SUSTAINABILITY ELEMENT

Eastern Urban Center (EUC)
Sectional Planning Area (SPA)
Otay Ranch GDP

DRAFT

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EUC SUSTAINABILITY ELEMENT

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I. INTRODUCTION

How we conduct land planning is critical to determining the overall health of the environment, social communities and the people who live within our communities. Energy, water and raw building material resources are increasingly being stretched to meet new demand, and efficient use of these items is vital to future sustainability. Dense, mixed use developments generally provide for healthier communities and make more efficient use of these resources.

Smart Growth Planning Principles

By integrating "Smart Growth" principles we have the ability to improve how our communities function and in turn improve the quality of life of our future residents. The Eastern Urban Center Plan embraces Smart Growth planning principles into its design on a number of critical levels.

The San Diego Association of Governments (SANDAG) has incorporated Smart Growth principles in the San Diego Regional Comprehensive Plan which includes the city of Chula Vista and Otay Ranch. SANDAG defines Smart Growth to be applied in the region as follows:

Smart Growth is a compact, efficient, and environmentally sensitive pattern of development that provides people with additional travel, housing and employment choices by focusing future growth away from rural areas and closer to existing and planned job centers and public facilities while preserving open space and natural resources and making more efficient use of existing urban infrastructure. Smart Growth is characterized by more compact, higher density development in key areas throughout the region that is walkable, near public transit, and promotes good community design. Smart growth results in more housing and transportation choices for those who live and work in smart growth areas.

In a report by the Urban Land Institute's California Smart Growth Initiative's Statewide Coordinating Committee, *Putting The Pieces Together - State Actions to Encourage Smart Growth Practices in California*, eight principles of smart growth were created to serve as framework for smart growth at the state, regional, and local levels. The principles are also used by the committee as recommendations for state initiatives to promote smart growth. The Eastern Urban Center Plan takes all eight of these recommendations into account through careful consideration of the needs of the region's residents, economy and available resources. The EUC addresses these principles as follows:

> *1. Preserve and enhance California's quality of life. Accommodate growth in ways that use the state's natural and financial resources efficiently, enhance its economic competitiveness, and provide local governments more certain and adequate funding.*
>
> By providing the highest intensities of land use in the Otay Ranch master plan in a mixed use, transit integrated environment, the EUC will make efficient use of land resources and will be served by logical and proximate connections to existing public infrastructure.

The EUC is the antithesis to sprawl development. Surrounded by new development on 75% of its borders, the EUC will essentially be an infill project by the time it begins construction. The project has been designed to encourage alternative modes of transportation and will maximize the financial commitments made to transit at the federal, state and local level by integrating transit centrally into its design. The EUC will be an economically vital community that will support the local jurisdiction by providing increased revenues in the form of property, retail sales and Transient Occupancy taxes while providing the public facilities necessary to serve the development concurrently, or in advance of when they are needed.

2. Create viable and livable communities. Ensure that existing communities remain or become vital and healthy places that provide opportunities for all residents to live, work, recreate, obtain a good education, and raise a family.

The mixed-use nature of development within the EUC will be an important factor in defining the character of daily life within the community. Development will include residential, office, retail, entertainment and civic uses located within close proximity to one another, and in some cases, within the same building. Development will include approximately 3,000 residential units and the project will offer significant new employment opportunities in the form of region-serving corporate office uses. The project will also provide both neighborhood and regional serving retail, service and entertainment opportunities to its residents within walking distance of every residential unit. Civic uses will also be an important part of the neighborhood fabric, and will include a library and fire station, as well as a mixed use cultural arts facility. All of these uses will be connected by a pedestrian-oriented network of streets, parks, plazas, trails and paseos that will link destinations within the project as well as providing connections to destinations outside the EUC.

Life-long learning opportunities will be available to all EUC residents. The community will have a designated site for a new elementary school, and will also be served by the six existing public, private and parochial school campuses within a one-mile radius of the community. Enhancing walkability, the EUC will be linked by a pedestrian bridge directly to a future middle school and high school just east of the project. The land use configuration is designed as a series of small, inter-connected walkable districts which provide for safe walk-to-school programs. The EUC will also have a designation for continuing education through a local, adult education facility. Also, City plans call for a University, in the format of a multi-institutional teaching center, to be established just south of the EUC, providing higher education within easy reach of the community.

Recreation elements are an important part of the EUC community fabric. The neighborhood park spaces, in the form of urban open space and plazas, are well integrated into the urban fabric to create the critical “place-making” features that foster community identity and social interaction. Regional trails and enhanced streetscapes build connections, while urban parks and plazas create identifiable nodes that encourage

public gathering. Complemented by the planned 70-acre Community Park located less than a mile west of the district, the EUC offers access to a full range of urban outdoor activities and experiences.

3. Invest in transportation linked to efficient land uses. Strengthen the links between transportation funding decisions and smart growth practices. Support smart growth practices with efficient transportation planning and investment strategies.

The land planning completed for the EUC acknowledges the need for vehicular traffic, but the emphasis has been placed on alternative forms of transportation. Public transit has been integrally woven into the fabric of the community. A regional serving Bus Rapid Transit (BRT) service line will run in a north-south direction, connecting the EUC to the international border to the south and to employment destinations in downtown and Sorrento Mesa to the north. This service will also link the EUC with other regional transit services including the San Diego Trolley. Local bus service will also be provided within the EUC. Transit stops have been integrated into the center of the project such that almost 90% of the EUC will be within a ¼ mile distance of transit. In addition to the centrally located services, the higher residential densities in the project together with the strong employment component will directly support and enhance transit viability.

The EUC has been planned with a fine grained grid system of streets, resulting in a very walkable community. The sidewalks range in width from 12-20 feet and will be amenitized to provide an inviting pedestrian experience. Block sizes are approximately 330 feet in length providing for short, walkable districts. Regional pedestrian, biking and electric cart trails on surrounding arterials provide access to adjacent neighborhoods and villages, regional parks and other amenities. Jogging trails have been provided throughout the office district connecting to the project's sidewalks, paseos, parks and plazas to create a complete pedestrian network that will serve the community's residents. Additionally, bicyclists will be accommodated on an established arterial system of bike lanes and, with the low speeds and diffused traffic in the project, will be accommodated within the EUC on all internal streets. Regional carpooling and car sharing programs will be encouraged to provide additional transportation alternatives for residents and office tenant employees.

4. Enhance housing opportunities. Support policies to increase the supply and affordability of housing to meet the needs of California families.

Residential development will include approximately 3,000 units in a variety of product types that will appeal to a wide cross section of buyers. Residential products may include lofts, flats, townhomes, carriage units, senior living and assisted care facilities, condominiums, and live/work units. Both rental and for-sale units will be provided. In addition, over 10% of the units in the EUC will be affordable to low and moderate

income buyers. Such a diverse mix of housing options will enhance the energetic character of the community.

5. Preserve open space, natural resources, and the environment. As much as possible, locate new developments in or adjacent to existing communities, so as to protect air and water quality, conserve wildlife habitat and natural land features and systems, and provide green space for recreation and other amenities.

