

OTAY RANCH VILLAGE SIX SPA WATER CONSERVATION PLAN

The City of Chula Vista is in the process of developing guidelines for the preparation and implementation of Water Conservation Plans. This effort involves a pilot study to evaluate the relative effectiveness, costs and issues associated with the implementation of additional water conservation measures beyond those currently mandated, in three new development projects including Otay Ranch Village Six. The evaluation will encompass additional technical water saving devices, as well as the potential expanded use of recycled water, and possible gray water use. The pilot study will provide information to be used in finalizing a Water Conservation Plan for Otay Ranch Village Six and is expected to be considered in conjunction with actions on the project's Tentative Subdivision Map. A final approved Water Conservation Plan will be placed in this Section of the SPA document upon adoption.

VILLAGE SIX SPA

Section II.8 Water Conservation Plan

April 2002

PBSJ Project No.: 048/620610.03

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Table of Contents

CHAPTER		PAGE
	Abbreviations and Terms	iii
1	Water Conservation Plan	
II.8.1	Executive Summary	1
II.8.2	Introduction	2
II.8.3	Purpose.....	2
II.8.4	Water Supply and Service.....	4
II.8.5	Projected Water Use	5
II.8.6	Mandated Water Conservation Measures.....	8
II.8.7	Non-Mandated Water Conservation Measures	8
II.8.8	Water Conservation Target	11
II.8.9	Implementation Measures	12
II.8.10	Monitoring	14
	Tables	
1	Proposed Land Use	4
2	Projected Village Six Potable Water Demands	5
3	Projected Village Six Recycled Water Demands.....	6
4	Village Six Potable Water Savings Due to Non-Mandated Measures .	12
	Figures	
1	Proposed Recycled Water Use Areas.....	7
	Appendices	
A	Otay Water District Ordinance	
B	City Review Comments	

Abbreviations and Terms

Abbreviations

ac	Acre
AAD	Average Annual Demand
CAS	Central Area System
CPF	Community Purpose Facility
CSA	Central Service Area
CFD	Community Facilities District
DU	Dwelling Unit
HOA	Home Owners Association
GDP	General Development Plan
gpd	Gallons per day
gpm	Gallons per minute
MG	Million gallons
MGD	Million gallons per day
MWD	Metropolitan Water District
ORC	Otay Ranch Company
psi	Pounds per square inch
SDCWA	San Diego County Water Authority
SPA	Sectional Planning Area
WCP	Water Conservation Plan
WRF	Water Recycling Facility
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Terms

District Otay Water District
 Project Village Six Development
 City City of Chula Vista

WATER EQUIVALENCIES TABLE

Measure		Equivalencies	
1 cubic foot	(cf)	7.48	gallons (gal)
1 cubic foot per second	(cfs)	62.4	pounds of water (lbs)
1 acre-foot	(ac-ft)	43,560	cubic feet (cf)
1 ac-ft		3,259,000	gallons (gal)
1 cfs		450	gallons per minute (gpm)
1 cfs		646,320	gallons per day (gpd)
1 million gallons per day	(mgd)	1,120	acre-feet per year (ac-ft/yr)

Note:

An acre-foot covers 1 acre of land 1 foot deep

Section II.8 - Water Conservation Plan

II.8.1 Executive Summary

The Village Six development (Project) is a master planned community located within the City of Chula Vista (City). The Project encompasses approximately 386.4 acres and is bounded by the future Olympic Parkway to the north, Birch Road to the South, and La Media Road and State Route 125 to the west and east, respectively. The principal landowners for Village Six include McMillin Companies (McMillin) and the Otay Ranch Company (Otay Ranch).

The City's Growth Management Ordinances requires that all major development projects consisting of 50 dwelling units or more prepare a Water Conservation Plan (WCP) at the time of SPA plan preparation. Since there are currently no formal guidelines for the preparation of the WCP, developers have typically prepared the required plans based primarily on State and Federally mandated water conservation measures and also closely reflect the requirements of the local water districts.

The City has undertaken an effort to develop and adopt formal guidelines for the preparation and implementation of required WCPs. The plan is intended to respond to the long-term need to conserve water in new and future developments. Additionally, it is intended that the plan will be implemented over the life of the Project and will establish standards that will be acceptable to future project residents regardless of water availability.

