LOS ALAMOS
COMMUNITY SERVICES DISTRICT

WATER FACILITIES
PLANNING STUDY

FINAL
DECEMBER 28, 2011

PREPARED BY:
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LOS ALAMOS COMMUNITY SERVICES DISTRICT

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Executive Summary

This Water Facility Planning Study provides analysis of the existing facilities, identifies deficiencies and recommends improvements to the water system to benefit the Community of Los Alamos. The study area of this report includes all of the land within the present Los Alamos Community Services District (LACSD or District) boundary, and those areas within the Urban Boundary, which are not currently within the District boundary. The principal land use in the study area is residential with a core commercial area along Bell Street and a large industrial parcel on the northeast side of town. The Zoning and Land Use designations within the Community Plan Update (2011) are the foundation for the future development and build out of the town of Los Alamos.

WATER DEMAND

The population of the town of Los Alamos is expected to increase from the present population of 1,800 to 2,087 by the year 2015 (an annual increase of 3.0%). The annual water demand is expected to increase from 97 MG/year currently to 120 MG/year by the year 2015 and approximately 212 MG/year at build out. The average daily water use calculated for this study is 360 gallons for single-family units and 200 gallons for multi-family units and 90 gallons/1000 SF for commercial and industrial developments. The average daily demand for the Community in 2010 was 264,863 gallons. The system's maximum daily demand in 2010 was 553,000 gallons on July 15, compared to a 5-year study period maximum of 952,000 on July 19, 2007. The decrease in use directly reflects the effectiveness of the tiered monthly rate schedule the District implemented in February 2007. The maximum daily demand was maintained at 2.1 times the average annual daily demand for 2009 and 2010.

WATER SUPPLY

Ground water is presently the only drinking water source available to the LACSD. The existing operating system consists of three operating wells (Wells No. 3A, 4 and 5), one steel 200,000-gallon tank, one 500,000-gallon partially buried storage reservoir, one one-million gallon steel tank and a single pressure zone distribution network of water mains. The water quality from existing Wells No. 3A, 4 and 5 meets all national and state requirements. It is recommended that the District replace Well #4 and install a new production well in the coming 5-year study period (2011-2015). The District should allocate funds in the budget for the replacement of the existing asbestos-cement waterlines as they deteriorate.

WATER STORAGE

The existing water storage facilities total nearly 1.5 million gallons of storage. Although the existing steel 200,000-gallon reservoir needs to be epoxy coated, it provides back-up emergency water storage for the Community and should be maintained. The existing 500,000-gallon reservoir needs structural roof repair and the District should consider the possibility of replacing the 500,000-gallon reservoir within the next 10 years. The installation of a new 1 MG tank is recommended to offset the replacement of the 500,000-gallon tank and to provide for additional development through 2020. The District should allocate funds in the budget for 1/3 of the cost of the 1 MG tank as a replacement of the existing 500,000-gallon reservoir (353,402 gallon capacity).

RECOMMENDATIONS

1. Continue with the water use tiered rate schedule. This has significantly reduced overall consumption of water throughout the community.

2. Continue to replace the old existing water meters with the radio read meters. This will aid in the reduction of loss between production and sales and increase the efficiency of staff time to provide services to the growing community.

3. Construct new water well by 2015.

4. Construct replacement well for Well #4 by 2015.

5. Begin the design process to construct a new one million-gallon water storage tank by 2020.

6. Increase the developer's connection fees from $7,705 to $8,072. This will be consistent with the Community's build out infrastructure needs.

7. Evaluate current water user fees based on budget revenues and necessary expenses to promote a safe and efficient water system for the Los Alamos Community. Make the replacement cost (not book value) of deteriorating infrastructure a key budget factor.

CHAPTER 1

INTRODUCTION

Study Area

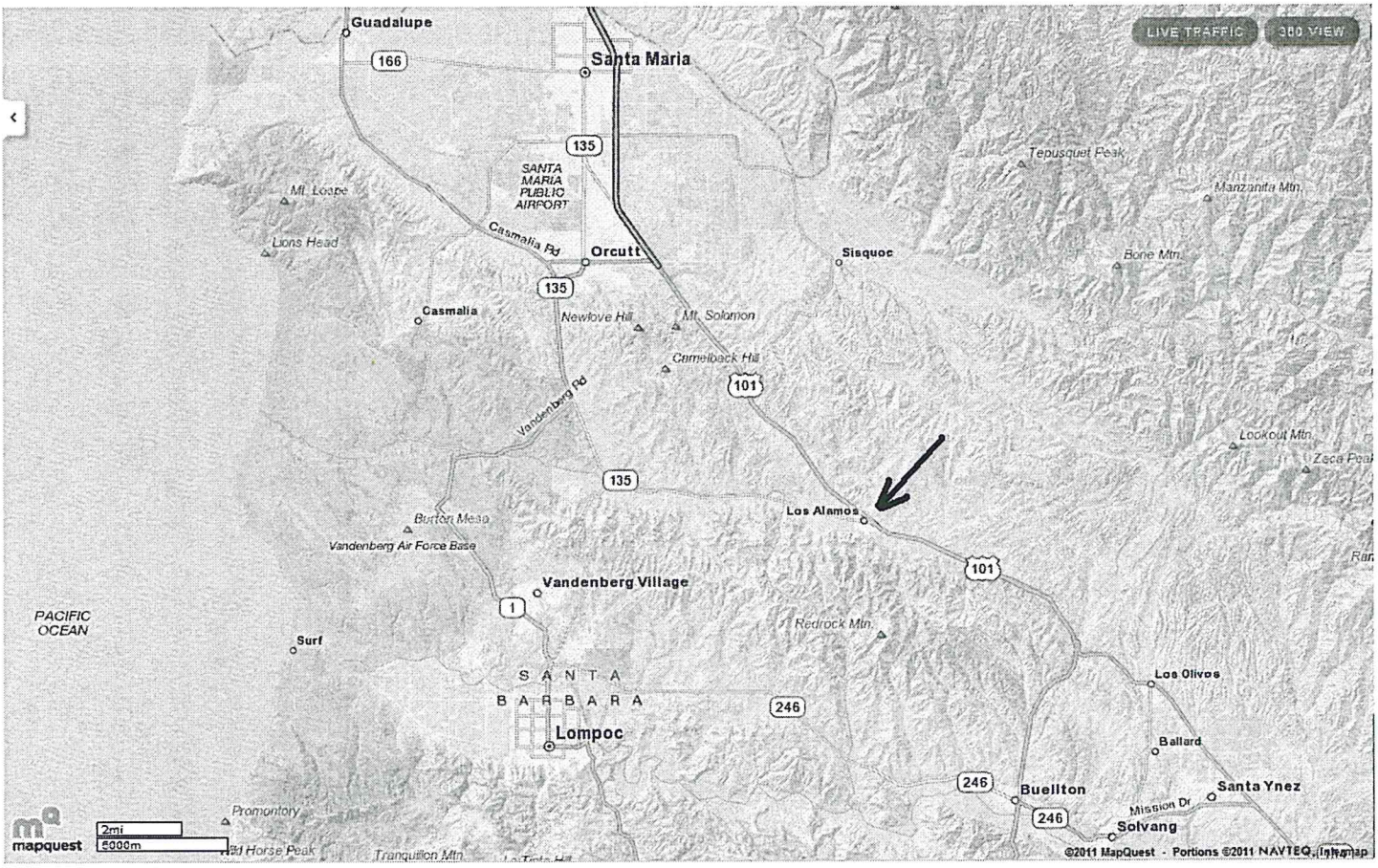
The town of Los Alamos is an unincorporated community located in west-central Santa Barbara County. Los Alamos is located off Highway 101 approximately 15 miles south of Santa Maria and 15 miles north of Buellton (Figure 1.1, page 2). U.S. Highway 101 passes through the community in a northwest to southeast direction and provides the principal connection between Los Alamos and Santa Maria to the north and the Santa Ynez Valley, Goleta and Santa Barbara to the south. State Route 135 is the main access corridor through downtown Los Alamos, connecting Los Alamos with agricultural lands, State Route 1 and Vandenberg Air Force Base to the west.

The Los Alamos Community Plan area is within the urban boundary line established when the Board of Supervisors adopted the Los Alamos Community Plan in 1994. The urban area includes the original Los Alamos town site established in 1879 and the larger lots, which were recorded as part of the town of Los Alamos in1881, located on both sides of Highway 101. The urban area also includes the Los Alamos Cemetery (established in 1888) and the Los Alamos Park (established in 1972).

The Los Alamos Community Services District (LACSD) provides wastewater collection and treatment service, water service, and owns and maintains Ferrini Park. Although the District boundary and the Urban boundary remain the same throughout most of the town, the District boundary does not include several large parcels located northeast of Highway 101. See Figure 1.2, page 4. A total of 16 parcels (22 potential residential units) are located outside of the District Boundary.

The area addressed by this study lies within the current boundaries of the Los Alamos Community Services District (LACSD) and the Urban Boundary defined by the Los Alamos Community Plan Update adopted February 2011.

Figure 1.1: Vicinity Map



History

The Los Alamos Community Services District (LACSD) was formed on October 29, 1956, under Division 4 of the Street and Highway Code for the purpose of providing water service to the Community of Los Alamos utilizing the 1915 Act for a special assessment district. Water service to the community began in 1958.

Current Events

The County of Santa Barbara Board of Supervisors adopted the Los Alamos Community Plan Update and the Form-Based Code and Bell Street Design Guidelines on February 15, 2011. The focus of the Community Plan Update is not to expand the Urban Boundary, but rather focus on urban infill and revitalization of the existing Los Alamos downtown. Santa Barbara County Land Use Element states, "The Community Plan establishes land use designations and zone districts and includes goals, policies, development standards and actions to guide future development."

The following is a list of Policy and Action items within the Los Alamos Community Plan Update that directly affect the build out of the town of Los Alamos and the approach to planning the water services provided to the community.

