APPENDIX 3.1.8-2

Overview of Water Service

DEXTER WILSON ENGINEERING, INC.

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CONSULTING ENGINEERS

OVERVIEW OF WATER SERVICE FOR OTAY RANCH VILLAGE 14 AND PLANNING AREAS 16/19

February 2018

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OVERVIEW OF WATER SERVICE
FOR
OTAY RANCH VILLAGE 14
AND PLANNING AREAS 16/19

February 2018

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Job No. 820-007

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ABBREVIATIONS

ac -	acre
AF -	acre-foot
AMSL -	above mean sea level
cfd -	community facilities district
cfs -	cubic feet per second
CRA -	Colorado River Aqueduct
GDP/SRP -	General Development Plan/Subregional Plan
gpd -	gallons per day
gpf -	gallons per flush
gpm -	gallons per minute
HOA -	homeowners association
IID -	Imperial Irrigation District
LAFCO -	Local Agency Formation Commission
mgd -	million gallons per day
MAF -	million acre-feet
MF -	multi-family land use designation
MWD -	Metropolitan Water District of Southern California
psi -	pounds per square inch
SAMP -	subarea master plan
SF -	single family land use designation
SDCWA -	San Diego County Water Authority
SWP -	State Water Project
UWMP -	Urban Water Management Plan

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

CHAPTER 1

INTRODUCTION

This report provides an overview of water service for the Otay Ranch Village 14 and Planning Areas 16/19 Project (Proposed Project). This report will estimate water demands for the Proposed Project, outline regional water facilities to be constructed, and recommend onsite facilities to accommodate project demands. The report includes an overview of water supplies in the region and recommends water facilities specific to the needs of the Proposed Project.

OVERVIEW AND BACKGROUND

The Proposed Project (defined below) is part of the overall Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas. The Proposed Project addressed by this technical report is located within a portion of Otay Ranch Village 14 and Planning Areas 16/19 in the Proctor Valley area of Otay Ranch as shown on Figure 1-1.

The underlying purpose of the Proposed Project is to implement the adopted Otay Ranch General Development Plan/Subregional Plan, Volume II (County of San Diego 1993), ("Otay Ranch GDP/SRP") and complete the planned development within Jackson Pendo Development Company's ("Applicant") ownership of Village 14 and Planning Areas 16/19. The Otay Ranch GDP/SRP is a component part of the County General Plan (County of San Diego 2011) and allows for a total of 2,123 homes in Otay Ranch Village 14 and Planning Areas 16/19. The Proposed Project's 1,119 homes represent a portion of the total 2,123 homes originally authorized in the Otay Ranch GDP/SRP.

The Proposed Project is designed to be consistent with the Otay Ranch GDP/SRP's Village Character Policy "to serve as a transitional area between urban densities to the west and Jamul to the east". The Proposed Project is therefore designed to provide a transitional village between the densities and character of eastern Chula Vista and the more rural community of

Jamul. The Proposed Project proposes 1,119[1] homes of which 994 are in Village 14 and 125 homes in Planning Areas 16/19 as shown in Table 1-1 Site Utilization Plan Summary.

The following describes the major components and characteristics of the Proposed Project.

DEFINITIONS

"County" Defined: The "County" is the County of San Diego Jurisdiction.

"Project Area" Defined: The "Project Area" is the Applicant's ownership within Otay Ranch Village 14 and Planning Areas 16/19 in addition to certain off-site areas for infrastructure as depicted in Figure 1-2. The Project Area covers approximately 1,283.6 acres owned by the Applicant and approximately 85.4 acres of Off-site improvements described below, for a total of 1,369 acres.

"Proposed Project" Defined: The "Proposed Project" is the Applicant's ownership as depicted in Figure 1-3. The specific plan for the Proposed Project is titled "Otay Ranch Village 14 and Planning Areas 16/19 Specific Plan." The Proposed Project includes a Specific Plan, General Plan Amendments, EIR, Rezone, Tentative Map, and an Otay Ranch RMP Amendment. The Proposed Project is further defined in Section 1.0 of the EIR which is incorporated herein by reference. Except for the off-sites described below, the Proposed Project specifically excludes the State of California's ownership in Village 14 and Planning Areas 16, which remains approved for development per the County's General Plan and the Otay Ranch GDP/SRP. The underlying County General Plan and Otay Ranch GDP/SRP land uses on the State's property will remain unchanged. In addition, the "Inverted L" is excluded from this analysis as it is not owned by the Applicant and is in the City of Chula Vista, (the property is owned by Otay Water District and the United States Fish and Wildlife Service).

1 Includes 97 residential units allocated to school site at 10 DU per Acre per Otay Ranch GDP/SRP policies in the event the school is not constructed. Each technical report evaluates the Proposed Project's impact assuming the more conservative land use, (i.e. the greater impact), as either an elementary school or as underlying allocated residential units. Footnote will not be repeated.

