

# **Appendix F**

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## **Placer Ranch Dry Utilities Final Reports**



## Dry Utilities Final Reports

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- Technical Memorandum, dated October 31, 2018
- Dry Utilities Study, dated July 18, 2017



**CAPITOL UTILITY SPECIALISTS**  
DRY UTILITY PLANNING • CONSULTING • DESIGN

## TECHNICAL MEMORANDUM

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**DATE:** October 31, 2018

**TO:** County of Placer

**FROM:** Gary Krause

**SUBJECT:** Addendum #1 to the Technical Dry Utilities Study for the Placer Ranch Specific Plan

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### Introduction

This Technical Memorandum functions as an Addendum to the Technical Dry Utilities Study for the Placer Ranch Specific Plan, dated July 18, 2017, prepared for the Placer Ranch Specific Plan. Its purpose is to evaluate the differences between the Original Project and the Revised Project (based on an updated Land Use Plan, dated October 17, 2018). Together, this Addendum and its associated Master Plan provide the appropriate technical data and analysis to guide buildout of Placer Ranch's backbone infrastructure as depicted on the Revised Project's Land Use Plan.

### Background

The Technical Dry Utilities Study evaluated the infrastructure requirements for the Original Project, however in October 2018, several refinements were made to the land use plan, which resulted in the Revised Project.

These refinements generally included the following revisions to the land use plan:

- In the area west of Fiddymont Road and north of Sunset Boulevard, several land use parcels were reconfigured to shift residential and school uses outside a 2,000' buffer from the Western Regional Sanitary Landfill's properties. This resulted in the enlargement of Park parcel PR-102, a southerly shift of school parcel PR-92, the conversion of GC and HDR (parcels PR-61 and PR-42) to a Campus Park use.
- Along Maple Park Drive, MDR and HDR uses (parcels PR-32 and PR-42) were converted to LDR and MDR.
- Along Campus Park Boulevard, the PF site for a water tank (parcel PR-100) was enlarged.
- Paseo's have been adjusted in response to land plan refinements in order to maintain the east/west connectivity.

- The alignments of C Street and Maple Park Drive were shifted slightly in response to the land use adjustments described above, while maintaining the prior street pattern and connections.
- Along Fiddymont Road, Campus Park parcel PR-70 was converted to MDR.
- Within the Town Center district south of Sunset Boulevard, HDR parcels PR-50 & 51 were converted to MDR, and MDR parcels PR-35-38 were converted to LDR.
- The allocation of “floating” reserve units in the Town Center district was increased from 150 units to 300 units. These units continue to be factored as HDR units.
- South of Sunset Boulevard, the alignment of Foothills Boulevard has been shifted in an eastward direction to align with the existing Duluth Avenue corridor south of the Plan Area. As a result of this shift, LDR parcel PR-24, CP parcel PR-88, and MDR parcel PR-38 have been slightly enlarged.
- In the area south of Sunset Boulevard and east of Foothills Boulevard, MDR parcel PR-38 was enlarged to provide vehicular access to Sunset Boulevard, per the Foothill Boulevard realignment noted above. This adjustment also resulted in a portion of OS parcel PR-134 being converted to MDR.
- In the area north of Sunset Boulevard and east of Foothills Boulevard, Campus Park parcels PR-86-89 were converted to a low-density, active-adult, residential use (LDR-A), and Campus Park parcels PR-84 and 85 were reduced in size.
- A private park site was added within the active adult community north of Sunset Boulevard and east of Foothills Boulevard.
- A 100’-wide paseo has been added along the east edge of the plan area as a buffer between the active adult residential parcels and offsite industrial uses located in the Sunset Area Plan.
- East of Foothills Boulevard, Campus Park Boulevard was slightly realigned in response to the land use adjustments described above, while maintaining the east/west connectivity to the Sunset Area Plan.
- Park sites were added and/or enlarged (as described above) to increase the plan-wide park acreage in a manner that meet the General Plan’s active parkland requirement of 5 ac./1,000 population.



The table below summarizes the differences between the Original Project and the Revised Project.

**Table 1: Comparison of Original and Revised Land Uses and Development Assumptions**

Land Use Designation	Acreage			Dwelling Units/ Square Footage		
	Revised Project	Original Project	Difference	Revised Project	Original Project	Difference
<b>Residential Uses</b>						
LDR Low Density Residential	446.0 ac	407.9 ac	38.2 ac	2,210 du	2,039 du	171 du
LDR-A Low Density Res. - Age-Restricted	183.1 ac	131.0 ac	52.1 ac	1,050 du	720 du	330 du
MDR Medium Density Residential	112.3 ac	132.3 ac	-20.0 ac	872 du	1,057 du	-185 du
HDR High Density Residential*	60.0 ac	93.0 ac	-33.0 ac	1,504 du	2,011 du	-507 du
<i>Subtotal</i>	801.4 ac	764.2 ac	37.3 ac	5,636 du	5,827 du	-191 du
<b>Commercial and Employment Uses</b>						
GC General Commercial	22.7 ac	25.6 ac	-2.9 ac	296,513 sf	334,933 sf	-38,420 sf
CMU Commercial Mixed Use	48.8 ac	48.8 ac	0.0 ac	637,718 sf	637,718 sf	0 sf
CP Campus Park	335.0 ac	395.5 ac	-60.6 ac	4,506,282 sf	5,384,152 sf	-877,870 sf
UZ University	301.3 ac	301.3 ac	0.0 ac	3,000,000 sf	3,000,000 sf	0 sf
<i>Subtotal</i>	707.7 ac	771.2 ac	-63.5 ac	8,440,513 sf	9,356,803 sf	-916,290 sf
<b>Open Space and Public Uses</b>						
PF Public Facilities (Schools)	32.7 ac	32.0 ac	0.7 ac			
PF Public Facilities (County Facilities)	10.3 ac	5.5 ac	4.8 ac			
PR Parks and Recreation	69.8 ac	50.7 ac	19.1 ac			
OS Open Space (Preserves/Paseos)	264.8 ac	272.8 ac	-8.0 ac			
<i>Subtotal</i>	377.5 ac	360.9 ac	16.6 ac			
<b>Other</b>						
ROW Placer Parkway	158.5 ac	158.5 ac	0.0 ac			
ROW Major Roadways & Landscape	168.1 ac	158.5 ac	9.6 ac			
<i>Subtotal</i>	326.6 ac	317.0 ac	9.6 ac			
<b>Total</b>	<b>2,213.3 ac</b>	<b>2,213.3 ac</b>	<b>0.0 ac</b>	<b>5,636 du</b> <b>8,440,513 sf</b>	<b>5,827 du</b> <b>9,356,803 sf</b>	<b>-191 du</b> <b>-916,290 sf</b>

\* includes 300 reserve units within the Town Center district

## Analysis

An evaluation of the difference in projected gas and electric peak demand between the original and revised projects was conducted to determine what, if any, effect those demand changes will have on the dry utility facilities planned to serve the development.

**Table 2: Impact of Original and Revised Land Uses on Peak Electric Demand**

Land Use Designations	Electric Peak Demand (Acreage Method)			Electric Peak Demand (SF & DUs Method)		
	Original Project 2017	Revised Project 2018	Difference	Original Project 2017	Revised Project 2018	Difference
Residential MDR & LDR	17.2	18.6	1.4	17.2	18.6	1.4
Residential HDR	6.8	5.1	-1.7	6.8	5.1	-1.7
Commercial	36.6	31.7	-4.9	41.0	35.1	-5.9
University	9.8	9.8	0.0	17.1	17.1	0.0
Schools & Public Facilities	3.4	3.7	0.4	4.1	4.4	0.4
<b>Total Peak Demand (MVA)</b>	<b>73.8</b>	<b>68.9</b>	<b>-4.8</b>	<b>86.2</b>	<b>80.3</b>	<b>-5.9</b>

The anticipated electric demand decreased roughly 7% (from 4.8 to 5.9 MVA, dependent on the method used to measure it), which will have no significant impact on the electric facilities (size of substation, size of main line feeders, et al) planned to feed the development.

**Table 3: Impact of Original and Revised Land Uses on Peak Gas Demand**

Land Use Designations	Natural Gas Peak Demand		
	Original Project 2017	Revised Project 2018	Difference
Residential MDR & LDR	190.8	206.6	15.8
Residential HDR	90.5	67.7	-22.8
Commercial	317.8	272.0	-45.8
University	150.0	150.0	0.0
Schools & Public Facilities	16.3	6.3	-10.0
<b>Total Peak Demand (MCFH)</b>	<b>765.4</b>	<b>702.6</b>	<b>-62.8</b>

The anticipated gas demand decreased 8.2% (63 MCFH), which will have no significant impact on the on the natural gas main line facilities planned to feed the development.

## Conclusions

Based on the analysis above it was determined that though projected demands decreased due to the revised land uses, the effects on the dry utility facilities necessary to serve the project as detailed in the Placer Ranch Technical Dry Utilities Study dated 7/18/2017 are inconsequential.

In summary, the analysis demonstrates that the changes between the Original Project and the Revised Project are negligible and will not change any of the conclusions reached in the technical study.



# Technical Dry Utilities Study

July 18, 2017

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## **I. Introduction**

### ***Study Purpose and Objectives***

This Technical Dry Utilities Study identifies the dry utility (electricity, natural gas, telephone/broadband, and cable television/broadband) infrastructure needed to serve the Placer Ranch Specific Plan (PRSP). The following topics are discussed:

- System designs
- Projected dry utility demands for the proposed project
- Proposed changes and additions to existing systems to accommodate development of the project
- On and off-site dry utility infrastructure required to serve the development

### ***Background Information on Study Area***

Placer Ranch is a 2,200 acre parcel of undeveloped land located in Placer County, California (Figure 1, Vicinity Map). The project is bounded by the City of Roseville to the south, the Western Regional Landfill to the north, the Sunset Area and Nichols Industrial Park to the east, and the Amoruso Ranch Specific Plan to the west. Access to the PRSP will be provided by Fiddymont Road, Woodcreek Oaks Boulevard, Foothills Boulevard and Sunset Boulevard. A future extension of Sunset Boulevard will bisect the project east to west. The proposed project will include commercial business parks, industrial facilities, single and multifamily residential units, parks, schools, major arterial roadways and open space. The new California State University Sacramento (CSUS) campus is the crown jewel of the development and will occupy the heart of the Land Plan. This study is based on the June 24, 2016 Land Use Plan shown in Figure 2.

Several miles of overhead electric transmission and distribution lines exist within the project boundaries, and a major natural gas transmission pipeline crosses the eastern portion of the site. Roseville Electric's Peaking Plant #2 (RPP2) is located near the southeast corner, adjacent to PG&E's large transmission line.

### ***Proposed Dry Utility Requirements***

New extensions of natural gas, electric, telephone and cable television/ broadband will be required to serve the new facilities and will be extended in joint trenches wherever possible. Utility trenches will be placed in franchise areas and on private property in multi-purpose easements (MPEs). To accommodate the joint trench, vaults, transformers, switches and other pedestals, MPEs will be created as needed within the private roads and properties. All new distribution facilities will be underground with the exception of transformers, switches, interrupters, pedestals and pad-mounted equipment.



