CHAPTER 2
Water Demand, Supplies, and Water Rights

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2.1 Introduction

In its application to the California Public Utilities Commission (CPUC) for the Monterey Peninsula Water Supply Project (MPWSP, or proposed project), California American Water (CalAm) proposes either to build a desalination plant with the capacity to produce up to 9.6 million gallons per day (mgd) of desalinated product water, or to build a smaller project that would include the purchase of product water from the proposed Pure Water Monterey Groundwater Replenishment (GWR) project and construction of a 6.4 mgd desalination plant (CalAm, 2016a). This chapter provides background information on CalAm's existing water supply system; describes the water demand[1] and supply information and assumptions included in CalAm's application; provides supplemental information about water supply and demand, and factors affecting them in the area that would be served by the proposed project; and addresses the topic of water rights as it pertains to project feasibility.

CalAm initially filed its application for the MPWSP (Application A.12-04-019) with the CPUC in April 2012 (CalAm, 2012a). The application requests a Certificate of Public Convenience and Necessity[2] and approval to build, own, and operate the MPWSP. In January 2013, CalAm submitted supplemental testimony that updated and superseded the water demand and supply estimates that had been provided in the original April 2012 application; the January 2013 testimony proposed a 9.6 mgd desalination plant that would produce approximately 10,627 acre

[1] Unless otherwise noted, "demand" as used in this chapter refers to *system demand* (sometimes known as production), which is the total amount of potable water produced from supply sources. Demand does not refer to the amount of water delivered and billed to customers, which is typically referred to as consumption or the amount of water consumed. System demand includes "unaccounted-for" or "non-revenue" water, such as water used for flushing water system pipes and fire fighting, and water lost to leaks within the delivery system.

[2] Public Utilities Code Section 1001 et seq. requires that investor-owned utilities seeking to build certain specified infrastructure obtain a Certificate of Public Convenience and Necessity from the CPUC demonstrating that the proposed infrastructure is necessary for the service, accommodation, convenience, or safety of the public.

feet per year (afy) of desalinated product water to meet estimated service area demand of 15,296 afy and provide return water for the Salinas Valley Groundwater Basin (SVGB return water),[3] or a project variant consisting of a 6.4 mgd plant in conjunction with the purchase of GWR water (Svindland, 2013a). In March 2016, CalAm submitted an amended application and updated project description. The 2016 amended application and associated testimony confirmed the project sizing and overall demand assumptions described in the January 2013 supplemental testimony while updating estimates of the quantities of desalinated product water that would be delivered to CalAm's service area and returned to the SVGB. The demand and supply information presented below is based on data provided in CalAm's January 2013 supplemental testimony, as updated or revised by CalAm since then. The information below also includes relevant supply and demand data collected independently from other sources such as the Monterey Peninsula Water Management District (MPWMD).

CalAm is proposing this project to replace part of its existing water supplies, which have been constrained by legal decisions affecting CalAm's diversions from the Carmel River and pumping from the Seaside Groundwater Basin. State Water Resources Control Board (State Water Board) Order 95-10, State Water Board Order 2009-0060 (also referred to as the Cease and Desist Order, or CDO), and the Monterey County Superior Court's adjudication of the Seaside Groundwater Basin in 2006 substantially reduced CalAm's rights to use these two primary sources of supply. Section 2.2 provides background on CalAm's existing water system and historical sources of supply as well as information about the State Water Board and Superior Court decisions. Section 2.3 discusses the components of demand that CalAm proposes to meet with the proposed project in conjunction with CalAm's portfolio of other water supply sources, and Section 2.4 describes the water supply sources that would be used to meet those demands. Section 2.5 describes other factors that could affect future water supplies and demand in the Monterey District. Section 2.6 discusses the topic of water rights as it pertains to project feasibility.

2.2 Background

2.2.1 Existing Water System

The proposed project would develop supplemental water supplies to serve CalAm's Monterey District service area (Monterey District). CalAm's Monterey District encompasses most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest. The Monterey District's main distribution system is located within these areas. The main system primarily relies on water supplies from the Carmel River and groundwater from the Coastal subarea of the Seaside Groundwater Basin. CalAm's Monterey District also includes five small satellite water systems along the Highway 68 corridor east of the City of Monterey: the Ryan Ranch, Bishop, Hidden Hills, Toro, and Ambler systems. Because the Toro and Ambler areas would not be served by the proposed project, these areas are not included in the proposed project's demand and supply assumptions.

[3] Refer to Section 2.5.1 and Section 2.6 for more information on SVGB return water.

2.2.1.1 Existing Water Supply Facilities

Facility Overview

CalAm's existing Monterey District water supply infrastructure includes the following:

- extraction wells in the Carmel Valley Alluvial Aquifer
- groundwater production wells in the Seaside Groundwater Basin
- a surface water reservoir on the Carmel River[4]
- Aquifer Storage and Recovery (ASR) facilities
- various water treatment facilities
- a conveyance and distribution system consisting of over 500 miles of pipelines and water mains ranging in size from 2 to 36 inches in diameter
- a portion of the supply produced by Sand City's 300 afy Coastal Desalination Plant

The majority of the Monterey District water supply comes from 21 extraction wells screened[5] in the upper alluvial deposits of the Carmel River in Carmel Valley known as the Carmel Valley Alluvial Aquifer. CalAm's Carmel River supplies are supplemented, especially during the summer high-demand season, by groundwater production wells in the Seaside Groundwater Basin. Monterey District water supplies are generally treated to remove iron, manganese, and hydrogen sulfide, to control corrosion, and to adjust pH. Sodium hypochlorite is used for primary and secondary disinfection at each treatment facility that provides water to the distribution system.

Distribution and Conveyance

The CalAm Monterey District's distribution and conveyance system is an assemblage of smaller systems that have merged over time, starting with the Carmel Valley and Monterey Peninsula areas and eventually expanding to include the Seaside, Del Rey Oaks, and Sand City areas. The system encompasses several distinct urban areas and water pressure zones and is divided into four distinct districts:

- Upper Carmel Valley
- Lower Carmel Valley and Monterey Peninsula
- Seaside
- Upper Lift Zones

Water produced from wells along the upper and lower reaches of the Carmel River in the Carmel Valley is conveyed in two directions: westward and clockwise around the Monterey Peninsula to the city of Monterey; and northward over the hills via the Segunda Reservoir, Segunda Pipeline,

4 Until recently CalAm operated two reservoirs on the Carmel River, the San Clemente and the Los Padres Reservoirs. Section 2.2.2 provides additional information on these reservoirs.

5 A well screen is a filtering device that serves as the intake portion of wells constructed in unconsolidated or semi-consolidated aquifers. The screen permits water to enter the well from the saturated aquifer, prevents sediment from entering the well, and serves structurally to support the aquifer material.

Segunda Pump Station, and Crest Tank facilities to the city of Seaside. The two flows converge at a low elevation – a hydraulic trough – near the Naval Postgraduate School in the city of Monterey. This hydraulic trough prevents Carmel River water supplies from being conveyed clockwise around the Monterey Peninsula to Seaside, and also prevents water produced in Seaside (i.e., groundwater pumped from the Seaside Groundwater Basin, including water produced from the existing ASR system) from being conveyed counterclockwise around the Monterey Peninsula.

2.2.2 Historical Sources of Supply

2.2.2.1 Carmel River

San Clemente Dam was built on the upper Carmel River in 1921 to form the San Clemente Reservoir. Surface water diverted at San Clemente Dam was the sole water supply for the Monterey Peninsula until the 1940s. Starting in the 1940s and continuing into the early 1990s, multiple production wells were installed in the Carmel Valley Alluvial Aquifer along the lower reach of the Carmel River. In 1949, Los Padres Dam, which forms Los Padres Reservoir, was built about 6 miles upstream of San Clemente Dam to control the inflow of water into San Clemente Reservoir. CalAm has owned and operated both reservoirs since 1966. Over the years, sediment that accumulated behind San Clemente and Los Padres Dams significantly reduced the usable storage in both reservoirs. As a result, by 1995 CalAm relied primarily on the multiple wells in the alluvial aquifer along the lower Carmel River for its Carmel River supplies and more recently CalAm has relied entirely on these wells for its Carmel River supply. The San Clemente Dam was removed in 2015, after two years of construction work to reroute the river and prepare the site for dam removal, and the Carmel River currently flows around the former dam site (California Coastal Conservancy, National Marine Fisheries Service, CalAm, et al., 2016). Summer releases from the Los Padres Reservoir continue to recharge a portion of the Carmel Valley Alluvial Aquifer and maintain fish habitat between the Los Padres Dam and San Clemente Dam site. MPWMD and CalAm are currently studying options for use or removal of the Los Padres Reservoir (MPWMD, 2015a; CalAm et al., 2016a).[6]

2.2.2.2 Seaside Groundwater Basin

In addition to Carmel River supplies, CalAm operates several production wells for its main system in the Coastal subarea of the Seaside Groundwater Basin. The Seaside Groundwater Basin, which encompasses 24 square miles and consists of several subareas, is generally bounded by the Pacific Ocean to the west, the Salinas Valley to the north, the Toro Park area to the east, and Highways 68 and 218 to the south.

East of the main system along the Highway 68 corridor, in the Laguna Seca subarea of the Seaside Groundwater Basin, CalAm operates wells that supply the Ryan Ranch, Bishop, and Hidden Hills satellite systems (WSC, 2012). CalAm also provides Carmel River water to these systems during fires and emergencies via an interconnection between the Crest Tank and Ryan

[6] The CPUC's General Rate Case for 2015-2017 authorized CalAm to co-fund studies with the MPWMD to develop a long term management plan for the Los Padres Dam and Reservoir, and in April 2016 the MPWMD approved a contract for preparation of the first such study, a Los Padres Dam fish passage study (MPWMD, 2016a).

Ranch. In addition, in June 2015 MPWMD approved CalAm's application for an interconnection between the Bishop and Ryan Ranch systems that would allow water to be conveyed from the Bishop system to Ryan Ranch for emergency use only (i.e., when Ryan Ranch supplies were insufficient to meet demand) (MPWMD, 2015b). As a result of the adjudication of the Seaside Groundwater Basin (see Section 2.2.4), these satellite systems will lose all of their allocated Seaside Groundwater Basin supplies by 2018. Therefore, the demand assumptions presented below in Section 2.3 include demand for the Ryan Ranch, Hidden Hills, and Bishop systems.

CalAm's Toro and Ambler satellite systems lie east of the Laguna Seca subarea, on the south side of Highway 68. There are no existing or proposed infrastructure interconnections between the main system and the Toro and Ambler systems, which rely on groundwater supplies from the Corral de Tierra Subbasin of the SVGB.

2.2.2.3 Allocation Program

The MPWMD augments, manages, and regulates surface and groundwater resources in the Carmel Valley and the greater Monterey Peninsula. MPWMD's jurisdiction includes the area served by CalAm's Monterey District (shown in **Figure 3-1** in Chapter 3, Description of the Proposed Project) and CalAm's sources of supply, which MPWMD defines as the Monterey Peninsula Water Resource System (MPWMD, 2015b). The MPWMD was established by state statute in 1978 to provide integrated management of all water resources for the Monterey Peninsula; among its functions is the allocation of water supply within its boundaries. MPWMD's initial, interim allocation, adopted in 1981, set CalAm's production limit (from the Carmel River system and the Coastal subarea of the Seaside Groundwater Basin) at 20,000 acre-feet (af), of which a net of 18,600 af was allocated among the jurisdictions in CalAm's service area. With the adoption of its current allocation program in 1990, MPWMD set CalAm's production limit at 16,744 afy. MPWMD has adjusted CalAm's production limit several times since then, most recently in 1997 when it set the production limit at 17,641 afy. Before the 2006 adjudication of the Seaside Groundwater Basin (described below in Section 2.2.4), the MPWMD assumed CalAm's yield from the Coastal subarea of the Seaside Groundwater Basin to be 4,000 afy (MPWMD, 2006a). In 2008, MPWMD expanded the regulated area it defines as the Monterey Peninsula Water Resource System to include the Laguna Seca subarea of the Seaside Groundwater Basin (through adoption of MPWMD Ordinance 135).

2.2.2.4 Carmel River Flow Agreements

In addition to MPWMD's allocation program and State Water Board Orders 95-10 and 2009-0060 (discussed below in Section 2.2.3), CalAm's use of its Carmel Valley wells is also restricted by agreements with state and federal wildlife agencies.

California Department of Fish and Wildlife Annual Memorandum of Agreement

An annual Memorandum of Agreement (MOA) developed and entered into each year by CalAm, MPWMD, and the California Department of Fish and Wildlife provides an annual guideline to minimize localized drawdown from the use of wells located along certain reaches of the Carmel

River, and limits surface water diversions from April to October. Before the San Clemente Dam was removed, the MOA specified minimum releases to the river from San Clemente Reservoir (CalAm, 2007). In 2015 the parties established minimum flow targets below the Los Padres Dam, which were expected to produce estimated minimum flows at the gaging station near the San Clemente Dam site (MPWMD, 2015c).

U.S. Fish and Wildlife Service and NOAA Fisheries Agreements

Two federally listed endangered species, the California red-legged frog and steelhead trout, inhabit the Carmel River.[7]

- The California red-legged frog was listed as threatened under the Federal Endangered Species Act (ESA) in 1996. In 1997, the U.S. Fish and Wildlife Service (USFWS) issued an ESA-4(d) rule that allowed it to prosecute for "take"[8] of the frog.
- The south/central California coast steelhead trout was listed as threatened under the ESA in 1997, and in 2000 NOAA Fisheries issued an ESA-4(d) rule allowing it to prosecute for take of steelhead.

USFWS and NOAA Fisheries have taken the position that any entity that pumps water from the Carmel Valley Aquifer may be liable for a take because the pumping may alter the habitat, affect the steelhead's ability to migrate in the river, and affect the frog's ability to grow to maturity. In 1997, CalAm entered into an agreement with USFWS to further regulate its well production activities in an attempt to avoid or mitigate impacts on the frog and has renewed that agreement several times. In 2001, CalAm negotiated a Conservation Agreement with NOAA Fisheries that included various changes in operations, with the long-term goal of procuring an alternative water supply source to reduce withdrawals from the Carmel River Alluvial Aquifer.

If CalAm fails to satisfy USFWS and NOAA Fisheries' concerns regarding ESA, those agencies could bring enforcement actions against CalAm and its customers. The consequences could include further reduction of the water supply obtained from the Carmel Valley Alluvial Aquifer, and fines that could be in the millions of dollars.

