

CITY OF REEDLEY

2000 Urban Water Management Plan for the City of Reedley Municipal Water System

City of Reedley Municipal Water System

1733 9th Street

Reedley, CA 93654

Contact Information

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Public Participation

The City of Reedley adopted their first Urban Water Management Plan in 1983 by approval of Resolution No. 3831 (Attachment 1) after public hearing by the City Council. The Ground Water Management Plan developed and adopted by the Alta Irrigation District August 14, 1994, was the subject of a Memorandum of Understanding (M.O.U.) adopted by the City Council regarding implementation of said Ground Water Management Plan in the City of Reedley by Resolution No. 95-133 (Attachment 2)., Said plan thus became the 1995 update of the Water Management Plan for the City of Reedley. The 2000 Urban Water Management plan for the City of Reedley was adopted by Resolution No. 2001-090, dated November 13, 2001. (Attachment 3).

The City of Reedley coordinated this 2000 Urban Water Management Plan with Alta Irrigation District within the boundaries of which the City is located, the Kings River Conservation District, and the Consolidated Irrigation District (Refer to Figure No. 1 attached.) Reedley's Waste Water Treatment Plant is west of the Kings River within the boundaries of the Consolidated Irrigation District. The Plan was then sent to the Department of Water Resources within 30 days of approval by the Reedley City Council. Coordination within the City was done with the City Building Department, Planning Department, Waste Water Treatment Division of the Public Works Department the Fire Department and the City Council.

Reedley Water System Service Area

Reedley service area is 4.25 square miles and is located on the eastside of the Kings River primarily, and with some limited growth occurring west of the Kings River at Manning Avenue and at Olsen Avenue to Kings River Road. Reference is made to Figure 3 attached. Ground slope of the area east of the Kings River is down to the south west at approximately 6.7 feet per mile (slope of 0.126%). Summers are hot and dry with daytime high temperatures as much as 112°F and no rainfall and winter lows to 20°F and rainfall averaging 12.34 inches per year (30-year average based on City of Reedley Wastewater Treatment Plant records). The City of Reedley is agriculturally oriented with the fruit packing and shipping industry being the primary support of the local economy. Reference is made to Figure 2, City of Reedley Population Projections.

Water Sources (Supply)

The City of Reedley depends entirely on ground water pumping for water supply. The ground water table in the Reedley area is dependant for the most part on snow melt runoff in canals and ditches of the Alta Irrigation District supplying farming with surface water for crops and some recharge during years of excess snow pack and rain, subsurface lateral movement of runoff from the Sierra Nevada Mountains to the east and some general surface runoff in creeks and the Kings River from said mountain range. The source of replenishment of the groundwater table is thus subject to wide fluetuations in volume. Examples are cited of annual diversions at the Alta Irrigation District headgate from the Kings River as follows:

1980	253,269 Acre feet
1977	38,721 Acre feet
Average Annual Diversion	165,121 Acre feet

Average length of water run in Alta Irrigation District

Canals	124 days
Shortest water run	28 days
Longest water run	195 days

Reference is made to attached Table 1, Schedule of Diversions and Water Run, 1977-2000 for Alta Irrigation District.

Water Usage

The Reedley Municipal Water System draws water from the underground water table with eight (8) wells, one (1) of which is used only as a standby. The wells pump directly into the system which includes two elevated 50,000 gal. storage tanks which “float” on the system and provide a control function. These two tanks are located on the property where Wells No.1 and No.2 are located. Reference is made to Figure 3, City of Reedley Water Well Sites (Sites No.1, No. 7, and No.8 are presently inactive.) The various pumps in the system are operated by pressure switches which turn the pumps on or off in response to pressure changes at each well site. Water is thus pumped into the system as called for by the pressure in the system at each well. Reference is made to Figure 4 which shows 1980 through 2000 year water production and projects future water production required based on the current annual average per capita usage of 213 gallons per day and the projected population as shown on Figure 2.

Between 1980 and 2000 year, per capita water usage reduced from 294 gal/capita/day to the 213 gal/capita/day figure based on water well production records and population figures shown on Figure 2.

It is proposed to continue to meet future water demand in the City of Reedley with a combination of increased pumping capacity and treatment to keep existing wells on line and continued water conservation measures to moderate demand. Reference is made to Table 2 which lists the developed well sites, their production rates and current operational status among other things.

The system provides water to 4,766 unmetered residential and commercial services and 226 metered commercial/institutional services and 30 metered industrial water users. At this time there are five heavy water users among the metered commercial and industrial users which amounts to approximately 2.5% of monthly demand during the peak water usage months of July and August. All but one of these high demand industrial users is in the fruit packing industry which operates primarily during July and August of each year. The one heavy user which operates throughout the

year amounts to approximately 0.6% of the water used during the system peak months of July and August. No attempt has therefore been made to separate out the Industrial from the Residential and Commercial usage because of lack of data and the small impact on the maximum day water usage which controls the need for water pumping capacity.

The system does not have the means to measure Institutional/Governmental or Landscape/Recreational usages.

Water Recycling

The City's Wastewater Treatment Plant provides primary and secondary treatment supplemented by solids removal by centrifuge and disposal of the hydraulic load to percolation ponds. A small portion of the plants 2.45 million gallon per day (mgd) annual average treated effluent flow is used for landscape irrigation within the plant area.

