WATER SUPPLY ASSESSMENT

RANCHO LOS AMIGOS -SOUTH CAMPUS

June 2018

TODD GROUNDWATER

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1. INTRODUCTION

1.1. PROPOSED PROJECT DESCRIPTION

Los Angeles County (County) is preparing an EIR to analyze environmental impacts associated with implementation of the proposed 474-acre Rancho Los Amigos South Campus Project (Project Site). The County proposes to develop three new County administrative buildings in the 28-acre Development Area on the Project Site, including the Internal Services Department (ISD) Headquarters, Probation Department Headquarters, and a Sheriff's Department Crime Laboratory. The total staffing for these buildings is expected to be approximately 3,000 employees. The final configuration of these buildings may potentially change through the design process; however, the total square footage for the proposed Project would be up to approximately 650,000 square feet, including:

- ISD Headquarters - approximately 370,000 square feet
- Probation Department Headquarters - approximately 220,000 square feet
- Sheriff's Crime Laboratory - approximately 60,000 square feet

The proposed Project also would include development of a parking structure, with a height not to exceed nine stories, and surface parking lots to be used for employee and visitor parking. The proposed Project plan is shown on **Figure 1** and is expected to be operational by 2021. Additional development to the Rancho Los Amigos South Campus Project is considered in this WSA to quantify the cumulative impact of the entire Project.

The proposed Project would be designed to achieve the Leadership in Energy and Environmental Design (LEED) gold rating (or a successor equivalent standard established by the U.S. Green Building Council) or better. Recycled water would be used on site to reduce the potable water demand. Construction could begin as early as the first quarter of 2019 and is anticipated to last up to approximately 30 months. The proposed Project would also require demolition of existing structures within the Development Area and the larger Project Site. The areas of the buildings demolished within the Project Site would be hydro seeded. This short-term water use is not included in this long-term Water Supply Assessment.

1.2. BACKGROUND

The California Water Code section 10910 (also termed Senate Bill 610 or SB610) requires that a water supply assessment (WSA) be provided to cities and counties for projects (of a specified type and size) that are subject to the California Environmental Quality Act (CEQA). The County recognizes the Rancho Los Amigos South Campus Project as subject to CEQA and SB610. Cities and counties are mandated to identify the public water system that might provide the Project's water supply and then to request a WSA, which includes a discussion regarding whether the public water system's total projected water supplies (available in normal, single dry, and multiple dry years during a 20-year projection) will meet the

projected water demand associated with the proposed Project in addition to the public water system's existing and planned future uses. The City of Downey (City) is the public water provider for the Rancho Los Amigos South Campus Project. Therefore, water supply and demand information for the City of Downey is presented herein.

A foundational document for preparation of the WSA is the Urban Water Management Plan (UWMP). The 2015 UWMP, which was adopted on February 2018, is available and relevant data have been updated by the City where applicable. WSAs and UWMPs both require water supply reliability information to be provided for the water service area in five-year increments over a 20-year planning horizon.

The 2015 UWMP estimates that the existing water service area population is approximately 112,400 persons as of 2015, based upon the California Department of Water Resources (DWR) Population Tool, and is estimated to increase to approximately 123,100 by the year 2030 (Stetson Engineers, 2018). The Project is expected to add a maximum of 3,000 new employees. The 2015 UWMP concludes that if projected imported and local supplies are developed as anticipated, no water shortages are anticipated in the City's service area during the planning period (Stetson Engineers, 2018). Furthermore, these calculations assume per capita consumption of 144 gallons per capita per day (GPCD) (Stetson Engineers, 2018), which is high relative to recent water demand rates and thus would tend to overestimate future water demand. As of June 2015, the City had reduced water use by 20.8 percent and thus achieved its water conservation standard set by the Water Conservation Act of 2009, which called for a 20 percent reduction by 2020 (SWRCB, 2016). The 2015 UWMP provides a more detailed discussion of water sources and supplies, water quality, reliability planning, conservation measures, contingency planning, and water recycling.

1.3. PURPOSE

The purpose of this WSA is to document the City's existing and future water supplies for its service area and compare them to the area's future water demand including that of the proposed Project. This comparison, conducted for both normal and drought conditions, is the basis for an assessment of water supply sufficiency in accordance with the requirements of California Water Code section 10910 (Senate Bill 610).

2. PROJECT WATER DEMAND

This section addresses water demands for the proposed land uses.

2.1. EXISTING WATER USE

The proposed Rancho Los Amigos South Campus Development Area is largely vacant and has been for some time. Previously, the area contained medical uses served by groundwater provided by the County. Water was supplied via groundwater wells operated by the County. While existing water use of the Development Area may include some minor irrigation, water use over the past five years has been minimal and for this WSA, it is assumed to be 0 AFY.

2.2. ESTIMATED FUTURE WATER DEMAND

Estimation of the future water demand for the proposed Project options involves application of water demand factors. The City's UWMP does not include an established methodology for estimating future demand. However, Project consultants provided estimates, which were reviewed for reasonableness. Project water demand estimates are summarized in Table 1.

