Appendix H:
Water Supply Assessment

WATER SUPPLY ASSESSMENT

FOR THE

WARM SPRINGS SOUTH FREMONT

COMMUNITY PLAN PROJECT

SEPTEMBER 2013

PREPARED FOR

CITY OF FREMONT,
CALIFORNIA

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

SECTION 1
INTRODUCTION

BACKGROUND

The City of Fremont (City) has requested a Water Supply Assessment (WSA) for the Warm Springs South Fremont Community Plan Project (Project). The project is a mixed use proposal including up to 4,000 high density multi-family housing units, a 750 student school, 45,000 ft^2 of retail space, 5,249,718 ft^2 of mixed Research and Development (R&D), general industrial and office building area. The Project site is approximately 850 acres located in South Fremont and generally centered on the future Warm Springs BART station (see Figure 1). The site includes approximately 160 acres of vacant lands and part of the former NUMMI facility. ACWD's 2010-2015 Urban Water Management Plan (UWMP or 2010 UWMP) includes estimated water demands associated with the assumed development of all vacant lands within the Project area, expanded use of the former NUMMI location, as well as increased "Smart Growth" housing in the vicinity of future and existing transportation hubs such as the new BART stations. The station will open in 2015 and the City forecasts that initial development may be underway by 2015 with subsequent development to occur over the next 20 years.

The Project will require water supplies for the new residential, commercial and industrial uses. The existing water provider in the area is the Alameda County Water District (ACWD). ACWD is a retail water purveyor with a service area that includes the cities of Fremont, Newark and Union City. ACWD provides water primarily to urban customers: approximately 70% of supplies are used by residential customers, with the balance (approximately 30%) utilized by commercial, industrial, and institutional customers. Net distribution system water use was approximately 48,800 acre-feet (AF), or an average of 43.6 million gallons per day (mgd) in fiscal year 2012-13. The District's primary sources of supply come from the California State Water Project (SWP), the San Francisco Regional Water System, and local supplies from the Alameda Creek Watershed and Niles Cone Groundwater Basin (underlying the ACWD service area).

California Water Code (Water Code) Section 10910 requires that a water supply assessment be provided to cities and counties for a project that is subject to the California Environmental Quality Act (CEQA), and which surpasses a threshold for the number of housing units and/or square feet of commercial/industrial buildings. The cities and counties are mandated to identify the public water system that might provide water supply to the project and then to request a water supply assessment. The water supply assessment documents sources of water supply, quantifies water demands, evaluates drought impacts, and provides a comparison of water supply and demand that is the basis for an assessment of water supply sufficiency.

PURPOSE

The purpose of this Water Supply Assessment is to document ACWD's existing and future water supplies for its service area and compare them to the service area's future water demands, including the future water demands of the Project. This comparison, conducted for both normal hydrologic conditions and drought conditions, is the basis for an assessment of water supply sufficiency in accordance with the requirements of California Water Code Section 10910.

METHODOLOGY

ACWD's long-term water supply strategy was developed as part of the District's Integrated Resources Planning Study (IRP) and adopted by the ACWD Board in 1995. This strategy is incorporated into ACWD's UWMP which documents ACWD's existing water supplies as well as the projected future demand for water and changing availability of our supplies. The demand projections were made the year prior to completion of the UWMP, or 2009, and relied on the most current published supply reliability and land use planning data at that time. This WSA will estimate the water demand for the Project and compare it to what was included in the UWMP while using the 2010 UWMP Data for analyzing and reporting water supply reliability and documenting ACWD's sources of supply as required under the Water Code.

SECTION 2
WATER DEMAND

This section provides an overview of historical and current water use in the District as well as a summary of future projected water demands for the Project and ACWD's service area.

WATER USE CATEGORIES

Water use in the ACWD service area is divided into two categories: 1) distribution system use and 2) groundwater system use. The distribution system use includes all water uses supplied by ACWD's treatment and production facilities and conveyed to ACWD customers via the District's distribution system. This use is further subdivided into the categories of single family residential (SFR), multi-family residential (MFR), commercial, industrial, institutional, landscape and other use.

Groundwater system use includes private (non-ACWD) groundwater pumping (primarily for industrial and municipal landscape irrigation uses), ACWD's Aquifer Reclamation Program pumping and saline groundwater outflow to San Francisco Bay. The Aquifer Reclamation Program (ARP) pumping is an ongoing ACWD program to pump brackish groundwater out of the aquifer system and replace it with fresh water recharged at the District's groundwater recharge facilities. Saline groundwater outflow to San Francisco Bay represents the groundwater outflow required to maintain groundwater flow in a bayward direction necessary to prevent seawater intrusion into the local aquifer system and to flush saline groundwater back to San Francisco Bay.

The District's groundwater system use is not anticipated to change significantly in the future. Therefore, the following discussions of water use are focused on the District's distribution system water use.

HISTORICAL AND CURRENT WATER USE

Table 1 provides a summary of the last ten years of water use within the District. As shown in the table, residential water use comprises approximately 70% of District water with the remaining 30% being used by commercial, industrial and institutional customers.

Water consumption patterns in the ACWD service area are a function of many independent factors including development, weather conditions, economic conditions and customer behavior. The District saw dramatic declines in consumption during the 1987-1992 drought due to voluntary conservation and District-sponsored demand management efforts. However, during the drought recovery period since 1992, several significant factors have influenced consumption. From 1993-2001 accelerated growth of both residential and business customers (including the high technology industry) occurred due to a strong economy. During this period, vacancy rates decreased and water consumption rose. From 2001 to 2007 the overall consumption in the District was relatively flat, attributed primarily to less robust local economic conditions, mild weather and on-going water conservation programs. Between 2008 and 2010, ACWD experienced large declines in overall water consumption which leveled out

in 2010 and have remained relatively constant since. The reduced demand has been attributed to a combination of successive dry year conditions, local and statewide conservation campaigns and a continued economic downturn. As a result, ACWD's 2010 UWMP reflects substantially lower forecast demand for water than was reported in previous UWMPs.

WATER DEMANDS - ACWD SERVICE AREA

ACWD's approach to water demand forecasting for the UWMP is to: 1) evaluate existing demands of lands already developed in the service area; 2) estimate future demands of currently undeveloped lands that are designated for development; and 3) combine the existing and future demands to estimate the overall District-wide future demands. This demand forecasting is done for six primary land use categories: single family residential, multi-family residential, commercial, industrial, and institutional. In order to estimate future demands of currently undeveloped lands in each of these categories, ACWD obtains the most recent zoning information for these lands. The land use information is provided by the cities' planning staff and includes general plan land use designations and, when available, more detailed information from specific plans or other planning documents. A District-wide water demand forecast for each land use category is then developed by multiplying the planned land use under each land use category by a District-wide average unit water use specific to that land use category. Additional potential future land use is also accounted for in the demand projections and is based on city-approved plans for redevelopment and/or intensification of specific areas. The demand forecast also considers future demands associated with Association of Bay Area Governments' (ABAG) most recent Smart Growth projections.

Actual unit water use for any specific land use project may vary significantly from the District-wide average. However, determining the actual unit water use for each specific development project in the service area is beyond the scope of ACWD's UWMP demand forecast. Rather than providing demand forecasts for specific land use projects, the UWMP provides an aggregated, District-wide demand forecast for each land use category, as well as the total District-wide demand. This approach is proven sufficiently accurate for long-term, District-wide demand forecasting and is consistent with the California Water Code requirements for urban water management planning. However, if the District has detailed information about the water demands of a specific project during the time it is preparing the UWMP, the District will account for the specific project's water demands in the UWMP in lieu of the District-wide average.

ACWD's 2009 Forecast is substantially revised from the 2004 Forecast in several key areas with a combined effect of reduced long-term demand. Key changes since 2004 are a slower rate of growth in the service area, continued restructuring of the local economy with a net loss of high water use industry (manufacturing), prolonged economic recovery from the recession, increased natural conservation with plumbing code updates, and accelerated conservation effect resulting from recent drought message and public awareness (behavior change).

The projected future demands in the ACWD service area are summarized in Table 2 (for the years 2015, 2020, 2025, 2030 and 2035). The water demand forecast also includes projected savings from water conservation - both "active conservation" sponsored by the District and

"passive conservation" which results from improved plumbing code standards. ACWD is a signatory to the California Urban Water Conservation Council's MOU on Urban Water Conservation and is committed to the implementation of all locally cost-effective water conservation best management practices. A complete description of ACWD's water conservation program, as well as water saving assumptions, is provided in Chapter 7 of the attached UWMP.

As described in the following section, the Project's demands are considered to be consistent with the District's demand forecast, and therefore, are not listed separately in Table 2. Demands listed in this table include the demands from all WSAs completed to date by ACWD except for those of the Ballpark Village Specific Plan, Masonic Homes Flatlands Projects and Solyndra Solar Panel Manufacturing Projects which have all been rescinded.

WATER DEMANDS – WARM SPRINGS SOUTH FREMONT COMMUNITY PLAN PROJECT

Estimation of Project Water Demands

The Warm Springs South Fremont Community Plan Project is a mixed use proposal including up to 4,000 high density multi-family housing units, a 750 student school, 45,000 ft^2 of retail space, 5,249,718 ft^2 of mixed Research and Development (R&D), general industrial and office building area. The Project site is approximately 850 acres located in South Fremont and generally centered on the future Warm Springs BART station (see Figure 1). The site includes approximately 160 acres of vacant lands and part of the former NUMMI facility. ACWD's UWMP includes estimated water demands associated with the assumed development of all vacant lands within the Project area, expanded use of the former NUMMI location, as well as increased "Smart Growth" housing in the vicinity of future and existing transportation hubs such as the new BART stations. The station will open in 2015 and the City forecasts that initial development may be underway by 2015 with subsequent development to occur over the next 20 years.

