5.4 Description of Alternatives Evaluated in Detail

5.4.1 Overview

This section describes the alternatives to the proposed project that are evaluated in detail in Section 5.5 and 5.6 of this EIR/EIS, including the "no project/no action" alternative. A description of the CEQA and NEPA guidelines related to alternatives evaluations is included in Section 5.1.1.

Consistent with the CEQA Guidelines, the analysis considers the ability of the alternatives to meet all or most of the basic project objectives. Consistent with NEPA guidance, the analysis considers the ability of alternatives to meet the project purpose and need. **Table 5.4-1** below provides an overview of the alternatives evaluated in detail.

The following sections describe each of the alternatives evaluated in detail organized in the following primary categories:

- Overview
- Construction Phase
- Operation and Maintenance Phase
- Ability to Meet Project Objectives / Purpose and Need

Each alternative is described by its primary components including: water intake, brine discharge, desalination plant, and product water conveyance facilities.

TABLE 5.4-1
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

Alternative	Components: Intake Facilities	Components: Brine Discharge/ Outfall Discharge Facilities	Components: Desalination Plant	Components: Conveyance Pipelines	Components: Groundwater Replenishment Project Water Purchase Agreement
Proposed Project *Described in Chapter 3*	9 new subsurface slant wells at CEMEX and conversion of test slant well to production well (10 total wells) Intake capacity of 24.1 mgd	• Brine Disposal Pipeline and Brine Mixing Box • Existing MRWPCA ocean outfall pipeline and diffuser • Ocean Outfall End Gate Modification	New 9.6 mgd desalination plant on 25 acres at Charles Benson Rd. site	Source Water pipeline, Brine Discharge pipeline, Castroville pipeline, Pipeline to Castroville Seawater Intrusion Project (CSIP) Pond, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements. Approximately 21 total miles of pipelines.	Not part of proposed project
No Project Alternative *Described in Section 5.4.2*	No new facilities would be constructed; payback to the Seaside Groundwater Basin would not occur; reliance on existing and planned water conservation and recycling programs; likely implementation of mandatory rationing and conservation measures.				CalAm would purchase and extract 3,500 afy of GWR water from the Seaside Groundwater Basin
Alternative 1 – *Slant Wells at Potrero Road* *Described in Section 5.4.3*	10 new subsurface slant wells at Potrero Rd. Existing test slant well at CEMEX removed Same intake capacity (24.1 mgd) as proposed project.	Same as proposed project	Same as proposed project	Same as proposed project, plus a new source water pipeline between intake and desal plant that adds additional 5.5 miles of source water pipeline. Approximately 26 total miles of pipelines.	Not part of alternative
Alternative 2 – *Open-Water Intake at Moss Landing* *Described in Section 5.4.4*	New Screened Open-Water Intake at Moss Landing – one 36" diameter intake pipeline (HDD[1] installation) Existing test slant well at CEMEX removed Same intake capacity (24.1 mgd) as proposed project.	Same as proposed project	Same as proposed project	Source Water pipeline, Brine Discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an additional 6.5 miles of source water pipeline. Approximately 27 total miles of pipelines.	Not part of alternative
Alternative 3 – *Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)* *Described in Section 5.4.5*	New Screened Open-Water Intake at Moss Landing – same location as Alt. 2; • two 42" diameter intake pipelines (HDD installation) and • a 110' L x 30' W x 12' tall intake structure Existing test slant well at CEMEX removed Larger intake capacity (49 mgd) than proposed project	New Outfall at Moss Landing; • two 36" diameter discharge pipelines (HDD installation) and • a 140'L x 10' W x 15' tall discharge structure	New 22 mgd desalination plant and co-located data center at 110-acre "East Tank Farm Parcel" off Dolan Road, Moss Landing	New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an 8 mi source water pipeline, transfer and brine discharge pipelines, and two new pipelines to serve other areas (Salinas and Santa Cruz Co; approximately 25 miles). Approximately 48 total miles of pipelines.	Not part of alternative

TABLE 5.4-1 (Continued)
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

Alternative	Components				
	Intake Facilities	**Brine Discharge/ Outfall Discharge Facilities**	**Desalination Plant**	**Conveyance Pipelines**	**Groundwater Replenishment Project Water Purchase Agreement**
Alternative 4 – *People's Moss Landing Water Desalination Project (People's Project)* *Described in Section 5.4.6*	New Screened Open-Water Intake at Moss Landing – same general location as Alt. 2, but different installation ● 40" diameter pipeline, combination HDD and laid on seafloor (for 1,100') ● two 96" diameter screened intakes Existing test slant well at CEMEX removed Larger intake capacity (approx. 30 mgd) than proposed project	New Outfall at Moss Landing; extension of existing outfall ● 36" diameter pipeline, combination HDD and laid on seafloor (for 700') ● two 16" diameter diffuser ports	New 12 mgd desalination plant at former National Refractories facility in Moss Landing	New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an alternative 8-mile-long source water pipeline. Approximately 20 total miles of pipelines.	Not part of alternative
Alternative 5a[2] – *Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at CEMEX)* *Described in Section 5.4.7*	Same as proposed project, but fewer slant wells (7) at CEMEX Smaller intake capacity (15.5 mgd) than proposed project	Same as proposed project except there would be less brine discharged.	New 6.4 mgd desalination plant at Charles Benson Rd site.	Same as proposed project, approximately 21 total miles of pipelines.	CalAm's purchase and extraction 3,500 afy of GWR water from the Seaside Groundwater Basin is considered in the cumulative analysis
Alternative 5b – *Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at Potrero Road)* *Described in Section 5.4.8*	Same as Alternative 1, but fewer slant wells (7) at Potrero Road Existing test slant well at CEMEX removed Smaller intake capacity (15.5 mgd) than proposed project			Same as proposed project, plus an additional 5.5 miles of source water pipeline, approximately 26 miles of pipelines.	

NOTES:

1 Horizontal Directional Drilling (HDD) is described in Section 3.3.4.3 in Chapter 3, Description of the Proposed Project

2 Alternative 5 includes a reduced size desalination plant. The CPUC authorized CalAm to enter into a water purchase agreement for 3,500 afy from the GWR Project, and to build the new Monterey Pipeline and associated pump station needed for the GWR project, in September 2016. As a result, the GWR project is a reasonably foreseeable future project, and the cumulative impact scenario evaluated for Alternatives 5a and 5b includes implementation of the GWR project. The GWR project is not considered for cumulative impacts in conjunction with the proposed project or Alternatives 1, 2, or 4 because if a desalination option is selected that is of a size sufficient to fully satisfy the project objectives in terms of water supply, such choice would presumably mean that the GWR project was not successful in securing funding, completing construction and undertaking operations. The GWR project is conservatively considered for cumulative impacts with Alternative 3 because under that option, CalAm could meet its full project water supply objectives via the DeepWater Desal project, or could obtain water from a combination of the DeepWater Desal project and the GWR Project. See Table 4.1-2 in Section 4.1.

5.4.1.1 Alternatives Development

This EIR/EIS examines three types of action alternatives: alternatives to the CalAm proposed project; reduced capacity alternatives, and desalination projects proposed by other entities.

First, the EIR/EIS analyzes alternatives to CalAm's proposed MPWSP. In Section 5.3, the action Alternative 1 (Slant Wells at Potrero Road) and Alternative 2 (Open-Water Intake at Moss Landing) were identified by screening alternative desalination plant components – water intake, brine discharge outfalls, and desalination sites. Components that are considered to be the least environmentally damaging are then combined into "whole" alternatives in Section 5.4.

Second, the action alternatives include two reduced capacity alternative scenarios. As explained in Chapter 1, CalAm's application includes two capacity options or build-out scenarios. The first option, the "Proposed Project," is designed to meet the full project objectives for water supply. The second option (Alternative 5) would meet the project objectives by combining a reduced-capacity desalination plant (6.4 mgd) with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from another source, the Pure Water Monterey Groundwater Replenishment (GWR) project. Two variations of the reduced capacity alternatives (5a and 5b) are provided based on alternative locations for the slant well intakes (CEMEX or Potrero Road).

Third, the EIR/EIS identifies two other desalination projects proposed by project proponents other than CalAm, that would provide water service to the CalAm Monterey District Service Area. The first project is the Monterey Bay Regional Water Project, also known as Deepwater Desal (Alternative 3); and the second is the People's Moss Landing Desalination Project (Alternative 4). Both projects at are different stages in development, and the project descriptions contained in this EIR/EIS are based on available information about the projects. These projects will be the subject of their own, separate, CEQA and NEPA processes.

5.4.2 No Project Alternative

Both CEQA and NEPA require that an EIR/EIS consider and analyze a "no project" or "no action" alternative. CEQA Guidelines Section 15126.6(e) provides the following guidance on the "no project" alternative:

- An EIR shall consider the specific alternative of "no project" and evaluate its impacts to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.
- The no project analysis shall discuss the existing conditions at the time the Notice of Preparation was published as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure.
- If the proposed project is a development project on identifiable property, the no project alternative is the circumstance under which the project does not proceed.

As described in the subsections below, the No Project Alternative reflects the scenario in which neither the proposed project nor Alternatives 1 through 5, described in Sections 5.4.3 through 5.4.8, would proceed.

Additionally, CEQ NEPA regulations at 40 CFR 1502.14 state that the alternatives analysis shall include an alternative of taking no action. In the case of the federal agency action, "no action" would mean that MBNMS would not authorize those portions of the proposed project or alternatives that would occur in the sanctuary. Where a choice of "no action" by the agency would result in predictable actions by others, this consequence of the "no action" alternative should be included in the analysis. Without MBNMS authorization, the proposed project and alternatives could not take place. Therefore, for purposes of this EIR/EIS, the CEQA No Project Alternative and the NEPA No Action Alternative are the same.

5.4.2.1 Overview

Under the No Project Alternative, the CPUC would not issue a CPCN for the MPWSP or another alternative; MBNMS would not issue authorizations or a special use permit for the components of the project within MBNMS, and no facilities would be constructed. CalAm would continue to operate its Monterey District facilities in compliance with the 2009 SWRCB Cease and Desist Order (CDO) as amended by SWRCB Order WR 2016-0016 (together referred to herein as the Revised CDO, described in more detail below) and the Seaside Groundwater Basin Adjudication.[1] Under the No Project Alternative, at the end of the Revised CDO extension period, CalAm would have an estimated 6,380 afy of potable water available for delivery within its service area from existing sources. The components of the No Project Alternative (i.e., changes compared to baseline conditions) that are the basis for analysis of its impacts in this EIR/EIS are as follows:

- Reduction in total water supply available to serve CalAm's Monterey District. CalAm's current supply is approximately 11,840 afy, and total long-term supply under the No Project Alternative would be 6,380 afy.[2]
- Between 2018 and 2021, curtailed diversion limits from the Carmel River system of 7,310 to 4,310 afy compared to current rate of pumping (8,310 afy);
- Reduction in pumping from Seaside Groundwater Basin from current operating yield of 2,200 afy to a safe yield of 1,474 afy; and
- Implementation of Revised CDO Stage 3 Conservation Measures and Stage 4 Rationing.

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1 The April 2015 MPWSP DEIR included two No Project Alternatives: No Project A was consistent with the CDO at the time; No Action B included an extension of the CDO timeframe. The No Project alternative in this EIR/EIS is consistent with the Revised CDO.

2 This estimate assumes a long term average supply of 1,300 afy from aquifer storage and recovery and that 230 afy would be available from the Sand City desalination plant, in addition to 3,376 afy from the Carmel River and 1,474 afy from the Seaside Groundwater Basin. Less water will be available from Sand City in the longer term; CalAm's supply from the Sand City desalination plant will eventually be reduced to 94 afy, although more is available until Sand City needs it for its own development. As under the MPWSP, the amount that would be available from aquifer storage and recovery could vary year to year depending on rainfall and river levels; less supply could be available at the end of 2021 if there are dry years between now and then.

Additionally, the analysis of the No Project Alternative considers the following differences compared to the proposed project; however, these are not considered direct or indirect impacts of the No Project Alternative because they do not represent a change from baseline conditions; rather, they represent avoided impacts or benefits not realized, and are discussed for purposes of comparison:

- No construction;
- No increase in total water supply to the estimated 16,430 afy with the proposed project;
- Between 2018 and 2022, 10,000 total fewer acre-feet of water diverted from Carmel River to customers;
- No increase in the Aquifer Storage and Recovery Project (ASR) reliable yield from 1,300;
- Continuation of moratorium on new water permit applications; and
- No “payback” to the Seaside Groundwater Basin.

A comparison of the components of the No Project Alternative to existing conditions and to the proposed project is provided in **Table 5.4-2**. These components are described in more detail in Sections 5.4.2.2 and 5.4.2.3.

**TABLE 5.4-2
COMPARISON OF THE NO PROJECT ALTERNATIVE
TO EXISTING CONDITIONS AND THE PROPOSED PROJECT**

Existing Conditions	Proposed Project	No Project Alternative
Construction		
n/a	Construction of MPWSP components as described in Chapter 3	No new construction; decommissioning of the test slant well
Operations		
8,310 afy diverted from Carmel River system	8,310 afy diverted until January 2022; 3,376 afy thereafter	8,310 afy reducing by 1,000 afy per year from 2018 to 2022; 3,376 afy thereafter Total of 10,000 af less water diverted from river between 2018 and 2021 compared to proposed project
Pumping of 2,200 afy from Seaside Basin	Pumping of 774 afy from Seaside Basin for 25 years; 1,474 afy thereafter 17,500 af payback to basin over 25 years	Pumping from Seaside Basin reducing to 1,474 afy by 2021 No payback
ASR reliable yield of 1,300 afy	Increased ASR injection capacity and long-term reliability	No increase in ASR injection capacity or long-term reliability *
Moratorium on new water service connections	Moratorium lifted	Moratorium continued
Stage 1 and 2 Conservation Measures in place	Stage 1 Conservation Measures continued Stage 2 Conservation Measures may sunset when conditions met	Stage 1 and 2 Conservation Measures continued Stage 3 Conservation Measures and Stage 4 Rationing implemented

NOTES:
* The separate Monterey Pipeline and Pump Station project, described as project No. 60 in Table 4.1-2 in Section 4.1, would increase the ability to convey ASR water to approximately 1,600 afy when completed. This is not a component of the No Project Alternative, but is considered a project in the cumulative scenario relevant to this alternative.

5.4.2.2 Construction

Under the No Project Alternative CalAm would not build any MPWSP facilities. Therefore, none of the construction described for the proposed project in Section 3.3 of Chapter 3, Description of the Proposed Project, would occur. However, the test slant well, currently permitted to operate intermittently until February 2019, would be decommissioned as described in Section 4.2.5 (Secondary Impacts of Mitigation Measure 4.2-10).

5.4.2.3 Operation and Maintenance

Under the No Project Alternative, the concept of "operation and maintenance" refers to CalAm's ongoing operation of its Monterey District water supply and distribution system with the water supplies and demands that are predictable based on applicable restrictions and regulations and other factors affecting both supply and demand. This section describes the estimated deficit in water supply compared to demand, the actions and circumstances that could affect that estimate, and the actions that would be triggered by that deficit in order to maintain essential water supply and comply with regulations (i.e., the conservation and rationing requirements described below).