The EUC site is part of the Otay Ranch master plan which includes an open space preserve system that, when completed, will cover more than 13,000 acres of permanently dedicated and maintained open space. The EUC itself contains no sensitive or protected habitat and has been used in the past primarily for dry farming activities. Portions of the site have been previously disturbed by grading activities. As part of the project approval, approximately 200 acres of permanent open space will be dedicated by the applicant and a permanent funding source put in place to manage that open space.

6. Preserve farmland. To the extent possible, avoid the conversion of California's prime agricultural land to other uses.

The Otay Ranch area does contain land suitable for agricultural use, but there has been no intensive agricultural use on the EUC site since the mid 1970's. Since that time the EUC has been used periodically for low-intensity dry farming and grazing activities, but these uses ceased on the site several years ago, therefore development of the site as contemplated in the master plan, will not result in impacts to ongoing agricultural operations. One of the uses being contemplated for the EUC is the establishment of a community garden which would acknowledge the historic use of the site and foster an appreciation of the agricultural heritage of the area.

7. Address growth issues regionally. Foster collaboration among state, regional, and local governments to solve problems that are regional-and not local in-nature.

The EUC has been identified by SANDAG as an Existing/Planned Smart Growth Urban Center. The plan not only acknowledges that designation, but takes to heart the principles that underlie that designation. These principles embrace compact, efficient and environmentally sensitive patterns of development that provide people with additional travel, housing and employment choices by focusing future growth away from unincorporated areas and closer to existing and planned job centers and public facilities.

The EUC plan represents a forward thinking approach to addressing regional growth issues. Growth is accommodated in a high density, mixed use environment which reduces the reliance on the automobile, supports regional transit services and expenditures and which fosters a sense of community and connectivity for its residents. Higher densities

are a more efficient use of land resources and the compact urban form reduces expenditures and maintenance costs for local and regional infrastructure and services.

8. Seek solutions at the grass roots. Educate and engage the community because grass-roots, community-centered processes and procedures are essential elements of smart growth.

The EUC project is a high profile project within the community. The applicant has engaged the community and local and regional community groups through an ongoing series of presentations which encourage public input. The project is also actively promoted by the City of Chula Vista through the efforts of its staff and elected officials.

The EUC will involve a long term buildout which will necessitate a long term commitment to community building activities and resident participation as the project matures. A community association or foundation will be established to ensure that event programming and other activities that support a sense of community will be permanent component of the project.

By utilizing Smart Growth principles, the EUC will provide for the needs of Southern California's increasing population in a compact, resource efficient and environmentally sensitive community.

Leadership in Energy and Environmental Design

The U.S. Green Building Council (USGBC), the Congress for New Urbanism, and the Natural Resources Defense Council (NRDC) have come together to develop a national set of standards for neighborhood location and design based on the combined principles of smart growth, new urbanism and green building. The goal of this partnership is to establish these standards for assessing and rewarding environmentally superior development practices within the rating framework of the LEED (Leadership in Energy and Environmental Design) Green Building Rating System™.

LEED for Neighborhood Development (LEED-ND) places an emphasis on the design and construction elements that bring buildings together into a neighborhood, and relate the neighborhood to its larger region and landscape. LEED-ND creates a label, as well as guidelines for design and decision-making, to serve as an incentive for better location, design and construction of new residential, commercial and mixed use developments. The rating system is designed to certify exemplary development projects that perform well in terms of smart growth, new urbanism and green building.

The EUC has been selected as one of 238 diverse LEED-ND pilot projects to participate in the USGBC's pilot program for LEED-ND certification. LEED-ND pilot projects are located in 39 different states and 6 countries. In addition, the EUC will participate as one of 60 focus group projects that will provide additional project-specific feedback on the

overall certification program. The project will be evaluated in four different categories including Smart Location & Linkages, Neighborhood Pattern & Design, Green Construction & Technology and Innovation & Design Process.

While the aforementioned Smart Growth planning principles lay the foundation in creating a sustainable development, the following air quality, energy conservation and water conservation plans outline energy and environmental design features which can be incorporated into the project to enhance long term sustainability.

II. AIR QUALITY IMPROVEMENT PLAN

II.1 Executive Summary

As detailed in this plan, numerous features have been included in the project and surrounding Otay Ranch Community to minimize air quality impacts from construction and operation of the Eastern Urban Center Sectional Planning Area (SPA) project.

The most significant air quality improvement measures are those policies and regulations established at the broadest geographic level, *i.e.*, State and Federal. However, project-level features or actions, although small and relatively insignificant, contribute to cumulative conditions and affect regional air quality. This report presents an overview of air quality issues, standards and regulations, and impact reduction opportunities. The proposed EUC project has been evaluated using the CO_2 INDEX Model in accordance with the City of Chula Vista Growth Management Program. The CO_2 INDEX model assessed the project design features which are intended to reduce vehicle trips, maintain or improve traffic flow, reduce vehicle miles traveled, and otherwise reduce emissions (direct or indirect) from the project. Because the necessary air quality improvement features are intrinsic to the project no special monitoring is required.

I.1 Introduction

This Air Quality Improvement Plan has been prepared in conjunction with the Otay Ranch Eastern Urban Center (EUC) Sectional Planning Area (SPA) Plan. The EUC is the sub-regional commercial, cultural, social and public services center envisioned as the heart of the Otay Ranch Planned Community. The Eastern Urban Center is planned to be the high density mixed-use urban center for the eastern portion of Chula Vista and the surrounding region.

The SPA Plan refines and implements the land use plans, goals, objectives and policies of the Otay Ranch GDP. It addresses existing and planned land uses, public facilities, design criteria, circulation, and other development components. Preparation and approval of a SPA Plan, including this AQIP, is required by the Otay Ranch GDP pursuant to Title 19, Zoning, of the Chula Vista Municipal Code.

II.3 Purpose

The purpose of this Air Quality Improvement Plan (AQIP) is to respond to the Growth Management Policies of the City of Chula Vista which require large development projects to prepare such a plan. The Growth Management Program implements the Growth Management Element of the General Plan and establishes an orderly process to carry out the development policies of the City.

The regulatory framework for this air quality plan includes federal, state and regional standards

as well as local planning requirements. The federal Clean Air Act was enacted in 1970 and amended in 1977 and 1990 to protect and enhance the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, the Environmental Protection Agency (EPA) developed primary and secondary national ambient air quality standards (NAAQS). Six pollutants of primary concern were designated: ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, lead, and suspended particulate (PM-10). In 1997, new standards for eight-hour ozone and fine particulate matter (PM-2.5) were promulgated. The EPA also allows the states the option to develop different (stricter) standards, which California has adopted.

California law requires that regional air quality districts implement regulations to reduce emissions from mobile sources through the adoption and enforcement of transportation control measures. San Diego County is in compliance with all State and federal air quality standards except the state standard for ozone; the area meets the less stringent federal ozone standard.

The State Implementation Plan (SIP) is the document that sets forth the state's strategies for achieving air quality standards. The San Diego Air Pollution Control District (APCD) is responsible for preparing and implementing the portion of the SIP applicable to the San Diego Air Basin (SDAB). The San Diego APCD adopts rules, regulations, and programs to attain state and federal air quality standards. The APCD prepared the original Regional Air Quality Strategy (RAQS) in 1992 pursuant to the SIP. The RAQS is subject to review and amendment every three years (triennial revisions) and was amended in 1995, 1998, 2001 and 2004.

