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September 17, 2020

EXHIBITS

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Exhibit 5 – Special Status Species and Natural Communities That Could Be Significantly Impacted During Construction of the Proposed Facilities
Exhibit 6 – Construction Staging Areas, Habitat Types, and Special-Status Species with Potential to Occur
Exhibit 7 – Final EIR/EIS Summary of Terrestrial Biological Resources Mitigation Measures
Exhibit 8 – Cal-Am proposed Habitat Mitigation and Monitoring Plan, June 2020

EXHIBIT 5

TABLE 4.6-6
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

Species or Resource	Subsurface Slant Wells	MPWSP Desalination Plant	Pipelines North of Reservation Road: Source Water Pipeline	Pipelines North of Reservation Road: New Desalinated Water Pipeline	Pipelines North of Reservation Road: Castroville Pipeline	Pipelines North of Reservation Road: Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond	Facilities and Improvements South of Reservation Road: ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline	Facilities and Improvements South of Reservation Road: New Transmission Main	Facilities and Improvements South of Reservation Road: Carmel Valley Pump Station	Facilities and Improvements South of Reservation Road: Ryan Ranch-Bishop Interconnection Improvements	Facilities and Improvements South of Reservation Road: Main System-Hidden Hills Interconnection Improvements	Staging Areas
Federal or State Listed Species												
Plants												
Monterey spineflower	X	X	X	X	X		X	X				X
robust spineflower	X		X	X	X		X	X				X
Seaside bird's-beak	X		X	X	X		X	X				X
Menzies' wallflower	X		X	X	X			X				X
sand gilia	X		X	X	X		X	X				X
Yadon's rein orchid							X				X	X
Pacific Grove clover										X	X	
Invertebrates												
Smith's blue butterfly	X		X	X	X			X				X
Fish												
South/central California coast steelhead					X							
Amphibians												
California tiger salamander		X	X	X	X	X				X	X	X
California red-legged frog		X	X	X	X	X			X	X	X	X
Birds												
Western snowy plover	X		X									
Other Special-Status Species												
Invertebrates												
globose dune beetle	X		X									
Plants												
Hickman's onion										X	X	
Hooker's manzanita	X		X	X			X	X			X	X
Toro manzanita							X	X		X	X	
Pajaro manzanita							X	X		X	X	
sandmat manzanita	X		X	X			X	X			X	X
ocean bluff milkvetch	X		X				X					
Monterey Coast paintbrush	X		X	X	X		X	X				X
Monterey ceanothus	X		X	X			X	X				X
Congdon's tarplant		X			X					X	X	
branching beach aster	X		X	X	X			X				X
Eastwood's goldenbush	X		X	X	X		X	X			X	X
sand-loving wallflower	X		X	X	X		X	X				X
Kellogg's horkelia	X		X	X	X		X	X				X

TABLE 4.6-6 (Continued)
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species or Resource	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water Pipeline	New Desalinated Water Pipeline	Castroville Pipeline	Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond	ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline	New Transmission Main	Carmel Valley Pump Station	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Staging Areas
Other Special-Status Species (cont.)												
Plants (cont.)												
Carmel Valley bush-mallow							X			X	X	
marsh microseris										X	X	
northern curly-leaved monardella	X		X	X	X		X	X				X
south coast branching phacelia	X		X	X	X		X	X				X
Monterey pine									X	X	X	
Michael's rein orchid	X		X	X	X		X	X		X	X	X
Santa Cruz microseris										X	X	
Santa Cruz clover										X	X	
Reptiles												
Western pond turtle				X	X							
black legless lizard	X		X	X	X		X	X				X
silvery legless lizard	X		X	X	X		X	X				X
coast horned lizard	X		X	X			X	X				X
Coast Range newt		X	X	X	X	X	X	X	X	X	X	X
Birds												
tricolored blackbird				X				X				
short-eared owl		X	X	X	X			X				X
western burrowing owl			X	X				X				X
red-tailed hawk		X	X	X	X	X	X	X	X	X	X	X
red-shouldered hawk		X	X	X		X	X	X	X	X	X	X
Ferruginous hawk		X	X	X	X			X				
Northern harrier		X	X	X	X		X	X				X
White-tailed kite		X	X	X	X	X	X	X	X	X	X	X
California horned lark		X	X	X	X			X		X		X
American peregrine falcon		X	X	X	X	X	X	X	X	X	X	
American kestrel		X	X	X	X	X	X	X	X	X	X	X
loggerhead shrike		X	X	X	X	X	X	X	X	X	X	X
Mammals												
pallid bat		X	X	X	X	X	X	X	X	X	X	X
Salinas kangaroo rat				X				X				X
western red bat		X	X	X	X	X	X	X	X	X	X	X
Monterey dusky-footed woodrat							X	X	X	X	X	X
Monterey shrew							X	X	X	X	X	X
American badger		X	X	X	X		X	X		X	X	X

TABLE 4.6-6 (Continued)
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species or Resource	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Natural Communities												
central dune scrub	X		X	X	X			X				X
central maritime chaparral							X					
northern coastal scrub		X			X		X	X		X		X
riparian woodland and scrub				X	X							
freshwater marsh					X							
coast live oak woodland				X			X	X		X	X	X
Environmentally Sensitive Habitat Areas												
	X		X	X	X			X				X
Critical Habitat												
Monterey spineflower												
western snowy plover	X		X									
south/central California coast steelhead					X							
California red-legged frog									X		X	
Tidewater goby					X							
Potential Wetlands and Waters												
Potentially USACE, RWQCB, and/or CDFW jurisdictional					X	X			X	X	X	
Potentially USACE, RWQCB, CDFW, and/or CCC jurisdictional	X		X	X				X				X
Local Tree Policies or Ordinances												
		X	X	X	X	X	X	X	X	X	X	

EXHIBIT 6

TABLE 4.6-3
CONSTRUCTION STAGING AREAS, HABITAT TYPES, AND SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR

Location	Site Description	Staging Area Footprint (acre)	Habitat Types Present in Study Area	Special-Status Species with Potential to Occur within or Adjacent to the Staging Areas
Monte Road/ Neponset Road in unincorporated Monterey County	Paved parking lot (semi-trucks) at Dole Vegetable Processing Plant	0.7	Developed/ Landscaped, Ice Plant Mats, Ruderal	Habitat for California tiger salamander, California red-legged frog, Coast Range newt, black legless lizard, and silvery legless lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent buildings and trees. Branching beach aster and Monterey spineflower documented in nearby central dune scrub.
Beach Road in Marina	Paved parking lot at Walmart	0.4	Developed/ Landscaped, Ruderal, Ice Plant Mats, Non-native Annual Grassland	Habitat for Salinas kangaroo rat, black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Branching beach aster documented in nearby central dune scrub.
Highway 1/1st Street in Marina	Gated paved parking lot	1.2	Developed/ Landscaped, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Monterey spineflower, coast buckwheat and branching beach aster documented in nearby central dune scrub. Smith's blue butterfly may occur in vicinity.
2nd Avenue, between Lightfighter Drive and Divarty Street, in Seaside	Paved parking lot at the Cal State University at Monterey Bay Athletic Fields	3.2	Developed/ Landscaped, Ruderal, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Landscaped manzanita observed at the site during ESA's reconnaissance survey.
2nd Avenue/ Lightfighter Drive in Seaside	Paved parking lot.	0.5	Developed/ Landscaped, Ruderal, Central Dune Scrub	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and other special-status species with potential to occur in central dune scrub occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.3	Developed/ Landscaped, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees.
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.2	Developed/ Landscaped, Ice Plant Mats, Ruderal, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower documented in nearby central dune scrub (AECOM, 2016).
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	Sandy area	0.1	Northern Coastal Scrub, Ice Plant Mats, Coyote Brush Scrub, Developed/ Landscaped	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Monterey shrew occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower and branching beach aster (AECOM, 2016) documented in nearby central dune scrub. Monterey ceanothus documented within survey area (AECOM, 2016) and confirmed to be located on vegetated shoulder of paved area by ESA during reconnaissance surveys.

EXHIBIT 7

TABLE 4.6-7
SUMMARY OF TERRESTRIAL BIOLOGICAL RESOURCE MITIGATION MEASURE RESTORATION AND COMPENSATION REQUIREMENTS*

Resource	Temporary Impact Restoration and/or Compensation Requirements	Permanent Impact Compensation Requirements
Protected trees	N/A	As required by local plans, policies, and ordinances as listed in Table 4.6-10
Western burrowing owl	Restore temporarily impacted habitat; no compensation required	Replacement of the habitat acreage, number of burrows, and number of burrowing owls impacted (1:1 compensation)
Secondary habitat as defined in the City of Marina's LCLUP (and not within ESHA as defined by the CCC)	Restore temporarily impacted habitat; no compensation required	1:1 compensation
Special-status plants	Restore temporarily impacted habitat; 1:1 compensation	2:1 compensation
Native stands of Monterey Pine	N/A	2:1 compensation
• Smith's blue butterfly • California tiger salamander and California red-legged frog • Sensitive natural communities, ESHA, primary habitat as defined in the City of Marina's LCLUP, or critical habitat • Jurisdictional waters	Restore temporarily impacted habitat; no compensation required	2:1 compensation
Western snowy plover	Restore temporarily impacted habitat; no compensation required	3:1 compensation

NOTE:

* This table provides a summary of the restoration and compensation requirements provided in the terrestrial resource mitigation measures. See the full text of the terrestrial resource mitigation measures for a detailed description of restoration and compensation requirements.

EXHIBIT 8

PROPOSED HABITAT MITIGATON AND MONITORING PLAN

Habitat Mitigation and Monitoring Plan

Monterey Peninsula Water Supply Project
Part One - Coastal Zone

California American Water

June 2020

Prepared for:

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Executive Summary

The purpose of the Monterey Peninsula Water Supply Project (MPWSP or Project) is to replace existing water supplies for California American Water's (Cal-Am's) Monterey District service area. The MPWSP will produce, transfer, and store desalinated water that will be conveyed to Cal-Am customers through the existing distribution system.

The Project area extends approximately 18 miles, from Castroville in the north to just east of the city of Carmel-by-the-Sea in the south. The MPWSP will include construction of a desalination plant in unincorporated Monterey County, seven subsurface intake slant wells in coastal sand dunes in the city of Marina, California, one pump station in Carmel Valley, and about 21 miles of water conveyance pipelines. In addition, the MPWSP will include improvements to the existing Seaside Groundwater Basin ASR system facilities that will enable Cal-Am to inject desalinated water into the groundwater basin for subsequent extraction and distribution to customers.

This Part 1 – Coastal Zone Habitat Mitigation and Monitoring Plan (HMMP) describes in detail the means and methods for accomplishing mitigation for potential permanent and temporary impacts of the MPWSP in the Coastal Zone, consistent with the requirements of **Mitigation Measures (MM) 4.6-1n, 4.6-1d, 4.6-1e, 4.6-1f, 4.6-1h, and 4.6-2b** of the certified MPWSP Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS 2018) (see Appendix B for the full text of MM 4.6-1n), as well as other requirements established by regulatory agencies, including the following:

- U.S. Fish and Wildlife Service (USFWS) Biological Opinion (USFWS BO) (08EVEN00-2017-F-0613)
- Central Coast Regional Water Quality Control Board (RWQCB) Water Quality Certification No. 32718WQ04

Mitigation Measure 4.6-1n states that "the HMMP shall outline measures to be implemented to, depending on the mitigation requirements, restore, improve, or re-establish special-status species habitat, sensitive natural communities, and critical habitat on the site." Table ES-1 summarizes the requirements identified in MM 4.6-1n, their applicability to Coastal Zone components of the MPWSP, and the location of the response within this HMMP.

Table ES-1. Requirements of MM 4.6-1n for the Habitat Mitigation and Monitoring Plan, Their Coastal Zone Applicability, and Where They Are Addressed in the Plan

MM 4.6-1n Requirement	Applies in CZ	Section Addressed	Remarks
1. Name and contact information for the property owner of the land on which the mitigation will take place	YES	1.6	All property owners for MPWSP-impacted properties within the Coastal Zone are listed.
2. Identification of the water source for supplemental irrigation	YES	7.6.3.1	Irrigation water demand calculations, schedule, and seasonal frequency are included.
3. Identification of depth to groundwater	YES	7.6.3.2	Water depth varies with elevation, underlying soil strata composition, and season. Water depth diagrams included.
4. Site preparation guidelines to prepare for planting, including coarse and fine grading	YES	7.7 and Appendix C	Guidelines are described in detail along with topsoil salvage and reinstallation.

MM 4.6-1n Requirement	Applies in CZ	Section Addressed	Remarks
5. Plant material procurement including assessment of risk of introduction of plant pathogens through use of nursery-grown container stock vs. collection and propagation of site-specific plant materials or use of seeds	YES	7.2 and 7.3	Procurement is described in detail along with topsoil salvage, reinstallation, and Phytophthora infestation control in plant nursery.
6. Planting plan outlining species selection, planting locations, and spacing for each vegetation type to be restored	YES	7.2 and Appendix C	Seeding/planting plan is shown on Plan 3/Appendix C. Section 7.2 describes planting seeding and vegetation types.
7. Planting methods, including containers, hydroseed or hydromulch, weed barriers, and cages, as needed	YES	7.10	Detailed information on restoration implementation activities is provided.
8. Soil amendment recommendations	YES	7.8	Discussion of amendments in sandy soils.
9. Irrigation plan, with proposed rates (in gallons per minute), schedule (i.e., recurrence interval), and seasonal guidelines for watering	YES	7.6.3 and Appendix C	Irrigation demand is calculated based on local precipitation and evapotranspiration rates. Irrigation schedule for drip and overhead is included. Irrigation plan is Plan 4/Appendix C.
10. Site protection plan to prevent unauthorized access, accidental damage, and vandalism	YES	7.6.4	Fencing will be provided in western snowy plover (Charadrius nivosus ssp. nivosus) habitats and areas with high herbivory.
11. Weeding and other vegetation maintenance tasks and schedule, with specific thresholds for acceptance of invasive species.	YES	7.4	Detailed descriptions are included. Plan 2/Appendix C indicates iceplant (Carpobrotus edulis) removal of different types based on density.
12. Performance standards by which successful completion of mitigation can be assessed in comparison to a relevant baseline or reference site, and by which remedial actions will be triggered;	YES	6.1 and Table 6-1	Performance standards are summarized. Performance standards will be assessed in comparison to the baseline pre-Project conditions.
13. Monitoring methods and schedule	YES	6.2, 6.3 and Table 6-3	Monitoring methods are described in detail and schedule is described and provided in a table.
14. Reporting requirements and schedule	YES	9.0	Reporting requirements are described, a schedule presented, and report outline included.
15. Adaptive management and corrective actions to achieve the established success criteria	YES	10.0	Adaptive contingency measures are described and a corrective action process presented.
16. Educational outreach program to inform operations and maintenance departments of local land management and utility agencies of the mitigation purpose to prevent accidental damages	YES	7.6.4	Cal-Am will implement an education outreach program to inform local agencies about the sensitivity of the restored areas.
17. Description of any other compensatory mitigation in the form of land purchase, establishment of conservation easements or deed restrictions, contribution of funds in lieu of active restoration, or purchase of mitigation bank credits, or other means by which the mitigation site will be preserved in perpetuity.	YES	1.3	Cal-Am proposes three different alternatives to implement this HMMP. They are described below in this section and again in section 1.3.

Mitigation Measure 4.6-1n is a comprehensive measure applicable to the entire MPWSP, which encompasses a large geographic area with diverse species and habitat types. An area-specific HMMP for the Coastal Zone components of the MPWSP has been prepared because: (1) the geographic area of the Coastal Zone components of the MPWSP is limited; and (2) the biological resources in the Coastal Zone components of the MPWSP are distinct from biological resources in other components and therefore not all species identified in MM 4.6-1n are present and/or anticipated in the Coastal Zone. As a result, this Part 1 – Coastal Zone HMMP is specific to the Coastal Zone only.

The expected MPWSP's permanent and temporary impacts to special-status biological resources and Environmentally Sensitive Habitat Areas (ESHAs) in the Coastal Zone are presented in Section 3, Project Impacts. Also provided are impact mitigation ratios that are to be applied based on those prescribed in the FEIR/EIS or as applicable permit conditions imposed on the Project by agencies with regulatory authority over biological resources identified within the affected Coastal Zone.

Cal-Am proposes to mitigate for permanent impacts through restoration and conservation of selected areas within an approximately 190-acre region of coastal dune habitat located in the northern portion of the CEMEX property (CEMEX North Mitigation Area [CNMA]). CEMEX is under a Cease and Desist Order (CDO) (CCC-17-CD-02) to stop operations and eventually transfer its entire property in the city of Marina to a nonprofit or governmental entity or consortium to be approved by the California Coastal Commission (CCC). The approved entity will acquire the entire site from CEMEX and will commit to holding and managing the site primarily for conservation purposes and other allowable uses, such as low-impact passive-recreation purposes or activities, public access, public education, removal activities, native habitat restoration activities, and activities consistent with Cal-Am's existing easement and related option.

As mitigation for the permanent impacts of the Project, Cal-Am proposes to develop, implement, and fund long-term mitigation efforts within the CNMA as prescribed in this HMMP and consistent with the allowable uses of the CEMEX site under the CDO. Prior to commencement of Project construction, a final, detailed HMMP will be prepared based on regulatory agency feedback that will finalize the implementation process. Because the CEMEX site is subject to the CDO and has not yet been purchased by an approved entity, Cal-Am proposes the following options for HMMP implementation:

- Cal-Am would develop, implement, and fund HMMP implementation in the CNMA. Cal-Am would begin to implement the HMMP's restoration and monitoring work prior to the transfer of the CEMEX site to a CCC-approved entity. Work could begin prior to the transfer with the approval of CEMEX and the CCC Executive Director pursuant to Section 6.2 of the CDO. Once the CEMEX site is transferred to an entity approved by the CCC, Cal-Am would establish an endowment to fund the remaining restoration and monitoring work prescribed in this HMMP, including long-term mitigation efforts in the CNMA;
- Cal-Am would fund HMMP implementation, but actual HMMP implementation would be undertaken by a CCC-approved entity. Cal-Am funding would cover full implementation of the HMMP, inclusive of long-term mitigation efforts; or
- Cal-Am would fund an endowment, equal to the cost of HMMP implementation (full implementation of the HMMP, inclusive of long-term mitigation efforts), to contribute to the purchase of the CEMEX site by a CCC-approved entity. Implementation of the HMMP would be a requirement of the purchase.

Compensatory mitigation will be implemented in the form of re-establishment, rehabilitation and enhancement of habitats through removal of existing sizeable invasive species populations, and reintroduction of native species indigenous to the dune habitat. Long-term management activities will focus on diligent removal of newly emerging invasive vegetation and on protection and preservation of restored and existing native habitats.

Based on the permanently impacted ESHA of 2.181 acres in the Coastal Zone, the approximately 190-acre CNMA offers numerous highly suitable and sizeable mitigation sites for those impacts that will meet the requirements, criteria and associated observations of the following:

- FEIR/EIS
- USFWS BO (08EVEN00-2017-F-0613)

- CCC Coastal Development Permit for the existing test slant well
- Applicable conditions stated in other regulatory agency permits
- Conclusions of consultations between Cal-Am and other resource agencies
- Presence of suitable and abundant habitat and environmental conditions to mitigate for impacted special-status biological resources
- Proximity of the mitigation area to impacted special-status biological resources
- Unprecedented availability of larger natural areas than would be required to comply with the minimum mitigation requirements in order to provide for flexibility in restoration design and ecological continuity and integrity
- Availability and degree of ecological benefit gained by the preservation, re-establishment, rehabilitation, and enhancement of habitats within the proposed mitigation area
- Multi-year field reconnaissance surveys and baseline investigations to determine suitability, and the opportunities and constraints for mitigation planning and implementation

The amount of permanent and temporary ESHA impacts of the MPWSP elements in the Coastal Zone will be 2.181 acres and 15.306 acres, respectively. The proposed CNMA provides mitigation opportunities within relatively intact and undisturbed upland dune and scrub habitat along a nearly mile-long stretch of the Monterey Bay coastline and consists of a system of large sandy dunes. No active sand mining has occurred in this area for decades even though some evidence of historic sand mines has been identified during reconnaissance surveys. As part of ongoing biological surveys at the CNMA, AECOM has (1) observed the presence of numerous special-status plants and wildlife; (2) identified suitable habitat for special-status plants and wildlife; (3) mapped large areas that are heavily infested with iceplant (*Carpobrotus edulis*); (4) identified a sizeable area of the upland dune and scrub habitat severely degraded by pumping of agricultural runoff and drainage water and the resulting fine sediment deposition; and (5) identified an area where sand mining occurred in the more distant historic past with no or poor vegetation re-establishment to date.

Based on these observations, the size and exceptional qualities of the site, and its potential for re-establishment, rehabilitation, and enhancement, the proposed CNMA is the ideal, and likely the only, mitigation site to offset the potential permanent impacts of the MPWSP that are described in this HMMP. As such, this HMMP proposes extensive, first-class ecological restoration consisting of invasive vegetation removal; imported soil remediation; regrading and stabilization of historic sand mines; and the re-establishment, rehabilitation, enhancement, and preservation of native habitats that far exceeds the general requirements outlined in the CDO for the CCC-approved entity that will own and manage the entire CEMEX property following mandated closure requirements.

On behalf of Cal-Am, AECOM has closely reviewed primary mitigation opportunities within the 190-acre CNMA and selected an approximately 6.6-acre area within the CNMA's north portion that has sufficient acreage to mitigate for the approximately 2.181 acres of permanent ESHA impacts (at a 3:1 ratio) in the Coastal Zone (6.544 acres of mitigation). The proposed mitigation area possesses suitable environmental conditions for the impacted Coastal Zone biological resources. With regards to temporary impacts, Cal-Am proposes to mitigate for temporary impacts to special-status biological resources in the Coastal Zone by in-place restoration of disturbed ESHAs at a 1:1 ratio. In addition, while not required, Cal-Am proposes to remove an additional 1.825 acres of iceplant mats in an area just outside of the Project's temporary impact boundary on the CEMEX site near the slant wells. This area will be restored to the native central dune scrub community. The additional iceplant removals are proposed to prevent reinvasion of iceplant from areas adjacent to work areas.

As required by MM 4.6-1n of the FEIR/EIS, this comprehensive HMMP describes in detail all measures to be implemented to restore, improve, or re-establish impacted special-status biological resources at the permanent and temporary mitigation sites within the Coastal Zone.

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Appendices

Figures

Tables

List of Acronyms

AMM	avoidance and mitigation measure
ASR	aquifer storage and recovery
Cal-Am	California American Water
Cal-IPC	California Invasive Plant Council
CCC	California Coastal Commission
CCH	Consortium of California Herbaria
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife (formerly CDFG)
CDFW-WL	CDFW watch list animal species
CDO	Cease and Desist Order
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CPUC	California Public Utilities Commission
CRLF	California red-legged frog
CRPR	California Rare Plant Rank
CSNC	California Sensitive Natural Community
CSSC	California Species of Special Concern
CTS	California tiger salamander
CZ	Coastal Zone
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
ESHA	Environmentally Sensitive Habitat Area
FE	federally listed as endangered
FEIR/EIS	Final Environmental Impact Report/Environmental Impact Statement
FESA	Federal Endangered Species Act
FT	federally listed as threatened
G1S1	globally and state critically imperiled plant or animal species
G2S2	globally and state imperiled plant or animal species
G3S3	Globally and state vulnerable plant or animal species
GIS	geographic information system
GPS	Global Positioning System
HMMP	Habitat Mitigation and Monitoring Plan
IEV	Invasive Exotic Vegetation
LCLUP	Local Coastal Land Use Plan

LCP	Local Coastal Program
M1W	Monterey One Water (formerly known as Monterey Regional Water Pollution Control Agency)
MBNMS	Monterey Bay National Marine Sanctuary
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MM	Mitigation Measure
MMRP	Mitigation Monitoring and Reporting Plan
MPWSP	Monterey Peninsula Water Supply Project
NMFS	National Marine Fisheries Service
PLS	Pure Live Seed
Project	Monterey Peninsula Water Supply Project
RO	reverse osmosis
ROW	right-of-way
RPRS	California Rare Plant Ranking System
RWQCB	Regional Water Quality Control Board
SE	state-listed as endangered
SER	Society for Ecological Restoration
SOD	sudden oak death
SSC	state species of concern
ST	state-listed as threatened
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAMC	Transportation Agency for Monterey County
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USFWS BO	USFWS Biological Opinion

Statement of Limitations

The information in this report is considered to be accurate at the date of issue and is in accordance with the conditions at the sites at the dates sampled. This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

This report includes permit requirements as well as guidelines for site assessment in accordance with permits, however, it does not substitute for agency permits. Agency permits, including the 401 certification, Incidental Take Permit, U.S. Fish and Wildlife Service Biological Opinion, 404 permit, and 1600 agreement should be reviewed to accurately determine the final agency requirements.

This HMMP has been prepared by highly qualified biologists, botanists, and landscape architects. The HMMP and its proposed efforts within the CEMEX Northern Mitigation Area ensures that habitat restoration, enhancement, and preservation are strategic priorities. It will apply a current and detailed understanding of an extensive set of multiyear biological resource data obtained to date. These data are used to prescribe an appropriate and effective distribution and intensity of mitigation efforts commencing at the earliest possible time. As a result, this HMMP's long-term restoration, re-establishment, and preservation strategy, applied to the only relatively undisturbed, large dune habitat area on the central California coast, exceeds the undefined and uncertain application of other generic restoration prescriptions associated with affected land parcels within the Coastal Zone.

1. Introduction

The purpose of the California American Water (Cal-Am) Monterey Peninsula Water Supply Project (MPWSP or Project) is to replace existing water supplies from the Carmel River and Seaside Groundwater Basin and produce, transfer, and store desalinated water in order to convey it to Cal-Am customers via the existing distribution system. Implementation of the Project will also increase use of the existing storage capacity in the Seaside Groundwater Basin aquifer storage and recovery (ASR) system.

Cal-Am's supply of water to its Monterey District is constrained by legal decisions affecting the Carmel River and Seaside Groundwater Basin water resources. State Water Resources Control Board (SWRCB) Order 95-10, SWRCB Order 2009-0060, and the Monterey County Superior Court's adjudication of the Seaside Groundwater Basin in 2006 substantially reduced Cal-Am's rights to use these two primary sources of water supply. On July 19, 2016, the SWRCB adopted Order WR 2016-0016, amending Order WR 2009-0060, requiring that unauthorized diversions from the Carmel River end by December 31, 2021. Cal-Am must replace this reduction in source water with a consistent and reliable water supply to maintain the existing service to its Monterey District customers. In response, Cal-Am has proposed the MPWSP to the California Public Utilities Commission (CPUC). The CPUC and Monterey Bay National Marine Sanctuary (MBNMS) evaluated the Project under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act; the CPUC approved the Project and certified the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) in September 2018 (see CPUC Decision 18-09-017).

1.1 Monterey Peninsula Water Supply Project

The MPWSP consists of the construction of a desalination plant, conveyance facilities, intake wells, brine storage and disposal, modifications to the existing ASR system and improvements to existing Cal-Am satellite systems. The implementation of the Project will offer Cal-Am a flexible and cost-effective approach to serving its 40,000 customers and to meeting the SWRCB orders in a timely manner. The Project will also enable Cal-Am to inject desalinated water into the Seaside Groundwater Basin for subsequent extraction and distribution from the ASR system to its customers. The MPWSP will serve the greater Monterey Peninsula.

The Project will be built in the cities of Marina, Seaside, and Monterey; in the census-designated place of Castroville; and in unincorporated Monterey County. The Project area consists of locations where pipelines and facilities will be installed, proposed staging areas, access routes, and a 25-foot work area on both sides of the centerline of most pipelines and around facilities. The Project work area limits along the proposed Castroville pipeline segment are set at 30 feet from the centerline on each side. Topographical elevations in the Project area range from approximately 10 to 300 feet above mean sea level. Existing land uses in and around the Project area include urban residential development, city streets, military properties, a Transportation Agency for Monterey County (TAMC) transportation corridor, undeveloped land managed by the California Department of Parks and Recreation, a sand mining operation at the CEMEX Lapis Plant, and agricultural lands. Figure 1-1 shows the Project location and Project components.

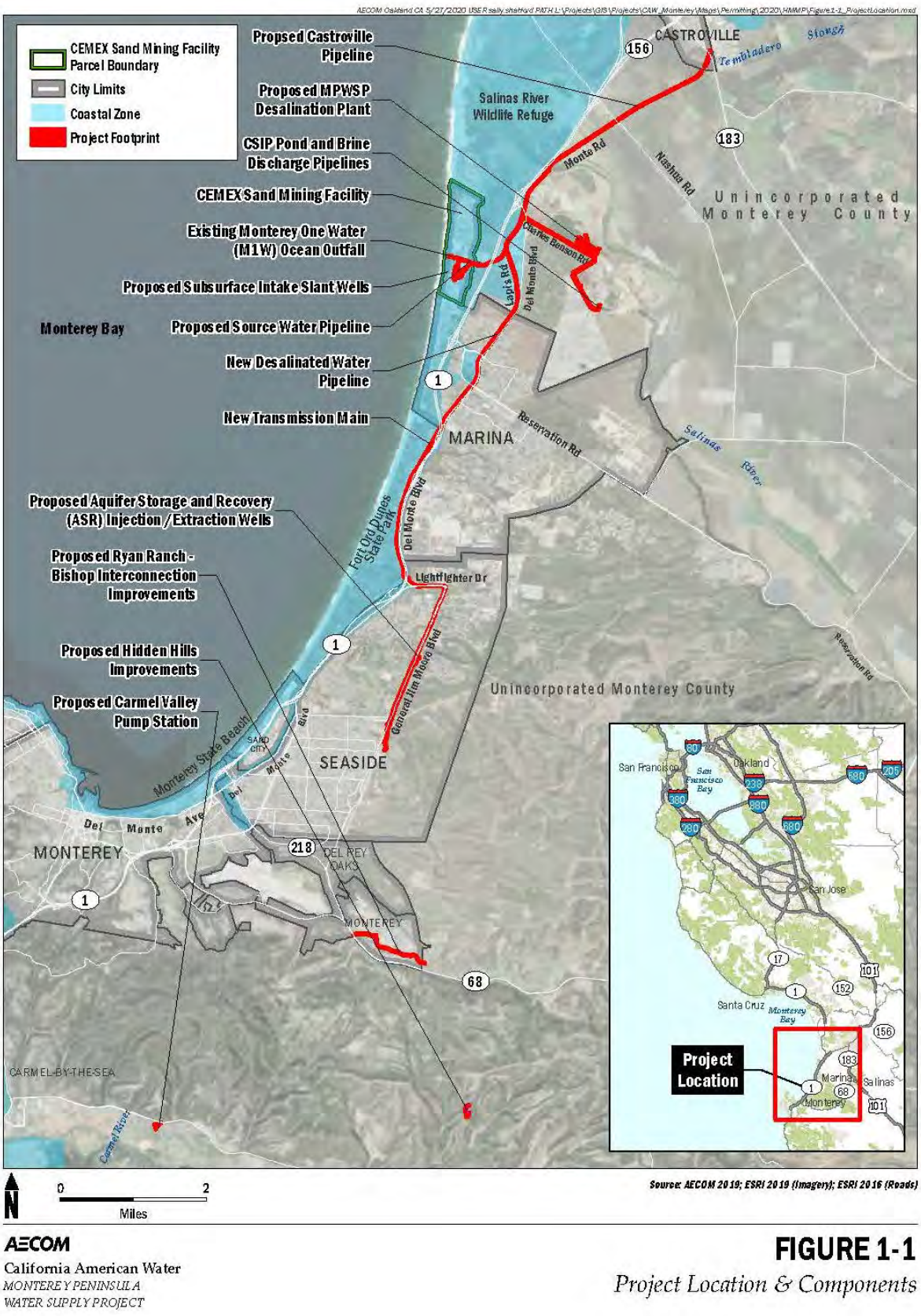

Figure 1-1. Project Location and Components

1.2 HMMP Objectives

The purpose of this Part 1 – Coastal Zone Habitat Mitigation and Monitoring Plan (HMMP) is to provide sufficient information and restoration detail to facilitate the implementation and determine the success of the restoration and monitoring proposed as mitigation for impacts to the special-status biological resources associated with the Coastal Zone components of the Project, consistent with the requirements of the 2018 FEIR/EIS. This Part 1 – Coastal Zone HMMP specifically addresses the requirements of Mitigation Measure (MM) 4.6-1n of the FEIR/EIS: Habitat Mitigation and Monitoring Program (refer to Appendix B for the full text), as well as the mitigation requirements of the following regulatory agencies:

- U.S. Fish and Wildlife Service (USFWS) Biological Opinion (USFWS BO) (08EVEN00-2017-F-0613)
- Central Coast Regional Water Quality Control Board (RWQCB) Water Quality Certification No. 32718WQ04

1.3 MPWSP Mitigation

Cal-Am proposes to mitigate for permanent impacts through restoration and conservation of selected portions of a 190-acre area of coastal dune habitat located in the northern portion of the CEMEX property (CEMEX North Mitigation Area [CNMA]). CEMEX USA is under a Cease and Desist Order (CDO) to stop operations and eventually transfer their entire property in the city of Marina to a nonprofit or governmental entity or consortium to be approved by the California Coastal Commission (CCC) (CCC-17-CD-02). The approved entity will acquire the entire site from CEMEX and will commit to holding and managing the site primarily for conservation purposes and other allowable uses, such as low impact passive recreation purposes or activities, public access, public education, removal activities, native habitat restoration activities, and activities consistent with Cal-Am's existing easement and related option.

