 2 Water Supply Reliability
Water Supply Assessment - Provision of SB 610
Lone Oak Development Project
City of Hanford

Supply Units	Average/Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
MGD	31.62	31.62	31.62	31.62	31.62
AFY	35,419	35,419	35,419	35,419	35,419

Note: Supply projections through the planning horizon of 2020.
Source: City of Hanford 2000 Urban Water Management Plan.

12.0 SUPPLY AND DEMAND COMPARISON

Citywide comparisons of projected supplies and demands are shown on Table 3. The City currently has the water supply capabilities to meet maximum daily demand (MDD) and to provide standby production capabilities, the supply capacity will consistently meet the demand requirements for any given year. Table 3 indicates a total demand of approximately 21,731 af projected for year 2020, compared with a projected supply capability for that same year of 58,023 af.

13.0 SUPPLY AND DEMAND COMPARISON

This Water Supply Assessment (WSA) was prepared to assist the City of Hanford in satisfying the requirements of SB 610. The WSA included a review of the City's Urban Water Management Plan Water System Master Plan, and this Project's water requirements.

In accordance with this review, and supported by the conclusion drawn in Section 8.0, this WSA considers that the water demands associated with this project have already been accounted for in the 2000 UWMP.

Table 3 Projected Supply and Demand Comparison
Water Supply Assessment - Provisions of SB 610
Lone Oak Development Project
City of Hanford

Condition	Demand		Available Supply		Supply Deficit
	(AF)	(MGD)	(AF)	(MGD)	(MGD)
Near-Term					
Normal	10,641	9.5	35,397	31.6	none
Multi-year Drought					
Year 1	10,641	9.5	35,397	31.6	none
Year 2	10,641	9.5	35,397	31.6	none
Year 3	10,641	9.5	35,397	31.6	none
2005					
Normal	12,434	11.1	38,645	34.5	none
Multi-year Drought					
Year 1	12,434	11.1	38,645	34.5	none
Year 2	12,434	11.1	38,645	34.5	none
Year 3	12,434	11.1	38,645	34.5	none
2010					
Normal	15,570	13.9	45,142	40.3	none
Multi-year Drought					
Year 1	15,570	13.9	45,142	40.3	none
Year 2	15,570	13.9	45,142	40.3	none
Year 3	15,570	13.9	45,142	40.3	none
2015					
Normal	18,482	16.5	51,527	46.0	none
Multi-year Drought					
Year 1	18,482	16.5	51,527	46.0	none
Year 2	18,482	16.5	51,527	46.0	none
Year 3	18,482	16.5	51,527	46.0	none
2020					
Normal	21,731	19.4	58,023	51.8	none
Multi-year Drought					
Year 1	21,731	19.4	58,023	51.8	none
Year 2	21,731	19.4	58,023	51.8	none
Year 3	21,731	19.4	58,023	51.8	none

Note: Supply projections assume that groundwater yield is not being reduced due to water quality issues.

Source: City of Hanford 2000 Urban Water Management Plan

APPENDIX K - CITY OF HANFORD MUNICIPAL CODE WATER SERVICE SYSTEM

Chapter 13.04

WATER SERVICE SYSTEM

Sections:

Section 13.04.010 Definitions.

For the purpose of this chapter, certain words and phrases used in this chapter are defined as follows:

"Customer" means any person or entity, including without limitation, the city, the state of California, the United States of America and any department or agency thereof, billed for water furnished by the water division of the city.

"Commercial service" means the furnishing of water to premises where the customer is engaged in trade or business.

"Commercial service" means the furnishing of water to premises where the customer is engaged in trade or business.

"Domestic service" means the furnishing of water for household residential purposes, including water used for sprinkling lawns, gardens and shrubbery, for washing vehicles, for cooling homes and for other similar and customary domestic purposes.

"Flat rate service" means furnishing of water in unmeasured quantities and allowed only as specified in this chapter.

"Industrial service" means the furnishing of water to premises for use by a customer in manufacturing or processing activities.

"Meter rate service" means the furnishing of water by measured quantities.