2.2.3 State Water Board Order 95-10 and Cease and Desist Order 2009-0060

State Water Board Order 95-10, issued in July 1995, substantially limited the supplies available to CalAm from the Carmel River. In the order, the State Water Board established that CalAm has a legal right to 3,376 afy (equivalent to about 3 mgd) from the Carmel River system, including surface water diversions from the river and subsurface flow pumped from the Carmel Valley Alluvial Aquifer. Prior to Order 95-10, CalAm's average annual use during non-drought years

[7] Refer to Section 4.6, Terrestrial Biological Resources in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, for more information on biological resources in the project area.

[8] As defined in the ESA, to "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

was approximately 14,106 afy (12.6 mgd).[9] The order found that CalAm was diverting approximately 10,730 afy of surface and/or subsurface flow from the Carmel River without a valid basis of right and directed CalAm to diligently undertake the following actions to terminate its unlawful diversions: obtain appropriative rights to the Carmel River water that was being unlawfully diverted; obtain water from other sources and make one-for-one reductions of the unlawful diversions; and/or contract with other agencies that had appropriative rights to divert and use water from the Carmel River. Order 95-10 directed CalAm, during its pursuit of an alternative supply, to implement conservation measures to offset 20 percent of demand[10] and restricted CalAm to an annual diversion of 11,285 afy (10.1 mgd) from Carmel River sources. This amount represented a 20 percent reduction from CalAm's average usage at the time of 14,106 afy. The order also prohibited CalAm from diverting water from San Clemente Dam when streamflows reach a predetermined low flow. The order directed CalAm to maximize use of the Seaside Groundwater Basin for the purpose of serving existing connections, honoring existing commitments (allocations), and to reduce diversions from the Carmel River to the greatest practicable extent (State Water Board, 1995).[11]

In October 2009, the State Water Board adopted Cease and Desist Order 2009-0060, based on the State Water Board's conclusion that Order 95-10 did not authorize CalAm to divert water from the Carmel River in excess of its water rights and that CalAm was illegally diverting water from the Carmel River in violation of Order 95-10 and Water Code Section 1052. The CDO requires that CalAm "diligently implement actions to terminate its unlawful diversions from the Carmel River and … terminate all unlawful diversions from the river no later than December 31, 2016." The CDO prohibits CalAm from diverting water from the Carmel River for new service connections or intensified water use at existing connections, and required CalAm to reduce diversions by 5 percent, or 549 afy, starting in October 2009, with further annual reductions starting in October 2011 and "continu[ing] until all unlawful CalAm diversions from the river have been terminated" (State Water Board, 2009).

In July 2016 the State Water Board adopted Order WR 2016-0016, which amends Order 95-10. Order 2016-0016 extends the date by which CalAm must terminate all unlawful diversions from the Carmel River from December 31, 2016, to December 31, 2021. The Revised CDO set an initial diversion limit of 8,310 afy for Water Year 2015-2016 (October 1, 2015-September 30, 2016) and establishes annual milestones that CalAm must meet in order to maintain the 8,310 afy diversion limit through 2021. The milestones would demonstrate tangible progress in developing alternative water supply that would enable CalAm to reduce and terminate its unlawful diversions. If CalAm fails to meet a milestone, the Revised CDO specifies that the annual diversion limit will be reduced by 1,000 afy. Section 5.4.2, No Project / No Federal Action, provides further discussion on the CDO and the milestones.

9 14,106 afy was CalAm's average use of Carmel River water from 1979 to 1988, according to Order 95-10 (citing information provided by CalAm).

10 Order 95-10 required a conservation reduction, in combination with conservation measures required by the MPWMD, of 15 percent in the 1996 water year and a reduction of 20 percent in each subsequent year.

11 Water supply projects that were considered by CalAm and the CPUC in response to Order 95-10 prior to the currently proposed project are described in Chapter 5, Alternatives Screening and Analysis.

2.2.4 Seaside Groundwater Basin Adjudication

Another purpose of the proposed project is to reduce CalAm's reliance on the Seaside Groundwater Basin, which is currently CalAm's other principal source of supply for the Monterey District. In March 2006, the Monterey County Superior Court issued a decision in *California American Water v. City of Seaside,* (Super. Ct. Monterey County, 2006, No. M66343), setting forth the adjudicated water rights of the various parties who produce groundwater from the Seaside Basin. The court amended that decision in February 2007.

In August 2003, CalAm sued a number of parties who held, or potentially held, water rights in the Seaside Groundwater Basin, and asked the court to adjudicate those rights. CalAm also asked the court to establish a plan for the coordination of groundwater management within the Seaside Groundwater Basin. Most of the defendants then cross-claimed against CalAm, and the Monterey Peninsula Water Management District and the Monterey County Water Resources Agency both intervened.

By adjudicating the water rights for all users of the basin, the court intended to protect the basin from long-term damage associated with potential seawater intrusion, subsidence, and other adverse effects that commonly result from overpumping. The Decision identified the "natural safe yield"[12] for the basin as a whole, and individually for the Coastal and Laguna Seca subareas, and found that production in each of the preceding 5 years had exceeded the natural safe yield throughout the basin and in each of its subareas. The Decision also found (and noted that all parties agreed) that continued production in excess of the natural safe yield would result in seawater intrusion and deleterious effects on the basin.

The Decision established a physical solution to basin management that was intended to reduce aquifer drawdown to the level of the natural safe yield; to maximize potential beneficial uses of the basin; and to provide a means of augmenting water supply for the Monterey Peninsula. In addition to allocating groundwater rights to the various users, the Decision established an initial "operating safe yield," to be decreased incrementally over time until withdrawals are equal to the identified natural safe yield.[13] The Decision also established the Seaside Groundwater Basin Watermaster, consisting of representatives of the parties to the complaint, to administer and enforce the provisions of the Decision. CalAm's 2007 allocation under the initial operating safe yield was 3,504 afy from the Coastal subarea and 345 afy from the Laguna Seca subarea. CalAm's current (water year[14] 2016) operating yield allocation is 2,254 afy from the Coastal subarea and 48 af from the Laguna Seca subarea (Watermaster, 2015). CalAm's eventual allocation, when withdrawals pursuant to the

[12] The Decision defines "natural safe yield" as the quantity of groundwater in the Seaside Basin that occurs solely as a result of natural replenishment. The estimate of natural safe yield assumes no action is taken to capture subsurface flow exiting the northern boundary of the basin.

[13] The Decision defines "operating safe yield" (also referred to as operating yield) as the maximum amount of groundwater resulting from natural replenishment that the Decision, based upon historical usage, allows to be produced from each subarea for a finite period of years, unless such level of production is found to cause material injury. In general, the initial operating yield for each subarea was to be maintained for the first three water years; starting in the fourth water year and triennially thereafter, it is to be decreased by 10 percent until the operating yield is equivalent to the subarea's natural safe yield.

[14] A water year runs from October 1 through September 30 of the following year, and is named for the year it ends. For example, water year 2016 extends for October 1, 2015, through September 30, 2016.

adjudication equal the natural safe yield of the basin, will be 1,474 afy from the basin overall (Watermaster, 2009). Although this quantity was calculated based on the basin as a whole, by the time withdrawals have been reduced to equal the natural safe yield, the entire natural safe yield of the Laguna Seca subarea will be allocated to other producers with overlying groundwater rights that are superior to CalAm's appropriative rights (Svindland, 2013a); therefore, CalAm's adjudicated right to 1,474 afy from the basin will be drawn from the Coastal subarea.

Table 2-1 summarizes key determinations contained in the Decision and the initial and current production allocations prepared by the Seaside Groundwater Basin Watermaster (Watermaster, 2007, 2015). For comparison, Table 2-1 also shows CalAm's production from the Seaside Groundwater Basin prior to Order 95-10, CalAm's average production for the years following Order 95-10 prior to the adjudication, and the MPWMD allocation for CalAm prior to the adjudication.

TABLE 2-1
SEASIDE GROUNDWATER BASIN ADJUDICATED OPERATING AND NATURAL SAFE YIELDS WITH CALAM'S PRE-ADJUDICATION PRODUCTION

Basin Management Element	Quantity
Initial operating safe yield – entire basin	5,600 af[a]
Total initial (2007) operating safe yield – Coastal subarea (CalAm and other producers)	4,611 af[a]
CalAm's initial (2007) standard production allocation of operating safe yield – Coastal subarea	3,504 af[b]
CalAm's current (water year 2016) operating yield allocation – Coastal subarea	2,254 af
Total initial (2007) operating safe yield – Laguna Seca subarea	989 af[a]
CalAm's initial (2007) standard production allocation – Laguna Seca subarea	345 af[b]
CalAm's current (water year 2016) operating yield allocation – Laguna Seca subarea	48 af
Natural safe yield – entire basin	2,581 – 2,913 afy
Natural safe yield – Coastal subarea	1,973 – 2,305 afy
Natural safe yield – Laguna Seca subarea	608 afy
Natural safe yield – CalAm's eventual allocation – entire basin	1,474 afy[c]
MPWMD allocation for CalAm for the Coastal subarea prior to the adjudication[d]	4,000 afy
CalAm Seaside Basin production when Order 95-10 was issued	2,700 afy
CalAm average annual production, water years 1996–2006, Coastal subarea	3,695 afy
CalAm average annual production, water years 1996–2006, Laguna Seca subarea	432 afy

NOTES: af = acre feet; afy = acre feet per year.

[a] The initial operating safe yield was established for the first three water years (changed from administrative years in the 2007 Amended Decision); at the beginning of the fourth water year and triennially thereafter, it is to be decreased by 10 percent until it is equivalent to the natural safe yield. The adjudication provides for possible revisions of the established operating safe yield based on the findings of the Seaside Groundwater Basin Watermaster.

[b] CalAm's initial standard production allocations are based on the table, "Seaside Basin Groundwater Account Per Amended Decision, Dated February 9, 2007," prepared by the Seaside Groundwater Basin Watermaster.

[c] This Seaside Groundwater Basin Watermaster estimate (Watermaster, 2009) revises the MPWMD's 2006 estimate that CalAm's eventual allocation would be 1,494 afy from the Coastal subarea and zero from the Laguna Seca subarea. Because other Laguna Seca subarea producers have water rights that are superior to those of CalAm, the entire natural safe yield of the Laguna Seca subarea will be allocated to other producers (Svindland, 2013a, pp. 16–17); therefore, CalAm's adjudicated right to 1,474 afy at natural safe yield would be drawn from the Coastal subarea.

[d] At the time, MPWMD's definition of the Monterey Peninsula Water Resource System did not include the Laguna Seca subarea; therefore a corresponding allocation was not provided for that subarea.

SOURCES: Monterey County Superior Court, 2007; MPWMD, 2006a; Watermaster, 2007, 2009, 2015; State Water Board, 1995; Svindland, 2013a.

The Decision also requires that production from the Seaside Groundwater Basin in excess of the natural safe yield (i.e., the difference between the natural safe yield and the interim operating yield limits) be replenished. CalAm and the Seaside Groundwater Basin Watermaster have agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy (Watermaster and CalAm, 2014). The replenishment volume, which may occur as in-lieu or artificial replenishment,[15] will be based on a running 5-year average. Based on this replenishment schedule, CalAm's proposed sizing of the MPWSP Desalination Plant assumes that, over the 25-year "repayment period," available supply from the Seaside Groundwater Basin will be limited to 774 afy (700 afy less than CalAm's adjudicated right of 1,474) (Svindland, 2013a).

2.3 CalAm Service Area Demand

Based on State Water Board Orders 95-10 and 2009-0060 and the Seaside Groundwater Basin adjudication, CalAm must develop a replacement water supply to meet existing demand in its Monterey District service area. In addition, CalAm proposes to provide sufficient supply to meet demand associated with the development of existing legal lots of record, Pebble Beach water entitlements in the Del Monte Forest area, and tourism demand under improved economic conditions within its service area.

2.3.1 Existing System Demand

Annual demand for CalAm's Monterey District main system plus the Bishop, Ryan Ranch, and Hidden Hills satellite systems between 2006 and 2015 is shown in **Table 2-2**. Average annual demand over this period was 12,351 afy. This estimate of average annual demand is about 940 afy lower than the estimated service area demand CalAm provided in its 2013 testimony (13,291 afy) based on years 2007 through 2011.

TABLE 2-2
EXISTING DEMAND[a] 2006–2015 (acre-feet)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Annual[b] Demand	14,176	14,596	14,439	13,198	12,270	12,129	11,549	11,356	10,250	9,545
10-Year Average (2006-2015): 12,351										

NOTES:
a
b Demand values are for the Monterey District main system plus the Ryan Ranch, Hidden Hills, and Bishop satellite water systems. Demand shown is for the calendar year.

SOURCE: California American Water, 2016b

15 "In-lieu replenishment" refers to programs in which groundwater producers agree to refrain, in whole or in part, from exercising their right to produce their full production allocation with the intent to replenish the Seaside Groundwater Basin through forbearance, in lieu of injection or spreading of non-native water. "Artificial replenishment" refers to the addition of non-native water to the groundwater supply of the Seaside Groundwater Basin, through spreading or direct injection, to offset cumulative over-production from the basin (Monterey County Superior Court, 2007).

CalAm anticipates that by the time the desalination plant is operational, the average 10-year and maximum year demand will be lower than the current 10-year average, most notably due to the continuing decline in per capita water use. As discussed below in Section 2.3.2, CalAm has concluded that demand in 2010, 12,270 afy, represents an appropriate estimate of annual demand for CalAm to use in assessing the adequacy of its water supplies to meet peak demands and regulatory supply capacity requirements.

2.3.2 Peak Demands

While annual water demand characterizes the overall system demand expected to occur within a service area, actual water use fluctuates over the course of a day, month, season, and year. For example, people use less water in the middle of the night and more around dinnertime; they use more during the warmer and drier months and seasons than in the cooler and wetter ones; and they typically use more in dry years than in average or wet years – at least until conservation measures kick in. The California Department of Public Health's California Waterworks Standards[16] require that public water system's water sources have the capacity to meet the system's maximum day demand and (for systems with 1,000 or more service connections) peak hour demand, and specify that maximum day demand and peak hour demand are to be determined based on the most recent ten years of operation. CPUC General Order 103-A also requires that water utilities within its jurisdiction meet these standards. CalAm considers peak month demand a more critical consideration for its operations than peak day demand because the Monterey District's portfolio of supplies provides sufficient flexibility to meet such short term peak demand. By contrast, peak month demand represents more sustained elevated demand, over multiple days, which needs to be considered as a factor in plant sizing (Svindland, 2013b). CalAm hopes to bring the desalination plant on line in 2020. By that time, the 10-year demand record would cover the period from 2010 through 2019, and the 2007, 2008 and 2009 demands will have dropped off the 10-year historical record period. CalAm assumes that demand in years 2016 through 2019 will not exceed demand in 2010 and that 2010 would, therefore, represent the maximum-demand year for this period (Svindland, 2016). CalAm also assumed that peak month demand in 2010 (July 2010), which was the highest month demand of the years 2010 through 2015, adequately represents peak month demand for planning purposes.