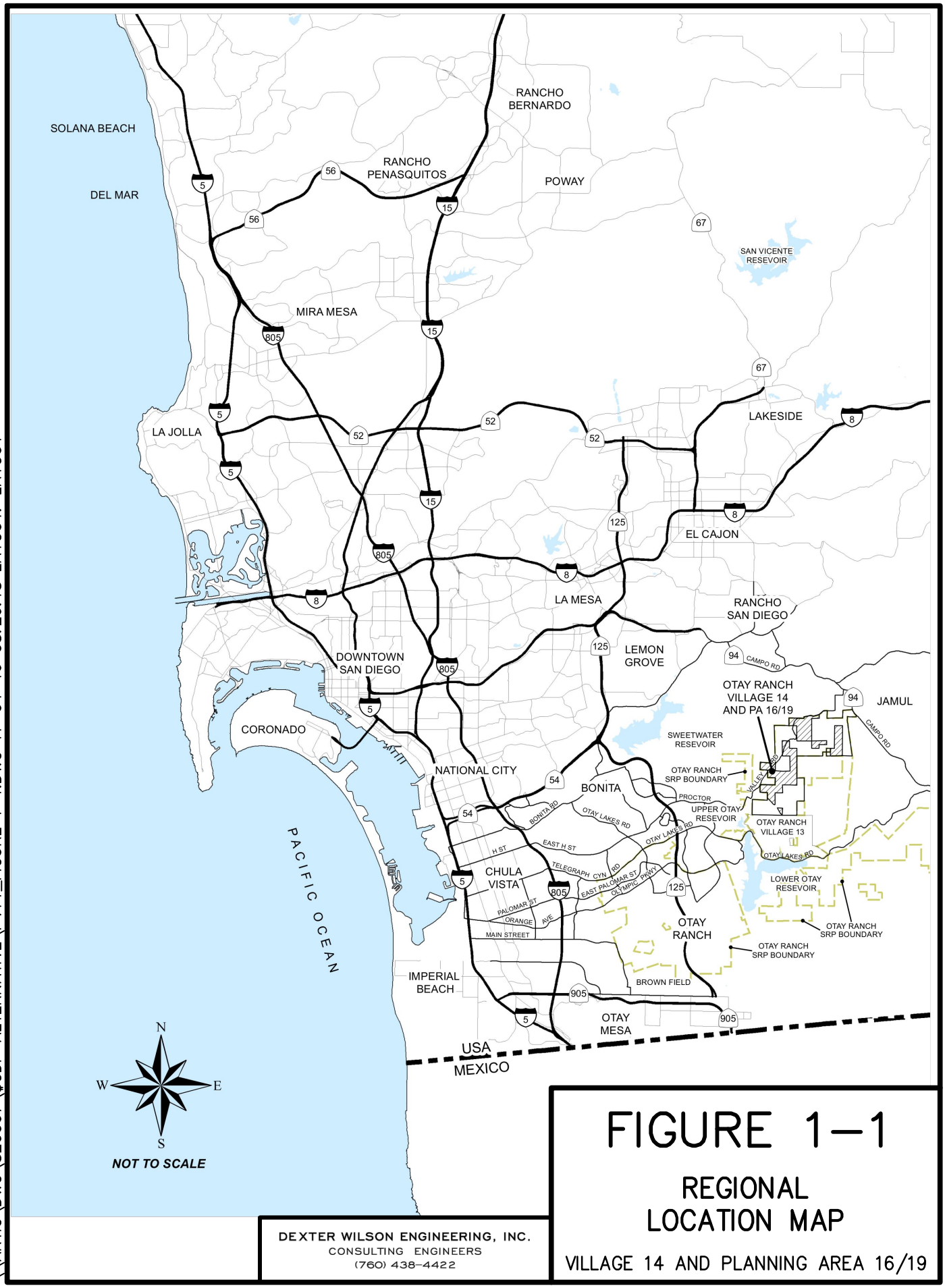

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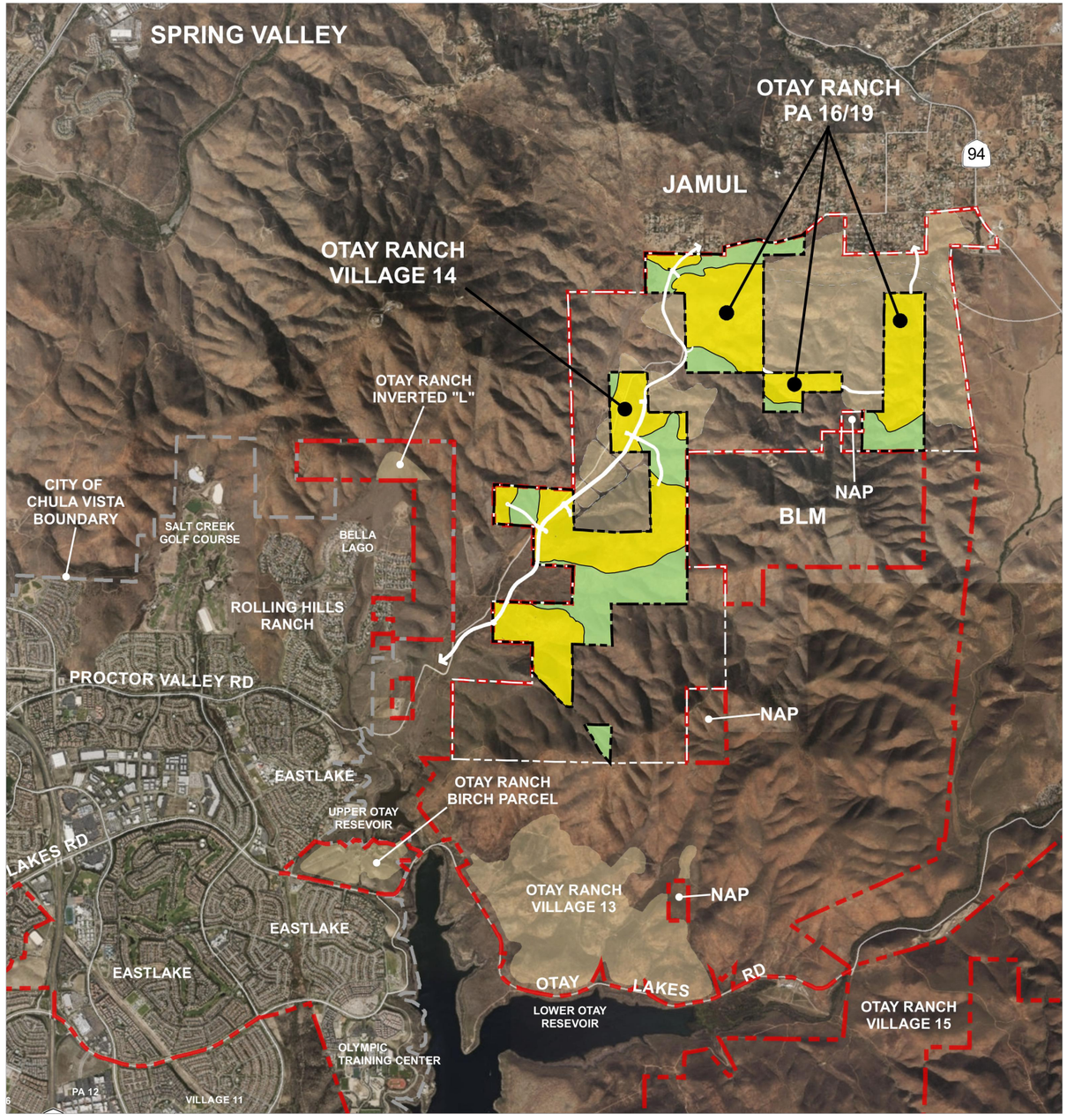
FIGURE 1-1

REGIONAL LOCATION MAP

VILLAGE 14 AND PLANNING AREA 16/19



SOURCE: LUEG-GIS 2014 AERIAL IMAGERY

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0 2,300 4,600

SCALE IN FEET

LEGEND

- OTAY RANCH GDP/SRP BOUNDARY
- PROPOSED SPECIFIC PLAN BOUNDARY
- OTAY V14 & PA16/19 VILLAGE BOUNDARY
- MUNICIPAL BOUNDARY
- V14 & PA16/19 DEVELOPMENT AREAS
- V14 & PA16/19 MSCP OPEN SPACE
- OTHER APPROVED DEVELOPMENT

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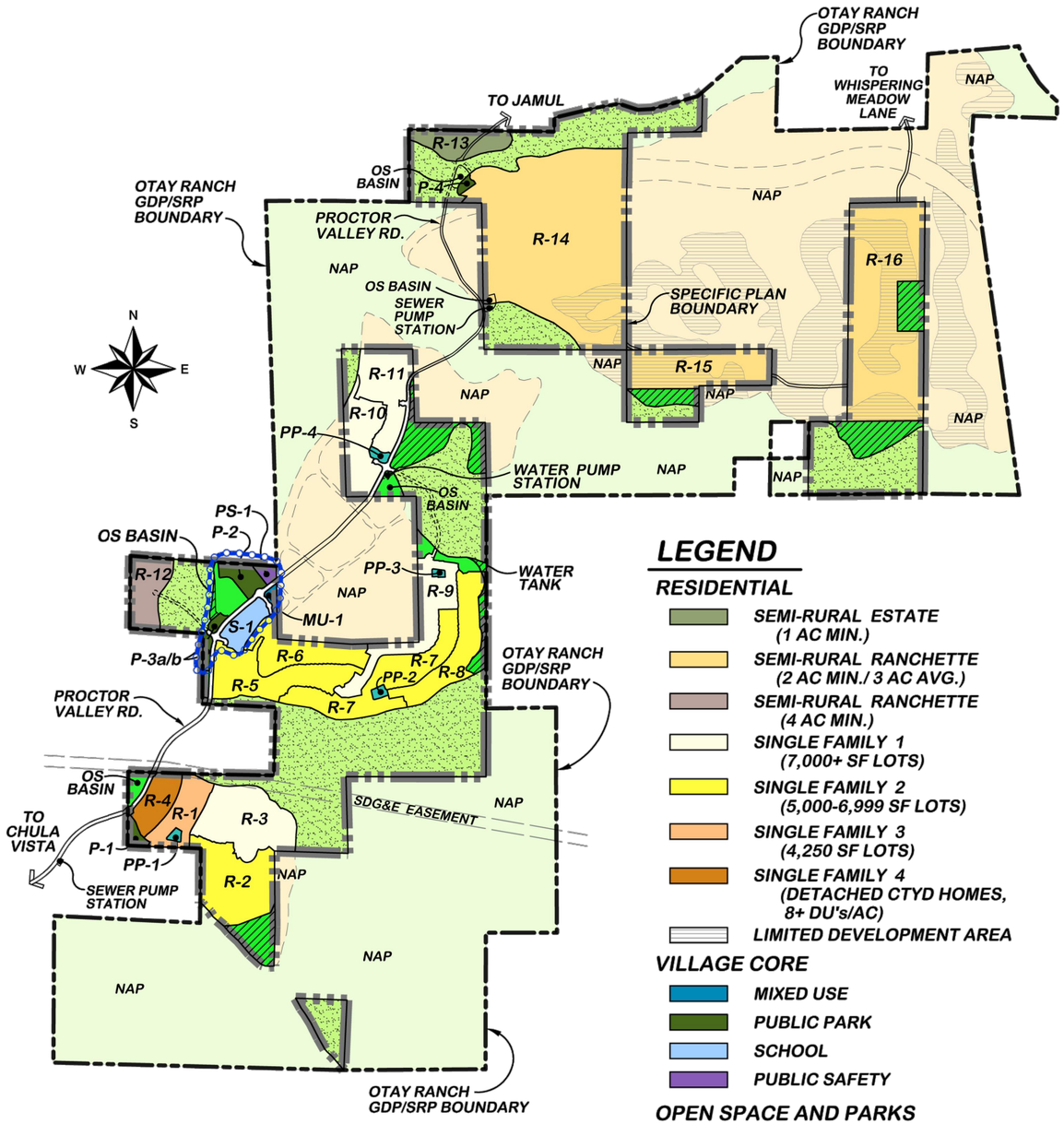
FIGURE 1–2

SURROUNDING LAND USES

VILLAGE 14 AND PLANNING AREA 16/19



LEGEND

RESIDENTIAL

- SEMI-RURAL ESTATE (1 AC MIN.)
- SEMI-RURAL RANCHETTE (2 AC MIN./ 3 AC AVG.)
- SEMI-RURAL RANCHETTE (4 AC MIN.)
- SINGLE FAMILY 1 (7,000+ SF LOTS)
- SINGLE FAMILY 2 (5,000-6,999 SF LOTS)
- SINGLE FAMILY 3 (4,250 SF LOTS)
- SINGLE FAMILY 4 (DETACHED CTYD HOMES, 8+ DU's/AC)
- LIMITED DEVELOPMENT AREA

VILLAGE CORE

- MIXED USE
- PUBLIC PARK
- SCHOOL
- PUBLIC SAFETY

OPEN SPACE AND PARKS

- PUBLIC PARK
- PRIVATE PARK
- OPEN SPACE
- OPEN SPACE PRESERVE
- CONSERVED OPEN SPACE
- OWNERSHIP OTHER THAN APPLICANT

ALL UNDERLYING OTAY RANCH SRP/GDP LAND USES REMAIN UNCHANGED

08-11-17

FIGURE 1–3

SITE UTILIZATION PLAN

VILLAGE 14 AND PLANNING AREA 16/19

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"Otay Ranch Village 14" Defined: "Otay Ranch Village 14" or "Village 14" as referred to herein is a discrete subset of the Proposed Project and reflects approximately 723.7 acres of the Applicant's ownership located exclusively within Village 14 as depicted in Figure 1-3. Approximately 994 homes are planned around a Village Core in this area, as shown in Table 1-2 Village 14 Site Utilization Plan Detail.

