IV.L.1 Water Supply

1.0 INTRODUCTION

This section presents an overview of the Los Angeles Department of Water and Power (LADWP) available water supply sources, currently and in the future; the anticipated potable and recycled water demands of the Proposed Loyola Marymount University Master Plan Project; and the impact of the Project's demand on LADWP's water supplies. Where impacts are identified, mitigation measures are recommended to reduce these impacts to less than significant levels. This section is based, in part, on analysis contained in the Loyola Marymount University Master Plan Water Supply Assessment, prepared by the Los Angeles Department of Water Resources (LADWP) and approved by the LADWP Board on September 15, 2009; this report is included as **Appendix IV.L.1**.

2.0 REGULATORY FRAMEWORK

2.1 State

2.1.1 California Urban Water Management Planning Act

The California Urban Water Management Planning Act (California Water Code Division 6, Part 2.6, Sections 10610–10656) requires every municipal water supplier that serves more than 3,000 customers or provides more than 3,000 acre-feet per year of water to prepare an Urban Water Management Plan addressing water demand and supplies for the ensuing 20-year period.

In the Urban Water Management Plan, the water supplier must describe its service area, including climate, current and projected population, and any other factors affecting water management and planning; identify and quantify existing and planned water supplies (including groundwater, if applicable) for the 20-year period identified, in five-year increments; and describe any water supply projects and programs that may be undertaken to meet demand in the service area. If groundwater is identified as an existing or future water source, the water supplier must provide a groundwater management plan or detailed information about the location of groundwater basins and past, current, and future projected withdrawals.

An Urban Water Management Plan must be updated every five years to identify short-term and long-term water demand management measures to meet water demand during normal, single-dry, and multiple-dry water years.

2.1.2 Senate Bill 610 and Senate Bill 221

State legislation concerning water supply, Senate Bills (SB) 610 and 221, were introduced in 2001 and became effective on January 1, 2002, and amended existing California law regarding land use planning and water supply availability by requiring lead agency decision makers to take water supply availability into account when making land use decisions. SB 610 and SB 221, considered "companion measures," require lead agencies to obtain detailed assessments and verification from their local water suppliers demonstrating that sufficient and reliable current and future water supplies are available to serve certain large proposed development projects in addition to existing demand, prior to completion of the environmental review process and project approval. SB 610 applies at the time that environmental documentation is prepared and SB 221 applies at the time a Tentative Tract Map or other related project actions are approved. Together, SB 610 and SB 221 are intended to provide a detailed evidentiary basis for project approval.[1]

As codified in the California Water Code (Section 10910 et seq.), SB 610 requires water suppliers to prepare a Water Supply Assessment (WSA) to define the projected water demand of a proposed project and determine if that demand is accounted for in the water supplier's current Urban Water Management Plan. Section 10912 of the Water Code defines a "project" as the following:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- A proposed industrial, manufacturing or processing plant, or industrial park, planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor space;
- A proposed mixed-use project that includes one or more of the previously listed projects; or
- A proposed project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

SB 610 states that a Water Supply Assessment must identify a water supplier's water supply entitlements, water rights, and water service contracts, including groundwater if applicable, and quantify actual

1 California Department of Water Resources. *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001*, (2003).

deliveries in prior years; provide a detailed description of any groundwater management plan in effect, including past and projected future groundwater withdrawal rates; and characterize the anticipated reliability of the supplier's future water supplies during normal, single-dry and multiple-dry water years in increments of five years for a 20-year period (or as far into the future as data permits) A Water Supply Assessment is also required to describe water projects or programs, including conservation measures, in place to reduce demand or meet the projected water demand in the service area.

Water suppliers are required to periodically update Urban Water Management Plans to describe water supply projects and programs currently in place or planned, to meet total projected water demand in the water supplier's service area. If a proposed project's water demand is already accounted for in an Urban Water Management Plan's discussion of projected future demand within a service area, the Water Supply Assessment is required to incorporate that information. If a proposed project is not accounted for in the current Urban Water Management Plan, the WSA must include a discussion as to whether the proposed project demand can be accommodated in addition to existing and planned future uses.

Whereas SB 610 requires a written assessment of water supply availability, SB 221 requires lead agencies to obtain an affirmative written verification of sufficient water supply prior to approval of certain residential subdivision projects. For this purpose, water suppliers may rely on an Urban Water Management Plan (if the proposed project is accounted for within the Plan), a Water Supply Assessment prepared for the project, or other acceptable information that constitutes "substantial evidence,"[2] ''Sufficient water supply'' is defined in SB 221 as the total water supplies available during normal, single-dry, and multiple-dry water years within the 20-year (or greater) projection period that are available to meet the projected demand associated with the proposed project, in addition to existing and planned future uses. Like SB 610, SB 221 applies to projects of 500 units or more; however, exemptions are granted to certain urban infill and low-income projects.[3]

2.1.3 California Code of Regulations

The California Code of Regulations (CCR), Title 20 (Public Utilities and Energy, Sections 1605.1(h) and (i) and 1605.3(h)) establishes water efficiency standards (i.e., maximum flow rates) for specific appliances including all new showerheads (2.5 gallons per minute at 80 pounds per square inch), lavatory and kitchen sink faucets (2.2 gallons per minute at 60 pounds per square inch), and commercial pre-rinse spray valves (1.2 gallons per minute at 60 pounds per square inch). Title 20 also establishes maximum water consumption standards for urinals and water closets (1.6 gallons per flush per unit for most units).

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2 California Water Code, Section 66473.7(b)(4).

3 California Water Code, Section 66473.7(i).

Title 24 (California Building Standards, Sections 2-5307 and 2-5352) prohibits the sale of fixtures that do not comply with the current regulations; prohibits the installation of fixtures unless the manufacturer has certified compliance with the flow rate standards; and addresses pipe insulation requirements that can reduce water used before hot water reaches fixtures.

2.1.4 State Executive Order S-06-08

In an effort to coordinate water conservation efforts at the state level, Governor Schwarzenegger put Executive Order S-06-08 into effect on June 4, 2008, in response to two consecutive years of below-average rainfall and very low snowmelt runoff, resulting in a statewide drought.[4] The Executive Order addresses water shortages that have forced numerous local California communities to mandate water conservation or rationing programs. The lack of water has created other problems, such as extreme fire danger due to dry conditions, economic harm to urban and rural communities, loss of crops and the potential to degrade water quality in some regions.[5] The Executive Order directs the Department of Water Resources to take the following actions:

- Facilitate water transfers to respond to emergency shortages across the state.
- Work with local water districts and agencies to improve local coordination.
- Help local water districts and agencies improve water efficiency and conservation.
- Coordinate with other state and federal agencies and departments to assist water suppliers, identify risks to water supply, and help farmers suffering losses.
- Expedite existing grant programs to help local water districts and agencies conserve.

The Executive Order also encourages local water districts and agencies to promote water conservation locally and regionally.

2.1.5 California Water Plan – Update 2009

The Pre-Final Draft *California Water Plan – Update 2009* released in October 2009, is prepared by the state's Department of Water Resources in compliance with State Water Code requirements and serves as a framework for decisions concerning water resources by water managers, legislators, and the general

4 State of California, Office of the Governor. Press release entitled "Governor Schwarzenegger Proclaims Drought and Orders Immediate Action to Address Situation" (GAAS:307:08), June 4, 2008, available at: http://gov.ca.gov/index.php?/print-version/press-release/9796/.

5 State of California, Office of the Governor. *Executive Order S-06-08*. http://gov.ca.gov/executive-order/9797/. June 2008.

public.[6] The *California Water Plan – Update 2009*, which is updated every five years and was last published in 2005, presents basic data and information about California's water resources, including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The *California Water Plan – Update 2009* also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects intended to address statewide water needs.

Volume I of the *California Water Plan – Update 2009* establishes resource management strategies for meeting the water resource management needs of each region and statewide. The 2005 *California Water Plan* was organized to incorporate a strategic plan with a vision, mission, goals, recommendations, and implementation plan. Volume I of the *California Water Plan – Update* expands on those strategic plan elements, primarily through the involvement of an interagency Steering Committee representing 21 state government agencies with jurisdictions over different aspects of water resources. The 2009 Update integrates plans and programs of these agencies. Additionally, as part of the 2009 Update, a 45-member Advisory Committee was created to expand regional outreach, ensure greater involvement of California Native American Tribes, and coordinate with federal agencies.

Volume II, Resource Management Strategies, describes resource management strategies that can be combined in various ways to meet the water management objectives and goals of different regions and to achieve multiple benefits. Twenty-nine strategies are proposed to improve resource stewardship, improve water quality, reduce water demand, increase storage, and increase operational efficiencies and transfers of water.

Volume III compiles 12 regional reports that describe each region's watersheds, population, and activities influencing the region's water use and supply reliability, focusing California's 10 hydrologic regions, which correspond to the state's major water drainage basins, as well as the Sacramento-San Joaquin River Delta region and the western Sierra Nevada and Cascade ranges.

The Final *California Water Plan – Update 2009* is scheduled for release in February 2010.

2.1.6 Global Climate Change

As discussed in detail in **Section IV.B.2, Global Climate Change**, changes to the global climate system and ecosystems and to California that could directly impact water resources include the following: (1) declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface

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6 Department of Water Resources, *Pre-Final Draft California Water Plan*. http://www.waterplan.water.ca.gov /cwpu2009/index.cfm. 2009.

evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures, (2) rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets, (3) changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones,[7] and (4) declining Sierra snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years.[8] In a study by the California Department of Water Resources, modeling of several climate change-induced warming scenarios indicated that "greater amounts of winter-season runoff" would occur and when combined with "static flood protection rules, [this] would lead to greater uncontrolled releases from SWP [the State Water Project] and CVP [the federal Central Valley Project] reservoirs." In addition, "reduced spring-season runoff into the reservoirs would lead to decreased water supplies and deliveries to SWP and CVP water users."[9]

The impact of climate change on the availability of future source water and water deliveries in California can only be approximated. According to California's Department of Water Resources, if no actions for improvement are taken, "a continued eroding of SWP water delivery reliability under the current method of moving water through the Delta" would result. "Annual SWP deliveries (Table A and Article 21 amounts) would decrease virtually every year in the future (i.e., 93 percent of future years). These reductions would amount to a 20 percent reduction from current levels in one out of four future years, and greater than 30 percent in one out of six future years."[10] Looking at the southwestern region of the United States, a paper published by the National Academy of Sciences looked at several studies on future impacts to the Colorado River. Overall, the results from 11 climate change models used by the United Nations Intergovernmental Panel on Climate Change indicated that "Colorado River discharge at Imperial Dam (naturalized flow) would decrease by up to 11 percent by the end of the century."[11]

The effects of streamflow changes on water storage have been evaluated in several studies. A study conducted in 1993 that used a U.S. Bureau of Reclamation Colorado River reservoir simulation model

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7 Intergovernmental Panel on Climate Change, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf. 2007.

8 California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, (2006).

9 California Department of Water Resources, *Progress on Incorporating Climate Change into Management of California's Water Resources*, (2006) 16.

10 California Department of Water Resources, *Summary: Final State Water Project Delivery Reliability Report, 2007*, (2008) 1.

11 National Academy of Sciences, *Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability*, (2007) 90-91.

found that a 20 percent reduction in Colorado River natural runoff would translate to a mean annual reduction in storage of 60 to 70 percent.[12] A study conducted in 2004 found that changes of up to 18 percent in runoff could result in decreases of up to 40 percent in total basin storage.[13] While climate change impacts on future water supplies contain inherent uncertainties, the Department of Water Resources acknowledges that "it is of interest for long-term system planners to understand likelihood aspects of such impacts so that preparations and/or system modifications might be strategized in a timely manner."[14] To further this effort, the Department of Water Resources is collaborating with the U.S. Bureau of Reclamation and climate researchers in exploring risk mitigation strategies.

Regionally, the Metropolitan Water District, a consortium of 26 cities and water districts in Southern California, joined the Water Utility Climate Alliance, which was formed to improve research into the impacts of climate change on water utilities, develop strategies for adapting to climate change and implement tactics to reduce their greenhouse gas emissions. The Water Utility Climate Alliance has identified several key research needs that would improve the drinking water industry's ability to develop strategies to cope with potential impacts of climate change:[15]

- Reduce the uncertainty in projections related to how the climate may change by improving and refining global climate models and applying them at the regional or local level;
- Enhance the collection, maintenance and accessibility of information, making the data more useful for decision-making purposes;
- Ensure that water providers worldwide have access to consistent climate data;
- Develop decision-support tools for planning, decision-making and policy-making that can accommodate deep uncertainty and the potential for abrupt climate changes; and
- Coordinate international research efforts, particularly with those countries that are already experiencing the effects of climate change, such as Australia.

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12 Nash, L.L., and P. Gleick, *The Colorado River Basin and Climate Change: The Sensitivity of Streamflow and Water Supply to Variations in Temperature and Precipitation*, (EPA 230-R-93-009), (1993).

13 Christensen, N.S., A.W. Wood, N. Voisin, D.P. Lettenmaier, and R.N. Palmer, *The effects of climate change on the hydrology and water resources of the Colorado River basin*, Climatic Change 62(1), (2004), 337-363.

14 California Department of Water Resources, *Final State Water Project Delivery Reliability Report, 2007*, (2008) 16.

15 Metropolitan Water District, "Metropolitan, Water Authority join other major U.S. water agencies to form new National Climate Alliance," http://www.mwdh2o.com/mwdh2o/pages/news/press01.html. 2008.

2.2 Local

2.2.1 City of Los Angeles Ordinances

In recent years, conservation has become an important aspect of water supply planning. As a result, 2005 water demand in the City of Los Angeles was comparable to that of the mid-1980s, despite a population increase of more than 750,000 residents.[16] LADWP attributes the savings in water consumption to the City's successful water conservation measures.

The City of Los Angeles has adopted several mandatory water conservation policies, as summarized below:

- Ordinance Nos. 163,532 and 164,093, enacted in 1988, require new buildings to install low-flush toilets and urinals (1.5 gallons per flush) in order to obtain building permits. Ordinance No. 163,532 also contains provisions requiring xerophytic or low water consumption landscaping. However, this was superseded by Ordinance 170,978, enacted in July 12, 1996, which applies to all projects except single-family dwellings that create 2,000 square feet or more of non-permeable surface. This comprehensive landscape ordinance replaces the original requirement in Ordinance No. 163,532 for xeriscape with "Water Management." It also requires projects to propose and document substantive water conserving features and techniques.

- Ordinance 170,978, enacted in July 12, 1996, which involves a comprehensive landscape ordinance that applies to all projects except single-family dwellings that create 2,000 square feet or more of non-permeable surface. The Ordinance replaces the original requirement for xeriscape with "Water Management." The xeriscape point system chart has been slightly augmented by increased choices as well as requiring projects to propose and document substantive water conserving features and techniques.

- Section 12.41 of the Los Angeles Municipal Code describes a City program to conserve of the City's imported water resources mandated by state law by setting minimum standards for water delivery systems to landscapes.

- Chapter XII, Article II of the Los Angeles Municipal Code (Water Closet, Urinal and Showerhead Regulations), amended by Ordinance Number 172,075 in 1998, generally applies to all residential, commercial, and industrial buildings in the City with showers, toilets, or urinals. All showers must have low-flow showerheads that do not exceed 2.5 gallons per minute, and all toilets must use a maximum of 3.5 gallons per flush or be fitted with a toilet flush-reduction device. Additionally, all urinals must use a maximum of 1.5 gallons per flush.

The measures included in the above-mentioned ordinances are considered baseline project permitting conditions.

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16 Los Angeles Department of Water and Power, *2005 Urban Water Management Plan*, (2005) 2-1.

The City amended its Emergency Water Conservation Plan in August 2008 and again in August 2009 to define new conservation phases and expanded conservation measures to be implemented based upon severity of need (Chapter XII, Article I, amended by Ordinances 180,148 and 180,823). The ordinance, first instituted during the drought of 1990, sets forth the following permanent Phase 1 prohibitions, currently in effect for all LADWP customers:

- No use of a water hose to wash any paved surfaces including, but not limited to, sidewalks, walkways, driveways, and parking areas, except to alleviate immediate safety or sanitation hazards. Use of water pressure devices for graffiti removal is exempt.

- No use of water to clean, fill or maintain levels in decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes unless such water is part of a recirculating system.