The City has investigated the feasibility of Wastewater Reclamation to comply with the California Regional Water Quality Control Board Central Valley Region's Order No. 95-110. Five alternates were evaluated by report dated April 3, 1997, by Provost and Pritchard Engineering Group, Fresno, California as follows:

1. Direct Farm Irrigation - privately owned land.
2. Consolidated Irrigation District - East Branch Smith-Ferry Canal
3. Landscape and Selma Golf Course Irrigation
4. U.C. Kearney Ag. Field Station
5. Irrigation of City owned Farmland

In-depth analysis of the different alternatives concluded that wastewater reclamation is currently not cost effective for the permanent food crops in this area or feasible based on the following items not addressed previously:

1. The costs for existing Consolidated Irrigation District (CID) surface water (\$15/acre/year) and groundwater (\$12/ac-ft) irrigation supplies are extremely inexpensive. The surface supply is an assessment per farmed acre and is paid to CID regardless of the volume of water taken.
2. High nitrogen levels in the wastewater exceed agronomic rates for stone fruit and grapes typically grown in the area. Potential damaging effects to crop yield and quality are probable, unless the wastewater is diluted.
3. The additional costs and paperwork to the grower associated with monitoring, reporting, and regulatory requirements are major disincentives to grower acceptance.
4. Potential negative acceptance from produce buyers. Some buyers won't purchase fruit/grapes grown with effluent.

The study concludes Wastewater relamation is not currently a viable disposal method for the Reedley Wastewater Treatment Plant. Based on the results of the study, efforts will continue in the direction of water treatment to make treated effluent acceptable for the maximum number of uses commensurate with the costs of treatment and transmission to the point of usage. Usage of plant effluent off the existing plant site must consider overcoming the high ground elevation which is 35 feet westerly of the plant and 50 feet easterly of the plant. East and north of the plant, the Kings River is also a consideration in the cost of transmission of treated effluent.

Plant capacity is estimated to be 3.0 mgd. A plant facilities master plan is to be done this 2001/2002 fiscal year to determine timing, costs, and facilities to increase capacity to meet estimated future demand. The City's National Pollutant Discharge Elimination System (NPDES) permit is also in process for renewal at this time.

Reliability Planning

As previously mentioned under Water Sources (Supply) of this plan, the city of Reedley water system depends entirely on pumping from the groundwater table and due to the fluctuation in the elevation of the ground water table, pumping costs are a major concern.

During the drought years of 1976 and 1977, 1980 through 1992, and 1997 and 1999, the system has not suffered shortages of water in meeting maximum day or long term (maximum month) demand. Short term power outage, however, has created water shortage lasting several hours. For such emergencies three of the system Wells (No.5A, No.9 and No.12) presently are equipped with emergency power. It is planned to drill a well within the next 12 months west of Well No.6 within the City's Mueller Park property to replace Well No.6 and continue to use the granular activated carbon filter unit installed at this site. This will give the system the added capacity to meet the estimated maximum hourly demand with all pumps running.

Well No.6 replacement will be equipped with an emergency diesel/generator set with automatic switching gear to bring the emergency pumping capacity above the level of the current annual average daily demand of 3,106 gpm and provide 75% of the estimated maximum day demand.

Figure 5 shows graphically the projection of future maximum hour pumping requirements which are the basis for design of future well additions to the system based on the Reedley Water System Master Plan Update prepared by John Carollo Engineers in 1984 but utilizing the current annual average per capita usage of 213 gallons per capita per day expanded to the maximum hourly demand as recommended by said 1984 report for future projections. With regard to longer term deficiencies, reference is made to the Alta Irrigation District Groundwater study done by the Kings River Conservation District and dated December 1992, and the Alta Irrigation District Ground Water Management Plan adopted August 14, 1994, by Alta Irrigation District and the implementation thereof approved by the Reedley City Council by Memorandum of Understanding adopted by said Council November 28, 1995, by Resolution No. 95-133.

As set forth in said Alta Irrigation District Ground Water Management Plan, the overall trend has shown a declining groundwater level throughout the District which has been periodically interrupted by short-term recovery. Based on long-term data, said Ground Water Management Plan determines that it would take approximately 22,000 acre-feet per year of additional surface water to correct the over draft situation presently estimated within the Alta Irrigation District. Based on average porosity and specific yield considerations, said plan goes on to state that this overdraft results in a decline in ground water storage of one (1) foot for every 7,000 acre-feet of overdraft. The plan further states that the storage can be regained if sufficient surface water supplies are made available to reduce the amount of groundwater pumping necessary to meet (agriculture) water demands (The City of Reedley is not supplied surface water by the Alta Irrigation District). There have been varying increases and decreases in static water levels in City of Reedley wells over the past 20 years. The long term trend is generally toward increasing depth to ground water but less overall in magnitude than that described in the Alta Irrigation Districts Ground Water Management Plan. In the area north of Manning Avenue, recent well soundings done by Alta Irrigation District north of Manning Avenue generally agree with sounding results of City wells. In the area south of Manning Avenue, the depths to ground water are influenced to some extent by the Kings River for Wells No.10 and No.11 approximating the depth to ground water of Alta Irrigation wells to the east (40 feet.) The new wells near the Central part of the City, Wells No.5a and No. 6a, and No.12 are drilled deeper and we are experiencing small decreases in depth to ground water.

Direct recharge by agreement with Alta Irrigation District utilizing Reedley storm drainage basins is possible provided joint use issues can be resolved and provided excess water is available through Alta Irrigation District. There is also the consideration of efficiency of recharge in the Reedley area since much of the Reedley Water System is over dense clay lenses separated by thin lenses of silty sands of varying thicknesses. This condition worsens in the area north of Manning Avenue and also affects the citing of Wells.

