WATER CONSERVATION PLAN

Village Seven Sectional Planning Area (SPA)
Otay Ranch GDP

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by Resolution No. 2004-329

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SECTION II.8
WATER CONSERVATION PLAN

TABLE OF CONTENTS

SECTION		PAGE
II.8.1	Executive Summary	II.8-1
II.8.2	Introduction	II.8-2
II.8.3	Purpose	II.8-3
II.8.4	Project Description	II.8-4
II.8.5	Water Service & Supply	II.8-7
II.8.6	Projected Water Use	II.8-8
II.8.7	State and Federal Water Conservation Requirements	II.8-10
II.8.8	Local Water Conservation Requirements	II.8-11
II.8.9	Water Conservation Estimated Savings	II.8-14
II.8.10	Implementation Measures	II.8-15
II.8.11	Monitoring	II.8-16

LIST OF TABLES

TABLE		PAGE
Table 1	Non-Mandated Water Conservation Measures	II.8-1
Table 2	Potable Water Demand	II.8-8
Table 3	Recycled Water Demand	II.8-9
Table 4	Total Water Conservation Estimate	II.8-14

LIST OF EXHIBITS

EXHIBIT		PAGE
WC-1	Water Conservation Planning Areas	II.8-5
WC-2	Site Utilization Plan	II.8-6

II.8.1 Executive Summary

As detailed in this plan, numerous features have been included in the project and commitments made by the Master Developer to minimize the use of water during the construction and use of development within the Otay Ranch Village Seven Sectional Planning Area (SPA). These measures are expected to result in an average water savings of 0.061 million gallons per day (MGD).

The following water conservation measures will be implemented in the project as described in this Water Conservation Plan:

Table 1
Water Conservation Measures

- Hot Water Pipe Insulation
- Pressure Reducing Valves
- Water Efficient Dishwashers
- Water Efficient Landscaping
- Evapotranspiration Controllers
- Soil Moisture Sensors
- Dual Flush Toilets

II.8.2 Introduction

Otay Ranch Village Seven SPA is a development component of the Otay Ranch Planned Community located in the eastern portion of the City of Chula Vista (City). Other portions of the community currently under development are the Villages One, Five, Six and Eleven. The predominate land use in the Village Seven SPA is single family residential with a large complement of public school sites, a commercial/mixed-use site in the Village Core, three CPF sites and a large greenbelt in Wolf Canyon. This Water Conservation Plan has been prepared with the initial SPA submittal which includes only a portion of the Village Seven area designated in the Otay Ranch General Development Plan (GDP), see the Water Conservation Planning Areas Exhibit WC-1. The inclusion of areas outside of the approved area to Village Seven SPA will require formal amendments or supplements to the adopted SPA documents including this Water Conservation Plan.

The approach to water conservation outlined in this plan is intended to be comprehensive and implemented throughout the life of the development project. Water conservation during construction and after occupancy are addressed, as well as the installation of water conserving landscaping, appliances and fixtures.

The following are goals of the Village Seven SPA Water Conservation Plan (WCP):

1. To conserve water during and after construction of the projects within the Otay Ranch Village Seven SPA.

2. To comply with the water conservation standards and policies of the City of Chula Vista and Otay Water District.

3. To create a comprehensive framework for the design, implementation and maintenance of water conserving measures, both indoor and outdoor.

4. To be economically efficient and cost effective.

II.8.3 Purpose

The purpose of this Water Conservation Plan (WCP) is to respond to the Growth Management Policies of the City of Chula Vista which require larger development projects to prepare a WCP. The water conservation measures presented in this plan are intended to respond to the long term need to conserve water in new development.

The City has adopted formal guidelines for the preparation and implementation of the required WCPs. This WCP incorporates the requirements of the adopted guidelines by following the mandated format for WCPs and incorporating the required water conservation measures into the Village Seven project. The guidelines require the following water conservation measures in all large residential projects subject to WCP requirements:

- Hot water pipe insulation
- Pressure reducing valves
- Water efficient dishwashers
- At least one outdoor water conservation measure from the Residential Water Conservation Measures list.
- At least one additional water conservation measure from either the indoor or outdoor categories identified on the Residential Water Conservation Measures list.
- Water conservation measures not found on the Residential Water Conservation Measures list may be proposed consistent with the provision of Part Five of the Water Conservation Plan Guidelines.

