

Malibu Lagoon Restoration and Enhancement Plan Final EIR

SCH #2005101123



California State
Department of
Parks and Recreation

Prepared For:



California State
Coastal Conservancy

Resource Conservation District of the Santa Monica Mountains

Prepared By:



In Cooperation With:



Terry A. Hayes Associates
and the above agencies

March 2006

**Malibu Lagoon Restoration and
Enhancement Plan
Final Environmental Impact Report (EIR)**

SCH #2005101123

Prepared for:

California Department of Parks and Recreation,
Resource Conservation District of the Santa Monica Mountains,
and the California State Coastal Conservancy

Prepared by:

Jones & Stokes
811 West 7th Street, Suite 800
Los Angeles, CA 90017

In cooperation with:

Terry A. Hayes Associates,
California Department of Parks and Recreation,
Resource Conservation District of the Santa Monica Mountains,
and the California State Coastal Conservancy

March 2006



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

NOTICE OF DETERMINATION

TO: State Clearinghouse
Office of Planning and Research
1400 Tenth Street, Room 222
P.O. Box 3044
Sacramento, California 95812-3044

FROM: Department of Parks and Recreation
1416 Ninth Street
P.O. Box 942896
Sacramento, California 94296-0001

SUBJECT: Filing of the Notice of Determination in compliance with Section 21108 of the Public Resources Code

STATE CLEARINGHOUSE NUMBER: 2005101123

PROJECT TITLE: Malibu Lagoon Restoration and Enhancement Plan

CONTACT PERSON: Suzanne Goode
1925 Las Virgenes Road
Calabasas, California, 91302

PHONE NO.: (818) 880-0350

PROJECT LOCATION: Malibu Lagoon is a 31-acre shallow water embayment located within Malibu Lagoon State Beach at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay. Malibu Lagoon empties into the Pacific Ocean at Malibu Surfrider Beach and is generally located south of the intersection of Pacific Coast Highway and Cross Creek Road in the City of Malibu, within Los Angeles County.

PROJECT DESCRIPTION: The Malibu Lagoon Restoration and Enhancement Plan (Plan) presents a comprehensive and adaptive management approach to restore and enhance the ecological structure and function of Malibu Lagoon, improve lagoon and coastal water quality, and enhance visitors' experience through improvements to access and interpretive displays. The Plan includes a water management component, a habitat and access plan, and a comprehensive long-term monitoring plan to ensure restoration goals are being achieved. The Plan was selected out of a range of alternatives for its ability to achieve restoration goals while minimizing short-term impacts to the existing system. The restoration goals for the lagoon consist of: increased tidal flushing; improved water circulation; improved coastal water quality; increased holding capacity; reduced predator encroachment; restoration of typical salt marsh hydrology; increased wildlife habitat; creation of a nesting island for least terns and western snowy plovers; creation of channel connections to the lagoon; and integration of public access with habitat protection. Major physical components of the Plan consist of: a relocated parking lot and staging area; implementation of Best Management Practices to minimize impacts of storm water runoff; slope improvements to the western edge of the lagoon; improvements to the existing boat house channel; and the creation of a new channel along the southern edge of the west lagoon.

This is to advise that the California Department of Parks and Recreation has approved the above project and has made the following determinations regarding the above described project:

1. The project will not have a significant effect on the environment.
 The project will have a significant effect on the environment.
2. An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
 A Negative Declaration was prepared for this project, pursuant to the provisions of CEQA.
3. Mitigation measures were were not made a condition of the approval of the project.
4. A Mitigation reporting or monitoring plan was was not adopted for this project.
5. A Statement of Overriding Considerations was was not adopted for this project.
6. Findings were were not made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval is available to the General Public at the California Department of Parks and Recreation, Angeles District, located at 1925 Las Virgenes Road, Calabasas, California, 91302.

Theodore Jackson, Jr.
Deputy Director
Park Operations

Date



State of California – The Resources Agency
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Theodore Jackson, Jr.
Deputy Director
Park Operations

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<i>Other documents and technical studies referenced in this report are incorporated as appendices to the EIR as well but are too voluminous to include in hard copy. All documents listed in Chapter 12 are available for public review either online or in hard copy. Please contact Damon Wing at the Resource Conservation District of the Santa Monica Mountains if you would like to view any of the documents listed: (310) 455-1030 x213.</i>		

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Acronyms and Abbreviations

AMSL	above mean sea level
AQMP	Air Quality Management Plan
basin plans	water quality control plans
BMPs	best management practices
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	Endangered Species Act
CGS	California Geological Survey
City	City of Malibu
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
Coastal Conservancy	State Coastal Conservancy
Corps	U.S. Army Corps of Engineers
CRHR	California Register of Historical Resources
CWA	Clean Water Act
DPR	California Department of Parks and Recreation
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
FAC	facultative plants
FACW	facultative wetland plants
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
IUCN	International Union for Conservation of Nature and Natural Resources
LARWQCB	Los Angeles Regional Water Quality Control Board
LCP	Local Coastal Program
LRWG	Lagoon Restoration Working Group
LTAC	Lagoon Technical Advisory Committee
LUP	Land Use Plan
msl	mean sea level
MMRP	Mitigation Monitoring and Reporting Program
NAHC	Native American Heritage Commission
NO ₂	nitrogen dioxide
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
OBL	obligate wetland plants
OHP	Office of Historic Preservation

OS	Open Space
PCH	Pacific Coast Highway
plan or project	Malibu Lagoon Restoration and Enhancement Plan
PM ₁₀	particulate matter 10 microns in diameter or less
PRC	Public Resources Code
RCDSMM	Resource Conservation District of the Santa Monica Mountains
ROC	reactive organic compound
ROW	right-of-way
RPA _s	Resource Protection Areas
RWQCB	Los Angeles Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SO ₂	sulfur dioxide
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WDR	Waste Discharge Requirement

Chapter 1

Introduction

Purpose of the EIR

The purpose of this Environmental Impact Report (EIR) is to inform agency decision makers and the public about the anticipated significant environmental effects of the proposed project, potential measures to mitigate these significant effects, and reasonable alternatives that could reduce the significant environmental impacts of the proposed project to less-than-significant levels.