As mitigation for the permanent impacts of the MPWSP, Cal-Am proposes to develop, implement, and fund long-term mitigation efforts within the CNMA as described in this HMMP and consistent with the allowable uses of the CEMEX site under the CDO. Because the CEMEX site is subject to the CDO and has not yet been purchased by an approved entity, Cal-Am proposes the options presented below for HMMP implementation. Prior to commencement of Project construction, a final detailed HMMP would be prepared based on regulatory agency feedback that would finalize the implementation process. Options for HMMP implementation include:

- Cal-Am would develop, implement, and fund HMMP implementation in the CNMA. Cal-Am would begin to implement the HMMP's restoration and monitoring work prior to the transfer of the CEMEX site to a CCC-approved entity. Work could begin prior to the transfer with the approval of CEMEX and the CCC Executive Director pursuant to Section 6.2 of the CDO.[1] Once the CEMEX site is transferred to an entity approved by the CCC, Cal-Am would establish an endowment to fund the remaining restoration and monitoring work prescribed in this HMMP, including long-term mitigation efforts in the CNMA;
- Cal-Am would fund HMMP implementation, but actual HMMP implementation would be undertaken by a CCC-approved entity. Cal-Am funding would cover full implementation of the HMMP, inclusive of long-term mitigation efforts; or

[1] The CDO provides that the owner and operator of the CEMEX site "shall not convey any new rights of ownership or use of the Property from June 15, 2017 until the entire Property is transferred pursuant to this Agreement, unless required to by law, or with the express written consent of the Executive Director." (CDO Section 6.2) Accordingly, with the express written consent of the CCC Executive Director the restoration activities outlined in the HMMP could occur on the CEMEX site prior to a transfer of ownership.

- Cal-Am would fund an endowment, equal to the cost of HMMP implementation (full implementation of the HMMP, inclusive of long-term mitigation efforts), to contribute to the purchase of the CEMEX site by a CCC-approved entity. Implementation of the HMMP would be a requirement of the purchase.

Compensatory mitigation will be implemented in the form of re-establishment, rehabilitation and enhancement of habitats through removal of existing sizeable invasive species populations, and reintroduction of native species indigenous to the dune habitat. Long-term management activities will focus on diligent removal of newly emerging invasive vegetation and protection and preservation of restored and existing native habitats.

Based on the permanently impacted Environmentally Sensitive Habitat Area (ESHA) of 2.181 acres in the Coastal Zone, the CNMA offers a highly suitable and sizeable mitigation site that is uniquely able to meet the requirements of the following:

- FEIR/EIS
- USFWS BO (08EVEN00-2017-F-0613)
- CCC Coastal Development Permit (CDP) for the existing test slant well
- Applicable conditions stated in other regulatory agency permits
- Conclusions of consultations of Cal-Am with resource agencies
- Presence of suitable habitat and environmental conditions to mitigate for impacted special-status biological resources
- Proximity of the mitigation area to impacted special-status biological resources
- Unprecedented availability of larger natural areas than would be required to comply with the minimum mitigation requirements in order to provide flexibility in restoration design and ecological continuity and integrity
- Availability and degree of ecological benefit gained by the preservation, re-establishment, rehabilitation, and enhancement of habitats within the proposed mitigation area
- Multi-year field reconnaissance surveys and baseline investigations to determine suitability and the opportunities and constraints for mitigation planning and implementation

Accordingly, Cal-Am seeks access to the CNMA for the HMMP. The mitigation area would provide opportunities within an approximately 190-acre area with relatively intact and undisturbed upland dune and scrub habitat that encompasses nearly a mile-long stretch of Monterey Bay coastline and consists of a system of large sandy dunes. No active sand mining has occurred in this area for decades. As part of ongoing biological surveys at the CNMA, AECOM has (1) observed presence of numerous special-status plants and wildlife; (2) identified suitable habitat for special-status plants and wildlife; (3) mapped large areas heavily infested with iceplant (*Carpobrotus edulis*); (4) identified a sizeable area of the upland dune and scrub habitat that is severely degraded by the pumping of agricultural runoff and drainage (the resulting thick layer of highly conductive fine soil serves as a supporting reservoir for numerous invasive exotic vegetation species); and (5) identified an area where sand mining occurred in the historic past, with no or poor vegetation re-establishment to date.

Based on these observations, the size and exceptional qualities of the site, and its potential for re-establishment, rehabilitation and enhancement, the proposed CNMA offers an ideal mitigation site to offset the potential permanent impacts of the MPWSP as described in this HMMP. This HMMP proposes extensive, first-class ecological restoration of the entire area, which will consist of invasive vegetation removal; imported soil remediation; regrading and stabilization of historic sand mines; and re-

establishment, rehabilitation, enhancement and preservation of native habitats, that far exceeds the requirements of the CDO for the entity that will be managing the property after CEMEX completes its mandated closure requirements.

Cal-Am proposes to mitigate for temporary impacts to special-status biological resources in the Coastal Zone by in-place restoration of disturbed ESHAs. In addition, while not required, Cal-Am proposes to remove an additional 1.825 acres of iceplant mats in an area just outside of the Project's temporary impact boundary on the CEMEX site near the slant wells. This area will be restored to a native central dune scrub community. The additional iceplant removals are proposed to prevent reinvasion of iceplant from areas adjacent to work areas.

As required by MM 4.6-1n of the FEIR/EIS, this comprehensive HMMP has been prepared to describe in detail all measures to be implemented to re-establish, rehabilitate, and enhance impacted special-status biological resources at the permanent and temporary mitigation sites within the Coastal Zone.

1.4 Mitigation Terminology and Definitions

1.4.1 Types of Compensatory Mitigation

Compensatory mitigation and its various types are defined in this document, based on the Army Corps of Engineers Final Rule published in the Federal Register on April 10, 2008 (USACE 2008). Since the cited document pertains specifically to wetlands (aquatic resources), *natural resource* was substituted for *aquatic resource* in the following definitions quoted from the document:

"**Compensatory mitigation** means the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of *natural* resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization have been achieved."

"**Restoration** means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded *natural* resource. For the purpose of tracking net gains in a natural resource area, restoration is divided into two categories: re-establishment and rehabilitation."

- "**Re-establishment** means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former *natural* resource. Re-establishment results in rebuilding a former *natural* resource, and results in a gain in *natural* resource area and functions."
- "**Rehabilitation** means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded *natural* resource. Rehabilitation results in a gain in *natural* resource function but does not result in a gain in natural resource area. Rehabilitation differs from enhancement in that rehabilitation is intended to result in a general improvement in the suite of the functions performed by a degraded *natural* resource. In contrast, enhancement activities focus on increasing one or two functions, rather than all the functions being performed by an existing *natural* resource."

"**Establishment** (creation) means the manipulation of the physical, chemical, or biological characteristics present to develop a *natural* resource that did not previously exist at the site. Establishment results in a gain in *natural* resource area and functions."

"**Enhancement** means the manipulation of the physical, chemical, or biological characteristics of a *natural* resource to heighten, intensify, or improve a specific *natural* resource function(s). Enhancement results in

the gain of selected *natural* resource function(s) but may also lead to a decline in other *natural* resource function(s). Enhancement does not result in a gain in *natural* resource area."

"**Preservation** means the removal of a threat to or preventing the decline of *natural* resources by an action in or near those *natural* resources. This term includes activities commonly associated with the protection and maintenance of *natural* resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of *natural* resource area or functions." "Preservation is rarely the sole source of compensatory mitigation [*for a permit*]; in most cases, natural resource restoration, establishment, and/or enhancement is required to achieve a minimum of one-to-one replacement of lost *natural* resources, and any required preservation augments that replacement."

1.4.2 Definitions

Project area refers to the area where all construction-related disturbances would occur. All permanent footprints of the proposed facilities are within the Project area.

Special-status biological resources include special-status plants and animals, sensitive natural communities, wetlands, and other waters of the United States and of the state, as defined by the U.S. Army Corps of Engineers (USACE), USFWS, the National Marine Fisheries Service, the California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and Game [CDFG]), the CCC, the California RWQCB, and the California Native Plant Society (CNPS). Several species known to occur within the Project area are accorded "special-status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species" (FEIR/EIS 2018).

Special-status plant and animal species are defined as:

- Species listed under the Federal Endangered Species Act (FESA), Marine Mammal Protection Act, California Endangered Species Act (CESA), California Fish and Game Code, or Native Plant Protection Act as endangered, threatened, or depleted; species that are candidates or proposed for listing; or species that are designated as rare, species of special concern, or Fully Protected.
- Locally rare species defined in the CEQA Guidelines, which may include species that are designated as sensitive, declining, rare, or locally endemic, or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watch lists. This includes species ranked by the CNPS as California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3, or 4.

Special-status plant and animal species are categorized as either listed or non-listed. The term listed special-status species refers to those species that are listed as threatened or endangered under FESA and/or CESA or as rare by the California Fish and Game Commission. Non-listed special-status species refers to all other types of special-status species, as described above, that are not listed as threatened or endangered under FESA and/or CESA or as fully protected by the California Fish and Game Commission. (FEIR/EIS 2018).

Environmentally Sensitive Habitat Area (ESHA) is a designated protected area within the Coastal Zone as defined in the California Coastal Act. The detailed definition of ESHA is provided in Section 3, Project Impacts (FEIR/EIS 2018).

Sensitive natural community (SNC) is a natural community that receives regulatory recognition from municipal, county, state, and/or federal entities, such as CDFW in its California Natural Diversity Database (CNDDB 2020), because the community is unique in its constituents, restricted in distribution,

supported by distinctive soil conditions, and/or considered locally rare (FEIR/EIS 2018). See Section 3, Project Impacts, for additional information.

1.5 Organization of This Document

Based on established USACE and other natural resource agency guidelines for the content of mitigation and monitoring plans and to address the requirements of MM 4.6-1n of the FEIR/EIS, this document is organized as follows:

Executive Summary: Briefly describes the reasons and objectives of the Project and mitigation for its impacts.

Section 1, Introduction. Describes the overall MPWSP and the objectives of the mitigation, and defines terms used in this HMMP.

Section 2, Project Requiring Mitigation. Provides a brief review of the Project components in the Coastal Zone and their location.

Section 3, Project Impacts. Presents a discussion of the Coastal Zone special-status biological resources impacts that were identified during the environmental review process and the measures that are applicable in the Coastal Zone.

Section 4, Mitigation Areas. Describes the proposed mitigation areas that will compensate for the permanent and temporary impacts of the MPWSP.

Section 5, Mitigation Goals. Discusses the goals for each special-status biological resource as presented in the FEIR/EIS mitigation measures.

Section 6, Performance Standards and Monitoring Methods. Discusses the performance standards set forth in the FIER/EIS, describes how their achievement will be monitored and documented, and details the specific standards necessary to determine the success or failure of these mitigation efforts.

Section 7, Mitigation Implementation Plan. Describes in detail how mitigative restoration will be implemented step-by-step.

Sections 8 through 11. Discuss maintenance, monitoring, contingency measures, adaptive management, and completion of mitigation responsibilities.

Appendix A Figure 3-1, Biological Resource Impacts

Appendix B Mitigation Measure 4.6-1n of the FEIR/EIS: Habitat Mitigation and Monitoring Program

Appendix C Restoration Plans

1.6 Responsible Parties

California American Water is the permit applicant and is financially responsible for the attainment of the mitigation goals. The contact information is:

California American Water
Monterey County District
511 Forest Lodge Road #100
Pacific Grove, CA 93950
Phone: 831-646-3217
Contact: Ian Crooks
Vice President, Engineering
Cell: (831) 236-7014

The names and contact information of the property owners/managers of the land on which the mitigation for permanent and temporary impacts to Coastal Zone special-status biological resources will take place:

CEMEX (inclusive of RMC Pacific Materials, LLC and Lone Star Aggregates)
Title: Plant Manager
Contact: Zachary A. Wise
Address: 100 Lapis Road, Marina, CA 93933
Telephone: (831) 883-3709
Email: zacharya.wise@cemex.com

State of California (Caltrans ROW crossings)
Address: 50 Higuera Street, San Luis Obispo, CA 93401-5415
Contact: Peter A. Hendrix
Title: District Permit Engineer
Telephone: (805) 549-3152
Email: peter.hendrix@dot.ca.gov

Transportation Agency for Monterey County (TAMC)
Address: 55-B Plaza Circle, Salinas, CA 93901
Contact: Todd Muck
Title: Deputy Executive Director
Telephone: (831) 775-4407
Email: todd@tamcmonterey.org

County of Monterey-Public Works (County road crossings outside TAMC)
Address: 1441 Schilling Place, 2nd Floor-South, Salinas, CA 93901
Contact: Carl P. Holm
Title: Acting Chief Director of Public Works and Facilities
Telephone: (831) 755-4879
Email: HolmCP@co.monterey.ca.us

Maryanne Martin, et al. (farmland parcel between Lapis and Del Monte roads)
Address: 1158 San Fernando Drive, Salinas, CA 93901-3010
Contact: Maryanne Martin
Title: Owner
Telephone: (831) 809-1159
Email: unknown

2. The Coastal Zone Components of Project Requiring Mitigation

This section briefly describes the MPWSP Coastal Zone components. The Project FEIR/EIS and *Biological Resources and Potential Environmentally Sensitive Habitat Areas in the City of Marina Coastal Zone* (AECOM 2017) contain a detailed Project description and additional information.

2.1 Description of Project Components in Coastal Zone

The Coastal Zone Project components will be built in the cities of Marina and Seaside, and in parts of unincorporated Monterey County (see Figures 2-1A and 2-1B). The Project area within the Coastal Zone includes locations where pipelines and intake wells will be installed, staging areas, access routes, and a 25-foot construction area on each side of the centerline of most pipelines and around facilities. For a short segment of the Castroville pipeline in the Coastal Zone and for attachment of the pipeline to the Monte Road bridge, the Project limits are set at 30 feet on both sides of the centerline. The Project area's topographic elevations in the Coastal Zone range from approximately 10 to 124 feet above mean sea level. The Project will consist of the following specific components in the Coastal Zone:

- A seawater intake system with seven subsurface intake slant wells (the existing test slant well will be converted to a permanent well, and six new wells will be built) located at the CEMEX Lapis Plant site in the northwestern part of the city of Marina (see Figure 2-2). These wells will extend offshore below the sea floor into the submerged lands of the MBNMS. A source water pipeline will convey the combined source water from the intake slant wells to the desalination plant.
- Desalinated water conveyance facilities, including pipelines, and a transmission main that will bring desalinated water to existing Cal-Am water infrastructure.
- Brine discharge pipeline from a proposed Brine Mixing Facility at the Monterey One Water (M1W) (formerly known as the Monterey Regional Water Pollution Control Agency) wastewater treatment plant and a combined discharge to the existing M1W ocean outfall, which discharges into the MBNMS.

During the Project implementation work in the Coastal Zone, construction equipment and materials will be strictly stored only within the permanent and temporary impact areas. These areas are already accounted for, and no separate staging in the Coastal Zone is required. Additional staging areas for the Project are outside of the Coastal Zone and are primarily paved parking lots located in developed or disturbed areas sited with the intent of avoiding special-status biological resources.

Project construction began in 2019 and will continue through June 2022 (40 months total). *Biological Resources and Potential Environmentally Sensitive Habitat Areas in the City of Marina Coastal Zone* (AECOM 2017) contains a detailed description of the construction schedule and related activities. Construction of the Coastal Zone components of the Project is scheduled to start in 2020.

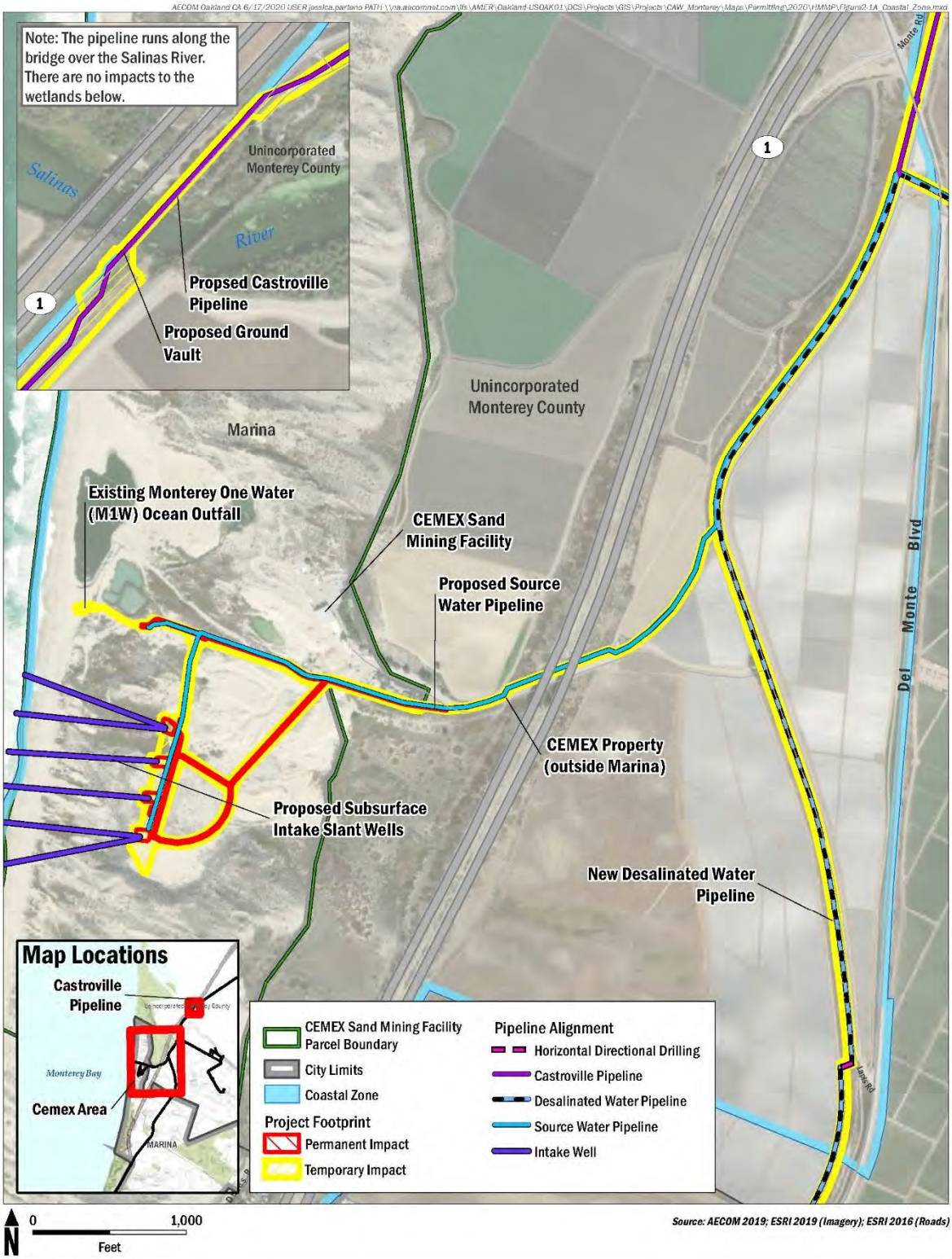

Figure 2-1A. Location of Project Components within the Coastal Zone

Figure 2-1B. Location of Project Components within the Coastal Zone

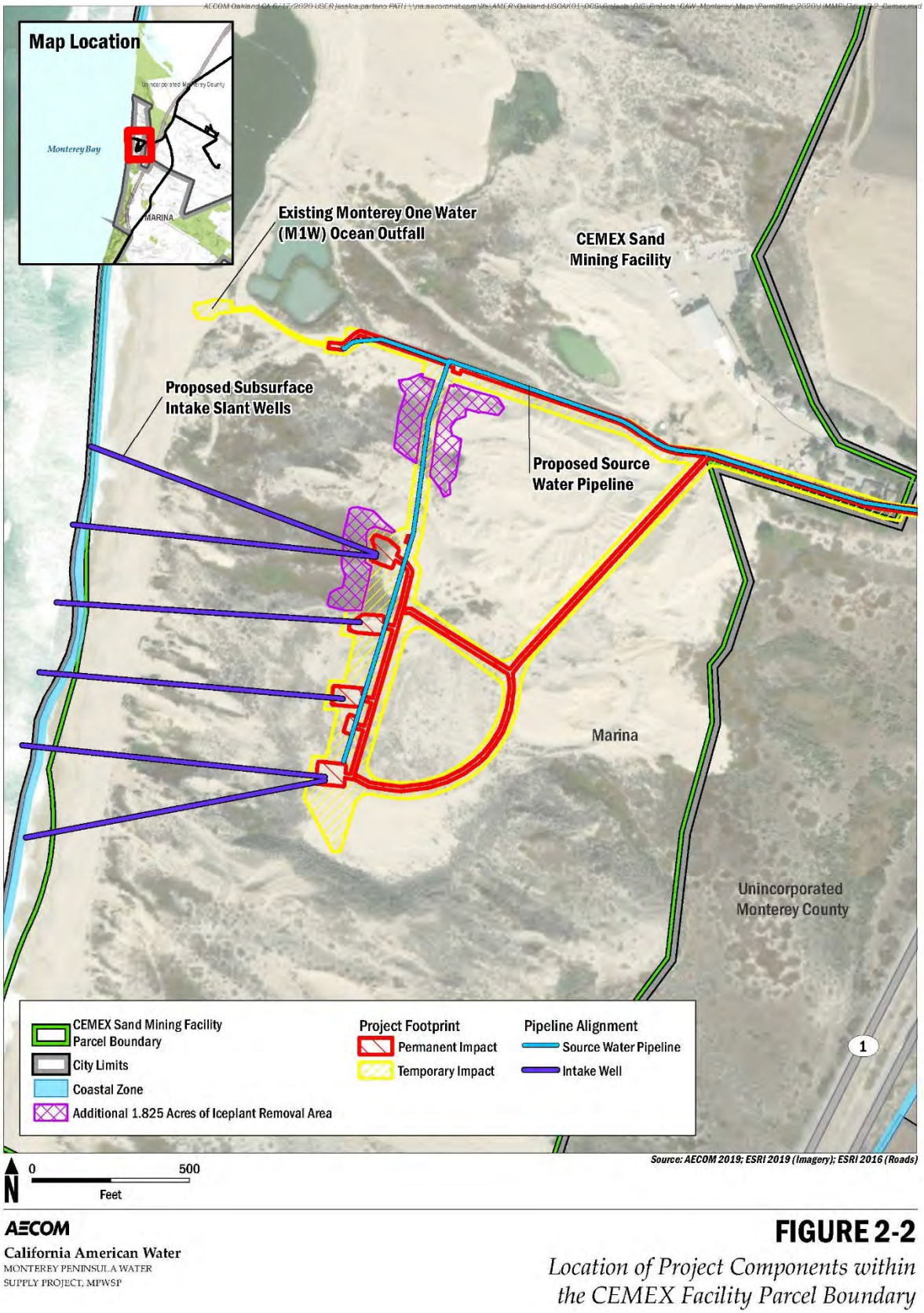

Figure 2-2. Location of Project Components within the CEMEX Facility Parcel Boundary

3. Project Impacts

Construction of the MPWSP will result in both permanent and temporary impacts to terrestrial biological resources, including special-status plant and animal species, sensitive natural communities, and ESHAs present in the Project area. After the completion of extensive biological resource surveys within the Project area and its vicinity, Cal-Am modified and redesigned numerous elements of the Project to avoid and minimize, to the maximum extent feasible, the impact on any terrestrial biological resource with the potential to occur within the Project footprint. The remaining biological resource impacts will be further reduced through implementation of avoidance and minimization measures (AMMs). Mitigation Measure 4.6-1n requires the HMMP to specifically "describe all of the restoration and compensatory mitigation requirements, including the required performance standards, identified in Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover, Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants, Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly, Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl, Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine, Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander and Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas."

Within the Coastal Zone, impacts from the Project to some special-status biological resources are unavoidable. These affected biological resource impacts within ESHA are shown in Figure 3-1 (refer to Appendix A). Project impacts were calculated, in acres, using geographic information system (GIS) technology based on the results of desktop analyses and biological field surveys to determine the areal extent of the Project footprint impact on each biological resource present. Temporary and permanent impacts are defined below and are summarized in Table 3-1 in Section 3.2. Mitigation for these resources is addressed in the HMMP, and the mitigation is covered under Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

The following mitigation assumptions were established during the determination of biological resource impacts associated with implementation of the MPWSP:

- Temporary and permanent impacts to biological resources will be mitigated differently, with permanent impacts requiring greater mitigation.
- Temporary impacts will be defined as construction impacts that can be fully restored to pre-disturbance conditions for most species following construction completion. Temporary impacts will include construction staging, laydown, and trenching areas, and other work space that will not be occupied by permanent facilities during Project operation.
- Permanent impacts will be defined as those impacts having lasting effects beyond the Project construction period or those that cannot be fully restored following construction completion. Permanent impacts include any above-ground areas that will be filled, paved, covered by structures such as wellheads, the desalination plant, the pump station, or other above-ground facilities.
- Ongoing, long-term Project maintenance activities will be considered a permanent impact.
- There will be no net loss of ESHA habitat upon completion of the mitigation.

The FEIR/EIS sets forth the MMs approved for biological resources within the Project limits. These MMs vary by resource type, temporary and permanent impacts, and location within the Project area.

3.1 Terrestrial Biological Resources

This section describes terrestrial biological resources impacted by the MPWSP in the Coastal Zone that will require compensatory mitigation. Terrestrial biological resources include special-status plants and wildlife, and vegetation communities and their associated wildlife.

3.1.1 Special-Status Plants and Wildlife

Special-status plant and wildlife species are defined as species listed under the Federal Endangered Species Act (FESA), Marine Mammal Protection Act, California Endangered Species Act (CESA), California Fish and Game Code, or Native Plant Protection Act as endangered, threatened, or depleted; species that are candidates or proposed for listing; species that are designated as rare, species of special concern, or Fully Protected; locally rare species defined in the CEQA Guidelines, which may include species that are designated as sensitive, declining, rare, or locally endemic, or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watch lists. This includes species ranked as California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3 or 4 by the CNPS:

- CNPS CRPR 1A is a plant that is presumed extinct in California
- CRPR 1B is a plant that is rare, threatened, or endangered in California and elsewhere
- CRPR 2A is presumed extirpated in California
- CRPR 2B is a plant that is rare, threatened, or endangered in California but more common elsewhere
- CRPR 3 is a plant about which more information is needed
- CRPR 4 is a plant of limited distribution

Special-status plant and animal species are categorized as either listed or non-listed. Listed special-status species refers to those species that are listed as threatened or endangered under FESA and/or CESA, or as rare by the California Fish and Game Commission. Non-listed special-status species refers to all other types of special-status species, as described above, that are not listed as threatened or endangered under FESA and/or CESA or as fully protected by the California Fish and Game Commission.

3.1.2 California Sensitive Natural Communities

A California Sensitive Natural Community (CSNC) is a natural community that receives regulatory recognition from municipal, county, state, and/or federal entities, such as the CDFW in its California Natural Diversity Database (CNDDB 2020), because the community is unique in its constituents, restricted in distribution, supported by distinctive soil conditions, and/or considered locally rare. For each natural community, the CDFW also uses a NatureServe rank that addresses the conservation status of the natural community using a one-to-five numerical scale (from most vulnerable to most secure), applied both globally (G) (worldwide or range-wide) and at the state (S) level as follows:

- 1 - Critically imperiled
- 2 - Imperiled
- 3 - Vulnerable
- 4 - Apparently secure
- 5 - Secure

3.1.3 Critical Habitat

Critical habitat is defined for listed species under Section 4 of the FESA (ESA 1973) and consists of:

- The specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the FESA, on which are found those physical or biological features (constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection; and
- The specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the FESA, upon a determination by the Secretary that such areas are essential for the conservation of the species.

3.1.4 Environmentally Sensitive Habitat Area

ESHA is a designated protected area within the Coastal Zone defined in the California Coastal Act as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (Pub. Res. Code §30107.5). Section 30240 further states that ESHA "shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas."

In areas where a Local Coastal Program (LCP) has been developed and approved, the LCP may include a separate definition of ESHA that can be more protective than the California Coastal Act definition; however, this definition cannot be less protective. The proposed Project is within the jurisdiction of three Local Coastal Programs: the City of Marina's LCP and its Local Coastal Land Use Plan (LCLUP), Monterey County's North County Land Use Plan, and the City of Seaside Local Coastal Program Land Use Plan. The definitions of ESHA in these local coastal programs are provided below.

The Project footprint within the Coastal Zone is approximately 34 acres; however, application of the definitions of ESHA in the documents cited below yielded the areas observed to be ESHA and are mapped using GIS accuracy and presented herein (refer to Appendix A). Ground cover within the project footprint in the Coastal Zone that did not meet published criteria established for defining ESHA principally included coyote brush scrub and California sagebrush scrub (these are not sensitive natural communities and are ranked lower than G3 or S3), acacia shrubland, Monterey cypress stands and eucalyptus groves established as landscaping, iceplant mats, active agriculture, ruderal areas and pavement.

3.1.4.1 City of Marina's Local Coastal Land Use Plan

The City of Marina's LCLUP designates areas protected within the Coastal Zone as primary and secondary habitats. For the purpose of this analysis, this document assumes that both primary and secondary habitat would correspond with the CCC's definition of ESHA. The definitions of primary and secondary habitat are described in Exhibit A of the City of Marina's LCLUP (Marina 1982) and presented below.

Primary habitat. This term includes all the environmentally sensitive habitat areas in Marina.

These are as follows:

- Habitat for all identified plant and animal species that are rare, endangered, threatened, or are necessary for the survival of an endangered species. These species will be collectively referred to as "rare and endangered."
- Vernal ponds and their associated wetland vegetation. The Statewide Interpretive Guideline for Wetlands and Other Wet Environmentally Sensitive Habitat Areas (California Coastal

Commission, February 14, 1981) contains technical criteria for establishing the inland boundary of wetland vegetation.

- All native dune vegetation, where such vegetation is extensive enough to perform the special role of stabilizing Marina's natural sand dune formations.
- Areas otherwise defined as secondary habitat that have an especially valuable role in an ecosystem for sensitive plant or animal life, as determined by a qualified biologist approved by the City of Marina.

Secondary habitat. This term refers to areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts that would significantly degrade the primary habitat. The secondary habitat area will be presumed to include the following, subject to a more precise determination upon individual site investigation:

- The potential/known localities of rare and endangered plant species as shown on the "Disturbed Vegetation" map in Marina's LCP
- The potential wildlife habitats as shown on the "Potential Wildlife Habitats" map in Marina's LCP
- Any area within 100 feet of the landward boundary of a wetland primary habitat area

Rare and endangered species. This term will apply to those plant and animal species that are rare, endangered, or threatened, or that are necessary for the survival of such species. The Environmental Analysis Report prepared for Marina's LCP identified such species in the dune habitat areas. While future scientific studies may result in the addition or deletion of species, the list at present includes:

- Smith's blue butterfly (*Shijimiaeoides enoptes smithi*)
- Globose dune beetle (*Coelus globosus*)
- Black legless lizard (*Anniella pulchra nigra*)
- Salinas kangaroo rat (*Dipodomys heermanni goldmani*)
- Seaside painted cup (*Castilleja latifolia* ssp. *latifolia*)
- Monterey spine flower (*Chorizanthe pungens* var. *pungens*)
- Eastwood's Ericameria (*Ericameria fasciculata*)
- Coast wallflower (*Erysimum ammophilum*)
- Menzies' wallflower (*Erysimum menziesii*)
- Coastal dunes milk vetch (*Astragalus tener* var. *titi*)
- Dune gilia (*Gilia tenuiflora* var. *arenaria*)
- Wild buckwheat (*Eriogonum latifolium*)*
- Wild buckwheat (*Eriogonum parvifolium*)*
- Bush lupine (*Lupinus* ssp.)+

* Only within the range of Smith's blue butterfly.
\+ Only within the range of the black legless lizard.

3.1.4.2 Monterey County's North County Land Use Plan

Section 2.3 of the North County Land Use Plan defines ESHAs as "areas in which plant or animal life or their habitats are rare or especially valuable because of their special nature or role in an ecosystem and

which could be easily disturbed or degraded by human activities and developments. These include Areas of Special Biological Significance as identified by the State Water Resources Control Board; rare and endangered species habitat, all coastal wetlands and lagoons, all marine wildlife, and kelp beds; and indigenous dune plant habitats" (Monterey County 1999).

3.1.4.3 City of Seaside Local Coastal Program Land Use Plan

Policy LUD-CZ 1.2.A of the City of Seaside Local Coastal Land Use Plan defines ESHA as "any area in which plant or animal life or their habitats are either rare, or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (Seaside 2013).

3.1.5 Special-Status Biological Resources Identification

To identify terrestrial biological resources within the Project area, AECOM biologists performed background investigations, desktop analyses, field surveys, and Maximum Entropy (MaxEnt 2017) modeling. The MaxEnt software is a computer-based tool that was used by AECOM biologists to precisely identify terrestrial biological resource distribution and accurately model the extent of various environmental niches. Identification of suitable habitats for special-status plants and wildlife was essential, as mitigation requirements are not typically focused on the numbers of impacted individual special-status plants and wildlife alone, but on the size of the impacted habitat. AECOM biologists have surveyed the entire Project and adjacent areas within 50 feet of the Project limits, including the 46-acre Cal-Am property where the Desalination Plant is proposed to be built. The complete methods and results of these investigations and surveys are available in the *Monterey Peninsula Water Supply Project Biological Resources Technical Memorandum* (AECOM 2020).

3.2 Impacts to Special-Status Biological Resources

Table 3-1 provides a list of temporary and permanent Project impacts to special-status wildlife, plants and habitats. These values overlap geographically and, therefore, are not additive.