Information on the Project's proposed land use was provided by the City of Fremont and is listed in Table 5. City of Fremont Staff has indicated that the data represents the upper end of development potential. ACWD estimates the Project will result in approximately 1,400 AF/yr. of new demand which is consistent with demand assumptions included in the current forecast and the 2010 UWMP.

Water Efficiency Measures to be Incorporated in the Project

In order to ensure that the Project incorporates the most up to date water efficiency measures, the Project should be developed with water efficient plumbing fixtures and irrigation systems at both residential and non-residential developments, including but not limited to those listed in ATTACHMENT D: Water Efficiency Measures for New Developments.

IMPACTS OF DROUGHT ON DEMANDS

Dry periods may impact water demands in the ACWD service area in several ways. Because approximately 40% of the District's residential demand is for landscape irrigation, dry periods

may result in an increase in demands due to less local rainfall available to meet the evapotranspiration requirements of lawns and other landscaping. However, demands may also be reduced due to customer efforts to be more water efficient during dry periods. As an example, during the 1987-1992 drought, ACWD customers reduced overall water use by approximately 20%. This response to the drought was due both to voluntary efforts and mandatory restrictions imposed by ACWD. However, because many customers have retained a "water conservation ethic" since the 1987-92 drought, and because of increased efficiencies of plumbing fixtures and the implementation of on-going District-sponsored water conservation programs, the ability to reduce overall water use during future droughts by similar levels may be lessened.

For planning purposes, it is assumed that during drought periods water demands for ACWD's distribution system customers (including those of the Project) do not change from those during normal years. However, the "groundwater system demands" are typically lower in dry years as lower groundwater levels, caused by reduced local recharge and increased reliance on groundwater storage, result in reduced saline groundwater outflows. ACWD will often minimize ARP pumping as well during dry periods. Summaries of projected demands under single dry year and multiple dry year conditions (based on a five year drought under 2031-2035 demand conditions) are provided in Table 3 and Table 4 respectively.

SECTION 3
WATER SUPPLY

ACWD's three primary sources of water supply are: 1) the State Water Project (SWP); 2) San Francisco's Regional Water System; and 3) local supplies. The SWP and San Francisco Regional Water Supplies are imported into the District service area through the South Bay Aqueduct and Hetch-Hetchy Aqueduct, respectively. Local supplies include fresh groundwater from the Niles Cone Groundwater Basin (underlying the District service area), desalinated brackish groundwater from portions of the groundwater basin previously impacted by seawater intrusion, and surface water from the Del Valle Reservoir. The primary source of recharge for the Niles Cone Groundwater Basin is percolation of runoff from the Alameda Creek watershed. To a lesser degree, a portion of ACWD's SWP supplies are also used for local groundwater percolation. Infiltration of rainfall and applied water within the ACWD service area also contribute to local groundwater recharge.

Due to the configuration of ACWD's water production facilities and the interconnection with the District's distribution system, the proposed Project may receive water supplies from all three primary sources of supplies, and would not be dependent on any single source of supply. Therefore, a description of all of ACWD's water supplies is provided below. Table 6 provides a summary description of the contracts and permits for these supplies and Table 7 provides a summary of the historical use of these supplies by ACWD.

WHOLESALE WATER SUPPLIES

As described above, ACWD's wholesale water supplies are: 1) State Water Project supplies purchased from the California Department of Water Resources; and 2) San Francisco Regional Water System supplies purchased from San Francisco. ACWD's contracts for these wholesale supplies are provided in Attachment C and each supply is described in greater detail below.

State Water Project

In 1961, the District signed a contract with the State Department of Water Resources (DWR) for a maximum annual amount of 42,000 acre-feet from the SWP, referred to as ACWD's "maximum Table A allocation". The SWP, managed by the DWR, is the largest state-built, multi-purpose water project in the country. The SWP facilities include 28 dams and reservoirs, 26 pumping and generating plants, and approximately 660 miles of aqueducts. The water stored in the SWP storage facilities originates from rainfall and snowmelt runoff in Northern and Central California watersheds. The SWP's primary storage facility is Lake Oroville in the Feather River Watershed. Releases from Lake Oroville flow down the Feather River to the Sacramento River, which subsequently flows to the Sacramento-San Joaquin Delta. The SWP diverts water from the Delta through the Banks Pumping Plant which lifts water from the Clifton Court Forebay (in the Delta) to the California Aqueduct and Bethany Reservoir. From Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct, which delivers State Water Project supplies to ACWD and other Bay Area water agencies in Alameda and Santa Clara Counties.

Semitropic Banking of ACWD's SWP Supplies: Because of the variability in the SWP supply availability, ACWD's 1995 IRP identified the need to secure 140,000 AF of off-site storage capacity to improve the dry year reliability of this supply source. Based on this IRP recommendation, ACWD has contracted with Semitropic Water Storage District for participation in the Semitropic Groundwater Banking Program in Kern County. In wet years, ACWD delivers its unused (excess) SWP supplies to Semitropic for storage in their groundwater basin. In dry years, ACWD can recover these supplies through: (1) an "in-lieu" exchange whereby ACWD will receive a portion of Semitropic's SWP supplies (and Semitropic will utilize groundwater previously stored by ACWD in its basin); and (2) a "pumpback" program where Semitropic directly pumps stored groundwater into the California Aqueduct and ACWD recovers this supply through SWP exchanges.

The rate at which ACWD can recover stored water in dry years is constrained by contractual limitations and limitations on the capacity of the Semitropic pumpback facilities. Based on the terms of the agreements with Semitropic, the amount of return capacity is based on the amount of storage capacity purchased. Because of these limitations, ACWD secured a total of 150,000 AF of storage capacity at Semitropic (in excess of the IRP's recommendation of 140,000 AF), in order to provide sufficient dry year return capacity to meet ACWD's projected needs in all but the most severe drought conditions.

The Semitropic Groundwater Banking Program does not provide a new source of supply for the District. Rather, it provides a means to store the District's unused SWP supplies in wet years for use during dry years when the delivery of SWP supplies may be significantly curtailed.

San Francisco's Regional Water System

ACWD also receives water from the San Francisco Regional Water System, operated by the San Francisco Public Utilities Commission (SFPUC). This supply is predominantly from the Sierra Nevada, delivered through the Hetch-Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties. The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River.

In 2009, ACWD, along with the other wholesale customers, signed a new Master Sales Agreement with San Francisco, supplemented by an individual Water Sales Contract. The new agreements have a term of 25 years and provide a commitment from San Francisco to provide, collectively, up to 184 mgd to its wholesale customers. ACWD's individual supply assurance is 13.76 mgd.

LOCAL SOURCES

As described above, ACWD's local sources include fresh groundwater from the Niles Cone Groundwater Basin, brackish groundwater desalination, and surface water supplies from the Del Valle Reservoir. Each of these supplies is described in greater detail below.

Niles Cone Groundwater Basin

The principal source of local supply for the District is the local aquifer system known as the Niles Cone Groundwater Basin. The primary source of recharge for the Niles Cone Groundwater Basin is local runoff from the Alameda Creek Watershed, which is captured, diverted and recharged at the District's groundwater recharge facilities. To a lesser extent, infiltration of rainfall and applied water within the ACWD service area also provide a local source of recharge for the groundwater basin. Though not a local supply but mentioned here for completeness, ACWD also uses a portion of its imported State Water Project supplies for groundwater recharge to more effectively manage the groundwater basin.

Chapter 3 of the 2010 UWMP documents the range in availability of supply from Alameda Creek and includes environmental bypass flow requirements from a March 2011 preliminary agreement between ACWD and the National Marine Fisheries Services (NMFS) and the Department of Fish and Wildlife (DFW).

The water quality in the groundwater system is characterized by fresh groundwater in the eastern portion of the groundwater basin transitioning into brackish groundwater in the western portion of the basin. The brackish groundwater is a result of historical seawater intrusion from the adjacent San Francisco Bay. Since the 1960's ACWD has managed the groundwater basin to prevent any additional seawater intrusion and has an on-going program to pump trapped brackish groundwater back to San Francisco Bay through the District's Aquifer Reclamation Program wells.

The Niles Cone Groundwater Basin has capacity to store water from year to year ("local groundwater storage"). However, the usable storage capacity of the groundwater basin is significantly limited by the potential for seawater intrusion if groundwater levels are maintained too low. Although local groundwater storage (i.e. groundwater supplies in excess of recharge) provides a short term source of supply during dry years, it is not a supply that is available every year because the groundwater system will require replenishment from freshwater sources, without which seawater intrusion would occur.

Chapter 4 of the UWMP (attached) provides a comprehensive description of the Niles Cone Groundwater Basin, including groundwater quality, groundwater levels, historical and projected groundwater pumping, and ACWD's groundwater management activities. A copy of ACWD's groundwater management policy is also provided in the UWMP. The Niles Cone Groundwater Basin is also described in DWR Bulletin 118 – Update 2003: *California's Groundwater*, and is not listed as in "overdraft" or "potentially overdraft condition" by the DWR.

Brackish Groundwater Desalination

In 2003 ACWD commissioned the Newark Desalination Facility. This 5-mgd facility utilizes the reverse osmosis process to remove salts and other impurities from the brackish groundwater pumped at ACWD's Aquifer Reclamation Program wells. Treated water from the Newark Desalination Facility is blended with untreated local groundwater and provided as a supply for the distribution system demands. In 2010 ACWD expanded this facility to 10-mgd.

Del Valle Reservoir

The District and Zone 7 Water Agency of the Alameda County Flood Control and Water Conservation District (hereafter referred to as "Zone 7"), have equal rights on Arroyo Del Valle to divert water to storage. When the California Department of Water Resources (DWR) constructed Del Valle Dam in the upper Alameda Creek Watershed, those rights were recognized in an agreement among DWR, the District, and Zone 7. Consequently, DWR typically makes a total of 15,000 AF of storage available annually in Del Valle Reservoir for use by ACWD and Zone 7. ACWD and Zone 7 equally share this storage capacity, thereby providing up to 7,500 AF of storage capacity annually to ACWD.