Residential

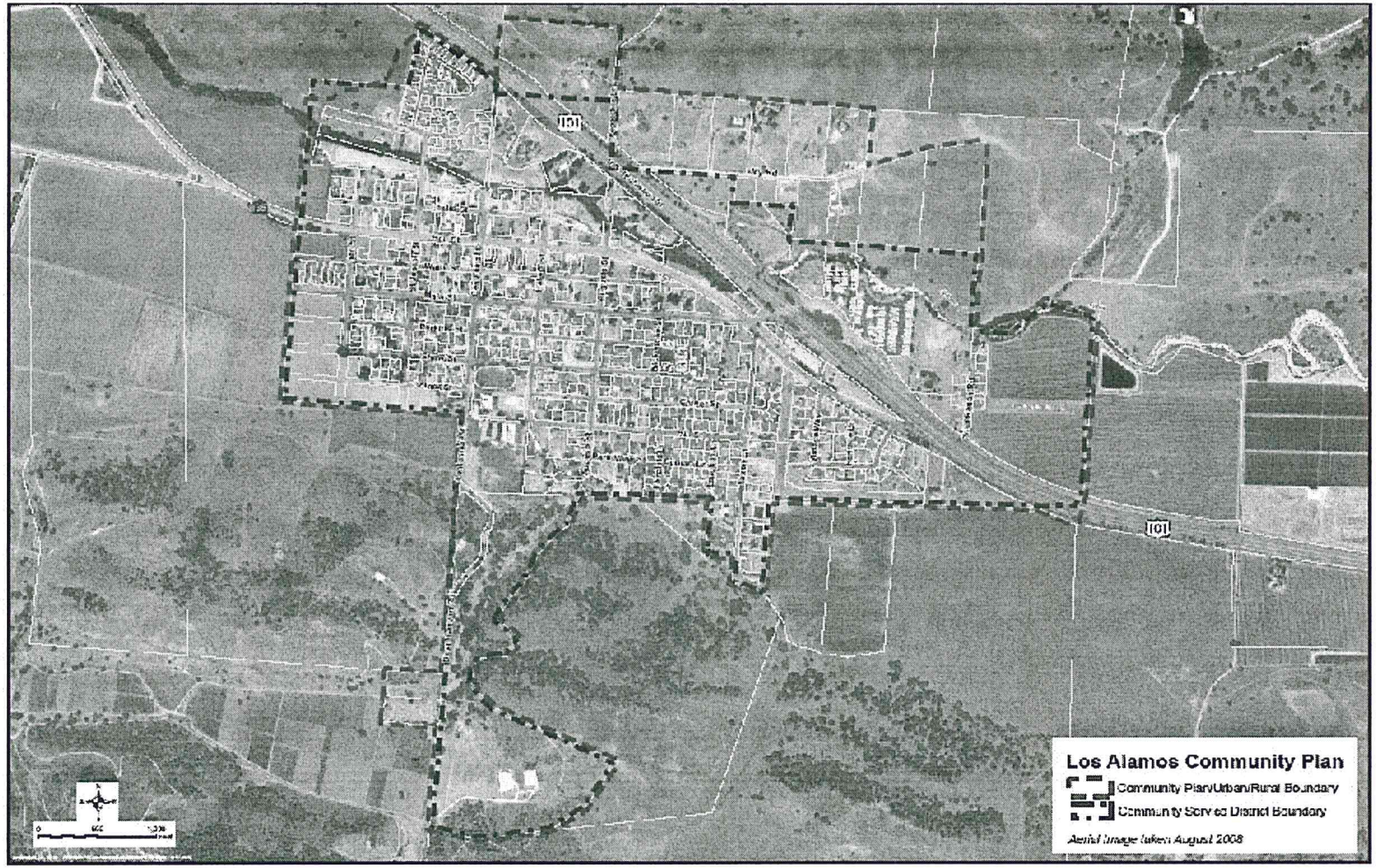
- Action LUR-LA-1.1.1: In order to allow greater flexibility for multi-family residential development, the County shall consider rezones to DR-12.3 for contiguous parcels in the 7-R-2 zone district along Leslie and Main Streets.
- Action LUR-LA-2.2.1: Residential Development located on the far western end of Bell Street, within the CM-LA zone, shall be set back at least 100 feet from parcels zoned for agriculture. If the residential development is part of a multi-parcel development concept or the project design demonstrates other adequate buffering, the agricultural buffer setback shall be established by Santa Barbara County Planning and Development during project design.
- Policy LUR-LA-3.1: In order to provide housing opportunities in addition to those in the CM-LA district, renovation of existing substandard units shall be encouraged.
- Policy LUR-LA-3.2: In order to provide housing opportunities, mixed use zoning shall be encouraged where it is compatible with commercial uses.

Commercial

- Policy LUC-LA-2.1: New commercial mixed-use development (both local and visitor-serving) shall be encouraged directly along the Bell Street corridor. Renovation and/or expansion of existing local-serving uses in this commercial core shall be encouraged.
- Policy LUC-LA-2.2: Residential uses in the CM-LA Zone District shall be allowed as a primary use, subject to the provisions of the Santa Barbara County Land Use and Development Code.

Items noted within the Los Alamos Community Plan Update that directly impact proposed build out are the new land use designations, the affordable housing overlay, Bell Street Commercial Core Design Overlay and the assumption that the Lucas and Lewellen winery project will be constructed as approved by the Santa Barbara County Planning Commission in 2008.

Figure 1.2: Urban Boundary Versus LACSD Boundary



New Land Use Designations

The changes in land use designations for specific locations are listed below and referenced by the subarea in which they occur. The subareas are taken directly from the Los Alamos Community Plan Update and are shown in Figure 1.3, page 8.

- Subarea 1: The Burtness parcel (A.P.N. 101-120-022) was rezoned from Highway Commercial (CH) to Retail Commercial (C-2). This change allows for flexibility to create commercial uses that are both compatible with highway traffic, yet provide commercial uses that compliment adjacent residential uses. This parcel is located within the Bell Street Design Control Overlay area, see Figure 1.4 on page 9.
- Subarea 2: No Change
- Subarea 3: No Change
- Subarea 4: The land use designation will remain General Commercial, however, the underlying zoning of C-2 has changed to CM-LA.
- Subarea 5: The Thompson parcel (A.P.N. 101-260-059) was rezoned from Residential (DR-8) to General Commercial (C-3) because of the parcel's proximity to Highway 101.
- Subarea 6: No Change
- Subarea 7: No Change
- Subarea 8: No Change
- Subarea 9: No Change

Affordable Housing Overlay

The Affordable Housing (AH) Overlay applies to properties located in the northwest portion of the Plan Area (see Figure 1.4, page 9). The AH overlay zone promotes affordable housing production and implements the policies of the Comprehensive General Plan Housing Element by providing development incentives. A residential project within the AH Overlay in Los Alamos is eligible for increased density up to 8 units per acre, providing that 30 percent of the units are affordable to households with very low income, or 50 percent of the units are affordable to a mix of very low, low and moderate incomes. Although the bonus densities for affordable housing are offered, the build out numbers for residential units within the Community Plan Update does not include potential density bonus units. The Plan states that the additional units are speculative in nature and believes that developers will not be able to utilize the bonus due to site constraints, project type or other reasons. However, the District has included the possibility of the affordable housing bonus density offer in the build out of Los Alamos. There is approximately six acres within the District that is offered this bonus density and is not currently under development. Build out of these six acres with the bonus density of 8 units/acres compared to the 4.6 units/acre will result in an increase of 20 residential units compared to the total number of units at build out in the Community Plan Update.

Downtown Commercial Rezone to Mixed Use

The new Community Mixed Use-Los Alamos (CM-LA) zone district and Form-Based Development Code replaces the C-2 zoning in downtown Los Alamos. The new Community Mixed Use-Los Alamos (CM-LA) zone district increases buildable area,

allows greater mixes of uses and relaxes permitting requirements and parking standards. The Form-Based Code removes zoning regulation barriers to development and encourages reinvestment in downtown Los Alamos. The Bell Street Design Guidelines adopted with the Community Plan Update in February 2011, map out regulatory requirements and provide step-by-step guidance for development along Bell Street, resulting in mixed-use developments with retail on the ground floor and residential units above and behind.

The build out of the community and the ability to provide water service to the community will be based on the Los Alamos Community Plan Update adopted on February 15, 2011. The Community Plan estimates 685 new residential units (288 units within the CM-LA zone), 451,480 SF of Commercial development and 98,035 SF of Light Industrial development.

Parcel 133-130-039 is the only parcel in Los Alamos with Light Industrial zoning. This parcel is the location of the Lucas and Lewellen winery project approved by the Santa Barbara County Planning Commission in 2008. Although the Los Alamos Community Plan defines their Goals, Policies and Development Standards for the Industrial land use to minimize the scale of any possible industrial project on this site through set backs, visibility constraints on packing and loading facilities and landscaping requirements, the maximum build out (335,412 SF of industrial space) for this parcel has been assumed for this study.

Authority and Scope

This study was undertaken on the authority between the Los Alamos Community Services District and Bethel Engineering. The Board voted to move forward with this study at the regularly scheduled Board Meeting on April 27, 2011. This study reviews the existing water facilities (production, storage and distribution), makes recommendations for improvements necessary within the 5-year planning period, as well as for build out of the town of Los Alamos per the Los Alamos Community Plan Update (Feb. 2011). The Connection Fee section of this study (Chapter 9) reviews the infrastructure necessary for build out of the Community and the estimated expense for this infrastructure. The estimated expense is used to calculate and make recommendations for connection fees for the next 5-year period.

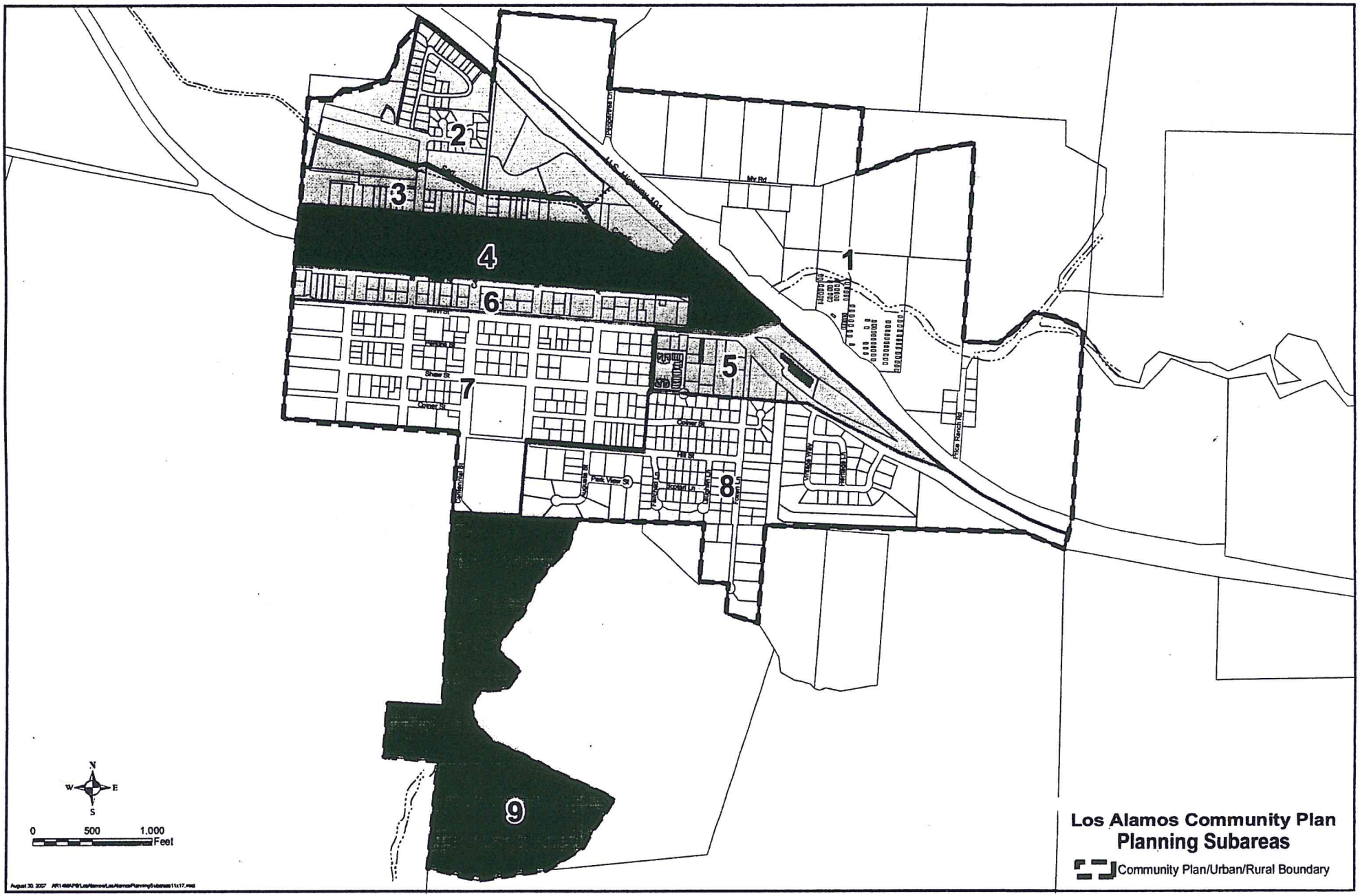
Abbreviations

The abbreviations used in this study are noted below.