The engineering consulting firm, KPFF, estimated the water demand of the proposed Project development as well as the demand for a sports center project (a separate project) and open space improvements. These are indicated as additional demand in Table 1. The demands were based on data provided by Syska Hennessy Group and the office of James Burnette; the potable demands total 134 acre-feet per year (AFY).

To confirm the water demand estimates supplied by KPFF, the water demand was calculated using a water use factor and square footage of each building. The proposed Project, Phase 1 B, includes mainly office space, with the ISD Headquarters and Probation Department Headquarters combined to be 590,000 square feet. The remaining 60,000 square feet is the Sheriff's Crime Laboratory. The office water demand factor is estimated at 0.15 gallons per day per square foot (gpd/sf) based on a previous WSA prepared for the City of Burbank (Todd 2017). A typical laboratory currently uses five times as much energy and water per square foot as a typical office building (Watch, 2016). Therefore, the laboratory water use estimate is 0.75 gpd/sf. Laboratory water use could include disinfection of equipment, washing, equipment cooling, and other uses. This check (based on water use factors and proposed area) calculates Project potable demand to be 149.5 AFY, higher than the KPFF estimate, but providing reasonable verification. One explanation for the difference is that the factor-based estimates assume that water demand continues seven days per week and the KPFF estimate assumes potable use for five days per week. For the purposes of this WSA, the KPFF water estimates (which are used in other parts of the EIR) are assumed to ensure consistency of approach.

While no specific landscape plans are provided, general parameters regarding future landscaped areas were considered. All planting areas are to be irrigated using high-efficiency sensors and automatic rain sensor controllers. Plants are expected to be a mix of turf, trees, and ornamental plantings (Gensler, 2017). The minimum requirement for the landscaped area for the Project was estimated using the County's guidelines; these state that 30 percent of the approximately 28-acre development footprint (8.4 acres) should be open space and at

least 50 percent of that should be landscaped, and presumably irrigated (4.2 acres). Accordingly, the estimated landscaped area would be approximately 4.2 acres or 183,000 square feet. Additional water will be used during the construction phase to hydroseed the landscaped area. However, this water demand is not expected to continue past the first six months. Based on this plan for irrigation, this plant mix, irrigation efficiency, and landscaped area, the water demand estimates presented by KPFF [104 acre-feet per year (AFY)] are reasonable. The water demand would be less if artificial turf is used at the Sports Center.

Based on the KPFF water demand estimates, calculation of potable water demand for the proposed Project is shown on **Table 1**. The total water demand at Project completion, 2021, is expected to be 184.7 AFY.

2.3. ESTIMATED FUTURE RECYCLED WATER USE

Recycled water is currently a supply source for the City and may be used to irrigate landscape in the development area. Los Angeles County, the City, and the Central Basin Municipal Water District (CBMWD, the recycled water provider) are working together to extend the recycled water conveyance system to the site (County, 2017). Recycled water eventually will be used for irrigation as well as dual plumbing for restrooms.

To minimize demand on the City's potable water system, developments at this site will be required to use recycled water in dual plumbing and irrigation systems. If a recycled water main is going to be extended to the site, it would be most beneficial to use dual plumbing for toilets and urinals; thereby providing a large reduction in demand of potable water. Once recycled water is implemented at the site for dual plumbing, non-potable demand may increase potentially up to 48 percent. Toilet use is approximately 66 percent of office demand and 13 percent of laboratory uses (USAID, 2017).

Table 1 shows the break-down of potable and non-potable use with complete implementation of recycled water. Non-potable use represents all irrigation water demand, 66 percent of office demand, and 13 percent of laboratory uses. The remaining water demand is assumed to be potable. The total long-term potable and non-potable use for the project is 47.5 AFY and 93.5 AFY, respectively. The cumulative development of the site would have a total potable and non-potable use of 52.2 and 132.5 AFY, respectively.

2.4. FUTURE WATER CONSERVATION

The Water Conservation Act of 2009 (SBx7-7) calls for a 20 percent reduction in urban water use by the year 2020. The water code was amended to require 2015 and 2020 water use targets to be developed in the 2010 UWMPs with updated targets in the 2015 UWMPs. According to the 2010 UWMP, the City set a 2020 compliance target for per capita water consumption of 138.5 GPCD in accordance with Section (10608.20) (b)(3) of the Water Code (Stetson Engineers 2012). Based on per capita water use from 2010 to 2015, the City of Downey has already achieved this compliance target (City of Downey, 2017). The City's water efficiency has increased since 2010, which is partly due to conservation measures and

awareness. Much of the water conservation is a result of Governor Jerry Brown's 2015 executive order mandating a 25 percent reduction in urban potable water use in response to the drought (State of California, 2015). In June 2015, in compliance with the State's executive order, the City approved its Ordinance 15-1341 which mandated water conservation regulations and restrictions.