Further, all non-residential projects subject to the WCP requirements must include the following conservation measures:

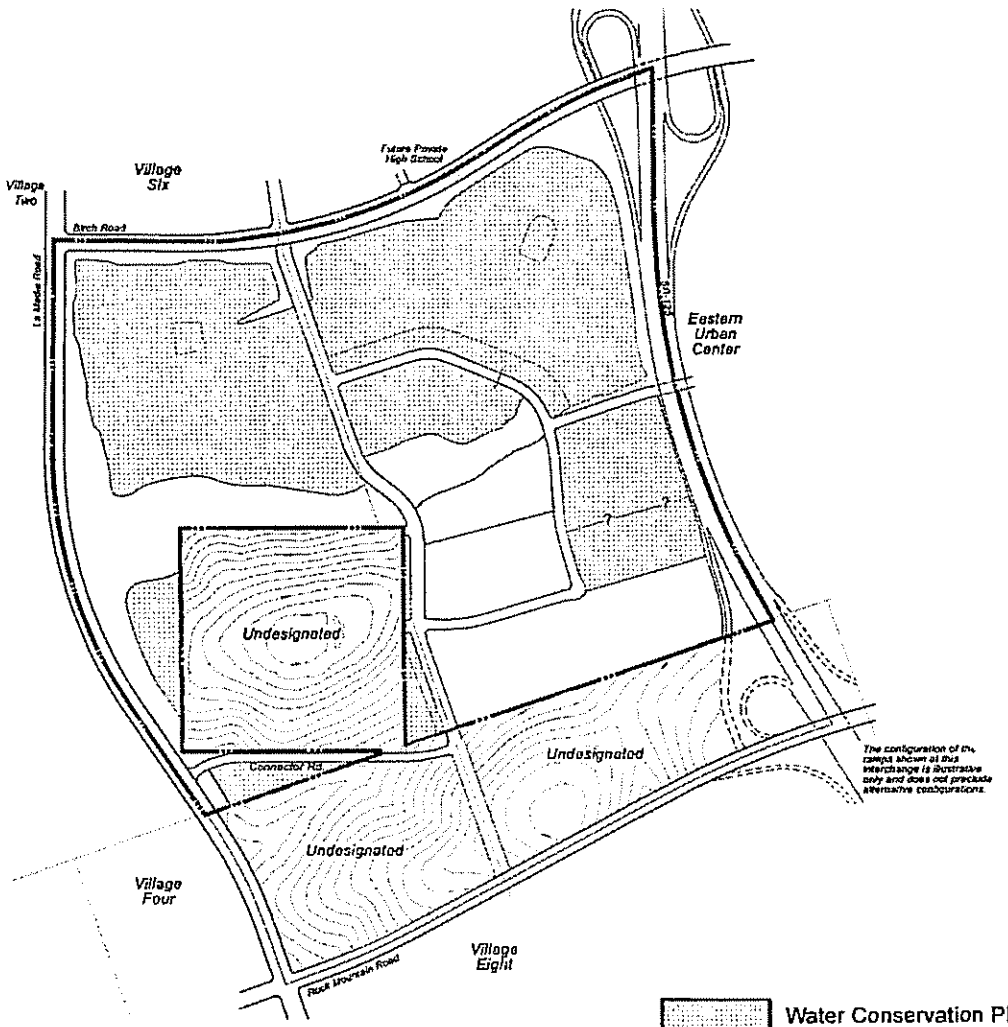
- Hot-Water Pipe Insulation.
- Pressure Reducing Valves.
- At least one outdoor water conservation measure from the Non-Residential Water Conservation Measures list.
- At least one additional water conservation measure from either the indoor or outdoor categories identified on the Non-Residential Water Conservation Measures list.
- Water conservation measures not found on the Non-Residential Water Conservation Measures list may be proposed consistent with the provision of Part Five of the Water Conservation Plan Guidelines.

II.8.4 Project Description

Otay Ranch Village Seven is an urban village as defined by the Otay Ranch General Development Plan, surrounded by prime arterials and an open space buffer augmented by the major open space feature in Wolf Canyon. The land use pattern implements the village concept with higher intensity uses and residential densities within a village core and decreasing intensity/density away from the core area. The Village Seven SPA Plan defines the village core in the central portion of the planning area, focused on a future commercial/mixed-use area. In addition to the commercial focal point, a public neighborhood park, and an elementary school site will comprise the core, along with multi-family residential development. The surrounding secondary area will include middle and high school sites, three CPF sites at the village entrance form La Media Road, and single family residential areas.