Supply Shortages

Baseline water demand in the service area is approximately 12,595 afy based on 2010 annual demand of 12,270 afy and 325 afy for existing Pebble Beach water entitlements, shown in Table 2-3 in Chapter 2. Under the No Project Alternative, no increase from baseline water demand would be reasonably predictable. Because the MPWSP or an alternative new water supply would not be implemented, this scenario assumes that potential demands associated with hospitality industry rebound[3] and legal lots of record could not be served, and thus are not counted among demands under the No Project Alternative. This scenario also assumes that there would be no "payback" to the Seaside Groundwater Basin of the amount of water CalAm has pumped in excess of its adjudicated right. That is, given that the commencement of the basin replenishment (or payback) is contingent upon having a new water supply to augment existing sources,[4] it is assumed that under this alternative, CalAm's basin replenishment obligation would be delayed indefinitely due to the lack of sufficient supply.

3 Increased demand that resulted from economic recovery at existing businesses would not require new water connections or permits to be served. However, given the constrained supply that would result under the No Project Alternative, economic rebound resulting in increased demand at existing water customers is not considered reasonably foreseeable under this alternative. Therefore, additional demand at existing businesses resulting from economic recovery is not considered part of the baseline service area demand for this analysis. (See also Section 5.5.20 regarding anticipated socioeconomic impacts of the No Project Alternative, and the discussion of this demand component in Section 6.3, which assumes that a degree of economic rebound identified by CalAm in its application as future demand has already occurred and is therefore reflected in existing annual demand.)

4 As discussed in Chapter 2, Section 2.2.4, CalAm is required to replenish the quantity of groundwater it has produced in excess of its adjudicated right in the period since the groundwater basin was adjudicated. CalAm's commitment to replenish the groundwater basin is based on a 2008 Memorandum of Understanding between CalAm and the Seaside Groundwater Basin Watermaster that calls for CalAm to commence replenishment on a feasible schedule upon completion and implementation of a water supply augmentation project. In 2014, CalAm and the Watermaster agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy upon completion and implementation of the MPWSP. CalAm's production from the basin during the replenishment period under the MPWSP would therefore be limited to 774 afy for 25 years. This replenishment would not occur under the No Project Alternative.

During the Revised CDO extension period under the No Project Alternative, CalAm's available supply of potable water to serve the Monterey District would decrease from 11,314 afy to 6,380 afy between 2017 and 2021. Supply would consist of the following existing sources:

- Continued use of Carmel River system water in compliance with SWRCB Order 95-10 and the Revised CDO; water supply of 8,310 afy, reduced by 1,000 af each October from 2018 through 2021, and 3,376 afy thereafter (*i.e., the Effective Diversion Limit; see Table 5.4-2 for difference between proposed project and No Project Alternative by water year*);
- Continued pumping of 1,474 afy from the Seaside Groundwater Basin (*in accordance with the Seaside Groundwater Basin adjudication; compared to 774 afy under the proposed project during 25-year replenishment period, and 1,474 afy thereafter*);
- Continued use at the end of the Revised CDO extension period of approximately 230 afy provided by Sand City's existing desalination plant (*eventually decreasing to CalAm's long-term supply from Sand City desalination plant of 94 afy, same as proposed project*); and
- Continued use of 1,300 afy from the existing Phase I and II projects of the ASR system.

SWRCB Order WR 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 to September 30, 2016) and established annual milestones that CalAm must meet in order to maintain the 8,310 afy diversion limit through 2021. Meeting the milestones would demonstrate tangible progress in developing an alternative water supply that will enable CalAm to reduce and terminate its unlawful diversions. If CalAm fails to meet a milestone in any given water year, the Revised CDO specifies that the annual diversion limit will be reduced by 1,000 afy for each of the following water years. The 1,000 afy reduction is only further reduced if another milestone is not met. Because five of the seven milestones require (or consist of) MPWSP approval, they would not be achievable under the No Project Alternative (which by definition assumes that the MPWSP would not be approved). Therefore, between 2016 and 2021, CalAm's diversions from the Carmel River would be reduced as shown below in **Table 5.4-3**. The analysis assumes that CalAm would achieve the milestones related to the Pure Water Monterey Groundwater Replenishment Project (GWR Project), which do not depend on MPWSP approval. Thus, based on the assumptions regarding Revised CDO milestones shown in the **Table 5.4-3**, prior to December 31, 2021 CalAm's supply from the Carmel River would range from 8,310 afy in 2016 to 4,310 afy at the end of 2021, and consist of its legal limit, 3,376 afy, thereafter.

In addition to the above-listed existing sources of water, the approved GWR Project, if fully implemented, could provide additional supply to the Monterey District. The GWR Project is separate from MPWSP and is considered a reasonably foreseeable project in the cumulative context for the No Project Alternative, but is not a component or consequence of this alternative, and therefore is not considered further in this subsection as a potential source of supply. See Section 5.4.2.4, Ability to Meet Project Objectives.

TABLE 5.4-3
ANTICIPATED CARMEL RIVER SYSTEM WATER SUPPLY UNDER THE NO PROJECT/ NO ACTION ALTERNATIVE BASED ON ORDER WR 2016-0016

Water Year	Milestone	Milestone Feasible / Assumed to Be Met under No Project / No Action?	Assumed Diversion Limit under No Project / No Action (afy)	Assumed Diversion Limit under Proposed Project (all milestones met; afy)	Date Reduction Assessed
2015-2016	CPUC approval of (1) Water Purchase Agreement for GWR Project water and (2) construction of CalAm components of the GWR Project conveyance facilities (the Monterey Pipeline and Pump Station)	Yes[a]	8,310	8,310	12/31/2016
2016-2017	Construction of the Monterey Pipeline and Pump Station commences	Yes[a]	8,310	8,310	Oct 1, 2017
2017-2018	CPUC Issuance of CPCN for MPWSP	No[b]	8,310	8,310	Oct 1, 2018
2018-2019	Construction of MPWSP desalination plant commences	No	7,310[c]	8,310	Oct 1, 2019
2019-2020	Completion of at least one source water production well; partial completion of other MPWSP components	No	6,310[c]	8,310	Oct 1, 2020
2020-2021	Additional progress on MPWSP production wells and other components	No	5,310[c]	8,310	Oct 1, 2021
2021-2022 and beyond	Substantial completion of MPWSP, allow delivery of MPWSP water	No	4,310 – 3,376[d]	8,310 to 3,376[d]	NA

NOTES: NA = Not applicable

[a] The milestones related to the GWR Project, which do not depend on MPWSP approval, have already been achieved.

[b] Issuance of a Certificate of Public Convenience and Necessity (CPCN) would constitute project approval, which is not assumed under this alternative.

[c] The City of Pacific Grove Local Water Project (No. 22 in Table 4.1-2 in Section 4.1) and the Monterey-Pacific Grove Area of Special Biological Significance (ASBS) Stormwater Management Project (No. 45 in Table 4.1-2 in Section 4.1) are recognized in the CDO as an available water supplies that if developed by Pacific Grove, would offset the required reductions resulting from a missed milestone, one acre foot for every acre foot offset by the use of recycled water. These projects could provide up to 192 afy in offset demand

[d] This analysis assumes a diversion limit of 4,310 afy through December 31, 2021 and diversions of only 3,376 afy, CalAm's legal entitlement, thereafter.

SOURCE: SWRCB, 2016.

The No Project Alternative water supplies of 11,314 afy through September 2018, which would be reduced to 6,380 afy by January 2022, could not serve the baseline demand of 12,595 afy. It is assumed that CalAm and MPWMD would continue their implementation of existing conservation programs and measures, described in Appendix K, with the same intensity as under existing conditions. Because these programs and measures, such as limiting losses from aging pipes, are existing and ongoing efforts, they are not considered a component of the No Action Alternative, but do provide context for potential further reductions in demand compared to baseline. Estimates of the effect of these ongoing programs on baseline demand are provided in Appendix K to the extent that they can be quantified. As described in Appendix K, the expected reduction in demand by 2021 from these ongoing conservation and demand management measures is approximately

1,260 afy, resulting in a total estimated baseline demand in 2021 of approximately 11,335 afy (i.e., 12,595 afy less 1,260 afy).

Monterey Peninsula Water Conservation and Rationing Plan Actions

Even with the potential reductions in demand between 2016 and 2021 described above, CalAm's available supply would not be able to meet estimated demand during any water year under the No Project Alternative. The long-term available water supply totaling approximately 6,380 afy at the end of the Revised CDO extension period (2021) is roughly 6,215 afy less than or approximately 51 percent of the existing baseline demand of 12,595 afy. Even assuming continued conservation efforts, this amount is roughly 4,955 afy less than or 56 percent of the total estimated demand of 11,335 afy anticipated by 2021 (reductions described above).[5] It is assumed that this deficit between available supplies and total demand under the No Project Alternative would trigger actions under MPWMD's 2016 Monterey Peninsula Water Conservation and Rationing Plan (Conservation and Rationing Plan) (MPWMD, 2016).

The Conservation and Rationing Plan, which comprises MPWMD Rules 160 to 167, requires (pursuant to MPWMD Rule 160) that MPWMD approve a physical storage target, as of May 1 each year, for the sources within the Monterey Peninsula Water Resources System (MPWRS)[6] and approve the distribution of monthly production from the water sources within the MPWRS on a quarterly basis. The production targets are based on production limits specified in SWRCB CDO Order WR 2009-006 and the Seaside Groundwater Basin Adjudication Decision. Triggers for Stages 2 and 3 Conservation and Stage 4 Rationing are determined, in part, by comparison of the annual available storage with storage that had been needed in the previous 12 months and comparison of the monthly production targets with actual monthly production. As with MPWMD's previous water conservation and rationing plan, Stage 1, Water Conservation: Prohibition of Water Waste (MPWMD Rule 162), remains in effect at all times and applies to all water users.

As noted, production targets are based on production limits specified in the CDO and the Seaside Groundwater Basin Adjudication. Therefore, under the No Project Alternative, production targets would be based on available supplies discussed above (i.e., no more than 3,376 afy from the Carmel River and 1,474 afy from the Seaside Groundwater Basin). Currently, actual production is more than 4,500 afy greater than the final Carmel River production limit of 3,376 afy. This analysis therefore assumes that actual production in the 12 months before the final CDO production limit takes effect would exceed the production target by more than 5 percent and

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5 A comparison of available supplies under the No Project Alternative at the end of the Revised CDO extension period with the most recent demand year, 2015, reveals a smaller but still substantial shortfall – 3,165 afy. Since 2015 was the fourth year of a major drought, during which drought regulations were in effect and there was heightened awareness of drought conditions, and does not include demand associated with existing Pebble Beach water entitlements, this analysis considers the comparison with 2010 demand and Pebble Beach entitlements, reduced by additional ongoing conservation programs, to more accurately reflect the difference between available supplies under the No Project Alternative and existing service area demand. These comparisons of available supplies and demand do not include demand associated with vacant legal lots of record or economic recovery that CalAm proposes to meet with the MPWSP (discussed in Section 2.3.3 of Chapter 2, Water Demand, Supplies, and Water Rights).

6 System storage includes storage in the Carmel Valley Alluvial Aquifer, the Seaside Groundwater Basin, and the Los Padres Reservoir.

trigger Stage 3 Water Conservation: Conservation Rates (MPWMD Rule 164), which could lead to Stage 4 Water Rationing (MPWMD Rule 165).

Stage 3 Water Conservation involves implementation of two succeeding conservation rate levels. Level 1 consists of a 25 percent surcharge on then-existing rates and Level 2 (to be implemented after the imposition of Level 1 for three months, if the monthly production target continues to be exceeded) consists of a 40 percent surcharge. (Neither surcharge would apply to residential customers in the first tier of water usage.) Stage 4 Water Rationing could be triggered if Stage 3 is deemed unsuccessful or Stage 3 fails to sunset after a period of eight months. Stage 4 could also take effect if directed by a governmental or regulatory agency to enact Stage 4 (which is also the case for Stages 2 and 3). The Conservation and Rationing Plan specifies that Stage 4 shall not be triggered "if the General Manager determines upon credible evidence that production targets associated with the final Cease and Desist Order are likely to be met by adhering to the requirements of a lesser Stage."

Mandatory reductions established under Stage 4 would be equal to the shortfall (e.g., the amount by which the last 12 months' actual production exceeded the then-current production target) or another amount reflected in a governmental or regulatory order. Stage 4 rationing measures could include:

- prohibitions on all or specified non-essential water uses;
- a moratorium on accepting water permit applications;
- a prohibition against new water service;
- suspension of annexations to CalAm's service area;
- restrictions on watering and irrigating; and
- requirements for specific reductions in residential water use.

Summary

Impacts related to a No Project Alternative could result in severely supply-constrained conditions in CalAm's Monterey District. Existing conservation programs would continue to be implemented and new conservation and rationing measures would be required in an attempt to balance out the severe supply shortfall following Carmel River diversion curtailments under the Revised CDO in 2018 through 2021. Given the limited water supplies, it is assumed this alternative would trigger Stage 3, Conservation Rates, and very possibly Stage 4, Rationing Measures, of the Monterey Peninsula Water Conservation and Rationing Plan.

5.4.2.4 Ability to Meet Project Objectives

Ability to Meet Project Objectives under Baseline Conditions

The No Project Alternative would fail to meet almost all of the key objectives of the MPWSP. This alternative would achieve compliance with the Revised CDO and Seaside Basin Adjudication, but would not provide a replacement water supply in order to do so. The available potable water supply under the No Project Alternative at the end of the Revised CDO extension period would be approximately 6,380 afy. This represents approximately 51 percent of baseline demand and approximately 56 percent of estimated demand after implementation of foreseeable demand management efforts described in Section 5.4.2.3 and Appendix K. This alternative would not provide supply to allow for replenishment of water that CalAm previously pumped from the Seaside Basin in excess of CalAm's adjudicated right; would not provide water supply reliability; and would not provide supply for the development of vacant legal lots of record or supply to meet demand resulting from economic rebound of the hospitality industry (see Section 2.3.3, Other Service Area Demand Assumptions, for a discussion of these demands). The limited available water supply would trigger rationing measures and could lead to water shortages throughout the CalAm Monterey District service area.

Ability to Meet Project Objectives Assuming Implementation of the GWR Project

As noted above in Section 5.4.2.1 and shown in **Table 5.4-2**, the Carmel River supply that is assumed to be available during the Revised CDO extension period under the No Project Alternative is based on the assumption that the Revised CDO milestones pertaining to the GWR Project (which do not depend on MPWSP approval) would be met, and as of publication of the Draft EIR/EIS, these milestones have been met. The GWR Project, when constructed, would provide 3,500 afy of potable supply for the CalAm service area. With the GWR Project supply, total supplies available to CalAm at the end of the Revised CDO extension period would total about 9,880 afy, which is about 78 percent of baseline demand and approximately 87 percent of estimated demand after implementation of foreseeable demand management and offset programs and other planned projects described in Section 5.4.2.3. Although this volume of supply would be much closer to the existing demand, the No Project Alternative in combination with the GWR Project would fail to meet most project objectives. While this scenario would achieve compliance with the Revised CDO and the Seaside Groundwater Basin Adjudication, even in combination with the GWR Project, the No Project Alternative would not provide supply to allow for replenishment of water that CalAm previously pumped from the Seaside Basin in excess of CalAm's adjudicated right; would not provide water supply reliability; and would not provide supply for the development of vacant legal lots of record or supply to meet demand resulting from economic recovery and rebound of the hospitality industry. In addition to failing to provide sufficient supply to meet the average demands assumed in MPWSP planning, the No Project Alternative combined with a GWR Project water purchase agreement would not provide sufficient supply flexibility to meet most peak demands.