The water conservation measures limit outside watering of potable water to only six minutes, two to three days a week (depending on the time of year), between 7 pm and 8 am; require that leaks are fixed within four days; prohibit watering within 48 hours after a rain event; and place restrictions on filling and refilling of pools, spas, and ponds (City of Downey 2016). Other measures require automatic shut off nozzles for hoses, restrict irrigation run off, prompt leak repair, and restrict swimming pools, for example. These measures were made permanent and are still active (City of Downey, 2017). Since June 2015, the City achieved its conservation standard by reducing water use by 20.8 percent (SWRCB, 2016).

Because of these regulations and the environmentally-aware design of the Project, water demand (especially landscape irrigation) could be lower than estimated. However, recycled water is not required to be conserved during drought periods. Given that much of the demand will be satisfied by recycled water, the more conservative pre-conservation water demand estimates were applied in the WSA to ensure adequate supply for the Project.

3. CITY OF DOWNEY WATER DEMAND

This section summarizes water demands for the City's service area, the proposed retailer for the Project.

The first part describes the factors affecting total water demand, including climate, population and employment, plus the mix of customer types, such as residential, commercial, agricultural and industrial. The second part documents water demands, not only under normal climatic conditions, but also during drought.

3.1. CLIMATE

Climate has a significant influence on water demand on a seasonal and annual basis. This influence increases with the portion of water demand for outside uses, specifically landscape irrigation.

Table 2 summarizes representative climate data for the City, including average monthly and annual rainfall and evapotranspiration (ETO) from the California Irrigation Management Information System, Monrovia (CIMIS) station (CIMIS, 2017). The City has a semi-arid, Mediterranean climate, characterized by dry summers and wet winters with year-round moderate-to-warm temperatures. Reflecting this pattern, water demand in the City is greater in the summer than in the winter.

As it would for the entire region, climate change may affect future water supply availability for the City by reducing water availability, changing local precipitation patterns, and increasing water demands. As discussed in greater detail below, the City largely relies on groundwater but is increasing its recycled water supply source to help offset potable demand.

California recently experienced a serious drought in 2012-2015, and is still recovering. In response, and as summarized in Section 2.4, the City passed permanent water conservation measures in June 2015.

3.2. POPULATION

City population, a key factor in water demand, is analyzed in the 2015 UWMP. **Table 3** reproduces the UWMP population value for the City's water service area with projections to 2040.

3.3. CURRENT WATER USE SECTORS AND WATER DEMAND

Table 4 documents the historical water demand for the City's service area by water use sectors for fiscal years 2010 through 2015 from the DWR Public Water Supply Statistic (PWSS) reports (DWR PWSS 2010-2015). The water use sectors (customer types) are listed on the left. Water demand data by sector were available only through 2011; for subsequent years, the sectors were adjusted proportionally based on total supply. Overall during the six-year period, total water use declined slightly, reflecting the success of water conservation programs among other factors. Unaccounted water, which includes routine pipeline flushing, unmetered use, water losses and inaccurate meter registration, is approximately 15.4 AFY (DWR PWSS 2010-2015).

3.4. PROJECTED WATER DEMAND

Table 5 summarizes actual 2015 and projected water demands for the City's service area from 2020 to 2040. The demand per sector was based on the projected required supply from the City, described in section 4 on the PWSS and distributed by sector based on available historical water demand by sector (PWSS, 2017). Overall, the projections indicate increasing water demands to 2040 for each water use sector. The projected residential and commercial water demands reflect water demand increases associated with general commercial and residential growth in the City, and have not been allocated to specific development projects.

3.5. WATER DEMAND IN NORMAL AND DROUGHT PERIODS

Water conservation is important to Southern California's water sustainability with direct effect on water demand, particularly during drought. As summarized in Section 2.4, the Water Conservation Act of 2009 calls for a 20 percent reduction in urban water use by the year 2020. In June 2015, the City of Downey Ordinance 15 -1341 mandated various water

conservation practices including limits on landscape irrigation practices, exterior washing, recreational use, and indoor use. The City is also a partner in The California Water Efficiency Partnership (formerly the California Urban Water Conservation Council). The CWEP provides resources, innovation, leadership and expertise on water efficiency for its partners. The group assembled 14 Best Management Practices for water conservation, which generally coincide with the five Demand Management Measures (DMMs) outlined in the Urban Water Management Plan guidelines, as follows:

- BMP 1: Utility Operations
- BMP 2: Public Education and School Education
- BMP 3: Residential Programs
- BMP 4: Commercial, Institutional, and Industrial Programs
- BMP 5: Landscape Programs

The total future demand may be lower than estimated as the City implements these best management practices for water efficiency.

4. CITY OF DOWNEY WATER SUPPLY

The City of Downey is the water retailer and provides water supply for domestic, irrigation and fire protection use. The 2015 UWMP states that the City overlies and pumps groundwater from the Central Basin, which is its principal source of potable water.

Table 6 lists the historical water supply sources from 2010 to 2016. Based on the seven-year average presented on **Table 6**, groundwater contributes 95 percent of the total water supply for Downey and 100 percent of potable supply. Recycled water contributes 5 percent of the total supply. Imported water is listed in **Table 6**, but has not been utilized since 2001.