"Otay Ranch Planning Areas 16/19" Defined: "Otay Ranch Planning Areas 16/19" or "Planning Areas 16/19" is a discrete subset of the Proposed Project and reflects approximately 559.8 acres of the Applicant's ownership located exclusively within Planning Areas 16/19 as depicted in Figure 1-3. Approximately 125 homes are planned on one-acre and three-acre average lots in this area, as shown in Table 1-3 Planning Area 16/19 Site Utilization Plan Detail. 127.1 acres of Limited Development Area ("LDA"), defined below, is further described in Table 4 LDA Detail.

Limited Development Area ("LDA") Defined: LDA is a defined land use designation in the Otay Ranch GDP/SRP. "An open space easement will cover the areas designated as 'Limited Development Area'…These areas will be left as natural open space with the exception that roads and utilities are anticipated to cross or lie within these areas…LDAs may be included within private lots but would have the following set of restrictions. Removal of native vegetation would be prohibited except as necessary for construction of roads and utilities. There would be no buildings or other structure, agriculture, landscaping, livestock, grazing, horses, trash disposal of fences allowed within these areas." Fuel modification is allowed in the LDA as "brushing for fire control zones would conform to the local fire district regulations". A total of 127.1 acres of LDA in Planning Areas 16/19 is further described in Table 1-4 LDA Detail. There is no LDA in Village 14.

"Otay Ranch RMP" and "MSCP Preserve" Defined: The Otay Ranch Resource Management Plan (RMP) provides for the conservation and management of the entire 11,375-acre Otay Ranch RMP Preserve. The MSCP County Subarea Plan Implementing Agreement describes the County's required contribution to the MSCP Preserve. The Implementing Agreement states that the required mitigation for Otay Ranch includes "protection of the areas identified as preserved in the boundaries of the Otay Ranch project including approximately 11,375 acres" of the Otay Ranch RMP Preserve. Therefore, the Otay Ranch RMP Preserve is a subset of the

MSCP Preserve.

The portion of the Proposed Project's land use designated as Otay Ranch RMP Preserve, while considered a part of the MSCP County Subarea plan Preserve, is unique to Otay Ranch because it specifically mitigates for direct and cumulative impacts associated with implementation of the Otay Ranch GDP/SRP. The proposed Project includes 426.7 acres of Otay Ranch RMP preserve, of which 270.2 acres are in Village 14 and 156.5 acres are in Planning Areas 16/19.

"Preserve Conveyance Obligation" Defined: To satisfy assemblage of the 11,375-acre RMP (MSCP) Preserve ranch-wide, a "Preserve Conveyance Obligation" was prescribed in the Otay Ranch RMP. The Preserve Conveyance Obligation is 1.188 acre of Otay Ranch RMP (MSCP) Preserve conveyed per 1 acre of development, as further defined in the adopted Otay Ranch RMP. This obligation, which is the primary basis of Proposed Project's required mitigation, may be achieved through conveyance of either the Applicant's RMP (MSCP) Preserve ownership or through off-site acquisition within the 11,375 acres Otay Ranch RMP (MSCP) Preserve.

"Conserved Open Space" Defined: "Conserved Open Space" refers to those areas with an Otay Ranch GDP/SRP land use designation other than Otay Ranch RMP Preserve that will be preserved on site and which will either be added to the Otay Ranch RMP Preserve (through a future RMP Amendment), managed under a separate Resource Management Plan, or utilized to mitigate impacts to the City of San Diego MSCP Cornerstone Lands. The approximately 72.4 acres of Conserved Open Space is comprised of 31.9 acres within the 127.1 acres of LDA and 3.6 acres of residential land use designation in Planning Area 16/19 plus 36.9 acres of residential land use designation within Village 14. The Conserved Open Space areas are located adjacent to Otay Ranch RMP Preserve and will be conserved by recording a biological open space easement over the land.

"Development Footprint" Defined: The Development Footprint includes areas where there will either be permanent or temporary ground disturbance. The Development Footprint includes: all on-site development; Off-site improvements; graded LDA; and impacts resulting from

infrastructure and other allowable uses within the MSCP Preserve per Section 1.9.3 of the MSCP County Subarea Plan.

"Off-site Improvements" Defined: "Off-site Improvements" total approximately 85.4 acres of both temporary and permanent impacts as shown in Table 1-5 Off-Site Improvements and include the following: Proctor Valley Road, including related wet and dry utilities, drainage facilities and trails; access roads in Planning Area 16; an off-site sewer pump station in the southern reach of Proctor Valley Road and off-site sewer facilities to connect to the Salt Creek Interceptor as planned since 1994.

Proctor Valley Road improvements include: South Proctor Valley Road (0.25 mile in the City of Chula Vista land and 0.2 acres privately owned in the County); South and Central Proctor Valley Road (1.5 miles in City of San Diego Cornerstone land); Central Proctor Valley Road (0.4 mile in CDFW Otay Ranch Village 14 land); and North Proctor Valley Road (0.75 mile in CDFW Otay Ranch land between Village 14 and Planning Area 16/19).

Proctor Valley Road Central and South are proposed to be improved and classified as a two-lane-with-median light collector with a width ranging from 68 to 74 feet, plus an additional 20-foot-wide fuel modification/construction easement on each side. Proctor Valley Road north is a two-lane interim road with a paved width of 28 feet in a 40-foot-side right-of-way. Improvements in Proctor Valley Road would include those typically in roadways, including wet and dry utilities, a sewer pump station, drainage, landscape, culverts, and trails. Proctor Valley Road is an approved County General Plan mobility element road and an approved facility in the MSCP County Subarea Plan.

In addition, there are three public off-site roads within Planning Area 16. These roads are located primarily within CDFW managed lands and are approved in the Otay Ranch GDP/SRP as facilities within designated development or LDA land use, (and are also approved facilities per the MSCP County Subarea Plan Section 1.9.3.3). Improvements in these off-site roads would include those typically in roadways, including wet and dry utilities, drainage, landscape, culverts, and trails.

PROPOSED SPECIFIC PLAN

Summary

The adopted Otay Ranch GDP/SRP requires the preparation of a Specific Plan, which includes a Site Utilization Plan to describe the land uses for the Proposed Project. Figures 1-2 and 1-3 depict the proposed Site Utilization Plan. Tables 1-1 to 1-5 quantify the proposed land uses. Approximately 994 homes are planned in Village 14, set in three distinct areas (referred to herein as the South, Central and North Village 14). 878 of these homes will be single-family homes located in gated enclaves and 116 will be detached courtyard homes. Twelve neighborhoods are planned with approximate densities ranging from 0.2 to 10.0 dwelling units per acre. Otay Ranch Village 14 is planned around a "Village Core", centrally located in the heart of the village. The Village Core is comprised of a 9.7-acre elementary school; a 7.2-acre Village Green (public park); a 1.7-acre Mixed Use Site with up to 10,000 square feet of commercial/retail uses; and a 2.3-acre public safety site for a fire station and satellite sheriff's facility. Additional public and private parks, swim clubs, trails and recreational facilities will be situated throughout South, Central and North Village 14. See Table 1-2 for detailed land uses in Village 14.

In addition to the homes in Village 14, there are 13 one-acre average sized estate lots proposed in Planning Area 19 and 112 three-acre average sized ranchettes proposed in Planning Area 16. Planning Area 16/19 neighborhoods will not be gated. The Limited Development Area may include public infrastructure, and/or be included in the private lots with a conservation easement. See Tables 1-3 and 1-4 for detailed land uses in Planning Area 16/19.

The Proposed Project's Specific Plan is designed around an active lifestyle and wellness recreation theme and includes a park and recreation system including four public parks totaling approximately 15.2 acres. The remaining private recreation facilities include three private swim clubs, and numerous pocket parks totaling approximately 9.5 acres. An approximately 4.5 mile, 10-foot wide decomposed granite Community Pathway is proposed along Proctor Valley Road from Chula Vista to Jamul. The Proposed Project includes approximately 27.9 acres of open space, (exclusive of the 110.1 acres of open space included in the residential gross acres),127.1 acres of LDA and 426.7 acres of Otay Ranch RMP Preserve within the Applicant's ownership. Of note, there is approximately 72.4 acres of Conserved Open Space within the proposed Project that will be conserved by recording a biological open space easement.