- No hotel, restaurant, café, cafeteria, or other public place where food is sold, served, or offered for sale shall serve drinking water to any person unless expressly requested.

- No customer shall permit water to leak from any pipe or fixture on the customer's premises; failure or refusal to affect a timely repair of any leak of which the customer knows or has reason to know shall subject said customer to all penalties provided herein for a prohibited use of water.

- No customer shall wash a vehicle with a hose if the hose does not have a self-closing water shut-off or device attached to it, or otherwise allow a hose to run continuously while washing a vehicle.

- No irrigating during periods of rain.

- No watering or irrigating lawn, landscape, or other vegetated areas between the hours of 9:00 AM and 4:00 PM, with the exceptions of public and private golf course greens and tees and professional sports fields, in order to maintain play areas and accommodate event schedules.

- Landscape irrigation with potable water using spray head sprinklers and bubblers shall be limited to no more than 10 minutes per watering day per station. All irrigating of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than 15 minutes per cycle and up to two cycles per watering day per station. Exempt from these landscape irrigation restrictions are irrigation systems using very low-flow drip-type irrigation when no emitter produces more than 4 gallons of water per hour and micro-sprinklers using less than 14 gallons per hour.

- No watering or irrigating any lawn, landscape, or other vegetated area in a manner that causes or allows excess or continuous water flow or runoff onto an adjoining sidewalk, driveway, street, gutter or ditch.

- No installation of single-pass cooling systems in buildings requesting new water service.

- No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.

- Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily.

- No large landscape areas shall have irrigation systems without rain sensors that shut off the irrigation systems. Large landscape areas with approved weather-based irrigation controllers registered with the Department are in compliance with this requirement.

Phase II prohibitions for all LADWP customers include restrictions applicable to Phase I and the following:

- No landscape irrigation shall be permitted on any day other than Monday, Thursday, or Saturday. These provisions do not apply watering with a hose if the hose does has a self-closing water shut-off or device attached to it, which is allowed every day during Phase II except between the hours of 9:00 AM and 4:00 PM.

- Irrigation of Sports Fields may deviate from the non-watering days in play areas and accommodate event schedules upon written notice to LADWP; however, to be eligible, mandatory reduction of the LADWP's Board-adopted degree of shortage plus an additional 5 percent from the customer's typical water use will be imposed within 30 days.

- Upon written notice to LADWP, large landscape areas may deviate from the non-watering days by doing the following: (1) have approved and registered weather-based irrigation controllers, (2) reduce monthly water use by LADWP Board-adopted degree of shortage plus an additional 5 percent within 30 days, and (3) must use recycled water if available from LADWP. This does not apply to drip irrigation supplying water to a food source or to hand-held hose watering, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase II except between 9:00 AM and 4:00 PM.

- Phase III prohibitions for all LADWP customers include restrictions applicable to Phases I and II, above, and the following:

- No landscape irrigation shall be permitted on any day other than Monday or Thursday.

- Irrigation of Sports Fields may deviate from the non-watering days in play areas and accommodate event schedules upon written notice to LADWP; however, to be eligible, mandatory reduction of LADWP's Board-adopted degree of shortage plus an additional 5 percent from the customer's typical water use will be imposed within 30 days.

- Upon written notice to LADWP, large landscape areas may deviate from the non-watering days by doing the following: (1) have approved and registered weather-based irrigation controllers, (2) reduce monthly water use by LADWP Board-adopted degree of shortage plus an additional 5 percent within 30 days, and (3) must use recycled water if available from LADWP. This does not apply to drip irrigation supplying water to a food source or to hand-held hose watering, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase III except between 9:00 AM and 4:00 PM.

Phase IV prohibitions for all LADWP customers include restrictions applicable to Phases I, II, and III, above, and the following:

- No landscape irrigation shall be permitted on any day other than Monday.
- No washing of vehicles allowed except at commercial car wash facilities.
- No filling of residential swimming pools and spas with potable water.
- Upon written Notice to LADWP, irrigation of Sports Fields may be granted one additional watering day. To be eligible for this, mandatory reduction of LADWP's Board-adopted degree of shortage plus an additional 10 percent from the customer's typical water use will be imposed within 30 days.
- Upon written notice to LADWP, large landscape areas may deviate from the specific non-watering days and be granted one additional watering day by meeting the following requirements: (1) have approved and registered weather-based irrigation controllers, (2) reduce monthly water use by LADWP Board-adopted degree of shortage plus an additional 10 percent within 30 days, and (3) must use recycled water if available from LADWP. This does not apply to drip irrigation supplying water to a food source or to hand-held hose watering, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase IV except between 9:00 AM and 4:00 PM.

Phase V prohibitions for all LADWP customers include restrictions applicable to Phases I, II, III, and IV, above, and the following:

- No landscape irrigation allowed.

Phase VI prohibitions for all LADWP customers include restrictions applicable to Phases I, II, III, IV, and V, above, and the following:

- The Board of Water and Power Commissioners can implement additional water prohibitions based on the available water supply. Additional prohibitions will be published at least once in a daily general circulation newspaper and become effective immediately.

The Emergency Water Conservation Plan takes a phased approach to prohibited uses, allowing LADWP to implement phases and impose additional conservation measures depending on the severity of water supply conditions. Implementation of Phases II and subsequent phases is dependent on assessment of the City's water supply by the Board of Water and Power Commissioners. Conservation phases can be terminated when LADWP forecasts Owens Valley and Mono Basin runoff to be a minimum of 110 percent of the normal annual levels, and the Metropolitan Water District determines that its Colorado

River and State Water Project water supplies will exceed 100 percent of projected demand, or as determined by the Mayor. As of June 1, 2009, the prohibitions of Phase III went into effect.[17]

2.2.2 Los Angeles Department of Water and Power 2005 Urban Water Management Plan

LADWP's current Urban Water Management Plan, prepared in accordance with the California Urban Water Management Planning Act, was adopted in 2005 and projects water demand through 2030. The Urban Water Management Plan includes the following, each of which is briefly discussed below:

- A description of LADWP's service area in terms of land use, climate, and demographics
- A description of past, existing, and planned sources of water available to the water supplier
- Future water demand projections
- Conservation goals and existing and proposed measures to reduce water demand
- Alternative sources of water
- Assessment of reliability and vulnerability of water supply
- Water shortage contingency analysis

2.2.2.1 LADWP Service Area

LADWP's service area encompasses the City of Los Angeles, an area of 464 square miles, or approximately 295,000 acres, as well as portions of West Hollywood, Culver City and small areas adjacent to City limits. Residential development (single-family and multi-family) constitutes the most prevalent land use type in the City, occupying approximately 52 percent of the total area, followed by open space/parks (24 percent), commercial land uses (11 percent), transportation/utilities/mixed uses (7 percent), and industrial uses (6 percent).[18] The population in LADWP's service area was estimated at 2.97 million in 1980 and 3.73 million in 2005, which represents an average annual growth rate of 1.3 percent during that period.

LADWP's future projections for its service area were obtained from the Metropolitan Water District of Southern California (Metropolitan Water District), which in turn relies on demographic data prepared for water service areas by the Southern California Association of Governments and contained in that agency's Regional Transportation Plan. The Southern California Association of Government's projections

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17 Los Angeles Department of Water and Power, Summary of Phase III of the Ordinance. http://www.ladwp.com /ladwp/cms/ladwp011971.pdf. 2009.

18 Los Angeles Department of Water and Power, *2005 Urban Water Management Plan*, 1-1 and 1-2.

consider actual historical growth rates as well as expected buildout of the City's General Plan. Based on these sources, the population of LADWP's service area is expected to increase at a 0.4 percent annual growth rate between 2005 and 2030, resulting in 368,000 new residents and a total of approximately 4.3 million residents.

Projected growth of 0.4 percent annually represents a reduction from the historical annual growth rate between 1980 and 2000 of 1.3 percent, and also represents a downward revision from the population projections contained in LADWP's 2000 Urban Water Management Plan and the 2001 Regional Transportation Plan. The downward adjustment reflects the 2005 Urban Water Master Plan's incorporation of 2000 Census data, the Southern California Association of Governments' downward adjustment to future population growth in the 2004 Regional Transportation Plan, and other variables such as the state's fiscal condition, employment statistics, and changing household size.

2.2.2.2 Water Supply Sources

LADWP water sources include the Los Angeles Aqueduct, which conveys runoff from the Eastern Sierras (accounting for up to 50 percent of the City's water supply until 2004, and varying since that year); groundwater from five basins (accounting for 15 percent of the City's water supply, and up to 30 percent in drought years); purchased water from the Metropolitan Water District, the largest wholesaler of water in California (used to supplement LADWP's other water supplies during dry years); and recycled water from City-operated wastewater treatment plants, which helps offset demand for imported water. Collectively, these sources have constituted an adequate and reliable water supply for the City, with recycled water increasingly steadily fulfilling more demand.

2.2.2.3 Future Water Demand Projections

Water demand projections in the Urban Water Management Plan are based on LADWP's demographic projections as well as historic billing data for customer classes (land use types), weather, and conservation trends, and are presented in increments of five years, through 2030. As summarized in **Table IV.L.1-1**, annual demand is expected to total 683,000 acre-feet per year in 2010, or approximately 610 million gallons per day, and 776,000 acre-feet per year in 2030, an increase of 17 percent over 2005. Demand between 1980 and 1989 increased from just under 600,000 acre-feet per year to over 700,000 acre-feet per year, subsequently dropped about 21 percent as the result of mandatory restrictions and conservation measures, and as of 2005 had returned to approximately 1985 levels. LADWP estimates that the long-term safe yield of its water supplies in 2010 is approximately 383,950 acre-feet per year during

average weather conditions, 232,250 acre-feet per year during a single-dry year, and 217,250 acre-feet per year during a multi-dry year period.[19]

Table IV.L.1-1
City of Los Angeles
Water Demand Through 2030[a]
(Thousand Acre-Feet per Year)

LADWP Water Use Sector (Land Use)	2000[b]	2005	2010	2015	2020	2025	2030
Single-family	240	231	237	239	250	260	262
Multi-family	199	198	205	219	228	236	250
Commercial	112	119	126	130	134	137	140
Government	41	43	44	44	45	45	46
Industrial	24	20	19	19	19	19	19
Non-revenue	60	48	50	52	55	57	58
Total	**667**	**661**	**683**	**705**	**731**	**755**	**776**

[a] *Based on normal weather conditions and assuming projected conservation levels.*
[b] *Actual data is shown for the year 2000, which was considered a dry year.*
Source: Los Angeles Department of Water and Power, 2005 Urban Water Management Plan, (2005) 1-9, Exhibit 1-K.

2.2.2.4 Conservation

Since the early 1990s, water conservation levels within LADWP's service area have stabilized at approximately 15 percent, meaning total demand during that time has consistently been approximately 15 percent lower than historical usage levels, despite population growth, because of conservation measures in place. As a result, 2005 demand was comparable to that of the mid-1980s, despite a population increase of more than 750,000 residents.[20]

LADWP set a higher water conservation goal of 20 percent in the 2005 Urban Water Management Plan in order to lessen reliance on imported water and ensure reliable supplies during droughts. Current conservation measures are grouped into categories including awareness/support, residential commercial/industrial/institutional, landscape, and system maintenance. Specific measures include tiered water pricing, financial incentives for the installation of water-conserving applicants, incentives for

19 Los Angeles Department of Water and Power, *2005 Urban Water Management Plan*, 6-6 through 6-9, Exhibits 6C through 6E.

20 Los Angeles Department of Water and Power, *2005 Urban Water Management Plan*, 2-1.

business and industry, and "large landscape" irrigation efficiency programs. LADWP also implements "supply side" management practices, such as infrastructure improvements that increase water supply system reliability and efficiency. The Urban Water Management Plan defines additional conservation measures proposed for future implementation.

2.2.2.5 Alternative Water Sources

LADWP is currently developing several alternative sources of water supplies, including water transfers, seawater desalination, and reuse of urban runoff (i.e., recycled water). Water transfers, the lease or sale of water between entities, are expected to help offset loss of supplies to environmental mitigation in the Owens Valley and Mono Lake. Desalination, not yet implemented, is considered a potentially valuable source of reliable water supplies in the future. Finally, the capture, treatment, and reuse of urban dry and wet weather runoff are options under consideration for the future. The treatment of poor-quality groundwater in three basins with potential resource availability is not considered viable at this time, owing to the high cost of such treatment.

2.2.3 Los Angeles Department of Water and Power Water Supply Action Plan

Recent water supply uncertainties affecting LADWP and the Metropolitan Water District culminated in 2007 with the lowest Eastern Sierra snowpack and driest year in the City of Los Angeles on record, court rulings limiting exports from the Sacramento San Joaquin Delta, and commitments to environmental mitigation in the Owens Valley and at Mono Lake. In response, on May 17, 2008, the Mayor of the City of Los Angeles and LADWP released a Water Supply Action Plan entitled *Securing L.A.'s Water Supply*, as part of the City of Los Angeles "Green LA" program. The Water Supply Action Plan acknowledges the effects of recent events and of climate change on Los Angeles' traditional water sources and calls for the creation of sustainable sources of water for the future of Los Angeles to reduce dependence on imported supplies. Specifically, the Water Supply Action Plan calls for investment in technology; the use of rebates and incentives; the installation of smart sprinklers, efficient washers and urinals; and the implementation of long-term conservation measures such as expansion of the recycled water system and investment in the clean-up of groundwater supplies.

The Water Supply Action Plan proposes to meet all new water demand beyond 2008 through a combination of water conservation and recycling, without reliance on additional imported water supplies. Through implementation of the Water Supply Action Plan, the City expects to conserve or recycle 32.6 billion gallons of water, enough to supply water to 200,000 homes for one year. By the year

2019, LADWP plans to fulfill half of all new demand through a six-fold increase in recycled water supplies, and by 2030 plans to meet remaining demand through increased conservation efforts.[21]

The Water Supply Action Plan identifies short-term and long-term strategies to secure water supplies, which are described below.

2.2.3.1 Short-Term Conservation Steps

The short-term conservation strategies set forth in the Water Supply Action Plan are intended to achieve the City's goal of fulfilling all new water demand through an increase in recycled water supplies and conservation strategies.

- **Enforce prohibited uses of water**. Prohibited uses are defined in the City's Emergency Water Conservation Plan Ordinance, and, while currently in effect, have not been actively enforced in recent years. LADWP plans to enforce its Drought Buster program, intended to heighten awareness of the prohibited uses, through penalties ranging from written warnings to water service shutoff for non-compliance.

- **Expand the prohibited uses of water**. This was achieved through the August 2008 and 2009 amendments to the existing Emergency Water Conservation Ordinance.

- **Extend public outreach efforts**. LADWP has committed funding to a conservation outreach and education program including improved customer communications; coordination with homeowner associations and Neighborhood Councils to promote water conservation; increased training of LADWP, Public Works, and Recreation and Parks field staff in recognizing prohibited uses of water; and increasing water conservation incentive and rebate programs.

- **Encourage regional conservation**. LADWP proposes to coordinate with the Metropolitan Water District to encourage its other member water agencies to adopt water conservation ordinances that address prohibited uses of water and enforcement of compliance with those prohibitions.

2.2.3.2 Action Plan Long-Term Strategies Through Technology

The long-term water conservation measures in the Water Supply Action Plan, listed below, reflect LADWP's 2006 Integrated Resources Plan.[22] Undertaken jointly with the Bureau of Sanitation, the Integrated Resources Plan acknowledges the technical, social, and institutional interrelationships between water, wastewater, and stormwater runoff and defines a strategy for integrating the City's management

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21 City of Los Angeles, Office of the Mayor, and Los Angeles Department of Water and Power, *Securing L.A.'s Water Supply*, 1.

22 Los Angeles Department of Water and Power, *Integrated Resources Plan (IRP): Planning for Wastewater, Recycled Water, and Stormwater Management*, http://www.ladwp.com/ladwp/cms/ladwp005148.jsp. 2007.

of these resources. The plan establishes policy for managing the City's water resources through 2025 and proposes to develop and implement facility plans for wastewater, stormwater and recycled water.

