CHAPTER 5
Alternatives Screening and Analysis

5.1 Introduction and Overview

This chapter describes the methodology used to identify and screen alternatives to the proposed project, compares the environmental impacts of the alternatives against the proposed project, and identifies the CEQA environmentally superior alternative and the NEPA environmentally preferable alternative and agency preferred alternative.

- ***Sections 5.1.1*** and ***5.1.2*** describe the guidelines for alternatives analysis under CEQA and NEPA, and the process by which the alternatives presented in this EIR/EIS will be carried forward and presented in the EIR/EIS for analysis. ***Section 5.1.2*** restates the proposed project objectives and significant impacts, and discusses their relevance in the alternatives review process.
- ***Section 5.2*** presents and discusses other water supply alternatives that were considered and may have informed the formulation of the alternatives analyzed in this EIR/EIS, but were not carried forward for detailed evaluation in this EIR/EIS.
- ***Section 5.3*** describes the process employed to develop, screen and evaluate potential alternative components and develop whole alternatives for analysis. **Section 5.3.1** describes

the regulatory considerations applicable to the successful implementation of a desalination project and **Section 5.3.2** describes the two-step screening and evaluation process for components of whole alternatives. After the individual components are described and screened to determine feasibility in step 1 (**Sections 5.3.3** through **5.3.5**), the components that are carried forward are evaluated against each other (step 2) in **Section 5.3.6.** Components that are considered to be the least environmentally damaging are then combined into "whole" alternatives in **Section 5.4**. Components that are not carried forward are described, with the reason for their dismissal, in Appendix I.

- ***Section 5.4*** describes a No Project/No Action Alternative and five action alternatives, and discusses their ability to meet project objectives.
- ***Section 5.5*** presents the impact analyses of the six whole alternatives (the No Project/No Action Alternative and the five action alternatives) that are described in Section 5.4 and compares those alternatives against the proposed project.
- ***Section 5.6*** identifies the environmentally superior/preferred alternative(s) and the NEPA agency preferred alternative.

5.1.1 Alternatives Analysis – CEQA/NEPA Requirements

One of the most important aspects of the environmental review process is the identification and assessment of the environmental impacts of reasonable alternatives. In addition to mandating consideration of the No Project/No Action Alternative, both the CEQA Guidelines (14 Cal. Code Regs. § 15126.6(d)) and the NEPA Regulations (40 CFR § 1502.14) emphasize the selection of a reasonable range of alternatives that meet the purpose and need of the proposed action, and the comparative assessment of the impacts of the alternatives to allow for public disclosure and informed decision-making.

5.1.1.1 CEQA Requirements

Section 15126.6 of the CEQA Guidelines sets forth the following criteria for selecting and evaluating alternatives:

- ***Identifying Alternatives*.** An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of "no project" must also be evaluated. Of those alternatives presented, an EIR needs to examine in detail only ones that are determined at a preliminary level to feasibly attain most of the basic objectives of the proposed project.
- ***Range of Alternatives*.** An EIR need not consider every conceivable alternative, but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those

alternatives necessary to permit a reasoned choice. The CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly." However, alternatives must also be feasible, and feasible is defined as capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

- ***Evaluation of Alternatives.*** The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Matrices may be used to display the major characteristics and the environmental effects of each alternative. If an alternative would cause one or more significant effects not caused by the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project.

5.1.1.2 NEPA Requirements

NEPA emphasizes that the identification and assessment of alternatives is the heart of the environmental impact statement (40 CFR § 1502.14). NEPA requires the agency to consider the no action alternative, other reasonable courses of action, and mitigation measures that are not already incorporated in the proposed action or alternatives. Except for the no action alternative, alternatives should meet the purpose and need (40 CFR 1502.13), and be reasonable, i.e., practical or feasible from the technical and economic standpoint and using common sense. NEPA also requires agencies to consider reasonable alternatives not within the jurisdiction of the lead agency (40 CFR §1502.14 (c)). Agencies must rigorously explore and evaluate all reasonable alternatives, and briefly discuss the reasons for eliminating alternatives from detailed study. Agencies must provide substantial and detailed treatment to each alternative in the analysis, and impacts of the alternatives should be presented in comparative form in order to sharply define the issues and provide a clear basis for choice to the public and the decision-makers.

5.1.2 Project Objectives and Significant Impacts

As noted in Section 5.1.1.1, the CEQA Guidelines call for evaluating alternatives that would attain most of the basic objectives of the project, but would avoid or substantially lessen any identified significant effects of the project. Under the CEQ regulations for NEPA (40 CFR § 1502.13, Purpose and Need; and 40 CFR § 1502.14, Alternatives), an EIS must identify "the underlying purpose and need to which the lead agency is responding in proposing the alternatives including the proposed action" (40 CFR § 1502.13), and present the environmental impacts for the proposed action and each alternative in comparative form, thus defining the issues and providing a clear choice among alternatives for decision-makers and the public (40 CFR § 1502.14). Therefore, under the CEQA Guidelines and CEQ regulations, appropriate alternatives for the EIR/EIS analysis are those that meet most of the basic project objectives (or underlying purpose and need for the project) and the purpose and need for the federal proposed action are reasonable/feasible. Furthermore, the analysis includes alternatives that would avoid or substantially lessen any of the significant environmental effects of the proposed project. In addition, the NEPA regulations (40 CFR §1502.23) require that the merits and drawbacks of the

various alternatives need not be displayed in a monetary cost-benefit analysis and that economic concerns should not outweigh important qualitative considerations. Under both CEQA and NEPA, costs may be and are considered in the assessment of the reasonableness or feasibility of an alternative. However, the analysis in this chapter does not focus on relative economic factors of the alternatives carried through for detailed analysis. Nevertheless, the EIR/EIS indicates those considerations that may be relevant and important to decision-makers, including factors not related to environmental quality.

5.1.2.1 MPWSP Objectives, Purpose and Need

The MPWSP is needed to replace existing water supplies that have been constrained by legal decisions affecting the Carmel River and Seaside Groundwater Basin water resources. In 1995, the California State Water Resources Control Board (SWRCB) directed CalAm to reduce and eventually terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 acre-feet per year (afy). SWRCB Order 95-10 directed CalAm either to obtain appropriative rights to the water that was being unlawfully diverted, or to obtain water from other sources. In the meantime, to reduce diversions from the Carmel River to the greatest practicable extent, the order directed CalAm to implement conservation measures to offset demand and to maximize its use of the Seaside Groundwater Basin to serve existing customers. (See Chapter 2 for more information on Order 95-10 and the subsequent Cease and Desist Order, SWRCB Order 2009-0060).

In 2006, the Monterey County Superior Court adjudicated the rights of various entities to use groundwater resources from the Seaside Groundwater Basin. In its decision, the Court established the adjudicated water rights of all the users of the Seaside Groundwater Basin, for the purpose of avoiding long-term damage to the basin. The adjudication substantially reduced the amount of groundwater available to CalAm (from approximately 4,000 afy to 1,474 afy). (See Section 2.2.4 in Chapter 2, Water Demand, Supplies, and Water Rights for more information on the Seaside Groundwater Basin adjudication.)

The need for the proposed MPWSP is predicated on the following:

- SWRCB Order 95-10, which requires CalAm to reduce and terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 afy, and SWRCB Order 2009-0060, which requires CalAm to terminate the diversions in excess of its legal entitlement by December 2021; and
- The Monterey County Superior Court's adjudication of the Seaside Groundwater Basin, which effectively reduced CalAm's pumping from the Seaside Groundwater Basin from approximately 4,000 afy at the time of the adjudication to CalAm's adjudicated right of 1,474 afy.

The purpose and need is thus to comply with these legal requirements while supplying sufficient water to CalAm customers. Project alternatives were evaluated for their ability to fulfill the project purpose and need and meet the basic objectives of the proposed project. The MPWSP objectives (presented in Chapter 1, Introduction) are repeated here for ease of reference:

The primary, or fundamental, objectives of the proposed MPWSP are to:

1. Develop water supplies for the CalAm Monterey District service area to replace existing Carmel River diversions in excess of CalAm's legal entitlement of 3,376 afy, in accordance with SWRCB Orders 95-10 and 2009-0060;
2. Develop water supplies to enable CalAm to reduce pumping from the Seaside Groundwater Basin from approximately 4,000 to 1,474 afy, consistent with the adjudication of the groundwater basin, with natural yield, and with the improvement of groundwater quality;
3. Provide water supplies to allow CalAm to meet its obligation to pay back the Seaside Groundwater Basin by approximately 700 afy over 25 years as established by the Seaside Groundwater Basin Watermaster;
4. Develop a reliable water supply for the CalAm's Monterey District service area, accounting for the peak month demand of existing customers;
5. Develop a reliable water supply that meets fire flow requirements for public safety;
6. Provide sufficient water supplies to serve existing vacant legal lots of record;
7. Accommodate tourism demand under recovered economic conditions;
8. Minimize energy requirements and greenhouse gas emissions per unit of water delivered; and
9. Minimize project costs and associated water rate increases.

The secondary objectives of the MPWSP are to:

1. Locate key project facilities in areas that are protected against predicted future sea-level rise in a manner that maximizes efficiency for construction and operation and minimizes environmental impacts;
2. Provide sufficient conveyance capacity to accommodate supplemental water supplies that may be developed at some point in the future to meet build out demand in accordance with adopted General Plans; and
3. Improve the ability to convey water to the Monterey Peninsula cities by improving the existing interconnections at satellite water systems and by providing additional pressure to move water over the Segunda Grade.

The purpose of the federal proposed actions is to authorize otherwise prohibited activities to occur within MBNMS, to ensure that the State and Federal permits and the proposed project comply with MBNMS regulations, and to ensure that MBNMS resources are protected by requiring terms and conditions that may be necessary. The MBNMS proposed action was prompted by CalAm's request for NMSA authorization and permits to construct, operate, maintain and decommission subsurface seawater intake facilities under the sanctuary and to allow brine discharges through an existing ocean outfall facility within the sanctuary; both activities would be associated with CalAm's proposed desalination plant. Therefore, the need for MBNMS action is to respond to CalAm's request in accordance with NMSA regulations and to protect sanctuary resources. As part of this EIR/EIS, CalAm is also considering other project alternatives which also involve intakes from and/or discharges into MBNMS which would require

authorization from MBNMS. Therefore, CalAm's project alternatives are also considered alternatives under NEPA.

5.1.2.2 Significant Environmental Impacts

The alternatives to be considered under CEQA and NEPA include those that avoid or substantially lessen one or more of the significant environmental effects identified for the proposed project. Many of the adverse environmental impacts described in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, were determined to be less than significant. Other adverse impacts were determined to be significant, but could be reduced to a less-than-significant level through the implementation of mitigation measures. Still other impacts were found to be significant and unavoidable even with mitigation measures. The consideration of these mitigation measures also satisfies the requirements under NEPA to consider mitigation alternatives, and for MBNMS to consider imposition of additional terms and conditions to the authorizations to minimize impacts on sanctuary resources.

Based on the analysis presented in Chapter 4, mitigation measures would reduce potentially significant impacts to less-than-significant levels for most topical areas, except for: conflict with the City of Marina's Local Coastal Land Use Plan (a terrestrial biology impact), construction noise and vibration, operational greenhouse gas emissions, and indirect impacts from growth. Further, the proposed project may result in significant and unavoidable cumulative impacts on transportation and traffic, noise and vibration, air quality during construction, and GHG during operations.

While the primary focus of the alternatives analysis in this chapter is to develop a reasonable range of alternatives and analyze their impacts on the environment, this chapter also analyzes two other separately proposed water supply projects in the region (DeepWater Desal and the People's Project) for full consideration and comparison among projects currently under NEPA and CEQA review that could satisfy the project objectives.

5.2 Alternatives Not Evaluated in Detail

This section provides a brief project history, and presents alternative projects that were considered in the past and may have informed the alternatives analyzed in this EIR/EIS, but were not carried forward for detailed evaluation. Many of the alternatives presented below were considered and rejected in earlier environmental review documents because the projects were determined to be politically, legally, economically, or technically infeasible; others are concepts that were speculative or technically or economically infeasible. These projects were revisited for this EIS/EIR and were eliminated from further review because they are incapable of meeting most of the basic project objectives or purpose and need as currently defined. The earlier environmental review documents are incorporated by reference pursuant to NEPA (40 CFR 1502.21) and CEQA Guidelines (Section 15150), and discussed in **Appendix I**. Additionally, Section 5.3 and Appendix I describe individual components, such as particular intake and outfall options, that are eliminated from further detailed analysis.

5.2.1 Overview

The MPWSP is the result of a multi-year planning effort. Since 1989, various entities have proposed several options intended to meet the water supply needs of the Monterey Peninsula and address the impacts on the Carmel River underlying SWRCB Order 95-10. Several of those options generated their own environmental review documents, which in turn contained many alternatives, some of which are still relevant here. As part of the 2009 Coastal Water Project EIR (CPUC, 2009), the CPUC reviewed these previously-prepared documents, including the Monterey Peninsula Long-Term Water Supply Contingency Plan (Plan B) Component Screening Report (CPUC, 2000) and the CPUC Carmel River Dam Alternative Plan B Project Report (CPUC, 2002), to determine what projects and alternatives had already been considered and eliminated since SWRCB Order 95-10 was issued.

The following section summarizes the previous proposals and projects, and the environmental documentation prepared for them (as relevant), and discusses why each of these alternatives is not addressed in detail in this EIR/EIS. No viable alternatives have been identified that would supply water without a desalination plant being included. Therefore, each of the whole action alternatives described in Section 5.4 includes a desalination plant of one size or another at some location within Monterey County.

5.2.2 New Los Padres Dam and Reservoir/Carmel River Dam and Reservoir Project

The New Los Padres Dam and Reservoir project was originally proposed by the Monterey Peninsula Water Management District (MPWMD) in 1989. It included a 24,000- acre feet (af) dam and reservoir on the Carmel River, located about 0.5 mile downstream of the existing Los Padres Dam. The project would have had a production limit of 21,000 afy, of which 3,381 af would have been available to accommodate growth, in the form of new connections and remodels. The MPWMD prepared the required CEQA documentation in 1994-1995, obtained a

Section 404 permit under the federal Clean Water Act in 1995, and obtained a water right permit from the SWRCB in June and July 1995. However, in November 1995 voters rejected a measure authorizing funding for the project (CPUC, 2009).

In 1996, CalAm proposed to build a "no growth" dam and reservoir to comply with Order 95-10. That proposal was called the Carmel River Dam and Reservoir Project. Physically, it would have been the same as the New Los Padres Dam and Reservoir project. It would only have served existing community needs, which were estimated at 17,641 afy rather than the 21,000 afy envisioned in the New Los Padres Dam and Reservoir project. CalAm applied to the CPUC for permission to build and operate the project (A.97-03-052) in 1997. In 1998, the MPWMD, acting as Lead Agency, prepared a draft supplemental environmental impact report based on the New Los Padres Dam and Reservoir EIR. MPWMD never certified the final environmental document because, in 1998, the state legislature passed Assembly Bill 1182, which ordered the CPUC to identify alternatives to the dam (CPUC, 2009). In 1999, in response to Assembly Bill 1182, the CPUC began evaluating alternatives to the Carmel River dam project to meet the requirements of SWRCB Order 95-10 (also known as Plan B) for the Monterey Peninsula.

Subsequently, CalAm concluded that the Carmel River dam project was not feasible for a number of factors, including general public opposition, concerns over impacts to endangered and threatened species, and the findings of the evaluation of alternatives in Plan B (see Section 5.2.3). These factors still make both the New Los Padres Dam and Reservoir Project and the Carmel River dam project infeasible.

5.2.3 CPUC Water Supply Contingency Plan ("Plan B")

In 1999, in response to Assembly Bill 1182 and to meet the requirements of SWRCB Order 95-10, the CPUC began evaluating alternatives to the Carmel River dam project. In 2002 the CPUC, working with CalAm and others, completed a water supply contingency plan (also known as Plan B) for the Monterey Peninsula. Plan B ultimately concluded that a combination of desalination and aquifer storage and recovery (ASR) could produce 10,730 afy.[1] The desalination component of the project would be located next to the Moss Landing Power Plant and would produce 9,430 afy. Treated water would flow to the CalAm service area through a new pipeline. The ASR element would provide 1,300 afy by diverting surplus water from the Carmel River and storing this water in the Seaside Groundwater Basin for later use.

As part of the Plan B process, a Component Screening Report was prepared to provide the background, framework, and evaluation of potential Plan B water supply components (CPUC, 2000). Fifteen project components were evaluated in detail to assess their ability to meet 11 Plan B

[1] The Draft Plan B Project Report included a desalination plant at Sand City, Seaside Groundwater Basin ASR, a water reclamation component, and a water rights component. Further analysis, however, determined the following: that the water rights component was not currently feasible due to agency policies; that the water reclamation component was not practical due to institutional complexities and project costs; and that a desalination plant at Sand City would be more difficult to implement and less appropriate for the desired scale of production than a desalination plant at Moss Landing. The Final Plan B Report, therefore, consisted of a Seaside Groundwater Basin ASR and a desalination plant at Moss Landing.

objectives and 16 Plan B criteria. The 15 project components considered in the Plan B screening analysis, and their disposition at the time, sorted by category, are presented in **Table 5.2-1**.

TABLE 5.2-1
RESULTS OF PLAN B COMPONENT SCREENING

Component Category/Component	Carry Forward	Hold	Exclude
Groundwater Development			
1. Carmel Valley Deep Fractured Bedrock Wells		X	
2. Seaside Basin ASR	X		
3. Tularcitos Basin ASR		X	
Desalination			
4. Desalination Plant at Marina		X	
5. Desalination Plant at Moss Landing	X		
6. Desalination Plant at Sand City	X		
Importation			
7. Water Purchase from CVP		X	
8. Water Purchase from Humboldt Bay		X	
9. Water Purchase from the Salinas Valley			X
Legal Strategies			
10. Pueblo Water Rights (Carmel River)			X
11. Pueblo Water Rights (Salinas River)			X
12. Table 13 Rights (Carmel River)		X	
Reclamation			
13. CAWD/PBCSD Reclamation Expansion		X	
14. SVRP Expansion		X	
15. Local Stormwater Reclamation Projects		X	

Of the 15 components, three (water purchase from the Salinas Valley, Pueblo Water Rights for the Carmel River, and Pueblo Water Rights for the Salinas River) were excluded with fatal flaws, and they continue to be infeasible alternatives.

Three of the Plan B components were carried forward for additional evaluation; two of them, Seaside Basin ASR and Sand City Desalination, have been implemented. The Desalination at Moss Landing component was evaluated in the 2009 Coastal Water Project EIR and is re-evaluated in this EIR/EIS.

The other Plan B components were placed in a "hold" category. Components that were put on hold were not as promising as the ones carried forward, due to any number of factors that indicated that implementation of a particular component was technically challenging, did not fulfill planning goals, or conflicted with environmental resources. Water Purchase from the Central Valley is now considered to be infeasible since it relied on the construction of the Import Pipeline by the Pajaro Valley Water Management Agency, which decided not to pursue the

project. Table 13 Water Rights and Local Stormwater Reclamation Projects[2] have been or are being implemented; an expansion of the Seaside Basin ASR, Desalination at Marina, and Reclamation components[3] are discussed in this EIR/EIS.

