Citrus Heights Water District
December 2005
Amended: January 2007

2005 URBAN WATER MANAGEMENT PLAN

CITRUS HEIGHTS WATER DISTRICT

Table of Contents

PUBLIC PARTICIPATION 1
PUBLIC PARTICIPATION 1
Plan Adoption 1
AGENCY COORDINATION 2
Interagency Coordination 2
SUPPLIER SERVICE AREA 4
Climate 4
Other Demographic Factors 4
Past Drought, Water Demand, and Conservation Information 6
WATER SOURCES (SUPPLY) 8
WATER SUPPLY SOURCES 11
SURFACE WATER 11
GROUNDWATER 12
WASTEWATER AND RECYCLED WATER 13
DESALINATED WATER 15
FUTURE WATER SUPPLY PROJECTS 15
WATER QUALITY IMPACTS ON AVAILABILITY OF SUPPLY 16
RELIABILITY PLANNING 17
RELIABILITY 17
FREQUENCY AND MAGNITUDE OF SUPPLY DEFICIENCIES 17
PLANS TO ASSURE A RELIABLE WATER SUPPLY 19
RELIABILITY COMPARISON 19
THREE YEAR MINIMUM WATER SUPPLY 19
REVENUE AND EXPENDITURE IMPACTS 20
MECHANISMS FOR DETERMINING ACTUAL REDUCTIONS IN WATER USAGE 20
TRANSFER OR EXCHANGE OPPORTUNITIES 22
Water Transfers 22
WATER USE PROVISIONS 24
PAST, CURRENT AND PROJECTED WATER USE 24
Residential Sector 26
Commercial Sector 26
Institutional/Governmental Sector 26
Landscape/Recreational Sector 26
Agricultural Sector 27
SUPPLY AND DEMAND COMPARISON PROVISIONS 28

SUPPLY AND DEMAND COMPARISON 28

WATER DEMAND MANAGEMENT MEASURES 32

DMM A -- WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS 33
DMM B -- RESIDENTIAL PLUMBING RETROFIT 36
DMM C -- SYSTEM WATER AUDITS, LEAK DETECTION, AND REPAIR 39
DMM D -- METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS 41
DMM E -- LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES 43
DMM F -- HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS 46
DMM G -- PUBLIC INFORMATION PROGRAMS 47
DMM H -- SCHOOL EDUCATION PROGRAMS 48
DMM I -- CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL ACCOUNTS 50
DMM J -- WHOLESALE AGENCY PROGRAMS 52
DMM K -- CONSERVATION PRICING 53
DMM L -- WATER CONSERVATION COORDINATOR 55
DMM M -- WATER WASTE PROHIBITION 56
DMM N -- RESIDENTIAL ULTRA-LOW-FLUSH TOILET REPLACEMENT PROGRAM 57

DMM SUMMARY 59

AGRICULTURAL WATER CONSERVATION PROGRAMS 61

WATER SHORTAGE CONTINGENCY PLAN 62

PREPARATION FOR CATASTROPHIC WATER SUPPLY INTERRUPTION 62
Water Shortage Emergency Response -- Emergency Response Plan 62

List of Tables

TABLE 1 -- COORDINATION AND PUBLIC INVOLVEMENT 3
TABLE 2 -- POPULATION PROJECTIONS 6
TABLE 3A -- CURRENT AND PROJECTED WATER SUPPLIES 11
TABLE 3B -- WASTEWATER COLLECTED AND TREATED 14
TABLE 3C -- FUTURE WATER SUPPLY PROJECTS 16
TABLE 4A -- WATER SUPPLY SHORTAGE STAGES AND CONDITIONS 18
TABLE 4B -- WATER SUPPLY PROJECTIONS (1980-2025) 18
TABLE 5 -- SURFACE AND GROUNDWATER WATER SUPPLY RELIABILITY 19
TABLE 6 -- INTERTIES WITH NEIGHBORING AGENCIES 22
TABLE 7 -- PAST, CURRENT, AND PROJECTED WATER USE 25
TABLE 8 -- NUMBER OF CONNECTIONS BY CUSTOMER TYPE 25
TABLE 9 -- PROJECTED WATER SUPPLY AND WATER DEMAND COMPARISON 28
TABLE 10 -- SINGLE DRY YEAR AND MULTIPLE DRY YEARS 29
TABLE 10A -- RELIABILITY AND COMPARISON WITH WATER SUPPLY OPTIONS 30
TABLE 10B -- RELIABILITY AND COMPARISON WITH WATER DEMAND OPTIONS 30
TABLE 10C -- RELIABILITY AND COMPARISON WITH WATER SUPPLY AND WATER DEMAND OPTIONS 31
TABLE 11 -- DMM A IMPLEMENTATION SCHEDULE AND WATER SAVINGS 34
TABLE 12 -- DMM B IMPLEMENTATION SCHEDULE 37
TABLE 13 -- DMM B WATER SAVINGS 37
TABLE 14A -- DMM C ELECTRONIC TRANSMISSION AND DISTRIBUTION SYSTEM WATER AUDITS 39
TABLE 14B -- DMM C VISUAL LEAK DETECTION AND REPAIR 40
TABLE 15A -- DMM D ACTUAL UNMETERED ACCOUNTS 41
TABLE 15B -- DMM D PLANNED UNMETERED ACCOUNTS 41
TABLE 16A -- DMM E LARGE LANDSCAPE SURVEYS ACTUAL, 2001-2005 43
TABLE 16B - DMM E LARGE LANDSCAPE SURVEYS PROJECTD, 2006-2010 43
TABLE 17 -- DMM I IMPLEMENTATION SCHEDULE AND WATER SAVINGS 51
TABLE 18A -- DMM N ULFT RETROFIT PROGRAM, SINGLE FAMILY ACTUAL 2001-2005 57
TABLE 18B -- DMM N ULFT RETROFIT PROGRAM, MULTI FAMILY ACTUAL 2001-2005 57
TABLE 18C -- DMM N ULFT RETROFIT PROGRAM, SINGLE FAMILY PROJECTED 2006-2010 58
TABLE 18B -- DMM N ULFT RETROFIT PROGRAM, MULTI FAMILY PROJECTED 2006-2010 58
TABLE 19 -- SUMMARY OF DMMS 60

Appendices

APPENDIX A Resolution to Adopt the 2005 Urban Water Management Plan

APPENDIX B Water Conservation Ordinance

APPENDIX C Citrus Heights Water District Metering Policies

APPENDIX D Citrus Heights Water District Metered Rate Schedule

APPENDIX E Sacramento Groundwater Authority Groundwater Management Plan (on compact disc)

APPENDIX F Historic Use of Surface Water and Groundwater

Citrus Heights Water District 2005 Urban Water Management Plan Contact Sheet

Date plan submitted to the Department of Water Resources: 12/31/2005

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The Water supplier is a: Special District

The Water supplier is a: Retailer

Utility services provided by the water supplier include: Potable Water

Is This Agency a Bureau of Reclamation Contractor? Yes

Is This Agency a State Water Project Contractor? No

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.

Public Participation

Citrus Heights Water District actively encourages community participation in its urban water management planning efforts and has since the first plan was developed in 1990. Public meetings were held on the 1990, 1995, 2000 and 2005 plans.

For this update to the Urban Water Management Plan (UWMP), a formal public session was held for review and comment on the draft plan before approval by CHWD's Board of Directors.

An effort was made to include grassroots community and public interest organizations, the Citrus Heights Chamber of Commerce, and the City of Citrus Heights. Notices of public meetings will be posted on CHWD's homepage on the Internet. Legal public notices for each meeting were published in the local newspaper and posted at CHWD's office. Copies of the draft UWMP were available at CHWD's office and mailed to other public agencies as appropriate.

Plan Adoption

Citrus Heights Water District prepared this update of its Urban Water Management Plan during the summer and fall of 2005. The updated UWMP was adopted by Board of Directors in December 2005 and submitted to the California Department of Water Resources within 30 days of Board approval. Attached as Appendix A is a copy of CHWD's Resolution Adopting the UWMP. This UWMP includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

Agency Coordination

Law

> 10620 (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
>
> (d) (1) An urban water supplier may satisfy the requirement of this part by participation in area wide regional, watershed, or basis wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.
>
> (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.
>
> (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Interagency Coordination

The Citrus Heights Water District is an active member of the local and regional water community, and utilizes a number of cooperative efforts to maximize the use of it water resources and minimize the need to develop additional water supplies, including:

American River Basin Integrated Regional Water Management Plan (ARB IRWMP). Citrus Heights Water District is an active participant in the development and implementation of the ARB IRWMP. This Plan identifies and promotes integrate water management strategies for the region including: water supply; water quality; water recycling; water use efficiency; habitat improvement; and recreation.

Water Forum Successor Effort (WFSE). Citrus Heights Water District is a signatory to the Water Forum Agreement, an agreement among Sacramento region business and agricultural leaders, citizens' groups, environmentalists, water managers and local government. The Water Forum Agreement has two co-equal objectives: to provide a reliable and safe water supply for the region's economic health and planned development to the Year

2030; and to preserve the fishery; wildlife; recreational and aesthetic values of the Lower American River. The WFSE is a group composed of Water Forum Agreement signatories and others who are working to carry out the seven major elements of the Water Forum Agreement, which include water conservation, groundwater management and other actions needed to ensure adequate water supplies while protecting the Lower American River.

Regional Water Authority Water Efficiency Program (RWA WEP). Citrus Heights Water District is a participant in the RWA WEP. This program pools the resources of water purveyors to help implement water conservation best management practices (BMPs) on a regional basis. CHWD uses this program to support its own in-house programs for water conservation BMPs.

Citrus Heights Water District received 93.6% of its calendar year 2004 water supply through the San Juan Water District (SJWD) water treatment plant located near Folsom Reservoir. SJWD is dependent, in part, on the U.S. Bureau of Reclamation (USBR) allocations and forecasts of surface water storage in Folsom Reservoir. Citrus Heights Water District has coordinated with SJWD regarding the portion of its supply that is dependent on the Bureau's forecasts and possible reductions during a prolonged drought. Coordination with other water supply agencies is on-going to prepare for the worst case scenario of "no water" being available from the Folsom Reservoir. Citrus Heights Water District staff has coordinated the development of this UWMP with its wholesale supplier, San Juan Water District.

Table 1
Coordination and Public Involvement

Entities	Coordination and Public Involvement Actions					
	Helped write the plan	Was contacted for assistance	Was sent a copy of the draft	Commented on the draft	Attended public meetings	Was sent a notice of intention to adopt
Wholesaler			X			X
Wastewater Agency						
Special Interest Groups						X
Citizen Groups						
General Public						X
Other Interested Parties/Agencies			X			X

Supplier Service Area

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 (2005-2025).

Climate

Citrus Heights Water District has a climate that is generally characterized as "Zone 8" which is the Cold Air Basin of the Central Valley. Summers are hot and dry, and winters are cool, with an annual average of 17.3 inches of precipitation. The region is subject to wide variations in annual precipitation, which occurs almost entirely between November and April.

Other Demographic Factors

Citrus Heights Water District is located approximately 12 miles northeast of Sacramento, California, and provides treated water for domestic, commercial, irrigation, and fire protection purposes to 7,639 acres in northeast Sacramento County and 144 acres in south Placer County. This area includes portions of the incorporated Cities of Citrus Heights and Roseville and the unincorporated communities of Fair Oaks, Orangevale, and Carmichael. The terrain is gently rolling and varies in elevation from 243 feet to 124 feet above sea level.

CHWD was formed on October 25, 1920 under Division 11, the Irrigation District Act, of the State of California Water Code. Considered an independent special district, CHWD is governed by a three member Board of Directors elected at large from divisions within CHWD.

The formation of CHWD was the culmination of a gradual development process which had its beginnings in agriculture in the mid-1800's. In 1854 the North Fork Ditch Company began diverting water from the North Fork of the American River to serve mining and agricultural needs in eastern Sacramento County. In 1916, the Citrus Heights Water Takers Association, a mutual water company, undertook to acquire water from the North Fork Ditch Company for distribution to the Citrus Heights Colony. Unable to finance the necessary water distribution system improvements to meet the increasing agricultural and residential demands

for water, the Association gave way to the formation of Citrus Heights Irrigation District in 1920.

The initial construction of the water transmission and distribution system to serve the 3,030 acres in the newly formed District moved ahead shortly after a successful $262,000 Bond election on July 9, 1921. During its period of early growth through the mid-1950's, CHWD supplemented its supply of North Fork Ditch Company surface water by drilling five deep wells to meet demands in excess of the capacity of the original 24-inch diameter transmission main. In 1957, the residents of CHWD passed a $750,000 Bond Issue to construct a new and larger 42-inch diameter transmission main to serve the current and anticipated future growth of CHWD. Two additional deep wells were acquired with residential development in the late 1950's concurrent with the completion of the enlarged transmission system. In the early 1990's, three additional wells were drilled to replace several of the aging wells and to increase the groundwater output. In 1994, the Board of Directors voted to change the name to Citrus Heights Water District to more appropriately reflect the urbanized area now being served.

The Cooperative Transmission Pipeline Project, a joint project with Citrus Heights Water District, San Juan Water District, Fair Oaks Water District, Orange Vale Water Company, and Northridge Water District (now merged with Arcade Water District to form Sacramento Suburban Water District) as participating agencies, was completed in 1997. The pipeline, 78 inches in diameter at the SJWD headworks, is designed to provide surface water delivery capacity and redundancy at ultimate buildout and to facilitate conjunctive use of the region's groundwater supplies.

Concurrently with the completion of Folsom Dam in 1956, the San Juan Water District (SJWD) was formed and acquired the facilities and water rights of the North Fork Ditch Company. SJWD has also contracted for additional water from the United States Bureau of Reclamation. Citrus Heights Water District now receives surface water from the American River through San Juan Water District's treatment plant adjacent to Folsom Dam. SJWD also provides treated water to Fair Oaks Water District, Orange Vale Water Company, Sacramento Suburban Water District, portions of the City of Folsom, and San Juan's own retail service area.