- **Increase water conservation through reduction of outdoor water use and new technology.** LADWP proposes to increase water conservation with the following programs:
  - **Residential smart sprinkler systems.** LADWP proposes to offer smart sprinkler systems already used in City parks and golf courses for residential use.
  - **Conservation rebates and incentives.** LADWP will expand its existing appliance and rebate and incentive programs to promote the installation of water-saving technology, including washers, water closets and urinals, etc.
  - **Targeting City parks and large landscapes.** LADWP proposes to retrofit three City parks per year with smart irrigation controllers and upgraded irrigation systems, and to install smart irrigation controllers in City parks under a grant-funded program.
  - **Action by public agencies.** LADWP proposes to assist City Departments and other public agencies in retrofitting plumbing fixtures and irrigation systems through the provision of up-front incentives for public agencies to purchase water-efficiency technology.
  - **Raising awareness**. LADWP will increase public awareness of prohibited uses of water and the need for conservation through reinstatement of its Drought Busters monitoring program, radio and print advertising, and other outreach.
  - **Enhance conservation through review of new developments.** LADWP will continue working with the City's Green Building Team to implement changes in local codes and standards to promote water efficiency in new construction and major renovations.
- **Maximize water recycling.** The City proposes to develop a Recycled Water Master Plan with the Bureau of Sanitation for expansion of the existing recycled water pipeline system and the use of recycled water for groundwater replenishment.
  - **Increase recycled water for irrigation and industrial use.** LADWP has allocated funding for projects intended to increase recycled water deliveries, add additional recycled water piping, and save potable water for 31,000 households.
  - **Use recycled water for groundwater replenishment.** LADWP proposes to reconsider sending tertiary treated wastewater to spreading basins for groundwater replenishment.
  - **Initiate stakeholder planning process.** LADWP will work with stakeholders from the Integrated Resources Plan process, including the City's Bureau of Sanitation and Department of Public Works, to maximize the use of recycled water.
  - **Upgrade Tillman Wastewater Treatment Plant**: As part of its commitment to increasing groundwater replenishment, LADWP will upgrade the Tillman Wastewater Treatment Plant with state-of-the-art, advanced treatment capability; similar to the Orange County Water District's recent water-recycling system. Advanced treatment would be constructed at the

Tillman Plant, and the highly treated wastewater would be piped to spreading basins for groundwater recharge.

– **Pursue all possible funding sources**. The City will seek additional funding for expansion of its recycled water system.

- **Enhance stormwater capture:** The City has established a goal of increasing groundwater recharge by retrofitting Big Tujunga Dam to enhance stormwater retention, and through several other large-scale projects it proposes to undertake cooperatively with the Los Angeles County Flood Control District and other agencies.

- **Accelerate clean-up of the San Fernando Groundwater Basin**. The San Fernando Groundwater Basin is the City's primary local water source, providing 11 percent of the total water supply. However, the Basin is experiencing a decline in groundwater levels that threaten its long-term sustainability. LADWP plans to increase groundwater recharge by working with County partners on large-scale projects affecting the Basin. The City proposes to clean up the contaminated San Fernando Groundwater Basin to expand groundwater storage and to maximize the City's groundwater supplies.

- **Expand groundwater storage**. LADWP is considering several opportunities for increased storage of groundwater, including along the Los Angeles Aqueduct and within the Central Coast Basin, which could function as water reserves in case of extreme drought or other emergencies.

3.0 EXISTING CONDITIONS

3.1 Water Supply

LADWP is the water supplier for the City of Los Angeles and, therefore, the Loyola Marymount University campus, or Proposed Project site. LADWP obtains its water supplies from three primary sources: the Los Angeles Aqueduct, groundwater, and purchased water from the Metropolitan Water District. Each is described in detail in **Sections 3.1.1, 3.1.2,** and **3.1.3**, respectively. As shown in **Table IV.L.1-2**, which summarizes the City's water supply over the past 10 years, LADWP had an available water supply of 642,011 acre-feet in 2008, of which approximately 22.9 percent came from the Los Angeles Aqueduct, 9.3 percent came from groundwater, and 66.8 percent came from the Metropolitan Water District, with approximately 1.1 percent from recycled water.

The 2005 Urban Water Management Plan indicates that LADWP is planning for future growth in the population in its service area. In 2008, as previously stated, according to Urban Water Management Plan projections, water demand by the year 2010 is projected to be 683,000 acre-feet per year, or approximately 610 million gallons per day.[23]

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23 Los Angeles Department of Water and Power, *2005 Urban Water Management Plan*, 1-10, Exhibit 1K.

LADWP plans to meet the expected increase in demand for water through continued conservation measures; integrated resources planning (i.e., the treatment and re-use of wastewater, stormwater, and recycled water); alternative water sources; and continued reliance on the Los Angeles Aqueduct, local groundwater, and water purchases from the Metropolitan Water District. According to LADWP, there are adequate supplies available to serve City needs over the next two decades. Imported water (i.e., from the City's own Los Angeles Aqueducts system and Metropolitan Water District purchases) is forecasted to remain as the City's primary water resource.

Table IV.L.1-2
LADWP Annual Water Supply
(Acre-Feet Per Year)

Year	Los Angeles Aqueducts	Local Groundwater	The Metropolitan Water District	Recycled Water	Transfers, Spread, Spills, and Storage	Total
1999	309,037	170,660	164,112	1,812	-3,507	**649,128**
2000	255,183	87,946	336,116	1998	2,569	**678,674**
2001	266,923	79,073	309,234	1,675	-1,994	**658,899**
2002	179,338	92,376	410,329	1,945	-1,405	**685,392**
2003	251,942	90,835	322,329	1,759	-2,258	**664,338**
2004	202,547	71,831	391,834	1,774	2,958	**670,944**
2005	368,839	56,547	185,346	1,401	3,140	**608,993**
2006	378,922	63,270	188,781	4,890	-1,336	**637,199**
2007	129,400	89,018	439,436	3,639	1,044	**660,449**
2008	147,365	60,149	429,110	7,051	1664	**642,011**

Source: Los Angeles Department of Water and Power, Water Supply Assessment – Loyola Marymount University Master Plan Project, September 2009.

As previously discussed, water conservation is an increasingly important part of LADWP's water supply planning. Since the late 1980s, LADWP has implemented permanent, mandatory conservation measures via ordinances requiring the installation of conservation devices in existing properties and water-efficient landscaping for new construction. As of 2005, LADWP estimated that water conservation levels remained above 15 percent (i.e., consumption is 15 percent less than would be the case without conservation measures) and attributed the savings in water consumption to successful water conservation measures.

The 2005 Urban Water Management Plan identifies existing and proposed conservation measures intended to simultaneously increase supplies while reducing demand as the City's population continues to grow. Existing conservation measures fall into five categories: (1) developing public awareness and support of the need for conservation (through a tiered water rate structure based on actual consumption, advertising, and school education) (2) improving residential conservation (through requiring mandatory plumbing fixture retrofitting, rebates, incentives), (3) targeting commercial/industrial/governmental uses (through rebates, guidance technical and funding assistance),(4) targeting large landscapes (requiring improved irrigation technology and practices) and (5) system maintenance to reduce water waste (improvements to pipelines, hydrants, and other infrastructure). LADWP intends future conservation efforts to focus on landscape water use efficiency and enforcing conservation by commercial/industrial/institutional customers.

As previously mentioned, LADWP's Integrated Resources Plan also sets policy regarding the City's water resources through 2025, and addresses the development and implementation of facility plans for wastewater, stormwater and recycled water.

LADWP also is pursuing the development of several alternative water supply options, including water transfers, seawater desalination, and the reuse of urban runoff, to ensure continued water reliability. As part of this, the implementation of recycled water projects and expansion of the existing recycled water system is expected to become an increasing source of water for the City.

In its 2004 Integrated Water Resources Plan Update and its 2007 Integrated Water Resources Plan Implementation Report (discussed in more detail in **Section 3.1.3.4**), the Metropolitan Water District identified seawater desalination as a promising water supply source in light of recent technological advances in seawater treatment, and offered subsidies for the production of desalinated seawater. In response to the Metropolitan Water District-offered subsidies for the production of desalinated seawater, LADWP undertook an investigation of suitable sites for a desalination plant, and determined that the Scattergood Generating Station, one of its coastal power generation facilities, was a potentially viable site. LADWP undertook a Preliminary Evaluation Study jointly with the U.S. Bureau of Reclamation and California State Department of Water Resources, which was completed in March 2008. Although LADWP currently does not have plans to implement seawater desalination, in the future, desalinated seawater may serve as one of the City's water supply sources.

3.1.1 Los Angeles Aqueducts

The 340-mile-long Los Angeles Aqueducts system, comprising the original Los Angeles Aqueduct completed in 1913 and the parallel Second Los Angeles Aqueduct completed in 1970 extends from the

Mono Basin, in the eastern part of the state, to Los Angeles. The Los Angeles Aqueducts are fed by runoff from the eastern slopes of the Sierra Nevada range, which peaks during late spring and summer snowmelt, as well as from pumped groundwater from nine wells beneath approximately 315,000 acres of LADWP-owned land within the Owens Valley. Water is conveyed through the system entirely by gravity.

With seven reservoirs, the system has a total delivery capability of 561,000 acre-feet per year and a total storage capacity of 300,560 acre-feet. Los Angeles Aqueduct system deliveries have varied considerably over time, from more than 400,000 acre-feet annually in very wet years, to a normal year supply of 276,000 acre-feet, to less than 75,000 acre-feet in very dry years. However, several court actions have affected actual deliveries in recent years.[24] In 1972, Inyo County filed a lawsuit challenging the City's groundwater pumping in the Owens Valley. The suit was settled in 1997 and resulted in LADWP's dedication of approximately 37,000 acre-feet of water annually for enhancement and mitigation projects and 80,000 acre-feet of water annually for irrigation, wildlife, recreation, and other uses in the Owens Valley.[25] In 1994, the State Water Resources Control Board issued Decision 1631, which limits LADWP's diversions from Mono Lake in order to allow the restoration of stream conditions, wildlife habitat, and fisheries; LADWP currently commits up to 74,000 acre-feet annually for these restoration activities. Finally, in 1998, LADWP and the Great Basin Unified Air Pollution Control District entered into a Memorandum of Understanding to mitigate dust emissions from Owens Lake, and the District revised the corresponding implementation plan in 2003. As a result, LADWP commits approximately 95,000 acre-feet annually for dust mitigation for an approximately 39-square-mile area of Owens Lake.

These reductions in supplies, coupled with less than normal runoff in the eastern Sierra Nevada in recent years, have reduced the aqueduct's ability to fulfill demand within LADWP's service area. Water management strategies, including increased water recycling and conservation, are necessary to accommodate these environmental offsets to maintain reliability. Los Angeles Aqueduct system deliveries supplied approximately half of the City's water needs from 1995 through 2004, and since 2004, have supplied approximately 262,550 acre-feet annually. In the future, the average annual delivery is expected to be between 200,000 and 230,000 acre-feet per year.[26]

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24 Los Angeles Department of Water and Power, *Urban Water Management Plan*, ES-7.

25 Los Angeles Department of Water and Power, *Water Supply Assessment: The Loyola Marymount University Master Plan Project*.

26 Los Angeles Department of Water and Power, *Water Supply Assessment: The Loyola Marymount University Master Plan Project*.

3.1.2 Local Groundwater

LADWP typically extracts groundwater from nine wellfields throughout the Owens Valley and three local groundwater basins (San Fernando, Sylmar, and Central Basins). LADWP pumps groundwater from its approximately 315,000 acres of land in the Owens Valley, which is used in Owens Valley and in Los Angeles.

Owens Valley includes approximately 3,300 square miles of drainage area and has yielded between approximately 57,000 acre-feet and 85,820 acre-feet of groundwater in a single year. Owens Valley was not identified in the California Department of Water Resources California's Groundwater Bulletin 118 Update 2003 (Bulletin) as an overdraft basin, nor does the Bulletin project that the Owens Valley will become overdrafted. However, the long-term groundwater management agreement between the City of Los Angeles and Inyo County contains plans and procedures to prevent overdraft conditions.

LADWP's pumping of local groundwater in the San Fernando, Sylmar, and Central basins is subject to court judgments that define its annual entitlements. Pumping in the San Fernando and Sylmar Basins is reported to the Upper Los Angeles River Area Watermaster and is reported to the California Department of Water Resources who acts as watermaster.

The San Fernando and Sylmar Basins are located in the Upper Los Angeles River Area. The San Fernando Basin consists of 112,000 acres of land and is where the majority of LADWP's groundwater is extracted. LADWP is entitled to 87,000 acre-feet annually in the San Fernando Basin.[27] As of October 2008, LADWP has also accumulated nearly 406,313 acre-feet of stored water credits in the San Fernando Basin (120,560 acre-feet of stored water credits that are available to be pumped now and 285,753 acre-feet that are held in reserve), which can be withdrawn during normal and dry years or in an emergency.[28] The Sylmar Basin consists of 5,600 acres. LADWP is entitled to 3,405 acre-feet annually from the Sylmar Basin.[29]

LADWP also has adjudicated rights to extract 15,000 acre-feet of groundwater per year from the Central Basin. The Central Basin is a large subbasin that occupies a large portion of the southeastern Coastal Plain of the Los Angeles Groundwater Basin. The Central Basin is bounded on the north by an impermeable rock formation known as the La Brea High formation, which divides the basin from the Hollywood Basin; on the southeast by Coyote Creek, a regional watershed boundary separating the basin from the Orange County Groundwater Basin; and on the southwest by the Newport Inglewood fault. The Los Angeles and

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27 Los Angeles Department of Water and Power, *Water Supply Assessment: The Loyola Marymount University Master Plan Project*, 22.

28 Los Angeles Department of Water and Power, *Water Supply Assessment: The Loyola Marymount University Master Plan Project*, 22.

29 Los Angeles Department of Water and Power, *Water Supply Assessment: The Loyola Marymount University Master Plan Project*, 22.

San Gabriel Rivers drain inland areas and cross the area containing the Central Basin as they approach the coast.

Between October 2007 and September 2008, LADWP extracted 50,009 acre-feet, 2,996 acre-feet, and 10,754 acre-feet from the San Fernando, Sylmar, and Central basins, respectively. Extractions by LADWP from the San Fernando, Sylmar, and Central Basins for the last 5 years are shown in **Table IV.L.1-3**, below.

Table IV.L.1-3
LADWP Groundwater Basin Supply

Water Year	San Fernando	Sylmar	Central
2003–2004	68,626	3,033	15,209
2004–2005	49,085	1,110	13,401
2005–2006	38,042	2,175	13,725
2006–2007	76,251	3,919	13,609
2007–2008	50,009	2,996	10,754

Source: Los Angeles Department of Water and Power, Water Supply Assessment: The Loyola Marymount University Master Plan Project, 2009.

Localized water quality issues also have restricted LADWP's ability to exercise its water rights in the San Fernando and West basins. As part of its ongoing regulatory compliance efforts, LADWP performs water quality testing of San Fernando Basin groundwater production wells. Trace levels of the contaminants trichloroethylene (TCE), perchloroethylene (PCE), and other volatile organic compounds (VOCs) have been detected during testing, which are due to previous improper chemical disposal.[30]

LADWP intends to continue local groundwater pumping to offset reductions in its imported supplies.

3.1.3 Metropolitan Water District of Southern California

The Metropolitan Water District serves 26 member agencies comprising 14 cities, 11 municipal water districts, and 1 County water authority; it is the largest water wholesaler in Southern California for domestic and municipal uses. As one of 26 member agencies, each of which have preferential rights to purchase water from the Metropolitan Water District, LADWP purchases water from the Metropolitan Water District to supplement its imported and local groundwater supplies. LADWP's preferential right is calculated based on the Metropolitan Water District Water Supply Allocation Plan[31] (discussed further in

30 Los Angeles Department of Water and Power, *Urban Water Management Plan*.

31 Metropolitan Water District of Southern California, *Water Supply Allocation Plan*, (2009).

Section 3.1.3.4). As indicated therein, as of June 30, 2009, LADWP has a preferential right to purchase 20.97 percent of the Metropolitan Water District's total water supply. LADWP will continue to rely on Metropolitan Water District to meet its current and future supplemental water needs.