5.4.3 Alternative 1 – Slant Wells at Potrero Road

5.4.3.1 Overview

This alternative is based on the screening of individual project components conducted in Section 5.3, Alternatives Development and Screening Process. Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.3.3.2, Intake Option 3 – Subsurface Slant Wells at Potrero Road). The desalination plant, brine discharge, product water conveyance pipelines and ASR components would be identical to the proposed project described in Chapter 3. Therefore, the description of

Alternative 1 focuses on the locations for the intake system and source water pipelines that are different from the proposed project.

This alternative would include the decommissioning of the test slant well at CEMEX, and construction of 10 subsurface slant wells in the beach parking lot at the west end of Potrero Road in northern Monterey County, near the southern border of the unincorporated community of Moss Landing (see **Figure 5.4-1**). The Potrero Road beach parking lot, which is owned and operated by the California Department of Parks and Recreation (California State Parks), lies within the coastal zone. The LCP land use plan designation for lands adjacent to the Potrero Road parking lot is Scenic and Natural Resource Recreation. The zoning designation of lands adjacent to the parking lot is Open Space Recreation (OR). This alternative would require CalAm to obtain an easement, right-of-entry, and/or lease agreement from the California State Parks for any facility that would encroach upon State Parks Property.

The slant wells would be grouped in two clusters, with five wells in each cluster and buried in the parking area, below the hardened sand parking surface. The wellheads would be located above the maximum high tide elevation and encased in a concrete vault that could be up to 20 feet wide, 30 feet long and 10 feet deep, and buried 5 feet below grade. The concrete vault would provide maintenance access to the well heads and pumps. The slant wells would be designed as pumping wells (i.e., each well would be equipped with an electric submersible pump) and would extend 220 to 535 feet seaward of the mean high water line (MHWL), terminating approximately 120 to 150 feet under the seafloor in Monterey Bay, within the submerged lands of MBNMS.

The electrical controls for the slant wells would be located at the edge of the parking lot. The electrical control building, the only above-ground structure, would be approximately 4 feet wide, 12 feet long, and 6 feet high. Overhead electrical lines would extend from the electrical control building to Potrero Road and east along the north side of Potrero Road to connect with the existing Pacific Gas and Electric (PG&E) power line on Potrero Road.

A short, 36-inch-diameter collector pipeline would convey the water from the slant well clusters to a source water pipeline that would be constructed within Potrero Road. The source water pipeline would be located within existing rights-of-way to convey water to the desalination plant at Charles Benson Road.

The source water pipeline would extend directly east from the parking lot -- south of and parallel to Potrero Road -- continue south along Highway 1, south/southeast along Molera Road, and southwest along Monte Road to the desalination plant site on Charles Benson Road (**Figure 5.4-1**). Other than the source water pipeline, which would result in approximately 5.5 miles of additional pipeline, all other pipelines would be the same as the proposed project.

5.4.3.2 Construction

All onshore construction activities and disturbance would occur in the parking lot at the western terminus of Potrero Road, and would not disturb the dunes or active beach area. Slant well construction would occur year-round and the entire parking lot, measuring less than one acre, would be closed during construction of the slant wells and associated infrastructure. The slant wells would be designed using similar materials, size and construction methodology as the proposed slant wells for the MPWSP. The boreholes would be approximately 900-1,000 feet long and drilled at an angle of 10 degrees below horizontal across the shallow Dune Sand Aquifer and the deeper Perched "A" Aquifers; the Perched "A" Aquifer is underlain by the relatively impermeable Salinas Valley Aquitard. The length of the wells and screen section intervals would depend on the aquifer materials encountered, and would extend under MBNMS submerged lands. The slant wells would be completed using up to 22-inch-diameter casings and up to 12-inch-diameter stainless steel screens. Effluent generated during construction and development of the slant wells would be placed in Baker tanks to allow sediment to settle out, and then discharged into a buried diffuser system in the parking lot for percolation into the underlying beach sands. Cuttings generated during the drilling process and the well head construction would be drained in a separation unit, with the drainage discharged to the buried diffuser. The dewatered cuttings (estimated at less than 200 cubic yards) would be hauled offsite for final disposal at an approved site.

Electrical power for pumping operations would be provided by connecting to PG&E's existing service at the Potrero Road site, located at the northeast corner of the parking lot. New power poles are anticipated to be installed by PG&E to reach the well site. A buried electrical conduit would be installed to convey power from the northwestern most power pole to an above ground 4 feet long, 2 feet wide, and 6 feet tall electrical control panel.

Alternative 1 would require the use of horizontal directional drilling (HDD) techniques to install pipeline underneath the Old Salinas River, Tembladero Slough, and the Salinas River. HDD is described in Section 3.3.4.3 of Chapter 3, Description of the Proposed Project. Other than the extended source water pipeline, all other pipelines would be constructed in the same manner and at the same locations as the proposed project.

5.4.3.3 Operation and Maintenance

Operation and maintenance requirements would be similar to that of the proposed project intake wells, except that they would occur at the Potrero Road location. All other aspects of operations and maintenance of the slant wells under Alternative 1 would be the same as the proposed project (see Sections 3.3 and 3.4 of Chapter 3, Description of the Proposed Project).

5.4.3.4 Ability to Meet Project Objectives

Alternative 1 would contain the same elements as the proposed project and would produce the same volume of product water. However, because of the hydrogeology of the Potrero Road area, Alternative 1 would draw a greater volume of water from the Salinas Valley Groundwater Basin than the proposed project. In the event the Salinas Valley Return Water obligation is determined to be 12 percent (the highest return value simulated), Alternative 1 would meet the need for replacement supplies and meeting peak month demand, but limited supply would be available for other uses, including accommodating tourism demand under recovered economic conditions. Alternative 1 would not provide sufficient supplies to serve existing vacant legal lots of record and would therefore, not meet the project objective/need for water, some of which was to support limited growth (e.g., Objective 6).

NOTES:
* See Subsection 7.10 for a description and analysis of this Alternative Salinas Valley Return option.

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project
Figure 5.4-1
Alternative 1- Slant Wells at Potrero Road

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5.4.4 Alternative 2 – Open-Water Intake at Moss Landing

5.4.4.1 Overview

This alternative is based on the screening of individual project components conducted in Section 5.3, Alternatives Development and Screening Process. Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system located offshore and southwest of the Moss Landing Harbor entrance (described in Section 5.3.3.6, Intake Option 9 – Screened Deep-water Ocean Intake at Moss Landing). The existing test slant well would be decommissioned, and except for an additional 6.5 miles of source water pipeline, the desalination plant, brine discharge, new Desalinated Water Pipeline, new Transmission Main, and ASR components would be identical to the proposed project described in Chapter 3, Description of the Project. The Castroville Pipeline, Pipeline to Castroville Seawater Intrusion Project (CSIP) Pond, and operational components related to delivering water to Castroville Community Services District (CCSD) would not be implemented. Therefore, the description of Alternative 2 focuses on the intake system and source water pipelines that are different from the proposed project.

Open Ocean Intake System

The intake system would consist of a new intake structure in the Monterey Submarine Canyon to draw in raw seawater from the waters of MBNMS, intake piping to deliver the seawater to the shore, and an onshore intake pump station to pump the seawater to the desalination facility.

The proposed intake structure would be located on the seafloor within a ravine near the head of the Monterey Submarine Canyon, southwest of the Moss Landing Harbor entrance (see **Figure 5.4-2**) in MBNMS. The intake structure would be installed at the end of a new subsurface intake pipeline at the point where it emerges from below the seafloor approximately 1,300 feet offshore from the mean high water line (MHWL) at a depth of approximately 156 feet below mean lower low water (MLLW), in the waters of MBNMS.

The intake structure would consist of a 36-inch diameter pipeline mounted with concrete pipe supports on a reinforced concrete pad fixed to the seafloor with screw-type anchors. The intake structure would be connected to the intake pipeline with flexible couplings and would have three wedgewire screen assemblies; each assembly would have two screens. The passive narrow-slot wedgewire screens would have a 1-millimeter (mm) slot size, and the screened intake water velocity would be at or below 0.5 feet per second.

Intake Pump Station and Source Water Pipeline

Seawater would be conveyed approximately 3,600 feet from the intake structure to an onshore pump station via a 36-inch-diameter subsurface intake pipeline. A partially buried intake pump station located near the end of the railspur (on Dolan Road near SR-1) would pump the seawater to the proposed desalination plant on Charles Benson Road through a 36-inch-diameter source water pipeline. The approximate 8-mile-long pipeline alignment from the intake pump station at Moss

Landing would extend west along Dolan Road to Highway 1, continue south along Highway 1, then south/southeast along Molera Road, then southwest along Monte Road to the desalination site on Charles Benson Road.

5.4.4.2 Construction

Under Alternative 2, construction of the intake system would be different than the proposed project, but the construction of the desalination plant, brine discharge facilities, product water conveyance pipelines and ASR would be the same. The open-water intake pipeline would be installed subsurface using HDD from the intake pump station. The existing railspur and underlying embankment would be removed, and the site would be graded to the final elevation of the intake pump station. The HDD entry pit would be within the footprint of the intake pump station. A surface-launched drill rig would drill a pilot bore to the intake structure location. The pilot bore would be enlarged to the size required for the intake pipe by using a back reamer(s). The pipe would likely be assembled on barges, lowered to the seafloor and pulled back through the borehole during the final reaming process.

At the breakout face where the pipeline emerges from the seafloor, a reinforced concrete pad would be secured to the ocean floor. The seafloor may need to be prepared below the concrete pad, using suction and/or mechanical techniques. The amount of seafloor material to be removed would depend on the local changes in bathymetric grade; excavated materials would be transferred to a barge and disposed of in a suitable area onshore or offshore.

Embedment type anchors are currently anticipated to be set into the seafloor to secure the concrete pad. Once the anchors have been installed, the intake structure would be placed on the seafloor. The entire assembly would be built offsite and transported to the intake structure location, then lowered to the seafloor by crane and set into place by divers. Alternatively, the intake structure could be assembled in place by divers as needed using modular components that are fabricated offsite then barged to the site. Once the intake structure has been installed, a prefabricated section of pipe would be used to connect the intake structure to the sub-seafloor pipeline.

5.4.4.3 Operation and Maintenance

Under Alternative 2, operation and maintenance of the desalination plant and product water pipelines would be similar to the proposed project. However, the intake system, including the pretreatment filters, would require increased maintenance due to the increased particulates in the open ocean intake water compared to water drawn through a subsurface intake. The intake screens would require manual cleaning approximately once per year, over a two-day period, using divers. The seawater intake pipeline maintenance would involve pigging; the pig has an abrasive coating that scrubs the pipeline walls, removing any buildup of ocean sediments, mineral deposits, and bio-growth. The pigging process would take approximately three days, it would be confined to the interior of the pipeline, the intake would be out of service during maintenance and material removed during maintenance would be released into the ocean.

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-2
Alternative 2 - Open Water Intake at Moss Landing

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5.4.4.4 Ability to Meet Project Objectives

Alternative 2 would meet most of the project objectives because it contains most of the same elements as the proposed project and would produce the same volume of product water. However, the intake would be located farther north at a location that CalAm does not currently control, resulting in the construction of additional length of source water pipeline. It would also result in additional permitting complexity associated with the construction and operation of an open-water intake due to entrainment and impingement of marine organisms. The increased permitting complexity may delay the availability of the supply relative to the State Board's CDO, delaying the ability to serve water to meet project objectives 1 through 7.

5.4.5 Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 is the Monterey Bay Regional Water Project (MBRWP or DeepWater Desal), which is being proposed by DeepWater Desal, LLC. The DeepWater Desal project will be evaluated in a separate EIR/EIS being prepared by the California State Lands Commission (as the CEQA Lead Agency) and MBNMS (as the NEPA Lead Agency). The California State Lands Commission and MBNMS issued a joint Notice of Preparation/Notice of Intent to prepare a Draft EIR/EIS for the MBRWP project[7] on June 1, 2015 (CSLC, 2015). For the purposes of this EIR/EIS, it is considered as an alternative to the proposed project and the description herein is based on information received from MBNMS. The evaluation of this alternative in this EIR/EIS is based on information available publically, information provided by MBNMS, and the independent judgement of the analysts using the best available information. More detailed analyses of the DeepWater Desal project will be forthcoming in the separate EIR/EIS and will be based on technical studies that were not available at the time this EIR/EIS was being prepared. The approach to analysis of the impacts of the DeepWater Desal project in this EIR/EIS is intended to be reasonable so as not to over- or under-state impacts, but also draws conservative conclusions where information is currently unavailable.

5.4.5.1 Overview

Alternative 3 includes the construction and operation of a screened open ocean intake system, a seawater desalination facility, a co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. Alternative 3 would be developed to meet a regional need for water, and CalAm would be one of several customers, or off-takers, of the supply. CalAm would decommission the test slant well at CEMEX, and purchase water from DeepWater Desal to serve the needs of their customers in the Monterey District. In addition to the facilities proposed by DeepWater Desal and an additional 6.5 miles of source water pipeline, the new Desalinated Water Pipeline, new Transmission Main, Highway 68 interconnection improvements, and ASR components would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The Castroville Pipeline, Pipeline to

[7] State Clearinghouse No.: 2015061001

CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. Alternative 3 includes the following new components:

- Open ocean intake system;
- Brine discharge system;
- Seawater desalination facility;
- Product water distribution systems (e.g., pipelines);
- Data center and back-up power generation; and
- Substation

As shown in **Figure 5.4-3**, the new components of Alternative 3 would be located in the Moss Landing area of unincorporated Monterey County and offshore in the Monterey Bay. Each component is described below.

Open Ocean Intake System

Alternative 3 would include a new, screened, open-water intake system located offshore and southwest of the Moss Landing Harbor entrance. To produce 25,000 afy (22 mgd) of potable water, the desalination facility would need approximately 55,000 afy (49 mgd) of raw seawater (source water). The intake system would consist of a new seawater intake structure, intake piping to deliver the seawater to the shore, and an onshore intake pump station to pump the seawater to the desalination facility via transfer piping. The location of the seawater intake facilities would be the same as identified in Alternative 2. Also, the intake design would be similar to the intake facility design in Alternative 2, but the Alternative 3 structure would be larger (two intake pipes for Alternative 3 versus one intake pipe for Alternative 2) to accommodate a larger project and to provide redundant intake and discharge ability. Additionally, the desalination plant for Alternative 3 is in a different location than Alternative 2, resulting in different source water and desalinated water pipeline alignments.

Intake Structure

As described for Alternative 2, the intake structure would be placed on the seafloor within a ravine near the head of the Monterey Submarine Canyon southwest of the Moss Landing Harbor entrance; its location would be approximately 1,300 feet offshore from the mean high water line (MHWL) at a depth of approximately 156 feet below mean lower low water (MLLW) in the waters of MBNMS.