In the early years of CHWD, residential and agricultural growth was nominal. Since, urban development has flourished to such a degree that presently there is no significant agriculture within CHWD. In the mid-1950's, CHWD's growth began to increase approximately 10 percent annually and since 1976 the population of CHWD has doubled with a resulting 25 percent increase in water consumption. The Sacramento

Area Council of Governments (SACOG) is the public organization that maintains census, housing, and employment information for a six county area in the Sacramento region. This data was previously recorded in CHWD's Water System Master Plan completed by Carollo Engineers in 1998 and is referenced in this UWMP. The SACOG projections indicate that Citrus Heights Water District population growth will be significantly lower in the next twenty years than it has been in the past. Buildout of CHWD is expected to occur approximately around the year 2024.

Table 2 shows the population total for CHWD in 2005 with projections to 2025.

Table 2
Population Projections

	2005	2010	2015	2020	2025
Service Area Population	66,580	67,500	68,500	70,500	70,150

Past Drought, Water Demand, and Conservation Information

The citizens of Citrus Heights Water District have a high commitment to quality of life and environmental issues. Water conservation is one of several high priority policies actively implemented in CHWD, and programs such as residential water audits, ultra-low flush toilet replacements, and landscape water audits are well accepted.

Citrus Heights Water District serves a current population of approximately 66,580 permanent residents. CHWD's water demand classifications are divided into Domestic, Commercial, Governmental/Institutional, and landscape irrigation accounts. Domestic accounts use approximately 86% of the total consumption while the other accounts use the remaining 14%.

During the nine year period from 1996 through 2004, CHWD experienced consumption consistently above 20,000 acre-feet per year (AFY), with an average yearly consumption of 21,336 acre feet (AF). The highest water demand year was 1999 with consumption reaching 23,054 AF. New residential and commercial connections increased at a rate of between 1% and 2% per year from 1989 to 1995. New residential and commercial connections have continued to increase since 1996 but at a slower rate. CHWD projects annual increases in the number of new residential and commercial service connections of not more than one percent (1.0%) through 2025.

The local region experienced a prolonged drought from 1987 through 1992. At that time CHWD met its customers' needs through careful

conjunctive management of groundwater and local reservoir supplies, and by investing in water conservation and public awareness programs. Community involvement made it possible to have voluntary reduction in water use from 1987 through 1989. Due to implementation of water conservation measures and programs, water demand has not been as high as it was in 1986 until recently. Since enactment of a Water Conservation Ordinance in 1987, water demand reached a low of 16,716 AF in 1991. From 1994 to 2005, CHWD has had adequate supplies every year which has apparently resulted in some relaxation of water conservation habits.

The average demand for Citrus Heights Water District for the past five (5) years (2000-2004) was 20,236 AFY. CHWD expects demand to peak in 2007 and decline after that year when CHWD expects to be fully metered and billing on an increasing block rate.

Water Sources (Supply)

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.]

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (1) An average water year.;(2) A single dry water year. (3) Multiple dry water years. 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 supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

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.
(2) Agricultural.
(3) The water use projections shall be in the same five-year increments described in subdivision (a).

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:
(2) A schedule of implementation for all water demand management measures proposed or described in the plan.
(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

10631 (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

10631 (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

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.

10631 (j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that 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.

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.

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.

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.

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, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

10632 (h) A draft water shortage contingency resolution or ordinance.

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

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. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, 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 quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

10633 (c) 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 (d) 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, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633 (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of

the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision..

10633 (f) 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 (g) 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, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

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 water management strategies and supply reliability.

Water Supply Sources

Citrus Heights Water District has a variety of water sources, including groundwater, local surface water, and interties with neighboring agencies as shown in Tables 3 and 6.

Table 3A
Current and Projected Water Supplies

Water Supply Sources	2005	2010	2015	2020	2025
Purchased from USBR					
Purchased from DWR					
Purchased from wholesaler (San Juan Water District)	28,770	28,770	28,770	28,770	28,770
District produced groundwater (Number of Wells)	2,500 (3)	5,830 (7)	8,330 (10)	10,000 (12)	10,000 (12)
Transfers					
Recycled Water					
Other					
Total	31,270	34,600	37,100	38,770	38,770

Units of Measure: Acre-Feet/Year
Year 2005 and subsequent years are estimated

Surface Water

The primary historic water source for Citrus Heights Water District is surface water from the American River. San Juan Water District (SJWD) receives surface water for treatment and distribution to its wholesale agencies, including Citrus Heights Water District, from Folsom Reservoir

which is located at the convergence of the North and South forks of the American River approximately 12 miles east of CHWD.

Folsom Dam, completed in 1956, is operated by the United States Bureau of Reclamation (USBR) for flood control, electrical power generation, recreation, and water supply purposes. Recreational uses include camping, fishing, and boating.
The watershed consists primarily of rugged mountain terrain and National Forests that help to protect the resource and limit public access so that the water quality remains high. The watershed experiences wide fluctuations in runoff.

Folsom Reservoir is dependent on winter rains and the mountain snow pack to provide run-off to fill the reservoir during the winter months and continue to fill it well into the summer. Since water is discharged year-round for power generation and flood control as well as other downstream environmental and water supply uses, the water level in the reservoir fluctuates during the course of the year. Although Folsom Reservoir's carry-over storage smoothes out some of this fluctuation, this supply is not as reliable as CHWD once thought, particularly during consecutive year shortages. Folsom Reservoir's useable capacity is 990,000 acre-feet (AF).

SJWD has a variety of surface waters (current and projected) totaling 82,200 acre-feet per year (AFY) available from Folsom Reservoir to include Pre-1914 Water Rights, Contracts (2) with the USBR for Central Valley Project (CVP) water and water contracted from Placer County Water Agency (PCWA).

Citrus Heights Water District has provided its demand projections to SJWD by providing a draft of its 2005 Urban Water Management Plan to SJWD that contains these demand projections.

Based upon SJWD's 2002 Wholesale Water Rate Study, approximately 35% of SJWD's wholesale supply, treatment and conveyance expenses are assigned to Citrus Heights Water District. For the purposes of this UWMP, 35% of the water supply available to SJWD is categorized as the current and projected surface water supply available to CHWD. This amount is 28,770 AFY.

Groundwater

CHWD's service area lies entirely within the Groundwater Management Plan (GMP) area of the Sacramento Groundwater Authority (SGA). SGA adopted its GMP in December 2003 and it is fully consistent with the provisions of CWC Section 10750 *et seq*. CHWD is a member of SGA

and falls under the authority of the SGA GMP. A copy of the SGA GMP is included as Appendix E.

CHWD extracts groundwater for public water supply from the North American Subbasin of the Sacramento Valley Groundwater Basin (Basin Number 5-21.64) as defined by the California Department of Water Resources (DWR). This subbasin has never been defined as overdrafted, and it is not projected to become overdrafted, by DWR.

CHWD presently could produce about 2,500 AFY from three deep groundwater wells located in the western one-third of CHWD. These wells are used as a secondary/emergency source of water supply. Production from these wells varies from 800 to 1600 gallons per minute at 80 psi. Over the past 30 years, CHWD has averaged pumping approximately 875 AFY. The wells are typically operated during the summer months for peaking and pressure sustaining purposes or during times when the surface water supply is reduced due to drought or other constraints.

A fourth groundwater well is currently under construction with approximately eight additional wells to be added in the future. CHWD's 1998 Water System Master Plan indicated the need for a minimum of eleven groundwater wells to serve CHWD during times of emergency or drought.

CHWD, together with many other water agencies within the region, are engaged in efforts to operate the groundwater basin in conjunctive use/banking and exchange mode to meet local and statewide water needs during dry, drier, and driest years.

There has been some hardness detected in the groundwater (primarily calcium and manganese), but the water quality meets or exceeds standards set for acceptable drinking water by the federal government and the California Department of Health Services.

Wastewater and Recycled Water

Wastewater collection in the Citrus Heights Water District service area is performed by the Sacramento Regional County Sanitation District (SRCSD). Wastewater collected within the CHWD service area is transported through sanitary sewer mains about 25 miles to the southwest, to the SRCSD wastewater treatment plant near Elk Grove, California. Citrus Heights Water District, along with most other local water agencies in the Sacramento County region, are in coordination with SRCSD regarding various issues such as conservation methodologies and rebates, reuse potential and other issues. CHWD has no authority or

control over municipal wastewater generated in the CHWD service area. CHWD also currently has no authority over reuse in its area, and there is no reuse water available in its service area. However, the local water purveyors understand that reuse may become an important element of integrated water supply planning and support the development of a reuse supply component.

SRCSD is currently conducting reuse studies or planning efforts. The SRCSD study is a more detailed investigation of reuse potential for the region and is expected to develop a list of reuse projects to begin planning and design. These efforts involve the coordination, updates and input from individual local water agencies, and from the Regional Water Authority and the Sacramento Groundwater Authority.

There is no wastewater treated within or near CHWD's service area, and no known plans by SRCSD to construct any treatment facilities within or near CHWD's service area. No recycled water was projected to be used in the 2000 UWMP, and none was used.

Municipal wastewater is generated in the CHWD service area from a combination of residential and commercial sources. The quantities of wastewater generated are proportional to the population and the water use in the CHWD service area. Estimates of wastewater flows generated within CHWD for present and future conditions are presented in Table 3B. The source of the estimates is the population projections presented in Table 2 and a per capita unit flow of 138 gallons per day (gpd) including commercial use. The per capita wastewater generation unit flow rate was obtained from the Sacramento Regional Wastewater Treatment Plant (SRWTP) 2020 Master Plan, and is applied to both Sacramento and Placer County customers within the CHWD service area. The projected effluent that will meet reuse water quality in the CHWD service area is estimated at zero as there are no immediate plans to make recycled water available in the CHWD service area.

Table 3B
Wastewater Collected and Treated

	2005	2010	2015	2020	2025
Wastewater collected in service area*	10,292	10,434	10,589	10,898	10,844
Amount that meets recycled water standard	0	0	0	0	0

Units of Measure: Acre-Feet/Year
* Wastewater is only collected in service area, there is no treatment in CHWD's service area.

The wastewater generated in Sacramento County is collected by gravity in a series of main, trunk and interceptor sewers owned and operated by SRCSD. Collected wastewater is transported to the SRWTP in Elk Grove. The regional plant serves the entire Sacramento metropolitan area

including the unincorporated county area adjacent to the City of Sacramento, the City of Citrus Heights, and the City of Folsom. The treatment plant receives and treats approximately 156 mgd (2004) of dry weather flow on average. The current capacity of the plant to treat dry weather flows is approximately 181 mgd. The treatment plant produces a disinfected secondary effluent that is discharged into the Sacramento River below Freeport. The principal treatment processes are primary sedimentation, pure-oxygen activated sludge, secondary sedimentation, and chlorination/de-chlorination. Planned disposal methods and quantities are presented in Table 5-3.

There is currently no treated wastewater within the CHWD service area that meets the recycled water standard and no known plans for such through the year 2025. Therefore, there is no detailed discussion of wastewater disposal and recycled water use within this Plan.

For reasons previously stated, CHWD does not currently plan to pursue an agreement for obtaining recycled water from SRCSD To get the treated wastewater delivered to CHWD would involve pipeline and pumping improvements that would be prohibitively expensive and infeasible given that such a pipeline would pass through about 25 miles of the most populated areas of Sacramento County. The use of recycled water is not considered to be a feasible or cost-effective water conservation alternative at any time within the scope of this Plan.

Desalinated Water

Citrus Heights Water District has no opportunities for development of desalinated water as a present or future long-term supply. This is because there are no supplies of ocean water, brackish ocean water, or brackish groundwater available to CHWD that could be developed.

Future Water Supply Projects

Table 3C provides a description of expected future water supply projects that may be undertaken to meet CHWD's projected water use.

Table 3C Future Water Supply Projects					
			Multiple-Dry AF Years to CHWD		
Project Name	**Normal-year AF to CHWD**	**Single-Dry AF/Year to CHWD**	**Year 1**	**Year 2**	**Year 3**
Mitchell Farms Groundwater Well	100	500	500	600	700
Skycrest School Groundwater Well	150	900	900	1000	1100
Bonita Way Groundwater Well	150	900	900	1000	1100
Future Groundwater Well, Location to be determined	150	900	900	1000	1100
Future Groundwater Well, Location to be determined	150	900	900	1000	1100
Future Groundwater Well, Location to be determined	150	900	900	1000	1100
Future Groundwater Well, Location to be determined	150	900	900	1000	1100
Future Groundwater Well, Location to be determined	150	900	900	1000	1100
Future Groundwater Well, Location to be determined	150	900	900	1000	1100
Total	1300	7700	7700	8600	9500

Water Quality Impacts on Availability of Supply

As shown in Table 3A, CHWD's two sources of supply through the Year 2025 are purchased water from San Juan Water District (surface water from Folsom Lake) and groundwater from CHWD wells. CHWD is not aware of any water quality issues that will impact upon water management strategies and supply reliability over this time frame. Therefore, CHWD does not project any water quality impacts on its water supply.

Reliability Planning

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.

Reliability

Frequency and Magnitude of Supply Deficiencies

The surface water supply of CHWD can be adversely affected by both natural and man-made events. Natural events include floods, drought, and earthquakes, while man-made events could include unrestricted growth and development within the service area, failure of Folsom Dam or its raw water pumping and conveyance facilities, re-operation of the reservoir or contamination of the reservoir.

CHWD's surface water supply was threatened during the autumn of 1977. After two years of severe drought, the water supply in Folsom Reservoir dwindled to 140,000 acre-feet of storage, only fourteen percent of its 990,000 AF capacity.

CHWD implemented a Water Conservation Ordinance in 1987 as a result of an impending prolonged drought and reduction in storage at Folsom Reservoir. The reservoir level remained low for five of the next six years. In 1991, the reservoir again reached a critical level and motivated CHWD

to amend its ordinance and to adopt a 5-Stage Water Conservation Ordinance (see Appendix B) and to implement a Stage 3 – Water Alert to all residents. In the years 1993 through 2005, CHWD has experienced a more reliable supply of water from Folsom Reservoir due, in part, to favorable weather condition and above average rainfall and mountain snow-pack. CHWD's Water Conservation Ordinance (shown in Appendix B) sets forth a 5-stage program to reduce water consumption based on increasing levels of water shortage. The stages as defined in the Ordinance, and the approximate percentage of shortage that would trigger implementation of each stage, are shown in Table 4A. Actual water supply from 1980 – 2000 and future supply projections through 2025 are shown in Table 4B. Historic uses of surface water and groundwater are provided in Appendix F.