The Rancho Los Amigos South Campus Project will utilize recycled water as a future water supply. As part of the development, connections to the recycled water system will be installed.

4.1. GROUNDWATER

As indicated in **Table 6**, groundwater is the main source of water supply for the City. Groundwater is pumped from the Coastal Plain of Los Angeles County Groundwater Basin, Central Basin, designated by the Department of Water Resources (DWR) as groundwater basin number 4-11.04 (DWR, 2003). The Central Basin is the southeastern portion of the Coastal Plain with a surface area of 277 square miles. The basin extends southeast to Coyote Creek and southwest to the Newport-Inglewood fault system.

The water bearing deposits include the unconsolidated and semi-consolidated marine and alluvial sediments of Holocene, Pleistocene, and Pliocene ages. The Holocene alluvium, (Gaspur and Semiperched aquifers), Pleistocene Lakewood (Bellflower and Gardena aquifers), and San Pedro Formations (Silverado aquifer) are the main groundwater

producing units. The storage capacity for the Central Basin is approximately 13.8 million AF (DWR, 2003).

Groundwater extraction by pumping wells is the primary means of groundwater discharge from the basin. The basin receives inflow from artificial recharge projects, subsurface flow from the San Gabriel Valley, and percolation from rainfall. DWR estimated groundwater for urban use in the basin at 217,367 AFY.

The Salt and Nutrient Management Plan (SNMP) for the Central Basin and West Coast Basin (Todd Groundwater, 2015) documents that average salt and nutrient concentrations in the West Coast Basin groundwater do not meet water quality objectives of the Regional Water Quality Control Board because of historical seawater intrusion. However, existing and planned implementation measures (including the barrier projects, desalters, recharge projects and other programs) ensure that salt and nutrient levels in groundwater will achieve the objectives in the future.

In 1961, the West Coast Basin was adjudicated to prevent overpumping (which caused seawater intrusion) and to restore groundwater levels. The Court appointed DWR to serve as Watermaster and account for water rights and groundwater extraction. As part of the adjudication, the Central and West Basin Water Replenishment District (WRD)[1] was created to manage, regulate, and replenish the Central and West Coast Basins.

On January 2, 1962, the WRD filed Case No. 786,656 in the Superior Court, County of Los Angeles, naming more than 700 parties as defendants. It sought to adjudicate water rights of groundwater and regulate pumping from the Central Basin. The first Central Basin Judgment became effective on October 1, 1966. The first amendment to the Judgment was implemented on March 21, 1980, and transitioned the administrative year from a water year (October 1 to September 30) to a fiscal year (July 1 to June 30). On May 6, 1991, the Judgment was amended again to modify the carryover and overproduction provisions. The Judgment was most recently amended by the Court in December 2013, which effected a water storage program. The City has an Allowed Pumping Allocation (APA) of 16,553.62 AFY. However, the total can be adjusted based on carryover rules and additional water can be leased from other water rights holders in the Central Basin.

The City operates and maintains 20 deep groundwater well sites and three MWD imported water connections. The proposed Project site contains an existing LA County well, but the Project does not include the use of this well or installation of new water wells. The City will provide groundwater from their existing network.

4.2. Recycled Water

Although the property does not currently receive recycled water, the City is actively pursuing opportunities to increase its use of recycled water. The City purchases recycled

[1] Renamed Water Replenishment District (WRD) of Southern California

water from Central Basin Municipal Water District (CBMWD). CBMWD purchases and resells tertiary-treated recycled water produced at the Los Angeles County Sanitation Districts Los Coyotes and San Jose Creek Water Reclamation Plants. The City uses recycled water for irrigation of landscaping and replenishment of several park ponds. Businesses at the Downey Promenade also use recycled water in dual plumbing equipped restrooms.

As presented on **Table 6**, the City used an average of approximately 731 AFY of recycled water between 2010 and 2016, accounting for approximately 5 percent of the water supply.

4.3. IMPORTED WATER

Imported water provided by MWD from the Colorado River and the Sacramento-San Joaquin River Delta (Delta) is purchased and delivered to the City. These two sources provide Southern California with approximately 2 million acre-feet (MAF) of water annually for urban uses. The Colorado River provides approximately 4.4 MAF annually for agricultural and urban uses while the Delta supplies Southern California with over 1 MAF annually. MWD receives its water supply via the Colorado River Aqueduct and the California Aqueduct. The Colorado River Aqueduct, managed by MWD, is 242 miles long and conveys water from the Colorado River to Lake Matthews. The California Aqueduct, part of the State Water Project and operated by the California Department of Water Resources, is 444 miles long and carries water from the Delta to Southern California (Stetson Engineers, 2018).