At the local level, the City has included a Growth Management Element (GME) in its General Plan. One of the stated objectives of the GME is to have active planning to meet federal and state air quality standards. To implement the GME, the City Council has adopted the Growth Management Program which requires Air Quality Improvement Plans for major development projects (50 residential units or commercial/industrial projects with equivalent air quality impacts). Title 19 (Sec. 19.09.0508) of the Chula Vista Municipal Code requires that a SPA plan package contain an AQIP.

On November 14, 2000, the City Council adopted the Carbon Dioxide (CO_2) Reduction Plan, which included implementing measures regarding transportation and energy efficient land use planning and building construction measures for new development. In this Plan, it was recognized that the City's efforts to reduce carbon dioxide emissions from new development are directly related to energy conservation and air quality efforts. As a result, the City initiated a pilot study effort to develop a program to be implemented in new SPA Plans through updating the guidelines for preparation of required Air Quality Improvement Plans (AQIPs). In summary, the pilot study involved the development of a computer model to evaluate the relative effectiveness of applying various site design and energy conservation features in new development projects.

Based on the pilot study and other data the City has developed guidelines for required AQIP's. These guidelines allow a project to either participate in the Chula Vista Greenstar Building Efficiency Program or evaluate the project using the Chula Vista CO_2 Index Model. The EUC developer selected to have the project modeled using the Chula Vista CO_2 Index Model and this

AQIP has been prepared consistent with guidelines for that option.

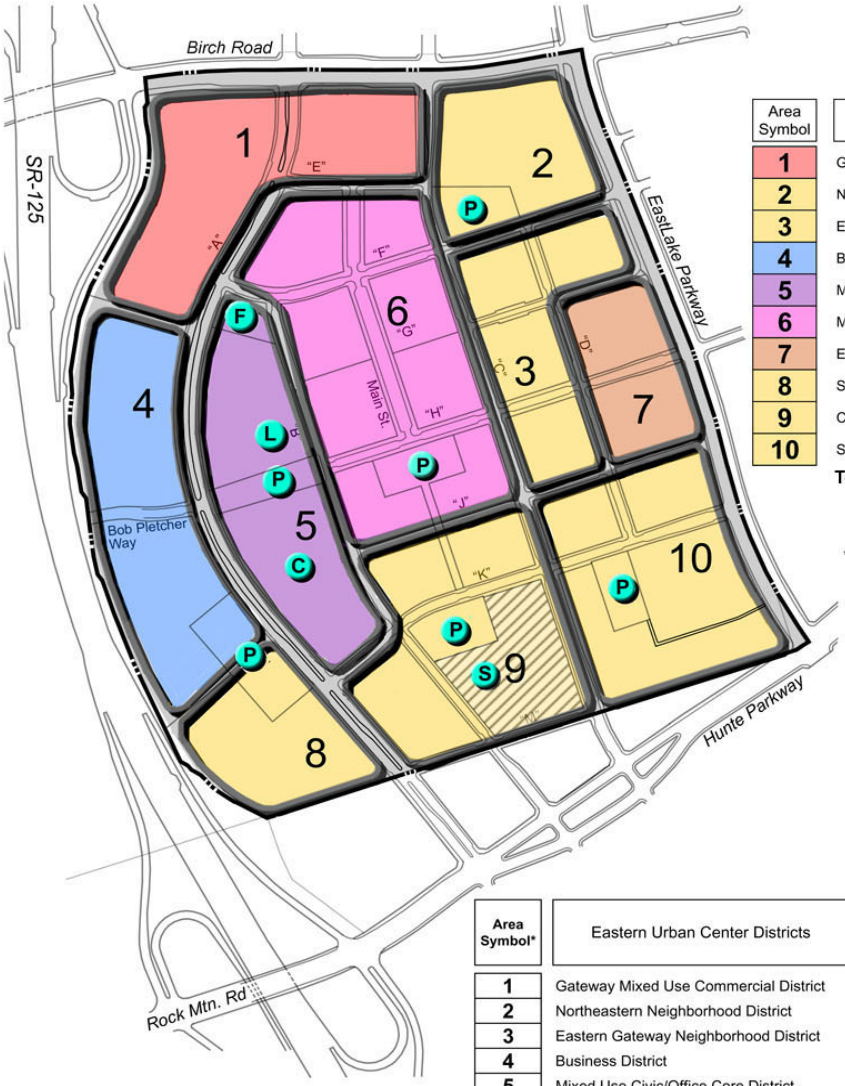
II.4 Project Description

Otay Ranch Eastern Urban Center is an urban village as defined by the Otay Ranch General Development Plan, surrounded by prime arterial streets. The land use pattern for the Eastern Urban Center (EUC) is complex. The entire project has mixed land uses, both horizontally and vertically. However, various areas within the project will have different characteristics associated with a predominate land use and a specific urban design motif. In the central portion of the EUC, a "Main Street District" which will have a downtown commercial character extends from Birch Road, south to a central town square which will have dominate retail, commercial and residential uses. Adjacent to SR-125 is the "Business District" which will have predominate office uses. The "Gateway Commercial" area is located to the north and will relate to/complement the adjacent Freeway Commercial area, which is located north of Birch Road. All of these areas will have a non-residential character, although residential uses may be integrated into the land use mix. The residential neighborhoods, located east and south of the Main Street District, each will have their own neighborhood park and residential character. Residential uses will predominate although non-residential uses may also be in the land use mix. Public spaces and uses are integrated into appropriate locations of the various land uses.

The conceptual location of the internal street system shown on the Site Utilization Plan (Exhibit 1) begins to establish the structure and pattern of horizontal development within the SPA. However, because of the many permutations of mixed-uses possible within the SPA, the land use and design configuration of vertical development will be established via Design Review approvals for various areas within the SPA.

The applicant owns all the land within the proposed SPA boundary (see Exhibit 1), totaling 2,983 residential units and 3,487,000 square feet of non-residential floor area. Additional land within the SPA designated by the Otay Ranch GDP is owned by others and not included in the current SPA proposal.

Site Utilization Plan



Area Symbol	Eastern Urban Center Districts	Acres
1	Gateway Mixed Use Commercial District	22.7
2	Northeastern Neighborhood District	13.2
3	Eastern Gateway Neighborhood District	17.2
4	Business District	25.4
5	Mixed Use Civic/Office Core District	23.3
6	Main Street District	34.7
7	Eastern Gateway District	9.6
8	Southwestern Neighborhood District	12.5
9	Central Southern Neighborhood District	24.4
10	Southeastern Neighborhood District	23.6
Total*		**206.6**

** Does not include perimeter arterial highways*

Area Symbol*	Eastern Urban Center Districts	Non-residential Sq. Ft. *(000's)* Permitted			Residential Dwelling Units Permitted		
		Low	Target	High	Low	Target	High
1	Gateway Mixed Use Commercial District	100	400	700	0	50	100
2	Northeastern Neighborhood District	2	120	200	150	300	500
3	Eastern Gateway Neighborhood District	5	50	250	150	400	750
4	Business District	500	1,362	1,900	0	100	150
5	Mixed Use Civic/Office Core District	100	900	1,000	0	200	300
6	Main Street District	80	240	400	100	533	800
7	Eastern Gateway District	10	170	400	50	200	300
8	Southwestern Neighborhood District	2	50	200	300	500	700
9	Central Southern Neighborhood District	2	45	100	130	500	650
10	Southeastern Neighborhood District	2	150	200	200	200	450
Maximum, Not to Exceed, Totals			**3,487**			**2,983**	

Potential Public Components

- P Park
- L Library
- F Fire Station
- S Potential Elementary School*
- C CPF Site

Note: *District 10 may also be an alternative for the Elementary School Site.*

Notes:
1. ** Numeric Area Symbols do not represent phases.*
2. *The allocation of intensity in each district shall be based on the building height regulations in the EUC Form Based Code.*

CITY OF CHULA VISTA

Eastern Urban Center
OTAY RANCH

Urban Design: RTKL
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Exhibit-1

II.5 Air Quality Action Measures

The following action measures were identified in the INDEX Pilot Study report and the CO_2 Reduction Plan. These action measures address the energy efficiency and emission reduction aspects of any proposed development. The indicators for the CO_2 INDEX model are based on these action measures and are used to evaluate the ability of a proposed project to meet the Chula Vista standards for air quality improvement through the project modeling process.