"Premises" means any lot, piece or parcel of land or any building or other structure having a connection with the water system of the city.

"Private fire protection service" means any water line connected to the water system for the sole use of fire prevention. An individual water meter shall be required on each fire protection service.

"Waste of water" means the improper use of, excessive use of or unlawful use of water supplied by the city.

"Water division" means that division of the city public works department designated to administer the water system of the California Water Service Company purchased by the city effective January 9, 1958. "Water division" shall include the superintendent and other employees of the city

serving in the water division.

"Water system" means the water business purchased by the city from the California Water Service Company effective January 9, 1958, together with such additions and improvements thereto as may be made from time to time. (Prior code § 6-6.01)

Section 13.04.020 Services offered.

A. New applicants for domestic service which is an existing nonmetered service may select to maintain the service as unmetered and pay the established unmetered flat rate. Once an applicant or customer has exercised its option to be served by either a flat or metered rate, it shall agree, while it remains a customer, to accept service under its selected rate schedule. All new connections to the water system shall be metered with a meter of at least three-quarters inch in size and installation of such meters shall be at the sole cost and expense of the applicant.

1. If the customer requests a conversion from flat rate service to metered service, the city will install the meter and bill the customer for one-half of the total labor and material costs for the installation of such meter. The customer shall pay the full amount of said billing within thirty (30) days of the date of the billing statement.

2. Should a customer remodel, modify, change or alter its premises and the cost of such remodeling, modification, change or alteration exceeds five thousand dollars ($5,000.00), the city shall install a water meter to measure water use by the customer at the premises. The applicant shall pay fifty (50) percent of the total cost of the purchase and installation of the meter, including without limitation, the cost of the meter-box. The customer shall pay said amount within thirty (30) days of the date of a billing statement from the city.

3. Should at any time, any federal, state or local law, regulation or ordinance mandate the installation of water meters for any type of water use, including, without limitation, the installation of water meters on currently unmetered service connections, then on the date any such federal, state or local law, regulation or ordinance is passed, adopted or enacted, the installation of water meters as required by such federal, state or local law, regulation or ordinance, or if requested by a customer, shall be at the sole cost and expense of the owner of the real property upon which the meter is to be installed.

4. If a customer's premises is demolished, destroyed or removed from the real property upon which it is located, reconnection to the water system shall require a meter and all costs shall be borne by the applicant.

5. Subdivisions (1), (2) and (3) above shall also apply to any premises located outside of the city limits, but within a county area receiving water service from the city.

B. Applicants for commercial service or industrial service shall be served under metered rates.

C. The water division shall furnish water at customer service connections at such pressure as may be available from time to time in the normal operation of the water division. (Prior code § 6-6.02)
(04-03, Amended, 04/06/2004)

Section 13.04.030 Applications for service--Establishment of credit.

A. Each applicant for water service may be required to establish credit before receiving service. Credit shall be deemed established if the applicant meets any one of the following conditions:

1. If the applicant makes a cash advance payment in the amount of one month's flat rate service or, if on service by meter, the applicant makes a cash deposit equal to twice the estimated average monthly meter bill; or

2. If the applicant has been a customer of the water division during the previous twelve (12) month period and has paid all water bills satisfactorily during such period.

B. All deposits made with the water division to establish credit shall be deposited in a

special fund and may be applied by the water division to a customer's unpaid bills for water service when service is discontinued. Such deposit, without interest, shall be refunded to a customer who has paid all bills for water service without delinquency for the previous twelve (12) consecutive months.

C. The water division shall furnish temporary service, if feasible, to any applicant on the following conditions:

1. That the applicant be required to pay in advance the estimated cost of installing and removing the facilities necessary to furnish the service; and

2. That the applicant be required to establish credit in the manner provided in subsection A of this section. (Prior code § 6-6.03)

Section 13.04.040 Water charges and rates.