AWWA	American Water Works Association
Bac-T	Bacteriological Test
CDPH	California Department of Public Health
EPA	Environmental Protection Agency
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
H.P.	horsepower

LACSD	Los Alamos Community Services District/District
MCL	Maximum Contaminant Level
MG	Million Gallons
mg/L	milligrams per liter
N.L.	not listed
psi	pounds per square inch
SF	square feet
SBCoFD	Santa Barbara County Fire Department
SFR	Single Family Residential
MFR	Multi-Family Residential
UPC	Uniform Plumbing Code

Figure 1.3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2
3
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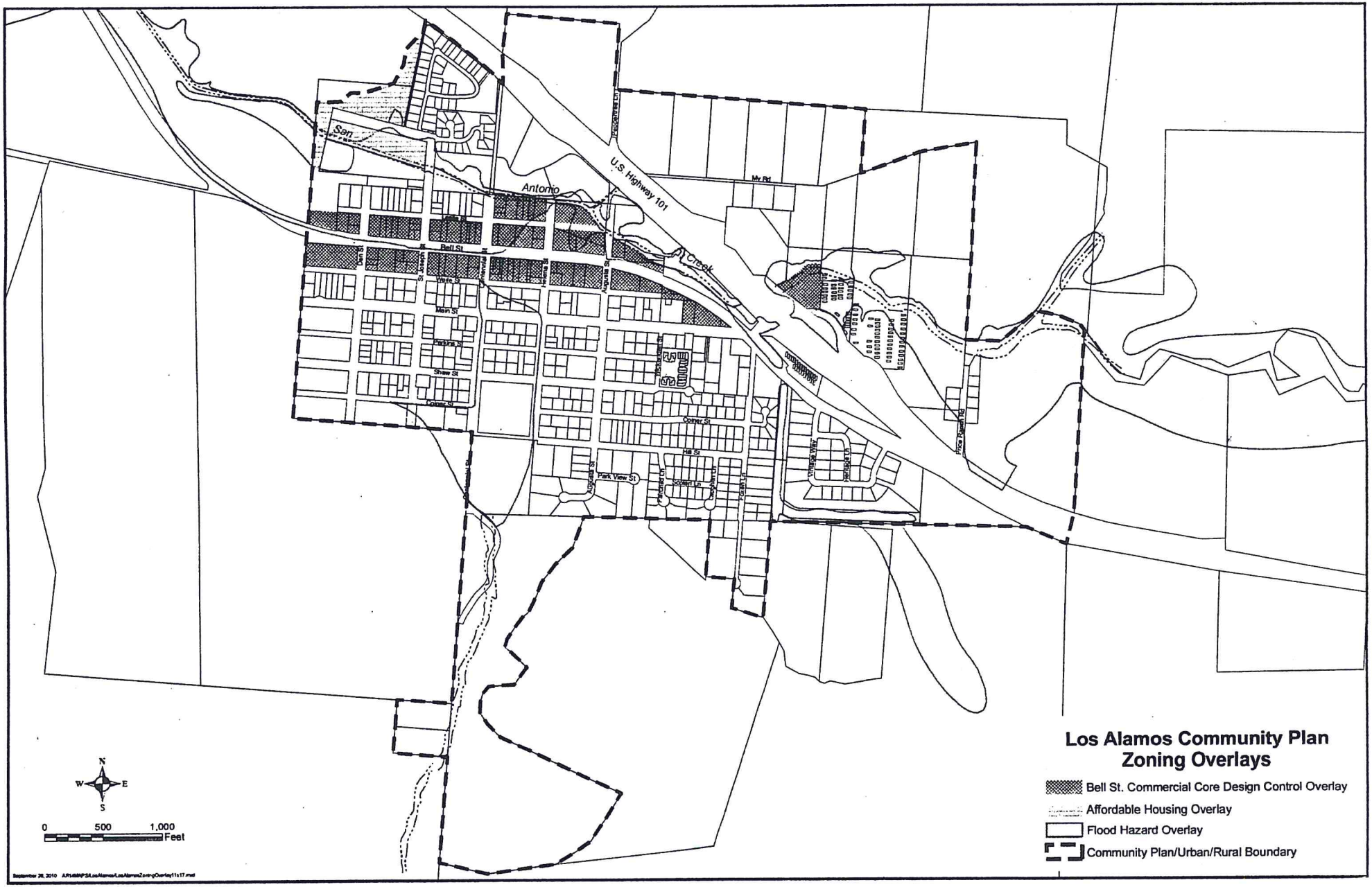
500
1,000
Feet
Los Alamos Community Plan
Planning Subareas
Community Plan/Urban/Rural Boundary

Figure 1.4


U.S. Highway 101
Antonio
Bell St
Main St
Shaw St
Coney St
Hill St
Park View St
Mt. Rd
Creek
Los Alamos Community Plan
Zoning Overlays
Bell St. Commercial Core Design Control Overlay
Affordable Housing Overlay
Flood Hazard Overlay
Community Plan/Urban/Rural Boundary
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CHAPTER 2

LAND USE AND POPULATION

Land Use

The County of Santa Barbara Board of Supervisors approved the Los Alamos Community Plan Update on February 15, 2011. As with the previous Community Plan (1994), the Community Plan Urban Boundary does not fully conform to the LACSD boundary (refer to Figure 1.2 on page 4).

Santa Barbara County has prepared the Community Plan Update (2011) and Bell Street Design Guidelines to encourage infill of the Bell Street corridor. The mixed-use zoning and new design guidelines provide the ability to develop a commercial property with a residential component. The zoning and land use designations within the Community Plan Update are the foundation for future development and build out of the town of Los Alamos.

Los Alamos has a majority of residential zoning surrounding the Bell Street Mixed Use (residential/commercial) and Commercial downtown. A large (23 acre) undeveloped parcel (133-130-039) exists on the southeast edge of the community and is zoned Light Industrial. In addition to the residential, commercial and light industrial zoning mentioned above, there are 16 large lots (3-5 acres each) zoned to accommodate up to 22 residential units located within the Urban Boundary, but outside the LACSD boundary. There are currently 10 residential units located in this area, which are served by on-site domestic wells. See Figure 2.1 on page 11 for the Zoning designations.

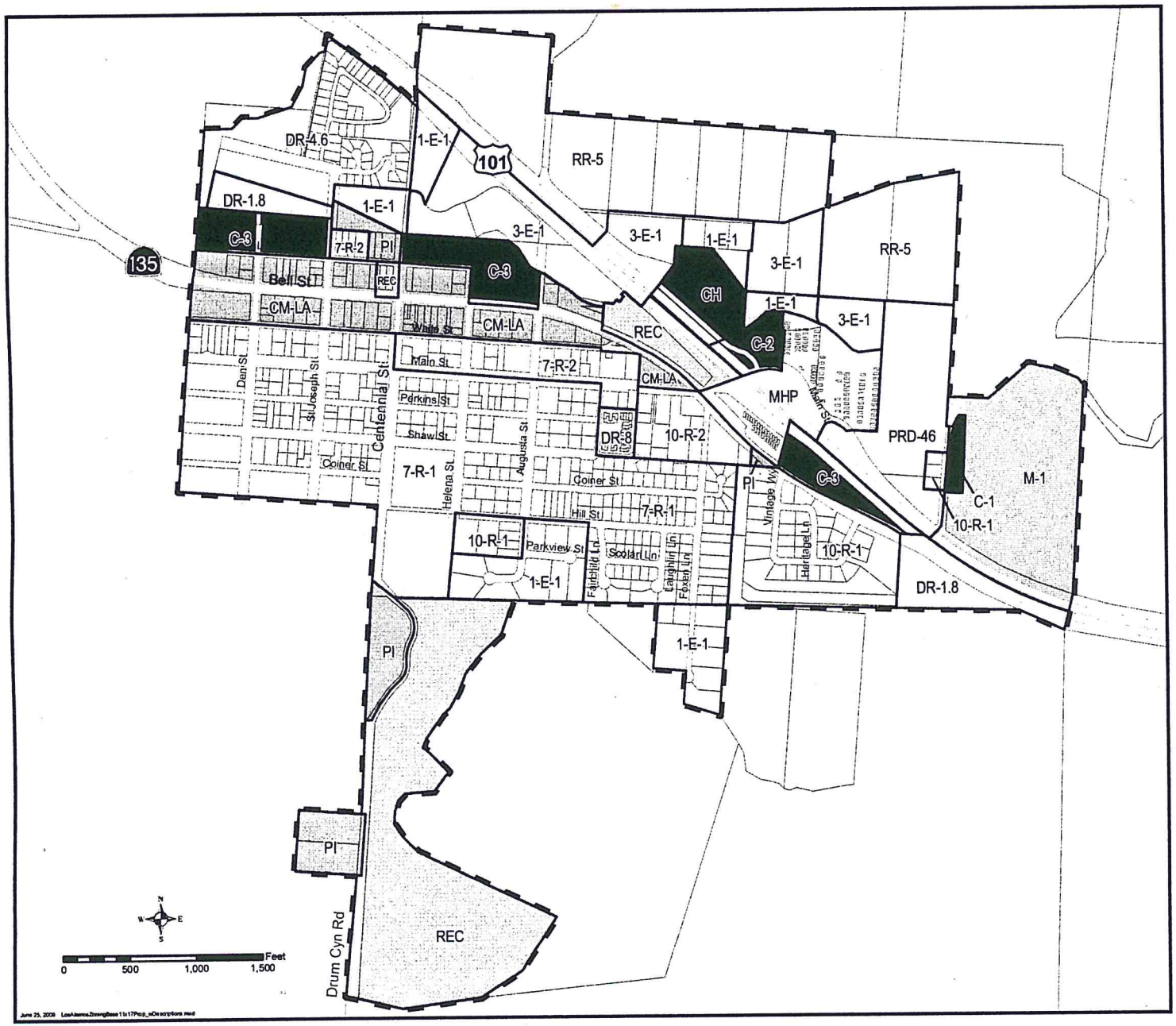
Calculations within this study for future number of residential units and commercial/industrial development are based on the Zoning designations per the Community Plan Update (2011) with the following adjustments.

- Build out of the six acres with the Affordable Housing Overlay will result in an increase of 20 residential units compared to the total number of units at build out in the Community Plan Update.

and

- Parcel 133-130-039 zoned Light Industrial could result in 335,412 SF of industrial development compared to the current Lucas and Lewellen project (98,035 SF) approved in 2008.

Figure 2.1



LOS ALAMOS COMMUNITY PLAN ZONING

RESIDENTIAL:

RR-5 Residential Ranchette, 5 Acre Minimum Lot Size

Single Family Residential:

3-E-1 3 Acres (Gross) Minimum Lot Size

1-E-1 1 Acre (Gross) Minimum Lot Size

10-R-1 10,000 Sq. Ft. (Net) Minimum Lot Size

7-R-1 7,000 Sq. Ft. (Net) Minimum Lot Size

Multiple Family Residential:

7-R-2 Two Family, 7,000 Sq. Ft. (Net) Minimum Lot Size

10-R-2 Two Family, 10,000 Sq. Ft. (Net) Minimum Lot Size

DR-1.8 Design Residential, 1.8 Units per Gross Acre

DR-4.6 Design Residential, 4.6 Units per Gross Acre

DR-8 Design Residential, 8 Units per Gross Acre

PRD-46 Planned Residential Development, 46 Units

MHP Mobile Home Park

COMMERCIAL:

C-1 Limited Commercial

C-2 Retail Commercial

C-3 General Commercial

CH Highway Commercial

PI Professional and Institutional

RESIDENTIAL/COMMERCIAL:

CM-LA Community Mixed Use - Los Alamos

INDUSTRIAL:

M-1 Light Industry

OPEN LAND USES:

REC Recreation

BOUNDARY LINES:

Zoning Boundary

Community Plan Boundary

Population/Housing

The population within the LACSD in 2000 was 1,372 per the 2000 California Census. The population estimate for Los Alamos in 2010 is 1,800. The 2010 census estimates a population of 1890 for the approximately 3.9 square mile Los Alamos area. However, because the District Boundary only encompasses approximately one square mile, but the majority of the population, the population served is estimated at 1800. Given the current Zoning and Land Use specified within the Los Alamos Community Plan Update (2011), the expected number of residential dwelling units at build out of the Urban Boundary will be 1341 (approximately 3,769 residents). Assumptions for the proposed build out number of residential units per the Community Plan (2011) are:

- Preservation of Historic Buildings.
- 17% of future residential development in commercial (CM-LA) zone based on permit trends and lot types.
- The number of ultimate residential units is reduced by 13 to account for 13 existing residential units assumed to be converted (redeveloped) at build out to commercial use. See total units at build out in Table 1 Community Plan Land Use and Build out Summary on page 25 of the Los Alamos Community Plan Update.
- Affordable Housing Overlay may not result in additional units due to site constraints, project type or other reasons. **The study discounts this assumption and includes an additional 20 units due to the Affordable Housing Overlay.**

There are a number of lots that are capable of supporting additional residential units, but due to the assumptions above are not included in the build out numbers. An example of this is the Olga Reed Elementary School Site. The Land Use designation for this site is RES-4.6/Educational. Therefore, the possibility exists that future redevelopment could construct residential dwellings on this site. However, it is assumed in the Community Plan, as well as within this study, that the school will remain in place.