This chapter describes the proposed project, the Malibu Lagoon Restoration and Enhancement Plan (plan or project). Provided below is an overview of the proposed plan, plan background, the California Environmental Quality Act (CEQA), and the scope and framework of the EIR.

The Proposed Plan

The California Department of Parks and Recreation (DPR), the Resource Conservation District of the Santa Monica Mountains (RCDSMM), and California State Coastal Conservancy (Coastal Conservancy), with input from the Lagoon Restoration Working Group (LRWG) and the Lagoon Technical Advisory Committee (LTAC), are proposing a restoration and enhancement plan for the Malibu Lagoon (lagoon) at Malibu Lagoon State Beach in the City of Malibu (City). The intent of the proposed plan is to restore and enhance the natural structure and function of the lagoon ecosystem, including water quality, circulation, habitat, and biodiversity, and to enhance public access and education opportunities.

The proposed plan proposes to decrease polluted runoff and increase circulation within the lagoon, thereby improving the quality of water and minimizing the effects of eutrophication. To enhance lagoon habitat, the plan would change the lagoon configuration and improve slopes and drainages, replant native species, and remove non-native species. The plan proposes to relocate and renovate the parking lot, enhance public access, and erect educational displays to better the visitors' experience. An ongoing monitoring plan will be implemented to evaluate, record, and analyze existing and changing ecological conditions of the lagoon using physical, chemical, and biological parameters. The records would

allow DPR, the RCDSMM, the Coastal Conservancy, the LTAC, and other agencies and stakeholders to assess the progress toward restoration goals, and to adaptively manage lagoon function and health.

Background

The 31-acre lagoon is located at the mouth of the Malibu Creek Watershed at Surfrider Beach along the northern shore of Santa Monica Bay within Malibu Lagoon State Beach. Its ecological significance as one of the last remaining coastal wetlands within Santa Monica Bay adds to the interest in developing a restoration and enhancement plan to improve the lagoon's conditions. The lagoon represents an important coastal wetland resource hosting both avian and aquatic species of important statewide and regional ecological significance.

The lagoon has experienced major changes in recent history due to nearby development and other human activities. Currently a fraction of its historical size, the lagoon is experiencing degraded conditions due to inflow of nutrient and pollutant rich water from urban runoff and storm drainage, urban encroachment, limited circulation, effluent from wastewater treatment, and invasion by non-native plant species.

Since 1929, when Caltrans used the site as a dump during the construction of the Pacific Coast Highway (PCH), continual urban development surrounding the Malibu Lagoon has reduced its size and degraded the quality of its water and habitats.¹ The construction of Rindge Railroad line, Pacific Coast Highway Bridge, commercial and residential development, parking lots, and a baseball field decreased the area of the lagoon. Urban runoff, increased sedimentation, increased freshwater flows, and invasion of non-native species have degraded the conditions of the lagoon as well.

A previous effort to restore the lagoon was initiated by the DPR in 1983. The 1983 restoration included the creation and revegetation of three channels with native salt marsh plants and the construction of boardwalks to allow public access. Another restoration effort occurred in 1996 when the California Department of Transportation adopted a restoration plan to mitigate the Malibu Lagoon/PCH bridge replacement. The plan included a goby habitat enhancement plan, revegetation of native species (to restore impacts from the bridge construction), and removal of non-native species.

By the 1980s, the ecological functioning and health of the lagoon had declined. Since the late 1980s, an ongoing community effort has been organized to assess lagoon health and develop restoration plans. In the late 1990s, the Coastal Conservancy funded a study by UCLA, which identified restoration goals for the Malibu Lagoon Task Force. This led

¹ Ambrose, R.F., and A.R. Orme. 2000. Lower Malibu Creek and Lagoon Resource Enhancement and Management. University of California, Los Angeles.

to the preparation of the Malibu Lagoon Restoration Feasibility Study and Final Alternatives Analysis, prepared under a grant from the Coastal Conservancy. After a year of facilitated discussion and consideration among the LRWG, the LTAC, DPR, and the Coastal Conservancy, the resulting recommendation was Alternative 1.5, the Modified Restore and Enhance Alternative for the restoration design, which embodied the restoration goals with the least amount of impacts to the existing lagoon ecosystem (refer to Figure 3-3 in Chapter 3).

The Plan proposed by DPR, RCDSMM, the Coastal Conservancy, and along with the LRWG and the LTAC, seeks to design and implement a restoration and enhancement program, including long-term monitoring and adaptive management for the lagoon.

Overview of CEQA

CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before taking action on them. The purpose of this focused EIR is to inform agencies and the public of significant environmental effects associated with the proposed project, describe and evaluate reasonable alternatives to the project, and propose mitigation measures that would avoid or reduce the project's significant effects.

In accordance with Section 15121(a) of the State CEQA Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an EIR is to serve as an informational document that will

inform public agency decision makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.