The intake structure would be approximately 110 feet long, 30 feet wide, and 12 feet tall and would consist of two 42-inch diameter pipe manifolds; each would be mounted with concrete pipe supports on reinforced concrete pads that would be fixed to the seafloor with screw-type anchors. The intake structure pipes would be connected to the intake pipelines with flexible couplings to allow for some movement. Each intake structure pipe would have 6 screen assemblies for a total of 12 screen assemblies; each assembly would have 2 screens. The screen assemblies would draw seawater from the open ocean through fine-mesh passive narrow-slot

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-3

Alternative 3 - Monterey Bay Regional Water Project

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wedgewire screens with a 1 mm slot size, and an intake water velocity at or below 0.5 feet per second. The intake structures would be installed at the end of the subsurface intake pipelines at the point where they emerge from below the seafloor.

Intake Pipelines, Pump Station and Transfer Pipelines

The primary difference between the intake pipelines of this alternative and Alternative 2 is that this alternative includes two intake pipelines rather than one. Seawater would be conveyed approximately 3,600 feet from the intake structure to an onshore pump station via two 42-inch-diameter subsurface intake pipelines. The pump station would be located near the end of the rail spur on Dolan Road near SR-1.

The onshore 3,600-square-foot pump station would be constructed of concrete and would be mostly below-grade with an exposed stairway access hatch, equipment access hatch, and roof heating, ventilating, and air conditioning (HVAC) unit. The intake pump station would contain approximately four centrifugal intake pumps (three operating and one standby), each with a rated capacity of approximately 12,000 gallons per minute and with a discharge pressure of 150 pounds per square inch. Additional features of the intake pump station include a system for pipeline maintenance (“pigging”), cathodic protection, and a water quality sampling station. The only equipment above-grade would be transformers and an emergency backup power supply system that would be housed in a small building. A gravel access entrance to the intake pump station from Dolan Road would be provided, along with a small parking area. Security fencing would be built around the facility and a security gate would provide for controlled access to the pump station.

A chemical biofouling control system would be included in the design of the pump station, and would prevent biological growth on the walls of the seawater conveyance pipelines. If required, biofouling control would be accomplished by periodic addition of liquid sodium hypochlorite.

The onshore intake pump station would pump the seawater to the main facility site through two 36-inch-diameter transfer pipelines installed via conventional trenching under Dolan Road. The transfer pipelines would be approximately 5,800 linear feet or 1.1 miles in length extending from the intake pump station to the main facility site.

The intake piping system would include multiple manifold access points at the main facility site, from which cold seawater would be directed to individual data center buildings (described below) for use in cooling. From the data center buildings, the warmed seawater would be pumped back to the intake pipeline. Following the data center interconnections, the warmed seawater would flow into an interim warm water holding tank, with a capacity of approximately 350,000 gallons. From the holding tank, the warmed seawater would be pumped to the desalination facility by a booster pump station located within the data center boundary. The booster pump station would be designed at the same capacity and redundancy as the intake pump station.

Brine Discharge Facilities

The desalination facility would generate approximately 30,000 AFY of brine as a result of the reverse osmosis treatment process and the discharge system would include the following three components:

- Brine pump station;
- Discharge pipelines; and
- Discharge diffuser structure.

Brine Pump Station and Discharge Pipelines

Brine would be discharged from the desalination facility to the offshore diffuser structure via two proposed subsurface 36-inch-diameter discharge pipelines. The discharge pipelines would be approximately 12,000 linear feet (2.3 miles) in length, extending from the desalination facility underground and would emerge from the seafloor northwest of the Moss Landing Harbor entrance. A brine pump system would be built at the desalination facility site to provide the required pressure and velocity at the discharge diffuser structure. The same HDD pit for the intake pipelines would be used for the discharge pipelines, which would be within the intake pump station footprint.

Discharge Diffuser Structure

The discharge diffuser structure would be located on the seafloor of Monterey Bay approximately 3,400 feet offshore from the mean high water line (MHWL at a depth of approximately 76 feet below mean lower low water (MLLW) (see Figure 5.4-3), where the two discharge pipes emerge from the seafloor. The ends of the two discharge pipes would create a confluence with a single 36-inch-diameter pipe manifold structure consisting of five separate standing pipe risers. Each riser would be fitted with a duckbill diffuser nozzle, capable of discharging a maximum of 5.45 mgd, for a combined discharge total of 27.26 mgd. The completed diffuser assembly would be about 140 feet long, 10 feet wide and 15 feet tall. The diffuser structure would be buried in riprap protective cover and ballast stone that would be placed up to the level of the diffuser, extend out a few feet in either direction, then descend down to the seafloor at a 4:1 horizontal to vertical slope. The ballast and armor stone may need to be keyed a few feet below the seafloor over a horizontal width of five feet. Approximately 8,000 cubic yards of armor ballast stone would be needed. Only the duckbill diffuser nozzles would extend above the protective cover.

Desalination Facility, Data Center, and Substation (Main Facility Site)

The Alternative 3 desalination facility, data center, and electrical substation components would be located in the Moss Landing area of unincorporated Monterey County. These facilities would be located on the south side of a 110-acre parcel off Dolan Road (main facility site). This parcel, also referred to as the East Tank Farm Parcel, is located on the north side of Dolan Road, approximately 1.5 miles east of Highway 1. The site is bordered by Dolan Road on the south, the Moss Landing Power Plant (MLPP) on the west, and predominantly agricultural lands and the Elkhorn Slough to the north and east.

Desalination Plant

Alternative 3 would include the construction and operation of a desalination facility on the main facility site off Dolan Road. The facility would produce 25,000 afy of potable water from raw seawater and would generate 30,000 afy of brine concentrate (brine) as a by-product.

The desalination plant would house all of the equipment used for the desalination process, except for the seawater intake system, brine discharge system, and product (potable) water distribution systems. The desalination plant would provide the following primary systems:

- Heat-transfer process (housed at data center);
- Pre-treatment system;
- Desalination and energy recovery system;
- Solids/residuals handling systems;
- Post-treatment system; and
- Finished product water storage and pump station.

The details of these facilities and associated operations are explained below. Major buildings that would house these systems are identified in **Table 5.4-4**. Additional details on the RO process are provided in Section 3.2.2.2 of Chapter 3, Description of the Proposed Project.

Heat-Transfer Process

The intent of co-locating the desalination facility and the data center would be to cool the data center with seawater rather than conventional cooling methods, and to warm the seawater with data center waste heat prior to the RO treatment process.[8] Therefore, the initial step in the RO treatment process would include capturing heat from the data center through a closed-loop cooling system. The seawater routed through a heat exchanger prior to entering the desalination facility would be used to cool the data center buildings and as a result, the seawater would be heated for the RO treatment process.

Pre-Treatment System

After the heat transfer process and prior to desalination, the seawater would require filtration to remove suspended solids and organic matter that could foul the RO membranes. The pre-treatment system could consist of dissolved air flotation, flocculation/sedimentation system, or a dual-media primary filtration system followed by a single-stage, deep-bed, dual-media filtration system with sufficient redundancy. The pre-treatment requirements would be determined after additional source water sampling is conducted as part of obtaining the drinking water permit for this alternative. The pre-treatment media filters would be designed to utilize filtered seawater or RO brine as a source of backwash water. Most of the backwash wastewater would be recycled through the backwash reclaim system. Following pre-treatment, filtered water would pass through micron cartridge filters that would capture any residual material not removed by the pre-treatment media filters. The product of the pre-treatment process is called feed water.

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8 Seawater warmed by heat from the data center would increase the efficiency of the desalination process (by making the membranes more malleable) and would therefore, reduce the energy required to operate the desalination facility.

TABLE 5.4-4
SUMMARY OF ALTERNATIVE 3 COMPONENTS CONSIDERED FOR ANALYSIS

Project Component	Component Characteristics	Quantity	Approximate Size	Maximum Height (in feet above grade)
Seawater Desalination Facility				
Pre-treatment systems	Dissolved air flotation, flocculation/sedimentation system, or a dual-media primary filtration system followed by dual-media filtration system.	1–2 buildings	TBD	35 feet
Backwash treatment system	Periodic backwashing of filters to remove accumulated solids.	1 building/enclosure	TBD	20 feet
Cartridge filtration system	Following pre-treatment, filtered water would pass through micron cartridge filters to capture residual matter. Systems include wetwell and pumps.	1 building	TBD	30 feet
Seawater reverse osmosis desalination and energy recovery system	Semi-permeable membranes to separate and concentrate salts from seawater, resulting in permeate (water that will become potable water) and a concentrated solution called brine. System includes pumps, treatment units, and energy recovery devices.	1 building	TBD	35 feet
Solids handling system	A lamella clarifier/solids settling system with integrated surge basin and either a belt filter press or centrifuges to achieve greater than 20% dry solids.	1 building/ enclosure	TBD	35 feet
Post-treatment system	Calcite or lime and carbon dioxide conditioning of SWRO permeate to adjust and stabilize pH. Includes a drawback tank and calcite contactors.	Multiple tanks	TBD	35 feet
Product water storage and delivery	Product water storage tanks, product water pump stations, and surge tank. Product water pump station discharges potable water into the distribution system.	1–2 finished water tanks 1–2 pump stations 1 surge tank	TBD	40 feet (finished water tank) 20 feet (pump station) 25 feet (surge tank)
Chemical storage and delivery	Fully contained bulk storage tanks.	1 building	TBD	30 feet
Transformer pad and MCC area	--	—	—	—
Control building	Control room, offices, bathrooms, storage, and maintenance shop.	1 building	TBD	35 feet
Parking	Desalination facility paved parking.	20 spaces	NA	NA

TABLE 5.4-4 (Continued)
SUMMARY OF ALTERNATIVE 3 COMPONENTS CONSIDERED FOR ANALYSIS

Project Component	Component Characteristics	Quantity	Approximate Size	Maximum Height (in feet above grade)
Seawater Intake System				
Intake structure	Located on the seafloor at a depth of approximately 156 feet, below mean lower low water (MLLW), would draw seawater from the open ocean in the MBNMS through fine-mesh screens (passive narrow-slot wedgewire screens with 1-millimeter slot size).	each structure consists of 2 pipes with 12 screen assemblies with 2 screens each that is screw-anchored to the seafloor and connected to an intake pipeline	110 feet long 30 feet wide	12 feet tall (above seafloor)
Intake pipelines	Convey seawater from the intake structure to onshore pump station.	2 pipelines	42-inch-diameter 3,600 linear feet	Below seafloor
Intake pump station	Draw seawater from the intake structure and pump it to the desalination facility.	1 building	3,600 square feet	Mostly below grade
Transfer pipelines	Transfer pipelines would carry the seawater from pump station to the desalination facility.	2 pipelines	36-inch-diameter 5,800 linear feet	Below grade
Brine Discharge System				
Brine discharge diffuser structure	Located on the seafloor at a depth of approximately 76 feet and would discharge brine into the MBNMS via a multi-jet linear diffuser designed to rapidly mix the brine with ocean water.	1 discharge structure consisting of 1 pipe with 5 separate pipe risers, each having a duckbill diffuser nozzle. Each structure is buried in riprap protective cover and ballast stone that would be placed up to the level of the diffuser	140 feet long 10 feet wide	15 feet tall (above seafloor)
Brine pump station	Located at the desalination facility, would provide required pressure and velocity at the discharge structure.	1 pump station	TBD	TBD
Discharge pipelines	Underground pipelines would convey brine from the desalination facility to the discharge diffuser structure in the ocean.	2 pipelines	36-inch-diameter 12,000 linear feet	Below grade
Product Water Distribution System				
Monterey Peninsula Distribution System	Pipeline that could transport 9 million gallons per day (MGD) of product water.	1 pipeline	36-inch-diameter	Below grade

TABLE 5.4-4 (Continued)
SUMMARY OF ALTERNATIVE 3 COMPONENTS CONSIDERED FOR ANALYSIS

Project Component	Component Characteristics	Quantity	Approximate Size	Maximum Height (in feet above grade)
Data Center				
Data center	Provides data transmission and data storage capabilities.	4 buildings	Approximately 1 million square feet	35 feet
Closed-loop cooling system	Each data center would include a closed-loop cooling system to provide air conditioning to offices and computer server areas.	4 (1 for each building)	NA	NA
Backup power supply	Back-up power generators to provide required redundant electrical power to data center and desalination facility in case of a full or partial loss of PG&E electrical services. Generators to be located in a generation plant building.	1 building 3 natural gas-fueled generators	10 megawatts (MW) each	35 feet (building)
Parking	Data center parking	138 spaces	NA	NA
Substation				
Substation	Provide a redundant supply of electric power.	1 substation	230 kV 137,000 square feet	40–50 feet
Switchgear building	House the switchgear assembly circuit breakers and associated substation auxiliary equipment.	1 building	960 square feet	12 feet
Control building	House other control and metering equipment.	1 building	800 square feet	12 feet
Electrical transmission facilities	Provide for interconnection to PG&E's transmission system located on the main facility site. Includes transmission lines, transmission towers, and underground circuits.	5 towers	NA	85–140 feet

NOTES:
TBD = To Be Determined at a later design stage
NA = Not Applicable

Desalination and Energy Recovery System

Approximately six to 10 RO pumps (plus one standby) would be used to pump the feed water through the reverse osmosis membranes. Each pump would have a rated capacity of approximately 1,600 to 2,500 gallons per minute. When the feed water is pressurized against the RO membrane surface, two resulting streams emerge: high-quality permeate (the water that would eventually become product or potable water) and concentrated brine. An integrated isobaric energy recovery system would recapture hydraulic energy. One complete standby RO unit and energy recovery system would be available to ensure reliable water treatment production.

Solids/Residuals Handling Systems

The pre-treatment filtration system would require periodic backwashing to remove accumulated solids retained by the filters. Filter backwash would be collected and treated in a backwash solids handling system consisting of a lamella clarifier/solids settling system with integrated surge basin, and either a belt filter press or centrifuges to achieve greater than 20 percent dry solids. The basin would be glass-lined bolted steel or concrete designed to contain sufficient backwash volume to stabilize feed flow to the solids settling system. A mixture of duplex stainless steel and thermoplastic valves, pipe, and fittings would be used throughout the system.

The RO membranes would require periodic cleaning in order to maintain efficiency. The cleaning process typically includes the use of a detergent in either an acid or base solution, depending on the nature of material being removed. Spent (used) membrane cleaning solution would be collected and neutralized prior to discharge into the brine discharge line or alternatively to the sanitary sewer, as determined by applicable regulation. The neutralization tank would have a capacity equal to one complete membrane-cleaning event and would be constructed of glass-lined bolted steel, fiberglass, or concrete. Approximately four membrane-cleaning events are anticipated annually.

Post-Treatment System

A portion of the reverse osmosis permeate would require post-treatment conditioning with calcite or lime and carbon dioxide for pH adjustment and stabilization, followed by disinfection. Sulfuric acid could be used to assist with calcite dissolution, and sodium hydroxide could also be used for pH control downstream of the calcite contactors. Calcite contactors are used to neutralize the pH and to add calcium and bicarbonates to the permeate. The post-treatment system would forward desalted permeate to the calcite contactors and then to the finished water storage tank for blending.

Final Product Water Storage and Pump Station

To provide sufficient retention time for complete disinfection, product water would be temporarily stored on site prior to being forwarded to the distribution pipelines. A distribution pipeline corrosion control inhibitor would also be added, if needed, to ensure that the final product water would be fully compatible with distribution pipeline materials.