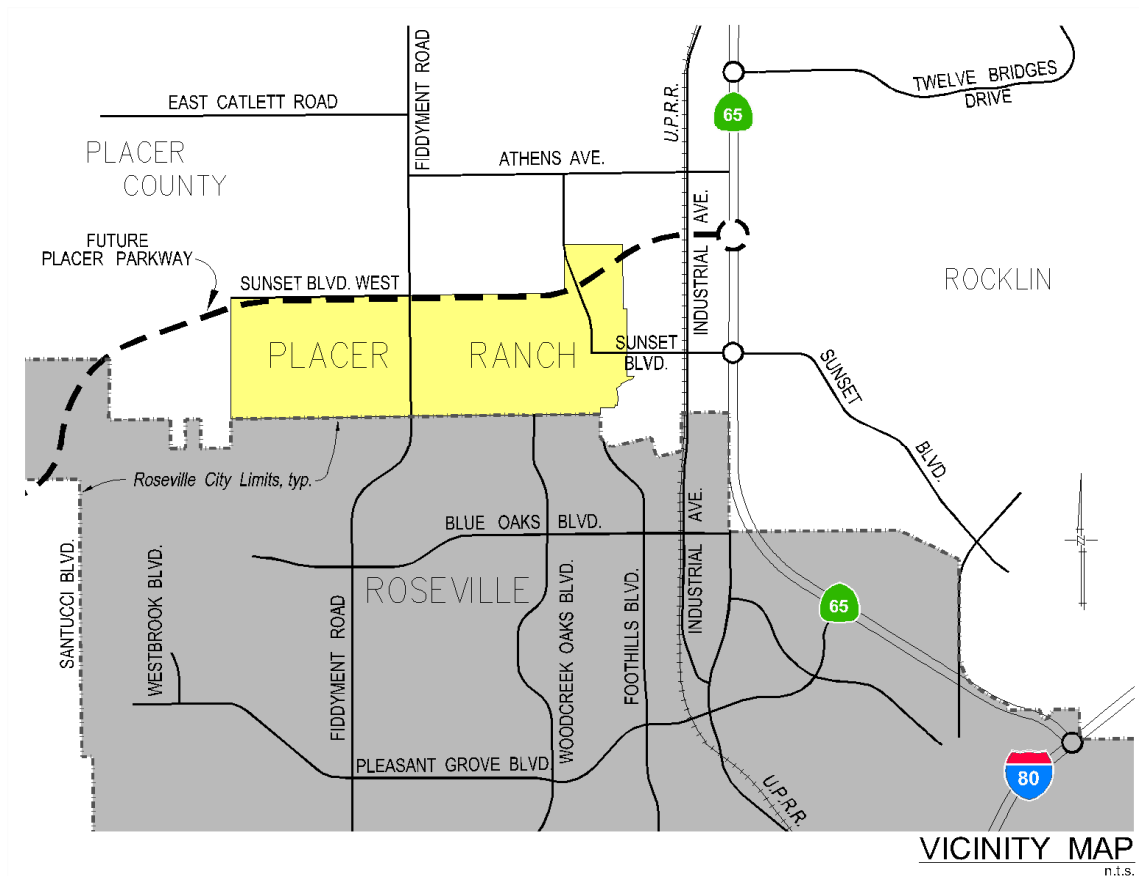
Pacific Gas & Electric Company (PG&E) – electric, PG&E – natural gas, AT&T – telecom and Wave Broadband – telecom, will provide service to the area. Consolidated Communications (CCI) and Comcast Communications have also indicated a strong interest in serving the PRSP.

### Project Phasing

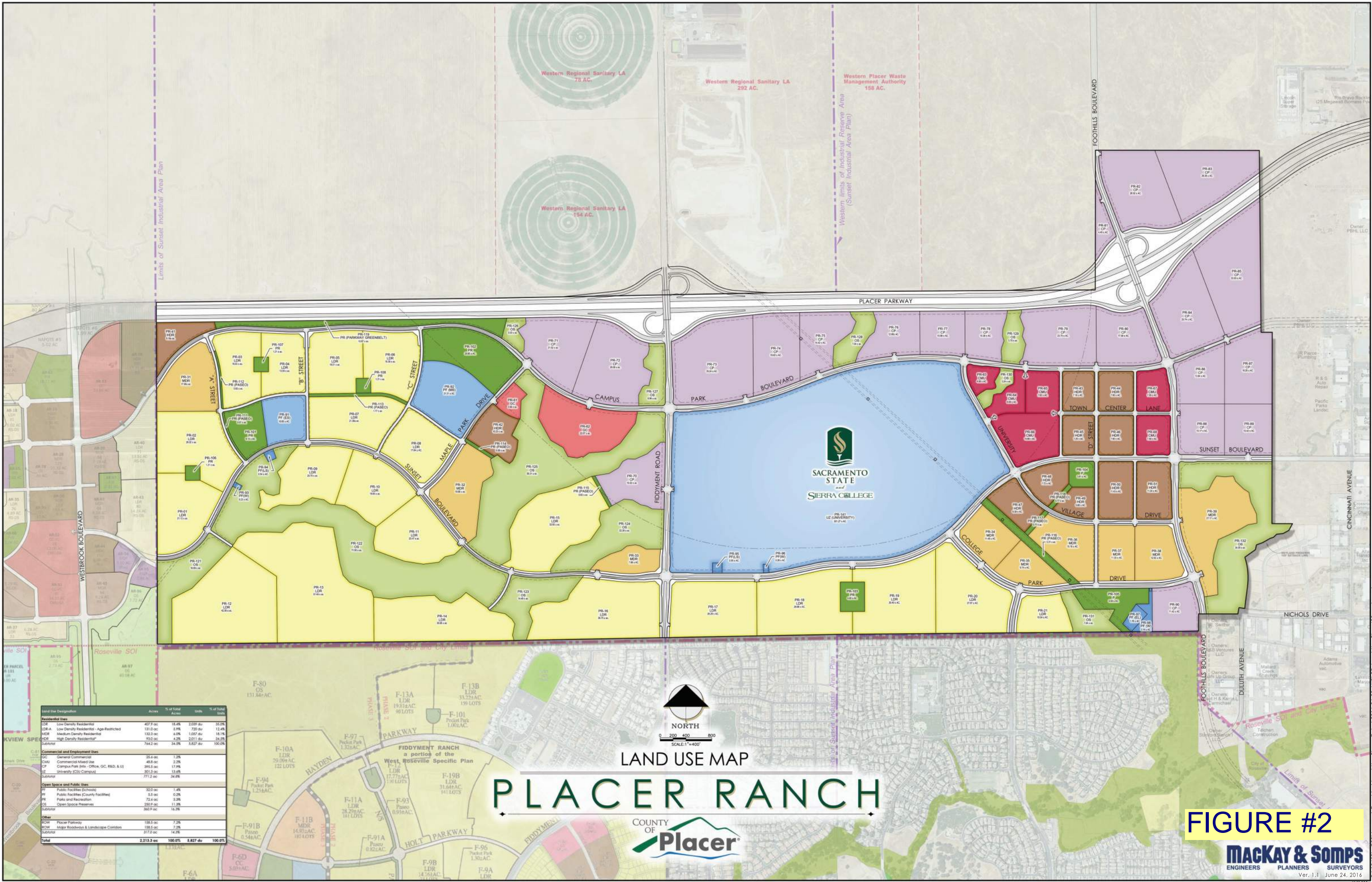
The PRSP is designed to allow the backbone infrastructure to be phased. Phase 1A is planned to include portions of Fiddymont Road, Sunset Boulevard, College Park Drive, Woodcreek Oaks Boulevard and the adjacent properties (Placer Ranch Specific Plan Phasing Plan - April 7, 2017, Figure 3), though phases may be developed in any sequence, provided public safety, health and welfare issues are addressed.

Placer Ranch is a project level plan. Parcel specific backbone improvements should be identified within the Infrastructure Phasing Plan for the phased Small Lot Vesting Tentative Maps.

**Figure 1 – Vicinity Map**













## II. Existing Conditions

This section discusses the existing conditions of the various dry utility systems in the project area. Appendix A - Existing Dry Utilities Exhibit, shows the entirety of the Specific Plan and the backbone elements of the existing dry utility facilities within and adjacent to it.

### **PG&E Electric**

A PG&E 12 kV three-phase overhead distribution line (Figure 4) runs north to south along the east side of Fiddymont Road. It will be relocated and converted to underground. Another 12 kV line runs west from Fiddymont Road and borders the property along the north side of Sunset Boulevard West.

PG&E's Rio Oso-Atlantic 230 kV double-circuit electric transmission tower line (Figure 5) runs in a northwest/southeast direction through the eastern portion of the project. The line is located in a 120' wide easement and is not centered – it runs along the south side.



**Figure 5 – PG&E Rio-Oso-Atlantic  
230kV Transmission Line**



**Figure 4 – PG&E 12kV  
Overhead Line**

PG&E's Pleasant Grove Substation is located on Industrial Boulevard north of Sunset Boulevard West and serves the industrial areas to the east of PRSP at 21 kV (Figure 6).

### **Roseville Electric**

Roseville Electric (RE) has a 60 kV overhead transmission line running in a northwesterly alignment adjacent to PG&E's 230 kV line until it ties to RE's Peaking Plant #2 (described below). The line continues west adjacent to and just south of PRSP - with 12 kV and fiber line underbuilds - to Woodcreek Oaks Boulevard where it dips underground (Figure 7), turns south and runs to a point where it rises up before entering Roseville's Dave Bakkie Substation.



**Figure 6 – PG&E Pleasant Grove**

**Roseville Power Plant #2 (RPP2):** Formerly owned by the Northern California Power Authority (NCPA), the City of Roseville now owns and operates this simple cycle combustion turbine peaking plant (Figure 8) near the development's southeast corner. The plant is fueled by natural gas transported by PG&E via a 4-inch steel tap from its Line 123 transmission line east of the site, and has access via an existing paved driveway off Nichols Drive that will need to be rerouted with the specific plan improvements. This line may need to be relocated at the project's expense.

The plant is inefficient per current standards and typically only runs 10 to 15 times a year, but Roseville Electric considers it a valuable resource. At some future point the City will decide how best to utilize it.



**Figure 7 – Roseville Electric  
60kV Riser**



**Figure 8 – Roseville Electric's Peaking Plant #2**

RPP2 is a high noise generator. The City of Roseville recommends that the maximum decibel level at the neighboring residential units not exceed 55 db. Sound walls, berms and open space may need to be employed to shield the residential units from the high noise levels generated when the plant is operating.