This EIR evaluates the direct, indirect, and cumulative impacts of the proposed project and alternatives in accordance with the provisions set forth in CEQA and the State CEQA Guidelines. It will be used to address potentially significant environmental issues and recommend adequate and feasible mitigation measures, where possible, that could reduce or eliminate potentially significant environmental impacts.

Lead Agency

Per CEQA, DPR is the Lead Agency in association with the Coastal Conservancy and RCDSMM. This EIR reflects the independent judgment of DPR and is intended to comply with CEQA and the State CEQA Guidelines (see Public Resources Code, §21100; State CEQA Guidelines, §§15120-15132).

Lead Agency – the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment.

Contacts:

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Resource Conservation District of the Santa Monica Mountains
 Damon Wing, Project Manager
 122 N. Topanga Canyon Boulevard
 Topanga, CA 90290

Responsible Agencies

Responsible Agency – public agency, other than the lead agency, that has the responsibility of carrying out or approving a project.

The following agencies have been identified as potential Responsible Agencies under CEQA:

- U.S. Army Corps of Engineers (lagoon restoration work within the Corps wetland delineation only – does not include Phase I Parking Lot Development)
- California Regional Water Quality Control Board (RWQCB) – LA Region
- California State Coastal Conservancy
- California Coastal Commission
- U.S. Fish and Wildlife Service (USFWS)
- National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS)
- City of Malibu - (Phase I Parking Lot Development Component Only)
- Caltrans District 7 - (Potential permitting agency for any work or staging that may take place within the Right-of-Way of Pacific Coast Highway)

Trustee Agencies

Trustee Agency – a state agency that has jurisdiction by law over natural resources affected by a project, that are held in trust for the people of the State of California.

The following agencies have been identified as potential Trustee Agencies under CEQA:

- California Department of Fish and Game (CDFG) – South Coast Region
- California Department of Parks and Recreation (DPR)
- U.S. Fish and Wildlife Service (USFWS)
- California Coastal Commission (CCC)
- Native American Heritage Commission (NAHC)
- State Historic Preservation Office (SHPO)

Scope of the EIR

In accordance with the State CEQA Guidelines, this document describes the potential environmental effects caused by construction, operation, and long-term monitoring activities related to restoring and enhancing the lagoon. The intent of this EIR is to disclose the environmental concerns and impacts associated with this restoration and enhancement plan. The document presents any potentially adverse impacts and their analysis, as well as identification of any feasible mitigation measures.

An Initial Study Checklist was not prepared prior to issuance of the Notice of Preparation (NOP) of an Environmental Impact Report. Therefore, each of the environmental topic areas listed in the CEQA Checklist is evaluated in this EIR. Specifically, the following issues are addressed in this document:

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Construction Effects
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Health (Vector Control)
- Public Services
- Recreation
- Transportation and Circulation
- Utilities and Service Systems

The Lead Agency (DPR) has not adopted its own CEQA thresholds for determining the significance of impacts in environmental analysis and documentation. As a state agency with trustee responsibility for widely

divergent habitat types and settings, the application of a static set of thresholds is not practical, nor would it allow the flexibility to determine site-specific context and intensity of project proposals and impacts.

DPR incorporates 278 units with jurisdiction over 1.5 million acres of land and major units within all of the state's ecoregions and geomorphic provinces. The Park system includes recreation areas, historic parks, and cultural sites that preserves and supports the most diverse assemblage of natural resource values of any land management agency in California.

For the reasons and circumstances detailed above, and to afford the most conservative scope of environmental review compliant with CEQA, the thresholds listed in Appendix G of the State CEQA Guidelines were applied in evaluating significance of impacts in this EIR.

On October 28, 2005, the DPR submitted a NOP for a 30-day review to the State Clearinghouse, responsible agencies, and interested parties. The NOP was also published in the *Malibu Times* and *Malibu Surfside News* on October 27, 2005. The NOP presented a description of the proposed project, potential environmental effects, instructions on how to provide comments, and the date, time, and location of the public scoping meeting that was held at Malibu City Hall the evening of November 16, 2005. The NOP and copies of all letters received in response to the NOP are included in Appendix B.

Approximately 15 persons attended the scoping meeting. An overview and history of the lagoon, the proposed Plan, and CEQA requirements were presented. The presentation included a chronology of preceding lagoon restoration actions that ultimately led to the development the proposed Plan. During the public comment portion of the meeting, questions were raised concerning construction phase beach access, biological impacts, and the methodology used to determine impacts. All questions and concerns raised at the scoping meeting have been addressed in this EIR.

Required Approvals

Required and discretionary and ministerial approvals from the State of California and other agencies may include, but are not limited to:

- The U.S. Army Corps of Engineers (Corps) would issue permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors.
- The CDFG would issue a Streambed Alteration Agreement pursuant to Section 1601 of the California Fish and Game Code.
- The CCC would issue a Coastal Development Permit pursuant to the California Coastal Act of 1976.

- The RWQCB would issue a Water Quality Certification pursuant to Section 401 of the Clean Water Act.
- The South Coast Air Quality Management District (SCAQMD) would issue a permit for stationary sources.
- The City of Malibu would issue a Coastal Development Permit for development of the parking lot component of the project only.
- A permit to work within California Department of Transportation Right-of-Way (ROW) may also be required.
- Section 7 consultation with NOAA/NMFS and USFWS

Preparers of This EIR

This EIR was prepared by Jones & Stokes Associates in association with Terry A. Hayes Associates (contact information below). Staff from the California Department of Parks and Recreation, the Coastal Conservancy, and the Resource Conservation District of the Santa Monica Mountains also assisted in the preparation of this document.