2.3.3 Other Service Area Demand Assumptions

CalAm proposes that the MPWSP be sized to provide sufficient supplies to also meet the water demands associated with the anticipated use of water entitlements held by the Pebble Beach Company and other Del Monte Forest property owners ("Pebble Beach water entitlements"); the anticipated economic recovery (or "rebound") of the local hospitality industry, resulting in increased water demand by existing businesses compared to current levels; and demand associated with the development of existing legal lots of record in jurisdictions served by the project (Svindland, 2013a). **Table 2-3** shows existing system demand together with these other demand components, which total approximately 2,005 afy; these demand components are discussed further below.

16 California Code of Regulations Title 22, Division 4, Chapter 16, Section 64554.

TABLE 2-3
OTHER DEMAND ASSUMPTIONS

Demand Component	Annual Demand (acre-feet)
Existing Service Area Demand	12,270
Pebble Beach Water Entitlements	325
Hospitality Industry Rebound Economic Recovery	500
Legal Lots of Record	1,180
Total to Service Area	**14,275**

SOURCE: RBF Consulting, 2013; CalAm, 2016; Svindland, 2016.

2.3.3.1 Pebble Beach Water Entitlements

In 1989, the MPWMD granted water entitlements totaling 380 afy to the Pebble Beach Company and two other fiscal sponsors for underwriting the development of a wastewater reclamation project. Of this 380 afy, entitlements totaling about 325 afy had not been used (i.e., had not been exchanged for water permits allowing actual water system connections) at the time CalAm revised its estimate of system demands in 2013; the remaining unused entitlements represented water demand that was not reflected in the existing demand figures shown in Table 2-2.

The wastewater reclamation project was jointly undertaken by the Carmel Area Wastewater District, the Pebble Beach Community Services District, and the MPWMD to provide recycled water in lieu of potable water to golf courses in the Del Monte Forest, which includes Pebble Beach. The MPWMD subsequently authorized the Pebble Beach Company to sell a portion of the remaining water entitlements to other Del Monte Forest property owners as a means of financing part of the project. The project now provides 100 percent of the irrigation water for all of the golf courses and some open space areas in the Del Monte Forest. The MPWMD estimates that the project saves approximately 1,000 afy of potable water (Stoldt, 2011). As of 2013, the MPWMD had issued water permits totaling 58.419 afy; the remaining Pebble Beach water entitlements totaled 321.581 afy (MPWMD, 2013a). Testimony by the MPWMD in February 2013 during the CPUC proceedings on the proposed MPWSP confirmed the remaining water entitlements and noted the likelihood that a portion of the 58.419 afy of issued permits have not yet been connected to the CalAm system; the MPWMD testimony concluded that the estimated 325 afy of future demand associated with the Pebble Beach water entitlements is reasonable (Stoldt, 2013).

Since 2013, MPWMD has issued additional water permits associated with the Pebble Beach water entitlements and, as of May 2016, the remaining entitlement for all Pebble Beach entitlement holders stood at 303.768 afy (MPWMD, 2016b). Because the recently issued permits may not immediately translate to water connections and water use, the estimate of 325 afy should remain a reasonable estimate of the portion of the Pebble Beach entitlements not reflected in existing system demands.

2.3.3.2 Hospitality Industry Rebound

The hospitality industry, which includes hotels, restaurants, and other visitor-serving businesses, experienced reductions in occupancy and visitation rates during the economic recession that began in late 2007. Since then, the industry has been recovering slowly: industry representatives expect that occupancy and visitation rates will soon rebound to pre-recession levels. So they feared that CalAm's previous demand estimate, which was based on recession-era numbers, would not accurately reflect demand in a healthy economy. In response to this concern, CalAm's January 2013 revised demand estimate allocated an additional 500 afy to meet demand associated with the future rebound of the local hospitality industry (Svindland, 2013a). CalAm based its estimate on discussions with hospitality industry representatives in the region (RBF, 2013) without providing additional documentation. As discussed below, MPWMD conducted its own assessment of CalAm's estimate using available data (MPWMD, 2013b). The MPWMD compared occupancy and water-use levels for several periods over the last 15 years, finding that the average occupancy level in 2011 was just below 68 percent (compared to 75 percent for the period of 1998 through 2001, when the economy was robust). The analysis noted that if the economy improved, occupancy rates would go up, and the demand for water would rise. So the proposed project should be sized to accommodate an increase in water use. The MPWMD's comparison of commercial-sector water use found that:

- Average annual demand in 2000 was about 440 afy greater than the average annual demand for 2009 through 2011;
- Average annual demand for 2006 through 2008 was 236 afy greater than the average annual demand for 2009 through 2011; and
- A 7 percent increase in the average annual demand in 2009 through 2011 (based on the 7 percent difference in occupancy rates between the 1998–2001 period and 2011) would increase water demand by 194 afy.

The MPWMD's direct testimony to the CPUC in February 2013 concluded that CalAm's estimate of demand related to tourism rebound was reasonable (Stoldt, 2013).[17]

CalAm's 2016 amended application and the testimony supporting it updated the existing service area demand estimate, providing information on average 10-year demand over the period 2006 through 2015, and using demand in 2010 as the basis for its analysis of system operations and the adequacy of anticipated supplies under the project. As in 2013, CalAm's current estimate of system demand includes 500 afy to meet future demand of the existing hospitality industry under recovered conditions. While the current estimate is based on consideration of a longer time frame, and while the region has recovered to some degree from the economic recession, the 10-year period CalAm considered for its demand estimate includes the past four years of drought, during which water use has dropped significantly. Therefore, even if the region's economy has largely recovered, water demand of existing businesses reflected in recent demand data may be lower

[17] For additional review of CalAm's estimate of this component of demand refer to Section 6.3, Growth Inducement. Refer to Section 2.6 of this chapter regarding assumptions about the allocation of water supply provided by the MPWSP.

than would be expected under normal weather conditions. As discussed in more detail in Section 6.3, Growth Inducement, this EIR/EIS assumes that some of the 500 afy CalAm estimates for economic recovery has already occurred, and some of this supply would be available for other uses.

2.3.3.3 Lots of Record

CalAm has repeatedly testified that the proposed project would also provide an estimated 1,181 afy of water to meet demand resulting from the development of vacant legal lots of record in the service area (Svindland, 2012; 2013a; 2016). CalAm had previously included this demand estimate in its 2006 *Urban Water Management Plan* (Management Plan). The 2006 Management Plan cited a 2001 analysis by MPWMD staff as the source for the estimate of 1,181 afy (CalAm, 2006).

In February 2013, the MPWMD reviewed its analyses of water demand related to legal lots of record and found no documentation to support the 1,181 afy estimate. The summary of the results of the documentation review, prepared for the MPWMD Board of Directors (MPWMD, 2013c), defines a legal lot of record as "a lot resulting from a subdivision of property in which the final map has been recorded in cities and towns, or in which the parcel map has been recorded in Parcels or Maps or Record of Surveys. Not all legal lots are buildable."[18] The summary states that "[t]he District does not certify that the estimate of 1,181 afy [for demand associated with vacant lots of record] is a valid value" and does not recommend its continued use.

The summary identifies two reports on the topic of lots-of-record water demand that were prepared for the MPWMD in 2000 and 2002, and notes that the 2001 estimate cited in CalAm's 2006 Management Plan was from an interim period between these two reports. The 2000 report, which had identified demand of 1,166.3 afy for vacant lots and remodels, was not adopted by the MPWMD Board because it did not include estimates for the city of Monterey or the unincorporated county; the revised 2002 report, which identified demand of 1,211 afy, included estimates for the city of Monterey but not for the unincorporated county (MPWMD, 2013c). The MPWMD's direct testimony to the CPUC in February 2013 reiterated these observations, stating that the MPWMD does not consider the 1,181 afy estimate a valid value and that the higher 2002 estimate did not account for vacant lots on improved parcels in the unincorporated areas. Thus, CalAm's estimate may underestimate the actual demand for lots of record (Stoldt, 2013).

On the other hand, comment on the 2015 MPWSP Draft EIR suggested that water demand per lot has likely decreased in years since those reports were prepared. It may be the case that per-lot water demand is somewhat lower than 15 years ago, considering the general trend in lower per capita demand in the service area and throughout the state; however, the extent of such reductions may not be quantifiable based on available data and, more important, water demand for lots in the unincorporated part of the service area had not been estimated at all in the 2000 study and were

[18] An exhibit filed in conjunction with MPWMD testimony in December 2013 states that "[i]t is generally considered that [legal lots of record] are considered buildable by, and have the approval of, the local land use jurisdiction.…" (MPWMD, 2013d).

only partly taken into account in the 2002 study, as stated in the MPWMD testimony. (Refer to Section 6.3, Growth Inducement, for additional discussion of this demand component.)

2.3.4 2010 Urban Water Management Plan Demand Estimates

Under the Urban Water Management Planning Act,[19] CalAm is required to provide information on existing and projected future demand in the Monterey District. The information presented in CalAm's 2010 Management Plan, which was completed in September 2012 (WSC, 2012), is summarized here for informational purposes. The Urban Water Management Planning Act requires all urban water suppliers to prepare a Management Plan (and update it every 5 years) for the purpose of "actively pursu[ing] the efficient use of available supplies." As part of their long-range planning, urban water suppliers must make every effort to meet their customers' needs during normal, dry, and multiple dry water years. So although CalAm did not cite the 2010 Management Plan as the basis for the proposed project's demand estimates, the evaluation of service area demands presented in the Management Plan provides insight into CalAm's expectations regarding population growth and water demand in the Monterey District using a different projection methodology from that used for the proposed MPWSP (summarized above in Sections 2.3.1 through 2.3.3).

2.3.4.1 Urban Water Management Plan Service Area Population

Senate Bill 7, enacted in November 2009,[20] requires all water suppliers in the state to increase water use efficiency. In particular, urban water suppliers must achieve a 20 percent reduction in urban per-capita water use by 2020, and must include in their 2010 Management Plans their baseline per-capita water use; their 2020 per-capita water use target; and an interim (2015) per-capita water use target. Consequently, CalAm performed an assessment of its service area population to calculate per-capita water use and project future service area demands for its 2010 Management Plan.

To determine the population of the Monterey District, which includes portions of unincorporated Monterey County, CalAm took geographic information system (GIS) shapefiles containing 2010 population data by census block obtained from the U.S. Census Bureau, compared those data with their service area boundaries, and determined how much of the service area was within each census block. Based primarily on the area of the Monterey District within each census block,[21] the 2010 Management Plan analysis estimated the population of each of the Monterey District's distribution systems and the District as a whole. The Management Plan indicates that the population of CalAm's entire Monterey District was 99,396 in 2010 and that the combined population of the main system and the Bishop, Hidden Hills, and Ryan Ranch satellite distribution systems, which would also be served by the proposed project, was 95,972. The Management Plan estimated future population growth for each distribution system based on the

19 California Water Code Section 10610 et seq.
20 Codified at California Water Code Sections 10608 and 10800–10853.
21 The UWMP population analysis found that, for the most part, population distribution was generally uniform within each census block; where population was not uniformly distributed, the distribution was adjusted based on visual inspection of recent aerial photographs.

Association of Monterey Bay Area Governments' 2008 forecast, which the Management Plan analysis adjusted to incorporate 2010 census data (WSC, 2012).

2.3.4.2 Urban Water Management Plan Demand Estimates

According to the CalAm 2010 Management Plan, total water use – that is, water delivered to customers and non-revenue water[22] – in the Monterey District in 2010 was 12,809 af. Total water use in the main system and the Bishop, Hidden Hills, and Ryan Ranch satellite systems in 2010 was 12,270 af. The Management Plan presents CalAm's calculation of baseline, interim (2015) target, and 2020 target per-capita water use rates for the Monterey District as required by Senate Bill 7: the baseline, 2015, and 2020 per-capita use rates were be 144, 131, and 118 gallons per-capita per day (gpcd), respectively. But the Monterey District's actual 2010 per-capita water use was 115 gpcd, which was less than its 2020 reduction target, and the Management Plan projections of future water demand between now and 2030 assumed the 115 gpcd rate.

The 2010 Management Plan estimates of non-revenue water are based on information CalAm submitted to the CPUC. The Management Plan indicates that non-revenue water for the Monterey main system decreased from 2,332 afy in 2005 to 1,389 afy in 2010 and was projected to decrease to 1,251 afy in 2030. Non-revenue water data for the satellite systems are not provided for 2005. In 2010, non-revenue water for the main system plus the Bishop, Hidden Hills, and Ryan Ranch satellite systems was 1,445 afy and was projected to decrease to 1,290 afy in 2030. (Refer to Section 2.5.3.3, below, for additional discussion of non-revenue water.)

The 2010 Management Plan projects total water demand in the Monterey District in 2030 to be 13,936 afy, and projects total demand in the main system and the Bishop, Hidden Hills, and Ryan Ranch satellite systems to be 13,544 afy (WSC, 2012). This amount is less than CalAm's current demand estimate for the proposed project service area (14,275 afy) and the supply that would be provided with implementation of the proposed project in conjunction with Carmel River, Seaside Groundwater Basin, and other assumed supplies (discussed in Section 2.4). Demand assumed for the MPWSP differs from that of the Management Plan because CalAm determined that an additional supply and demand analysis was needed to address the repayment of the Seaside Groundwater Basin, the potential for tourism in the area to recover, the Pebble Beach water entitlements, and water for lots of record. These factors are included in CalAm's current assumptions regarding service area demand, as described in Section 2.3.3.

[22] Non-revenue or unaccounted-for water refers to the difference between the total water produced in a system and the total water billed to customers (i.e., water consumed). Non-revenue water includes water lost to leaks in the distribution system, water use that is not billed or tracked in the system, such as water used for firefighting and system flushing, and unauthorized uses.