### ***PG&E Natural Gas***

PG&E has a 12-inch steel gas transmission main (Line 123) traversing roughly north – south through the far eastern portion of the property. This transmission main brings natural gas to the general area at high pressures - likely 500 to 600 pounds per square inch gauge (psig), but that can vary. Lines of this type are typically engineered to a maximum allowable operating pressure



**Figure 9 – PG&E Gas Regulator  
Station – Sunset Blvd. West**

(MAOP) of 900 psig. Regulator stations reduce the transmission pressure to typical distribution pressures (MAOP 60 psig) and serve the adjacent communities. The closest regulator station (Figure 9) is on Sunset Boulevard West near Cincinnati Avenue. It serves the industrial areas in the vicinity of Cincinnati and Industrial Avenue but is well positioned to serve PRSP. A second regulator station was recently constructed on Westbrook Boulevard just north of Pleasant Grove Boulevard (Figure 10). Two other gas regulator stations also feed into the system: One at Blue Oaks Boulevard and Industrial and the other at Country Club Drive and Badovinac Drive.

PG&E has an 8-inch plastic (pl) gas distribution main stubbed north at Fiddymment Road, a 6-inch pl main stubbed north at Woodcreek Oaks Boulevard and a 4-inch pl main stubbed north at Grove Hill Way. A 4-inch pl main is stubbed west at Nichols Drive.

#### ***AT&T Telephone/Broadband***

The Stanford/Rocklin central office (CO) is located north of Sunset Boulevard on Industrial Avenue, just east of the project. AT&T overhead and underground facilities run along Cincinnati Avenue and Nichols Drive from the Stanford exchange, only a few short blocks away.



**Figure 10 – PG&E Gas Regulator Station w/SCADA Controller– Westbrook Blvd.**



**Figure 11 – AT&T Controlled Environment Vault**

AT&T has copper and fiber infrastructure (depending on the age of the development) extending through the residential projects south of PRSP (Fiddymment Farms, Diamond Creek and Crocker Ranch). A controlled environment vault (CEV – Figure 11) is located just off Woodcreek Oaks Boulevard where it dead ends into the project, and an AT&T hut sits on Nichols Drive near PRSP's eastern edge. Conduit is stubbed north on Fiddymment Road near the project's southern boundary.

#### ***Wave Broadband System***

Wave Broadband has conduit structure with fiber stubbed west at Sunset Boulevard and Cincinnati Avenue, and at Nichols Drive and Duluth Avenue.

### ***Comcast Telephone/Broadband System***

Comcast has facilities stubbed north at Fiddymment Road, Woodcreek Oaks Boulevard and Grove Hill Way, and facilities stubbed west at Nichols Drive.

### ***Consolidated Communications Telephone/Broadband System***

Consolidated Communications (CCI) is well positioned to serve the PRSP. Its Placer Corporate CO is located on Placer Corporate Drive near West Sunset Boulevard, and it has conduit stubbed west on Sunset Boulevard towards PRSP from that CO. It has conduit from its Del Webb CO stubbed to the project's southern boundary on Fiddymment Road, and conduit from its Blue Oaks CO stubbed north to the project's boundary on Woodcreek Oaks Boulevard. Conduits from CCI's Industrial CO are stubbed to the north end of Foothills Boulevard towards the project.

### ***Sprint Fiber System***

A Sprint fiber line extends north-south through the PRSP along the east side of Fiddymment Road as an underbuild to the PG&E overhead 12 kV line.



### III. Developed Conditions

This section discusses the developed conditions of the various dry utility systems in the project area. Appendices B through E show the major backbone elements of the proposed dry utility facilities.

#### A. Pacific Gas & Electric -- Electric

Pacific Gas & Electric (PG&E) will supply electric service to the PRSP Area in accordance with its rules and regulations. Two methods were employed to determine the estimated peak electric demand at buildout: The “acreage method” and the “demand per square foot by type of occupancy method.” For situations where the demand for a similar size & type facility was available (i.e., the schools and the university), we used it rather than a calculated demand for that component of the demand study.

A probable peak demand range of between 71 and 76 megavolt amperes (MVA) at buildout (Table 1) was established using the methods discussed above. For planning purposes we assume a peak demand of 76 MVA.

**Table 1 – Estimated Electric Peak Demand at Buildout (MVA)**

Land Use	Residential <sup>1</sup> LDR & MDR 3,816 Units	Residential HDR 2,011 Units	Commercial <sup>2</sup> Business/Retail 6,356,803 SF	University 3,000,000 FT	Schools, Public Fac.	Peak Demand MVA
Peak Demand (Acreage)	17.2	5.0	36.6	9.0	3.4	71.1
Peak Demand (SF & DUs)	17.2	5.0	41.0	9.0	4.1	76.3

#### Substations

Three substations will either serve or back up service to Placer Ranch -- one will be located onsite, and two offsite:

Pleasant Grove Substation: PG&E’s Pleasant Grove Substation is located just west of the site on Industrial Avenue (just north of Sunset Boulevard West) and will serve the initial phases of PRSP. It’s a 135 MVA substation consisting of three 45 MVA banks and six main-line 21 kV breakers/ get-away circuits (two per bank). The station ran at 60 kV until about three years

<sup>1</sup> Residential Demands (LDR & MDR) are based on SMUD’s Residential & Commercial Electric Demand Table (received April, 2009). Estimated HDR demands are based on more recent information provided by PG&E.

<sup>2</sup> Commercial Demands are based on PG&E’s Table 4-3, Commercial Demand Volt-Amperes per Square Foot by Type of Occupancy (July 2008) and SMUD’s Residential & Commercial Electric Demand Table

ago when PG&E upgraded the transmission line to 115 kV. In anticipation of the upgrade, PG&E installed dual rated transformers (115/60/21 kV banks) so the upgrade was accomplished relatively easily. At peak demand Pleasant Grove is running at ~110 to 115 MVA, close to 80% of capacity. There are no plans for expansion; PG&E considers 135 MVA to be the ultimate buildout.

Athens Substation: A new substation has long been planned on the east side of Industrial Avenue, just north of 12 Bridges Drive and south of the new Hwy 65 bypass that curves west over Industrial. PG&E owns the 10 acre site and projects construction to begin in 2020 to 2022. Once built the utility will off-load some of the existing Pleasant Grove demand to Athens so the Pleasant Grove substation can pick up new load as Placer Ranch develops. Athens will be a 115 to 21 kV, 3 bank, 135 MVA substation.

Placer Ranch Substation: PG&E Planning<sup>3</sup> confirms a new substation will be required for Placer Ranch, though no recent formal written request to the landowner has been made for a site. The requirements are for a parcel rectangular in shape (roughly 450 feet X 400 feet, approximately four acres) with access capabilities for large utility trucks, cranes and equipment. The site must be immediately adjacent to PG&E's 230 kV transmission line and located in the business park section (as opposed to residential) of the development. The owner's preferred location is in the southeast portion of the PRSP, adjacent and east of RE's Peaking Plant #2. PG&E will need to purchase the substation site at fair market value and negotiate the appropriate easements (access to the adjacent 230 kV corridor and ingress/egress) necessary to make the site operational.

Placer Ranch will be a 230 to 21 kV, 3 bank, 135 MVA substation. PG&E projects construction to begin in 2030 to 2040, with actual timing driven by demand.

### ***Preferred Distribution Voltage - 21kV or 12 kV***

PG&E has a three phase 12 kV overhead line that runs north-south through the development on Fiddymont Road. Its Pleasant Grove substation (located just east of the project) provides distribution voltage at 21 kV. So it's set up to serve at either or both 21 and 12 kV. And while either voltage could serve, the 21 kV system presents significant financial benefits to PG&E and to the developer.

Potential economic benefits include:

- Higher Capacity Feeder Mains – a 21 kV feeder main has a capacity of approximately 20 MVA<sup>4</sup>, whereas a 12 kV feeder main of the same conductor size has a capacity of about

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<sup>3</sup> In an 8/26/16 meeting in PG&E's Auburn Office on the electric service requirements for serving Placer Ranch, PG&E Planner Scott Kostka confirmed that a substation will be required.

<sup>4</sup> Main-line capacity depends on a number of variables – conductor size and type, distance to the substation, power factor, etc.



10 MVA. So the utility can feed roughly twice the customers/demand off a 21 kV mainline circuit as it can from a 12 kV circuit. A distribution system that requires only about half the outside plant (main-line conductor, conduit, splice boxes, etc.) to serve the same customer base is a win – win for PG&E and the developer.

- **Less Conductor** – Single phase circuits in a 12 kV system are 2-wire. Single phase circuits in a 21 kV system are 1-wire. Twice as much conductor is required to serve the residential portion of a development at 12 kV.
- **Fewer Interrupters (residential neighborhoods)** – An I-9 interrupter at 21 kV has 6 positions for 6 single phase radials, potentially serving 600 residences. An I-9 interrupter at 12 kV can only use 4 of the 6 positions, so it can serve only 200 residences. And while from a practical standpoint we'd only serve about 450 homes at 21 kV and 150 homes at 12 kV from a single interrupter, the advantage is obvious: Three times as many residences can be served from an interrupter at 21 kV as at 12 kV. At an average cost of about \$60,000 per interrupter, that can add up.
- **Conduit** – Single phase circuits in a 12 kV system require 4-inch conduit, while a 21 kV system requires only 2-inch conduit. Construction costs are lower with 21 kV.
- **Transformer Pads** - The transformer pads in a 21 kV system are slightly smaller, less expensive and require a smaller excavation; pads in a 12 kV system are larger, more expensive and require a larger excavation. Construction costs are lower with 21 kV.

Both PG&E and the developer benefit from a 21 kV system. Fortunately, PG&E intends to serve all of Placer Ranch at 21 kV.

### **System Design**

PG&E's underground distribution systems can be divided into two parts: The large capacity 600 amp main-line backbone feeder circuits that extend down the major roads (Appendix B – PG&E Electric Backbone Exhibit), and the smaller capacity 200 amp local loops and radial circuits that extend from it and run through the neighborhoods.

PG&E typically designs its main-line circuits for up to 100% loading<sup>5</sup>. Roughly 20 megawatts (MW) capacity is available with 1100 AL conductor on a



**Figure 12 – Pad Mounted Interrupter**

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<sup>5</sup> PG&E is reviewing its design standards and may modify its practice of 100% loading to a more conservative figure going forward.

single main-line 21 kV circuit, though actual capacity depends on proximity to the substation, conductor size, conductor rating and other factors. Smaller main-line conductor (i.e., 600 AL) has a proportionally reduced capacity.

Based on the estimated peak demand (76 MVA), we project four to five 600 amp main-line feeder circuits in 6" conduit to serve Placer Ranch. The backbone circuits will have main-line interrupters (primarily pad mounted 600 amp I-9s, or a 3-way, 3-way switch with a 200 amp interrupter) near all the major intersections (Figure 12) as well as at every 1500 kVA of main-line load.

The smaller capacity three phase and single phase 200 amp circuits may be looped or extended as radials off main-line circuits and will distribute electric service to the commercial and residential neighborhoods. PG&E's standards allow a maximum of 100 customers on a 1-wire radial<sup>6</sup>, but we rarely design above 75 units/radial.