Recycled Water

The District's long-term supply strategy includes a potential recycled water program, which will provide up to 1,600 AF/yr of non-potable supply (e.g. landscape irrigation and industrial process water). As described in Chapter 6 of the UWMP, the source of recycled water will likely be from a joint project with ACWD and Union Sanitary District (USD). As an interim supply, another potential source is the purchase of recycled water from the South Bay Water Recycling Program. Recycled water distribution pipelines will be separate from the District's existing potable distribution system and, therefore, would not adversely affect existing potable supply operations. The volume of recycled water produced would be the same in drought years as in normal years, thus providing a firm source of supply. Demand for recycled water for irrigation purposes is highest in the summer months. Therefore, in addition to increasing water supply, use of reclaimed water would help meet peak monthly and daily production capacity needs.

In 2010 ACWD and USD completed the ACWD/USD Recycled Water Feasibility Study Update. This study identified two potential recycled water projects with a potential combined supply of up to 2,500 AF/Yr. However, a significant portion of this supply would be to meet demands from future land use projects (including a golf course) which, as of 2013, have not yet been developed and are in various stages of the planning process. In addition, because of economic conditions, the 2007-09 drought, and other factors, the existing and projected water demands in the ACWD service area are significantly lower than previous forecasts. Based on discussions with representatives from the Fremont, Union City and Newark, it is also likely that many of the planned development projects (including potential future recycled water customers) will be significantly delayed until economic conditions are more favorable.

Because of the lower projected water demands over the UWMP planning horizon coupled with uncertainties regarding the timing of future developments, recycled water is not included in the

25-year planning horizon of the water supply-demand comparisons provided in the 2010 UWMP. However, recycled water is still considered a potential future source of supply for ACWD, especially in light of uncertainties with the reliability of ACWD's existing supplies, and a potential rebound of water demands in the service area – both of which could accelerate the need for a recycled water project. As part of the District's review of the Integrated Resources Planning Study, ACWD will continue to evaluate the potential timing for a future recycled water project in the service area.

WATER SUPPLY UNCERTAINTIES

The purpose of this section is to identify factors which may impact current planning assumptions, the significance and magnitude of which are currently unknown. As described below, the potential impacts of global warming are a key uncertainty which may impact all of ACWD supplies. In addition, each of ACWD's supplies face uncertainties which may be unique to the source of supply. A summary of water supply uncertainties facing ACWD's supplies is provided in Table 8 and discussed in greater detail below.

Climate Change

Climate change may result in reduced snowpack, unknown changes to local rainfall patterns, increased temperature-dependent water demands and rising sea-levels. ACWD's local supplies would be most impacted by marked changes in seasonal rainfall patterns and intensity while sea-level rise will directly impact available storage and operation of ACWD's coastal aquifer. ACWD's imported water supplies rely heavily on winter precipitation being held in "storage" as snow pack in the Sierra Nevada Mountains, which gradually release their water to streams and reservoirs in the spring and early summer as the snowpack melts. Climate change is anticipated to diminish the size of the snowpack as well as the timing of the release, potentially reducing the annual yield of the State Water Project and San Francisco Regional System for water supply.

Quantifying the impact of these climate change factors on the individual and combined resources of ACWD is very complex and, as of yet, not possible. Key to resolving and quantify net impacts on supply reliability will be improvements in the analytic tools used to predict changes to global weather patterns. This includes improving or refining:

- Emissions projections to characterize future atmospheric composition
- General Circulation Models (GCMs) to predict future weather
- Downscaling tools used to translate GCMs to local or regional levels[1].

The following provides an overview of efforts to study and, where possible, quantify the potential impacts of climate change on ACWD's supplies.

1 The current average GCM grid is 100 miles, a spatial resolution of 10,000 mi^2 or roughly 13x the size of the Alameda Creek watershed. The Intergovernmental Climate Change Panel qualified the use of existing GCMs to confidently provide "credible quantitative estimates of future climate change, particularly at continental scales and above." ICPP (emphasis added)

Surface Water: As of 2009 DWR's biennial State Water Project Delivery Reliability Report (DRR), which is the source of reliability data used in the 2010 UWMP, incorporates potential changes in hydrology and sea-level using climate change projections recommended by the State of California Climate Action Team. DWR analyzed 12 different climate change scenarios using six different GCMs and two different future emission scenarios and then selected the median impact scenario for inclusion in the 2009 DRR. The median scenario displayed the most nearly median level impacts for the following model outputs: temperature, precipitation, total inflow to major reservoirs, shifts in timing of run-off, and Delta exports. These scenarios were generated for mid-century (2050) and then interpolated to estimate the 2029 levels impacts.

A review of all 12 scenarios provides some insight into the variability and uncertainty of climate change impacts on SWP supplies within a 20-year window, the potential range of impacts to SWP reliability are:

- Estimated changes in annual average SWP south-of-Delta Table A deliveries range from a slight increase of about 1 percent for a wetter scenario to about a 10 percent reduction for one of the drier climate change scenarios.

- Estimated increased winter runoff and lower Table A allocations resulting in slightly higher average annual Article 21 deliveries in the three drier climate change scenarios[2]. However, the increases in Article 21 deliveries do not offset the losses to Table A. The wetter scenario with higher Table A allocations results in fewer Article 21 delivery opportunities and slightly lower annual Article 21 deliveries.

- Estimated SWP carryover storage is reduced in the drier climate change scenario and is somewhat increased in the wetter climate change scenario.

Impacts from climate change will become more significant in the latter half of the 21st century. Therefore, while impacts are included in this analysis, the water supply impacts anticipated from climate change are minimal during the 20-year purview of the UWMP and WSA.

Groundwater: In 2003, and then again in an update prepared in August of 2005, the Pacific Institute for Studies in Development, Environment and Security prepared a literature search report for DWR, which summarized recommendations for coping with and adapting to climate change from key peer-reviewed publications and specifically considered the potential impacts of climate change on groundwater. The Pacific Institute's report is entitled, *Climate Change and California Water Resources: A Survey and Summary of the Literature*, by Michael Diparsky and Peter H. Gleick, Pacific Institute (*Climate Change and Water Resources*).

[2] Article 21deliveries refer to Article 21 of the SWP contracts which allows for contractors to receive additional water deliveries only under specific conditions. These conditions include: 1) Article 21 water is available only when excess water is available in the Delta, and 2) Article 21water is available only when conveyance capacity through the SWP facilities is available. Due to the uncertainties regarding the availability of Article 21 water, ACWD does not include this supply in its water supply planning and Urban Water Management Plan.

Climate Change and Water Resources found that little work has been done on the impacts of climate change for specific groundwater basins, or for general groundwater recharge characteristics or water quality. As the following conclusions from the report illustrate, the potential impacts of climate change on groundwater resources are divided, with some potentially resulting in increased availability of groundwater and others potentially resulting in less.

- Changes in recharge will result from change in effective rainfall as well as a change in the timing of the recharge season. Increased winter rainfall could lead to increased groundwater recharge.

- Higher evaporation or shorter rainfall seasons could mean that soil deficits persist for longer periods of time, shortening recharge seasons.

- Because a significant portion of winter recharge comes from deep percolation of precipitation below the rooting zone, warmer winter temperatures between storms would be expected to increase and dry out the soil between storms. A greater amount of rain in subsequent storms would then be required to wet the root zone and provide water for deep percolation.

- Sea-level rise could affect coastal aquifers through saltwater intrusion.

- Warmer, wetter winters would increase the amount of runoff available for groundwater recharge. However this additional runoff would be occurring at a time when some basins are either being recharged at their maximum capacity or are already full.

- Reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.

Local Supplies

In addition to potential climate change impacts, the availability of ACWD's local supplies may be influenced by a variety of other factors including additional operational and facility modifications to accommodate on-going Alameda Creek fishery restoration efforts beyond those preliminarily agreed to by NMFS/DFW. Upstream land use, flood control and water supply projects in the Alameda Creek Watershed may also impact the supply and quality of water available at ACWD's groundwater recharge facilities. There also may be uncertainties regarding future releases from the major reservoirs in the Alameda Creek Watershed, including Calaveras and San Antonio Reservoirs (SFPUC) and Del Valle Reservoir (DWR), as required for environmental purposes and/or operational agreements. This includes, for example, an arrangement between ACWD and SFPUC that provided water to ACWD for groundwater recharge during a period when the Niles Cone Groundwater Basin was in overdraft condition and threatened by seawater intrusion. Similarly, efforts to develop groundwater supplies by entities in the South East Bay Plain (north of ACWD) may also impact ACWD's groundwater supply availability. ACWD is currently working to address these items. However, it is not clear whether or not these issues will ultimately impact ACWD's local supplies.

San Francisco Regional Supplies

In order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC is undertaking a Water System Improvement Program (WSIP). Completion of the projects in the WSIP is critical to ensuring the reliability of the San Francisco Regional supplies. However, it is currently uncertain if the SFPUC will be successful in fully implementing this program, and if it will be accomplished in a timely manner.

State Water Project Supplies

The reliability of ACWD's State Water Project supplies will continue to remain uncertain due to the on-going concerns regarding the sustainability of the Delta. These concerns include the Delta ecosystem and potential future environmental regulations, levee stability and the potential for catastrophic failure of these levees, urban encroachment within the Delta, and water quality within the Delta due to urban and agricultural discharges.