Table 4A
Water Supply Shortage Stages and Conditions

Stage No.	Water Supply Conditions	% Shortage
1	Normal Water Supply	0 % to 5%
2	Water Alert	5% to 10%
3	Water Warning	10% to 25%
4	Water Crisis	25% to 50%
5	Water Emergency	Greater than 50%

Table 4B
Water Supply Projections 1980 – 2025
Acre-Feet Per Year

Sources of Supply	1980*	1985*	1990*	1995*	2000*	2005 ***	2010	2015	2020	2025
Folsom Reservoir **	17,250	19,740	18,603	18,332	18,363	18,900	28,770	28,770	28,770	28,770
Ground water	1,318	505	40	89	2,192	100	5,830	8,330	10,000	10,000
Water Transfers	0	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	0	
Totals	18,568	19,975	18,643	18,421	20,555	19,000	34,600	37,100	38,770	38,770

* Actual Supply figures used
** Consists of Pre-1914 "Rights" waters and USBR contract water
***Current Year Estimate based on January – October use.

Plans to Assure a Reliable Water Supply

The future supply projections assume normal inflows to Folsom Reservoir; however, as noted above, these inflows are dependent on the weather and are historically at or below normal. Any sustained below-normal inflows to the reservoir will adversely affect CHWD's ability to meet the projected customer demands using surface water only. The loss of power to CHWD is not an issue since the system is gravity fed, but the treatment plant at San Juan Water District may be affected and back-up power would need to be available. CHWD is currently engaged in several initiatives to ensure a reliable supply including conjunctive use of groundwater, the development of additional wells, upgrade of existing wells, increased conservation efforts, and the installation of water meters to better manage the existing supplies.

Reliability Comparison

San Juan Water District is projecting water supply reductions of approximately 7.5% for both a single dry water year and for each year of multiple dry water years. SJWD's availability of wholesale water thereby reduces from 82,200 AFY to 76,150 AFY. Surface water availability for CHWD similarly reduces from 28,770 to 26,612 AFY. Table 5 details estimated water supply projections associated with several water supply reliability scenarios.

Table 5
Surface and Groundwater Supply Reliability

			Multiple Dry Water Years		
Source	**Average/ Normal Water Year 2005 (Volume)**	**Single Dry Water Year (Volume)**	**Year 1 (Volume) 2006**	**Year 2 (Volume) 2007**	**Year 3 (Volume) 2008**
San Juan WD	28,770	26,612	26,612	26,612	26,612
CHWD Groundwater Wells	2,500 (3 wells)	2,500 (3 wells)	2,500 (3 wells)	2,500 (3 wells)	4,300 (5 wells)
Total	31,270	29,112	29,112	29,112	30,912

Unit of Measure: Acre-Feet/Year

Three Year Minimum Water Supply

Based on experiences during recent drought periods, CHWD recognizes that it is better to enter into a water shortage alert early, at a minimal level, to establish necessary conservation measures and programs, to gain

public support and participation, and to reduce the likelihood of more severe shortage levels later. As CHWD continues to become more water efficient, it may become more difficult for customers to reduce their water use during water shortages (this is called "demand hardening"). CHWD does not believe that its customers are yet approaching demand hardening because there are still large potential water efficiency improvements in residential plumbing fixtures, appliances, and landscapes, and in the commercial and institutional sectors. However, improved water use efficiency does mean that water supply reserves must be larger and that water shortage responses must be made early to prevent severe economic and environmental impacts.

In the spring of each year, CHWD's Board of Directors forecasts the year's minimum water supply availability for each of its sources of water, and projects its total water supply for the current year. Based on the water shortage stages and triggers, a water shortage condition may be declared. The most recent driest three-year historic sequence for CHWD's water supplies was from 1990 to 1992. Because shortages can have serious economic and environmental impacts, CHWD will make every effort to limit water shortages.

Revenue and Expenditure Impacts

CHWD's water rates are structured so that the full operating costs of CHWD are recovered through service charges that do not vary with the amount of water consumed. Therefore, revenues for the amount of water consumed rise and fall in direct proportion to the cost of providing the water supply. Reductions in water consumption related to water supply shortage stages will reduce CHWD revenue, but since the cost of supply should fall in equal measure, no net effect is anticipated. In theory, CHWD water consumption could drop to zero and there would be no net effect on revenues needed to support CHWD operations, since these revenues are covered in service charges, not water consumption charges. No measures are currently contemplated as being necessary to address either the revenue or expenditure impacts of water shortages, including rate adjustments or development of reserves.

Mechanisms for Determining Actual Reductions in Water Usage

Actual reductions in water usage will be determined through metered measurement of water consumption. By the end of 2006, nearly all of CHWD's water services will be metered, allowing CHWD to determine water usage by the end user and compare usage against seasonal historical averages to determine the percentage reductions achieved.

Penalties and Charges for Excessive Use

CHWD's Water Conservation Ordinance (Appendix B) does not currently contain charges for excessive use. CHWD is currently undertaking efforts with the other retail water agencies served by San Juan Water District to develop a new ordinance with common language to be adopted by all of these agencies. It is anticipated that this new ordinance will contain provisions for charges for excessive use.

Existing penalties for violation of Mandatory Requirements of the CHWD's Water Conservation Ordinance are addressed in Section III – Enforcement Measures of the Ordinance in Appendix B to this Plan.

Transfer or Exchange Opportunities

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Water Transfers

CHWD currently has 20 interconnections with six of its seven contiguous water agencies. Four of these agencies depend on the same source, Folsom Reservoir, for their primary water supply. These interconnections are considered as water sources for emergency conditions and are wholly dependent on the status of the other agency at the time of an emergency. Each of the other agencies has different production capabilities and storage facilities.

Table 6 shows the total hydraulic capacity of CHWD interconnections based on water main sizes exclusive of CHWD's 42-inch and SJWD's 78-inch transmission main capacities. However, it is unlikely that neighboring agencies could provide this total potential supply on an on-going basis due to their own supply restriction and other limiting factors.

Table 6
INTERTIES WITH NEIGHBORING AGENCIES

Water Agency	Source(s)	Number of Interties	Total Flow (Potential)
California American Water Co.	Groundwater Wells	5	4,000
Carmichael Water District	American River Groundwater Wells	1	1,000
City of Roseville	Folsom Reservoir Groundwater Wells*	2	2,000
Fair Oaks Water District	Folsom Reservoir Groundwater Wells*	3	4,000
Orange Vale Water Company	Folsom Reservoir Groundwater Wells*	0	0
Sacramento Suburban Water District	Folsom Reservoir Groundwater Wells	6	5,000
San Juan Water District	Folsom Reservoir	3	4,500
Total Potential Supply Available		20	20,500 GPM
Total Potential Supply Available per Day in Acre-Feet			90 AF/day
Total Potential Supply Available per Month in Acre-Feet			2,700 AF/mo

* Sources listed are secondary and/or emergency sources of these agencies and not considered available

With CHWD being so vitally dependent upon its surface water deliveries from Folsom Reservoir via San Juan Water District's treatment plant, the need for emergency interconnections and/or additional ground water pumping capacity is recognized. For the five-year period from 2000 to 2004, the peak water use month was July, averaging 2,917 AF/month. As noted in Table 6, surface water and groundwater delivery capacity from interconnections with other agencies is estimated to be 2,700 AF/month. This quantity is comprised of an estimated 1,400 AF/month of Folsom reservoir surface water and 1,300 AF/month of local groundwater. Several additional locations for proposed emergency interconnections and additional wells have been identified and will be evaluated as surrounding development dictates.

Water Use Provisions

Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

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.

Past, Current, and Projected Water Use

Since 1990, new connections are being added at a rate about 2% per year, but because of new plumbing efficiency standards, landscape guidelines, and other "normal year" conservation programs, water demand is only increasing at a rate of about 1% per year. Unaccounted water losses are estimated to be less than 5% of total demand. Table 7 illustrates Past, Current, and Projected Water Use 1995 - 2025 in acre-feet per year. Table 8 illustrates Past, Current, and Projected Water Use 1995 - 2025 in number of connections by customer type per year.

Table 7
Past, Current, and Projected Water Use

Water Use Sectors	1995	2000	2005	2010	2015	2020	2025
Single family residential	14,361	16,017	14,500	16,000	15,700	15,300	15,300
Multi-family residential	1,500	1,676	1,500	1,700	1,700	1,700	1,700
Commercial	1,390	1,552	1,500	1,600	1,600	1,600	1,600
Industrial	0	0	0	0	0	0	0
Institutional & governmental	500	559	500	600	600	600	600
Landscape	670	751	700	800	800	800	800
Sales to other agencies	0	0	0	0	0	0	0
Saline barriers	0	0	0	0	0	0	0
Groundwater recharge (recycled water)	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Agriculture [1]	0	0	0	0	0	0	0
Unaccounted-for system losses	0	0	0	0	0	0	0
Total	18,421	20,555	18,700	20,700	20,400	20,000	20,000

Unit of Measure: Acre-Feet/Year (AFY)
[1] Agricultural water does not include water that is privately pumped

Table 8
Number of Connections by Customer Type

Customer Type	1995	2000	2005	2010	2015	2020	2025
Single family residential	16,960	17,262	17,534	18,420	19,350	20,340	21,380
Multi-family residential	650	664	680	710	740	770	800
Commercial	650	701	740	780	820	860	900
Industrial	0	0	0	0	0	0	0
Institutional and governmental	80	97	110	120	130	140	150
Landscape/recreation	150	163	186	200	220	240	260
Agriculture	0	0	0	0	0	0	0
Other (Recycle water)	0	0	0	0	0	0	0
Total	18,490	18,887	19,250	20,230	21,260	22,350	23,490

Over the past several years, it became apparent that CHWD needed to improve information about its customers. Previously, CHWD identified and billed customers on the basis of street address with an additional irrigation charge for lots over one-half acre in size. With the installation of meters, the meter size has also played a part in the computation of charges. CHWD was unable to easily distinguish a commercial customer from a large landscape customer or from a large multi-family complex. Obviously, each would have different needs in the event of a water shortage. Therefore, CHWD modified its water billing system and now has classified the accounts by use class and can identify each customer by sector and usage category.

Residential Sector

In Citrus Heights Water District there were approximately 25,681 dwelling units including single family, duplex, trailers, and apartments as of December 31, 2000. These dwelling units averaged 2.56 persons for a total population of 65,746. Total system per capita water use averages 279 gallons per day. Water efficiency improvements, conservation efforts and metering of all accounts will impact per capita water use, which will help to avoid a return to high use levels. By the year 2025 dwelling units are expected to increase to 27,726. These dwelling units are expected to average 2.53 persons for a total population of 70,150. Total system per capita water use in the year 2025 is expected to be approximately 255 gallons per person per day.
Residential water use in 2025 is estimated at 216 gallons per person per day (gpcpd).

Commercial Sector

CHWD has a complex mix of commercial customers, ranging from antique stores, insurance offices, beauty shops, and gas stations to multi-story office buildings, outlet and regional shopping centers, and high-volume restaurants and other facilities serving the population. This sector is growing at about 1% per year. Other sectors such as Institutional/Government, and Landscape/Recreational, are also tracked individually. These sectors are expected to increase at a lower rate over the planning period.

Citrus Heights Water District, together with three other water agencies, is currently pursuing high water users in these sectors to use the available water supply more efficiently with crop evapotranspiration data. A CIMIS (California Irrigation Management and Information System) station is currently available in the region with data available on a daily basis from several websites.

Institutional/Governmental Sector

CHWD includes a stable institutional/governmental sector, primarily local government, schools, and public parks. This sector will keep pace with the growth of CHWD.

Landscape/Recreational Sector

Landscape and Recreational customer accounts are expected to increase approximately 1% per year for the next 20 years due to continued growth in the need to serve the expected increase in population. Increased efficiency through irrigation audits and landscape conversions at existing

parks, golf courses, and cemeteries should help offset new demand resulting from projected increases in this sector.

Agricultural Sector

Agricultural water demand is relatively small within CHWD and is projected to gradually decrease over the next twenty years. The General Plans of the County of Sacramento and City of Citrus Heights reflect interest in retaining open space, quality of life, environmental values, and the long-term maintenance of a diverse economic base. However, it is projected that rising property values and the demand for housing and commercial space will result in the eventual conversion of more agricultural land to urban uses.

Supply and Demand Comparison Provisions

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.

Supply and Demand Comparison

Table 9 compares current and projected water supply and demand. The chart was developed using the secure supply from Folsom Reservoir and CHWD's well production. The table indicates that future water demand will always be less than the "Pre-1914 Water Rights" and "USBR Contracts" water from Folsom Reservoir.

Citrus Heights Water District has provided a copy of their draft 2005 Urban Water Management Plan to San Juan Water District, notifying SJWD of CHWD's demand projections. SJWD has identified and quantified existing and planned sources of water for their entire service area in their 2005 Urban Water Management Plan, but they have elected not to specify quantities to be delivered to any specific retail agency.

Table 9
Projected Water Supply and Water Demand Comparison

	2005	2010	2015	2020	2025
Supply totals*	31,270	34,600	37,100	38,770	38,770
Demand totals	19,400	20,700	20,400	20,000	20,000
Difference	+11,870	+13,900	+16,700	+18,770	+18,770
% of Projected Normal	161.2%	167.1%	181.9%	193.9%	193.9%

Units of Measure: Acre-Feet/Year
* Includes projected wholesale surface water supply and groundwater supply

In any one dry or critically dry year, CHWD will need to carefully manage its water supply, and may need to enter into at least a Stage 2 "Water Alert". This will be especially true if additional water is not available from

Folsom Reservoir, if the wells cannot keep pace with the increased demand or if the metered rates have not resulted in the expected demand reduction. In the second consecutive dry or critically dry year, CHWD will most likely need to enter into a higher conservation "Stage" in order to reduce demand when faced with the likely reduced availability of surface water. See the Water Shortage Contingency Plan sections and Table 10 for more detailed information. (See Conservation Ordinance, Appendix B, for "Stage" definitions and triggers)

Table 10 presents a supply and demand comparison where demand does not fluctuate in conjunction with a change in supply. This analysis demonstrates that if supply were to be reduced from a water supply shortage, the existing supply is not sufficient to meet demands.

Tables 10A, 10B, & 10C show how supply options and demand options can alter the outcome of a water shortage.