LAND USE

a. Compact development - Minimize sprawl.
b. Density - Increase intensity of land use.
c. Land Use Diversity - Mix and variety of uses.
d. Orientation toward pedestrian and bicycles.
e. Orientation toward transit.

BUILDINGS & LANDSCAPING

f. Energy efficient building construction - Reduce energy use by exceeding Title 24 building standards.
g. Solar Use - Solar thermal applications and power generation.
h. Vegetation - Uptakes air pollutants and greenhouse gases and provides shading to reduce temperatures.

TRANSPORTATION

Important components of Transportation Action Measures include dense street networks, completeness of sidewalks and direct routes to activity nodes.

i. Pedestrian Facilities - Circulation design and improvements for pedestrian use.
j. Bicycle Facilities - System design and improvements to encourage bicycle use.
k. Transit Facilities - Transit system design and improvements to circulation system.

INFRASTRUCTURE

l. Water Use - Land planning that reduces water consumption. See Water Conservation Plan (Section V of the Sustainability Element) for details.

II.6 Project Evaluation

As identified in the CO_2 INDEX Pilot Study, the twelve key indicators listed in the table below have the greatest potential to achieve favorable scores based on project design. To “pass” the modeling test, project scores must reflect improvements at or beyond the threshold scores in two out of four indicators in each element: Land Use, Transportation and Environment.

Table II-A
CO2 Index Model Indicators

Element	Indicator	Unit of Measure	Threshold Score
Land Use	Land Use Mix	0 to1 index	.4 or higher
	Land Use Balance	0 to 1 index	.75 or higher
	Neighborhood Completeness	% of key uses	50 or higher
	Internal Vehicle Connectivity	0 to 1 index	.75 or higher
Transportation	Pedestrian Network Coverage	Pedestrian Routes/Streets Ratio	1.0 or higher
	Pedestrian Route Directness	Walkable distance v. straight-line ratio	1.5 or lower
	Transit Service Coverage	Stops/sq. mile	10 or higher
	Daily Auto Driving	Vehicle-miles/day/capita	20 or less
Environment	Park Proximity	Distance to closest park	1200 ft or less
	Total Residential Energy Use	MMBtu/yr/capita	24 or less
	Total Non-residential Energy Use	MMBtu/yr/emp	12 or less
	Total Res. & Non-res. Energy Use	MMBtu/yr/person	70 or less

Two EUC development scenarios were modeled. Both were consistent with the overall statistics shown on the Site Utilization Plan but each represented a different distribution of development intensity within the project. The results of each alternative were very comparable to the other indicating that development intensity variations, within the overall SPA Plan limitations, would yield comparable results.