Funding for the preparation of this document as well as preparation and implementation of the Restoration Plan is provided by the Coastal Conservancy and the State Water Resources Control Board.

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Chapter 2 Summary

Introduction and Background

The California Department of Parks and Recreation (DPR), the Resource Conservation District of the Santa Monica Mountains (RCDSMM), and the California State Coastal Conservancy (Coastal Conservancy), with input from the Lagoon Restoration Working Group (LRWG) and the Lagoon Technical Advisory Committee (LTAC), are proposing a restoration and enhancement plan for Malibu Lagoon (lagoon) within Malibu Lagoon State Park. The intent of the proposed plan is to restore and improve the natural structure and function of the lagoon ecosystem, including water quality, circulation, habitat, and biodiversity, and to enhance public access and education opportunities.

The 31-acre lagoon is located at the mouth of the Malibu Creek Watershed at Surfrider Beach along the northern shore of Santa Monica Bay within Malibu Lagoon State Beach. Its ecological significance as one of the last remaining coastal wetlands within Santa Monica Bay adds to the interest in developing a restoration and enhancement plan to improve the lagoon's conditions. The lagoon represents an important coastal wetland resource hosting both avian and aquatic species of important statewide and regional ecological significance.

The lagoon has experienced major changes in recent history due to nearby development and other human activities. Currently a fraction of its historical size, the lagoon is experiencing degraded conditions due to inflow of nutrient and pollutant rich water from urban runoff and storm drainage, urban encroachment, limited circulation, and invasion by non-native plant species.

The proposed plan proposes to decrease polluted runoff and increase circulation within the lagoon, thereby improving the quality of water and minimizing the effects of eutrophication. To enhance lagoon habitat, the plan would change lagoon configuration and improve slopes and drainages, replant native species, and remove non-native species. The plan proposes to relocate and renovate the parking lot, enhance public access, and erect educational displays to better the visitors' experience. An ongoing monitoring plan will be implemented to evaluate, record, and analyze existing and changing ecological conditions of the lagoon

using physical, chemical, and biological parameters. The records would allow DPR, the Coastal Conservancy, the LTAC, and other agencies and stakeholders to assess the progress toward restoration goals.

Goals and Objectives

The Lead Agency has identified the following major objectives for the proposed project:

- Decrease urban runoff from surrounding sources into the lagoon to improve its water quality and decrease eutrophication.
- Increase circulation of water during open and closed conditions.
- Restore habitat by re-establishing suitable soil conditions and native plant species and removing non-native species.
- Relocate existing parking lot to increase habitat size and eliminate polluted runoff to the lagoon.
- Evaluate, record, and analyze existing and changing ecological conditions of the lagoon using physical, chemical, and biological parameters to allow agencies, organizations, and stakeholders to monitor progress towards restoration goals.

Project Location and Setting

Malibu Lagoon is a 31-acre shallow water embayment occurring at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay. Malibu Lagoon empties into the Pacific Ocean at Malibu Surfrider Beach and is generally located south of the intersection of PCH and Cross Creek Road at Malibu Lagoon State Beach in the City of Malibu. Please refer to Chapter 3 for project location maps.

Project Description

The purpose of the plan is to restore and enhance the ecological conditions of the lagoon and improve public access and education about the lagoon. The plan presents information regarding the current condition of the lagoon, goals and strategies for the restoration, and implementation of a monitoring plan. Essentially, the plan offers strategies to protect the lagoon as one of the remaining southern California coastal wetlands, prevent further deterioration of the lagoon, improve visitors' experience, and educate the public about the lagoon's ecosystem processes.

Based on the findings of the *Malibu Lagoon Restoration Feasibility Study Final Alternatives Analysis*,¹ DPR, the Coastal Conservancy, and the LTAC, with substantial input from the LRWG, recommended Alternative 1.5 as the preferred restoration design for the lagoon. Major components of the preferred plan alternative² are explained below.

The existing parking lot would be relocated to the north and west to be adjacent to the PCH. The new parking lot and staging areas would be created with runoff treatment controls, including permeable pavement or other similar substances, appropriate native vegetation, and would include a staging area to enhance existing educational and recreational uses of the site. The current number of parking spaces would remain and new interpretive displays and panels would be installed.

The main lagoon channel would remain substantially “as is.” The western edge of the main lagoon at the interface with the western arms complex would be reconfigured in the form of a naturalized slope to provide a degree of separation between main lagoon and west channel system.

The existing boathouse channel would be deepened and recontoured to create a new avian island along the bank of the Adamson House grounds. This would create additional mudflat habitat and promote additional water circulation around the new island.

The project employs a holistic approach to habitat restoration. The overall restoration plan has individual elements such as the Water Management Plan, Habitat Plan, Access, Education, and Interpretation Plan, and Monitoring Plan. Please refer to Chapter 3, Project Description, for more detail, plans, and maps of the proposed project.

Alternatives to the Proposed Project

CEQA requires that an EIR describe a range of reasonable alternatives to the proposed project or to the location of the restoration plan that could feasibly avoid or lessen any significant environmental impacts while substantially attaining the basic objectives of the restoration plan. The alternatives described below (with the exception of the No-Project Alternative) were carried forward from the *Malibu Lagoon Restoration Feasibility Study Final Alternatives Analysis*. Please refer to Chapter 11 and Table 11-1 for a complete discussion of project alternatives and their comparative environmental impacts.

¹Moffatt & Nichol in association with Heal the Bay. *Malibu Lagoon Restoration Feasibility Study, Final Alternatives Analysis*. March 2005. This document is available on the Heal the Bay website: <http://www.healthebay.org/currentissues/mlhep/default.asp>

² Moffatt & Nichol. Final Malibu Lagoon Restoration and Enhancement Plan. June 2005.