Projected long term reliability of the SWP has declined from 72% to 60% of Maximum Table A allocation over the past decade (Table 9) with most of the reductions coming from actions to protect endangered species. In December of 2007, Federal District Court Judge Oliver Wanger issued a final court order ("Wanger Decision") which put into place an operational plan requiring the State Water Project and Central Valley Project (CVP) to reduce Delta export pumping operations in order to protect the Delta smelt. This court action was replaced by a biological opinion in December of 2008, which largely upheld the operating restrictions imposed by the Wanger Decision. In June of 2009 a revised biological opinion for salmonids was published which further restricted the State's ability to deliver supplies presently and for the foreseeable future.

Future uncertainty and potential for additional changes in delivery reliability remain. The State Water Resources Control Board (State Water Board) released the "Final Report on the Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem" in August of 2010 as required under SBX7 1 of 2009, which sought to protect the public trust resources of the Delta ecosystem. The purpose for developing the criteria is to inform planning decisions for the Delta Plan and the Bay Delta Conservation Plan (BDCP), a multiagency effort with the goal of providing long-term Federal and State Endangered Species Act compliance for Delta export operations. At this point, the extent to which these criteria will be implemented and what effect they may have on the State's ability to deliver water supplies is unknown. The plan seeks a 50-year permit to cover the Delta pumping of the State Water Project which should reduce future uncertainty in SWP deliveries. The draft BDCP and EIR are currently in public comment. The final environmental review document is scheduled for release in the first quarter of 2014 which will trigger a record of decision and notice of determination by the federal agencies.

Semitropic Banking Program

ACWD faces several uncertainties with regard to recovery of water from the Semitropic Banking Program. These uncertainties include: 1) water quality concerns with regard to groundwater from Semitropic that is pumped back into the California Aqueduct; and 2) the ability to make the upstream exchanges needed to deliver the recovered water to the ACWD service area. With regards to the water quality issues, Semitropic has initiated a pilot water treatment plant which has treated the groundwater to meet the required criteria for pumping this water into the California Aqueduct. Semitropic has indicated that this pilot treatment plant may form the basis for a future permanent treatment facility. With regards to the exchange capacity needed to recover dry year supplies from Semitropic, ACWD has coordinated with Semitropic, DWR, and other Semitropic Banking partners to ensure coordination of the planned use of the Semitropic recovery capacity and the needed exchanges. However, the risk remains that under certain critical dry year conditions ACWD may not be able to recover 100% of the District's contractual recovery capacity from Semitropic. Mitigation measures to minimize the risk associated with the constraints in Semitropic dry year recovery include: 1) re-operation of local and other storage available to ACWD (i.e. Niles Cone Groundwater Basin, Del Valle Reservoir, San Luis Reservoir) in coordination with recovery from Semitropic and/or; 2) explore alternative dry year supply programs.

SB 7 – Water Conservation Requirements under the 2009 Comprehensive Water Package

The Water Conservation Bill of 2009 (SBX7-7), requires a statewide 20% reduction in urban per capita water use by 2020. It requires urban water retail suppliers such as ACWD to determine baseline water use and set reduction targets according to specified requirements to be achieved by 2020. ACWD must also demonstrate progress toward the 2020 goal by meeting an interim goal in 2015. See Chapter 8 of the 2010 UWMP for additional information on ACWD's baseline and targets.

As documented in the 2010 UWMP, ACWD's water demand forecast and population growth estimates indicated that the District will be able to meet 2015 and 2020 goals. However some uncertainty remains, notably:

- Changes to projected demand and population figures
- Department of Water Resources or the State Legislature could modify the Water Code and/or compliance methodology
- Disproportionate growth in Commercial/Industrial demand to residential demand or an increase a large industrial water usage.

WATER SUPPLY IN NORMAL AND DRY YEAR CONDITIONS

The projected availability for each of ACWD's water supplies under normal, critical dry year and multiple dry year conditions are provided in Table 10 through Table 12. As documented in the District's 2010 UWMP, information on the projected availability of ACWD's local supplies is based on the long-term historical hydrologic conditions in the Alameda Creek Watershed. Information on the projected reliability of ACWD's wholesale supplies from the

State Water Project and San Francisco Regional Water System supplies were provided by the DWR and San Francisco Public Utilities Commission, respectively.

Water Supply under Normal Year Conditions

In order to be consistent with the recommendations by the DWR in the use of SWP reliability information, this water supply assessment characterizes long-term average conditions as normal year conditions. As shown in Table 10, under normal year conditions supplies from the SWP and San Francisco Regional Water System comprise approximately 55% of the water available to ACWD, with the balance coming from local supplies. All of the supplies listed in Table 10 are existing supplies available to ACWD, and have been historically utilized by the District. Supplies from local groundwater reserves and the Semitropic Groundwater Banking Program are not included as normal year supplies because these supplies are intended for dry year conditions (or other water shortages) and are not intended to meet normal year demands.

Water Supply under Critical Dry Year Conditions

As shown in Table 11, the availability of ACWD's overall water supplies under a critically dry year may be significantly reduced. Under critically dry conditions, the SWP deliveries would be reduced to approximately 10% of the maximum contractual amounts (referred to as the "Table A" amounts in the SWP contracts). In addition, ACWD's other supplies from the San Francisco Regional Water System and local supplies from the Alameda Creek Watershed may also be substantially reduced during a critically dry year.

In order to mitigate these potentially severe water supply cut-backs, ACWD would rely on groundwater reserves stored in the local Niles Cone Groundwater Basin, and reserves stored at the Semitropic Groundwater Banking Program. As described above, the amount of storage in the local Niles Cone Groundwater Basin is limited due to threats of seawater intrusion when groundwater elevations fall below sea-level. ACWD has therefore invested in additional off-site storage at the Semitropic Groundwater Banking Program. Under two separate agreements with Semitropic, ACWD has contracted for a combined total of 150,000 AF of storage capacity. The District currently has approximately 140,000 AF of water in storage at the Semitropic banking program. However, the maximum rate at which stored water can be returned to ACWD from Semitropic is constrained by ACWD-Semitropic contractual limitations. As shown in Table 11, under the most severe drought conditions, the maximum rate at which water can be returned to ACWD is 13,500 AF/Yr[3].

Water Supply under Multiple Dry Year Conditions

Table 12 provides summaries of the projected supply availabilities under a long-term (five-year) drought for 2031-2035 demand conditions. This multiple year drought sequence is based on the 1987-1991 historical hydrologic conditions, which represents the most severe five-year

3 As a condition to ACWD providing water service to the Patterson Ranch Development Project in Fremont, ACWD's maximum rate of recovery from Semitropic Groundwater Banking Program during critically dry years may increase by 300 AF/YR (from 13,500 to 13,800 AF/YR) or ACWD may require alternate mitigation measures such as acquiring a new water supply or investing in District-wide conservation programming (above and beyond that which is planned by ACWD) as specified in the 2010 Patterson Ranch Recirculated Draft EIR.

drought on record (based on projected availability of ACWD's supplies over the 1922-2003 hydrologic period). The results from this analysis indicate that ACWD's water supplies may be significantly reduced during a multiple year drought. However, the supply reduction would not be as severe as during a single, critically dry year condition. As with the single dry year condition, both local groundwater storage and off-site groundwater storage in Semitropic will play key roles in offsetting shortfalls in the District's other local and imported supplies.

SECTION 4
WATER SUPPLY AND DEMAND ANALYSES

The following provides a comparison of ACWD water supplies and projected future demands, including the demands associated with the proposed Project. The supply/demand comparisons are provided for normal, single year dry, and multiple dry year conditions.

NORMAL YEAR WATER SUPPLY

Table 13 provides a comparison of normal year water supply and demands under future levels of development in five-year increments from 2015 through 2035. As shown in the tables, ACWD's projected supply under normal year conditions is sufficient to meet current and projected future demands, which include demands for this Project.

SINGLE DRY YEAR WATER SUPPLY

Table 14 documents the comparison of water supply and demand under a single critical dry year condition based on 1977 hydrologic conditions. As with the normal year conditions, the single dry year supply/demand comparison is provided in the same five-year increments between 2015 and 2035.

As shown in the table, ACWD anticipates facing a water supply shortage during single critical dry year supply conditions. This shortage is less than previously anticipated in the 2005 UWMP due primarily to the reduction in forecast demands, discussed under Section 2 – Water Demands. District planning has held since the 1995 IRP that shortages anticipated during critical droughts of this magnitude and frequency (1 in 35 years) will be mitigated through a combination of demand management measures (including rationing) and purchases of dry year water through programs such as the Drought Water Bank (initiated during the 1987-92 drought by the DWR).

MULTIPLE DRY YEAR WATER SUPPLY

Table 15 documents projected water supply and demand under an extended dry period (multiple year drought). As documented in the UWMP, ACWD recognizes the hydrology of 1987 to 1991 to be most severe five-year period for the District's imported and local supplies. The multiple year dry period was reviewed for the level of demand anticipated between the years of 2031 and 2035 as that is the highest level of demands anticipated during the next 20 years.

SECTION 5
SUMMARY AND CONCLUSIONS

1. The City of Fremont has proposed the Warm Springs South Fremont Community Plan Project which includes 4,000 high density residential housing, 45,000 sq. ft of retail building area, a 750 student school, and 5,294,718 sq. ft. of mixed R&D, general industrial and office building area.

2. The total projected demand for the Project is approximately 1,400 AF/yr.

3. The Project demand is consistent with planning assumptions and is included in ACWD's forecast and water supply planning established in the 2010 UWMP

4. ACWD has diverse sources of supply that include imported water from the State Water Project and San Francisco Regional Water System, as well as local supplies from the Alameda Creek Watershed and underlying Niles Cone Groundwater Basin. Due to the configuration of ACWD's water production facilities, the proposed Project would not be dependent on any single source of supply.

5. ACWD's imported and local water supplies may be significantly cut back during droughts. In order to improve ACWD's dry year reliability, ACWD has secured 150,000 AF of off-site storage capacity at the Semitropic Groundwater Banking Program in Kern County. ACWD currently has approximately 140,000 AF in storage at the Semitropic Program.