Table 3-1. Permanent and Temporary Impacts to Special-Status Biological Resources

FEIR/EIS MM	Common Name	Scientific Name	Status[2]	Monterey Peninsula Water Supply Project Impact Acreage[1]			
				Marina Coastal Zone			Monterey Co. Coastal Zone
				Primary Permanent	Primary Temporary	Secondary Temporary	Temporary
4.6-1d	Western snowy plover habitat	Charadrius nivosus ssp. nivosus	FT, CSSC, ESHA	2.120	6.147	-	-
4.6-1e	Monterey spineflower	Chorizanthe pungens var. pungens	FT, CRPR 1B.2, ESHA	2.163	6.017	1.477	1.396
	Sandmat manzanita (individual plants)	Arctostaphylos pumila	CRPR 1B.2, ESHA	-	-	0.587	0.005
	Ocean bluff milkvetch	Astragalus nuttallii var. nuttallii	CRPR 4.2, ESHA	0.594	1.724	-	-
	Monterey Coast paintbrush	Castilleja latifolia	CRPR 4.3, ESHA	0.051	0.181	-	-
	Monterey ceanothus	Ceanothus rigidus	CRPR 4.2, ESHA	-	-	0.369	-
	Branching beach aster	Corethrogyne leucophylla	CRPR 3.2, ESHA	<0.001	0.144	-	-
	South coast branching phacelia	Phacelia ramosissima var. austrolitoralis	CRPR 3.2, ESHA	-	-	0.035	-
	Michael's rein-orchid	Piperia michaelii	CRPR 4.2, ESHA	-	-	0.033	-
4.6-1f	Smith's blue butterfly habitat (butterflies and/or host plants present)	Euphilotes enoptes smithi (Eriogonum latifolium, Eriogonum parvifolium)	FE, ESHA	0.146	0.464	1.014	0.057
4.6-1h	Western burrowing owl[3]	Athene cunicularia	CSSC, ESHA	-	-	-	-
4.6-2b	Sandmat manzanita chaparral	Arctostaphylos pumila provisional shrubland alliance	G1S1, CSNC, ESHA (CMC)	-	-	0.577	0.005
	Silver dune lupine - mock heather scrub	Lupinus chamissonis – Ericameria ericoides shrubland	G3S3, CSNC, ESHA (CDS)	0.006	0.064	2.608	2.644
	Dune mat	-	G3S3, CSNC, ESHA (CDS)	0.013	0.035	-	-
	Coast live oak woodland	Quercus agrifolia woodland alliance	G5S4, CSNC, ESHA	-	-	-	0.069
	Coastal brambles	Rubus ursinus shrubland alliance	G3S3, CSNC, ESHA (NCS)	-	0.118	-	-
	Deerweed scrub	Acmispon glaber shrub alliance	G5S5, Juvenile Maritime Chaparral, ESHA (CMC)	-	-	-	0.107
	Sparsely-vegetated dune community	-	S3, ESHA (CDS)	2.078	5.400	-	-
4.6-1g	Northern California legless lizard habitat (dune bush lupine and yellow bush line)	Anniella pulchra habitat (Lupinus chamissonis, Lupinus arboreus)	CSSC, ESHA	-	0.030	0.005	0.631
	Coast horned lizard	Phrynosoma coronatum	CSSC, ESHA	0.001	0.001	-	-

FEIR/EIS MM	Common Name	Scientific Name	Status[2]	Monterey Peninsula Water Supply Project Impact Acreage[1]			
				Marina Coastal Zone			Monterey Co. Coastal Zone
				Primary Permanent	Primary Temporary	Secondary Temporary	Temporary
4.6-1j	American badger burrow	Taxidea taxus	CSSC, ESHA	-	-	0.007	0.109
N/A	Nicklin's peninsula snail habitat	Helminthoglypta nickilniana	G3S1, ESHA	-	-	0.004	-
N/A	Globose dune beetle habitat	Coelus globosus	Local, G1G2S1S2, ESHA	0.004	0.017	-	-

[1]All work within the Seaside Coastal Zone will occur underground as horizontal directional drilling; therefore, there are no permanent or temporary impacts in the Seaside Coastal Zone. All permanent impacts are located in the primary Marina coastal zone, so columns for permanent impacts in other areas are not included. Impact acreages do not account for overlapping areas between biological resources and therefore are not additive. Impacts to resources outside the coastal zone are addressed in a separate HMMP.

[2]Special-status species and habitat code designations:

Federal:
FE = Federally listed as endangered
FT = Federally listed as threatened

State:
CSSC = California species of special concern
CSNC = California sensitive natural community
G1 = Globally critically imperiled
G2 = Globally imperiled
G3 = Globally vulnerable
G4 = Globally apparently secure
G5 = Secure

S# = State ranking (same ranking numbers from G Ranks apply to S ranks at the State level)

ESHA communities:
CMC = Central maritime chaparral
CDS = Central dune scrub
NCS = Northern coastal scrub
ESHA = Environmentally sensitive habitat area

California Rare Plant Rank (Formerly known as CNPS List):
1B = Plants rare, threatened, or endangered in California and elsewhere.
3 = Plants about which more information is needed.
4 = Plants of limited distribution.
An extension reflecting the level of threat to each species is appended to each CRPR as follows:
.2 – Moderately threatened in California.
.3 – Not very threatened in California.

Local designations:
Local = considered sensitive in a local plan

[3]Western burrowing owl has not been observed in the Project area since 2018, as its habitat was converted to agricultural use independent of this Project. Because mitigation is only required for occupied burrowing owl habitat in the FEIR/EIS, the Project will have no impacts to burrowing owl habitat.

3.3 Mitigation Requirements

This section describes mitigation requirements for impacts to special-status biological resources within the Project area.

Mitigation ratios were established based on the MPWSP FEIR/EIS requirements, the USFWS BO, and related consultations with the natural resource agencies. These ratios determine the size of an area that will be purchased and/or restored to compensate for impacts to special-status species and their habitats. Mitigation ratios for temporarily and permanently impacted special-status species habitats, sensitive communities, and environmentally sensitive habitat areas are as indicated in Table 3-2. A 3:1 ratio is applied to all ESHAs located at the CEMEX site, as the majority of this site will sustain impacts to resources that require 3:1 mitigation (western snowy plover [*Charadrius nivosus* ssp. *nivosus*], Monterey spineflower, and Smith's blue butterfly habitats).

Table 3-2. Mitigation Ratios by Biological Resource and Impact Type

Biological Resource	Permanent Impact Mitigation Ratio	Temporary Impact Mitigation Ratio
Western Snowy Plover Habitat[1]	3 : 1	1 : 1
Monterey Spineflower[2]	3 : 1	1 : 1
CRPR-listed Special-Status Plants[3]	2 : 1	1 : 1
Smith's Blue Butterfly Habitat[2]	3 : 1	1 : 1
Burrowing Owl Habitat[3]	1 : 1	1 : 1
Sensitive Communities and Environmentally Sensitive Habitat Areas (ESHAs in Coastal Zone)[4, 5]	3 : 1	1 : 1

[1]As required in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion (USFWS BO) and the FEIR/EIS.

[2]A 3:1 mitigation ratio for permanent impacts and 1:1 mitigation ratio for temporary impacts to these resources are required by the USFWS BO. This supersedes the 2:1 ratio for permanent impacts to these resources included in the FEIR/EIS.

[3]As required in the FEIR/EIS.

[4] Cal-Am proposes a 3:1 mitigation ratio for permanent impacts to ESHAs in the Coastal Zone at the CEMEX site, as noted in the Mitigation Strategy Memo provided to the California Coastal Commission on October 2, 2019. While a 2:1 mitigation ratio for permanent impacts to ESHAs is provided for in the FEIR/EIS and would be required in areas outside of the CEMEX site, all of the Project's permanent impacts are located on the CEMEX site; therefore, the 2:1 mitigation ratio is not used in this document.

[5] While not required, an additional 1.825 acres of iceplant mats will be removed just outside of the Project temporary impact boundary on the CEMEX site near the slant wells and restored to the native central dune scrub community in the area. The additional iceplant removals are proposed to prevent reinvasion of iceplant from areas adjacent to work areas.

Based on the required impact acreages presented in Table 3-1 and the mitigation ratios presented in Table 3-2, the required mitigation acreage for each terrestrial biological resource was calculated. Table 3-3 is a summary of the mitigation acreage for each resource.

Table 3-3. Mitigation Requirements by Biological Resource

Common Name	Monterey Peninsula Water Supply Project Impact and Mitigation Acreages[1]											
	Marina Coastal Zone									Monterey Co. Coastal Zone		
	Primary Permanent Impact	Ratio	Total Mitigation Area	Primary Temporary Impact	Ratio	Total Mitigation Area	Secondary Temporary Impact	Ratio	Total Mitigation Area	Temporary Impact	Ratio	Total Mitigation Area
Western snowy plover habitat	2.120	3:1	6.359	6.147	1:1	6.147	-	-	-	-	-	-
Monterey spineflower	2.163	3:1	6.490	6.017	1:1	6.017	1.477	1:1	1.477	1.396	1:1	1.396
Sandmat manzanita (individual plants)	-	-	-	-	-	-	0.587	1:1	0.587	0.005	1:1	0.005
Ocean bluff milkvetch	0.594	2:1	1.188	1.724	1:1	1.724	-	-	-	-	-	-
Monterey Coast paintbrush	0.051	2:1	0.101	0.181	1:1	0.181	-	-	-	-	-	-
Monterey ceanothus	-	-	-	-	-	-	0.369	1:1	0.369	-	-	-
Branching beach aster	<0.001	2:1	<0.001	0.144	1:1	0.144	-	-	-	-	-	-
South coast branching phacelia	-	-	-	-	-	-	0.035	1:1	0.035	-	-	-
Michael's rein-orchid	-	-	-	-	-	-	0.033	1:1	0.033	-	-	-
Smith's blue butterfly habitat (butterflies and/or host plants present)	0.146	3:1	0.439	0.464	1:1	0.464	1.014	1:1	1.014	0.057	1:1	0.057
Sandmat manzanita chaparral	-	-	-	-	-	-	0.577	1:1	0.577	0.005	-	-
Silver dune lupine - mock heather scrub	0.006	3:1	0.018	0.064	1:1	0.064	2.608	1:1	2.608	2.644	-	-
Dune mat	0.013	3:1	0.039	0.035	1:1	0.035	-	-	-	-	-	-
Coast live oak woodland	-	-	-	-	-	-	-	-	-	0.069	-	-
Coastal brambles	-	-	-	0.118	1:1	0.118	-	-	-	-	-	-
Deerweed scrub	-	-	-	-			-	-	-	0.107	-	-
Sparsely-vegetated dune community	2.078	3:1	6.234	5.400	1:1	5.400	-	-	-	-	-	-
Northern California legless lizard habitat (dune bush lupine and yellow bush line)	-	-	-	0.030	1:1	0.030	0.005	1:1	0.005	0.631	1:1	0.631
Coast horned lizard	0.001	3:1	0.004	0.001	1:1	0.001	-	-	-	-	-	-
American badger burrow	-	-	-	-	-	-	0.007	1:1	0.007	0.109	1:1	0.109
Nicklin's peninsula snail habitat	-	-	-	-	-	-	0.004	1:1	0.004	-	-	-
Globose dune beetle habitat	0.004	3:1	0.013	0.017	1:1	0.017	-	-	-	-	-	-

[1]Impact and mitigation acreages do not account for overlapping areas between biological resources and therefore are not additive.

In considering the impacts to, and mitigation for, various biological resources, it was recognized that resources frequently occur together as components of the same habitat or community, sometimes with three or more resources in a given area. For example, much of the impacted western snowy plover habitat also serves as Smith's blue butterfly habitat and is occupied by Monterey spineflower. Many of the impacts to specific species and habitats in Table 3-1 overlap with others. Therefore, the mitigation proposed in this HMMP will compensate for more than one biological resource where habitat overlaps occur (i.e., multiple in-kind mitigation). To calculate the required mitigation acreage, overlapping layers of special-status terrestrial biological resources were merged into a single GIS layer with no overlaps, so that no areas were counted twice due to overlapping resources. These areas were then multiplied by the required mitigation ratios for permanent impacts (3:1) or temporary impacts (1:1). As stated earlier in this section, all permanent impacts are located at the CEMEX site, where a 3:1 mitigation ratio is required due to the abundance of resources requiring 3:1 mitigation (and as indicated in the MWPSP Mitigation Strategy Memo of November 2019). Impacts to individual biological resources will still be mitigated at the level required for each resource, as displayed in Table 3-4. However, like the impacted areas, some mitigation areas will contain more than one mitigated biological resource.

Table 3-4. Total Impact Acreages and Mitigation Requirements by Project Component

Project Component	Monterey Peninsula Water Supply Project Total ESHA Impact and Mitigation Acreages							
	Marina Coastal Zone						Monterey Co. Coastal Zone	
	Primary Permanent Impact	Mitigation Acreage (3:1)	Primary Temporary Impact	Mitigation Acreage (1:1)	Secondary Temporary Impact	Mitigation Acreage (1:1)	Temporary Impact	Mitigation Acreage (1:1)
Beach Junction Box	-	-	0.931	0.931	-	-	-	-
Castroville Pipeline, Desalinated Water Pipeline, Source Water Pipeline	-	-	-	-	-	-	4.477	4.477
Cemex Plant	2.181	6.544	5.332	5.332 With additional proposed by Cal-Am 7.157[1]	-	-	0.015	0.015
Proposed Transmission Main	-	-	-	-	4.457	4.457	0.094	0.094
Subtotal	2.181	6.544	6.263	8.0881	4.457	4.457	4.586	4.586
Total Impact	2.181		15.306					
Total Mitigation	6.544		17.131					

[1] While not required, includes 1.825 acres of additional iceplant removal adjacent to temporary impact area [7.157 (5.332 + 1.825) acres].

3.4 MPWSP Temporary and Permanent Impact Areas within CEMEX

As indicated in the MPWSP FEIR/EIS, construction activities associated with installation of nine additional subsurface slant wells, including staging, materials storage, and stockpiling, would temporarily disturb approximately 9 acres of land (FEIR:3–49). This was based on an approximation of 1 acre of disturbance per new slant well for the Project area boundary shown in Figure 3-3a of the FEIR/EIS. A portion of this construction footprint overlaps with a portion of the construction footprint for the Source Water Pipeline (FEIR/EIS:3–49).

The 9 acres includes 8 acres for temporary staging, materials storage, and stockpiling areas, which would be restored following construction, and 1 acre for new permanent above-ground facilities (FEIR/EIS 4.6-130); however, maintenance of the subsurface slant wells every 5 years would result in the permanent loss of approximately 6 acres of primary habitat/ESHA (FEIR/EIS:4.6-197, footnote 25). This maintenance area is located within the 8-acre temporary subsurface slant well construction footprint (FEIR/EIS:4.6-216, footnote 27). Therefore, as analyzed in the FEIR/EIS, the Project (including construction and maintenance) would result in a net permanent impact on 7 acres and a temporary impact on 2 acres. The acreages analyzed in the FEIR/EIS were assumed for a seawater intake system designed to serve a 9.6 million gallon per day (mgd) desalination plant. However, Alternative 5a was selected as the proposed alternative, which involves slant well impacts associated with a 6.4 mgd desalination plant. The FEIR/EIS projected a 15-percent reduction in impact areas for the implementation of Alternative 5a.

Based on subsequent design drawings prepared for Alternative 5a, temporary and permanent Project areas within the CEMEX property and ESHA were mapped and presented in Cal-Am's July 2018 Coastal Development Permit application to the City of Marina. The detailed design for MPWSP components within the CEMEX property subsequently yields 8.5 acres, just less than the estimated 9 acres analyzed in the FEIR/EIS. The estimated 6 acres, of 8 acres estimated as maintenance area, designated as permanent impacts in the FEIR/EIS were reduced to 1.2 acres of permanent impact by the subsequent design of the facilities. This 1.2 acres, when added to the 1 acre of permanent impacts identified for surface facilities in the FEIR/EIS, yields a total of 2.2 acres of permanent impacts. The residual 4.3 acres remain as temporary impacts, and in addition to the 2 acres already designated as a temporary impact, yield a total of 6.3 acres of temporary impacts. The 6.3 acres of temporary impacts and 2.2 acres of permanent impacts within the 8.5-acre Project footprint at CEMEX substantially reduced the area of permanent impact of 7 acres analyzed in the FEIR to 2.2 acres, consistent with impact reductions suggested by the CCC in their comments on the Draft EIS/EIR. The 15-percent reduction in impact areas postulated under Alternative 5a in the FEIR/EIS is associated with the reduction of permanent impact areas resulting from removal of one wellhead at the southern Project area and its segment of access road.

3.5 Terrestrial Biological Resource Impacts Mitigation

This section describes mitigation for terrestrial biological resource impacts by the MPWSP in the Coastal Zone. Mitigation of all temporary impacts to terrestrial biological resources will occur through restoration of these areas to pre-construction conditions or protection of these resources in place, or a combination of these two strategies. Mitigation for permanent impacts to terrestrial biological resources will occur through habitat enhancement and protection of specified locations within the CEMEX North Mitigation Area.

3.5.1 Western Snowy Plover

Western snowy plover habitat was delineated based on the presence of suitable, sparsely vegetated, sandy substrates with habitat connectivity to the beach, as well as the confirmed presence of nests and plovers in the slant wells portion of the Project on surveys conducted by Point Blue in 2019. In addition, designated critical habitat for western snowy plover is present west of the Project, along the beach. Suitable habitat for the western snowy plover occurs at the slant wellheads and along the segment of the Source Water Pipeline located north of the wellheads on the CEMEX property, and will experience both temporary and permanent impacts. Construction within western snowy plover habitat will occur only during the western snowy plover non-breeding season (defined as October 1 through February 28) unless otherwise approved by the USFWS. Approval to work outside of the non-breeding season requires pre-construction nesting surveys, periodic monitoring during construction, and the construction of visual barriers around work areas within the line of sight of potential nesting habitat.

Temporary impacts to western snowy plover habitat will be mitigated in place and in kind at the ratio indicated in Table 3-2. As mitigation for permanent impacts to western snowy plover breeding and foraging habitat, new habitats will be established, re-established, rehabilitated, enhanced, and permanently preserved in the CEMEX North Mitigation Area at the ratio indicated in Table 3-2 (and described in Section 5.3).

3.5.2 Special-Status Plants

3.5.2.1 Monterey Spineflower

Monterey spineflower (FT) is one of the dominant groundcover species along the New Transmission Main, Source Water Pipeline, and Desalinated Water Pipeline alignments, and the Intake Wells. Monterey spineflower habitat was delineated based on presence of this species during at least one of the annual field surveys conducted between 2014 and 2019, as the distributions of annual plant species can shift between years. Monterey spineflower plants that were mapped as points during field surveys were each assigned an area of 1-foot diameter based on the representative size of small patches of this species. Monterey spineflower will be both temporarily and permanently impacted (Table 3-1).

Monterey spineflower plants located within temporary construction areas would be fenced or flagged for avoidance (where feasible) prior to construction, or avoided through other means (e.g., seasonal avoidance or placement of heavy fabric or wooden mats over occupied habitat). If temporarily impacted, Monterey spineflower plants and habitat will be restored in place and in kind at the ratio indicated in Table 3-2. Permanently impacted areas will be restored at the mitigation ratio indicated in Table 3-2 by establishing or re-establishing their habitat at the CEMEX North Mitigation Area.

3.5.2.2 Other Special-Status Plants

Numerous special-status (CRPR-listed [CNPS 2018]) plants occur in nearly all segments of Project and will be temporarily and permanently impacted by the Project. Special-status plant habitats were delineated based on the presence of plants during at least one of the annual field surveys conducted between 2014 and 2019, as distributions of annual species can shift between years. Special-status plants mapped as point data were assigned an area of 1 to 15 feet, depending on observations and species type.

In compliance with the Mitigation Monitoring and Reporting Plan (MMRP), to the extent feasible, Project facilities were sited to avoid permanent and temporary impacts on special-status plants. Special-status plants located within temporary construction areas will be fenced or flagged for avoidance (where feasible) before construction, or will be avoided through other means (e.g., seasonal avoidance or placement of heavy fabric or wooden mats over occupied habitat). If impacted, special-status vegetation will be restored in temporarily impacted habitats, in place and in kind, at the ratio indicated in Table 3-2. Permanently impacted areas will be restored at the mitigation ratio indicated in Table 3-2 by establishing or re-establishing their habitat at the CEMEX North Mitigation Area.

3.5.3 Smith's Blue Butterfly

Smith's blue butterfly habitat was delineated based on the presence of host plants (coast buckwheat (*Eriogonum latifolium*) and the seacliff buckwheat (*Eriogonum parvifolium*) on biological resource surveys conducted annually between 2014 and 2019. In addition, adult Smith's blue butterfly individuals were observed on surveys conducted in the Project footprint in 2019. Cal-Am will implement all avoidance and minimization measures required by USFWS as part of the FESA Section 7 consultation between the Office of National Marine Sanctuaries and USFWS. Construction of Project elements was planned to avoid mapped host plants for Smith's blue butterfly whenever feasible. In areas where it is not feasible to avoid disturbance to host plants, they will be salvaged and relocated per the protect-in-place and

relocation plan required under MM 4.6-1f and with USFWS approval of the relocation plan. A qualified biologist will resurvey the work area no more than 30 days before the start of ground disturbance.

Temporarily impacted Smith's blue butterfly habitats will be restored in place and in kind at the ratio indicated in Table 3-2. Permanently impacted areas will be restored at the mitigation ratio indicated in Table 3-2 by establishing or re-establishing their habitat at the CEMEX North Mitigation Area. The CEMEX North Mitigation Area falls within the known range of Smith's blue butterfly, consists of coastal prairie and coastal scrub plant communities that suit the butterfly's habitat needs, and contains numerous populations of its host plants, the coast buckwheat and the seacliff buckwheat.

3.5.4 Western Burrowing Owl

Detailed surveys for western burrowing owl (*Athene cunicularia*) habitat have been performed by AECOM biologists in 2018 and 2019 and continued in 2020. The survey results through 2019 are described in the Western Burrowing Owl and Loggerhead Shrike Survey Results for California American Water Monterey Peninsula Water Supply Project (AECOM 2019e). No owls have been observed in the Project area since the fall of 2018. If occupied habitat is affected by the Project, temporarily and/or permanently impacted burrowing owl habitats will be restored in place and in kind at the ratio indicated in Table 3-2 and as indicated in MM 4.6-1h in the FEIR/EIS.

3.5.5 Sensitive Communities and Environmentally Sensitive Habitat Areas

Environmentally Sensitive Habitat Areas as defined by the CCC and LCLUPs, and California Sensitive Natural Communities (CSNCs) as defined by CDFW are present and will be impacted by the Project. CSNCs were mapped in the Project area on annual biological surveys conducted between 2014 and 2019.

ESHAs located in the Project area include habitats known to support "rare" species, as defined by CCC. ESHAs in the Project area include habitats for Northern California legless lizard, coast horned lizard, American badger, several California Species of Special Concern [CSSC]), Nicklin's peninsula snail (State Critically Imperiled) and globose dune beetle (considered "rare" by CCC and "rare and endangered" by the City of Marina LCP). All of these species were documented in surveys of the Project area conducted between 2014 and 2019, and their habitats will be impacted by the Project. Their habitats were delineated with GIS software based on the results of these surveys. In compliance with the MMRP and to the extent feasible, Project facilities have been sited to avoid permanent and temporary impacts to these important biological resources.

CNSCs and ESHAs located within temporary construction areas will be fenced or flagged for avoidance (where feasible) prior to construction. Temporarily impacted sensitive communities and ESHAs will be restored in kind and in place and as one area of the Project is completed, restoration in that area will begin concurrent with Project construction in other areas of the site. Permanently impacted ESHAs will be mitigated at a compensation ratio per Table 3-2 through restoration, establishment, re-establishment, and enhancement of sensitive communities and ESHAs at the CEMEX North Mitigation Area.

In addition to mitigation for impacts to ESHA, the sensitive wildlife species whose habitats are defined as ESHA will be protected through species protection measures required by the FEIR/EIS. Northern California legless lizard and coast horned lizard will be surveyed by a qualified biologist 24 hours before initiation of ground-disturbing activities and relocated if found. Surveys for American badger dens will be conducted within 14 days prior to construction; if found, burrows will either be collapsed by hand (if inactive), relocated (if active during the non-pupping season), or temporarily avoided (if active during the pupping season, typically February 15 to June 1).

Several transient special-status species were observed in the Project area during biological surveys conducted between 2014 and 2019, but do not constitute ESHA for the purpose of calculating impacts. These species include bald eagle, bank swallow, Bryant's savannah sparrow, Cooper's hawk, grasshopper sparrow, and loggerhead shrike. While the Project may have a minimal impact on foraging habitat for these transient species, these impacts overlap with other resources designated as ESHA and therefore these impacts are already accounted for.

4. Mitigation Areas

This section describes potential mitigation properties that would be used to compensate for the Project impacts on special-status biological resources in the Coastal Zone. Cal-Am will address mitigation for impacts to biological resources in two ways: as compensatory mitigative restoration of ESHAs for permanent impacts and as in-place and in-kind restoration of ESHAs for temporary impacts.

Compensatory mitigation for the Project's permanent impacts will consist of habitat re-establishment, rehabilitation, enhancement, and preservation at prescribed locations within the CNMA. The potential protection instruments are described below in Subsection 4.1.2. The mitigation for temporary impacts will consist of in-place and in-kind restoration of the same special-status biological resources to their pre-construction condition and as one area of the Project is completed, restoration in that area will begin concurrent with Project construction in other areas of the site.

4.1 CEMEX North Permanent Impacts Mitigation Area

4.1.1 Selection Criteria

The location for the permanent impacts mitigation site was selected based on the requirements, criteria and associated observations of the following:

- FEIR/EIS
- USFWS BO
- CCC Coastal Development Permit for the existing test slant well
- Applicable conditions stated in other regulatory agency permits
- Conclusions of consultations between Cal-Am and other resource agencies
- Presence of suitable and abundant habitat and environmental conditions to mitigate for impacted special-status biological resources
- Proximity of the mitigation area to impacted special-status biological resources
- Unprecedented availability of larger natural areas than would be required to comply with the minimum mitigation requirements in order to provide for flexibility in restoration design and ecological continuity and integrity
- Availability and degree of ecological benefit gained by the preservation, re-establishment, rehabilitation, and enhancement of habitats within the proposed mitigation area
- Multi-year field reconnaissance surveys and baseline investigations to determine suitability, and the opportunities and constraints for mitigation planning and implementation

After a review of several properties in the vicinity of the Project and based on the above criteria, it was determined that the area most suitable for the mitigation of the Project's permanent impacts on special-status biological resources is within a large intact coastal dune complex in the northern portion of the CEMEX Lapis Plant property—the CNMA. The CNMA offers highly suitable multi-resource mitigation sites of varying sizes and does not overlap with areas that CEMEX is required to restore based on the CDO and Reclamation Plan prepared for the CEMEX plant consistent with the Surface Mining and Reclamation Act (SMARA) requirements. Based on the mitigation requirements of the special-status biological resources permanently impacted in the Coastal Zone, it was determined that an appropriate mitigation site that would provide suitable habitats for all of the impacted resources is located in the northernmost

portion of the CNMA. This selected area offers a number of opportunities to re-establish severely degraded habitats while providing a free water source. The area is depicted on Restoration Plans 1 through 4 in Appendix C, which show the existing restoration potential in the entire CNMA area, the proposed restoration site preparation plan, the proposed restoration site planting plan, and the proposed restoration site irrigation plan.

4.1.2 Protection Instruments

Cal-Am proposes to develop, implement, and fund long-term mitigation efforts within the CNMA as described in this HMMP and consistent with the allowable uses of the CEMEX site under the CDO. Prior to commencement of Project construction, a final detailed HMMP will be prepared based on regulatory agency feedback that will finalize the implementation process. Because the CEMEX site is subject to the CDO and has not yet been purchased by an approved entity, Cal-Am proposes the following options for HMMP implementation:

- Cal-Am would develop, implement, and fund HMMP implementation in the CNMA. Cal-Am would begin to implement the HMMP's restoration and monitoring work prior to the transfer of the CEMEX site to a CCC-approved entity. Work could begin prior to the transfer with the approval of CEMEX and the CCC Executive Director pursuant to Section 6.2 of the CDO. Once the CEMEX site is transferred to an entity approved by the CCC, Cal-Am would establish an endowment to fund the remaining restoration and monitoring work prescribed in this HMMP, including long-term mitigation efforts in the CNMA;
- Cal-Am would fund the HMMP implementation, but actual HMMP implementation would be undertaken by a CCC-approved entity. Cal-Am funding would cover full implementation of the HMMP, inclusive of long-term mitigation efforts; or
- Cal-Am would fund an endowment, equal to the cost of HMMP implementation (full implementation of the HMMP, inclusive of long-term mitigation efforts), to contribute to the purchase of the CEMEX site by a CCC-approved entity. Implementation of the HMMP would be a requirement of the purchase.

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4.1.3 Location

The proposed CNMA within which specific mitigation measures will be prescribed is an approximately 190-acre portion of the CEMEX Lapis Plant property. The CEMEX Lapis Plant property is an approximately 400-acre parcel in the northwest coastal portion of the city of Marina. A portion of this property has been an active sand mine for decades. The 400-acre property is an elongated, north-to-south-oriented parcel of large coastal sand dunes bounded by the Monterey Bay on the west, the Salinas River National Wildlife Refuge on the north, a narrow strip of natural areas and farmlands along Highway 1 on the east, and the Marina Dunes Preserve in the south. The entrance is located approximately 0.15 mile west of Highway 1 on a gravel road heading west of Lapis Road.

4.1.4 Ownership

The property is owned by CEMEX Inc., DBA RMC Pacific Materials, a subsidiary of CEMEX USA, a global building materials company that produces, distributes, and sells cement, ready-mix concrete, aggregates, sand, and related building materials (www.cemexusa.com/company-profile). As previously described, CEMEX is currently under a CDO from the CCC (CCC-17-CD-02) that requires the company to cease operations by December 31, 2020; to gradually remove facilities and restore limited portions of the property by December 31, 2025; and to subsequently convey the property to a nonprofit or governmental entity or consortium approved by the CCC per the CDO, section 6.1, as stated below:

> *6.1 Conveyance*
>
> *A. Subject to Section 23.2, Respondent shall transfer fee title to all of the Property to a non-profit or governmental entity or consortium approved by the Commission, in consultation with the City of Marina, ("Buyer"), such approval not to be unreasonably withheld, that commits to hold and manage the property primarily for conservation purposes, with the only other allowable uses being for low-impact, passive recreation purposes or activities, public access, public education, removal activities, activities to restore native habitat, and activities consistent with existing easements identified by CEMEX prior to the Effective Date. Any uses that qualify as development as defined in the Coastal Act, and that require Coastal Act authorization consistent with Section 2.4, above, will require a coastal development permit.*

Furthermore, the property will be protected for conservation in perpetuity:

> *6.1 Conveyance*
>
> *C. To protect the Property in perpetuity, the purchase-sale agreement will include (1) a requirement that if Buyer ever chooses to transfer acquired property, Buyer must comply with the same requirements regarding the approval of any subsequent purchaser, (2) commitments with respect to allowable use(s) of the Property as listed above, and (3) an obligation that any future transfer must include such requirement and commitments for any subsequent transferee as well; provided, however, that Respondent's obligations in connection with conveyance of the Property shall be deemed fully satisfied upon the conveyance of the Property in accordance with this Section 6.1.*

4.1.5 Present Sensitive Biological Resources

Reconnaissance-level surveys in June of 2018 and biological surveys in June and August of 2019 identified a number of special-status biological resources, including populations of several federally listed, state-listed, and CRPR-listed plants such as Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*), sand-loving wallflower (*Erysimum ammophilum*), south coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*), Monterey coast paintbrush (*Castilleja latifolia*), a large number of Smith's blue butterfly individuals and populations of their host plants (coast and seacliff buckwheat), as well as evidence of globose dune beetle. In many areas, large, fairly intact populations of other more common endemic dune species and a variety of special-status wildlife species were observed. Snowy plover is monitored for nesting within selected habitats in the western part of the CEMEX property, which contains roughly 15 nesting pairs (Point Blue 2017). For a complete report of the biological survey methods and results, see the *Survey Results for the CEMEX Lapis Plant Northern Area* (AECOM 2019c). Existing biological resources at the CNMA are depicted on Figures 4-1 and 4-2.

Despite the presence of a number of special-status biological resources, many large areas that were formerly pristine central dune scrub were observed to be heavily infested with dense patches of iceplant mats and other weedy species, such as poison hemlock (*Conium maculatum*), black mustard (*Brassica nigra*), and wild radish (*Raphanus sativus*), in areas with finer soils.