Table 1-1
Village 14 and Planning Areas 16/19
Site Utilization Plan Summary
January 9, 2018

Description	Village 14		Planning Area 16/19		Total Proposed Project	
	Gross Acres *(1,2)*	Target Units *(3)*	Gross Acres *(4,5)*	Target Units	Gross Acres	Target Units
Residential Subtotal	344.2	897.0	363.6	125	707.7	1,022
Residential Use on School Site (9.7 acres) *(3)*		97				97
Non-Residential Uses						
Mixed Use *(6)*	1.7				1.7	
Public Parks	13.8		1.4		15.2	
Private Parks/Recreation *(2)*	4.5				4.5	
Public Safety Site	2.3				2.3	
Elementary School Site *(3)*	9.7				9.7	
Open Space	27.6		2.1		29.7	
Conserved Open Space	36.9		35.5		72.4	
Otay Ranch RMP Preserve	270.2		156.5		426.7	
Circulation	12.7		0.8		13.6	
Non-Residential Uses Subtotal	379.5	-	196.3		575.8	-
Total Proposed Project	**723.7**	**994**	**559.8**	**125**	**1283.5**	**1,119**

Notes

(1) Residential gross acres in Village 14 includes 96.0 acres of related internal slopes, fuel modification and/or preserve edge.

(2) Village 14 has 5.0 acres of private pocket parks included in the residential acreage; therefore the subtotal including PPP is 9.5 acres.

(3) Units allocated to school site at 10 DU/ac per the Otay Ranch GDP/SRP policies. Should school site not be needed, 97 units may be built. Should the school site be needed, the Total Target Units is 897 in Village 14 and 1,022 total.

(4) Residential gross acres in Planning Area 16/19 includes 14.1 acres of related private lift and pump stations.

(5) Residential gross acres in Planning Area 16/19 includes 127.1 acres of limited development area (LDA). See Table 4 for details.

(6) Village 14 Mixed Use acreage includes 10,000 sf of commercial use.

(7) 85.4 acres of offsite impacts are in excluded from the acreage above. See Table 5 for details.

Table 1-2
Village 14
Site Utilization Plan Detail
January 9, 2018

Description		Gross Acres (1,2)	Target Units	Density
Single Family Residential				
R-1	50*85	18.0	81	4.5
R-2	60*100	38.5	82	2.1
R-3	71*100	41.1	73	1.8
R-4	Courtyard	13.8	116	8.4
R-5	50*100	35.1	103	2.9
R-6	60*100	25.7	71	2.8
R-7	60*85	40.7	108	2.7
R-8	60*100	28.7	75	2.6
R-9	75*100	30.0	74	2.5
R-10	70*85	25.1	49	1.9
R-11	80*100	28.6	61	2.1
R-12	4 ac min	18.9	4	0.2
Single Family Residential Subtotal		**344.2**	**897**	**2.6**
Residential Use on School Site (9.7 acres) *(3)*			97	
Non-Residential Uses				
Mixed Use *(4)*	MU - C	1.7		
Public Parks				
P-1	South Park	2.9		
P-2	Village Green Park	7.2		
P-3	Scenic Park	3.7		
Public Parks Subtotal		13.8		
Private Parks & Recreation				
PP-1	South	1.0		
PP-2	Central	1.2		
PP-3	Private Park	0.7		
PP-4	North	1.5		
PPP *(4)*	Various	0.0		
Private Parks/Recreation Subtotal		4.5		
Public Safety Site		2.3		
Elementary School Site *(3)*		9.7		
Open Space		27.6		
Conserved Open Space		36.9		
Otay Ranch RMP Preserve		270.2		
Circulation - Arterial		12.7		
Non-Residential Uses Subtotal		**379.5**		
Village 14 Subtotal		**723.7**	**994**	**1.4**

Notes

(1) Residential gross acres includes 96.0 acres of related internal slopes, fuel modification and/or preserve edge open space lots.

(2) Village 14 has 5.0 acres of private pocket parks included in the residential acreage; therefore the subtotal including PPP is 9.5 acres. built.

Should the school site be needed, the Total Target Units is 897.

(4) Village 14 Mixed Use acreage includes 10,000 sf of commercial use.

(5) Off-site impacts are in excluded from the acreage above. See Table 5 for details.

Table 1-3
Planning Areas 16/19
Site Utilization Plan Detail
January 9, 2018

Description		Gross Acres (1,2)	Target Units	Density
Residential Uses				
R-13	Estates 1/2 acre min	13.4	13	1.0
R-14	Ranchettes 2 acre min	192.0	71	0.4
R-15	Ranchettes 2 acre min	41.9	11	0.3
R-16	Ranchettes 2 acre min	116.3	30	0.3
Residential Subtotal		**363.55**	**125**	**0.3**
Non-Residential Uses				
Public Park P-4	Northern Park	1.4		
Open Space		2.1		
Conserved Open Space		35.5		
Otay Ranch RMP Preserve		156.5		
Circulation Arterial		0.8		
Non-Residential Uses Subtotal		**196.3**		
Planning Area 16/19 Subtotal		**559.8**	**125.0**	**0.2**

Notes

(1) Gross acres includes 127.1 acres of limited development area (LDA). See Table 4 for details.

(2) Residential gross acres includes 14.1 acres of related private lift and pump stations open space lots.

(3) Off-site impacts are in excluded from the acreage above. See Table 5 for details.

Table 1-4
Planning Areas 16/19
Limited Development Area (LDA) Detail
January 9, 2018

Description		Component Acres LDA	Component Acres Other	Acres Total
Residential Uses				
R-13	Estates 1 acre avg	0.0	13.4	13.4
R-14	Ranchettes 3 acre avg	17.3	174.7	192.0
R-15	Ranchettes 3 acre avg	27.1	14.8	41.9
R-16	Ranchettes 3 acre avg	50.9	65.4	116.3
Residential Subtotal *(5)*		**95.3**	**268.3**	**363.6**
Non-Residential Uses				
Public Park P Northern Park			1.4	1.4
Open Space			2.1	2.1
Conserved Open Space		31.9	3.6	35.5
MSCP Preserve			156.5	156.5
Circulation Arterial			0.8	0.8
Non-Residential Uses Subtotal		**31.9**	**164.4**	**196.3**
Planning Area 16/19 Subtotal		**127.1**	**432.7**	**559.8**

Table 1-5
Village 14 and Planning Areas 16/19
Off-Site Infrastructure (Temporary + Permanent)
January 9, 2018

Off-site *(1)*	Location	Acres		
		ROW	Temporary	Total
Proctor Valley Road - MSCP Planned Facility *(2)*				
South	City of Chula Vista	2.3	2.8	5.1
South	City of San Diego	10.1	17.6	27.7
Central	City of San Diego	2.8	4.3	7.1
Central	State	4.1	8.6	12.7
North	State	3.6	13.2	16.8
North	County of SD Easement	0.1	0.2	0.3
PA 16 Access Roads - MSCP Allowed Facility *(2)*				
R-14 to R-15	State	0.3	1.0	1.3
R-15 to R-16	State	1.6	7.2	8.8
R-16 to Whispering Meadows	State	1.5	4.2	5.7
Sewer Trunk Line to Salt Creek Interceptor *(3)*	City of Chula Vista	--	--	--
Total		**26.4**	**59.0**	**85.4**

Notes

(1) Off-sites include all road improvements, sewer, water, drainage and related utilities.

(2) See section 1.9.3 of the MSCP for planned and allowed facilities.

(3) In existing improved Proctor Valley Road to approximate tie in at Hunte Parkway

WATER SERVICE

The Proposed Project is within the boundaries of the Otay Water District (OWD), San Diego County Water Authority (SDCWA), and Metropolitan Water District of Southern California (MWD) for water service. Retail water service for the Proposed Project is to be provided by the OWD. The Proposed Project will require annexation into an OWD Improvement District in order to obtain water service. This annexation is an internal discretionary action by OWD and requires a written request and payment of processing fees.

The OWD has existing and planned facilities in the vicinity of the Proposed Project and water service can be provided by expanding the existing system. In particular, water service will be provided by the 980 Pressure Zone (980 Zone) within the Central Area System, the 1296 Pressure Zone (1296 Zone) within the Regulatory System of the OWD, and a new proposed 1460 Zone supplied from the 1296 Zone. The 980 Zone currently includes two pump stations which pump water into two existing 980 Zone reservoirs approximately two miles to the west of the Proposed Project. There are three existing 1296 Zone Reservoirs approximately one quarter mile to the north of the Proposed Project. This report will provide recommendations for improving and expanding the 980 Zone and 1296 Zone as needed to provide water service to the Proposed Project.