Transformers will be located in residential neighborhoods (Figure 13) and at commercial sites (Figure 14) to serve individual users. Capacitor banks (Figure 15) will be installed throughout the project to help with voltage and capacitance issues on hot days. PG&E



**Figure 13 – Single Phase Transformer**



**Figure 15 – Capacitor Bank w/ #7 Box**



**Figure 14 – Three Phase Transformer**

prefers overhead capacitor banks in its system as they have fewer cooling problems, but since there will be no new pole lines in Placer Ranch the capacitors will be pad-mounted.

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<sup>6</sup> Current standard allows 600 homes on a PMI-9 interrupter at 21 kV (6 radials at 100 units per radial). To increase reliability, PG&E is reviewing that standard and may reduce it to 300 customers in the future.

The new standard calls for one capacitor for roughly every 2.5 MW's (larger capacitors are available that can bump the need to only one for every 4.0 MW's), so at buildout we expect 18 to 20 or more pad mounted capacitors distributed throughout the project. Each capacitor requires a dedicated adjacent subsurface 3-way switch in a #7 box. The developers and PG&E will want to keep these out of the neighborhoods, so plan for them in the commercial areas and along the major roads (Fiddymment Road, Sunset Boulevard, Campus Park Boulevard, Foothills Boulevard, etc.) It would be wise to identify locations early on where these facilities can be placed, as they are sizable (78"wide x 68"deep x 65" tall).

PG&E can remotely monitor and control much of its equipment (subsurface switches, pad mounted capacitors, 600 amp subsurface interrupters, etc.) in underground areas using SCADA (supervisory control and data acquisition), and is employing it more frequently. It does not yet have a SCADA option for pad-mounted interrupters, though we expect it will shortly. Assume some SCADA controlled equipment (Figure 16) will be placed in Placer Ranch.

Street lighting will be designed and constructed to Placer County standards along all public streets as part of the roadway frontage improvements.



**Figure 16 – Pad Mount Capacitor Bank with SCADA Controller & Antenna for a Subsurface Switch**

### ***Project Phasing & Service to Phase 1***

Though not finalized at this time, Phase 1 is assumed to be parcels PR-17 thru PR-21 (and the areas immediately adjacent), the areas bordered by Fiddymment Road, Sunset Boulevard and College Park Drive.

Electric service to Phase 1 is a challenge, with no easy or inexpensive solutions. PG&E's 21 kV distribution system is a considerable distance from Phase 1 (the Sunset Area east of the site), so service will likely come from the overhead 12 kV line on Fiddymment Road but served from Pleasant Grove Substation at 21 kV.



**Figure 17 – 21kV to 12kV Auto-bank**

To serve the first phase at 21 kV, significant rearrangement is required. The existing 12 kV line must be converted to 21 kV, which PG&E will accomplish with system tie auto-transformers (auto-banks) with a 21 kV side and a 12 kV side (i.e., the source side and the load side). We envision 21 to 12 kV auto-banks (Figure 17) in three locations – Fiddymment Road north of Athens Avenue, Fiddymment Road at the project’s southern boundary and Sunset Boulevard West just west of Fiddymment Road. (The auto-bank on Athens Road just west of the casino will probably be relocated to one of these locations as part of the upgrade). At roughly \$.5 million each, two to three auto-banks represent a substantial capital investment at the start of Phase 1. However, the inherent advantages of a 21 kV system should justify the costs.

A second option is a shoe fly (temporary overhead line) southwest across the project from near where Sunset Boulevard enters the site to Phase 1. The developer could pick a route free of obstructions and with the best chance of staying “out of the development path” for a few years and provide an all-weather road, and PG&E would build a temporary line. Past experience suggests the temporary line (or portions of it) will have to be relocated once or several times as development moves east.

With either option above, reliability quickly becomes an issue: Per PG&E’s standards, “Any portion of a main-line serving more than 1500 kVA (nameplate) of energized transformers *or more than 100 customers* (emphasis added) shall be connected to the main-line at both ends...” In other words, once over 100 houses are energized the line must be looped. The standards allow for a radial supply on a temporary basis in some instances, but neither of the solutions discussed above will go very far in serving Phase 1. The final solution may require both options.

The final design for serving Phase 1 will not be determined for some time. PG&E will need to evaluate its local system, perform economic studies and weigh its options before deciding how best to serve the first phase of Placer Ranch.

### ***PG&E’s Rio Oso-Atlantic 230 kV Double Circuit Tower Line***

As noted previously, a PG&E 230 kV tower line runs in a northwest/southeast direction through the eastern portion of Placer Ranch in a 120-foot wide easement. The line isn’t centered in the easement, leaving PG&E the space and land rights to construct a parallel 230 kV tower line at some future point when energy demand requires it.

The utility had planned to reconductor the tower line a few years back to increase capacity, but that was deferred. New electric load is not developing at the pace projected due to conservation and renewable energy sources such as wind, rooftop solar, etc.

We wouldn’t rule out PG&E constructing a parallel 230 kV line through Placer Ranch at some future point, but it isn’t a high priority and will not happen in the near future.



## B. PG&E Natural Gas

In accordance with its rules and regulations, Pacific Gas & Electric Company (PG&E) will supply natural gas to the PRSP. We estimate peak gas demand at buildout at approximately 765 thousand cubic feet per hour (765 MCFH).

**Table 2 -- Estimated Natural Gas Peak Demand at Buildout**

Land Use	Residential LDR & MDR (3,816 Units)	Residential HDR (2,011 Units)	Commercial, Business/Retail (6,356,803 SF)	University (3,000,000 SF)	Schools, Public Fac.	Peak Demand (MCFH)
Peak Demand (MCFH)	191	90	318	150	16	765

### Gas System Design

PG&E has natural gas distribution facilities adjacent and stubbed to the site in Fiddymment Ranch, Crocker Ranch, Diamond Creek and the Sunset West Industrial Area, so no offsite gas bring-up is required. And with gas regulator stations on Sunset Boulevard West near Cincinnati and Westbrook Boulevard north of Pleasant Grove Boulevard, the project is assured a plentiful gas supply.

Gas mains will be extended into and loop through the development as the project progresses. From the gas regulator station on Sunset Boulevard, PG&E will likely extend an 8-inch plastic gas distribution main west along the extension of Sunset Boulevard to Fiddymment Road, then north to the future Campus Park Boulevard and west to the project boundary. A 6-inch gas main will continue north and south along Foothills Boulevard and University Drive, with 6-inch and 4-inch ribs extending off the feeder mains and looping along the major roads (Campus Park Boulevard, University Village Drive, Maple Park Drive, etc.) 2-inch distribution mains will loop through the remaining roads and through subdivisions, commercial areas and business parks.

Distribution mains and services will extend off the mains and will be sized based on anticipated gas loads to the various parcels. Residential neighborhoods will have 2-inch plastic mains and 1-inch services (Appendix C – PG&E Natural Gas Backbone Exhibit).

### Gas Service to Phase 1

PG&E is well positioned to serve PRSP with natural gas. Gas will be extended north into PRSP from Fiddymment Road where PG&E has an 8-inch plastic gas main stubbed, and at Woodcreek Oaks Blvd where the utility has a 6-inch plastic gas main stubbed.

### ***PG&E's Line 123 Gas Transmission Main***

PG&E owns and operates Line 123, a 12-inch steel natural gas transmission pipeline that runs somewhat diagonally (southwest to northeast) through the far eastern portion of the development in a 10-foot wide transmission pipeline easement.

The line was constructed in 1943 so is due to be upgraded at some point in the relatively near future, particularly as residential density around the line increases. The developers would prefer to realign and relocate the transmission main into Foothills Boulevard or in a PUE/LSE/MPE adjacent to Foothills Boulevard, where it would continue north to Campus Park Boulevard then east to the eastern edge of the development. However, the cost to relocate the line will be significant and may not be justifiable.

**Recent Improvements:** As part of its Pipeline Safety and Enhancement Plan (PSEP), PG&E recently upgraded roughly 3.1 linear miles of Line 123 to comply with California Public Utilities Commission (CPUC) Decision 11-06-017, which called for the strength – testing or replacement of untested pipe. The existing 12-inch diameter steel pipe was replaced with a 16-inch diameter pipe from Baseline Road north to Blue Oaks Boulevard. It also replaced sections to the north of Placer Ranch between the Fire Station and parking garage at Thunder Valley Casino and across the Orchard Creek wetland preserve north to Lincoln.

**PG&E's 10-Foot Pipeline Easement:** In 2006 PG&E wrote a letter<sup>7</sup> to Placer County regarding the Placer Ranch Specific Plan stating in part: "In the interest of continued operation, maintenance and public safety, planned growth must support a minimum 40-foot wide buffer adjacent to, and alongside such transmission pipeline easements." The easement only specifies 10 feet, yet the utility requests a 90-foot strip (two 40-foot buffer strips plus the 10-foot easement). The easement allows the grantor's property alongside the described strip to be used for installation and maintenance purposes, but it doesn't appear to grant PG&E a 90-foot permanent strip. A 10-foot wide easement for a facility of this type in a residential neighborhood is clearly undesirable, so PG&E's appeal to create a larger buffer zone around its transmission main is not unwarranted.

To summarize: A good portion of the land abutting the easement will be zoned residential, and the future developers and homeowners would prefer to not have the new residences adjacent to a high pressure gas transmission main. The developer would prefer the pipeline be relocated to a more appropriate location and PG&E would like to improve its legal rights, access and buffer zone.

We envision several options for dealing with the line:

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<sup>7</sup> Robert Steigmeyer of PG&E's Building and Land Services, Auburn office, to Lori Lawrence of County of Placer, March 22, 2006.

- Create a 40 foot buffer zone on each side of the 10-foot easement as requested. We assume PG&E would rebuild and upgrade the pipeline “in place” to comply with CPUC Decision 11-06-017. This option would require PG&E to purchase the adjacent buffer zone property at fair market value.
- PG&E may conclude that the existing 10-foot easement is adequate for the new 16-inch diameter pipe with the full knowledge that multi-story residential dwelling units will be built directly adjacent. Again, we assume PG&E would rebuild and upgrade the pipeline to comply with CPUC Decision 11-06-017.
- PG&E could relocate and upgrade the line in an easement in an alternate alignment. One option is adjacent to Foothills Boulevard, where it would continue north to Campus Park Boulevard then east to the eastern edge of the development. Any alternate alignment will add length and cost to the upgrade project and neither PG&E nor the developer has indicated an interest in paying for this type solution.

There may be other options. A viable solution is likely years away and subject to future study and negotiations with PG&E.

## C. AT&T

AT&T is the incumbent local exchange carrier (ILEC) and will provide telecom services to the PRSP in accordance with its rules and regulations.

### System Design

AT&T's Stanford/Rocklin central office (CO) is located east of PRSP on Cincinnati Avenue, just north of Sunset Boulevard West. It's a mega wire center equipped with the latest in fiber telecom technology and serves much of northwest Roseville (Crocker Ranch, Westbrook and portions of Fiddymont Farms and Westpark), as well as Rocklin and Lincoln through its Stanford and Lincoln exchanges.