As noted previously, this Water Conservation Plan has been prepared with the initial SPA approval within Village Seven which includes only a portion of the village (see Exhibit WC-1). See also the Site Utilization Plan, Exhibit WC-2. All other private development sites in Village Seven are owned by others and will require a formal amendment of the SPA package to be included in the approved SPA (shown as "undesignated" on the Site Utilization Plan). Subsequent development submittals by other property owners shall address Water Conservation compliance requirements either by amending or supplementing this plan or preparing separate plans concurrently with the required SPA amendment(s).

Water Conservation Planning Areas



Water Conservation Plan included in SPA Plan.

Undesignated Water Conservation Plan not included in SPA Plan.

Public Ownership Parcels *(Schools & Park)*

CITY OF CHULA VISTA

Vista Verde

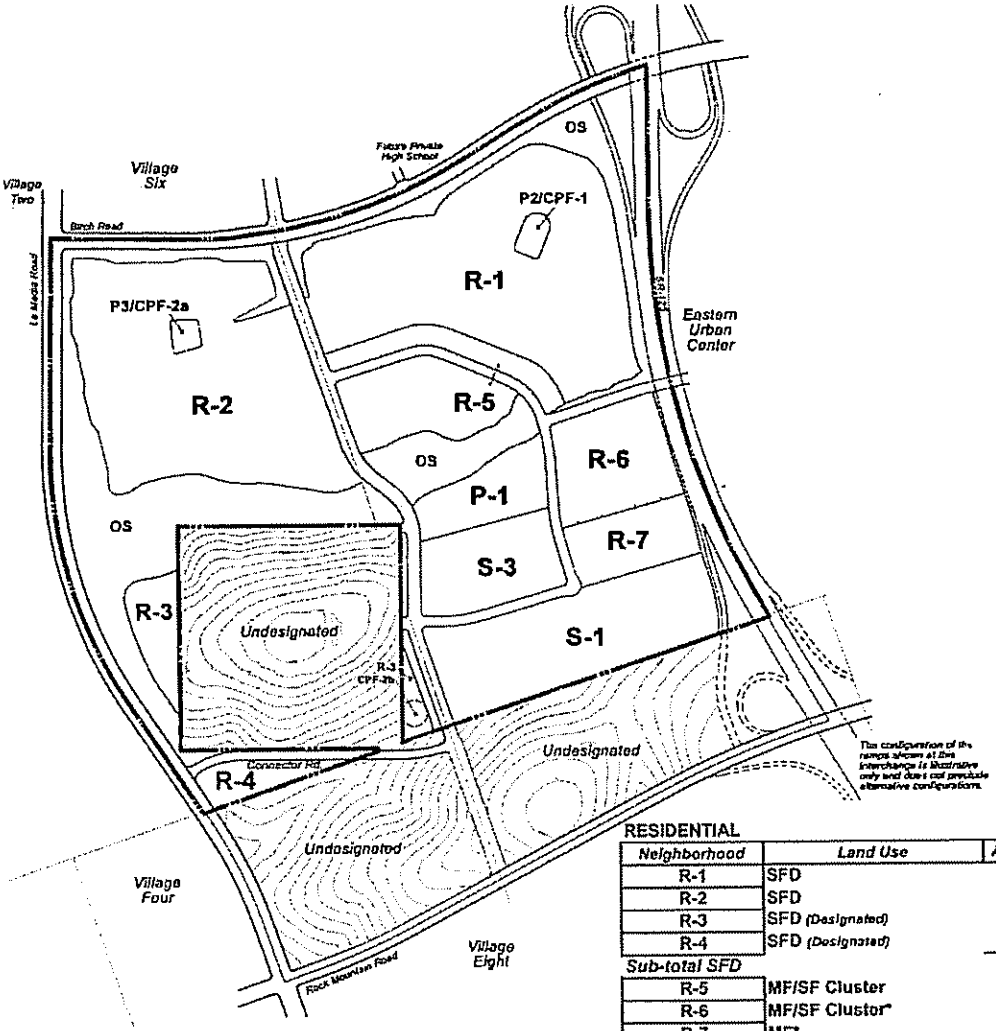
Village Seven - Otay Ranch

Land Planning

5/26/04

Exhibit WC-1

Site Utilization Plan



RESIDENTIAL

Neighborhood	Land Use	Acres	du/ac	DU
R-1	SFD	50.7	6.8	346
R-2	SFD	50.5	7.4	375
R-3	SFD (Designated)	5.3	4.2	22
R-4	SFD (Designated)	3.1	4.2	13
Sub-total SFD		*109.6*	*6.9*	*756*
R-5	MF/SF Cluster	17.4	7.6	132
R-6	MF/SF Cluster*	12.5	15.4	193
R-7	MF*	8.0	15.4	123
Sub-total MF		*37.9*	*11.8*	*448*
Total Residential		147.5	8.2	1,204