The City's effort involves a pilot study of three master-planned projects, including the Village Six development. The pilot study will evaluate the relative effectiveness, costs, and issues associated with the implementation of additional water conservation measures beyond those currently mandated. Specific non-mandated water conservation measures identified for implementation in the Village Six project include:

- Hot water pipe insulation
- Pressure reducing valves
- Water efficient dishwashers
- Educational Program

The estimated total potable water savings for the Project due to implementation of the non-mandated quantifiable conservation measures is approximately 27,723 gallons per day (gpd), which is approximately 4 percent of the total projected potable water demand for the Project. Additional conservation measures are estimated to reduce the projected total potable water demand by an additional 26,490 gallons per day (gpd), which is approximately 3.9%. Note that recycled water conservation measures were not included in the estimated savings through non-mandated measures.

Merchant builders will be encouraged to display the following conservation measures in model homes and offer these measures as options to potential homebuyers.

- Dual Flush Toilets
- High-Efficiency Washing Machines
- Hot-Water On-Demand Units

II.8.2 Introduction

The Village Six development (Project) is a proposed master-planned community included in the Otay Ranch General Development Plan (GDP) and located within the City of Chula Vista (City). Principal landowners include the McMillin Companies (McMillin) and Otay Ranch Company (ORC). As mandated by the City's Growth Management Ordinance, a Water Conservation Plan (WCP) for the Project is being prepared concurrently with preparation of the Sectional Planning Area (SPA) Plan. Consistent with the Master Planned Communities Outline, Section II.8 of the Village Six SPA Plan contains the Water Conservation Plan. In addition to the general requirements specified in the Growth Management Ordinance, the Project has been included in a pilot study to assess specific non-mandated water conservation measures. Consequently, this WCP has been prepared in accordance with the pilot study.

The approach to water conservation outlined in this plan includes identification of specific non-mandated water conservation measures to be implemented throughout the life of the Project. The WCP includes a description of the measures and presents targeted water use reduction goals for the Project.

II.8.3 Purpose

The purpose of the WCP for Village Six is to identify specific non-mandated water conservation measures to be implemented as part of a pilot study currently being performed by the City. In accordance with the Growth Management Policies of the City, the water conservation measures presented in this plan are intended to respond to the long-term need to conserve water in new and future developments. This plan is intended to be implemented over the life of the Project and to establish standards which will be acceptable to future Project residents regardless of water availability.

The City's Growth Management Ordinance requires that all major development projects consisting of 50 dwelling units or more prepare a WCP at the time of SPA plan preparation. Currently, there are no formal guidelines for the preparation of the WCP. Developers have typically prepared the required plans based primarily on State and Federal mandated water conservation measures that also reflect the requirements of the local water districts. The City Council has expressed a desire that other currently non-mandated water conservation measures, including potential use of gray water and expanded recycled water use, be considered in future WCPs.

In response, the City is undertaking an effort to develop and adopt formal guidelines for the preparation and implementation of required WCPs. The effort involves a pilot study of three master-planned projects, including the Village Six development. The pilot study will evaluate the relative effectiveness, costs and issues associated with the implementation of additional water conservation measures beyond those currently mandated. The results of the evaluation will assist the City and developers in identifying the most beneficial conservation features to be implemented in a particular development.

Specific non-mandated water conservation measures identified by the principal landowners for implementation in the Village Six project include:

- Hot water pipe insulation
- Pressure reducing valves
- Water efficient dishwashers
- Educational Program

Project Description

The Project encompasses approximately 386.4 acres located within the Village Six SPA of the Otay Ranch GDP. Proposed development includes single-family residential, multi-family residential, commercial, parks, schools, Community Purpose Facilities (CPF), and open space. Table 1 contains a summary of the proposed land use for McMillin's and Otay Ranch's portions of Village Six based on gross acreages. McMillin's portion will consist primarily of single-family and multi-family residential construction, a 0.8-acre common usable open space area, a 32.5-acre private high school, and 11.5-acre church site. The lots being developed by McMillin are located in the northwestern and southeastern most sections of Village Six.

Otay Ranch's portion of Village Six includes planned land use consisting of single-family and multi-family residential construction, a 7.6-acre park, a 10-acre elementary school, commercial development, a CPF site, and open space. The lots being developed by Otay Ranch are located in the northeastern and southwestern most sections of Village Six.