A. Purpose. Charges and rates to pay the cost of operation, maintenance, debt service, equipment replacement, expansion and administration of the city water system, including without limitation, the city cross-connection program identified in Chapter 13.16 of the Hanford Municipal Code, shall be levied against all customers of the city water system. The charges and rates shall be calculated in accordance with the provisions of this Chapter 13.04 and Chapter 13.16 of the Hanford Municipal Code and shall be adopted by resolution of the city council. Costs of the city water system shall include, without limitation, the following items:

1. Sufficient financing for an adequate operation and maintenance program, including without limitation, competent operating and management personnel;

2. Funds to be reserved for necessary future replacements, improvements, and expansions of the facilities; and

3. Funds to cover all debt service incurred in the maintenance, operation, replacements, improvements, expansions and management of the facilities.

B. Water Service Charges. The structure of the charges shall be as follows:

1. Meter rate services;

2. Residential flat rate service;

3. Private fire protection service.

C. Charges and Rates Outside the City Limits. For all her connections serving premises located outside the city limits, the rates to be charged a customer shall be one and one-half times the calculated meter rate for metered services and one and one-half times the established flat rate for unmetered services. Included in such rates are additional charges for the following conditions:

1. Every user of water outside the limits of the city who shall have an evaporative cooler which does not have a recirculating pump connected to it and as a part thereof;

2. Every user of water outside the limits of the city who has a water cooled refrigeration unit which is not properly connected to a cooling tower designed and used for the purpose of reusing the same watering such refrigeration unit. (Prior code § 6-6.04)

(99-01, Amended, 03/17/1999)

Section 13.04.050 Delinquencies and Collections

1. Water service charges, connection fees, and other charges identified in this chapter shall be collected by the director of finance.

2. Flat rate water service charges shall be billed monthly with other city utilities. All water service charges shall be earned as of the day of each month of service, regardless of the date of the termination of water service, and no rebates shall be made for midmonth disconnections.

3. Water service charges based on metered water use shall be billed monthly with other city utilities.

4. All other fees and charges not listed in paragraphs 2 and 3 of this Section 13.04.050 shall

be paid as set forth in this chapter. Fees and charges not requiring prepayment or payment at the time of issuance shall be included on the next monthly city utility bill to the customer.

Delinquencies.

1. Penalty Fees. In the event any customer fails to pay the water service charges, connection fees, and other required charges and fees identified in this Section 13.04.050 within fifteen (15) days after the date of the applicable city utility bill, the city may assess a basic penalty for late payment in the amount of ten percent (10%) of the delinquent water related charges and fees which amount shall be added to the delinquent charges and fees, and the director of finance shall collect the basic penalty along with the delinquent charges and fees.

The city may also assess an additional penalty, not exceeding one and one-half (1-1/2) percent per month for nonpayment of the delinquent charges and fees and nonpayment of basic penalties.

2. Discontinuance of Service. In the event any customer fails to pay any charges or fees described in this chapter, including any penalty or fee, within fifteen (15) days after the date of the applicable city utility bill, the city, in addition to all other remedies it may have, may discontinue furnishing water service and all other services identified on the applicable city utility bill and shall not resume the same until all charges and fees, together with any penalties, service charges or connection fees necessitated by the resumption of water service, have been paid in full.

Prior to discontinuing all services identified on the applicable city utility bill, the city shall send written notice to the customer advising the customer that all utilities identified in the applicable city utility bill will be discontinued if payment of the total amount identified in said written notice is not paid to the city within ten (10) days after the date of said written notice.

3. Court Action. In addition to the discontinuing all utilities identified on the applicable city utility bill, the city may file a civil action against the customer for the collection of any amount due and unpaid. Such remedy shall be cumulative and in addition to any other remedy provided in this chapter or by law.

4. Notice of Liens. In the event a customer fails to pay, in full, all charges, fees or penalties identified in this chapter within ninety (90) days of the date of any city utility bill, the city shall notify the owner of the real property receiving the water service, in writing, of such delinquency and that the delinquency shall be collected pursuant to the provisions of paragraph 5 of this chapter 13.04.050.

5. Lien Proceedings. In the alternative to filing a civil action against the customer, the city council, pursuant to the applicable provisions of the California Health and Safety Code, may elect to have all delinquent charges, fees and penalties collected on the tax roll in the same manner, at the same time and by the same persons together with and not separately from general taxes. Such delinquent charges, fees and penalties shall thereafter constitute a lien against the lot or parcel of land against which the charges have been imposed.