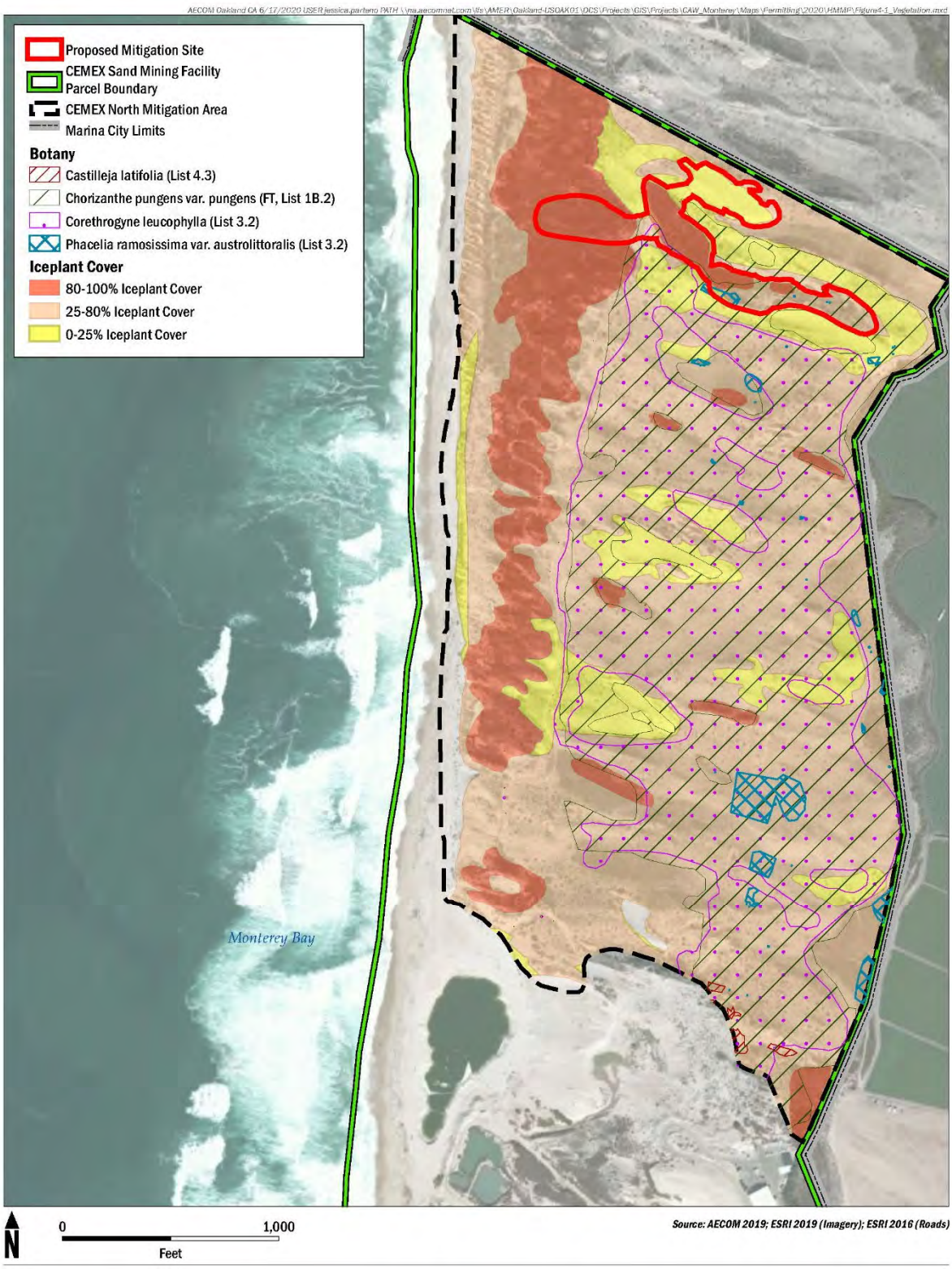

Figure 4-1. CEMEX Vegetation

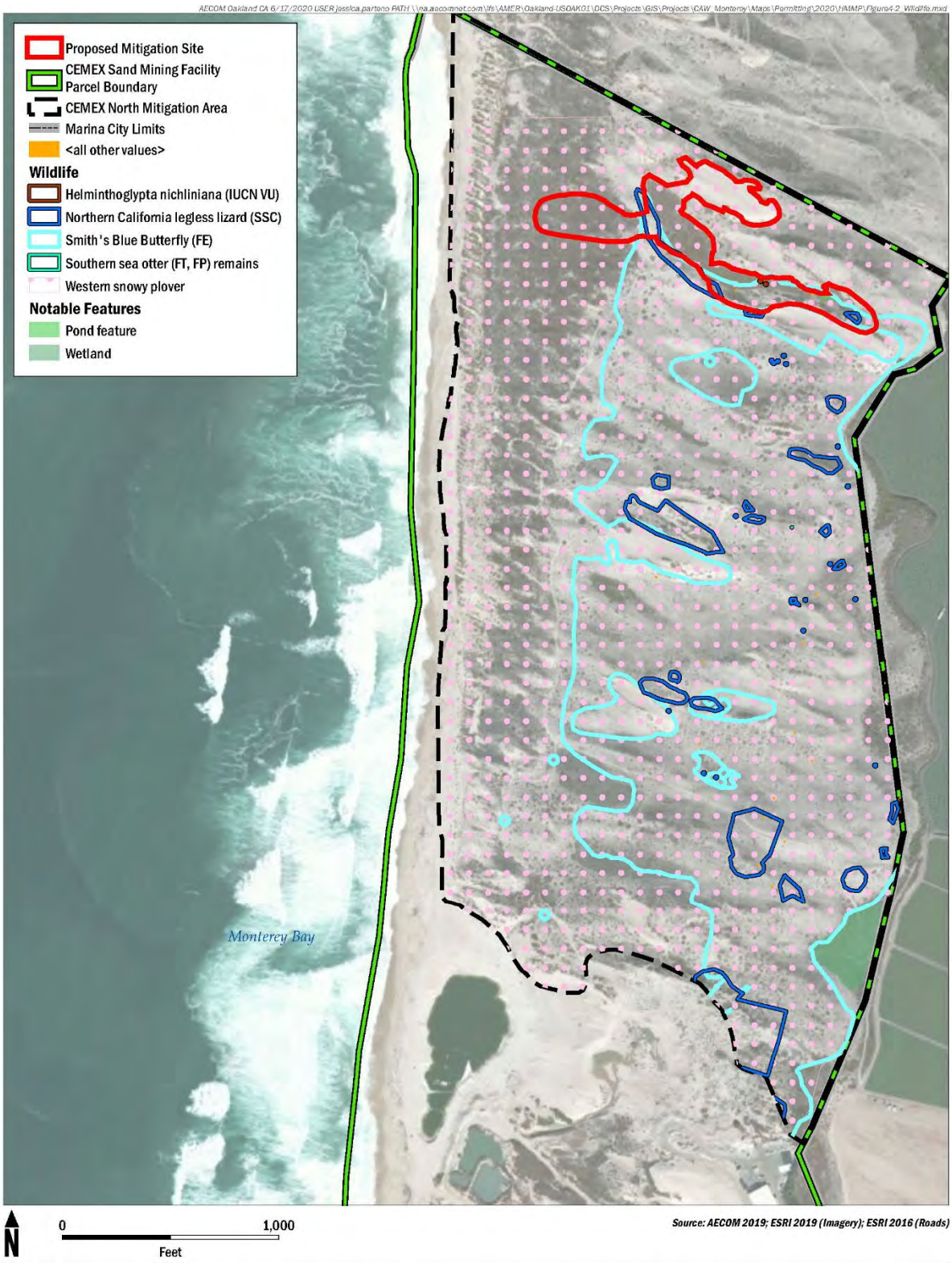

Figure 4-2. CEMEX Special-Status Wildlife

4.1.6 Present Habitats and Communities

Because the CNMA consists of a natural coastal dune complex with sandy soils and steep terrain that extends from the high tide mark along Monterey Bay on the west side to the edge of the farm fields on the east side, the area has not been used for any form of development and has remained fairly intact. Public access is not allowed. The primary natural community at the CNMA is sparsely vegetated central dune scrub complex with a mix of silver dune lupine-mock heather scrub, deerweed scrub, sparsely vegetated dune community, coyote brush scrub, dune mat, iceplant mats, and poison oak scrub along the eastern edge. Apart from the large iceplant mats, fine sediment deposits resulting from pumped agricultural runoff, and unvegetated and steep areas where sand mining occurred in the historical past, the natural communities in the area represent intact and well-preserved native vegetation types with a predominance of native plant species. Iceplant is spreading rapidly through the native habitats and appears to be destroying most native vegetation in its path and severely reducing species diversity.

4.1.7 Functions and Values

The natural communities present at the CNMA have retained most of their historical ecological functions and values. Most habitats present at the site still exhibit a high degree of ecological integrity. Iceplant mats that are spreading through the area are highly detrimental to native vegetation and have low to no functions and values.

4.1.8 Historic and Existing Hydrology

There are no natural water bodies within the CNMA. One man-made artificial drainage pond has been created in the northeastern part of the area over the years (Figure 4-3). The pond is supplied with water by a large-pipe, underground drainage system. Agricultural runoff (from large farm fields to the east of the coastal dunes) with fine dissolved organic soil is being continuously pumped about 150 feet up into one of the small basins formed by the sand dunes. During storm events, the water overflows from the artificial drainage pond into a large dune valley, where the resulting fine and rich soil has been colonized by iceplant (Figure 4-4). Figure 4-5 shows a view of the typical topography of the area.

Because the amount of drainage water is highly variable, when there is little pumping, the water stays at varying depths within the drainage pond area. However, during rainstorm events, the drainage pond overflows and the sediment-rich water from the farm field below spills into a large adjacent dune valley, where it slowly builds a thick layer of fine organic soil. This layer of soil attracts numerous invasive exotic plant species. The areas around and downstream of the drainage pond are heavily infested with iceplant and several other highly invasive plant species, such as poison hemlock, black mustard, and wild radish.

Figure 4-3. Farm Field Drainage Supplies Water for a Small Man-Made Pond

Figure 4-4. Agricultural Drainage Water Being Pumped from a Farm East of the Dunes (left photo); Dune Valley Colonized by Iceplant (right photo)

Figure 4-5. Typical Topography in the CEMEX North Mitigation Area

4.1.9 Topography

The entire CNMA consists of a large, steep, and topographically fairly intact complex of coastal dunes, with a rolling and, in some places, very steep landscape. The highest dune is estimated to be around 200 feet above mean sea level (Google Earth 2019).

4.1.10 Soils

The soils throughout the CNMA are almost exclusively pure sand, with textures varying from coarse near the coast to fine on the east sides of the dunes. There is a large dune valley with an approximately 12-inch-thick layer of dark organic soil (Figure 4-6). As previously mentioned, the organic soil was formed by sedimentation and filtration from the water pumped into the dunes from adjacent farmlands. Because the edaphic conditions in this area are inhospitable for the native central dune scrub vegetation and because the area serves as a nutrient reservoir for invasive exotic species, the soil layer should be either removed or buried with a deep layer of sand. The area is heavily degraded and completely covered with a thick layer of iceplant mat. Ripgut brome (*Bromus diandrus),* cheatgrass (*Bromus techtorum*), and other weedy exotics are present in

Figure 4-6. Dark Organic Soil Sedimented Out from Agricultural Drainage

smaller amounts. This dune valley offers a great mitigation opportunity for ESHA re-establishment in the quantities that are required to mitigate the Project impacts to special-status biological resources.

The dominant soil series, as identified by the U.S. National Resources Conservation Service (NRCS), is dune land and consists of gently sloping to steep areas of loose, wind-deposited quartz and feldspar sand on hummocks, mounds, and hills. Drainage is excessive, permeability is rapid, and runoff is very slow or slow (NRCS 1978).

4.1.11 Invasive Exotic Vegetation

Iceplant mat is one of the most prevalent invasive vegetation alliances known within the Coastal Zone. At the CNMA, iceplant is taking up a large percentage of the land vegetation cover (Figure 4-5). Black mustard, a California Invasive Plant Council (Cal-IPC) Moderate species; wild radish, a Cal-IPC Limited species; and European searocket (*Cakile maritima*) are common within the area, but do not contribute to a major percentage of the plant community cover. Most of the CNMA has been drastically altered by the invasion of iceplant, and for this reason, the area offers an excellent mitigation opportunity for ESHA re-establishment in the quantities that are required to mitigate the Project impacts to special-status biological resources. Iceplant forms dense, monotypic mats in the entire area and suffocates and eradicates most herbaceous perennials that are not taller and woody. The dense green carpets alter sand dune structure and function by slowing sand movement and changing sand deposition patterns. In natural communities, dunes continually change in response to sands transported into these systems by waves and wind, typically forming morphologically and floristically distinct foredune and backdune communities. Prior to the establishment of invasive species, foredunes were less continuous in terms of structure, hummocky in nature, and generally low in height with gentle slopes (Barbour and Johnson 1988; Pickart and Sawyer 1998). Natural foredune complexes are often characterized by relatively flat corridors or “blow-outs” between dune ridges that allow movement of wind and sediment, as well as animals and “slacks,” or depressional basins where groundwater and precipitation form dune swales or wetlands. Non-native species and their deep root and rhizome systems armor dune systems and prevent natural migration, which leads to overly large and steeply sloped foredunes and backdunes (Cooper 1936, 1967; Pickart and Sawyer 1998). They may also change the pattern of dune development, creating continuous ridges parallel to the beach rather than ones oriented perpendicular to the beach along the prevailing wind direction, as is the case at the CNMA (Cooper 1958; Seabloom and Wiedemann 1994; Wiedemann and Pickart 2004). Figure 4-7 shows one of the many heavily iceplant-infested areas at the CNMA.

4.1.12 Present and Historical Uses

The property has been owned by CEMEX as part of the CEMEX-Lapis Sand Mine since 1906. However, in 2017, a settlement between CEMEX and the State Lands Commission, CCC, and the City of Marina has forced the operations to phase out by 2020 (CEMEX 2017). As of now, the operations, which include sand extraction, have remained confined to a small area just south of the CEMEX headquarters off Lapis Road in Marina. The majority of the remaining 400 acres have not been recently used for sand extraction; however, evidence of historic sand mining was noted during the reconnaissance surveys. Because most of these areas have not naturally revegetated even decades after the disturbance, they are a great mitigation opportunity for ESHA re-establishment in the quantities that are required to mitigate for the Project impacts to special-status biological resources. Figure 4-8 shows one of the historical sand mines at the CNMA.

Figure 4-7. Iceplant-Infested Area at CNMA within Selected Restoration Site (Appendix C).

Figure 4-8. Historic Sand Mining Area at CNMA

4.2 Temporary Impacts Mitigation Areas

4.2.1 Temporary Impacts Mitigation Properties

All temporary Project-related impacts in the Coastal Zone will be restored on-site and in kind to pre-Project conditions, as mandated by the FEIR/EIS and USFWS BO, and no additional compensatory mitigation is required. In addition, while not required, Cal-Am proposes to remove an additional 1.825 acres of iceplant mats in an area just outside of the Project temporary impact boundary on the CEMEX site near the slant wells. This area will be restored to a native central dune scrub community.

Cal-Am proposes to begin temporary impacts habitat restoration gradually in step with the Project. As one area of the Project is completed, restoration in that area will begin concurrent with Project construction in other areas of the site.

4.2.2 Selection Criteria

Because the preferred compensatory mitigation is in kind and in-place, it was determined that compensatory mitigation for temporary impacts of the Project will be implemented within the Project area, in the same place where each impact occurred to the maximum extent feasible. As one area of the Project is completed, restoration in that area will begin concurrent with Project construction in other areas of the site. Recontouring and revegetation would be applied to reach this implementation requirement.

4.2.3 Protection Instruments

There are currently no protection instruments that would guarantee protection in perpetuity of the restored special-status biological resources.

4.2.4 Location

Since the compensatory mitigation for temporary impacts will be implemented in the same place where each impact occurred, the temporary impacts mitigation properties are all within the Project area footprint (refer to Figures 1-1, 2-1A, 2-1B and 2-2). Iceplant mat removal adjacent to temporary impact areas is shown on Figure 2-2.

4.2.5 Ownership

The areas where temporarily impacted biological resources will be restored to their original condition are within the TAMC right-of-way (ROW), Caltrans ROW, in Monterey County Public Works department roadways, in a small agricultural parcel owned by Maryanne Martin, and in the CEMEX-owned sand mining plant and their segment of railroad spur leading into the plant.

4.2.6 Present Sensitive Biological Resources

Reconnaissance-level surveys in June of 2018 and biological surveys in June and August of 2019 found populations of several federally listed, State-listed, and CRPR-listed plants. Smith's blue butterfly host plants were also identified. A complete report of the survey methods and results for the Project area can be found in the *Monterey Peninsula Water Supply Project Biological Resources Technical Memorandum* (AECOM 2020). Table 3-1 summarizes all impacts to special-status biological resources in the Coastal Zone of the MPWSP. Figure 3-1 shows the locations of special-status biological resources within the permanent and temporary impact boundaries of the Project.

4.2.7 Present Habitats and Communities

The Project area consists of a diverse mix of well-preserved native habitats, degraded natural areas, agricultural fields, and a former transportation corridor owned by TAMC that includes patches of marine

chaparral and special-status plants that have reclaimed their native habitat. Some areas on the CEMEX property include healthy patches of natural coastal dune complex.

4.2.8 Functions and Values

Some habitats within the Project area have retained their ecological functions and values, including the area around the proposed slant wells where snowy plovers are still nesting. Other native habitats present within the Project area have lost some of their historical ecological functions and values because of extensive adjacent development. Other habitats exhibit considerable disturbance and degradation. Iceplant mats and other invasive species populations are common in these areas and have contributed to their demise and loss of functions and values.

4.2.9 Invasive Exotic Vegetation

Iceplant mat is one of the most prevalent invasive exotic vegetation alliances in the temporarily impacted areas, taking up large percentage of the vegetation cover. Iceplant destroys most native plant populations through its fast growth, expansion and the resulting shading, alteration of soil properties and especially pH, and allelopathy. Very often, iceplant dies shortly after exhausting the soil nutrients and leaves unsightly black patches of dead plant material behind. These serve as organic soil reservoir for other invasive species. Black mustard, a Cal-IPC Moderate species, wild radish and European searocket, Cal-IPC Limited species, are three additional common invasive exotic species in the temporarily impacted areas; however, these species do not contribute to a substantial percentage of the vegetation cover.

As discussed above, while not required, Cal-Am proposes to remove an additional 1.825 acres of iceplant mats in an area just outside of the Project temporary impact boundary on the CEMEX site near the slant wells. The area will be restored to a native central dune scrub community. This work is further discussed in Section 7.10.7.

5. Mitigation Goals

The primary goal of the compensatory mitigation for permanent and temporary impacts in the Coastal Zone areas of the Project is to restore ecological functions and values equal to or better than those present before the implementation of the Project. Temporarily impacted habitats will be restored in place and in kind through reinstallation of topsoil and recontouring grades to pre-Project conditions, and revegetation with locally native species. Permanent Project impacts will be mitigated through selective removal of iceplant mats, regrading and stabilization of historic mining areas, remediation of impacted soils, reseeding, irrigation installation and subsequent re-establishment, rehabilitation and enhancement of ESHA habitats at designated locations with the CNMA. The CNMA provides areas for compensatory mitigation for permanent impacts to western snowy plover, special-status plants, Smith's blue butterfly, western burrowing owl, as well as sensitive natural communities, and ESHA. The restoration implementation plan within the CNMA and temporary impact areas are described in detail in Section 7.

The FEIR/EIS mitigation measures mandated specific mitigation goals for permanent and temporary impacts to each of the special-status biological resources present in the Coastal Zone are summarized in Table 3-2 above.

5.1 Mitigation Rationale

The proposed compensatory mitigation is based on field observations of the presence of native and invasive vegetation, preferences for soils, hydrology, slope aspect, exposure to prevailing winds, and salt spray tolerance in the area of the Project and its vicinity. Pre-Project habitats were compared with the habitat re-establishment, rehabilitation and enhancement potential of the mitigation sites, as well as their potential to provide adequate space and to replace lost functions and values. As described in Section 4, Mitigation Areas, these factors form the basic rationale for the selection of mitigation sites and their expected restoration success.

6. Performance Standards and Monitoring Methods

This section defines performance standards for the restoration of permanent and temporary Project impacts and describes methods to monitor and report progress toward their accomplishment. Compliance with these standards will be regularly monitored, and an annual monitoring report will be developed to assess whether mitigation sites are progressing to or have achieved mitigation goals and complied with performance standards, and whether the restoration was effective. Performance standards for the mitigation sites are based on mitigation goals and focus primarily on desired native vegetation establishment or the presence of quality habitat for the impacted special-status biological resources in the Coastal Zone. Performance standards for the permanent and temporary mitigation sites are mandated by the FEIR/EIS and are summarized in Table 6-1. Biological monitoring to evaluate the restoration performance and compliance with performance standards will be performed by the Biological Monitor and funded by Cal-Am. Annual reporting is required under the USFWS BO and FEIR/EIS MM 4.6-1d.

6.1 Performance Standards Based on Baseline Data

Performance standards are observable and measurable attributes of different components of the mitigation sites. The mandated performance standards for the mitigation of the permanent and temporary impacts of the Project are summarized in Table 6-1 by resource type and presented in the order in which they are listed in the FEIR/EIS. Documenting baseline (pre-construction) conditions is an important component of the restoration monitoring program, as the performance standards for the 5-year restoration will be based on baseline data. Pre-impact baseline data will consist of (1) vegetation community description; (2) density of native perennial species; (3) absolute cover of native perennial species; (4) absolute cover of Invasive Exotic Vegetation (IEV); (5) presence and numbers of special-status plant species; (6) species diversity, indicating dominant and associate species in site-specific plant lists; and (7) photographs. Pre-impact data will be used to determine compliance with performance standards.

Table 6-1. Mitigation Requirements and Performance Standards for Special-Status Biological Resources Impacts

Resource	Mitigation Goals	Mitigation Requirements and Performance Standards for Temporary Impacts	Mitigation Requirements and Performance Standards for Permanent Impacts	Monitoring Period
Western Snowy Plover	• Temporary impacts mitigation at 1:1 ratio. • Permanent impacts mitigation at 3:1 ratio • Comply with all other requirements of FEIR Mitigation Measure 4.6-1d for avoidance and minimization.	Restored site shall meet the following performance standards by the fifth year following restoration: • Temporarily impacted areas are returned to pre-Project conditions or greater • Native vegetation cover shall be at least 70 percent of baseline native vegetation cover • The restoration area shall have no more cover by invasives than the baseline. • Anti-perching devices, such as bird spikes or wire strips, shall be installed and maintained on the top of the proposed electrical control cabinets to discourage potential plover predators.	HMMP to describe creation, restoration, and/or enhancement methods that may include, but not be limited to removal of iceplant, stabilization of dune sand, planting, seeding or other means of re-establishing native plant species. HMMP to describe measures to manage recreational activities to benefit western snowy plover. Measures may include requiring that dogs are on leash, fencing is installed around breeding areas, and kite flying is restricted in the breeding season. Compensation areas shall meet the following performance standards by the fifth monitoring year: • Native vegetation cover shall be at least 70 percent of the native vegetation cover in the impact area. • The compensation areas shall not be heavily vegetated. • Invasive species cover shall be less than or equal to the invasive species cover in the impact area. • No barrier between the compensation site and the water. • No significant erosion.	5 Years
Special-Status Plants	• Temporary impacts mitigation at 1:1 ratio. • Permanent impacts mitigation at 3:1 for Monterey spineflower, 2:1 ratio for all other special status plants. • Comply with all other requirements of FEIR Mitigation Measure 4.6-1e.	Compensation areas shall meet the following performance standards by the fifth year following initiation of compensation efforts: • The compensation area shall be at least the same size as the impact area. • Native vegetation cover shall be at least 70 percent of the native vegetation cover in the impact area. • Population of the impacted special-status species shall have either: - at least 60 percent cover of the impact area, or - at least 70 percent survival of installed plants • Invasive species cover shall be less than or equal to the invasive species cover in the impact area Additionally, restored populations shall have greater than the number of individuals of the impacted population, in an area greater than or equal to the size of the impacted population, for at least 3 consecutive years without irrigation, weeding, or other manipulation of the restoration site.		5 Years
Smith's Blue Butterfly	• Temporary impacts mitigation at 1:1 ratio. • Permanent impacts mitigation at 3:1 ratio • Comply with all other requirements of FEIR Mitigation Measure 4.6-1f.	Restoration or compensation sites shall meet the following performance standards by the fifth year following restoration: • Temporarily impacted areas are returned to pre-Project conditions or greater • Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover • The population of coast buckwheat and/or seacliff buckwheat shall have either:	Restoration or compensation sites shall meet the following performance standards by the fifth year following restoration: • Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover • The population of coast buckwheat and/or seacliff buckwheat shall have either: - at least 60 percent cover of the baseline/impact area, or - at least 70 percent survival of installed plants • No more cover by invasives than the baseline/impact area	5 Years

Resource	Mitigation Goals	Mitigation Requirements and Performance Standards for Temporary Impacts	Mitigation Requirements and Performance Standards for Permanent Impacts	Monitoring Period
		- at least 60 percent cover of the baseline/impact area, or - at least 70 percent survival of installed plants • No more cover by invasives than the baseline/impact area	• Plan.	
Western Burrowing Owl	• Temporary impacts mitigation at 1:1 ratio. • Comply with all other requirements of FEIR Mitigation Measure 4.6-1h.	While no temporary impacts to burrowing owl are anticipated, if burrowing owls are found on-site, compensatory mitigation for loss of breeding and/or wintering habitat shall be implemented onsite or offsite in accordance with burrowing owl Staff Report on Burrowing Owl Mitigation guidance and in consultation with CDFW. At a minimum, the following measures shall be implemented: • Temporarily disturbed habitat shall be restored to pre-construction conditions, including soil decompaction and revegetation. Alternatively, compensatory credits may be purchased through an approved mitigation bank, or approved Habitat Conservation Plan.	While no permanent impacts to western burrowing owl habitat are anticipated, since western burrowing owls were observed in the Coastal Zone of the Project in the past, pre-construction biological monitoring will be performed as required, and if any burrows are identified mandated mitigation measures will be implemented.	5 Years
Sensitive Communities and ESHAs	• Temporary impacts mitigation at 1:1 ratio. • Permanent impacts mitigation at 3:1 ratio, as noted in the Mitigation Strategy Memo provided to the California Coastal Commission on October 2, 2019. • Comply with all other requirements of FEIR Mitigation Measure 4.6-2b.	Restoration sites shall meet the following performance standards by the fifth year following restoration: • Temporarily impacted areas are returned to pre-Project conditions or greater • Native vegetation cover shall be at least 70% of baseline/impact area native vegetation cover • No more cover by invasives than the baseline/impact area • Topsoil shall be salvaged during grading and earthmoving activities, stockpiled separately from subsoil, and protected from erosion (e.g., covered or watered). Composting additives shall be used to amend the soil, if needed, and compacted topsoil shall be properly prepared prior to reuse for post-construction restoration of temporarily disturbed areas. A minimum of 12 inches of topsoil shall be salvaged (or if there is less than 12 inches of topsoil initially, as much as is available practicable).	Compensation sites shall meet the following performance standards by the fifth year following restoration: • Native vegetation cover shall be at least 70% of baseline/impact area native vegetation cover • No more cover by invasives than the baseline/impact area • Topsoil shall be salvaged during grading and earthmoving activities, stockpiled separately from subsoil, and protected from erosion (e.g., covered or watered). Composting additives shall be used to amend the soil, if needed, and compacted topsoil shall be properly prepared prior to reuse for post-construction restoration of temporarily disturbed areas. A minimum of 12 inches of topsoil shall be salvaged (or if there is less than 12 inches of topsoil initially, as much as is available practicable).	5 Years

6.2 Monitoring Methods

Monitoring provides a tool for determining the progress and attainment of performance standards at the mitigation sites. To ensure that all mitigation sites are progressing toward the performance standards established in this HMMP, qualified Biological Monitors will regularly monitor the mitigation sites. Mitigation monitoring activities will assess restoration performance based on the performance standards mandated for each type of special-status biological resource. Project impact areas will be surveyed for pre-Project/baseline data by the Biological Monitor or Restoration Ecologist before construction and the start of monitoring of mitigation sites in order to provide comparable sets of data by which the mitigation sites' performance will be assessed. Mitigation monitoring results will be documented in annual reports that will be prepared and submitted to applicable resource agencies by the Biological Monitor. Monitoring procedures, schedules, and performance will vary according to habitat type. Detailed methods for monitoring vegetation, hydrology, and species performance are described below.

6.2.1 Maintenance (Qualitative) Monitoring

Restoration Ecologists will perform regular mitigation site maintenance inspections. Maintenance monitoring visits will be conducted as needed, based on the season (e.g., more IEV growth occurs in the spring, so more monitoring visits will occur then) and the needs of the restoration area. Monitoring will focus on seed germination success (from both natural recruitment and seeding), native plant health and vigor, wildlife presence, erosion-control needs, herbivory, transplanted shrub watering needs, irrigation system functionality, and restoration area access issues. General photographs of the restoration area(s) will be taken to document conditions.

6.2.2 Performance (Quantitative) Monitoring

Restoration performance monitoring will include quantification of vegetation characteristics (e.g., native and non-native vegetation cover, species diversity, dominant species, target species cover and density) and collection of established viewpoint photographs. Performance monitoring will be conducted at each restoration area by Restoration Ecologists or Biological Monitors based on the monitoring schedule discussed in Section 6.3, below, until the restoration areas have met their performance standards. The percent cover of native perennial species will be estimated using a modified relevé method. The relevé method was developed in Europe, and the CNPS in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995) published a Vegetation Sampling Protocol that was developed as a quantitative sampling technique applicable to vegetation communities in California (CNPS 2000). The relevé method is generally considered a "semiquantitative" method. It relies on ocular estimates of plant cover rather than on counts of the "hits" of a particular species along a transect line or on precise measurements of cover/biomass by planimetric or weighing techniques. Table 6-2 lists the relevé categories that will be used to collect percent cover of native perennials.

Table 6-2. Relevé Category for Percent Cover

Relevé Category	
0%	>30–40%
>0–1%	>40–50%
>1–5%	>50–60%
>5–10%	>60–70%
>10–15%	>70–80%
>15–20%	>80–90%
>20–30%	>90–100%

In addition to native perennial cover, data collected for each restoration area will include the number of dominant native species. Dominant native species are defined as those species that compose 25 percent or more of the total vegetative cover in a particular restoration area. Data pertaining to any erosion issues, evidence of wildlife use, natural recruitment of native seedlings, and non-native vegetation cover will also be recorded. Performance monitoring will occur concurrently with one of the maintenance monitoring visits to the extent practicable. Quantitative data will be used to evaluate performance of the restoration areas in relation to the performance standards. Specific vantage point photographs of the restoration area(s) will be taken to document conditions, as described in detail below.

6.3 Monitoring Schedule

The permanent and temporary impact mitigation areas will be monitored at regular intervals for a minimum of 5 years, as shown in Table 6-3. Monitoring dates indicated in the table are approximate and will be adjusted every year to account for rainfall, weather, and plant phenology. Floristic composition and vegetation cover monitoring visits will be timed to coincide with the flowering period of the target or the majority of the target species in each type of mitigation area. The frequency of monitoring visits can be increased or decreased as needed based on observations, conditions in the field, or pertinent agency requirements.

Table 6-3. Mitigation Sites Monitoring Schedule

Biological Resource / Performance Standard	Monitoring Frequency	Jan	Feb	Mar	Apr*	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec
Western Snowy Plover Habitat													
Native Vegetation Cover	Quarterly, Year 1-2	X			X			X			X		
Native Vegetation Cover	Annually, Year 3-5										X		
IEV Cover	Monthly, Year 1-2	X	X	X	X	X	X	X	X	X	X	X	X
IEV Cover	Quarterly, Year 3-5	X			X			X			X		
Barriers btw. Mitigation Site and Water	Quarterly, Years 1-5	X			X			X			X		
Erosion	Quarterly, Years 1-5	X			X			X			X		
Pre-Project Condition Return	Annually, Year 1-5										X		
Special-Status Plants													
Native Vegetation Cover	Quarterly, Year 1-2	X			X			X			X		
Native Vegetation Cover	Annually, Year 3-5										X		
Survival of Transplants and Containers	Quarterly, Year 1-2	X			X			X			X		
Survival of Transplants and Containers	Annually, Year 3-5										X		
IEV Cover	Monthly, Year 1-2	X	X	X	X	X	X	X	X	X	X	X	X
IEV Cover	Quarterly, Year 3-5	X			X			X			X		
Special-Status Plant Cover	Monthly, Year 1-2	X	X	X	X	X	X	X	X	X	X	X	X
Special-Status Plant Cover	Quarterly, Year 3-5	X			X			X			X		
Pre-Project Condition Return	Annually, Year 1-5										X		
Smith's Blue Butterfly													
Native Vegetation Cover	Quarterly, Year 1-2	X			X			X			X		
Native Vegetation Cover	Annually, Year 3-5										X		
IEV Cover	Monthly, Year 1-2	X	X	X	X	X	X	X	X	X	X	X	X
IEV Cover	Quarterly, Year 3-5	X			X			X			X		
Coast/Seacliff Buckwheat Cover	Monthly, Year 1-2	X	X	X	X	X	X	X	X	X	X	X	X
Coast/Seacliff Buckwheat Cover	Quarterly, Year 3-5	X			X			X			X		
Transplants and Container Survival	Quarterly, Year 1-2	X			X			X			X		
Transplants and Container Survival	Annually, Year 3-5										X		
Pre-Project Condition Return	Annually, Year 1-5										X		

Biological Resource / Performance Standard	Monitoring Frequency	Jan	Feb	Mar	Apr*	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec
Western Burrowing Owl**													
Pre-Project Condition Return	Annually, Year 1-5										X		
Sensitive Communities and ESHAs													
Native Vegetation Cover	Quarterly, Year 1-2	X			X			X			X		
Native Vegetation Cover	Annually, Year 3-5										X		
IEV Cover	Monthly, Year 1-2	X	X	X	X	X	X	X	X	X	X	X	X
IEV Cover	Quarterly, Year 3-5	X			X			X			X		
Pre-Project Condition Return	Annually, Year 1-5										X		

* Perform semi-annual maintenance monitoring.
**Western burrowing owl is included in the monitoring and maintenance schedule pending pre-construction survey results. Currently, there is no western burrowing habitat present within the temporary or permanent impact areas.