Table IIB - Modeling Results

Chula Vista Indicator Scores

Element	Indicator	Units	Terra Nova	College Estates 1	College Estates 2	*Weighted By*	*TN Value*	*TN Weight*	*CE1 Value*	*CE1 Weight*	*CE2 Value*	*CE2 Weight*	Weighted Average	Village 6	Village 11	EastLake III	EUC 2008
Demographics	Population	residents	3482	3249	1839		*3647*		*2794*		*2726*		3055	6261	6974	6173	7,709
Demographics	Households	dwelling units	1159	1083	613								--	2083	2321	2056	2,988
Demographics	Employment	employees	40	245	40		*42*		*211*		*59*	--	104	241	305	792	7,961
Demographics	Land Area	acres	199	242	141			--		--		--	--	282.98	509.24	743.61	208.4
Land-Use	Development Footprint	acres/resident	0.06	0.07	0.06	*residents*	*0.06*	*3482*	*0.07*	*3249*	*0.06*	*1839*	0.06	0.04	0.04	0.07	0.03
Land-Use	Street Network Extent	street mi./capita	2.43	2.76	2.66	*residents*	*2.43*	*3482*	*2.76*	*3249*	*2.66*	*1839*	2.60	1.79	2.44	1.38	0.6
Land-Use	Amenity Proximity (retail)	ft.	2363	3491	4240	*dwelling units*	*2363*	*1159*	*3491*	*1083*	*4240*	*613*	3194	2192	2925	6260	1694
Land-Use	Single-Family Dwelling Density	DU/acre	8.22	5.51	6.94	*dwelling units*	*8.22*	*1159*	*5.51*	*1083*	*6.94*	*613*	6.92	8.13	7.08	4.50	N/D
Land-Use	Multi-Family Dwelling Density	DU/acre	16.66	NA	NA	*dwelling units*	*16.66*	*1159*	*0*	*1083*	*0*	*613*	6.76	24.90	15.80	17.25	19.73
Land-Use	Average Residential Density	DU/acre	9.98	5.51	6.94	*dwelling units*	*9.98*	*1159*	*5.51*	*1083*	*6.94*	*613*	7.63	12.25	10.38	5.77	19.73
Land-Use	Employment Density	emps./acre	2.51	12.01	4.08	*employees*	*2.51*	*40*	*12.01*	*245*	*4.08*	*40*	9.86	5.05	6.80	11.25	51.98
Land-Use	Commercial Building Density	ratio	NA	0.08	NA	*comm. parcel area (sf)*	*0*	*0*	*0*	*280548*	*0*	*0*	0.08	0.35	0.35	0.35	0.53
Land-Use	Use Mix	0 to 1 index	0.33	0.27	0.36	*land area (acres)*	*0.33*	*199*	*0.27*	*242*	*0.36*	*141*	0.31	0.37	0.32	0.32	0.46
Land-Use	Use Balance	0 to 1 index	0.52	0.34	0.34	*land area (acres)*	*0.52*	*199*	*0.34*	*242*	*0.34*	*141*	0.40	0.48	0.49	0.44	0.90
Land-Use	Neighborhood Completeness	% of key uses	40	40	40	*residents*	*40*	*3482*	*40*	*3249*	*40*	*1839*	40	60	60	80	80
Land-Use	Block Size	acres	23.48	9.08	10.75	*land area (acres)*	*23.48*	*199*	*9.08*	*242*	*10.75*	*141*	14.41	6.14	9.29	18.43	6.05
Land-Use	Pedestrian Orientation of Buildings	ft.	NA	103	NA	*feet of setback*	*0*	*0*	*103*	*889*	*0*	*0*	103	N/D	N/D	N/D	N/D
Land-Use	Internal Connectivity for Pedestrians	0 to 1 index	0.73	0.81	0.75	*no. of ped. intersections*	*0.73*	*105*	*0.81*	*102*	*0.75*	*85*	0.76	1.00	0.98	0.95	1.00
Land-Use	Internal Connectivity for Vehicles	0 to 1 index	0.77	0.79	0.66	*no. of street intersections*	*0.77*	*57*	*0.79*	*58*	*0.66*	*53*	0.74	0.82	0.74	0.84	1.00
Land-Use	External Access for Pedestrians	ft. between points	1138	804	1983	*study perimeter (ft.)*	*1138*	*18080*	*804*	*16086*	*1983*	*15865*	1299	1279	619	2919.71	981
Land-Use	External Access for Vehicles	ft. between points	1934	2011	2644	*study perimeter (ft.)*	*1934*	*18080*	*2011*	*16086*	*2644*	*15865*	2184	1511.73	1598.79	4671.54	1,070
Land-Use	Street Network Density	miles/sq. mi.	15.37	19.71	18.83	*land area (acres)*	*15.37*	*199*	*19.71*	*242*	*18.83*	*141*	18.01	17.97	21.40	15.59	13.2
Land-Use	Housing Proximity to Transit	ft. to closest stop	1439	1667	861	*dwelling units*	*1439*	*1159*	*1667*	*1083*	*861*	*613*	1401	1306	1560	1317	1,694
Land-Use	Employment Proximity to Transit	ft. to closest stop	2819	445	984	*employees*	*2819*	*40*	*445*	*245*	*984*	*40*	804	1064	1040	1081	2,155
Land-Use	Transit-Oriented Residential Density	DU/acre w/i 1/4 mi.	11	5	7	*dwelling units w/in 1/4 mi.*	*11*	*1073*	*5*	*896*	*7*	*613*	8	12.25	10.40	6.05	26.05
Land-Use	Transit-Oriented Employment Density	emps./acre w/i 1/4 mi.	3	12	4	*employees w/in 1/4 mi.*	*3*	*0*	*12*	*388*	*4*	*40*	11	4	6	10	25.41
Transportation	Pedestrian Network Coverage	ped. routes/streets ratio	0.94	0.85	0.92	*total street miles*	*1*	*3058*	*1*	*4777*	*1*	*2647*	0.89	1.00	1.00	1.00	1.00
Transportation	Pedestrian Crossing Distance	ft. curb to curb	45	41	39	*no. of street intersections*	*45*	*57*	*41*	*58*	*39*	*53*	42	42	36	52	28
Transportation	Pedestrian Route Directness	walk ft./straightline ft. ratio	1.62	1.76	1.45	*dwelling units*	*1.62*	*1159*	*1.76*	*1083*	*1.45*	*613*	1.64	1.61	1.38	1.59	1.48
Transportation	Bicycle Network Coverage	% of streets w/route	16	6	NA	*total street miles*	*16*	*3058*	*6*	*4777*	*0*	*0*	10	95	100	97	100
Transportation	Transit Service Coverage	stops/sq. mi.	8	11	23	*land area (acres)*	*8*	*199*	*11*	*242*	*23*	*141*	13	11	5	18	6.1
Transportation	Daily Auto Driving	veh-mi./day/capita	22	22.00	22	*residents*	*22*	*3482*	*22.00*	*3249*	*22*	*1839*	22	22.0	22.0	22.0	21.6
Infrastructure	Residential Water Use	gal./day/capita	~~128~~	~~171~~	~~153~~	*residents*	*128*	*3482*	*171*	*3249*	*153*	*1839*	~~150~~	~~151~~	~~160~~	~~193~~	54.0
Environment	Park Space Supply	acres/1000 residents	11.20	3.62	7.89	*residents*	*11.20*	*3482*	*3.62*	*3249*	*7.89*	*1839*	7.62	1.51	2.65	3.08	1.74
Environment	Park Proximity	ft. to closest park	2090	2732	1266	*dwelling units*	*2090*	*1159*	*2732*	*1083*	*1266*	*613*	2157	1359	1659	2558	635
Environment	Open Space Supply	% of land area	19	2	6	*land area (acres)*	*19*	*199*	*2*	*242*	*6*	*141*	9	10	13	16	8.1
Environment	Open Space Contiguity	0 to 1 index	0.72	0.53	0.58	*open space acres*	*0.72*	*37.81*	*0.53*	*4.85*	*0.58*	*8.43*	0.68	0.62	0.35	0.67	0.25
Environment	Housing Energy Use	MMBtu/yr./capita	27.59	32.30	35.55	*residents*	*28*	*3482*	*32*	*3249*	*36*	*1839*	31	24.33	22.59	28.89	16.67
Environment	Household Transportation Energy Use	MMBtu/yr./capita	46.80	46.80	46.80	*residents*	*47*	*3482*	*47*	*3249*	*47*	*1839*	47	46.80	46.80	46.80	45.95
Environment	Nonresidential Building Energy Use	MMBtu/yr./emp	0.00	18.03	0.00	*employees*	*0*	*3482*	*18*	*3249*	*0*	*1839*	18.03	14.19	22.36	42.72	26.00
Environment	Total Energy Use	MMBtu/yr./person	73.55	74.86	80.60	*residents + employees*	*74*	*3482*	*75*	*3249*	*81*	*1839*	75.56	69.02	67.42	71.94	50.61
Environment	NOx Emissions	lbs./yr./person	33.01	33.45	33.82	*residents + employees*	*33*	*3482*	*33*	*3249*	*34*	*1839*	33.35	32.66	32.51	33.35	31.90
Environment	SOx Emissions	lbs./yr./person	0.72	0.83	0.92	*residents + employees*	*1*	*3482*	*1*	*3249*	*1*	*1839*	0.80	0.63	0.60	0.81	0.58
Environment	HC Emissions	lbs./yr./person	58.43	58.44	58.44	*residents + employees*	*58*	*3482*	*58*	*3249*	*58*	*1839*	58.43	58.43	58.43	58.44	57.37
Environment	CO Emissions	lbs./yr./person	452.06	452.15	452.23	*residents + employees*	*452*	*3482*	*452*	*3249*	*452*	*1839*	452.13	451.98	451.95	452.13	443.73
Environment	PM Emissions	lbs./yr./person	0.13	0.14	0.16	*residents + employees*	*0*	*3482*	*0*	*3249*	*0*	*1839*	0.14	0.11	0.10	0.14	0.10
Environment	C02 Emissions	lbs./yr./person	10238	10566	10846	*residents + employees*	*10238*	*3482*	*10566*	*3249*	*10846*	*1839*	10493	9941	9835	10471	9661

II.7 Implementation Measures

Because the land use mix and project design features which meet the AQIP requirements are intrinsic to the project, no specific implementation measures are required. The project only need be developed as envisioned in the SPA Plan. The City of Chula Vista will continually review development plans at each stage of design and construction approval. These reviews will assure that the project is developed in a manner consistent with the SPA Plan and which meets the AQIP requirements.

