

**OTAY RANCH FREEWAY COMMERCIAL
SPA AMENDMENT
WATER CONSERVATION PLAN**

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ABBREVIATIONS

ac -	acre
ac-ft -	acre-foot
cfcd -	community facilities district
cfs -	cubic feet per second
gpd-	gallons per day
gpf-	gallons per flush
gpm-	gallons per minute
HOA-	homeowners association
mgd-	million gallons per day

USEFUL CONVERSIONS

1 acre-foot	=	325,829 gallons
1 mgd	=	1,000,000 gallons/day
1 cfs	=	448.8 gpm
1 cubic foot	=	7.48 gallons
1 mgd	=	694.4 gpm

EXECUTIVE SUMMARY

The City of Chula Vista's Growth Management Ordinance (CVMC 19.09.050C) requires that all development projects with 50 dwelling units or greater prepare a Water Conservation Plan at the time of the Sectional Planning Area plan preparation. A Water Conservation Plan was prepared for the Planning Area 12 (PA 12) Freeway Commercial project when the project was originally approved in 2002. This plan presents a review of presently available technologies and practices which result in water conservation in primarily residential development. This report presents an updated Water Conservation Plan with measures that will be incorporated into the planning and design of the Otay Ranch PA 12 SPA Amendment, including the requirements outlined in the Chula Vista Landscape Water Conservation Ordinance (CVMC 20.12).

The PA 12 Freeway Commercial project consists of an FC-1 site that has already been developed as commercial per the originally approved SPA plan and an FC-2 site that is currently under development under the existing mixed-use entitlement. Baldwin & Sons has applied to add 300 dwelling units to the proposed apartments east of Town Center Drive in FC-2. This updated water conservation plan is being prepared for the FC-2 site. Town Center Drive, which bisects the FC-2 site, was constructed concurrent with the FC-1 site development.

The FC-2 site consists of 36.3 acres of property that is entitled for hotels and mixed use residential with ancillary commercial uses and a park. The SPA Amendment is required to increase residential density. The FC-2 site will include approximately 900 multi-family residential units, 300 hotel rooms, a 2.0-acre park site, and 15,000 square feet of retail commercial.

The Otay Water District is the local water agency that supplies potable water and recycled water to PA 12 FC-2. The current total estimated average potable and recycled water use for the project is 0.19 mgd and 0.03 mgd, respectively.

The State and local government have mandated a number of water conservation measures. The focus of this study is on the implementation of non-mandated water conservation measures. The project will install hot water pipe insulation, pressure reducing valves, and water efficient dishwashers in all multi-family residential units. Additionally, the builder will install dual flush toilets and other water conserving irrigation equipment and techniques in compliance with the Landscape Water Conservation Ordinance. At buildout of the project, implementation of the above measures along with the use of recycled water would reduce estimated potable water usage on the project by an estimated 53,385 gpd.

INTRODUCTION

In recent years, the subject of water conservation has been given increased attention. The growing awareness of the need and value of water conservation has been sparked by local and regional water purveyors concerned about meeting the future water demands of their customers, particularly during drought conditions. Water conservation provides an alternative approach to the problem of finding new water sources to meet the water demand for a proposed community. The intent of water conservation is to manage water demand so that the customers receive adequate service but use less water.

Much has been done to educate consumers about limitations of water supply, the serious implications of a long-term drought and the need for water conservation, but there is a practical limit to the percentage reduction of water use in established communities. This limit is a result of the types of plumbing fixtures installed in existing homes as well as the difficulty in altering consumers' established patterns of water use. Any water conservation effort, voluntary or mandatory, requires the cooperation of the public. Public information should be utilized to inform and convince the consumer that a change in personal water use habits is in everyone's best interest.

In recent years, the private development sector has become more attuned to the concerns of water availability and has recognized the value of addressing water conservation issues throughout planned development projects. By incorporating low water use plumbing fixtures, promoting drought tolerant landscaping, and providing educational materials to homeowners within the development project, private developments can do much to cultivate an interest in water conservation and establish new patterns of water use. These efforts can have significant impacts with regard to reducing the need for securing and importing larger quantities of water for use in San Diego County. The Landscaping Water Conservation Ordinance went into effect on January 1, 2010 and requires homeowners to be efficient with the landscape systems and plant selection.

In 2006 the State repealed the Water Conservation in Landscaping Act and adopted a new Water Conservation in Landscaping Act, Government Code Sections 65591 et seq. The new Act requires the Department of Water Resources to update the previously adopted model efficient landscape ordinance that provides for greater efforts at water conservation and more efficient use of water in landscaping. Government Code Section 65595 requires that on or before January 1, 2010 a local agency shall adopt a water efficient landscape ordinance that is at least as effective in conserving water as the updated model ordinance or adopt the model ordinance. If a local agency does not adopt a water efficient landscape ordinance by the deadline, the updated model ordinance shall apply within the local agency's jurisdiction and shall be enforced by the local agency.