6. Key uncertainties facing ACWD's supplies include the effects of climate change as well as supply restrictions due to endangered species and environmental protection. ACWD's projected long-term average supply reliability from the State has been reduced from 72% to 60% of Maximum Table A Allocation, primarily as a result of Delta export pumping restrictions to protect endangered species.

7. Under normal year conditions, ACWD's water supplies are projected to be sufficient to meet the future demands in the service area, including the Project's demands.

8. ACWD's UWMP identifies that ACWD may face water supply shortages during critically dry years. As described in the UWMP, ACWD would look to secure additional supplies through a DWR drought water bank or similar water purchase/transfer program under these severe drought conditions. ACWD may also implement a drought contingency plan, which would include provisions for ACWD customers to cut back on water use, the magnitude of which would depend on the severity of the shortage. Because the Project's demands are consistent with the UWMP demand forecast, the development of the Project will not result in increased shortages from that which is already factored into ACWD's planning. However, because ACWD anticipates potential future shortages under severe drought conditions, water supplies to the Project may be cut back during these severe dry year conditions. The level of cut back to the Project would be consistent with the rest of ACWD's customers, and would depend on the magnitude of the dry-year shortage facing the entire District.

9. As part of the Project description, the Project shall be developed with water efficient plumbing fixtures and irrigation systems at both residential and non-residential developments, including but not limited to those listed in ATTACHMENT D: Water Efficiency Measures for New Developments.

10. The determination of water supply sufficiency is based on the implementation of the water efficiency measures set forth in paragraph 9 above and these water efficiency measures must be included in the environmental analysis for this Project and in the City's conditions of Project approval.

11. Under Government Code § 66473.7 ACWD will be required to issue a written verification ensuring sufficient water supply if a residential subdivision is part of the Project. ACWD will re-evaluate the assumptions and conclusions of this water supply assessment at that time. If these assumptions have changed significantly ACWD may require additional mitigation measures as a condition of providing a water supply verification and/or as a condition of providing water service.

12. This water supply assessment is based on the proposed land use of the Warm Springs South Fremont Community Plan Project, as provided to ACWD by the City of Fremont (documented in ATTACHMENT A). If, prior to Project approval, the proposed land use within the Project area changes from what is currently incorporated in this water supply assessment, ACWD will evaluate the impacts that these changes may have on ACWD's water supplies. In the event that the land use changes impact the conclusions of this water supply assessment, ACWD may require additional mitigation measures as a condition of providing water service to the Project. If the proposed land use changes occur after Project approval and approval of the final subdivision maps, ACWD will evaluate the potential water supply impacts of these changes, and may require additional mitigation as a condition of providing water service to those areas with the changed land use condition.

13. The determination made in this water supply and demand analysis is based on the circumstances as of the date this water supply assessment was approved. In the event that subsequent evaluation of District-wide demands and supplies in-light of the water supply uncertainties set forth in this water supply assessment indicates that there will be an imbalance between demands and supplies, ACWD may require additional mitigation for the Project. For example, if District supplies are not sufficient to meet the demands, as a condition of water service, ACWD may require the Project proponent to: 1) acquire a new water supply to offset the water supply impacts of the Project, and/or: 2) invest in District-wide conservation programming (above and beyond that which is planned by the District) to offset the increase in District-wide demands that are a result of the Project; and/or 3) provide other mitigations deemed necessary to offset specific impacts identified (such as purchasing storage and recovery capacity in Semitropic Groundwater Banking Program).

    ACWD reserves the right to impose conditions that go beyond the conditions that the City of Fremont may impose as part of the environmental analysis at the time ACWD provides a

verification of sufficient supply for the Project and/or enters into a water service agreement with the developer to provide water service to the Project.

Table 1 ACWD Past and Current Water Use (Acre-Feet)

Water Use Category	Fiscal Year									
	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12
Distribution System										
Single Family Residential	25,300	26,200	23,700	25,000	25,200	24,600	24,100	21,500	21,800	21,700
Multi-Family Residential	8,500	8,500	8,200	8,000	8,100	8,100	7,400	7,600	7,500	7,600
Commercial	5,000	5,200	5,300	5,500	5,300	5,200	5,100	4,700	4,700	3,800
Industrial	4,100	3,900	3,400	3,500	3,400	3,100	2,800	2,500	2,500	2,600
Institutional	2,200	2,300	2,000	2,100	2,100	2,100	2,100	1,800	1,700	1,900
Landscape	5,600	6,300	5,600	5,200	5,700	6,000	5,600	4,800	4,900	6,400
Other	100	100	100	200	100	100	200	100	200	100
Total Consumption	50,800	52,500	48,300	49,500	49,900	49,200	47,300	43,000	43,300	44,100
Unaccounted for Water	3,600	3,900	3,300	3,700	5,100	5,800	3,500	4,100	4,100	4,200
Distribution System Total	54,400	56,400	51,600	53,200	55,000	55,000	50,800	47,100	47,400	48,300
Groundwater System										
Private Groundwater	3,400	3,600	3,800	3,000	3,000	2,200	2,100	1,900	2,000	2,600
Groundwater Reclamation										
-ARP Pumping	7,700	11,100	9,400	11,600	9,900	6,600	4,900	7,000	11,300	12,000
-Saline Outflow	5,800	7,200	6,600	8,400	6,800	7,400	7,400	6,800	6,100	4,700
Groundwater System Total	16,900	21,900	19,800	23,000	19,700	16,200	14,400	15,700	19,400	19,300
Grand Total	71,300	78,300	71,400	76,200	74,700	71,200	65,200	62,800	66,800	67,600

Notes:

1. Annual consumption is based on units billed during the Fiscal Year (July 1 to June 30). ACWD uses bi-monthly billing cycle.
2. All values rounded to the nearest 100.
3. Total Consumption values may not equal sum of individual components due to rounding.
4. Multi-Family Residential, Commercial, Industrial, and Institutional categories do not include dedicated landscape irrigation water use within these categories.
5. Landscape water use includes all dedicated landscape accounts for Multi-Family Residential, Commercial, Industrial and Institutional customers.
6. Distribution System Total represents total water production, as reported in ACWD's Annual Groundwater Survey Reports.
7. System Losses are calculated as the difference between Distribution System Total (total production) and Total Measured Consumption and include water for fire suppression, distribution system flushing, distribution system and service line leaks, etc.
8. Groundwater System demands are based on annual reported values in ACWD's Annual Survey Report on groundwater conditions. FY 09/10 Figures are currently an estimate
9. Groundwater Reclamation demands represents groundwater system demands to protect and reclaim the groundwater system from seawater intrusion.
10. Groundwater System demands do not include "Other Outflows" as reported in ACWD's Annual Survey Report on Groundwater Conditions.

Table 2 Estimated Future Water Demands in the ACWD Service Area – Normal Year (AF/yr)

Water Use Category	Year				
	2015	2020	2025	2030	2035
Distribution System					
Single Family Residential	23,600	24,300	24,600	24,900	25,100
Multi-Family Residential	9,600	9,900	10,200	10,500	11,100
Commercial	6,500	7,100	7,500	7,900	8,100
Industrial	3,700	4,400	5,000	5,800	5,900
Institutional	3,600	4,100	4,600	5,300	5,300
Other	100	100	100	100	100
Sub-Total	47,100	49,900	51,900	54,500	55,600
Adjustment for plumbing code savings	(-800)	(-1,500)	(-2,000)	(-2,400)	(-2,700)
Sub-Total Demand	46,300	48,400	49,900	52,100	52,900
Total Distribution System Demand with unaccounted for waters	50,900	53,000	54,800	57,000	58,000
Adjustments for water conservation savings	(800)	(1,400)	(1,400)	(1,400)	(1,400)
Groundwater System Demand	16,200	16,200	16,200	16,200	16,200
Total ACWD Forecast Demands	66,300	67,800	69,600	71,800	72,800

Notes:

1. All numbers are from ACWD's 2010 UWMP. Forecast includes demand assumptions for the Project.
2. All values rounded to the nearest 100. Total values may not equal sum of individual components due to rounding errors.
3. Numbers do not reflect demand reductions resulting from SB-7.
4. Landscape Irrigation included within Multi-Family Residential, Commercial, Industrial, and Institutional categories.
5. Adjustment for conservation includes savings due to District-sponsored water conservation programs.
6. Total Distribution System Demand includes 8% unaccounted for water or UAW. UAW is calculated as the difference between total production and total measured consumption and is mostly comprised of meter inaccuracy but also includes physical water such as water used for fire suppression, distribution system flushing, distribution system and service line leaks.
7. Groundwater System demands include: (1) private pumping, (2) ARP pumping and (3) saline groundwater outflows.

Table 3 Estimated Future Water Demands in the ACWD Service Area – Critical Dry Year (AF/yr)

Water Use Category	Year				
	2015	2020	2025	2030	2035
Distribution System					
Single Family Residential	23,600	24,300	24,600	24,900	25,100
Multi-Family Residential	9,600	9,900	10,200	10,500	11,100
Commercial	6,500	7,100	7,500	7,900	8,100
Industrial	3,700	4,400	5,000	5,800	5,900
Institutional	3,600	4,100	4,600	5,300	5,300
Other	100	100	100	100	100
Sub-Total	47,100	49,900	51,900	54,500	55,600
Adjustment for plumbing code savings	(-800)	(-1,500)	(-2,000)	(-2,400)	(-2,700)
Sub-Total Distribution System Demand (without losses)	46,300	48,400	49,900	52,100	52,900
Sub-Total Distribution System Demand (with losses)	50,900	53,000	54,800	57,000	58,000
Adjustments for water conservation savings	(800)	(1,400)	(1,400)	(1,400)	(1,400)
Groundwater System Demand	13,100	13,100	13,100	13,100	13,100
Total ACWD Forecast Demands	**63,200**	**64,700**	**66,500**	**68,700**	**69,700**

Notes:

1. All numbers are from ACWD's 2010 UWMP. Forecast includes demand assumptions for the Project.
2. All values rounded to the nearest 100. Total values may not equal sum of individual components due to rounding errors.
3. Numbers do not reflect demand reductions resulting from SB-7.
4. Landscape Irrigation included within Multi-Family Residential, Commercial, Industrial, and Institutional categories.
5. Adjustment for conservation includes savings due to District-sponsored water conservation programs.
6. Total Distribution System Demand (with losses) includes estimated system losses of 8.4%. Distribution system losses are calculated as the difference between total production and total measured consumption and include water for fire suppression, distribution system flushing, distribution system and service line leaks, etc.
7. Groundwater System demands include: (1) private pumping, (2) ARP pumping and (3) saline groundwater outflows.