**Table 1
Proposed Land Use**

PARCEL	LAND USE ¹	DEVELOPED BY	ACRES	DWELLING UNITS
R-1	SF Residential	McMillin	26.2	105
R-3	SF Residential	McMillin	35.6	159
R-4	SF Residential ²	McMillin	20.4	92
R-6	SF Residential	McMillin	20.4	126
R-10	MF Residential	McMillin	12.1	212
CPF-2	Catholic Church	McMillin	11.5	—
R-11/S-2	Private High School	McMillin	32.5	—
		McMillin Sub-total	158.7	694
R-2a	SF Residential	Otay Ranch Company	19.7	87
R-2b	SF Residential	Otay Ranch Company	21.3	115
R-5	SF Residential	Otay Ranch Company	16.6	111
R-7a	SF Residential	Otay Ranch Company	12.9	88
R-7b	MF Residential	Otay Ranch Company	5.8	165
R-8	MF Residential	Otay Ranch Company	11.7	337
R-9a	MF Residential	Otay Ranch Company	21.8	163
R-9b	MF Residential	Otay Ranch Company	12.7	326
CPF-1	Public Facility ³	Otay Ranch Company	5.2	—
C-1	Commercial	Otay Ranch Company	3.0	—
S-1	Elementary School	Otay Ranch Company	10.0	—
P-1	Park	Otay Ranch Company	7.6	—
		Otay Ranch Co. Sub-total	148.3	1,392
ADD'L LAND USE				
OS	Open Space	McMillin/Otay Ranch Co.	21.1	—
CIRC	Circulation	McMillin/Otay Ranch Co.	58.3	—
Additional Land Use Total			79.4	—
VILLAGE 6 TOTAL			386.4	2,086

1. SF is Single Family, MF is Multi Family

2. Unit R-3 includes 0.8 ac designated as Common Usable Open Space planned for development as a recreation facility.

3. Community Purpose Facility (CPF) includes non-profit type facilities.

Information pertaining to HOA or CFD controlled landscaping was not available at the time this study was prepared and, therefore, delineation of these parcels is not included.

II.8.4 Water Supply and Service

The Project is situated within the Otay Water District (District) and will receive potable and recycled water from the District's Central Area System (CAS). The District is a member of the San Diego County Water Authority (SDCWA) which purchases imported water from the Metropolitan Water District of Southern California (MWD). The Project is located within the District's Central Service Area (CSA) and will receive water supply from extensions to the existing Central System transmission network.

The District will also provide recycled water service to the Project. As mandated by District policy, recycled water will be utilized for landscape irrigation on all greenbelts. Recycled water supply is currently available from the District's Ralph W. Chapman Water Recycling Facility (WRF) located near the intersection of Singer Lane and Highway 94. The plant has a practical

capacity of 1.0 million gallons per day (MGD) of recycled water for non-potable water uses such as irrigation of golf courses, school playing fields, public parks, and public landscaping. Recycled water supply is also anticipated to be available from the City of San Diego's 15.0 MGD capacity South Bay Water Reclamation Plant (SBWRF), located in the Tijuana River Valley near the US-Mexico border. The SBWRF is expected to be completed in 2002.

II.8.5 Projected Water Use

Potable Water

Table 2 contains a summary of the estimated Village Six potable water demand based on land use type and projected residential density. The unit demands are based on data provided by the District and do not reflect implementation of any non-mandated conservation measures.