III. ENERGY CONSERVATION PLAN

III.1 Introduction

Recognizing the importance of energy conservation, the Otay Ranch General Development Plan includes goals, objectives and policies that provide for the long range increase in energy conservation and reduction of energy consumption. The General Development Plan requires the preparation of a Non-Renewable Energy Conservation Plan to identify feasible methods to reduce the consumption of nonrenewable energy resources, including transportation, building design and use, lighting, recycling, alternative energy sources and land use.

Fossil fuels, which are non-renewable energy sources, provide the majority of energy utilized in the San Diego region. These fuels are directly consumed in the form of gasoline, diesel fuel, and natural gas, and indirectly as electricity generated from these fuels.

On November 14, 2000, the Chula Vista City Council adopted the Carbon Dioxide (CO_2) Reduction Plan which included implementing measures regarding transportation and energy efficient land use planning and building construction measures for new development. In this plan, it was recognized that the City's efforts to reduce carbon dioxide emissions from a new development are directly related to energy conservation and air quality efforts. Subsequently, the City adopted guidelines for the preparation of Air Quality Improvement Plans (AQIPs), which are required of all SPA Plans, to implement specific CO_2 reduction strategies. As detailed in the Eastern Urban Center (EUC) AQIP, the applicant has had the proposed project modeled using the CO_2 INDEX Model. The modeling effort demonstrated that the proposed project design is consistent with the standards of the CO_2 Reduction Plan which will result in air quality improvement as well as energy conservation.

On March 29, 2006 the City of Chula Vista signed a Memorandum of Agreement with the intent of establishing a national energy research center at the University Park and Research Center. In partnership with the Gas Technology Institute, the U.S. Department of Energy and the Center for Energy Studies at San Diego State University, the National Energy Center for Sustainable Communities (NECSC) is intended to transform the city into a living laboratory for energy research and demonstration projects. The Eastern Urban Center was designated an applied research site where research would take place to advance the understanding of how emerging technologies, building materials and methods can be employed to produce low-impact residential, commercial, and institutional developments in the community while also conducting applied research that examines technological, economic, social and institutional barriers that prevent existing energy-efficient technologies, materials and management practices from taking place.

On October 3, 2006, Resolution 2006-303 was approved, authorizing the mayor to execute the US Mayors Climate Protection Agreement. Adopted was the City's commitment to "Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system." The mayor subsequently made a motion directing staff to come up with policy for applying LEED Silver design standards or the equivalent to all city buildings. The

Eastern Urban Center will be home to city buildings such as the EUC Library and Fire Station No. 9, designed and constructed to the energy efficient standards as required by the city for City-owned buildings and facilities.

Opportunities for energy conservation in new development fall into three general categories: 1) the arrangement and intensity of land uses; 2) mass transit and alternative transportation modes; and, 3) building siting, design and construction. Arguably, one of the greatest opportunities for significant conservation of energy produced by fossil fuels is transportation related. The EUC SPA maximizes these opportunities for conservation by implementing a land use plan which concentrates intensity around new transit facilities, provides for regional and local transit service into the project area and encourages alternative transportation modes such as walking, bicycles, and electric carts.

III.2 Land Use & Community Design

Energy conservation features or components of the Otay Ranch EUC land use plan and community design features include:

- Transit Oriented Development: The Eastern Urban Center project is a transit oriented mixed-use urban core, with a regional transit facility included within the central core. Approximately 90% of the higher density, mixed-use structures including housing, shops, services, offices, school, parks and civic facilities are located within a quarter of a mile walking distance of the regional transit facilities. The EUC's compact design and integrated street/pedestrian corridor circulation system places all internal destinations within easy walking or biking distance. The regional transit facility will provide ready access to public mass transit for commuting trips and travel to other regional destinations. The city will provide bus service to this village in addition to the SANDAG regional transit system. Transit stops will be conveniently located in the central core of the EUC. In addition, each of the internal streets is also a pedestrian corridor with streetscape features enhancing the pedestrian experience and promoting non-vehicular circulation.

- Housing Efficiency: In addition to the transit benefits associated with increased density near transit centers, there are building related energy benefits. In many of the interior residential districts of the Eastern Urban Center, block widths are kept to a minimum of 330 feet to encourage walkability, while improving access and convenience to a variety of services. Also, multi-family homes use less energy for space heating and cooling than typical single-family detached homes. The Eastern Urban Center includes only multi-family dwelling units which will provide energy saving compared to conventional subdivisions.

- Street Widths, Pavement and Street Trees: Reducing street widths can reduce urban heat island effects and consequently energy demand for air conditioning. In addition to reduced street pavement width, the inclusion of street trees which shade the pavement will reduce temperatures by providing tree canopies, helping to absorb CO_2 emissions

while improving air quality. The Eastern Urban Center mixed flow streets have reduced widths, consistent with the standards of the Otay Ranch General Development Plan, compared to typical suburban development patterns.

III.3 Transit Facilities

In addition to the transit facilities and transit oriented design, the Otay Ranch Eastern Urban Center project includes specific design measures to accommodate additional transportation modes (see SPA Plan Chapter III Mobility):

- Regional Transit Service: The Eastern Urban Center includes a right-of-way for future expansion of the San Diego regional transit (MTDB) system through Otay Ranch; the Red Car concept in the MTDB *TransitWorks* Strategic Plan. The right-of-way extends from the regional commercial center to the north, along EastLake Parkway, west to the heart of the EUC and then south to other Otay Ranch villages. Timing for construction of the transit system is yet to be determined.

- Bus Service: The Eastern Urban Center may also include facilities based on the Green Car and Blue Car service concepts using buses described in the recently adopted *TransitWorks* Strategic Plan by MTDB. The Green Car represents local routes using mini to mid-size buses. The Green Car would act as a collector and provide feeder to Blue or Red Car concepts. Green Car service is to be provided on residential and major streets. The Blue Car will provide short distance trips (1–5 miles) with frequent stops along major streets and arterials.

- Electric Cart: The provision of circulation routes which can accommodate electric cart use provides another alternative mode of transportation, in addition to bicycles and walking for short trips. Within the EUC, electric carts would be expected to share streets with other vehicles due to the low speeds on internal streets. Along the perimeter of the EUC, the design of Birch Road incorporates the Village Pathway which links the villages throughout Otay Ranch and accommodates the use of electric carts. At this time, the viability of electric cart use is unknown since it depends on market, price, consumer acceptance and access to adjacent activity centers/destinations.

- Shared Car Program: Shared parking programs will be encouraged within the Eastern Urban Center to both community associations and business organizations in an effort to promote sustainable living and an improved quality of life. Research shows that for every carshare vehicle, approximately 15 private automobiles are taken off the road, thereby reducing miles driven, emissions and parking congestion. Car share programs require reserved parking spaces within the built environment and a carsharing program to administer memberships, reservations and operations. Alternative-fuel or electric car charging stations for personal vehicles may also be installed where appropriate. At this time, the viability of car sharing programs is unknown since it depends on market, price, consumer acceptance and access to adjacent activity centers/destinations. Currently,

organized car sharing programs do not exist in the City of Chula Vista.

- Shuttle Service: To further encourage the use of public transit services within the multi-use University District, future planning may include a city or community sponsored shuttle service providing connection to the Otay Ranch Town Center shopping areas to the Eastern Urban Center core and Village Nine/University educational uses. Additionally, incentives, such as the SANDAG ECO passes, could be provided to residents; and commuter programs such as regional carpooling and vanpooling will be promoted.