Water Demand Management Measures

Currently the following water demand management measures are being practiced by the Reedley Municipal Water System:

1. Water meters are required on all new development. However, only commercial, industrial and institutional accounts are charged based on water consumption. Since all new commercial, industrial and institutional developments have had to install meters, their use of plant types which are drought resistant has definitely increased and their attention to their automatic irrigation timer schedules has been emphasized requiring more attention to water conservation by said users. Waste Water Treatment charges to commercial, industrial, and institutional water users have been based on their water meter readings beginning in 1998. Where constituent loading affects treatment cost as well as flow volume, wastewater flow meters are utilized. Both methods have had the affect of making the respective user aware of volume of water used and promoted greater efficiency to lower their water use cost. We believe this is partially responsible for the reduction in high volume industrial water user

flow as a percentage of total volume of water produced.

2. Source meters are on all existing well sites and will be installed on all new well sites. The result will be 100% metering of all sources of supply.
3. Water use records are kept for the metered commercial and industrial accounts.
4. General public information programs are carried on through the use of water conservation flyers which are handed out at the counter where bills are paid and messages on implementing water conservation which are printed on the utility billings. Public information dissemination appears to have a significant affect in the short term. It does seem to be effective in reducing water usage during the hot periods in the summer months as much as 5%. Increased activity in this area would be proposed in the future. The Reedley water system may also be benefitting from radio and television water conservation information sponsored by the City of Fresno.
5. The current rate structure for both metered and unmetered is a flat rate which does not allow for a reduction in rate for increased usage. The flat rate for residential usage provides for an increase when the area being served is larger than a standard lot size. The City may, by ordinance, require metered rates on residential property when the service size is two-inch or larger.
6. Wastewater reclamation and reuse is carried on at the wastewater treatment plant per se and utilized for irrigation of the landscaping within the treatment plant proper. It is estimated that approximately five-acre feet of water per year from reclaimed wastewater are utilized in the irrigation of the plantings within the wastewater treatment plant area.
7. Landscaping installed within City controlled facilities has, to some extent, been planted with drought resistant (low water use) plants and trees. The City's list of approved trees for planting within the street right-of-way was developed keeping in mind the drought resistant varieties of trees (plantings which would be permitted to be installed by developments as they occur). No direct way of measuring the City-wide reduction in usage is available for this activity.

Reference is made to the section titled Water Usage of this report which mentions that between 1980 and 2000 year, annual average per capita water usage reduced from 294 gal/capita/day to 213 gal/capita/day based on water well production records and the population figures shown on Figure 2. Based on this apparent reduction in per capita annual average use it is planned to continue updating our water and sewer rates in line with costs of operation of the water system and the Wastewater Treatment Plant and to continue with general public information programs as described in Item No. 4 above. It is also planned to continue with the use and requiring of drought resistant plantings as described in Item No. 7 above.

8. The City has adopted the 1998 California Plumbing Code based on the 1997 uniform plumbing code which includes standards for water-conserving fixtures and fittings.

Additional Water Demand Management Measures

The following water demand management measures are under consideration for use by this utility with a brief discussion of each related to water use, cost, and other significant impacts:

1. Install water meters on existing unmetered commercial, industrial and institutional accounts. Change these accounts to be invoiced for water consumption and sewer discharge based on meter reading.
2. Investigate the availability of slide, moving picture, and video tape programs on water conservation to be made available to schools. This should be discussed with the Kings Canyon Unified School District after establishing availability and levels of presentations to obtain an indication of the best type of films, slides, or video tapes to use for the various grade levels. Implementation 2002-03.
3. Continue and expand the program of distribution of water conservation flyers and notes on water bills. Make available in printed form additional information on water conserving landscapes. Distribution of this material at particular times of the year (particularly in the spring) appears to be critical. This would be the time when new plantings, etc., are being considered. Estimated cost \$3,000. Implementation 2002-03.
4. During the warm months of May, June, July, and August, it is proposed to prepare public service announcements for the radio dealing with water conservation with helpful hints for reducing water consumption in the landscape, garden, and general use in the bathroom and kitchen. Cost is primarily staff time to develop announcements. Implementation 2002-03 with expansion in 2003-04.
5. Obtain cost data and provide budgetary item for providing water conservation kits (shower flow restrictors, water closet bags, and color tablets for detecting leaky water closets). Since 1979, State law has required all new shower heads, toilets, and faucets sold in the State or installed in new construction to meet certain low flow standards. This particular proposal would target the pre-1979 construction which was not retrofitted during the 1976 drought or would provide replacement kits for those which were distributed at that time and have since worn out, or for whatever reason, use discontinued. The public information program will be necessary in the distribution of these retrofit kits. Determination will have to be made as to the best approach to obtain the maximum impact for the cost involved. Estimated cost to purchase and distribute retrofit kits as described above for approximately 40% of our service connections is \$3,000. Implementation 2003-04.
6. Continue with updating the City of Reedley tree planting list for drought resistant plantings

in the street parkway area in connection with City construction projects and approval of new commercial and industrial developments within the City as well as similar planting for single and multi-family dwelling projects.

7. The City continued implementing incremental sewer service charge increases based on water meter readings for large multi-family residential and commercial and industrial users. Unmetered accounts are also being increased a proportional amount. The City at this time, plans to continue with the last iteration of this program in July of 2002 based on costs of providing the service.
8. It is a possible consideration to adopt an ordinance defining, water wastage and providing for penalties therefor for items such as requiring hand operated spray devices with automatic shut off on release of operating handles for car washing or plant irrigation (as opposed to an open uncontrolled hose end), prohibition of driveway washing (as opposed to using a broom), and allowing water to run in a gutter. Present ordinance requires use of sprinklers as opposed to flood irrigation from open hose or hose bibb. The above only if public information appeals do not generate additional results.