Table 2
Projected Village Six Potable Water Demands

PARCEL	LAND USE	DWELLING UNITS	UNIT DEMAND ⁽¹⁾	AREA (acres)	AAD (gpd)
McMillin					
R-1	Single-family	105	385 gpd/DU	26.2	40,425
R-3	Single-family	159	385 gpd/DU	35.6	61,215
R-4	Single-family	92	385 gpd/DU	20.4	35,420
R-6	Single-family	126	385 gpd/DU	20.4	48,510
R-10	Multi-family	212	188 gpd/DU	12.1	39,856
CPF-2	Catholic Church	—	1,785 gpd/ac	11.5	20,528
R-11/S-2	Private High School	—	2,232 gpd/ac	32.5	72,540
McMillin Total		694		158.7	318,494
Otay Ranch					
R-2a	Single-family	87	385 gpd/DU	19.7	33,495
R-2b	Single-family	115	385 gpd/DU	21.3	44,275
R-5	Single-family	111	385 gpd/DU	16.6	42,735
R-7a	Single-family	88	385 gpd/DU	12.9	33,880
R-7b	Multi-family	165	188 gpd/DU	5.8	31,020
R-8	Multi-family	337	188 gpd/DU	11.7	63,356
R-9a	Multi-family	163	188 gpd/DU	21.8	30,644
R-9b	Multi-family	326	188 gpd/DU	12.7	61,288
CPF-1	Public Facility	—	1,785 gpd/ac	5.2	9,282
C-1	Commercial	—	1,785 gpd/ac	3.0	5,355
S-1	Elementary School	—	1,250 gpd/ac	10.0	12,500
Otay Ranch Total		1,392		140.7	367,830
VILLAGE 6 TOTAL		2,086		299.4	686,324

1) Unit demand sources:

Residential demand adapted from actual annual water consumption data provided by Jim Peasley,

Otay Water District, 10/22/01

Mixed Use/Commercial demand from OWD Water Resources Master Plan (1995)

The total projected potable water use, without non-mandated conservation measures is approximately 686,324 gpd.

Recycled Water

The City requires the use of recycled water, if available, for landscape irrigation within designated areas as defined by state and local health codes. Recycled water will be used to irrigate arterial road landscaping, manufactured slopes within open space areas, parks and multi-family residential areas. Recycled water will be used for landscape irrigation on all common landscape parcels in accordance with District Ordinance *Section 26: Water Reclamation Plan and Implementing Procedures* (Appendix A).

Developers have recognized expansion of the recycled water system to serve irrigation of single-family homes provides an opportunity for large quantities of potable water to be offset by recycled water use. Although this has been identified as a potential water conservation measure, the District does not currently support the expansion of the recycled water system to include single-family residential units. Current District policy excludes the use of recycled water for irrigation of land uses not specifically identified in the Master Plan as designated recycled water use areas.

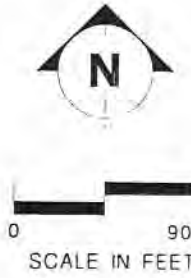
The Project will receive recycled water supply from extensions to the existing CSA recycled water transmission system which is currently under construction but not yet complete. As specified in the District’s Master Plan, the recycled water duty used to convert irrigated acreage into average annual demand (AAD) is 2,232 gallons per day (gpd) per gross acre for all land use types within the Project. Proposed recycled water use areas within Village Six are shown in Figure 1. The estimated recycled water demands for the Project are presented in Table 3.

**Table 3
Projected Village Six Recycled Water Demands**

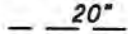
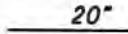




LAND USE	ACREAGE (gross ac)	PERCENT IRRIGATED (%)	IRRIGATED AREA (ac)	UNIT DEMAND (gpd/ac)	AVG DEMAND (gpd)
R-3 (Common Usable Open Space)	0.80	100	0.80	2,232	1,786
R-7b	5.80	15	0.87	2,232	1,942
R-8	11.70	15	1.76	2,232	3,917
R-9a	21.80	15	3.27	2,232	7,299
R-9b	12.70	15	1.91	2,232	4,252
R-10	12.10	15	1.82	2,232	4,051
C-1	3.00	10	0.30	2,232	670
CPF-1	5.20	20	1.04	2,232	2,321
CPF-2 (Catholic Church)	11.50	20	2.30	2,232	5,134
R-11/S-2 (Private School)	32.50	20	6.50	2,232	14,508
Circulation/ Landscaping	58.30	10	5.83	2,232	13,013
Open Space	21.10	100	21.10	2,232	47,095
P-1	7.60	100	7.60	2,232	16,963
S-1	10.00	20	2.00	2,232	4,464
Total Village 6	214.10	—	57.09	—	127,414

The total projected recycled water use is approximately 127,414 gpd.

Section II.8 - Water Conservation Plan



LEGEND

-  20" 680 ZONE EXISTING RECYCLED WATER PIPELINE
-  20" 944 ZONE EXISTING RECYCLED WATER PIPELINE
-  20" 680 ZONE PROPOSED RECYCLED WATER PIPELINE
-  20" 944 ZONE PROPOSED RECYCLED WATER PIPELINE
-  PROPOSED RECYCLED WATER SERVICE AREA
-  R008 CIP NO.