2.4 Available Supplies

Table 2-4 shows the individual supply sources, both with and without the GWR project.[23] These supply sources are described below. As the table shows, available supplies range from 16,211 afy to 16,994 afy, depending on whether the proposed 6.4 mgd or 9.6 mgd plant is built and whether Seaside Groundwater Basin replenishment is in progress or completed. The "Supply Available for Other Uses" in Table 2-4 is the difference between Total Supplies and Service Area Demand. It represents water from the MPWSP that could be available for other uses, such as returning water to the Salinas Valley Groundwater Basin, or supporting growth. Both uses are discussed in Section 6.3, Growth Inducing Impacts.

2.4.1 Carmel River System

As described above in Section 2.2.3, State Water Board Order 95-10 established that CalAm has a legal right to divert a total of 3,376 afy from the Carmel River system, including surface water diversions from the Carmel River and water pumped from the Carmel Valley Alluvial Aquifer.

2.4.2 Seaside Groundwater Basin Supplies

As described in Section 2.2.4, CalAm's adjudicated right to Seaside Groundwater Basin groundwater at the natural safe yield of the basin is 1,474 afy. CalAm and the Seaside Groundwater Basin Watermaster have agreed to a 25-year replenishment schedule for CalAm to pay back the volume of groundwater CalAm has withdrawn in excess of its adjudicated right. CalAm will start to pay back the basin once it has new water supplies. While repayment could occur as either in-lieu or artificial replenishment, CalAm's supply assumption for the sizing of its MPWSP Desalination Plant is that repayment over the 25-year period will occur as in-lieu replenishment at the rate of 700 afy, based on a 5-year running average. Therefore, supply assumed to be available from the Seaside Basin over this period would be limited to 774 afy, again, based on a 5-year running average.

2.4.3 Aquifer Storage and Recovery

The MPWMD and CalAm have implemented Phase I and Phase II of the Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) project. The ASR project entails diverting and conveying Carmel River water during periods of high flow that occur between December and May of each year to the Seaside Groundwater Basin, where it is injected into the aquifer for storage and subsequently recovered for delivery to customers. The Phase I project, which was completed in 2007, includes two ASR injection/extraction wells (the ASR-1 and ASR-2 Wells, also known as Santa Margarita Wells #1 and #2) and a chemical/electrical building that includes a disinfection system for treating extracted water. The ASR-1 and ASR-2 wells are located at the

[23] The GWR project would convey advanced treated water from the Monterey Regional Water Pollution Control Agency to the Seaside Groundwater Basin, where it could be injected for storage and subsequent recovery by CalAm. MRWPCA, the Lead Agency for the GWR EIR certified the Final EIR and approved the GWR project in October 2015.

TABLE 2-4
CALAM MONTEREY DISTRICT WATER SUPPLIES WITH PROPOSED MPWSP
(acre-feet per year)

Supply Source	During Replenishment of the Seaside Groundwater Basin		After Replenishment of the Seaside Groundwater Basin	
	Without GWR (9.6 mgd[a] Desalination Plant)	With GWR (6.4 mgd[b] Desalination Plant)	Without GWR (9.6 mgd[a] Desalination Plant)	With GWR (6.4 mgd[b] Desalination Plant)
Carmel River[c]	3,376	3,376	3,376	3,376
Seaside Groundwater Basin[d]	774	774	1,474	1,474
Aquifer Storage and Recovery (ASR)[e]	1,300	1,300	1,300	1,300
Sand City Coastal Desalination Plant[f]	94	94	94	94
Groundwater Replenishment Project (GWR)[g]	0	3,500	0	3,500
MPWSP Desalination Plant Production[h]	10,750	7,167	10,750	7,167
Total Supplies	**16,294**	**16,211**	**16,994**	**16,911**
Service Area Demand (from Table 2-3)	14,275	14,275	14,275	14,275
Supply Available for Other Use (Total Supplies Minus Service Area Demand)	**2,019**	**1,936**	**2,719**	**2,636**

NOTE: mgd = million gallons per day

[a] 9.6 mgd is the rated capacity of the desalination plant CalAm proposes to build for the MPWSP, and is typically used to characterize the size of the plant; operating at full capacity a 9.6 mgd plant would produce 10,750 acre feet of desalinated water per year. (That is, the conversion factor is 893 gallons per day per acre-foot per year, or about 1,120 acre-feet per year per 1 million gallons per day.)

[b] 6.4 mgd is the rated capacity of the desalination plant CalAm proposes to build if the GWR project is successfully implemented. The 6.4 mgd rated capacity is typically used to characterize the size of the smaller plant proposed in conjunction with the GWR water purchase. Operating at full capacity a 6.4 mgd plant would produce 7,167 acre feet per year.

[c] CalAm's recognized right to Carmel River water established in Order 95-10.

[d] CalAm's adjudicated water right in the Seaside Groundwater Basin is 1,474 afy; in-lieu recharge of 700 afy would occur during 25-year Seaside Groundwater Basin replenishment period.

[e] Assumed average annual yield with completion of Phase II of the ASR; Phase I of the ASR is currently in operation, and Phase II is nearing completion.

[f] Quantity shown is CalAm's long-term share of plant production pursuant to agreements between CalAm and the city of Sand City.

[g] The Final EIR for the GWR project was certified and the GWR project approved by the Monterey Regional Water Pollution Control Agency, the lead agency, in October 2015.

[h] Assumes 9.6 mgd and 6.4 mgd desalination plants operating at full capacity.

SOURCE: CalAm, 2016b; Svindland, 2016.

former Fort Ord military base, on the east side of General Jim Moore Boulevard near Eucalyptus Road. ASR water supplies that are extracted from the Seaside Groundwater Basin are disinfected onsite before being conveyed via an existing 16-inch diameter pipeline beneath General Jim More Boulevard to the CalAm distribution system (MPWMD, 2005). In water year 2011, which was wetter than average, 1,117 af of Carmel River water was injected into the groundwater basin. In water year 2012, 132 af was injected; in 2013, 295 af was injected, in 2014, no Carmel River water was injected, and in 2015, 215 af was injected. The estimated average annual yield from the Phase I injection/extraction wells is 920 afy.

The Phase II ASR project has been built and will start running when treatment facilities are completed at the Phase I site. Phase II includes two additional injection/extraction wells (ASR-3 and ASR-4 Wells) at Seaside Middle School, located on the west side of General Jim Moore Boulevard. Together, the ASR-3 and ASR-4 Wells provide the capacity to yield an additional 1,000 afy from the ASR system, resulting in a total capacity of 1,920 afy for Phases I and II combined (Denise Duffy & Associates, 2012). The Phase I and Phase II ASR projects correspond to MPWMD and CalAm's existing State Water Board Permits 20808A and 20808C, which authorize the diversion of up to 2,426 afy for ASR Phase I, and up to 2,900 afy for ASR Phase II (State Water Board, 2007, 2011). Permit conditions establish limits on diversions to the ASR system, including a requirement that minimum mean daily instream flows in the Carmel River be maintained for the protection of fisheries, wildlife, and other instream uses. Because diversions for the ASR system are contingent on maintaining minimum daily instream flows, and precipitation and streamflow can vary substantially from year to year, for the purposes of CalAm's water supply assumptions, the estimated combined long-term average annual yield from ASR is 1,300 afy for the Phase I and Phase II projects (RBF, 2013). In addition to the injection/extraction wells and treatment facilities, the Phase I and Phase II ASR facilities include two pump stations, a backflush percolation basin,[24] and conveyance pipelines.

As part of the MPWSP, CalAm proposes two additional injection/extraction wells, ASR-5 and ASR-6 Wells. The purpose of the proposed ASR-5 and ASR-6 Wells is to increase the injection/extraction capacity for both desalinated product water and Carmel River supplies and to improve system reliability. The proposed ASR-5 and ASR-6 Wells would not increase CalAm's yield from injected Carmel River supplies; consequently, the average annual yield from Carmel River supplies that are diverted to underground storage would remain at 1,300 afy. The proposed MPWSP ASR facilities are described in Chapter 3, Description of the Proposed Project, and evaluated throughout this EIR/EIS.

2.4.4 Sand City Coastal Desalination Plant

The Sand City Coastal Desalination Plant, which began operations in April 2010, is owned by the City of Sand City and operated by CalAm. The plant's total capacity is 300 afy, of which CalAm's long-term share is 94 afy. The balance of the plant's capacity is reserved by Sand City to support its future growth. Sand City is served by CalAm's distribution system, consistent with the MPWMD's allocation program.

2.4.5 Groundwater Replenishment Project

As described in more detail in Chapter 5, Alternatives, CalAm's MPWSP Application includes a variant of the MPWSP that would combine a reduced-capacity desalination plant (6.4 mgd compared to 9.6 mgd under the MPWSP) with the purchase of 3,500 afy of product water from the GWR project, a joint project proposed by Monterey Regional Water Pollution Control Agency (MRWPCA) and MPWMD. The MRWPCA would inject up to 3,500 afy of purified water from a

[24] The backwash percolation basin receives discharges produced during routine backflushing and operation of the ASR injection/extraction wells.

new advanced water treatment plant into the Seaside Groundwater Basin. Under a purchase agreement with the MPWMD, CalAm would later extract the 3,500 afy for delivery to customers.

If CalAm is able to purchase water from the GWR project, the size of its MPWSP Desalination Plant could be reduced. MRWPCA certified the Final EIR for the GWR and approved the project in October 2015. Because of uncertainties pertaining to project timing and cost at the time CalAm submitted its application for the MPWSP, CalAm's project application proposes a 9.6 mgd plant, but also seeks authorization to reduce the size of the proposed plant to provide 6.4 mgd, and to enter into a water purchase agreement if the cost of the GWR water is reasonable. CalAm would then supplement its supplies with water purchased from the GWR project.

On September 15, 2016, the CPUC issued a Decision authorizing CalAm to enter into a Water Purchase Agreement with the MRWPCA and the MPWMD for the purchase of 3,500 afy. The CPUC Decision also authorizes CalAm to build the new Monterey Pipeline and Monterey Pump Station (CPUC, 2016).

2.4.6 Other supplies

2.4.6.1 Table 13 Water

In 1993, CalAm applied to the State Water Board (Application No. 30215A) for a permit authorizing CalAm to divert from the Carmel River water above its existing rights under Order 95-10 and the ASR permits. This additional water is known as Table 13 water. In October 2013, the State Water Board issued water-right Permit 21330 in response to this application. The permit conveys to CalAm the right to divert a maximum of 1,488 af annually from December 1 of each year to May 31 of the succeeding year, subject to prior rights, the adequacy of daily instream flow, and other provisions and requirements.

In MPWSP testimony submitted to the CPUC in February 2013, before the Table 13 permit was issued, CalAm stated that the Table 13 water would be subject to flow criteria similar to criteria that applied to water diversions for the ASR, and that the Table 13 diversions would, therefore, be constrained by the limited timeframe in which they could occur and by the existing production capacity of the wells and treatment plant on the Carmel River. CalAm also noted that, unlike the ASR diversions, Table 13 water could only be used within the Carmel River watershed. Based on its analysis of customer water use in the watershed at times of year when Table 13 water would be available, CalAm estimated that, during wet years, a maximum of 600 afy of Table 13 water could be used. Because Table 13 water would not be available during dry years, CalAm did not assume the availability of Table 13 water for purposes of sizing the proposed plant (Svindland, 2013c). CalAm reiterated this perspective in testimony provided in 2016.

According to quarterly reports posted at CalAm's website under the State Water Board's Cease and Desist Order, CalAm began reporting diversions of Table 13 water with its reporting of monthly water diverted to ASR storage under Permits 2080A and 2080C in October 2015 (reported in Table 2 of the quarterly reports). According to the October 2015 report, CalAm diverted 42.2 af of Table 13 water for use in water year 2015 and diverted a total of 214.7 af to its

four ASR injection wells in Seaside under its ASR permits 2080A and 2080C (CalAm, 2015). According to its April 2016 quarterly report, CalAm diverted 164.2 af of Table 13 water in the first half of water year 2016 (through March 2016), and diverted 647 af of water to storage under its ASR permits (CalAm, 2016c).

2.4.6.2 Malpaso Water Company LLC

In 2015, the State Water Board issued Water Right License 13868A (License 13868A) to Malpaso Water Company, LLC. License 13868A authorizes Malpaso to divert up to 85.6 afy from the Carmel River and to have this water conveyed by CalAm through its water distribution system to property owners that have entered into subscription agreements with Malpaso, for beneficial uses on their properties.[25] License 13868A authorizes use of the diverted water in CalAm's service area in the Carmel River watershed or in the City of Carmel-by-the-Sea. In its decision issuing License 13868A, the State Water Board determined that diversions of water from the Carmel River under the new license for the benefit of Malpaso's Water Use Permit subscribers would not be classified as water diverted by CalAm for new service connections or for increased use of water at existing service connections that are prohibited under terms of the CDO.

Malpaso has since contracted with CalAm for the conveyance of water diverted under License 13868A to Malpaso's Water Use Permit subscribers through CalAm's distribution system, and for the temporary use of the portions of License 13868A that are not used each year by Malpaso Water Company Water Use Permit subscribers to supply water to CalAm.[26]

In August 2015, MPWMD adopted Ordinance 65, which gives Malpaso a water entitlement of 80 afy through the CalAm distribution system. The size of the entitlement reflects anticipated production and conveyance losses compared to 85.6 afy diversion permitted by License 13868A. MPWMD will only issue a water use permit to a property owner after the person has purchased the water and received plan approval (Locke, 2016).

License 13868A thus increases supplies available to the CalAm Service area from 16,294 afy to 16,380 afy (during the Seaside Basin replenishment period, assuming a 9.6 mgd desalination plant, and from 16,994 afy to 17,090 afy after the replenishment period).

2.4.6.3 Rancho Canada Golf Course Retirement

In April 2016, a coalition of conservation organizations[27] announced plans to acquire 140 acres of the Rancho Canada Golf Club, whose lease expires in April 2017. Under the plan, a large portion of the land, which is located along the Carmel River near Palo Corona Regional Park, would ultimately be turned over to the Monterey Peninsula Regional Park District. The Trust for Public Land would acquire and hold the property until summer of 2017, while raising funds that would enable the Trust to convey the property to the park district. The parties expect to finance

[25] MPWMD Ordinance 165.
[26] MPWMD Ordinance 165.
[27] The organizations include the Trust for Public Land, the Monterey Peninsula Regional Park District, the Santa Lucia Conservancy, and Trout Unlimited.

the deal through a variety of sources, including state grants, private donations, and support from CalAm (Monterey County Herald, 2016). As part of the plan, CalAm and the Trust executed a water diversion forbearance agreement in April 2016 to reduce pumping from the Carmel River and retire irrigation of two golf courses at the golf club. That irrigation now uses about 381 afy of Carmel River water. CalAm has agreed to pay the Trust for its forbearance of diversion during the CDO extension period, which will help CalAm offset its unauthorized diversions and help the Trust acquire the property. Because the acquisition plan anticipates converting much of the acquired land to riparian habitat, a substantial portion of water previously used to irrigate the golf courses should remain in the river permanently (CalAm et al., 2016a).