MWD distributes imported water to its 26 members, including the Central Basin Municipal Water District (CBMWD), the water wholesaler that has supplied water to the City. Until fiscal year (FY) 2000-01, the City purchased small amounts of treated imported water from CBMWD when needed to augment the City's annual potable water supplies. Beginning in FY 2000-01, groundwater became the sole source of drinking water for the City. Due to the high cost of the imported CBMWD water, the City intends to rely solely on its groundwater wells to meet the potable water demands of its customers into the future. However, the City will continue to maintain its imported water connections with CBMWD by paying readiness–to-serve and capacity charges to CBMWD in the event this water is ever needed for emergency purposes.

4.4. WATER SUPPLY IN NORMAL AND DROUGHT PERIODS

The California Water Code requires a WSA to include discussion of how supply will meet demand during normal, single dry, and multiple dry years during a 20-year projection. The City's 2015 UWMP provides discussion of water supply and demand in normal and drought periods, included herein by reference. The UWMP documents the City's Water Contingency Plan adopted as Ordinance No. 925 that includes a four-stage water-rationing plan, with reductions of up to 50 percent (Stetson Engineers, 2018). The four stages implement various consumption reduction methods to reduce demand by 15, 25, 35, and 50 percent for stages I through IV respectively.

Based on the City's projected water supply, **Table 7** summarizes water supply and demand for the City for a normal year. The increase in water supply and demand was estimated by Dan Mueller, Principal Engineer and Utilities Manager at the City of Downey (Downey 2017). Groundwater and recycled water demand are estimated to increase by 2.8 percent annually until fiscal year 2020 and then 1 percent annually through 2040.

Tables 8 and **9** show supply and demand in single-year and multi-year dry conditions. The available water supply in a single-dry and multiple dry years was estimated using the observed ratio of normal to dry years in past years. The historical normal year was selected as FY 2007-08 (or 18,402 AF) and FY 2011-12 (or 16,886 AF) was used as a historical single dry year. The historical multiple dry year period including FY 2011-12, FY 2012-13, and FY 2013-14 (or 16,886 AF, 17,215 AF, and 17,279 AF, respectively) was used to estimate the City's projected water demands during a multiple dry year period. Recycled water supply is expected to remain constant throughout either drought.

The City can expect to meet future demands for both single and multiple dry years through 2040 (Stetson Engineers, 2018). Even so, future drought response would follow the water use efficiency mandates as shown through the most recent drought.

4.5. PROJECTED WATER SUPPLY

Table 7 shows the projected supply in Downey in a normal year. The total water demand of the Project is anticipated to be met with the current portfolio of supply discussed in the following section. Groundwater production is capped at the City's adjudicated Allowed Pumping Allocation (APA) of 16,553.62 AFY. The December 2013 amendments to the Judgment allows for a party to the Judgment to store up to 50 percent of that Party's Allowed Pumping Allocation. Unused Pumping Allocations may be converted to stored water. The stored water may be used to adjust the carryover volume equal to the difference between 60 percent of the party's Allowed Pumping Allocation and unused Allowed Pumping Allocation converted to storage. The City is allowed to store up 200 percent (33,107 acre-feet) of its 16,553.62 acre-feet Allowed Pumping Allocation. According to the 2015 UWMP (Stetson Engineers, 2018), if additional supply is needed, it can be leased from other water rights holders in the Central Basin.

5. COMPARISON OF SUPPLY AND DEMAND

The City of Downey 2015 Urban Water Management Plan (adopted February 2018) did not specifically include the South Campus Project but did recognize potential commercial, institutional, and industrial expansion.

As shown in **Table 1** for the proposed Project Phase 1, the City water demand would experience a net increase of 47.5 AFY in potable water demand and a net increase of 93.5 AFY in non-potable demands. This assumes that recycled water deliveries would serve all

irrigation demand and dual plumbing is fully implemented. For the City, these increases are within planned increases in water demand. The commercial sector is expected to increase in demand from 2,702 in 2015 to 3,511 AFY in 2040 (Table 5), an increase of 809 AFY.

Table 1 also shows the projected cumulative water demand for the Sports Center, other Open Space Irrigation, and the HOME Project. Together, the water demand for all facilities on the south campus is 52.2 AFY and 132.5 AFY for potable demand and non-potable respectively. There are no other approved projects considered in the City at this time, but other projects may be considered in the future.

As documented in **Tables 7**, **8**, and **9**, the City has sufficient water supply for existing water demands and projected water demands, including the demand of the proposed Project, if it can lease additional supply in normal years as expected. Projected water demands may be less than projected with implementation of ongoing conservation measures. The City has sufficient water supply to manage demand in single dry, and multiple dry years during a 20-year projection.

6. REFERENCES

California Department of Water Resources, *California's Groundwater, Update 2003,* Bulletin 118, October 2003. http://www.water.ca.gov/groundwater/bulletin118/index.cfm

California Department of Water Resources, 2017, *Public Water Supply Statistics Reports, City of Downey (2010-2015).*

California Irrigation Management Information System (CIMIS), 2017 http://www.cimis.water.ca.gov/WSNReportCriteria.aspx, Last accessed 9/14/17

California Water Efficiency Partnership, website, https://www.cuwcc.org/Resources/BMP-Resources, Last access: 9/19/17

City of Downey Water Conservation Website: http://www.downeyca.org/depts/pw/utilities/water_conservation.asp (accessed 9/14/17)

City of Downey, 2015. *Ordinance No. 15-1341, An Ordinance of the City Council of the City of Downey Amending Article VII, Chapter 3.5, of the Downey Municipal Coode as It Relates to Water Conservation Regulations and Restrictions.*, June.