A Final Plan B Project Report was prepared to document the refinement of the most viable components selected during the screening project. Additional engineering design and environmental analysis refined, modified, and focused the results presented in the Plan B Project Report, which provided the technical foundation and point of departure for the analysis of the Coastal Water Project. It included all of the essential features of the project: (a) a desalination project at Moss Landing using the Moss Landing Power Plant cooling water system for feedwater; (b) a water conveyance pipeline from Moss Landing to the CalAm's Monterey District; (c) ASR near Seaside; and (d) storage of Carmel River winter flows at the ASR site for recovery in the summer. At 10,730 AFY capacity, Plan B did not include a provision to replace some of the water pumped from the Seaside Basin because the over pumping problem was not recognized at that time.

In 2003, the CPUC dismissed CalAm's Carmel River dam application without prejudice, ordered CalAm to file a new application for the Coastal Water Project, and determined that the CPUC should be the Lead Agency for the Coastal Water Project EIR. CalAm responded to the CPUC's decision by filing an application for a Certificate of Public Convenience and Necessity (CPCN) (A.04-09-019) and proposing the Coastal Water Project.

5.2.4 Coastal Water Project

In 2004, CalAm filed Application A.04-09-019 seeking a CPCN from the CPUC for the Coastal Water Project. The Coastal Water Project (also referred to as the Moss Landing Project) was sized, like the "no growth" New Los Padres Dam and Reservoir Project, to meet existing water demand, and did not include supplemental supplies to accommodate growth. On January 30, 2009, the CPUC published a Draft EIR analyzing the environmental impacts of the Coastal Water Project, as well as the environmental impacts of two project alternatives: the North Marina Project[4] and the Regional Project.[5] The CPUC published the Coastal Water Project Final EIR (SCH No. 2006101004) in October 2009 and certified the EIR in December 2009 (Decision D.09-12-017). A year later, in Decision D.10-12-016, the CPUC approved the Regional Project alternative.

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2 This Plan B component included several small scale stormwater reclamation projects that could be implemented within small drainage basins in Carmel, Pebble Beach and Pacific Grove, Monterey and Seaside.

3 This Plan B component included an incremental of the CAWD/PBCSD Recycled Water Project and the incremental expansion of the Salinas Valley Reclamation Project.

4 The North Marina Project alternative included most of the same facilities as the previously proposed Coastal Water Project and, like the previously proposed Coastal Water Project, would only provide replacement supplies to meet existing demand. The key differences between this alternative and the previously proposed Coastal Water Project were that the slant wells and desalination plant would be constructed at different locations (Marina State Beach and North Marina, respectively), and the desalination plant would have a slightly greater production capacity (11 mgd versus 10 mgd).

5 The Regional Project would have been implemented jointly by CalAm, Marina Coast Water District (MCWD) and Monterey County Water Resources Agency (MCWRA).The Regional Project was to be implemented in phases and included vertical seawater intake wells on coastal dunes located south of the Salinas River and north of Reservation Road; a 10-mgd desalination plant in North Marina (Armstrong Ranch); product water storage and conveyance facilities; and expansions to the existing Seaside Groundwater Basin ASR system.

In January 2012, after the CPUC approved the Regional Project, CalAm withdrew its support for that project because of potential conflicts among the regional partners, and in April 2012, CalAm submitted Application A.12-04-019 (CalAm, 2012) seeking a CPCN from the CPUC for the MPWSP to build, own, and operate a desalination facility for water supply. The CPUC closed the Coastal Water Project proceeding A.04-09-019 in July 12, 2012, with Decision D.12-07-008. However, certain elements of the three projects evaluated in the Coastal Water Project EIR (e.g., intake, plant location and brine discharge components) have been carried into the alternatives analysis presented in this EIR/EIS.

5.2.5 MCWRA Interlake Tunnel and Spillway Modification Project

The Interlake Tunnel has been under consideration since the late 1970s and was included in the Monterey County Water Resources Agency (MCWRA) July 1991 Water Facilities Capital Plan as an approach to better manage flood and conservation flows in the Salinas River watershed. Since the early 1990s, the MCWRA has focused its groundwater management efforts on completing the Salinas Valley Water Project, which entails the Salinas River Diversion Facility and a modification to the Nacimiento Dam Spillway. More recently, the Interlake Tunnel project was included in the 2013 Greater Monterey County Integrated Regional Water Management Plan. With the current drought, MCWRA has a renewed interest in the Interlake Tunnel and Spillway Modification Project (Interlake Tunnel Project).

The Interlake Tunnel Project is being considered by the MCWRA, and would involve the construction of an 11,000-foot-long tunnel to divert approximately 50,000 afy of water from Nacimiento Reservoir to San Antonio Reservoir that would have otherwise been spilled at Nacimiento Dam. The Nacimiento River basin produces nearly three times the average annual flow of the San Antonio River basin, so capturing high Nacimiento River flows and diverting those flows to San Antonio Reservoir would increase the overall storage capacity of the system (MCWRA, 2014). The spillway of the San Antonio Reservoir would be raised an additional 10 feet to provide a total storage capacity of 59,000 af.

In July 2014, the Monterey County Board of Supervisors approved funding that allowed the MCWRA to prepare for and commence environmental review of the project. Starting in August, 2014, the MCWRA's Board of Directors has held several public workshops to provide background information about the Interlake Tunnel and to provide updates on project activities and accomplishments. On April 28, 2016, MCWRA published a Notice of Preparation to prepare an EIR on the Interlake Tunnel Project and held scoping meetings in May 2016. MWCRA anticipates construction of the Interlake Tunnel Project could begin late in the second half of 2018.

The Interlake Tunnel project is intended to provide additional flood control and water supply benefits to the existing users and beneficiaries of the MCWRA's benefit assessment Zone 2C. The project will be funded in part by property owners in Zone 2C through a Proposition 218 assessment. CalAm's Monterey District is not included in Zone 2C. Even if CalAm could

overcome the legal and economic challenges of the assessments, the water created by the Interlake Tunnel Project would need to be conveyed to a new Surface Water Treatment Facility (e.g., it could flow down the Salinas River for extraction at the Salinas Valley Water Project's Rubber Dam, and be conveyed to CalAm's Charles Benson Road site) in order to comply with the Surface Water Treatment Rule, before being delivered to CalAm customers.

Demands for water from the Salinas River watershed come from numerous sources, including the Salinas Valley growers, Nacimiento Lake property owners, saltwater intrusion prevention efforts, and environmental protection measures. Given the uncertainty of this resource, the tremendous demand for water to serve a number of different purposes and the Monterey County Agency Act prohibition on out- of-basin transfers, it is extremely unlikely CalAm could secure the appropriative surface water rights for this supply (CPUC, 2000). Therefore, this alternative was not further evaluated in this EIR/EIS.

5.2.6 Pure Water Monterey Groundwater Replenishment Project

The Pure Water Monterey Groundwater Replenishment (GWR) Project is jointly sponsored by the Monterey Regional Water Pollution Control Agency and the Monterey Peninsula Water Management District; the City of Salinas, the Marina Coast Water District, and the Monterey County Water Resources Agency are also participating. The GWR Project would serve northern Monterey County by providing purified water to recharge the Seaside Groundwater Basin (CalAm may later extract and distribute up to 3,500 afy) and 4,750 afy of additional recycled water to augment the existing Castroville Seawater Intrusion Project's agricultural irrigation supply.

The GWR Project is not considered in this EIR/EIS as a stand-alone alternative to the MPWSP because it would not provide enough water to meet the basic project objectives of the MPWSP; it would be about 6,250 afy short. The GWR Project sponsors prepared a separate EIR on the GWR Project; the Final EIR for the GWR Project was certified in October 2015 and a consolidated Final EIR was published in January 2016.

On September 15, 2016, in Decision 16-09-021, the CPUC authorized CalAm to enter into a Water Purchase Agreement, which provides that the MRWPCA will sell purified water from its advanced treated Pure Water Monterey Groundwater Replenishment Project to the Monterey Peninsula Water Management District, which in turn will sell it to CalAm for distribution to ratepayers in the Monterey District service area. The decision also authorized CalAm to build the new Monterey pipeline and Monterey pump station. This decision met the first milestone in the SWRCB's Cease and Desist Order (SWRCB Order 2009-0060), and the GWR Project is included in the No Project/No Action alternative described in Section 5.4. The GWR Project is, therefore, considered in this EIR/EIS as a project in the cumulative scenario as described in Section 4.1, Overview. However, the GWR Project would not be relevant in the context of the proposed project or any alternative that includes a 9.6 mgd desalination plant built and operated by CalAm (i.e., Alternatives 1 and 2) because, if the GWR project is implemented, CalAm would not need

to construct a 9.6 mgd desalination plant (the proposed project); instead, it would construct the 6.4 mgd plant as described in Alternatives 5a and 5b.

CPUC Decision 16-09-021 authorized CalAm to construct the new Monterey Pipeline and Pump Station. For all alternatives (including the proposed project), the approved new Monterey Pipeline and Pump Station are included in the cumulative impact analysis since those facilities will be built with or without the remainder of the GWR Project elements.

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5.3 Alternatives Development, Screening and Evaluation Process

The following section describes the alternatives' development, screening and evaluation process, and focuses on the basic components of any desalination project: intakes, desalination plants and outfalls. Section 5.3.1 describes the regulatory considerations applicable to the successful implementation of a desalination project and section 5.3.2 describes the two-step screening and evaluation process for alternative components. After the individual components are described and screened to determine feasibility in step-1 (sections 5.3.3 through 5.3.5), the components that are carried forward are evaluated against each other in step-2 (section 5.3.6). Components that are considered to be the least environmentally damaging[6] are then combined into "whole" alternatives in section 5.4. Components that are not carried forward are described, with the reason for their dismissal, in Appendix I.

5.3.1 Regulatory Considerations

In order to be viable, alternatives must be capable of complying with regulations governing desalination plants in order to receive the required regulatory approvals. A complete list of applicable regulations was provided in Chapter 3, Table 3-8.

In addition, regulators require the design and operation of intakes and outfalls to avoid or minimize adverse environmental impacts. Key guidance that relates to evaluation of alternatives is outlined in SWRCB's policies and the *California Ocean Plan*, California Coastal Commission policies, and NOAA policy guidelines for desalination facilities in MBNMS, described below.

5.3.1.1 State Water Resources Control Board and the California Ocean Plan

The SWRCB is responsible for regulating water resources under the California Water Code and is the state agency authorized to implement the federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) program in California. The SWRCB and its nine Regional Water Quality Control Boards regulate the discharge of pollutants to State waters through the issuance and administration of NPDES permits, which may be combined with state-level permits, called waste discharge requirements that regulate discharges to state waters under the California Water Code.

6 As discussed above, under NEPA, alternatives selection criteria does not require identification of only those alternatives considered to be the less environmentally damaging than the preferred alternative, but analysis should include alternatives (including mitigation alternatives) that are designed to minimize impacts. NEPA requires alternatives to be reasonable, or feasible, which could include consideration of whether the alternative is capable of complying with regulations governing desalination plants in order to receive the required regulatory approval. Furthermore, the purpose and need for the Federal proposed action includes a requirement to ensure that NMSA regulatory requirements are met and that MBNMS resources are protected. Therefore, this criterion for eliminating alternatives from further study that are least environmentally damaging also eliminates alternatives that are infeasible because they are likely to be incapable of complying with the regulatory requirements and do not meet the Federal purpose and need to protect sanctuary resources.

Section 13142.5 of the California Water Code requires new or expanded coastal industrial facilities, including desalination plants, to use the "best available site, design, technology, and mitigation measures feasible" to minimize the intake and mortality of marine life. The SWRCB prefers subsurface intakes, but allows surface water intakes where subsurface intakes are not feasible or economically viable. (SWRCB, 2016)

Effective January 2016, the *Water Quality Control Plan for Ocean Waters of California* (or Ocean Plan; SWRCB, 2016) establishes water quality objectives and beneficial uses for waters of the Pacific Ocean adjacent to the California Coast outside of estuaries, coastal lagoons, and enclosed bays. The Ocean Plan establishes effluent quality requirements and management principles for specific waste discharges such as brine discharge from desalination plants. This is discussed in detail in Chapter 4, Section 4.3, Surface Water Hydrology and Water Quality. Concerning brine discharge from a desalination plant, the Ocean Plan requires an owner or operator to first evaluate the availability and feasibility of diluting brine by commingling with wastewater. If wastewater is unavailable, then multiport diffusers are the next preferred method of brine disposal (SWRCB, 2016). These requirements protect beneficial uses by establishing a consistent statewide analytic framework for new desalination facilities for the best available site, design, technology, mixing requirements, and feasible mitigation measures, to minimize intake and mortality of marine life.

As described in the Ocean Plan:

> *The [Ocean Plan] contains four primary components intended to control potential adverse impacts on marine life associated with the construction and operation of desalination facilities as described below. (SWRCB, 2016):*
>
> - *Clarify SWRCB's authority over desalination facility intakes and discharges;*
> - *Provide guidance to the regional water boards regarding the determination required by Water Code section 13142.5, subdivision (b) for the evaluations of the best available site, design, technology, and mitigation measures to minimize the intake and mortality of marine life at new or expanded desalination facilities;*
> - *[Provide] A narrative receiving water limitation for salinity applicable to all desalination facilities to ensure that brine discharges to marine waters meet the biological characteristics' narrative water quality objective[7] and do not cause adverse effects on aquatic life beneficial uses.*
> - *Monitoring and reporting requirements that include effluent monitoring, as well as monitoring of water column bottom sediments and benthic community health to ensure that the effluent plume is not harming aquatic life beyond the brine mixing zone.*
> - *California Coastal Com*mission Guidance and Policies

The California Coastal Commission (CCC) is involved in nearly all coastal desalination proposals through planning, permitting, permit appeals, or other reviews. The CCC report entitled *Seawater*

[7] The 2016 Ocean Plan Section II. E (biological characteristics water quality objective) requires that, "marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

Desalination and the California Coastal Act (CCC, 2004) addresses issues related to desalination along the California coast and potential effects on coastal resources and uses; identifies and discusses California Coastal Act policies that are applicable to desalination facilities; and provides information likely to be required during the coastal development permit review process.

Chapter 5 of the *Seawater Desalination and the California Coastal Act* report (CCC, 2004) outlines Coastal Act environmental policies related to desalination facilities and processes, focusing on marine biology and water quality policies.[8] Applicable coastal policies include the need to protect and enhance marine resources and to protect the biological productivity of coastal waters.

The report identifies a desalination plant's seawater intake and discharge as the two components with the most potential to cause direct adverse impacts on marine life and water quality: desalination facilities that draw water directly from the open ocean can kill many small marine organisms. Subsurface intakes have the advantage of eliminating or minimizing impingement and entrainment, and the CCC encourages applicants to use subsurface intakes whenever feasible if they would not cause significant adverse impacts on beach topography or potable groundwater supplies. Where subsurface intakes would not be feasible, the use of an open-water intake would require mitigation measures to reduce adverse effects or compensatory measures to offset impacts. The CCC recommends that the feasibility of subsurface intakes be considered during the conceptual design stage of a proposal and during environmental review of desalination projects (CCC, 2004). Before the CCC will consider permitting an open-water intake, the proponent must show that a subsurface intake is infeasible. For those projects proposing open-water intakes, up-to-date studies of entrainment and impingement impacts are necessary (Lester, 2006). To address marine biological impacts, the CCC requires design measures, such as a low intake velocity rate of 0.5 feet per second in accordance with the Clean Water Act, velocity limits, and screens. The CCC requires feasibility studies to evaluate the economic, social, and environmental impacts expected from open-water intake operations (CCC, 2004).

5.3.1.2 MBNMS Guidelines for Desalination Plants

MBNMS and NOAA Fisheries, in collaboration with the California Coastal Commission and the Central Coast RWQCB, developed guidelines for discretionary approvals of new desalination facilities in the document entitled *Guidelines for Desalination Plants in the Monterey Bay National Marine Sanctuary* (NOAA, 2010). This document provides non-regulatory guidelines to ensure that future desalination plants in the sanctuary are properly sited and designed, and are operated in a manner that results in minimal impacts on the marine environment. The guidelines address several issues associated with desalination, including site selection, impacts from construction and operations, plant discharges, and intake systems. Failure to meet these guidelines makes it very difficult for the project to meet the purpose and need for the federal action. Key relevant guidelines include:

[8] The report cautions that this focus should not be construed as treating other coastal resources as less important; rather it assumes that effects on other resources, and conformity review of a desalination facility with other Coastal Act policies, would likely be similar to many other coastal development projects.

- Desalination plant proponents should pursue collaborations with other water suppliers and agencies currently considering water supply options in the area to evaluate the potential for an integrated regional water supply project. This should include an evaluation of other potential desalination locations and alternatives, as well as other forms of water supply.
- All desalination plants in MBNMS should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible. The feasibility of using subsurface intakes as an alternative to open-water intake methods should be investigated. Other options for consideration should include: vertical wells and Ranney wells, horizontal directionally drilled and slant-drilled wells, seabed filtration systems, and other sub-seafloor structures. Where feasible and beneficial, subsurface intakes should be used. The implementation of subsurface intakes should not cause saltwater intrusion to aquifers or adversely affect coastal wetlands that may be connected to the same aquifer being used by the intake, and the intake proposal must address the likelihood of increased coastal erosion in the future. Subsurface intakes have the potential to minimize or eliminate impingement and entrainment impacts and improve the performance and efficiency of a desalination project by providing a certain level of pretreatment.
- Where subsurface intakes are not feasible, open-ocean intakes should be sited with existing pipelines of acceptable structural integrity. If new pipelines are necessary, sub-seafloor placement should be evaluated to minimize disturbances to biological resources and to recreational and commercial activities.
- Methods of minimizing impingement and entrainment impacts should be evaluated for open-ocean intakes. These should include design alternatives such as placing the intake structure to avoid sensitive habitat or highly productive areas, screening the intake ports, increasing the number of intake ports, or decreasing the intake velocity. Use of open-ocean intakes should be evaluated to determine expected entrainment and impingement impacts associated with various intake velocities and screen mesh sizes based on long-term monitoring data from the area, including diurnal and seasonal variations in planktonic abundance and location.
- Desalination plant intakes should be sited to avoid sensitive habitats. For open-water intakes, areas of high biological productivity (such as upwelling centers or kelp forests or other dense beds of submerged aquatic vegetation) should be avoided.
- The feasibility of diluting brine effluent by blending it with other existing discharges should be investigated. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges, including discharging to an area with greater circulation or at a greater depth, increasing in the number of diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure.

5.3.2 Component Development and Screening Process

This alternatives analysis begins by describing and screening the key components of the desalination project. To maximize the range of components considered, this EIR/EIS separately considered seawater intake options, desalination plant locations and brine discharge options. The various options include different facility locations and technologies, and in some cases, also consider opportunities for co-locating project facilities with existing infrastructure. All options in the screening process are sized for a 9.6 mgd desalination plant, but could be adjusted for a

6.4 mgd plant; in either event, the comparison addresses like elements. Each component option is defined and screened; those with fatal flaws were eliminated (see Appendix I) and options carried forward were evaluated.