Table 4 Estimated Future Water Demands in the ACWD Service Area – Multiple Dry Years (AF/Yr)

Water Use Category	Year				
	2031	**2032**	**2033**	**2034**	**2035**
Distribution System					
Single Family Residential	24,940	24,980	25,020	25,060	25,100
Multi-Family Residential	10,620	10,740	10,860	10,980	11,100
Commercial	7,940	7,980	8,020	8,060	8,100
Industrial	5,820	5,840	5,860	5,880	5,900
Institutional	5,300	5,300	5,300	5,300	5,300
Other	100	100	100	100	100
Sub-Total	54,720	54,940	55,160	55,380	55,600
	0	0	0	0	
Adjustment for plumbing code savings	-2,460	-2,520	-2,580	-2,640	-2700
Sub-Total Distribution System Demand (without losses)	52,260	52,420	52,580	52,740	52,900
Sub-Total Distribution System Demand (with losses)	57,200	57,400	57,500	57,700	57,900
Adjustments for water conservation savings	-1,400	-1,400	-1,400	-1,400	-1,400
Groundwater System Demand	13,400	11,500	11,000	10,600	9,500
Total ACWD Forecast Demands	**69,200**	**67,500**	**67,100**	**66,900**	**66,000**

Notes:

1. All numbers are from ACWD's 2010 UWMP. Forecast includes demand assumptions for the Project.
2. All values rounded to the nearest 100. Total values may not equal sum of individual components due to rounding errors.
3. Numbers do not reflect demand reductions resulting from SB-7.
4. Landscape Irrigation included within Multi-Family Residential, Commercial, Industrial, and Institutional categories.
5. Adjustment for conservation includes savings due to District-sponsored water conservation programs.
6. Total Distribution System Demand (with losses) includes estimated system losses of 8.4%. Distribution system losses are calculated as the difference between total production and total measured consumption and include water for fire suppression, distribution system flushing, distribution system and service line leaks, etc.
7. Groundwater System demands include: (1) private pumping, (2) ARP pumping and (3) saline groundwater outflows.

Table 5 Water Demands for Warm Springs South Fremont Community Plan Project

Element	Planning units		GPD/ Unit	Demand estimate (rounded) (AF/yr)
Retail / Commercial	45,000	Building Area	0.282	10
Residential (high density MFR)	4,000	Dwelling units	150	670
"R&D" or "Hi-tech"	1,749,906	Building Area	0.1035	200
General Industrial	1,749,906	Building Area	0.1035	200
Office	1,749,906	Building Area	0.1035	200
School	750	Students	15	10
Estimated Total Project Demand *(rounded)*				1,290
Water Supplies Required *(8.4% Unaccounted for Water)*				1,400
Approximate peak day demand in mgd *(1.6x peaking factor)*				2.0

Notes:

1. Project details provided initially by City of Fremont in WSA request letter were subsequently revised by email communication (Hutar, 2013)
2. Assumes that all non-retail building area split evenly between General Industrial, Office and R&D uses.
3. City stipulates that a 600 room hotel may be included within the non-residential net building area figure; ACWD estimates the demands of a hotel to be consistent with the demands of the other types of development contemplated in the categories presented here.
4. Demand units (gpd/unit) from the 2009 Water Demand Forecast except for "School" category. Demand per student was determined from empirical per student demand data from 17 Fremont Unified School District schools. Enrollment data from California Public School Enrollment - School Report year 2006-2007

Table 6 Overview of Contracts and Permits for ACWD's Existing Water Supplies

SUPPLY COMPONENT	Category	Description	Maximum Quantity (AF/Yr)	Ever Used
Imported Supplies				
- State Water Project	Contract	In 1961, ACWD signed an agreement with the California State Department of Water Resources for a maximum annual amount of 42,000 AF/Yr from the State Water Project (SWP). SWP water is delivered to ACWD via the South Bay Aqueduct. This contract expires in the year 2035.	42,000	Yes
- San Francisco Regional Water System	Contract	In 2009, ACWD along with the other wholesale customers signed a new Master Sales Agreement with San Francisco. The new agreement has a term of 25 years and provides a commitment from San Francisco to provide, collectively, up to 184 mgd to its wholesale customers. ACWD's contractual purchase amount is 13.76 mgd.	15,344	Yes
Local Supplies				
- Alameda Creek Diversions for Groundwater Recharge	Water-rights permit	ACWD applied for a water rights permit from the SWRCB in 1949, granted in 1951 (permit no. 8428) to appropriate up to 40,000 AF/Yr of unappropriated water from the Alameda Creek for groundwater storage and replenishment.	40,000	Yes
- Del Valle Reservoir	Water-rights permit	ACWD received a water rights permit in from the SWRCB in 1958 (permit no. 11320) to appropriate up to 60,000 AF/Yr of unappropriated water from Arroyo Del Valle in the Alameda Creek Watershed for storage and later beneficial use.	60,000	Yes
- Groundwater Storage in Niles Cone Groundwater Basin - Desalination of Brackish Groundwater	Other	ACWD manages and protects the Niles Cone Groundwater Basin for water supply under its Groundwater Management Policy (adopted 1989, amended 2001). This Policy is based on the statutory authority granted to ACWD under the County Water District Law; the Replenishment Assessment Act of ACWD; and local well ordinances.	N/A	Yes
Banking / Transfers				
- Semitropic Groundwater Banking Program	Contract	In 1996 and in 2001 entered into agreements with Semitropic Water Storage District for 150,000 AF of combined groundwater storage capacity for banking of ACWD's excess SWP supplies in wet years. The banked water is to be returned to ACWD in dry years via a series of exchanges. These banking agreements expire in the year 2035.	13,500 (maximum return quantity during critically dry years)	Yes

Table 7 Historical Water Supply Utilization by ACWD (AF/Yr)

Fiscal Year	SWP supplies used at ACWD facilities	Del Valle	San Francisco Regional Water	Newark Desal Facility	Net Local Groundwater Recharge [2]	Recovered from Semitropic GW bank	Total In-District Water Supply	SWP Supply delivered to Semitropic GW bank
92-93	14,900	4,100	13,000	-	40,700	-	72,700	-
93-94	21,600	5,000	12,200	-	28,500	-	67,300	-
94-95	16,100	4,200	13,000	-	35,900	-	69,200	-
95-96	18,600	5,300	12,200	-	27,600	-	63,700	-
96-97	7,700	15,900	14,700	-	25,300	-	63,600	6,200
97-98	12,900	10,600	13,700	-	58,000	-	95,200	10,000
98-99	20,800	5,300	13,600	-	33,200	-	72,900	18,800
99-00	25,200	3,800	13,800	-	26,900	-	69,700	7,200
00-01	26,400	200	13,000	-	31,000	-	70,600	7,300
01-02	21,900	4,600	13,500	-	32,100	-	72,100	100
02-03	17,600	7,400	14,000	-	31,400	-	70,400	20,800
03-04	18,500	6,700	13,700	2,600	30,700	-	72,200	4,000
04-05	18,800	6,000	11,800	3,900	38,700	-	79,200	9,300
05-06	15,600	7,700	11,700	3,900	38,200	-	77,100	41,500
06-07	13,800	11,000	15,300	2,800	26,000	-	68,900	11,900
07-08	22,600	500	15,000	3,600	24,600	5,500	71,800	-
08-09	10,400	4,200	12,600	3,200	24,100	10,600	65,100	-
09-10	18,100	2,500	11,700	1,100	30,800	-	64,200	-
10-11	14,300	5,900	8,800	6,600	33,600	-	69,200	-
11-12	18,320	2,600	9,320	8,900	17,000	-	56,140	5,000

1. All values rounded to the nearest 100. Total values may not equal sum of individual components due to rounding errors.
2. Recharge figures less evaporation and other losses.