NON-RESIDENTIAL

Neighborhood	Land Use	Acres
P-1	Public Park	7.6 (7.0 ac net req'd)
P2/CPF-1	CPF (Common OS)	1.1
P3/CPF-2a	CPF (Common OS)	0.7
CPF-2b	CPF	1.0
S-1	High School (Designated)	23.4
S-3	Elem. School	11.1
OS	Open Space (Designated)	47.8
Undesignated	Undesignated Uses	121.3
Clr.	Circulation	62.9
Total Non-Residential		276.9
VILLAGE TOTAL		424.4

* Refer to SPA Text for provisions to blend these two parcels.

CITY OF CHULA VISTA

Vista Verde

Village Seven - Otay Ranch

Civil Land Planning

8/24/04

Exhibit WC-2

II.8.5 Water Service & Supply

Most of the potable water used in San Diego County is imported from the Colorado River and the Sacramento-San Joaquin Rivers Delta. A small portion is from local surface water storage reservoirs and groundwater.

The Otay Water District (OWD) provides water service to the Otay Ranch Village Seven SPA project area. The OWD is a member of the San Diego County Water Authority (CWA) which purchases the imported water from the Metropolitan Water District of Southern California (MWD). The OWD obtains filtered water from CWA and delivers it local customers.

The Village Seven SPA is located within the OWD's Central Service Area. The project will receive its water supply from the District's Central Area System. Potable water is provided to the Central Service Area of the Otay Water District via the Second San Diego Aqueduct. Water is delivered at aqueduct connections No. 10 and No. 12 and is conveyed by gravity to the Central Service Area emergency/operating reservoirs at a grade of 624 feet. Water is then pumped to the existing 711 and 980 service zones.

The OWD also provides recycled water to the project area. The District owns and operates the Ralph W. Chapman Water Recycling Facility located near the intersection of Singer Lane and Highway 94. This plant has a stated capacity of 1.3 million gallons of recycled water per day for non-potable water uses such as irrigation of golf courses, school playing fields, public parks, and public landscaping. An additional recycled water supply will be available from the City of San Diego's 15.0 million gallons per day (MGD) capacity South Bay Water Reclamation Plant, which is located in the Tijuana River Valley at Monument and Dairy Mart Roads near the Mexican border. The initial phase of this plant was recently completed.

Recycled water requirements for the project will be coordinated by the Otay Water District and the City of Chula Vista. The phased construction of potable and recycled water facilities, based on the District-approved master plans, will be incorporated into the Village Seven SPA Public Facilities Financing Plan and/or subdivision map conditions for the project to assure timely provision of required facilities.

II.8.6 Projected Water Use

This section presents information on the anticipated water demand of the Otay Ranch Village Seven project. The following potable water and recycled water consumption estimates are taken from Chapter 7 of the Village Seven SPA Plan.

Potable Water Demand

Table 2 shows projected water use in Otay Ranch Village Seven SPA, based on average use rates from the Otay Water District's Master Plan, which do not reflect significant conservation measures, and the proposed land use statistics.

Table 2
Potable Water Demand

Land Use	Net Area (ac)	Dwelling Units	Unit Demand	Average Annual Day Demand (gpd)*
SF Residential	109.6	756	500 gpd/du	378,000
MF Residential	37.9	448	300 gpd/du	134,400
Elementary School	11.1		1,785 gpd/ac	19,814
High School	23.4		1,785 gpd/ac	41,769
Public Park	7.6		2,155 gpd/ac	16,378
CPF	2.8		893 gpd/ac	2,500
TOTAL				**0.593 mgd**

* gpd = gallons per day; mgd = million gallons per day Source: Powell/PBS&J (7/03)

Recycled Water Demand

The projected demand for recycled water in Otay Ranch Village Seven is 0.110 MGD for landscape irrigation as shown in Table 3 below.