6. Restoration of Service. The utilities identified on the city utility bill shall not be restored until all charges, fees and penalties, including without limitation, all expenses of removal, discontinuance, disconnection, restoration and reconnection have been paid.

7. The city may discontinue water service without notice to the customer when the apparatus, appliances or equipment using water, in the sole opinion of the city, is found to be dangerous or unsafe. The city shall promptly notify the customer of the reasons for the discontinuance and the corrective action to be taken by the customer before service can be restored.

8. The city may discontinue service without notice to any customer when the use of water thereon by the apparatus, appliances, equipment or otherwise is found by the city in its sole discretion, to be detrimental or injurious to water service furnished to other customers. The city shall promptly notify the customer of the reasons for the discontinuance and the corrective action to be taken by the customer before service can be restored.

9. The city may discontinue water service without notice to any customer when it is determined by the city in its sole discretion, that the customer has obtained water service by fraudulent means or has diverted the water service for unauthorized use. The city shall not restore service until the customer has complied with all the rules and regulations of the city and the city has been reimbursed for

the full amount of the service rendered and the actual cost to the water division incurred by reason of such fraudulent use. (Prior code § 6-6.05)
(05-11, Amended, 09/06/2005)

Section 13.04.060 Voluntary discontinuance of service.

A customer may have his water service discontinued by giving notice to the water division not less than two days before the effective date. Such customer shall be required to pay all water charges until the effective date identified in such notice. When such notice is not given, the customer shall be required to pay for water service until two business days after the water division has knowledge that the customer vacated the premises or otherwise has discontinued water service. (Prior code § 6-6.06)

Section 13.04.070 Reconnection charges.

A. The water division may charge for restoring water service which has been discontinued for noncompliance with the provisions of this chapter:

B. Water reconnection charges shall be established by separate council resolution. (Prior code § 6-6.07)

Section 13.04.080 Right to refuse service.

The water division may refuse to provide water service to any person or entity if the requested water service is not in accordance with the provisions of this chapter. (Prior code § 6-6.08)

Section 13.04.090 Free rates unlawful.

No water service shall be furnished to any customer free of charge. (Prior code § 6-6.09)

Section 13.04.100 Resale of water.

Except by special agreement with the water division, no customer shall resell any water furnished by the water division to the customer. (Prior code § 6-6.10)

Section 13.04.110 Billing.

A. All water charges shall be due at the finance department upon the receipt of the bill and shall become delinquent fifteen (15) days after the date of the bill. All bills for water charges shall be rendered monthly. Meters shall be read at regular intervals for the preparation of regular metered service bills and as required for the preparation of closing bills. Should a monthly billing period contain less than twenty-seven (27) days or more than thirty-three (33) days, a pro rata correction in the bill shall be made. Proportional adjustments shall be made when other billing periods are used.

B. Opening bills, closing bills and other bills requiring proration shall be computed in accordance with the applicable schedule prorated on the basis of the number of days in the period to a thirty (30) day month. A minimum charge of twenty dollars ($20.00) will be made to any customer for service. When an applicant other than the original customer requests a water connection at the same location within one month after the date of the original application, the bill of the original customer shall be prorated for the period his service was connected. (Prior code § 6-6.11)

Section 13.04.120 Service interruptions.

The water division shall exercise reasonable diligence to provide continuous and adequate water service to customers but cannot guarantee complete freedom from interruption. The water division shall have the right to suspend water service temporarily to make necessary repairs or improvements to the water system. In the event of such temporary suspension of service, the water division shall notify the customers affected as soon as circumstances permit and shall prosecute the work of repair or improvement with due diligence and with the least possible inconvenience to the customers. The water division shall not be liable for interruptions, shortages or the insufficiency of the water supply or water pressure or any loss or damage occasioned thereby. The water division shall not be responsible for the installation or maintenance of any water line beyond the end of its service lines at the meter connection or curb stop as defined by the city's standard construction specifications. (Prior code § 6-6.12)

Section 13.04.130 Refund agreements.