The Stanford Wire Center will provide telecommunications service to the PRSP. The primary feed will be a large count fiber trunk running south along Cincinnati from the CO then west along Sunset Avenue West, though fiber may have to extend south around the development and north up Fiddymont Road and/or Woodcreek Oaks Boulevard due to phasing.

Residential: Two types of fiber systems are employed for residential projects: 1) Fiber to the premises (FTTP) and, 2) Fiber to the node (FTTN).



**Figure 19 – Optical Network Terminal adjacent to an Electric Meter Panel**



**Figure 18 – AT&T Primary Flex Point**

AT&T's most advanced pure fiber connection medium is FTTP, where fiber runs from the CO directly to each residence. Large count fiber cables (the CO fiber) run from the CO to Primary Flex Points (PFPs, Figure 18). Each PFP contains multiple splitters (optical prisms) and can serve from 100 to 500 homes. We anticipate 20 to 25 PFPs serving PRSP's residential neighborhoods. Fiber cables (the distribution fibers, 432 – 216 – 144 – 72 – 48 - 24 strand) extend from each PFP to



Fiber Serving Terminals (FSTs) placed strategically throughout the neighborhoods in small flush-mount vaults. Each FST can serve up to 8 homes, but typically serve 5 to 6. A single fiber runs from the FST to an optical network terminal (ONT, Figure 19) mounted on the outside wall of each residence, so each home is fed by its own fiber.

Two main equipment components are placed at the home: 1) The ONT, which sits in a flush mount Telco cabinet on the side of the house and, 2) An external back-up battery located either in the garage or the house. The ONT converts the digital light signal (data encoded in a pulse of light) from the CO to an analog electrical signal which provides the desired services – dial tone, cable and internet (i.e., a triple play of services).

AT&T's next most advanced residential fiber optic cable connection is FTTN, where fiber from the CO overlays an existing copper network to a fiber cabinet placed adjacent to an existing service area interface (SAI) box. Copper runs from the fiber cabinet to the SAI, with the existing copper distribution pairs remaining as the final legs to the residences. Large portions of the adjacent neighborhoods (Crocker Ranch and Diamond Creek) are served FTTN.



**Figure 20 – AT&T Remote Terminal Cabinet**

AT&T's intention is to serve the residential portion of PRSP with FTTP.

Commercial: Service to commercial and retail customers will be based on their requirements -- either copper or fiber fed. AT&T still runs copper for traditional business telephone service unless a customer specifically requests and contracts for fiber service. Large businesses, office buildings, strip malls, schools, hospitals, libraries etc. will be served via fiber fed Digital Loop Carrier (DLC), which uses an optical fiber trunk cable from the CO

to a remote terminal (RT), and copper pairs as the final leg from the RT cabinet to the end user. Multiple dwelling units (MDUs) will also be served fiber-fed DLC.

We anticipate several RT cabinets (Figure 20) placed in MPEs to serve the schools and commercial sites.

A backbone conduit and manhole system capable of supporting both copper and fiber systems will run along Sunset Boulevard and the other major roads (Appendix D – AT&T Telecom Backbone Exhibit).



**Figure 21 – Cable TV Doghouse**

### **AT&T Service to Phase 1**

AT&T is well positioned to support PRSP's first phase. It has facilities stubbed north at Fiddymment Road and Woodcreek Oaks Blvd.

### **D. Wave**

Wave is the cable television provider for this portion of Placer County and will support the PRSP with cable TV and broadband/internet.

#### **System Design**

Wave offers a "triple play" of services (dial tone, video and internet). It installs a hybrid fiber-coaxial (HFC) system that combines fiber and coaxial cable in DB 120 conduit. In an HFC system, the information (TV channels, data, voice, et al) is sent from the company's headend to optical nodes in the local neighborhoods via optical fiber trunk cables. The optical node (i.e., the fiber node) converts the digital light signal (data encoded in a pulse of light) to an electrical signal for the final leg via coaxial cable to the end users.

Wave pipes the main roads with 1-3 inch and 2-2 inch as its backbone system, and runs 2-2 inch ducts as typical in subdivisions (Appendix E – Wave Cable TV Backbone Exhibit). Wave will provide its own system -- conduit, boxes, pedestals, fiber, coax, nodes, amplifiers, splitters, power supplies, etc. Fiber nodes, nodes, amplifiers, splitters and power supplies are often placed in dog houses (Figure 21). Each fiber node (Figure 22) is fed with 6 fibers and serves 300 to 400 customers (Wave is working to reduce that to ~200 customers). We anticipate 20 to 30 fiber nodes if served via this technology.

Wave recently launched its own version of a FTTP system, and PRSP will almost certainly enjoy that latest technology.

Wave Broadband has conduit structure with fiber stubbed west at Sunset Boulevard and Cincinnati Avenue, and at Nichols Drive and Duluth Avenue.



**Figure 22 – Cable TV Fiber Node & Power Supply**

### **Wave Service to Phase 1**

Wave has fiber facilities stubbed west at Sunset Boulevard and Cincinnati Avenue, and at Nichols Drive and Duluth Avenue, so is not well positioned to serve Phase 1. A study will be required to determine the most economical route for Wave to serve Phase 1.

## E. Comcast

Comcast has indicated a strong interest in serving the PRSP and has facilities in the adjacent neighborhoods to the south that are well positioned to serve. It would push fiber to the site in existing conduit that extends north up Fiddymment Road and Woodcreek Oaks Boulevard, and west on Sunset Boulevard West.

### System Design

Comcast offers a “triple play” of services (dial tone, video and internet). It installs an HFC system similar to the one described above for Wave Broadband in a high density polyethylene (HDPE) pipe as opposed to conduit. The HDPE (Figure 23) comes on reels, is typically black or terra cotta colored, and looks very similar to gas pipe.



Figure 23 – Comcast HDPE Reel

Comcast recently launched its own version of an FTTP system and PRSP should receive that latest technology.

### Comcast Service to Phase 1

Comcast is well positioned for PRSP’s first phase. It has facilities stubbed north at Fiddymment Road as well as at Woodcreek Oaks Boulevard.

## F. Consolidated Communications

CCI is interested in serving the PRSP. It is the ILEC for most of Roseville, but would compete with AT&T in PRSP as a competitive local exchange carrier (CLEC).

CCI would offer a “triple play” of services (dial tone, video and internet access) via fiber-optic cable from any of four COs (Placer Corporate, Del Webb CO, Blue Oaks CO and/or Industrial CO).

System design is much like that described above for AT&T. CCI would offer FTTP to both its residential and commercial customers.



Figure 24 – Sprint Fiber Line on PG&E Poles

### **CCI Service to Phase 1**

CCI is exceptionally well positioned for PRSP's first phase. It has conduit from its Del Webb CO stubbed north on Fiddymont Road, and conduit from its Blue Oaks CO stubbed north on Woodcreek Oaks Boulevard.

### **G. Sprint Fiber**

The Sprint fiber line traversing the project on Fiddymont Road (an underbuild on the PG&E 12 kV line) is a long haul trunk & toll line that runs from Mexico to Canada. As such, it will not provide telecom service to PRSP.

The fiber line (Figure 24) will be relocated and converted to underground as the project develops, but that presents challenges. The architecture of this aerial line is unusual and obsolete – no spare fiber is coiled anywhere along it to deal with the relocations, underground conversions or car pole accidents that invariably occur. Any changes whatsoever require complete reconstruction from splice point to splice point, which could be a half a mile away in each direction. The splices themselves are in buried boxes (not flush-mount boxes with lids, truly buried boxes) making them inaccessible without a backhoe. It's a challenging and expensive system to work with.

## IV. Service to the University

### *PG&E Electric*

A review of the electric peak demand of assorted universities in Northern and Central California indicated a range of 16 MVA on the high side (University of California at Berkeley) to 3.5 MVA on the low side (Sonoma State), with most universities surveyed falling within the 5 to 8 MVA range. California State University Sacramento (CSUS) is similar in size and student body<sup>8</sup> to the university proposed for Placer Ranch and has a peak demand of 9 MVA. And it is an older and less efficient campus than we'd expect for the new university. Based on the above, we estimate the peak demand for the university at 9 MVA at buildout.

Three options for serving the university with electric service are discussed below:

**1) Option A – 480 Volt Service (Secondary) through a PG&E Distribution System:** Option A is the typical approach PG&E uses for commercial, industrial, schools or large multifamily projects. A PG&E 21 kV, three phase circuit would loop underground through the campus and tie to circuits in Fiddymont Road, Sunset Boulevard, Campus Park Boulevard and/or University Village Drive. The buildings throughout the campus would be individually served at 277-480 volts through PG&E owned transformers. U.C. Davis used this approach for its latest student housing project.

**2) Option B – 21 kV Primary Service through the PG&E Distribution System:** Underground main-line 21 kV circuits owned and maintained by PG&E will extend throughout Fiddymont Road, Sunset Boulevard, Campus Park Boulevard and University Village Drive. University owned 21 kV circuits - all primary metered - could tie to the PG&E main-line circuits (2 to 4 ties at buildout), take service at 21 kV, then loop through and distribute power to the campus. This would allow the university to take advantage of PG&E's primary service rate. Multiple feeds from different circuits (and eventually different substations) would add an extra level of redundancy and reliability in the event of circuit failures. The majority of universities throughout Northern California are primary metered.

**3) Option C – 12 or 21 kV Primary Service through a Customer Owned Substation:** A third option is for the university to own and maintain its own substation and wheel power from the 230 kV lines that cross the campus. The University of California at Davis, for example, takes service in this manner.

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<sup>8</sup> The new Placer County campus is 300 acres and will accommodate ~30,000 students at buildout. The existing California State University Sacramento campus is almost built out, also 300 acres and accommodates ~28,800 students.



### **Summary Conclusion – Electric Service to the University**

In a meeting with CSUS staff and Roseville Electric on October 8, 2014<sup>9</sup>, the university indicated it would likely take primary service (Option B).

### **PG&E Gas**

The university campus will be served from the 6-inch and 8-inch distribution mains that run adjacent to the campus. We estimate the gas demand for the university at 150 MCFH at buildout.

There are two options for providing the university with natural gas service:

**1) Option A -- University Owned System, Transport from PG&E's Distribution System:** PG&E natural gas mains will loop the perimeter of the university in Fiddymont Road, Sunset Boulevard, Campus Park Boulevard and/or University Village Drive. The university could tap these mains at multiple locations and distribute the natural gas on campus in a university owned gas distribution system. Depending on the size of the load, each tap will require a rotary or turbine meter at the demarcation point where ownership of the gas distribution system transfers to the University.

In a transport arrangement, PG&E would not be the gas provider. The university would most likely contract for long term transportation with the Department of General Services (DGS). PG&E would act as a public "freeway/pipeline" to allow the buyer and the seller to complete the transaction, and collect a "transport fee."

Once in the university's system, the gas would be distributed throughout the campus at elevated pressure (likely 5 psig) then regulated down to standard delivery pressure (.25 psig) where it enters each building. An exception might be a central boiler which operates at a pressure above standard delivery pressure.