The population and number of dwelling units has increased over the last four decades as shown in Table 2.1 on page 13 and is expected to continue to increase as new residential development continues to fill in the Urban Boundary limits.

TABLE 2.1: POPULATION AND HOUSING 1970-Build out

YEAR	LOS ALAMOS POPULATION	PERCENT CHANGE	ANNUAL GROWTH RATE	NUMBER OF HOUSING UNITS*	NUMBER OF NEW HOUSING UNITS	PERCENT CHANGE	ANNUAL RATE
1970	402	---	---	146	---	---	---
1980	723	80%	6.1%	269	123	84%	6.3%
1990	1,031	43%	3.6%	369	100	37%	3.2%
2000	1,372**	33%	2.9%	471	102	28%	2.5%
2010	1,800***	31%	2.8%	649	178	38%	3.3%
2015	2,087	16%	3.0%	752	103	16%	3.0%
Build Out	3,769	81%	3.0%	1,341****	589	78%	3.0%

*Included active and inactive water meters
**Per the 2000 California Census
***Adjusted from the US Census 2010, see Population/Housing on page 12
****Estimated Per Land Use and Zoning Designations in the Community Plan Update (2011)

The number of residential dwelling units is currently 649. The current population is estimated at 1,800.

There were 21 dwelling units completed between 2006 and 2010 (see Tables 2.3 & 2.4 on page 14). There are an additional 74 units proposed for development at this time (see Table 2.5 on page 15). It is assumed that 103 units (including the 74 in Table 2.5) will be completed in the next 5 years. Based on an annual rate of growth at 3%, residential build out of Los Alamos will take approximately 25 years (2035).

Table 2.2 below indicates commercial and industrial land use projections based on the current zoning within the Urban Boundary noted by the Los Alamos Community Plan Update 2011.

TABLE 2.2

COMMERCIAL AND LIGHT INDUSTRIAL 2010-Build Out

YEAR	COMMERCIAL (SF)	PERCENT INCREASE	LIGHT INDUSTRIAL (SF)	PERCENT INCREASE
2010	200,150	-----	0	----
2015	243,513	21.7*	0	----
2020	296,271	48.0*	100,000	----
BUILD OUT (2040)	651,630**	120*	335,412	----

*Annual percent increase assumed at 4.0%
**Includes Public/Institutional, Excludes Elementary School (48,365 SF)

TABLE 2.3

RESIDENTIAL PROJECTS COMPLETED 2006-2010

PROJECT NAME	DESCRIPTION (# of Units)	OCCUPIED (Date completed)
Aquiniga	1-SFD	2/28/07
598 Foxen Lane	3-SFD	2/28/07
Price Ranch Rd	4-SFD	4/19/07
Village Collection	4-SFD	5/23/07
Coss	1-SFD	10/31/07
Troyna	1-SFD	11/30/07
Jetstream Properties	4-SFD	6/15/08
McKee	1-SFD	8/29/08
TOTAL:	19-SFD	

TABLE 2.4

COMMERCIAL/INDUSTRIAL PROJECTS COMPLETED 2006-2010

PROJECT NAME	DESCRIPTION (# of SF)	OCCUPIED (Date completed)
Telles	Cabinet Shop/2-apt units (1704 s.f.)	1/27/09
The Station	Restaurant (3495 s.f.)	12/21/10
TOTAL:	2 units/5199 SF	

TABLE 2.5

PROJECTS IN PROCESS*

PROJECT NAME	DESCRIPTION (# of Units or SF of commercial)	STATUS
Creekside Village	40-SFD Units	Under Construction
742-762 Bell Street	15 Apartment Units	In Planning Process
535 Main Street	1-SFD Unit	In Planning Process
230/240 Den Street	15 Apartment Units	In Planning Process
9086 Highway 101*	3-SFD Units	In Planning Process
TOTAL:	74 Units	

Projects in process are based on current applications with the District for Service Availability

*Water service only (exempt from sewer service)

CHAPTER 3

PRESENT AND FUTURE WATER DEMANDS

Water Service Area

The District is authorized to provide water service within the LACSD boundary. However, under special circumstances, the District could provide water service outside the District Boundary with an out of agency service agreement reviewed and approved by the LACSD Board of Directors if it has adequate water available to meet the demands. All water connections are on a first come-first serve basis. The physical constraint for this study is the Los Alamos Community Plan Urban/Rural Boundary in Figure 1.2, page 4.

Present Water Demand

Urban water use includes residential (single-family and multi-family), commercial, institutional, industrial and landscape irrigation. The average water demand for single-family residential dwelling units was calculated based on the 2006-2010 average daily demand for single-family units from the Public Water System Statistics data sheet divided by the number of single-family water meters. The average water demand for multi-family residential dwelling units was calculated based on the 2006-2010 average daily demand for multi-family units from the Public Water System Statistics data sheet divided by the number of multi-family units. See Table 3.3 on page 18 and Table 3.4 on page 19. The water demand for commercial, institutional and industrial land uses is calculated from the metered water demand for commercial, institutional and industrial properties divided by the existing square footage of developed commercial, institutional and industrial buildings as quantified by the Los Alamos Community Plan Update. The estimate for industrial demand is included with commercial and institutional because there is no industrial development within the District Boundary at this time to use as a demand reference. Landscape irrigation, assembly halls, churches and bulk water uses from fire hydrants total approximately an additional 25% of water use in the Community. The majority of the water demand is from landscape irrigation. Thus, landscape irrigation has been added to water demand calculations as a separate line item and estimated based on 25% of the cumulative total of commercial/institutional, industrial and residential demand.

The Los Alamos Community Services District initiated a tiered monthly rate schedule in February 2007 for water use in an effort to promote water conservation throughout the Community. Based on water production and demand data, the tiered monthly rate schedule has noticeably decreased the water use throughout town. Present water production and demand data show a net production in 2010 of 96,675,000 gallons and metered water total of 89,646,312 gallons. The produced and metered water totals in 2006 were 110,546,000 gallons and 106,793,456 gallons respectively. Although there was an increase in water production and use in 2007, there is an overall decrease in use of approximately 16% over the last 5-years (study period 2006-2010). See metered water

demand decrease calculation on this page. See Tables 3.1, 3.2, 3.3 and 3.4 on pages 17 through 19 for historical water use data.

METERED WATER DEMAND DECREASE

106,793,456 gallons (2006 metered water)
-89,646,312 gallons (2010 metered water)
17,147,144 gallons (decrease of 16% in metered water demand during study period 2006 to 2010)

Water production compared to metered water (sold) for 2010 shows a loss of 7%. This is an acceptable rate and well below the 12-15% loss accepted as an industry standard.

TABLE 3.1

WATER USE TREND 2006-2010

YEAR	AVERAGE DAILY DEMAND (gpd)	MAXIMUM DAILY DEMAND (gpd)	PEAKING FACTOR	METERED CONNECTIONS
2006	302,866	831,000 (July 23)	2.7	587
2007	322,688	952,000 (July 19)	2.9	526
2008	317,912	815,000 (June 23)	2.6	545
2009	304,225	645,000 (Aug 9)	2.1	547
2010	264,863	553,000 (July 15)	2.1	543

TABLE 3.2

MONTHLY AND ANNUAL AVERAGE WATER PRODUCTION

	2006	2007	2008	2009	2010
January	5,573,000	6,422,000	4,523,000	5,442,000	4,681,000
February	6,607,000	5,176,000	4,348,000	4,318,000	3,780,000
March	4,720,000	7,327,000	8,606,000	5,006,000	5,576,000
April	4,828,000	9,116,000	11,387,000	9,569,000	6,156,000
May	9,658,000	12,537,000	12,086,000	12,843,000	9,142,000
June	13,109,400	13,867,000	12,635,000	12,353,000	12,488,000
July	15,603,000	14,618,000	12,963,000	13,750,000	12,238,000
August	13,930,000	13,587,000	13,575,000	13,873,000	11,630,000
September	12,652,000	11,465,000	12,351,000	12,126,000	10,745,000
October	9,171,000	9,613,000	10,769,000	8,631,000	8,002,000
November	8,834,000	8,270,000	7,843,000	7,892,000	6,763,000
December	5,861,000	5,783,000	4,952,000	5,239,000	5,474,000
Annual Average	110,546,000	117,781,000	116,038,000	111,042,000	96,675,000

TABLE 3.3

WATER USE FOR SINGLE-FAMILY DWELLING UNITS

	Annual Water Use (CF)	Average Water Use (GPD)	Average Water Use (GPD)/Unit	Metered Connections
2006	8541300	175050	352	498*
2007	8790900	180165	388	464*
2008	8708400	178474	378	472*
2009	8302300	170152	361	471*
2010	7121800	145958	311	469*

Table data from Public Water System Statistics supplied by District
*Inactive meters on vacant lots, not included.

SINGLE-FAMILY DWELLING UNITS

Average Daily Demand $= \frac{352+388+378+361+311}{5}$

$= \frac{1790}{5}$

= 358 gpd/unit **USE 360 gpd/unit**

TABLE 3.4

WATER USE FOR MULTI-FAMILY DWELLING UNITS

YEAR	Annual Water Use (CF)	Average Water Use (GPD)	Average Water Use (GPD)/Unit	Number of Units
2006	1760600	36083	209	173
2007	1587900	32543	188	173
2008	1473100	30190	175	173
2009	1483300	30400	176	173
2010	1600900	32810	190	173

Table data from Public Water System Statistics supplied by District

MULTI-FAMILY DWELLING UNITS

Average Daily Demand $= \frac{209+188+175+176+190}{5}$

$= \frac{938}{5}$

= 188 gpd/unit **USE 200 gpd/unit**

TABLE 3.5

WATER USE FOR COMMERCIAL & INDUSTRIAL LAND USES

YEAR	Annual Water Use (CF)	Average Water Use (GPD)	Average Water Use (GPD)/1000 SF
2006	1654500	33908	136
2007	864600	17720	71
2008	1042900	21374	86
2009	1064800	21823	88
2010	810100	16603	67

Table data from Public Water System Statistics supplied by District

COMMERCIAL/INDUSTRIAL LAND USES

Average Daily Demand $= \frac{136+71+86+88+67}{5}$

$= \frac{448}{5}$

= 90 gpd/1000 SF

Future Water Demand

The future water demand is based on the projected development (residential, commercial and industrial) per the current zoning in the 2011 Los Alamos Community Plan Update. The existing split between single-family units and multi-family units is approximately 75% to 25%. However, the 2011 Los Alamos Community Plan Update proposes that build out will result in a near 50%/50% split of the single-family and multi-family units. The water demand calculations below use the 75%/25% residential split to estimate the next 5-year demands, a 70%/30% residential split for estimated 2020 (10-year) projections and a residential 50%/50% split for the projected build out demand. The maximum day demand was calculated by multiplying the average daily demand by a peaking factor of 2.1 as estimated from historical data (see Table 3.1 on page 17). Total projected average and maximum day demands are shown in Table 3.8, page 21.