Table 8 Summary of Potential Future Factors that may Influence ACWD Water Supply Reliability

SUPPLY	Factor		
	Legal/Environmental	**Water Quality**	**Climatic**
Imported Supplies			
-State Water Project	ESA* requirements may constrain Delta pumping	Potential seawater intrusion impacts if Delta Levees fail.	Supply is dependent on hydrologic conditions
- San Francisco Regional Supply	ESA requirements may require additional reservoir releases	None anticipated	Supply is dependent on hydrologic conditions
Local Supplies			
- Groundwater Recharge	ESA requirements may impact groundwater recharge operations	None anticipated	Supply is dependent on hydrologic conditions
- Groundwater Storage	None anticipated	None anticipated	Supply is dependent on availability of water to store in wet years
- Del Valle	ESA requirements may require downstream flow releases	None anticipated	Supply is dependent on hydrologic conditions
- Desalination	None anticipated	None anticipated	Supply is dependent on local groundwater conditions
- Recycled Water	None anticipated	None anticipated	None anticipated
Banking/Transfers			
- Semitropic Banking	Delta pumping constraints may impact ability to recover water through SWP exchanges	Banked groundwater may require treatment	Supply is dependent on availability of water to store in wet years

* Endangered Species Act

Table 9 State Water Project Delivery Reliability Reports (DRR) Statistics

	2002 Report	2005 Report	2007 Report	2009 Report	2011 Report
Average % of Full Allocation in year of report	72%	69%	63%	60%	60%
Primary cause for reduction	N/A	Changes in modeling assumptions and demands	Wanger Decision + limited Climate Change	Biological Opinions on Salmonids & Smelt + expanded Climate Change	None change

Table 10 Projected Normal Year Supply

SUPPLY/DEMAND	Year				
	2015	2020	2025	2030	2035
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	27,500	27,500	27,500	27,500	27,500
- San Francisco Regional	15,400	15,400	15,400	15,400	15,400
Total Imported Supplies	42,900	42,900	42,900	42,900	42,900
Local Supplies					
- Groundwater Recharge	24,500	24,500	24,500	24,500	24,500
- Groundwater Storage	0	0	0	0	0
- Del Valle	5,800	5,800	5,800	5,800	5,800
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	35,400	35,400	35,400	35,400	35,400
Banking/Transfers					
- Semitropic Banking	0	0	0	0	0
TOTAL SUPPLY	*78,300*	*78,300*	*78,300*	*78,300*	*78,300*

Notes:

1. Normal Year conditions based on projected water supply availability under 1936 hydrologic conditions.

Table 11 Projected Critical Year Supply

SUPPLY/DEMAND	Year				
	2015	2020	2025	2030	2035
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	4,000	4,000	4,000	4,000	4,000
- San Francisco Regional	13,400	13,400	13,400	13,500	13,500
Total Imported Supplies	17,400	17,400	17,400	17,500	17,500
Local Supplies					
- Groundwater Recharge	15,600	15,400	15,100	14,900	14,600
- Groundwater Storage	10,000	10,000	10,000	10,000	10,000
- Del Valle	100	100	100	100	100
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	30,800	30,600	30,300	30,100	29,800
Banking/Transfers					
- Semitropic Banking	13,500	13,500	13,500	13,500	13,500
TOTAL SUPPLY	*61,700*	*61,500*	*61,200*	*61,100*	*60,800*

Notes:

1. Critical Dry Year conditions based on projected water supply availability under 1977 drought conditions.

Table 12 Projected Multiple Dry Year Supply

SUPPLY/DEMAND	Year				
	2031	2032	2033	2034	2035
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	11,000	12,400	24,900	8,200	11,800
- San Francisco Regional	15,100	13,000	11,100	9,900	10,600
Total Imported Supplies	26,100	25,400	36,000	18,100	22,400
Local Supplies					
- Groundwater Recharge	14,800	15,100	13,900	16,100	13,700
- Groundwater Storage	5,700	4,800	0	10,000	2,500
- Del Valle	1,500	800	800	400	4,900
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	27,100	25,800	19,800	31,600	26,200
Banking/Transfers					
- Semitropic Banking	15,900	16,700	11,500	14,000	16,400
TOTAL SUPPLY	*69,100*	*67,900*	*67,300*	*63,700*	*65,000*

Notes:

1. Multiple Dry Year conditions based on projected water supply availability under 1987-91 drought conditions.

Table 13 Water Supply and Demand Comparison: Normal Year

SUPPLY/DEMAND	Year				
	2015	2020	2025	2030	2035
Total Supply	78,300	78,300	78,300	78,300	78,300
Forecast Demands	66,300	67,800	69,600	71,800	72,800
Anticipated Shortage	*none*	*none*	*none*	*none*	*none*

Notes:

1. All values rounded to the nearest 100 AF.
2. Forecast Demands include Project demands.

Table 14 Water Supply and Demand Comparison: Critical Dry Year

SUPPLY/DEMAND	Year				
	2015	2020	2025	2030	2035
Total Supply	61,700	61,500	61,300	61,100	60,800
Forecast Demands	64,200	64,600	65,500	66,700	66,800
Anticipated Shortage	(2,500)	(3,100)	(4,200)	(5,600)	(6,000)

Notes:

1. All values rounded to the nearest 100 AF.
2. Forecast Demands include Project demands.
3. Critical Dry Year conditions are based on projected water supply availability under 1977 drought conditions.

Table 15 Water Supply and Demand Comparison: Multiple Dry Year

SUPPLY/DEMAND	Year				
	2031	2032	2033	2034	2035
Total Supply	69,100	67,900	67,300	63,700	65,000
Forecast Demands	69,300	67,500	67,200	66,900	66,100
Anticipated Shortage	(200)	*none*	*none*	(3,200)	(1,100)

Notes:

1. All values rounded to the nearest 100 AF.
2. Forecast Demands include Project demands.
3. Multiple Dry Year conditions are based on projected water supply availability under 1987-91 drought conditions; supply includes access to stored water in Semitropic

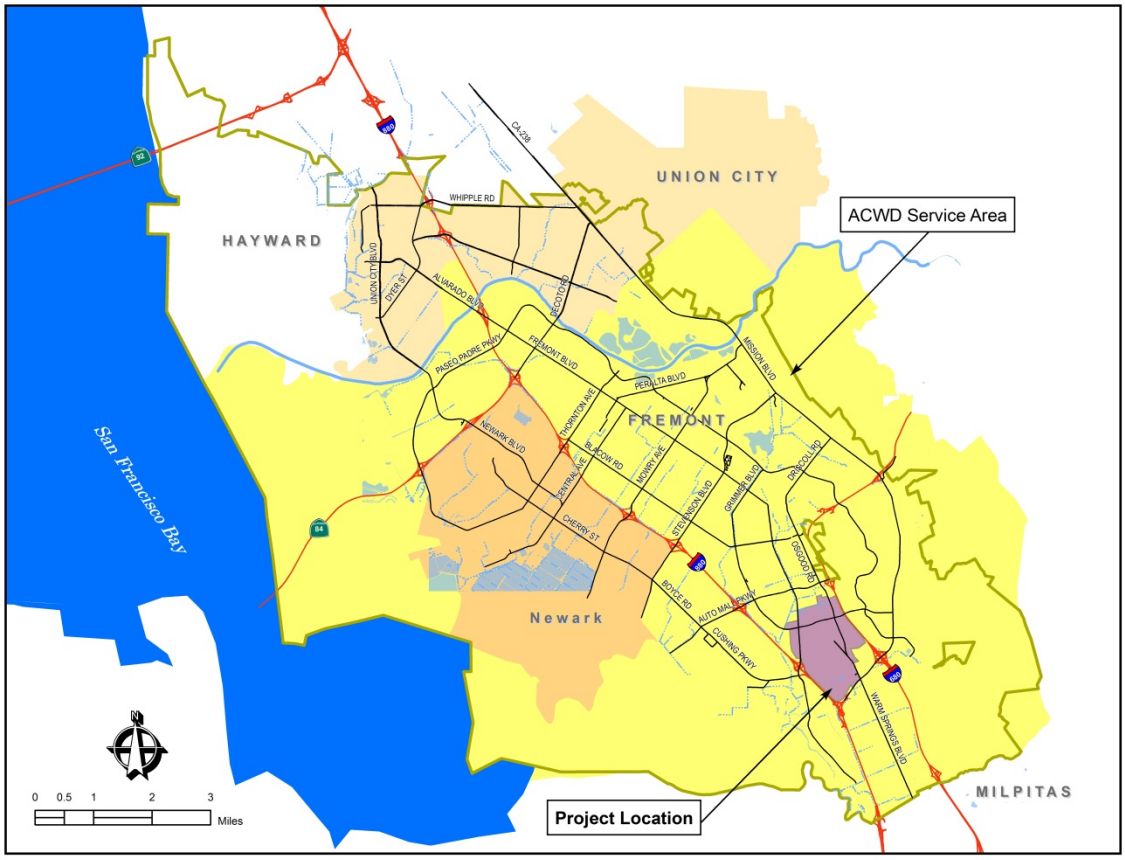

Figure 1 ACWD Service Area and Warm Springs South Fremont Community Plan Project Location Map

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ATTACHMENT A
LETTER OF REQUEST FROM CITY OF FREMONT FOR WATER SUPPLY ASSESSMENT AND EMAIL WITH CHANGE OF ASSUMPTIONS

Community Development Department
39550 Liberty Street | P.O. Box 5006, Fremont, CA 94537-5006
www.fremont.gov

July 12, 2013

Mr. Eric Cartwright
Water Resources Planning Manager
Alameda County Water District
43885 South Grimmer Boulevard
Fremont, CA 94538

RE: Water Supply Assessment - Warm Springs/South Fremont Community Plan

Dear Mr. Cartwright,

The City of Fremont has initiated preparation of the Warm Springs/South Fremont Community Plan. The planning area is approximately 850 acres and is shown on the enclosed vicinity map. The City's General Plan identifies the planning area as a priority development area for new employment and potentially housing uses. The Community Plan process will build upon the previous studies that were completed in 2012, including the Economic Development Administration Land Use Alternatives and Urban Land Institute (ULI) Advisory Services Panel Report. Additional background information can be found at www.fremont.gov/warmsprings.

The new BART Station will open in 2015 and the City forecasts that initial development may be underway by 2015 with subsequent development to occur over the next 20 years. The Community Plan will include consideration of a mixed-use development with up to 4,000 high-density multi-family residential units, commercial/retail, hotel and office/R&D/industrial uses totaling 20,000 jobs or approximately 8,545,000 square feet. Other potential uses in the planning area may include public plazas, neighborhood parks, and siting of an elementary school. These uses may be included in the plan in support of adding residential uses to the planning area. Specific siting of any of the described uses has not been identified.