PROPOSED RECYCLED WATER USE AREAS

FIGURE 1



II.8.6 Mandated Water Conservation Measures

The federal water efficiency plumbing standards are included in the Energy Policy Act enacted in 1992, and effective January 1, 1994. Passage of the Act provided a uniform standard for manufacturers of water-using fixtures including ultra-low-flow-toilets, low-flow showerheads and faucets, aerators, washing machines, and other appliances and fixtures.

State regulation of water use efficiency is based on the California Constitution Water Code. The Constitution provides the basis for efficient water use and is the foundation for the state's subsequent policies and mandates regarding water conservation and reuse. Additionally, the Urban Water Management Planning Act, which was adopted by the California Legislature in 1983 and amended serially through 1995, requires advance planning for water supplies to meet projected demands in the short term and long-term, with emphasis on water conservation, water recycling, emergency planning for drought restrictions on water use and other provisions.

In California, regulation of manufacturing and installation of hot-water-related plumbing fittings is under the jurisdiction of the California Energy Commission. The efficiency requirements and regulations are incorporated in the California Code of Regulations Title 20, Chapter 2, Subchapter 4; Energy Conservation, Article 4: Appliance Efficiency Regulations, California. The regulations establish the maximum flow rate of all new showerheads, lavatory faucets, sink faucets, and tub spout diverters manufactured, sold or offered for sale in California.

In summary, current federal and state legislation mandates apply to the required use of certain plumbing devices that meet specified maximum flow rates. These devices include:

- Showerheads
- Lavatory Faucets
- Sink Faucets
- Metering Faucets in Public Restrooms
- Tub Spout Diverters
- Residential Water Closets
- Flushometer Valves
- Commercial Water Closets
- Urinals

In addition, the City of Chula Vista's Landscape Manual, Part One, General City Requirements, 4.4.3 Water Management Element, requires the use of recycled water, if available, for landscape irrigation within designated areas as defined by state and local health codes.

II.8.7 Non-Mandated Water Conservation Measures

As part of the Water Conservation Pilot Study, the City and participating developers evaluated numerous potential water conservation measures for use within the designated development projects. Based on the evaluation, the principal developers selected the following indoor and outdoor measures for implementation in all of the participating projects. It should be noted that

actual water savings can vary widely depending on individual circumstances, and depending on antecedent water use habits, against which savings are measured. These measures are described below.

The *Water Use Efficiency: Strategies for Proposed Residential Development* report prepared by Bahman Sheikh, Ph.D., P.E. for the City includes a benefit/cost summary for the potential conservation measures and may be referred to for such information.

INDOOR MEASURES

Hot Water Pipe Insulation

Insulation of hot water pipes and separation of the hot and cold pipes to reduce heat exchange will reduce the amount of time the faucet will need to flow to produce hot water. The estimated unit water savings is 6.58 gal/day, which equates to an average annual water savings of 2,400 gallons per residential dwelling unit.

Pressure Reducing Valves

Installation of a pressure-reducing valve at the water connection location can maintain the pressure within residential units below 60 psi, thereby reducing the volume of leakage that may be present and preventing excessive flow of water from all appliances and fixtures. The estimated unit water savings is 4.93gal/day or an average annual water savings of 1,800 gallons per residential dwelling unit.

Water Efficient Dishwashers

New water efficient dishwashers can save as much as 2 gallons per cycle over a non-efficient model. Based on 0.9 cycles per day per single-family residence, the estimated unit water savings is 1.78 gal/day, which results in an annual water savings of 650 gallons per residential dwelling unit.

OUTDOOR MEASURES

Educational Program

Education of the homeowner as to how to design, maintain and monitor their landscape irrigation system is one of the most cost effective ways to implement water conservation. A key component will include an informational booklet. Creating a laymen's handbook that is instructive on how to properly water yard landscaping and providing it to each homeowner could provide a substantial potable water savings. According to the City's consultant, the average homeowner can save 15 percent of their watering cost by implementing recommended planting, irrigation, and landscape maintenance practices. For the purpose of this evaluation, an average reduction in landscape irrigation of 15 percent was used for estimation purposes. This is equivalent to 30 gal/day per medium density, single-family dwelling units. The estimated annual water savings is 10,950 gallons per medium density, single-family dwelling unit.