6.4 Photo-Documentation

A minimum of three permanent photo-monitoring stations per acre will be established for each mitigation site. Photographs will be taken annually from the same vantage points and in the same direction at each restoration area during the same season. At least three permanent photo-monitoring stations will be established for mitigation sites smaller than 1 acre and for each distinct natural community, and there will be at least three stations for geographically separate restoration areas. All photo monitoring stations will be mapped using GPS and marked with rebar or polyvinyl chloride pipe (if feasible) following construction. Photo-monitoring station locations will include vantage points that best capture representative areas of each restoration area.

Photos will be taken with a digital camera at an approximate height of between 4 feet 8 inches and 5 feet above the ground level. Vertical camera angle and lens properties will be documented so consistency of photographic methods is maintained between monitoring years. For each photo, the photo station number, number of images taken, direction of the photo station, height of the photo above the ground, number, date, time, and restoration area will be recorded.

7. Mitigation Implementation Plan

This section discusses specific mitigative restoration implementation methods, tasks, and activities that will be performed to restore habitats impacted by the MPWSP in the Coastal Zone. The section is organized in the order in which the work will be implemented. Each restoration method, task, and activity description addresses the restoration industry's typical requirements, and where applicable, compliance with the FEIR/EIS mitigation measures and the USFWS BO by biological resource and type of impact. Appropriate restoration methods that have been applied locally with success are outlined in this section; however, each restoration site will be different and may respond to different restoration approaches. Cal-AM will employ a Society for Ecological Restoration certified ecological restoration professional (CERP, Restoration Ecologist) with expertise in dune restoration to work in close consultation with CCC and other stakeholder agencies on the use of the restoration methods described in this HMMP in order to achieve the performance standards mandated by the FEIR/EIS and USFWS BO. Restoration approaches will be based on detailed site and biological resource analysis conducted by the Restoration Ecologist in the field. On behalf of Cal-Am, AECOM has closely reviewed primary mitigation opportunities within the 190-acre CNMA and selected an approximately 6.6-acre mitigation site within the CNMA's north portion that has sufficient acreage to mitigate for the approximately 2.181 aces of ESHA permanent impacts (at 3:1) in the Coastal Zone. The proposed mitigation site possesses suitable environmental conditions for the impacted Coastal Zone biological resources.

Potential key restoration activities identified in this section include seed collection of local genotype native plant species, native plant seed propagation, contract growing of container seedling plants, plant pathogen risk assessment, invasive exotic vegetation removal, special-status plant salvage, avoidance of existing biological resources, preparation of planting and irrigation construction documents, site preparation, topsoil salvage, decompaction, soil testing, soil and dune stabilization, soil amending, seeding, container stock planting, transplanting of salvaged plants, restoration site protection, and plant establishment. Adaptive management is an important component of this HMMP, as certain restoration techniques may not be suitable in all areas of the Project and the CNMA, given environmental factors such as soil texture, soil infiltration rate, slope aspect, prevailing winds, herbivory, and presence of invasive exotic vegetation.

7.1 Implementation Schedule

Restoration implementation will consist of a number of activities that will be conducted before and after construction of the MPWSP Coastal Zone components. Table 7-1 summarizes key tasks and their general timing. Adaptive refinements to the implementation of restoration activities will be made at the discretion of the Restoration Ecologist in coordination with agency personnel. Additional details regarding these activities are presented below.

Table 7-1. Restoration Implementation Activities and Their Timing

Activity	Description	Timing
Pre-Construction		
Seed Collection and Procurement of Common Native Plants	Seed collection and procurement will start at least 3 years prior to restoration to secure sufficient amounts of seed for a successful restoration.	3 Years before Restoration Start
Special-Status Plant Seed Collection and Propagation	Seed collection and procurement of special-status plants will start at least 3 years prior to restoration to secure sufficient amounts of seed for a successful restoration. Propagation of seed will start after initial collection from special-status plants is completed and at least 2 years before restoration work begins.	2 to 3 Years before Restoration Start
Container Plants and Plant Pathogen Risk Assessment	Host plants for Smith's blue butterfly and other special-status plant species not available from seed in 2020 may have to be grown in plant nurseries. Phytophthora control measures will be implemented.	2 Years before Restoration Start
Invasive Exotic Vegetation Removal	Invasive exotic vegetation removal will begin at least 2 years before the start of restoration to reduce competition for resources.	2 Years before Restoration Start
Avoidance and Minimization Measures	The FEIR/EIS prescribes general and biological resource-specific measures for avoidance and minimization of impacts that must be implemented before the start of construction.	Begin Minimum 1 Year before Construction Start
Restoration Construction Documents Preparation	Detailed restoration, planting, erosion protection and irrigation plans, specifications, and a cost estimate will be prepared for the restoration of permanent and temporary mitigation areas. The construction document package should be developed early in order to address tasks such as seed collection, propagation, IEV control and eradication, and existing plant salvage.	Prepare 2 to 3 Years before Restoration Implementation
Host Plant or Special-Status Plant Salvage	Host and special-status plant salvage will be conducted when plants are not actively growing. Prime maritime chaparral species selected by the Restoration Ecologist will be salvaged before the Project starts.	One to 2 Years before Construction Start
MPWSP COASTAL ZONE ELEMENTS CONSTRUCTION		
Mitigation Implementation		
Topsoil Salvage	Will be implemented throughout the Project area as part of the Project.	During MPWSP Construction
Topsoil Redistribution	Soil salvage and replacement is a requirement of the Project specifications (for the entire Project area) and the Biological Opinion (for sensitive habitat areas).	During MPWSP Construction
Soil Decompaction	Soil decompaction will be implemented in areas with relative compaction >80%.	During MPWSP Construction
Contour and Finish Grading	To restore original condition, habitats and hydrological functions will be established.	During MPWSP Construction
Imprinting	Will be implemented in suitable restoration areas.	0-6 Months after Construction Completion
Installation or Transplanting of Special-Status Shrubs	Shrub installation and transplanting will occur in late October - early November so that seeding can immediately follow.	0-6 Months after Construction Completion
Seeding	Seeding should occur in the fall, prior to the onset of winter rain, to the maximum extent practicable to take advantage of natural rainfall patterns and reduce native plant competition with exotic plants.	0-6 Months after Construction Completion
Fence/Sign Installation	Will be installed as needed in areas that could be impacted by herbivory, vandalism, and traffic.	0-6 Months after Construction Completion

Activity	Description	Timing
IEV Removal	Will occur weekly and will be intensive and ongoing; weeding will occur post construction to achieve performance standards and minimize competition with native plants.	0-6 Months after Construction Completion
Trash and Debris Removal	Will be performed as needed and will be ongoing.	0-6 Months after Construction Completion

FEIR/EIS = Final Environmental Impact Report/Environmental Impact Statement
IEV = Invasive Exotic Vegetation
MPWSP = Monterey Peninsula Water Supply Project

7.2 Seed Collection and Procurement

Seed for restoration will be collected from local populations of plants and from areas with environmental conditions similar to those of the MPWSP Coastal Zone components and within the Project seed collection area described below. Commercial seed suppliers typically collect native seed from diverse areas throughout California, and often have seed lots collected from an acceptable distance or even directly from the vicinity of the Project. The following seed suppliers have been successfully used to source seed for other restoration projects and may have appropriate seed available: Pacific Coast Seed, S&S Seed, Cornflower Farms, and Hedgerow Farms. For some native plant species, seed will need to be commercially propagated because sufficient amounts of seed for the Project will not be available within the Project's seed collection area.

7.2.1 Common Native Plants Seed

Seeds of native plants without special-status designation will be collected from the Project area and vicinity to the maximum extent practicable 2 to 3 years before ESHAs in the Coastal Zone are impacted. The Project seed collection area will extend in an approximately 3-mile-wide band along the coast of Monterey Bay from Elkhorn Slough to the City of Monterey. Since this area is densely urbanized, seed collection will be planned well ahead of time, and seed collection permits will be obtained from landowners and agencies with jurisdiction. Limited amounts of seed may also be procured from local vendors if the seed was obtained from parent plant sources located within the Project seed collection area. Seed sources from outside of the Project seed collection area must be preapproved by the pertinent agencies before the seeds are introduced at the mitigation sites. Collection efforts will target as many different native annual and perennial species as available during each collection session. The same species may be collected from multiple sites and during different times to increase genetic diversity and viability. Not all desired species will be available for collection in any particular year due to climatic factors, plant phenology, and herbivory.

The native seed mixes recommended below will serve as the seed collection and seeding palette that will be used to guide the restoration effort, and the mixes will be adjusted based on actual field availability. Tables 7-2, 7-3, and 7-4 list the proposed restoration plant species suitable for restoration of the primary habitats impacted in the Coastal Zone: central dune scrub, central maritime chaparral, coast live oak woodland, and northern coastal scrub. The central dune scrub seed mix will be appropriate for the restoration of the silver dune lupine – mock heather, dune mat, deerweed scrub and sparsely vegetated dune sensitive natural communities and ESHAs, as well as, in a limited fashion, for the re-establishment of Smith's blue butterfly and western snowy plover habitats at the CNMA after the removal of iceplant, the regrading and stabilization of historic mining areas, and the remediation of agricultural sediment deposits. The seed mixes are divided into two primary vegetation zones that occur in the dune complex at CNMA – the windward foredunes and coastal bluffs and the leeward backdunes, mid-dunes, and swales. The coast live oak woodland, northern coastal scrub and central maritime chaparral seed mixes will be

suitable for in-kind and in-place restoration of temporary impacts to small patches of these communities within the Project footprint. Other native species may be added as approved by the Restoration Ecologist and after consultation with agency personnel to facilitate species diversity. Seed of some species may not be available for purchase or present in sufficient amounts for collection. In this case, small amounts of seeds can be used for contract seed propagation, and the increase and/or seeding rates of other species may be adjusted as appropriate to maintain minimum seeding rates; this will be determined by the Restoration Ecologist in collaboration with the pertinent resource agencies. Seed mixes will include a minimum of 15 native species consisting of 5 keystone species and 10 associate species and will achieve a minimum seeding rate of 50 seeds per square foot on level and gently sloping areas, and 75 seeds per square foot in areas steeper than 4:1.

Table 7-2. Central Dune Scrub Potential Seed Mix Species*

Scientific Name	Common Name	Foredunes and Coastal Bluffs	Backdunes, Mid-Dunes, and Swales
Abronia latifolia	yellow sand verbena	X	X
Abronia maritima	red sand verbena	X	X
Abronia umbellata	pink sand verbena		X
Achillea millefolium	yarrow	X	X
Acmispon glaber	deerweed		X
Acmispon argophyllus var. argophyllus	Southern California silver lotus		X
Agoseris apargioides var. eastwoodiae	beach dandelion	X	
Ambrosia chamissonis	beach burr	X	X
Armeria maritima	seathrift	X	X
Artemisia pycnocephala	coastal sagewort	X	X
Astragalus nuttallii var. nuttallii	ocean bluff milkvetch	X	X
Atriplex leucophylla	saltbush	X	
Baccharis pilularis	coyote brush		X
Calystegia soldanella	beach morning glory	X	
Camissoniopsis cheiranthifolia	beach primrose	X	X
Cardionema ramosissimum	sandcarpet		X
Carex pansa	sand dune sedge	X	
Castilleja latifolia	Monterey paintbrush		X
Chorizanthe pungens ssp. pungens	Monterey spineflower		X
Corethrogyne filaginifolia	common sandaster		X
Crocanthemum scoparium	peak rush rose		X
Croton californicus	California croton		X
Cryptantha leiocarpa	beach cryptantha		X
Deinandra corymbosa	coastal tarweed		X
Dudleya farinosa	sand lettuce	X	X
Ericameria ericoides	mock heather		X
Erigeron glaucus	seaside daisy	X	X
Eriogonum latifolium	coast buckwheat	X	X
Eriogonum parvifolium	seacliff buckwheat		X
Erysimum ammophilum	coast wallflower		X

Scientific Name	Common Name	Foredunes and Coastal Bluffs	Backdunes, Mid-Dunes, and Swales
Eriophyllum staechadifolium	lizardtail	X	X
Festuca octoflora	six weeks fescue		X
Fragaria chiloensis	beach strawberry	X	X
Gilia tenuiflora ssp. arenaria	sand gilia		X
Lupinus chamissonis	silver dune lupine	X	X
Phacelia ramosissima var. austrolittoralis	branching phacelia		X
Poa douglasii	sand dune blue grass	X	X
Polygonum paronychia	beach knotweed		X
Toxicodendron diversilobum	poison oak		X

*50 pure live seeds per square foot on level areas and slopes less than 4:1; 75 Pure Live Seeds on slopes >4:1

Table 7-3. Coast Live Oak Woodland/Northern Coast Scrub Potential Seed Mix Species

Scientific Name	Common Name
Acmispon glaber	deerweed
Arctostaphylos tomentosa	wooly-leaf manzanita
Artemisia californica	California sagebrush
Baccharis pilularis	coyotebrush
Ceanothus rigidus	Monterey ceanothus
Ceanothus thyrsiflorus var. thyrsiflorus	blue blossom
Diplacus [Mimulus] aurantiacus	sticky monkeyflower
Elymus glaucus	blue wildrye
Eriophyllum confertiflorum	golden yarrow
Eschscholzia californica	California poppy
Fragaria vesca	woodland strawberry
Frangula californica ssp. californica	California coffeeberry
Frangula californica ssp. tomentella	hoary coffeeberry
Galium porrigens	climbing bedstraw
Heteromeles arbutifolia	toyon
Iris douglasiana	Douglas iris
Lepechinia calycina	white pitcher sage
Lupinus bicolor	miniature lupine
Lupinus nanus	sky lupine
Lupinus variicolor	varied lupine
Marah fabacea	manroot
Melica imperfecta	coast range oniongrass
Melica torreyana	Torrey's oniongrass
Pedicularis densiflora	Indian warrior
Penstemon centranthifolius	scarlet bugler
Phacelia ramosissima var. austrolitoralis	South Coast branching phacelia
Pholistoma auritum var. auritum	branching phacelia

Scientific Name	Common Name
Prunus ilicifolia ssp. ilicifolia	holly-leaved cherry
Quercus agrifolia	coast live oak
Rubus ursinus	California blackberry
Scrophularia californica	California bee-plant
Stipa cernua	nodding needlegrass
Symphoricarpos mollis	creeping snowberry
Toxicodendron diversilobum	poison oak
Umbellularia californica	California bay tree

Table 7-4. Central Maritime Chaparral Potential Seed Mix Species

Scientific Name	Common Name
Acmispon argophyllus var. argophyllus	Southern California silver lotus
Acmispon glaber	deerweed
Adenostoma fasciculatum	chamise
Arctostaphylos hookeri ssp. hookeri	Hooker's manzanita
Arctostaphylos pumila	sandmat manzanita
Artemisia californica	California sagebrush
Baccharis pilularis	coyotebrush
Ceanothus dentatus	cropleaf ceanothus
Ceanothus rigidus	Monterey ceanothus
Ceanothus thyrsiflorus var. griseus	Yankee point ceanothus
Ceanothus thyrsiflorus var. thyrsiflorus	blue blossom
Chorizanthe pungens var. pungens	Monterey spineflower
Cirsium occidentale	cobwebby thistle
Crocanthemum scoparium	peak rush rose
Croton californicus	California croton
Cryptantha clevelandii	Cleveland's cryptantha
Cryptantha intermedia	common cryptantha
Cryptantha micromeres	minute-flowered cryptantha
Diplacus aurantiacus	sticky monkeyflower
Elymus glaucus	blue wildrye
Ericameria ericoides	mock heather
Ericameria fasciculata	Eastwood's goldenbush
Eriophyllum confertiflorum	golden yarrow
Eschscholzia californica	California poppy
Gilia tenuiflora ssp. arenaria	Monterey sand gilia
Gilia tenuiflora ssp. tenuiflora	greater yellowthroat gila
Heteromeles arbutifolia	toyon
Horkelia cuneata var. sericea	Kellogg's horkelia
Lepechinia calycina	white pitcher sage
Lomatium parvifolium	coastal biscuitroot
Lupinus bicolor	miniature lupine

Scientific Name	Common Name
Acmispon argophyllus var. argophyllus	Southern California silver lotus
Lupinus chamissonis	silver lupine
Lupinus nanus	sky lupine
Lupinus truncatus	blunt leaved lupine
Lupinus variicolor	varied lupine
Marah fabacea	Manroot
Melica imperfecta	coast range oniongrass
Melica torreyana	Torrey's oniongrass
Micropus californicus	q-tips
Monardella sinuata ssp. nigrescens	northern curly leaf monardella
Pedicularis densiflora	Indian warrior
Penstemon centhranthifolius	scarlet bugler
Phacelia ramosissima var. austrolitoralis	south coast branching phacelia
Pholistoma auritum var. auritum	branching phacelia
Piperia michaelii	Michael's rein-orchid
Pteridium aquilinum	bracken fern
Rhamnus californica	coffeeberry
Rhamnus tomentella	hoary coffeeberry
Salvia mellifera	black sage
Stipa cernua	nodding needlegrass
Toxicodendron diversilobum	poison oak

Seed collection, purchase, seed increase and propagation planning will begin at least 3 years before the start of restoration to prevent restoration delays and setbacks if local, ecotypical seed amounts are not acquired in sufficient amounts and diversity to support the restoration effort. Seed will be procured from commercial seed suppliers and professional collectors of native seed. Small amounts of seed may be collected by Restoration Ecologists during restoration planning and field surveys.

After field collection, native plant seed will require drying and cleaning by standard methods including those described by Young and Young (1992). Removing detritus, weed seed and chaff from seed during cleaning will maintain its viability, vigor and health, and will reduce seed bulk during storage. A sieve screen can facilitate cleaning in the field. Pulpy seed will be de-pulped, dried and cleaned before it is placed in storage. After de-pulping, de-husking, drying, and cleaning, native plant seed collected in the wild will be tested for purity (%) and germination (%) by a testing laboratory. When these two properties are factored, they express the percentage amount of Pure Live Seed (PLS) in a pound of bulk seed. Native seed will be weed-free and will be stored by commercial seed suppliers in cool, dry conditions in suitable containers. Standard industry storage methods will be employed to deter molding, disease spread, or loss of viability, and to preserve seed materials in good condition until their use at the mitigation sites.

7.2.2 Special-Status Plants Seed

In order to implement compensatory mitigation for permanent and temporary impacts to special-status plants, a large amount of their seed and potentially other propagules will be needed. Seed of impacted special-status plants within the Coastal Zone portion of the Project area, such as Monterey spineflower, sandmat manzanita, ocean bluff milkvetch, Monterey ceanothus, Monterey Coast paintbrush, branching

beach aster, south coast branching phacelia, and Michael's rein orchid, will be collected for at least 3 years before their populations are impacted by the construction work. Seed will also be collected from populations of special-status plants from outside of the Project area, but within the seed collection area described above, with prior approval of the corresponding agencies and property owners. Similar to the timing of the seed collection of common native plants, seed collection of special-status species will begin at least 3 years before the start of the mitigation work to ensure that sufficient seed is available for restoration. Only small amounts of the seeds of special-status plants will be available within the Project seed collection area because of their rarity, and only small amounts of the available seed will be allowed to be collected in order to protect the plants and prevent negative impacts on their populations and reproduction.

7.2.3 Native Plant Seed Propagation

Seed collected from special-status native plants and seed collected only in small amounts from common, desirable species because of the low amounts present in the Project seed collection area during the seed collection period will be used for propagation and will be sent to commercial seed propagators for seed increase. The propagation process will take 2 or more years under beneficial conditions. Typically, seed from up to the fourth commercially propagated generation is still considered genetically similar and acceptable for restoration. Even if propagated seed is not available in large amounts during the initial seeding, additional amounts produced by propagators in subsequent years may be used to reseed poorly performing restoration areas.

7.3 Container Plants and Plant Pathogen Risk Assessment

In some cases, special-status plants may have to be propagated in a nursery setting and may be grown in a variety of containers ranging from small plugs and bands to tree pots and multi-gallon plastic containers. During their production in the plant nursery, there is a high risk of contamination of the container stock with a destructive water mold (*Phytophthora*) that has been spreading throughout California in the past several decades. The genus *Phytophthora* includes a number of different species that cause a variety of severe plant diseases known as sudden oak death (SOD), root and crown rot, blight, and potato famine. To prevent the spread of the disease, restoration efforts at mitigation sites will focus on seeding and on-site transplantation of existing salvaged plants rather than installation of container grown plants. Plant propagation in nurseries will be avoided to the maximum extent practicable because of the risk of any of the several *Phytophthora* spp. introduction to the mitigation sites. The following *Phytophthora* prevention guidance will be followed if container plant propagation is deemed necessary:

- A thorough risk assessment and field review will be conducted before a nursery is chosen to grow container plant stock for the Project mitigation sites.
- Any nursery contracted for this work must have followed for the past 3 years and must be currently following the requirements set forth in *Guidelines to Minimize Phytophthora Pathogens in Restoration Nurseries* (Phytophthora 2016).
- At least 5 percent of all container plants will be tested at a source nursery for *Phytophthora* infection before their delivery to mitigation sites.

7.4 Invasive Exotic Vegetation Removal

IEV management and control techniques will begin at the permanent and temporary mitigation sites in the Coastal Zone at least 2 years before the start of construction. These techniques will include targeted and landscape-level manual removal and, as a last resort and with the resource agencies approval, chemical

treatment. IEV management methods and strategies will depend on many factors, including invasiveness, IEV reproduction strategies, degree of infestation, presence of common and sensitive native species, regulatory requirements, presence of aquatic habitat, terrain, and plant species composition.

Non-chemical, targeted, and landscape-level treatment will be the preferred choice for non-native invasive plant control in the restoration areas. Targeted control methods such as manual removal with weed wrenches or string trimmers (also known as a weed whacker) or hand pulling will be used for small IEV infestations. Hand pulling of weeds will occur around planting basins unless adequate protection is afforded around plants to protect them from mechanical string trimmer damage. Landscape-level methods such as mechanical raking, mowing, sheathing, or solarization may be used for larger IEV infestations. These non-chemical treatments would be repeated throughout the growing season, as necessary to control resprouting and extended germination periods. IEV removal will be implemented at mitigation sites before construction begins and as needed during the mitigation monitoring period to reduce the weed seed bank and competition with native target plants.

Chemical IEV control methods will be used only when repeated applications of physical control methods are not successful or practical. Herbicides will be only used as a last resort and with prior approval from pertinent resource agencies, and their use will comply with all applicable laws and regulations. Any herbicide proposed for use in the Project area will be approved for use in California and in the specific habitat as appropriate and must not be considered a threat to any special-status wildlife or plant species.

The most destructive invasive exotic plant in the Coastal Zone is iceplant, which is present in large portions of the vegetation cover at both the CNMA and at most temporarily impacted sites. At the CNMA, three different levels of eradication effort will be implemented.

In areas of 80 to 100 percent cover of iceplant (Figure 7-1) with minimal amounts of remnant native vegetation, mechanized equipment such as bobcats or small tractors with a root rake clam grapple attachment and screen bucket attachment will be deployed to remove the iceplant and all of its organic debris, as discussed in Section 7.10, below.

Figure 7-1. CNMA with 80-100% Cover of Iceplant and Remnant Populations of Native Plants (red patches)

Figure 7-2. Iceplant Seeds

The cleaned sand will still contain large amounts of iceplant seeds (Figure 7-2), which are as small as coarse sand particles, and roots. To effectively eradicate the iceplant seedbank and remaining underground roots, the cleared areas will be covered with clear plastic sheathing and solarized for three of the warmest/sunniest months of the year and then immediately reseeded with native seed mixes inoculated with mycorrhizal fungi and irrigated. In windward areas where potential aeolian erosion could degrade the restoration area and blow away seed, coir erosion control fabric and/or sand drift fencing will be installed to minimize the impact on the seedlings. In leeward areas, sand will be imprinted to enhance seedling survival. Large masses of iceplant organic matter left behind after chemical treatment of the mats often serve as reservoirs of nutrients and seedling shelter for other invasive exotic species (Pickart and Sawyer 1998), and additionally protect iceplant seed previously deposited in the sand. The organic matter can be allelopathic to native plants, harbor pathogenic chytrid fungi and molds that are detrimental to dune species, and lower levels of mycorrhiza (D'Antonio and Mahall 1991). The majority of central dune scrub plants are well adapted to pure sand with minimal to no plant nutrients, elevated pH, soils with very low electroconductivity and minimal organic matter. Once large amounts of decomposed iceplant organic matter are removed along with the green parts, the level of soil nutrients decreases, the pH gradually reverts from acid to alkaline, and weedy competition is easily starved and shaded out by the indigenous species.

In areas with 25 to 80 percent cover of iceplant, where it may have similar cover as native species (Figure 7-3), the Restoration Ecologist will decide based on the specific conditions in each area whether iceplant should be removed with mechanical equipment, chemically treated or manually pulled. Iceplant is typically shallow-rooted, requiring excavation to no more than 6 inches deep even though fine roots may go up to 25 inches deep. For this reason, iceplant can be easily removed by hand in many instances. The removal of iceplant mats will result in bare soils that are left in a "roughened" condition due to the shallow excavation and removal of roots. Every reasonable effort will be made to avoid damage to native vegetation in and adjacent to the designated work area. Small iceplant individuals will be pulled by hand from the sand. A trenching shovel or similar tool shall be used to help sever the roots and excavate any remaining shoots or runners. Larger clonal mats of iceplant will be removed by excavating the roots beneath one edge and rolling the mat up onto itself. As the mat is rolled up, the roots will be severed just below the soil surface, freeing the mat and allowing it to be rolled further. In situations where the mats of iceplant cannot be rolled, the plants will be pulled from the ground and any remaining roots will be excavated with shovels. At the completion of the removal, the restoration area will be raked to gather any remaining plant material such as roots, shoots, and leaves, which shall be added to existing biomass stockpiles. These same tools and techniques will be used to remove any re-sprouting iceplant. The pulled iceplant and remnant organic matter will be removed from the CNMA, and any larger areas with substantial iceplant seedbank and without native vegetation will be solarized and seeded with native plant seed mixes and irrigated immediately after completion of the soil sterilization process.

In areas with a 0 to 25 percent cover of iceplant (Figure 7-4), the iceplant will be removed primarily by chemical treatment—spraying, wicking or brushing with glyphosate in such a way as to minimize overspray over adjacent soil and native vegetation, as determined by the Restoration Ecologist. In cases

where manual pulling will not interfere with existing vegetation, iceplant will be removed manually and all pulled parts and organic matter will be removed to a composting facility.

7.5 Avoidance and Minimization Measures

As described above, there are four types of special-status biological resources with the potential to be impacted by the development of the Coastal Zone components of the MPWSP: western snowy plover, special-status plants, Smith's blue butterfly, and sensitive natural communities / environmentally sensitive habitat areas. The FEIR/EIS and USFWS BO include both general measures and resource-specific detailed measures to avoid and minimize impacts to each special-status biological resource in the Coastal Zone impact area of the MPWSP. Implementation of these avoidance measures is essential in order to ensure that temporary and permanent impacts do not exceed the totals analyzed in the FEIR/EIS. The applicable avoidance measures that would be applied prior to and during construction of the Coastal Zone components of the MPWSP are described in detail in Section 6 of this HMMP.

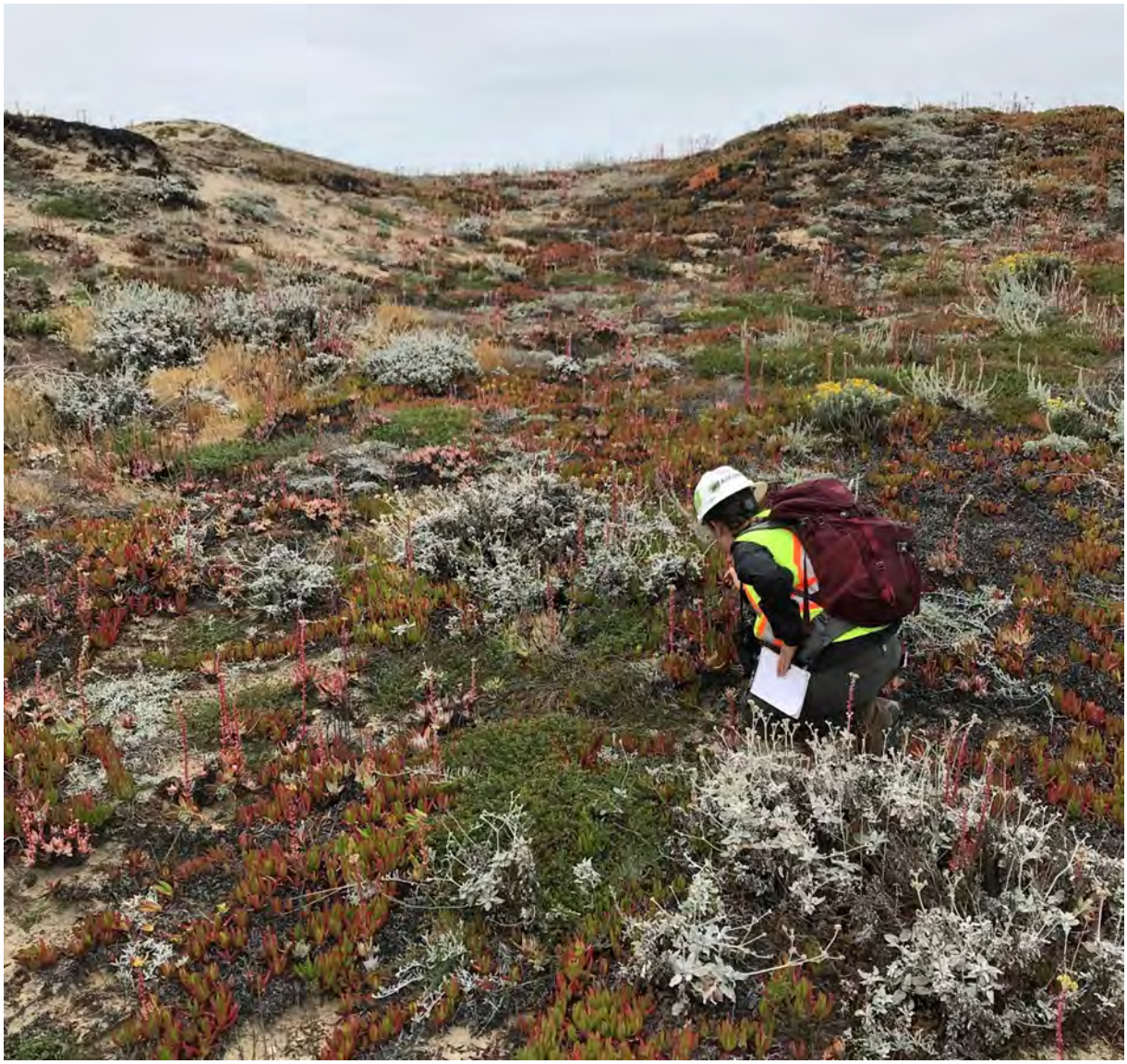

Figure 7-3. CNMA with 25-80% Cover of Iceplant Mixed with Native Central Dune Scrub Vegetation

Figure 7-4. CNMA – Example of an Area with 0-25% Cover of Iceplant

7.6 Restoration Contract Documents

7.6.1 Site Restoration Preparation Plan

A conceptual site restoration preparation plan for the 6.6-acre mitigation site within the CNMA has been developed and shows the size and location of areas where ESHA will be re-established by removal of iceplant, regrading and stabilization of a historic sand mine[2], and remediation of non-native soil. The plan presents information regarding proposed techniques to prepare these areas for reseeding and replanting with native central dune scrub vegetation. The plan indicates which iceplant removal method will be used based on the iceplant mat density.

[2] The referenced historic sand mine is not one that is proposed for removal under the CDO or Reclamation Plan. No active sand mining has occurred in this area for decades.

7.6.2 Planting/Seeding Plan

A conceptual planting/seeding plan has been prepared for the selected mitigation site at the CNMA indicating vegetation zones that will be seeded and planted to re-establish native habitats and ESHA. The proposed plant species for each vegetation zone are listed in Tables 7-2, 7-3 and 7-4, above.

7.6.3 Irrigation Plan

A conceptual irrigation plan has been developed for the mitigation site within the CNMA. Since it is unlikely that it will be possible for seeding and plant installation work to be predictably completed in late October and late January (respectively), which is the ideal period for natural establishment of Coastal Zone vegetation, because of potential snowy plover presence, irrigation will be provided at the mitigation site to supply plants with water during the establishment period and up to 2-3 years of the monitoring period to increase plant survival, health and vigor, and decrease the potential of planting failure resulting in costly revegetation and extension of the mandated 5-year maintenance and monitoring period. A temporary irrigation system will be an inexpensive way to ensure successful plant establishment when the annual weather patterns, seasonal closures for listed species, and construction schedules do not coincide with the ideal restoration planting time (in comparison to the cost of failure). With irrigation in place, supplemental irrigation can be also easily provided during dry winter spells of more than 3 weeks that have become common in recent years. The construction level irrigation drawings will be prepared by a landscape architect or a qualified irrigation specialist with experience in native plant restoration.

7.6.3.1 Water Source

Several potential sources of water for the irrigation system are (1) the desalinated water produced and supplied by the MPSWP, (2) the existing water source at the CEMEX property, or (3) the drainage water pumped to an overflow pond in the northeast part of the CNMA. This pond water could be pumped from still water areas of the pond where sediment settled out and the water would be additionally filtered and regularly tested for excessive nutrients and pesticides before it would be applied in restoration areas. Water will be applied in a way that will prevent runoff and overwatering and will allow for the gradual “weaning off” of plants.