Item No. 1 through 8 above are presented here as an indication of possible methods by which the underground water supply can be positively affected to assure continued use as the basic supply of water for the City of Reedley. Events are occurring in the area of wastewater treatment for the City which will govern what we will be required to do over the next few years in the form of a new NPDES Permit.

RESOLUTION NO. 3831

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REEDLEY
APPROVING URBAN WATER MANAGEMENT PLAN FOR THE CITY OF
REEDLEY MUNICIPAL WATER SYSTEM

NOW, THEREFORE, be it resolved as follows:

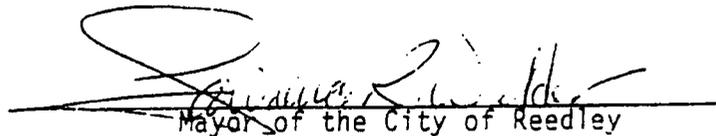
1. That certain document entitled "Urban Water Management Plan for the City of Reedley Municipal Water System" is hereby approved.
2. That the Director of Public Works is authorized to transmit same to the Department of Water Resources in compliance with the provisions of the Water Code of the State of California.

The foregoing resolution is hereby approved this 19th day of August, 1986, by the following vote:

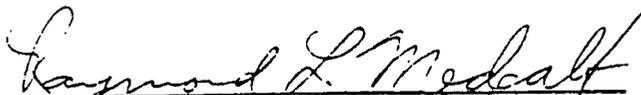
AYES: Councilmen Taguchi, Huebert, Soleno, Croissant and Mayor Wilder.

NOES: None.

ABSENT: None.


Mayor of the City of Reedley

ATTEST:


Raymond L. Medcalf, City Clerk

RESOLUTION NO. 95-133

A RESOLUTION OF THE CITY OF REEDLEY CITY COUNCIL
AUTHORIZING EXECUTION OF A MEMORANDUM OF
UNDERSTANDING WITH ALTA IRRIGATION DISTRICT FOR
IMPLEMENTATION OF A GROUNDWATER MANAGEMENT PLAN.

The City Council of the City of Reedley hereby authorizes the City Manager to execute a Memorandum of Understanding (MOU) with Alta Irrigation District regarding the implementation of the Groundwater Management Plan adopted August 14, 1994, by the Alta Irrigation District Board of Directors, in the City of Reedley as provided in said MOU.

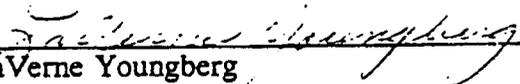
This foregoing resolution is hereby approved this 28th day of November, 1995, by the following vote:

AYES: Taguchi, Soleno, Fite, Youngberg.

NOES: None.

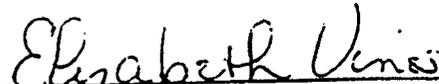
ABSTAIN: None.

ABSENT: Clark



LaVerne Youngberg
Mayor of the City of Reedley

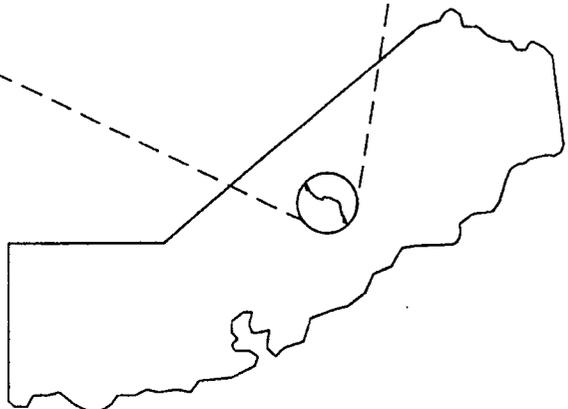
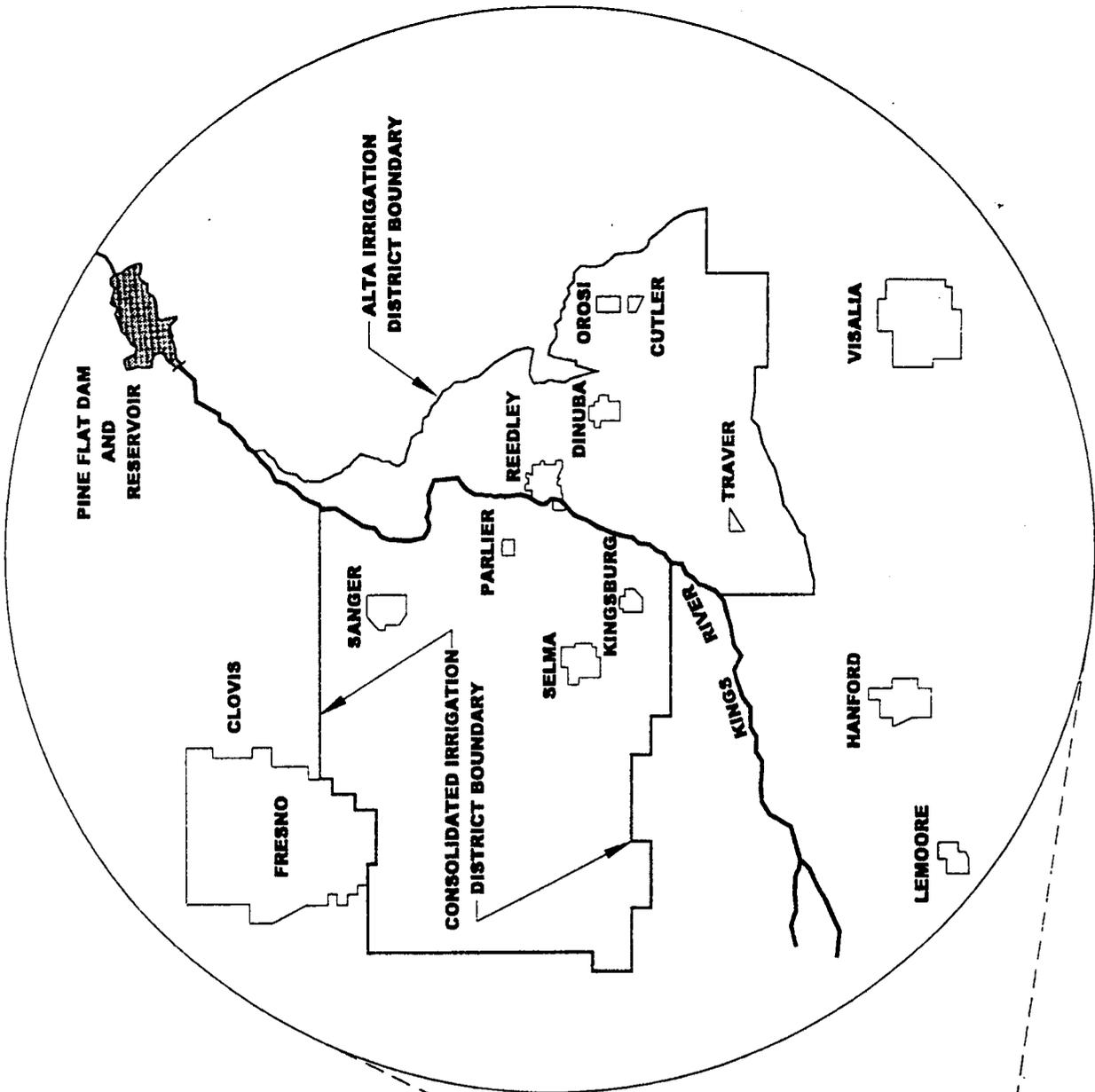
ATTEST:



Elizabeth Vines, City Clerk

FIGURE 1

**LOCATION OF:
CITY OF REEDLEY &
ALTA IRRIGATION DISTRICT &
CONSOLIDATED IRRIGATION DISTRICT**



CITY OF REEDLEY POPULATION PROJECTION

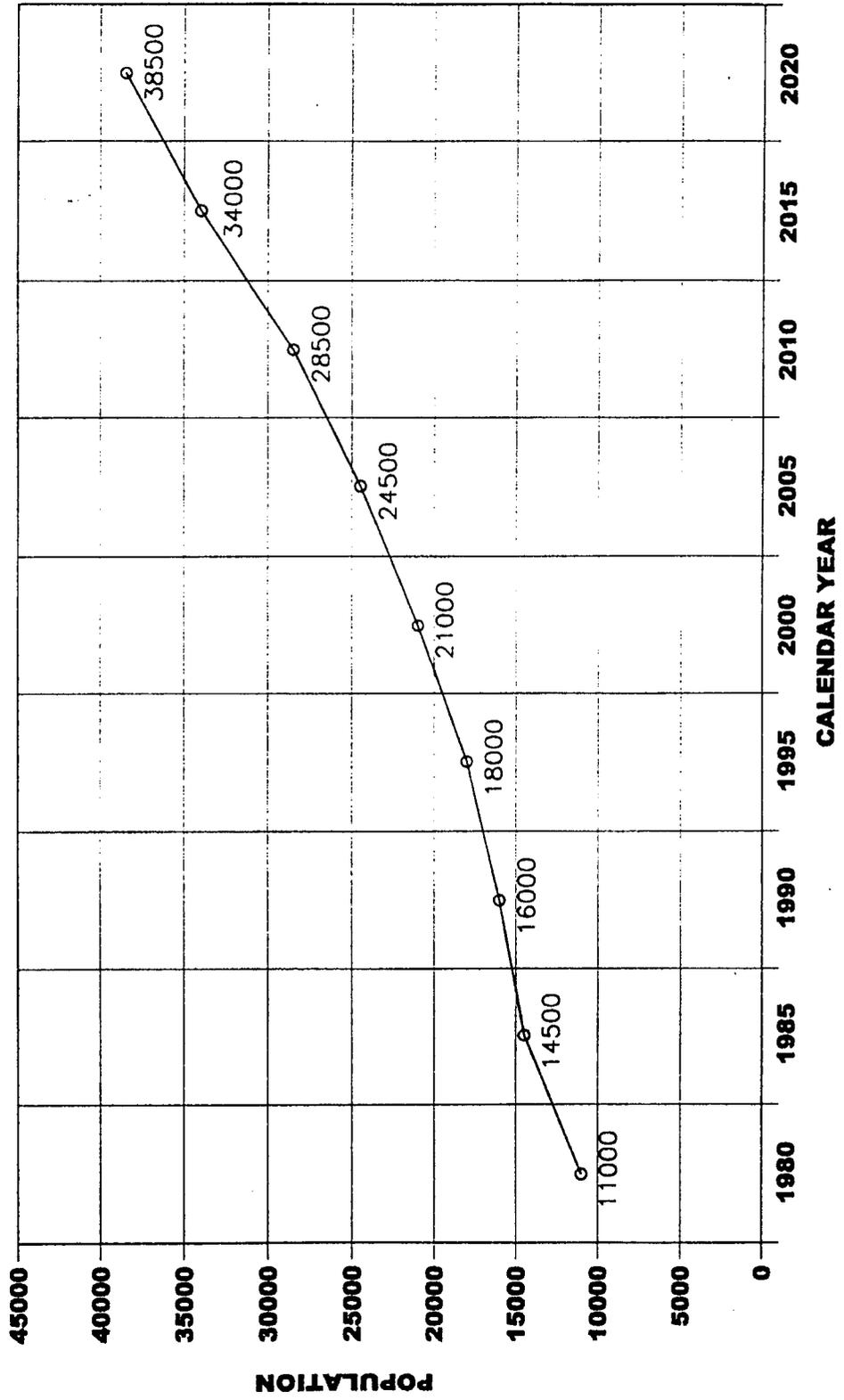
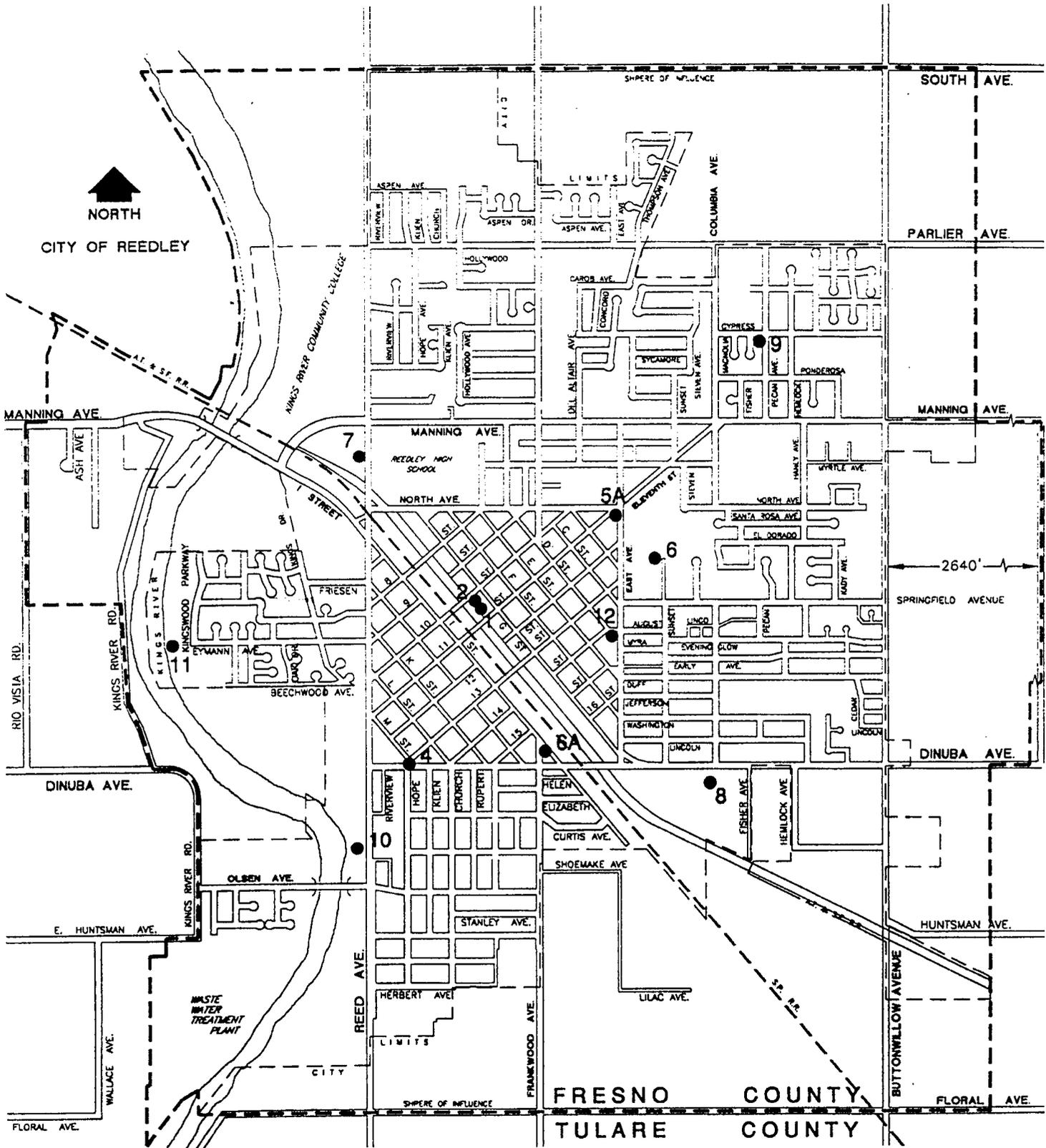