Because the forbearance agreement between CalAm and the Trust is temporary, and future water use at the site is uncertain, this analysis does not assume that this project would necessarily make the offset supply, formerly used for irrigation, available for other future use.

2.5 Other Supply and Demand Considerations

To meet projected system demand along with the other supply sources discussed above, CalAm proposes to build a 9.6 mgd desalination plant. The plant would include six 1.6 mgd reverse osmosis modules and one 1.6 mgd standby module. As noted above in Section 2.3.2, water demand fluctuates over the day, season, and year. Similarly, the availability of some water supplies that would be used along with the proposed desalination plant also varies over the course of the year. For example, while CalAm has a right to an annual quantity of Carmel River water, the river produces more water in the winter and less in the summer. So to provide adequate service, any water system must be sized to ensure it can meet anticipated peak demands, and it is standard engineering practice to do so. Therefore, anticipated monthly operations were analyzed as part of the development of the proposed project (RBF Consulting, 2013). In addition to CalAm service area water demand, plant operations include CalAm's SVGB return water obligation: the volume of water that would be returned to the SVGB based on the percentage of SVGB groundwater that was produced as source water by the subsurface slant wells. SVGB return water is discussed below in Section 2.5.1 and in Section 2.6, Water Rights.

This section also describes other factors that could affect future water demand and supplies in CalAm's Monterey District.

2.5.1 Salinas Valley Groundwater Basin Return Water

MPWSP source water would include some brackish groundwater from the SVGB. As part of the proposed project, CalAm would return to the SVGB a volume of desalinated product water equal to the amount of SVGB groundwater included in the source water. While CalAm's SVGB return water obligation will be based on the amount of fresh water in the source water, in order to consider the effect of the return water for this EIR/EIS, groundwater modeling simulated scenarios with return water obligations representing 0, 3, 6, and 12 percent of the source water (see Section 4.4, Groundwater Resources). The amount of SVGB groundwater included in the source water is expected to decrease over time (CalAm et al., 2016b).

In June 2016, several parties involved in the current proceeding asked the CPUC to approve their proposed "Settlement Agreement on MPWSP Desalination Plant Return Water" (CalAm et al., 2016b). The settlement describes how CalAm would fulfill its annual SVGB return water obligation. As the settlement explains:

- Delivering return water by injecting desalinated water from the proposed project into the SVGB is considered less desirable than delivering return water for beneficial use in the SVGB.
- The Castroville Seawater Intrusion Project (CSIP) may not have sufficient capacity to accommodate all of the MPWSP SVGB return water under some conditions.
- The Castroville Community Services District (CCSD), which provides municipal and domestic water service to the Town of Castroville, currently relies on about 780 afy of SVGB groundwater to meet Castroville's water demands, and increasingly has experienced water supply challenges because the water is getting saltier.
- The CCSD wants to take delivery of a SVGB return water supply to replace all or part of CCSD's current reliance on groundwater from the SVGB.

To fulfill its SVGB return water obligation, CalAm would make return water available for other water suppliers to use instead of pumping groundwater from the SVGB. The return water settlement requires CalAm either to make 800 afy of return water available for delivery to CCSD, assuming they build the 9.6 mgd plant, or to make 690 afy available if they build the 6.4 mgd plant. CCSD's avoided cost – that is, what they would have had to pay to produce enough groundwater to meet demand – will determine the price that CCSD would pay for the return water. If there is any return water left after CCSD takes its share, CalAm would deliver it to the CSIP. The pipeline that would need to be built to convey return water to Castroville is described in Chapter 3, Description of the Proposed Project, and its potential impacts are evaluated in subsequent chapters of this EIR/EIS. See Section 2.6, below, for more on this topic.

2.5.2 Potential Future Changes in Supply

2.5.2.1 Los Padres Reservoir

State Water Board Order 95-10 reduced CalAm's right to divert surface water to storage at Los Padres Reservoir from 3,030 afy to 2,179 afy, because the legal right to divert water to storage is limited by the physical ability to store the water. In a 2006 study, the MPWMD noted that the State Water Board could revisit Order 95-10 and, by applying the same logic, further reduce CalAm's right to divert water to storage based on additional losses in reservoir capacity due to ongoing sedimentation (MPWMD, 2006a). A 2008 bathymetric study by the Watershed Institute at California State University at Monterey Bay determined that the usable storage capacity of the reservoir in 2008 was 1,669 af. Based on the 2008 study, MPWMD estimates that the long-term sedimentation rate of the reservoir is 21 afy and that more than 510 af of replacement supply would likely be needed to offset the lost capacity (MPWMD, 2015b). As noted in Section 2.2.2, MPWMD and CalAm are currently studying the long term options for the Los Padres Dam and Reservoir.

2.5.2.2 Conclusion of Seaside Groundwater Basin Replenishment Period

As discussed in Section 2.2.4, the proposed project assumes the availability of 747 afy of water supply from the Seaside Groundwater Basin. At the conclusion of the 25-year replenishment period, CalAm would have access to its total adjudicated right of 1,474 afy, thus augmenting available supply by 700 afy.

2.5.3 Potential Future Changes in Demand

Several recent and planned projects and actions could serve to reduce or offset demand assumed by CalAm during the planning and sizing of the proposed MPWSP Desalination Plant. Conversely, growth within the Monterey District service area that is consistent with adopted general plans could increase demand beyond that assumed for the proposed project. This section describes other projects and actions that were not explicitly accounted for in CalAm's demand estimates but that could affect future service area demand.

As the price of water changes, customers' behavior may change as well. When water is less expensive, people typically use more of it; when water is more expensive, people typically conserve more. But no one knows how much water will cost in the future, or how the CPUC will structure CalAm's water rates. Also, people in CalAm's Monterey District have a long history of water conservation, and already use very little water compared to the rest of the state. But if the MPWSP comes on line, that would make CalAm's water supply more reliable, and would probably lift the constraints imposed by Order 95-10 and the CDO, which might induce people to use more water, even if that water is also becoming more expensive. Given the number of variables involved, speculating about what effect future water prices might have on behavior is futile.

2.5.3.1 Pacific Grove Local Water Project

The City of Pacific Grove wants to create a new supply of non-potable water. In the first phase of the Pacific Grove Local Water Project, the city will build and operate a 0.25 mgd satellite recycled water treatment plant that would provide up to 125 afy of recycled water primarily to the Pacific Grove Municipal Golf Links and the El Carmelo Cemetery.[28] The recycled water would replace potable supply currently used for these facilities. Pacific Grove certified an EIR on the project in November 2014. In October 2015, the city certified a supplemental EIR on a modified project, and approved the project as modified. The modified project includes a water entitlement for the city from MPWMD for up to 90 afy of the potable water saved by the PGLWP, to be used to serve a portion of Pacific Grove's anticipated buildout water demand (City of Pacific Grove, 2015).

The State Water Board approved Clean Water State Revolving Fund financing for the project in November 2015. The approval includes a condition that prohibits the allocation of potable water saved by the project for new uses until the State Water Board gives consent to use the water for new connections. In January 2016, MPWMD adopted Ordinance No. 168, which establishes an

[28] Subsequent phases of the PGLWP could provide up to 600 afy of recycled water to sites within the cities of Pacific Grove and Monterey and unincorporated areas of Pebble Beach (City of Pacific Grove, 2014).

entitlement for Pacific Grove of 66 afy for consumption from CalAm's distribution system; permanently suspends from use 13 afy, for the benefit of the Carmel River system; and reserves 9 afy for the MPWMD for its exclusive use for allocation to other jurisdictions. MPWMD established the entitlement so that it would be available to Pacific Grove when the State Water Board authorizes use of the saved water for new connections (MPWMD, 2016c; State Water Board 2015). The project is expected to be operational and delivering up to 125 afy by the end of December 2016 (MPWMD, 2016c). Although the MPWMD has issued the City of Pacific Grove a permit to receive potable supply from CalAm's system, when available, and MPWMD has reserved for itself, for future allocation, an entitlement for a portion of the saved water, the combined permits for Pacific Grove and MPWMD associated with this project are less than the amount of potable water currently used for irrigation that the project would offset. So the project should reduce demand when it is operational.

In 2013, CalAm and several other parties asked the CPUC to approve a settlement agreement on plant sizing and operations. The Settling Parties agreed that the Pacific Grove project would be a valuable part of a comprehensive solution to water issues in CalAm's Monterey District when integrated with the MPWSP, the GWR Project, and ASR (CalAm et al., 2013a).

2.5.3.2 Pebble Beach Recycled Water Project Phase II

The Carmel Area Wastewater District-Pebble Beach Community Services District reclamation project provides recycled water to irrigate Del Monte Forest golf courses and other open space areas. Phase I of the project, completed in 1994, offset demand for about 70 percent, or 700 af, of the potable water previously used for this purpose (Sweigert, 2008). Phase II of the project, which was completed in 2009, eliminated the need to mix any potable water with the recycled water; the project now supplies 100 percent of the water used at the area golf courses and is estimated to save approximately 1,000 afy of potable water (Stoldt, 2011). In planning for the MPWSP, CalAm based its current estimate of service area demand on the 10-year average of years 2006 through 2015. Assuming Phase II of the reclamation project became operational midway through 2009, the additional 300 afy demand reduction it achieved would be reflected in demand data for more than half that baseline period; therefore, although additional reductions in service area demand may occur as a result of this project it is expected such reductions would be minor.

2.5.3.3 Non-revenue Water Reduction

The Final EIR for the Coastal Water Project and the Regional Project[29] noted that improvements in CalAm's distribution system could reduce demand by reducing non-revenue water. Non-revenue water, also known as unaccounted-for water, is the difference between a water system's metered production and metered consumption.

[29] As described in Chapter 1 (Section 1.4), CalAm previously proposed the Coastal Water Project to replace existing Carmel River supplies to which CalAm no longer has a recognized legal right pursuant to Order 95-10 (discussed in Section 2.2.2 above). The Regional Project emerged as an alternative to the Coastal Water Project during the environmental evaluation of the Coastal Water Project. The CPUC certified the EIR in 2009 and approved the Regional Project, which would have been jointly implemented, in two phases, by CalAm and the Marina Coast Water District, in 2010. CalAm eventually withdrew its support for the Regional Project due to the inability to resolve issues that arose related to its implementation, and in 2012 proposed the MPWSP as an alternative.

In its 2009 CDO, the State Water Board observed that the industry standard for non-revenue water was 10 percent; that CalAm's non-revenue water was about 12 percent of production; and that the MPWMD had required CalAm to reduce non-revenue water to 7 percent (State Water Board, 2009). The State Water Board concluded that CalAm should be required to reduce its system losses by about 549 afy and should immediately start to reduce the losses. Similarly, in 2009, the CPUC addressed CalAm's acute need to reduce non-revenue water in the Monterey District. The CPUC ordered CalAm to develop and implement a program for reducing unaccounted-for water in its Monterey main system and associated subsystems and, to provide a financial incentive, the CPUC created a penalty/reward program to be calculated based on a 9 percent non-revenue water target (CPUC, 2012). A June 2012 CPUC rate case decision (D.12-06-016) also found that non-revenue water in the Monterey District needed to be reduced.

CalAm has often described the company's efforts to reduce non-revenue water in its Monterey District (Sabolsice, 2012; CalAm et al., 2016a). These efforts include:

- investigating and analyzing main breaks and service leak data and evaluating pressure-control methodologies
- replacing older water mains and service lines in areas shown to be more prone to leaks
- replacing meters
- deploying acoustic leak-detection devices throughout the system
- implementing operational fixes such as pressure reduction

CalAm submits quarterly compliance reports to the State Water Board under the CDO (CalAm, 2011, 2012b, 2013, 2014, 2015.) In those reports, CalAm states that between the 2011 and 2015 water years, the company has reduced system losses by an average of 506 afy, compared to the base year system losses in water year 2009. Further, for the last three years, the reduction in system losses ranged from 752 af in water year 2013 to 919 af in water year 2015, which exceeds the 549 afy target established in the CDO. CalAm notes that the actual components of unaccounted-for water are difficult to identify because unaccounted-for water represents a combination of system leaks and unmetered water use. Savings from system repairs and line replacements and the like would be reflected in CalAm's system demands data for those years, as part of the 10 years of demand data discussed in Section 2.3.1.

CalAm's program to address system losses will continue under the CDO and the CPUC's decisions. While additional reductions in demand can be expected from continuing efforts to address system losses, data are not available to quantify potential additional future savings from such efforts. Over time, the size of additional reductions in system losses will inevitably decrease as CalAm replaces the oldest and most leak-prone lines and implements other efforts to reduce losses.

2.5.3.4 General Plan Buildout

CalAm is not proposing that the MPWSP meet future demands associated with general plan buildout, although the proposed project does include water for some future development (e.g., development of vacant lots of record and development in the Del Monte Forest commensurate

with existing Pebble Beach water entitlements). Phase 2 of the Regional Project[30] included water to meet projected future service area demands; the MPWMD prepared that estimate of future water needs in 2006 based on information obtained from the service area jurisdictions (MPWMD, 2006b). Each jurisdiction provided estimates of the number of residential units and nonresidential square footage that would be developed under buildout of the currently adopted general plan as well as anticipated residential remodels. Because not all jurisdiction submitted estimates for lots of record as a distinct category, that aspect of general plan buildout in the 2006 estimate does not compare to CalAm's current estimate for lots of record. The MPWMD estimated that 4,545 afy would be needed to meet future water demands (MPWMD, 2006b).