The advantage of this type of service is it allows the university or DGS to purchase natural gas competitively on the open market at lower rates, bypassing the local utility (PG&E) except for the transport fee.

**2) Option B -- University Owned System, Service from PG&E's Distribution System:** The university could tap the gas mains at multiple locations from Fiddymont Road, Sunset Boulevard, Campus Park Boulevard and/or University Village Drive and take service from PG&E rather than procuring the gas from an outside supplier and "transporting" it to the campus. Portions of the University of California at Davis campus (new student housing) take service in this manner.

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<sup>9</sup> The City of Roseville is no longer the electric service provider to PRSP, but it was at the time of the referenced 10/8/14 meeting.

### ***Telecom Service***

The university campus will maintain its own telecommunications network consisting of an underground conduit system - with copper and fiber systems - connecting each campus building to a main distribution point. The university will design to bring the AT&T, Wave Broadband, Comcast and/or CCI feeds to its main distribution point (it could take feeds at several campus locations), and will then run the feed(s) through its own equipment.

The network system will be capable of providing voice, data, internet, WiFi, TV/video and security services throughout the campus.

## **V. Environmental Documents**

We recommend the environmental documents include evaluation of the cumulative impacts of existing, relocated and proposed dry utility facilities.



## **VII. Summary & Conclusions**

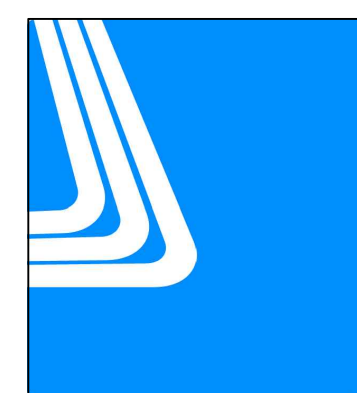
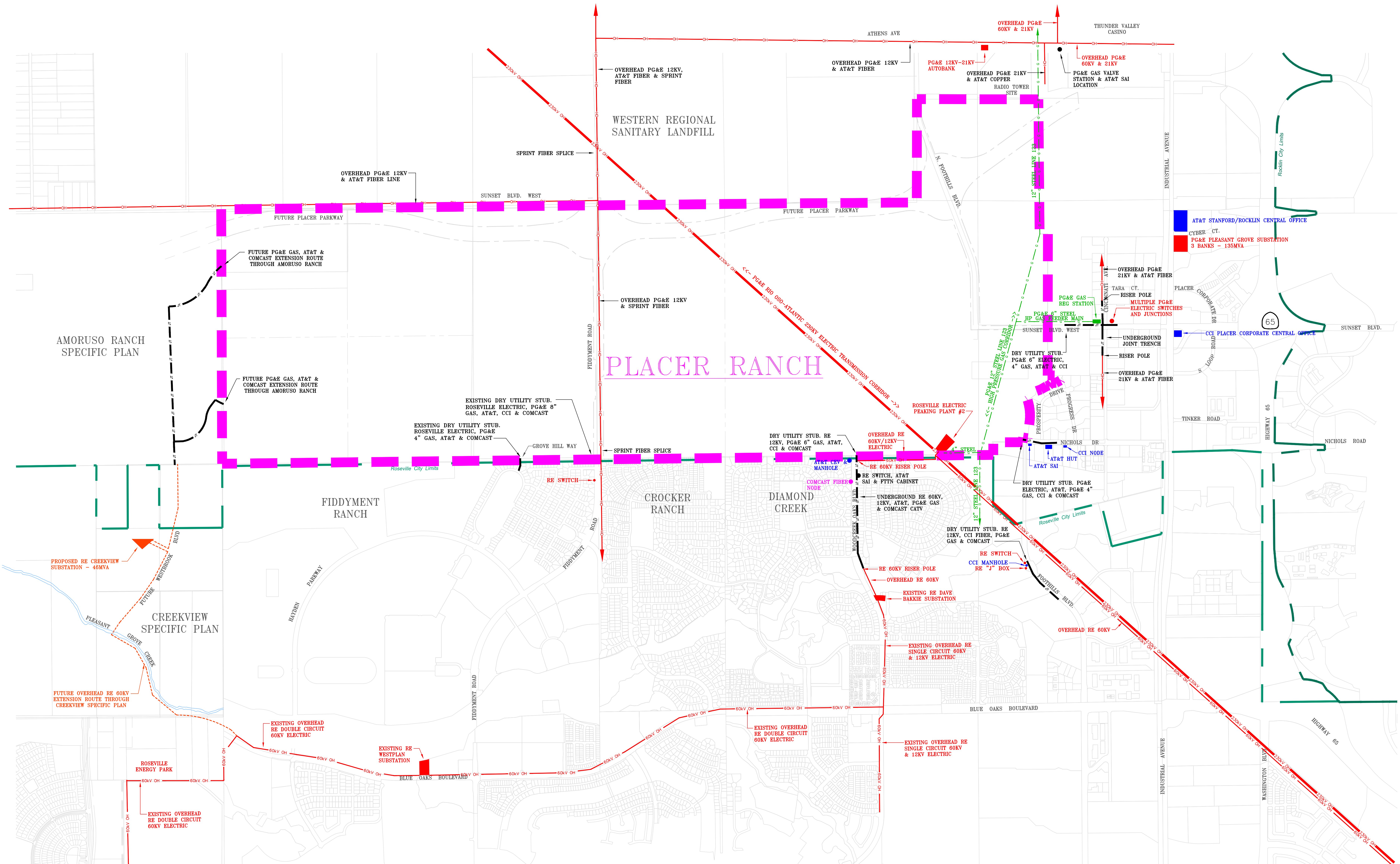
### ***Summary & Conclusions***

From a dry utility perspective, we do not anticipate any insurmountable obstacles in serving PRSP. We anticipate the usual challenges – undergrounding and relocating existing overhead lines (PG&E and Sprint), siting of telephone remote terminals, tapping the 230 kV line for the PG&E's new substation, working around, over and under PG&E's 230 kV high voltage electric transmission tower line and its Line 123 gas transmission line.

PG&E natural gas, AT&T, Wave, Comcast & CCI all have distribution facilities stubbed to or near the project's first phases -- ready to be extended and activated. Conceptual utility layouts assume that main feeders stubbed to the north of the PRSP will be oversized to accommodate future growth in the Sunset Area Plan.

Providing PG&E electric service to the first phase at 21 kV will be logistically challenging and expensive since the closest 21 kV facilities are east of the project on Cincinnati Avenue and Sunset Boulevard and north of it on Athens Avenue near the Thunder Valley Casino. Extensions of new electric facilities will be made under PG&E's Electric Rule 15, which currently allows for a cost sharing arrangement between the utility and the developer (Discount Option).





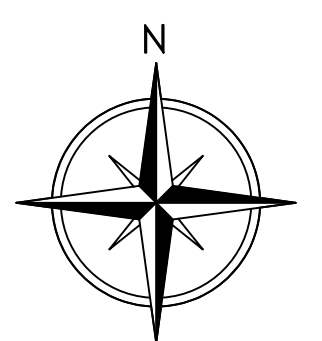
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\*THIS EXHIBIT IS INTENDED AS A GENERAL OVERVIEW OF SOME OF THE PROMINENT EXISTING DRY UTILITY FACILITIES IN THE GENERAL AREA. IT WAS PREPARED FROM FIELD OBSERVATIONS, USA MARKINGS, UTILITY MAPS WHEN AVAILABLE AND OUR EXPERIENCE AND QUALIFICATIONS. FACILITIES ARE SHOWN AT APPROXIMATE LOCATIONS ONLY AND HAVE NOT BEEN SURVEYED. CAPITOL UTILITY SPECIALISTS MAKES NO GUARANTEES AS TO ACCURACY AND ACCEPTS NO RESPONSIBILITY FOR MISMARKED OR OMITTED ITEMS.

## PLACER RANCH EXISTING DRY UTILITIES EXHIBIT

APPENDIX A  
JULY 2017



BASE MAP PROVIDED BY  
MACKAY & SOMPS CIVIL ENGINEERS

SCALE: NTS



2 - 600A MAINLINE SUBSTATION CIRCUITS


1 - 600A MAINLINE SUBSTATION CIRCUIT

200A LOCAL CIRCUITS

PROPOSED PG&E ELECTRIC SUBSTATION

PG&E/ROSEVILLE ELECTRIC TERRITORY BOUNDARY

The map illustrates the proposed PG&E electric backbone for Placer Ranch. It features several key streets: Placer Parkway at the top, Fiddymont Road running vertically, and Sunset Blvd. running horizontally. Other streets include Westbrook Boulevard, Roseville Electric Territory, PG&E Territory, Roseville Electric Territory, Woodcreek Oaks Blvd., Foothills Blvd., Duluth Avenue, Nichols Drive, College Drive, Village Drive, University Drive, Town Center Lane, and Campus Parkway. The map shows two mainline substation circuits (blue dashed lines) and one mainline substation circuit (green dashed line). Red dashed lines represent 200A local circuits. A red circle indicates the proposed PG&E electric substation. The PG&E/Roseville Electric Territory boundary is shown as a thick cyan line. Arrows indicate the direction of power flow. A label 'TO PLEASANT GROVE SUBSTATION>>>' is located in the upper right corner.