The Metropolitan Water District imports water from the Colorado River Aqueduct and the State Water Project, and distributes this water to its member agencies. It also has more than 5.0 million acre-feet of storage capacity in reservoirs and groundwater basins, with approximately 1.08 million acre-feet currently in storage, and implements a water surplus and drought management program that provides a means for allocating water supplies during periods of shortage and surplus.[32]

Based on the water supply planning requirements that are imposed on Metropolitan Water District member agencies, such as water supply assessments, urban water management plans, and written verification requirements, the Metropolitan Water District has indicated that current supplies can meet the demands of its customers at least through 2025.[33] It has compared total projected water demands and conservatively estimated water supplies over the next 20 years in its Integrated Water Resources Plan (2004) and has determined that, if its supply programs are implemented under its Integrated Resource Plan Update, "…the IRP Update analysis demonstrates that the resource targets of the 1996 IRP, factored in with the changed conditions discussed in this report, provide for 100 percent reliability in 2020 and up to 2025."[34] Metropolitan Water District indicates that its additional reserve supplies are a buffer that "serves as a contingency measure to help ensure regional reliability and to mitigate against implementation risk."[35]

Metropolitan Water District water supplies sources, including the Colorado River, State Water Project, and additional sources, are discussed below, together with related environmental concerns and litigation affecting deliveries from these sources.

3.1.3.1 Colorado River

Water Supplies

The Metropolitan Water District was established in 1928 to obtain and deliver Colorado River water to Southern California, to supplement local supplies. The Metropolitan Water District has the right to divert

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32 Metropolitan Water District of Southern California, *Profile: A Summary of the Delivery and Distribution System, Facilities and Equipment*, http://www.mwdh2o.com/mwdh2o/pages/news/at_a_glance/mwd_profile.pdf. 2009.

33 Metropolitan Water District of Southern California, Integrated Resources Plan, (2004).

34 Metropolitan Water District of Southern California, Integrated Resources Plan, (2004), ES-2.

35 Metropolitan Water District of Southern California, Integrated Resources Plan, (2004), ES-2.

water from the Colorado River under Section 5 of the federal Boulder Canyon Project Act.[36] Water from the Colorado River or its tributaries is also available to other users in Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, and Mexico.

Colorado River water is supplied to the Metropolitan Water District through the 242-mile-long Colorado River Aqueduct, which is owned and operated by the Metropolitan Water District. Water from the Colorado River is diverted at Lake Havasu on the California/Arizona border and conveyed across the Mojave Desert to Lake Mathews near the City of Riverside by the Metropolitan Water District. Imported Colorado River water is treated at a filtration plant prior to use and then distributed to member agencies throughout Southern California. To ensure a reliable supply of water in times of drought, Diamond Valley Lake, located in southwest Riverside County near Hemet, stores water received from the Colorado River Aqueduct.

Colorado River water delivery to the Metropolitan Water District is dependent upon the availability of unused apportionment available to California. California, which has a higher priority than a portion of Arizona and Nevada's apportionments during water shortages, was apportioned the use of 4.4 million acre-feet per year of water from the Colorado River, plus half of any surplus made available for use collectively in Arizona, California, and Nevada, under a 1964 Supreme Court decree (Arizona vs. California and the Boulder Canyon Project Act). Under the 1931 priority system that formed the basis for distribution of Colorado River water to California, the Metropolitan Water District holds the fourth priority right to 550,000 acre-feet of water annually, which is expected to be available every year for the next 20 years during all year types (i.e., wet, normal, single-dry, and multiple-dry years).[37] In addition, the Metropolitan Water District holds the fifth priority right to 662,000 acre-feet of water, in excess of California's basic apportionment.

Until 2003, the Metropolitan Water District had been able to obtain its full fifth priority right as a result of the availability of surplus and apportioned unused water. However, Arizona and Nevada have increased their use of water from the Colorado River, leaving no unused apportionment available for California since 2002. In addition, a severe drought in the Colorado River Basin has meant no surplus water has been available since 2002. Since 2002, the Metropolitan Water District deliveries of Colorado River water varied from a low of 633,000 acre-feet in 2006 to a high of 905,000 acre-feet in 2008. For 2009, the Metropolitan Water District estimates receiving over 1 million acre-feet.[38]

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36 U.S. Secretary of the Interior. Boulder Canyon Project Act, Section 5, (1968).

37 Metropolitan Water District of Southern California. *Integrated Water Resources Plan Implementation Report*, (2004).

38 Metropolitan Water District of Southern California. *Revenue Bond Official Statement, Water Revenue Bonds for $200,000,000, 2008 Authorization, Series A, (*Appendix A, Metropolitan Water District of Southern California).

In response, the Metropolitan Water District has taken steps to increase its share of Colorado River water through agreements with other agencies with rights to use this water. These include (1) an agreement with the Imperial Irrigation District for additional water storage conservation; (2) an agreement with the Central Arizona Water Conservation District to demonstrate the feasibility of that agency's storing Colorado River water in central Arizona for the benefit of an entity outside the State of Arizona; (3) an agreement with the Central Arizona Water Conservation District and the Southern Nevada Water Authority to fund the construction of a new 8,000 acre-foot off-stream regulating reservoir near the All-American Canal in Imperial County, in return for which the Metropolitan Water District received 100,000 acre-feet from Lake Mead; (4) an agreement with the Palo Verde Irrigation District for a Land Management, Crop Rotation, and Water Supply Program, which will provide 118,000 acre-feet of additional water; and (5) implementing the Interim Surplus Guidelines, which allows the distribution of unused water to Arizona, California, and Nevada.[39]

Environmental Concerns

Federal and state environmental laws protecting fish species and other wildlife species have the potential to affect Colorado River operations, in turn affecting certain hydropower operations and the amount of water deliveries to the Colorado River Aqueduct. To address environmental concerns, a broad-based state, federal, tribal, and private regional partnership that includes water hydroelectric power and wildlife management agencies in Arizona, California, and Nevada have developed a multi-species conservation program for the main stem of the Lower Colorado River, known as the Lower Colorado River Multi-Species Conservation Program.

A second environmental issue concerning the Colorado River water supply is the presence of quagga mussels (*Dreissena rostriformis bugensis*), which were discovered for the first time in Lake Mead in January 2007. Quagga mussels, which are a non-native invasive species, can clog intakes and raw water conveyance systems, and destroy fish habitats and affect lakes and beaches. The Metropolitan Water District is currently working to enhance its ability to detect the mussels by studying mussel transport in conveyance systems, assessing the vulnerability of Metropolitan Water District raw water conveyance systems, studying the feasibility of boat cleaning facilities, and developing and implementing control strategies.

Litigation

Several lawsuits are currently pending that generally pertain to Colorado River water availability and supplies, as described below. The outcome of this litigation is not expected to substantially affect the

39 Metropolitan Water District of Southern California. *Revenue Bond Official Statement, (*Appendix A), A-12.

Metropolitan Water District's Colorado River Aqueduct allocations to LADWP, or, in turn, LADWP's ability to meet the water demand of the Water District, since LADWP has access to alternative water supplies, plans the implementation of and participation in conservation programs, and is increasing its use of reclaimed water, among other variables.

Quantification Settlement Agreement Litigation. In 2003, the Metropolitan Water District, Coachella Valley Water District, and Imperial Irrigation District executed the Quantification Settlement Agreement (Quantification Settlement Agreement) and related agreements, which established water use limits for each of the member agencies, thereby facilitating water transfers from agricultural to urban uses. The Quantification Settlement Agreement, a major component in the Metropolitan Water District's ability to comply with the 1964 Supreme Court decree, sets forth specific water conservation requirements for agricultural uses, land management, and the availability of surplus water. Quantification Settlement Agreement-related litigation has been filed and is expected to go to trial during the winter of 2010 over the validity of the Quantification Settlement Agreement and the CEQA claims.[40] Any adverse impact on Metropolitan Water District or its Colorado River supplies cannot be adequately determined at this time.

Cadiz Litigation. A lawsuit was filed in 2006 against the Metropolitan Water District by the publicly held agricultural company Cadiz Incorporated, a major landowner in San Bernardino County, over a proposed off-stream storage and dry-year supply program. The program proposed facilities to store water from the Colorado River Aqueduct and to transfer indigenous groundwater to the Metropolitan Water District as a dry year supply. In October 2002, the Metropolitan Water District decided not to proceed with the program. In January 2006, Cadiz served the Metropolitan Water District with an action alleging that the Metropolitan Water District breached agreements to complete the environmental review of the program and to accept the pipeline right-of-way that could have been used by Cadiz with other potential project partners. The two parties reached a settlement in early 2009 and in June 2009 Cadiz announced an agreement to develop an underground pipeline conveyance system with other water providers.

Grand Canyon Trust Litigation. Additionally, litigation was filed in December 2007 against the Bureau of Reclamation by the non-profit organization Grand Canyon Trust, alleging that the Bureau of Reclamation's planning and operation of the Glen Canyon Dam (which allowed the creation of Lake Powell) does not comply with requirements of the National Environmental Policy Act and the Federal Endangered Species Act. The Grand Canyon Trust claims that the Bureau of Reclamation has failed to implement a reasonable and prudent alternative in the United States Fish and Wildlife Service's 1994 Biological Opinion for Glen Canyon Dam operations for the protection of endangered humpback chub and razorback sucker. Grand Canyon Trust alleges that the Bureau of Reclamation must develop

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40 Metropolitan Water District of Southern California. *Revenue Bond Official Statement, (*Appendix A).

and implement a water release program with steady high flows in the spring and low steady flows in the summer and fall during low water years. In 2009, the Bureau of Reclamation was ordered to develop a new operating plan and reconsider impacts of the dam flows may harm the endangered fish.[41]

Navajo Nation Litigation. Finally, the Navajo Nation has filed litigation against the Department of the Interior, specifically the Bureau of Reclamation and the Bureau of Indian Affairs, alleging that the Bureau of Reclamation has failed to determine the quantity of the Colorado River water rights of the Navajo Nation and that the Bureau of Indian Affairs has failed to protect the interest of the Navajo Nation. Negotiations are currently underway; however, the litigation has not delayed implementation of the Quantification Settlement Agreement.

3.1.3.2 State Water Project

Water Supplies

In addition to Colorado River water, the other major source of water for the Metropolitan Water District, and therefore LADWP, is water from northern California transported via the State Water Project. The State Water Project encompasses a 600-mile-long system of reservoirs, aqueducts, power plants, and pumping plants. It diverts and stores surplus water during wet periods and distributes it to the Metropolitan Water District's service areas throughout Southern California. Other State Water Project functions include flood control, power generation, recreation, fish and wildlife protection, and water quality management in the Sacramento-San Joaquin Delta.[42]

Lake Oroville is the State Water Project's largest storage facility, with a capacity of about 3.5 million acre-feet. Releases from Lake Oroville flow down the Feather River into the Sacramento River, which drains the northern Central Valley. The Sacramento River flows into the Sacramento-San Joaquin Delta, comprising 738,000 acres of land interlaced with channels that receive runoff from about 40 percent of the State's land area. The State Water Project and the Central Valley Project rely upon Delta channels to move Sacramento River inflow to points of diversion in the south Delta. Accordingly, the Delta is part of the State Water Project conveyance system and a key component in State Water Project deliveries.

The Sacramento-San Joaquin Delta is a network of natural and artificial channels and reclaimed islands at the confluence of the Sacramento and San Joaquin Rivers. The Delta forms the eastern portion of the San Francisco estuary, receiving runoff from over 40 percent of the state's land area. It is a low-lying region

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41 Metropolitan Water District of Southern California. *Revenue Bond Official Statement* (Appendix A).

42 State of California, The Resources Agency, Department of Water Resources, Bay-Delta Office, *State Water Project Delivery Reliability Report – 2007, http://baydeltaoffice.water.ca.gov/swpreliability/Final_DRR_2007_011309.pdf.* 2007.

where sediment from the Sacramento, San Joaquin, Mokelumne, Cosumnes, and Calaveras Rivers commingles with organic matter deposited by marsh plants. Covering 738,000 acres interlaced with hundreds of miles of waterways, much of the land is below sea level and relies on more than 1,100 miles of levees for protection against flooding. The Delta also provides a unique estuarine habitat for many resident and migratory fish and birds, some of which are listed as threatened or endangered. Most of the native fish either migrate through the Delta or move into it for spawning. Resident native fish are mainly present in areas strongly influenced by the Sacramento River inflows. Because the State Water Project and the Central Valley Project use Delta channels to convey water to the southern Delta for diversion, the Delta is the focal point for water distribution throughout the state.

Central Valley Project and State Water Project reservoir releases and Delta exports are coordinated according to the Coordinated Operating Agreement, which sets guidelines for the sharing of water supply and responsibility for meeting water quality standards in the Delta. The majority of the water exported by the State Water Project is dependent upon water rights derived from Lake Oroville storage; however, the State Water Project can also divert water that is considered excess in the Delta. Excess conditions in the Delta typically result when there is sufficient inflow to meet all beneficial needs and the State Water Project is not required to make supporting releases from Lake Oroville.

From the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano Counties through the North Bay Aqueduct. In the southern Delta, the State Water Project diverts water for delivery south of the Delta. A system of reservoirs and pumping plants store and deliver water from the southern Delta to the California Aqueduct, which transports water to San Luis Reservoir in Merced County. San Luis Reservoir is jointly operated by Department of Water Resources and the Bureau of Reclamation (Reclamation) and has a storage capacity of more than 2 million acre-feet; the Department of Water Resources' share of gross storage in the reservoir is about 1.062 million acre-feet. State Water Project water not stored in San Luis Reservoir, and water eventually released from San Luis Reservoir, continues to flow south through the California Aqueduct and branches off to supply State Water Project contractors.

Long-term water supply contracts with the Department of Water Resources for a total of 4,173 thousand acre-feet per year, in effect until at least 2035, have been signed by 29 State Water Project contractors, including the Metropolitan Water District. Each contract contains a schedule of the maximum amount of water a contractor may receive annually in a table referred to as Table A. All available water is allocated annually in proportion to each contractor's annual Table A amount. State Water Project deliveries of water are based on Table A and Article 21 contract provisions, which are described below.

Table A

The State Water Project contractual Table A amount is the maximum amount of water that a State Water Project contractor may request each year from the State Water Project. Table A is used by the Department of Water Resources in determining each contractor's proportionate share, or allocation, of the total State Water Project water supply of available water for each year. The reliability of State Water Project supplies is subject to annual hydrology, environmental and legal constraints, and planned improvements to the system.

The total planned annual delivery capability of the State Water Project and the sum of all State Water Project contractors' maximum Table A amounts, as specified in the water supply contracts, is approximately 4.2 million acre-feet per year, 4.1 million acre-feet per year of which is deliverable in certain wet years. Of this 4.2 million acre-feet per year, the Metropolitan Water District has a maximum annual Table A contract amount from the State Water Project of 1.91 million acre-feet per year, which is approximately 46 percent of the total Table A entitlement contracts in the state.[43] This Table A amount does not reflect the actual amount of water available to the Metropolitan Water District from the State Water Project, which varies from year to year based on climate, environmental, and legal considerations. Water received from the State Water Project by Metropolitan Water District between 2002 through 2008 varied from a low of 1.4 million acre-feet in 2002 to a high of 1.8 million acre-feet in 2004.[44] The Metropolitan Water District's allocation in calendar year 2008 was 35 percent of its contracted amount, or 669,000 acre-feet. Following two dry years and the uncertain hydrology projected for 2009, the Department of Water Resources' allocation estimate to State Water Project contractors for 2009 was set at 40 percent on May 20, 2009. Under this allocation the Metropolitan Water District will receive approximately 764,000 acre-feet from the State Water Project, including water from water transfers, groundwater banking, and exchange programs.[45]

Article 21

Article 21 refers to a provision in the contract for delivering water that is available in addition to State Water Project Table A amounts. Article 21 water represents surplus water available from a California banking program through which state and regional water agencies can buy and sell surplus water. Article 21 water allocations are only available during wet years or years in which the supply of water is greater than the demand.

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43 State Water Project Delivery Reliability Report (2008)

44 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A), A-5.

45 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A), A-5.

State Water Project Water Delivery Reliability

In the 2005 *State Water Project Delivery Reliability Report*, the California Department of Water Resources presents its method for calculating State Water Project delivery reliability, the factors affecting State Water Project delivery reliability, and the limitations to estimating future water delivery reliability. According to the Department of Water Resources, water delivery reliability depends on three general factors: (1) the availability of water at the source, (2) the ability to convey water from the source to the desired point of delivery, and (3) the magnitude of demand for the water.