The Educational Program will be a cooperative effort among the City of Chula Vista, the Otay Water District and the developer to train and assist homeowners in the design and installation of water efficient landscaping. The program will include educational seminars conducted by the Master Developer for new homebuyers throughout the construction phase of the Project. The Master Developer will provide all educational materials. The contents of the educational program including an information booklet shall be approved by the Director of Planning and Building.

OPTIONAL MEASURES

The Master Developer will encourage the merchant builders to offer other non-mandated conservation options to homebuyers. It is envisioned that the following water conservation components will be displayed in model homes and offered as options to homebuyers. The options may include:

- Dual Flush Toilets
- High-Efficiency Washing Machines
- Hot-Water On-Demand Units
- Evapotranspiration (ET) Controllers

Dual Flush Toilets

Dual-Flush Toilets are designed to provide the user the option to flush with partial (0.8 gallons) flow of water or with a full (1.6 gallon) flow, depending on need. According to the pilot study report, the estimated annual water savings is 4,000 gallons per residential unit.

High-Efficiency Washing Machines

High-efficiency washing machines are front-loading models of clothes washers. Also referred to as horizontal-axis washing machines, they require approximately 60 percent of the water used by conventional washing machines and can provide an annual water savings of 7,000 gallons per residential unit according to the pilot study report.

Hot-Water On-Demand Units

There are currently two types of hot-water on-demand devices available. The two types include the Pump-Back Device and the Point-of-Use, or Tank-less Water Heater. The frequency of use of the fixture determines the amount of savings.

The Pump-Back Device includes a combination of a valve and a pump. When activated, the cold water residing in the pipe between the water heater storage tank and the fixture is forced into the cold-water pipes until the water arrives at the fixture. Operational cost of the pump-back units involves expenditure of some electrical energy. However, according to the pilot study report, the estimated water savings from pump-back hot water demand units are 5,300 gallons per year per residential unit, which is equivalent to 14.5 gpd/DU.

The Point-of-Use, or Tank-less Water Heater includes the installation of small water heaters located very close to the point of use. Water is heated only when and precisely as much as needed and to the exact temperature necessary. According to the pilot study report, the estimated water savings from the Point-of-Use units are 5,300 gallons per year per residential unit, which is equivalent to 14.5 gpd/DU.

EVAPOTRANSPIRATION (ET) Controllers

ET controlled irrigation systems are designed to operate with timed, fixed irrigation scheduling. Radio signals from a central control station transmit the appropriate information to irrigation controllers that operate a number of sprinklers. The controllers activate the irrigation system for the appropriate length of time to deliver the precise amount of water based on real-time estimates of actual plant evapotranspiration. The estimated average water savings per acre is approximately 737 gpd which is approximately a 33 percent savings.

Gray Water

Gray water is untreated household wastewater originating from baths, showers, lavatories, and clothes washers, which does not come in contact with toilet waste and is used in irrigation of residential or other landscaping. The state requirements for use of gray water are contained in the California Plumbing Code. The Code contains detailed and strict plumbing design requirements for the collection system, storage, overflow, bypass and distribution of the gray water. Currently, there are no federal regulations affecting the use of gray water.

The City of Chula Vista performed a cost analysis of several sizes of irrigation areas to determine at what point use of gray water becomes cost effective. A household size of 3.2 residents was assumed. The breakpoint was determined to be approximately 2,300 sq ft of irrigated area. The City also determined that a minimum lot size of 6,000 square foot would probably be needed to provide the 2,300 sq ft landscaped area. Lot sizes with less than 2,300 sq ft of landscape area will probably not provide a cost-effective opportunity for use of a gray water system. Since lot sizes within the Village Six development are less than the 6,000 sq ft necessary to make this conservation measure feasible, the measure to use gray water was not further evaluated.

II.8.8 Water Conservation Target

The estimated potable water savings for the Project due to implementation of the non-mandated conservation measures, excluding those identified as optional measures, described above are summarized in Table 4. Note that the estimated savings are applicable to projected potable water use within the Project. Recycled water conservation measures have not been considered.