The City of Chula Vista City Council adopted an ordinance that complies with the findings and declarations of the State's Water Conservation in Landscaping Act and is as effective as the State's updated model water efficient landscape ordinance. This water conservation plan

incorporates the requirement of the City's ordinance.

The Otay Ranch Freeway Commercial project is within the Otay Ranch General Development Plan (GDP). The Otay Ranch GDP was adopted in 1993 and included objectives for water conservation to be incorporated into the development of Otay Ranch. These objectives included the implementation of water efficient fixtures, increased use of drought tolerant landscaping, and use of recycled water for irrigation. The objective of these measures is to reduce the per capita water use within Otay Ranch by 25 percent as compared to county wide 1989 per capita levels. This report will demonstrate how the City, in partnership with the Otay Water District and development community are meeting these objectives.

PURPOSE

The State Legislature determined in the Water Conservation in Landscaping Act that the State's water resources are in limited supply. The Legislature also recognized that while landscaping is essential to the quality of life in California, landscape design and maintenance must be water efficient. The City of Chula Vista's Growth Management Ordinance requires that all major development projects (50 dwelling units or greater) prepare a Water Conservation Plan at the time of Sectional Planning Area Plan preparation. The City has adopted guidelines for the preparation and implementation of required Water Conservation Plans.

This report will present water conservation measures which will be incorporated into the planning and design of the project, including an estimate of the anticipated water savings. Approximately half of the water used by residences in California is used outdoors. For this reason, the City's Landscape Water Conservation Ordinance will be an important component of reduced water usage.

Although not covered in detail, there are several secondary benefits to conserving water that should be kept in mind when reviewing material in this report. These benefits include reduced sewage flows, reduced natural gas use, and reduced electricity use. Using less water in the shower, for example, reduces the amount of water input into the sewer system and reduces the amount of energy required to heat the water.

PROJECT DESCRIPTION

Proposed development for the FC-2 site includes approximately 900 multi-family residential dwelling units, 300 hotel rooms, a 2.0-acre park, and 15,000 square feet of commercial retail. Appendix A provides the proposed land use plan for FC-2 and Table 1 provides a land use summary.

TABLE 1 FREEWAY COMMERCIAL SPA AMENDMENT FC-2 SITE LAND USE SUMMARY	
Land Use	Quantity
MF Residential Units	900 units
Hotels	300 units
Park	2.0 acre
Commercial	15,000 SF ¹

¹ Retail Commercial is on approximately 4.0 acres of the site.

WATER SERVICE AND SUPPLY

The Otay Water District is the local water agency that supplies potable water and recycled water to Freeway Commercial. The Otay Water District relies solely on the San Diego County Water Authority (SDCWA) for its potable water supply. The SDCWA is the largest of 27-member agencies of the Metropolitan Water District of Southern California (MWD), which is the primary importer of domestic water in Southern California.

PROJECTED WATER USE

Potable Water Demand

Water use is affected by, among other things, climate and the type of development. In California, recent trends towards the construction of more multi-unit housing, the general reduction in residential lot size, and a number of local agency water conservation programs in effect are all tending to reduce per capita water consumption.

Potable water demands were projected by taking the total development for each land use and multiplying by water use factors. Table 2 provides the projected potable water demand for the FC-2 site based on the current SPA Amendment. The total estimated potable water use is 0.19 mgd. The estimated potable water usage in Table 2 is reduced as a result of the use of recycled water for irrigation of parks, common areas, etc. Potable water use factors were taken from the 2018 Freeway Commercial Sub Area Master Plan Amendment: Potable and Recycled Water.

TABLE 2 FREEWAY COMMERCIAL PROJECTED POTABLE WATER DEMANDS (FC-2 SITE)			
Location (Land Use)	Quantity	Unit Rate	Average Demand, gpd
Multiple-Family Residential	900 units	170 gpd/unit ¹	153,000
Commercial	3.6 ac	1,785 gpd/ac ^{1 2}	6,428
Hotel	300 rooms	115 gpd/room	34,500
Park	2.0 ac	--- ²	1,000 ²
TOTAL			194,928

¹ Assumes that recycled water will be used at these sites.

² Estimated potable water use for restrooms, drinking fountains, etc. based on other similar facilities.

Recycled Water Demand

In accordance with Section 26 of the Otay Water District Code of Ordinances, FC-2 will utilize recycled water for the irrigation of open space slopes, parks, and the common area of commercial and multi-family residential sites. Table 3 provides the updated estimate for the FC-2 site recycled water demand. The total estimated recycled water demand is 0.03 mgd.