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PLACER RANCH

PG&E ELECTRIC BACKBONE EXHIBIT

APPENDIX B

JULY 2017



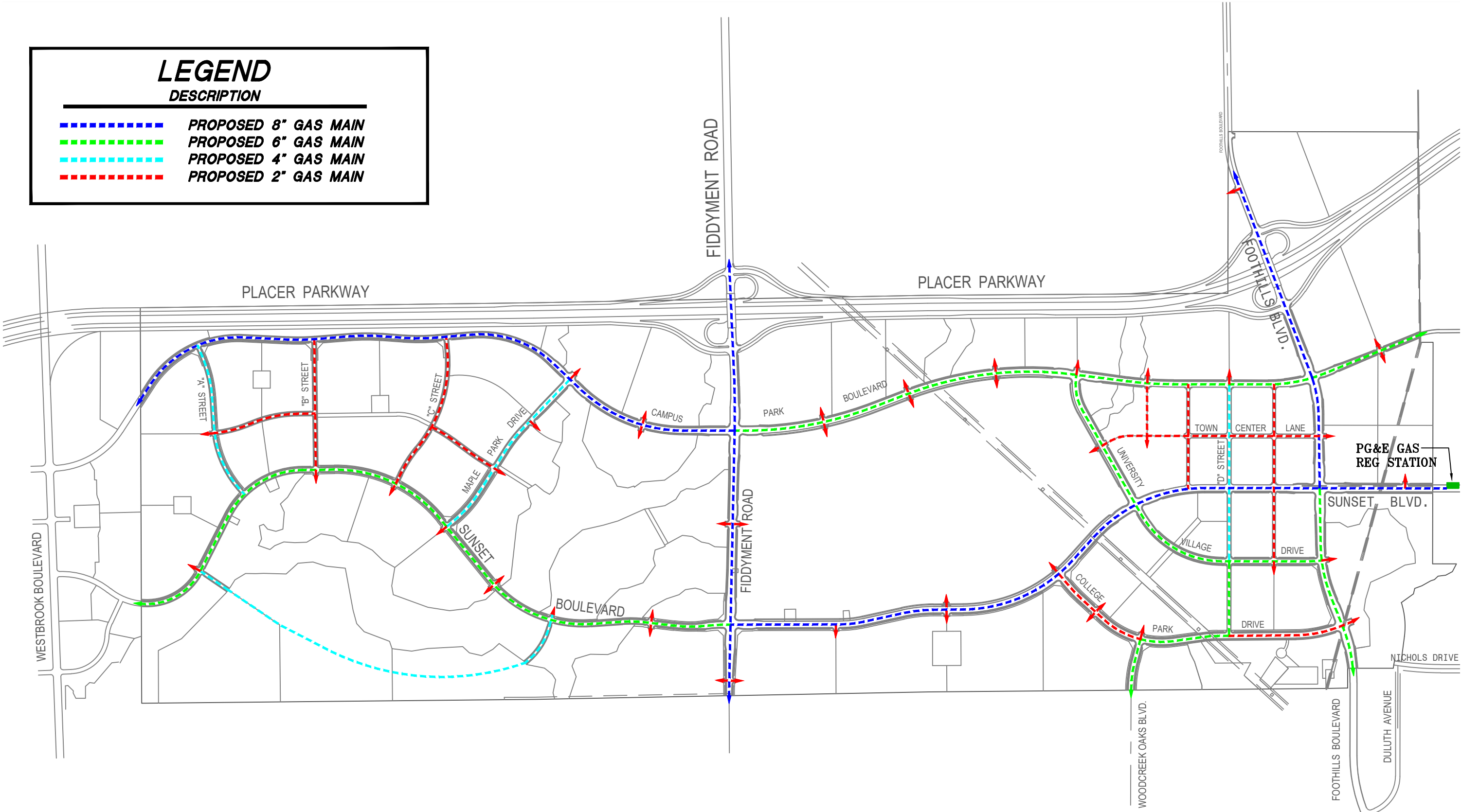
BASE MAP PROVIDED BY  
MACKAY & SOMPS CIVIL ENGINEERS  
SCALE: 1"=1,250'

\*THIS EXHIBIT IS A CONCEPTUAL ELECTRICAL DESIGN ONLY AND REPRESENTS AN EDUCATED GUESS AS TO WHAT THE PG&E SYSTEM MAY LOOK LIKE AT BUILDOUT BASED ON THE UTILITY'S CURRENT STANDARDS. PG&E RESERVES THE RIGHT TO RUN ITS FACILITIES AS NEEDED; ACTUAL DESIGNS MAY DIFFER FROM THAT PRESENTED.

# LEGEND

## DESCRIPTION

- PROPOSED 8" GAS MAIN
- PROPOSED 6" GAS MAIN
- PROPOSED 4" GAS MAIN
- PROPOSED 2" GAS MAIN



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## PLACER RANCH PG&E NATURAL GAS BACKBONE EXHIBIT

APPENDIX C  
JULY 2017



BASE MAP PROVIDED BY  
MACKAY & SOMPS CIVIL ENGINEERS

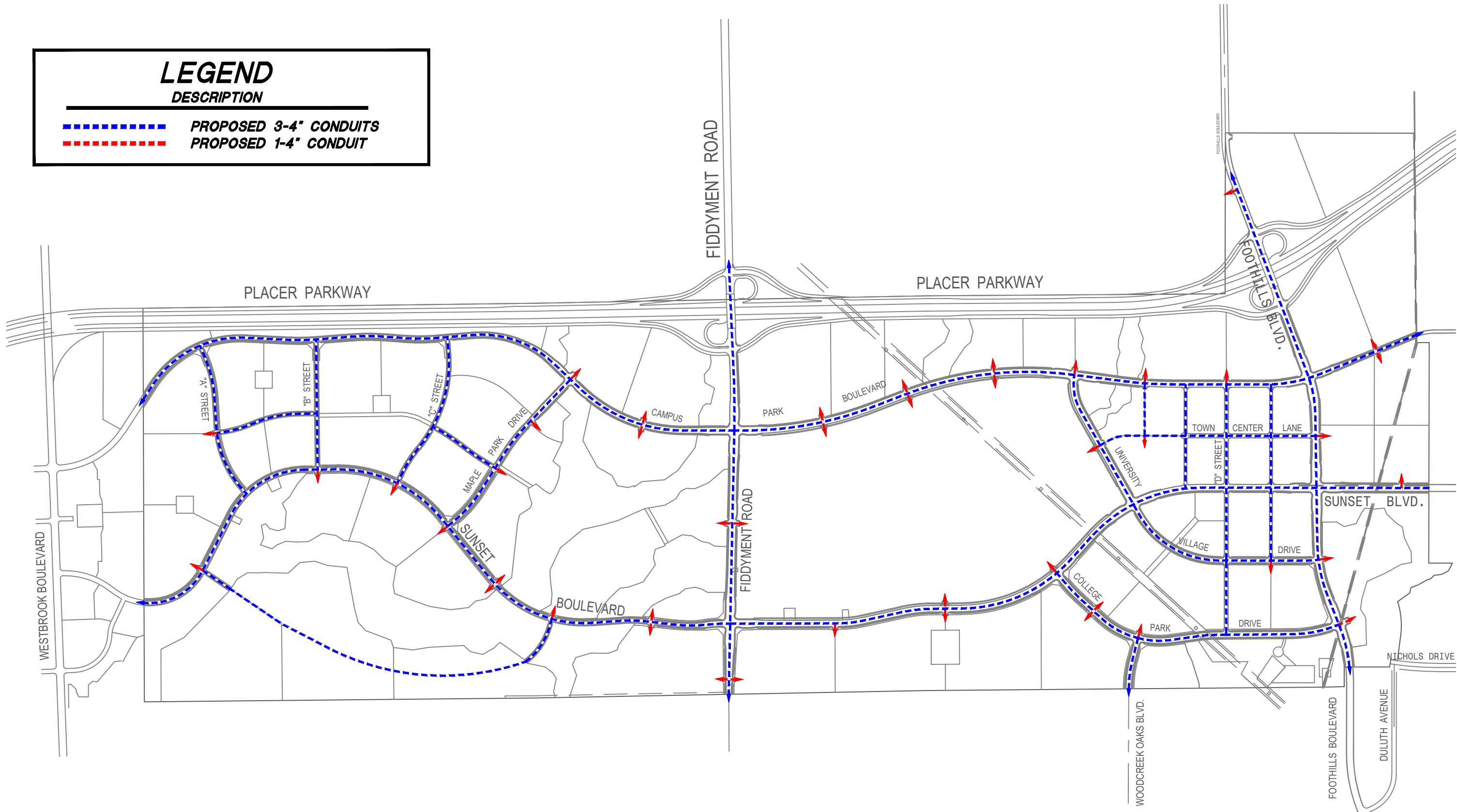
SCALE: 1"=1,250'

\*THIS EXHIBIT IS A CONCEPTUAL NATURAL GAS DESIGN ONLY AND REPRESENTS AN EDUCATED GUESS AS TO WHAT THE PG&E SYSTEM MAY LOOK LIKE AT BUILDOUT BASED ON THE UTILITY'S CURRENT STANDARDS. PG&E RESERVES THE RIGHT TO RUN ITS FACILITIES AS NEEDED; ACTUAL DESIGNS MAY DIFFER FROM THAT PRESENTED.

**LEGEND**

**DESCRIPTION**

-  **PROPOSED 3-4" CONDUITS**
-  **PROPOSED 1-4" CONDUIT**



**Capitol Utility  
Specialists**

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**PLACER RANCH  
AT&T TELECOM BACKBONE EXHIBIT**

**APPENDIX D  
JULY 2017**



BASE MAP PROVIDED BY  
MACKAY & SOMPS CIVIL ENGINEERS

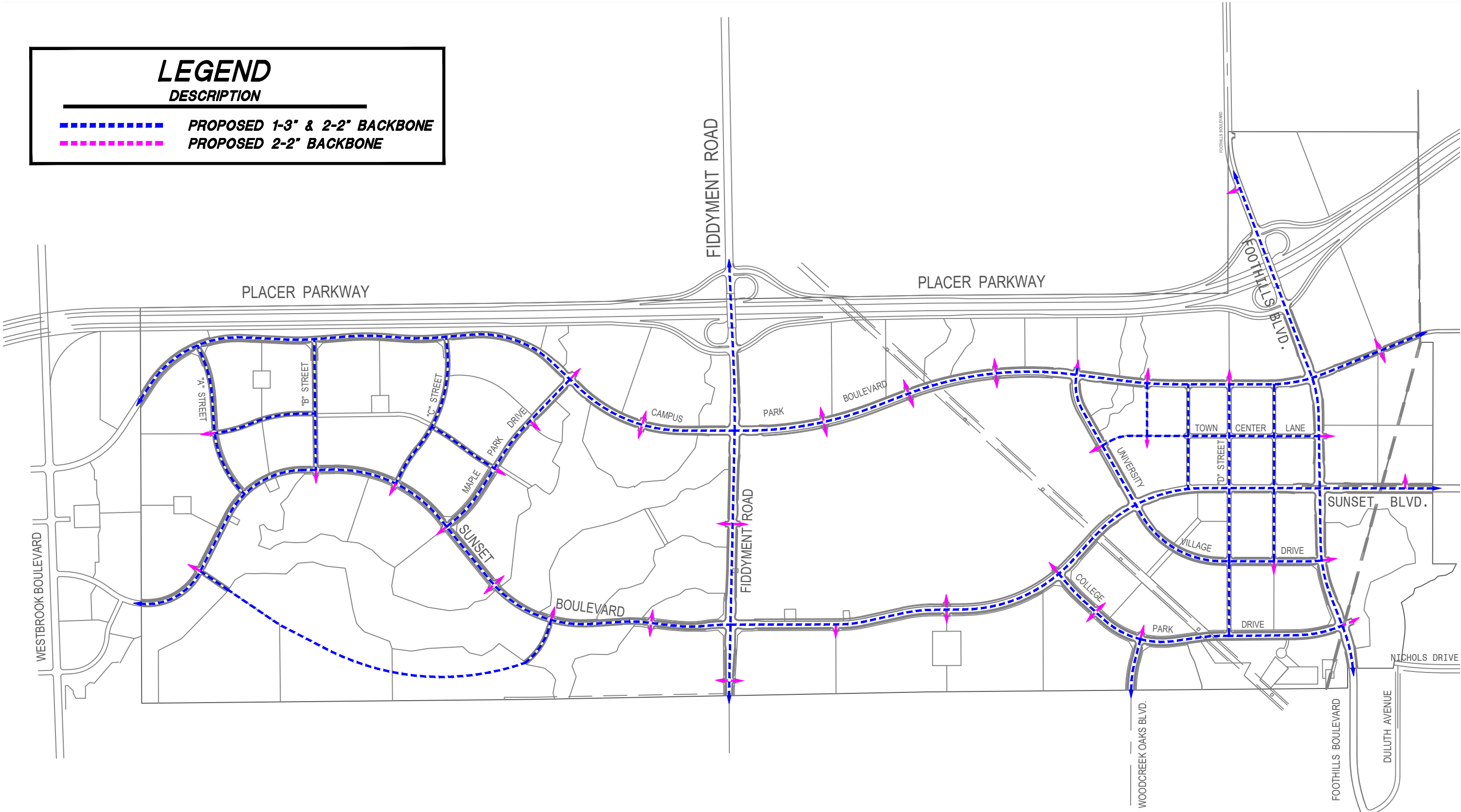
SCALE: 1"=1,250'

\*THIS EXHIBIT IS A CONCEPTUAL TELECOM DESIGN ONLY AND REPRESENTS AN EDUCATED GUESS AS TO WHAT THE AT&T SYSTEM MAY LOOK LIKE AT BUILDOUT BASED ON THE UTILITY'S CURRENT STANDARDS. AT&T RESERVES THE RIGHT TO RUN ITS FACILITIES AS NEEDED; ACTUAL DESIGNS MAY DIFFER FROM THAT PRESENTED.