PURPOSE OF STUDY

This report provides an overview of water service for the Proposed Project. This document is prepared as a supporting document for the Proposed Project's Specific Plan and EIR. The developer of the Proposed Project will be required to prepare, for review and approval by the OWD, a Subarea Master Plan (SAMP) concurrent with the processing of preliminary final engineering plans. The SAMP will provide more detailed information on project phasing, pump station and reservoir capacity requirements, recycled water system improvements and processing requirements, and computer modeling to justify recommended pipe sizes.

PROCESSING SUMMARY

A summary of the major permits and process approvals that must be completed prior to the Proposed Project being eligible for water service from OWD include:

- Project EIR, Specific Plan and Tentative Map(s) approvals through County of San Diego
- Water Supply Availability and Verification Report
- OWD Improvement District annexation approval
- Approval of SAMP by OWD
- Final Engineering Improvement Plan approvals

CHAPTER 2

DESIGN CRITERIA AND PROJECTED WATER DEMANDS

This chapter presents the design criteria used to evaluate the water system for the Proposed Project. The design criteria are utilized for analysis of the existing water system as well as for design and sizing of proposed improvements and expansions to the existing system to accommodate demands in the study area. Unless otherwise noted, this criteria is taken from the OWD Water Facilities Master Plan Update.

Duty Factors and Peaking Factors

Table 2-1 presents the duty factors used in projecting the total average demand for the Proposed Project. The required fire flows and durations are also listed. Actual fire flow requirements will be determined as site specific details such as building footprints and construction materials become available. The fire flow requirements listed in Table 2-1 are used by the OWD in master planning their overall water system.

TABLE 2-1
WATER DUTY FACTORS

Land Use Designation	Unit Domestic Demand	Required Fire Flow (gpm)	Required Fire Flow Duration (hours)
Rural Residential (<1 DU/AC)	1,000 gpd/unit	2, 500	2
Single Family - Low (1-3 DU/AC)	700 gpd/unit	2,500	2
Single Family - Medium (3-10 DU/AC)	435 gpd/unit	2,500	2
MF Residential (>10 DU/AC)	200 gpd/unit	2,500	2
Commercial	1,785 gpd/ac	3,500	3
Public Safety	1,785 gpd/ac	3,500	4
School	1,785 gpd/ac	5,000	4
Park	1,900 gpd/ac	------	-------

To convert average day potable water demands to maximum day demands and average day potable water demands to peak hour demands, the applicable figures from the Water Agency Standards were utilized.

System Pressures

Generally, the potable water distribution system is designed to maintain static pressures between 65 psi and 200 psi. This criteria is used to initially divide a project between water service zones. The potable water distribution system has been designed to yield a minimum of 40 psi residual pressure at any location under peak hour demand flows, and a minimum residual pressure of 20 psi during maximum day demand plus fire flow conditions. Potable water mains are sized to maintain a maximum velocity of 10 feet per second under a maximum day plus fire flow scenario and a maximum velocity of 6 feet per second under peak hour flow conditions.

Pump Station

Pump stations are sized for a firm capacity equivalent to the maximum day demand of the zone being served and all higher zones supplied by the pump station. Firm capacity is defined as the pumping capacity of the station when one pumping unit is out of service. To allow OWD flexibility to avoid pumping during peak electricity times, the pumps will be sized to allow pumping to occur over a 16 hour period.

Reservoirs

Reservoir storage consists of operational storage, emergency storage, and fire flow storage. Operational storage is to be equivalent to 30 percent of the maximum daily demand for the area being served. Emergency storage is to be equivalent to 100 percent of the maximum daily demand for the area be served. Fire flow storage is to be based on the highest fire flow and duration required within the service area. Where multiple reservoirs are provided within a pressure zone, the fire flow storage requirement applies to the whole zone and not to each individual reservoir.

Projected Water Demands

The use of recycled water within watersheds tributary to surface water storage reservoirs that provide supply for potable domestic water uses must be approved by the owners of the reservoirs in order to protect water quality in these reservoirs. The Applicants for other projects in this watershed have met with and discussed the use of recycled water with the City of San Diego, the operator of the reservoirs. The City of San Diego has requested that all projects not use recycled water because they are concerned about the runoff from the project entering the reservoirs and increasing nutrients and salinity. For this reason, the projected water use within the Proposed Project has been estimated with the assumption that the use of recycled water within the project will not be allowed. Table 2-2 provides the projected potable water demand for the Proposed Project by pressure zone. The total estimated average potable water use is 0.80 mgd. This demand will be supplied from OWD's 980 Zone, 1296 Zone, and newly formed 1460 Zone, as discussed in Chapter 4.

TABLE 2-2
OTAY RANCH VILLAGE 14 AND PLANNING AREAS 16/19
PROJECTED POTABLE WATER DEMANDS

Neighborhood	Land Use Designation	Gross Acres	Quantity, Units	Water Duty Factor	Total Average Water Demand, GPD
980 Zone					
R-1	SF Residential	18.0	81	435 gpd/unit	35,235
R-2	SF Residential	38.5	82	700 gpd/unit	57,400
R-3	SF Residential	41.1	73	700 gpd/unit	51,100
R-4	Residential	13.8	116	435 gpd/unit	50,460
R-5 (portion)	SF Residential	30.0	88	700 gpd/unit	61,600
R-6 (portion)	SF Residential	17.4	48	700 gpd/unit	33,600
R-7 (portion)	SF Residential	2.6	7	700 gpd/unit	4,900
R-10 (portion)	SF Residential	14.4	28	700 gpd/unit	19,600
R-11 (portion)	SF Residential	6.1	13	700 gpd/unit	9,100
R-12	SF Residential	18.9	4	1,000 gpd/unit	4,000
MU-C	Mixed Use-Com	1.7	---	1,785 gpd/ac	3,035
P-1	Park	2.9	---	1,900 gpd/ac	5,510
P-2	Park	7.2	---	1,900 gpd/ac	13,680
P-3	Park	3.7	---	1,900 gpd/ac	7,030
PP-1	Private Park	1.0	---	1,900 gpd/ac	1,900

TABLE 2-2
OTAY RANCH VILLAGE 14 AND PLANNING AREAS 16/19
PROJECTED POTABLE WATER DEMANDS

Neighborhood	Land Use Designation	Gross Acres	Quantity, Units	Water Duty Factor	Total Average Water Demand, GPD
PP-4	Private Park	1.5	---	1,900 gpd/ac	2,850
PPP	Private Park	2.5	---	1,900 gpd/ac	4,750
FS-1	Public Safety	2.3	---	1,785 gpd/ac	4,105
S-1	School	9.7	97[1]	435 gpd/unit	42,195
Subtotal 980 Zone			**637**		**412,050**
1296 Zone					
R-5 (portion)	SF Residential	5.1	15	700 gpd/unit	10,500
R-6 (portion)	SF Residential	8.3	23	700 gpd/unit	16,100
R-7 (portion)	SF Residential	38.1	101	700 gpd/unit	70,700
R-8	SF Residential	28.7	75	700 gpd/unit	52,500
R-9	SF Residential	30.3	74	700 gpd/unit	51,800
R-10 (portion)	SF Residential	10.7	21	700 gpd/unit	14,700
R-11 (portion)	SF Residential	22.3	48	700 gpd/unit	33,600
R-13	SF Residential	14.3	13	1,000 gpd/unit	13,000
R-14	SF Residential	192.0	71	1,000 gpd/unit	71,000
R-16 (portion)	SF Residential	27.1	7	1,000 gpd/unit	7,000
P-4	Park	1.4	---	1,900 gpd/ac	2,660
PP-2	Private Park	1.2	---	1,900 gpd/ac	2,280
PP-3	Private Park	0.7	---	1,900 gpd/ac	1,330
PPP	Private Park	2.5	---	1,900 gpd/ac	4,750
Subtotal 1296 Zone			**448**		**351,920**
1460 Zone					
R-15	SF Residential	41.9	11	1,000 gpd/unit	11,000
R-16 (portion)	SF Residential	89.2	23	1,000 gpd/unit	23,000
Subtotal 1460 Zone			**34**		**34,000**
TOTAL			**1,119**		**797,970**

[1] Units allocated to school site at 10 DU/ac per Otay Ranch GDP/SRP policies. Water demands were projected based on the residential unit allocation to be conservative (97 units x 435 gpd/unit 42,195 gpd as residential allocation versus 9.7 ac x 1,785 gpd/ac = 17,315 gpd as school).

CHAPTER 3

WATER SUPPLY

Urban Water Management Planning Act

In 1983, the Legislature enacted the Urban Water Management Planning Act (California Water Code sections 10610 through 10656), which requires every urban water supplier that provides water to 3,000 or more customers, or over 3,000 acre feet (af) of water annually, to make every effort to ensure the appropriate level of reliability in its water service to meet the needs of its customers during normal, dry, and multiple-dry years. The Urban Water Management Plan (UWMP) is required in order for a water supplier to be eligible for the Department of Water Resources (DWR) administered state grants, loans, and drought assistance. The UWMP provides information on water use, water resources, recycled water, water quality, reliability planning, demand management measures, best management practices, and water shortage contingency planning for a specified service area or territory.