TABLE 3 FREEWAY COMMERCIAL PROJECTED RECYCLED WATER DEMANDS (FC-2 SITE)					
Location (Land Use)	Quantity	Recycled Water Factor	Net Recycled Acreage	Unit Rate¹	Average Demand, gpd
Multi-Family Residential	900 units	15%	---	30 gpd/unit	27,000
Commercial	4.0 ac	10%	0.4	1,900 gpd/ac	760
Park	2.0 ac	100%	2.0	1,900 gpd/ac	3,800
TOTAL					31,560

¹ Based on OWD 2015 Water Facilities Master Plan.

MANDATED WATER CONSERVATION MEASURES

The State and many local Governments have mandated a number of water conservation measures. Table 4 summarizes the conservation measures that are currently mandated by the State of California and also provides the requirements of the 2016 California Green Building Standards Code.

TABLE 4 MANDATED WATER CONSERVATION DEVICES		
Device	Baseline Requirement	2016 Green Building Standards Code
Showerheads	2.5 gpm	2.0 gpm
Lavatory Faucets	2.2 gpm	1.2 gpm
Sink Faucets	2.2 gpm	1.8gpm
Metering Faucets in Public Restrooms	0.25-0.75 gal/cycle	0.25 gal/cycle
Residential Water Closets	1.6 gpf	1.28 gpf
Flushometer Valves	1.6 gpf	1.28 gpf
Commercial Water Closets	1.6 gpf	1.28 gpf
Urinals	1.0 gpf	0.5 gpf

LOCAL WATER CONSERVATION REQUIREMENTS

There are a number of water conserving measures required by the Otay Water District and City of Chula Vista Landscape Manual. These include the use of recycled water for the irrigation of parks, median landscaping, open space slopes, and common landscaped areas where feasible. The Landscape Manual also requires some drought tolerant plant selection in the landscaping plan and the use of evapotranspiration controllers for parks and common landscaped areas. Additionally, the Landscape Water Conservation Ordinance that went into effect on January 1, 2010 is expected to reduce outdoor water consumption due to the setting of strict water budgets on City approved landscape plans that must not be exceeded.

The City of Chula Vista Water Conservation Plan Guidelines requires the following three indoor water conservation measures for residential units and non-residential units. These measures are mandatory.

Residential Measures - Mandatory

1. Hot Water Pipe Insulation. This measure involves the insulation of hot water pipes with 1-inch walled pipe insulation and separation of hot and cold-water piping. This measure is estimated to cost an additional \$50 during initial construction and result in annual savings of 2,400 gallons per residential unit.
2. Pressure Reducing Valves. Setting the maximum service pressure to 60 psi reduces any leakage present and prevents excessive flow of water from all appliances and fixtures. This measure is estimated to cost \$100 during initial construction and result in annual water savings of 1,800 gallons per residential unit.
3. Water Efficient Dishwashers. There are a number of water efficient dishwashers available that carry the Energy Star label. These units cost an additional \$500 on average and result in an estimated yearly water savings of 650 gallons per residential unit.

Non-Residential Measures - Mandatory

1. Hot water pipe insulation with 1-inch walled pipe insulation.
2. Compliance with Division 5.3 of the California Green Building Standards Code in effect at the time of plan submittal.
3. Pressure reducing valves.

Non-Mandatory Measures

In addition, to comply with the City's current water conservation requirements, the developer must select at least one outdoor measure and one additional indoor or outdoor water conservation measure for residential development and non-residential development. Water conservation measures not included on the City's Residential Water Conservation Measures list may be proposed by the developer. Since this project does not propose any single-family residences, all outdoor irrigation water use is proposed to be met with recycled water. Thus, there are no outdoor water measures that would result in a direct reduction in potable water use. The developer will implement, from the City's list of approved measures, the following indoor non-mandatory measure in multi-family residential units and non-residential units.

1. Dual Flush Toilets. The developer will install dual flush toilets within the project. This measure is estimated to cost \$200 per household and result in annual water savings of 4,000 gallons per year per residential unit.

WATER CONSERVATION ESTIMATED SAVINGS

The estimated water savings for water conservation measures are based on the estimates provided in the previous section of this report. The potential water savings varies widely based on land use types. Multi-family residential units, for example, have much less opportunity to implement additional water saving measures than low density single family residential units. This is primarily because the common landscaped areas of multi-family units are required to be irrigated with recycled water and, thus, there are no outdoor water conservation measures that can directly offset potable water usage in these areas.

Table 5 summarizes the total estimated water savings for the PA 12 FC-2 SPA Amendment based on the proposed required measures and non-mandatory measure described above.