Availability of Source Water

With respect to the availability of source water, factors of uncertainty include the inherent annual variable location, timing, amount, and form of precipitation in California. The second source of uncertainty is due to global climate change. Current literature suggests that global warming could significantly impact the hydrological cycle, changing California's precipitation pattern and amount from the historical record.

Ability to Convey Source Water

With respect to the ability to convey source water to the desired point of availability, the Department of Water Resources reports that an uncertainty factor exists with respect to State Water Project operations, because they are closely regulated by Delta water quality standards established by the State Water Resources Control Board and set forth in Water Rights Decision 1641. The Department of Water Resources also reports other factors of uncertainty due to the continuing unexplained decline in many pelagic (open water) fish species, including the Delta smelt since the early 2000s, and future sea level rise associated with global climate change, which could increase salinity in the Delta and the risk of interruptions in State Water Project diversions from the Delta due to levee failures. Finally, legal challenges to State Water Project operation and ongoing planning activities related to the Delta may affect State Water Project operations, and are described in more detail below.

Demand for System Water

With respect to estimating future demand for State Water Project water, the Department of Water Resources has identified uncertainty factors including population growth, water conservation, recycling efforts, other supply sources, and global climate change. In addition to the above-identified factors affecting water delivery reliability, the Department of Water Resources has reported other limitations and assumptions, such as changes in the way water is conveyed from the Delta, or operating rules to protect

the delta smelt, or present weather conditions compared to those between 1922 and 2003,[46] all of which are explained in the *State Water Project Delivery Reliability Report 2007*. This report also identifies the status of four major concurrent Delta planning efforts that are underway with objectives related to providing a sustainable Delta over the long-term: the Delta Vision, Delta Risk Management Strategy, CALFED Ecosystem Restoration Program Conservation Strategy, and Bay-Delta Conservation Plan, which could affect State Water Project and Central Valley Project operations in the Delta, and affect water delivery reliability.

Environmental Concerns

Global Climate Change. Future State Water Project deliveries are expected to be impacted by climate change, a topic of growing concern for water planners and managers because of its potential impacts on California's future water supplies. The Department of Water Resources' *2005 California Water Plan Update* contains its first assessment of such potential impacts and identifies the potential impacts of global climate change based on more than a decade of scientific studies on the subject.

Changes in Sierra snowpack patterns (the source of the State Water Project's water supply in Lake Oroville), hydrologic patterns, sea level, rainfall intensity, and statewide water demands are all possible should global climate change prove to be increasing through time. The California Climate Action Team, made up of representatives from several state agencies including the California Environmental Protection Agency and the Resources Agency, issued a *Report to Governor Schwarzenegger and the Legislature* in March 2006 that evaluated the impacts of climate change on the state and examined adaptation strategies that would best prepare the state to respond to the adverse consequences of climate change. The report indicated that water supply would be primarily affected by decreased snowpack in the Sierra Nevada and changing melt patterns. The Sierra Nevada provides natural water storage roughly equal to half the storage capacity in the state's reservoirs. Between 2035 through 2064, snowpack in the Sierra Nevada could decrease between 10 and 40 percent. By the end of the century, the loss could be as much as 90 percent if temperatures rise to the upper estimated temperature range. Increasing temperatures would also cause the snowpack to melt earlier in the year. The potential storage loss would depend on whether reservoirs can be managed to capture earlier snowmelt at the risk of losing flood control capacity.

Computer models (such as CALVIN) have been developed to show water planners what types of effect climate change could have on the water supply. Department of Water Resources has committed to continue to update and refine these models based on ongoing scientific data collection, and to incorporate

46 Department of Water Resources, Bay-Delta Office, *State Water Project Delivery Reliability Report – 2007*, 20-23.

this information into future California Water Plans, so that agencies like the LADWP and Metropolitan Water District can plan accordingly.

The Department of Water Resources' *2007 Final State Water Project Delivery Reliability Report* also addresses global climate change, noting that until the impacts of climate change on precipitation and runoff are better quantified, future weather patterns are usually assumed to be similar to those of the past. Department of Water Resources has also acknowledged that this assumption has an inherent uncertainty, especially given the evolving information on the potential effects of global climate change, and has indicated that as information regarding global climate change becomes better defined, it will be helpful in guiding the development of statewide strategies for the future management and development of water resources facilities, including the State Water Project. The California Climate Action Team's *Report to Governor Schwarzenegger and the Legislature* states that strategic investments in measures tied to water energy intensity would substantially reduce climate change emissions. According to the Report, approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute, and use water and wastewater in the state. Increasing water use efficiency or reducing demand has trickle-down benefits, by reducing the energy demand associated with the conveyance, treatment, or distribution of that water. The public review draft of the Department of Water Resources *2009 Water Plan Update* includes increased agricultural and urban water use efficiency as key components of the plan. Urban water use efficiency measures include water efficiency standards for appliances, irrigation and landscaping restrictions, community and public outreach, other Department of Water Resources legislation, and adopting the Governor's recommendations with the goal of reducing statewide per capita water use by 20 percent by 2020.

Endangered Species Act Considerations. Several fish species present in the Bay-Delta area have been listed as endangered or threatened under the federal or California Endangered Species Acts in recent years, which has had the effect of limiting the State Water Project's flexibility in terms of water deliveries. Five species, including the winter-run and spring-run Chinook salmon, Delta smelt, North American green surgeon, and Central Valley steelhead, are currently listed. The longfin smelt was listed in February 2008 as a candidate species for protection under the California Endangered Species Act, and several entities have petitioned for its listing under the federal Endangered Species Act as well. Critical habitat must also be designated for each listed species under the federal Endangered Species Act. The federal Species Act requires that before a federal agency authorizes funds or actions, it must consult with the appropriate federal fishery agency about the potential impacts on such actions on threatened or endangered species or their habitat, and the result of the consultation is the issuance of a Biological Opinion. Some of the Biological Opinions issued in connection with the aforementioned listed and candidate species and their habitats are the subject of ongoing litigation, as discussed below.

Litigation

Delta Smelt Biological Opinion; Wanger and Watershed Decisions (Federal and California Endangered Species Act Litigation). In addition to climate change, various court actions affect State Water Project water supplies throughout California. In February 2005, the United States Fish and Wildlife Service issued a Biological Opinion finding that the operations and criteria for the Central Valley Project and State Water Project would not result in jeopardy to the Delta smelt. In May 2005, the Natural Resources Defense Council and others filed a supplemental complaint in federal court against the Secretary of the Interior and the Director of United States Fish and Wildlife Service, challenging the adequacy of the 2005 Biological Opinion. In June 2006, plaintiffs filed a motion for summary judgment. In July 2006, in light of new information, the U.S. Bureau of Reclamation, operator of the Central Valley Project, requested that United States Fish and Wildlife Service reinitiate consultation on the operations plan and criteria for the Central Valley Project. In May 2007, U.S. District Court Judge Oliver Wanger found that the 2005 Biological Opinion was inadequate and that the no-jeopardy determination was arbitrary, capricious, and contrary to the law.

Additionally, in October 2006, plaintiff, Watershed Enforcers, a project of the California Sportfishing Protection Alliance, filed a lawsuit in Alameda County Superior Court alleging that the Department of Water Resources was not in compliance with the California Endangered Species Act and did not have the required state incidental take permit to protect the Delta smelt as part of Department of Water Resources pumping operations at the Harvey O. Banks Pumping Plant located near the City of Tracy (*Watershed Enforcers, et al. v. California Department of Water Resources, et al.* Alameda County Superior Court No. RG06292124 [*Watershed* decision]). In April 2007, the court agreed and ordered a shutdown of pumping from the Delta if appropriate permits could not be obtained in 60 days. In May 2007, the Department of Water Resources filed an appeal of the trial court's decision, which automatically stayed the decision pending the outcome of the appeal. At the same time, the Department of Water Resources entered into a Memorandum of Understanding with the California Department of Fish and Game to jointly work with the appropriate federal agencies to develop a federal Biological Opinion that complies with California's Endangered Species Act. During preparation of the new Biological Opinion, the Department of Water Resources committed itself to actions related to protecting the Delta smelt and other species through adaptive management provisions. Upon completion of this effort, the Department of Water Resources plans to submit a request to California Department of Fish and Game for a consistency determination under the California Endangered Species Act that would allow for incidental take based on the new federal Biological Opinion.

On August 31, 2007, Judge Wanger announced an initial ruling that outlined an operational plan calling for reductions in water supplies to protect the Delta smelt. The Court specified that reduced operations

would last until September 2008, while federal agencies develop a revised Biological Opinion for Delta smelt that will ensure the State Water Project's and Central Valley Project's compliance with the requirements of the federal ESA.

In December 2007, Judge Wanger issued a final court order that curtailed Delta pumping to protect the Delta smelt. The range of reduced operations is consistent with earlier estimates made by the Department of Water Resources following the Court's initial ruling in August 2007. Following Judge Wanger's final ruling, the Department of Water Resources performed additional modeling and analysis of the impacts of the *Wanger* decision on Delta pumping. According to the Department of Water Resources, the final ruling would primarily affect export pumping between January and June of each year, when juvenile Delta smelt are at greatest risk of entrainment in pumps. Further, Department of Water Resources has stated that the actual impact on State Water Project water supply will depend on a number of factors, including the locations where adult smelt spawn and offspring hatch, levels of precipitation for the year, and water temperatures affecting how quickly the fish migrate.

On December 15, 2008, the final Biological Opinion for Delta smelt was issued by the United States Fish and Wildlife Service. The 2008 opinion continues restrictions on State Water Project and federal Central Valley Project operations that have been in place under the 2007 court order. However, it imposes new requirements for Delta outflows under certain conditions and requires increased reservoir releases in the fall of some years to reduce salinity. The Department of Water Resources estimates that, under median hydrologic conditions, the new opinion could have the effect of reducing State Water Project deliveries to the Metropolitan Water District by between 300,000 and 700,000 acre-feet in 2009.[47,48]

The *Wanger* and *Watershed* decisions have implications for imported State Water Project/Central Valley Project water supplies throughout California. There have been short-term effects related to issues presented in the *Watershed* and *Wanger* decisions. For example, pumping operations were shut down for approximately nine days in June 2007 due to concerns over the declining number of Delta smelt. Department of Water Resources then operated the pumps at limited levels for several weeks while waiting for the smelt to migrate to cooler waters, and resumed normal operations in July 2007. There is also concern that the remedy adopted by the District Court could ultimately become part of the conditions in the new incidental take permit. These concerns, if they materialize, could limit the percentage of State Water Project water that can be delivered to State Water Project Contractors. If such remedies are not ultimately part of the incidental take permit, the permit itself may contain conditions

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47 Metropolitan Water District of Southern California. *Revenue Bond Official Statement* (Appendix A), A-7.

48 For additional information regarding the 2008 Biological Opinion, see the Department of Water Resources (http://www.Water.Ca.Gov/News/) and the U.S. Fish And Wildlife website http://www.fws.gov/sacramento/delta_update.htm

that would lower the percentage of State Water Project water made available for delivery to Southern California. As previously stated, the Department of Water Resources is currently in the process of determining what effect the Delta smelt Biological Opinion will have on future State Water Project supplies.

Salmon Biological Opinion. On June 4, 2009, the National Oceanic and Atmospheric Administration released its final Biological Opinion finding that water pumping operations in California's Central Valley by the federal Bureau of Reclamation jeopardize the continued existence of several threatened and endangered species under the jurisdiction of the National Oceanic and Atmospheric Administration Fisheries Service. The Bureau has provisionally accepted the recommended changes to its water pumping operations and has said it will begin to implement its near-term elements as it evaluates the overall opinion. Federal biologists and hydrologists concluded that current water pumping operations in the Federal Central Valley Project and the California State Water Project should be modified to ensure survival of winter and spring-run Chinook salmon, Central Valley steelhead, the southern population of North American green sturgeon, and southern resident killer whales, which rely on Chinook salmon runs for food.

As part of the final opinion, the National Oceanic and Atmospheric Administration Fisheries Service has identified a number of ways the Bureau can operate the water system to benefit the species, including increasing the cold water storage and flow rates. Such methods will enhance egg incubation and juvenile fish rearing, as well as improve the spawning habitat and the downstream migration of juvenile fish. The National Oceanic and Atmospheric Administration estimates that changing water operations will impact an estimated 5 to 7 percent of the available annual water on average moved by the federal and state pumps, or about 330,000 acre-feet per year. Agricultural water use in California is roughly 30 million acre-feet per year. The National Oceanic and Atmospheric Administration estimates that water operations will not be affected by the opinion immediately and will be tiered to water year type. The opinion includes exception procedures for drought and health and safety issues. In addition, the opinion calls for the bureau to develop a genetics management plan and an acoustic tagging program to evaluate the effectiveness of the actions and pilot passage programs at Folsom and Shasta reservoirs to reintroduce fish to historic habitat.

The American Recovery and Reinvestment Act is expected to mitigate some costs resulting from the opinion's recommended actions. The Department of the Interior identified $109 million to construct a Red Bluff Pumping Plant that will allow the old Red Bluff Diversion Dam to be operated in a "gates out" position to allow salmon and green sturgeon unimpeded passage. In addition, the Act contains $26 million to restore Battle Creek, a salmon tributary to the Sacramento River. The water projects included in the opinion are Shasta Dam at the upper headwaters of the Sacramento River, Folsom and

Nimbus dams on the American River, and New Melones Dam on the Stanislaus River. The opinion also covers the state and federal export facilities in the Delta, the Nimbus hatchery on the American River, and the operations of diversion structures, including the Red Bluff Diversion Dam on the mainstem Sacramento and the Delta Cross Channel gates in the Delta. The Bureau initiated the formal phase of consultation in May 2008 and then cooperated with NOAA's Fisheries Service throughout the development of the Biological Opinion and alternative actions in coordination with the U.S. Fish and Wildlife Service and the California Departments of Water Resources and Fish and Game.

The Department of Water Resources stated that the salmon Biological Opinion could reduce Delta exports, for 2009 between 300,000 and 700,000 acre-feet under normal hydrologic conditions, and stated its support for a multi-species approach, as envisioned in the Bay Delta Conservation Plan, as the best approach to habitat and wildlife conservation as well as a reliable water supply.[49] As indicated above, the National Oceanic and Atmospheric Administration Fisheries calculates that its Biological Opinion that addresses salmon, steelhead, and green sturgeon will reduce by 5 to 7 percent the amount of water state and federal projects will be able to deliver from the Delta to the San Francisco Bay Area, San Joaquin Valley, Central Coast and Southern California.[50] Initial estimates by the Department of Water Resources place impacts during an average year close to 10 percent, on top of current pumping restrictions imposed by Biological Opinions to protect Delta smelt and other species.[51]

The Department of Water Resources is currently in the process of determining the effect of the new salmon Biological Opinion on future State Water Project supplies. Department of Water Resources will also continue to work with the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Fish and Game and others on the Bay Delta Conservation Plan steering committee to develop a collaborative habitat conservation plan under the Endangered Species Act and the California Natural Community Conservation Planning Act, with the goal of creating a long-term strategy for Delta sustainability that complies with state and federal environmental laws.

Monterey Agreement Litigation. In September 2000, the Third District Court of Appeal for the State of California issued its decision in *Planning and Conservation League; Citizens Planning Association of Santa Barbara County and Plumas County Flood Control District vs. California Department of Water Resources and Central Coast Water Authority*. This case was an appeal of (1) a challenge to the selection of the Central Coast Water Authority as Lead Agency with respect to the preparation of environmental documentation for certain amendments to the State Water Contract (the "Monterey Agreement," which reflects the

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49 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A), A-7.

50 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A), A-8.

51 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A), A-8.

settlement of disputes regarding the allocation of State Water Project water), (2) the adequacy of the environmental documentation prepared with respect to the Monterey Agreement, and (3) the transfer by the Department of Water Resources of the Kern County Water Bank from the State to the Kern County Water Agency. The Court of Appeal agreed with the trial court that the Department of Water Resources should have been the Lead Agency with respect to the preparation of environmental documentation for the amendments to the State Water Contract. However, it reversed the trial court's holding that the environmental documentation was adequate. The Court of Appeal held that the environmental documentation was defective in failing to analyze the environmental effects of the Monterey Agreement's elimination of the permanent shortage provisions of the State Water Contract.[52] However, no State Water Project contracts were set aside.