No Project

Under the No Project Alternative, implementation of the Restoration and Enhancement Plan would not occur. The parking lot and lagoon would remain and continue to be used by the public in its existing state. As a consequence, the No Project Alternative would not result in any of the beneficial effects of the proposed project. Biological restoration goals would not be achieved and habitat conditions would likely continue to degrade.

Moreover, water quality would continue to degrade as sediment carried from storm flows is deposited in the lagoon area, thus contributing to aggradation and formation of eutrophic conditions. The No Project Alternative would not contribute to compliance with TMDL targets for nutrients and bacteria, thus, water quality would remain impaired and likely worsen over time.

Alternative 1: Enhancement Alternative

The Enhancement Alternative was designed with the intent to improve existing conditions in the western lagoon arms with the least cost and least degree of disturbance to the existing lagoon habitat. The elevations of the channels in the western portion of the lagoon are too high to allow for inundation at ocean tidal elevations below mean sea level when the barrier beach berm is open. In addition the western channels are too narrow, constricted, and isolated from one another to allow for adequate circulation of lagoon water. The existing topography has resulted in an overabundance of upland habitat.

The enhancement alternative would lower the existing channels elevations, thus allowing for an increase tide inundation during open conditions. Topography of the channels and islands in the western lagoon would be lowered to accommodate vegetation types typically associated with coastal estuaries. Channel widths and depths would be increased and channels would be connected to remove existing dead ends.

Alternative 1 does not include improvements to the parking lot area or educational components.

Further discussion of Alternative 1 can be found in the *Malibu Lagoon Restoration Feasibility Study Final Alternatives Analysis* on pages 44 and 45.

This Alternative intends to:

- Improve circulation by expanding and deepening of existing channels in the western arms;

- Remove dead ends by connecting the A (north) channel to the C (south) Channel;
- Establish more appropriate marsh vegetation by lowering the elevation of western channels and islands to minimize upland habitat;
- Increase lagoon holding capacity during closed conditions;
- Provide additional bird habitat and minimize the need to export soils offsite by expansion of the mid-stream bar in the main lagoon body (no structural engineering is proposed to protect this bar).
- Provide unvegetated avian areas through the creation of a salt panne. The salt panne is intended to create an unvegetated area that uses a depression to capture water that will subsequently evaporate leaving behind higher salts in the soils that will minimize vegetative growth; and
- Minimize cost and disruption to existing lagoon habitats.

In comparison to the proposed project, Alternative 1 would result in lesser beneficial effects to biological resources; similar cultural resources effects; similar consistency with local and regional plans; and a lesser degree of temporary construction impacts. However, this alternative could result in adverse impacts to hydrology and water quality, whereas the proposed project would be beneficial in this regard.

Alternative 1.75 Restore/Enhance Modify with the North Channel

The Restore/Enhance Modify with the North Channel is a variation of the proposed project that includes the North Channel connection as an adaptive management tool. The North Channel may further improve flushing through the upper western arms and circulation during closed conditions. Further discussion of Alternative 1.75 can be found in the *Alternatives Analysis* on page 52.

Alternative 1.75 was intended to achieve:

- Tidal influence created by a single main channel with a naturalized dendritic planform more indicative of natural systems;
- Increased tidal flushing during open conditions by deepening of the west lagoon (no work is proposed in the main lagoon). This will also increase holding capacity (storage volume);
- Enhanced and increased salt marsh environment during open conditions and maximized wind fetch to enhance wind-driven circulation during closed conditions;

- Permanent avian islands. These islands will be designed to afford better protection from predators and will be optimized to suit avian enhancement goals;
- Expanded wetland and marsh acreage by relocating the existing parking lot into degraded upland habitat. The new parking lot will be designed to be permeable to maximize water quality enhancements through naturalized filtration/infiltration;
- Increased flushing of sediments through the connection of the new North Channel;
- Opportunities for new visitor facilities and educational resources.

In comparison to the proposed project, Alternative 1.75 would result in similar beneficial effects to biological resources; similar cultural resources effects; similar consistency with local and regional plans; and a similar degree of temporary construction impacts. This alternative would result in greater beneficial effects with regard to hydrology and water quality however.

Alternative 2.0: Restore and Enhance Alternative

The Restore and Enhance Alternative intends to restore and enhance those areas that have diminished in functions or are in a currently degraded state.

The proposed new North Channel connection is meant to convey an appropriate source of drainage from upstream that could include the Cross Creek storm drain, the main creek, or both. The North Channel would act as a connection between the upper end of the western arm to the Cross Creek storm drain, the main creek or both under a western bent on the PCH Bridge. The purpose is to convey a limited stormflow discharge into the upstream end of the western arms to flush fine sediment from the western lagoon. Further discussion of Alternative 2 can be found in the *Alternatives Analysis* on pages 48 and 49.

Alternative 2.0 was intended to achieve:

- Tidal influence created by a single sinuous main channel;
- Increased tidal flushing during open conditions by deepening of the west lagoon (no work is proposed in the main lagoon). This would also increase holding capacity (storage volume);
- Enhanced and increased salt marsh environment during open conditions and maximized wind fetch to enhance wind-driven circulation during closed conditions; and
- Unvegetated avian areas through the creation of a salt panne. The salt panne is intended to create an unvegetated area that uses a depression to capture water that would subsequently evaporate

leaving behind higher salts in the soils that would minimize vegetative growth.