Since the 2006 estimate was prepared, the future water needs of four jurisdictions have been revised, reducing the total:[31]

- Monterey County adopted a new general plan that revised their water demand estimates (Monterey County, 2010);
- The City of Pacific Grove testified on the MPWSP in 2013, revising its estimate of water needed to accommodate general plan buildout (Hardgrave, 2013);
- The City of Seaside commented on the April 2015 MPWSP Draft EIR, updating its future water needs, and noting that full buildout of the West Broadway Urban Village Specific Plan would require a net increase of 80 afy of water (City of Seaside, 2015).
- Sand City built the 300-afy Sand City Coastal Desalination Plant. In consideration for the delivery of 300 afy of potable water from this plant to the CalAm system, MPWMD Ordinance 132 establishes a water entitlement of 206 afy from the CalAm system for Sand City, separate from the city's current water allocation, and indicates that the remaining 94 afy will be permanently added to CalAm's system (as shown above in Table 2-4). The estimated future demand for Sand City is therefore revised to reflect that 206 afy of the city's future demand will be offset by supply from the city's desalination plant (which is not included in the supplies assumed for the MPWSP in Table 2-4).

With these revisions, future demand would total 3,526 afy. **Table 2-5** shows the MPWMD's 2006 future demand estimates, with and without the four revisions. In addition, Pacific Grove may reduce its future demand estimate by 66 afy because of the Pacific Grove Local Water Project (see Section 2.5.3.1). However, the city has not submitted a formal revision to its demand estimate since the 2013 revision noted above.

30 Refer to Chapter 1 for more information on the Regional Project.

31 The EIR prepared for the *Monterey County General Plan* provides two estimates of future water demand for the Greater Monterey Peninsula: one for the general plan planning horizon, which extends to 2030, and one for complete buildout under the general plan, which the EIR projected would occur in 2092. The estimate assumed in this analysis (1,005 afy) is for the 2030 planning horizon. Total buildout demand under the general plan is much higher (4,439 afy, not including unincorporated Carmel and Del Monte Forest, for which buildout estimates are not provided). Because the general plan EIR estimate of demand used a substantially higher per-capita water use rate than is currently assumed, and projected a higher population level than is currently assumed by the Association of Monterey Bay Area Governments, there is reason to believe that the 2092 buildout projection overstates both future population and water demand; therefore, the shorter term planning horizon was considered a more reasonable estimate for this analysis.

TABLE 2-5
FUTURE WATER DEMAND – SERVICE AREA JURISDICTIONS
(acre-feet per year)

Jurisdiction	Future Supply Needs (2006 Estimate)[a]	Future Supply Needs (Revised Estimate)
City of Carmel	288	288[b]
City of Del Rey Oaks	48	48
City of Monterey	705	705
City of Pacific Grove	1,264	500[c,d]
City of Sand City	386	180[e]
City of Seaside	582	662[f]
Monterey County (Unincorporated)	1,135	1,005[b,g,h]
Monterey Peninsula Airport District	138	138
Total	**4,545**	**3,526**

NOTES:
[a] Based on the MPWMD's "Estimated Long-Term Water Needs by Jurisdiction Based on General Plan Build-out in Acre-Feet," Exhibit 1-C of Special Meeting/Board Workshop Agenda Item 1, MPWMD Board of Directors Packet, May 18, 2006b.
[b] State Water Board License 13868A, issued in 2015, authorizes Malpaso Water Company to divert 85.6 afy from the Carmel River for delivery to property owners in CalAm's service area in the Carmel River watershed or the City of Carmel-by-the-Sea who have entered into subscription agreements with Malpaso Water Company. Provision of this water supply could therefore reduce system demand in the City of Carmel-by-the-Sea and unincorporated Monterey County by a total of 86.6 afy if the water available from Malpaso Water Company is fully subscribed.
[c] Revised based on testimony submitted to the CPUC by the City of Pacific Grove revising its 2006 estimate as shown.
[d] Future supply needs by the City of Pacific Grove may be reduced by an additional 66 afy in recognition of the 66 afy water entitlement established for the city by MPWMD in consideration of its Pacific Grove Local Water Project (see Section 2.5.3.1).
[e] Sand City's 300 afy desalination plant, which was constructed after preparation of the 2006 estimate of future supply needs, provides Sand City a water entitlement of 206 acre-feet (pursuant to MPMWD Ordinance 132) to meet future demand in the city, thereby offsetting the original demand estimate by 206 afy. (Because this portion of the Sand City plant's production is not included in the supplies assumed by CalAm, shown in Table 2-4, it is also not shown here, in order to avoid double counting demand that will be met by another source.)
[f] Revised based on the City of Seaside comment on April 2015 Draft EIR and attached water supply assessment indicating that full buildout of the West Broadway Urban Village Specific Plan would require a net increase of 80 afy of water (City of Seaside, 2015; Schaaf & Wheeler, 2008); the specific plan was adopted in 2010.
[g] Revised based on the Final EIR prepared for the 2010 *Monterey County General Plan*; the estimate shown is for the unincorporated county areas served by the Carmel River and Seaside Basin aquifer in the general plan horizon year (2030), rather than general plan buildout (which is not expected until 2092).
[h] The estimate provided in the 2010 General Plan Final EIR for the unincorporated county area served by the Carmel River and Seaside Basin aquifer includes 492 acre feet for the Highway 68/Airport affordable housing overlay, as well as supply for Greater Monterey Peninsula area (316 acre feet), the Carmel Mid-Valley affordable housing overlay (75 acre feet), Cachagua (partial) (5 acre feet), Carmel Valley (60 acre feet), unincorporated Carmel (37 acre feet), and Del Monte Forest (20 acre feet).

SOURCES: MPWMD, 2006b; Monterey County, 2010; Hardgrave, 2013, City of Seaside, 2015; Shaaf & Wheeler, 2008.

As discussed in Section 2.3, the proposed MPWSP would provide water supply to meet a projected total service area demand of about 14,275 afy, which is 2,005 afy more than CalAm's estimate of current annual demand, 12,270 afy. Part of this 2,005 afy is intended to serve existing service area customers in the hospitality industry under improved economic conditions, and part is intended to serve future development of lots of record and development associated with Pebble Beach water entitlements. Analysis presented in Section 6.3 indicates CalAm might have overestimated the amount needed to serve existing hospitality industry customers under improved economic conditions (500 afy) by about 250 afy and that the other 250 afy designated for hospitality industry recovery may therefore be available to serve future growth. Assuming that revised estimate for the hospitality industry, about 1,755 afy of the 14,275 afy would be available

to serve additional development in the CalAm service area. Although the project proposes to meet a narrower range of future development components than was assumed for Phase 2 of the Regional Project, the amount of water provided by the proposed project to serve additional development represents about half of the revised estimate of future service area demands. As the revised estimate in Table 2-5 indicates, the proposed project would provide 1,471 afy less than would be needed to meet water demand associated with general plan buildout (3,526 afy) and the other future water demand considered in the 2006 analysis.

The MPWMD, the Monterey Peninsula Regional Water Authority, Monterey County, and CalAm plan to determine an accurate estimate of the added capacity needed to meet the General Plan buildout projections for communities served by CalAm. The findings from this process, which will be undertaken separately from the current A. 12-04-019 proceeding, will be reported to the CPUC either within a subsequent rate design phase of A. 12-04-019 or as part of the general rate case process (CalAm et al., 2013b).

2.5.4 Assumptions about the Allocation of MPWSP Water

As discussed in Section 2.3, CalAm proposes to size the MPWSP Desalination Plant to provide, along with other sources, sufficient supply to meet service area demand of 14,275 afy. This amount is 2,005 afy more than the 12,270 afy existing service area demand (shown in Table 2-3), and without Seaside Basin replenishment, it would be 2,705 afy more than existing demand. In addition to meeting existing service area demand, CalAm proposes sizing the plant to meet demand associated with existing Pebble Beach water entitlements, estimated demand associated with the development of vacant legal lots of record and, if the economy improves, demand from increased water use at existing hospitality businesses. While such increases in water demand can reasonably be expected, estimating future water demand necessarily entails the use of assumptions about demand factors that cannot be predicted with absolute certainty. (As discussed in Section 2.3.3, MPWMD's review of the factors included in CalAm's estimate produced somewhat different results. For example, MPWMD's review indicated that supply needed for future development of vacant lots of record may be underestimated and the supply needed for economic recovery of the hospitality industry may be overestimated.) Moreover, under past and current allocation programs, once a given supply has been allocated to a jurisdiction, whether or not the jurisdiction reserves its allocation for specific uses and at specific levels that CalAm assumed for project sizing would be up to the jurisdiction. It is the jurisdiction's responsibility to determine, subject to applicable plans, policies, laws, and regulations, whether or not to approve a new or intensified water use within its boundaries. In addition, with other supply sources the MPWSP would provide total supply of 16,294 during the Seaside Basin replenishment and 16,994 after the replenishment period, as shown in Table 2-4. Available supply after 14,275 afy of anticipated demand was met may need to be returned to the Salinas Valley Groundwater Basin, or may be available for growth within service area jurisdictions, depending on the return water obligation.

One of the MPWMD's key functions is to allocate water supply within its boundaries. The water supply that the proposed project would provide, along with other existing and planned supplies, would continue to be subject to MPWMD's allocation program. Although MPWMD has not yet

begun to address allocation of the proposed MPWSP supply, this analysis assumes that the same considerations that informed the past and current allocations will be relevant to the allocation of the MPWSP supply. This EIR/EIS assumes that water provided by the proposed project will be allocated to meet existing demand and that any water left over would be allocated in general proportion to projected growth in the CalAm service area jurisdictions.

2.6 Water Rights

The topic of water rights is not one typically addressed in an EIR/EIS. It is a legal matter that is rarely relevant to the question of whether a proposed project being evaluated under CEQA or NEPA will generate impacts on the environment. Here, however, the issue of water rights is addressed as one of project feasibility.

The proposed project (MPSWP) and Alternative 5a are designed to take supply water from the ocean via underground slant wells that draw water from the earth underneath the ocean. The wells would be located at the western edge of the Salinas Valley Groundwater Basin (SVGB, or the "Basin"), a large basin that extends approximately 100 miles between Monterey Bay (in the northwest) to the Salinas River headwaters (in the southeast). Details concerning the Basin conditions and stratigraphy (geologic conditions) are set forth in Section 4.4, Groundwater Resources, of this EIR/EIS. Particularly because the project supply wells could draw some water from the Basin, concerns have been expressed as to whether CalAm does or will hold legal rights to use the water that would be taken by the slant wells, treated at the desalination plant and supplied to CalAm customers located outside the Basin.

The CPUC is not the arbiter of whether CalAm possesses water rights for the project and nothing in this EIR/EIS should be construed as the CPUC's opinion regarding such rights, except to the extent that the CPUC must determine whether there is a sufficient degree of likelihood that CalAm will possess rights to the water that would supply the desalination plant such that the proposed project can be deemed to be feasible. Indeed, no government agency will formally grant water rights to CalAm for the proposed project. In California, groundwater other than subterranean streams and underflow of surface water is regulated through common law (court cases) rather than through the issuance of permits by government bodies. The SVGB is not an adjudicated groundwater basin, so use of the groundwater in the Basin is not subject to existing court decree, written agreements or oversight by an impartial watermaster.[32] There are three relevant types of groundwater rights: (1) overlying rights whereby those who own land atop the Basin may make reasonable use of groundwater on such land; (2) prescriptive rights whereby a water user has acquired another's rights to use water via an open, adverse and sustained use under a claim of right that such user would otherwise not be entitled to; and (3) appropriative rights whereby the groundwater may be used outside the Basin or for municipal purposes. While CalAm owns 46 acres of land (the proposed desalination plant location) overlying the Basin, that land would not support sufficient water for the

[32] An adjudicated groundwater basin is one in which a court has determined the amount of groundwater that each party may extract per year, often based upon studies of the basin and a determination of the safe yield of the basin to sustain it in the long-term. Adjudicated groundwater basins have court-appointed watermasters, who oversee basin operations.

project and would not enable CalAm to use the water beyond the property that it owns. CalAm has no prescriptive groundwater rights in the Basin. Thus, CalAm would take any Basin water for the project via appropriative rights, which are junior to existing appropriations and to overlying users. If the proposed project is approved and any dispute arises as to whether or not CalAm possesses legal water rights, such dispute likely would be resolved through court action. Naturally, however, if CalAm does not have the right to the supply water for the proposed project, the proposed project could not proceed and would thus prove infeasible. This section examines whether, based upon the evidence currently available, the CPUC could conclude that there is a sufficient degree of likelihood that CalAm will possess rights to the water that would supply the desalination plant such that the proposed project can be deemed to be feasible.

Numerous court decisions have enunciated that an EIR for a large scale land use development project must analyze the reasonably foreseeable impacts of supplying water to the project. Such an EIR should show a reasonable likelihood that water will be available from an identified source and must evaluate environmental impacts from likely future water sources to serve the proposed project. Those cases arise in a different context than the MPWSP. Those cases are concerned with whether there will be enough water to support construction of land use projects and to supply the operational needs of the project occupants for drinking, cooking, bathing, waste water, industrial processes, irrigation, etc. Quite conversely, the MPWSP is itself a water supply project, aimed primarily at creating the water supply to replace current water supplies to which CalAm is not legally entitled. From a physical perspective, it is more than reasonably foreseeable that sufficient water is available to supply feedwater for the MPWSP desalination plant. There is knowledge as to where the water will come from and certainty that a sufficient quantity of water will be available. The physical effects of MPWSP's withdrawal of water are fully analyzed in Section 4.4, Groundwater Resources, of this EIR/EIS.

The primary purpose in requiring an EIR to identify the water supply source for a project and to analyze the effects of supplying water to the project is to ensure that land use development projects that will use water are not built without consideration of water supply.[33] Unlike with land use development projects, here, if CalAm did not possess legal rights to use the feedwater for the MPWSP desalination plant, then the desalination plant simply could not operate and the project would not go forward. That is why water rights factors in as a key project feasibility issue.

[33] Numerous court decisions have enunciated that an EIR for a large scale land use development project must analyze the reasonably foreseeable impacts of supplying water to the project. Such an EIR should show a reasonable likelihood that water will be available from an identified source and must evaluate environmental impacts from likely future water sources to serve the proposed project. Those cases arise in a different context than the MPWSP. Those cases are concerned with whether there will be enough water to support construction of land use projects and to supply the operational needs of the project occupants for drinking, cooking, bathing, waste water, industrial processes, irrigation, etc. Quite conversely, the MPWSP is itself a water supply project, aimed primarily at creating the water supply to replace current water supplies to which CalAm is not legally entitled. From a physical perspective, it is more than reasonably foreseeable that sufficient water is available to supply feedwater for the MPWSP desalination plant. There is knowledge as to where the water will come from and certainty that a sufficient quantity of water will be available. The physical effects of MPWSP's withdrawal of water are fully analyzed in Section 4.4, Groundwater Resources, of this EIR/EIS.