Table 3
Recycled Water Demand

Land Use	Net Area (ac)	Percent Irrigated	Irrigated Area (ac)	Irrigation Rate (gpd/ac)	Average Day Demand (gpd)*
MF Residential	37.9	15%	5.7	2,152	12,234
Park	7.9	100%	7.6	2,152	16,355
Elementary. School	11.1	20%	2.2	2,152	4,777
High School	23.4	20%	4.7	2,152	10,114
CPF	2.8	20%	0.6	2,152	1,291
Open Space	47.8	50%	23.9	2,152	51,433
Streets	62.9	10%	6.29	2,152	13,536
TOTAL					**0.110 mgd**

* gpd = gallons per day; mgd = million gallons per day

Source: Powell/PBS&J (7/03)

II.8.7 State & Federal Water Conservation Requirements

Some water conservation measures are mandated by state or federal law. The federal water efficiency plumbing standards were 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 efficiency is based on the California Constitution and 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. The Act 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, among 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, Appliance Efficiency Regulations. These regulations establish the maximum flow rate for all new showerheads, lavatory faucets, sink faucets, and tub spout diverters manufactured, sold or offered for sale in California.

In effect, current federal and state legislation require the 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

Water savings in a typical single family home in Southern California through use of mandated fixtures has been calculated to be approximately 25% of the pre-conservation total.

II.8.8 Local Water Conservation Requirements

In addition to the State and Federal requirements identified above, the City of Chula Vista and the Otay Water District have also adopted water conservation requirements.

The City of Chula Vista Growth Management Ordinance, Municipal Code Section 19.09.050C, requires a Water Conservation Plan (WCP) to be submitted with all Sectional Planning Area (SPA) Plans. The WCP is to provide an analysis of water usage requirements of the proposed project, as well as a detailed plan of proposed measures for water conservation, use of reclaimed water, and other means of reducing per capita water consumption from the proposed project, as well as defining a program to monitor compliance.

As noted in Section II.8.3 Purpose, all projects subject to a WCP are required to include a specific set of water conservation measures from a menu provided by the City. Per that requirement, the following water conservation measures will be incorporated in the project as described below:

- Hot Water Pipe Insulation
- Pressure Reducing Valves
- Water Efficient Dishwashers
- Water Efficient Landscaping
- Evapotranspiration Controllers
- Soil Moisture Sensors
- Dual Flush Toilets

Landscape irrigation is another significant opportunity for water conservation and local agencies have established their own mandates. The City of Chula Vista Landscape Manual requires the use of recycled water, if available, for landscape irrigation within all designated areas as allowed by state and local health codes. Further, Section 26 of the OWD ordinances state that it is the District's policy that reclaimed water shall be used "...whenever its use is financially and technically feasible, and consistent with legal requirements, preservation of public health, safety and welfare, and the environment." The use of recycled water in the Otay Ranch Village Seven project will comply with this requirement. All common area landscaping in the project will be irrigated with recycled water.

Use of recycled water does not reduce the irrigation demand for landscaping but more efficiently uses available water supplies by using potable water indoors and using recycled water for outdoor irrigation.

Measures Included in Project

Each of the selected water conservation measures included in the project is detailed below along with an estimate of the water savings associated with each.

Indoor Measures

Hot Water Pipe Insulation

Insulation of hot water pipes and separation of the hot and cold pipes to reduce heat exchange can reduce the amount of time a faucet will need to flow to produce hot water. The estimated water savings is 2,400 gallons per residential unit per year.

Pressure Reducing Valves

Installation of a pressure-reducing valve at the water service connection can maintain the pressure below 60 psi, reducing the volume of leakage that may be present and prevent excessive flow of water from all appliances and fixtures. The estimated water savings is 1,800 gallons per residential unit per year.

Water-Efficient Dishwashers

Dishwashers with water saving features such as water level sensors instead of timed fillers. The estimated water savings is 650 gallons per unit per year.

Outdoor Measures

The two property owners within the approved SPA boundary have selected different outdoor measures. McMillin (Neighborhoods R-1, R-5, R-6 and R-7 on Exhibit WC-2) has selected

Water-Efficient Landscaping

Guidelines for water-efficient landscaping are included in the City's Landscape Design Manual. Water efficient landscaping will be utilized on all developer installed landscaping, including the front yards of single family homes. This includes the use of drip irrigation where possible and restriction of sprinkler irrigation as recommended by the water purveyors. The estimated water savings by using water efficient landscaping is up to 50 percent of non-efficient landscaping. For a 2,100 square foot landscaped area, a saving of 12,000 gallons per year is estimated.