**LEGEND**

**DESCRIPTION**

- PROPOSED 1-3" & 2-2" BACKBONE**
- PROPOSED 2-2" BACKBONE**



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**PLACER RANCH  
WAVE BROADBAND BACKBONE EXHIBIT**

**APPENDIX E  
JULY 2017**



BASE MAP PROVIDED BY  
MACKAY & SOMPS CIVIL ENGINEERS

SCALE: 1"=1,250'

\*THIS EXHIBIT IS A CONCEPTUAL BROADBAND DESIGN ONLY AND REPRESENTS AN EDUCATED GUESS AS TO WHAT THE WAVE BROADBAND SYSTEM MAY LOOK LIKE AT BUILDOUT BASED ON THE UTILITY'S CURRENT STANDARDS. WAVE RESERVES THE RIGHT TO RUN ITS FACILITIES AS NEEDED; ACTUAL DESIGNS MAY DIFFER FROM THAT PRESENTED.





**CAPITOL UTILITY SPECIALISTS**  
DRY UTILITY PLANNING • CONSULTING • DESIGN

## TECHNICAL MEMORANDUM

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**DATE:** October 31, 2018

**TO:** County of Placer

**FROM:** Gary Krause

**SUBJECT:** Addendum #1 to the Technical Dry Utilities Study for the Placer Ranch Specific Plan

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### Introduction

This Technical Memorandum functions as an Addendum to the Technical Dry Utilities Study for the Placer Ranch Specific Plan, dated July 18, 2017, prepared for the Placer Ranch Specific Plan. Its purpose is to evaluate the differences between the Original Project and the Revised Project (based on an updated Land Use Plan, dated October 17, 2018). Together, this Addendum and its associated Master Plan provide the appropriate technical data and analysis to guide buildout of Placer Ranch's backbone infrastructure as depicted on the Revised Project's Land Use Plan.

### Background

The Technical Dry Utilities Study evaluated the infrastructure requirements for the Original Project, however in October 2018, several refinements were made to the land use plan, which resulted in the Revised Project.

These refinements generally included the following revisions to the land use plan:

- In the area west of Fiddymont Road and north of Sunset Boulevard, several land use parcels were reconfigured to shift residential and school uses outside a 2,000' buffer from the Western Regional Sanitary Landfill's properties. This resulted in the enlargement of Park parcel PR-102, a southerly shift of school parcel PR-92, the conversion of GC and HDR (parcels PR-61 and PR-42) to a Campus Park use.
- Along Maple Park Drive, MDR and HDR uses (parcels PR-32 and PR-42) were converted to LDR and MDR.
- Along Campus Park Boulevard, the PF site for a water tank (parcel PR-100) was enlarged.
- Paseo's have been adjusted in response to land plan refinements in order to maintain the east/west connectivity.



- The alignments of C Street and Maple Park Drive were shifted slightly in response to the land use adjustments described above, while maintaining the prior street pattern and connections.
- Along Fiddymont Road, Campus Park parcel PR-70 was converted to MDR.
- Within the Town Center district south of Sunset Boulevard, HDR parcels PR-50 & 51 were converted to MDR, and MDR parcels PR-35-38 were converted to LDR.
- The allocation of “floating” reserve units in the Town Center district was increased from 150 units to 300 units. These units continue to be factored as HDR units.
- South of Sunset Boulevard, the alignment of Foothills Boulevard has been shifted in an eastward direction to align with the existing Duluth Avenue corridor south of the Plan Area. As a result of this shift, LDR parcel PR-24, CP parcel PR-88, and MDR parcel PR-38 have been slightly enlarged.
- In the area south of Sunset Boulevard and east of Foothills Boulevard, MDR parcel PR-38 was enlarged to provide vehicular access to Sunset Boulevard, per the Foothill Boulevard realignment noted above. This adjustment also resulted in a portion of OS parcel PR-134 being converted to MDR.
- In the area north of Sunset Boulevard and east of Foothills Boulevard, Campus Park parcels PR-86-89 were converted to a low-density, active-adult, residential use (LDR-A), and Campus Park parcels PR-84 and 85 were reduced in size.
- A private park site was added within the active adult community north of Sunset Boulevard and east of Foothills Boulevard.
- A 100’-wide paseo has been added along the east edge of the plan area as a buffer between the active adult residential parcels and offsite industrial uses located in the Sunset Area Plan.
- East of Foothills Boulevard, Campus Park Boulevard was slightly realigned in response to the land use adjustments described above, while maintaining the east/west connectivity to the Sunset Area Plan.
- Park sites were added and/or enlarged (as described above) to increase the plan-wide park acreage in a manner that meet the General Plan’s active parkland requirement of 5 ac./1,000 population.

The table below summarizes the differences between the Original Project and the Revised Project.

**Table 1: Comparison of Original and Revised Land Uses and Development Assumptions**

Land Use Designation	Acreage			Dwelling Units/ Square Footage		
	Revised Project	Original Project	Difference	Revised Project	Original Project	Difference
<b>Residential Uses</b>						
LDR Low Density Residential	446.0 ac	407.9 ac	38.2 ac	2,210 du	2,039 du	171 du
LDR-A Low Density Res. - Age-Restricted	183.1 ac	131.0 ac	52.1 ac	1,050 du	720 du	330 du
MDR Medium Density Residential	112.3 ac	132.3 ac	-20.0 ac	872 du	1,057 du	-185 du
HDR High Density Residential*	60.0 ac	93.0 ac	-33.0 ac	1,504 du	2,011 du	-507 du
<i>Subtotal</i>	801.4 ac	764.2 ac	37.3 ac	5,636 du	5,827 du	-191 du
<b>Commercial and Employment Uses</b>						
GC General Commercial	22.7 ac	25.6 ac	-2.9 ac	296,513 sf	334,933 sf	-38,420 sf
CMU Commercial Mixed Use	48.8 ac	48.8 ac	0.0 ac	637,718 sf	637,718 sf	0 sf
CP Campus Park	335.0 ac	395.5 ac	-60.6 ac	4,506,282 sf	5,384,152 sf	-877,870 sf
UZ University	301.3 ac	301.3 ac	0.0 ac	3,000,000 sf	3,000,000 sf	0 sf
<i>Subtotal</i>	707.7 ac	771.2 ac	-63.5 ac	8,440,513 sf	9,356,803 sf	-916,290 sf
<b>Open Space and Public Uses</b>						
PF Public Facilities (Schools)	32.7 ac	32.0 ac	0.7 ac			
PF Public Facilities (County Facilities)	10.3 ac	5.5 ac	4.8 ac			
PR Parks and Recreation	69.8 ac	50.7 ac	19.1 ac			
OS Open Space (Preserves/Paseos)	264.8 ac	272.8 ac	-8.0 ac			
<i>Subtotal</i>	377.5 ac	360.9 ac	16.6 ac			
<b>Other</b>						
ROW Placer Parkway	158.5 ac	158.5 ac	0.0 ac			
ROW Major Roadways & Landscape	168.1 ac	158.5 ac	9.6 ac			
<i>Subtotal</i>	326.6 ac	317.0 ac	9.6 ac			
<b>Total</b>	<b>2,213.3 ac</b>	<b>2,213.3 ac</b>	<b>0.0 ac</b>	<b>5,636 du</b> <b>8,440,513 sf</b>	<b>5,827 du</b> <b>9,356,803 sf</b>	<b>-191 du</b> <b>-916,290 sf</b>

\* includes 300 reserve units within the Town Center district

## Analysis

An evaluation of the difference in projected gas and electric peak demand between the original and revised projects was conducted to determine what, if any, effect those demand changes will have on the dry utility facilities planned to serve the development.

**Table 2: Impact of Original and Revised Land Uses on Peak Electric Demand**

Land Use Designations	Electric Peak Demand (Acreage Method)			Electric Peak Demand (SF & DUs Method)		
	Original Project 2017	Revised Project 2018	Difference	Original Project 2017	Revised Project 2018	Difference
Residential MDR & LDR	17.2	18.6	1.4	17.2	18.6	1.4
Residential HDR	6.8	5.1	-1.7	6.8	5.1	-1.7
Commercial	36.6	31.7	-4.9	41.0	35.1	-5.9
University	9.8	9.8	0.0	17.1	17.1	0.0
Schools & Public Facilities	3.4	3.7	0.4	4.1	4.4	0.4
<b>Total Peak Demand (MVA)</b>	<b>73.8</b>	<b>68.9</b>	<b>-4.8</b>	<b>86.2</b>	<b>80.3</b>	<b>-5.9</b>

The anticipated electric demand decreased roughly 7% (from 4.8 to 5.9 MVA, dependent on the method used to measure it), which will have no significant impact on the electric facilities (size of substation, size of main line feeders, et al) planned to feed the development.

**Table 3: Impact of Original and Revised Land Uses on Peak Gas Demand**

Land Use Designations	Natural Gas Peak Demand		
	Original Project 2017	Revised Project 2018	Difference
Residential MDR & LDR	190.8	206.6	15.8
Residential HDR	90.5	67.7	-22.8
Commercial	317.8	272.0	-45.8
University	150.0	150.0	0.0
Schools & Public Facilities	16.3	6.3	-10.0
<b>Total Peak Demand (MCFH)</b>	<b>765.4</b>	<b>702.6</b>	<b>-62.8</b>

The anticipated gas demand decreased 8.2% (63 MCFH), which will have no significant impact on the on the natural gas main line facilities planned to feed the development.

## Conclusions

Based on the analysis above it was determined that though projected demands decreased due to the revised land uses, the effects on the dry utility facilities necessary to serve the project as detailed in the Placer Ranch Technical Dry Utilities Study dated 7/18/2017 are inconsequential.

In summary, the analysis demonstrates that the changes between the Original Project and the Revised Project are negligible and will not change any of the conclusions reached in the technical study.