TABLE 3.6

PROJECTED RESIDENTIAL WATER DEMAND

YEAR	POPULATION *	RESIDENTIAL DWELLING UNITS	SINGLE FAMILY UNITS**	MULTI-FAMILY UNITS***	AVERAGE (gpd)	ANNUAL (MG)
2011	1854	668	501	167	213,760	78.0
2012	1909	689	517	172	220,520	80.5
2013	1967	709	532	177	226,920	82.8
2014	2026	730	548	182	233,680	85.3
2015	2087	752	564	188	240,640	87.8
2020	2419	872	610	262	272,000	99.3
Build Out	3769	1341	671	670	375,560	137.1

*3.0% Annual Growth Rate

**75% of Dwelling Units through 2015, 70% of Dwelling Units in 2020 and 50% of Dwelling Units at Build Out.

***25% of Dwelling Units through 2015, 30% of Dwelling Units in 2020 and 50% of Dwelling Units at Build Out.

TABLE 3.7

PROJECTED COMMERCIAL & INDUSTRIAL WATER DEMAND

YEAR	COMMERCIAL (SF)	LIGHT INDUSTRIAL (SF)	AVERAGE (gpd)	ANNUAL (MG)
2011	208,156	0	18,734	6.8
2012	216,482	0	19,483	7.1
2013	225,142	0	20,263	7.4
2014	234,147	0	21,073	7.7
2015	243,513	0	21,916	8.0
2020	296,271	100,000	35,664	13.0
Build Out	651,630	335,412	88,834	32.4

TABLE 3.8

PROJECTED WATER DEMAND TOTALS

YEAR	COMMERCIAL & INDUSTRIAL AVERAGE (gpd)	RESIDENTIAL AVERAGE (gpd)	LANDSCAPE IRRIGATION AVERAGE (gpd)	TOTAL AVERAGE (gpd)	MAXIMUM DAILY DEMAND (gpd x 2.1)	ANNUAL DEMAND (MG)
2011	18,734	213,760	58,750	290,618	610,297	106.1
2012	19,483	220,520	60,640	300,004	630,008	109.5
2013	20,263	226,920	62,450	308,979	648,855	112.8
2014	21,073	233,680	64,350	318,441	668,727	116.2
2015	21,916	240,640	66,344	328,195	689,210	119.8
2020	35,664	272,000	76,946	384,580	807,618	140.4
Build Out	88,834	375,560	116,099	580,493	1,219,035	211.9

CHAPTER 4

EXISTING SOURCES OF WATER SUPPLY

Groundwater

The San Antonio Groundwater Basin is the only existing source of water supply for LACSD. The District currently operates three wells, #3A, #4 and #5.

Basin Description

The San Antonio Groundwater Basin underlies the entire District and yields water to the District wells. The 110 square mile basin is a narrow wedge-shaped trough (the Los Alamos syncline) that collects runoff from the Solomon-Casmalia Hills to the north, the Purisima Hills to the south, the Burton Mesa Hills to the west and the westernmost flank of the San Rafael Mountains to the east. Average annual rainfall within the basin ranges from 15 to 19 inches. Los Alamos is located in the upper one-third of the basin. The groundwater resource tributary area available to LACSD comprises about 50 sq. miles of the watershed.

Groundwater Occurrence and Movement

Ground and surface water move south and north from the Solomon and Purisima Hills, respectively, towards the center of the valley, then westerly where the water is eventually discharged to the ocean. There is no evidence of salt-water intrusion into the aquifer.

Groundwater occurs as perched groundwater in the younger alluvial materials in the valley. The alluvium is locally permeable and yields minor quantities of water to shallow wells. Specific capacities (yield/foot of draw down) in these shallow wells are as high as 13 gpm/ft, but they produce limited quantities of water due to the limited thickness of the deposits.

The LACSD wells penetrate into the Paso Robles formation, which underlies the alluvium. This formation is the major aquifer in the Los Alamos area. It is characterized by lenses of gravel, sand, silt, and clay. High yields can be obtained from wells that penetrate many of the course-grain (gravel and sand) lenses. Bedding planes south of the axis of the Los Alamos syncline are nearly vertical or inverted. Deep wells in this area would obtain little recharge, and would be expected to be poor producers. Wells north of the axis, in the vicinity of San Antonio Creek, can be expected to produce high yields. The existing LACSD wells are in the higher producing area.

The period from 1991-2001 brought a higher than average amount of precipitation to the local area, recharging the local basins. However, 2002 and 2004 were extremely dry years and 2003 had an average rainfall. Slight to moderate overdrafts exist in the San Antonio Groundwater Basin. The town of Los Alamos uses approximately 1% of the water extracted from the San Antonio Groundwater Basin. Agricultural use consists of approximately 80%.

Water Rights

Present groundwater extractions through wells conform to correlative rights. This means that LACSD, as an overlying landowner, has the right to extract groundwater from the basin and use it for reasonable beneficial uses on overlying land. There is no priority system among overlying users, regardless when use begins. Overlying users have priority over appropriators taking water out of the basin.

Water Production

The District has three water supply wells. Well #3A, #4 and #5. The aquifer and pumping equipment at well #3A (completed in December 2010) is capable of supplying 430 gpm. Well #4 is capable of supplying 220 gpm. Well #5 is capable of supplying 750 gpm to the system.

Water Quality

Drinking Water Regulation

The quality of drinking water is regulated by both State and Federal agencies. With the passage of the Safe Drinking Water Act (P.L. 93-523) in 1974, congress authorized the United States Environmental Protection Agency (EPA) to develop national regulations to control drinking water contaminants that may have an adverse effect on health or which may adversely affect the overall aesthetics of the water. The general approach of regulatory agencies has been to mandate standards on health-related contaminants and recommend goals on aesthetic parameters. As a more complete knowledge of the health effects develops, parameters originally judged to be of aesthetic interest may be changed to health-related standards.

The EPA has established National Primary Drinking Water Regulations, which specify maximum contaminant levels (MCLs) for a variety of inorganic chemical and physical, microbiological and radioactive contaminants. These primary standards, which have been in effect since June 25, 1977, are designed to protect the public health and are applicable to all drinking water suppliers who regularly service at least 25 individuals daily, or who provide at least 15 service connections.

On July 19, 1979, the EPA circulated the National Secondary Drinking Water Regulations. These regulations, which became effective on January 19, 1991, specify maximum contaminant levels for those substances that are not hazardous to health, but may cause taste, odor, color, staining, or other conditions that adversely affect the aesthetics of the drinking water. The major difference between the Primary and Secondary Regulations is that the Secondary Regulations are unenforceable at the Federal level. They have been issued only as State guidelines. However, a state may adopt some or all of the Secondary Regulations as part of its drinking water program, thus making these regulations enforceable within the State.

The California Department of Public Health (CDPH) has been delegated primary enforcement power for both the National Primary and Secondary Drinking Water

Regulations. This agency has opted, with few exceptions, to retain the same MCLs as the EPA.

Table 4.1, page 25, presents drinking water standards as published by the EPA and CDPH. The State regulations apply to all suppliers of water for domestic use within California. When a supplier provides water that fails to comply with the water quality standards, the CDPH may elect to notify the supplier that all costumers must receive written notification that the quality of water fails to comply with the Department's standards, requirements, or other conditions. Comments by the Department on the dangers of noncompliance may also be required in public notices. Failure to comply with such public notice constitutes a misdemeanor. If, after 90 days following the notification, the water quality standards are not met, the CDPH may present a claim to the Superior Court to require the supplier to demonstrate that the water does comply with the standards or that the supplier has a reasonable plan of action for achieving compliance. If this is not established, a cease and desist order will be issued to prevent any new service connections until the required standards are met.

Groundwater Quality

The mineral quality of the groundwater in the San Antonio Groundwater Basin underlying LACSD is generally acceptable for domestic uses. Groundwater extracted from different wells in the basin, and at different times, does vary in chemical character and mineral concentrations. This is due to a mixing in the wells of water from different aquifers penetrated by the wells and is normal. A steady increase of concentration of a particular element over a period of time is indicative of contamination to the aquifer. Of particular concern is the concentration of the nitrate ion (NO_3).

Table 4.2, page 26, shows water analyses for Wells #3A, #4 and #5. Mineral, physical and trace element analyses for Wells #3A, #4 and #5 are within the allowed limits.

TABLE 4.1

DRINKING WATER STANDARDS

Constituent	EPA Limit (mg/L)	CDPH Title 22 Limit (mg/L)
Inorganics		
Aluminum	0.05 – 2	0.2
Antimony	0.006	0.006
Arsenic	0.010	0.05
Asbestos	7 MFL	7MFL
Barium	2	1
Beryllium	0.004	0.004
Cadmium	0.0005	0.005
Chloride	250	
Chromium	0.1	0.05
Color	15	
Copper	1.0	1.3
Cyanide	0.2	0.15
Flouride	4.0	2
Iron	0.3	
Lead	0.015	0.015
Manganese	0.05	
Mercury	0.002	0.002
Nickel	Remanded	0.1
Nitrate	(as N) 10	(as NO_3) 45
Nitrite (as N)	1	1
Odor	3	
pH	6.5-8.5	
Selenium	0.05	0.05
Silver	0.10	
Sulfate	250	
Thallium	0.002	0.002
Total Dissolved Solids	500	
Total Nitrate/Nitrite (as N)	10	10
Zinc	5	
Radionuclides		
Gross Alpha particle activity	15 pCi/L	15 pCi/L

TABLE 4.2

WATER ANALYSES FOR WELLS #3A, #4 AND #5

Constituent	Well #3A (mg/L)	Well #4 (mg/L)	Well #5 (mg/L)
Inorganic Analysis			
Aluminum	40	ND	ND
Antimony	ND	ND	ND
Arsenic	4	0.003	0.003
Barium	23.7	ND	ND
Beryllium	ND	ND	ND
Cadmium	1.3	0.001	0.002
Chromium	ND	ND	ND
Copper	ND	ND	ND
Cyanide	ND	ND	ND
Iron	190	ND	ND
Lead	1.2	ND	ND
Manganese	10	ND	0.04
Mercury	ND	ND	ND
Nickel	2	ND	0.04
Nitrite (as N)	1.9	ND	ND
Selenium	5	0.005	ND
Silver	ND	ND	ND
Thallium	ND	ND	ND
Zinc	ND	0.05	0.28
General Mineral Analysis			
Total Dissolved Solids	450	399	590
Specific Conductance	683	582	889
Total Hardness (as CaCO3)	219	188	320
Bicarbonate	100	75	155
Carbonate	ND	ND	ND
Hydroxide	ND	ND	ND
Alkalinity (as CaCO3)	80	75	155
Calcium	53	44.2	72.5
Magnesium	21	18.9	33.8
Sodium	47	46.9	69.5
Potassium	3	2.6	3.2
Chloride	75	66	80
Nitrate (as NO3)	8.6	2.8	9.2
Sulfate	158	91.8	183
Flouride	0.2	0.2	0.1
pH	6.4	6.2	6.4
MBAS	ND	ND	ND
Color	ND	ND	ND

Constituent	Well #3A (mg/L)	Well #4 (mg/L)	Well #5 (mg/L)
Odor Threshold	ND	ND	ND
Lab Turbidity	2.1	ND	ND

ND = Non-Detected

For additional information on water quality contact the Los Alamos Community Services District Office at 344-4195.

CHAPTER 5

EXISTING PUBLIC WATER SYSTEM

Existing Facilities

The water system consists of production, distribution, and storage facilities. This system includes three wells, three reservoirs, distribution pipelines, disinfection using sodium hypochlorite, liquid sodium hydroxide for corrosion control and a SCADA (Supervisory Control and Data Acquisition) system.

Production Facilities
LACSD owns three operating wells within the District boundaries. Wells #3A, #4 and #5 are the District's production wells. For information on the San Antonio Groundwater Basin and water quality, see Chapter 4 on page 22.

Well #3 was drilled in August 1978. Over the course of the last few years, Well #3 lacked the desired production levels for the District due to a worn casing. The District completed the installation of Well #3A in December 2010, which is approximately 25 feet from Well #3. The close proximity to Well #3 was designed such that Well #3A could tie directly into the distribution lines through the existing building, saving on additional infrastructure. The installation of well #3A also included the addition of SCADA and a variable frequency drive (VFD). Well #3A is 500' deep, 12" diameter PVC casing and currently produces 430 gpm.