A. Refund Agreements/Water Main Construction Reimbursement Other Than Oversizing. If a customer constructs and installs a water main pipeline having a size of eight (8) inches or smaller and the city determines that the water main pipeline constructed and installed by the customer will provide water service to other property owners whose property is adjacent to the water main pipeline, subject to the provisions of a reimbursement agreement approved by the Hanford City Council, the city will reimburse the customer, based upon a front foot charge, an amount not to exceed one-half of the actual cost paid by the customer for the construction and installation of the water main pipeline. No reimbursement shall be provided for either upline extensions or lateral extensions of the water main pipeline. As connection is made to the water main pipeline by other customers, a reimbursement amount, including interest, at a rate equal to the Local Agency Investment Fund ("LAIF") interest rate in effect on the date of execution of the reimbursement agreement by the city, shall be collected by the city from the connecting customers and held in accordance with the terms and conditions of the reimbursement agreement. It shall be the sole responsibility of the customer who is a party to the reimbursement agreement to request payment of the funds received by the city from the other customers connecting into the water main pipeline. The maximum term of any reimbursement agreement shall be for a period of ten (10) years and any and all claims for reimbursement by the customer must be made within one year after th date of expiration of the reimbursement agreement. Should no request for reimbursement be made within said one (1) year period, the funds held by the city pursuant to the terms and conditions of the reimbursement agreement may be used by the city for water system purposes as determined by the city with no further obligation to the customer.

(Prior code § 6-6.13)

(99-01, Amended, 03/16/1999)

Section 13.04.131 Refund agreements/water main construction by the City of Hanford

Should the City of Hanford ("City") construct and install a water main pipeline which will provide water service to property owners/customers whose property is adjacent to or across the street from the water main pipeline, each such property owner/customer shall reimburse the City, based upon a front footage charge as determined by the City, the actual cost paid by the City for the construction and installation of an eight inch water main pipeline plus the cost of engineering and administrative services incurred by the City in the construction and installation of the eight inch water main pipeline, exclusive of oversizing as identified in Section 13.04.140 of the Chapter. Before connection is made to the water main pipeline, by the property owner/customer, a reimbursement amount, as determined by the City, including interest, at a rate equal to the Local Agency Investment Fund ("LAIF") interest rate in effect on the date of the final payment made by the City for the construction and installation of the water main pipeline, shall be paid by the property owner/customer to the City. The City's right to receive reimbursement shall

be for a period of ten (10) years after the date of the filing of the Notice of Completion for the construction and installation of the water main pipeline and any and all claims for reimbursement by the City must be made within one (1) year after the date of expiration of said ten (10) year period.
(00-04, Added, 05/01/2001)

Section 13.04.140 Oversized water mains.

The city shall have the right to require a customer to construct an oversized water main pipeline. if the city requires a customer to construct an oversized water main pipeline, the city shall reimburse the customer the actual cost paid by the customer for the oversizing in accordance with the provisions of Chapter 15.49 of the Hanford Municipal Code. Only water main pipelines larger than eight (8) inches in internal diameter shall be considered oversized; however, if a customer requires a water main pipeline larger than eight (8) inches for its own purposes, the oversized water main pipeline constructed and installed by the customer will be considered the size required to serve that customer. The city engineer is hereby empowered to make the determination as to how much, if any, oversizing is required and is also empowered to determine the difference in cost between the actual construction and installation cost and the average cost of pipeline. The decisions made by the city engineer shall be binding and conclusive on the customer.
(Prior code § 6-6.14)
(99-01, Amended, 03/16/1999)

Section 13.04.150 Water use.