City of Downey, 2017. Personal communication: Dan Mueller, August.

County of LA, 2017. Waleed Jouzy, personal communication, September and October.

Gensler 2017, Rancho Los Amigos South Campus Parcel B Volume I: Project Overview & Design Criteria, September.

Gensler 2017, Rancho Los Amigos South Campus Parcel C Volume I: Project Overview & Design Criteria, September.

Gupta, Amit, Going Green: The Real Reason for Labs to Invest in Water Conservation Technologies, Consolidated Sterilizer Systems, 2014.

Mountain View, City of, *Water System Master Plan – Final Report*, August 2010.

State of California, 2015, , Governor Jerry Brown Executive Order Executive Order B-29-15, https://www.gov.ca.gov/news.php?id=18910, April 1.

State Water Resources Control Board (SWRCB), 2016. Water Conservation Reporting, DRINC PORTAL Website: http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml, (accessed 9/14/17).

Stetson Engineers, 2012. *2010 Urban Water Management Plan, City of Downey*. January.

Stetson Engineers, 2018. *2015 Urban Water Management Plan, City of Downey*. February.

Todd Groundwater, 2015, *Salt and Nutrient Management Plan for the Central Basin and West Coast Basin*, prepared for Water Replenishment District of Southern California, February. http://www.wrd.saltnutrient.com/

Todd Groundwater, 2017, Avion Burbank Project Water Supply Assessment, Prepared for the City of Burbank, August.

USAID Water Demand Management Program, 2017, Office Buildings Water Efficiency Guide.

Watch, Daniel and Deepa Tolat, Sustainable Laboratory Design, Perkins+Will, August 19, 2016. https://www.wbdg.org/resources/sustainable-laboratory-design

Table 1. Estimation of Average Future Water Demand

Water Demand	Demand (gpm)	Indoor Demand (AFY)	Irrigation Peak Demand(AFY)	ETo Factor	Near-term Irrigation Demand (AFY)	Long-term Average Irrigation Demand (AFY)	Non-Potable Fraction of Demand	Non-Potable Demand (AFY)	Potable Demand (AFY)
Project									
Crime Lab Building	22	9.5	---	---	---	---	30%	2.9	6.6
Parking Structure	0	0.0	---	---	---	---	---	0.0	0.0
Probation Building	101	43.6	---	---	---	---	66%	28.8	14.8
ISD Building	177	76.5	---	---	---	---	66%	50.5	26.0
Irrigation Demand	35	---	18.8	0.6	11.4	11.4	100%	11.4	---
PROJECT TOTAL		**129.6**	**18.8**	**---**	**11.4**	**11.4**	**---**	**93.5**	**47.5**
Additional Demand									
Sports Center Building	1	0.4	---	---	---	---	0%	---	0.4
Sports Center Irrigation	55	---	29.6	0.6	17.9	17.9	100%	17.9	---
Hydroseeding	165	---	88.7	0.6	53.6	---	100%	---	---
Open Space Irrigation	65	---	34.9	0.6	21.1	21.1	100%	21.1	---
HOME Project, Public Safety	10	4.3	---	---	---	---	0%	---	4.3
ADDITIONAL DEMAND TOTAL	---	**4.8**	**153.2**	**---**	**92.6**	**39.0**	**---**	**39.0**	**4.7**
Cumulative Total									
CUMULATIVE TOTAL	**---**	**134.4**	**172.1**	**---**	**103.9**	**50.3**	**---**	**132.5**	**52.2**

Source: KPFF RLA South Campus Water Demand (Estimate Average Load)

Table 1a. Check of the Estimation of Future Water Demand, Project

Water Demand	Office/Lab Area (sq ft)	Demand (gpd per sqft)	Demand (gpd)	Potable Demand (AFY)
Project				
Crime Lab Building	60,000	0.75	45,000	50.4
Probation/ ISD Building	590,000	0.15	88,500	99.1
PROJECT TOTAL			**133,500**	**149.5**

Source: Water Factors from WSA for Burbank, Todd 2017

Table 2. Climate Data

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall[1] (in)	2.88	3.15	1.69	0.66	0.26	0.08	0.03	0.08	0.01	0.58	0.73	2.14	**12.29**
ETo[2] (in)	2.20	2.41	3.71	4.36	5.29	5.78	6.55	6.02	4.87	3.40	2.38	1.90	**48.87**

Source: (2020 - 2040) City of Downey 2015 UWMP, Section 3.3

1) Los Angeles County Department of Pulic Works, Station 1256, 1986 - 2015
2) Monrovia CIMIS Station #159, Sept 2000 - Aug 2017

Table 3. Population Projections

Population[1]	2015	2020	2025	2030	2035	2040
Citywide Population	112,354	116,741	121,077	123,103	125,163	127,257
Assumed Annual Growth	---	0.77%	0.73%	0.33%	0.33%	0.33%

Source: (2020 - 2040) City of Downey 2015 UWMP, Table 3-1.