Well #4 was drilled in July 1988. In July 2008, Well #4 was slip-lined and had a variable frequency drive motor (VFD) and SCADA installed. Well #4 currently produces 220 gpm. The District anticipates replacing Well #4 in the near future as it reaches its expected design life (25 years). Unfortunately this site does not offer the same ability to install a new well and use the existing infrastructure to tie into the distribution system as Well #3. A new well site will be required.

Well #5 was completed in July 2007. Well #5 is located across Gonzalez Drive from Creekside Village. The installation of well #5 also included the addition of SCADA and a variable frequency drive (VFD). The well is approximately 1000' deep, 12" diameter stainless steel casing and currently produces 750 gpm.

Storage Reservoirs
Three reservoirs located in the hills west of the District provide storage and pressure for the water distribution system. There is a 200,000-gallon welded steel tank that was constructed in 1958 and refurbished in 1994 by having the interior recoated. It was placed into service as an emergency backup to provide adequate fire flows. Due to the lower high water elevation of the 200,000-gallon tank compared to the other two reservoirs, this tank can only be used by manually operating the valve. This emergency storage tank is operated once a week to maintain the quality of the water.

The 500,000-gallon reservoir is an underground concrete reservoir connected to the distribution system by a 12-inch distribution main. The roofing material was replaced in 1995 and eight dormer vents were installed to aid with the ventilation. The District has also repaired the joints in the concrete reservoir in response to leaks. In 2004, the District discussed having the reservoir lining replaced and possible structural replacement of the wood roof. In addition, the rebar is beginning to pop through the concrete on the interior of the reservoir. The District has opted to not repair these items and focus on a replacement tank for the future. It is assumed in this study that the reservoir will remain in tact through the next 5 year period, but will likely need replaced in the following 5-year period (2016-2020).

A 1-million gallon welded steel tank was constructed in 2004 next to the 500,000-gallon reservoir. The site for the tank was graded to provide for an additional future 1-million gallon tank. The high water elevations for the existing and proposed 1 MG welded steel tanks are lower than the high water elevation for the underground reservoir, thus sacrificing some volume in the 500,000-gallon reservoir.

TABLE 5.1

EXISTING RESERVOIR DATA

RESERVOIR	MATERIAL	ACTUAL CAPACITY
200,000 gal.	Welded Steel	177,025 gal.
500,000 gal.	Concrete	353,402 gal.
1 MG	Welded Steel	916,353 gal.
TOTAL:		1,446,780 gal.

Distribution System

The distribution system throughout Los Alamos is comprised of 6 and 8-inch diameter distribution mains. The original distribution mains are asbestos-cement piping with PVC piping being installed since the 1980's. At this time, all future mains installed will be PVC. A 12-inch transmission main connects the one-million-gallon, 500,000-gallon and 200,000-gallon reservoirs to the distribution system near the turnout to the 200,000-gallon tank by the park. Wells #3A, #4 and #5 are connected to the distribution system within the 6 and 8-inch diameter distribution mains that lead to the 12" diameter transmission main with one pressure zone.

A bypass line and valves were installed in May 2009 at the junction of the 12" transmission main and the 8" distribution mains heading north and east into town from the tanks to provide the ability to serve the town with the 200,000-gallon tank during maintenance operations on the larger tanks.

The existing water system is capable of providing required fire flows and pressures in addition to providing safe, potable water for domestic and other uses. According to the fire hydrant tests performed by the District, the static water pressure is approximately 70-

75 psi throughout town depending on the level of the water in the reservoir. The Uniform Plumbing Code (UPC) requires that water system pressure should not exceed 80 psi. A pressure-reducing valve would be required on a service that exceeds 80 psi. Pressure should not drop below 30 psi during average demand. For additional information on fire flow and system pressure requirements, see pages 34 and 35 of Chapter 6.

CHAPTER 6

DESIGN CRITERIA

Design Criteria

A system of design criteria must be established to help determine which portions of the existing system are adequate, and to help identify system deficiencies. The design criteria details the planning goals for the water system, defining the level of service and reliability that should be expected of a modern and efficiently run water system.

LACSD treats water supply and storage as separate and distinct entities throughout the calculations within this study, as a conservative effort to provide a reliable source of water to the Community. However, all of LACSD's water supply comes from the groundwater basin, itself a large reservoir, therefore the two system components, supply and storage, are closely interrelated as long as a power supply source is available. The District maintains generators to run the well pumps for this purpose.

Supply and Production

The Water System Design Criteria for the LACSD water supply is to maintain the maximum day demand for the Community from diverse and reliable resources. The expectation is that two wells could be out of service simultaneously (maintenance, equipment failure, etc.).

The three existing wells #3A, #4 and #5 currently produce 430 gpm, 220 gpm and 750 gpm, respectively. If two of the existing (best production) wells are out of service (#3A and #5), the District can produce 220 gpm, making it impossible to provide for the District's current maximum day demand of 553,000 gallons. This situation would be consistent with an emergency and the District's Emergency Notification Plan should be followed to reduce consumption. The construction of a new water supply well should be completed as soon as funds are available to provide the maximum day demand from diverse and reliable resources per the LACSD Water System Design Standards. Emergency and fire flow water is currently available in the District's water storage tanks.

Storage

Water storage requirements are evaluated based on the following:

1. Operational Storage
2. Fire Storage
3. Emergency Storage

Operational Storage

The operational storage for the District is calculated based on storing 75% of the maximum daily demand. The District's production pumps are set to come on during off-

peak hours, unless the Community uses more than the operational storage volume of water. The current settings will begin to pump water to the storage tanks during partial peak hours and peak hours only an estimated 45 days out of the year, mostly being within the partial peak hours. (See hour details below.) This is an acceptable exchange for the cost of increased storage that would be required to maintain the District's daily demand 100% of the year (maximum day demand, MDD, of 553,000 gallons) within the off-peak hours. It is assumed in this report that the operational capacity will remain at 75% of the maximum day demand throughout build out.

Period A – Summer (May 1 – Oct. 31, Monday – Friday only*)	
Off-Peak	9:30 p.m. – 8:30 a.m.
Partial-Peak	8 a.m. – noon, 6 p.m. – 9:30 p.m.
Peak	noon – 6 p.m.

Period B – Winter (Nov. 1 – April 30, Monday – Friday only*)	
Off-Peak	9:30 p.m. – 8:30 a.m.
Partial-Peak	8:30 a.m. – 9:30 p.m.

* Saturdays, Sundays and Holidays are considered off-peak.

The daily operation of the system utilizes the stored water during the daytime hours and pumps water in the off-peak hours (9:30-p.m. to 8:30 a.m.) to maintain economic efficiency. The current setting for the well pumps to kick on is 9:40 p.m. and pump until the tanks are full. The District generally runs the pumps on all of the wells for 6-8 hours (frequency of the pumps are adjusted accordingly) in the off-peak hours to fill the tanks. However, if the operational stored water is depleted at any time during the day, the wells will kick on automatically and begin to fill the tanks. The current level for the wells to come on is when the District's total storage capacity is at 70%. This allows an operational storage of 420,000 gallons (≈75% of Maximum Daily Demand).

Fire Storage

Fire storage is required when the capacity of the production facilities is insufficient to meet the necessary maximum daily demand plus fire demand considering the required fire flows, residual pressure and duration. If fire storage is necessary, the volume is determined in accordance with local fire department requirements. The Santa Barbara County Fire Department recommends fire storage equal to 2,500 gpm for 2 hours, which is equivalent to a fire storage volume of 300,000 gallons. The volume is not based on population or number of dwelling units and will therefore remain the same throughout build out. See Chapter 7 on page 37 for further recommendations regarding the need for additional facilities to meet County requirements.

Emergency Storage

The concept of emergency storage is based on selecting a storage volume that will be sufficient to supply the service area in times of planned or unplanned equipment outages or major disasters such as earthquakes. Equipment outages may include pump maintenance or failure, power failure or pipeline breakage.

There are multiple ways to calculate the necessary storage for emergency situations. One alternative is to store the system's maximum day demand (553,000 gallons). A second alternative is to store three times the average day's demand. The second alternative is more conservative and thus a slightly modified version was used for the calculations in this study. See calculations below.

The emergency storage volume for the District is based on the conservative average daily demand, not the annual average daily demand. The conservative average daily demand assumes that in an emergency the District will notify customers of the emergency and that water conservation efforts will be used. Therefore, the average daily demand calculation was for the months of January and February only (not the entire year) and two standard deviations were added to this value.

2010 January and February total	= 8,461,000
Averaged over 59 days	= 143,407 gallons
Standard Deviation	= 40,174 gallons (x 2 = 80,348 gallons)
Conservative Average Water Use	= 223,755 gallons (approximately 85% of 2010 annual average)

These months represent the lowest water use and are therefore used as reference for conservative water use for the Community. Therefore, emergency storage should be equal to 3 x 223,755 gallons or 671,265 gallons. The community should be notified immediately of an outage and be requested to reduce consumption of water during the emergency.

The District has an Emergency Notification Plan to notify all customers of an emergency and to reference ways to reduce consumption during the emergency. A Water Demand Management Contingency Plan prepared by the District would address water savings over and above on-going water conservation practices.

Combined Storage Requirements

The combined water storage capacity for LACSD should meet the total for operational, fire and emergency storage. The storage total should be the District's operational storage of 75% of the maximum daily demand (420,000 gallons), 300,000 gallons for fire storage, and three times the conservative average day demand (671,265 gallons) for emergency storage. Under present conditions this would require a total storage volume of 1,391,265 gallons.

Presently the District has 1,446,780 gallons of storage provided for the town of Los Alamos. This provides approximately 4% excess storage towards build out of the Community.

Transmission and Distribution

Water transmission and distribution facilities carry water from the supply source to the system users or to storage, and from storage to the system users. The transmission and

distribution piping must be capable of carrying water reliably and safely to the customer, and to provide required volumes of water for fire fighting at the required residual pressure.

Pressure

Water pressure at a consumer's service should neither be too high nor too low. Pressure lower than 30 psi makes lawn watering difficult and can cause flow reductions in one water-using appliance when another is opened for use. High pressure may cause faucets to leak, valve seats to wear out quickly, lead to over watering and can cause water hammer. The Uniform Plumbing Code requires that water pressure in the water system not exceed 80 psi without a pressure-reducing valve on the service system. Design maximum and minimum pressure criteria of 80-psi static and 30 psi during maximum day demand are recommended. The District maintains an average water pressure throughout town of 70-75 psi, with the highest pressure near 80 psi at Well #5.

Fire pressure criteria defines minimum pressure under two conditions. The first condition is the residual pressure at the fire hydrant. The Santa Barbara County Fire Department requires a minimum residual pressure of 20 psi at the hydrant. This means that the pressure at the fire hydrant at the time of fire flow must be at least 20 psi. This pressure is desired to ensure adequate positive pressure head when connected to the booster pumps on a fire truck.

The second condition that needs to be met applies to the remainder of the system during a fire. The California Administrative Code, Title 22, Chapter 16, requires that changes to the system must be designed to maintain an operating pressure at all service connections of not less than 20 psi under the following demand:

1. User hour maximum demand.
2. User average day demand plus design fire flow.

The purpose of this criterion is to prevent backflow from a consumer to the system. This ensures that no foreign substances will enter the water system during a fire flow, and also ensures that every consumer will have at least minimum water pressure during an emergency.

Fire Flow

In addition to the pressure criteria during fire fighting, there are standards governing the amount of water required for fire flows. Most local fire departments now use Uniform Fire Code requirements as a basis for fire flow requirements and for fire protection ordinances.