Table 10
Single Dry Year and Multiple Dry Water Years

Water Supply Sources	Current Supply 2000-2004 (Volume)	Single Dry Water Year (Volume)	Multiple Dry Water Years		
			Year 1 (Volume)	Year 2 (Volume)	Year 3 (Volume)
Supply totals*	31,270	**29,112	29,112	29,112	29,112
Percent Shortage	0%	7.5%	7.5%	7.5%	7.5%
Demand totals***	20,236	20,236	20,236	20,236	20,236
Difference	+11,034	+8,876	+8,876	+8,876	+8,876

Unit of Measure: Acre-Feet/Year (AFY)
* Dry years supply assumes only surface and groundwater availability
** Consists of Pre-1914 "rights" water and USBR contracts water plus 3 wells operating at current yearly peak output of 2,500 AFY
*** Based on total average demand for FY 2000-2004 and estimating no change in demand for next three dry years

Table 10A modifies the comparison by increasing the supply available for use with the inclusion of 1,300 AF/month of interagency transfers, not dependent on Folsom Reservoir supply, in the second dry year as the only source of additional supply. This additional supply could only be generated by the agencies that currently depend on groundwater since the scenario is based on supply being restricted or not available from Folsom Reservoir. Demand remains the same as in Table 10. This analysis demonstrates that changes in supply may be narrowly sufficient to meet the demand in the second and third years of a water shortage.

Table 10A Reliability and Comparison with Water Supply Options					
Water Supply Sources	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	31,270	29,112	29,112	18,100	18,100
Demand totals	20,236	20,236	20,236	20,236	20,236
Difference	+11,034	+8,876	+8,876	-2,136	-2,136
Unit of Measure: Acre-Feet/Year					

Table 10B modifies the comparison by implementing demand management measures (DMMs) and other consumption reduction methods (2,002 AFY reduction). This comparison holds supply at the same level as Table 10A. This analysis demonstrates that the use of conservation measures is marginally not sufficient to completely meet the demand during the second and third years of a water shortage.

Table 10B Reliability and Comparison with Water Demand Options					
Water Supply Sources	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	31,270	29,112	29,112	18,100	18,100
Demand totals	18,234	18,234	18,234	18,234	18,234
Difference	+13,036	+10,878	+10,878	-134	-134
Unit of Measure: Acre-Feet/Year					

Table 10C modifies the comparison in Table 10B by increasing supply with the addition of one more groundwater well to mitigate the second and third years of a water shortage and modifying water user habits through conservation measures. It demonstrates that most circumstances of shortage can be planned for. However, effort should be devoted towards securing additional supplies during a catastrophic supply reduction.

Table 10C Reliability and Comparison with Water Supply and Water Demand Options					
Water Supply Sources	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	31,270	29,112	29,112	18,933	18,933
Demand totals	18,234	18,234	18,234	18,234	18,234
Difference	+13,036	+10,878	+10,878	+699	+699
Unit of Measure: Acre-Feet/Year					

During multiple dry year scenarios, CHWD does not anticipate any increase in demand beyond the year 2010. CHWD will be implementing metered water billing for all of its customers beginning in 2008. The change from flat-rate to metered billing is expected to decrease water demand in the future. Coupled with the fact that the CHWD service area will be essentially built-out by 2010, CHWD is not projected any increases in demand after 2010.

Water Demand Management Measures

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:.....

Citrus Heights Water District is committed to implementing water conservation programs. This Section discusses water conservation. For the purpose of responding to the Urban Water Management Planning Act, CHWD will address the 14 Demand Management Measures (DMMs). Descriptions of CHWD's water conservation programs follow.

Citrus Heights Water District is not a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California (MOU) and is therefore not a member of the California Urban Water Conservation Council (CUWCC). CHWD has, in good faith, addressed and taken steps to comply with all of the BMP targets listed in the CUWCC MOU where applicable. CHWD will consider becoming a member of the CUWCC and a signatory to the MOU in some future year. The following are some of the benefits of being a member of the CUWWC: conferences, Best Management Practices (BMP) workshops, free publications, research regarding water management practices, leadership on water legislation and networking with other agencies and interest groups.

DMM A – Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

IMPLEMENTATION DESCRIPTION: Since 1991, in cooperation with other water agencies, CHWD has offered free residential water use surveys to single-family residential and multi-family residential customers (see Table 11). CHWD is not currently able to identify the top 20% of water users in each water use sector because CHWD is not yet fully metered. Surveys are offered through CHWD's semi-annual newsletter and by flyers distributed to individual residences when a new meter is installed. It is CHWD's goal to complete surveys for 15% of the single family residential and 15% of the multi-family residential connections per year for the next 15 years.

CHWD has contracted with a local certified Irrigation Review Specialist to conduct the water use surveys. CHWD's Conservation Specialist participates in the reviews in order to become familiar with the process and to remain current as a Certified Irrigation Auditor. The Conservation Specialist is qualified to conduct additional audits to increase the number completed each year. A Master Gardener is on staff at San Juan Water District (CHWD's Wholesaler) and is available to assist CHWD in training the residents and staff on landscape efficiency improvements and about the drought-tolerant plants that are commonly grown in the area.

Single-family residential surveys take approximately two hours (including travel time, report writing and follow-up) and are conducted by the contract Irrigation Review Specialist. Interior audits are not offered by CHWD as a matter of practice due to liability concerns. Residents that are new to the area, that have had a meter installed at their property, or that inquire at CHWD's office are given a packet that contains a low-flow showerhead, faucet aerator, toilet leak detection tablets, and toilet tank water displacement bag. The customer is also provided with information on CHWD's ultra-low flush toilet replacement program (see DMM N).

The irrigation review conducted by the contract Irrigation Review Specialist includes showing the customer the location of the water meter and how to read it, if one is installed; measures the landscaped areas; tests the sprinkler system for irrigation efficiency and distribution uniformity; teaches the customer how to set the irrigation controller; develops a three-season irrigation schedule (based on soil type, evapotranspiration, and irrigation system), recommends sprinkler system repairs or improvements and provides brochures on water efficient landscaping, design, and plants. Multi-family residential surveys are similar, but require coordination with owners/managers, tenants, and landscaping services. Institutional and governmental customers have been offered water use surveys.

(see DMM E and DMM I).

IMPLEMENTATION SCHEDULE and CONSERVATION SAVINGS:

Table 11
DMM A Implementation Schedule and Water Savings

Year	Surveys completed Single Family1	Surveys completed Multi-Family2	Annual Water Savings3/4 (AF)(e)	Cumulative Water Savings3/4 (AF)(e)
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	0	0
1998	0	0	0	0
1999	3	1	0.2	0.2
2000	44	2	1.8	2
2001	173	5	4	6
2002	135	2	7	13
2003	179	8	10	23
2004	87	7	11	34
2005	150e	48e	9e	43e
2006	175e	76e	11e	54e
2007	175e	76e	11e	65e
2008	175e	76e	11e	76e
2009	175e	76e	11e	87e
2010	175e	76e	11e	98e
2011	175e	76e	11e	109e
2012	175e	76e	11e	120e
2013	175e	76e	11e	131e
2014	175e	76e	11e	142e
2015	175e	76e	11e	153e

e = estimate
1 = 15% of (17,534 single family households/15 years) = 175/year
2 = 15% of (7,577 multi-family households/15 years) = 76/year
3 = Water Savings based on calculations provided by CUWCC's "Total Water Savings Report"
4 = Estimated Annual Savings based on average of previous five year savings

METHODS TO EVALUATE EFFECTIVENESS: For each dwelling unit the contract Irrigation Review Specialist completes a customer data form including lot size and landscaped area square footage. This data is used to analyze the customer's water use, and to refine the program. A follow-up visit is scheduled with CHWD's Conservation Specialist to evaluate the customer's progress and the effectiveness of the irrigation schedule provided by the contract Irrigation Review Specialist and to present the customer with an interior retrofit kit with instructions on installation.

CHWD staff plans to survey the customers' water use records and compare historic with current use for one year after the survey if the customer has been metered for at least one year. If the reduction in water

use is not in line with DMM water savings estimates, staff will flag the customer's account and offer a follow-up survey.

BUDGET: Proposed annual budget: $18,000 includes CHWD personnel time, contracting for an Irrigation Review Specialist, brochures, and purchase of low-flow showerheads, faucet aerators, toilet tank leak detection tablets, and other miscellaneous materials (this budget item does not reflect the costs associated with ultra-low flush toilets - see DMM N).

DMM B – Residential Plumbing Retrofit

IMPLEMENTATION DESCRIPTION: CHWD does not have an ordinance in effect that requires replacement of high-flow showerheads and other water use fixtures with their low flow counterparts. CHWD estimates that it has not yet satisfied the 75% saturation requirement for single-family or multi-family housing units.

CHWD distributes low-flow showerheads, faucet aerators, and toilet tank leak detection tablets at the City of Citrus Heights' local fairs and during Water Awareness Month. At these events CHWD also emphasizes water use surveys and the ultra-low-flush toilet replacement program (refer to DMM A and DMM N). CHWD's program also includes the distribution of these items whenever a new owner moves into a residence within CHWD (New Resident Packets) and in Retrofit Kits distributed to each home as a meter is installed. CHWD has targeted 5% of its approximately 14,900 pre-1992 single family homes and 5% of its approximately 6,800 pre-1992 multi-family dwelling units every year. In order to reach the targeted 5% every year, CHWD will need to distribute excess devices due to the probability of distribution to people outside the targeted group.

IMPLEMENTATION SCHEDULE: CHWD will continue to implement this DMM at a targeted rate of 5% of pre-1992 single and multi-family customers every year. However, actions required by this DMM are included as part of DMM A and DMM N, which CHWD believes is a more efficient approach to implementing DMM B. Table 12 lists the water savings devices distributed and proposed for distribution for both DMM A and B through 2015.

Table 12
DMM B Implementation Schedule

Year	Low-Flow Showerheads		Faucet Aerators		Toilet Tank Leak Detection Tablets	
	Single Family	Multi-Family	Single Family	Multi-Family	Single Family	Multi-Family
1997	0	0	0	0	0	0
1998	125	0	250	0	125	0
1999	750	0	1500	0	750	0
2000	1625	0	3250	0	1625	0
2001	360	0	720	0	360	0
2002	234	0	468	0	234	0
2003	300	4	600	8	300	4
2004	798	33	1596	66	798	33
2005	1500e	33e	3000e	66e	1500e	33e
2006	2000e	33e	4000e	66e	2000e	33e
2007	200e	15e	400e	30e	200e	15e
2008	200e	15e	400e	30e	200e	15e
2009	200e	15e	400e	30e	200e	15e
2010	200e	15e	400e	30e	200e	15e
2011	200e	15e	400e	30e	200e	15e
2012	200e	15e	400e	30e	200e	15e
2013	200e	15e	400e	30e	200e	15e
2014	200e	15e	400e	30e	200e	15e
2015	200e	15e	400e	30e	200e	15e

e = estimate

CONSERVATION SAVINGS:

Table 13
DMM B Water Savings

Year	Annual Water Savings (AF)	Cumulative Water Savings (AF)
1999	---	---
2000	0	0
2001	3	3
2002	5	8
2003	7	15
2004	13	28
2005	13	41e
2006	9e	50e
2007	9e	59e
2008	9e	68e
2009	9e	77e
2010	9e	86e
2011	9e	95e
2012	9e	104e
2013	9e	113e
2014	9e	122e
2015	9e	131e

e = estimate

METHODS TO EVALUATE EFFECTIVENESS: Refer to DMM A and DMM N.

BUDGET: Proposed annual budget: see DMM A.

DMM C – System Water Audits, Leak Detection, and Repair

IMPLEMENTATION DESCRIPTION: CHWD conducts electronic transmission and distribution system water audits periodically and visual leak detection and repair activities routinely.

CHWD is located in a relatively flat area of the northeast portion of Sacramento County and a small portion of southern Placer County. The soil types and the shallow depth of the waterlines, in combination with the prevailing high pressures throughout CHWD's water distribution system, minimize the likelihood of non-surfacing leaks. Experience has shown that most leaks that occur will surface and be visually detected. This fact has been borne out by the few minor leaks discovered in 2000 through 2002 using electronic locating of leaks by the use of sound amplification. Because of the expense of electronic locating of leaks with limited results, CHWD has elected at this point in time to rely upon visual detection of leaks as being the most cost-effective approach to leak detection and repair.

IMPLEMENTATION SCHEDULE: Visual detection of leaks, and repair of leaks as they are detected, is an ongoing part of CHWD's water distribution system operations and maintenance program.

Table 14A
Electronic Transmission and Distribution System Water Audits

Year	Miles Surveyed	Leaks detected electronically	Cost per leak	Leaks repaired	Water Savings (Acre-Feet) (estimate)
2000	19.2	3	$1,582	3	7.0
2001	8.6	7	$678	7	18.6
2002	1	4	$501	4	7.3
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	0	0
2006	0e	0	0	0	0
2007	0e	0	0	0	0
2009	0e	0	0	0	0
2009	0e	0	0	0	0
2010	0e	0	0	0	0
2011	0e	0	0	0	0
2012	0e	0	0	0	0
2013	0e	0	0	0	0
2014	0e	0	0	0	0
2015	0e	0	0	0	0

METHODS TO EVALUATE EFFECTIVENESS: CHWD senior management annually reviews the data records to confirm that estimated unaccounted-for water losses stay under 5%. When CHWD becomes a fully-metered system in 2007, it will have more accurate water consumption information with which to more accurately determine the level of unaccounted-for water losses.

Table 14B
Visual Leak Detection and Repair

Year	Total Leaks Detected Visually	Cost per leak	Leaks repaired	Water Savings (Acre-Feet) (estimate*)
2001	70	$678	70	21.5
2002	64	$501	64	19.6
2003	62	$1,000	62	19.0
2004	44	$1,990	44	13.5
2005	30e	$1,830	30	9.2
2006	35e	$1,920	35	10.7
2007	34e	$2,020	34	10.4
2008	33e	$2,120	33	10.1
2009	32e	$2,225	32	9.8
2010	31e	$2,335	31	9.5
2011	30e	$2,452	30	9.2
2012`	30e	$2,575	30	9.2
2013	30e	$2,705	30	9.2
2014	30e	$2,840	30	9.2
2015	30e	$2,980	30	9.2

*Leak estimates based upon 10 GPM for 7 days = 100,000 gallons per leak approximately

CONSERVATION SAVINGS: Estimated water savings from leak repairs will vary annually depending the number and size of leaks detected and repaired.