2.6.1 State Water Resources Control Board Report

Questions have been posed in the CPUC's proceeding as to whether CalAm could demonstrate water rights to the MPWSP supply water. Furthermore, as noted above, CalAm's right to the project feedwater is a basic feasibility issue for the project. The SWRCB is the state agency authorized to exercise adjudicatory and regulatory functions in the areas of water rights, water quality and safe and reliable drinking water. By letter dated September 26, 2012, the CPUC asked that the SWRCB assist the CPUC and issue an opinion as to whether CalAm has a credible legal claim to the supply water for the MPWSP. The SWRCB carefully considered the then-available facts and evidence concerning the MPWSP, prepared a draft report on water rights, circulated that draft for public comments and ultimately issued its July 31, 2013, Final Review of California American Water Company's Monterey Peninsula Water Supply Project (Report). The Report is attached to this EIR as **Appendix B2**.

First off, the Report confirms that "Cal-Am needs no groundwater right or other water right to extract seawater from Monterey Bay." Report at 33. Thus, CalAm does not need a water right for the vast majority of the MPWSP supply water because most of the supply water for the 9.6 mgd desalination plant with supply wells at the proposed CEMEX location is projected to be seawater from the Monterey Bay. No water right need be secured for the seawater element of the MPWSP supply water.

Next, as to water that may be derived from the Basin itself rather than from the ocean, the Report explains (as discussed above) that there are three types of groundwater rights: (1) overlying rights for those who own land above the Basin; (2) prescriptive rights for those who have adversely established a pattern of use of Basin water; and (3) appropriative rights. CalAm would need an appropriative groundwater right to retrieve and export water from the Basin. The Report sets forth the view of the SWRCB as to the set of circumstances that must exist in order for CalAm to have the requisite appropriative rights to support the project. Essentially, if the extraction of otherwise unusable Basin groundwater will not harm lawful water users and any fresh water extracted can be returned to the Basin without injury to existing legal water users, then CalAm would have rights to the portion of feedwater that comes from the Basin because the MPWSP product water that contains such Basin water would be "developed water."

Developed water is water that was not previously available to other legal users and that is added to the supply by the developer through artificial means as a new water source. "The key principle of developed water is if no lawful water user is injured, the effort of an individual to capture water that would otherwise be unused should be legally recognized." Report at 37. Due to long-term seawater intrusion (where the seawater has moved inland) in the Basin, large areas of the Basin groundwater are impaired as to drinking and agricultural uses. The geographic areas from which the project supply wells could draw water inland of the sea are indeed intruded by seawater. (See Section 4.4, Groundwater Resources) "Since this groundwater is reportedly impaired, it is unlikely that this water is, or will be put to beneficial use." Report at 15. In fact, in response to concerns over seawater intrusion and historic overdraft in the Basin, the County adopted Ordinance No. 3709, which precludes the installation of new groundwater wells and

prohibits groundwater pumping between mean sea level and 250 feet below mean sea level in certain areas.

The Report concludes that the withdrawal for creating developed water is appropriate so long as no injury is incurred by existing legal water users of the Basin. Setting up the test to discern whether CalAm possesses water rights for the proposed project, the Report states:

> [I]n developing a new water source Cal-Am must establish no other legal user of water is injured in the process. Even if Cal-Am pumps water unsuitable to support beneficial uses, the water could not be considered developed water unless users who pump from areas that could be affected by Cal-Am's MPWSP are protected from harm.
>
> Cal-Am proposes a replacement program for the MPWSP water that can be attributed to fresh water supplies or sources in the Basin. If Cal-Am can show all users are uninjured because they are made whole by the replacement water supply and method of replacement, export of the desalinated source water would be permissible and qualify as developed water. In the future, this developed water would continue to be available for export even if there are additional users in the Basin. Developed waters are available for use by the party who develops them, subject to the "no injury" standard discussed previously.

Report at 38. The Report specifies three categories of foreseeable injuries that conceivably could be experienced by overlying water users within the area of influence of the MPWSP supply wells: "(1) a reduction in the overall availability of fresh water due to possible incidental extraction by the MWPSP; (2) a reduction in water quality in those wells in a localized area within the capture zone; and, (3) a reduction in groundwater elevations requiring users to expend additional pumping energy to extract water from the Basin." Report at 45. Each of these possible forms of injury is examined below.

State water policy favors enhancement of beneficial uses of water. Specifically, Article X, section 2 of the California Constitution requires "that the water resources of the State be put to beneficial use to the fullest extent to which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented." In addition, Water Code sections 12946 and 12947 proclaim it state policy to economically convert saline water to fresh water, stating, "Desalination technology is now feasible to help provide significant new water supplies from seawater, brackish water and reclaimed water."

In light of these legal requirements, the Report discusses the physical solution doctrine of water rights law, which could come into play if the MPWSP would beneficially develop water, but would in so doing cause injury absent one or more mechanisms to address and ameliorate such injury. In such a circumstance, physical solutions could be employed by CalAm to alleviate the harm effected by the MPWSP and make whole the injured water rights holders. The types of physical solutions would be dictated by the actual harm caused by the MPWSP, but could include such actions as providing replacement water supplies or funding improvements or additional pumping costs needed to ensure that the senior water users in the Basin remain in the same position as they were prior to construction and implementation of the MPWSP. The Report stated that, "Under the physical solution doctrine, although the Basin continues to be in a condition of overdraft, to maximize beneficial use of the state's waters Cal-Am may be allowed to pump a

mixture of seawater, brackish water, and fresh water and export the desalinated water to non-overlying parcels." Report at 42. As discussed above, the key criteria are that existing water users will not be injured by CalAm's use of Basin groundwater and that any fresh water component withdrawn by the MPWSP supply wells will be returned to the Basin in a productive way.

Specifically on the topic of the return options for any fresh water drawn from the Basin by the MPWSP, the Report provides:

> Cal-Am could use one of several possible options to replace any fresh water it extracts from the Basin. Cal-Am could return the water to the aquifer through injection wells, percolation basins, or through the CSIP. Cal-Am would need to determine which of these methods would be the most feasible, and would in fact, ensure no harm to existing legal users. The feasibility analysis would depend on site-specific geologic conditions at reinjection well locations and at the percolation areas. These studies need to be described and supported in detail before Cal-Am can claim an appropriative right to export surplus developed water from the Basin.

Report at 39. The Report emphasizes more than once that any injection wells or percolation basins for the purpose of returning fresh water to the Basin would need to be located where the underlying aquifer does not contain degraded water so as to avoid a waste of beneficial water.

> In summary, to appropriate groundwater from the Basin, the burden is on Cal-Am to show no injury to other users. Key factors will be the following: (1) how much fresh water Cal-Am is extracting as a proportion of the total pumped amount and how much desalinated water is thus available for export as developed water; (2) whether pumping affects the water table level in existing users' wells and whether Cal-Am can avoid injury that would otherwise result from any lowering of water levels through monetary compensation or paying for upgraded wells; (3) whether pumping affects water quality to users' wells within the capture zone and whether Cal-Am can avoid or compensate for water quality impacts; (4) how Cal-Am should return any fresh water it extracts to the Basin to prevent injury to others; and (5) how groundwater rights might be affected in the future if the proportion of fresh and seawater changes, both in the larger Basin area and the immediate area around Cal-Am's wells.

Report at 46. The Report concluded that further data were needed in order to apply the facts and evidence to the criteria set forth in the Report for determining CalAm's water rights. The Report noted that information was needed pertaining to the depth of the project supply slant wells, the hydrogeologic conditions of the site and the area, updated modeling to evaluate the impacts of the project, aquifer testing, and studies to help determine how extracted fresh water would be replaced. Most of these studies and activities have been undertaken and the results are described and reflected in Section 4.4, Groundwater Resources. CalAm has supplied details about its proposed supply wells and return water proposal. Test borings have helped to characterize the hydrogeologic framework within which the project would operate. Groundwater modeling has been conducted. CalAm also obtained approval to construct a test well on the CEMEX site. That well is in place (and core samples taken during the drilling of the well confirmed the assumptions about hydrogeologic conditions) and test pumping is occurring. Test slant well pumping and monitoring data was used to refine the aquifer properties represented in the revised version of the groundwater model to test the model's reliability for simulating drawdown from slant well

pumping. Once the test well results are complete, the modeling will be verified and will be re-run as warranted. Thus, the full panoply of evidence concerning the project's relationship to groundwater (and thus water rights) may continue to evolve and be refined throughout the CPUC proceeding. This preliminary analysis of water rights is based upon detailed and extensive groundwater aquifer characterization and groundwater modeling that has been undertaken by the EIR/EIS preparers to assess the effects of the project on Basin groundwater users.[34]

2.6.2 Project Water Rights

As noted above, CalAm extraction of seawater does not require water rights. The question presented is thus whether Basin water rights holders would be injured or harmed by virtue of withdrawal from the Basin of any amount of water that is not purely seawater. The extensive groundwater modeling conducted for this EIR/EIS and discussed in detail in the Groundwater Resources section and in **Appendix E2** is different from that conducted for the 2015 Draft EIR on the MPWSP. As explained in Chapter 4.4, Groundwater Resources, the modeling is specifically targeted to isolating the change in groundwater levels that would be generated by the MPWSP. This modeling, however, cannot project the amount of Basin water that is expected to be drawn into the supply wells. Due to decades of seawater intrusion in the area, any Basin water extracted by the supply wells would be brackish water, which is a combination of ocean water and water that originated from the inland aquifers of the Basin. CalAm proposes as part of the MPWSP to return to the Basin (in the manner further described below) the fresh water portion of the brackish source water. In other words, although the groundwater modeling indicates that the Basin water that could be withdrawn by the supply wells would be brackish and thus not fresh, potable water, the MPWSP would return to the Basin desalinated product water in the amount of the fresh water molecules that make up the withdrawn brackish Basin water. In that the quantity of such fresh water component of the supply water is not currently known, the modeling and the EIR/EIS analysis assess a range of return water between 0 and 12 percent of the source water.

The concept of significant effect under CEQA is not necessarily synonymous with harm or injury to water rights holders. In other words, physical change caused by the project might not rise to the level of a significant environmental impact under CEQA, but could still cause some harm or injury to a Basin water user (for instance, if the cost to a Basin water rights holder of withdrawing water were to rise even though the environment would not suffer significant impacts). Here, though, the Groundwater Resources section of this EIR/EIS strives to and does in fact effectively and meaningfully analyze two of the three precise concepts of "harm" or "injury" set forth in the Report. These two criteria are reduction in the availability of fresh water and reduction of water quality. In addition, the analysis in the Groundwater Resources section (based upon the groundwater modeling) provides an answer to the third concept of injury set forth in the Report, that of a reduction in groundwater levels that requires users to spend additional funds to extract water.

[34] The EIR/EIS preparers have also had the benefit of working closely with, and receiving input from, the Hydrogeologic Working Group (HWG) that was formed as a result of the proposed settlement in the CPUC proceeding on the MPWSP. The HWG is composed of experts representing myriad parties in the CPUC proceeding with diverse interests related to the Basin, including but not limited to the Monterey County Farm Bureau, the Salinas Valley Growers Association and CalAm. The EIR/EIS preparers obtained feedback from the HWG as to the groundwater aquifer characterization and the groundwater modeling assumptions.

The impact evaluation in the Groundwater Resources section of this EIR/EIS applied the following relevant thresholds of significance, determining that the project would generate a significant adverse environmental impact if any of the following would occur :

- Substantial depletion of groundwater supplies or substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned land uses for which permits have been granted).

- Extraction from the subsurface slant wells were to lower groundwater levels in the Dune Sand Aquifer or the 180-Foot Equivalent Aquifer such that nearby municipal or private groundwater production wells were to experience a substantial reduction in well yield or physical damage due to exposure of well pumps or screens.

- Extraction from the subsurface slant wells would substantially deplete groundwater in the SVGB such that there would be a net deficit in aquifer volume.

- Extraction from the subsurface slant wells would adversely affect groundwater quality by exacerbating seawater intrusion in the SVGB.

- Violation of any water quality standards or degradation of water quality.

- Extraction from the subsurface slant wells would adversely affect groundwater quality by exacerbating seawater intrusion in the Basin.

Applying the thresholds stated above, the analysis concludes that the MPWSP would not result in a significant impact to groundwater resources. It would not reduce, or affect at all, the availability of fresh water (only brackish water from the Basin is projected to be drawn into the MPWSP supply); would not lower groundwater levels in the Basin so as to affect the water supply of any groundwater users or substantially deplete aquifer volume; and would not alter or reduce groundwater quality.

Due to the long-degraded condition of water in the Basin within the radius of influence (the area within which the project could affect groundwater levels), there are few active wells that could potentially be affected by the project. As discussed in detail in the Section 4.4, Groundwater Resources, there are only three active supply wells with well screens across the Dune Sand Aquifer or 180-Foot Equivalent Aquifer within the area where the project may cause groundwater levels to decrease by more than 1 foot but no more than 5 feet.[35] These three wells are located at the Monterey Peninsula Landfill and are used for dust control. Given that the well pumps and the screens are set at least tens of feet below the existing groundwater level, a decrease in the levels of less than 5 feet would not cause injury to this overlying user. There are four active wells with well screens in the 400-Foot Aquifer. These include the South Well on the CEMEX property, a well on land owned by Ag Land Trust that is used to supply water for dust control, and two private wells

[35] This is based upon an assumption that no return water (0 percent) is supplied to the Basin, and thus represents a worst case, conservative scenario given that, as discussed in detail in the Groundwater Resources section, the more water that is returned to the basin as envisioned by the proposed project, the less total impact there would be on the groundwater levels.

with unknown owners. Due to the brackish to saline quality of the groundwater within the 400-Foot Aquifer, these wells would not be expected to supply drinking water. The Groundwater Resources section concludes as to all active wells that a water level decline between 1 and 5 feet would not expose well screens, cause damage, or reduce yield in the groundwater supply wells that could be influenced by the MPWSP. All in all, the project was determined not to result in a significant impact in terms of groundwater supplies either quantitatively or qualitatively. Thus, it appears reasonable to conclude that the MPWSP would not result in harm or injury to the water rights of legal users of water in the Basin in terms of fresh water supply or water quality, two of the Report's three injury criteria relative to the development of legal water rights.