A. Unlawful Acts. In the use of water supplied by the city no person shall:

1. Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation except on the following designated days: Properties with even-numbered addresses, Tuesday, Thursday and Saturday. Properties with odd-numbered address, Wednesday, Friday and Sunday; or

2. Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation or wash any type of vehicle, boat or trailer on Monday; or

3. Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation on any day of the week between the hours of ten a.m. and six p.m. during periods designated as "daylight savings time" (generally occurring between April 15th and October 15th): or

4. Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation except by the use of a hand-held hose, a sprinkling device or an approved sprinkling system; or

5. Keep, maintain, operate or use any water connection, hose, faucet, hydrant, pipe, outlet or plumbing fixture which is not tight and free from leakage or dripping; or

6. Sprinkle, irrigate or otherwise apply water to any yard, ground, premises or vegetation between the hours of twelve midnight and five a.m. unless the water device used to apply such water is controlled by an automatic shut-off device or a person is in immediate attendance of the watering device; or

7. Allow excessive water to run or waste from his property on to sidewalks, streets or adjoining or adjacent property; or

8. Use water for sidewalk, driveway or walkway washing or cleaning, except that a business may apply water to paved areas of the business premises in order to maintain the same in a clear and sanitary condition; or

9. Willfully or negligently waste water in any manner.

B. Violations--Notices--Penalties. The violation of any provisions of subsection A of this section shall result in the following actions by the city:

(Flat Rate Customers)

1. First Violation. A verbal warning of the violation shall be issued by the public works

department personnel or police department to the respective water customer of the city.

2. Second Violation. A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the city.

3. Third Violation. A written notice of the violation shall be issued by the public works department personnel or police department to the respective water customer of the city and a charge of fifteen dollars ($15.00) shall be added to the next water bill of such customer as a one time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.

4. Fourth Violation. A written notice of the violation shall be issued by the public works department personnel or the police department to the respective water customer of the city and a water meter shall be installed by the city to meter all water use upon the real property where the violation occurred. All costs of purchase and installation of the water meter, including without limitation, city overhead, shall be billed to the respective water customer of the city and the customer shall pay the full amount thereof within thirty (30) days of the date of the billing.

5. Fifth Violation. A written notice of the violation shall be issued by the public works department personnel or the police department to the respective water customer of the city and a charge of fifty dollars ($50.00) shall be added to the water bill of such customer as a one time charge for such violation. The customer shall pay the full amount of the charge within thirty (30) days of the date of the water bill.

(Metered Customers)

a. The notices and charges for metered water service shall be the same as flat rate water service with regards to violations identified in subdivisions (1), (2), (3) and (5) of this subsection.

b. As regards a fourth violation by a customer with metered service, a written notice of the violation shall be issued by the public works department personnel or the police department to the respective water customer of the city and a charge of twenty-five dollars ($25.00) shall be added to the water bill of such customer as a one time charge for the violation. The customer shall pay the full amount of the charge within thirty (30) days of the date of the water bill.

(As to Flat Rate and Metered Service)

6. Sixth Violation. A written notice of the violation will be issued by the public works department personnel or the police department to the respective water customer of the city and a water flow restricter shall be installed by the city to restrict water use upon the real property where the violation has occurred. All costs of purchase and installation of the water flow restricter, including without limitation city overhead, shall be billed to the customer and the customer shall pay the full amount of such cost within thirty (30) days of the date of the billing. The flow restricter shall remain installed until the customer has provided the city's public works department with evidence that the customer has modified its water use so that it will not again violate the ordinance codified in this section.

C. Leaks in Customer's System. When a leak is discovered by a customer in a customer's water system and a customer is charged for water that it has not used, as a result of the leakage, it shall be the policy of the city to aid the customer in locating the leak. If the leak is repaired by the customer within a period of ten days of the date the leak is discovered and the customer can establish that a portion of the charges identified in its water bill are in excess of the amount normally charged to the customer, that excess amount of water use caused by the leakage shall be charged to the customer at the standard water rate. If the leak is not repaired by the customer within the ten-day period, the portion of the excess water usage which results from the leakage will be billed at two times the standard water rate until the leak is repaired by the customer.

D. Determination of Number of Offenses. In order to be defined as a violation other than a first violation, the violation must occur within one year of the date of the first violation. (Ord. 95-06 § 1, 1995; prior code § 6-6.15)

Section 13.04.160 Unauthorized water use.