BUDGET: Proposed annual budget: $67,200 from Operations and Maintenance budget.

DMM D – Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

IMPLEMENTATION DESCRIPTION: CHWD began installing meters on all new commercial connections and billing by volume of in 1972. In compliance with State law, CHWD has been requiring meters on all new connections since 1992. The Board of Directors approved a commercial and governmental meter retrofit program which retrofitted all unmetered commercial and governmental connections with meters in 1997. Currently, all these accounts are metered. In 1998, the Board of Directors approved a contract for metering all of its multi-family residential accounts. Currently, all of these accounts are metered. In 1999, the Board of Directors approved an initial contract for metering all of its single-family residential customers. To date, over 15,300 of CHWD's 18,150 residential customers have been metered. CHWD fully intends to meet the amended mandatory Federal target of 2008 for metering each water service connection within its boundaries and to begin billing each account on the metered rate. The following tables document the status of unmetered accounts and meter retrofits as of December 31 of the respective years.

Table 15A
Actual Water Meter Installations

	2001	2002	2003	2004	2005
# of unmetered accounts	10,901	5,982	5,361	3,917	1,862e
# of retrofit meters installed	3,014	4,919	621	1,444	2,055e
# of accounts without commodity rates	16,993	17,024	16,900	16,788	16,624e

CHWD has in place a tiered increasing block rate billing structure for metered accounts. All commercial, governmental, and multi-family accounts are billed at the metered rate. Single-family accounts that have been metered are billed on a flat rate unless they voluntarily choose to be billed on the metered rate. See Citrus Heights Water District's Metering Policies (attached as Appendix C). All accounts that are not presently billed on metered rates are scheduled to be billed on the metered rate beginning in 2008. A billing unit is one hundred cubic feet (748 gallons), commonly abbreviated HCF or CCF. For rate information, see DMM K and Appendix D.

Table 15B Planned Water Meter Installations						
	2006	2007	2008	2009	2010	2015
# of unmetered accounts	0	0	0	0	0	0
# of retrofit meters installed	1,862	0	0	0	0	0
# of accounts without commodity rates	16,500	16,200	23*	23*	23*	23*
Meter Reading, Billing & Maintenance Costs	$349,000	$349,000	$349,000	$349,000	$349,000	$349,000
Debt Service Costs – Bonds Used to Fund Meter Retrofits	$828,000	$828,000	$828,000	$828,000	$828,000	$828,000
*Metered water services for Citrus Heights Water District facilities are not billed.						

IMPLEMENTATION SCHEDULE: CHWD will continue to install and read meters on all services, and will continue to conduct its meter maintenance and repair program.

METHODS TO EVALUATE EFFECTIVENESS: Periodic review of customer water use, comparing current water use with historic data.

CONSERVATION SAVINGS: Metering of accounts may result in an 8.8% reduction in demand compared to non-metered accounts, per estimates developed in the Citrus Heights Water District 1998 Water System Master Plan.

BUDGET: Proposed annual budget: $349,000 for meter reading, billing and maintenance for 2006 and subsequent years. Debt service on the bonds (Certificates of Participation) sold to finance a portion of the water meter retrofits is budgeted at $828,000 annually to the year 2019, then drops to $196,000 for 2020-2032. The capital cost for completion of the meter retrofit program in 2006 is estimated to be $1.8 million.

DMM E – Large Landscape Conservation Programs and Incentives

IMPLEMENTATION DESCRIPTION: CHWD has offered large landscape water audits on a voluntary basis to the parks, schools, and cemeteries located within CHWD boundaries since 1991. CHWD has conducted water audits for the Sunrise Recreation and Park District, San Juan Unified School District, Sylvan Cemetery District and residential customers who are metered and have large landscapes. CHWD's contract Irrigation Review Specialist conducted these surveys. During the surveys, the contractor calculates a water budget for the site -- the amount of water necessary for that site based on the size of the landscape and the climate. CHWD staff reviews landscape customer's water use monthly. If the water budget is exceeded for an extended period of time, the customer is offered technical assistance. On-site follow-up evaluations are recommended for customers whose annual water use exceeds their water budget.

CHWD is able to identify approximately 186 dedicated irrigation meter accounts with approximately 18 of these operating on a water budget. Currently, the budgeted use and actual use data is not tracked. However, every account in this category is provided with water use-notices on each bill they receive.

Table 16A
Large Landscape Surveys, Actual 2001-2005

	2001	2002	2003	2004	2005
# of budgets developed	6	5	0	0	0
# of surveys completed	6	11	6	16	7
# of follow-up visits	2	5	0	0	0
Actual expenditures	$1,500	$1,700	$1,060	$2,500	$1,120
Actual Water Savings - AFY	*	*	*	*	*
*actual water savings not measured					

Table 16B
Large Landscape Surveys, Projected 2006-2010

	2006	2007	2008	2009	2010
# of budgets developed	10	10	10	10	10
# of surveys completed	10	10	10	10	10
# of follow-up visits	10	10	10	10	10
Actual expenditures	$1,600	$1,600	$1,600	$1,600	$1,600
Projected Water Savings - AFY					

The Sacramento Area Water Works Association (SAWWA), in conjunction with the California Department of Water Resources, installed a California Irrigation Management Information System (CIMIS) weather station at Phoenix Park in Fair Oaks, California, in 1996. Daily climatological data (temperatures, relative humidity, wind velocity, precipitation, and several other measurements that are beneficial for efficient irrigation) are made available on a telephone recording for the public and through CHWD's website.

CHWD's conservation staff continually works with Sunrise Recreation & Park District, San Juan Unified School District and the City of Citrus Heights to improve water use efficiency at public landscapes and greenbelts. This may include the redesigning of a landscape. Many parks within CHWD are scheduled to install automated CIMIS-based (or similar systems) controllers with soil moisture sensors in the next five years. The service to these classes of customer as well as other large landscape (over three acres) property owners is offered free of charge.

CHWD has been participating in and assisting in the funding of the Regional Water Authority's Large Landscape Grant Project after being awarded matching funds through Proposition 13 Grants since 2001. This program has a consultant who is contacting large landscape owners served by the participating agencies and encouraging them to upgrade their irrigation systems and components with the grant money as an incentive. These system components and the irrigation review that is included will assist in establishing a water budget and having an irrigation system capable of implementing the recommendations of the contract Irrigation Review Specialist.

IMPLEMENTATION SCHEDULE and METHODS TO EVALUATE EFFECTIVENESS: CHWD plans to complete the remaining large landscape customers' water use surveys over the next ten years. CHWD will continue to implement this DMM by annual review of customers' water use and by offering on-site follow-up evaluations to customers whose total water use exceeds their total annual water budget. CHWD also plans to continue its partnership in the RWA Large Landscape Grant project and encourage participation with the Proposition 13 grant money and free services.

The marketing strategy to implement this DMM involves direct mailings through RWA's Large Landscape Grant program. The RWA has also conducted landscape seminars and classes on efficient irrigation techniques, and has promoted their programs at local Home and Garden Shows. Public Service Announcements are made through RWA's Regional Water Efficiency Program. These include pre and post irrigation

season PSAs through radio and television ads "Tune up your Turf" and "Slow the Flow in the Fall". Billboard advertising has also been initiated with the message "Overwatering Kills Plants".

CONSERVATION SAVINGS: Landscapes that are upgraded based on survey recommendations could result in as much as a 0.3% reduction in total water demand. The impact of this DMM on the individual customer is unknown at this time but may result in savings as high as 15%.

BUDGET: Proposed annual budget: see DMM A.

DMM F – High-Efficiency Washing Machine Rebate Programs

IMPLEMENTATION DESCRIPTION: CHWD currently participates on the RWA Water Efficiency Program (WEP) committee that is in negotiations with the Sacramento Municipal Utility District and Pacific Gas and Electric Company to establish a partnership to offer rebates on high-efficiency washing machines. Both of these utilities have a program in place and the additional incentive funding they could receive would benefit them as well as the RWA. CHWD's current position is to delay participation in this DMM pending the outcome and an evaluation of the benefits of the efforts of these agencies.

CHWD performed a cost effectiveness analysis to preliminarily determine the costs of implementing this DMM versus the estimated water savings. Using a rebate amount of $75 per washing maching and estimated water savings of 5,100 gallons per year per machine, the estimated water savings for a single year for 100 high-efficiency washing machines is estimated to be 1.57 acre-feet of water. The cost to CHWD for a single year is estimated to be $8,500 for 100 washer rebates. This includes $75 per rebate plus an estimated administrative cost of $10 per rebate to process the rebates. At CHWD's 2007 effective cost of purchased treated water ($94.62 per acre-foot), the annual cost of water saved is estimated to be $148.58. Using an estimated service life of 10 years for each washer, and taking into account the increasing cost of purchased water over that 10-year service life, the cost–to-savings ratio is greater than 4 to 1. Therefore, the cost effectiveness analysis does not support implementation of this DMM by CHWD.

CHWD believes that rebates for this type of consumer purchase are also most likely to be claimed by customers who were planning on replacing a washing machine anyway. Viewed from another perspective, CHWD is likely to benefit from customers who replace their aging washing machines with new, high-efficiency models without having to promote these purchases by offering rebates.

IMPLEMENTATION SCHEDULE: None

METHODS TO EVALUATE EFFECTIVENESS: None

CONSERVATION SAVINGS: None

BUDGET: Proposed annual budget: $0

DMM G – Public Information programs

IMPLEMENTATION DESCRIPTION: CHWD promotes water conservation and other resource efficiencies as a member of and in coordination with the Regional Water Authority (RWA). CHWD distributes information publicly through water bills, brochures, semi-annual newsletter, community speakers, paid advertising, and many special events every year. RWA's Water Efficiency Program member agencies received the benefits of reaching over one million viewers through 11 television stories that aired on Sacramento's major network channels in 2005. In addition, 290,000 impressions were made through print stories in the Sacramento Bee, Neighbors (regional news insert to the Bee), the Elk Grove Citizen and Pocket News. Over 405,000 impressions were made through radio stories and public service announcements. Another 543,062 commuters were reached via 27 billboards featuring an "over-watering" theme with the "Be Water Smart" message.

SAWWA established a world-wide web home page (www.sawwa.org) in 1997 which includes information on water conservation, backflow prevention, and other resource issues.

Citrus Heights Water District has also established a website (www.chwd.org) that contains information about CHWD's conservation programs as well as information about CHWD itself.

IMPLEMENTATION SCHEDULE: CHWD will continue to provide public information services, conservation materials, and maintain membership in associations to remind the public about water and other resource issues.

METHODS TO EVALUATE EFFECTIVENESS: CHWD will track the commentary regarding the information provided.

CONSERVATION SAVINGS: CHWD has no method to quantify the savings of this DMM but believes that this program is in the public's interest and enhances the effectiveness of the other DMMs.

BUDGET: Proposed annual budget: $33,000 (from water conservation activities budget) for printing of the semi-annual newsletter and postage plus association membership and other materials as necessary to support community events.

DMM H – School Education Programs

IMPLEMENTATION DESCRIPTION: CHWD began its school education program in 1992 and continues to work with the San Juan Unified School District to promote water conservation and other resource efficiencies at school facilities and to educate students about these issues. As part of CHWD's water conservation program, all students in the schools within CHWD in grades 4 thru 6 are invited to participate in the annual Water Awareness Poster Contest. Over 800 students typically participate with the three top student's posters winning $100 savings bonds and $100 for each of the winner's classrooms. The three top student's posters compete with winners in three other agencies for the top award and all are included in the yearly conservation calendar. The conservation calendars and complimentary T-shirts are awarded to every participant. CHWD provides educational materials as part of the school presentations given each year which include workbooks, activity books, posters and classroom materials.

Through CHWD's association with RWA, over 7,000 additional elementary and middle school students participated in a program called "Be Water Wise" cosponsored by the Sacramento Bee newspaper. The Bee's Newspapers in Education "Be Water Wise" Program is designed to reinforce water awareness at home. The competition for grades K-4 involved students gathering water-saving tips with their parents. Teachers returning the most tips increased the chances of their class being selected in the drawing at the end of the program. The winning classes received a visit from Mr. Leaky (the RWA icon) and prizes furnished by the RWA. The program has been a great success in the region with the participation of thousands of family members. Over 250 teachers have been involved every year for the past 12 years.

IMPLEMENTATION SCHEDULE: CHWD will continue to implement this DMM at the levels described.

METHODS TO EVALUATE EFFECTIVENESS: CHWD will continue to offer classroom presentations and will track the number given. Also, the total number of posters submitted will be a good indication of the success of this DMM.

CONSERVATION SAVINGS: CHWD has no method to quantify the savings of this DMM but believes that this program is in the public's interest and enhances the effectiveness of the other DMMs.

BUDGET: Proposed annual budget: $18,000 for CHWD personnel time to prepare and deliver school presentations, to coordinate the poster contest, and to cover materials used for the school programs as well as

association membership costs. This budget also includes the cost for T-shirts and calendars presented to each participant of the conservation poster contest.

DMM I – Conservation Programs for Commercial, Industrial, and Institutional Accounts

IMPLEMENTATION DESCRIPTION: For the last several years, CHWD has provided water use audits to any commercial or institutional customer (CII) who so requested. CHWD is currently upgrading its computer software so that it will be able to complete a computerized analysis of these customers by monthly and annual water usage to identify the top 10% of the commercial customers and the top 20% of the institutional customers. CHWD plans to develop a program to contact these customers by letter, and to follow up with telephone calls, to offer audits. So far, several of these customers have been surveyed for water use efficiency. In addition, CHWD has recently been involved in RWAs "Rinse and Save" Program which replaces high water use spray nozzles (3 to 5 gpm) with low water use nozzles (1.5 gpm). Restaurants in CHWD's service area were targeted. Included in the program was training on proper use of the new nozzles. These nozzles were distributed at no charge to the customer and included an interior water audit which identified high water use toilets. CHWD had 13 sites participate with 18 nozzles replaced. CHWD has offered toilet rebates to the CII community within its service area since the beginning of the rebate program (see DMM N). Table 16 lists the schedule and projected savings of this DMM through 2015.

IMPLEMENTATION SCHEDULE: CHWD will continue to implement this DMM at the annual target rate for at least the next five years.