Table 4. Historical Water Demand by Water Use Sectors (AFY)

Customer Type	Actual Water Demand (AFY)		Projected Water Demand (AFY)					Average
	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	
Single-Family Residential	8,262	8,398	8,846	8,879	8,103	7,148	7,375	51.4%
Multi-Family Residential	3,102	3,092	3,289	3,301	3,013	2,658	2,742	19.1%
Commercial/Institutional	2,208	2,734	2,624	2,633	2,403	2,120	2,187	15.2%
Industrial	814	511	703	706	644	568	586	4.1%
Landscape Irrigation	649	1,179	971	974	889	784	809	5.6%
Other	15	16	16	16	15	13	14	0.1%
Unmetered*	694	202	31	31	28	25	26	0.2%
Total Potable Sales	**15,744**	**16,132**	**16,471**	**16,473**	**15,030**	**13,239**	**13,605**	**95.6%**
Non-potable demand	658	754	744	806	738	671	747	4.4%
TOTAL WATER CONSUMPTION	**16,402**	**16,886**	**17,215**	**17,279**	**15,768**	**13,911**	**14,352**	**100.0%**

Source: PWSS (2010-2016), totaled for the fiscal year

*Unmetered water includes additional water supplied but not reported

Table 5. Projected Water Demand by Water Use Sectors (AFY)

Customer Type	Actual Demand	Projected Water Demand (AFY)				
	2015	2020	2025	2030	2035	2040
Single-Family Residential	7,730	9,214	9,556	9,716	9,878	10,044
Multi-Family Residential	3,003	3,579	3,712	3,774	3,838	3,902
Commercial/Institutional	2,702	3,221	3,340	3,396	3,453	3,511
Industrial	452	539	559	568	578	587
Institutional/Governmental	647	771	800	813	827	841
Landscape Irrigation	195	232	241	245	249	253
Other	127	151	157	160	162	165
Agricultural	0	0	0	0	0	0
Wholesale	0	0	0	0	0	0
Losses	174	207	215	219	222	226
Total Potable Sales	**15,030**	**17,914**	**18,580**	**18,891**	**19,207**	**19,529**
Non-Potable Demand	738	800	850	870	890	910
TOTAL WATER CONSUMPTION	**15,768**	**18,714**	**19,430**	**19,761**	**20,097**	**20,439**

Source: (2020 - 2040) City of Downey 2015 UWMP, Tables 4-1 and 4-2.

Table 6. Historical Water Supply Sources (AFY)

Water Supply Sources	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	7 Year Average
Groundwater	15,744	16,132	16,471	16,473	15,030	13,239	13,605	15,242
Recycled Water	658	754	744	806	738	671	747	731
Imported Water from MWD	-	-	-	-	-	-	-	-
TOTAL	**16,402**	**16,886**	**17,215**	**17,279**	**15,768**	**13,911**	**14,352**	**15,973**

Source: City of Downey, fiscal year values

Table 7. Normal Year Supply and Demand Comparison (AFY)

Water Sources	2020	2025	2030	2035	2040
Available Supply (AF)					
Groundwater	17,914	18,580	18,891	19,207	19,529
Recycled Water	800	850	870	890	910
Imported Water	0	0	0	0	0
Total Supply	**18,714**	**19,430**	**19,761**	**20,097**	**20,439**
Demand (AF)					
Total Normal Demand	**18,714**	**19,430**	**19,761**	**20,097**	**20,439**
Supply/Demand Comparison					
Supply/Demand Difference	**0**	**0**	**0**	**0**	**0**

Source: (2020 - 2040) City of Downey 2015 UWMP, Tables 4-1, 4-2, 4-3, 6-8, 6-9 and 7-2.

Table 8. Single Dry Year Supply and Demand Comparison (AFY)