In comparison to the proposed project, Alternative 2 would result in similar beneficial effects to biological resources; similar cultural resources effects; similar consistency with local and regional plans; and a similar degree of temporary construction impacts. This alternative would also result in similar beneficial impacts to hydrology and water quality.

Areas of Controversy

The scoping process did not reveal any areas of controversy surrounding the project.

Issues to Be Resolved

There are no outstanding issues to be resolved.

Summary of Impacts and Mitigation Measures

Table 2-1 presents a summary of impacts under each resource area, recommended mitigation measures, and the level of significance of impacts before and after implementation of mitigation measures.

Table 2-1. Summary of Environmental Effects

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
DEIR Chapter 4 – Consistency with Local and Regional Plans			
The use and designation of the project site would not change as a result of the restoration and enhancement project and would be compatible with the surrounding land uses, which include single-family residential, public open-space, and visitor-serving commercial.	No Impact	No mitigation is required.	No Impact
The restoration and enhancement plan would be consistent with the relevant policies and objectives in the Malibu General Plan, Malibu Lagoon State Beach Resource Management Plan & Development Plan, California Coastal Act, and the Malibu Local Coastal Program.	No Impact	No mitigation is required.	No Impact
The restoration and enhancement plan does not conflict with any plans, policies, goals, objectives, or zoning designations.	No Impact	No mitigation is required.	No Impact
DEIR Chapter 5 – Hydrology and Water Quality			
The project would result in improved water quality due to increased circulation within the lagoon system.	Beneficial	No mitigation is required.	Beneficial
The relocation and reconfiguration of the parking lot would result in altered surface drainage and associated flood flow patterns. Permeable paving materials and drainage swales would reduce the quantity and improve the quality of surface runoff. Maintenance of the storm water runoff components is critical to maintaining benefits long-term and thus mitigation measure HYDRO-1 is required.	Beneficial	HYDRO-1: Maintenance of stormwater system. Permeable tiles, drainage swales, pumps, pipelines, and any associated equipment must be maintained on a regular basis to ensure full functioning. Maintenance may include removal of fine sediments from tile gaps for proper infiltration and periodic sediment removal from drainage swales for capacity maintenance. The project manager will ensure that all components of the storm drainage system are maintained to design and manufacturer specifications on a regular basis.	Beneficial

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
Effects to sediment delivery patterns as a result of the project could affect beach replenishment and nearshore coastal habitat. Under the proposed project, the inlet channel to the western arms of the lagoon would be relocated southward and positioned to reduce the western arms exposure to sedimentation during and following storms. It is anticipated that more storm delivered sediments would be transported directly to the main lagoon, and subsequently be available to the coastal zone for beach nourishment or down-coast transport. The project is not likely to significantly alter sand related depositional processes.	Less than Significant	No mitigation is required.	Less than Significant
The project could affect natural tidal lagoon opening and closure patterns. While the proposed lagoon restoration project will alter the geometry, volume, and orientation of the lagoon, it will not significantly affect the mass water balance of the watershed that is the principal influence behind the lagoon being either open or closed. The proposed project is not anticipated to alter the seasonal patterns or processes driving lagoon opening and closure.	Less than Significant	No mitigation is required.	Less than Significant
The project would reduce the potential to expose people or structures to risk of flooding or impede 100-yr flood flows. The holding capacity of the lagoon would increase and the storm water components of the parking area would reduce and redirect storm flows.	Beneficial	No mitigation is required (see Mitigation Measure HYDRO-1).	Beneficial
Groundwater supply and recharge would be immeasurably affected by reconfiguration of surface water runoff and lagoon morphology.	Less than Significant	No mitigation is required.	Less than Significant
The proposed project would not alter the existing potential for the area to be inundated by a seiche, tsunami, or hillslope related mudflow processes.	Less than Significant	No mitigation is required.	Less than Significant

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
DEIR Section 6 – Biological Resources			
<p>Construction of the project could result in some loss of, or temporary disturbance to, the following vegetation communities and habitats: southern willow scrub; atriplex scrub; baccharis scrub; mule fat scrub; Venturan coastal sage; mixed scrub; coastal salt marsh; brackish marsh; coastal and valley freshwater marsh; southern sycamore-alder riparian woodland; non-native grassland; mudflats; beach/sand bar; and open water. Any removal or damage to these resources could have a temporary, short-term adverse effect on sensitive natural communities or federally protected wetlands; however, this and other restoration activities (such as replanting of native species, removal of non-native species, ongoing monitoring, wetland expansion, etc) would result in a long-term benefits to the lagoon. Total available marsh habitat would increase roughly 7 acres – a 115% increase over existing conditions. The functions and values of the biological resources within the lagoon would be improved as a result of implementation of the project.</p>	Less than Significant	No mitigation is required.	Less than Significant
<p>Construction activities could affect common wildlife species that occur in the project area. Any disturbance to wildlife and/or habitat during construction would be adverse, but less than significant given the temporary and intermittent nature of effects.</p>	Less than Significant	No mitigation is required.	Less than Significant
<p>Construction activities could result in direct or indirect impacts on California black walnut. The individual black walnuts observed in the southern sycamore-alder riparian woodland during the 2004 vegetation mapping do not represent a significant population of this CNPS list 4 species. Thus, less-than-significant impacts would result from potential disturbance to black walnut.</p>	Less than Significant	No mitigation is required.	Less than Significant