In eliminating component options, this EIR/EIS considered whether the intake options could provide a sufficient and reliable source of seawater, or whether the outfall options could provide a reliable method of discharge. This EIR/EIS also considered site conditions, the availability of the site, the existing infrastructure, subsurface conditions derived from borehole data (for subsurface intakes), and input from resource agencies. Finally, component options must meet regulatory requirements – for example, if a component would cause a permanent and significant decline in marine species, it would not likely receive regulatory approval. The component options presented below came primarily from the following sources:

- *Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates,* A.12-04-019, Before the Public Utilities Commission of the State of California, April 23, 2012, as revised by subsequent CalAm testimony concerning A.12-04-019.
- *Memorandum: Contingency Planning for the MPWSP (Update of November 1, 2012 TM),* Prepared by RBF Consulting, January 9, 2013.
- *Proposal Submitted by the Moss Landing Commercial Business Park, LLC, to Design and Build the People's Moss Landing Desal Project* (MLBP 2013a), February 15, 2013, provided in response to CPUC Information Request, and Project Details, Project Title: The People's Moss Landing Water Desal, Project Sponsor: Moss Landing Business Park, LLC (MLBP, 2013b), provided in response to CalAm request for information, April 25, 2013.
- *Monterey Bay Regional Water Project, Project Narrative: Supplement to California State Lands Lease Application,* Prepared by DeepWater Desal LLC, Revised February 3, 2016, downloaded from the DeepWater Desal website, www.deepwaterdesal.com/reports-and-publications.htm.
- *Horizontal Well Technology Application In Alluvial Marine Aquifers For Ocean Feedwater Supply And Pretreatment, Section 2, Research And Development For Horizontal/Angle Well Technology,* Prepared by Geoscience Support Services, Inc., September 30, 2008, submitted to California Department of Water Resources.
- Input from regulatory agencies provided during an interagency meeting in Pacific Grove on June 10, 2013.
- Project Descriptions of DeepWater Desal and People's Project, provided by MBNMS, June 2016

The component screening results for intake options (Section 5.3.3), outfall options (Section 5.3.4) and desalination plant sites (Section 5.3.5) are presented below.

5.3.3 Intake Options Screening Results

There are two general types of desalination intake systems: open-water and subsurface. Open-water intakes collect seawater directly from the ocean using a screened inlet structure. An intake pipeline then conveys the water from the offshore inlet structure to an inland location. Subsurface intakes – like the one described for the proposed project – would draw water from beneath the ocean floor. These two intake technologies have different site requirements, design features, and construction techniques, and are described in **Appendix I1**.

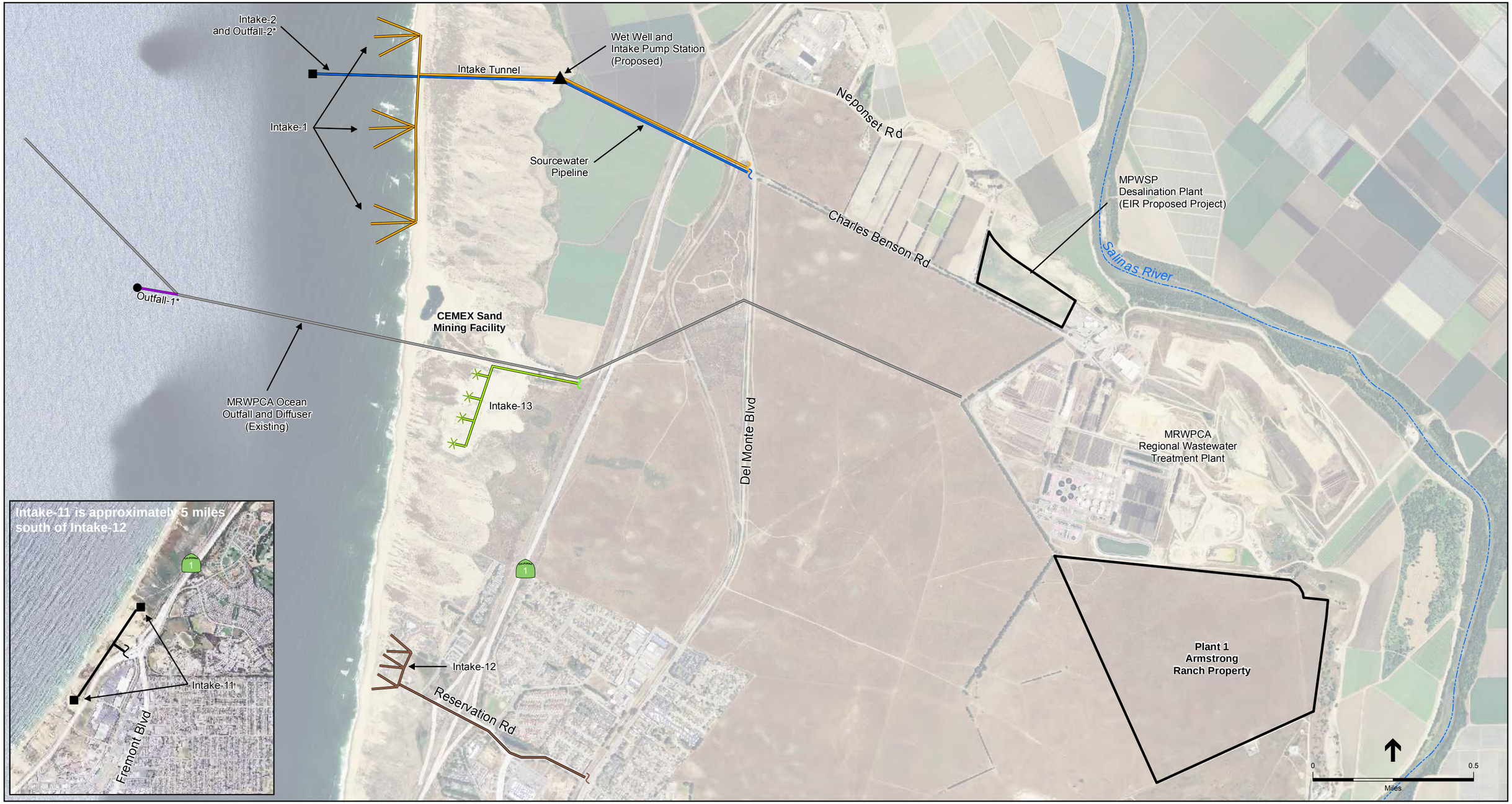
Thirteen intake options were identified and screened for fatal flaws and are shown on **Figures 5.3-1** and **5.3-2**. Six of the thirteen were not carried forward for further analysis, and they are described in **Appendix I2**, along with an explanation for their elimination. Options that were retained are described in this section, and they are evaluated against the proposed project's slant wells at the CEMEX active mining area in Section 5.3.6. **Table 5.3-1** presents the intake options, and summarizes the results of the screening process.

5.3.3.1 Intake Option 1 – Subsurface Slant Wells at North CEMEX

This intake option, which includes 10 slant wells penetrating the submerged lands of MBNMS in an area north of the CEMEX active mining area, was not carried forward into the alternatives evaluation. Construction activities would temporarily disturb approximately 10 acres of critical habitat for sensitive biological resources (California western snowy plover and Smith's blue butterfly, coast buckwheat, Yadon's wallflower, Monterey spineflower, and sand gilia) 2 in the active beach area and 0.25 acre of prime farmland on the inland side of the dunes. In addition, the footprint of the intake pump station would permanently disturb approximately 3,000 square feet of prime farmland. As described in **Appendix I2**, Intake Option 1 was determined to be fatally flawed due to permitting issues regarding impacts on biological resources.

5.3.3.2 Intake Option 2 – New Open-Water Intake at North CEMEX Site

This option would locate a new open-water intake on the seafloor within MBNMS at the northern end of the CEMEX mining facility, about 0.8 mile north of the CEMEX active mining area. A 5,000-foot-long, 36-inch-diameter intake pipeline would extend from the inland side of the dunes to approximately 2,400 feet offshore. The intake pipeline would be installed using trenchless construction techniques under the beach and dune areas and would daylight on the ocean floor at a depth of approximately 40 feet below the water surface. A passive wedge-wire intake screen would be mounted on a vertical shaft connected to the western terminus of the intake pipeline. This open-water intake would be gravity-driven and would deliver seawater to a 3,000 square-foot intake pump station and wet well located on the inland side of the dunes. The intake pump station would pump the seawater to the Desalination Plant. As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae and suspended and colloidal solids as well as pathogens from the source water prior to conveying it through the reverse-osmosis system.



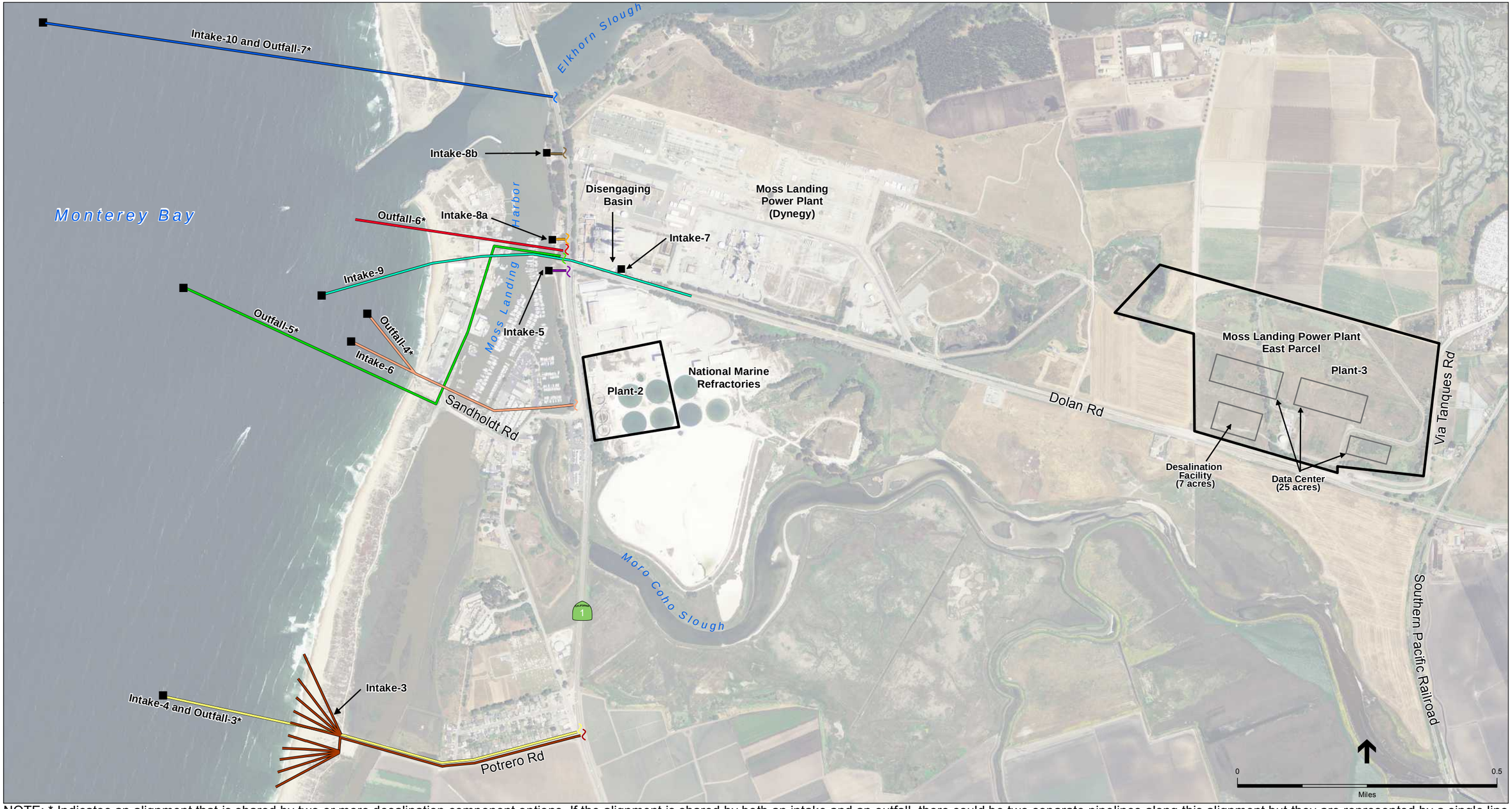
NOTE: * Indicates an alignment that is shared by two or more desalination component options. If the alignment is shared by both an intake and an outfall, there could be two separate pipelines along this alignment but they are represented by a single line. Similarly, if the same existing pipeline could either be converted into an intake or an outfall, the same line represents both options.

SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 5.3-1

Alternative Component Options - Marina and Seaside



NOTE: * Indicates an alignment that is shared by two or more desalination component options. If the alignment is shared by both an intake and an outfall, there could be two separate pipelines along this alignment but they are represented by a single line. Similarly, if the same existing pipeline could either be converted into an intake or an outfall, the same line represents both options.

SOURCE: ESA, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 5.3-2

Alternative Component Options - Moss Landing

TABLE 5.3-1
INTAKE OPTIONS SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-1	Subsurface Slant Wells at North CEMEX[a] (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[b]	• This option would be located approximately 0.8 mile north of the CEMEX active mining area. • Up to ten slant wells would be buried in the beach "swash" zone. • Gravity-fed intake system would drain to a new pump station located on the inland side of the dunes.	*Not carried forward based on input from resource agencies regarding impacts on sensitive biological resources*[c]
Intake-2	Open-Water Intake at North CEMEX (new construction)	Open ocean	• This option would be located about 0.8 mile north of the CEMEX dredging pond. • A 5,000-foot-long, 36-inch-diameter intake pipeline would extend 2,400 feet offshore. • The intake pipeline would be installed using trenchless construction technology beneath the dunes, beach, and ocean floor. • A passive wedge-wire intake screen would be mounted on a 3-foot vertical riser at the western end of the intake pipeline, approximately 40 feet below the water surface. • Gravity-fed intake system would drain to a new pump station located on the inland side of the dunes.	*Retained for further analysis*
Intake-3	Subsurface Slant Wells at Potrero Road (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[b]	• This option would be located at the west end of Potrero Road. • A total of 10 subsurface slant wells would be constructed in the beach parking lot at the end of Potrero Road. • Wellheads would be buried in the parking lot. • Each well would be equipped with an electric submersible pump. • An enclosed electrical control building would be located at the edge of the parking lot.	*Retained for further analysis*
Intake-4	Open-Water Intake at Potrero Road (new construction)	Open ocean	• This option is located at the west end of Potrero Road. • A 3,100-foot-long, 36-inch-diameter intake pipeline would extend 2,400 feet offshore. • The intake pipeline would be installed using trenchless construction technology beneath the beach and ocean floor. • A passive wedge-wire intake screen would be mounted on a 3-foot vertical riser at the western end of the intake pipeline approximately 40 feet below the water surface. • A new pump station would be located at the eastern end of the intake pipeline in the beach parking lot.	*Retained for further analysis.*

NOTES:

[a] Presented in CalAm's January 2013 Supplemental Testimony as the proposed project
[b] Subsurface intakes will extract mostly seawater for feedwater, but a portion of the feedwater may originate from inland sources.
[c] March 26, 2013 meeting called by Congressman Sam Farr at California State Park's office in Monterey, CA. Attendees included the CPUC, CalAm, National Marine Fisheries Service, Monterey Bay National Marine Sanctuary, United States Fish and Wildlife Service, and U.S. Army Corps of Engineers.
[d] Based on the results of six exploratory boreholes in the Moss Landing area (Geoscience, 2014).

TABLE 5.3-1 (Continued)
INTAKE OPTION SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-5	Ranney Wells at Moss Landing Harbor (modify an existing intake system)	Moss Landing Harbor	• This option is located in Moss Landing Harbor, immediately west of the National Refractories site. • This option would convert the existing intake system into a Ranney well intake system located in Moss Landing Harbor. • The existing intake for the National Refractories site consists of a screened open-water intake (currently sitting in the mud), an intake pump station in Moss Landing Harbor, and two 36-inch-diameter source water conveyance pipelines extending from the harbor to the former National Refractories site.	*Not carried forward because of the unsuitable hydrogeologic conditions.*[d]
Intake-6	Open-Water Intake near Moss Landing Harbor (modify & extend existing intake)	Open ocean	• This option is located in Monterey Bay near Moss Landing Harbor. (Peoples' Moss Landing Desalination Project proposed intake) • Open ocean/bay intake system that would rehabilitate the existing caisson intake structure to include a new 40-inch intake pipe that would extend out from the existing caisson approximately 1,400 feet in the open ocean/bay. Two wedge wire passive screens (one active and one standby) would be attached at the end of this new pipeline extension and would be located approximately 120 feet below mean sea level. Each passive screen structure would be 96 inches in diameter and would be used to draw seawater into the existing caisson. The screens would be designed for a maximum through-screen velocity of 0.5 feet per second and with 1.0 mm wedge wire slots to minimize impingement and entrainment.	*Retained for further analysis.*
Intake-7	Disengaging Basin at Moss Landing Power Plant (new diversion from spent cooling system)	Spent once-through cooling water	• This option is located at the Moss Landing Power Plant. • This option would divert seawater from the power plant's cooling system for use as source water for the MPWSP Desalination Plant. • Currently, the seawater used for this option is drawn through the power plant's existing northern intake in Moss Landing Harbor, routed through power-generating Units 1 and 2 for cooling and discharged to a disengaging basin from which it is conveyed to the power plant's outfall and discharged into Monterey Bay. • Under this option, the spent cooling water would be diverted at the disengaging basin and conveyed to the MPWSP Desalination Plant.	*Not carried forward because of the potential future changes in the power plant's operation to meet settlement agreement with SWRCB resulting in additional construction in the future, substantial reduction in intake water volume, and disruption of the intake.*
Intake-8a and 8b	Open-Water Intakes at Moss Landing Power Plant (new connections to two existing intakes)	Moss Landing Harbor	• This option is located in Moss Landing Harbor. • MLPP has two existing cooling system intakes in Moss Landing Harbor just west of the power plant site. The northern intake serves Units 1 and 2; the southern intake serves Units 6 and 7. The existing intakes use pumps to draw water and bar racks and traveling screens to reduce entrainment. • Under this option, a new pump station would be installed behind or near the southern intake screen to divert an additional 24 mgd of feedwater to the MPWSP Desalination Plant. • While the southern intake would be the primary connection point, a pipeline connection to the northern intake would allow CalAm to receive flow from either intake.	*Retained for further analysis.*

TABLE 5.3-1 (Continued)
INTAKE OPTION SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-8a and 8b (cont.)			• The pump station would deliver seawater through a new, 36-inch diameter underground pipeline under Highway 1 to Dolan Road, where it would meet a new source water pipeline to the MPWSP Desalination Plant. • Apart from use of the intake screen, the diversion of feedwater from the harbor for the desalination plant would be independent of the power plant's cooling system operations.	
Intake-9	Open-Water Intake at Moss Landing (new construction)	Screened deep-water ocean intake system	• One subsurface intake pipeline would be installed below the seafloor using HDD from the pipeline's eastern end, on Dolan Road near the Moss Landing Power Plant, to the western end, where it "daylights" on the upper slope of the Monterey submarine canyon. • Passive, low velocity, wedge-wire screens on 6-foot risers would be attached to the western end of the intake pipeline close to where it emerges from the subsurface and anchored to the seafloor. • The screened intake would be located about 1,300 feet offshore, on the seafloor, 156 feet below the water surface, and below the euphotic zone (the upper zone of the water column where photosynthesis can occur). • From the screened intakes, raw seawater would flow by gravity through the intake pipeline to an onshore wet well and pump station. • The pump station would be located at the end of the railspur (near the corner of Dolan Road and SR 1). • DeepWater Desal proposed intake location.	*Retained for further analysis.*
Intake-10	Open-Water Intake in former fuel oil gas pipeline at Moss Landing (modify existing pipeline)	Open ocean	• This option would retrofit a pipeline formerly used to offload fuel oil for the Moss Landing Power Plant from an offshore terminal. The pipeline consists of a 24-inch diameter segment under Moss Landing Harbor to Moss Landing Beach and an 18-inch diameter section that extends from the beach approximately 3,000 feet into Monterey Bay.	*Not carried forward because the size of the pipeline would be too small to provide the quantity of source water needed.*
Intake-11	Ranney Wells in Seaside/Sand City (new construction)	Upper dune sands aquifers (Salinas and Seaside Groundwater Basins	• This option proposes 3 Ranney wells at two sites in the former Fort Ord coastal area in Seaside/Sand City: − Fort Ord Bunker Site – 2 Ranney wells − Fort Ord MW-1 site (west of the Highway 1/California Avenue intersection) – 1 Ranney well	*Not carried forward because its location offers no advantages to the CEMEX location, it would not avoid or eliminate any potential impacts of the proposed project and would add substantial length of pipeline to feed any plant location being considered.*
Intake-12	Subsurface Slant Wells at Reservation Road (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[a]	• This option is located at the west end of Reservation Road near the Marina Coast Water District desalination facility. • 9 slant wells would be constructed in the parking lot. • Wellheads would be buried in the parking lots. • Each well would be equipped with an electric submersible pump.	*Not carried forward because this location would be in direct conflict with MCWD's existing (non-operating) desalination plant or any plans MCWD may have in the future for building a desalination project in its service area.*

TABLE 5.3-1 (Continued)
INTAKE OPTION SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-13	Ranney Wells at CEMEX Active Mining Area (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[a]	• This design option would be located in the CEMEX active mining area (same location as the subsurface slant wells described under the proposed project). • 4 Ranney wells (approximately 5.75 mgd each) would be constructed on the south side of the CEMEX settling ponds and access road • Each Ranney well would consist of a 12-foot-diameter buried caisson extending to a depth of 50 feet below the ground surface, with five 500-foot-long screened laterals extending radially from the caisson. • A 1,475-foot-long collector pipeline would convey seawater from the Ranney wells to the Source Water Pipeline. • The construction disturbance area would be the same as the proposed project.	*Retained for further analysis. – This design option could be used at any location where slant wells are being considered.*

The site is within unincorporated Monterey County. Construction of this intake option would temporarily disturb approximately 0.25 acre of prime farmland on the inland side of the dunes and 2,000 square feet on the ocean floor. The intake pump station would be housed in a 3,000 square-foot building on the inland side of the dunes and would permanently disturb approximately 3,000 square feet of prime farmland; the intake pipeline would have a permanent footprint of about 200 square feet on the ocean floor. However, because the intake pipeline would be installed via tunneling technologies from the inland side of the dunes, construction of Intake Option 2 would not disturb sensitive habitat in the active beach area. **Appendix I1** provides additional information regarding general construction methods and maintenance of open-water intakes. No entrainment/impingement studies or pilot testing have been completed to determine the volume of organic marine material that would be affected by the intake, but an analysis by the CCC suggests that the effects of an open-water intake for the MPWSP, expressed as area of production foregone (APF, see Section 5.5, Marine Biological Resources for further explanation), would be something less than 20 acres (Luster, 2016).