CONSERVATION SAVINGS: Savings evaluations will be provided to CHWD and the customer by the consultant. Estimates place these savings at 0.002% of total CHWD water demand.

Table 17 DMM I Implementation Schedule and Water Savings			
Year	**Surveys completed CII**	**Annual Water Savings (AF)**	**Cumulative Water Savings (AF)**
1997	1	0.2	0.2
1998	0	0	0.2
1999	1	0.2	0.4
2000	3	0.6	1.0
2001	0	0	1.0
2002	0	0	1.0
2003	1	0	1.0
2004	26	1.0	2.0
2005	15e	0.5e	2.5e
2006	15e	0.5e	3.0e
2007	15e	0.5e	3.5e
2008	15e	0.5e	4.0e
2009	15e	0.5e	4.5e
2010	15e	0.5e	5.0e
2011	15e	0.5e	5.5e
2012	15e	0.5e	6.0e
2013	15e	0.5e	6.5e
2014	15e	0.5e	7.0e
2015	15e	0.5e	7.5e
e = estimate			

METHODS TO EVALUATE EFFECTIVENESS: CHWD will continue to implement this DMM by annual review of customers' water use, and by offering on-site follow-up evaluations to customers whose total water use exceeds their total annual water budget.

BUDGET: Proposed annual budget: see DMM A.

DMM J – Wholesale Agency Programs

IMPLEMENTATION DESCRIPTION: Citrus Heights Water District is not a wholesale agency, therefore does not have a requirement to implement this DMM.

IMPLEMENTATION SCHEDULE: N/A

METHODS TO EVALUATE EFFECTIVENESS: N/A

CONSERVATION SAVINGS: N/A

BUDGET: Proposed annual budget: N/A

DMM K – Conservation Pricing

IMPLEMENTATION DESCRIPTION: CHWD employs a three-tiered increasing block rate to encourage conservation on its metered accounts. CHWD currently has 85% of its customer accounts metered, with about 16% of those accounts actually being billed on metered water consumption. CHWD plans to have 100% of its accounts metered by January 2007, with billing for metered water consumption using the three-tiered water rate to begin for all customers after January 2008. See Appendix D for the Citrus Heights Water District Schedule of 2005 Bi-Monthly Metered Water Rates.

CHWD has had metered water rates in place since 1972, when the first commercial accounts became metered. These rates are reviewed annually by CHWD's elected Board of Directors, and adopted with revisions as determined by the Board.

The increasing block rate is structured such that customers with water consumption that is about 80 percent of average or lower (for all CHWD customers) will pay unit prices for water used within Tier 1, consumption that is 80 percent to 130 percent of average is charged at unit prices for water used within Tier 2, and water consumption that exceeds 130% of the average for all CHWD customers is charged at the Tier 3 rate for those units of water. The number of units of water provided within each pricing tier varies depending upon the size of the water meter that serves the customer. This strategy recognizes that customers with larger water meters generally have a higher water demand (e.g., more landscaping, greater number of occupants, etc.) so that a multi-unit apartment dwelling with a 2-inch connection is allowed a greater number of units of water in each tier than a single-family residence on a standard-size residential lot. The tiers are not seasonally adjusted, so that customers may find themselves paying for some water at Tier 3 prices only during high-use times of year, generally the hotter, drier months where greater outdoor irrigation is prevalent.

METHODS TO EVALUATE EFFECTIVENESS: CHWD will monitor all accounts that reach the third tier of the rate structure and identify those accounts that consistently reach Tier 3 of the metered rate structure. These accounts will be offered an Irrigation Review to help manage water use.

CONSERVATION SAVINGS: The incentive of this DMM is to decrease the customer's water costs and water use through price incentives as described above. The expected annual water savings are projected to be 8.8%of the total CHWD demand per year and will contribute to the total itemized in DMM D.

BUDGET: Proposed annual budget: $5,000 for work related to annual analysis and adjustment of tiered pricing structure.

DMM L – Water Conservation Coordinator

IMPLEMENTATION DESCRIPTION: CHWD designated a Water Conservation Coordinator in 1989. The Conservation Coordinator develops and manages the conservation program and DMM implementation. The Conservation Coordinator is also responsible for preparing and submitting the DMM Implementation Report. Other duties of the Conservation Coordinator include: Communication and promoting water conservation issues to management; coordinating agency conservation programs with operations and planning staff; preparing annual conservation budget; monitors the impacts of programs and recommends improvements. The Conservation Coordinator is also responsible for training a full-time Conservation Specialist who assists with the conservation programs as well as patrolling CHWD and enforcing the Water Conservation Ordinance. Also, CHWD contracts with consultants to implement a number of DMMs. The Conservation Coordinator is responsible for managing the efforts of the consultants/contractors.

IMPLEMENTATION SCHEDULE: CHWD will continue to implement this DMM.

METHODS TO EVALUATE EFFECTIVENESS: The Special Programs Coordinator has the responsibility of performing the duties of CHWD's Conservation Coordinator and, as such, will prepare and present reports to the Assistant General Manager on the status and effectiveness of programs under his direction.

CONSERVATION SAVINGS: CHWD has no method to quantify the savings of this DMM but believes that this program is in the public's interest and enhances the effectiveness of the other DMMs.

BUDGET: Proposed annual budget: $36,000 for the portion of time the Special Programs Coordinator spends as a Water Conservation Coordinator on activities related to the conservation program.

DMM M – Water Waste Prohibition

IMPLEMENTATION DESCRIPTION: CHWD adopted a Water Conservation Ordinance in 1988, which is actively enforced. Enforcement includes the Conservation Specialist whose job is, in part, to educate customers, and if necessary, issue warnings and citations for water waste violations year round. The Ordinance also includes requirements for recirculating pumps on decorative fountains and evaporative coolers and automatic shut off valves for ponds. See Appendix B for the Ordinance and information on regulations, restrictions and enforcement.

IMPLEMENTATION SCHEDULE: CHWD has permanently incorporated this DMM into its ordinances.

METHODS TO EVALUATE EFFECTIVENESS: All citations and violations are reported annually. Over the past several years of this DMM CHWD has seen a reduction in the number of violations.

CONSERVATION SAVINGS: CHWD has no method to quantify the savings of this DMM but believes that this program is in the public's interest and enhances the effectiveness of the other DMMs.

BUDGET: Proposed annual budget: $85,000 for the Conservation Specialist and a vehicle and a portion of the conservation department's overhead.

DMM N – Residential Ultra-Low-Flush Toilet Replacement Program

IMPLEMENTATION DESCRIPTION: CHWD established a high visibility ultra-low- flush toilet replacement program together with three other water agencies in 1995. Rebates of up-to-$75 per voluntary toilet replacement were offered to all commercial, institutional, and residential customers through flyers, the semi-annual newsletter, direct mail, newspaper advertisements and press releases. Beginning in 2004, CHWD joined a partnership with the Sacramento Regional County Sanitation District through the conservation program of the Regional Water Authority. This partnership added $50 to the rebate total. The customer receives the rebate after furnishing proof of replacement of 7, 5.5, or 3.5 gallon per flush toilet with a 1.6 gallon per flush toilet. Installation is verified and the old toilet (s) is removed and destroyed after an on-site visit by CHWD staff. In 2004, CHWD issued rebates for 275 toilet replacements totaling rebates of more than $21,000.

CHWD's Board of Directors set the yearly target at 100 rebates per year. Since the program began in 1995, CHWD has issued approximately 1700 rebates for ULF toilets installed within CHWD.

IMPLEMENTATION SCHEDULE: CHWD will continue to implement this DMM until CHWD's goal is met: at least 80% of all non-conserving and low-flush model toilets in CHWD will be replaced with ultra-low-flush models.

Table 18A
DMM N – ULFT Retrofit Program, Single Family Actual 2001-2005

	2001	2002	2003	2004	2005
# of ULFT rebates	6	5	123	173	226
# of ULFT direct installs	0	0	0	0	0
# of ULF CBO installs	0	0	0	0	0
Actual expenditures $	$5,400	$3,825	$9,225	$34,375	$29,250
Water Savings – AFY*	3	2	6	8	10

*estimated based on water savings of 4 gallons per flush x 10 flushes per day = 0.0448 AFY per ULFT

Table 18B
DMM N – ULFT Retrofit Program, Single Family Projected 2006-2010

	2006	2007	2008	2009	2010
# of ULFT rebates	200	200	200	200	200
# of ULFT direct installs	0	0	0	0	0
# of ULF CBO installs	0	0	0	0	0
Actual expenditures $	$24,500	$24,500	$24,500	$24,500	$24,500
Water Savings – AFY*	9	9	9	9	9

*estimated based on water savings of 4 gallons per flush x 10 flushes per day = 0.0448 AFY per ULFT

Table 18C DMM N – ULFT Retrofit Program, Multi Family Actual 2001-2005					
	2001	2002	2003	2004	2005
# of ULFT rebates	0	2	0	1	16
# of ULFT direct installs	0	0	0	0	0
# of ULF CBO installs	0	0	0	0	0
Actual expenditures $	$0	$150	$0	75	$2,000
Water Savings – AFY*	0	0.075	0	0.038	0.7
*estimated based on water savings of 4 gallons per flush x 10 flushes per day = 0.0448 AFY per ULFT					

Table 18D DMM N – ULFT Retrofit Program, Multi Family Projected 2006-2010					
	2006	2007	2008	2009	2010
# of ULFT rebates	10	10	10	10	10
# of ULFT direct installs	0	0	0	0	0
# of ULF CBO installs	0	0	0	0	0
Actual expenditures $	$1,250	$1,250	$1,250	$1,250	$1,250
Water Savings – AFY*	0.4	0.4	0.4	0.4	0.4
*estimated based on water savings of 4 gallons per flush x 10 flushes per day = 0.0448 AFY per ULFT					

METHODS TO EVALUATE EFFECTIVENESS: CHWD will be able to monitor individual accounts who have installed a ULF toilet to confirm actual savings realized from the installation when all accounts are metered.

CONSERVATION SAVINGS: Projected total annual water savings from toilet retrofits at full implementation are 128 AFY.

BUDGET: Proposed annual budget: $24,500 for materials, rebates, and administrative costs.

DMM SUMMARY

Table 19 summarizes the totals for each DMM, the amount budgeted, and the savings in AF/YR and as a percentage of the system total water consumption.

Table 19
PROJECTED SUMMARY OF ANNUAL DEMAND MANAGEMENT MEASURES

Demand Management Measures	Demand Management Measures Definition	Budget Amount 2006	Savings AF/YR (Projected)	% of Total Water Usage Within CHWD (20,236 AFY basis)
A	Water Survey Programs for Single-Family Residential and Multifamily Residential Customers	$18,000 Contractor & Retrofit Kits	11	0.05
B	Residential Plumbing Retrofit	See DMM A & DMM N	9	0.04
C	System Water Audits, Leak Detection & Repair	$67,200 CHWD O & M	11	0.05
D	Metering with Commodity Rates for all new connections and retrofit of existing connections	$349,000 Meter reading, billing & maintenance costs. Capital Costs shown at bottom of Table.	1,781	8.80
		$828,000 Debt service on bonds for meter retrofit costs		
E	Large Landscape Conservation programs and incentives	See DMM A	61	0.30
F	High-efficiency washing machine rebate programs	$0	N/A	N/A
G	Public Information programs	$33,000 Newsletter & Association Fees	N/A	N/A
H	School Education programs	$18,000 T-shirts, Calendars, Association Fees, Misc.	N/A	N/A
I	Conservation programs for Commercial, Industrial, and Institutional accounts	See DMM A	0.5	0.002
J	Wholesale agency programs	N/A	N/A	N/A
K	Conservation Pricing	$5,000 Billing Software	See DMM D	See DMM D
L	Water Conservation Coordinator	$36,000 Time spent on program	N/A	N/A
M	Water Waste Prohibition	$85,000 Conservation Specialist & Vehicle	N/A	N/A
N	Residential Ultra-Low-Flush Toilet Replacement program	$24,500 Rebates & Staff Time	128	0.06
Total (Annual)		$1,463,700	2,002	9.84
Total 2006 Capital Costs (See DMM D)		$1,800,000		

Agricultural Water Conservation Programs

Since CHWD has few agricultural water accounts, it plans to treat any remaining parcels as large landscape areas and will developed water budgets and use tiered pricing for these customers as it does for any large landscape customer.

Water Shortage Contingency Plan

Preparation for Catastrophic Water Supply Interruption

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.

Water Shortage Emergency Response – Emergency Response Plan

CHWD developed a comprehensive water shortage contingency plan, which was incorporated into CHWD's Emergency Response Plan in early 1992. CHWD's plan is consistent with provisions in the County's Emergency Response Plan. Both plans contain procedures for the distribution of potable water in a disaster; these procedures are consistent with guidelines prepared by the California State Office of Emergency Services.

Response to a catastrophic interruption of supply is handled through a series of interconnected plans. All Disaster or Act of War Plans, from the state to local levels, use the Federal Civil Defense and Emergency Planning systems as role models with additions that take into consideration any unique conditions or situations which may exist within their jurisdictions.

At the national level, the Federal Emergency Management Agency (FEMA) controls all functions of Civil Defense or Emergency Planning for the Federal Government. FEMA will not assume control of an emergency until the President of the United States declares a State of Emergency or an Act of War occurs. At that point FEMA will assume control through the State of California Office of Emergency Services (State OES) and make available all of its resources.

At the state level, the State OES will control any disaster within the state after a State of Disaster has been declared by the Governor and can make available all of its resources. The State OES further controls the Master Mutual Aid Agreement that can also be used in a local disaster (CHWD is a member of California's Water Agency Response Network, a mutual aid system for water utilities, in accordance with State requirements).

At the county level, the Sacramento County OES will control the unincorporated areas of the County. They will coordinate mutual aid within the County, and act as an intermediary between local governments or utilities and the State mutual aid office.

On CHWD's level, CHWD will control all emergencies according to its Emergency Response Plan.

CHWD's Emergency Response Plan is designed as both an outline and a procedures manual. It covers notification procedures, emergency responsibilities of CHWD staff, hazardous materials containment, training, and procedural outlines for responding to various types of emergency events. As under normal operating conditions, in an emergency CHWD's primary concern is the health and safety of the general public and CHWD personnel.

Water Supply and Transmission and Distribution System Reliability

CHWD has taken, and continues to take, steps to increase the reliability of its water supply and ability to distribute water under a variety of emergency conditions.