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
<p>Construction activities could result in temporary disturbance to the wandering (salt marsh) skipper. However, pre- and post-project acreages of suitable habitat for wandering (salt marsh) skipper would be similar if not identical. Any potential impacts during construction would be less than significant.</p>	<p>Less than Significant</p>	<p>No mitigation is required.</p>	<p>Less than Significant</p>
<p>Construction activities could result in impacts to southern steelhead trout.</p>	<p>Significant</p>	<p>BIO-1: Southern Steelhead Trout.</p> <p>Construction and lagoon excavation may occur during steelhead migration. In order to avoid direct impacts to steelhead, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.</p> <p>In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of similar tools. In the event that water must be pumped from these areas during construction, it shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be reflooded in a manner that minimizes disturbance of the lagoon salinity stratification and substrate and the release of sediment.</p> <p>Reinundation of the western lagoon may provide refuge areas for fish during construction activities in the main lagoon. Block netting and barriers shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS-approved</p>	<p>Less than Significant</p>

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
Construction activities could result in impacts to the tidewater goby.	Significant	<p>fisheries biologist would be conducted during any channel or bank disturbance. Pages 100 and 101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outline a possible construction sequence in more detail that incorporates several of these ideas.</p> <p>BIO-2: Tidewater Goby.</p> <p>Construction of the restoration project shall be timed to minimize disturbance of the western shoreline of the main lagoon when larval tidewater gobies are using the near-shore habitat. In order to avoid direct impacts to gobies, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.</p> <p>In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts to gobies shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of similar tools. In the event that water must be removed from these areas during construction, it shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be reflooded in a manner that minimizes disturbance of the lagoon salinity stratification and substrate and the release of sediment.</p> <p>Construction in the main lagoon shall occur outside of the May 1 through November 1 breeding season for the tidewater gobies. Re-inundation of the western lagoon may provide refuge areas for fish during construction activities</p>	Less than Significant

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		in the main lagoon. Block netting shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS approved fisheries biologist would be conducted during any channel or bank disturbance. Pages 100 and 101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outline a possible construction sequence in more detail that incorporates many of these ideas.	
Construction activities could result in disturbance to California brown pelican.	Significant	<p>BIO-3: California Brown Pelican.</p> <p>On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.</p>	Less than Significant
Construction activities could result in disturbance to western snowy plover.	Significant	<p>BIO-4: Western Snowy Plover.</p> <p>Schedule construction activities and ground disturbance in suitable/occupied habitat to avoid the western snowy plover breeding season from mid-March to August 30. On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.</p>	Less than Significant
Construction activities could result in disturbance to Heermann's Gull.	Significant	<p>BIO-5: Heermann's Gull.</p> <p>On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.</p>	Less than Significant
Construction activities could result in disturbance to elegant tern.	Significant	<p>BIO-6: Elegant Tern.</p> <p>On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.</p>	Less than Significant
Construction activities could result in disturbance to the California least tern.	Significant	<p>BIO-7: California Least Tern.</p> <p>Schedule construction activities and ground disturbance to avoid the California least tern breeding season and post-breeding season foraging (July to August). On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.</p>	Less than Significant

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
DEIR Chapter 7 – Cultural Resources			
<p>Construction of the proposed project could result in impacts to Prehistoric site <i>Humaliwo</i> (CA-LAN-264).</p>	<p>Significant</p>	<p>CR-1: Cultural Resources Testing in Area Adjacent to CA-LAN-264</p> <p>Cultural resources, including CA-LAN-264 and the historic Adamson House grounds and ancillary structures, will be avoided to the extent possible. The hydrology of the lagoon will not be changed such that the boathouse or grounds are at greater risk of flood or construction impacts.</p> <p>Cultural resources excavations will be undertaken prior to any ground-disturbing activities along the eastern bank of the main lagoon channel adjacent to CA-LAN-264 if any project-related earthwork occurs within 100 feet of the known boundary of CA-LAN-264. Test excavations shall not take place within the known boundaries of CA-LAN-264 but adjacent to the boundaries if project construction would require any ground-disturbing activities within 100 feet of the known site boundary.</p> <p>Because sensitivity is moderate to high for cultural resources, including human remains, to be present along this edge of the project area, a subsurface testing program should be implemented to identify if resources are present, and evaluate potential NRHP-eligible resources. This should be undertaken if any project related construction comes within 100 feet of the known boundary of CA-LAN-264 (See Dillon 1987:45).</p> <p>If subsurface testing identifies intact, significant archaeological resources within the project area that cannot be avoided, the project would have an adverse effect.</p> <p>Development of measures to mitigate adverse effects would be necessary and a Memorandum of Agreement would be required to complete Section 106 consultation.</p> <p>The preconstruction testing program should include, but need not be limited to:</p> <ul style="list-style-type: none"> development of a testing strategy to identify subsurface archaeological deposits, including further research on previous investigations and regarding 	<p>Less than Significant</p>

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		<p>previous lagoon excavations, in an effort to refine the scope of any field effort;</p> <ul style="list-style-type: none"> • evaluation of significance and integrity of exposed archaeological deposits (according to the National Historic Preservation Act [NHPA], NRHP, and CRHR criteria) if present, in consultation with the State Historic Preservation Officer (SHPO); and • consultation with local Native Americans if prehistoric or ethnohistoric resources are identified. <p>Upon identification of any significant prehistoric or historical archaeological resources, it will be necessary to avoid these resources during project development, or to formulate a treatment plan to mitigate adverse effects. A treatment plan, adopted within a Memorandum of Agreement, to be negotiated in consultation with the SHPO, would likely include the following:</p> <ul style="list-style-type: none"> • an acceptable data recovery plan stating specific research goals and questions that are to be addressed if archaeological deposits are to be recovered, • postfield artifact processing and analysis, • report preparation in accordance with the guidelines of CDPR, and • permanent curation of artifacts and documents in a repository consistent with the National Park Service guidelines for the curation of archaeological collections (36 Code of Federal Regulations [CFR] 79). <p>Feature recovery should employ standard archaeological excavation techniques. The testing and evaluation plan should be designed and implemented by a qualified Prehistorical Archaeologist and, if discoveries warrant, a qualified Historical Archaeologist.</p> <p>Both the testing and evaluation plan and the data recovery strategy should be developed in consultation with the project proponent and interested local Native American groups. It should state that Native American human</p>	