- Bicycle Transportation: Bicycling will also be encouraged within the project. Bike routes provided on the EUC streets will connect to the City's regional trail system to provide bicycle commuting and recreational use opportunities. Bicycle racks will be distributed throughout the retail and office zones, while shower and bicycle storage facilities at employment centers will be encouraged.

- Walkability: The site's design will help to decrease reliance on automobile use for local transportation needs by providing commercial, community and civic services and amenities in close and walkable proximity to residential development. The EUC's urban park system provides a distribution of parks within approximately a three minute walking distance from any residential unit within the project, while regional transit stops are located within a quarter mile walking distance of residential, retail, and office developments. Neighborhood streets and sidewalks will be pedestrian-oriented, properly illuminated and will provide connections to the open space network and to adjoining neighborhoods. Roads will be designed to minimum widths to calm traffic and encourage walkability.

III.4 Building Siting & Construction

The careful selection and design of appliances, building systems and architectural and site design features will all help to reduce the energy demands of the Eastern Urban Center development. Energy conservation features for building siting and construction include the following:

- Energy Efficient Land Use Mix and Building Siting: The proposed EUC land use mix and project features have been evaluated using the CO_2 Index Model which is intended to measure the air quality improvement (and energy efficient) characteristics of a proposed project. The EUC project met the threshold standards required to "pass" the modeling evaluation. Thus, the project includes an appropriate land use mix and sufficient site design features to be consistent with City requirements for CO_2 reduction.

- Improved Building Construction Standards: In California, buildings constructed today use approximately 50% less energy than buildings constructed prior to 1978, before energy efficiency standards went into effect in the mid-1970s. These Building Energy Efficiency Standards appear in Title 24 of the California Code of Regulations and have recently been updated (by AB970). These building construction standards are likely to

advance as a result of the Title 24- 2008 update, the Global Warming Solutions Act and other State and Federal energy efficiency initiatives.

- Commercial Lighting: Interior lighting consumes approximately 30% of the energy used in commercial buildings. The large component in commercial energy use makes it a good target for the application of conservation measures. By encouraging commercial builders to include energy efficient lighting, a reduction in commercial electrical demand could be expected.

- Energy Efficient Appliances: New residences in the EUC will be equipped with new appliances which are significantly more energy efficient than earlier models. According to the U.S. Department of Energy, new appliances included in new homes such as ranges, ovens and dishwasher save 30 to 50% of the energy compared to appliances manufactured 20 years ago. Energy Star appliances will be encouraged. Residences in the EUC will require significantly less energy than those in older areas of the region due to increased building and appliance energy efficiency.

- Public Area Lighting: Lighting for public areas such as streets, parks and other public spaces will utilize energy efficient fixtures, consistent with City standards and requirements.

- Energy Management: Sound architectural and site design will help to reduce the project's overall energy use. The site's solar exposure provides a unique opportunity to passively light indoor spaces through the liberal use of window glazing along the southern facades of buildings. Direct solar access will be suggested to encourage the use of photovoltaic panels for energy generation.

  To reduce HVAC use for heating and cooling of structures, buildings could be oriented to harness the prevailing winds to naturally ventilate indoor spaces. Also, careful selection of vertical landscape elements such as trees, large shrubs and climbing vines will be encouraged to shade southern and western building facades to reduce heating in summer and increase solar heat gain in winter months.

- Material Management: The use and disposal of domestic, commercial and construction materials accounts for a large portion of the built environment's ecological footprint. To reduce this impact, to promote healthy indoor environments, and to reduce the heat island effect of the site, materials used for the construction of the EUC will be carefully selected and installed. The waste stream leaving the site will be managed through the development of recycling, composting and material re-use programs.

  To reduce the demand for raw materials required for building construction, the use of recycled-content, salvaged, refurbished, reusable, durable and rapidly-renewable materials will be encouraged for building and landscape construction. Materials with low occurrence of toxic or volatile organic compounds will be preferred for building and landscape construction in order to maintain healthy living and community spaces.

For the community, an overall recycling waste program will be developed in accordance with City guidelines, and additional educational programs will be instituted to promote the benefits of recycling and re-usable energy within the EUC.

III.5 Community Resources

A continuing commitment to sustainability will be one of the main facets of the Eastern Urban Center community. The availability of helpful information and the establishment of regular community events, and the development of working partnerships with area non-profit groups will be important components to a long-term sustainability plan to help residents and businesses maintain this commitment to energy efficiency.

Interpretive and educational spaces and displays may be integrated in the parks landscape and encouraged within indoor spaces to demonstrate environmentally-friendly features of the site.

Promoting the practice of sustainability will be one of the goals of the Eastern Urban Center community and parks programming. Parks will be located in the heart of each of the residential and commercial districts and each will be individually themed on a different concept of energy (*i.e.* Transformation, Interaction, Motion, Cycles, Light, Kinetic and Performance). The community association will regularly publish a community-wide newsletter and other educational information that will, in part, encourage involvement in stewardship and sustainability programs. One such program might be a weekly farmer's market that would provide residents the option of purchasing local produce and other goods. Another such program might include art or science exhibits in the civic core showcasing the creative energy of local residents. Mat palates, tai chi or yoga classes could be programmed in parks to reinforce the importance of physical energy into ones daily activities.

In support of recent resolutions adopted by the City of Chula Vista to educate the public in areas concerning energy conservation, partnerships will be fostered and encouraged between energy providers, non-profit groups, and local charter schools to provide additional ecological education programs for the community.

IV. WATER CONSERVATION PLAN

IV.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 Eastern Urban Center (EUC) Sectional Planning Area (SPA). These measures are expected to result in an average water savings of 0.099 million gallons per day (MGD).

The following non-mandated water conservation measures will be implemented in the project:

Table IV-A
Non-Mandated Water Conservation Measures

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

IV.2 Introduction

The Otay Ranch Eastern Urban Center SPA is a development component of the Otay Ranch Planned Community located in the eastern portion of the City of Chula Vista (City). The Eastern Urban Center is planned to be the high density mixed-use urban center for the eastern portion of Chula Vista and the surrounding region.

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 is addressed, as well as the installation of water conserving landscaping, appliances and fixtures.

The following are goals of the Eastern Urban Center SPA Water Conservation Plan (WCP):

1. To conserve water during and after construction of the projects within the Otay Ranch Eastern Urban Center 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.

IV.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 large 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 Eastern Urban Center 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.

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

- Hot water pipe insulation.
- Pressure reducing valves.
- 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.

Because the Eastern Urban Center is comprised of both residential and non-residential uses, it will be required to meet both requirements.

IV.4 Project Description

Otay Ranch Eastern Urban Center is an urban village as defined by the Otay Ranch General Development Plan, surrounded by prime arterial streets. The land use pattern for the Eastern Urban Center (EUC) is complex. The entire project has mixed land uses, both horizontally and vertically. However, various areas within the project will have different characteristics

associated with a predominate land use and a specific urban design motif. In the central portion of the EUC, a "Main Street District" which will have a downtown commercial character extending from EastLake Parkway, west to a "Civic Core" which will have dominate office and civic uses. Adjacent to SR-125 is the "Business District" which will have predominate office uses. The "Gateway Commercial" area is located to the north and will relate to/complement the adjacent Freeway Commercial area, which is located north of Birch Road. All of these areas will have a non-residential character, although residential uses will be integrated into the land use mix. The residential neighborhoods, located north and south of the Main Street District, each will have their own neighborhood park and residential character, as residential uses will predominate although non-residential uses will also be integrated. Public spaces and uses are integrated into appropriate locations of the land use mix.