Table 4
Village Six Potable Water Savings Due to Non-Mandated Measures

Water Saving Measures	Units	Unit Water Savings ⁽¹⁾	Savings
Quantifiable			
<i>McMillin Residential</i>			
Hot Water Pipe Insulation	694 DU	6.58 gpd/DU	4,567 gpd
Pressure Reducing Valves	694 DU	4.93 gpd/DU	3,421 gpd
Water Efficient Dishwashers	694 DU	1.78 gpd/DU	1,235 gpd
McMillin Subtotal			9,223 gpd
<i>Otay Ranch Residential</i>			
Hot Water Pipe Insulation	1,392 DU	6.58 gpd/DU	9,159 gpd
Pressure Reducing Valves	1,392 DU	4.93 gpd/DU	6,863 gpd
Water Efficient Dishwashers	1,392 DU	1.78 gpd/DU	2,478 gpd
Otay Ranch Subtotal			18,500 gpd
Quantifiable Total			27,723 gpd
Saving Based on Total Demand⁽²⁾			4 %
Estimated			
<i>McMillin</i>			
Information Booklet (Med Density)	482 DU	30 gpd/DU	14,460 gpd
McMillin Subtotal			14,460 gpd
<i>Otay Ranch</i>			
Information Booklet (Med Density)	401 DU	30 gpd/DU	12,030 gpd
Otay Ranch Subtotal			12,030 gpd
Estimated Total			26,490 gpd
Saving Based on Total Demand⁽²⁾			4 %
VILLAGE 6 TOTAL⁽²⁾			54,213 gpd
			8 %

1) Unit water savings data sources:

Pipe insulation, pressure reducing valves, efficient dishwasher savings from draft

Water Use Efficiency: Strategies for Proposed Residential Developments (9/01)

Information booklet for medium density assumes 15% reduction of 3,000 SF of turf landscaping demand (City of Chula Vista, 3/01)

2) See Table 2 for Total Projected Potable Water Demand

The total projected water savings due to implementation of non-mandated quantifiable measures is approximately 27,723 gallons per day (gpd), which is approximately 4 percent of the total projected potable water demand summarized in Table 2. It is estimated that the Educational Program could reduce the projected total potable water demand by an additional 26,490 gallons per day (gpd) which is approximately 3.9 percent of the total projected water demand.

II.8.9 Implementation Measures

The water conservation measures selected by both McMillin and Otay Ranch required to be implemented as part of the WCP for the Project include three indoor and one outdoor measure.

The required indoor measures selected include:

1. Hot Water Pipe Insulation,
2. Pressure Reducing Valves,
3. Water Efficient Dishwashers.

The required outdoor measure:

1. Educational Program.

The estimated potable water savings due to implementation of the selected non-mandated conservation measures described in Section II.8.7, are summarized in Table 4.

To additionally promote the WCP, the developer will encourage the merchant builder to offer other non-mandated conservation options to homebuyers. These options will be displayed in the model homes and may include Dual Flush Toilets, High-Efficiency Washing Machines, Hot-Water On-Demand Units and Evapotranspiration (ET) Controllers.

Implementation of the WCP shall include the following effort by the Master Developer. In addition to establishing requirements and guidelines for merchant builders, the Master Developer will be responsible for the following:

- Provide educational materials and guidance to new homeowners;
- Install drought tolerant landscaping, approved by the City, in selected streetscapes and open areas;
- Require the inclusion of drought tolerant plant materials and efficient irrigation systems in the majority of builder installed landscaping; and
- Organize and conduct educational seminars on a semi-annual basis or as agreed upon by the City, the District and the Master Developer throughout the construction phase of the Project. The seminars will serve to educate the homeowners on proper use and maintenance of the water conservation measures as well as inform them of any additional options available.

A significant responsibility will also rest with the City of Chula Vista to ensure and enforce the provisions of this conservation plan, specifically the Planning & Building Department and the Building and Parks Construction Department. The department will review plan submittals and develop an internal program to ensure that water conservation measures are properly implemented in public areas, and approve planting and irrigation plans for public parks and open spaces. The program should also allow the City to monitor water usage. Additional actions will include a cooperative effort among the Master Developer, the City of Chula Vista, Otay Water District and the merchant builders to develop and conduct seminars and other outreach programs intended to educate and inform the homeowners of methods to conserve water. The seminars should also include information on the location and use of recycled water within Village Six. The Master Developer shall provide all educational materials for use in the Educational Program.