Metropolitan Water District intervened in the case in order to fully participate in the issues before the trial court. The parties entered confidential mediation proceedings in the spring of 2001 and negotiated a settlement agreement in the fall of 2002. All parties to the litigation and all 29 agencies that have long-term contracts for water service from the Department of Water Resources executed the settlement agreement, which allows continued operation of the State Water Project under the Monterey Agreement principles while a new environmental impact report is being prepared. A draft EIR was issued for public review in October 2007. The public comment period has concluded and the final EIR remains in preparation as of early winter 2009.[53]

3.1.3.3 Additional Water Supplies: Local Resources, Surface Water Storage, Groundwater Storage, and Transfers

In 1996, the Metropolitan Water District published its first Integrated Water Resources Plan, a 20-year resource plan intended to balance locally developed and imported water supplies. In 2004, the Metropolitan Water District published the 2004 Integrated Water Resources Plan Update, which extends the original 20-year resource plan from 2020 to 2025 and reports on the effectiveness of the 1996 Integrated Resources Plan in providing reliability, diversity, and flexibility for the region.[54] The Metropolitan Water District's 2004 Integrated Water Resources Plan Update noted that future water supply reliability for its member agencies depends not only upon actions by the Metropolitan Water District's to secure reliable imported supplies, but also further development of local projects by local agencies such as LADWP.

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52 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A).

53 Metropolitan Water District of Southern California. *Revenue Bond Official Statement (*Appendix A).

54 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Update,* (2004), 1.

In its 2007 Integrated Water Resources Plan Implementation Report, the Metropolitan Water District reports its progress toward implementing the targets contained in the 2004 Integrated Water Resources Plan Update and provides a detailed update for each of its water resource development categories, including restating dry-year targets and examining current considerations, changed conditions, implementation strategies and identified programs, implementation challenges and cost information. Seven water supply development categories are identified in the report, including (1) conservation, (2) local resources, (3) Colorado River Aqueduct, (4) State Water Project supplies, (5) Central Valley storage and transfer programs, (6) in-region groundwater conjunctive use storage, and (7) in-region surface water storage. The report concluded that "while changes occur in all resource areas, the Metropolitan is able to maintain supply reliability through its diversified water resources portfolio."[55] A brief summary of each of the water resource development categories is provided below (excepting the Colorado River and State Water Project supplies, previously discussed):

- *Conservation*: In 2006, the Metropolitan Water District invested $10.6 million in conservation programs and initiatives, including executing a 10-year residential master conservation funding agreement with member agencies, encouraging the use of high-efficiency toilets, strengthening outdoor conservation programs and introducing new Industrial Process Improvement programs. In 2005–2006, the Metropolitan Water District programs conserved approximately 762,000 acre-feet, which was an increase of approximately 30,000 acre-feet over the previous fiscal year. The Metropolitan Water District 2010 target for conservation savings is 865,000 acre-feet.[56]

- *Local Resources—Recycling, Groundwater Recovery and Seawater Desalination*: the Metropolitan Water District has invested $213 million with its member agencies to develop local resource programs. The Metropolitan Water District contributed approximately $24.5 million toward the production of 127,000 acre-feet of local resource production supplies in 2006, which is an increase of 16,000 acre-feet from 2005. The Metropolitan Water District's 2010 target for regional water recycling and groundwater recovery is 410,000 acre-feet. Further, three desalination project agreements have been signed.[57]

- *Central Valley Storage and Transfer Programs*: The Metropolitan Water District has developed significant water storage and transfer program partnerships in the Central Valley and has witnessed increased cooperation with the Department of Water Resources and federal agencies to facilitate water transfers. The Metropolitan Water District continues to pursue transfers with Central Valley parties and has worked to improve existing storage programs with existing SWP storage partners.[58] For 2008, the Metropolitan Water District is currently seeking to acquire up to 250,000 acre-feet by temporary transfer from the Central Valley.

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55 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report,* Executive Summary.

56 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, 5-6.

57 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report,* 7-8.

58 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, 19.

- *In-Region Groundwater Storage*: The 2007 Integrated Water Resources Plan Implementation Report identified that components of the Metropolitan Water District's in-region groundwater storage program may not meet its 2010 dry-yield target of 275,000 acre-feet. As of October 2006, groundwater storage had been developed to provide about 135,000 acre-feet.[59] In response, the Metropolitan Water District conducted a groundwater basin assessment to explore other groundwater storage opportunities. The Metropolitan Water District's recent Groundwater Basin Assessment Study provided new information to focus on meeting this goal.[60] The Metropolitan Water District will continue to develop new strategies for groundwater storage.[61]

The Metropolitan Water District's 2007 Integrated Water Resources Plan Implementation Report states that the agency has continued to react aggressively to address challenges facing water resources. By amending existing strategies, the Metropolitan Water District has made significant progress in most resource areas toward meeting the Integrated Water Resources Plan targets. For example, in fiscal year 2006–2007, the Metropolitan Water District saved approximately 812,000 acre-feet through conservation efforts and is expected to meet its 2010 target.[62] The Metropolitan Water District's Board has taken a number of actions to strengthen conservation efforts, including:

- Program refinements, including more options, streamlined administrative processes, upgraded and new incentives, and more standardization across programs to increase program participation;

- Expanded incentives, including new incentives that have been added to facilitate the installation of water conserving devices, as well as grants and like funding from other agencies to help expand incentive programs;

- New programs, including the Public Sector Water Efficiency Partnership Demonstration Program (the Metropolitan Water District 's Board authorized $15 million for the Program) that allows the Metropolitan Water District to work with member agencies to save water through public agencies within the Metropolitan Water District's service area that have high potential to achieve accelerated conservation or water recycling use.[63]

As of the 2007 Integrated Water Resources Plan Implementation Report, local resource production is expected to exceed the 2010 target of 426,000 acre-feet based on current production and expansion of existing programs.[64] Existing supplies in Central Valley storage programs are also expected to exceed the 2010 target of 300,000 acre-feet.[65] In-region groundwater storage programs are currently falling short of

59 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, 20.

60 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report,* I-6.

61 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, 22.

62 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, I-5.

63 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report.*

64 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*.

65 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, I-6.

the Metropolitan Water District's Integrated Water Resources Plan 2010 target. Moreover, while State Water Project dry-year resources met financial year 2006-2007 target level estimates (446,000 acre-feet), the Integrated Water Resources Plan's 2010 target of 463,000 acre-feet (or longer-term targets) are not projected to be met. The Metropolitan Water District is actively working to find new ways to meet this goal through other programs, such as Central Valley storage, and has already exceeded its 2010 goal for dry-year surface water storage.[66]

The Metropolitan Water District is currently planning to comprehensively update the 2004 Integrated Resources Plan in 2009; it will address existing and new challenges such as the delta smelt litigation and climate change.[67]

3.1.3.4 Metropolitan Water District Actions in Response to Environmental Concerns and Litigation

The Metropolitan Water District has instituted a number of programs that seek to avoid or mitigate risks facing the Colorado River or State Water Project, including development of a Water Supply Allocation Plan and a comprehensive series of Delta programs. It has also taken specific actions to ensure overall supply reliability, including development of a Regional Urban Water Management Plan, a Water Surplus and Drought Management Plan, regular updates of its Integrated Water Resources Plan, and a Five-Year Supply Plan.

These programs and actions are described in detail below.

Intentionally Created Surplus Program

The Intentionally Created Surplus Program allows Metropolitan Water District to store additional surplus water in Lake Mead under the federal guidelines for operation of the Colorado River system reservoirs. The intentionally created surplus water will be delivered to Metropolitan Water District in accordance with the terms of a December 13, 2007 Delivery Agreement between the United States and Metropolitan. Other parties include the Imperial Irrigation District, the Coachella Valley Water District, and San Diego County Water Agency.[68]

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66 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, I-7.

67 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Implementation Report*, I-3.

68 Metropolitan Water District of Southern California. *Revenue Bond Official Statement* (Appendix A), A-18.

Water Supply Allocation Plan

As a result of the concerns regarding availability of State Water Project supplies due to legal issues and dry conditions, the Metropolitan Water District began a process in July 2007 to develop an approved plan and formula for allocating supplies to its member agencies. As a result of that process, the Metropolitan Water District staff developed a proposed Water Supply Allocation Plan, which was approved by its Board of Directors in February 2008 and is updated (audited) in June of each year. The Water Supply Allocation Plan defines each member's preferential rights to purchased water supplies from the Metropolitan Water District and provides a methodology for determining the reduction of imported water supplies to each member agency and establishes a penalty rate structure should an agency exceed its allocation. Ultimately, the Water Supply Allocation Plan will form the basis for an urban water shortage contingency analysis and will be incorporated into the Metropolitan Water District's Regional Urban Water Management Plan. As indicated in the April 2009 Water Supply Allocation Plan, as of June 30, 2009, LADWP has a preferential right to purchase 20.97 percent of the Metropolitan Water District's total water supply. LADWP will continue to rely on Metropolitan Water District to meet its current and future supplemental water needs.

Based upon Department of Water Resources' State Water Project allocation projections at its April 14, 2009 meeting, the Metropolitan Water District Board of Directors declared a Water Supply Allocation Plan Level 2 Regional Shortage from July 1, 2009 through June 30, 2010, requiring a minimum 10 percent reduction in demand for purchased water from its member agencies. As a result of this declaration, the Metropolitan Water District adopted a Level 2 Water Supply Alert, resulting in a regional call for cities, counties, member agencies, and retail water agencies to implement extraordinary conservation by adopting and enforcing drought ordinances and other measures to reduce the use of storage reserves.[69] Based on Metropolitan Water District's Water Supply Allocation Plan, imported water supplies available to LADWP will be reduced during the allocation period.

San Francisco Bay/Sacramento-San Joaquin River Delta Programs: The CALFED Bay-Delta Program, Delta Vision Process, and Bay-Delta Conservation Plan

The CALFED Bay-Delta Ecosystem Restoration Program is a collaborative effort of 25 state and federal agencies convened to improve California's water supplies and the environmental health of the San Francisco Bay/Sacramento-San Joaquin River Delta and its watershed. CALFED is charged with improving water quality, enhancing water supply reliability, assuring long-term protection for levees, and restoring the Delta ecosystem. In 2000, CALFED drafted a 30-year plan for management and

69 Metropolitan Water District of Southern California, "Water Reserve Levels,"http://www.mwdh2o.com/mwdh2o/pages/yourwater/wateralert/levels.html. 2009.

restoration of the Delta. The plan was set forth in a programmatic Record of Decision and adopted in 2004; the California Bay-Delta Authority was created to oversee its implementation.

In 2006, Governor Schwarzenegger initiated the Delta Vision process through Executive Order S-17-06, which created a cabinet-level Delta Vision Committee, the Delta Vision Blue Ribbon Task Force, Delta Science Advisors, and a Stakeholder Coordination Group.

The Task Force was charged with developing a vision for restoring ecological damage done to the San Francisco Bay/Sacramento-San Joaquin River Delta by development and pollution (the Delta Vision), as well as a plan for maintaining the Delta's health while ensuring a reliable water supply for the population dependent on water from the Delta (the Delta Vision Strategic Plan).

In October 2008, the Task Force published the Delta Vision Strategic Plan, which sets forth the following seven goals:[70]

- Legally acknowledge the co-equal goals of restoring the delta ecosystem and creating a more reliable water supply system
- Recognize and enhance the unique cultural, recreation and agricultural goals of the delta
- Restore the delta ecosystem in the context of the surrounding estuary
- Promote statewide conservation, efficiency, and sustainable use
- Build facilities to improve the existing water conveyance system and expand statewide storage
- Reduce flood risks in the delta through emergency preparedness, appropriate land uses, and levee investment
- Establish a new governance structure to achieve these goals

The Delta Vision Strategic Plan also listed the following 10 recommendations for near-term actions to implement the plan:[71]

- Obtain needed information on water diversion and use
- Initiate collection of improved socio-economic, ecosystem, and physical structure data about the Delta to inform policy processes and project level decision making by all public agencies, local, state, and federal

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70 State of California Resources Agency Agency, *Blue Ribbon Task Force: Delta Vision Strategic Plan,* Executive Summary, http://www.deltavision.ca.gov/StrategicPlanningDocumentsandComments.shtml. 2008.

71 State of California Resources Agency, *Delta Vision Strategic Plan*, Appendix B: Action Recommendations by Agency.

- Accelerate completion of in-stream flow analyses for the Delta watershed by the Department of Fish and Game
- Conduct a Middle River Corridor Two Barrier pilot project
- Complete construction of an alternative intake for the Contra Costa Water District
- Evaluate the effectiveness of a Three Mile Slough Barrier project.
- Construct a demonstration fish protection screen at Clifton Court Forebay
- Advance near-term ecosystem restoration opportunities
- Stockpile rock and other emergency response materials
- Assess and improve state capacity to respond to catastrophic events in the Delta

Following completion of the Delta Vision Strategic Plan, the Delta Vision Committee was asked to review the Task Force report and make its own implementation recommendations to the Governor and Legislature. The Delta Vision Committee submitted a report to the Governor in December 2008 that identified eight "fundamental actions" it deemed priorities for the foundation of a sustainable delta:[72]

- A new system of dual water conveyance through and around the Delta to protect municipal, agricultural, environmental, and the other beneficial uses of water;
- An investment commitment and strategy to restore and sustain a vibrant and diverse Delta ecosystem including the protection and enhancement of agricultural lands that are compatible with Plan goals;
- Additional storage to allow greater system operational flexibility that will benefit water supplies for both humans and the environment and adapt to a changing climate;
- An investment plan to protect and enhance unique and important characteristics of the Delta region;
- A comprehensive Delta emergency preparedness strategy and a fully integrated Delta emergency response plan;
- A plan to significantly improve and provide incentives for water conservation – through both wise use and reuse – in both urban and agricultural sectors throughout the state;
- Strong incentives for local and regional efforts to make better use of new sources of water such as brackish water cleanup and seawater desalination; and

72 State of California Resources Agency, *Delta Vision Committee Implementation Report,* http://deltavision.ca.gov /DV_Committee/Jan2009/08-231_Delta_Vision_Committee_Implementation_Report.pdf. 2008.

- An improved governance system that has reliable funding, clear authority to determine priorities and strong performance measures to ensure accountability to the new governing doctrine of the Delta: operation for the coequal goals. Completion of this fundamental action is absolutely essential to the sustained operation and maintenance of all of these recommendations.

Finally, development of the Bay-Delta Conservation Plan was undertaken in 2006 by a Steering Committee to promote the recovery of endangered, threatened, and sensitive species and their habitats in the Delta, while simultaneously protecting and restoring water supplies. A long-term conservation strategy intended to be implemented over a 50-year period, the Bay-Delta Conservation Plan is a Habitat Conservation Plan under state law and a Natural Communities Conservation Plan under federal law. When completed, the BDCP will serve as the basis for issuance of endangered species permits for the operation of state and federal water projects.

Regional Urban Water Management Plan

In accordance with the Urban Water Management Planning Act, in 2005 the Metropolitan Water District prepared a Regional Urban Water Management Plan that addresses water supplies through 2030.[73] The Regional Urban Water Management Plan addresses Metropolitan Water District's service area and historical water use in the service area; future demand estimates; water supply reliability, including water shortage contingency and catastrophic supply interruption planning; water supply sources, including the Colorado River Aqueduct, State Water Project, and additional sources; conservation; alternative water sources, including recycling, groundwater recovery, and desalination; water storage and groundwater management; and water quality. Programs and policies contained in the 1999 Water Surplus and Demand Management Plan, 2004 Integrated Water Resources Plan Update, and 2006 Integrated Water Resources Plan Implementation Plan (both discussed above) are reflected in the Regional Urban Water Management Plan.