Fire flow requirements are established using various parameters including: area covered by a structure, clearance between structures, and type and material of construction. The Santa Barbara Development Standard #2 defines the fire hydrant flow requirements inside of a water purveyor's district as follows:

Area Type/Acres	Hydrant Spacing	Minimum Hydrant Flow
Commercial	300 ft.	1,250 gpm
Urban & Rural Developed Neighborhoods	500 ft.	750 gpm
Rural 5 to 10 Acres	600 ft.	500 gpm
Rural Over 10 Acres	800 ft.	500 gpm

The minimum Santa Barbara County Fire Department fire flow requirement from any single fire hydrant within a single-family residential area is 750 gpm with a residual pressure of 20 psi. In areas where development is anything other than single-family residential, the minimum required fire flow per the County's Standards for Development is 1250 gpm with 20-psi residual pressure. However, Santa Barbara County Fire Department recommends a minimum of 1500 gpm in commercial and industrial development areas per the 2010 California Fire Code. The residual pressure at this flow rate plus average day demand should be no less than 20 psi (California Administrative Code, Title 22, Chapter 16). The existing flow rates throughout town are between 1100 gpm and 1350 gpm. Although the fire hydrant open flow does not provide for the recommended 1500 gpm, the system pressure is adequate to provide the 1500 gpm with a 20-psi residual pressure. The existing system meets the criteria for the Santa Barbara County Fire Department Standards and their recommendations. New developments will be required to have fire sprinklers and may have additional conditions of approval based on the flow needs for the individual development proposed (additional water storage, booster pump, etc.). These conditions would be placed on a project by the Santa Barbara County Fire Department.

Fire flow from automatic sprinkler systems must be considered in fire flows since a common pipeline network supplies both the fire sprinkler flow and the fire department demand flow. While the fire flow available at a hydrant may be reduced because of a structure utilizing a sprinkler system, the water system still must provide the water volume to operate both the sprinkler system and the fire hydrant at required flows.

Planning Considerations

The Design Criteria listed above represents the planning goals for the District's water system. The Criteria defines the level of service and reliability that should be expected of a modern and efficiently run water system.

The Design Criteria for the LACSD water system is outlined as follows:

Water System Design Standards

Design Water Requirements	Average day demand of 360 gpd for Single-Family Residential Units, 200 gpd for Multi-Family Residential Units, 90 gpd/1000 sf. for Commercial and Industrial Buildings plus an additional 25% for Landscape Irrigation and Other Uses. Maximum day demand of 2.1 times the average day demand.
Sources of Supply	Supply maximum day demand from diverse and reliable sources (i.e. multiple wells for production).
Storage Capacity	Operational requirements of 75% of maximum daily demand (MDD), plus 300,000 gallons for fire protection, plus three times the conservative average day demand for emergency events, all from diverse and reliable sources.
Mains	All water mains sized to carry maximum day demand plus fire flow. Maximum head loss to be 10 feet per 1000 lineal feet. Maximum velocity to be 8 fps, except during fires. Minimum main size for residential to be 6-inch. Minimum main size for commercial to be 8-inch. **All mains to be looped.**
Fire Flow	Minimum flow for residential areas to be 750 gpm. Minimum flow for commercial and industrial areas to be 1500 gpm (2010 California Fire Code).
System Pressure	**Maximum** 80 psi **Minimum Peak Hour** 30 psi **Minimum Fire Flow** 20 psi residual
Source Reliability	System must meet requirements with the two largest capacity wells, currently #3A and #5, out of the system.

CHAPTER 7

FUTURE WATER SYSTEM

Chapter 7 evaluates Los Alamos Community Services District's existing water system to determine if it is adequate for the next five years and what improvements may need to be incorporated. Chapter 7 will also look at build out of the community per the 2011 Community Plan Update and recommend improvements that will be required to accommodate that scenario.

Supply

Currently, the San Antonio Groundwater Basin is the only water supply source available to LACSD. The addition of Well #3A and the reduction in water consumption due to the tiered rate schedule put in place in 2007 is currently maintaining the District's water system supply. The immediate concern for the water supply for the District is during the maintenance of the existing supply wells.

EXISTING (2010)
2010 Maximum daily demand = 553,000 gallons
Assume that 2 wells are out of service (#3A and #5).
Well #4 produces 220 gpm

$$\frac{553{,}000 \text{ gallons}}{220 \text{ gpm} \times 60 \text{ min/hr}} = 41.9 \text{ hours (impossible)}$$

The District should be planning for another water well at this time.

5-YEARS (2015)
Estimated 2015 Maximum Daily Demand = 689,210 gallons
Assume that one well is constructed and produces an average 450 gpm.
Two wells are out of service (#3A and #5).
New Well #6 + Well #4 produce 670 gpm

$$\frac{689{,}210 \text{ gallons}}{670 \text{ gpm} \times 60 \text{ min/hr}} = 17.1 \text{ hours}$$

The situation represented above (two highest production wells are out of service) is not acceptable and water conservation efforts would be initiated and stored water would be used. However, if the highest production well, Well #5, is assumed to be the only well out of service, production is 1100 gpm. This allows the pumping time to be decreased to 10.5 hours. If the District were to construct another well capable of 450 +/- gpm as recommended in the existing calculation above, the system will meet the Water System Design Criteria listed in Chapter 6. However, note that Well #4 is nearing its useful life and the District should consider the replacement of this well in addition to the construction of a new well within this planning study period (2010-2015).

10-YEARS (2020)
Estimated 2020 Maximum Daily Demand = 807,618 gallons
Assume that Well #3A produces 420 gpm, Well #5 produces 750 gpm, Well #6 required above produces 450 gpm and a replacement well for Well #4 (Well #4A) has been constructed and produces 450 gpm.
Wells #5 and #6 are out of service.
Well #3A and Well #4A produce 870 gpm.

$$\frac{807{,}618 \text{ gallons}}{870 \text{ gpm} \times 60 \text{ min/hr}} = 15.5 \text{ hours}$$

The proposed construction of a new well (Well #6) and the replacement of Well #4 (Well #4A) can possibly provide for the MDD estimated in 2020, but would require the District's Emergency Notification Plan to be put into effect to reduce consumption. If the highest production well, Well #5, is assumed to be the only well out of service, production is 1320 gpm. This allows the pumping time to be decreased to 10.2 hours. The addition of another new well (Well #7) is encouraged prior to 2020.

BUILD OUT (2040)
Estimated 2040 Maximum Daily Demand = 1,219,035 gallons
Assume that the wells in the system have an average of 450-gpm production and that the wells can only be pumped for 12 hours maximum each.

$$\frac{1{,}219{,}035 \text{ gallons}}{12 \text{ hours} \times 60 \text{ min/hr}} = 1{,}693 \text{ gpm @ 450 gpm (average) for each well}$$

The District will need four wells with an average production rate of 450 gpm to maintain the maximum daily demand and two additional wells to be in place such that the highest producing wells are assumed to be out of service.

The District will need to have a total of six wells with an average production of 450 gpm each to serve the community at build out. If three wells are out of service simultaneously, the other three could still provide for the Community maximum day demand with 15 hours of pumping time. This would be an extreme situation and may call for the District to impose Community-wide conservation efforts.

Storage

The LACSD storage design criteria are discussed in Chapter 6 on page 31. The District currently has 1,446,780 gallons of total storage at their disposal.

EXISTING (2010)
Operational Storage = 420,000 gallons
Fire Storage = 2500 gpm x 2 hours = 300,000 gallons
Emergency Storage = 3 x 2010 Conservative Average Daily Demand
= 3 x 223,755 gpd
= 671,265 gal.
TOTAL STORAGE = 420,000 + 300,000 + 671,265 = **1,391,265 gallons**

The existing water storage facilities (1,446,780 gallons) are acceptable for the existing community. There is approximately 4% excess total storage capacity which could be used for the build out of the Community.

5-YEARS (2015)
Operational Storage = 75% (MDD) = 516,908 gallons
Fire Storage = 2500 gpm x 2 hours = 300,000 gallons
Emergency Storage = 3 x 2015 Conservative Average Daily Demand
= 3 x 0.85(328,195) gpd
= 836,897 gal.
TOTAL STORAGE = 516,908 + 300,000 + 836,897 = **1,653,805 gallons**

The existing storage facilities total 1,446,780 gallons. This leaves a 207,025-gallon deficiency. The addition of a new water production well and the replacement of Well #4 in the community in the next five years would create the ability to supply water to the community in a consistent manner and due to the expense would be priority over additional storage. However, the District should begin to fund (with connection fees discussed in Chapter 9) the additional storage required as the Community moves towards build out.

With the deterioration of the existing underground 500,000-gallon storage reservoir, additional 10-year water storage requirements were shown to show the importance of the replacement of the existing reservoir in addition to the need for increased storage volume by the growing Community.

10-YEARS (2020)
Operational Storage = 75% (MDD) = 605,714 gallons
Fire Storage = 2500 gpm x 2 hours = 300,000 gallons
Emergency Storage = 3 x 2015 Conservative Average Daily Demand
= 3 x 0.85(384,580) gpd
= 980,679 gal.
TOTAL STORAGE = 605,714 + 300,000 + 980,679 = **1,886,393 gallons**

By 2020, it is assumed that the 500,000-gallon reservoir will require replacement. Without the 353,402-gallons of storage provided by the reservoir, the District would have only the 200,000-gallon tank and the 1 MG tank providing storage for the Community. This leaves a 793,015-gallon deficiency for storage capacity. The District should prepare for the installation of a new 1 MG-gallon water storage tank by 2020 for new

development in addition to the replacement of the existing 500,000-gallon reservoir. In addition to the connection fee proposed to cover the cost of additional development (see Chapter 9 on page 46), it is recommended that the District examine the funding they currently set aside for repair and replacement funds and ensure that the replacement of the existing 500,000-gallon reservoir is considered in the current water rate schedule and annual budgets.

BUILD OUT (2040)
Operational
Storage = 75% MDD = 914,276 gallons
Fire Storage = 2500 gpm x 2 hours = 300,000 gallons
Emergency Storage = 3 x 2040 Conservative Daily Demand
= 3 x 0.85(580,493) gpd
= 1,480,257 gal.
TOTAL STORAGE = 914,276 + 300,000 + 1,480,257 = **2,694,533 gallons**

TABLE 7.1

STORAGE REQUIREMENTS

YEAR	AVE. DAY DEMAND (gal.)	MAX. DAY DEMAND (gal.)	OPERATIONAL STORAGE (gal.)	EMERGENCY STORAGE (gal.)	FIRE STORAGE (gal.)	TOTAL REQUIRED STORAGE (gal.)
2010	264,863	553,000	420,000	671,265	300,000	1,391,265
2015	328,195	689,210	516,908	836,897	300,000	1,653,805
2020	384,580	807,618	605,714	980,679	300,000	1,886,393
Build Out	580,493	1,219,035	914,276	1,480,257	300,000	2,694,533

Although the present storage conditions meet the Community's needs currently, consideration should be given for future development within the District and Urban Boundary. Build out of Los Alamos under the 2011 Community Plan Update will result in the need for a total of 2,694,533 gallons of storage.

If the 500,000-gallon storage reservoir were no longer utilized, the addition of approximately 1.6 million gallons of storage would be necessary to provide the required storage volume for build out of the Community. The funding and timing for construction of a single 1.6 million gallons of storage by the Los Alamos Community Services District will be difficult to complete. Both funding and the need for the additional storage will increase slowly throughout build out of the Community. Thus, it is recommended that the storage volume be constructed with multiple tanks over time. It is assumed for this study that a 1-million-gallon tank would be constructed on the existing pad next to the existing 1-million gallon tank as a way to replace the existing 500,000-gallon reservoir and move closer to the necessary water storage for build out. Therefore, 1/3 of the price for the 1-million gallon tank would be from Repair and Replacement funds and the other

2/3 would come from capital funds (connection fees). The 200,000-gallon tank would be maintained. See Table 7.2 below.