Turning to the third of the three injury criteria set forth in the Report – increased pumping costs – as noted above, the water levels in seven potentially active wells could drop by somewhere between 1 and 5 feet, thus requiring marginally more energy to extract the water from those wells. As a physical solution to ensure that those well owners continue to enjoy the same measure of water rights as they do prior to MPWSP implementation and thus are not injured, CalAm could compensate the well owners for any increased pumping costs causally tied to the MPWSP. Assuming that CalAm were to compensate the owner of these wells for any increased pumping costs sustained due to the MPWSP, the slant wells' operation would not cause injury under the Report's third injury criteria.

Furthermore, CalAm has proposed a mitigation measure (set forth in Section 4.4, Groundwater Resources as Mitigation Measure 4.4-3) to further ensure that Basin groundwater users are not injured. Working with the Monterey County Water Resources Agency, CalAm would fund the installation of monitoring wells to expand the County's network of groundwater monitoring wells so as to be better able to monitor on an on-going basis the effect of the project slant wells on groundwater within the radius of influence. If the monitoring efforts were to demonstrate that the project were affecting any existing neighboring active wells, CalAm would coordinate with the affected well owner and take both interim and long-term steps to avoid harm (possibly including improving well efficiency, providing a replacement water supply and/or compensating the well owner for increased costs).

In light of the foregoing, it seems reasonable to conclude that the MPWSP would not cause harm or injury to Basin water rights holders such that CalAm would possess the right to withdraw water from the Basin to produce "developed water" for beneficial use and under the physical solution doctrine.

The entirety of the geographical area of the Basin that would be affected by the project contains brackish water rather than fresh water. Based on the groundwater modeling and as discussed in the Groundwater Resources section, while the project may actually improve the Basin's seawater intrusion issue by slowing the seawater interface line from advancing more inland, the project is not forecasted to draw any fresh water through the MPWSP source water supply wells over the life of the project. If indeed no fresh water is withdrawn by the project, then no physical solution in the form of return to the Basin of fresh water (or other off-setting mechanism to alleviate the harm) would be required in order for CalAm to secure and maintain water rights for the project feedwater. If the water in the Basin were to become fresher in the future such that the MPWSP supply wells

were drawing fresh water from the Basin, then a physical solution (such as the proposed return component of the project, discussed below) would be needed in order for CalAm to maintain rights to the Basin water for the project.[36]

In any event, the proposed project does include a return water component. CalAm proposes to return to the Basin the percentage of supply water that is determined to have originated from the inland aquifers of the Basin, i.e., the fresh water component of the water that is extracted by the slant wells as if the brackish water could be segregated between its ocean (seawater) and inland (fresh water) elements. Not only would this plan further ensure that there is no injury to Basin groundwater users, but the Basin and its groundwater users could be benefitted by the return of fresh water to the seawater-intruded Basin.

The Report stated in this regard:

> Cal-Am could use one or more of several possible methods to replace any fresh water it extracts from the Basin. Cal-Am could return the water to the aquifer through injection wells, percolation basins, or through the CSIP. Cal-Am would need to determine which of those methods would be the most feasible, and would in fact, ensure no harm to existing legal users. The feasibility analysis would depend on site-specific geologic conditions at reinjection well locations and at the percolation areas. These studies need to be described and supported in detail before Cal-Am can claim an appropriative right to export surplus developed water from the Basin.

Report at 39. The Report further provides that percolation basins or injection wells would need to be located "where the underlying aquifer does not contain degraded water" (Report at 45); "it would not be appropriate to inject or percolate desalinated water in [the] intruded area, as the water would essentially be wasted." Report at 32.

CalAm has worked with other stake-holders to develop its current proposal for returning water to the Basin. The construct proposed was not an identified option at the time that the SWRCB Report was prepared and thus was not specifically addressed therein, but appears to advance the goals stated in the Report for returning water to the Basin. CalAm proposes to deliver fully desalinated water to end users for use in lieu of existing groundwater production from the SVGB. The two points of delivery would be (i) to the Castroville Community Services District (CCSD) to supply water for municipal purposes (e.g., typical drinking, bathing, sewer, watering and other non-agricultural water uses) and (ii) to the Castroville Seawater Intrusion Project (CSIP) pond or directly into the reclaimed water CSIP pipe for use by the agricultural users that obtain water through CSIP. Under these return water locales, the clean desalinated water would be provided for municipal or agricultural use (respectively) in lieu of pumping Basin water in an amount equal to the quantity of return water. The return water would be supplied as follows:

[36] The Report addresses the effects on the water rights equation of possible changed conditions in the Basin over time. See Report at pages 43-45. Appropriate physical solutions in the event that the MPWSP wells draw a higher proportion of fresh water in the future may vary depending on whether the higher amount of fresh water results from the MPWSP itself or is due to other causes. The Report states that if increased availability of fresh water were not attributed to the MPWSP and the fresh water extractions could not be returned to the Basin in sufficient quantities, CalAm may have to limit extractions or otherwise modify its project so as to eliminate harm to Basin water users.

1. At the start-up of the MPWSP, 175 acre feet of return water would be provided to CSIP.
2. Each year, 805 acre feet of return water will be provided to CCSD, even if the calculated amount of Basin water withdrawn by MPWSP is less than that amount.
3. To the extent that the calculated amount of Basin water withdrawn by MPWSP exceeds 805 acre feet, that excess amount will be provided to CSIP.

Water is expected to be returned between May and November of the same calendar year as it is withdrawn (see Chapter 3, operating table) such that the senior overlying and prescriptive users would not suffer harm from loss of water. As examined by the groundwater modeling and explained in the Groundwater Resources section, this proposed return water plan would improve groundwater conditions in the 400-Foot Aquifer underlying the CSIP, CCSD and adjacent areas because water levels would increase as a result of in-lieu groundwater recharge, and would benefit each of the aquifers by either reducing the area of influence of the MPWSP or by increasing groundwater levels in other areas. Since this return option would essentially put the Basin in a "no net loss" position in terms of fresh water quantity and would benefit legal water users by providing fresh water for beneficial use in lieu of Basin pumping, it appears consistent with the Report and enhances the preliminary conclusion that CalAm would likely possess water rights for the project.

2.6.3 Effect of Monterey County Water Resources Agency Act

In 1990, the State Legislature enacted the Monterey County Water Resources Agency Act (the Agency Act), creating the MCWRA as a flood control and water agency. The jurisdictional boundaries of the MCWRA are coterminous with County of Monterey boundaries. Per the Agency Act, MCWRA is charged with preventing the waste or diminution of the water supply in its territory by, among other things, controlling groundwater extractions and prohibiting groundwater exportation from the Salinas River Groundwater Basin. When it enacted the Agency Act, the California State Legislature expressly provided that: "no groundwater from that basin may be exported for any use outside the basin, except that use of water from the basin on any part of Fort Ord shall not be deemed such an export. If any export of water from the basin is attempted, [MCWRA] may obtain from the superior court, and the court shall grant, injunctive relief prohibiting that export of groundwater." Agency Act at section 21. The Agency Act further empowers the MCWRA to prevent extraction of groundwater from particular areas of the Basin if needed to protect groundwater supplies. Accordingly, MCWRA adopted Ordinance 3709 (the "Ordinance") prohibiting groundwater extraction within the northern Salinas Valley between the depths of 0 mean sea level and -250 mean sea level.

This section evaluates whether it appears at least preliminarily that the proposed project would be consistent with the Agency Act (including the Ordinance) such that the application of the Agency Act would not undermine the project's right to withdraw and supply water and thus, impair the feasibility of the project from water rights and legal feasibility perspectives.

First, the State Water Resources Control Board Report, discussed in detail above, raises the question as to whether the Agency Act would apply to all of the proposed project groundwater

extractions given the location of some screens of the slant wells outside the jurisdictional boundaries of the County:

> The applicability of the Agency Act to the MPWSP is unclear. As currently proposed, the project would use slanted wells and have screened intervals located seaward of the beach. Although the project would serve areas within the territory of the MPWSP, the points of diversion for these proposed wells may be located outside the territory of MCWRA as defined by the Agency Act.

Report at 39. The Agency Act's effect on project feasibility may be minimized by virtue of its application only to water drawn through well screens located within County jurisdiction. Assuming, however, that the Agency Act would apply to the entire project, the Report (while acknowledging that the SWRCB is not the body charged with interpreting the Agency Act) opines that the project would appear consistent with the Agency Act and the Ordinance given that the project would return to the Basin any quantity of fresh water withdrawn from the Basin. The Report states:

> Based on the State Water Board's analysis, as reflected in the Report, the Project as proposed would return any incidentally extracted usable groundwater to the Basin. The only water that would be available for export is a new supply, or developed water. Accordingly, it does not appear that the Agency Act or the Ordinance operate to prohibit the Project. The State Water Board is not the agency responsible for interpreting the Agency Act or MRWCA's ordinances. It should be recognized, however, that to the extent the language of the Agency Act and ordinance permit, they should be interpreted consistent with policy of article X, section 2 of the California Constitution [declaring that the waters of the state shall be put to maximum beneficial use], including the physical solution doctrine . . .

Report at 40. Therefore, it appears at least preliminary reasonable to conclude that the project would be consistent with the Agency Act and the Ordinance such that those laws would not impair project feasibility.

2.6.4 Effect of Annexation Agreement

In 1996, the MCWRA, the MCWD, the City of Marina, the owners of Armstrong Ranch and then owners of the CEMEX property (RMC Lonestar) entered into an *Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands* ("Annexation Agreement").[37] The agreement established a framework for management of groundwater from the Basin and included terms and conditions for the annexation of lands (including the Armstrong Ranch and CEMEX properties) to MCWRA's benefit assessment zones as a financing mechanism to fund groundwater resource protection and reduction of seawater intrusion (MCWD, et al. 1996).

Under the Annexation Agreement, MCWD's authority to withdraw potable groundwater from the Basin would be limited to 3,020 afy year until such time as a plan for development of a long-term potable water supply capable of mitigating seawater intrusion was developed and implemented. If

[37] The MRWPCA was not a party to the Annexation Agreement. However, an Addendum attached as Exhibit G to the Annexation Agreement provides that MRWPCA could later elect to become a party to that Agreement.

and when the Armstrong Ranch property were annexed to MCWD's benefit assessment zones, non-agricultural use of Basin groundwater withdrawn from that property would be capped at 920 afy. If and when the CEMEX property was annexed to MCWD's benefit assessment zones, withdrawal of groundwater from that property would be capped at 500 afy.

The Armstrong Ranch property is not included as part of the proposed MPWSP. However, at the CEMEX property (where CEMEX currently conducts sand mining operations), CalAm proposes construction of subsurface slant wells extending offshore under Monterey Bay and other infrastructure to support the MPWSP Seawater Intake System. Consequently, this section addresses the status of annexation of the CEMEX property pursuant to the Annexation Agreement to determine its effect on MPWSP feasibility and the rights of CalAm to withdraw water from wells drilled on the CEMEX property. Specifically, this section examines: (1) whether annexation of the CEMEX property has occurred, triggering the 500 afy groundwater withdrawal limitation; and (2) whether that withdrawal limitation (if effective) would apply to water withdrawn by the MPWSP slant wells, such that CalAm would lack the right to pump the requisite water for the project and operation of the MPWSP would become infeasible.

Section 7.3 of the Annexation Agreement provides that "Lonestar Property annexation to the Zones will not take effect until the Lonestar Property has been approved for prior or concurrent annexation into MCWD" (MCWD, et al. 1996). Annexation of the property, now owned by CEMEX, requires compliance with CEQA and discretionary approval by the Monterey County Local Agency Formation Commission (LAFCO). At its June 12, 2012 regular board meeting, the MCWD Board adopted a resolution (No. 2012-42) to initiate CEQA studies and submit to LAFCO an application for the annexation of the CEMEX property into the MCWD. However, at its November 30, 2012 meeting, counsel for the MCWD Board reported that no application to LAFCO for annexation of the CEMEX property had been submitted (MCWD, 2012). At that same meeting, the MCWD Board adopted Resolution 2012-88, which requires a super majority vote of 4 of 5 MCWD Board members or a majority of the voters within the 1975 jurisdictional boundaries of MCWD to approve any future land annexation (MCWD, 2012).

The MCWD Board considered the status of this possible annexation at its February 17, 2015 meeting. As of that date, no requisite CEQA document for annexation of the CEMEX property had been started and no LAFCO annexation application for the CEMEX property had been submitted. The Agenda Transmittal from the MCWD staff for the February 17, 2015 Board meeting identified several issues and hurdles that would impair MCWD's ability to move forward with annexation of the CEMEX property. Specifically, based upon meetings with the LAFCO Executive Director and CEMEX officials, the MCWD staff reported that annexation would also require approval of a sphere of influence amendment by LAFCO; such an amendment would need to be consistent with the City of Marina General Plan, which does not envision development of the CEMEX property in a manner that would require MCWD water service; CEMEX does not envision developing its land so as to justify provision of urban-level services by MCWD; and CEMEX would not be willing to pay to the County the fee for annexation to MCWD. In light of these facts, MCWD staff concluded that submitting the required application to LAFCO would be "costly and potentially not achievable in the end." (MCWD, 2012). As of the end of 2016,

MCWD has taken no further action to pursue annexation of the CEMEX property. MCWD's 2015 Urban Water Management Plan, adopted June 6, 2016, notes that the Annexation Agreement would not take effect until the CEMEX property were annexed. Therefore, with respect to the CEMEX property, the Annexation Agreement is not yet effective and the 500 afy groundwater withdrawal limitation does not apply to the proposed MPWSP. The annexation does not appear likely to occur in the foreseeable future, and thus there is no current indication that the Annexation Agreement poses a feasibility issue to the project's use of water.

Moreover, even if annexation of the CEMEX property to MCWD's benefit assessment zones were to take place in the future, triggering the 500 afy groundwater withdrawal limitation, it appears that operation of the MPWSP could still be feasible. CalAm could conceivably construct and employ an injection well on the CEMEX property to return 500 afy to that property such that the MPWSP would have a net-zero effect on groundwater from the CEMEX land and conceivably could operate regardless of whether the 500 afy groundwater withdrawal limitation were imposed at some point in the future. In addition, any other proposed return to the SVGB, such as the return water program proposed as part of the MPWSP, would keep the Basin whole, serving the purpose of the Annexation Agreement as set forth in Section 1.1 of that Agreement by reducing seawater intrusion and protecting the groundwater resources of the Basin, thus arguably being consistent with the Annexation Agreement.

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