FIGURE 2

FIGURE 3



CITY OF REEDLEY WATER WELL SITES

● no. EXISTING WATER WELL SITE

CITY OF REEDLEY WATER USAGE PROJECTIONS

BASED ON EXISTING ANNUAL PUMPING
RECORDS AND CENSUS DATA AND STATE
DEPT. OF FINANCE POPULATION ESTIMATES

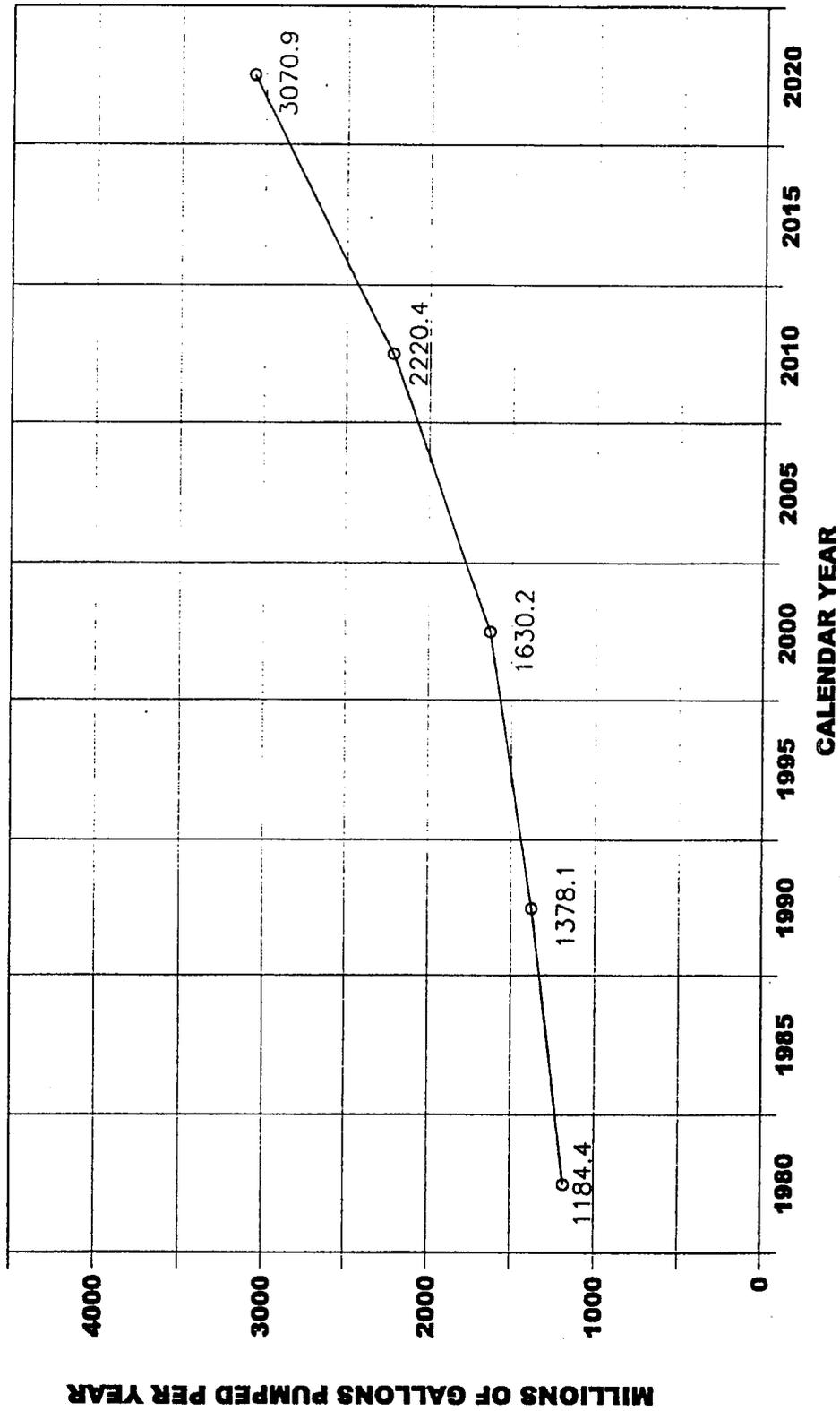


FIGURE 4

CITY OF REEDLEY PROJECTION OF MAXIMUM HOURLY WATER USAGE

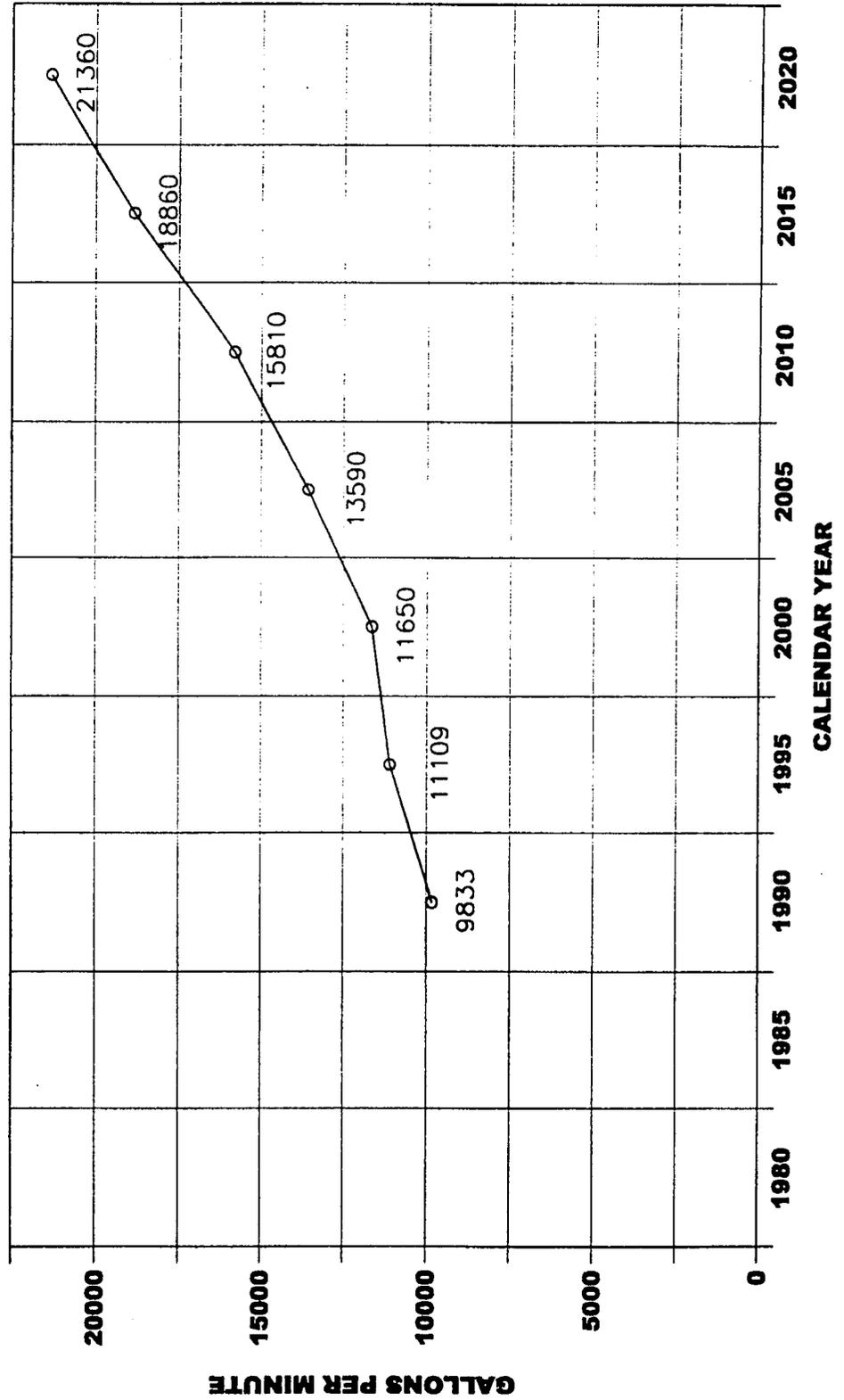


FIGURE 5

ALTA IRRIGATION DISTRICT HEAD GATE FROM THE KINGS RIVER

SCHEDULE OF DIVERSION & WATER RUN FOR 1977 - 2000

DIVERSION FROM HEADGATE

YEAR	ACRE FEET	WATER RUN SEASON	DAYS
1977	38,721	JUL 1 - JUL 28	28
1978	246,204	MAY 11 - OCT 31	169
1979	181,999	MAY 1 - AUG 31	123
1980	253,269	APR 1 - SEP 13	166
1981	145,581	MAY 4 - AUG 14	103
1982	247,599	APR 20 - OCT 31	195
1983	205,445	APR 28 - OCT 14	167
1984	214,165	MAR 31 - SEP 7	161
1985	170,826	APR 28 - AUG 26	121
1986	227,709	APR 7 - SEP 30	177
1987	121,270	MAY 4 - AUG 4	93
1988	59,188	JUN 13 - AUG 1	50
1989	89,983	MAY 28 - AUG 4	69
1990	58,463	JUN 21 - AUG 7	48
1991	107,706	MAY 21 - AUG 10	82
1992	66,623	MAY 28 - JUL 26	59
1993	246,415	APR 2 - OCT 2	184
1994	122,677	MAY 17 - AUG 18	93
1995	236,725	APR 9 - SEP 30	174
1996	222,268	APR 2 - SEP 1	153
1997	214,341	MAR 24 - AUG 26	156
1998	172,176	MAY 1 - SEP 30	153
1999	147,120	MAY 2 - AUG 26	117