The conceptual location of the internal street system shown on the Site Utilization Plan (Exhibit 1) begins to establish the structure and pattern of horizontal development within the SPA. However, because of the many permutations of mixed-uses possible within the SPA, the land use and design configuration of vertical development will be established via Design Review approvals for various areas within the SPA.

The applicant owns all the land within the proposed SPA boundary (see Exhibit 1), totaling 2,983 residential units and 3,487,000 square feet of non-residential floor area. Additional land within the SPA designated by the Otay Ranch GDP is owned by others and not included in the current SPA proposal.

IV.5 Water Service & Supply

The Otay Water District (OWD) provides water service to the Otay Ranch Eastern Urban Center 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 to its local customers.

The Eastern Urban Center SPA is located within the OWD's Central Service Area. 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 980 pressure zone (PZ).

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.

It is anticipated that the Eastern Urban Center will receive recycled water via proposed connections to the 944 Recycled Water Zone distribution systems. 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 Eastern Urban Center SPA Public Facilities Financing Plan and/or subdivision map conditions for the project to assure timely provision of required facilities.

IV.6 Projected Water Use

This section presents information on the anticipated water demand of the Otay Ranch Eastern Urban Center project. The following potable water and recycled water consumption estimates are taken from the Eastern Urban Center Technical Water Plan prepared by PBS&J, revised November 2007.

Potable Water Demand

Table 1 shows projected water use in Otay Ranch Eastern Urban Center, 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 IV-B Land Use Summary
(Potable Water Demand)

Land Use	Gross Acres	Units	Water Demand (gpd)
Residential	143.2	2,983 DUs	760,665
Commercial/Office		3,479 Msf	122,221
Fire Station		18 Ksf	295
Hotel		150 Rooms	5,716
Parks	12.8		7,950
Right-of-Way	50.5	--	0
TOTAL	**206.5**	**--**	**889,266**

gpd = gallons per day
Source: PBS&J, EUC Technical Water Study, Rev. 11/07

Recycled Water Demand

The projected demand for recycled water in Otay Ranch Eastern Urban Center is 0.064 MGD for landscape irrigation as shown in Table 4 on the following page.

Table IV-C Recycled Water Demand

Land Use	Area (ac)	% Irrigated[c]	Irrigated Area (ac)	Irrigation Rate (gpd/ac)	Total RW Demand (gpd)[a]
Mixed Use Commercial/Hotel/Residential	143.2	10	14.3	2,155	30,853
Parks	12.8	100	12.8	2,155	27,562
Right-of-Way[b]	50.5	5	2.5	2,155	5,446
TOTAL	**206.5**		**29.6**		**63,861**
Source: PBS&J, EUC Technical Water Study					

a) Total demand based on OWD's WRMP, or approximately 2,155 gpd/ac.
b) Irrigated areas for Right-of-Way include landscaped medians not previously called out as parks
c) % Irrigated per OWD's WRMP with the exception of Right-of-Way

A Water Supply Assessment and Verification Report for the Eastern Urban Center was approved by the Otay Water District Board on August 1, 2007

IV.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. No comparable conservation calculations for high density mixed-use development such as that proposed within the EUC, are available.

IV.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 V.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 proposed portion of the Eastern Urban Center:

<u>Residential</u>

- Hot water pipe insulation
- Pressure reducing valves
- Water efficient dishwashers
- Dual flush toilets
- Water-efficient landscaping for all developer installed landscaping

Non-Residential

- Hot water pipe insulation
- Pressure reducing valves
- Dual flush toilets
- Evapotranspiration (ET) irrigation controllers

These measures are detailed along with estimates of water savings due to conservation in the following chapter.

Landscape irrigation is a 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 Eastern Urban Center 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.

IV.9 Water Conservation Estimated Savings

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.

Residential Uses

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.

Dual Flush Toilets

Dual flush toilets provide the option to flush with a partial (0.8 gallon) flow of water or with a full (1.6 gallon) flow depending upon need. The estimated water savings from a dual flush toilet is 4,000 gallons per residential unit annually.

Outdoor Measures

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. 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. However the landscaped areas within the EUC residential will be much smaller so the assumed reduction per unit will be ten percent of the single family estimate (1,200 gallons per year).

Non-Residential Uses

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.

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.

Dual Flush Toilets

Dual flush toilets provide the option to flush with a partial (0.8 gallon) flow of water or with a full (1.6 gallon) flow depending upon need.

Outdoor Measures

Evapotranspiration (ET) Irrigation Controllers

These controllers vary the timing of fixed irrigation scheduling based on estimates of actual plant evapotranspiration rates. A radio signal from a central control station or satellite transmits information to the controllers to operate the sprinklers for the appropriate length of time.

In order to calculate the estimated savings in the non-residential portion of the project, it has been assumed that 3,350 square feet of non-residential use is equivalent to one multi-family residential unit. This equivalency is based on the water consumption factors of 300 gallons/day for a multi-family unit and 1,785 gallons/acre/day for mixed uses and a 50% floor area yield for typical suburban non-residential uses. Using the equivalency factor, the estimated saving per residential unit can also be applied to the non-residential portion of the project.

Based on the savings estimates detailed above, the total water conservation estimate for the Otay Ranch Eastern Urban Center project is 0.099 million gallons per day, per Table V-D on the following page.

Table IV-D
Total Water Conservation Estimate

Conservation Measure	DUs or Equivalent DUs	Savings/DU	Annual Conservation Estimate
Residential Uses			
Hot Water Pipe Insulation	2983	2,400 g/yr	7.16 million
Pressure Reducing Valve	2983	1,800 g/yr	5.37 million
Water Efficient Dishwasher	2983	650 g/yr	1.94 million
Dual Flush Toilet	2983	4,000 g/yr	11.93 million
Water Efficient Landscaping	2983	1,200 g/yr	3.58 million
Residential Subtotal			**29.98 million**
Non-Residential Uses			
Hot Water Pipe Insulation	1044	1,200 g/yr	1.25 million
Pressure Reducing Valve	1044	900 g/yr	0.94 million
Dual Flush Toilet	1044	2,000 g/yr	2.09 million
Evapotranspiration Controllers	1044	2,000 g/yr	2.09 million
Non-Residential Subtotal			6.37 million
TOTAL			**36.35 million**
Average Daily Savings	**- -**	**- -**	**0.099 million**

IV.10 Implementation Measures

The following non-mandated water conservation measures will be implemented in the project as described in the preceding sections of this plan:

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

Implementation of this Water Conservation Plan shall primarily be the responsibility of the Master Developer and individual site developers. The Master Developer will establish requirements and guidelines for site developers/builders and implement the educational program for new homeowners. The Master Developer 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.

IV.11 Monitoring

In order to ensure that all provisions of this plan are met, the standard review of landscape and construction documents formed 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 Eastern Urban Center SPA (*e.g.*, tentative map, building or grading permit, *etc.*) may be utilized to address or ensure compliance with the prescribed water conservation measures.