7.6.3.2 Existing Groundwater Table

The existing groundwater table depth in the Coastal Zone of the MPWSP varies substantially with elevation and geologic composition of the underlying strata. Figure 7-5 shows a schematic geologic cross-section in the vicinity of MPWSP Coastal Zone elements. In low areas of the Project with pervious underlying soils, the groundwater table is near the surface; in higher elevation areas of the Project, with impervious geology, the water is up to 50 feet below the surface. Figures 7-6 and 7-7 show the approximate groundwater table depth within the Coastal Zone of the MPWSP. Per MM 4.6-2b, this discussion of the groundwater table within the restoration areas is provided to better assess the potential for re-establishment of target habitats.

Figure 7-5. Schematic Geologic Cross Section in the Vicinity of MPWSP Coastal Zone Elements
Source: Montgomery Watson, Salinas River Basin Water Resources Management Plan (1994)

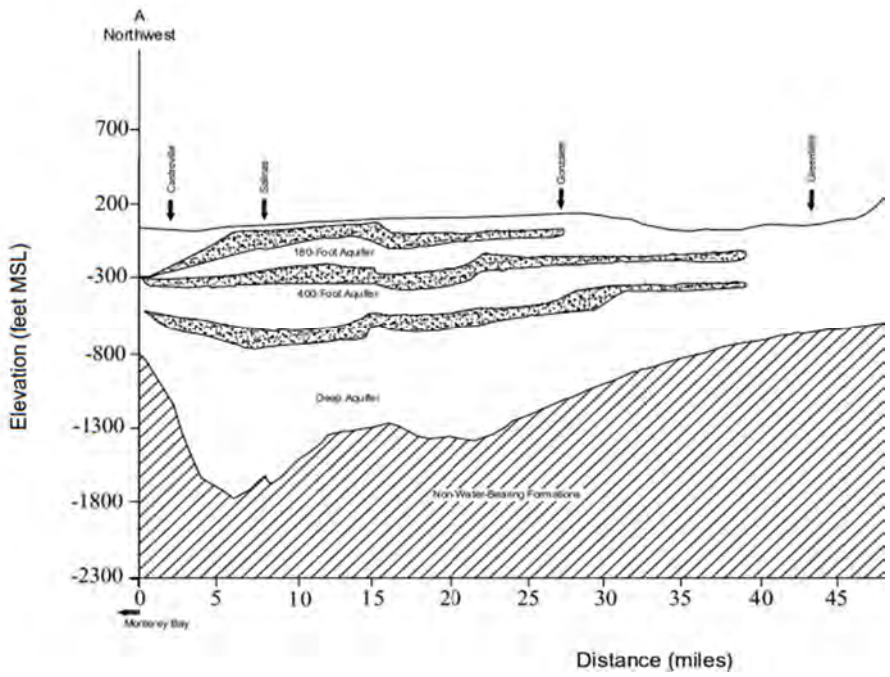

Figure 7-6. Schematic Geologic Cross Section A-A' Indicating Depth to Groundwater Table in the Vicinity of MPWSP

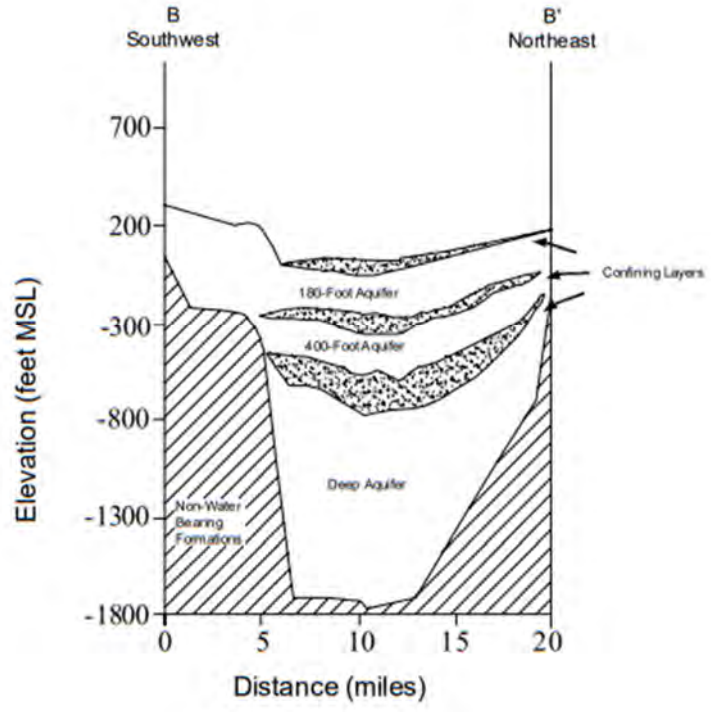

Figure 7-7. Schematic Geologic Cross Section B-B' Indicating Approximate Depth to Groundwater Table in the Vicinity of MPWSP

7.6.3.3 Irrigation Demand and Schedule

An irrigation water demand and schedule for an acre of each of the four mitigation habitat types is shown in Tables 7-5 and 7-6 below. The central dune scrub and central maritime chaparral habitats include plant species that are extremely drought-resistant and have very low irrigation requirements. Central dune scrub will be the largest habitat that will be restored through re-establishment of native habitats in areas where iceplant has been eradicated at the mitigation site within the CNMA and at the Slant Wells temporary impact mitigation site. Central maritime chaparral will be primarily restored in small areas of TAMC ROW. Coast live oak woodland and northern coastal scrub natural communities are also quite drought-resistant, however, require higher amounts of irrigation than central dune scrub and Central maritime chaparral. The irrigation demand calculation indicates that the maximum water demand will be needed in July resulting in a continuous demand of approximately 0.53 gallons per minute per acre for the central dune scrub and central maritime chaparral communities, and 1.1 gallons per minute per acre for the coast live oak woodland and northern coastal scrub habitat. Since irrigation will be applied once a week the required water supply flow rate in July will be approximately 24.4 gallons per minute for 88 minutes for a drip irrigation system with 500 2-gph drip emitters per acre for the central dune scrub and central maritime chaparral, and is set at 100 gallons per minute for 122 minutes per acre for the overhead irrigation system for the coast live oak woodland and northern coastal scrub habitats. If a water source with a lower flow rate than needed for this type of application is not available, the irrigation duration will be adjusted (extended) to provide the required amount of water to vegetation. As shown in the irrigation schedule, watering will be performed at a frequency and duration to provide deep and relatively infrequent (for sandy soils) watering for the newly planted vegetation. Drip irrigation will be used in Smith's blue butterfly habitats for coast and seacliff buckwheat plants watering to avoid potential impacts associated with "summer rain" on adults, eggs and larvae of the species. In areas where both overhead and drip irrigation will be beneficial at different times of the year, a retrofittable irrigation system will be installed with overhead sprinkler heads that will be replaceable with heads containing multiple drip emitters and spaghetti tubing.

7.6.4 Site Protection and Fencing Plan

Recreational activities and access will be limited at the 6.6-acre mitigation site within the CNMA during the maintenance and monitoring period. Site protection, which could consist of fencing, signage, or other acceptable resource protection measures, will be implemented under the direction of the Restoration Ecologist. As part of the site protection measures, Cal-Am will post signs at 100-foot intervals around snowy plover habitat and mitigation sites requiring that dogs be on leash and prohibiting kite flying during the breeding season and site protection will be installed around breeding areas. During and after restoration installation, road signs "No Vehicles" or "Alternate Route" will be installed in selected areas at mitigation sites if vehicular activity might impact restoration progress or success. Site protection will be utilized in newly vegetated areas to restrict access, vandalism and unintentional trampling and to enhance native vegetation establishment. Inspection of the site protection devices will coincide with site monitoring activities. Cal-Am will implement an educational outreach program to inform operations and maintenance departments of local land management and utility agencies of the mitigation purpose of restored areas to prevent accidental damage.

7.6.5 Restoration Construction Document Package

A detailed restoration construction package will be prepared by a qualified Restoration Ecologist retained by Cal-Am. The construction set will include detailed site restoration preparation plans, planting/seeding plans, erosion control plans, site protection and fencing plan, planting and irrigation schedules and details. Drawings will be accompanied by detailed specifications that will address each restoration work item and material. The detailed restoration construction set will provide additional detail regarding species

to be planted, transplanted and seeded, their specific quantities, container sizes, spacing, and placement within the mitigation sites.

Table 7-5. Irrigation Water Demand for Mitigation Sites

Month	Days in Month	PC[1] Mean Monthly Precipi-tation Marina, CA	ET_o[2] Reference Evapo-transpiration Marina, CA	ETa[2] Ctrl. Dune Scrub & Maritime Chaparral Evapo-transpiration 0.15	ETb[2] Coast Live Oak Woodl. & N. Coastal Scrub Evapo-transpiration 0.30	MIRa[3] Ctrl. Dune Scrub & Maritime Chaparral Monthly Irrigation Requirement	MIRb[3] Coast Live Oak Woodl. & N. Coastal Scrub Monthly Irrigation Requirement	SIDa[4] Ctrl. Dune Scrub & Maritime Chaparral Irrigation Demand per Month per Acre	SIDb[4] Coast Live Oak Woodl. & N. Coastal Scrub Site Irrigation Demand per Month	ADDa[5] Ctrl. Dune Scrub & Maritime Chaparral Average Daily Demad each Month	ADDb[5] Coast Live Oak Woodl. & N. Coastal Scrub Average Daily Demad each Month
	(days)	(in)	(in)	(in)	(in)	(in)	(in)	(gal/mo/ac)	(gal/mo/ac)	(gal/day)	(gal/day)
January	31	3.00	1.24	0.19	0.37	0.00	0.00	0	0	0	0
February	28	2.92	1.68	0.25	0.50	0.00	0.00	0	0	0	0
March	31	2.77	3.10	0.47	0.93	0.00	0.00	0	0	0	0
April	30	1.00	3.90	0.59	1.17	0.00	0.21	0	5,748	0	192
May	31	0.34	4.65	0.70	1.40	0.45	1.32	12,087	35,669	390	1,151
June	30	0.09	5.10	0.77	1.53	0.84	1.80	22,821	48,685	761	1,623
July*	**31**	**0.04**	**4.96**	**0.74**	**1.49**	**0.88**	**1.81**	**23,802**	**48,956**	**768**	**1,579**
August	31	0.07	4.65	0.70	1.40	0.78	1.66	21,215	44,797	684	1,445
September	30	0.18	3.90	0.59	1.17	0.51	1.24	13,693	33,471	456	1,116
October	31	0.74	2.79	0.42	0.84	0.00	0.12	0	3,279	0	106
November	30	1.85	1.80	0.27	0.54	0.00	0.00	0	0	0	0
December	31	2.12	1.24	0.19	0.37	0.00	0.00	0	0	0	0
ANNUAL TOTAL:		**15.12**	**39.01**	**5.85**	**11.70**	**3.46**	**8.16**	**93,618**	**220,605**		

* **Max Irrigation Demand occurring in July**

(1) https://www.idcide.com/weather/ca/marina.htm search on May 23, 2020

(2) ET_o - Reference Evapotranspiration based on CIMIS Zone 2, CaDWR,May 2020. ETa - CDS & CMC Average (0.15)*Et_o, Etb - CLOW & NCS Average (0.30)*Eto.

(3) Monthly Irrigation Requirements for native vegetation is based on the following equation: MIRu = (Etu-PC)/IE, MIRw = (Etw-PC)/IE
Where: MIR = Monthly Irrigation Requirement
Eta= Mean Monthly Evapotranspiration of Central Dune Scrub (CDS) and Central Maritime Chaparral (CMC)
Etb= Mean Monthly Evapotranspiration of Coast Live Oak Woodland (CLOW) & Northern Coastal Scrub (NCS)
PC= Mean Monthly Precipitation
IE= Irrigation Efficiency (assumed to be 80%)

(4) Site Irrigation Demand, SID = MIR *Conversion Factor from inch to foot (0.083)* Site Area in feet as shown below*Conversion factor from cubic foot to gallon (7.481)

(5) Average Daily Demand, ADD = average daily site irrigation demand each month

CDS & CMC Restoration Area is 43,560.00 S.F.
CLOW & NCS Restoration Area is 43,560.00 S.F.

Table 7-6. Irrigation Schedule for Establishment Year Plantings*

	Ctrl. Dune Scrub and Maritime Chaparral[1]	Coast Live Oak Woodland and NC Scrub[2]	Ctrl. Dune Scrub and Maritime Chaparral[1]	Coast Live Oak Woodland and NC Scrub[2]
Month	Frequency	Frequency	Duration	Duration
April	none	1/mo	0 min.	14 min.
May	4/mo	4/mo	45 min.	90 min.
June	4/mo	4/mo	84 min.	120 min.
July	4/mo	4/mo	88 min.	122 min.
August*	4/mo	4/mo	78 min.	112 min.
September*	4/mo	4/mo	51 min.	84 min.
October	4/mo	4/mo	0 min.	min.

1 Drip Irrigation system with 500 2-gph drip emitters per acre.
2 Overhead irrigation with 100 gpm flow per acre (this can be split and staggered if available water supply flow is lower).
* Based on field observations of restoration plantings and as determined by Restoration Ecologist, frequency and duration can be gradually decreased in late summer (August, September) when coastal species typically transition into dormancy if they are well developed in Years 2 and 3 of monitoring.

7.7 Site Preparation

The following sections describe key steps in the compensatory restoration of permanently and temporarily impacted Project areas in the Coastal Zone in the order they should be implemented.

7.7.1 Topsoil Salvage

As required by MM 4.6-2b of the FEIR/EIS, topsoil will be salvaged during grading and earthmoving activities, stockpiled separately from subsoil, and protected from runoff and wind erosion (e.g., covered, watered or seeded with native annuals). A minimum of 12 inches of topsoil will be salvaged and in areas where there is less than 12 inches of topsoil, as much as is available and practicable will be salvaged as determined by Restoration Ecologist. Non-native topsoil at the proposed permanent impacts mitigation site at CNMA will not be salvaged. It will be either removed or buried with sand.

Topsoil in temporary impacted Project areas will be salvaged based on the detailed requirements of engineering specifications for the Project prepared in compliance with the FEIR/EIS,[3] and the task will include the setup of soil staging areas for separate stockpiling of topsoil and subsoil, clearing of vegetation, maintenance and protection of topsoil, and reinstallation and regrading of subsoil and topsoil. Topsoil will be placed last, after the placement of subsoils and the installation of the pipeline, and temporary impact mitigation sites will be regraded to match pre-construction topography.

Before native vegetation is cleared and grubbed from the Project area, native plant seed shall be collected from all native vegetation and either stored in a storage facility with appropriate environmental conditions for long-term seed storage or used for seed propagation. Smith's blue butterfly host plants (coast and seacliff buckwheat) will be salvaged to the maximum extent feasible and either immediately transplanted to other temporarily impacted areas of the Project where installation of the pipeline has been completed or placed into plant containers and maintained in a nursery until they can be replanted at the site where they were salvaged. A *Smith's Blue Butterfly Protect in Place and Relocation Plan for the MPWSP* (McGraw 2020) has been prepared for the Project by a qualified biologist, and it will be closely followed during the Project construction and mitigative restoration implementation.

Before any soil excavation begins, removal and eradication of highly and moderately invasive exotic vegetation as rated by California Invasive Plant Council and as locally determined by the Restoration Ecologist will be implemented. Topsoil heavily infested with the propagules of any invasive exotic plant, as determined by the Restoration Ecologist, will be marked and stored separately from regular topsoil and either removed from the Project area, or if determined to be re-useable, placed at least 12 inches below regular clean topsoil to minimize the potential of invasive exotic vegetation germination and growth. Topsoil without invasive plant propagules from non-mitigation segments of the Project can be used in mitigation sites where existing topsoil is infested with IEV propagules.

Native cleared and grubbed vegetation will be stockpiled and chipped into mulch that will be used at mitigation sites with habitats and vegetation adapted to highly conductive soils with higher organic content such as coast live oak woodland or coastal brambles sensitive natural communities.

7.7.2 Decompaction

Since restoration of the mitigation sites will involve primarily work with sandy soils, which typically do not compact, soil decompaction may not be necessary in most cases. It may be needed in areas where surface soils are repeatedly driven on, or where materials, equipment or vehicles are stored during construction. Decompaction reduces soil density thus allowing plant roots to get well established,

[3] Section 4.6-2b., of FEIR/EIS Cal-Am Monterey Peninsula Water Supply Project (P-4.6-219 ii.) March 2018 Chapter 6.6 Terrestrial Biological Resources

increases water and air infiltration, and reduces issues associated with nutrient movement. The decision of whether to mechanically decompact any mitigation site will be made by the Restoration Ecologist.

Soil compaction is best described by bulk density and relative compaction. Bulk density is defined as the weight per unit of volume occupied by the soil. Relative compaction is the density of a given soil sample expressed as a percentage of the maximum density for the same soil. Relative compaction in the top 12 inches of soil in the mitigation sites will not exceed 80 percent. Examples of soil bulk densities that inhibit root growth are provided by soil type in Table 7-7.

Table 7-7. Soil Bulk Densities that Inhibit Root Growth by Soil Type

Soil	Limiting Bulk Density (g/cm3)
Loamy sand	1.75
Sandy loam	1.65
Loam	1.55
Silt loam	1.45
Clay loam	1.45
Clay	1.40

Source: Alexander and Poff 1985

In compacted areas, as determined by the Restoration Ecologist base on soil compaction probe measurements, the soil will be ripped to a depth of approximately 18 inches. The soil will be left roughened after ripping and before application of seed. The soil surface heterogeneity left by ripping or by seed application methods will promote seedling germination and survival and will help reduce soil erosion and recompaction. The Restoration Ecologist will oversee mechanical decompaction.

7.7.3 Imprinting

Imprinting was developed in the 1970's as a low-cost revegetation method for degraded lands with low rainfall. Rainwater infiltration research showed that the micro-roughness and macroporosity of the soil surface control the rates and routes of rainwater infiltration into dry soils. In turn, infiltration is the key to soil erosion control since very high infiltration rates essentially eliminate water runoff and erosion. The soil surface of smoothly graded, compacted or degraded areas it typically flat and sealed contributing to quick rainwater runoff and fast erosion. Thus, soil infiltration improvement through imprinting is the key to rainwater retention and quick revegetation. Land imprinting was developed to economically convert smooth, sealed soil surfaces into coarse ones to restore rainwater infiltration deep into the soil. Land imprinters are designed to reshape the soil surface to impart roughness and openness with minimal disturbance of plant material and soil structure. Land imprinters do not dig into, loosen and invert the soil surface, covering the plant material in that process. Instead, they impress and emboss smooth-walled, v-shaped shallow furrows in the soil surface. Land imprinters make a wedge-shaped imprint in sandy soils where seeds are placed. The imprints are typically stable for up to 2 years, allowing seeds to germinate with the natural wet and dry seasons. A seed hopper can either be fixed on the front of the machine and pressed into the imprint, or the hopper can be fixed to the back and broadcast seed into the imprints. Substantially less rainfall is required for seedling establishment compared to drill-seeded furrows because of the key benefits of imprinting – forming of soil to prevent surface erosion, trapping, funneling, and infiltrating of rainwater and shielding of the seedlings from harsh elements.

Imprinting will be performed at the mitigation sites after construction and topsoil re-installation have been completed. Imprinting greatly increases successful establishment of seed and reduces the need for

mulch, soil irrigation, and soil erosion protection. It creates microsites that catch and hold wind-dispersed seed, encouraging germination and plant establishment from seeds of local origin.

7.7.4 Soil Testing

Site preparation activities will include basic soil testing (to determine if soil amendments are needed). Soil samples collected from different locations within the restoration areas will be sent to a soil laboratory to determine soil texture, water infiltration rate, percentage of organic matter, pH, salinity, concentration of soluble salts, fertility, sodium and macro- and micronutrient levels. The laboratory will provide recommendations for soil amendments depending upon soil conditions and the type of plants proposed for restoration. Soil amendments that would promote invasive plants will be avoided.

7.7.5 Installation of Erosion Control Materials

Erosion control materials will be installed as part of site preparation if construction activities create conditions that are conducive to soil erosion. Erosion control measures will be implemented both as part of the Project construction Stormwater Pollution Prevention Plan (SWPPP) and as part of the habitat restoration work after the Project completion. Erosion control materials such as mulch, straw wattles and coir fabric will be used as needed to support the restoration progress until the soil/sand is stabilized and vegetation has grown sufficiently. Hydroseeding and hydromulching will be also used where appropriate in conjunction with manual seeding as needed to stabilize wind or rainfall erodible slopes and surfaces.

7.7.6 Plant Salvage

Special-status herbaceous perennials and shrubs within the Project permanent and temporary impact areas will be salvaged and maintained in a plant nursery until they can be replanted at the permanent mitigation site in CNMA. This requirement will apply to sandmat manzanita (*Arctostaphylo pumila*), Monterey ceanothus (*Ceanothus rigidus*), ocean bluff milkvetch (*Astragalus nuttallii var. nuttallii*), branching beach aster (*Corethrogyne leucophylla*), and Michael's rein-orchid (*Piperia michaelii*). Host plants for the Smith's blue butterfly will be protected and salvaged in compliance with *Smith's Blue Butterfly Protect in Place and Relocation Plan for the MPWSP* (McGraw 2020), a protection and salvage plan that has been prepared by a qualified biologist.

7.7.7 Special-Status Biological Resources Avoidance and Minimization

Special-status biological resources avoidance and minimization shall closely follow the requirements of FEIR/EIS and BO for the Project.

7.7.8 Trash Removal

Site preparation activities will include removal of any debris, non-native plants and plant parts, and contour grading. Non-vegetative debris such as trash will be removed by the construction contractor prior to transition to the restoration phase.

7.8 Soil Amendments

Soil amendments are typically not added to native soils for native planting programs, in part because higher nutrient levels, especially nitrogen, favor the growth of IEV species. Salvaged native topsoil will be used within the restoration areas to the maximum extent practicable. Should soil testing indicate a substantial lack of key plant macro- or micronutrients or other problematic conditions such as high acidity, low levels of calcium carbonate ($CaCO_3$) or others that merit remediation, soil amendments will be applied per direction of Restoration Ecologist and based on recommendations from the soil testing laboratory.

7.9 Soil Import/Disposal

Existing topsoil that is present within the Project area will be carefully salvaged, separated from subsoil and properly stored for reuse at the mitigation sites to the maximum extent practicable. Should any additional topsoil need to be imported, it will be weed and contaminant free, clean topsoil, and the source and quality will be approved by the appropriate agencies. Any soil that might have to be removed from the Project area will be disposed of at an approved location.

7.10 Habitat Restoration

7.10.1 Seeding

Seeding of all mitigation sites will occur in the late fall, preferably before the first rains occur in early November. Native seed mixes will follow the species recommendations presented in Section 7.2.1. The species composition may change based on seed amounts and availability by species and based on consultation with the pertinent resource agencies. The ratios may also be refined based on the results of post-construction conditions and site-specific observations. Seed can be hydroseeded, dispersed by hand from buckets or with belly grinders over finish graded areas and then raked into the soil or sand. In areas where soil imprinting will be implemented, seed will be placed in the depressions.

7.10.2 Container Plant Stock Planting

Although container plant stock is not going to be used if possible, a description of typical installation of container plants is provided. Planting holes will be prepared based on the size and species growth patterns of plants, typically twice the container width and once the container depth. During planting pit excavation, all native soil will be stockpiled on the side for reuse. The plant will be carefully removed from its container and placed in the planting hole. Container plants will never be held or handled by their stems or branches when being removed from the containers. If the root ball is extremely dense, it will be carefully pulled apart at the base. The bottom of the hole should not be excavated deeper than the container depth so that it is firm and can support the plant without excessive settlement. The hole with the plant placed inside and if possible oriented the same way it was grown in the nursery will be backfilled with the stockpiled topsoil. Midway in the backfilling process, soil will be lightly tamped down to prevent air pockets near the roots. After complete backfilling of the planting hole the soil will be carefully tamped again. A water retention basin of 3 to 4 inches high will be built around the plant with any leftover soil. The basins will be approximately 2 feet in diameter and able to hold at least 1 gallon of water.

7.10.3 Special-Status Herbaceous Perennials and Shrubs Transplantation

The optimal season for salvaging and transplanting shrubs is in the late summer/early fall dry period when many coastal plants are dormant, the evapotranspiration is decreasing due to cooler days. Since roots of plants adapted to growth in sand and sandy soils are typically very deep, the host plant extraction will have to be completed very carefully by manual excavation, possibly with the assistance of a small backhoe, especially for large host plants. The plant orientation to the south will be marked with red flagging tape attached to the outermost branchlets on the south side of the plant while still in the ground. The backhoe bucket will be used to extract the plant with substantial amount of adjacent undisturbed soil so that the majority of the root system extending down to deeper layers is preserved. Whenever possible, fine roots and surrounding native soil will be removed with the host plant. Smaller specimens will be extracted manually by careful use of shovels, rakes, and brushes to free the horizontal roots from surrounding soil. Plants will also be removed by careful excavation of a trench around them and placement of closely spaced, angled wooden studs tied together around the perimeter with steel straps to form a conical shaped enclosure that would then be extracted from the ground with the host plant and its soil by the backhoe and placed directly in the prepared plant containers. Broken or crushed roots will be

cleanly clipped and the plants with their rootballs will be carefully placed into light-colored and appropriately sized plant containers. Any voids between the plants' rootballs and container walls will be filled with native soil. Broken or otherwise damaged branchlets of the host plants will be trimmed off, and the crown of the plants will be carefully thinned to reduce evapotranspiration and transplant shock after placement in the containers. Each plant will be irrigated immediately after the salvaging and setting in the container is complete.

The replanting site for salvaged plants will be at the proposed mitigation site within the CNMA. Planting holes will be pre-dug with a shovel or backhoe to facilitate installation. The excavated soil will be used to carefully fill in the hole around the plant while it is held in position. Roots will be buried to their original depth and supported in place with soil. Water retention basins will be constructed around each plant to initially collect rainwater and prevent runoff.

7.10.4 Mechanical Equipment proposed for Restoration

The equipment that will be used to implement the mitigative restoration is listed below and shown in Figures 7-8 through 7-14, respectively.

- Land imprinter
- Hydroseeding truck
- Tractor ripper attachment for soil decompaction by ripping
- Bobcat with root rake clam grapple for removal of dense iceplant mats
- Light ground pressure dump truck for removal of iceplant masses
- Bobcat with flip screen bucket for separation of organic iceplant debris from sand
- Bobcat with vibratory screen bucket for separation of organic iceplant debris from sand

Figure 7-8. Land Imprinter

Figure 7-9. Hydroseeding Truck

Figure 7-10. Tractor Ripper Attachment for Soil Decompaction by Ripping

Figure 7-11. Bobcat with Root Rake Clam Grapple for Removal of Dense Iceplant Mats

Figure 7-12. Light Ground Pressure Dump Truck for Removal of Iceplant Masses

Figure 7-13. Bobcat with Flip Screen Bucket for Separation of Organic Iceplant Debris from Sand

Figure 7-14. Bobcat with Vibratory Screen Bucket for Separation of Organic Iceplant Debris from Sand

7.10.5 Western Snowy Plover Habitat Restoration

Cal-Am will restore all temporarily impacted potential snowy plover habitats in the Coastal Zone immediately following construction at a 1:1 ratio. At a minimum, the restored sites will meet the following performance standards by the fifth year following restoration:

- Temporarily impacted areas will be returned to pre-Project conditions or greater.
- Native vegetation cover will be at least 70 percent of baseline native vegetation cover
- The restoration area will have no more cover by invasives than the baseline.

Anti-perching devices, such as bird spikes or wire strips, will be installed and maintained on the top of the proposed electrical control cabinets and any other potential perching devices within 300 feet of western snowy plover habitat to discourage potential plover predators.

Permanent loss of western snowy plover habitat will be accurately determined based on final design and construction specifications and will be compensated at a minimum ratio of 3:1. Compensation will be in the form of permanent off-site re-establishment, rehabilitation, enhancement, and preservation of habitats for western snowy plover at the proposed mitigation site at the CNMA as described in this HMMP and depicted on conceptual restoration drawings. Cal-Am will submit this HMMP to the CCC and USFWS for input and approval and identify and secure access rights and other approvals to implement and execute this HMMP.

The restoration activities proposed in this HMMP will result in:

- The removal of iceplant, which covers up to 100 percent of some areas, from approximately 6.61 acres of central dune scrub habitat within the proposed mitigation site at CNMA.
- Reseeding with locally collected central dune scrub species that will be supported with a temporary irrigation system, maintained and monitored for 5 years.
- Recontouring, stabilization and revegetation of unstable and unvegetated dune sands within 1.26 acres of what appears to have been a historic mining site.
- Removal or burial with native sand of non-native, pumped-drainage deposited soil in a 2.36-acre dune valley at the proposed mitigation site at CNMA. The non-native soil has altered the original habitat and serves as a reservoir for invasive exotic vegetation. Central dune scrub habitat (ESHA) will be re-established after the soil is remediated.
- Removal of iceplant and supplemental seeding in areas of the mitigation site where iceplant vegetation cover is ranging between 25 to 80 percent and in areas of low vegetation coverage. Maintenance and monitoring for 5 years.

The CNMA boundary does not include areas subject to separate mandatory restoration actions by CEMEX pursuant to the CDO or Reclamation Plan.

Cal-Am will conduct or will support a qualified third-party Biological Monitor to conduct annual monitoring of mandated performance standards such as native and invasive vegetation cover and density, presence of barriers between mitigation site and water, and dune sands erosion for a minimum of five years. At a minimum, the mitigation areas shall meet the following performance standards by the fifth monitoring year:

- Native vegetation cover shall be at least 70 percent of the native vegetation cover in the impact area.
- The western snowy plover mitigation areas shall not be heavily vegetated.

- Invasive species cover shall be less than or equal to the invasive species cover in the impact area.
- No barrier shall be installed or planted between the compensation site and the water.
- There will be no significant erosion

This measure also applies to periodic maintenance of the subsurface slant wells, which would result in a permanent loss of western snowy plover habitat. Compensatory mitigation for permanent loss from periodic maintenance of the subsurface slant wells would only be applied once and would not be applied for each five-year maintenance event.

7.10.6 Special-Status Plants Populations and Habitat Restoration

Compensation for permanent and temporary impacts to special-status plant occurrences will be provided at a 2:1 and 1:1 ratio respectively (refer to Table 3-2). Compensation for permanent impacts to the Monterey spineflower will be provided at a 3:1 ratio (refer to Table 3-2). Compensation for permanent loss of special-status plant populations will include restoration and long-term stewardship of the proposed mitigation site within the CNMA, a known occupied habitat of several listed species and the restoration and reintroduction of special-status plants populations in degraded, and unoccupied areas of the mitigation site. Mitigation for temporary impacts will be in kind and in place. A restoration area will be set up for each permanently impacted special-status plant in suitable habitats at the mitigation site. Permanently impacted special-status plants that can be transplanted (as described above), will be relocated to suitable habitats at the mitigation site, and if their survival is less than 70 percent, their population will be gradually increased from seed until they reach at least 60 percent cover of the impact area. Plants that cannot be transplanted will be propagated from seed until their vegetation cover at the mitigation site reaches at least 60 percent of the impact area. At a minimum, all mitigation areas will meet the following performance standards by the fifth year following completion of restoration landscape installation:

- The compensation areas shall be at least the size as required by the mitigation ratio.
- Native vegetation cover shall be at least 70 percent of the native vegetation cover in the impact area.
- Population of the impacted special-status species shall have either:
  - at least 60 percent cover of the impact area, or
  - at least 70 percent survival of installed plants
- Invasive species cover shall be less than or equal to the invasive species cover in the impact area

Additionally, restored populations shall have greater than the number of individuals of the impacted population, in an area greater than or equal to the size of the impacted population, for at least 3 consecutive years without irrigation, weeding, or other manipulation of the restoration site.

7.10.6.1 Smith's Blue Butterfly Habitat Restoration

A *Smith's Blue Butterfly Protect in Place and Relocation Plan for the MPWSP* (McGraw 2020) has been prepared for the Project by a qualified biologist, and it will be closely followed during the Project construction and mitigative restoration implementation. Compensation for temporary impacts to host plant populations will be in place and in-kind restoration at a 1:1 ratio (refer to Table 3-2.) Compensation for permanent loss of host plant populations will be in the form of permanent off-site re-establishment, restoration, enhancement, or preservation at a 3:1 ratio (refer to Table 3-2). At a minimum, the restoration

or compensation sites shall meet the following performance standards by the fifth year following restoration:

- Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover
- The population of coast buckwheat and/or seacliff buckwheat shall have either:
  - at least 60 percent cover of the baseline/impact area, or
  - at least 70 percent survival of installed plants
- No more cover by invasives than the baseline/impact area

7.10.6.2 Western Burrowing Owl Habitat Restoration

There are no anticipated temporary or permanent impacts to western burrowing owl and no habitat present in the Project area within the Coastal Zone. However, western burrowing owls were observed in the area in the past. Should any burrowing owls be observed during pre-construction surveys, temporarily disturbed habitats will be restored to pre-construction conditions.

7.10.6.3 Sensitive Natural Communities and ESHA Restoration

Any temporarily impacted sensitive natural communities, ESHA, primary habitat, and critical habitat, will be restored to previous conditions or better in place at the end of construction. Compensatory mitigation for permanent impacts on sensitive natural communities and ESHA will be implemented at a 3:1 ratio (refer to Table 3-2). Compensation for permanent loss of sensitive natural communities and ESHA will be in the form of permanent off-site re-establishment, rehabilitation, enhancement, and preservation at the proposed mitigation site within CNMA. At a minimum the habitats at the mitigation site at CNMA will meet the following performance standards by the fifth year following restoration:

- Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover
- No more cover by invasive species than the baseline/impact area

7.10.7 Additional Habitat Restoration Proposed Adjacent to Temporary Impact Areas

As noted previously, while not required, Cal-Am proposes removal of an additional 1.825 acres of iceplant as part of this HMMP. Specifically, in the area of the proposed slant wells, Cal-Am proposes to re-establish ESHA in areas currently occupied by iceplant mats, which have reduced the habitat value at the CEMEX site.