The storage facilities would consist of one aboveground tank with provision for a second tank, if required; each with a maximum capacity of 5.5 million gallons. The tanks would be constructed of pre-stressed concrete.

The product water pump station would discharge potable drinking water for distribution. Approximately eight operating pumps and one standby pump would each have a rated capacity of approximately 1,900 gallons per minute and be capable of discharge pressures reaching 100 pounds per square inch to the distribution system.

Data Center

The data center (approximately 1 million square feet of total building space) would be located on the 110-acre main facility site off Dolan Road next to the desalination plant and would consist of the following three major components, which are described below:

- Data center buildings and a landing area;
- Closed-loop cooling system; and
- Back-up power supply.

Data Center Buildings and Landing Area

Four buildings and a landing area (a concrete pad and connection points for electrical and mechanical support) would make up the data center. A data center is made up of computer servers that provide the physical infrastructure to receive and store electronic data for people, businesses, and government entities that can be retrieved by those using the internet. The data center would include approximately 1 million square feet of total building space. Three data center buildings and a concrete landing pad for modular data center equipment are planned.

Closed-Loop Cooling System

Each data center building would include a closed-loop cooling system designed to provide air-conditioning to both office and computer server areas of the buildings. In lieu of the chiller units and evaporative cooling systems typically employed for air conditioning, the data center buildings would use cold seawater to cool the buildings and systems.

A closed-loop heating and cooling system works through heat transfer. Hydronic piping would be routed throughout the data center to each air handling device. This piping would be a closed loop, meaning the same freshwater continues to recirculate through the system. The hydronic system would require an initial "charge" where the entire loop would be filled with water. This water would likely be purchased from Pajaro Sunny Mesa Community Services District and imported to the data center. As water circulates through the closed loop, it would flow through heat exchangers where it would pick up heat from the facility. It would then circulate through a large heat exchanger through which the cold seawater would also be passing. Cold seawater would pass through a non-contact, tube-and-shell, or plate-style heat exchanger where it would collect heat from the data center cooling system. There would be no mixing of seawater with fresh cooling water, and no seawater piping would enter the data center facilities. After leaving the heat exchanger, the warmed seawater would be recombined with the desalination intake pipeline. No seawater would be lost to the heat transfer process.

The data center closed-loop cooling system within each of the four buildings would hold approximately 400,000 to 850,000 gallons of fresh water, for a total of approximately 2.5 million gallons for all four buildings. Prior to the initial charging, the fresh water may require treatment, such as softening and deionization, to remove hardness minerals that could result in scaling.

The closed-loop system would not be expected to consume water during normal operation. There would be incidental losses from system leaks and make-up water would be added during operation to keep the system fully charged. Annual maintenance would include replacing up to 20 percent of the closed-loop system capacity with fresh water. Water from the closed-loop system, whether captured from incidental losses or maintenance procedures, would be discharged to the sanitary sewer system, in compliance with any applicable pre-treatment requirements.

Back-Up Power Supply

Electrical service from the PG&E system would provide the main source of power for the data center and a new substation would be constructed on the main facility site (see below). Additionally, the proposed data center would include up to three natural gas-fueled back-up power generators, either gas turbines or reciprocating engines (each retrofitted with carbon/greenhouse gas [GHG] capture technology), to provide the required redundant electrical power in the case of a full or partial loss of electrical service from the grid. The generators would each be rated at up to 10 megawatts (MW) and would be located within a generator plant building. Natural gas fuel for the generators would be supplied by an existing PG&E-owned natural gas pipeline that is located in the main facility site. New service connection to this natural gas pipeline would be installed as part of the project. It is expected that each generator would be operated for no more than 1,500 hours per year.

Substation

The data center would require up to 150 MW of electrical power and the desalination facility and other site infrastructure would require an additional 25 MW of electrical power. A redundant supply of electric power would require constructing a new 230-kilovolt (kV) substation with a footprint of approximately 137,000 square feet.

The substation and five transmission towers (ranging from 85 to 105 feet above grade) would be built on the main facility site and would be designed to interconnect with PG&E's transmission system through the 230 kV high-voltage power lines that run through a corridor located on the main facility site. The interconnection and substation facilities would be designed to provide the redundant electrical power supply required to ensure power quality and reliability for operations. The preliminary design proposes an air-insulated substation enclosed in a metal structure so all conductors, instruments, switches, and breakers would be fully enclosed.

Product Water Conveyance

The DeepWater Desal proposal includes product water pipelines to supply three different areas: the Monterey Peninsula; Castroville and Salinas; and North Monterey and Santa Cruz Counties. It is assumed that up to an additional 25 miles of product water pipelines could be constructed to accommodate the product water that would not serve the Monterey Peninsula.

The desalinated product water would be delivered from the desalination plant site to the Monterey Peninsula via a 36-inch diameter pipeline. The pipeline would leave the desalination plant west along Dolan Road, south along Highway 1, south/southeast along Molera Road, southwest along Monte Road, to a connection point near the intersection of Monte Road, Lapis Road, and Charles Benson Road. The pipeline would then connect to the product water conveyance system described for the proposed project in Chapter 3, Description of the Proposed Project and shown on **Figure 5.4-3**.

Hydroacoustic Monitoring System

Alternative 3 would also include the construction and operation of a hydroacoustic monitoring system. The hydroacoustic information link (HAIL) monitoring system would allow for the collection of continuous water quality data for Project monitoring, and may also be useful for other research and/or academia needs that may be of interest pertaining to the Monterey Submarine Canyon. The system would repurpose an existing, abandoned Dynegy oil pipeline in Monterey Bay and consist of three primary components: transmitter(s), receiver; and, onshore processor. The transmitter would send low-rate hydroacoustic data to the receiver located at the end of the Dynegy pipeline. The onshore computer processor would receive the data from the receiver. The HAIL system would provide a reliable underwater data link for instruments located up to approximately 6 miles from the system receiver.

This component of DeepWater Desal’s application is not substantively related to the proposed project objectives or purpose and need and therefore, the hydroacoustic monitoring system and associated facilities are not analyzed in this EIR/EIS.

5.4.5.2 Construction

Open Ocean Intake System

The 42-inch-diameter dual intake pipelines would be constructed subsurface using HDD from the intake pump station site to the offshore seawater intake structure location in Monterey Bay. The installation of the pipelines would include anchoring in place and installation of ballast.

The HDD entry pit would be within the footprint of the intake pump station on Dolan Road. Prior to installation of the intake pipelines, the railroad spur and underlying embankment would be removed, and the site graded to the final elevation of the intake pump station.

The HDD segment of the intake pipelines would traverse subsurface along the north side of Dolan Road, cross under Highway 1, the Moss Landing Harbor Channel, and Moss Landing Sand

Spit within the discharge tunnel easement of the MLPP, and then to a point offshore where the pipelines would surface on the seafloor. The pipelines would also be at least 80 feet below the MLPP discharge pipe. Both intake pipelines would have similar elevations and would be separated by 10 to 20 feet along the alignment.

The HDD method uses a drill rig launched from an onshore location to drill a pilot bore to the intake structure location. The pilot bore would be enlarged by one or more back reamers to the size required for the intake pipe. It is assumed that the pipes would be assembled on barges, lowered to the seafloor and pulled back through the borehole during the final reaming process.

Construction of the intake structure would occur after installation of the pipelines has been completed. The bed of the intake structure may need to be prepared below the concrete pads. This would be accomplished using diver-assisted or lead dredging using suction and/or mechanical techniques. The amount of seafloor materials to be removed would depend on the local changes in bathymetric grade, but should be confined within the planned 120- by 50-foot area to accommodate the intake structure. Excavated materials would be transferred to a barge and disposed of in a suitable area onshore or offshore.

Embedment type anchors would be set into the seafloor to secure the concrete pads and would extend 10 feet below the seafloor. Given that sub-seafloor materials are soft, screw-type anchors would be installed and the intake structure would be placed on the seafloor. The entire assembly would be built off site and transported to the intake structure location, then lowered to the seafloor by crane and set into place by divers. Alternatively, the intake structure could be assembled in place by divers as needed using modular components that are fabricated off site then barged to the site. Once the intake structure has been installed, a prefabricated section of stiff or flexible pipe would be used to connect the intake structure to the sub-seafloor pipelines.

The 36-inch diameter transfer pipelines from the intake pump station to the desalination facility would be installed along the defined Dolan Road alignment within a conventional trench that is approximately 10 feet wide and 15 feet deep. Approximately 5 to 10 feet of cover would be provided between the top of the pipeline and roadway.

Brine Discharge Facilities

Installation of the five-jet linear diffuser would be similar to the intake structure since the diffuser structure would be supported on prefabricated concrete pads placed on the seafloor. The diffuser structure would be buried in riprap protective cover and ballast stone. The discharge pipelines would be constructed entirely subsurface except in the “breakout” location in the vicinity of the outfall structure on the shoulder of the Monterey Submarine Canyon. The same HDD pit used for the intake pipelines (within the intake pump station site) would be used to install the offshore portions of the discharge pipelines. Using conventional trench methods (as described above), the pipelines would be buried under Dolan Road between the desalination facility and the HDD site.

The onshore pipeline segments would be constructed of fiberglass-reinforced plastic or similar non-metal material onshore and high-density polyethylene (HDPE) or flexible polyvinyl chloride (PVC) for the offshore pipeline segments.

Desalination, Data Center, and Substation Construction

Construction of the data center, desalination facility, and substation on the main facility site would take approximately 2 years to complete. Activities would include site mobilization, demolition, site preparation and grading, paving for parking and access routes, trenching and backfilling for underground yard piping, excavation and installation of foundations, construction of all structures, interior finishing, equipment installation, testing, and commissioning. Construction equipment used would be very similar to equipment used for the proposed project, as listed in **Table 3-4** of Chapter 3, Description of the Proposed Project. Approximately 60 acres of land on the main facility site could be disturbed during construction. The remainder of the 110-acre main facility site is located within a PG&E easement across the site, which would be subject only to improvements related to the interconnections of the substation with the PG&E transmission system and existing natural gas pipeline.

Product Water Conveyance

The product water distribution systems would also involve site mobilization, site preparation and grading, trenching and backfilling for underground piping, and paving where pipeline alignments would be located in paved roads to the connection point with the proposed project conveyance system. Construction activities for the product water conveyance system would be the same as described for the proposed project in Section 3.3 of Chapter 3, Description of the Proposed Project in addition to the 25 miles of pipeline needed to serve Salinas and areas in Santa Cruz County.

5.4.5.3 Operation and Maintenance

Seawater Intake System

The intake system would operate 24 hours a day, 365 days a year. Redundant screens on the intake structure and the dual intake pipelines would allow for the intake system to operate continuously, even during maintenance activities.

Screen sections for the intake structure could be removed entirely for maintenance purposes when needed and the end of each intake pipe could be removed to facilitate cleaning or pigging. The intake screens would be manually cleaned by divers once per year, which would take two days to complete.

Dual-intake pipes are proposed to provide for system redundancy and to maintain source water flows during pipeline maintenance. One screen/pipeline could be out of service for maintenance while the other screen/pipeline system is in service. Annual pipeline maintenance would involve pigging to remove accumulated sediment and bio-growth. The pig has an abrasive coating that scrubs the pipeline walls, removing any buildup of ocean sediments, mineral deposits, and bio-growth.

Material removed during intake screen and pipeline maintenance would be released into the ocean at the screen location where manual screen cleanings are taking place or at the end of the intake pipeline where the pig is released. Wastes would not be disposed of elsewhere.

Brine Discharge Facilities

The brine discharge system would also operate 24 hours a day, 365 days a year. The dual discharge pipelines would allow for the discharge system to operate continuously even during routine inspections using closed-circuit television video. No other chemical- or mechanical-type cleaning system would be required.

Desalination Facility

The desalination facility would operate 24 hours a day, 365 days a year. The facility would be centrally operated from a computerized control system that would assist the facility staff in operating and monitoring the process equipment. The desalination facility would contain redundancy to facilitate periodic on-line maintenance of the individual treatment components with no reduction in facility output. However, approximately 18 days throughout the year, the facility could require reduced or no capacity for major maintenance or inspection purposes, such as those needed for State Water Resources Control Board, Division of Drinking Water Programs, compliance. This would result in an approximate annual plant availability of 95 percent, similar to the proposed project.

Chemical Storage and Use/Safety Procedures

Chemical use and storage would be similar to the proposed project (see Section 3.2.2.4 in Chapter 3, Description of the Proposed Project). Chemicals certified for use in drinking water treatment would be used in the desalination process to optimize pre-treatment filtration, ensure the correct water quality standards are met, and maintain the reverse osmosis membrane elements in a clean condition. Chemicals would also be used for stabilization and disinfection of the desalted product water to allow for distribution in a regulated potable water supply.

The chemicals would be delivered to the site in bulk quantities and stored in fully contained bulk storage tanks prior to use. All chemical storage, handling, and feed facilities would be designed, constructed, and maintained in compliance with all applicable governmental codes and regulations to ensure safe storage and handling.

Staffing

The desalination facility would be fully automated, but would be continuously staffed with a total of approximately 18 full-time employees spread over three shifts. Additionally, outside services would be required from electrical, equipment, and instrumentation contractors, and the service industry.

Data center core staffing would require 20 employees during each 8-hour shift. Additional contracted staff and client visitors could add up to an additional 20 people during any 8-hour shift. If required, staggering shifts to avoid peak-hour traffic times could be accommodated as most scheduled maintenance would take place during non-peak load times late at night, on weekends, or during holiday shutdowns to minimize disruption.

Solid Waste Generation

The proposed desalination facility would generate waste from the solids produced in the pre-treatment process. These solids would be settled, dewatered, and ultimately disposed of in a solid waste landfill or other approved land application method. Approximately 8.5 tons per day, or 3,102 tons per year, of sludge would be generated from the pre-treatment process and would be hauled off the site for disposal. The solids would contain naturally occurring organic and inorganic matter removed from the raw seawater during the pre-treatment process and precipitated iron from coagulation dosing with ferric chloride, if needed. Other solid wastes generated would include used cartridge filters generated during routine maintenance activities. Spent reverse osmosis membranes are non-hazardous waste and would be disposed of in a landfill. The administrative activities at the facility and the data center would generate typical office wastes.

Electrical Power Consumption

The operating desalination facility would consume 12 to 16 MW of electric power to provide for desalination facility, intake system, discharge system, and product water distribution system operation. The data center would require 150 MW of electrical power to operate.

Water Use and Wastewater Generation

Potable water would be required for the main facility site breakroom/kitchen and restrooms, which would result in the demand for 2,300 gallons per day of water. Potable water would be supplied via a new water line connection to an existing potable water line located in Dolan Road. Product water from the desalination facility would not be used on site for domestic purposes. Sanitary waste would be routed to the Castroville Community Services District for delivery to MRWPCA. Peak flows associated with the discharge of water from the closed-loop cooling system would be expected to occur once a year and would be approximately 588,000 gallons.

Stormwater Drainage

Stormwater detention ponds would be installed along the north side of the main facility site to provide approximately 3.6 acre-feet of water quality treatment. The ponds would be planted with native plantings.