Any person using water from the city water system in violation of any provision of the Hanford Municipal Code shall pay, upon demand by the city, a penalty charge in an amount which shall be determined by city council resolution.
(99-01, Added, 03/16/1999)

APPENDIX L - WATER SHORTAGE CONTINGENCY PLAN

RESOLUTION NO. 04-06-R

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF HANFORD PROHIBITING CERTAIN USES OF WATER FOR WATER CONSERVATION PURPOSES AND DECLARING AN EMERGENCY

At a regular meeting of the City Council of the City of Hanford duly called and held on the 20th day of January, 2004, it was moved by Council Member AYERS, and seconded by Council Member CHIN, and carried that the following resolution be adopted:

WHEREAS, California Water Code Sections 375 et. seq. permit public entities which supply water to adopt and enforce a water conservation program; and

WHEREAS, the City Council has adopted certain water use restrictions included in Chapter 13.04 of the Hanford Municipal Code; and

WHEREAS, the City Council finds and determines that a water shortage could exist due to increased demand or limited supply; and

WHEREAS, the City Council finds it may become necessary to increase water conservation restrictions in the interest of the people and for the public welfare.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Hanford approves and adopts the Emergency Water Conservation Policy attached hereto and made a part hereof.

Passed and Adopted at a regular meeting of the City Council of the City of Hanford held on the 20th day of January ,2004, by the following vote:

AYES: Council Member AYERS

CHIN

GALLEGOS

BUFORD

NOES: Council Member NONE

ABSTAIN: Council Member NONE

ABSENT: Council Member NONE

Marcelyn M. Buford, Mayor

ATTEST: Karen McAlister
City Clerk

STATE OF CALIFORNIA)
COUNTY OF KINGS) ss
CITY OF HANFORD)

I, KAREN McALISTER, City Clerk of the City of Hanford, do hereby certify the foregoing Resolution was duly passed and adopted by the City Council of the City of Hanford at a regular meeting thereof held on the 20th day of January, 2004.

Dated: January 21, 2004

Karen McAlister, City Clerk

EMERGENCY WATER CONSERVATION POLICY FOR THE CITY OF HANFORD

Section 1. Declaration of Policy. California Water Code Sections 375 et. seq. permit public entities which supply water at retail to adopt and enforce a water conservation program to reduce the quantity of water used by the people therein for the purpose of conserving the water supplies of such public entity. The City Council of the City of Hanford ("Council") hereby establishes a water conservation program pursuant to California Water Code Sections 375 et. seq. based upon the need to conserve water supplies and to avoid or minimize the effects of future shortage.

Section 2. Findings. The Council finds and determines that certain conditions could occur in the City to require that the water sources available be placed to maximum beneficial use to the extent to which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such water be encouraged with a view to the maximum reasonable and beneficial use thereof in the interest of the people and for the public welfare.

Section 3. Application. The provisions of this policy shall apply to all water served to persons, customers and property by the City.

Section 4. Authorization. The City Manager or a designated representative is hereby authorized to implement the provisions of this policy as directed by the Council. Additionally, the City Manager or designated representative is hereby authorized to make minor and limited exceptions to prevent undue hardship or unreasonable restrictions, provided that water shall not be wasted or used unreasonably and the purpose of this policy can be accomplished.

Section 5. Water Conservation Stages. No person shall knowingly use water or permit the use of water supplied by the City for commercial, industrial, agricultural, governmental or any other purpose in a manner contrary to any provisions of this policy. At no time shall water be wasted or used unreasonably.

The following stages shall take effect upon declaration as herein provided:

(a) **Stage 1 - Enforcement Required - Minor Shortage Potential.**

Stage 1 applies during periods that the City determines that water usage should be reduced approximately 10% - 20% in order to meet all of the water demands of its customers, either now or in the foreseeable future. Implementation of Stage 1 should result in a minimum of 10% reduction in water use from a base period to be determined at the time of declaration.