The additional iceplant removals are proposed to prevent reinvasion of iceplant from areas adjacent to work areas. The iceplant mats outside of the temporary impact area will be removed and native central dune scrub community will be re-established in the area. The specific plant species for these areas will be determined by the Restoration Ecologist through a habitat suitability assessment of the areas currently occupied by iceplant.

8. Maintenance During Monitoring Period

An important element of ensuring success of the temporarily impacted, restoration areas will be to establish and re-establish habitats that will be self-sustaining and maintenance-free over the long term. Maintenance will include isolated one-time actions or repairs as well as specific maintenance actions that will be needed in perpetuity (e.g., fence repair). Initially, maintenance is often necessary to ensure plant establishment success, especially during early growth when plants are vulnerable to desiccation and herbivory.

8.1 Responsible Parties

Restoration of vegetation communities and listed species' habitat within temporary impact areas will be funded, managed, implemented, maintained, and reported by a variety of responsible parties:

Cal-Am – Project proponent responsible for funding and successfully completing the restoration activities identified in this HMMP, including achievement of final performance standards. The contact information is:

California American Water
Monterey County District
511 Forest Lodge Road #100
Pacific Grove, CA 93950
Phone: 831-646-3287
Contact: Ian Crooks
Vice President, Engineering

Restoration Contractor/Restoration Ecologist – Cal-Am will retain a Restoration Contractor (who will employ a qualified Society for Ecological Restoration Certified Ecological Restoration Professional) for implementation of this HMMP. The Restoration Contractor's responsibilities will include the following:

- Manage the schedule of restoration activities.
- Oversee the work of all subcontractors retained for restoration tasks.
- Prepare progress reports on implementation.
- Maintain communications with the Biological Monitor, as needed.
- Ensure that HMMP activities occur according to schedule and within the requirements of all applicable Project permits.
- Conduct monitoring and maintenance (unless a separate Maintenance Contractor and a Biological Monitor are engaged by Cal-Am for the post-establishment part of the 5-year monitoring period (Years 2 to 5).

8.2 Maintenance Activities

8.2.1 Irrigation

The Restoration or Maintenance Contractor will be responsible for irrigation system inspection and repair. Irrigation system component parts will be inspected each year before use in late spring and adjustments made each season during initial operation. Malfunctioning or broken irrigation system parts may need repairs or replacement, and if uncontrolled application of water causes erosion, the erosion will be repaired.

8.2.2 Fencing

Fencing will be installed around planted areas after construction to exclude access and/or manage herbivory. Where temporary fencing is used, it will be removed as soon as the vegetation has become well established (in approximately 2 to 3 years) and the Restoration Ecologist has determined that it is able to survive without protection. Temporary or permanent fencing and associated components will be inspected on a monthly basis. Repairs of damaged components will be made immediately.

8.2.3 Biological Resources

Maintenance of mitigation sites will be initiated after results of monitoring inspections conducted by biologists in compliance with the monitoring schedule are reported. Replanting will be implemented if necessary, during the monitoring period to replace dead plants in order to meet the performance standards presented in this document and required by agency permits. The Restoration Contractor will be required to replace any plants that die or decline during the 1-year establishment warranty period, either in kind or with approved substitutes.

Replanting will also be required if any mitigation sites fails to meet the native plant vegetation cover or special-status plant coverage performance standards. If any mitigation site fails to meet any performance standards during any of the 5 monitoring years, the Restoration Contractor will be required to first provide replanting recommendations and then implement them upon the Restoration Ecologist's approval. Replanting will be the responsibility of the Restoration Contractor; however, the Restoration Ecologist will be responsible for reviewing and approving the replacement plants and approach.

8.2.4 Invasive Exotic Vegetation Control

IEV monitoring, control and management will be conducted regularly within the restoration areas to improve the performance of target native plants, enhance native vegetation cover, reduce competition, and enhance habitats for listed species. IEV management throughout the restoration areas will be essential and particularly intensive especially the first 2 years of the monitoring period. Many IEV species are present in the Project area and surrounding areas and will be able to grow and reproduce quickly and easily in the irrigated mitigation sites. Ground disturbance and vehicle and equipment traffic associated with restoration activities in the mitigation sites may introduce or help disperse populations of IEV species in the absence of non-native invasive plant management. Vehicles and equipment should be washed and cleaned before returning to mitigation sites from other work sites to remove any seeds of invasive species and other microscopic potential pathogens.

8.3 Overall Maintenance Schedule

As described in Table 6-2, Restoration Ecologists will perform regular maintenance inspections. Monitoring visits will be conducted regularly; however, their frequency will be adjusted based on the season, IEV phenology (e.g., more weedy vegetation growth occurs in the spring) and the needs of each restoration area. Maintenance monitoring visits will focus on native seed germination and establishment (from natural recruitment and seeding if conducted), native plant vigor, soil conditions, presence/absence of IEV species, wildlife presence, erosion-control needs, transplanted shrubs and succulent watering needs, and site access issues. General photographs of the mitigation sites will be taken to document conditions.

9. Monitoring Reporting

9.1 Reporting Scheduling

Maintenance activities and performance monitoring results for all of the permanent and temporary mitigation sites will be recorded based on the mitigation sites' monitoring schedule, which is presented in Section 6, Performance Standards and Monitoring Methods. The results will be included in annual monitoring reports submitted to CCC, CDFW, USFWS, and other agencies by the Restoration Ecologist. Additional reports and updates will be provided should they be required for any important stages of the restoration process or for consultation with relevant agencies. Maintenance (qualitative) monitoring forms will be completed during each maintenance visit and will be used to track the progress of the restoration areas on each performance standard and to inform adaptive management needs.

9.2 Reporting Contents

9.2.1 Annual Monitoring Report

The Annual Monitoring Report will be prepared during each of the 5 monitoring years and will document the conditions encountered during annual monitoring visits. Using the format presented in subsection 9.3 below, it will describe any corrective seeding, replacement planting and/or general maintenance conducted throughout the year. Annual reports will be based on the information recorded on the as-maintained drawings and maintenance monitoring forms, and on information obtained from monitoring photographs from established points as well as field observations. These reports will include a summary of maintenance and monitoring activities, any challenges encountered, and the general condition and health of the developing vegetation. Photographs taken during the monitoring visits will provide visual records of the progress in each restoration area.

A comparison of the monitoring results to the performance standards will be made in the Annual Report to evaluate the progress of the restoration areas toward achievement of final performance standards and to determine if the restoration areas are on a trajectory to meet performance standards by Year 5. The reports will identify any restoration areas that have achieved final success. Recommendations and schedules for corrective measures for restoration areas that are not on a trajectory to achieve final success will be identified, described, and implemented by the Restoration Contractor.

9.2.2 As-Built and As-Maintained Drawings

An as-built drawing set will be prepared by the Restoration or Maintenance Contractor to document any changes made during the implementation of the restoration work. Drawings will include details regarding seeding changes, planting/transplanting adjustments, the replacement species, and irrigation system changes made during installation at the mitigation sites. Photographs of the newly established restoration areas will be included where necessary to document conditions that are difficult to capture on drawings. Changes from approved mitigation drawings made during the construction will be recorded for all mitigation sites, habitat types and support areas.

Based on the as-build drawings, the Maintenance Contractor will develop and keep current a set of "as-maintained" drawings of the maintenance work completed. These drawings will be updated continuously to include any changed conditions, newly installed plants, removed plants, results of the planting survival surveys, and changes to infrastructure items. As-maintained drawings documenting current physical conditions at each mitigation site will be reduced to an 11"x17" format and included as an appendix in the Annual Monitoring Report outlined below in subsection 9.3.

9.2.3 Qualitative (Maintenance) Monitoring Forms

The Maintenance Contractor will prepare and keep current a record of all maintenance work performed at the mitigation sites. The record will be a standard form that will include, at a minimum, information on: (1) Restoration Area Designation and Exact Location; (2) Date; (3) Weather; (4) Special-Status Species Observations; (5) Maintenance Performed Observations; and (6) Maintenance Needed Observations. In addition, the record will identify and discuss IEV control performed, irrigation activity and maintenance, general plant health, vandalism, site feature conditions, general observations and issues, personnel on-site, and any other pertinent observations and information describing site conditions and restoration maintenance activities performed since the previous monitoring visit. Maintenance monitoring forms for each entire monitoring year will be included in the Annual Monitoring Report.

9.2.4 Performance (Quantitative) Monitoring

Performance standard compliance monitoring will be implemented by the Restoration Ecologist as described in detail in Section 6, Performance Standards and Monitoring Methods, of this report and results will be included in the Annual Monitoring Reports.

9.3 Annual Monitoring Report Format

The Annual Monitoring Reports will be compiled generally according to the following outline:

- Executive Summary
- Introduction: Background, Location, Restoration Program Components
- Native Vegetation Cover Performance Standard Monitoring
    - Methods
    - Performance Standard
    - Baseline Conditions
    - Monitoring Results at Mitigation Sites
    - Monitoring Results at Reference Sites
    - Compliance
- Invasive Exotic Vegetation Cover Performance Standard Monitoring
    - Methods
    - Performance Standard
    - Baseline Conditions
    - Monitoring Results at Mitigation Sites
    - Monitoring Results at Reference Sites
    - Compliance
- Specific Habitat Performance Standard Monitoring
    - Methods
    - Performance Standard
    - Baseline Conditions
    - Monitoring Results at Mitigation Sites

  - Monitoring Results at Reference Sites
  - Compliance
- Discussion of Results and Proposed Corrective Measures Action Items
- Appendix A: As-Built/As-Maintained Drawings
- Appendix B: Maintenance Monitoring Forms
- Appendix C: Performance Monitoring Results Forms
- Appendix D: Monitoring Photographs from Established Points

10. Contingency Measures

Restoration is an evolving science and requires a mechanism to deal with uncertainty. Adaptive management is a comprehensive approach to natural resource management activities in which feedback between observation and corrective action is emphasized to address uncertainty, as illustrated in the CDFW adaptive management diagram in Figure 10-1. Through this structured effort, a decision-making framework allows the Project's monitoring metrics to be interpreted and to take corrective actions as necessary. Likewise, monitoring provides the data necessary for tracking ecosystem health, for evaluating progress towards restoration goals and objectives (i.e., performance measures), and for evaluating and updating problem statements, goals and objectives, conceptual models, and restoration actions. Table 10-1 summarizes a simple framework for making decisions and actions based on the monitoring of project metrics.

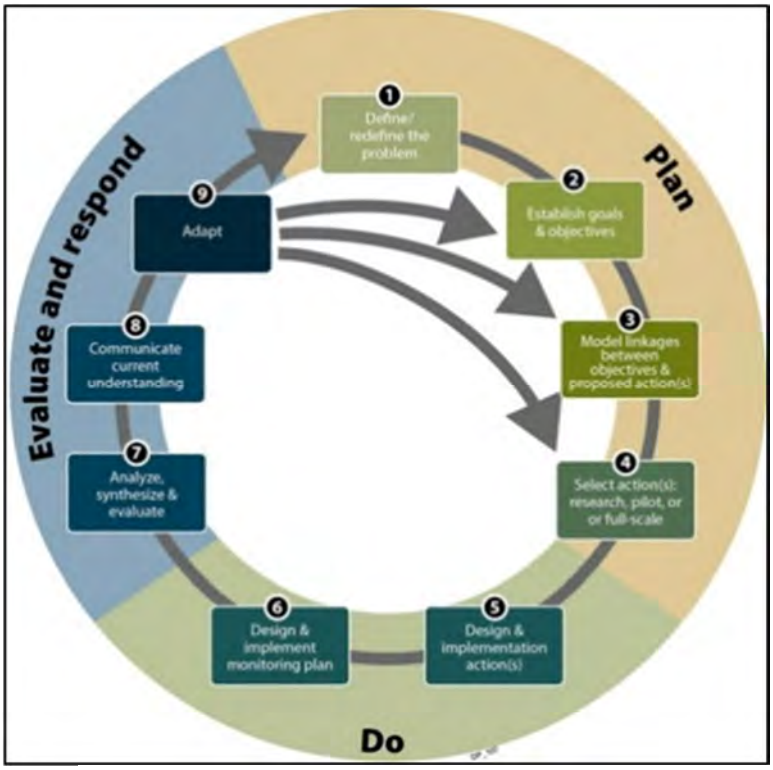

Figure 10-1. CDFW Adaptive Management Diagram

If it becomes evident that any Project performance standards were not met based on the review of the results of annual monitoring surveys, adaptive management will be immediately initiated, past performance weaknesses and causes identified, and strategies to enhance the likelihood of achieving the performance standards in the subsequent year will be developed and implemented. The adaptive measures will then be regularly monitored and evaluated to achieve performance standards within the time remaining in the monitoring period.

Table 10-1. Monitoring Decision-Making Framework

Conclusion Categories	Decisions and Actions
Conclusion 1 - Project is meeting objectives based on values of monitoring metrics and criteria.	• Evaluate the monitoring program (continue, reduce, or eliminate some metrics).
Conclusion 2 - Project is trending towards objectives based on values of monitoring metrics and criteria.	• Evaluate the monitoring program (continue, reduce, eliminate some metrics). • Confer with project team to evaluate whether rates of progress toward objectives are appropriate.

Conclusion Categories	Decisions and Actions
Conclusion 3 - Project is not meeting (or trending away from) objectives based on monitoring values of performance criteria.	• Evaluate causes. • Confer with the project team to assess the monitoring program to determine if appropriate data are being collected to assess and evaluate causes. • Evaluate whether performance criteria metrics are appropriate. • Develop a plan to address problems. • Implement the plan and monitor results.

11. Completion of Mitigation Responsibilities

11.1 Notification of Completion

The compensatory mitigation for permanently and temporarily impacted Project areas will be deemed complete at the end of the 5-year monitoring period if the final performance standards are met. The performance standards mandated by the FEIR/EIS, the USFWS BO, and CDFW will be compared with monitoring results at the end of Year 5 of the monitoring period. If it is determined that performance standards have not been met, additional maintenance and monitoring will be needed until performance standards are achieved.

11.2 Agency Confirmation

Upon completion of the restoration program and after all performance standards have been met, a notification of completion and a request for release from further maintenance and monitoring obligations will be submitted to CCC, USFWS, CDFW, and any other pertinent agencies.

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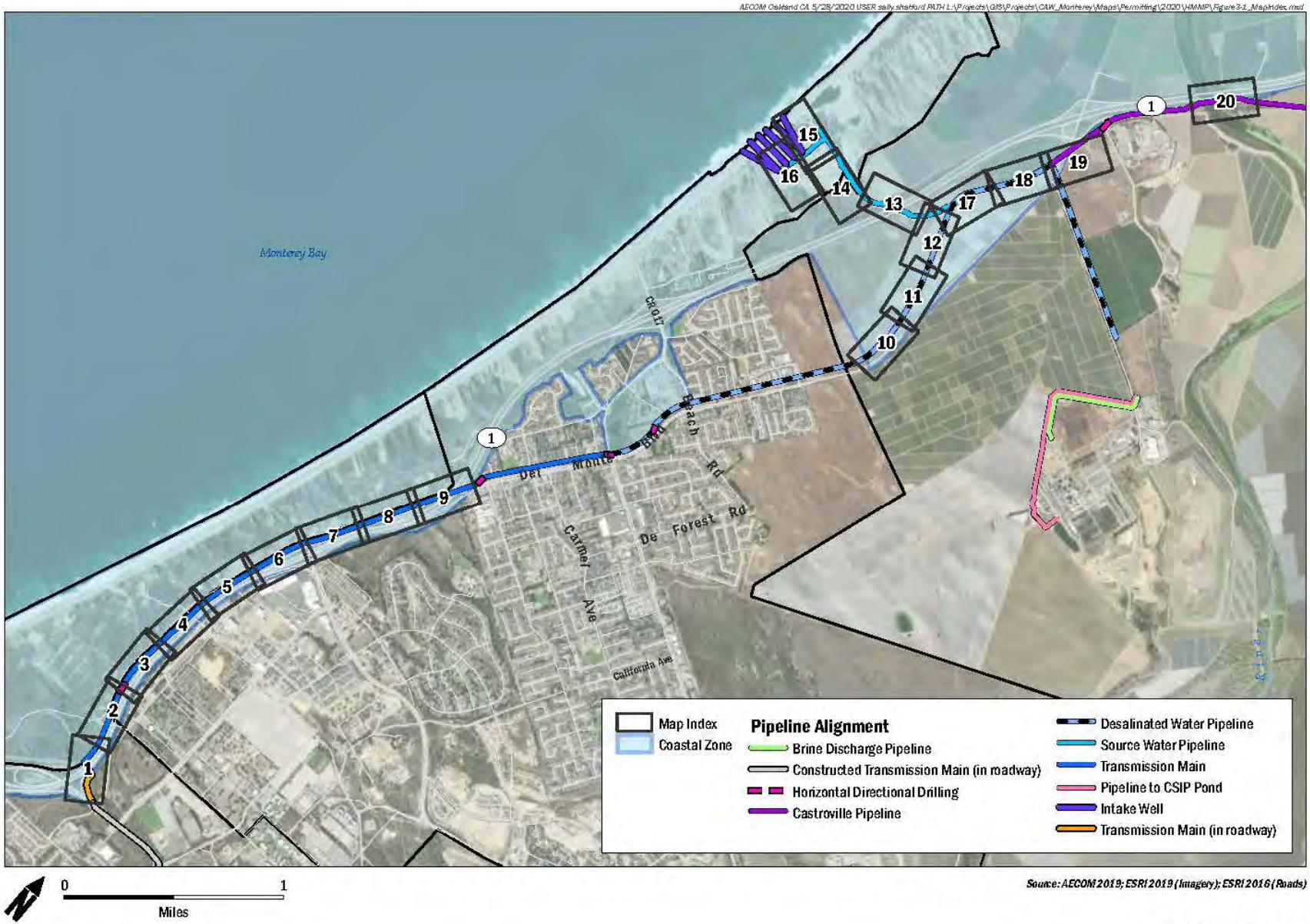
Appendix A

Figure 3-1: Biological Resource Impacts



AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT

FIGURE 3-1
Index Sheet: Biological Resource Impacts

FIGURE 3-1

Biological Resource Impacts
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FIGURE 3-1

Biological Resource Impacts
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Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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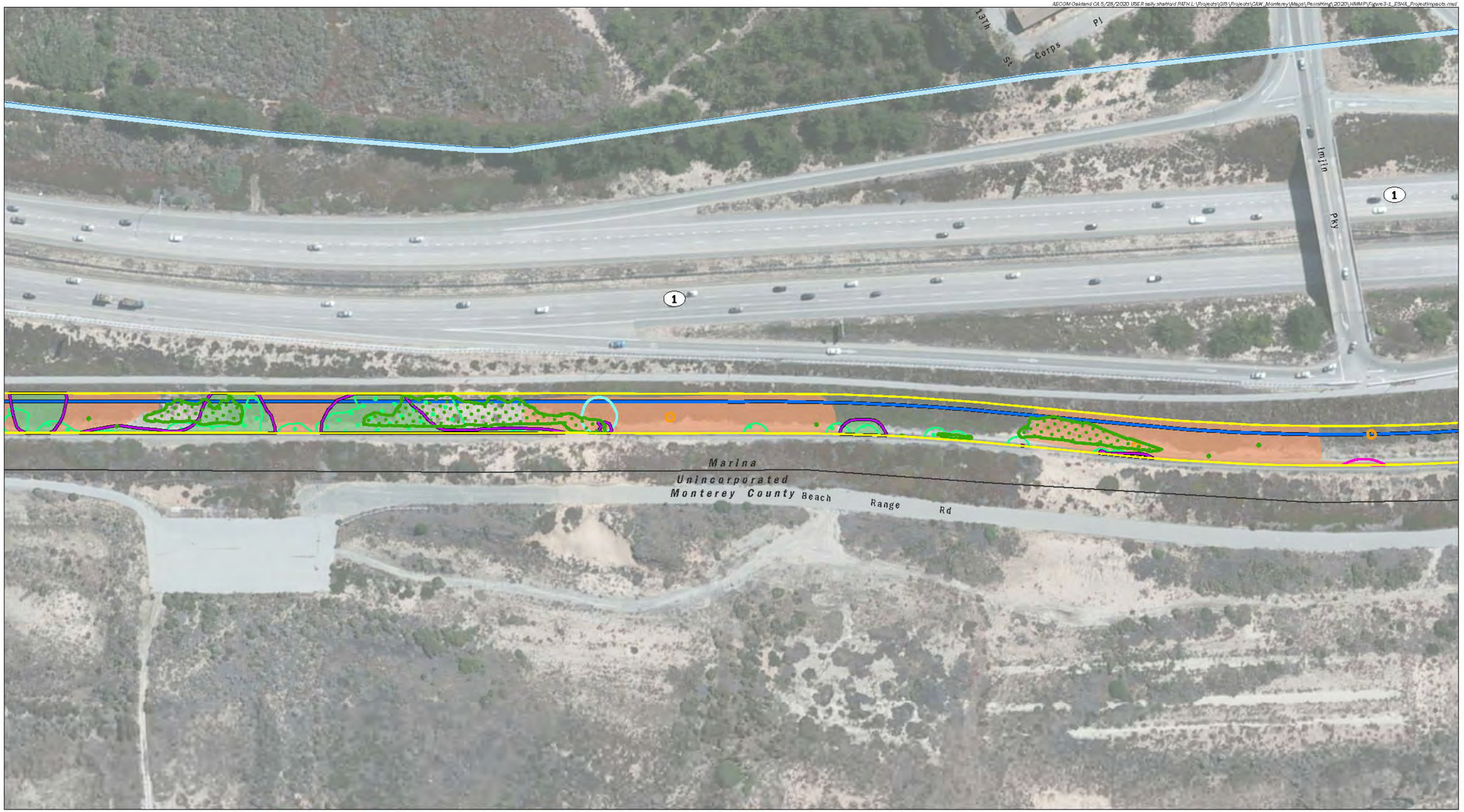

0 200
Feet

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT, MPWSP

Coastal Zone

Project Impact
Temporary Impact

Pipeline Alignment
Transmission Main

Habitat Master
Sandmat manzanita chaparral (SMC)
Silver dune lupine-mock heather scrub (SDL-MC)

Wildlife
American badger (SSC) burrow
Northern California legless lizard (SSC)
Smith's Blue Butterfly (FE)

Botany
Arctostaphylos pumila (List 1B.2)
Ceanothus rigidus (List 4.2)
Chorizanthe pungens var. pungens (FT, List 1B.2)

Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1
Biological Resource Impacts
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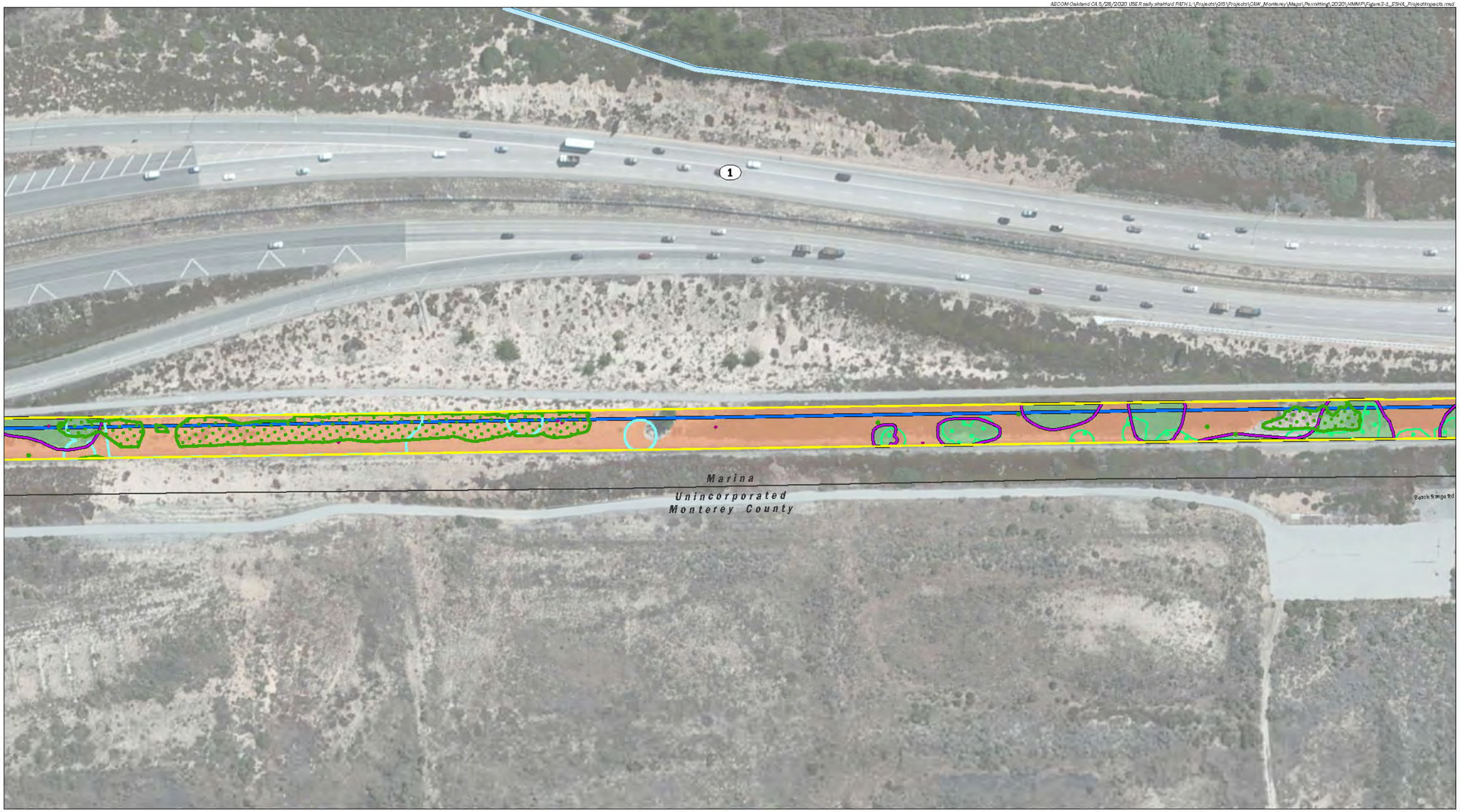

FIGURE 3-1

Biological Resource Impacts
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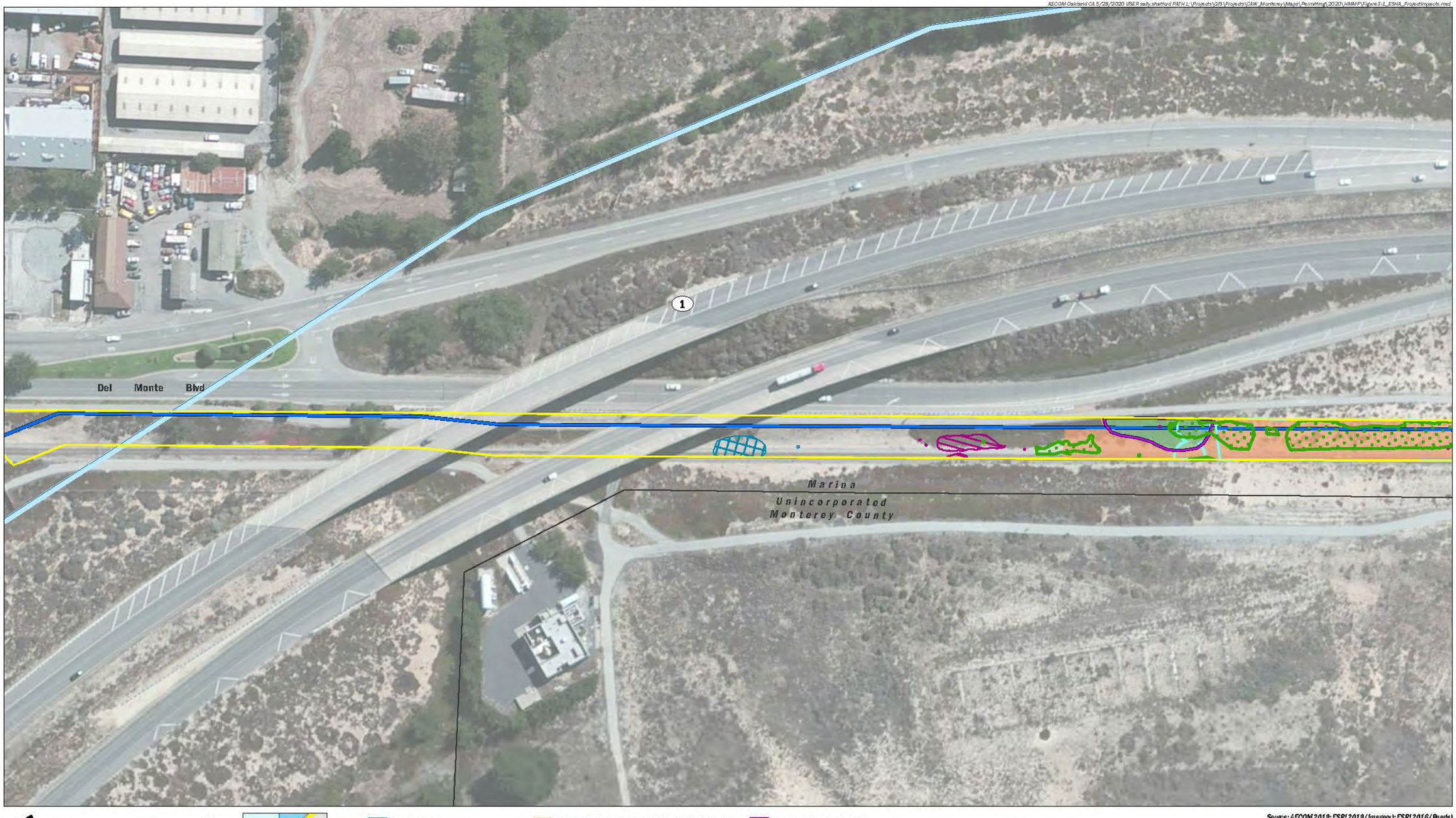

0 200
Feet

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT, MPWSP

Coastal Zone

Project Impact
Temporary Impact

Pipeline Alignment
Transmission Main

Habitat Master
Sandmat manzanita chaparral (SMC)
Silver dune lupine-mock heather scrub (SDL-MC)

Wildlife
Smith's Blue Butterfly (FE)

Botany
Arctostaphylos pumila (List 1B.2)
Chorizanthe pungens var. pungens (FT, List 1B.2)
Phacelia ramosissima var. austrolittoralis (List 3.2)
Piperia michaelii (List 4.2)

Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1
Biological Resource Impacts
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FIGURE 3-1

Biological Resource Impacts
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Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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FIGURE 3-1

Biological Resource Impacts
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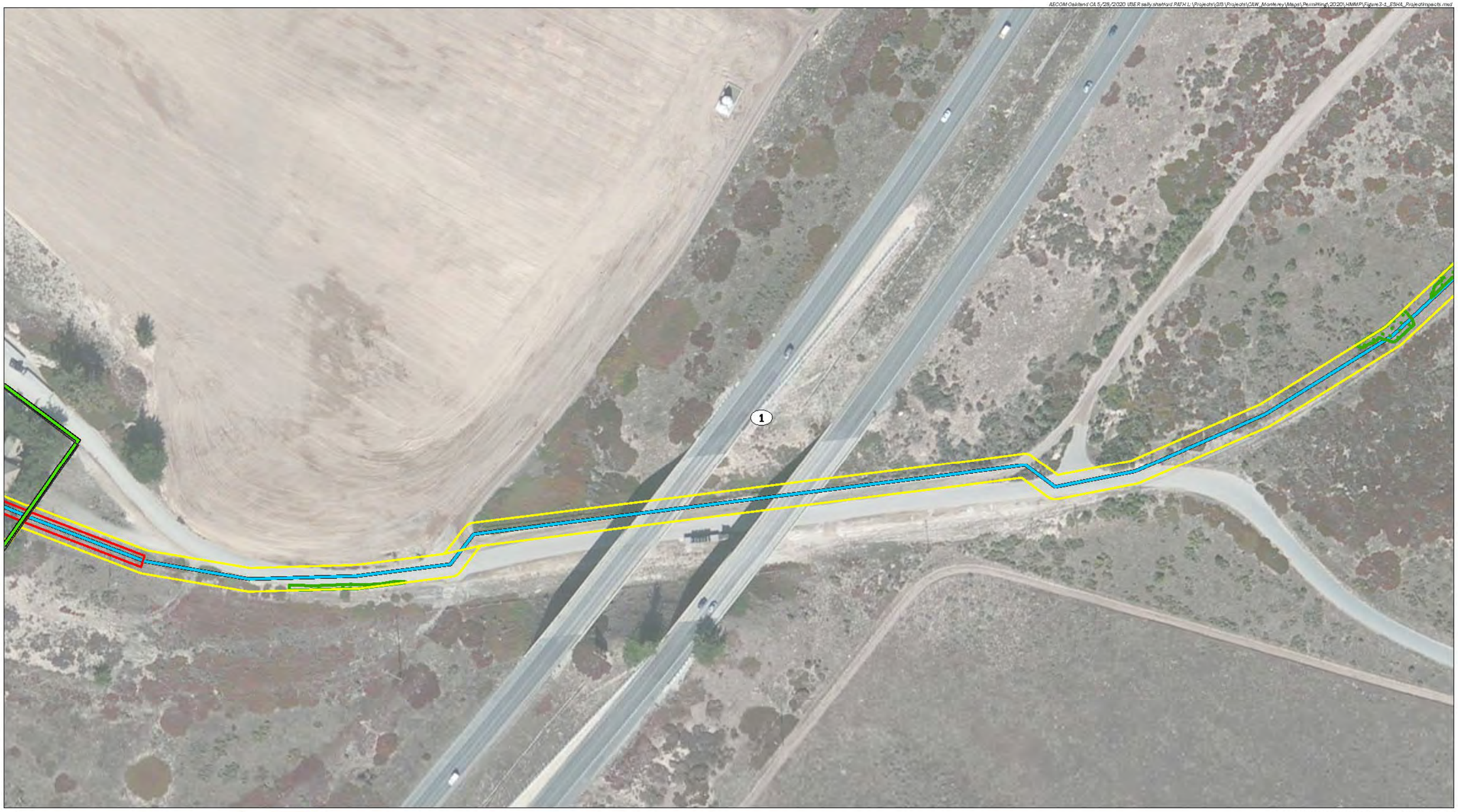

Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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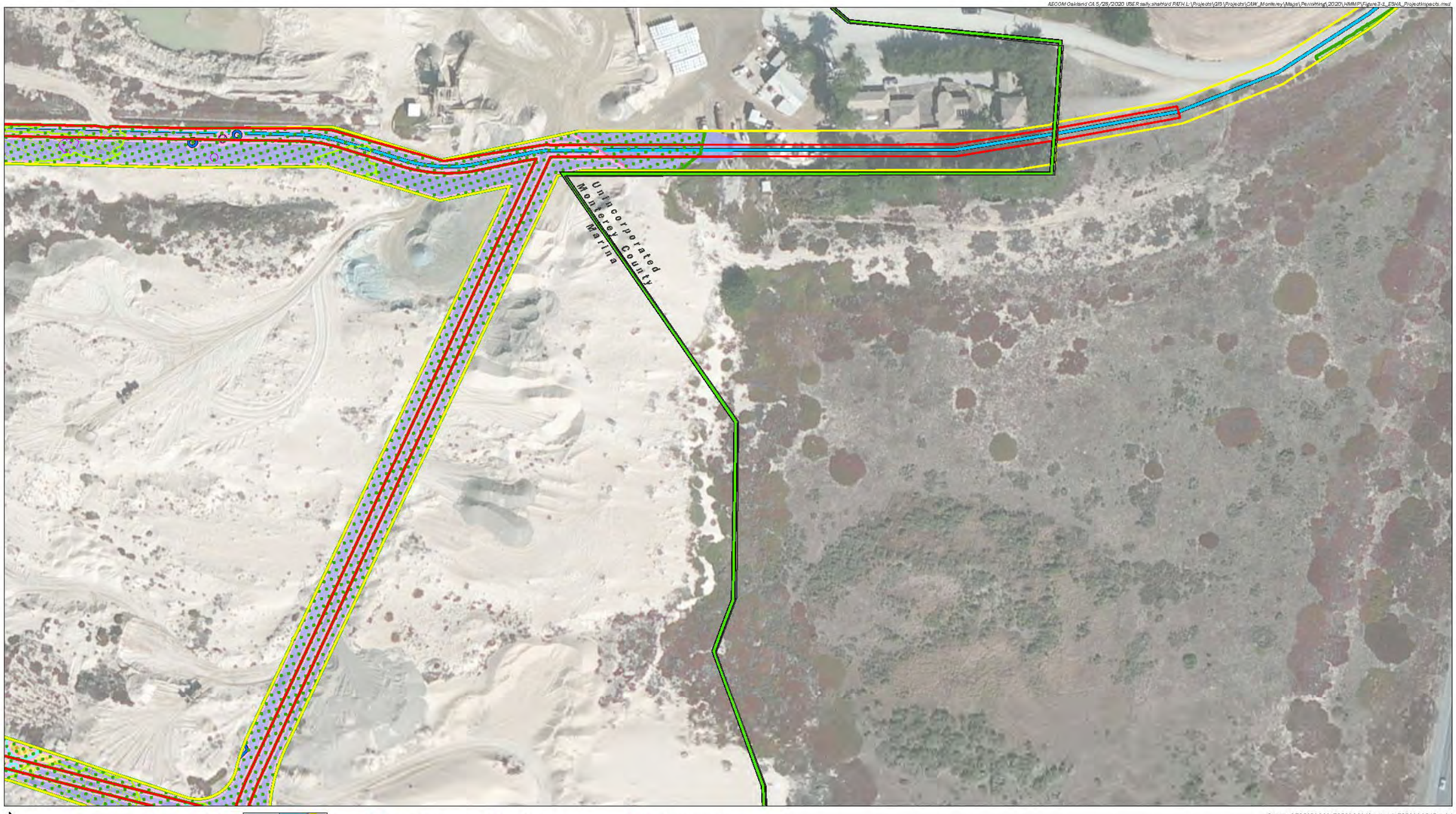

FIGURE 3-1

Biological Resource Impacts
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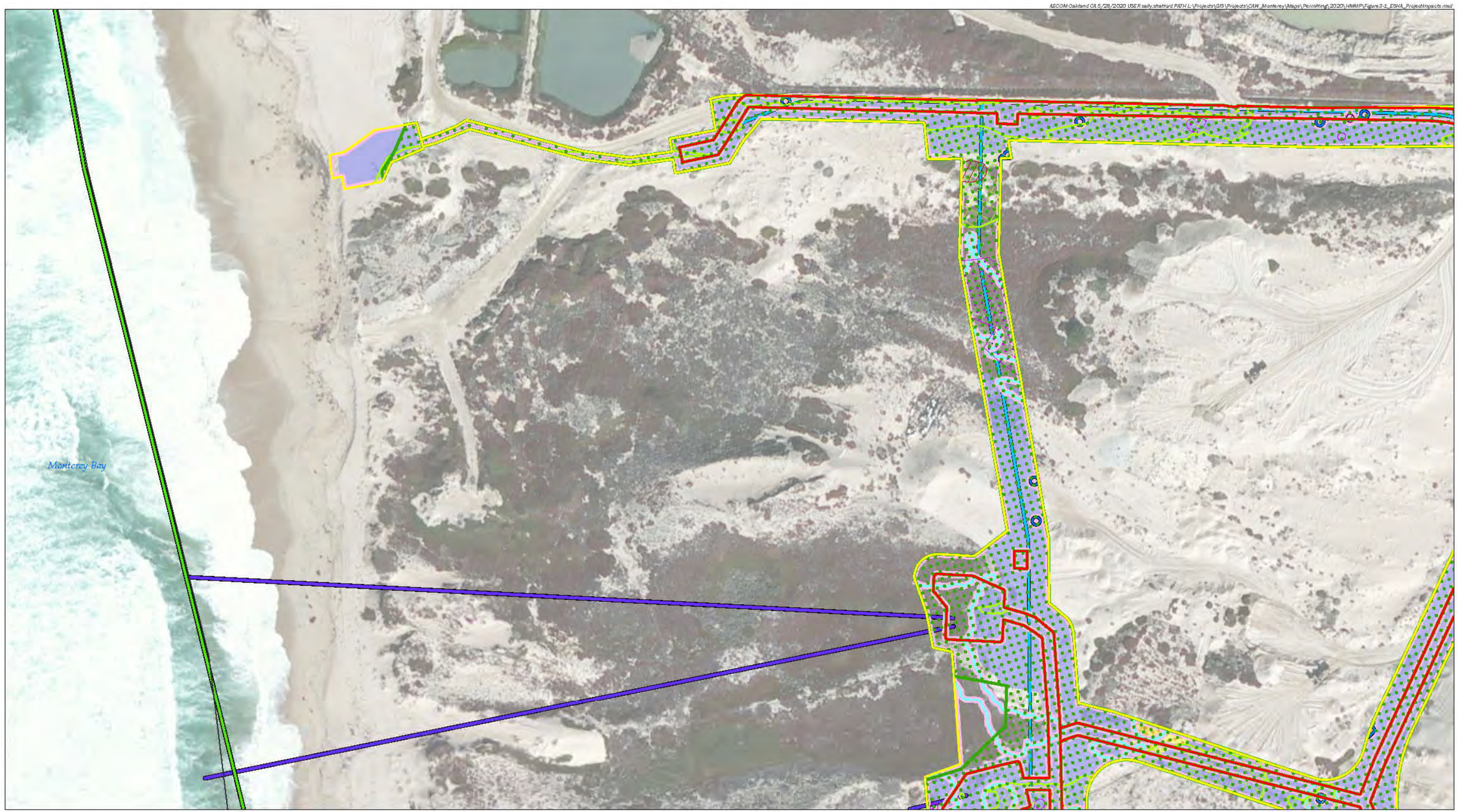

FIGURE 3-1

Biological Resource Impacts
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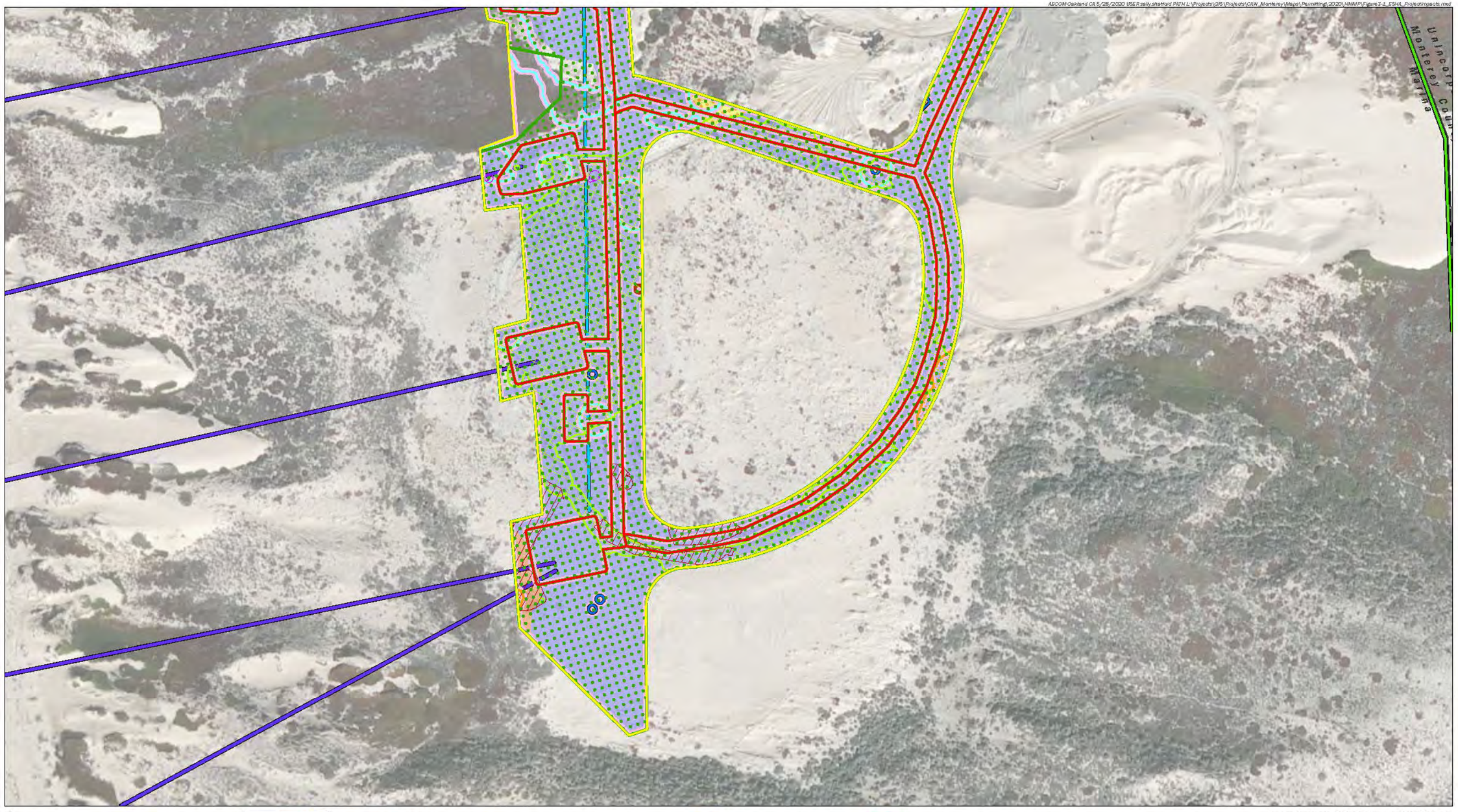

FIGURE 3-1

Biological Resource Impacts
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Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1

Biological Resource Impacts
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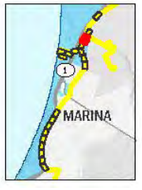
0 200
Feet

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT, MPWSP



Coastal Zone
Project Impact
Permanent Impact
Temporary Impact
Pipeline Alignment
Castroville Pipeline
Desalinated Water Pipeline
Source Water Pipeline
Habitat Master
Silver dune lupine-mock heather scrub (SDL-MC)
Wildlife
Burrowing Owl (SSC)
Northern California legless lizard (SSC)
Smith's Blue Butterfly (FE)
Botany
Chorizanthe pungens var. pungens (FT, List 1B.2)

Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1
Biological Resource Impacts
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FIGURE 3-1

Biological Resource Impacts
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0 200
Feet

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT, MPWSP

Coastal Zone
Project Impact
Permanent Impact
Temporary Impact
Pipeline Alignment
Castroville Pipeline

Habitat Master
Coastal brambles (CB)

Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

FIGURE 3-1
Biological Resource Impacts
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Appendix B

Mitigation Measure 4.6-1n of the FEIR/EIS:
Habitat Mitigation and Monitoring Program

Mitigation Measure 4.6-1n applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.
Cal-Am shall develop and submit a Habitat Mitigation and Monitoring Plan (HMMP) to the appropriate resource agencies (CCC, CDFW, CCRWQCB, USACE, USFWS, and local agencies that require a habitat mitigation and monitoring plan) for approval prior to Project construction. The HMMP will be a comprehensive document that will describe all of restoration and compensatory mitigation requirements, including the required performance standards, identified in

- Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover,
- Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants,
- Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly,
- Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl,
- Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine,
- Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander, and
- Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

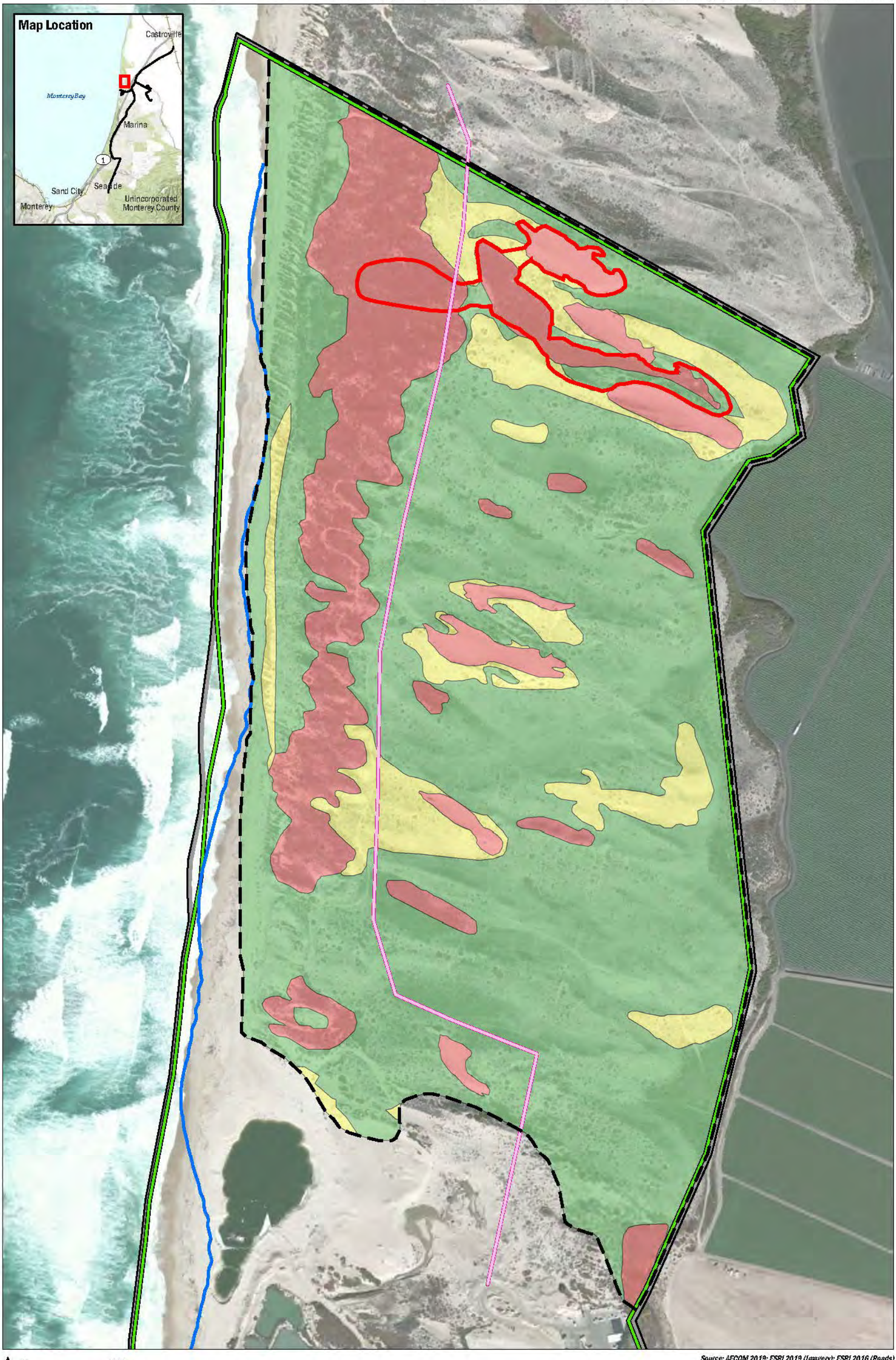
The HMMP shall be implemented at all areas where special-status species habitat or sensitive natural communities will be restored, created, or enhanced to mitigate for Project impacts either prior to, concurrently with, or following Project construction, as specified in the HMMP. The HMMP shall outline measures to be implemented to, depending on the mitigation requirements, restore, improve, or re-establish special-status species habitat, sensitive natural communities, and critical habitat on the site, and shall include the following elements:

1. Name and contact information for the property owner of the land on which the mitigation will take place
2. Identification of the water source for supplemental irrigation
3. Identification of depth to groundwater
4. Site preparation guidelines to prepare for planting, including coarse and fine grading
5. Plant material procurement, including assessment of risk of introduction of plant pathogens through use of nursery-grown container stock vs. collection and propagation of site-specific plant materials, or use of seeds
6. Planting plan outlining species selection, planting locations and spacing, for each vegetation type to be restored
7. Planting methods, including containers, hydroseed or hydromulch, weed barriers and cages, as needed
8. Soil amendment recommendations

9. Irrigation plan, with proposed rates (in gallons per minute), schedule (i.e., recurrence interval), and seasonal guidelines for watering
10. Site protection plan to prevent unauthorized access, accidental damage and vandalism
11. Weeding and other vegetation maintenance tasks and schedule, with specific thresholds for acceptance of invasive species
12. Performance standards by which successful completion of mitigation can be assessed in comparison to a relevant baseline or reference site, and by which remedial actions will be triggered; success criteria shall include the minimum performance standards described in Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover, Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants, Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly, Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl, Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine, Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander and Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.
13. Monitoring methods and schedule
14. Reporting requirements and schedule
15. Adaptive management and corrective actions to achieve the established success criteria
16. Educational outreach program to inform operations and maintenance departments of local land management and utility agencies of the mitigation purpose of restored areas to prevent accidental damages
17. Description of any other compensatory mitigation in the form of land purchase, establishment of conservation easements or deed restrictions, contribution of funds in lieu of active restoration, or purchase of mitigation bank credits, or other means by which the mitigation site will be preserved in perpetuity.

Appendix C

Restoration Plans



0 400 Feet
1 Inch = 400 Feet

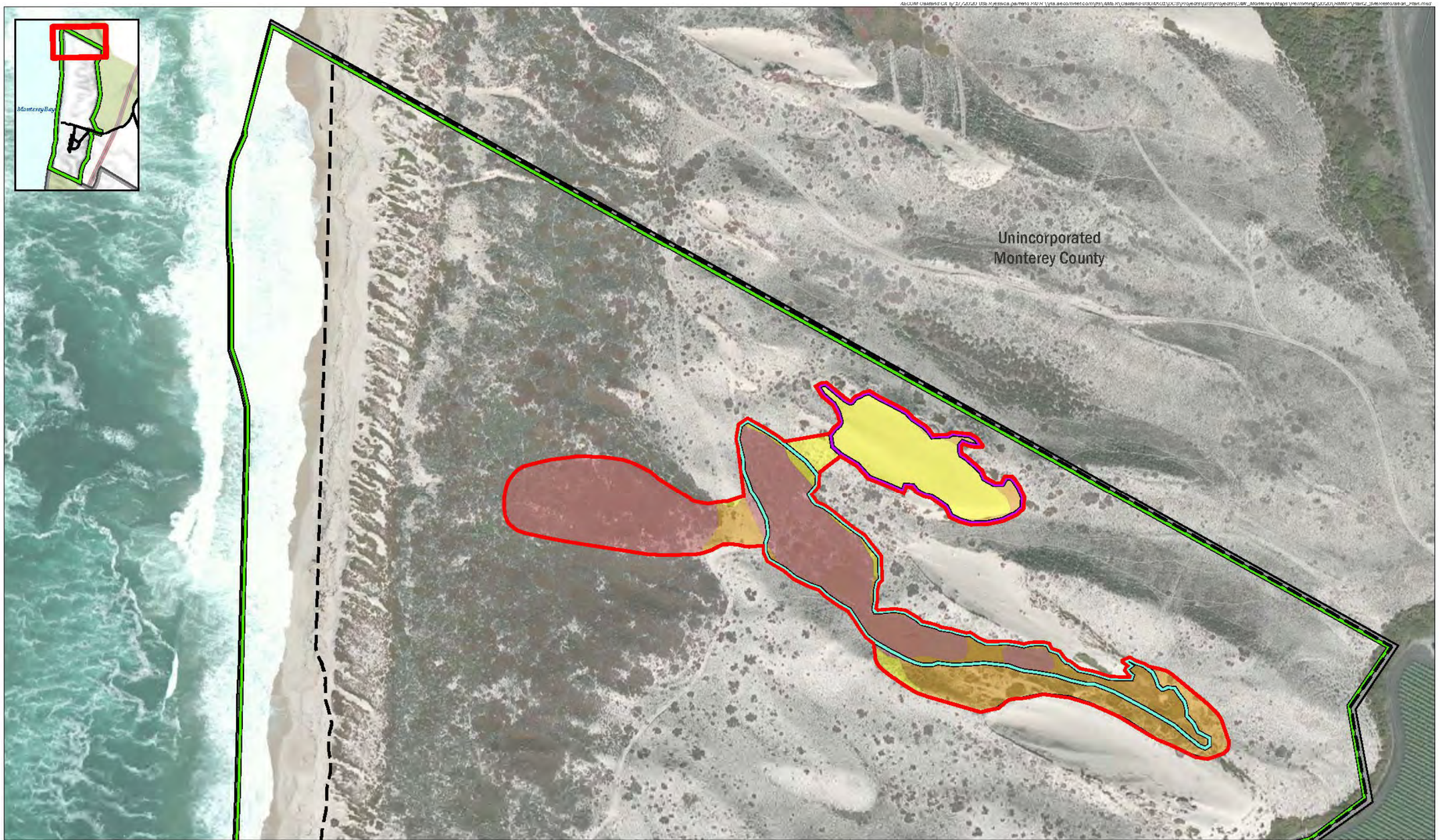
Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT

- Proposed Mitigation Site
- CEMEX North Mitigation Area
- Marina City Limits
- CEMEX Sand Mining Facility Parcel Boundary
- Snowy Plover Nesting Boundary
- Mean High Water Line

RESTORATION LEGEND
- Potential Re-establishement (38.14 Acres)
- Potential Rehabilitation (20.96 Acres)
- Potential Enhancement (131.03 Acres)

PLAN 1
Overall Conceptual Restoration Area



Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

N
0 200 Feet
1 Inch = 200 Feet

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT

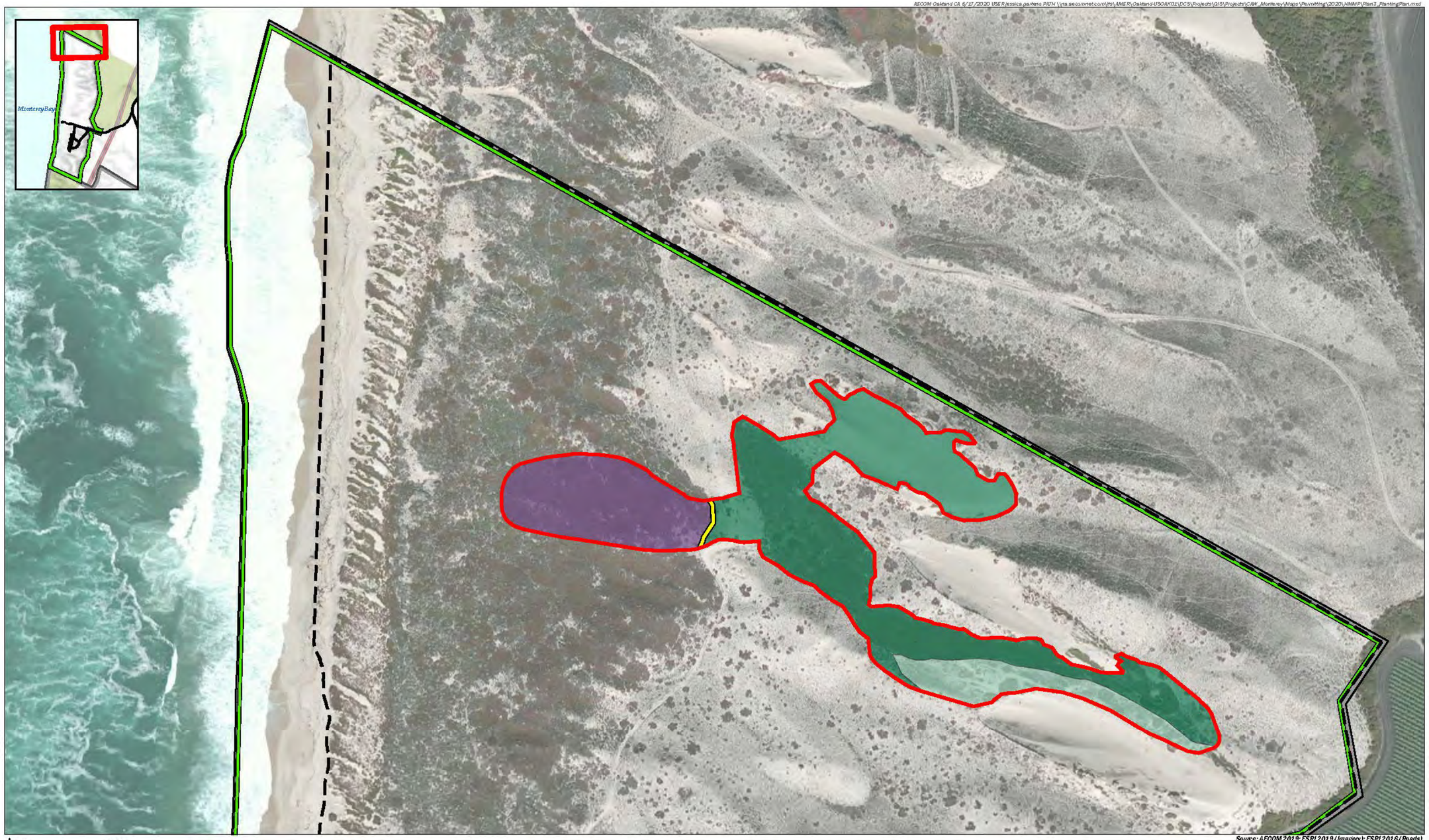
- Proposed Mitigation Site
- CEMEX Sand Mining Facility Parcel Boundary
- Marina City Limits
- CEMEX North Mitigation Area

RESTORATION LEGEND

- Agricultural Sediment Removal Area (2.36 Acres)
- Re-grading & Native Plant Stabilization of Historic Mining Area (1.26 Acres)
- 80-100% Iceplant Cover - Mechanical Removal (3.31 Acres)
- 25-80% Iceplant Cover - Mechanical/Chemical/Manual Removal (1.84 Acres)
- 0-25% Iceplant Cover - Manual & Herbicide Wicking Removal (1.46 Acres)

PLAN 2

Site Restoration Preparation Plan



AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT

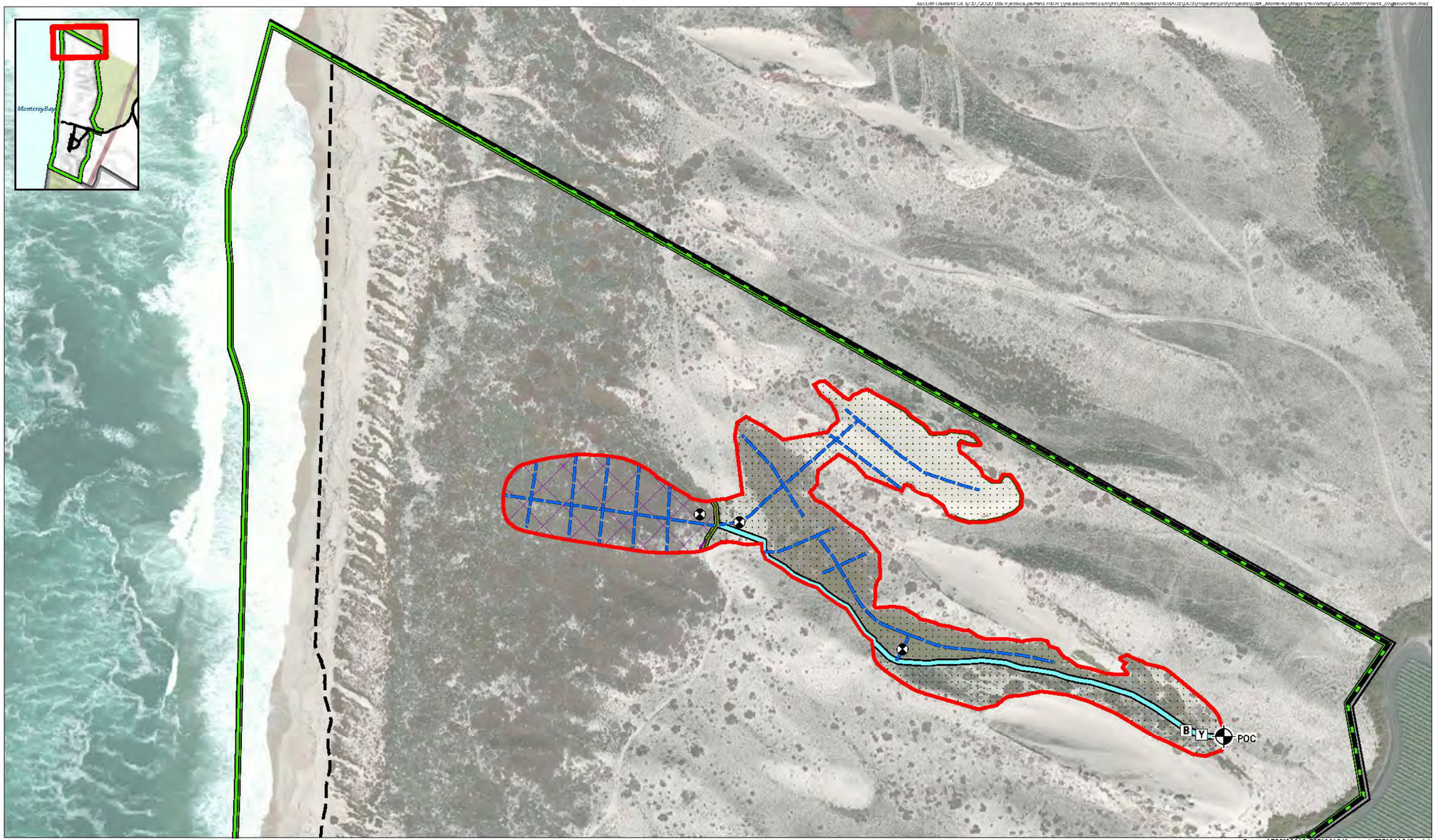
- Proposed Mitigation Site
- CEMEX Sand Mining Facility Parcel Boundary
- Marina City Limits
- CEMEX North Mitigation Area

PLANTING LEGEND

- Foredune/Backdune Boundary
- Full Areal Cover Seeding with Backdune Mix
- Full Areal Cover Seeding with Foredune Mix
- Supplemental Seeding with Backdune Mix
- Supplemental Seeding with Foredune Mix

PLAN 3

Planting Plan



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1 Inch = 200 Feet

Source: AECOM 2019; ESRI 2019 (Imagery); ESRI 2016 (Roads)

AECOM
California American Water
MONTEREY PENINSULA WATER SUPPLY PROJECT

- Proposed Mitigation Site
- CEMEX Sand Mining Facility Parcel Boundary
- Marina City Limits
- CEMEX North Mitigation Area

IRRIGATION LEGEND

- Foredune/Backdune Boundary
- Drip Irrigation
- Retrofittable Sprinkler System
- Battery Controller Operated Valve
- B Booster Pump
- Point of Connection
- Y Y-Strainer
- Irrigation Main
- Lateral Pipe

PLAN 4
Irrigation Plan