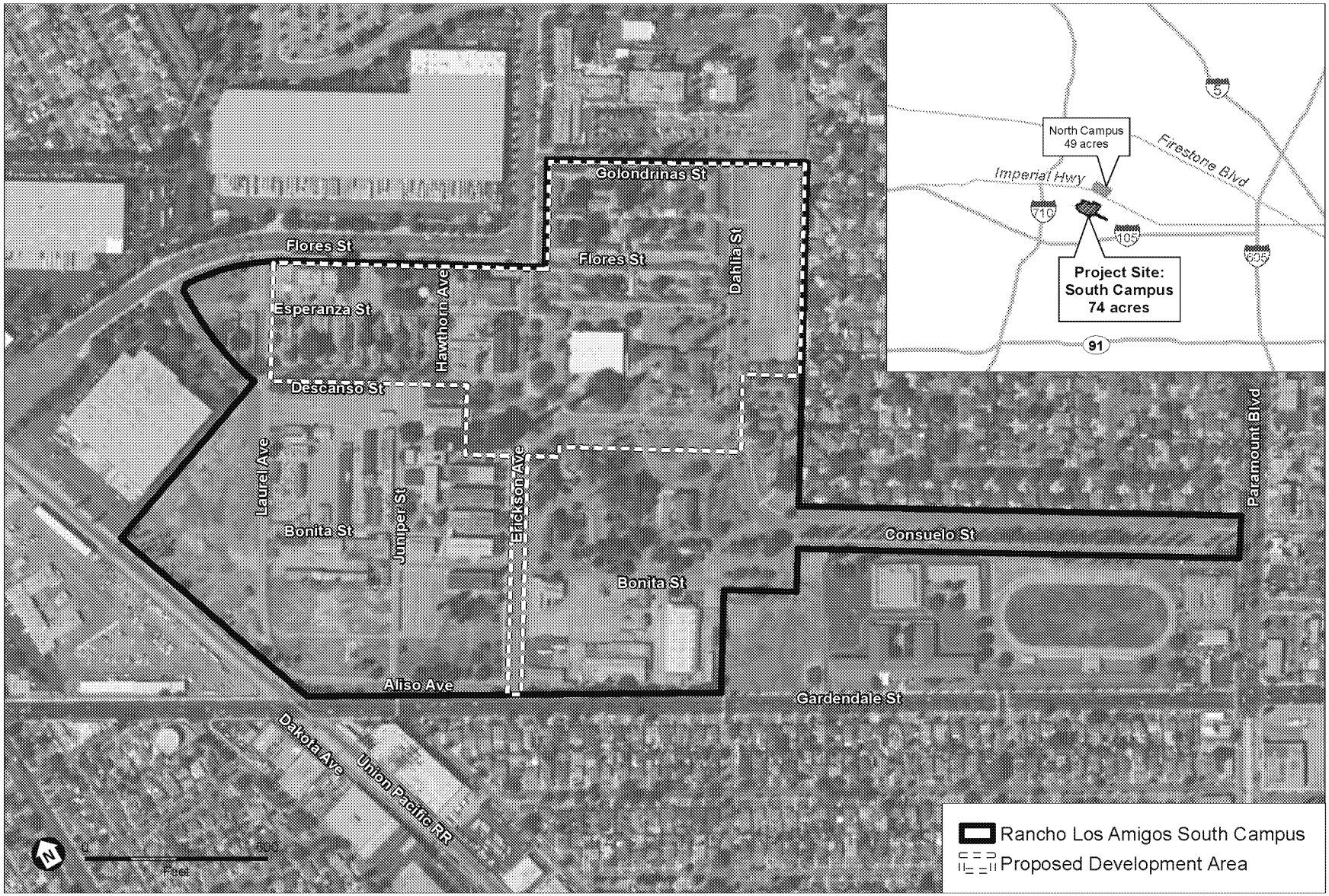
Water Sources	2020	2025	2030	2035	2040
Available Supply (AF)					
Total Supply	**17,218**	**17,876**	**18,180**	**18,489**	**18,804**
Normal Year Supply	18,714	19,430	19,761	20,097	20,439
% of Normal Year	92%	92%	92%	92%	92%
Demand (AF)					
Total Dry Demand	**17,218**	**17,876**	**18,180**	**18,489**	**18,804**
Normal Year Demand	18,714	19,430	19,761	20,097	20,439
% of Normal Year	92%	92%	92%	92%	92%
Supply/Demand Comparison					
Supply/Demand Difference	**0**	**0**	**0**	**0**	**0**

Source: (2020 - 2040) City of Downey 2015 UWMP, Tables 4-1, 4-2, 4-3, 6-8, 6-9, 7-1 and 7-3.

Table 9. Multiple Dry Year Supply and Demand Comparison (AFY)

Water Sources	2020	2025	2030	2035	2040
First year					
Supply totals	17,218	17,876	18,180	18,489	18,804
Demand totals	17,218	17,876	18,180	18,489	18,804
Difference	**0**	**0**	**0**	**0**	**0**
Second year					
Supply totals	17,592	18,264	18,575	18,891	19,213
Demand totals	17,592	18,264	18,575	18,891	19,213
Difference	**0**	**0**	**0**	**0**	**0**
Third year					
Supply totals	17,592	18,264	18,575	18,891	19,213
Demand totals	17,592	18,264	18,575	18,891	19,213
Difference	**0**	**0**	**0**	**0**	**0**

Source: (2020 - 2040) City of Downey 2015 UWMP, Tables 4-1, 4-2, 4-3, 6-8, 6-9, 7-1 and 7-4.



SOURCE: ESRI 2017; Los Angeles County Department of Public Works 2017

Rancho Los Amigos South Campus Project EIR

ESA

June 2018

TODD GROUNDWATER

Figure 1
Project Location