II.8.10 Monitoring

It is anticipated that the merchant builders will be providing potential homebuyers the option to include additional non-mandated conservation options other than those selected by the Master Developer. The Merchant Builder will be encouraged to develop a program to track the options selected by the homebuyers and provide this information to the City.

The provision of recycled water is the responsibility of the District, which will also be responsible for enforcing water quality regulations. The determination to use recycled water for irrigation for public parks and open spaces rests with the City. To ensure that all provisions of this plan are met, the standard review of landscape and construction documents performed by the City will include an evaluation of compliance with the provisions of this WCP. This approach will allow for a formal determination by the City that each of the required measures is implemented. Future discretionary or administrative actions with regard to development within the Village Six project may be utilized to address or ensure compliance with the prescribed water conservation measures.

Appendix A
Otay Water District Ordinance



CITY OF
CHULA VISTA

PLANNING AND BUILDING DEPARTMENT

February 26, 2002

Ranie Hunter
Otay Ranch Company
350 W. Ash Street, Suite 730
San Diego, CA 92101

Subject: Revised Draft Water Conservation Plan for Otay Ranch Village Six

Dear Ms. Hunter:

We have completed our review of the revised draft Water Conservation Plan (WCP) for Otay Ranch Village Six. Thank you once again for your participation in the water conservation pilot study and the conservation efforts you have included in your WCP.

I have attached a file containing an edited copy of your revised WCP. In addition to those changes the City has the following comments and concerns:

1. Page 9. Outdoor Measures. Educational Program.
Our comments and concerns regarding Information Booklets and documentation still apply. There are insufficient specific program commitments to document such savings through the Educational Program. See letter dated November 28, 2001.

Reference is made to a Delorenzo & Associates memorandum as Appendix B and should be inserted into your document in the proper location at the back of the WCP. We have reviewed a Delorenzo & Associates memorandum and have not found documentation to justify a claim of 30% reduction in water consumption due to an information booklet.

2. Page 11. Water Conservation Target and Page 12. Table 4.
This section should identify the documented water conservation measures and savings separate from the Information Booklet.

The City's consultant has recommended that a potable water savings of 15% be used in calculating the savings attributed to water-efficient landscapes resulting from the implementation of an education program and information booklet. A more accurate estimate of water conservation in the project would be achieved.

3. Page 14. Monitoring.

The monitoring program needs to identify the responsibilities of the developer and the merchant builders as well as the City and OWD. Other developers involved in the WCP study have proposed a monitoring "pilot" study. Data are gathered from OWD or homeowners who have agreed to install water efficient landscaping as recommended in the Information Booklet. The water bills are then compared with similar properties that have not participated in these additional voluntary measures. The proposal includes a financial incentive for participating homeowners.

Your specific proposal needs to be included.

4. If it is determined that no recycled water will be used in the residential parkways, what do the Otay Ranch Company and McMillin Land Development Company propose in lieu of expanded recycled water?

In light of the fact that the other two projects have agreed to additional water saving devices, we strongly encourage identification of one or more additional measures. If such measures are not proposed, you should be prepared to justify your program to the Planning Commission and City Council.

Please incorporate the above-mentioned changes into your draft Water Conservation Plan. If you have questions or would like to discuss these comments further, please contact me at (619) 409-5928.

Sincerely,



Mary Venables
GreenStar Program Coordinator

Cc: Frank Zaidle, McMillin Land Development
John Lippitt, City of Chula Vista
Mark Stephens, City of Chula Vista

OTAY RANCH VILLAGE SIX SPA WATER CONSERVATION PLAN

The City of Chula Vista is in the process of developing guidelines for the preparation and implementation of Water Conservation Plans. This effort involves a pilot study to evaluate the relative effectiveness, costs and issues associated with the implementation of additional water conservation measures beyond those currently mandated, in three new development projects including Otay Ranch Village Six. The evaluation will encompass additional technical water saving devices, as well as the potential expanded use of recycled water, and possible gray water use. The pilot study will provide information to be used in finalizing a Water Conservation Plan for Otay Ranch Village Six and is expected to be considered in conjunction with actions on the project's Tentative Subdivision Map. A final approved Water Conservation Plan will be placed in this Section of the SPA document upon adoption.