TABLE 5 FC-2 SPA AMENDMENT MULTI-FAMILY PROPOSED WATER CONSERVATION MEASURES					
Measure	Location	Yearly Water Savings, gal/unit	Daily Water Savings, gpd/unit	Percentage of Total Usage¹	Project Total Water Savings², gpd
Hot Water Pipe Insulation	Indoor	2,400	6.58	3.9	5,922
Pressure Reducing Valves	Indoor	1,800	4.93	2.9	4,437
Water Efficient Dishwashers	Indoor	650	1.78	1.0	1,602
Dual Flush Toilets	Indoor	4,000	10.96	6.5	9,864
TOTAL		8,850	24.25	14.3	21,825

¹ Based on 170 gpd/unit average usage.

² Based on 900 Multi-Family Residential Units.

³ This measure will reduce the amount of recycled water used for irrigation and has, therefore, not been included in the total potable water savings.

Water Conservation Summary

As detailed in this report, the PA 12 FC-2 project is committed to being water efficient through the use of recycled water for irrigation and utilizing other water conservation devices and measures. Table 6 summarizes the baseline potable water use if recycled water and water conservation measures were not utilized and provides the anticipated water savings outlined in this report. As shown, the use of recycled water and other water conservation measures is expected to reduce potable water usage by 53,385 gpd, or 24 percent.

As evidenced by the information contained in this study, the objectives of the Otay Ranch GDP to incorporate water saving fixtures, drought tolerant landscaping, and recycled water usage into the development are being met. Based on information contained in the 1989 San Diego County Water Authority Annual Report, average water use within the Otay Water District was 220 gallons per day per capita (20,469.7 AF for a population of 83,000) . Based on 2007 data from the OWD 2008 Master Plan, per capita water usage has dropped to approximately 189 gpd (33.26 mgd for a population of 186,000). These per capita numbers include non-residential demands, but clearly indicate the effectiveness that the above measures are having. This trend is expected to continue as adopted guidelines are increasingly focused on reducing per capita water use.

TABLE 6 PA 12 FC-2 SPA AMENDMENT WATER CONSERVATION SUMMARY	
Description	Average Use, gpd
Total Water Use	
Potable Water Use (Table 2)	194,928
Recycled Water Use (Table 3)	31,560
Total Baseline Water Use	226,488
Water Conservation Savings	
Recycled Water (Table 3)	31,560
Multi Family Measures (Table 5)	21,825
Total Conservation Savings	53,385
Net Potable Water Usage ¹	173,103
Reduction from Baseline Usage	24%

¹ Potable water use (Table 2) minus water conservation savings (Table 5).

IMPLEMENTATION MEASURES

The non-mandated water conservation measures to be included in the residential component of the PA 12 FC-2 project are listed in Table 5. The non-residential development within the project will utilize hot water pipe insulation, pressure reducing valves, water efficient landscaping systems, and dual flush toilets as well as meeting all requirements of Division 5.3 of the California Green Building Standards Code in effect at the time of plan submittal.

MONITORING

For the water conservation measures proposed to be incorporated into the PA 12 FC-2 project, Table 7 summarizes the implementation timing for each measure, as well as the responsibility for monitoring the implementation of the measures.

TABLE 7
PA 12 FC-2 SPA AMENDMENT
IMPLEMENTATION AND MONITORING PROGRAM

Water Conservation Measure	Responsibility for Implementation	Timing	Monitoring of the Implementation
Hot Water Pipe Insulation	Developer	Prior to Issuance of Building Permit	City Building Department
Pressure Reducing Valves	Developer	Prior to Issuance of Building Permit	City Building Department/Otay Water District
Water Efficient Dishwashers	Developer	Prior to Issuance of Building Permit	City Building Department
Dual Flush Toilets	Developer	Prior to Issuance of Building Permit	City Building Department

REFERENCES

1. Bahman Sheikh, Water Use Efficiency, Strategies for Proposed Residential Developments, September 2001.
2. City of Chula Vista Water Conservation Plan Guidelines, adopted May 27, 2003.
3. Chapter 20.12 Chula Vista Landscape Water Conservation Ordinance, January 2010.
4. Otay Water District Water Resources Master Plan, October 2008, Revised April 2013.
5. Freeway Commercial Sub Area Master Plan Amendment: Potable and Recycled Water, 2018
6. San Diego County Water Authority Annual Report, 1989.
7. California Green Building Standards Code, 2016.

APPENDIX A

LAND USE MAP

OTAY RANCH PLANNING AREA 12

"FREEWAY COMMERCIAL NORTH" OR "FC-2"

CONCEPTUAL DEVELOPMENT PLAN