TABLE 7.2

PROPOSED BUILD OUT STORAGE

RESERVOIR	MATERIAL	ACTUAL CAPACITY (gallons)
EXIST 1 MG	Welded Steel	916,353
PROPOSED 1 MG*	Welded Steel	916,353
PROPOSED 775,000 gal	Welded Steel	697,500**
EXIST 200,000 gal.	Welded Steel	177,025
TOTAL:		2,707,231

*1/3 Replacement for the existing 500,000 gallon underground reservoir, 2/3 for Additional Development
**Estimated volume based on 90% capacity to high water elevation

Distribution System

The purpose of the distribution system is to provide a safe and reliable supply of water for all necessary uses. This requires that pressure and volume requirements be met during fire flows and maximum day demand. To meet these requirements, transmission and distribution lines must be sized to provide required flows. The District should continue to require minimum 6" pipes in residential areas and 8" pipes in commercial areas. Providing a distribution system that is laid out in a grid pattern enhances system reliability. Looping of the distribution mains provides a redundancy that ensures continued service to most of the area served if one line has to be valved off for maintenance or repair. As additional development projects come on line, infill of looped systems shall continue to be required with individual projects to provide for their needs at their expense.

Asbestos-cement pipes have an estimated life span of approximately 70 years. Replacing the existing asbestos-cement pipes with PVC should be considered as an on-going project to update the District's water distribution system over time as the pipes deteriorate and repairs become necessary. It is important that the District budgets accordingly to allow for the replacement of these lines in addition to other parts of the system. The life expectancy for PVC is approximately 100 years.

CHAPTER 8

PROPOSED IMPROVEMENTS

The original asbestos-cement water supply lines and connections installed in 1958 will need replacement over the next 10-20 years. It is recommended that replacement of these lines take place as the District begins to notice breaks. The District should take note of multiple breaks within a certain area and should not repair the problem pipes, but replace them with PVC water main lines. Repetitive breaks on a section of pipe will indicate that the line is nearing its design life. The replacement of existing waterlines will be funded from the District's depreciation funds. It is important that the District include funds in their annual budget for depreciation of these lines (book value plus additional funds (25-50%) for the increase in cost for replacement. The District currently has approximately 60,000 linear feet of water mains.

A proposed cost list and schedule for completing necessary improvements for the next 5-year study period (2011-2015) are summarized in Tables 8.3 and 8.4 on pages 43 and 44. These tables estimate the improvements costs at $935,000 for Capital Improvements in the next five years and $1,160,000 for depreciation funded (repair and replacement) improvements in the next five years.

TABLE 8.1

IMPROVEMENTS COMPLETED 2006-2010

	Improvements	Date Completed	Cost
1	Well #5	July 2007	$946,084
2	Well #4 Slip Lining/VFD/SCADA	July 2008	$72,088
3	Back Up Tank By-pass	May 2009	$10,011
4	Well #3A	December 2010	$212,527
5	Well #5 Video Inspection & Repairs	December 2010	$25,456
6	Radio Read Meters Phase I	On-going	$50,591
		TOTAL COST:	$1,316,757

TABLE 8.2

COMPLETED WATER MAINTENANCE PROJECTS 2006-2010

IMPROVEMENTS	DATE OF COMPLETION	COST
Repaired Leaks to 500,000 gal Reservoir	January 2006	$3,000
1-Million Gallon Tank Cleaning	May 2007	$3,300
Office Roofing & Painting *	July 2007	$3,000
Ferrini Park Restoration *	March 2008	$9,400
Water Valve Replacement (1-6" & 2-8")	April 2010	$2,800
	TOTAL COST:	$21,500

* Shared 50/50 between sewer and water expense

TABLE 8.3

PROPOSED CAPITAL IMPROVEMENTS 2011-2015

Priority	Improvements	Recommended Date of Completion	Cost
1	Water Rate & Connection Fee Study	2011-12	$10,000
2	Carport at Office*	2011-2013	$25,000
3	New Water Well	2015	$900,000
		TOTAL COST:	$935,000

* Shared 50/50 between sewer and water expense.
Note: Costs are based on current value and may fluctuate based on future economic influence.

Table 8.4 lists replacement infrastructure and maintenance projects required to continue the existing water system as reliable and efficiently run. It is very important that the District's service fees represent the funding necessary to complete the items listed in Table 8.4. The District must place an emphasis on the ability to replace infrastructure and that the replacement value is higher than the initial purchase price/value due to inflation.

TABLE 8.4

PROPOSED WATER MAINTENANCE PROJECTS 2011-2015

IMPROVEMENTS	RECOMMENDED DATE OF COMPLETION	COST
1-Million Gallon Tank Cleaning	May 2011*	$4,000
Radio Read Meters Phases II* & III	2011-2012	$50,000
500,000 Gallon Tank Cleaning	2011	In House
200,000 Gallon Tank Cleaning	2011	In House
System Valve Replacement	2011-2012	$15,000
Well #3A Video Inspection	2015	$2,000
Well #4 Video Inspection	2015	$2,000
Well #5 Video Inspection	2015	$2,000
4 Replacement Work Vehicles**	2011-2015	$50,000
Replace Water Supply Well #4	2015	$800,000
Epoxy Coat 200,00-gallon tank	2015	$35,000
On-Going Replacement of Water Lines and Connections	As-Needed	$40,000/year*** = $200,000
	TOTAL COST:	$1,160,000

*Already completed
**Shared 50/50 between sewer and water expense.
***Based on replacement of pipes over 75 year-average life at $50/LF
Note: Costs are based on current value and may fluctuate based on future economic influence.

The District must consider the need to replace the 500,000-gallon underground reservoir in the near future. The reservoir is currently providing for the District in an acceptable manner, but is noted as deteriorating and will require replacement or extensive retrofit. The timing for the replacement or retrofit is assumed at this time to be necessary during the 5-year study period of 2016-2020. The reservoir is expected to remain in place through 2015. However, as this is a large expense for the District (estimated at $200,000 for 1/3 of the new 1 MG tank and removal of the existing reservoir), it is recommended that the District anticipate the need for the replacement and include this expense in any proposed rate studies.

Capital Improvements consist of infrastructure required to maintain the current level of service to existing customers and future customers as Los Alamos moves towards build out. The capital improvements recommended in Tables 8.3 (page 43) and 8.5 (page 45) for build out of the Community will allow the District to continue water service for the Community through build out proposed by the Los Alamos Community Plan (2011). The estimated costs are realistic and the proposed schedule should allow development to proceed in an orderly fashion while facilities are being upgraded. However, it is important that the District move forward with the necessary improvements ahead of the increase in residential, commercial and industrial development.

TABLE 8.5

PROPOSED CAPITAL IMPROVEMENTS 2016-BUILD OUT

Improvements	Recommended Date of Completion	Cost
1 MG water tank*	2020	$ 500,000
New Water Wells (2)	2020+	$1,800,000
775,000-gal tank**	2030	$ 650,000
	TOTAL:	$ 2,950,000

*Total cost for tank is estimated at $750,000. 1/3 funding will be from R&R Funds for Replacement of the existing 500,000 gallon underground reservoir and 2/3 funding will be from Connection Fees for Additional Development

**Includes site preparation.

Note: Costs are based on current value and may fluctuate based on future economic influence.

CHAPTER 9

CONNECTION FEE

As discussed in Chapter 8, Capital Improvements consist of the Los Alamos Community Services District's proposed infrastructure necessary to provide for the development that will be sustained by the District's water system. The Capital Improvements (new infrastructure) are paid for by the Capital Improvement Fees (connection fees) from new developments. Chapter 9 reviews the existing water connection fee and the ability to provide the necessary infrastructure. The connection fee for water in Los Alamos is currently $7,705. Revenues from this source could amount to $793,615 in the next 5 years based on collecting 100% of the new 103 residential units (estimated based on 3% annual growth, see Table 3.6 on page 20). To complete all of the improvements during this planning period (Table 8.3, page 43) money will need to be borrowed from other funding sources. It is recommended that the District increase fees to account for these improvements as they move towards build out of the community.

Water Service Connection Fee Calculation

The water service connection fee that new developers will pay for a service connection to the Los Alamos Community Services water system combines two charges. The first is a "buy-in" fee to the existing infrastructure. The second is a charge to recover the cost of facilities to serve the demand the new development creates.

The buy-in portion of the connection fee is calculated based on the total existing assets divided by the number of units planned for at build out of the town. The value for the total existing assets is a combination of 100% of the itemized cost of water only related assets and 50% of the water/sewer related assets on the Los Alamos Community Services Depreciation Schedule. The total number of units is adjusted for the proposed commercial and industrial properties planned for in the 2011 Los Alamos Community Plan Update. The total existing assets value for the water infrastructure for the Los Alamos Community Services District is from the Los Alamos Community Services District Depreciation Schedule ending 6/30/11.

Calculating the residential equivalents for commercial and industrial development is based on the average daily water demand of 90 gpd/1000 SF of building space compared to the 360 gpd/unit for a single-family dwelling.

At build out, the Los Alamos Community Plan Update estimates that 651,630 SF of commercial space will be developed and that 335,412 SF of industrial space will be developed. This is a total of 987,042 SF. The residential equivalent units for this amount of commercial and industrial space are calculated on page 47.

Average Com./Ind. water demand at build out	= 987,042 SF * 90 gpd/1000 SF = 88,834 gpd
Residential Equivalent Single-Family Units	= 88,834 gpd/360 gpd/unit **= 247 units** **NOTE: 51 equivalent units are existing and there are 196 potential equivalent units. See Buy-In calculation below.**

The buy-in portion of the water connection fee for new development should be reviewed every five years to include additional infrastructure installed in the water system. The build out of Los Alamos will remain 1341 residential units plus the commercial and industrial residential equivalents (247 units). The total units are 1588 per the 2011 Los Alamos Community Plan Update zoning.

The long time frame between 2011 and build out (2040) creates uncertainty about the ability of the District to collect connection fees from 100% of the units proposed for build out by the 2011 Los Alamos Community Plan Update and economically add capacity to the water system. Therefore, an 80% factor will be applied to the total number of units proposed at build out. The Facilities Planning Study is done every five years and will adjust the possible build out units as build out of the Community progresses. As units are added to the system the uncertainty of total build out units will decrease, decreasing the need for the 80% factor.

Buy-In = $\frac{\text{TOTAL EXISTING ASSETS VALUE}}{\text{Build out Units (adjusted for commercial/industrial)}}$

= $\frac{\$3,134,815.49 + [(50\%) \times 1,058,022.68^*]}{\text{Existing units} + [\text{Future Units} \times 80\%]}$

= $\frac{\$3,663,826.83}{(649+51) + [(692 + 196) \times 80\%]}$

= $\frac{\$3,663,826.83}{1410 \text{ units}}$

= **$2,600**

*Total of Water and Sewer related assets on the LACSD Depreciation Schedule (50% are counted towards water)

The second portion of the water connection fee is established to recover the cost of facilities to serve the demand that the new development creates. This will also be reviewed every five years to determine the necessary infrastructure to serve the proposed development as well as any changes in the number of units at build out. The District will provide for build out of the Community based on the zoning in the 2011 Los Alamos

Community Plan Update. The improvements necessary for build out include those in Tables 8.3 (page 43) and 8.5 (page 45).

The same 80% factor discussed above will be applied to the total number of units proposed at build out for the remaining undeveloped land. The Facilities Planning Study is done every five years and will adjust the possible build out units as build out of the Community progresses. As units are added to the system the uncertainty of total build out units will decrease, decreasing the need for the 80% factor.

Average Com./Ind. water demand 2011-BUILD OUT = 70,100 gpd (Table 3.7)
Residential Equivalent Single-Family Units = 70,100 gpd/360 gpd/unit
= 195 units

Development Created Demand Costs/Unit = $\frac{\text{Prop. Capital Improvements 2011-Build Out}}{\text{Est. Development 2011-Build Out (80\%)}}$

= $\frac{\text{Proposed Capital Improvements 2011-BO}}{\text{692 units + 195 units (adjust com./ind. dev.)}}$

= $\frac{\$935,000 + \$2,950,000}{887 \text{ units} * 80\%}$

= $\frac{\$3,885,000}{710 \text{ units}}$

= $5,472

TOTAL Water Connection Fee = Buy-In + Development Created Demand Costs
= $2,600 + $5,472 = $8,072

The District's current water service connection fee for new development is $7,705. It is recommended that the District increase the water service connection fee to $8,072 to provide the necessary infrastructure for expected development and the associated system needs.