Per Senate Bill 610, the City of Fremont is formally requesting preparation of a Water Supply Assessment (WSA) by Alameda County Water District to evaluate water resources with respect to the proposed Community Plan. The City will be preparing an Environmental Impact Report (EIR) to evaluate the potential environmental effects of the project and will use the information on water demand and supply provided in the WSA as a resource for completing the EIR analysis. The City's primary consultant for preparation of the Community Plan is Perkins + Will and the consultant preparing the EIR is First Carbon Solutions. A Notice of Preparation was issued on March 22, 2013.

It is our understanding that the WSA will be completed within 90 days after the receipt of this letter. The City looks forward to working with the District through this process and will provide additional information as it becomes available. Please do not hesitate to contact me at (510) 494-4454 or kwheeler@fremont.gov with any questions pertaining to the project description or implementation.

Sincerely,

Kristie R. Wheeler

Kristie R. Wheeler
Planning Manager

Thomas Niesar

From: Nancy Hutar <NHutar@fremont.gov>
Sent: Tuesday, July 30, 2013 10:15 AM
To: Thomas Niesar
Cc: Kristie Wheeler
Subject: City of Fremont - Warm Springs Community Plan - water numbers

Thomas,

Thank you for your draft WSA project assumptions last week. We have internally discussed the building square footage numbers and here are the final numbers for your utilization:

Multi-family housing units – 4,000 units

For industrial and commercial uses – a total of 5,294,718 s.f. (you can round up to 5,300,000)
Of this 5.3 million s.f., retail uses should be 45,000 s.f. only. The other three categories (R&D, general industrial and office) can then split the remaining s.f. three ways.

However, we do also have a 600 room hotel allowed within the 5.3 million s.f. and a 750 student elementary school in addition to the 5.3 million s.f. We don't know how these two uses will impact your numbers.

Please contact me with questions of comments. Thanks.

Nancy Hutar
Project Manager
City of Fremont
Community Development Department
39550 Liberty Street
Fremont, California 94538

510-494-4540
510-494-4402 fax
nhutar@fremont.gov
www.fremont.gov

Mail:
P.O. Box 5006
Fremont, California 94537-5006

ATTACHMENT B – ACWD URBAN WATER MANAGEMENT PLAN 2010-2015

ATTACHMENT C
ACWD WATER SUPPLY CONTRACTS

- **State Water Project Water Supply Contract (partial)**
- **San Francisco Water Supply Contract**

(note: Complete State Water Project Supply Contract is available on DWR website: http://www.swpao.water.ca.gov/wsc/index.cfm)

ATTACHMENT D – WATER EFFICIENCY MEASURES FOR NEW DEVELOPMENTS

WATER EFFICIENCY MEASURES FOR NEW RESIDENTIAL DEVELOPMENT - V.041713			
GPF = gallons per flush, GPM = gallons per minute, WF = water factor			
Indoors	**Water Usage Rates**	**Recommendation Details**	**Federal or State Requirements**
Toilets	**1.28 GPF**	High efficiency toilets (HET) have a flush volume of 1.28 GPF, dual flush models are also considered HETs, with an average flush less than 1.28 GPF. Choose HETs that are third party tested and certified as passing a 350 g or higher flush volume test as established by the Uniform North American Requirements.	Mandatory to comply with CALGreen under the prescriptive method - effective January 1, 2011 Required January 1, 2014
Showerheads	**2.0 GPM**	EPA's Water Sense Program recommends showerheads with a flow rate of 2.0 GPM or less.	Mandatory to comply with CALGreen under the prescriptive method - effective January 1, 2011
Lavatory Faucets	**1.5 GPM**	Lavatory faucets with aerators that restrict flow to 1.5 GPM or less.	
Kitchen Faucets	**1.5 GPM**	Kitchen faucets with aerators that restrict flow to 1.5 GPM or less.	
Clothes Washers	**6 WF**	High efficiency clothes washers (HEW) with a water factor of 6 have a maximum average water use of 6 gallons per cubic foot of laundry. HEWs are typically front loading horizontal axis washers.	National Standard effective January 1, 2018
Dishwashers	**3.5 - 5.0 gallons per cycle**	Efficient dishwashers that use 5.0 gallons/cycle or less (standard-sized - 8 or more place settings), 3.5 gallons/cycle or less (compact size - less than 8 place settings)	National Standard effective May 30, 2013
Outdoors		**Recommendation Details**	**Federal or State Requirements**
Turf Landscaping		Limit turf to areas where it is functional. Avoid planting turf in narrow, odd-shaped areas which are hard to irrigate efficiently.	Many of these measures are now required as part of the CA Model Water Efficient Landscape Ordinance effective January 1, 2010
Non-turf Landscaping		Select native or low water using plant species. High water using plants should be grouped together and irrigated seperately.	
Irrigation System		Irrigation systems should be designed to maximize efficiency and reduce water waste by minimizing overspray and runoff. Use low volume (e.g., drip) irrigation in non-turf areas.	
Irrigation Controller		An automatic, self-adjusting irrigation controller is recommended. Automatic, self-adjusting controllers utilize prevailing weather conditions, current and historic evapotranspiration, soil moisture levels, and other relevant factors to adapt water applications to meet the needs of plants.	
Overhead Sprinklers and Spray Heads		Should not be used in narrow areas, eight (8) feet wide or less, or where adjacent to impervious surfaces where overspray and excess run-off can occur.	
Valves and Circuits		Should be separated into hydrozones based on plant type and plant water needs.	
Decorative fountains		All decorative fountains should recycle water.	
Swimming Pools and Spas		Covers should be used on all pools or spas.	
Bay-Friendly Landscaping Best Practices		Adopt the Bay-Friendly Program's (Stopwaste.org) 7 best practices for landscaping and gardening. 1. Landscape Locally; 2. Landscape for Less to the Landfill; 3. Nurture the Soil; 4. Conserve Water; 5. Conserve Energy; 6. Protect Water & Air Quality; 7. Create Wildlife Habitat	

WATER EFFICIENCY MEASURES FOR NEW COMMERCIAL DEVELOPMENT- V.041713			
GPF = gallons per flush, GPM = gallons per minute, WF = water factor			
Indoors	**Water Usage Rates**	**Recommendation Details**	**Federal or State Requirements**
Toilets	**1.28 GPF**	High efficiency toilets (HET) have a flush volume of 1.28 GPF, dual flush models are also considered HETs, with an average flush less than 1.28 GPF. Choose HETs that are third party tested and certified as passing a 350 g or higher flush volume test as established by the Uniform North American Requirements.	Mandatory to comply with CALGreen under the prescriptive method - effective January 1, 2011 Required January 1, 2014
Urinals	**0.5 GPF**	High efficiency urinals (HEU) have a flush volume of 0.5 GPF or less.	
Showerheads	**2.0 GPM**	EPA's Water Sense Program recommends showerheads with a flow rate of 2.0 GPM or less.	Mandatory to comply with CALGreen under the prescriptive method - effective January 1, 2011
Lavatory Faucets	**.5 GPM**	Lavatory faucets with aerators that restrict flow to .5 GPM or less.	
Kitchen Faucets	**1.5 GPM**	Kitchen faucets with aerators that restrict flow to 1.5 GPM or less.	
Clothes Washers	**6 WF**	High efficiency clothes washers (HEW) with a water factor of 6 have a maximum average water use of 6 gallons per cubic foot of laundry. HEWs are typically front loading horizontal axis washers. This applies to familiy-sized washers commonly used in multi-family settings and laudromats.	Potential requirement in 2-5 years DOE Rulemaking due by January 1, 2015
Cooling Towers		Should be equipped with a recirculating system with a minimum of five (5) cycles of concentration. Newly constructed cooling towers should be operated with conductivity controllers, as well as make up and blowdown meters.	
Food Steamers		Should be boiler less or self-contained where applicable.	
Ice Machine		Should be air-cooled, or use no more than 25 gallons of water per 100 pounds of ice and should be equipped with a recirculating cooling unit.	
Commercial Refrigeration		Should be air-cooled or if it is water cooled it should have a closed loop system.	
Pre-rinse Dishwashing Spray Valve	**1.2 GPM**	Should have a maximum flow rate of 1.2 or less GPM.	
Vehicle Wash Facility		Shall reuse a minimum of 50% of the water.	
Outdoors		**Recommendation Details**	**Federal or State Requirements**
Turf Landscaping		Limit turf to areas where it is functional. Avoid planting turf in narrow, odd-shaped areas which are hard to irrigate efficiently.	Many of these measures are now required as part of the CA Model Water Efficient Landscape Ordinance effective January 1, 2010
Non-turf Landscaping		Select native or low water using plant species. High water using plants should be grouped together and irrigated seperately.	
Irrigation System		Irrigation systems should be designed to maximize efficiency and reduce water waste by minimizing overspray and runoff. Use low volume (e.g., drip) irrigation in non-turf areas.	
Irrigation Controller		An automatic, self-adjusting irrigation controller is recommended. Automatic, self-adjusting controllers utilize prevailing weather conditions, current and historic evapotranspiration, soil moisture levels, and other relevant factors to adapt water applications to meet the needs of plants.	
Overhead Sprinklers and Spray Heads		Should not be used in narrow areas, eight (8) feet wide or less, or where adjacent to impervious surfaces where overspray and excess run-off can occur.	
Valves and Circuits		Should be separated into hydrozones based on plant type and plant water needs.	
Decorative fountains		All decorative fountains should recycle water.	
Swimming Pools and Spas		Covers should be used on all pools or spas.	
Bay-Friendly Landscaping Best Practices		Adopt the Bay-Friendly Program's (Stopwaste.org) 7 best practices for landscaping and gardening. 1. Landscape Locally; 2. Landscape for Less to the Landfill; 3. Nurture the Soil; 4. Conserve Water; 5. Conserve Energy; 6. Protect Water & Air Quality; 7. Create Wildlife Habitat	