Senate Bills 610 and 221

On January 1, 2002, SB 610 took effect. SB 610, which was codified in the Water Code beginning with section 10910, requires the preparation of a water supply assessment (WSA) for projects within cities and counties that propose to construct 500 or more residential units or the equivalent. SB 610 stipulates that when environmental review of certain large development projects is required, the water agency that is to serve the development must complete a WSA to evaluate water supplies that are or will be available during normal, single-dry, and multiple-dry years during a 20-year projection to meet existing and planned future demands, including the demand associated with a proposed project.

Enacted in 2001, SB 221, which was codified in the Water Code beginning with section 10910, requires that the legislative body of a city or county, which is empowered to approve, disapprove or conditionally approve a subdivision map, must condition such approval upon proof of sufficient water supply. The term "sufficient water supply" is defined in SB 221 as the total water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that would meet the projected demand associated with the proposed subdivision. The definition of sufficient water supply also includes the requirement that sufficient water encompass not only the proposed subdivision, but also existing and planned future uses, including agricultural and industrial uses.

Urban Water Management Plans

The California Urban Water Management Planning Act requires that each urban water supplier providing water for municipal purposes, either to more than 3,000 customers, or more than 3,000 acre-feet of water annually, must prepare, adopt, and update a UWMP at least once every five years on or before December 31, in years ending in five and zero. This applies to MWD, SDCWA, and its member agencies, including OWD, that serve unincorporated San Diego County. The intent of an UWMP is to present information on water supply, water usage/demand, recycled water, and water use efficiency programs in a respective water district's service area. An UWMP also serves as a valuable resource for planners and policy makers over a 25 year time frame.

The UWMP process ensures that water supplies are being planned to meet future growth. UWMPs are developed to manage the uncertainties and variability of multiple supply sources and demands over the long term. Water agencies and districts update their demand and supply estimates based on the most recent San Diego Association of Governments (SANDAG) forecast approximately every five years to coincide with preparation of their UWMPs. The most current supply and demand projections are contained in the 2015 UWMPs of MWD, SDCWA, and OWD. SDCWA member districts rely on the UWMPs and Integrated Resources Plans (IRPs) of MWD and the Regional Water Facilities Master Plan of SDCWA for documentation of supplies available to meet projected demands.

Normal year, single-dry year, and multiple-dry year 2015 UWMP supply and demand assessments for MWD, SDCWA, and OWD are intended to describe the water supply reliability and vulnerability to seasonal or climatic conditions, to the extent practical. Normal water years are considered to be years that experience average rainfall for the respective district. Single-dry water years are considered one year drought events. Multiple-dry water years refer to a series of below average rainfall for particular areas (i.e., multiple drought year conditions). Projections for multiple-dry years are made in five year increments. In the 2015 UWMPs, MWD, SDCWA and all SDCWA member agencies, including OWD, that serve unincorporated San Diego County determined that adequate water supplies would be available to serve existing service areas under normal year, single-dry year, and multiple-dry year conditions through the year 2040.

REGIONAL AND LOCAL WATER SUPPLY

Metropolitan Water District

MWD supplies water to approximately 18.7 million people in a 5,200-square mile service area that includes portions of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego counties. SDCWA is one of MWD's 26 member agencies. Supply and demand projection information for MWD is included in its 2015 Regional UWMP, adopted in May 2016. MWD's long-term strategy for a sustainable water supply is provided in its Integrated Resources Plan (IRP), updated approximately every five years, and last updated in October 2015. MWD's IRP identifies a mix of resources (imported and local) that will provide 100 percent reliability for full-service demands through the attainment of regional targets set for conservation, local supplies, State Water Project (SWP) supplies, Colorado River supplies, groundwater banking, and water transfers through the year 2040. SDCWA is the largest MWD agency in terms of delivery, purchasing approximately 25 percent of MWD's water. MWD gets its water from two sources. The first source is the Colorado River, which is connected to MWD's six-county service area through a 242-mile aqueduct. The aqueduct system is known as the Central Valley Project (CVP). The CVP is operated by the U.S. Bureau of Reclamation. The second source is water from northern California, which supplies water through a series of dams, aqueducts, pipelines, and other facilities known as the State Water Project (SWP). The SWP is operated by the California Department of Water Resources (DWR). From the Colorado River Agreement (CRA), MWD is apportioned 550,000 acre-feet of water per year (AFY) from the Colorado River. Despite this low apportionment, MWD was able to transport up to 1.2 million acre-feet (MAF) through the CRA in past years by relying on unused apportionments from Arizona, Nevada, and California agricultural agencies. However, because MWD's firm water supply from the CRA is only 550,000 AF that is the number planning agencies must rely on for development. To supplement this supply, MWD also has several existing programs and programs being developed in cooperation with other agencies.

From the SWP, MWD is contractually entitled to receive 1,911,000 AF of water; however, the level of SWP supply development, state and federal environmental regulations, and other factors have restricted and, in some cases, reduced actual amount of available SWP water. As a result of these and other limitations, MWD estimates that actual SWP supplies will be 701,000 AF in a single dry year and 566,000 AF during multiple dry years, with Delta improvements.

In May 2016, the MWD adopted its 2015 Regional UWMP, which is an update to its prior 2010 Regional UWMP. In its 2015 UWMP, MWD evaluated water supply reliability, over a 20-year period, for average, single-dry, and multiple-dry years. To complete its most recent water supply reliability assessment, MWD developed estimates of total retail demands for the region, factoring in the impacts of conservation. After estimating demands, the water reliability analysis identified current supplies and supplies under development to meet projected demands. MWD's reliability assessment showed that MWD can maintain reliable water supplies to meet projected demands through the year 2040. MWD also identified buffer supplies, including other SWP groundwater storage and transfers, which could serve to supply additional water needs. Appendix A.3 to the MWD 2015 Regional UWMP contains detailed justifications for the sources of supply projected to meet water demands in the region, including Colorado River Aqueduct deliveries (Colorado River supplies) and California Aqueduct deliveries (SWP supplies).

San Diego County Water Authority (SDCWA)

The SDCWA service area covers approximately 951,000 acres and encompasses the western third of San Diego County. SDCWA has 24 member agencies, 15 of which provide water to unincorporated areas of San Diego County. The SDCWA is responsible for ensuring a safe and reliable water supply to support the region's economy and the quality of life for three million residents. Because of the County's semi-arid climate and limited local water supplies, SDCWA has historically imported between 70 and 95 percent of the water used in the San Diego region from MWD. In 2008, MWD provided 71 percent of the San Diego region's water supply. Most of this water is obtained from the Colorado River and the SWP through a system of pipes, aqueducts, and associated facilities. Through development of new local water supply sources such as the Carlsbad desalination plant, SDCWA has become increasingly less reliant on MWD water supplies in recent years.

Both MWD and SDCWA provide water supplies to their member agencies in order to meet projected water demand based upon regional population forecasts. The San Diego Association of Governments (SANDAG) is responsible for providing and updating land use planning and demographic forecasts for San Diego County. MWD and SDCWA update their water demand and supply estimates based on the most recent SANDAG forecasts approximately every five years to coincide with preparation of the their respective UWMPs.

In June 2016, the SDCWA adopted its 2015 UWMP, updating the previously adopted 2010 UWMP. Sections 4, 5, and 6 of SDCWA's 2010 UWMP contain documentation of SDCWA's existing and planned water supplies, including MWD supplies (imported Colorado River water and SWP water), SDCWA supplies, and local member agency supplies (surface water reservoirs, water recycling, groundwater, and groundwater recovery). SDCWA supplies include (1) IID water transfer supplies, (2) Supplies from conservation projects to line the All-American Canal and the Coachella Canal, located in Imperial and Coachella Valleys, and (3) development of a seawater desalination facility at the Encina Power Plant in Carlsbad, which is anticipated to produce 56,000 AFY of additional water supplies (See Table 3-1 below).

Additionally, since 1980, approximately 5 percent to 30 percent of the member agencies water has come from local sources, primarily from surface water reservoirs as indicated in Table 3-1. Recycled water and groundwater recovery projects are growing in importance in the region, and water conservation efforts have also made SDCWA member agencies less dependent on imported water.

TABLE 3-1
PROJECTED NORMAL YEAR WATER SUPPLIES (AFY)

WATER SOURCE	2020	2025	2030	2035	2040
Water Authority Supplies					
IID Water Transfer	190,000	200,000	200,000	200,000	200,000
Supply from MWD	136,002	181,840	207,413	224,863	248,565
Coachella Canal and All American Canal Lining Projects	80,200	80,200	80,200	80,200	80,200
Regional Seawater Desalination	50,000	50,000	50,000	50,000	50,000
Member Agency Supplies					
Surface Water	51,580	51,480	51,380	51,280	51,180
Water Recycling	40,459	43,674	45,758	46,118	46,858
Groundwater	17,940	19,130	20,170	20,170	20,170
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Brackish Groundwater Recovery	12,100	12,500	12,500	12,500	12,500
TOTAL PROJECTED SUPPLIES	**587,581**	**648,124**	**676,721**	**694,431**	**718,773**

Source: San Diego County Water Authority 2015 Urban Water Management Plan.