CHWD's transmission and distribution system is gravity-fed from CHWD's treated water supplier, the San Juan Water District. CHWD requires no pumping for water pressure for its surface water supply. Therefore, there are no back-up electricity generation or pumping facilities required to maintain water pressure in the event of most power outage situations. The treated surface water comes from Hinkle Reservoir, a reservoir operated and maintained by San Juan Water District (SJWD), and SJWD has back-up electrical generating capacity to power the limited production of treated surface water into Hinkle Reservoir, in the event of a prolonged power outage. One CHWD groundwater well, the Sylvan Well, has diesel-powered back-up generating capacity for groundwater pumping in the event of power outages. New groundwater well facilities that will be designed and constructed by CHWD in the coming years will include the capability to hook up portable electrical generating units to power the wells in a power outage or to utilize other sources of energy such as natural gas.

In the event of an earthquake or other catastrophic natural disaster, CHWD maintains up-to-date system maps to enable isolation of damaged areas of the system to maintain water pressures and limit loss of water supply. Copies of system maps are distributed to all Operations crews and maintained in work vehicles, as well as available through CHWD's computerized Geographical Information System (GIS). CHWD

participated in the construction of the Cooperative Transmission Pipeline (CTP, completed in 1997), a 72-inch transmission main that serves CHWD and other water purveyors that receive treated surface water from SJWD. The CTP, in conjunction with CHWD's 42-inch transmission main that also serves water from SJWD's Hinkle Reservoir, provides additional reliability of surface water transmission capability. CHWD's Emergency Response Plan provides for response by CHWD personnel under a variety of scenarios, including the destruction, sabotage or contamination of CHWD facilities and water supplies.

APPENDIX A

RESOLUTION TO ADOPT THE 2005 URBAN WATER MANAGEMENT PLAN

CITRUS HEIGHTS WATER DISTRICT
RESOLUTION NO. 17-2005

RESOLUTION ADOPTING THE 2005 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Citrus Heights Water District Urban Water Management Plan is prepared and submitted to fulfill the requirements of the California Urban Water Management Planning Act of 1983, Assembly Bill No. 797, Water Code Section 10610 et seq.; and

WHEREAS, this Act requires all urban water suppliers that provide water for municipal purposes to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare and adopt an Urban Water Management Plan, and update it at least every five years and file said Plan with the California Department of Water Resources; and

WHEREAS, the District has prepared and made available for public review a draft Urban Water Management Plan, and a properly noticed public hearing regarding said Plan was conducted by the Board of Directors on November 9, 2005; and

WHEREAS, the Board of Directors intends that the Plan shall serve as a guideline to assist the District in its efforts to encourage conservation and efficient use of water.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of Citrus Heights Water District as follows:

1. The 2005 Urban Water Management Plan is hereby adopted; and the District Secretary is hereby authorized and directed to file the Plan with the California Department of Water Resources; and

2. The District General Manager is hereby directed to implement the programs as set forth in the 2005 Urban Water Management Plan, subject to review and express authorization of the Board of Directors for all actions requiring the approval of the Board of Directors.

PASSED AND ADOPTED by the Board of Directors of the CITRUS HEIGHTS WATER DISTRICT this 13th day of December, 2005, by the following vote, to wit:

AYES: Directors: Dains, Dion, Rose
NOES: Directors:
ABSTAIN: Directors:
ABSENT: Directors:

S E A L

Original signed by: Joseph M. Dion
JOSEPH M. DION, President
Board of Directors
Citrus Heights Water District

ATTEST:

Original signed by: Robert A. Churchill
ROBERT A. CHURCHILL, Secretary

CITRUS HEIGHTS WATER DISTRICT
RESOLUTION NO. 01-2007

RESOLUTION RE-ADOPTING THE 2005 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Citrus Heights Water District Urban Water Management Plan is prepared and submitted to fulfill the requirements of the California Urban Water Management Planning Act of 1983, Assembly Bill No. 797, Water Code Section 10610 et seq.; and

WHEREAS, the District prepared and made available for public review a draft Urban Water Management Plan, and a properly noticed public hearing regarding said Plan was conducted by the Board of Directors on November 9, 2005; and

WHEREAS, the District submitted the Plan to the California Department of Water Resources, and has subsequently revised the Plan to comply with the requirements of the California Urban Water Management Planning Act based on review by the Department of Water Resources; and

WHEREAS, the Board of Directors intends that the Plan shall serve as a guideline to assist the District in its efforts to encourage conservation and efficient use of water.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of Citrus Heights Water District as follows:

1. The 2005 Urban Water Management Plan is hereby re-adopted; and the District Secretary is hereby authorized and directed to file the Plan with the California Department of Water Resources; and

2. The District General Manager is hereby directed to implement the programs as set forth in the 2005 Urban Water Management Plan, subject to review and express authorization of the Board of Directors for all actions requiring the approval of the Board of Directors.

PASSED AND ADOPTED by the Board of Directors of the CITRUS HEIGHTS WATER DISTRICT this 9h day of January, 2007, by the following vote, to wit:

AYES:	Directors:	Dains, Dion
NOES:	Directors:	
ABSTAIN:	Directors:	
ABSENT:	Directors:	Rose

SEAL

CITRUS HEIGHTS WATER DISTRICT ORGANIZED OCT 25 1920 SACRAMENTO COUNTY

JOSEPH M. DION, Vice President
Board of Directors
Citrus Heights Water District

ATTEST:

ROBERT A. CHURCHILL, Secretary

APPENDIX B

WATER CONSERVATION ORDINANCE

ORDINANCE NO. 2 - 91
AN ORDINANCE ESTABLISHING A WATER CONSERVATION PROGRAM
WITHIN CITRUS HEIGHTS IRRIGATION DISTRICT

WHEREAS, this Ordinance is to establish Water Conservation Requirements and Enforcement Measures to be implemented to reduce water consumption within CITRUS HEIGHTS IRRIGATION DISTRICT, recognizing that water is a valuable natural resource which should not be wasted, further recognizing that CITRUS HEIGHTS IRRIGATION DISTRICT is resolved to provide its customers with high quality water for domestic, commercial, irrigation, and fire protection purposes at adequate pressures and equitable rates and further recognizing that water availability can be adversely affected by weather conditions, environmental commitments, a depleting ground-water basin, and growth, and

WHEREAS, the adoption of this Ordinance does hereby establish the following staged water conservation program.

SECTION I - STAGE DEFINITIONS:

STAGE 1 - NORMAL WATER SUPPLY: The District's supply or distribution system is able to meet all the water demands of its customers in the immediate future.

STAGE 2 - WATER ALERT: There is a probability that the District's supply or distribution system will not be able to meet all the water demands of its customers.

STAGE 3 - WATER WARNING: The District's supply or distribution system will not be able to meet all the water demands of its customers.

STAGE 4 - WATER CRISIS: The District's supply or distribution system is not able to meet all the water demands of its customers under STAGE 3 - WATER WARNING requirements.

STAGE 5 - WATER EMERGENCY: The District is experiencing a major failure of a supply, storage, or distribution facility.

SECTION II - MANDATORY REQUIREMENTS - STAGES 1 - 5:

Upon declaration or amendment by the Board of Directors of a specific Stage in effect as defined in Section I, the following mandatory water conservation requirements shall be in effect.

STAGE 1 - NORMAL WATER SUPPLY

1. Water will be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the consumer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining & refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the District.

STAGE 2 - WATER ALERT

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the consumer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the District.

6. Landscape and pasture irrigation shall be limited to a maximum of **THREE DAYS PER WEEK** when necessary based on the following ODD-EVEN schedule.

Customers with street addresses that end with an **ODD** number may irrigate only on **TUESDAYS, THURSDAYS,** and **SATURDAYS.**

Customers with street addresses that end with an **EVEN** number may irrigate only on **WEDNESDAYS, FRIDAYS,** and **SUNDAYS.**

NO irrigation is permitted on **MONDAYS.**

7. Landscape and pasture irrigation is not permitted between Noon and 6:00 PM and automatic sprinkler system timers shall be set to operate during off-peak hours between Midnight and 6:00 AM.

8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.

9. Restaurants shall serve water only upon specific request.

10. Drip irrigation for non-turf areas is excluded from these requirements.

STAGE 3 - WATER WARNING

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the consumer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the District.

6. Landscape and pasture irrigation shall be limited to a maximum of **TWO DAYS PER WEEK** when necessary based on the following ODD-EVEN schedule.

Customers with street addresses that end with an **ODD** number may irrigate only on **TUESDAYS,** and **SATURDAYS.**

Customers with street addresses that end with an **EVEN** number may irrigate only on **WEDNESDAYS**, and **SUNDAYS.**

NO irrigation is permitted on **MONDAYS, THURSDAYS,** and **FRIDAYS.**

7. Landscape and pasture irrigation is not permitted between Noon and 6:00 PM and automatic sprinkler system timers shall be set to operate during off-peak hours between Midnight and 6:00 AM.

8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.

9. Restaurants shall serve water only upon specific request.

10. Drip irrigation for non-turf areas is excluded from these requirements.

STAGE 4 - **WATER CRISIS**

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the consumer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the District.

6. Landscape and pasture irrigation shall be limited to a maximum of **ONE DAY PER WEEK** only when necessary based on the following ODD-EVEN schedule.

Customers with street addresses that end with an **ODD** number may irrigate only on **SATURDAYS.**

Customers with street addresses that end with an **EVEN** number may irrigate only on **SUNDAYS.**

NO irrigation is permitted on **MONDAYS, TUESDAYS, WEDNESDAYS, THURSDAYS,** and **FRIDAYS.**

7. Landscape and pasture irrigation is not permitted between Noon and 6:00 PM and automatic sprinkler system timers shall be set to operate during off-peak hours between Midnight and 6:00 AM.

8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.

9. Restaurants shall serve water only upon specific request.

10. Drip irrigation for non-turf areas is excluded from these requirements.

11. No potable water from the District's system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams until the WATER CRISIS has been declared over.

12. Prohibit water use for ornamental ponds and fountains.

13. Washing of automobiles or equipment shall be done on the lawn or at a commercial establishment that uses recycled or reclaimed water.

STAGE 3 - WATER EMERGENCY

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the consumer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be

allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the District.

6. Landscape and pasture irrigation shall **NOT BE ALLOWED.**

7. Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations.

8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.

9. Restaurants shall serve water only upon specific request.

10. No potable water from the District's system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams.

11. Prohibit water use for ornamental ponds and fountains.

12. Washing of automobiles or equipment shall be done at a commercial establishment that uses recycled or reclaimed water.

13. No potable water from the District's system shall be used for construction purposes such as dust control, compaction, or trench jetting.

14. New connections to the District system will not be allowed.

SECTION III - ENFORCEMENT MEASURES:

A. Upon initial observation by District personnel of a violation of the Mandatory Requirements outlined in SECTION II, the violator shall be informed of the District's Water Conservation Program and shall be provided with appropriate water conservation information. A Notice of Violation will be issued and left at the premises.

B. Upon a second observation by District personnel of a violation of the Mandatory Requirements, a second Notice of Violation will be issued and left at the premises. A certified letter, return receipt requested, will be forwarded to the violator and/or property owner notifying of said offense and informing same of the consequences of further violations.

C. Upon a third observation by District personnel of a violation of the Mandatory Requirements, a third Notice of Violation will be issued and certified letters sent as outlined in Section III - B above. The violator and/or

property owner will be notified in writing that the water supply to said premises will be terminated in ten (10) days.

Prior to scheduled termination, the violator may choose to pay a penalty charge of Twenty-five Dollars ($25) in lieu of service termination. Payment of said penalty charge will avoid said termination and will be considered a waiver of appeal.

Should the violator wish to appeal said Notice of Violation and appear before the Board of Directors, written intent of same shall be received in the District Office at 6230 Sylvan Road, Citrus Heights, California prior to the aforementioned service termination date. Written notification of the date and time of the appeal hearing will be forwarded to the consumer.

D. Each subsequent violation beyond the third Notice of Violation will be treated in the same manner as in Section III - C above.

E. Should water service be terminated for repeated Water Conservation Ordinance violations, the County Health Department shall be notified, and a restoration of service charge of Fifty Dollars ($50) must be received by the District before water service is restored.

F. The Board of Directors reserves the right to require, at the violator's expense, installation of a water meter for repeat violations beyond Section III - C above. Upon such installation, water use will be billed monthly based upon current metered service rates. Installation of a water meter will not cause a violator to be exempt from the Mandatory Requirements or Enforcement measures.

G. Violation notices from other than the currant calendar year shall be considered null and void when applying the enforcement provisions of this Ordinance.

H. Consumers for whom these Mandatory Requirements may present an undue hardship may request a variance from the District. Said variance request shall be submitted in writing to the General Manager and shall accurately describe the reasons for non-conformance with specific provisions of this Ordinance. Variance requests will be approved or denied in writing by the District.

SECTION IV:

The provisions of this Ordinance shall not be construed as having been adopted persuant to the provisions of Section 375 of the Water Code.

SECTION V:

The provisions of Ordinance 2-88 are hereby repealed.

THIS ORDINANCE SHALL BE IN FULL FORCE AND EFFECT UPON THE DATE OF ITS PASSAGE.

PASSED AND ADOPTED by the Board of Directors of CITRUS HEIGHTS IRRIGATION DISTRICT, this 2nd day of April 1991, by the following vote, to-wit:

AYES:	Directors:	Ingram, Nunnemaker, Homen
NOES:	Directors:	None
ABSENT:	Directors:	None

S E A L

CITRUS HEIGHTS IRRIGATION DISTRICT
ORGANIZED
OCT 25
1920
SACRAMENTO COUNTY

Henry L. Ingram
HENRY L. INGRAM, President
Board of Directors
Citrus Heights Irrigation District

ATTEST:

Robert A. Churchill
ROBERT A. CHURCHILL
Secretary

APPENDIX C

CITRUS HEIGHTS WATER DISTRICT METERING POLICIES

CITRUS HEIGHTS WATER DISTRICT
POLICIES AND PROCEDURES MANUAL

POLICY TYPE : WATER SERVICE
POLICY TITLE : METERING OF WATER SERVICES - GENERAL
POLICY NUMBER : 8400
DATE ADOPTED : JANUARY 21, 1997
DATE AMENDED : FEBRUARY 6, 2001

8400.00 METERING OF SERVICES – GENERAL

Citrus Heights Water District believes that metering of all water services is an effective means of maintaining and improving the close control of water system operations. This Aclose control≅ is necessitated by the increasing challenges in obtaining adequate water supplies and the increasing costs of providing water service to its consumers.