5.3.3.3 Intake Option 3 – Subsurface Slant Wells at Potrero Road

This option would involve the installation of a total of 10 subsurface slant wells penetrating the submerged lands of MBNMS 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.

The slant wells would be drilled from the parking lot, and the wellheads would be buried in the parking area, below the hardened sand surface of the lot. The slant wells would be designed as pumping wells -- that is, each well would be equipped with an electric submersible pump. The slant wells would be grouped into two clusters, with five wells in each cluster. A short, 36-inch-diameter collector pipeline would convey the seawater from the slant well clusters to a Source Water Pipeline that would be built within Potrero Road. The Source Water Pipeline would be located within existing rights-of-way, and would convey seawater to the desalination plant. All other aspects of construction and maintenance of the slant wells under Intake Option 3 would generally be consistent with those of the slant wells under the proposed project (see Chapter 3, Description of the Proposed Project.

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 following construction, 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. The California Department of Parks and Recreation (California State Parks) owns and operates the beach parking lot at Potrero Road. Implementation of subsurface slant wells at this location would require easements from California State Parks. Slant well construction would require temporary closure of the beach parking lot.

The Potrero Road beach parking lot lies within the coastal zone; the *North County Land Use Plan* of the *Monterey County General Plan* designates this land for public/quasi-public and scenic and natural resources and recreational uses (Monterey County, 1982).

5.3.3.4 Intake Option 4 – Open-Water Intake at Potrero Road

This option would locate a new open-water intake pipeline at the beach parking lot at the west end of Potrero Road. A 0.6-mile-long (3,100-feet), 36-inch-diameter open-water intake pipeline would extend from the beach parking lot to approximately 2,400 feet offshore into MBNMS. The intake pipeline would be installed using trenchless construction technology under the beach and ocean floor, and would emerge on the ocean floor at a depth of about 40 feet below the water surface. A passive wedge-wire screen would be mounted on the seafloor on a vertical shaft connected to the western end of the intake pipeline. The intake pipeline would convey raw seawater to a new intake pump station. This above-ground pump station would be housed in a 3,000 square foot building located in the northeast corner of the beach parking lot. As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae, suspended and colloidal solids, and pathogens from the source water before conveying it through the reverse-osmosis system.

Construction of this intake option would temporarily disturb approximately 2,000 square feet of the seafloor in MBNMS, and the footprint of the screened riser would permanently disturb about 200 square feet of ocean floor. It is assumed that land-based construction activities for an open-water intake at the Potrero Road site would occur entirely in the beach parking lot. General construction methods and considerations for open-water intakes, as well as operation and maintenance assumptions, are described in **Appendix I1**. Refer to the description of this site under Intake Option 3, above, for information regarding existing land uses and the General Plan land use designations at this site.

5.3.3.5 Intake Option 5 – Ranney Wells at Moss Landing Harbor (Modify Existing Intake System at National Refractories site)

This intake option was originally proposed for the People's Moss Landing Water Desal Project by the Moss Landing Business Park, LLC and would involve the conversion of an existing open-water intake system of the former National Refractories and Minerals Corporation (National Refractories) in Moss Landing Harbor into a Ranney well subsurface intake system, and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 5 was determined to be fatally flawed because borehole data indicated that individual sand and sand and gravel lenses in the Moss Landing area are not vertically or laterally extensive and that the permeable deposits were not thick enough for a subsurface intake system in this area to be capable of providing a reliable source of seawater for the MPWSP Desalination Plant.

5.3.3.6 Intake Option 6 – Open-Water Intake at Moss Landing

This option would consist of an open-water intake system that would draw seawater from Monterey Bay, as proposed by the People's Project. The intake would use an existing 20-foot diameter intake pump caisson structure that is located on the beach, next to the Monterey Bay Aquarium Research Institute on Sandholdt Road in Moss Landing. The existing open-water intake structure would include a new 40-inch diameter intake pipe that would extend out from the existing caisson approximately 1,400 feet into the open bay and ocean. Two wedge wire passive

screens, one active and one stand by, would be attached at the end of this new pipeline extension and would be located approximately 120 feet below mean sea level. Each passive screen structure would be 96-inches in diameter and would be used to draw seawater into the existing caisson. The screens would be designed for a maximum through-screen velocity of 0.5 feet per second, and would contain 1.0 mm wedge wire slots to minimize impingement and entrainment.

A new 10-foot high pump and pump house structure would be built on top of the existing caisson with a first-floor elevation height of approximately 17 feet above mean sea level so that the pumps would be outside of the tsunami zone of inundation. Vertical turbine pumps would be used, with the pumps submerged in the intake structure and the motors in the pump house above. From the pump house, a new 40-inch diameter pipeline would convey the seawater beneath the Moss Landing Harbor and State Route 1 to the desalination plant following existing rights-of-way.

5.3.3.7 Intake Option 7 – Disengaging Basin at Moss Landing Power Plant (Water from Spent Cooling System)

This intake option would divert spent cooling water from the disengaging basin at the Moss Landing Power Plant (MLPP) for use as source water at the MPWSP Desalination Plant and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 7 was eliminated from further consideration due to uncertainties regarding the reliability, quality, and quantity of the potential source water supply.

5.3.3.8 Intake Option 8 – Open-Water Intake at Moss Landing Harbor (Either of Two Existing Intakes for Moss Landing Power Plant Cooling System)

This option would use the power plant's existing cooling system intake screens to screen source water for the MPWSP Desalination Plant, and would be independent of the power plant's cooling system operations (RBF Consulting, 2013).

The power plant has two cooling water intakes, both located along the eastern edge of Moss Landing Harbor. The northern intake ("Intake 8b") is used to draw cooling water for power generating Units 1 and 2, and the southern intake ("Intake 8a") is used to draw cooling water for power generating Units 6 and 7. The intakes use vertical traveling screens fitted with woven wire mesh panels mounted on a continuous belt; the northern intake has a total of six traveling screens (three for each power generating unit) and the southern intake has a total of eight traveling screens (four for each generating unit). The screens include a drive mechanism and spray cleaning system. As the screens rotate vertically through the water, debris on the screens is lifted out of the water to the top of the screen belt, where it is sprayed off the screen by the screen wash system. The screens at the northern intake are normally rotated every four hours, or they may activate automatically based on the pressure differential on the upstream and downstream faces of the screen. They can also run continuously. Because power generating Units 6 and 7 operate less frequently, the traveling screens at the southern intake are currently rotated and cleaned on an as-needed basis (Tenera, 2007). The northern intake structure was modified in conjunction with the

approval of new Units 1 and 2 in 2000;[9] the traveling screens at the northern intake are inclined about 35 degrees from vertical and have 5/16-inch woven wire mesh panels. The traveling screens at the southern intake structure are vertical in the water column and have traveling screens with 3/8-inch wire mesh panels. Both intakes also include initial bar racks; the traveling screens are located 20 and 25 feet behind the bar racks at the northern and southern intakes, respectively. The bar racks at the northern intake have 3 1/2-inch openings between the bars and the bar racks at the southern intake have 3 5/8-inch openings (Tenera, 2007; Dynegy, 2011). Nine pumps operate the northern intake. The six pumps that draw cooling water for Units 1 and 2 are located about 300 feet behind the intake; the remaining three pumps are used for the screen wash system. Seven pumps operate the southern intake. The four pumps that draw water for Units 6 and 7 are located about 30 feet behind the intake. Like the northern intake, another three pumps are used for the screen wash system (Tenera, 2007).

Under this option, new diversion pumps and a pipeline to connect to a new source water pipeline would be installed behind the power plant's existing intake screens to pump seawater to the desalination plant. While the southern intake would be the primary connection point, a secondary pipeline connection to the power plant's northern intake would enable CalAm to draw water from either intake. A new source water pump station would be installed near the southern intake to deliver the seawater via a new connecting pipeline to a new 36-inch-diameter source water pipeline. Trenchless construction would be used to install the pipeline under Highway 1. As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae, suspended and colloidal solids, and pathogens from the source water before conveying it through the reverse-osmosis system.

This intake option would modify an existing MLPP facility (in this case, the existing intakes in Moss Landing Harbor). Physical space is available at the existing intakes for these modifications; access to the intakes would be via Highway 1.

5.3.3.9 Intake Option 9 – Screened Deep-water Ocean Intake at Moss Landing

This intake option has been proposed by DeepWater Desal, LLC, as part of the Monterey Bay Regional Water Project. This analysis assumes a version that has been scaled down to meet the needs of the 9.6 mgd project proposed by CalAm. The intake option would consist of an intake structure in the Monterey Submarine Canyon that would draw in raw seawater, intake piping that would deliver the seawater to the shore, and an onshore pump station that would pump the seawater to the desalination facility. The offshore intake structure location is very close to the intake location described in Option 6. The difference between these two options is the method of installing pipelines to connect onshore facilities to the offshore intake structure.

The 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. It would be installed at the end of the subsurface intake pipeline at the point where it emerges from below the seafloor,

[9] The new Units 1 and 2 replaced the plant's original Units 1 through 5 which were retired in 1995.

approximately 1,300 feet offshore from the mean high water line at a depth of approximately 156 feet below mean low water.

Seawater would be conveyed from the intake structure to an onshore pump station via a 42-inch-diameter subsurface intake pipeline. The pipeline would be constructed subsurface using horizontal directional drilling (HDD) from the pump station site located near the end of the railspur at the corner of Dolan Road and SR-1. The pipeline would extend approximately 3,600 feet to the offshore seawater intake structure location. The HDD pit would be within the pump station footprint.

As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae, suspended and colloidal solids, and pathogens from the source water before conveying it through the reverse-osmosis system.

5.3.3.10 Intake Option 10 – Open Deepwater Intake in PG&E Fuel Oil Pipeline at Moss Landing

This intake option would use the existing carbon-steel pipeline previously used by PG&E for offloading fuel oil for the Moss Landing Power Plan and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 10 is fatally flawed because the existing fuel line likely contains a substantial amount of fuel residue which could present a public health issue, and the 18-inch-diameter of the offshore section of the pipeline would be too small to support a 9.6 mgd facility.

5.3.3.11 Intake Option 11 – Ranney Wells in Seaside/Sand City

This intake option emerged from earlier investigations conducted by the MPWMD and would involve the installation of three Ranney wells at two sites in the former Fort Ord coastal area in Seaside and Sand City and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 11 would involve the installation of three Ranney wells at two sites in the former Fort Ord coastal area in Seaside and Sand City. However, the former Fort Ord Wastewater Treatment Plant site and former Stillwell Hall sites faced political challenges, and the Bunker site faced siting constraints and relatively low-permeability sands that would limit the potential amount of feedwater that could be developed from a subsurface intake.

5.3.3.12 Intake Option 12 – Subsurface Slant Wells at Reservation Road

This intake option would locate at least nine subsurface slant wells at the western terminus of Reservation Road on the inland side of the Marina State Beach parking lot and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, a potential constraint to Intake Option 12 is Marina Coast Water District's existing 300 afy desalination plant and associated intake well, as well as their plans for developing a future desalination facility that could include development of a subsurface seawater intake system, which would result in well

interference. Additionally, the location of Intake Option 12 is not favorable for slant well installation due to the shallow depth of the aquifers.

5.3.3.13 Intake Option 13 – Ranney Wells at CEMEX Active Mining Area

Intake Option 13 would substitute the proposed subsurface slant wells at the CEMEX active mining area with four Ranney wells, each spaced approximately 350 feet apart (CalAm, 2014). A Ranney well is comprised of a vertical caisson (a large diameter shaft where the water is collected from each well and then pumped) extending below the water table, from which horizontally placed perforated screens (laterals) are extended. Like the slant wells under the proposed project, the Ranney wells would be set back approximately 900 feet inland from the shoreline. Each caisson would be 12 feet in diameter, and would be buried approximately 50 feet into the sand, with the top of the caisson flush with the beach surface. Each of the four Ranney wells would be equipped with five screened laterals that would draw groundwater from the shallow Dune Sands Aquifer. A pipeline that is about 1,475 feet long and 42 inches in diameter would collect seawater from the Ranney wells and convey it to the Source Water Pipeline located beneath the CEMEX access road. The electrical controls for the Ranney wells would be housed in an aboveground electrical control panel located just south of the CEMEX settling ponds and existing access road, and an electrical control building would be located at the eastern entrance of the CEMEX property. The footprint required for the Ranney wells, the source water pipeline, electrical control panel, and electrical control building would be identical to the proposed project (CalAm, 2014). See **Appendix I1** for a general discussion of construction and maintenance assumptions associated with Ranney Wells.

5.3.3.14 Intake Screening Summary

Seven intake options were determined to be feasible and were carried forward for evaluation. The next step compares the impacts of each intake option against the proposed slant wells at CEMEX to determine if adverse impacts would be reduced. This step is described in Section 5.3.6.

5.3.4 Outfall Options Screening Results

For a 9.6 mgd desalination plant, a brine stream ranging between approximately 12 and 14 mgd would be discharged via an ocean outfall in accordance with Ocean Plan requirements. See Section 3.4.1 in Chapter 3, Description of the Proposed Project, for a description of brine discharges under the proposed project.

This analysis considers several potential outfall options for brine discharge, all retained for evaluation in the second step of the process. They are summarized in **Table 5.3-2**, shown in **Figures 5.3-1** and **5.3-2** and described in sections 5.3.4.1 through 5.3.4.7. All outfall options, except for Outfall Option 1, would discharge into the waters of the MBNMS.

TABLE 5.3-2
OUTFALL OPTIONS SCREENING RESULTS

ID	Name	Description	Screening Results
Outfall-1	Modified MRWPCA Outfall and New Diffuser (modifications to existing outfall facility)	• This option would use the existing MRWPCA outfall pipeline in MBNMS, which ends at a 1,100-foot-long diffuser. This gravity-driven facility discharges treated wastewater from the MRWPCA Regional Wastewater Treatment Plant. • A 2.6-mile-long, 20-inch-diameter brine discharge pipeline would be suspended inside the existing MRWPCA outfall pipeline. • A new 500-foot-long brine diffuser would connect to the existing outfall pipeline. • A new pump station would be built near the headworks of the existing MRWPCA outfall, on the MRWPCA parcel. • The annular space between the outer wall of the inserted pipeline and the inner wall of the outfall would continue to be gravity-driven and would be used for wastewater effluent flow during all flow conditions. • The new brine discharge pipeline and diffuser would be used for pressurized brine discharges during wet-weather flows only; under all other flow conditions, the existing outfall and diffuser would be used.	*Retained for Further Analysis*
Outfall-2	New Outfall at North CEMEX Site (new construction)	• A 24-inch diameter outfall pipeline would be built approximately 0.8 mile north of the CEMEX active mining area in MBNMS. • An outfall pipeline would extend approximately 2,500 feet offshore and end at a new diffuser designed to meet Ocean Plan requirements. • An outfall pipeline would tunnel under the dunes, beach, and ocean floor. • A pump station would be built at the desalination plant site to pump brine through the new outfall and diffusers.	*Retained for Further Analysis*
Outfall-3	New Outfall at Potrero Road (new construction)	• A 24-inch-diameter outfall pipeline would be built east to west along Potrero Road into MBNMS. • From the western end of Potrero Road, the outfall pipeline would extend approximately 3,000 feet offshore and end at a new diffuser designed to meet Ocean Plan requirements. • The outfall pipeline would be constructed under the beach and ocean floor using tunneling technologies.	*Retained for Further Analysis*
Outfall-4	Modified National Refractories Outfall (modifications to existing outfall facility)	• The existing 2,750-foot-long, 51-inch-diameter outfall extends underground from the western boundary of the former National Refractories site in Moss Landing, under the marina, the commercial harbor, and the harbor "island," and daylights near its end, approximately 620 feet offshore in the Monterey Bay in MBNMS at a depth of approximately 43 feet beneath the water surface. (Same outfall as proposed by the Peoples' Project) • The existing outfall would be repaired to address joint decoupling and minor cracks, and new diffusers would be attached. The pipe is buried with approximately 25 feet of cover over the entire length • Operation of this outfall would require repair of the outfall pipeline and diffuser, and would require modifications to meet the State Ocean Plan requirements. Due to the age and condition of the existing 51-inch pipeline, a new 36-inch-diameter pipeline would be slip-lined within the existing 51-inch outfall facility and then extended approximately 700 feet further to a depth of approximately 120 feet in the Monterey Bay on the edge of the submarine canyon. The 700-foot-long pipeline extension would be laid and anchored on the ocean floor and covered in riprap. This segment of pipeline would contain a diffuser system with 32 nozzles.	*Retained for Further Analysis*