(b) **Stage 2 - Enforcement Required - Moderate Shortage Potential.**

Stage 2 applies during periods when the City determines that water usage should be reduced approximately 20% - 35% in order to meet all of the water demands of its customers now or in the foreseeable future. Implementation of Stage 2 should result in a minimum of 20% reduction in water use from a base period to be determined at the time of declaration.

(c) **Stage 3 - Enforcement Required - Critical Shortage Potential.**

Stage 3 applies during periods when the City determines that water usage should be reduced approximately 35% - 50% in order to meet all of the water demands of its customers now or in the foreseeable future. Implementation of Stage 3 should result in a minimum of 35% reduction in water use from a base period to be determined at the time of declaration.

Specific mandated restrictions in water use for Stages 1, 2 and 3 shall be determined by the Council and include:

1) Landscape (except residential) - Eliminate watering of ornamental turf areas. Water only actively used turf areas no more than twice per week. Trees and shrubs may be watered only twice per week using a hand-held hose with a positive shutoff nozzle or drip irrigation. Use of reclaimed water, however, is exempt.
2) Household and Household Members (residential landscapes) - Water no more than twice per week using only hand-held hose with positive shutoff nozzle or drip irrigation systems. Eliminate sprinkler use.
3) Construction Usage - All construction water must be reclaimed or nonpotable. Issuance of construction meters will be only for testing and disinfection of potable water lines.

4) Development Construction - Prior to the issuance of any building permit, the developer will be required to certify that a reduction (20% for Stage 1, 35% for Stage 2 and 50% for Stage 3) of the projected average water usage for that development shall be achieved.

Section 6. Implementation of Conservation Stages. The City shall monitor the projected supply and demand for water by its customers on a daily basis. The City Manager shall recommend to the Council the extent of the conservation required through the implementation and/or termination of particular conservation stages in order for the City to prudently plan for and supply water to its customers. Thereafter, the Council may order that the appropriate stage of water conservation be implemented or terminated in accordance with the applicable provision of this policy. The declaration of any stage shall be made by a mass mailing, and public announcement and notice shall be published a minimum of three (3) consecutive times in a newspaper of general circulation. The stage designated shall become effective immediately upon announcement.

Section 7. Violations, Notices, Penalties. The following list of penalties is currently enforced and included in Chapter 13.04 of the Hanford Municipal Code. For clarification and communication purposes, the penalties have been included in this policy.
The violation of any provisions of this policy shall result in the following actions by the City:

(Flat Rate Customers)

1. **First Violation.** A verbal warning of the violation shall be issued by the public works department personnel or police department to the respective water customer of the City.
2. **Second Violation.** A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City.
3. **Third Violation.** A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a charge of fifteen dollars ($15.00) shall be added to the next water bill of such customer as a one time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.

4. **Fourth Violation.** A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a water meter shall be installed by the City to meter all water use upon the real property where the violation occurred. All costs of the purchase and installation of the water meter including, without limitation, City overhead shall be billed to the respective water customer of the City, and the customer shall pay the full amount thereof within thirty (30) days of the date of billing.

5. **Fifth Violation.** A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a charge of fifty dollars ($50.00) shall be added to the next water bill of such customer as a one time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.

(Metered Customers)

a) The notices and charges for metered water service shall be the same as flat rate water service with regards to violations as identified in subdivisions 1), 2), 3) and 5) of this subsection.

b) As regards a fourth violation by a customer with metered service, a written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a charge of twenty-five dollars ($25.00) shall be added to the next water bill of such customer as a one time charge for such violation. The customer shall pay the full amount of such charge within thirty (30) days of the date of the water bill.

(As to Flat Rate and Metered Service)

6. **Sixth Violation.** A written notice of the violation shall be issued by public works department personnel or police department to the respective water customer of the City, and a water flow restricter shall be installed by the City to restrict water use upon the real property where the violation has occurred. All costs of purchase and installation of the water flow restricter including, without limitation, City overhead shall be billed to the customer, and the customer shall pay the full amount of such cost within thirty (30) days of the date of billing. The flow restricter shall remain installed until the customer has provided the City's public works department with evidence that the customer has modified its water use so that it will not again violate the ordinance codified in this section or the provisions of this policy.