- Metering provides a basis for assessing users equitably.
- Metering provides a database for system performance studies, for planning future facilities, and aids in the evaluation of conservation measures.
- Metering improves accountability for water delivered through the system and, therefore, facilitates management decisions.

The District receives a majority of its water supply from the United States Bureau of Reclamation (USBR) via Folsom Lake. This surface water is purchased from San Juan Water District (SJWD) that in turn contracts with the USBR for a surface water supply. As a water conservation measure, the USBR requires that Citrus Heights and other SJWD affiliated water purveyors to install water meters to measure the water consumption of all customers. The SJWD interim renewal contract with the USBR requires the installation of water measuring devices and billing based on metered consumption by February 2005. California State Senate Bill (SB) 229 has required the installation of meters on all new services in the District since January 1, 1991.

CITRUS HEIGHTS WATER DISTRICT
POLICIES AND PROCEDURES MANUAL

POLICY TYPE : WATER SERVICE
POLICY TITLE : METERING OF SINGLE DWELLING, DUPLEX DWELLING, AND CONDOMINIUM/TOWNHOME DWELLING WATER SERVICES
POLICY NUMBER : 8404
DATE ADOPTED : JANUARY 21, 1997
DATE AMENDED : APRIL 1, 2003
AUTHORITY : SB 229

8404.00 METERING OF SINGLE DWELLING DUPLEX DWELLING, AND CONDOMINIUM/TOWNHOME DWELLING SERVICES

Water service to single dwelling, duplex dwelling and condominium/townhome dwelling residences in the District shall be metered on or before December 31, 2006 in compliance with the District's USBR/CVPIA Water Conservation Plan. Such a timeline will enable residential customers to receive a minimum of twelve (12) months of water consumption history prior to mandatory conversion from annual billing on a flat rate basis to bi-monthly billing based on a metered basis beginning with January, 2008 water consumption.

8404.01 NEW SERVICES

California State Senate Bill (SB) 229 has required the installation of meters on all new services, including single, duplex, condominium/townhome dwelling services, in the District beginning January 1, 1992. Water meters shall be installed on these services and read on a frequency of not less than bi-monthly.

8404.05 EXISTING SERVICES

The District shall install water meters on services to single dwelling, duplex dwelling, and condominium/townhome services in a method that provides for:

a. Cost effectiveness.
b. Reduction of multiple visits to site by District personnel.
c. Minimal disruption of customer service.

As such, water meters shall be installed by and at the expense of the District at all service locations at which the District has, at its sole discretion, an occasion to perform maintenance or construction activities on its facilities.

8404.10 VOLUNTARY METERING OF SINGLE DWELLING, DUPLEX DWELLING AND CONDOMINIUM/TOWNHOME DWELLING SERVICES

With a Federally mandated requirement to meter all residential accounts by January 2008, and the intent to do so by December 31, 2006 Citrus Heights Water District hereby establishes a voluntary metering program open to all District resident-owners of single, duplex, condominium/townhome dwellings.

Citrus Heights Water District will install meters at District expense on qualifying accounts on a Afirst come, first served basis. The schedule of installation will be established based upon the District's receipt of a signed Awater meter installation≅ application. The installation schedule will be wholly dependent on the availability of District resources to facilitate the installation subject to quantities established by the Board of Directors.

Citrus Heights Water District will allow resident-owners that elect to participate in the voluntary program the choice of converting from the annual flat rate billing to billing on the metered consumption rate. The District will supply resident-owners with consumption figures and resulting charges based on the metered consumption. The resident-owner must decide in writing whether or not to convert to the metered rate. The decision to convert will not be subject to change. Once water use to a property is billed based upon a metered rate, a metered billing rate shall continue to remain in effect regardless of changes in ownership or tenancy.

Citrus Heights Water District will also offer the choice of converting from the annual flat rate billing to billing on the metered consumption rate to those other residential accounts, which have been equipped with water meters in accordance with SB 229, this Policy's Section 8404.05, or equipped with water meters for any other reason.

Resident-owners that voluntarily elect to convert from the annual flat rate billing to billing on the metered consumption rate may do so at any time during the year by completing the Arequest for billing on the metered rate section of the water meter installation application. Conversion to the metered billing rate will begin with the next regular bi-monthly meter reading schedule for the appropriate meter reading route following receipt and approval of the application. Annual flat rate payments received in advance will be prorated based upon the calendar day of the year corresponding to the beginning meter reading date for metered billing purposes. Advance annual flat rate payments received in excess of the prorated flat rate charge will not be refunded but will be credited to the resident-owner's meter account.

Accounts for which flat rate charges are delinquent or properties upon which a lien is recorded are eligible for conversion to metered billing upon satisfaction of the delinquency or lien including outstanding penalties and interest.

8404.50 BILLING

Billing shall be on a flat-rate annual basis pursuant to Accounts Receivable Policies 7151, 7152 or 7153 unless one of the following conditions apply:

a. A voluntary conversion to metered billing per Section 8404.10 is requested.
b. A mandatory conversion to metered billing per the District=s Water Conservation Ordinance is necessitated.
c. A new dwelling is constructed or occupied for the first time after December 31, 1997.

8404.60 WATER METER SIZES

The following water meter sizes shall apply based upon occupancy:

a. Single Dwelling - Detached

Defined:	One single detached or stand-alone residential dwelling unit on a parcel of land not exceeding 2.499 gross acres.
Occupancy Code:	SFR
Meter Size:	1"

b. Single Dwellings - Detached

Defined:	Two single detached or stand-alone residential dwelling units on a parcel of land not exceeding 2.499 gross acres. The second residence is typically a secondary dwelling unit on the parcel such as a guest quarters or an independent apartment unit.
Occupancy Code:	SFR
Meter Size:	1"

c. Single Dwelling - Attached

Defined:	One single residential dwelling unit on a parcel of land not exceeding 0.500 gross acres that is attached by common wall to another similar single dwelling on a separate parcel of land.
Occupancy Code:	SFC
Meter Size:	3/4"

d. Duplex Dwelling - Two sides

Defined:	One residential building containing two attached dwelling units on a parcel of land not exceeding 2.499 gross acres in which the parcel of land is served through one District water service.
Occupancy Code:	DPR
Meter Size:	1"

d. Duplex Dwelling - One side

Defined:	One residential building containing two attached dwelling units on a parcel of land not exceeding 2.499 gross acres in which each dwelling unit is served by an independent District water service.
Occupancy Code:	DPS
Meter Size:	3/4"

e. Condominium/Townhome

Defined:	One residential building containing three or more attached dwelling units in which each dwelling unit is served by an independent District water service. Water service may include or exclude service for a nominal amount of irrigation contiguous to the dwelling unit.
Occupancy Codes:	CTI or CTE
Meter Size:	3/4"

f. Residential Parcels 2.500 acres and larger

Defined:	The following water service and meter sizes shall apply to one or two single detached or stand-alone residential dwelling units on a parcel of land as follows:
Occupancy Code:	SFR

Acreage	Water Service Size	Water Meter Size
2.500-4.999 acres	1 1/4" maximum	1" maximum
5.000-7.500 acres	1 1/2" maximum	1 1/2" maximum
Over 7.500 acres	2" maximum	2" maximum

CITRUS HEIGHTS WATER DISTRICT
POLICIES AND PROCEDURES MANUAL

POLICY TYPE : WATER SERVICE
POLICY TITLE : METERING OF APARTMENT COMPLEX AND MOBILE HOME DEVELOPMENT WATER SERVICES
POLICY NUMBER : 8405
DATE DRAFTED : DECEMBER 31, 1997
DATE ADOPTED : FEBRUARY 6, 2001
DATE AMENDED :

8405.00 METERING OF APARTMENT COMPLEX AND MOBILE HOME DEVELOPMENT SERVICES

Citrus Heights Water District requires meters for all Apartment Complex and Mobile Home Development services including service for domestic, irrigation, swimming pool, clubhouse and/or other uses. Meters shall typically be installed at the point of connection to the District's water main.

8405.10 DEFINITIONS

Apartment Complexes shall be defined as properties containing a multiple dwelling unit(s) consisting of three (3) units or more that are not individually owned.

Mobile Home Developments shall be defined as properties containing dwellings that reside in a multi-unit mobile home development.

8405.20 METERING REQUIREMENTS

New Apartment Complex and New Mobile Home Development services shall be metered at the expense of the property owner/developer.

CITRUS HEIGHTS WATER DISTRICT
POLICIES AND PROCEDURES MANUAL

POLICY TYPE : WATER SERVICE
POLICY TITLE : METERING OF COMMERCIAL WATER SERVICES
POLICY NUMBER: 8410
DATE ADOPTED : NOVEMBER 5, 1996
DATE AMENDED : FEBRUARY 6, 2001

8410.00 METERING OF COMMECIAL SERVICES

Citrus Heights Water District requires meters for all Commercial services. Meters shall typically be installed at the point of connection to the District main not withstanding existing metered services.

8410.10 DEFINITION:

Commercial shall be defined as all accounts except Government Accounts and the following Dwelling Unit Accounts: Single Family Residences, Duplexes, Condominiums/Townhomes, Apartments, and Mobile Homes.

Not withstanding businesses in a home and/or clubhouses, properties containing a combination of commercial accounts and dwelling unit accounts shall be considered commercial for meter installation and billing purposes.

8410.20 METERING REQUIREMENTS

New commercial services, including conversions of existing non-commercial services to commercial use, shall be metered at the expense of the property owner/developer. New commercial services will be billed immediately upon metered water consumption.

APPENDIX D

CITRUS HEIGHTS WATER DISTRICT METERED RATE SCHEDULE

Schedule of 2006 Bi-Monthly Metered Water Rates

Meters: Bimonthly Charges 1 unit = 1 ccf = 100 cubic feet
Bimonthly Service Charge plus unit charge based upon consumption
Bimonthly Service Charge does not apply for meters not in use (i.e. units = 0)

COMMERCIAL & DOMESTIC METERS

		Tier 1		Tier 2		Tier 3	
Size	Service Chg	Units	Unit $	Units	Unit $	Units	Unit $
¾"	$26.70	1 - 20	$0.34	21-40	$0.40	41 +	$0.44
1"	$38.31	1 - 40	$0.34	41-80	$0.40	81 +	$0.44
1½"	$66.90	1 – 120	$0.34	121-240	$0.40	241 +	$0.44
2"	$101.45	1 - 160	$0.34	161-320	$0.40	321 +	$0.44
3"	$181.32	1 - 320	$0.34	321-640	$0.40	641 +	$0.44
4"	$295.46	1 - 640	$0.34	640-1280	$0.40	1281 +	$0.44

IRRIGATION METERS

		Tier 1		Tier 2		Tier 3	
Size	Service Chg	Units	Unit $	Units	Unit $	Units	Unit $
¾"	$13.35	1 - 20	$0.34	21-40	$0.40	41 +	$0.44
1"	$19.17	1 - 40	$0.34	41-80	$0.40	81 +	$0.44
1½"	$33.45	1 – 120	$0.34	121-240	$0.40	241 +	$0.44
2"	$50.73	1 - 160	$0.34	161-320	$0.40	321 +	$0.44
3"	$90.66	1 - 320	$0.34	321-640	$0.40	641 +	$0.44
4"	$147.73	1 - 640	$0.34	640-1280	$0.40	1281 +	$0.44

COMBINATION METERS: Combination Meters are sized to provide water for fire protection and commercial, domestic and/or irrigation purposes.

		Tier 1		Tier 2		Tier 3	
Size	Service Chg	Units	Unit $	Units	Unit $	Units	Unit $
4"	$101.45	1 - 640	$0.34	641-1280	$0.40	1281 +	$0.44
6"	$181.32	1 - 640	$0.34	641-1280	$0.40	1281 +	$0.44
8"	$295.46	1 - 640	$0.34	641-1280	$0.40	1281 +	$0.44

CONSTRUCTION WATER METERS: Deposit of $1,100.00 is required for each Construction Water Meter

		Tier 1	
Size	Service Chg	Units	Unit $
3"	$90.66	All	$0.64

NORTH RIDGE COUNTRY CLUB

		Tier 1	
Size	Service Chg	Units	Unit $
8"	$114.93	All	$1.20

APPENDIX E

SACRAMENTO GROUNDWATER AUTHORITY
GROUNDWATER MANAGEMENT PLAN
DECEMBER 2003

APPENDIX F

HISTORIC USE OF SURFACE WATER AND GROUNDWATER

Citrus Heights Water District
Historic Water Consumption

December 1, 2005

Year	Surface Water Use acre ft	Ground Water Use acre ft	Total Water Use acre ft
*year to date			
2005*	18,155.43	0.00	18,155.43
2004	19,753.34	1,347.25	21,100.59
2003	17,938.32	572.94	18,511.26
2002	17,576.36	2,295.78	19,872.14
2001	20,553.54	588.22	21,141.76
2000	18,362.54	2,192.35	20,554.89
1999	20,343.23	2,711.03	23,054.26
1998	19,129.86	1,336.64	20,466.50
1997	21,297.95	475.74	21,773.69
1996	20,742.06	42.68	20,784.74
1995	18,331.96	89.27	18,421.23
1994	18,671.27	87.45	18,758.72
1993	16,974.34	589.73	17,564.07
1992	17,448.73	109.83	17,558.56
1991	16,694.25	22.18	16,716.43
1990	18,602.83	40.30	18,643.13
1989	17,790.62	54.52	17,845.14
1988	19,774.11	100.11	19,874.22
1987	19,168.89	839.89	20,008.78
1986	20,225.79	342.02	20,567.81
1985	19,470.34	504.92	19,975.26
1984	19,075.30	606.92	19,682.22
1983	16,634.80	181.79	16,816.59
1982	15,331.00	619.17	15,950.17
1981	17,707.00	1,204.88	18,911.88
1980	17,250.00	1,318.47	18,568.47
1979	16,000.00	1,905.39	17,905.39
1978	15,000.00	1,141.50	16,141.50
1977	12,824.60	4.97	12,829.57
1976	15,000.00	1,521.54	16,521.54
1975	13,608.00	1,755.06	15,363.06