TABLE 5.3-2 (Continued)
OUTFALL OPTIONS SCREENING RESULTS

ID	Name	Description	Screening Results
Outfall-5	New Outfall at Sandholdt Road (new construction)	• A new 24-inch-diameter outfall pipeline would be aligned east to west from Sandholdt Road. The outfall pipeline would extend approximately 1,000 feet offshore into MBNMS and end at a new diffuser designed to meet Ocean Plan requirements.	*Retained for Further Analysis*
Outfall-6	Existing Outfall for Moss Landing Power Plant Spent Cooling System (new connections to existing facilities)	• The Moss Landing Power Plant has two existing 144-inch-diameter outfall pipelines that end approximately 1,000 feet offshore from the Moss Landing Harbor inlet approximately 20 feet above the ocean floor and 20 feet below the water surface. This outfall is used during power plant cooling system operations. • Under this option, brine concentrate would be conveyed to the disengaging basin at the power plant via a new pipeline connection. Brine would discharge to Monterey Bay via the two existing outfall pipelines.	*Retained for Further Analysis*
Outfall-7	New Outfall at Moss Landing	• Brine would discharge from the desalination facility to the offshore discharge diffuser structure via one proposed subsurface 36-inch-diameter discharge pipeline. The discharge diffuser structure would be located in Monterey Bay approximately 3,400 feet offshore in MBNMS. (Same outfall location as proposed by Deepwater Desal Project) • Operation of the outfall would include a multi-jet linear diffuser that would be located on the seafloor, and that would consist of five separate standing pipe risers emerging from a single 36-inch pipe manifold. Each riser would be fitted with a duckbill diffuser nozzle. 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. Only the duckbill diffuser nozzles would extend above the protective cover.	*Retained for Further Analysis*

5.3.4.1 Outfall Option 1 – Modified MRWPCA Outfall and New Diffuser

This option would involve inserting a smaller-diameter pipeline inside the existing Monterey Regional Water Pollution Control Agency's (MRWPCA) outfall pipeline, installing a new diffuser to the end of the smaller pipe, which would exit the existing outfall pipe where the existing outfall turns to the northwest, and building a new pump station at the MRWPCA Regional Wastewater Treatment Plant site. This outfall option was originally intended to address what were thought to be potential water quality and outfall capacity impacts associated with using the existing outfall for brine discharge. However, it is possible to meet the Ocean Plan limits for the proposed project with mitigation, as presented in Section 4.3.3.5 (Surface Water Hydrology and Water Quality). At the MRWPCA outfall headworks under Outfall Option 1, approximately 2.6 miles of 20-inch diameter pipe would be pushed inside the existing MRWPCA outfall pipe. The 20-inch diameter pipe would extend to the first offshore bend in the outfall pipe. A new connection would be built as an exit structure at the bend of the existing pipe, and a barge would be used to transport, sink, attach, and secure a new 500-foot-long diffuser to the existing pipe and to the ocean floor for discharging and dispersing the brine (see **Figure 5-1**). It is estimated that construction activities associated with this outfall option would result in approximately 0.5 acre of disturbance on the ocean floor.

The modified outfall would be configured with a new pump station to be built on or near the MRWPCA property, in the vicinity of the existing MRWPCA outfall headworks. During wet-weather periods, when effluent flows are high, the brine stream would be pumped through the inserted pipe and the new diffuser, and MRWPCA's wastewater effluent would be pumped through the annular space between the outer wall of the inserted pipeline and the inner wall of the outfall and the existing diffuser. Pumping would provide MRWPCA the same effective capacity as the existing outfall.

It is assumed that the MRWPCA would continue to maintain and operate the modified outfall. Maintenance activities would involve, as they do now: annual integrity test, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. The MRWPCA conducts these maintenance activities at regular intervals. Other maintenance activities could include hand scraping of the diffuser section of the outfall line.

5.3.4.2 Outfall Option 2 – New Outfall at North CEMEX Site

This option would involve building a new ocean outfall pipeline and diffuser at the north CEMEX site (i.e., the same location as Intake Options 1 and 2), and building a brine discharge pump station at the desalination plant site.

As with the other outfall options, the length of the outfall pipeline would vary depending on whether the desalination plant was built at the proposed Charles Benson Road site or at one of the two site options presented in Section 5.3.5. For the purposes of this screening step, only the 5,500-foot-long segment of the outfall pipeline that would extend between the inland side of the dunes to the east and the diffuser in the open ocean at the western end is considered. This

segment would be identical regardless of the location of the desalination plant. The outfall pipeline would be 24 inches in diameter. The eastern 2,500-foot-long segment would extend from the inland side of the dunes to the shoreline. The outfall pipe would tunnel under the dunes and beach and would daylight on the ocean floor approximately 2,500 feet offshore (see **Figure 5-1**). A 500-foot-long diffuser, designed to meet the 2012 Ocean Plan requirements, would be built on the ocean floor at the western end of the pipe.

The diffuser would be delivered via barge, lowered, attached to the pipeline, and anchored to the ocean floor. A 50-foot-wide construction corridor would be needed to anchor the diffuser to the ocean floor. Segments of the outfall pipeline located east of the dunes would be installed using open-trench construction methods except that, as with the proposed project pipelines, jack and bore methods would be used for the segment crossing under Highway 1 and any drainages along the alignment. The brine discharge pump station at the desalination plant site would be used to pump the brine stream through the outfall and diffuser and disperse the discharge.

The City of Marina has jurisdiction over much of this land, which is subject to the *City of Marina General Plan* and *Local Coastal Land Use Plan*. This land is designated for Habitat Preserve and Other Open Space land uses and zoned Coastal Conservation and Development (City of Marina, 2000; City of Marina, 1982). The north CEMEX intake pump station site would be located in unincorporated Monterey County and, therefore, would be subject to provisions of the *North County Land Use Plan* of the *Monterey County General Plan*. The site is designated as prime farmland. There appears to be sufficient physical space to accommodate an outfall pipe, pending approval of the appropriate easements. Maintenance activities would involve annual integrity tests, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. Other maintenance activities could include hand scraping of the diffuser section of the outfall line. Implementation of this outfall option would require coordination and access agreements with CEMEX.

5.3.4.3 Outfall Option 3 – New Outfall at Potrero Road

This outfall option is similar to Outfall Option 2, except that it would be located approximately 4.5 miles to the north. This option proposes construction of a new outfall pipeline and diffuser extending offshore from the beach parking lot at the west end of Potrero Road, and building a new brine discharge pump station.

From the beach parking lot, approximately 3,000 linear feet of 24-inch diameter pipe would be installed using trenchless technologies beneath the beach and ocean floor. The outfall pipeline would daylight on the ocean floor, and a 500-foot-long diffuser, designed to meet proposed 2014 Ocean Plan requirements, would be attached to the western end of the pipe (RBF Consulting, 2013) and anchored to the ocean floor. Construction activities on and disturbance of the ocean floor are assumed to be similar to those described above for Outfall Option 2. It is assumed that the portion of the outfall pipeline located east of the Potrero Road beach parking lot would be built using open-trench construction methods except when crossing major roads, such as Highway 1, or when crossing drainages, when jack and bore methods would be used. The brine

discharge pump station would be located in the existing parking lot, would pump the brine stream through the outfall and diffuser, and would disperse the discharge.

The description of Intake Option 3 in Section 5.3.3.2, above, provides information regarding land use and zoning at the Potrero Road site. There appears to be sufficient physical space to accommodate the outfall pipe, pending approval of the appropriate easements. Maintenance activities would involve annual integrity tests, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. Other maintenance activities could include hand scraping of the diffuser section of the outfall line. This outfall option would require CalAm to obtain an easement from California State Parks for any portions of the outfall pipeline that traverse parkland at the end of Potrero Road.

5.3.4.4 Outfall Option 4 – Modified National Refractories Outfall

Outfall Option 4 would involve modifications to the existing outfall at the former National Refractories site, now called the Moss Landing Business Park or Moss Landing Commercial Park and is also the proposed outfall for the People's Project (described as Alternative 4, in Section 5.4).

The existing outfall is a 2,750-foot-long, 51-inch-diameter[10] concrete pipe that terminates approximately 800 feet offshore in Monterey Bay, at a depth of 43 feet below the water surface (SPI and Helm, 2013; Mickley, 2012; MLBP LLC, 2013b). From a point near the western boundary of the former National Refractories site, the outfall pipeline is routed beneath the marina, the commercial harbor, and "Moss Landing Island,"[11] to the point at which it emerges from the surface near its terminus in the bay (Landmark Realty, 2011). The pipe is buried with approximately 25 feet of cover over the entire length. A structural evaluation identified cracks that could be repaired with epoxy resin and indicated that, after the repair, the concrete pipe would be structurally adequate to function as an outfall. Operation of this outfall would require repair of the outfall pipeline and diffuser, and would require modifications to meet the State Ocean Plan requirements. Due to the age and condition of the existing 51-inch pipeline, a new 36-inch-diameter pipeline would be slip-lined within the existing 51-inch outfall pipeline and then extended approximately 700 feet further to a depth of approximately 120 feet in the Monterey Bay on the edge of the submarine canyon. The discharge would include one new 16-inch diffuser port.

The outfall is not currently used for discharges from the former National Refractories site; however, the outfall pipeline currently has within it two 8-inch polypropylene intake pipelines. These intake lines access open water through ports in the existing outfall diffuser; intake screens are attached to the lines about 100 feet from the end of the diffuser and serve the MLML, Phil's Fish Market, sea lion facilities, and the Monterey Bay Aquarium Research Institute (MLBP LLC,

[10] Mickley (2012) reports the outfall has an inside diameter of 51 inches and an outside diameter of 56 inches. The *Final Report of Evaluation of Seawater Desalination Projects* prepared for the Monterey Peninsula Regional Water Authority (SPI and Helm, 2013) describes the existing outfall pipeline as 51 inches, as does the Peoples' Moss Landing Water Desal Project (PML Desal, 2014) and a RWQCB permit (Order No. R3-2009-0002). Other sources describe the outfall as 52 inches (Miller, 2012) or 54 inches (Landmark Realty, 2011).

[11] Moss Landing Island refers to the area between the harbor and the bay north of Sandholdt Bridge.

2013c, RWQCB, 2009). The People's Project sponsors have indicated their interest in continuing to accommodate this use of the outfall pipeline along with modifications to use the pipeline as an outfall to serve a new desalination plant (MLBP LLC, 2013c).

The construction activities associated with the necessary repairs to the existing outfall are not known. However, it is assumed the offshore portion of the outfall would be accessed by barge and that a new diffuser would replace the existing one.

5.3.4.5 Outfall Option 5 – New Outfall at Sandholdt Road

This outfall option is similar to Outfall Option 2 (New Outfall at North CEMEX Site) and Option 3 (New Outfall at Potrero Road), but would be located at Moss Landing. This outfall option would involve construction of a new ocean outfall and diffuser extending offshore from a point on Sandholdt Road, and a new brine discharge pump station at the desalination plant site that is ultimately selected.

Although the MPWSP Contingency Plan did not identify a specific site on Sandholdt Road for this option, this analysis assumes that the site for this outfall option is on the west side of Sandholdt Road directly west of Sandholdt Bridge, where the road turns north. The July 2014 Revised Draft Moss Landing Community Plan identified several sites in this area as having "development potential," and the location appears suitable for accommodating the construction of a subsurface outfall. The Community Plan identifies one of the three development potential sites in this immediate location as "pier" (where the Sandholdt Pier formerly existed), another as "aquaculture slab," and the third as "MLML" (one of several sites on Sandholdt Road identified as being associated with MLML). Construction of a subsurface desalination outfall from this area would not preclude future construction of a new pier development of an aquaculture facility in the vicinity, or many other potential future land uses. From the site on Sandholdt Road, the outfall pipeline would tunnel beneath the seafloor and emerge from the surface about 1,000 feet offshore; a 500-foot long diffuser would be attached to the outfall pipeline. Construction activities at this site and disturbance on the ocean floor are assumed to be similar to those described above for Outfall Option 2.

The site and areas to the north along Sandholdt Road are designated Industrial-Coastal Dependent – Light in the current Monterey County Land Use Plan: Moss Landing (1982) and Waterfront Industry in the July 2014 Revised Draft Moss Landing Community Plan; the site is zoned LI (CZ) (Light Industrial-Coastal Zone). The Salinas River State Beach borders the site to the south. There appears to be sufficient physical space to accommodate the outfall pipe, subject to obtaining the appropriate easements. Maintenance activities would involve annual integrity tests, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. Other maintenance activities could include hand scraping of the diffuser section of the outfall line. Implementation of this outfall option would require that CalAm coordinate with and obtain appropriate access agreements and easements from landowners, including California State Parks if any portion of the outfall pipeline traverses parkland.

5.3.4.6 Outfall Option 6 – Modify Existing Outfall for Moss Landing Power Plant Cooling Water

This outfall option would involve the construction of a new pipeline connection to the existing disengaging basin at the Moss Landing Power Plant to discharge brine via the power plant's existing cooling water system outfall, and a new brine discharge pump station located at the desalination plant site.

The Moss Landing Power Plant and existing outfall pipelines are owned by Dynegy Moss Landing, LLC. The outfall facility consists of two 144-inch diameter outfall pipelines that end approximately 1,000 feet offshore in Monterey Bay at approximately 20 feet above the seabed and 20 feet beneath the water surface (CPUC, 2009). Spent cooling water from the power plant's power generating Units 1 and 2 discharges to the disengaging basin, from which the water flows to the power plant's outfall pipelines; cooling water from power generating Units 6 and 7 discharges to the outfall pipelines downstream from the disengaging basin. The brine stream from the desalination plant would thus mix with spent cooling water from Units 1 and 2 in the disengaging basin and would mix with the spent cooling water from all four generating units in the outfall pipelines before being discharged to Monterey Bay, assuming current power plant operations.

In response to the requirements of section 316(b) of the federal Clean Water Act, in 2010 the SWRCB adopted a policy regulating coastal power plants that use once-through cooling systems[12] (SWRCB, 2014). Under the SWRCB's once-through cooling policy, starting in 2016, the power plant must reduce its intake of cooling water by 83.7 percent to reduce entrainment and impingement. Alternatively, if the power plant cannot or chooses not to reduce its intake, it must achieve a greater reduction in mortality from entrainment and impingement in some other way, and must fully comply with the reduction by December 31, 2020. Dynegy has indicated its intention to retrofit the power plant's four generating units to reduce entrainment and impingement impacts under the once-through cooling policy. Complying with the policy would dramatically reduce the amount of cooling water discharged through the power plant's outfall, and the cooling water that is discharged is expected to have much higher concentrations of minerals compared to current discharges from the power plant. This is because, once the generating units are retrofitted, evaporation during the cooling process will concentrate the minerals in the original seawater. Therefore, once the power plant complies with the once-through cooling policy, the plant's cooling water system would provide little, if any, dilution of the desalination plant's brine discharge. Through a 2014 settlement agreement between the SWRCB and Dynegy, these reductions would be met by new technology, screening, and other methods. When the power plant meets its required reductions, CalAm would need to insert a smaller pipeline within one of the existing outfall pipelines and the existing riser, and to attach an appropriate diffuser to achieve the pressure required for brine discharge rates at the outfall diffuser.

Under existing conditions, all construction activities would occur in previously disturbed areas, and no construction would be required in the open waters of the Monterey Bay or Moss Landing Harbor. When the power plant complies with the once-through cooling policy after 2020, or when

[12] Once-through cooling systems circulate water through pipes to absorb heat from power plants or data centers for example, and discharge the now warmer water to the ocean.

the power plant shuts down, construction associated with slip-lining one of the MLPP outfall pipelines would occur primarily at the power plant site. Underwater work in Monterey Bay would consist of attaching a new brine diffuser to the end of the slip-lined pipe and anchoring the diffuser to the ocean floor. Building this outfall would require CalAm to coordinate and enter into appropriate agreements with Dynegy.

5.3.4.7 Outfall Option 7 – New Outfall at Moss Landing

This outfall option uses the same outfall location as the proposed DeepWater Desal, LLC Monterey Bay Regional Water Project. However, compared to the DeepWater Desal Project this analysis assumes that the size of the outfall and the associated pipeline has been scaled down to meet the needs of the 9.6 mgd project proposed by CalAm. The option would include the following three components:

- A discharge diffuser structure;
- A brine pump station; and
- Discharge pipelines.

The discharge diffuser structure would be located in Monterey Bay, approximately 3,400 feet offshore from the Mean High Water Level in the waters of MBNMS and would be secured to the seafloor. The planned elevation of the discharge diffuser structure is approximately 76 feet below Mean Lower Low Water.

The multi-jet diffuser structure would be located on the seafloor and would consist of standing pipe risers emerging from a single 36-inch pipe manifold that would be connected to the end of the discharge pipeline. Each riser would be fitted with a duckbill diffuser nozzle. The diffuser structure would be buried in riprap protective cover and ballast stone. Only the duckbill diffuser nozzles would extend above the protective cover.

5.3.4.8 Outfall Screening Summary

All seven outfall options considered were determined to be feasible and were carried forward for evaluation. The evaluation step compares the impacts of each outfall option against the proposed use by the MPWSP of the existing MRWPCA outfall to determine if adverse impacts would be reduced. This step is described in Section 5.3.6.

5.3.5 Desalination Plant Site Options Screening Results

This analysis considers three alternative locations for the MPWSP Desalination Plant. The desalination plant site options are summarized in **Table 5.3-3** below, and shown on **Figures 5.3-1** and **5.3-2**. The option that was not carried forward into this analysis is described in **Appendix I2**, while the options that were retained for further evaluation are described below (Sections 5.3.5.1 and 5.3.5.2). The primary considerations for the desalination plant site options are the suitability, availability, and proximity of the sites to the possible locations of intake and outfall facilities. For this analysis, it is assumed that the desalination facilities described in Chapter 3, Description of

the Proposed Project, for the Charles Benson Road site would be required at all of the desalination plant site options, and that a minimum of 10 acres is needed to accommodate these facilities. As such, this section focuses on the physical footprint of the desalination facilities and does not evaluate different treatment processes. Although the pre-treatment requirements could vary depending on the quality of the source water (open-water vs. subsurface intake), it is assumed that any modifications to the desalination processes could be accommodated within the same footprint.[13]

TABLE 5.3-3
DESALINATION PLANT SITE OPTIONS SCREENING RESULTS

Figure ID	Site	Description	Screening Results
Plant-1	North Marina Armstrong Ranch Property	This 320-acre site, a portion of which is owned by the Marina Coast Water District, is located south of the MRWPCA Regional Wastewater Treatment Plant and the Monterey Regional Environmental Park. The site is used for agriculture and grazing. The desalination plant would be built on 10 acres of land.	*Not Carried Forward because this site, while previously-approved by the CPUC as part of the Regional Project, is owned by MCWD and is no longer available to CalAm.*
Plant-2	Moss Landing National Marine Refractories Site	This site, owned by Moss Landing - Business Park, LLC, is located on Highway 1, southeast of the Dolan Road/ Highway 1 intersection, across Dolan Road from the Moss Landing Power Plant. This is the former Kaiser Refractories Moss Landing Magnesia Plant site. The desalination plant would be built on 25 acres of the 183-acre site.	*Retained for Further Analysis*
Plant-3	Moss Landing Power Plant East Tank Farm Parcel	This 110-acre site, owned by Dynegy, is located on Dolan Road, approximately 1,500 feet east of the Moss Landing Power Plant.	*Retained for Further Analysis*

5.3.5.1 Desalination Plant Site Option 1 – Armstrong Ranch at North Marina

This desalination plant option would be located on approximately 10 acres of the 320-acre Armstrong Ranch parcel, which is situated south of and adjacent to the MRWPCA Regional Wastewater Treatment Plant and the Monterey Regional Environmental Park. The Marina Coast Water District currently owns this site, which was evaluated in the Coastal Water Project EIR as the location for the desalination plant for the North Marina and Regional Project alternatives, and it was not carried forward into the alternatives evaluation. See **Appendix I2**. Given that Marina Coast Water District currently owns the property, and that CalAm already owns the 46-acre Charles Benson Road site, which is located approximately 0.75 mile to the north, and since Site Option 1 does not provide any advantage over the Charles Benson Road site, it was not carried forward.