Water Surplus and Drought Management Plan

The Metropolitan Water District adopted the water shortage contingency analysis required under the Urban Water Management Plan Act as a separate, detailed plan called the Water Surplus and Drought Management Plan in 1999. The Water Surplus and Drought Management Plan contains policy guidance to manage the Metropolitan Water District's supplies and achieve the goals laid out in its 1996 Integrated Resources Plan. It also identifies actions expected to be necessary during water surpluses and shortages

73 Metropolitan Water District of Southern California, *The Regional Urban Water Management Plan* (2005).

to minimize the probability of severe shortages and to avoid extreme shortages and shortages in allocations. Withdraws from storage to meet demands are considered to constitute a shortage stage.[74]

The Metropolitan Water District's storage supplies and existing management practices are intended to allow it to manage water shortages without having to reduce retail water deliveries to municipal and industrial buyers except in the event of severe or extreme shortages.[75] In the event of a shortage, the Metropolitan Water District has a range of options to assure water availability to its member agencies, including the withdrawal of water stored in in-region reservoirs; withdrawals from out-of-region storage, in the Semitropic and Arvin-Edison groundwater banks; reduction or suspension of long-term seasonal and groundwater replenishment deliveries; withdrawals from groundwater; drawing on State Water Project terminal reservoir storage; imposing additional conservation and measures on its member agencies; reducing discounted agricultural water deliveries; initiating water transfers through existing contracts or the spot market; and reducing allocations to its member agencies.[76]

In response to the current dry conditions, the Metropolitan Water District has already implemented some of these options, including withdrawing water stored in its Central Valley reservoirs, reducing groundwater initiated replenishment cuts, undertaking public outreach concerning conservation, and reducing discounted agricultural water supplies.[77]

Integrated Water Resources Plan

As previously stated, in 1996 the Metropolitan Water District published its first Integrated Water Resources Plan, a 20-year resource plan intended to balance locally developed and imported water supplies. In 2004, the Metropolitan Water District published the 2004 Integrated Water Resources Plan Update, which extends the original 20-year resource plan from 2020 to 2025 and reviews the targets set in the 1996 Integrated Resources Plan for water supply reliability, diversity, and flexibility for the region.[78] The main objectives of the 2004 Update are to review the resource development targets and implement the 1996 Integrated Water Resources Plan achievements; identify significant changed conditions for water resource development since the 1996 Integrated Water Resources Plan; and evaluate the reliability of the Integrated Water Resources Plan Preferred Resource Mix through 2020, adjusting targets as needed to reflect changed conditions, and extending resource targets through 2025.

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74 Metropolitan Water District of Southern California, *Water Surplus and Drought Management Plan*, II-16.

75 Metropolitan Water District of Southern California, *Water Surplus and Drought Management Plan*, 23.

76 Metropolitan Water District of Southern California, *Water Surplus and Drought Management Plan*, 23.

77 Metropolitan Water District of Southern California, *Water Surplus and Drought Management Plan*, 4.

78 Metropolitan Water District of Southern California, *Integrated Water Resources Plan Update*, 1.

The 2004 Plan Update recommended a supply buffer of up to 10 percent of regional demand. The buffer serves as a contingency plan to help ensure regional reliability and to reduce implementation risk. Therefore, the Metropolitan Water District will develop 500,000 acre-feet of supplies in addition to the resource targets by 2025. Development of the buffer will be equally split between local and imported sources.

The 2004 Plan Update discusses the Metropolitan Water District's historical and projected deliveries of Colorado River and State Water Project water. The conclusion of the 2004 Plan Update and supplemental information published by the Metropolitan Water District, such as its annual Implementation Reports, is that with its current water supply portfolio and planned actions, the Metropolitan Water District will have sufficient water to deliver to LADWP to meet all of the water demands in the LADWP service area, for the next 20 years. The Metropolitan Water District is currently revising its Integrated Water Resources Plan, currently scheduled for release in November 2009.[79]

Five-Year Supply Plan

In April 2008, the Metropolitan Water District began development with its 26 member agencies of a Five-Year Supply Plan to identify specific water resource and conservation actions intended to manage water deliveries in light of the expected continued dry conditions and court restrictions on traditional water supplies. The Five-Year Supply Plan focuses on the following six areas:

Water Conservation. Increase public outreach to heighten awareness of the need to conserve water; increase funding and support for water conservation ordinance and rate structure; accelerate installation of water-efficient fixtures; and extend existing programs that provide conservation assistance to public agencies.

Colorado River Transactions. Purchase additional water supplies from the Palo Verde Irrigation District Land Management Program and the Coachella Valley Water District. Investigate participation with the Bureau of Reclamation for the pilot operation of the Yuma Desalter; potential advance delivery of water stored in the Arizona Groundwater Account; water transfers with Arizona; and a transfer from California Native American tribes.

Near-Term Delta Actions. Implement actions that protect fish species and reduce supply impacts, including habitat and hatchery projects and physical and operational actions that reduce conflicts between environmental needs and water supply conveyance.

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79 Metropolitan Water District of Southern California. *Revenue Bond Official Statement* (Appendix A), A-3.

State Water Project Transactions. Purchase up to 300,000 acre-feet of water from the Drought Water Bank, established in 2009 by the Department of Water Resources to facilitate water transfers between sellers upstream of the Bay-Delta to buyers of State Water Project and Central Valley Project water.

Groundwater Recovery. Implement groundwater treatment and recovery from basins throughout the Metropolitan Water District's service area, yielding up to approximately 300,000 acre-feet. An additional 5,000-20,000 acre-feet could be supplied from wells in San Bernardino Valley Municipal Water District's service area; 70,000-100,000 acre-feet over five years from the Hayfield Groundwater Basin adjacent to the Colorado River Aqueduct; and more than 300,000 acre-feet of recovered groundwater from agricultural drainage in the San Joaquin Valley, if the Metropolitan Water District funds treatment facilities.[80]

Local Resources. Expand or accelerate plans for water reclamation and seawater desalination through funding physical infrastructure, feasibility studies, design, and environmental review, purchasing partial ownership of a future project; purchasing delivery rights for a new water supply; and funding hookups to existing recycled water lines. These projects are estimated to have the potential to yield more than 160,000 acre-feet by 2013.

3.2 Water Demand

LMU's Westchester campus is approximately 142 acres in size and is currently developed with university uses, including approximately 1,651,000 gross square feet of academic and administrative facilities (e.g., classrooms, seminar rooms, laboratories, offices, and libraries); approximately 942,000 gross square feet of residential and residential support facilities for students, faculty, and LMU's Jesuit community; and approximately 185,000 gross square feet of athletic facilities. The campus also contains approximately 40.2 acres of open space, including 15.2 acres of outdoor athletic facilities and 25 acres of landscaped open space.

LMU's enrollment cap, as approved by the City in 2000 with a conditional use permit associated with the acquisition of the Hughes campus, is 7,800 FTE students.[81] As of Fall 2008, LMU's actual enrollment was

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80 Metropolitan Water District of Southern California. *Revenue Bond Official Statement* (Appendix A), A-20 & A-25.

81 FTE is a unit of measurement used to calculate enrollment for academic and master planning purposes, as opposed to student headcount. One undergraduate FTE student is defined as one undergraduate student taking 12 course units, which represents a full course load. Students taking fewer course units are considered to constitute a fraction of an FTE student, whereas students taking more than 12 units constitute more than one FTE student. One graduate FTE student is defined as one graduate student taking 9 course units, which represents a full course load. Graduate students taking fewer course units are considered to constitute a fraction of an FTE student, whereas students taking more than 9 units constitute more than one FTE student.

6,868 FTE students (or 7,555 headcount students) and it employed approximately 1,484 FTE faculty and staff on campus, some of whom also live on campus.[82]

A number of water conservation features are currently integrated into the existing campus, including a reclaimed water system for irrigation, drought-tolerant landscaping, the "trayless dining" program, and several LEED-certified buildings.[83] As shown in **Table IV.L.1-4**, below, LMU currently consumes approximately 562.5 acre-feet of water per year.

Table IV.L.1-4
Existing LMU Campus Water Demand

Land Use	Quantity	Water Demand (gallons per day)	Water Demand (gallons per year)	Annual Demand (acre-feet per year)
University or College	7,555 stu	18.00	135,986.40	152.32
Residential Dorm: College	2,208 stu	75.00	165,600.00	185.50
Apartment 1 bedroom	55 du	134.00	7,370.00	8.26
Apartment 2 bedrooms	263 du	293.00	77,095.00	86.32
Structure Parking	503,450 sf	0.00	0.00	0.00
School: Pavilion	4,120 seat	4.00	16,480.00	18.46
Building Subtotal			*402,495*	*450.85*
Cooling Towers – University Hall	1,599 ton	11.46	18,325.00	20.53
Cooling Towers – Central Plant	1,250 ton	11.46	14,325.00	16.05
Landscape irrigated by potable water	942,290 sf		66,995.13	75.04
Landscape and Cooling Towers Subtotal			*99,644.67*	*111.62*
Total Existing Use			**502,140.07**	**562.50**

Source: City of Los Angeles, Department of Water and Power, Water Supply Assessment for the Loyola Marymount University Master Plan Project. September 2009.
stu = students; du = dwelling units; sf = square feet

82 One full-time staff member works 40 hours per week. Two part-time staff members working 20 hours per week equals one full-time-equivalent staff person. A similar calculation is made for FTE faculty, except that due to reduced hours on Campus associated with a part-time faculty member, three part-time faculty members equals one FTE faculty member.

83 LEED-Certified buildings located on campus include: William H. Hannon Library, Del Rey North and South, and Leavey 5 and 6. (Loyola Marymount University Website. *Green LMU: Green Building.* http://www.lmu.edu /sites/Community_home/Green_LMU/The_Campus/Built_Environment/Green_Building.htm. 2009.)

3.3 Water Infrastructure

The water infrastructure on LMU's campus is supplied by three existing LADWP water mains. These include a 12-inch water main in LMU Drive, the primary entrance to the campus, a 12-inch water main in McConnell Avenue, and an 8-inch water main in W. 80th Street. LMU's water system combines domestic and fire water on the main campus "loop" beneath Loyola Boulevard and Ignatian Circle, and elsewhere on campus.

As discussed in **Section IV.J.2, Fire Protection and Emergency Medical Services,** fire flow tests were undertaken in 2009 by KPFF Consulting Engineers[84] of the four hydrants near the center of campus, farthest from the points of connection with LADWP water mains, to determine whether the flow from these hydrants met Los Angeles Fire Code requirements of 4,000 gallons per minute at 20 pounds per square inch, with a minimum residual pressure of 20 pounds per square inch, flowing simultaneously from four adjacent hydrants.[85] The analysis demonstrated that when the four hydrants farthest from a water source on campus flow simultaneously, each flowing at 1,000 gallons per minute to meet the minimum fire flow requirement for a combined fire flow of 4,000 gallons per minute, the residual pressure ranged from 46.8 to 49.7 pounds per square inch with no domestic water demand and from 36.6 to 39.6 pounds per square inch with simultaneous average domestic water demand. Accordingly, fire flow and residual pressure at the four hydrants farthest from the points of connection with the campus water supply considerably exceeds the minimum 20 pounds per square inch of pressure required and meets the code requirement.

The flow tests also demonstrated that when these four hydrants flow simultaneously, at the minimum residual pressure of 20 pounds per square inch, the hydrants produce a combined total of 6,980 gallons per minute with zero domestic water demand and a combined total of 5,520 gallons per minute with simultaneous average domestic water demand (see **Section IV.J.2, Fire Protection and Emergency Medical Services**, for further discussion of fire flow.)

4.0 IMPACT ANALYSIS

4.1 Methodology

This analysis is based on the WSA prepared for the LMU Master Plan Project by LADWP and included in **Appendix IV.L.1** of this Draft EIR. Sources of information used to describe existing and future water

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84 KPFF Consulting Engineers, *LMU Water System Analysis, Fire Flow Calculations*, (2009). (Provided in **Appendix IV.J.2**.)

85 City of Los Angeles, Municipal Code Sec. 57.09.06, A.2.

supply include the LADWP web site, the LADWP *2005 Urban Water Management Plan*, the LADWP *2005 City of Los Angeles Water Quality Report*, the City of Los Angeles General Plan, and the Metropolitan Water District Integrated Resources Plan (IRP) Update, published in 2004. Potential impacts were analyzed through consultation with LADWP.

4.2 Significance Thresholds

The *Los Angeles CEQA Thresholds Guide* indicates that the determination of significance shall be made on a case-by-case basis, considering the following factors:

- The total estimated water demand for the project;
- Whether sufficient capacity exists in the water infrastructure that would serve the project, taking into account the anticipated conditions at project buildout;
- The amount by which the project would cause the projected growth in population, housing, or employment for the Community Plan area to be exceeded in the year of the project completion; and
- The degree to which scheduled water infrastructure improvements or project design features would reduce or offset service impacts.

Appendix G of the State *CEQA Guidelines* provides sample questions for use in an initial study to determine a project's potential for environmental impacts. According to the applicable sample questions[86] included in Appendix G under Section XVI, Utilities and Service Systems, a project would have a potentially significant impact if it would:

XVI.b) Require or result in the construction of new water facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or

XVI.d) Not have sufficient water supplies available to serve the project from existing entitlements and resources, and new or expanded entitlements are needed.

The factors used in the *Los Angeles CEQA Thresholds Guide* to determine significant water supply impacts are inclusive of those provided in Appendix G of the State *CEQA Guidelines*. Therefore, based on the City's factors, the Proposed Project would have a significant impact on water supply if:

WATER-1 The total estimated water demand for the Project at buildout would exceed available supplies or distribution infrastructure capabilities (i.e., water infrastructure); or

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86 The remainder of the Appendix G Utilities and Service Systems sample questions (XVI.a, -c, and -e through -g) pertain to wastewater and solid waste and are addressed in **Sections IV.L.2**, **Wastewater**, and **IV.L.3**, **Solid Waste**, respectively.

WATER-2 The Project would exceed the projected employment, housing, or population growth projections of the applicable Community Plan as assumed in the planning for future water infrastructure needs.

4.3 Project Design Features

The Proposed Project would include the following water conservation features by Proposed Project buildout:

4.3.1 University and Dorm Features

- Bathroom faucets – 1.5 gallons per minute (private), 0.5 gallon per minute (public)
- Self-closing faucets in public restrooms
- Kitchen faucets – 1.5 gallons per minute
- Pre-rinse kitchen spray head
- Showerheads: no more than 1 showerhead per stall
  - Low-flow showerheads – 2.0 gallons per minute
- High efficiency clothes washers – water savings factor of 5.0 or less (residential); water savings factor of 7.5 or less (residential)
- High efficiency toilets – 1.28 gallons per flush or less, or dual flush
- High efficiency/ultra low flow urinals – 0.125 to 0.5 gallon per flush
- Energy Star dishwashers
- Domestic water heating system located in close proximity to point(s) of use
- Tankless and on-demand water heaters
- Cooling tower conductivity controllers or cooling tower pH conductivity controllers
  - Cooling towers to operate at minimum of 5.5 cycles of concentration
- Water-saving pool filter

4.3.2 Irrigation/Landscaping Features

- Rotating sprinkler nozzles – 0.5 gallon per minute
- Micro-spray nozzles

- Drip/subsurface irrigation (micro-irrigation)and bubbler irrigation
- Weather based irrigation controller
- Hydro-zoning plantings (grouping similar water needs plants together)
- Zoned irrigation
- Drought-tolerant plants: 75 percent of new landscape plantings
- Artificial turf (cost permitting)
- Landscaping contouring to minimize precipitation runoff
- Infiltration planters (i.e., notched curb to allow runoff to flow into planted areas)
- Stormwater capture and infiltration of on campus sump

4.3.3 Reclaimed Water Features

- Reclaimed water system for irrigation
- On-site hydrogen peroxide reclaimed water treatment
- Convert cooling towers to 100 percent reclaimed water use, as permitted by law

All new construction in the State of California is subject to the Building Energy Efficiency standards set forth in Title 24 of the California Code of Regulations. Buildings constructed on campus under the Proposed Project would comply with the City's Green Building Program Ordinance, adopted in April 2008, which is intended to reduce the use of natural resources, create healthier living environments and minimize the negative effects of development on local, regional, and global ecosystems. Furthermore, the Proposed Project would meet, at a minimum, the U.S. Green Building Council's Leadership in Energy and Environmental Design® (LEED®) Certified level, or equivalent criteria.

In addition to green building design, LMU would incorporate drought-tolerant landscape materials and water conservation features, as noted in Mitigation Measure PDF-WATER-1, into future landscape improvements.

4.4 Project Impacts

The Proposed Project proposes the development of approximately 508,000 net new gross square feet (gsf) of academic, administrative, and student support facilities, approximately 476,000 net new gsf of student residential facilities, and approximately 28,000 gsf of net new indoor athletic facilities, including a new 3,420-square-foot (529,875 gallons) diving pool. As part of the Upper Campus Central Plant, the proposed

project would construct a 1,400-ton thermal energy storage system, eliminating the need for an additional or expanded central plant in the future. Additionally, the Proposed Project would add approximately 4.8 acres of net new outdoor athletic facilities (approximately 2.78 acres of which would be irrigated) and approximately 5 acres of irrigated landscaped open space.