Fencing, Access, and Parking

The main facility site is surrounded by a 7-foot-high chain-link fence. The perimeter of the desalination facility would be similarly fenced and would include three-strand barbed wire. Facilities within the main facility site perimeter, such as the electrical substation, could have additional fencing for both safety and security reasons. The main entrance for the facility site would be through the existing access via controlled automatic gates, located on the south side of the site at the western terminus of Via Tanques Road near its intersection with Dolan Road. A new secondary entrance would be located on the western side of the site off of Via Tanques Road. Two parking lots would also be installed at the main facility site, with a total of 158 spaces for employee and visitor parking.

Lighting and Landscaping

Outdoor area lighting for the main facility site would consist of permanently mounted fixtures secured to structures, equipment, walls, and poles as required, providing access lighting for personnel and for security. The lighting system would be designed to provide nighttime lighting levels consistent with applicable standards.

The landscaping plan for the main facility site includes planting tall native screening trees around the perimeter of the site and around major buildings. Low to medium-height native grasses and shrubs would also be planted.

Product Water Conveyance

The product distribution pipelines would likely be owned by the water agency purchasing water from the project; CalAm would own the pipelines to the Monterey Peninsula and others would own the pipelines to Salinas and Santa Cruz County. Annual flushing, valve operation, and system integrity inspection would be expected. Product water distribution system maintenance activities would be the same as for the proposed project (see Section 3.4.3 of Chapter 3).

5.4.5.4 Ability to Meet Project Objectives

Alternative 3 would meet all of the project objectives and would produce the required volume of product water, but its permitting complexity may delay the availability of the supply relative to the State Board's Cease and Desist Order. The alternative includes an open-water intake and the placement of ballast rock on the seafloor, and the desalination facilities would be co-located with a data center. The alternative would produce more water than is needed for CalAm's Monterey District and those contracts would need to be negotiated. An additional 6.5 miles of product water pipeline would be required to connect the alternative to the proposed project's pipelines in Marina; 25 additional miles of product water pipelines are also required to deliver water to other customers. DeepWater Desal would need to complete its own project-specific EIR/EIS process, develop mitigation for the impingement and entrainment losses associated with the open water intake, receive the required permits (including authorizations from MBNMS) and enter into a water purchase agreement with CalAm. The water purchase agreement would need to be approved by the CPUC prior to delivery of product water to CalAm's customers in the Monterey District service area. The increased permitting complexity may delay the ability to serve water to meet project objectives 1 through 7.

5.4.6 Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 is the People's Moss Landing Water Desalination Project (People's Project), which is proposed by Moss Landing Green Commercial Park, LLC (MLGCP). The People's Project will be evaluated in a separate EIR that is being prepared for the Moss Landing Harbor District as the CEQA Lead Agency. The Moss Landing Harbor District issued a Notice of Preparation[9] for the People's Project on June 25, 2015 (Moss Landing Harbor District, 2015). It is possible that a joint EIR/EIS will be prepared for the project, with MBNMS as lead federal agency, if a complete application is submitted to the Sanctuary.[10] For the purposes of this EIR/EIS, this project is considered as an alternative to the proposed project and the description herein is based on information received from MBNMS in June 2016. The evaluation of this alternative in this EIR/EIS is based on information that was publically available, information provided by MBNMS, and the independent judgement of the analysts based on the available information. More detailed analyses of the People's Project will be forthcoming in the separate environmental review document(s) and will be based on technical studies that were not available at the time this EIR/EIS was being prepared. The approach to analysis of the impacts of the People's Project in this EIR/EIS is based on available information, and draws conservative conclusions where information is currently unavailable.

5.4.6.1 Overview

Alternative 4 includes decommissioning the test slant well at CEMEX, and the construction and operation of an open ocean intake system, a 12 mgd desalination plant and associated components to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula area. The People's Project applicant has used CalAm's required need for replacement supplies and water needs of the General Plan Build-out to size this alternative. None of the project components would be the same as the proposed project except for the product water pipelines south of Neponset Road, at the point marked "connection to CalAm" on **Figure 5.4-4**. Alternative 4 would include the following new components:

- Open ocean intake system in the same vicinity as Alternative 3;
- Desalination plant including source water receiving tanks; pretreatment, reverse osmosis, and post-treatment systems; chemical feed and storage facilities and associated non-process facilities.
- Brine discharge system consisting of rehabilitating and extending an existing 51-inch diameter discharge pipeline; and

9 State Clearinghouse number 2015061103
10 The project proponent submitted permit application materials to MBNMS in October 2015 and the application was deemed incomplete. A revised application has not yet been submitted, as of October 2016.

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-4

Alternative 4 - Peoples' Moss Landing Water Desalination Project

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- All of the desalinated product water would be delivered from the desalination plant site to the Monterey Peninsula via a new 36-inch diameter pipeline. The pipeline would leave the desalination plant west along Dolan Road, then south along Highway 1, then south/southeast along Molera Road, then southwest along Monte Road, to a connection point near the intersection of Monte Road, Lapis Road, and Charles Benson Road. The almost 8-mile-long pipeline would then connect to the product water conveyance system described for the proposed project in Chapter 3, Description of the Proposed Project and shown on Figure 5.4-4.

As shown in **Figure 5.4-4**, the components of Alternative 4 would be located in the Moss Landing area of unincorporated Monterey County and offshore in the Monterey Bay. Each component is described below.

Open Ocean Intake System

The screened open ocean intake system in Monterey Bay would draw seawater for use as source water for the desalination plant. Approximately 30 mgd of source water would be needed to produce approximately 12 mgd of desalinated product water. The intake would use an existing 20-foot-diameter intake pump caisson structure located on the beach adjacent to the Monterey Bay Aquarium Research Institute on Sandholt Road in Moss Landing. The existing caisson was originally built in the 1940s and used as an open intake facility and pump house. The previous intake pipeline was removed and does not currently exist. The intake structure would be rehabilitated to include a new 40-inch diameter intake pipe that would extend approximately 1,400 feet out from the existing caisson into MBNMS. The near shore portion of the pipe (the first 300 feet) would be drilled under the seafloor and the remaining 1,100 feet would be laid on the seafloor and covered with riprap armoring.

Two wedgewire screens (one active and one stand-by) would be attached at the end of this new pipeline extension and would be located on the seafloor approximately 120 feet below mean sea level (msl). Each screen structure would be 96-inches in diameter, would be designed with 1.0 mm wedgewire slots for a maximum through-screen velocity of 0.5 feet per second and would be fabricated from copper nickel alloy to minimize the potential for biofouling.

A new 10-foot-high pump house would be built on top of the existing caisson structure with a first-floor elevation of approximately 17 feet above msl. Vertical turbine pumps would be used, with pumps submerged in the intake structure and motors in the pump house above. From the pump house, a new 40-inch diameter underground pipeline would convey the seawater under the island and beneath the Moss Landing Harbor and State Route 1 (or Highway 1) and deliver it to the proposed desalination plant at the Moss Landing Green Commercial Park.

Brine Discharge Facilities

An existing 2,750-foot outfall pipeline originates at the Moss Landing Green Commercial Park, goes under the marina and the marina parking lot island, under the commercial harbor, under the island, and extends approximately 800 feet from shore to a water depth of approximately 43 feet in Monterey Bay (Landmark Realty, 2011). The 51-inch-diameter concrete pipe is buried with approximately 25 feet of cover over the entire length (Miller, 2012). Due to the age and condition of the existing 51-inch-diameter pipeline, a new 36-inch-diameter pipeline would be slip-lined within the existing pipeline and extended approximately 700 feet on the seafloor to a water depth of approximately 120 feet at the edge of the submarine canyon (see **Figure 5.4-4**). The discharge would include two new 16-inch-diameter diffuser ports. Alternative 4 would discharge approximately 17.5 mgd of brine effluent with a maximum concentration of 62.5 ppt.

Desalination Facility (Moss Landing Green Commercial Park)

The desalination plant for Alternative 4 would be located at the Moss Landing Green Commercial Park, located on the southeast corner of Dolan Road and Highway 1. The approximately 200-acre site is zoned under the Monterey County General Plan for Heavy Industrial Coastal Dependent use. Of the total site, a 16.5-acre parcel is being proposed for developing the Alternative 4 desalination plant and would be fenced off from the rest of the property.

The desalination plant would include: (1) an equalization basin to receive and store the incoming source water; (2) an inlet pump station to convey source water from the equalization basin to a pretreatment system; (3) a pretreatment system; (4) a reverse osmosis system; (5) a post treatment system; (6) a return flow pipeline that would convey brine and washwater back to the disengaging basin; (7) chemical feed and storage facilities; and (8) facilities for residuals management. The desalination plant site would also contain a 5 million gallon treated water storage tank, as well as non-process administrative facilities.

Equalization Basin

The source water pipeline would terminate at a series of existing open top, partially buried, concrete storage tanks to serve as an equalization basin. The equalization basin would stabilize volume and temperature of the source water received from the intake facility prior to entering the desalination pretreatment process. The equalization basin would include rehabilitating two existing partially buried concrete open tanks to provide some equalization of the seawater, adequate retention time for coagulation of chemicals (as described below: *Pretreatment*) to react with the raw seawater to provide settling of large particulates and solids that may have made it through the passive screens. Each of these two tanks would have a capacity of 1.8 million gallons and plate settlers would be installed in the tanks to enhance sedimentation and settling. A coagulant dosing system would be used upstream of the contact tanks to inject chemicals such as ferric chloride into the seawater in order to improve the efficiency of downstream treatment processes. These tanks would be equipped with hopper bottoms for solid collection. A mechanical rotating sludge collector would be installed in each tank to remove deposited solids.

Inlet Pump Station

An inlet pump station would be located at the desalination plant and would pump raw seawater from the equalization basin to the pretreatment system. The pump station would be sized for a lift of approximately 30 feet and would have a capacity of 30 mgd.

Pretreatment System

The proposed pretreatment system would have a capacity of 30 mgd, and would consist primarily of flocculation, dissolved air flotation, media filtration, ultra-filtration, and cartridge filtration.

Reverse Osmosis System

The desalination plant would utilize a RO system similar to that described for the proposed project in Section 3.2.2.2 of Chapter 3, Description of the Proposed Project. The RO membranes would be housed in a new approximately 20,000 square-foot building. The system would utilize a "first pass" and partial "second pass" process to meet water quality requirements. Hardness, alkalinity, and pH of the product water would be adjusted after the RO process to meet water quality standards. Disinfection, as required to meet regulatory requirements, would take place using hypochlorite.

Byproducts and Residual Management

The following is a summary of the types and estimated quantities of byproducts and residuals produced at the proposed facility:

- Concentrate (brine) from the RO system. This stream would essentially have all the salts and ions present in the source water but at higher concentration. At the proposed RO recovery rate of 45 percent, the concentration of salts and ions would be 1.8 times that of seawater. At this recovery rate, the concentrate would contain total dissolved solids (TDS) in the range of 63,000 to 64,000 mg/L depending on the seawater temperature and salinity.
- Recovered and Treated backwash water from the Media Filters. The back wash water from the Media Filters and UF would be transferred to backwash collection tanks and pumped to the backwash treatment system consisting of sludge tank and centrifuges. The sludge would be collected and sent to a sludge treatment facility, while the clear supernatant would be mixed with the concentrate and sent to the outfall.
- Recovered and Treated Clean Backwash from Post Treatment. Similarly recovered clean backwash from post treatment would be mixed in the outfall blend tank and sent to the outfall. **Table 5.4-5** is a summary and expected quality of the combined outfall.

TABLE 5.4-5
OUTFALL WATER QUALITY AND QUANTITY

Product	Flow (MGD)	TDS (mg/L)
Concentrate (Brine) from RO	15.46	65,000
Recovered and Treated Backwash from Media Filtration	1.98	35,800
Recovered and Treated Clean Backwash from Post Treatment	0.06	400
Combined Total	**17.5**	**61,500**

- Clean-in-Place (CIP) Wastes. All three types of membranes used in Alternative 4 would require CIP systems. A CIP involves two steps: 1) circulating cleaning chemicals through the membranes; and 2) flushing the membranes with clean water to remove the waste-cleaning solutions. Neutralization systems would be included in the membrane facility with a neutralization tank placed under the building floor. The appropriate chemical, typically either sodium bisulfite acid or sodium hydroxide, would neutralize the cleaning chemicals so the waste can be properly sent to the sanitary sewer. A vertical chemical resistant pump would serve as mixing the chemicals as well as pumping the neutralized content of the tank gradually to the sewer system. The CIP events would be scattered throughout a week to reduce peak waste flows.

- Miscellaneous Wastes. Miscellaneous drains from analyzers, wash-downs, sample panels, etc., would be connected to the sanitary sewer system.
- Bathroom and Indoor Plumbing Wastes. Bathroom, showers and other building plumbing wastes would be connected to the sanitary sewer system. **Table 5.4-6** shows the estimated peak volumes and continuous flows to the sanitary system. A sewage pump station would be included adjacent to the desalination plant site and flow would be discharged into the Castroville Sanitation District sewer at the intersection of Dolan Road and Highway 1.

TABLE 5.4-6
OTHER RESIDUALS DISPOSAL

Residual	Total Volume per Event (gallons)	Frequency	Continuous flow (gpd)	Comment	To
RO CIP Cleaning	300,000	Once per month	50,000	Neutralized	Sanitary Sewer
BWRO Cleaning	80,000	Once every 2 months	20,000	Neutralized	Sanitary Sewer
Floor Drain, Analyzers, and Wash Waters	N/A	Continuous	3,000	Neutralized	Sanitary Sewer
Sanitary Sewer from Buildings and Offices	N/A	Continuous	1,500	Neutralized	Sanitary Sewer
Combined Total			74,500	Neutralized	Sanitary Sewer

- All process solid wastes would be combined and sent to the sludge tanks and sludge treatment facility. The sludge treatment would consist of sludge conditioning, centrifuges, thickeners, belt presses and chemical treatment for production of 30-35 percent solid content sludge, which would be sent off site by dump trucks. **Table 5.4-7** shows estimated volume of sludge to be hauled offsite.

TABLE 5.4-7
ESTIMATED SLUDGE PRODUCTION

Item	Units	Design
Dry Sludge Volume (30% Solids)	Gal/Day	407
Weight of Dry Sludge	Pounds/Day	4,070
Number of Hauling Trucks per Week		<2

Product Water Conveyance

Alternative 4 would include a 5 million gallon treated water storage tank at the desalination plant site, and a product water pipeline to connect to the CalAm Monterey District distribution system. The desalinated water would be delivered from the desalination plant site to the Monterey Peninsula via a new 8-mile-long, 36-inch-diameter pipeline that would proceed south along Highway 1, south/southeast along Molera Road, southwest along Monte Road, to a connection point near the intersection of Monte Road, Lapis Road, and Charles Benson Road. At this point, the new pipeline would connect to the product water pipelines described for the proposed project in Chapter 3, Description of the Proposed Project.

The People's Project would produce more water than is needed to meet the project objectives of the MPWSP. After meeting current customer demand of approximately 12,500 afy, the People's Project, in addition to existing supplies, would result in an excess of 6,000 afy for potential growth in the region.