[13] For example, the pretreatment requirements are determined by the quality of the source water. The conceptual design for the MPWSP Desalination Plant at the Charles Benson Road site is based on the pretreatment requirements for a subsurface intake system. If an open-water intake were used, adjustments to the pretreatment system could be required.

5.3.5.2 Desalination Plant Site Option 2 – Moss Landing National Refractories Site

Site Option 2 is the National Refractories site owned by Moss Landing Business Park, LLC. It is located at 7697 Highway 1 in Moss Landing, southeast of the intersection of Dolan Road and Highway 1, across from the Moss Landing Power Plant. The desalination plant would be built on approximately 25 acres of the 183-acre parcel.[14] This site option is also proposed by Moss Landing Business Park, LLC as the location of a desalination plant for the Peoples' Moss Landing Desalination Project.

This is the site of the former Kaiser Refractories Moss Landing Magnesia Plant, which used to extract magnesium from seawater, but which closed in February 1999 (Landmark Realty, 2011). The site is located in unincorporated Monterey County. The *Moss Landing Community Plan* zones this site as HI (CZ) – Heavy Industrial (Coastal Zone) (Monterey County, 1982).

Approximately 25 acres of the parcel are available for purchase or lease. Some existing structures at the site could be incorporated into the desalination plant design, including buildings, access roads, and parking lots.

5.3.5.3 Desalination Plant Site Option 3 – Moss Landing Power Plant East Tank Farm Parcel

This parcel, which is also called the East Tank Farm Parcel, is located on the north side of Dolan Road, approximately 1.5 miles east of State Route 1 (SR-1), just east of the unincorporated community of Moss Landing, in the unincorporated area of Monterey County. The 110-acre site is bordered by Dolan Road on the south, by the Moss Landing Power Plant on the west, and by predominantly agricultural lands and the Elkhorn Slough to the north and east. Only 25 acres of the site would be required for the desalination plant. The site contains some remnants of equipment used at the tank farm, such as pipelines and empty electrical cabinets. Many of the earthen berms that surrounded the fuel oil tanks remain in place.

The *Monterey County General Plan* designates the East Tank Farm Parcel for Heavy Industrial Coast Dependent use. Building a desalination plant at this site would require that CalAm purchase or lease the land from Dynegy.

5.3.5.4 Desalination Plant Site Screening Summary

Two desalination site options were determined to be feasible and were carried forward for evaluation. The next step compares each desalination plant site against the proposed project plant site to determine if adverse impacts would be reduced. This evaluation step is described in Section 5.3.6.

[14] The gross acreage of APN No. 133-172-013, National Refractories is 183 acres; however, a portion of the land consists of wetlands and Moro-Cojo Slough as well as areas affected by flooding. Therefore, the net usable area of the parcel is estimated to be 165 acres.

5.3.6 Evaluation of Intake, Outfall, and Desalination Plant Options

This section evaluates the relative environmental effects of the intakes, outfalls and desalination plant sites that were carried forward from the prior screening step, compared against the components of the proposed MPWSP. For each environmental topic presented in Chapter 4, a comparison of impacts is presented in **Tables 5.3-4**, **5.3-5**, and **5.3-6** for intakes, outfalls and desalination plant sites respectively. The components that are determined through the evaluation to avoid or reduce potential environmental impacts are used to compile whole alternatives in Section 5.4 that are evaluated against the proposed project in Section 5.5.

Tables 5.3-4 through 5.3-6 present summary descriptions of the potential environmental impacts associated with the implementation of a particular component of the proposed project, as described in Chapter 4. The impacts of the component options are described comparatively using the following descriptors:

- **Similar** – impacts would be identical or would be of the same general magnitude as the MPWSP proposed component
- **Increased** – impacts would be notably greater than the proposed MPWSP component
- **Decreased** – impacts would be notably less than the proposed MPWSP component

5.3.6.1 Evaluation Results for Intake, Outfall and Desalination Plant Options

Intake Options

Three types of intake options were compared against the proposed slant wells in **Table 5.3-4**:

- Alternative subsurface slant well location (Intake Option 3) – comparison showed a mix of increased, similar, and decreased environmental effects.
- Alternative subsurface well technology (Intake Option 13) – comparison showed similar environmental effects as the proposed slant wells for all environmental topic areas.
- Open water intake facilities and locations (Intake Options 2, 4, 6, 8, and 9) – comparison showed a mix of increased, similar, and decreased environmental effects.

Alternative Subsurface Well Location

Intake Option 3, Slant Wells at Potrero Road, would provide an optional location for slant wells behind (east of) the dunes, in the parking lot at the end of Potrero Road. This location would avoid impacts associated with coastal erosion and would reduce potential impacts on sensitive biological resources at the proposed CEMEX site, but would be located in a 100-year flood plain. During construction, this option would require the temporary closure of the parking lot for the state park and would have increased noise and access impacts on nearby residences. Because Intake Option 3 would decrease some environmental effects (while increasing others) compared

with the proposed project, it is carried forward for development into "whole" alternatives (Alternative 1 in Section 5.4).

Alternative Subsurface Well Technology

Ranney wells (Intake Option 13) were shown to result in similar environmental effects compared to the proposed slant wells, resulting in neither increased or decreased impacts. Ranney wells do offer an opportunity to replace slant well technology at either the CEMEX or the Potrero Road site if necessary. However, because no difference in environmental effects was demonstrated, it is unnecessary to carry it forward for analysis.

Open-water Intake Facilities and Locations

As discussed previously in Section 5.3.1, the CCC, MBNMS, SWRCB, and other resource agencies will not consider permitting an open-water intake unless a subsurface intake is proven to be infeasible or would result in greater environmental impacts. Although not anticipated, a subsurface intake could be deemed infeasible. If it were not possible to implement a subsurface intake for the proposed MPWSP, CalAm would need to consider an open-water intake (presented as Intake Options 2, 4, 6, 8, and 9). However, it is unnecessary to analyze every possible open water intake facility and location. Therefore, the comparison presented in Table 5.3-4 was used to identify the open water intake option capable of reducing environmental effects to the greatest degree possible, as described below.

Open-water options at Moss Landing (Options 6, 8 and 9) would avoid the noise and construction impacts at North of CEMEX (Option 2) and Potrero Road (Option 4) because of the existing industrial land uses in the Moss Landing area; however, no entrainment or impingement studies have been performed at either of these locations. Of the Moss Landing open-water options evaluated, Intake Option 8 (MLPP) would have fewer construction-related impacts because it would involve a modification to an existing facility. Intake Option 6 would have the greatest potential for construction-related impacts of the open-water options evaluated, due to the need to remove the existing diffuser and replace it with a new riser and wedgewire screens; due to structural modifications that would be required on the land side; and due to the impacts associated with installing and securing a length of new pipeline and riprap armoring on the seafloor.

Intake Option 9 (DeepWater Desal) would have fewer operational impacts than the other open water intakes because of its proposed location and design: studies conducted by DeepWater Desal suggest the abundance of marine species is reduced at this deep water location. When compared to the other open-water intakes evaluated, Intake Option 9 could have fewer impacts from impingement and entrainment than the other open water intakes considered but increased construction impacts when compared to Option 8. Construction impacts are more easily mitigated than the operational impacts from impingement and entrainment; therefore, Intake Option 9 was carried forward into the development of whole alternatives (Alternative 2 in Section 5.4).

TABLE 5.3-4
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.2 GEOLOGY, SOILS, AND SEISMICITY							
Construction Activities: Construction would have an LSM impact related to potential increased soil and sand erosion.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
Operations and Facility Siting: LS impact related to exposure of people or structures to seismically-induced ground-shaking, or liquefaction and lateral spreading. LSM impact related to exposure of structures to coastal erosion and bluff retreat caused by sea level rise.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Increased.** Coastal erosion and scour from the caisson would be exacerbated by sea level rise. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Similar.**
4.3 SURFACE WATER HYDROLOGY AND WATER QUALITY							
Construction Activities LS impact related to degradation of water quality due to soil erosion or toxic chemical releases and discharge of water produced during well drilling and development. No water quality impact from discharges of treated water and disinfectant from well drilling and development, however, LSM water quality impacts from discharges of treated water and disinfectant during Source Water Pipeline construction.	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Similar.**	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Similar.**	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Similar.**
Operations and Facility Siting: No alteration in drainage patterns such that on or offsite flooding would increase or the capacity of the stormwater drainage system would be exceeded. LS water quality impact due to slant well maintenance; increased erosion, siltation, and surface runoff due to alteration of drainage patterns; impedance or redirection of flood flows due to siting facilities in a 100-year flood hazard area; and exposure of people or structures to risk of loss, injury or death from flooding due to tsunamis or sea level rise.	**Similar.**	**Increased.** The parking lot at Potrero Road is within the 100-year flood zone. All other impacts would be similar to that of the proposed slant wells.	**Similar.**	**Similar.**	**Similar.**	**Decreased.** No impacts associated with siting facilities in a 100-year flood hazard area. Less impact related to tsunamis and sea level rise flooding because above ground facilities are outside the respective flood area.	**Similar.**
4.4 GROUNDWATER RESOURCES							
Construction Activities: LS impact related to interference with groundwater recharge, violation of any water quality standard, or degradation of groundwater quality.	**Decreased.** No impact.	**Similar.**	**Decreased.** No impact.	**Decreased.** No impact.	**Decreased.** No impact.	**Decreased.** Construction would have no impact related to interference of groundwater recharge, depletion of supplies, or water quality.	**Similar.** Construction would be similar to those of the proposed project. The same APMM identified for the proposed project would be implemented for this option.
Operations and Facility Siting: LSM impact related to depletion of groundwater supplies or interference with groundwater recharge and LSM impact related to violating water quality standards.	**Decreased**. Open-water intakes would not affect groundwater.	**Increased.** Operation and siting would be greater than the proposed project due to a greater percentage of feedwater coming from the groundwater basin. The APMM identified under the proposed project would also be applied for this option.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Similar.** Operational impacts would be similar to those of the proposed project. The same APMM identified for the proposed project would be implemented for this option.

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.5 MARINE BIOLOGICAL RESOURCES							
Construction Activities: LS impact on candidate, sensitive, or special status species; and no impact related to interference with the movement of native resident or migratory fish or wildlife species. *Operations and Facility Siting:* LS impacts on candidate, sensitive, or special status species; potential conflict with provisions of an adopted habitat conservation plan (or similar plan); and interference with the movement of any native resident or migratory fish or wildlife species.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation is not available.	**Similar.** Impacts would be similar to and potentially less than those of the proposed project because the slant wells would be located farther back from the high tide line.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during construction. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during construction. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Increased.** Construction impacts would be decreased because connection with existing screen would be inland. Impacts from operation would be increased and new mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during construction. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Similar.**
4.6 TERRESTRIAL BIOLOGICAL RESOURCES							
Construction Activities: LSM impact on candidate, sensitive, or special-status species; riparian habitat, critical habitat or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. Construction would not conflict with local tree ordinances.	**Decreased.** The impact of intake construction would be reduced since the construction area would be located within agricultural land behind the sand dunes. The construction area does not support federal wetlands, federal other waters, and /or waters of the State riparian areas, critical habitat, or sensitive natural communities so would not impact these resources. The intake would have similar impacts on candidate, sensitive, or special-status species. The intake would not conflict with local tree ordinances as there are no trees within the impact area.	**Decreased.** The intake construction would be located in a parking lot behind the sand dunes and would not directly impact sensitive natural communities or wetlands. However, wetlands, central dune scrub and other sensitive natural communities are located adjacent to the work area and could be impacted during construction. This intake would have a similar level of impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. The intake would not conflict with local tree ordinances as there are no trees within the impact area.	**Decreased.** The intake construction would be located in a parking lot behind the sand dunes and would not directly impact sensitive natural communities or wetlands. However, wetlands, central dune scrub and other sensitive natural communities are located adjacent to the work area and could be impacted during construction. This intake would have a similar level of impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. The intake would not conflict with local tree ordinances as there are no trees within the impact area.	**Decreased.** Construction of this intake includes construction of a new pump station onshore in ruderal or non-native grassland areas. No riparian habitat, critical habitat, or sensitive natural communities occur at the pump station site, so there would be a decreased level of impact on these resources This area could support special-status species and would have a similar level of impact on candidate, sensitive, or special-status species. The pump station would be located adjacent to Moss Landing Harbor, a potential federal and State other water and construction of the pump station could impact this feature. This intake would have a similar level of impact on federal wetlands, federal other waters, and/or waters of the State. No riparian habitat, critical habitat, or sensitive natural communities occur at the pump station site. There are trees located at the pump station site. Impacts on these trees could conflict with local tree ordinances and the impact would be similar.	**Decreased.** Construction/modification of this intake includes construction of a new pump station onshore in currently developed or ruderal areas with non-native trees. No riparian habitat, critical habitat, or sensitive natural communities occur at the pump station site, so there would be a decreased level of impacts on these resources. This area could support special-status species and therefore, similar to the proposed project, this impact would have a similar level of impact on candidate, sensitive, or special-status species. The pump station would be located adjacent to Moss Landing Harbor, and construction of the pump station could impact a similar level of federal wetlands, federal other waters, and/or waters of the State. There are trees located at the pump station site. Impacts on these trees could conflict with local tree ordinances and the impact would be similar.	**Increased.** Construction of the intake would occur within ruderal and agricultural areas dominated by non-native grassland and non-native trees and would not directly impact sensitive natural communities or wetlands. However, the construction area would be located adjacent to wetlands, riparian areas, and sensitive natural communities associated with Elkhorn Slough and these areas could be impacted by construction. This intake would have a similar level of impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. There are trees located at the pump station site. Impacts on these trees could conflict with local tree ordinances and the impact would be similar.	**Similar.** The impact of the intake construction would be similar to the MPWSP project intake as construction would occur at the same location and have the same construction disturbance area as the proposed project.

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.6 TERRESTRIAL BIOLOGICAL RESOURCES (cont.)							
Operations and Facility Siting: LSM impact on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. No conflict with adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas, therefore NI.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Similar.** Operational impacts would be similar since periodic maintenance cleaning would occur in the parking lot adjacent to sensitive biological resources and would have a similar level of impact related to the adverse effects on species identified as candidate, sensitive, or special-status; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Similar.**
4.7 HAZARDS AND HAZARDOUS MATERIALS							
Construction Activities: LS impacts related to transport, use and disposal of hazardous materials and the risk of fire during construction; LSM impact related to potential release of hazardous materials; and NI associated with siting the slant wells on a known hazardous materials site or with hazardous materials handling or emissions within 0.25 mile of a school.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
Operations and Facility Siting: Operation would have LS impacts related to the transport, use, and disposal of hazardous materials; and NI related to hazardous materials handling or emissions within 0.25 mile of a school or airport hazards.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.8. LAND USE, LAND USE PLANNING, AND RECREATION							
Construction, Operations, and/or Facility Siting Operation would have LS impacts related to consistency with applicable land use plans, policies, and regulations.	**Similar.**	**Increased.** Construction would have an increased but mitigable impact associated with disruption of established recreational land uses or closure of a recreational facility because it would require the temporary closure of the state beach parking. Operations would have an increased but	**Increased.** Construction would have an increased but mitigable impact associated with disruption of established recreational land uses because it would require the temporary closure of the state beach parking lot. Operational impacts would also be increased but mitigable	**Similar.**	**Increased.** Impacts would be increased because in-water work at the intakes screens result in an increased impact on recreational and commercial uses at the harbor. This temporary impact could be mitigated.	**Increased.** The impact associated with construction of this intake would be similar to that of the proposed project. The impacts associated with operation of the above-ground intake facilities would be increased compared to those of the proposed slant wells because the impacts	**Similar.**

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.8. LAND USE, LAND USE PLANNING, AND RECREATION (cont.)							
		mitigable impact related to land use compatibility because, it is assumed, the parking lot would have to be closed about every 5 years for slant well maintenance.	because of the permanent displacement of a portion of the parking lot for the intake pump station and because operation of the pump station would increase ambient noise levels.			associated with consistency with land use plans, policies, and regulations and with land use compatibility would be increased compared to the proposed project, due to the location of the preferred wet well and pump station in an area designated for agricultural use. New mitigation would need to be developed to reduce the impact.	
4.9 TRAFFIC AND TRANSPORTATION							
<u>*Construction Activities:*</u> LSM impacts from Source Water Pipeline construction-related increase in traffic safety hazards due to potential conflicts between large construction vehicles and other vehicles, bicyclists, and pedestrians; wear and tear on smaller haul-route roadways caused by heavy trucks transporting equipment and material to and from construction work areas; reduction in roadway capacity; emergency access impairment and the potential to impede vehicular, bicycle, or pedestrian traffic flow or disrupt public transportation.	**Similar.**	**Increased.** Impacts would be increased compared to those of the proposed project slant wells because the impact related to parking conditions would require partial or complete closure of the parking lot during construction. This impact could be reduced through mitigation.	**Increased.** Impacts would be increased compared to those of the proposed project slant wells because the impact related to parking conditions would require partial or complete closure of the parking lot during construction. This impact could be reduced through mitigation.	**Decreased.** Impacts associated with increased traffic safety hazards; and wear and tear on smaller haul routes would be somewhat less than those of the proposed project because this intake would involve less overall construction, and therefore fewer construction	**Decreased.** Impacts associated with, increased traffic safety hazards; and wear and tear on smaller haul routes would be somewhat less than those of the proposed project because this intake would involve less overall construction, and therefore fewer construction	**Decreased.** Impacts associated with increased traffic safety hazards; and wear and tear on smaller haul routes would be somewhat less than those of the proposed project because this intake would involve less overall construction, and therefore fewer construction	**Similar.**
The proposed project would have LS impacts related to temporary increase in traffic and parking conditions in public areas.		All other impacts would be similar to those of the proposed project.	All other impacts would be similar to those of the proposed project.	related trips and a shorter construction period; however the impact determination would remain the same as the proposed project.	related trips and a shorter construction period; however the impact determination would remain the same as the proposed project.	related trips and a shorter construction period; however the impact determination would remain the same as the proposed project.	
4.10 AIR QUALITY							
<u>*Construction Activities:*</u> In conjunction with other project components, LSM impact related to the generation of criteria air pollutants that could exceed ambient air quality standards. LS impact related to the exposure of sensitive receptors to pollutant concentrations and objectionable odors.	**Decreased.** Emissions over the duration of the construction period would be somewhat less because of less construction activity.	**Similar.** Emissions over the duration of the construction period would be somewhat less because of less construction activity. Somewhat greater exposure of sensitive receptors to construction-related pollutants due to closer proximity of slant well drill sites (within 1,000 feet) and Source Water Pipeline (within 50 feet) to a residential area. Net impacts would be similar.	**Similar.** Emissions over the duration of the construction period would be somewhat less because of less construction activity. Somewhat greater exposure of sensitive receptors to construction-related pollutants due to closer proximity of slant well drill sites (within 1,000 feet) and Source Water Pipeline (within 50 feet) to a residential area. Net impacts would be similar.	**Similar.** Emissions over the duration of the construction period would be somewhat less because of less construction activity. Somewhat greater exposure of sensitive receptors to construction-related pollutant concentrations would be similar; although a residence and RV park on Moss Landing Road would be within 500 feet the construction activities associated with the pump station, the amount of emissions and overall construction period would be expected to be less. Net impacts would be similar.	**Similar.** Although daily construction-related emissions would be similar, emissions over the duration of the construction period would be somewhat less because of less construction activity. The applicable MMs identified for the proposed project would apply and impacts would be LSM. Although an RV park on Moss Landing Road would be within 1,350 feet the construction activities associated with the pump station; exposure of sensitive receptors to construction-related pollutant concentrations would be less due to the reduced amount of emissions that would be emitted. The impact classification would be the same, LS.	**Decreased.** Emissions over the duration of the construction period would be somewhat less because of less construction activity.	**Similar.**