Section 9 of SDCWA's 2015 UWMP evaluates water supply reliability in average, single-dry, and multiple-dry years. Based on SDCWA's water supply reliability assessment, SDCWA concluded that water supplies would be sufficient through 2040. (See section below regarding Summary of Water Supplies and Demand, and Tables 3-2 through 3-4.)

Based on the imported and member agency local water sources discussed above, SDCWA estimates that it, along with member agency local sources will be able to supply 587,581 AF of water in 2020, as demonstrated in Table 3-1, above. Therefore, according to the MWD and SDCWA 2015 UWMPs, there is available water to meet all of the region's anticipated demand, including development of the Proposed Project, in average/normal and dry water years, as demonstrated in Table 3-2, Table 3-3 and Table 3-4, below. A Water Supply Assessment and Verification Report will need to be prepared for the Proposed Project by OWD to further detail the water supply assumptions and findings of OWD, SDCWA, and MWD. The reason that supplies exactly meet demands in Table 3-2 is that SDCWA only imports the amount of water necessary to meet demand. In Tables 3-3 and 3-4, years that show a deficit would require the use of water storage offsets and management actions to balance demand and supplies. These tables simply indicate that SDCWA has adequate supply to meet projected demands.

TABLE 3-2
AVERAGE/NORMAL WATER YEAR SUPPLY AND DEMAND ASSESSMENT (AFY)

MEMBER AGENCY SUPPLIES	**2020**	**2025**	**2030**	**2035**	**2040**
Surface Water	51,580	51,480	51,380	51,280	51,180
Water Recycling	40,459	43,674	45,758	46,188	46,858
Groundwater	17,940	19,130	20,170	20,170	20,170
Brackish Groundwater Recovery	12,100	12,500	12,500	12,500	12,500
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Potable Reuse	3,300	3,300	3,300	3,300	3,300
WATER AUTHORITY SUPPLIES					
IID Water Transfer	190,000	200,000	200,000	200,000	200,000
Supply from MWD	136,002	181,840	207,413	224,863	248,565
Coachella Canal and All American Canal Lining Projects	80,200	80,200	80,200	80,200	80,200
Carlsbad Desalination Plant	50,000	50,000	50,000	50,000	50,000
TOTAL PROJECTED SUPPLIES	587,581	648,124	676,721	694,431	718,773
TOTAL ESTIMATED DEMANDS[1]	587,581	648,124	676,721	694,431	718,773
DIFFERENCE	**0**	**0**	**0**	**0**	**0**

[1] With Conservation.
Source: San Diego County Water Authority 2015 Urban Water Management Plan.

TABLE 3-3
SINGLE DRY WATER YEAR SUPPLY AND DEMAND ASSESSMENT (AFY)

MEMBER AGENCY SUPPLIES	2020	2025	2030	2035	2040
Surface Water	6,004	6,004	6,004	6,004	6,004
Water Recycling	40,459	43,674	45,758	46,188	46,858
Groundwater	15,281	15,281	15,281	15,281	15,281
Brackish Groundwater Recovery	12,100	12,500	12,500	12,500	12,500
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Potable Reuse	3,300	3,300	3,300	3,300	3,300
WATER AUTHORITY SUPPLIES					
IID Water Transfer	190,000	200,000	200,000	200,000	200,000
Supply from MWD	263,340	264,740	263,340	260,680	258,720
Coachella Canal and All American Canal Lining Projects	80,200	80,200	80,200	80,200	80,200
Carlsbad Desalination Plant	50,000	50,000	50,000	50,000	50,000
TOTAL PROJECTED SUPPLIES	666,684	681,699	682,383	680,083	678,863
TOTAL ESTIMATED DEMANDS[1]	629,198	694,147	725,006	743,990	770,765
DIFFERENCE[2]	**37,486**	**(12,448)**	**(42,623)**	**(63,907)**	**(91,902)**

[1] With Conservation.
[2] Potential shortages would be met from carryover storage and management actions.
Source: San Diego County Water Authority 2015 Urban Water Management Plan.

TABLE 3-4
MULTIPLE DRY WATER YEAR SUPPLY AND DEMAND ASSESSMENT (AFY)

	Near Term			Long Term		
Scenario	**2017**	**2018**	**2019**	**2036**	**2037**	**2038**
Multiple Dry Years						
Demands	491,000	495,910	500,869	749,030	756,521	764,086
Supply	525,710	558,634	586,587	720,576	678,564	642,327
Potential Surplus or (Shortage)[1]	34,710	62,724	85,718	(28,454)	(77,957)	(121,759)

[1] Potential shortages would be offset through carryover storage and management actions.
Source: San Diego County Water Authority 2015 Urban Water Management Plan.

Otay Water District

Once water is made available by SDCWA, it is transferred across San Diego County in two aqueducts containing five large-diameter pipelines. The First Aqueduct includes Pipelines 1 and 2, and the Second Aqueduct includes Pipelines 3, 4 and 5. The OWD maintains several

connections to Pipeline 4, which delivers filtered water from the MWD filtration plant at Lake Skinner in Riverside County.

In San Diego County, OWD provides water services to southern El Cajon, La Mesa, Rancho San Diego, Jamul, Spring Valley, Bonita, eastern Chula Vista, and Otay Mesa along the international border with Mexico. OWD covers approximately 80,000 acres, and has approximately 47,000 connections. OWD has approximately 709 miles of pipelines, 24 pump stations, and 40 reservoirs with a total storage capacity of 226 million gallons (mg). OWD provides approximately 90 percent of its water service to residential land uses, and 10 percent to commercial and industrial land uses. Average annual consumption for OWD is approximately 30,000 af. OWD maintains five major systems to supply and deliver water, which include Hillsdale, Regulatory, La Presa, Central, and Otay Mesa.

In addition, OWD has a connection to the La Mesa - Sweetwater Extension Pipeline, which delivers filtered water from the R.M. Levy Water Treatment Plant which is owned and operated by the Helix Water District. However, this connection currently supplies water to the north portion of OWD only. Furthermore, OWD maintains a connection to the City of San Diego's water system in Telegraph Canyon Road and has an agreement which allows the District to receive water from the Lower Otay Filtration Plant.

In June 2016, OWD's Board of Directors adopted the updated OWD 2015 UWMP. Sections 2, 3, and 4 of the 2015 UWMP provides an overview of OWD's service area, its current water supply sources, supply reliability, water demands, measures to reduce water demand, and planned water supply projects and programs. Section 5 of the 2015 UWMP contains OWD's water service reliability assessment. This section states that the level of reliability is based on the documentation in the UWMP's prepared by MWD and SDCWA and that these agencies have determined they will be able to meet potable water demands through 2040, during normal and dry year conditions. According to the 2015 UWMP, OWD currently relies on MWD and SDCWA for its potable supply, and OWD has worked with these agencies to prepare consistent demand projections for OWD's service area.

Current Drought Conditions

Since the time the Executive Order B-29-15 (EO) was issued by Governor Brown on April 1, 2015, statewide water conditions have improved. Mandatory water use reductions that were in effect in 2015 and the early part of 2016 have been lifted and both the SDCWA and OWD are in a Level 1 drought condition which encourages voluntary cutbacks to water use.

The Proposed Project will comply with SWRCB and OWD regulations, emergency, or otherwise that are applicable and in effect at the time of building permit issuance. The Proposed Project will implement interior water conservation project design features.

The Proposed Project has also prepared a Water Conservation Plan (WCP, December 2017) that is specific to this project. The WCP evaluates mandatory and optional water conservation measures to be incorporated into the project and evaluates the potential water savings from the implementation of these measures.

The SDCWA and the OWD will continue to have a viable supply of water. The San Diego County Water Authority has worked diligently over the past decades to develop a diverse water supply for the region. The recently completed Carlsbad desalination plant and water transfers from the Imperial Valley are a few examples of how SDCWA has increased and diversified supplies to the area. SDCWA and its member agencies are working on several other projects to increase local supplies.

POTABLE WATER

The OWD will supply water to the Proposed Project from the 980 Zone of the District's Central Area System and the 1296 Zone of the Regulatory System. A new 1460 Zone system is also proposed to be formed off the 1296 Zone to serve 34 lots in Planning Areas 16/19 that are too high to be served from the 1296 Zone. The 980 Zone and 1296 Zone systems will be interconnected by a pump station to be constructed within the Proposed Project. The 980 Zone accesses water from the SDCWA aqueduct by Otay Flow Control Facilities Number 10 and 12, which fill 624 Pressure Zone reservoirs. Water is then distributed within the 624 Zone and pumped to the 711 and 980 Zone storage and distribution systems. The 980-2 Pump Station pumps water directly from the 624 Zone to the 980 Zone system. The 980-1 Pump Station remains as part of the Central Area System to serve as a backup resource to the 980-2 Pump Station in the event it is needed.