5.4.6.2 Construction

Construction activities would take approximately 24 months and would include site grading and excavation; installation of prefabricated and onsite fabricated components (e.g., pretreatment and RO equipment, storage tanks, etc.); construction of buildings, electrical system, pump station and pipelines; and disposal of construction waste and debris. Construction equipment and materials associated with the open ocean intake system and desalination plant would be stored within the respective construction work areas. Construction equipment and materials associated with pipeline installation, including stockpiling of material, would be stored along the pipeline easements and at nearby staging areas. Staging areas would not be sited in sensitive areas such as riparian or critical habitat for protected species. To the extent feasible, parking for construction equipment and worker vehicles would be accommodated within the construction work areas and on adjacent public roadways complying with public parking signs.

Construction estimates are presented below in **Table 5.4-8**.

TABLE 5.4-8
ASSUMPTIONS FOR CONSTRUCTION ACTIVITIES

Alternative Components	Total Excess Spoils and construction Debris (Cubic Yards)	Construction Equipment	Construction Duration and Work Hours
Open Ocean/Bay Intake	150	Barge, Excavators, HDD Drilling Equipment, Dozers, Divers, Trucks	Overall schedule is approximately 6 months. Typical construction hours are from 7am to 4pm M-F.
Desalination Plant Facilities	40,000	Excavator, Backhoe, Grader, Crane, Dozer, Compactor, Trencher/Boring Machine, Front-end Loader, Water Truck, Flat-bed Truck, Forklift	Overall schedule is approximately 24 months. Typical construction hours are from 7 am to 4 pm - Monday through Friday
Outfall Pipeline and Diffuser	100	Barge, Excavators, HDD Drilling Equipment, Dozers, Divers, Trucks, etc.	Overall schedule is approximately 3 months. Typical construction hours are from 7 am to 4 pm - Monday through Friday
Product Water Pipeline	50,000	Excavator, Backhoe, Grader, Crane, Dozer, Compactor, Trencher/Boring Machine, Front-end Loader, Water Truck, Flat-bed Truck, Forklift, Compressor Jack Hammer, Asphalt Paver/Roller, Street Sweeper	Refer to proposed project in Chapter 3. Product water would be delivered to CalAm at Marina, then same as proposed project

Open Ocean Intake Pipeline

The existing caisson intake facility would be rehabilitated to withdraw the required 30 mgd of source water. Horizontal directional drilling or another trenchless technique would be used for the near shore portion of the new intake pipe (from caisson to approximately 300 feet offshore) and the remaining 1,100 feet of new pipe would be laid on the seafloor, ballasted with concrete collars and protected with riprap armoring. Two passive wedgewire screens would be mounted on a riser. Construction would require a combination of barges and scuba divers.

From the rehabilitated caisson and new pump house, a new 40-inch diameter pipeline would be installed using horizontal directional drilling methods to transfer the seawater to the desalination plant. The intake pipeline would be horizontally directional drilled under the Moss Landing Harbor and would then cross Highway 1 using pipe bursting methods to insert the new pipe into an existing 36inch pipeline crossing Highway 1. The pipe bursting process consists of advancing a conical-shaped bursting head that has a diameter 50 to 100 mm larger than the new replacement pipe, through the existing pipe. The product pipe immediately follows the bursting head as it is simultaneously pulled or pushed into the newly formed cavity.

Construction of the open ocean intake facility would be completed within approximately six months. During peak construction, five to ten construction workers may be employed.

Brine Discharge Pipeline

A new 36-inch diameter pipeline would be slip-lined within the existing 51-inch-diameter outfall pipeline. From the end of the existing outfall pipeline, 700 feet of new, 36-inch diameter pipeline would be laid on the ocean floor at a depth of approximately 120 feet below mean sea level and would include two 16-inch diameter diffuser ports. A combination of barges and scuba divers would be required to install the outfall extension on the ocean floor. The new outfall location would be at the same elevation as (120 feet below msl) and would be approximately 630 feet away from the open ocean intake.

Desalination Plant

Construction of the desalination plant and appurtenant facilities would include site preparation, equipment delivery, and building construction. Ground clearing and excavation of the site would be performed using heavy construction equipment such as bulldozers, backhoes, cranes, and graders. Heavy equipment would be used to construct connections with existing water conveyance systems, and to construct footings of tanks and other support equipment. Upon completion of excavation, construction activities would also include pouring concrete footings for tanks, laying pipeline and making connections, installing support equipment such as control panels and fencing the perimeter of the site.

Product Water Conveyance

Construction activities associated with the product water conveyance pipelines would be the same as described for the proposed project in Section 3.3.4 in Chapter 3, Description of the Proposed Project.

5.4.6.3 Operation and Maintenance

Open Ocean/Bay Intake Pipeline

The intake screens would be provided with an automatic airburst connection from a boat for occasional cleaning. A buoy would mark the spot of the screens to help avoid potential problems with boaters and anchoring.

Brine Discharge

The People's Project has not provided any information about the maintenance of the brine discharge system.

Desalination Plant

Chemical Feed and Storage Facilities

Various chemicals to be used during treatment would be stored and processed onsite, similar to the proposed project. The chemicals include:

- Coagulant (Ferric Chloride or Ferric Sulfate)
- Flocculant/Polymer/Filter Aid
- Sulfuric Acid
- Antifoulant
- Lime
- Caustic
- CO2
- Hypochlorite
- Ammonia
- Sodium Metabisulfite

The listed chemicals are non-flammable, and would be stored in tanks that meet applicable regulatory requirements and are located within the new pre-treatment, reverse osmosis and post-treatment building. The design of this building would incorporate the regulatory requirements for hazardous materials storage. In addition, two lime saturation tanks, situated adjacent to the chemical building, would contain a bed of calcite for post treatment after the RO process. Chemicals may be purchased in bulk and then processed on site.

Power Usage

Estimated power usage is between 8 and 9 kWh, assuming average water temperatures.

The primary source of electricity would be either direct service from Moss Landing Power Plant through an over-the-fence agreement with Dynegy, or from PG&E provided from an existing 12 kV electrical system. An independent secondary power supply (if available) or emergency backup generator would be required to operate the entire facility during power shortages. The emergency generator could run on diesel fuel or natural gas (preferred, if available).

Product Water Conveyance

Operation and maintenance activities associated with the product water conveyance facilities under Alternative 4 would be the same as under the proposed project.

5.4.6.4 Ability to Meet Project Objectives

Alternative 4 would meet all of the project objectives and would produce the required volume of product water, but its permitting process may delay the availability of the supply relative to the State Board's CDO. The alternative includes an open-water intake, a new discharge, and the placement of new pipeline and ballast rock on the seafloor. The alternative would produce more water than is needed for CalAm's current needs and the surplus would be available for growth in the region. An additional 6.5 miles of product water pipeline would be required to connect the alternative to the proposed project's pipelines in Marina. The People's Project would need to complete an EIR (and an EIS) process, develop mitigation (e.g., for the approximately 42,000 ft^2 of seafloor that would be covered in ballast rock and for the impingement and entrainment losses associated with the open water intake), receive the required permits and enter into a water purchase agreement with CalAm. The water purchase agreement would need to be approved by the CPUC prior to delivery of product water to CalAm's customers in the Monterey District service area. The increased permitting complexity may delay the ability to serve water to meet project objectives 1 through 7.

5.4.7 Alternative 5a – Reduced Project 6.4-mgd Desalination Plant *(Intake Slant Wells at CEMEX)*

5.4.7.1 Overview

This alternative is a variation of the proposed project, the implementation of which would be contingent upon the successful implementation of the Pure Water Monterey Groundwater Replenishment Project (GWR). As discussed in Section 1.1, Introduction, CalAm proposes to build a desalination plant with the capacity to produce up to 9.6 mgd of desalinated product water (proposed project), but also seeks authorization to reduce the size of the proposed plant to provide 6.4 mgd, and to purchase product water from the proposed GWR Project if it becomes clear that the GWR Project will be completed and on line in a timeframe that can supply water to meet the proposed project's purpose and needs (CalAm, 2016). Since the GWR Project was approved by the MRWPCA in October 2015, and the CPUC in September 2016 authorized CalAm to purchase 3,500 afy of the GWR supply for extraction from the Seaside Groundwater Basin, the GWR Project is assumed in the No Action alternative and analyzed as a project in the cumulative scenario for several of the alternatives, including Alternatives 5a and 5b. The GWR Project is described in Table 4.1-2 in Section 4.1 of Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures, and a GWR Project Description is included in this EIR/EIS as Appendix H. Additional details on the GWR Project may be found in MRWPCA and MPWMD, 2016b.

Therefore, Alternative 5a includes the construction and operation of the reduced-capacity desalination plant capable of producing 6.4 mgd (compared with 9.6 mgd for the proposed project). Project components would be sited at the same locations as the proposed project and the only differences are the number of slant wells and the size of the desalination plant; all other facilities would be the same as for the proposed project. The GWR Project is addressed in the cumulative impacts analysis for this alternative.

Description of the Reduced Project

Figure 5.4-5 presents an overview of Alternative 5a. **Table 5.4-9** provides a detailed list of the facilities. Except for the number of slant wells (reduced to seven from 10) and the capacity of the desalination plant (reduced to 6.4 mgd from 9.6 mgd), the facilities are the same as described for the proposed project in Chapter 3, Description of the Proposed Project. Alternative 5a would include the following facilities:

- An intake system, which would consist of seven subsurface slant wells (five active and two on standby; these would consist of the converted test slant well and six new wells) located at the CEMEX site extending seaward of the mean high water line (MHWL) into MBNMS, and a source water pipeline.
- A 6.4 mgd desalination plant and appurtenant facilities, including source water receiving tanks; pretreatment, reverse osmosis (RO), and post-treatment systems; chemical feed and storage facilities; brine storage and facilities; and other associated non-process facilities.
- Desalinated water conveyance facilities, including pipelines, pump stations, and treated water storage tanks; same as the proposed project.
- An expanded ASR system, including two additional injection/extraction wells (ASR-5 and ASR-6 Wells), two parallel ASR Conveyance Pipelines to convey water to and from the ASR-5 and ASR-6 Wells, and an ASR Pump-to-Waste System; same as the proposed project.

Construction

Construction of Alternative 5a would be similar to the proposed project as described in Section 3.3 of Chapter 3, Description of the Proposed Project, and summarized in **Table 3-4**. The Alternative 5a facilities are expected to be constructed over approximately 24 months (same as the proposed project), from July 2019 through June 2021. See Section 3.3.10, Construction Schedule.

5.4.7.2 Operation and Maintenance

The Alternative 5a facilities would be operated in the same manner as for the proposed project (refer to Section 3.4, Operations and Maintenance).

Subsurface Slant Wells

Up to five subsurface slant wells would be operated at any given time, producing a combined total of up to 15.5 mgd of source water for the MPWSP Desalination Plant. Two wells would be maintained on standby. The existing test slant well would be converted into a permanent well.

6.4-mgd MPWSP Desalination Plant

The MPWSP Desalination Plant would utilize the 15.5 mgd of filtered source water to produce desalinated product water and approximately 9 mgd of brine. The 9 mgd of brine would be discharged out of the existing MRWPCA ocean outfall and diffuser into Monterey Bay, as described for the proposed project.

Castroville Pipeline

The 4.5-mile-long, 12-inch-diameter Castroville Pipeline (same as the proposed project) would convey desalinated water (Salinas Valley return flows) from the MPWSP Desalination Plant to the CSIP distribution system and the CCSD Well #3.

Pipeline to CSIP Pond

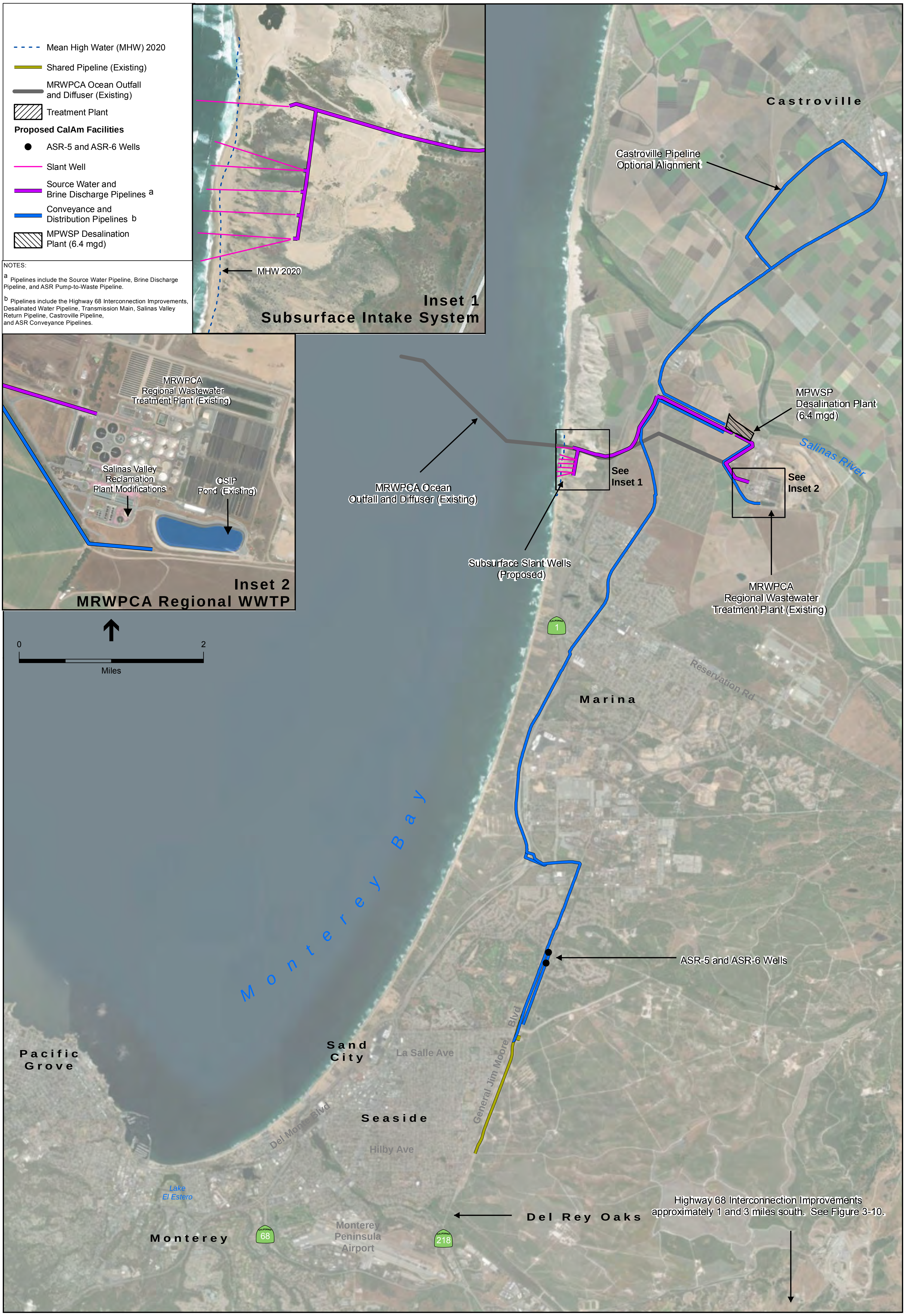
If the Castroville Pipeline is not built, CalAm would pump the Salinas Valley return water from the MPWSP Desalination Plant through a new 1.2-mile-long, 12-inch-diameter pipeline to the existing Castroville Seawater Intrusion Project pond at the southern end of the MRWPCA Regional Wastewater Treatment Plant. From the Castroville Seawater Intrusion Project pond, water would be delivered to agricultural users in the Salinas Valley through existing infrastructure.