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.10 AIR QUALITY (cont.)							
Operations and Facility Siting: Operation of the proposed slant wells and associated intake facilities would have no impact related to the generation of emissions of criteria pollutants that could contribute to an exceedance of an ambient air quality standard; and would have NI related to the exposure of sensitive receptors to substantial pollutant concentrations.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.11 GREENHOUSE GASES							
Construction, Operations, and/or Facility Siting: Construction and operation amortized over 40 years would have SUM impacts related to GHG emissions and potential conflicts with Executive Order S-3-05 and AB 32.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.12 NOISE AND VIBRATION							
Construction Activities: LS impact from increase in ambient noise levels; exposure of people to, or generation of, noise levels in excess of established standards; and exposure of people to, or generation of, excessive groundborne vibration. However, Source Water Pipeline construction would have an LSM impact related to excessive groundborne vibration. Construction would conflict with construction time limits of the City of Marina. *Operations and Facility Siting:* LS impact related to permanent increase in ambient noise levels and exposure of people to, or generation of, operational noise levels in excess of established standards.	**Similar.**	**Increased.** Nighttime construction would result in sleep interference due to increased proximity of sensitive receptors compared with the proposed project and require mitigation. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Increased.** Nighttime construction would result in sleep interference due to increased proximity of sensitive receptors, and because operation of the intake pump station, could increase the ambient noise level by 5 or more dBA and require mitigation. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Decreased.** Construction activity would be further from sensitive land uses. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Decreased.** Use of the existing intakes would require substantially less construction activity and would occur further from sensitive land uses. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Decreased.** Construction activity would be further from sensitive land uses. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Similar.**
4.13 PUBLIC SERVICES AND UTILITIES							
Construction, Operations, and/or Facility Siting: LSM impact related to subsurface utilities disruption or relocation. No impact on landfill capacity but LSM impact on State or local recycling goals and waste diversion rates. LS impact on landfill capacity and state or local recycling goals; no impact related to the need for additional wastewater treatment or conveyance capacity.	**Similar.**	**Similar.**	**Similar.**	**Decreased.** Would result in less impact related to disruption or relocation of existing subsurface utilities. Other impacts would be similar.	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.14 AESTHETICS							
Construction, Operations and/or Facility Siting: LS construction impact on scenic resources and visual character of the area; LSM impact due to light and glare during nighttime construction. LS operation impact on scenic resources and visual character; no impact related to permanent new sources of light and glare.	**Increased.** Adverse effects on scenic resources and visual character during construction and operations would be somewhat greater at this more primitive, pristine shoreline location. Impacts associated with operation would be similar to those of the proposed project.	**Similar.**	**Similar.**	**Increased.** This option would result in impacts related to effects on scenic resources or the visual character of the area during construction and operation at the pump station on the beach. All other impacts would be similar to the proposed project.	**Similar.**	**Similar.**	**Similar.**
4.15 CULTURAL RESOURCES							
Construction Activities: LSM impact related to a historical resource or historic properties; LSM impacts related to the potential to cause a substantial adverse change in the significance of an archaeological resource and related to the potential inadvertent discovery of human remains; and LS impact related to the destruction of a unique paleontological resource.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Similar.**
4.16 AGRICULTURE AND FOREST RESOURCES							
Construction, Operations, and/or Facility Siting: NI related to the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; conflict with agricultural zoning or Williamson Act contracts; or otherwise resulting in the conversion of farmland to non-agricultural use. However, those impacts for the Source Water Pipeline would be LSM.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Increased.** Intake location would conflict with agricultural zoning and the potential to otherwise result in the conversion of farmland to non-agricultural use. New mitigation measure(s) would be required The impact related to the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use would be similar to the proposed project.	**Similar.**
4.17 MINERAL RESOURCES							
Construction, Operations, and/or Facility Siting: LS impact on future recovery of mineral resources and temporary interference with active mining operations at the CEMEX facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Similar.**
4.18 ENERGY RESOURCES							
Construction, Operations, and/or Facility Siting: LSM construction impact associated with the potential wasteful or inefficient use of energy. LS operation impacts due to use of electricity or fuel in an unnecessary, wasteful or inefficient manner and potential to impact, in conjunction with other project components, local or regional energy supplies.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.19 POPULATION AND HOUSING							
Construction, Operations, and/or Facility Siting: Construction and operation would have an LS impact related to direct growth inducement.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5
OUTFALL OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(modification of existing outfall pipe plus a new diffuser)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.2 GEOLOGY, SOILS, AND SEISMICITY							
Construction, Operations, and Facility Siting: The proposed project outfall would have no construction or operational impacts on geology, soils, or seismicity.	**Similar.** Impacts would be similar to those of the proposed project because this option would modify an existing facility.	**Increased.** There would be an increased potential for soil erosion or loss of topsoil during construction. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction.	**Increased**. There would be an increased potential for soil erosion or loss of topsoil during construction. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction.	**Increased.** Construction impacts would be similar to those of the proposed project because this is option would modify an existing facility. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction. Assuming the outfall facilities would be located in an area of the former National Refractories site that would not be subject to flooding related to sea level rise, all other impacts also would be similar to those of the proposed project outfall.	**Increased**. There would be an increased potential for soil erosion or loss of topsoil during construction. Impacts of operation and siting would be increased due to the potential for the site to be subject to coastal retreat due to sea level rise, and potential for the new pipeline to encounter corrosive soils,. There would also be a greater potential for liquefaction.	**Increased.** Impacts would be similar to those of the proposed project because this is option would modify an existing facility. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction.	**Increased.** There would be an increased potential for soil erosion or loss of topsoil during construction. There would be an increased potential for the new pipeline to encounter corrosive soils (proposed project had no impact related to corrosive soils). There would also be a greater potential for liquefaction.
4.3 SURFACE WATER HYDROLOGY AND WATER QUALITY							
Construction Activities: No construction- related impacts on surface water hydrology or water quality.	**Increased.** Water quality impacts would increase due to dewatering effluent discharges; as well as from increased soil erosion, inadvertent toxic chemical releases, and treated water and disinfectant discharges from existing and new pipelines.	**Increased**. Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines.	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines.	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines.	**Similar.** Impacts would be similar to those of the proposed project because this is an existing facility.	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines
Operations and Facility Siting: LS impact related to violation of water quality standards or waste discharge requirements: no plume modeling was conducted and impacts from the brine were not considered for this, or any option. No other impacts related to surface water hydrology or water quality.	**Similar.**	**Increased.** Flooding risk would increase because the eastern end of the outfall (on the east side of the dunes) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise, and a dam inundation area; the outfall and connecting discharge pipeline would be underground in this area. Other impacts similar to those of the proposed project.	**Increased.** Flooding risk would increase because the eastern end of the outfall (on the east side of the dunes) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise, and a dam inundation area; the outfall and connecting discharge pipeline would be underground in this area. Other impacts similar to those of the proposed project.	**Increased.** Flooding risk would increase because the eastern end of the outfall (on the east side of the dunes) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise. The impact would be greater than for Options 2, 3, and 5), because the above-ground facilities associated with this outfall (such as a pump station) are assumed to also be located here. Mitigation would be required. Other impacts would be similar to those of the proposed project.	**Increased**. Flooding risk would increase because the eastern terminus of the outfall (on Sandholdt Road) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise, and a dam inundation area; the outfall would be underground although the connecting discharge pipeline may be above-ground a short distance away, and therefore vulnerable, if attached to the underside of the Sandholdt Bridge. Other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased to an LS impact because the MLPP disengaging basin is in an area at risk of flooding due to sea level rise. All other impacts are similar to the proposed project.	**Increased**. Impacts would be increased to an LS due to risk of flooding due to sea level rise, because the above-ground facilities associated with the outfall (such as the pump station) were located at the former tank farm on Dolan Road (which is where the DeepWater Desal Project proposes to locate a desalination plant and other facilities and is in an area at risk of flooding due to sea level rise). Other impacts would be similar to the proposed project.
4.4 GROUNDWATER RESOURCES							
Construction Activities: There would be no construction-related impacts on groundwater resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
Operations and Facility Siting: There would be no impacts related to operations on groundwater resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.5 MARINE BIOLOGICAL RESOURCES							
Construction Activities: There would be no construction-related impacts on marine resources.	**Increased.** Marine biological impacts would be greater because attaching and anchoring the diffuser would involve in-water work and disturbance of the sea floor within MBNMS. Impacts include: physical disruption of sediments and mortality of resident epifauna and infauna; increased turbidity from sediment resuspension; and disruption of foraging by bottom-feeding fishes. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in the MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity from sediment resuspension and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in the MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity from sediment resuspension and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because of in-water work and disturbance of the seafloor needed to repair the existing outfall pipeline and to attach and anchor a new diffuser within the MBNMS. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity associated with sediment resuspension, and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in the MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity associated with sediment resuspension, and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because of in-water work and disturbance of the ocean floor associated with attaching and anchoring a new diffuser within the MBNMS. It is assumed a new diffuser would be required for brine discharge under this option due to anticipated reductions in the MLPP cooling water discharges. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, although turbidity would not be increased as much as for the other options because the outfall's nearshore location is very sandy without much fine material. Foraging by bottom-feeding fishes and sea otters could be disrupted in the disturbed area until biological communities recovered. The construction zone is within sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. Being very near the mouth of Elkhorn Slough, construction activity at this site also has the potential of affecting the large group of sea otters that frequent the area west of the Highway 1 bridge. Controls on construction activities would be needed to avoid injuries to otters.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in the MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity associated with sediment resuspension, and disruption of foraging by bottom-feeding fishes. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.
Operations and Facility Siting: Operation would have LSM impacts related to potential effects of candidate, sensitive, or special-status species; interference with the movement of any native resident or migratory fish or wildlife species; and conflict with adopted plans.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.6 TERRESTRIAL BIOLOGICAL RESOURCES							
Construction Activities: There would be NI on terrestrial biological resources.	**Similar.** Modification of the existing outfall would occur in the marine environment and would not be expected to impact terrestrial biological resources, which is similar to the proposed project.	**Increased.** Construction of a new outfall would occur within agricultural land behind the sand dunes. The construction area does not support federal wetlands, federal other waters, and /or waters of the State, riparian areas, critical habitat, or sensitive natural communities, so would have no impacts to these resources, which is similar to the proposed project. The outfall would have increased impacts on special-status species such as birds protected by the federal Migratory Bird Treaty Act. Similar to the proposed project, the intake would not conflict with local tree ordinances as there are no trees within the impact area, therefore NI.	**Increased.** Construction activities would avoid sensitive natural resources (by using jack and bore techniques under the slough), but construction would still occur adjacent to wetlands and sensitive natural communities associated with the slough and sand dunes and would have impacts on these biological resources as well as special-status species, such as western snowy plover, that could occur in this area. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area,	**Similar.** Modification of the existing outfall would occur in the marine environment and would not be expected to impact terrestrial biological resources, which is similar to the proposed project.	**Increased.** Impacts from all construction activities would occur in previously disturbed areas. Therefore, it is anticipated that there would not be direct impacts on wetlands or natural communities. However, construction would occur adjacent to central dune scrub and wetlands associated with the slough could be impacted by construction. Construction of the outfall would have impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, other federal waters, or waters of the State. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area,.	**Increased.** Impacts from all construction activities would occur in previously disturbed areas away from wetlands and sensitive natural communities. Therefore, it would not impact sensitive natural communities or wetlands. Few special-status species have potential to be impacted by this alternative, but there is potential for construction activities to impact special-status species such as birds protected by the federal Migratory Bird Treaty Act. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area,.	**Increased.** Impacts from all construction activities would occur in previously disturbed areas away from wetlands and sensitive natural communities. Therefore, it would not impact sensitive natural communities or wetlands. Few special-status species have potential to be impacted by this alternative, but there is potential for construction activities to impact special-status species such as birds protected by the federal Migratory Bird Treaty Act. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area.
Operations and Facility Siting: Use of the existing outfall structure would have NI on terrestrial biological resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.7 HAZARDS AND HAZARDOUS MATERIALS							
Construction Activities: There would be NI related to hazards or hazardous materials during construction.	**Increased.** Impacts would be increased because the construction could include the transport, use, and disposal of hazardous materials. All other impacts would be similar to those of the proposed project outfall.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would be increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because repairs could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would be increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.	**Increase.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.
Operations and Facility Siting: There would be an LS impact associated with locating project facilities within an airport land use plan area and no other operational or siting impacts related to hazards or hazardous materials during construction.	**Similar.**	**Decreased.** This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased**. This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased**. This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased** This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased.** This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased**. This option would not be located in an airport land use plan area, therefore no impact would occur.

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.8 LAND USE, LAND USE PLANNING, AND RECREATION							
Construction Activities: There would be NI on land use, land use planning, and recreation.	**Similar.**	**Similar.**	**Increased.** Impacts would be increased because construction would require temporary closure of the beach parking lot, requiring mitigation measures.	**Similar.**	**Increased.** Impacts would be increased due to potential disruption at the State Beach which borders or is close to the southern border of the site.	**Similar.**	**Similar.**
Operations and Facility Siting: Operation would have NI related to consistency with applicable land use plans, policies, and regulations and compatibility with adjacent land uses.	**Similar.**	**Similar.**	**Increased**. Impacts would be increased because periodic maintenance could require access to the outfall from the construction area, which would temporarily displace some beach parking.	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.9 TRAFFIC AND TRANSPORTATION							
Construction Activities: Construction activities would have NI on traffic and transportation.	**Increased**. Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation mitigation measures would be required	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of the mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.
Operations and Facility Siting: Operation and maintenance would have an LS impact related to long-term traffic increases on regional and local roadways.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.10 AIR QUALITY							
Construction Activities: There would be no construction and NI on air quality.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased to there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.
Operations and Facility Siting: Operation would have NI related to increased emissions of criteria air pollutants and exposure of sensitive receptors to substantial pollutant concentrations.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.11 GREENHOUSE GASES							
Construction and Operations: There would be no construction- or operational-related impacts on GHG emissions; NI.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.12 NOISE AND VIBRATION							
Construction Activities: There would be NI related to noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.
Operations and Facility Siting: Operation would have LS impacts related to a permanent increase in ambient noise levels and exposure of people to or generation of excessive operational noise levels.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.13 PUBLIC SERVICES AND UTILITIES							
Construction Activities: There would be NI related to disruption of or need to relocate local utilities during construction.	**Increased.** Impacts would be greater because inserting the interior pipeline could disrupt use of the outfall and would require mitigation measures.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be increased to greater construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.
Operations and Facility Siting: There would be NI related to the need for new or physically altered government facilities, LS impacts related to effects on landfill capacity or the need for new wastewater facilities, and an LSM impact related to increased corrosion of the outfall and diffuser.	**Increased.** This option could have greater impacts related to the capacity of the MRWPCA outfall because the interior pipeline might restrict wastewater flows. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Similar**. There would not impact the MRWPCA outfall and diffuser, but the brine would have similar impact related to increase corrosion in the existing outfall pipeline. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased**. This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.
4.14 AESTHETICS							
Construction Activities: There would be NI from construction on aesthetics resources.	**Similar.**	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Similar.**	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.
Operations and Facility Siting: Operation would have NI on scenic resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.15 CULTURAL RESOURCES							
Construction, Operations and/or Facility Siting There would be NI on cultural resources.	**Similar.**	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.
4.16 AGRICULTURE AND FOREST RESOURCES							
Construction, Operations, and/or Facility Siting: There would be NI on agricultural and forest resources.	**Similar.**	**Increased**. Impacts would be increased because construction could temporarily disrupt and displace Farmland of Statewide Importance, and could conflict with existing zoning for agricultural uses or Williamson Act contracts.	**Increased.** Impacts would be increased because construction could temporarily disrupt and displace Farmland of Statewide Importance, and could conflict with existing zoning for agricultural uses or Williamson Act contracts.	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.17 MINERAL RESOURCES							
Construction, Operations, and/or Facility Siting: There would be NI on mineral resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.18 ENERGY RESOURCES							
Construction Activities: There would be NI on energy resources.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.
Operations and Facility Siting: Operation would have LS impacts related to the use of large amounts of fuel and energy and constrains on the local or regional energy supplies.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.19 POPULATION AND HOUSING							
Construction, Operations, and/or Facility Siting: Construction and operation would have an LS impact related to direct growth inducement.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-6
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: MPWSP Desalination Plant **Site on Charles Benson Road** *(new construction)*	**Desalination Plant Site Option 2: Moss Landing** **National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant** **East Tank Farm Parcel** *(new construction)*
4.2 GEOLOGY, SOILS, AND SEISMICITY		
Construction Activities: Construction would have LSM impact associated with the potential to increase soil erosion or loss of topsoil. *Operations, and Maintenance:* Operation and maintenance would have a LS impact as a result of the potential to expose people or structures to seismically-induced groundshaking, liquefaction, lateral spreading, and corrosive soils. There would be NI from the potential to expose people or structures to landslides, coastal retreat due to sea level rise, subsidence, expensive soil and soil disposal.	**Similar**	**Similar**
4.3 SURFACE WATER HYDROLOGY AND WATER QUALITY		
Construction Activities: Construction would have a LS impact related to the degradation of water quality associated with increased soil erosion, inadvertent releases of toxic chemicals, and a LSM impact from construction-related discharges of dewatering effluent from open excavations, and water produced during well drilling and development. *Operations and Maintenance:* The potential to violate water quality standards or waste discharge requirements or result in an adverse water quality effect as a result of brine discharges during project operation would be a LS impact. Operation and maintenance would have a LS impact from the alteration of drainage patterns in a way that would increase erosion, siltation, the amount of surface runoff, increase flooding on- or offsite, or exceed the capacity of the stormwater drainage systems. Furthermore, the potential to expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise would be LS. No impacts would result from the impeding or redirecting flood flows, or exposing people or structure to risk of loss, injury, or death from flooding due to a tsunami.	**Increased** – In addition to the impacts identified for the proposed project, this option could expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise and coastal flooding. Other impacts would be similar to the proposed project.	**Increased** – – In addition to the impacts identified for the proposed project, this desalination site option could expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise and coastal flooding. Other surface water hydrology and water quality impacts would be similar to the proposed project.
4.4 GROUNDWATER RESOURCES		
Construction Activities: Construction would not substantially deplete groundwater supplies, interfere substantially with groundwater recharge, nor would construction violate water quality standards or otherwise degrade water quality and there would be NI. *Operations and Maintenance:* For the reasons stated above, operation and maintenance would have NI on groundwater resources.	**Similar**	**Similar**
4.5 MARINE RESOURCES		
Construction, Operations and Maintenance: There would be no impact on Marine Resources as a result of construction or operations at desalination plant location at Charles Benson Road.	**Similar**	**Similar**
4.6 TERRESTRIAL BIOLOGICAL RESOURCES		
Construction Activities: Project-related construction activities would have LSM impacts related to the adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification; and conflict with local tree ordinances. *Operations and Maintenance:* Operations and maintenance would result in LSM impacts on species identified as candidate, sensitive, or special-status, either directly or through habitat modification and NI to riparian habitat, critical habitat, or other sensitive natural communities; federal wetlands, federal other waters, and/or waters of the State; or conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	**Increased** - This desalination site option would likely have similar impacts on biological resources. However, two drainages may be considered jurisdictional features by the USACE, RWQCB and/or CCC. Therefore, this site option has an increased potential to adversely affect federally protected wetlands, federal “other waters”, and Waters of the State and would require mitigation for impacts on wetlands or other waters. Operations would have similar impacts on special-status species and NI to wetlands or other waters; riparian habitat, critical habitat, or other sensitive natural communities; or conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	**Increased** – This desalination option is located within non-native grassland and scrub habitat, which may be considered a sensitive natural community. Additionally, a potential wetland is located on the site. This desalination plant would have adverse environmental effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification; riparian habitat, critical habitat, or sensitive natural communities; federal wetlands, federal other waters, and/or waters of the State; and conflict with local tree ordinances. Operations of this desalination plant would have similar impacts on special-status species and no impacts on wetlands or other waters; riparian habitat, critical habitat, or other sensitive natural communities; or conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