Otay Ranch Company (Neighborhood R-2 on Exhibit WC-2) has selected:

Evapotranspiration (ET) Controllers

Timed, fixed irrigation scheduling based on estimates of actual plant evapotranspiration rates.

Radio signal from a central control station or satellite transmits information to the controllers to operate the sprinklers for the appropriate length of time. Water savings are estimated to be 20,000 gallons per year per single family residential unit.

One Additional Measure

The two property owners have selected different additional measures as well. McMillin has selected:

Soil Moisture Sensors

Soil moisture sensors placed at two or more depths and at several locations in the landscape to help determine when the soil is dry enough to require irrigation. Alone, soil moisture sensors do not achieve water savings, except to avoid over watering and limit irrigation water waste.

Otay Ranch Company has selected:

Dual Flush Toilets

Provides option to flush with partial (0.8 gallon) flow of water or with a full (1.6 gallon) flow depending on need. It is estimated that a dual flush toilet can save 4,000 gallons of water per year

II.8.9 Water Conservation Estimated Savings

Based on the savings estimates detailed in the preceding section, the total water conservation estimate for the applicant's portion of the Otay Ranch Village Seven project is 0.029 million gallons per day, per Table 4 below.

Table 4
Total Water Conservation Estimate

Conservation Measure	Annual Estimated Savings/Unit		Conservation Estimate (gallons/year)
	SF Unit	MF Unit	
Hot Water Pipe Insulation (all)	2,400 g	2,400 g	2.890 million
Pressure Reducing Valve (all)	1,800 g	1,800 g	2.167 million
Water Efficient Dishwasher (all)	650 g	650 g	0.783 million
Water Efficient Landscaping (346 SFD/448 MF)	12,000 g	1,200 g	4.690 million
Evapotranspiration Controllers (410 SFD)	20,000 g	2,000 g	8.200 million
Soil Moisture Sensors (346 SFD/448 MF)	n/a	n/a	none
Dual Flush Toilets (410 SFD w/ 2 toilets ea.)	4,000 g/toilet	4,000 g/toilet	3.280 million
TOTAL	--	--	**22.010 million**
Average Daily Savings	--	--	**0.061 MGD**

II.8.10 Implementation Measures

The following water conservation measures will be implemented in the project as described in this Water Conservation Plan:

1. Hot Water Pipe Insulation
2. Pressure Reducing Valves
3. Water Efficient Dishwashers
4. Water Efficient Landscaping
5. Evapotranspiration Controllers
6. Soil Moisture Sensors
7. Dual Flush Toilets

Implementation of this Water Conservation Plan shall primarily be the responsibility of the Master Developers and individual site developers. The Master Developers will establish requirements and guidelines for site developers/builders. Alternate water conservation measures consistent with the Water Conservation Plan Guidelines may be substituted as approved by the Director of Planning and Building, at his/her sole discretion. The Master Developers will also install water efficient landscaping, approved by the City, in all developer installed landscape areas.

A substantial responsibility will also rest with the City of Chula Vista Planning and Building Department to ensure and enforce the provisions of this conservation plan. This 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.

Mains and laterals for recycled water will be installed with the major road and infrastructure improvements. The provision of reclaimed water is the responsibility of the Otay Water District, which will also be responsible for enforcing water quality regulations. Use of recycled water for irrigation in open space and public park areas will be the responsibility of the City of Chula Vista while such use on school sites will be the responsibility of the appropriate school district.

II.8.11 Monitoring

In order to ensure that all provisions of this plan are met, the standard review of landscape and construction documents preformed by the City will include an evaluation of compliance with the provisions of this Water Conservation Plan. This approach will allow for a formal determination by the City that each of the required measures are implemented. Future discretionary or administrative actions with regard to development within the Otay Ranch Village Seven SPA (*e.g.*, tentative map, building or grading permit, *etc.*) may be utilized to address or ensure compliance with the prescribed water conservation measures.

References

Cinti Land Planning; Draft Otay Ranch Village Seven SPA Plan; June 2004.

City of Chula Vista; Water Conservation Plan Guidelines; May 27, 2003.

Metropolitan Water District of Southern California; Final Draft Regional Urban Water Management Plan. July 1990.

Willdan Associates and Bud Gray; Growth Management Program - City of Chula Vista. 1990.