Seaside Groundwater Basin ASR System

The Seaside Groundwater Basin ASR system would be operated in a similar manner as under the proposed project.

5.4.7.3 Ability to Meet Project Objectives

The implementation of Alternative 5a on its own and without the GWR project and associated water purchase agreement, would only partially meet the project objectives because the 6.4-mgd project would not develop enough supply to serve the existing land uses and water entitlements [12,845 afy] baseline or associated peak demands in CalAm's Monterey District. The 6.4 mgd desalination plant in combination with other existing sources (Carmel River legal entitlement, Seaside Basin, ASR, and Sand City Desalination) would achieve compliance with Order 95-10 and the Seaside Groundwater Basin Adjudication. However, Alternative 5a would not provide water supply reliability; and would not provide supply to fully serve Pebble Beach water entitlements or anticipated economic recovery at existing businesses. It would not provide enough supply to enable development of vacant legal lots of record. Assuming that the GWR Project is constructed (which is assumed in the cumulative analysis for this alternative), it would provide 3,500 afy of potable supply for the CalAm service area. Alternative 5a in combination with the GWR Project supply would meet the project objectives.



SOURCE: ESA, 2014

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Figure 5.4-5
Alternative 5a - Intake Slant Wells at CEMEX

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TABLE 5.4-9
ALTERNATIVE 5A FACILITIES

Facility	Description
Intake System	
Subsurface Slant Wells (Construction technology is same as proposed project) Approximately 15.5 mgd of water drawn from beneath the ocean floor in MBNMS for use as source water for the desalination plant.	• Seven slant wells located at the CEMEX site, extending offshore beneath Monterey Bay (the conversion of an existing test slant well into a permanent well plus six new wells at five new well sites) into MBNMS, with up to five wells operating at any given time and two wells maintained on standby • The slant wells would be grouped into six well sites: three sites with one well each and two sites with two wells. Each well would have a wellhead and mechanical piping vault (meter, valves, and gauges); each well site would have one electrical enclosure, and one pump-to-waste basin (same as proposed project). • Well length, screens, pumps and concrete pads would be the same as described for the proposed project well sites 1 through 5.
Source Water Pipeline Conveys the combined source water from the slant wells to desalination plant.	• 2.2-mile-long, 42-inch-diameter pipeline • Two hydraulic surge tanks would be located near the collector pipe/Source Water Pipeline connection point, south of the CEMEX access road and inland of the dunes
Desalination Facilities	
Pretreatment System Would treat source water to remove suspended and dissolved contaminants	• Pressure filters or multimedia gravity filters would be housed within a 6,000-square-foot pretreatment building • Two 300,000-gallon backwash supply and filtered water equalization tanks • Two 0.25-acre, 6-foot-deep lined backwash settling basins with decanting system
Reverse Osmosis System Would remove salts and other minerals from pretreated source water	• Dual-pass RO system consisting of four active modules and one standby module, with each module producing 1.6 mgd of “permeate” (the purified water produced through the RO membrane) • UV disinfection system (if required) • The RO and post-treatment systems and chemical storage tanks would be housed within a 30,000-square-foot process and electrical building
Post-treatment System Would adjust the hardness, pH, and alkalinity of the desalinated product water and disinfect the water in accordance with drinking water requirements	• Chemical feed lines and injection stations (for carbon dioxide, lime, sodium hydroxide, phosphate-based corrosion inhibitor, and sodium hypochlorite)
Chemical Storage The capacity would range from less than 5,000 gallons to 20,000 gallons, depending on the treatment chemical	• Chemical storage tanks with secondary containment • Sumps and sump pumps
Administrative Building Would house restrooms, locker rooms, break rooms, conference rooms, electrical controls, laboratory facilities, equipment storage and maintenance, and electrical service equipment	• 4,000- to 6,000-square-foot building

TABLE 5.4-9 (Continued)
ALTERNATIVE 5A FACILITIES

Facility	Description
Brine Storage and Disposal Facilities	
Brine Storage and Disposal Brine concentrate produced during the RO process would be conveyed to the brine storage basin located at the MPWSP Desalination Plant before it is conveyed to the wastewater treatment plant for disposal into waters of MBNMS	• 3-million-gallon brine storage basin • 3,900-foot -long, 36-inch-diameter Brine Discharge Pipeline
MRWPCA Ocean Outfall Pipeline and Diffuser (existing) Would convey brine from the wastewater treatment plant to the existing ocean outfall pipeline in MBNMS, which terminates at a diffuser located offshore that would discharge the concentrate into Monterey Bay	• 2.3-mile long, 60-inch-diameter pipe (onshore portion) • 2.1-mile-long, 60-inch-diameter pipe (offshore portion) • 1,100-foot-long diffuser with 172 ports (129 ports are open and 43 are closed), each 2 inches in diameter and spaced 8 feet apart on alternating sides
Desalinated Water Conveyance and Storage Facilities	
Treated Water Storage Tanks Would serve as holding tanks from which water would be pumped to either the CalAm water system, the existing CSIP pond or the Castroville Pipeline.	• Two 103-foot-diameter, 1,750,000-gallon aboveground storage tanks (providing a total combined storage volume of 3.5 million gallons)
Desalinated Water Pumps Would pump desalinated product water to either the: 1) CalAm water system or; 2) CCSD and/or CSIP as Salinas Valley return flows	• Two 3.2 mgd capacity, 400-horsepower pumps and two 1.6 mgd capacity, 200-horsepower pumps to pump water through the Desalinated Water Pipeline to the CalAm water system • Two 1.4 mgd, 10-horsepower pumps to pump water through the Salinas Valley Return Pipeline CSIP Pond or the Castroville Pipeline to CCSD
New Desalinated Water Pipeline Would convey desalinated product water from the treated water storage tanks at the MPWSP Desalination Plant to the new Transmission Main at Reservation Road	• 3.3-mile-long, 36-inch-diameter pipeline
New Transmission Main Would convey desalinated product water between the Desalinated Water Pipeline at Reservation Road and ASR facilities at General Jim Moore Boulevard	• 6-mile-long, 36-inch-diameter force main
Carmel Valley Pump Station 500-square-foot facility that would provide the additional water pressure needed to pump through the existing Segunda Pipeline into Segunda Reservoir	• 3 mgd, 100 hp pump station

TABLE 5.4-9 (Continued)
ALTERNATIVE 5A FACILITIES

Facility	Description
Desalinated Water Conveyance and Storage Facilities (cont.)	
Castroville Pipeline Would convey desalinated product water from the MPWSP Desalination Plant to the Castroville Seawater Intrusion Project (CSIP) distribution system and the Castroville Community Services District (CCSD) Well #3 • Product water would be delivered to the CSIP system via a new connection point located approximately halfway along the pipeline alignment at Nashua Road and Monte Road • At the northern pipeline terminus, product water would be delivered to the CCSD at Del Monte Avenue and Merritt Street	4.5-mile-long, 12 inch-diameter pipeline extending from MPWSP Desalination Plant to Castroville (see **Figures 3-11** and **3-12**)
Pipeline to CSIP Pond Would convey desalinated product water from the MPWSP Desalination Plant to the CSIP pond for subsequent delivery to agricultural users in the Salinas Valley.	1.2-mile-long, 12-inch-diameter pipeline (see **Figure 3-5**)
Interconnection Improvements for State Route 68 Satellite Systems a) Ryan Ranch–Bishop Interconnection b) Main System–Hidden Hills Interconnection Would allow MPWSP supplies to be conveyed to the Ryan Ranch, Bishop, and Hidden Hills water systems	a) 1.1-mile-long, 8-inch-diameter pipeline b) 1,200-foot-long, 6-inch-diameter pipeline
ASR System	
Six ASR Injection/Extraction Wells (four existing wells and two proposed): • ASR-1 and ASR-2 Wells (existing) • ASR-3 and ASR-4 Wells (existing) • ASR-5 and ASR-6 Wells (proposed) Would be used to inject Carmel River supplies and desalinated product water into the Seaside Groundwater Basin for storage; during periods of peak demand, would be used to extract the stored water for delivery to customers	• Two proposed 1,000-foot-deep injection/extraction wells (ASR-5 and ASR-6 Wells) with a combined injection capacity of 2.2 mgd and extraction capacity of 4.3 mgd • Four existing injection/extraction wells (Phase I and II wells)

TABLE 5.4-9 (Continued)
ALTERNATIVE 5A FACILITIES

Facility	Description
ASR System (cont.)	
ASR Pipelines: 1. ASR Recirculation Pipeline 2. ASR Conveyance Pipeline 3. ASR Pump-to-Waste Pipeline ASR Recirculation pipeline would be used to convey water from existing conveyance pipelines and infrastructure at Coe Avenue and General Jim Moore Boulevard to the new ASR-5 and ASR-6 Wells for injection ASR Conveyance Pipeline would be used to convey extracted ASR water supplies to the existing infrastructure at Coe Avenue/General Jim Moore Boulevard ASR Pump-to-Waste Pipeline would convey backflush effluent produced during routine maintenance of the ASR-5 and ASR-6 Wells to the existing Phase I ASR settling basin.	● Three parallel 0.8-mile-long, 16-inch-diameter pipelines

5.4.8 Alternative 5b – Reduced Project 6.4-mgd Desalination Plant (*Intake Slant Wells at Potrero Road*)

5.4.8.1 Overview

This alternative, like Alternative 5a, is a variation of the proposed MPWSP, the implementation of which would be contingent upon the successful implementation of the GWR Project. Furthermore, Alternative 5b (**Figure 5.4-6**) is similar to Alternative 5a described above, except that the intake slant wells would be located at the Potrero Road site (same as Alternative 1 but fewer wells) instead of at the CEMEX site. Alternative 5b therefore, includes the decommissioning of the test slant well at CEMEX, and the construction and operation of the reduced-capacity desalination plant capable of producing 6.4 mgd (compared with 9.6 mgd for the proposed project), with the intake wells at Potrero Road. The effects of Alternative 5b in combination with the GWR project are discussed in the evaluation of cumulative impacts.

Only the following facilities would be different from Alternative 5a (refer to Section 5.4.7 for a description of other facilities):

- An intake system consisting of seven subsurface slant wells (five active and two on standby at any given time) located at the Potrero Road site (described in Alternative 1) extending 220 to 535 feet offshore into MBNMS.
- A 42-inch-diameter source water pipeline as described under Alternative 1 would connect the slant wells to the 6.4 mgd desalination plant at the Charles Benson Road site.

5.4.8.2 Construction

Construction methods for the intake wells and source water pipeline would be similar to those described for Alternative 1 except that only seven intake wells would be needed (five active and two on standby). The source water pipeline alignment would be the same as described under Alternative 1. All other components (i.e., desalination plant, brine discharge, ASR and product water pipelines) would be the same as described under Alternative 5a.

5.4.8.3 Operation and Maintenance

Operation and maintenance requirements would be the same as described under Alternative 5a.

5.4.8.4 Ability to Meet Project Objectives

Just like Alternative 5a, the implementation of Alternative 5b alone, without the GWR Project, would not meet project objectives because the 6.4 mgd project would not produce enough supply to meet the annual or peak demands in CalAm’s Monterey District. Similar to Alternative 5a, this alternative would meet all project objectives if the GWR Project is operational and able to deliver water to CalAm.

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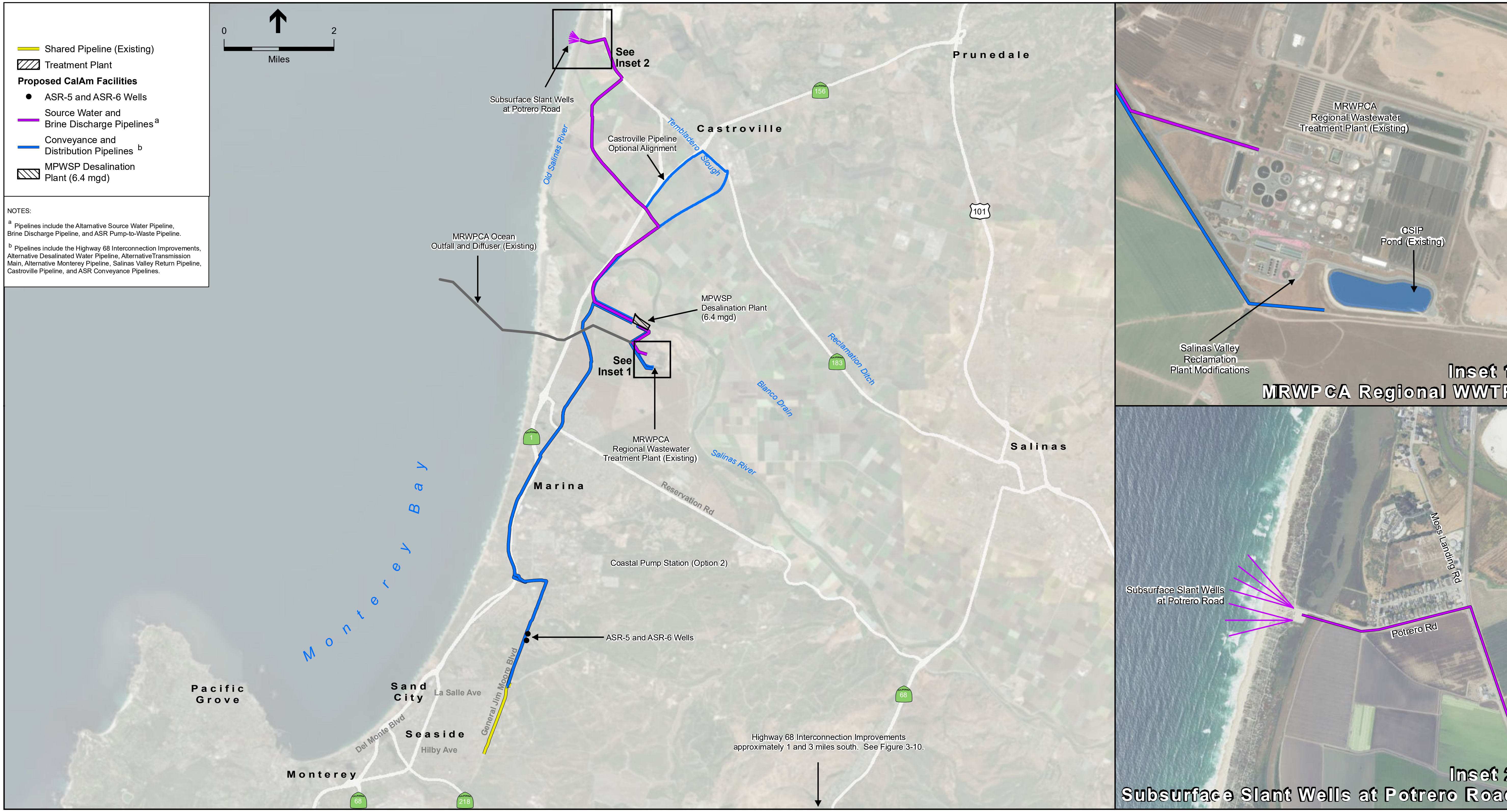

SOURCE: ESA, 2015

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Figure 5.4-6
Alternative 5b - Intake Slant Wells at Potrero Road

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