TABLE 5.3-6 (Continued)
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: MPWSP Desalination Plant Site on Charles Benson Road *(new construction)*	**Desalination Plant Site Option 2: Moss Landing National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant East Tank Farm Parcel** *(new construction)*
4.7 HAZARDS AND HAZARDOUS MATERIALS		
Construction Activities: Construction would have an LS impact associated with the potential to create a hazard to the public through the routine transport, use and disposal of hazardous materials and an LSM impact associated with the potential to release hazardous materials to the environment. The increased risk of fire during construction would be an LS impact. There would be NI from siting the MPWSP Desalination Plant on a known hazardous materials site and no impact from hazardous materials handling or hazardous emissions within 0.25 mile of a school during construction. *Operations and Maintenance:* Compliance with applicable laws and regulations would ensure that periodic maintenance activities would have an LS impact associated with the transport, use, and disposal of hazardous materials. There would be NI from hazardous materials handling or hazardous emissions within 0.25 mile of a school during operation. The MPWSP Desalination Plant would be located within an airport land use plan area; therefore the impact would be LS.	**Similar**	**Similar**
4.8 LAND USE, LAND USE PLANNING, AND RECREATION		
Construction Activities: There are no parks or recreational facilities near the MPWSP Desalination Plant site; NI related to disruption or closure of recreational facilities. *Operations and Maintenance:* LS impact with respect to land use compatibility because the proposed project would not preclude continued use of other adjacent lands for grazing and other agricultural activities.	**Similar**	**Similar**
4.9 TRAFFIC AND TRANSPORTATION		
Construction Activities: Construction activities would have LSM impacts due to a temporary increase in traffic from construction workers and trucks traveling to and from the construction work areas and increases in traffic safety hazards due to potential conflicts between large construction vehicles and other vehicles, bicyclists, and pedestrians. Wear and tear on smaller haul route roadways caused by heavy trucks transporting equipment and material to and from construction work areas would be an LSM impact. Construction would have an LS impact on the capacity of roadways, emergency access and disruptions to public transportation, bicycle, and pedestrian facilities during construction. *Operations and Maintenance:* The impact of long-term traffic increases from the operation and maintenance activities would be LS.	**Similar**	**Similar**
4.10 AIR QUALITY		
Construction Activities: Emissions of criteria air pollutants and contribution to the violation of an ambient air quality standard during construction of the MPWSP Desalination Plant (and all other project components) would be LSM. The MPWSP Desalination Plant (and all other project components) potential to expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during construction would be LS. *Operations and Maintenance:* Operation and maintenance would have LS impacts related to the increase of criteria pollutant emissions that could affect regional air quality and the potential to expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.	**Similar**	**Similar**

TABLE 5.3-6 (Continued)
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: MPWSP Desalination Plant **Site on Charles Benson Road** *(new construction)*	**Desalination Plant Site Option 2: Moss Landing** **National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant** **East Tank Farm Parcel** *(new construction)*
4.11 GREENHOUSE GASES		
Construction Activities: The contribution to climate change of GHG emissions from construction, in conjunction with other project construction, amortized over the 30 month construction period would have a SUM impact. *Operations and Maintenance:* The contribution to climate change of GHG emissions from operation and maintenance, in conjunction with other project operations would be SUM.	**Similar**	**Similar**
4.12 NOISE AND VIBRATION		
Construction Activities: Construction would have LS impacts due to a temporary increase in ambient noise level, exposure to construction noise levels in excess of standards established, and exposure to excessive groundborne vibration during construction. These impacts would be LS because construction noise and vibration levels would be below established thresholds and standards. *Operations and Maintenance:* For the reasons stated above operation and maintenance would have a LS impact as a result of noise and vibration.	**Similar**	**Increased** – Due to the site proximity to nearby residences to this desalination site option, construction at this location has an increased potential to violate established standards and expose sensitive receptors to increase vibrations. Furthermore, operation of a desalination plant on this site would likely violate established standards set by Monterey County and could require mitigation.
4.13 PUBLIC SERVICES AND UTILITIES		
Construction Activities: Project-related construction activities would have LSM impacts due to the disruption or relocation of regional or local utilities and the potential to exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste. Construction would not result in the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services, therefore NI would occur. *Operations and Maintenance:* Operation and maintenance would have an LS impact related to the potential to exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste. Impacts would be LSM as the MPWSP Desalination Plant could result exceed wastewater treatment requirements of the Central Coast RWQCB. There would be no need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services, therefore no impact would occur.	**Similar**	**Similar**
4.14 AESTHETICS		
Construction Activities: Construction would have an LS impact on scenic resources, visual character or light and glare, as there are no designated scenic roadways or scenic viewpoints from which the construction activities would be visible from and the MPWSP Desalination Plant would constructed near similar types of industrial development. Furthermore, there are no nearby residences that could be affected by lighting. *Operations and Maintenance:* For the reasons stated above, operation and maintenance would have an LS impact on aesthetics resources.	**Similar**	**Increased** – This desalination site option would be located within 500 feet of nearby residences, which could be affected by night time lighting and would require mitigation to reduce impacts. Other impacts would be similar to the proposed project.
4.15 CULTURAL RESOURCES		
Construction Activities: No historical resources eligible for listing in the CRHR or historic properties eligible for listing in the NRHP are located within the indirect APE for the MPWSP Desalination Plant. Therefore, there would be NI on historical resources from construction. The potential inadvertent discovery of human remains is considered an LSM impact. Construction would result in an LS impact related to the direct or indirect destruction of a unique paleontological resource or site, or unique geologic feature during construction.	**Similar**	**Similar**

TABLE 5.3-6 (Continued)
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY ENVIRONMENTAL IMPACTS COMPARISON

Proposed Project: MPWSP Desalination Plant **Site on Charles Benson Road** *(new construction)*	**Desalination Plant Site Option 2: Moss Landing** **National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant** **East Tank Farm Parcel** *(new construction)*
4.16 AGRICULTURE AND FOREST RESOURCES		
Construction Activities: Construction would have NI related to conversion of important farmland, conflicts with agricultural zoning or land with Williamson Act contracts, or otherwise change the existing environment in a way that would result in the conversion of farmland to non-agricultural use because the MPWSP Desalination Plant would not be located in an area mapped as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; on land under Williamson Act contract. *Operations and Maintenance:* For the reasons stated above operation and maintenance would have NI on agricultural resources.	**Similar**	**Similar**
4.17 MINERAL RESOURCES		
Construction Activities: There are no active mining in the immediate vicinity of the MPWSP Desalination Plant. The MPWSP Desalination Plant would be constructed in an area designated as MRZ-2. Development on the site could limit the future recovery of mineral resources beneath the plant footprint. Therefore, impacts would be LS. *Operations and Maintenance:* For the reasons stated above operation and maintenance would have a LS impact.	**Similar**	**Similar**
4.18 ENERGY CONSERVATION		
Construction Activities: Construction of the MPWSP Desalination Plant (and all other project components) would require the use of fuels and electricity, as well as indirect energy use associated with the production of construction materials. The potential for project construction to use large amounts of fuel or energy in a wasteful manner would be a LSM. *Operations and Maintenance:* While operation and maintenance would use fossil fuels and electricity, the use of such energy would not be unnecessary, wasteful or inefficient; therefore, the impact of fuel and energy use would be LS. Impacts of operation, in conjunction with other components, on local or regional energy supplies or the need for expanded generation or transmission facilities would also be LS.	**Similar**	**Similar**
4.19 POPULATION AND HOUSING		
Construction Activities: Construction of the MPWSP Desalination Plant (and all other project components) would require up to 400 construction workers. The potential for project construction to induce substantial population growth as a result of construction would be LS as proposed project would not create employment opportunities substantially greater than would normally be available to construction workers in the area. *Operations and Maintenance:* During operation and maintenance, it is assumed that approximately 25 to 30 facility operators and support personnel would operate the MPWSP Desalination Plant. This incremental increase would not induce population growth in the region; therefore the direct growth-inducing impact of the project would be LS.	**Similar**	**Similar**

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A summary of the intake options comparison table is presented below in **Table 5.3-7**.

TABLE 5.3-7
SUMMARY OF INTAKE OPTIONS COMPARISON TABLE

	Intake Option 2	Intake Option 3	Intake Option 4	Intake Option 6	Intake Option 8	Intake Option 9	Intake Option 13
4.2 Geology, Soils, and Seismicity							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	↓	↓	↓	↑	↓	↓	=
4.3 Surface Water Hydrology and Water Quality							
Construction Activities	↑	=	↑	↑	=	↑	=
Operations and Facility Siting	=	↑	=	=	=	↓	=
4.4 Groundwater Resources							
Construction Activities	↓	=	↓	↓	↓	↓	=
Operations and Facility Siting	↓	↑	↓	↓	↓	↓	=
4.5 Marine Biological Resources							
Construction Activities	↑	=	↑	↑	↑	↑	=
Operations and Facility Siting	↑	=	↑	↑	↑	↑	=
4.6 Terrestrial Biological Resources							
Construction Activities	↓	↓	↓	↓	↓	↑	=
Operations and Facility Siting	↓	=	↓	↓	↓	↓	=
4.7 Hazards and Hazardous Materials							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.8 Land Use, Land Use Planning, and Recreation							
Construction Activities	=	↑	↑	=	↑	↑	=
Operations and Facility Siting	=	↑	↑	=	↑	↑	=
4.9 Traffic and Transportation							
Construction Activities	=	↑	↑	↓	↓	↓	=
4.10 Air Quality							
Construction Activities	↓	=	=	=	=	↓	=
Operations and Facility Siting	=	=	=	=	=	=	=

TABLE 5.3-7 (Continued)
SUMMARY OF INTAKE OPTIONS COMPARISON TABLE

	Intake Option 2	Intake Option 3	Intake Option 4	Intake Option 6	Intake Option 8	Intake Option 9	Intake Option 13
4.11 Greenhouse Gases							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.12 Noise and Vibration							
Construction Activities	=	↑	↑	↓	↓	↓	=
Operations and Facility Siting	=	↑	↑	↓	↓	↓	=
4.13 Public Services and Utilities							
Construction Activities	=	=	=	↓	=	=	=
Operations and Facility Siting	=	=	=	↓	=	=	=
4.14 Aesthetics							
Construction Activities	↑	=	=	↑	=	=	=
Operations and Facility Siting	↑	=	=	↑	=	=	=
4.15 Cultural Resources							
Construction Activities	↓	↓	↓	↓	↓	↓	=
4.16 Agriculture and Forest Resources							
Construction Activities	=	=	=	=	=	↑	=
Operations and Facility Siting	=	=	=	=	=	↑	=
4.17 Mineral Resources							
Construction Activities	↓	↓	↓	↓	↓	↓	=
Operations and Facility Siting	↓	↓	↓	↓	↓	↓	=
4.18 Energy Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.19 Population and Housing							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=

↑ Increased impact ↓ Decreased impact = Similar impact

Outfall Options

The only outfall option not requiring new construction in MBNMS or any physical modification is the proposed project's use of the existing MRWPCA outfall. All other outfall options would require additional pipelines, modification of an existing outfall, new construction on the ocean floor in MBNMS, or both. As a result, outfall options 1 through 7 would result in increased adverse environmental effects during construction compared with the proposed use of the existing outfall. However, some outfall options demonstrated reduced impacts for certain environmental topic areas during operation or as a result of facility siting, including:

- **Hazards and Hazardous Materials** – Outfall options 2 through 7, unlike the proposed use of the existing outfall, would result in greater impacts, although the facilities would not be located within an airport land use plan area.
- **Public Services and Utilities** – Outfall options 2, 3, 4, 5, and 7 would result in reduced impacts related to increased corrosion of the existing wastewater outfall and diffuser compared with the proposed use of the existing outfall.

All seven of the outfall options would result in increased construction impacts, including new impacts in the marine environment, compared to the proposed project, and would not avoid or minimize potential environmental impacts, other than those noted above. Therefore, only the proposed use of the existing outfall was carried forward in the development of the "whole" alternatives because they would not meet the Federal purpose and need to minimize impacts and are not likely to meet regulatory requirements.

A summary of the outfall options comparison table is presented below in **Table 5.3-8**.

Desalination Plant Site Options

Two alternative desalination plant sites were compared to the proposed desalination plant site at Charles Benson Road. These included Option 2: Moss Landing National Marine Refractories site (which is the site proposed as part of the People's Moss Landing Project), and Option 3: Moss Landing Power Plant East Tank Farm Parcel (which is the site proposed as part of the DeepWater Desal Project). The comparative analysis presented in Table 5.3-6 determined the following for each of the desalination site options:

- **Option 2**: The National Marine Refractories Site would have a similar level of environmental effects for most of the environmental topic areas compared to the proposed site at Charles Benson Road, but would result in increased impacts on surface water hydrology (it is located in the 100-year flood zone) and terrestrial biology.
- **Option 3**: The East Tank Farm Parcel would have a similar level of environmental effects for most of the environmental topic areas compared to the proposed site at Charles Benson Road, but would result in increased impacts on surface water hydrology, terrestrial biology, noise and vibration, and aesthetics.

TABLE 5.3-8
SUMMARY OF OUTFALL OPTIONS COMPARISON TABLE

	Outfall Option 1	Outfall Option 2	Outfall Option 3	Outfall Option 4	Outfall Option 5	Outfall Option 6	Outfall Option 7
4.2 Geology, Soils, and Seismicity							
Construction Activities	=	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	↑	↑	↑	↑	↑	↑
4.3 Surface Water Hydrology and Water Quality							
Construction Activities	↑	↑	↑	↑	↑	=	↑
Operations and Facility Siting	=	↑	↑	↑	↑	↑	↑
4.4 Groundwater Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.5 Marine Biological Resources							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.6 Terrestrial Biological Resources							
Construction Activities	=	↑	↑	=	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.7 Hazards and Hazardous Materials							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	↓	↓	↓	↓	↓	↓
4.8 Land Use, Land Use Planning, and Recreation							
Construction Activities	=	=	↑	=	↑	=	=
Operations and Facility Siting	=	=	↑	=	↑	=	=
4.9 Traffic and Transportation							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.10 Air Quality							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=

TABLE 5.3-8 (Continued)
SUMMARY OF OUTFALL OPTIONS COMPARISON TABLE

	Outfall Option 1	Outfall Option 2	Outfall Option 3	Outfall Option 4	Outfall Option 5	Outfall Option 6	Outfall Option 7
4.11 Greenhouse Gases							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.12 Noise and Vibration							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.13 Public Services and Utilities							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	↑	↓	↓	↓	↓	=	↓
4.14 Aesthetics							
Construction Activities	=	↑	↑	=	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.15 Cultural Resources							
Construction Activities	=	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	↑	↑	=	=	=	=
4.16 Agriculture and Forest Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	↑	↑	=	=	=	=
4.17 Mineral Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.18 Energy Resources							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.19 Population and Housing							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=

↑ Increased impact ↓ Decreased impact = Similar impact

Overall, there are no potential impacts associated with developing the Charles Benson Road desalination plant site that would be avoided or minimized by using either of the other options. For this reason, and because CalAm already owns the property, only the Charles Benson Road site was carried forward for development of whole alternatives.

A summary of the desalination plant site options comparison table is presented below in **Table 5.3-9**.

TABLE 5.3-9
SUMMARY OF DESALINATION PLANT SITE OPTIONS COMPARISON TABLE

	Desalination Plant Site Option 2	Desalination Plant Site Option 3
4.2 Geology, Soils, and Seismicity		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.3 Surface Water Hydrology and Water Quality		
Construction Activities	↑	↑
Operations and Facility Siting	↑	↑
4.4 Groundwater Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.5 Marine Biological Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.6 Terrestrial Biological Resources		
Construction Activities	↑	↑
Operations and Facility Siting	↑	↑
4.7 Hazards and Hazardous Materials		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.8 Land Use, Land Use Planning, and Recreation		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.9 Traffic and Transportation		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.10 Air Quality		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.11 Greenhouse Gases		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.12 Noise and Vibration		
Construction Activities	=	↑
Operations and Facility Siting	=	↑

TABLE 5.3-9 (Continued)
SUMMARY OF DESALINATION PLANT SITE OPTIONS COMPARISON TABLE

	Desalination Plant Site Option 2	Desalination Plant Site Option 3
4.13 Public Services and Utilities		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.14 Aesthetics		
Construction Activities	=	↑
Operations and Facility Siting	=	↑
4.15 Cultural Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.16 Agriculture and Forest Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.17 Mineral Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.18 Energy Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.19 Population and Housing		
Construction Activities	=	=
Operations and Facility Siting	=	=

↑ Increased impact ↓ Decreased impact = Similar impact

Summary of Component Option Evaluation Conclusions

Of the seven intake options evaluated, for reasons described previously and in Table 5.3-4, two intake options were carried forward into the development of whole alternatives for full EIR/EIS analysis-- Option 3, Slant Wells at Potrero Road, and Option 9, Open-water Intake at Moss Landing. Because all of the outfall options evaluated would have greater construction-related impacts (Table 5.3-5) in MBNMS than the proposed project, which would use the existing MRWPCA outfall without modification, only the existing MRWPCA outfall was carried forward into the development of whole alternatives. The proposed Charles Benson Road desalination plant site was also carried forward since neither of the other options offers any advantage to, and would not reduce any significant impacts of, the proposed project.

Based on the conclusions of the component evaluations, the intake, desalination plant site, and outfall options were combined into whole alternatives for detailed consideration. They are fully described in Section 5.4 and evaluated in Section 5.5. Alternative 1 would utilize slant wells at Potrero Road (Intake Option 3) and Alternative 2 would utilize an open-water intake at Moss Landing (Intake Option 9). Both alternatives would use the Charles Benson Road desalination

plant site and the existing MRWPCA outfall. The components of the DeepWater Desal alternative and the People's Project alternative were included and evaluated in the components screening process; the DeepWater Desal and the People's Project, as well as two reduced sized alternatives are also described in Section 5.4 and are evaluated in Section 5.5.

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