2000	166,441	APR 10 - AUG 31	144
AVERAGE 165,121 ACRE FEET		AVERAGE	124 DAYS
MOST 253,269 ACRE FEET		MOST	195 DAYS
LEAST 38,721 ACRE FEET		LEAST	28 DAYS

WATER RECAP

HEADGATE DIVERSIONS:	ACRE FEET	
DELIVERED	105,227	63%
RECHARGE	51,229	31%
OPERATION LOSS 5%	8,321	5%
EVAPORATION LOSS 1%	1,664	1%

TOTAL HEADGATE DIVERSIONS: 166,441

WELL DATA

WELL No.	WELL PRODUCTION (GAL/MIN) METER READING 9/5/01	STANDING WATER DEPTH (FEET) 9/5/01	WELL HEAD GROUND ELEV. (FEET)	DATE PUT IN SERVICE (MO/YEAR)	STATUS
1	-	58	345	6/1953	OUT OF SERVICE
2	900	58	345	9/1950	OPERATIONAL
4	1000	52	344	2/1948	STANDBY
*5A	2000	65	348	6/1987	OPERATIONAL
6	-	59	346	7/1976	OUT OF SERVICE GAC INSTALLED '98
6A	1800	60	344	6/1988	OPERATIONAL
**9	950	59	350	8/1975	OPERATIONAL GAC INSTALLED '96
10	1000	42	339	10/1975	OPERATIONAL
11	1200	40	316	6/1989	OPERATIONAL
**12	2000	67	345	9/1993	OPERATIONAL

**OPERATIONAL
UNITS TOTAL 9850 GAL/MIN**

**WELL PRODUCTION AND STANDING WATER
DEPTHS BELOW WELL HEAD PROVIDED BY
WATER MAINTENANCE SUPERVISOR**

**STANDBY
UNIT(S) TOTAL 1000 GAL/MIN**

*** EQUIPPED WITH EMERGENCY NATURAL GAS POWER
W/ANGLE DRIVE & AUTOMATIC SWITCHING GEAR**

**** EQUIPPED WITH EMERGENCY DIESEL/GENERATOR
SET & AUTOMATIC SWITCHING GEAR**

**WELLS 7 AND 8 ARE OUT OF SERVICE
DUE TO EXCEEDING MAXIMUM CONTAMINANT
LEVEL FOR DBCP**