WATER-1 Would the total estimated water demand for the Project at buildout would exceed available supplies or distribution infrastructure capabilities (i.e., water infrastructure)?

WATER-2 Would the Project exceed the projected employment, housing, or population growth projections of the applicable Community Plan as assumed in the planning for future water infrastructure needs?

4.4.1 Construction

Throughout each phase of Proposed Project construction, water would be used during grading and earthmoving activities to reduce fugitive dust and aid in earth compaction. Construction contractors may supply specialized equipment and water supplies (i.e., water trucks) for this purpose. Although grading activities are expected to take place during each Proposed Project phase, this constitutes a temporary and short-term water demand, and therefore construction-related water use is expected to result in less than significant impacts on water supplies and distribution.

4.4.2 Operation

4.4.2.1 Water Demand

Implementation of the Proposed Project would result in a net increase of 54 acre-feet per year over existing conditions, as shown in **Table IV.L.1-5, Proposed Project Water Demand**. Implementation of the water conservation measures to which LMU has committed and are listed above as Project Design Features would reduce water demand by 45,826 gallons per day or 51.3 acre-feet per year. The use of recycled water for irrigation and cooling towers would reduce the Proposed Project's water consumption by an additional 230,433 gallons per day or 258.1 acre-feet per year. In total, the water conservation measures would reduce the Proposed Project's potable water demand by 37 percent, or 309.4 acre-feet per year.[87] The net consumption of approximately 54 acre-feet per year after conservation measures and use of recycled water represents a relatively small fraction (approximately 0.065 percent) of the projected water demand of 776,000 acre-feet per year that LADWP plans to meet by 2030 under normal weather conditions, as shown in **Table IV.L.1-1**, above.[88] Accordingly, despite the campus' size, the Proposed

87 City of Los Angeles, Department of Water and Power, Water Supply Assessment for the Loyola Marymount University Master Plan Project. 2009.

88 City of Los Angeles Department of Water and Power, 2005 UWMP, Exhibit 6C.

Project would use the second least net amount of water of all City projects for which an LADWP Water Supply Assessment has been prepared since 2005, through the incorporation of extensive water conservation measures and the use of recycled water.[89]

LADWP has stated that the Proposed Project's net increase of 54 acre-feet per year is within the 2005 Urban Water Management Plan's projected water supplies under normal, single-dry, and multiple-dry years through 2030 and is within their 25-year growth projection.[90] As discussed above, the State, Metropolitan Water District, and the City of Los Angeles have extensive plans underway to address water supply and delivery issues. Given the above, the Los Angeles Department of Water and Power has sufficient water supply to meet the demands of the Proposed Project.

Table IV.L.1-5
Proposed Project Water Demand

Land Use	Quantity	Water Demand Factor (gallons per day/unit)	Water Demand (gallons per day)	Annual Demand (acre-feet per year)
Proposed Project & Remaining Uses				
Residential Dorm: College	1,070 stu	75	80,250	89.90
Apartment 1 bedroom	32 du	134	4,288	4.80
Apartment 2 bedrooms	793 du	293	232,349	260.28
Residential Total[1]			*316,887*	*354.98*
University	8,580 stu	18	154,440	173
School: Pavilion	6,000 seats	4	24,000	27
Diving Pool	3,420 sf	.4	1,372.39	1
Cooling Towers – Central Plant	1,250 ton	11.46	5,288,625.00	16.05
Cooling Towers –Additional Central Plant	750 ton	8.27	2,263,912.50	6.95
Cooling Towers – University Hall	1,599 ton	11.46	6,688,457.10	20.53
Cooling Tower Total			*38,852.04*	*43.52*
Structure Parking	716,600 sf	0	0	0

89 City of Los Angeles, Department of Water and Power, Water Supply Assessment for the Loyola Marymount University Master Plan Project. 2009.

90 City of Los Angeles, Department of Water and Power, Water Supply Assessment for the Loyola Marymount University Master Plan Project, 5.

Land Use	Quantity	Water Demand Factor (gallons per day/unit)	Water Demand (gallons per day)	Annual Demand (acre-feet per year)
Building Subtotal			***535,551.43***	***599.94***
Landscape Total	2,694,622 sf acres		191,581.24	214.61
Total Water Demand			***727,133***	***814.5***
Less Existing Building Subtotal			-402,495	-450.9
Less Additional Conservation			-45,826	-51.3
Less Recycled Water Use (Existing Landscaping)			-66,995.13	-75.0
Less Recycled Water Use (Existing Cooling Towers)			-32,649.54	-36.6
Less Recycled Water Use (New Landscaping)			-124,586	-139.6
Less Recycled Water Use (New Cooling Tower)			-6,203	-6.9
Less Total Recycled Water Use			-230,433	-258.1
Net Increase			**48,378**	**54.2**

Source: City of Los Angeles, Department of Water and Power, Water Supply Assessment for the Loyola Marymount University Master Plan Project. September 2009.
Note: Some subtotal figures may not add up precisely to total figures, due to rounding.
stu = students; du = dwelling units; sf = square feet

4.4.2.2 Water Infrastructure and Facilities

As discussed above, the Proposed Project would house an additional 989 FTE students on-campus and increase the number of FTE faculty and staff from 1,484 as of Fall 2008 to approximately 1,800 at Proposed Project buildout. Based on the 2000 U.S. Census, the Westchester-Playa del Rey Community Plan projected a 2007 total population of approximately 54,534 residents in the Community Plan Area and approximately 23,475 dwelling units.[91,92] The Proposed Project-related increase in the campus residential population would therefore constitute approximately 2 percent of the estimated 2007 Community Plan Area resident population. This estimate is likely somewhat conservative, since it is reasonable to assume

91 City of Los Angeles. *Local Statistical Profile: Westchester Community Plan Area, (*April 2009). http://cityplanning.lacity.org/DRU/Locl/LocPfl.cfm?geo=cp&loc=Wch.

92 As stated in the Local Statistical Profile for the Westchester Community Plan Area, the 2007 "Total Population" is the sum of the "Resident Population", or household residents (51,810), and the "Population in Group Quarters", or persons living in dormitories, military barracks, prisons, and health care institutions" (2,724).

that at least some of the students that would occupy on-campus housing would otherwise live in the Westchester-Playa del Rey Community Plan Area.

By the Year 2025, the Community Plan Area is expected to have an estimated total population of 87,779 residents and a total housing supply of 39,333 dwelling units, with 5,000 of the additional dwelling units expected to be group quarters.[93] The Proposed Project-related population increase on campus would constitute approximately 1.6 percent of the estimated 2025 total population, and the proposed increase in campus housing is already accounted for in the Community Plan's estimated increase in group quarters specifically, and dwelling units generally, in the Community Plan Area. LMU does not propose to increase the enrollment cap beyond the previously approved 7,800 FTE student enrollment cap or to house more than 75 percent of the undergraduate FTE students on campus under the Proposed Project. The LADWP Urban Water Management Plan accounts for a citywide growth of 0.4 percent annually until 2025, which will increase the overall City's population by approximately 368,000 new residents between 2004 and 2025.[94] As the Proposed Project's population and employment growth is accounted for within the Westchester-Playa del Rey Community Plan and the Urban Water Management Plan, the Proposed Project would not exceed the employment, housing, or population growth projections contained in the Community Plan, nor would it exceed assumptions about future water infrastructure or facility needs contained in the Urban Water Management Plan.

Additionally, LMU would be responsible for connections to the existing municipal water lines in McConnell Avenue, 80th Street and LMU Drive. As discussed above, water pressure at the four hydrants farthest from a water supply source produced a combined total of 5,520 gallons per minute with the residual water pressure ranging from 36.6 to 39.6 pounds per square inch, with simultaneous average domestic water demand. This exceeds the minimum Los Angeles Municipal Code requirement of 4,000 gallons per minute and 20 pounds per square inch of residual pressure. Therefore, adequate water flow and water pressure exists in the water supply infrastructure serving the LMU campus to accommodate the anticipated increase in demand associated with the Proposed Project, given the water conservation measures to be implemented, without the need for upgrades to the existing off-site water system. (See **Appendix IV.J.2**, for more information on the fire flow study.) As such, the existing water infrastructure would meet the peak water demand following Proposed Project buildout, and impacts would be less than significant.

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93 City of Los Angeles. *Westchester-Playa del Rey Community Plan, (*2004 and subsequent amendments), pp. III-2 and III-3.

94 City of Los Angeles Department of Water and Power, 2005 UWMP, 1-2 & 1-3.

4.4.3 Consistency with Regulatory Framework

4.4.3.1 California Urban Water Management Act

Los Angeles Department of Water and Power has prepared the Urban Water Management Plan in accordance with the California Urban Water Management Plan Act. Los Angeles Department of Water and Power updates its Urban Water Management Plan every five years with the next update planned for 2010. As discussed above, the Proposed Project's water demand is accounted for within the 2005 Urban Water Management Plan.

4.4.3.2 Senate Bill 221 and Senate Bill 610

As required by SB 610 and SB 221, the Proposed Project constitutes a "project" under Section 10912 of the Water Code and a Water Supply Assessment was prepared by the Los Angeles Department of Water and Power on September 1, 2009, and is contained in **Appendix IV.L.1**. The Water Supply Assessment concluded that sufficient water supplies are available to meet the increase water demand of the Proposed Project.

4.4.3.3 California Code of Regulations

The Proposed Project's design features and each building's LEED certification (or equivalent) would ensure that facilities constructed under the Proposed Project exceed the water efficiency requirements of Title 20 of the California Code of Regulations. As such, the Proposed Project would be consistent with Title 20 of the California Code of Regulations.

4.4.3.4 City of Los Angeles Ordinances

LMU has agreed to water conservation measures more stringent than the requirements of City Ordinances. As such, the Proposed Project would be consistent with the City's Ordnances.

4.4.3.5 Los Angeles Department of Water and Power 2005 Urban Water Management Plan

As discussed above, the Proposed Project is within the 2005 Urban Water Management Plan's projected water supplies under normal, single-dry, and multiple-dry years through 2030 and is within their 25-year growth projection.[95]

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95 Los Angeles Department of Water and Power, *Water Supply Assessment for the Loyola Marymount University Master Plan Project*, (2009), 5.

4.4.3.6 LADWP's Water Supply Action Plan

The Los Angeles Department of Water and Power (LADWP), a member agency of the Metropolitan Water District, has implemented policies for water conservation as part of the City of Los Angeles "Green LA" program. Together with the Mayor's Office, LADWP developed a Water Supply Action Plan entitled *Securing L.A.'s Water Future*, which calls for a comprehensive approach to meeting increased demand for water, combining short-term steps to conserve water with long-term investment in water-efficient technology, increase water recycling, and develop improvements in the groundwater supply.[96] As discussed above, the Proposed Project would include numerous water conservation measures that would comply with LADWP's Water Supply Action Plan. The Proposed Project is therefore consistent with this plan.

4.5 Project Design Features and Mitigation Measures

PDF-WATER-1: The Proposed Project would include the following water conservation features by Proposed Project buildout:

- Bathroom faucets – 1.5 gallons per minute (private), 0.5 gallon per minute (public)
- Self-closing faucets in public restrooms
- Kitchen faucets – 1.5 gallons per minute
- Pre-rinse kitchen spray head
- Showerheads: no more than 1 showerhead per stall
- Low-flow showerheads – 2.0 gallons per minute
- High efficiency clothes washers – water savings factor of 5.0 or less (residential); water savings factor of 7.5 or less (residential)
- High efficiency toilets – 1.28 gallons per flush or less, or dual flush
- High efficiency/ultra low flow urinals – 0.125 to 0.5 gallon per flush
- Energy Star dishwashers
- Domestic water heating system located in close proximity to point(s) of use
- Tankless and on-demand water heaters

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96 City of Los Angeles, Office of the Mayor, and Los Angeles Department of Water and Power, *Securing L.A.'s Water Supply: City of Los Angeles Water Supply Action Plan,* http://www.ladwp.com/ladwp/cms/ladwp010588.jsp. 2008.

- Cooling tower conductivity controllers or cooling tower pH conductivity controllers
  - (Cooling towers to operate at minimum of 5.5 cycles of concentration)
- Water-saving pool filter
- Rotating sprinkler nozzles – 0.5 gallon per minute
- Micro-spray nozzles
- Drip/subsurface irrigation (micro-irrigation)and bubbler irrigation
- Weather based irrigation controller
- Hydro-zoning plantings (grouping similar water needs plants together)
- Zoned irrigation
- Drought-tolerant plants: 75 percent of new landscape plantings
- Artificial turf (cost permitting)
- Landscaping contouring to minimize precipitation runoff
- Infiltration planters (i.e., notched curb to allow runoff to flow into planted areas)
- Stormwater capture and infiltration of on campus sump
- Reclaimed water system for irrigation
- On-site hydrogen peroxide reclaimed water treatment
- Convert cooling towers to 100 percent reclaimed water use, as permitted by law
- New buildings shall meet, at a minimum, the U.S. Green Building Council's Leadership in Energy and Environmental Design® (LEED®) Certified level, or an equivalent criteria.

The proposed Project would result in less than significant impacts on water supply and infrastructure, and, therefore, no mitigation is required.

4.6 Level of Impact After Mitigation

No significant impacts on water supply or infrastructure would result from implementation of the Proposed Project, and no mitigation is required. Therefore, no adverse impacts related to water supply or infrastructure would occur.

4.7 Cumulative Impacts

4.7.1 Water Demand

Development of the Proposed Project, combined with the related projects identified in **Section III, General Description of Environmental Setting**, would cumulatively increase water demand in the City of Los Angeles. Using Southern California Association of Governments' growth forecasts for the City of Los Angeles, LADWP has projected that there will be an adequate supply of water to accommodate anticipated growth through 2030.[97] Given that the Urban Water Management Plan projects water supplies to serve existing and projected needs and that approved related projects would be within Southern California Association of Governments' growth forecasts for the City of Los Angeles, it is anticipated that the LADWP will be able to supply the demands of the Proposed Project and related projects through the foreseeable future, and no significant cumulative impacts related to water demand are anticipated. LADWP maintains historical water use data separated into major billing categories: single-family residential, multi-family residential, industrial, and commercial/institutional. According to SCAG's 2004 Regional Transportation Plan, a citywide growth of 0.4 percent annually until 2025 is expected, which will increase the overall City's population by approximately 368,000 new residents between 2004 and 2025, and will also result in 1.8 percent annual growth in housing, and an employment growth of 0.7 percent annually.[98]

According to LADWP's Urban Water Management Plan, in 2030, annual water demand is expected to be as follows: single-family residences would consume 262 acre-feet; multi-family residences would consume 250 acre-feet; commercial uses would consume 140 acre-feet; government would consume 46 acre-feet; industrial uses would use 19 acre-feet; and non-revenue uses would consume 58 acre-feet.[99] As the related projects are within these categories and the City would ensure each related project's water demand is accounted for within LADWP's Urban Water Management Plan, the related projects would not result in a cumulative impact. Given the above, and that LADWP has stated that adequate water

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97 City of Los Angeles, Department of Water and Power. *2005 Urban Water Management Plan.*

98 City of Los Angeles Department of Water and Power, 2005 UWMP, 1-2 & 1-3.

99 City of Los Angeles Department of Water and Power, 2005 UWMP, Exhibit 1K.

supplies exist to meet the demands of the Proposed Project, as well as existing and planned future demands, the Proposed Project would not result in significant cumulative impacts on water supply.

4.7.2 Water Infrastructure

Development of the Proposed Project, combined with the related projects identified in **Section III, General Description of Environmental Setting,** would cumulatively increase demand on the existing water infrastructure. However, as with the Proposed Project, the related projects would be subject to discretionary review to ensure that existing water infrastructure is adequate to meet each project's increased demand. If LADWP indicates that new water service and improvements to the existing water system are necessary, each project proponent would be responsible for paying their fair share of the cost of any necessary improvements or new connections to the existing water infrastructure. Additionally, as with water demand, discussed above, the City would ensure each related project's water demand is accounted for within LADWP's Urban Water Management Plan.

Based on the above, each proposed project would be responsible for improvements to water infrastructure if LADWP deems it necessary. Therefore, the Proposed Project would result in a less than significant cumulative impact on water infrastructure.