The Regulatory System serves the eastern portion of the North District. Water is supplied to this area from Flow Control Facility 14 and a 36-inch line that feeds the 520 Zone Regulatory Reservoirs. From here, a series of pump stations, pipelines, and reservoirs form a series of higher pressure zones including the 1296 Zone that is located to the north of the Proposed Project.

To receive potable water service, the Proposed Project will need to expand the existing 980 Zone and 1296 Zone systems and create a new 1460 Zone. The following details the existing potable water facilities located in the vicinity of the Proposed Project.

980 Zone

There are two existing pump stations in the 980 Zone: the 980-1 Pump Station referred to as the Eastlake Pump Station, located on the south side of Otay Lakes Road at Lane Avenue and the 980-2 Pump Station. The 980-1 Zone Pump Station, which currently has two active pumps and one standby pump that are all rated for 4,000 gpm and maintain a firm station capacity of 8,000 gpm, pumps water from the 711 Zone system into the 980 Zone distribution system, and into two existing 980 Zone reservoirs located in the OWD Use Area. The 980-2 Pump Station pumps water from the 624 Zone to the 980 Zone and currently has three duty pumps, one standby pump, and two empty pump cans for future expansion. This station has a firm pumping capacity of 12,000 gpm.

Both existing reservoirs in the 980 Zone are located at the same site within the OWD Use Area, north of Rolling Hills Ranch. These reservoirs each have a capacity of 5.0 million gallons, for a total of 10.0 million gallons. The location of these reservoirs is provided on Figure 3-1.

The major 980 Zone pipelines in the vicinity of the Proposed Project are all located west of the Proposed Project and include transmission lines in Hunte Parkway and Proctor Valley Road. The 36-inch transmission line in Proctor Valley Road has been extended to east of Hunte Parkway to the eastern most portion of Rolling Hills Ranch, as shown on Figure 3-1. This line was oversized to serve future development in Proctor Valley and to provide an interconnection between the Central and Regulatory Areas of OWD.

1296 Zone

There is one pump station that supplies the 1296 Zone. This station is located north of Lyons Valley Road near the 944 Zone Reservoirs and has four existing pumps and room for a fifth pump to be added in the future. This station has a firm capacity of 2,900 gpm and pumps water to three 1296 Zone Reservoirs located at the same site. These reservoirs have a total capacity of approximately 5.0 million gallons. Transmission and distribution lines in this area range from 8-inch to 16-inch and include a 10-inch line that is extended in Proctor Valley Road, just to the north of the Proposed Project.

1296-1 PUMP STATION

6"

12"

1296-1 RES. (1.0 MG)

1296-2 RES. (2.0 MG)

1296-3 RES. (2.0 MG)

12"

12"

12"

12"

MELODY RD.

10"

8"

8"

16"

10"

PLANNING AREA 16/19

N

SCALE: 1"=3000'

0 3000 FEET

980-1 RES
(5.0 MG)

980-2 RES
(5.0 MG)

PROCTOR VALLEY
VILLAGE 14

1100 ZONE
PUMPSTATION

30"

30"

20"

20"

30"

36"

16"

12"

12"

PROCTOR VALLEY RD.

HUNTE PKWY.

LEGEND

EXISTING 980 ZONE

EXISTING 1100 ZONE

EXISTING 1296 ZONE

FIGURE 3-1

EXISTING WATER FACILITIES

VILLAGE 14 AND PLANNING AREA 16/19

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

CHAPTER 4

RECOMMENDED WATER FACILITIES

The Proposed Project will receive water service by expanding the existing 980 Zone and 1296 Zone water systems and forming a new 1460 Zone off the 1296 Zone. Figure 3-1 provided the existing major water facilities in the vicinity of the Proposed Project and Figures 4-1 and 4-2 provide the recommended onsite water facilities for the project. As discussed previously, a Subarea Master Plan(s) will be prepared prior to approval of final engineering improvement plans for the Proposed Project to identify the sizing and timing of all onsite and offsite water facilities for the project. The OWD Master Plan identifies a major north-south interconnection in this area to connect the Central Area and Regulatory Systems.

980 Pressure Zone

The Proposed Project will receive water service by expanding OWD's existing 980 Zone water system. The sizing and timing of all on-site and off-site water facilities for the Proposed Project site will be identified in a Subarea Master Plan to be reviewed and approved by OWD. The Subarea Master Plan will be prepared for the Proposed Project and submitted to OWD for approval prior to approval of final engineering plans.

The lower portion of the Proposed Project can be served from the 980 Zone by connecting to the existing 36–inch line in Proctor Valley Road and extending a 20-inch transmission line to the Proposed Project. This transmission line was identified in the OWD Master Plan and will be extended through the project as a 20-inch line to interconnect the 980 Zone and 1296 Zone. This line will feed the proposed 1296 Zone pump station. The OWD Master Plan also identifies the need for a 2.0 million gallon 980 Zone reservoir within the Village 14 project that will be fed from a 16-inch line. Other pipelines within the 980 Zone will consist of 8-inch through 12-inch lines.

The anticipated range of pad elevations for areas that will receive service from the 980 Zone will be 610 feet to 830 feet. Service to these pads from the 980 Zone results in maximum static pressures ranging from 65 psi to 160 psi.

1296 Pressure Zone

The upper elevations of Village 14 and the majority of Planning Areas 16/19 will be served from the 1296 Zone. The OWD Master Plan identifies a 1296 Zone Pump Station within Village 14 with a capacity of 4,000 gpm. A 20-inch transmission line will be required from this pump station to the existing 1,296 Zone system. The 1296 Zone portion of the Proposed Project is all residential and supporting facilities can be served by 8-inch and 12-inch distribution lines. Connections to the existing 1296 Zone lines to the north are proposed. The anticipated range of pad elevations for areas that will receive service from the 1296 Zone will be 831 feet to 1,100 feet. Service to these pads from the 1296 Zone results in maximum static pressures ranging from 85 psi to 201 psi.

1460 Zone

There are 34 estate lots within the Planning Area 16/19 area that cannot receive adequate service from the 1296 Zone. Service to these lots is proposed to be provided from a 1460 Zone hydropneumatic pump station. The station would be designed with redundant domestic pumps, each required to meet the peak hour demands of the service area. The station would also include a high flow pump to meet fire flow requirements. The pump station would include a backup power generator, alarms, and controls in accordance with OWD requirements. Pad elevations proposed to receive service from this zone range from 1,150 feet to 1,320 feet which results in static pressures ranging from 61 psi to 134 psi.

LEGEND

- PROJECT BOUNDARY
- PROPOSED WATER LINE 1296 ZONE
- EXISTING WATER LINE 1296 ZONE
- EXISTING 1100 ZONE
- PROPOSED WATER LINE 980 ZONE
- EXISTING WATER LINE 980 ZONE
- P2430 — OWD CIP NUMBER

NOTE: PIPES ARE RECOMMENDED AS 8-INCH UNLESS OTHERWISE NOTED.

SEE FIGURE 4-2 FOR CONTINUATION

PROPOSED 980 ZONE RESERVOIR P2576 (2.0 MG)

PROPOSED 1296 ZONE PUMP STATION P2002 (4,000 gpm)

PROCTOR VALLEY VILLAGE 14

20" P2430

20" P2181

16" P2576

12"

PROCTOR VALLEY ROAD

CONNECT TO EXISTING 36" LINE

N

SCALE: 1"=1400'

0 1400 FEET

FIGURE 4-1

VILLAGE 14 PROPOSED WATER SYSTEM

VILLAGE 14 AND PLANNING AREA 16/19

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LEGEND

- PROJECT BOUNDARY
- PROPOSED WATER LINE 1296 ZONE
- EXISTING WATER LINE 1296 ZONE
- PROPOSED WATER LINE 980 ZONE
- PROPOSED WATER LINE 1460 ZONE
- P2181 — OWD CIP NUMBER

NOTE: PIPES ARE RECOMMENDED AS 8-INCH UNLESS OTHERWISE NOTED.

N

SCALE: 1"=1000'

0 1000 FEET

CONNECT TO EXISTING 10" LINE

10"

12"

12"

MELODY RD.

8"

8"

20" P2181

20" P2181

CONNECT TO EXISTING 8" LINE

PROPOSED 1460 ZONE HYDROPNEUMATIC PUMP STATION

SEE FIGURE 4-1 FOR CONTINUATION

ROAD

VALLEY

PROCTOR

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FIGURE 4-2
PLANNING AREA 16/19 PROPOSED WATER SYSTEM
VILLAGE 14 AND PLANNING AREA 16/19