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		<p>remains will be treated in compliance with Health and Safety Code, Sections 7050.5, 8010, and 8011 and Public Resources Code, Section 5097.98. Given the potential for encountering Native American artifacts, a Native American should monitor all subsurface excavations.</p>	
		<p>CR-2: Cultural Resources Monitoring in Area Adjacent to CA-LAN-264</p> <p>Cultural resources monitoring is recommended during any ground disturbing activities along the eastern bank of the main lagoon channel adjacent to CA-LAN-264. Monitoring will be conducted if conditions allow for observation of spoils. Monitoring of dredging is probably not feasible given underwater activity would not be visible. However, underwater cultural sites may be present, and the material dredged will be inspected for the presence or absence of cultural material. The remainder of the project area may be monitored if notable cultural materials are discovered, or monitoring may be further limited if the monitoring area appears previously disturbed (as may be the case in areas where the California Department of Transportation (Caltrans) has deposited fill material and riprap).</p> <p>If prehistoric cultural resources are discovered in this area during monitoring or other construction, all work will be halted in the vicinity of the archaeological discovery until a qualified archaeologist can visit the site of discovery and assess the significance of the archaeological discovery. Further treatment may be required, including site recordation, excavation, site evaluation, and data recovery.</p>	
<p>Potential exists for ground-disturbing activities to damage previously unidentified buried cultural resources sites.</p>	<p>Potentially Significant</p>	<p>CR-3: Stop Work If Cultural Resources Are Discovered during Ground-Disturbing Activities.</p> <p>If buried cultural resources—such as flaked or ground stone, historic debris, building foundations, shellfish remains or non-human bone—are inadvertently discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a</p>	<p>Less than Significant</p>

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		<p>State Parks archaeologist or designee can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include: development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs, such as excavation or detailed documentation. Avoidance of cultural remains shall be the top priority at all times.</p> <p>If cultural resources are discovered during construction activities, the construction contractor will verify that work is halted until appropriate site-specific treatment measures, such as those listed above, are implemented.</p>	
		<p>CR-4: Comply with State Laws Pertaining to the Discovery of Human Remains. If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary to comply with state laws relating to the disposition of Native American burials that fall within the jurisdiction of the California Native American Heritage Commission (Public Resources Code Section 5097). Construction work shall not continue within 100 feet of a location where human skeletal remains are found.</p> <p>According to California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American.</p> <p>If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission to determine the most likely living descendant(s). The most likely living descendant shall determine the most appropriate means of treating the human remains and any associated grave artifacts, and shall oversee disposition of the human remains and</p>	

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		associated artifacts by the project archaeologists. This impact would be significant, but implementation of the mitigation measures above would reduce this impact to a less-than-significant level.	
DEIR Chapter 8 – Construction Effects			
Air Quality: Pollutant emissions during Phase I and Phase II construction.	Less than Significant	No mitigation is required. However, as best management practices consistent with SAQMD Rule 403 compliance, the following measures shall be taken during construction: AQ-1: Dust sweeping. The construction area and vicinity (driveways, access roads, and staging areas) shall be swept with water sweepers on a daily basis or as necessary to ensure there is no visible dust. AQ-2: Covering or watering of stockpiles. On-site stockpiles of debris, dirt or rusty material shall be covered or watered at least twice daily to prevent fugitive dust. AQ-3: Covering of haul trucks. All haul trucks hauling soil, sand, and other loose materials shall either be covered or maintain two feet of freeboard.	Less than Significant
No changes to existing land uses would occur during construction of the project and no impacts would result. Please refer to Chapter 4 for a discussion of the project’s consistency with local and regional planning documents.	No Impact	No mitigation is required.	No Impact
Hydrology and Water Quality: Release of construction-related sediment from access roads, staging areas, ground-disturbing activities and stock piling during Phase I and Phase II construction into the lagoon could affect water quality.	Potentially Significant	HYDRO-2: Implement Best Management Practices to Control Discharge of Construction-Related Pollutants to Surface Waters. Because project construction will cover an area greater than 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared by the Lead Agency or its contractor as required by the regional water quality control board (RWQCB) under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. The SWPPP shall meet the requirements of the RWQCB as well as any City and County requirements.	Less than Significant

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		<p>The SWPPP will identify best management practices (BMPs) to maintain water quality. The final selection and design of erosion and sediment controls shall be subject to approval by the Lead Agency. BMPs in the SWPPP may include, but is not limited to, the following elements:</p> <ul style="list-style-type: none"> • Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed for disturbed areas. • Earth dikes, drainage swales, and ditches shall be provided to intercept, divert, and convey surface runoff and sheet flow; prevent erosion; and reduce pollutant loading. Specific areas that may need such measures shall be identified on the construction drawings. • Roads used during construction shall be continuously swept and cleaned of accumulated earth and debris in the construction zone during project construction, particularly before predicted rainfall events. • Excavated materials deposited or stored on-site temporarily shall not be placed in or adjacent to open water channels and shall be wetted and covered as necessary to prevent runoff and erosion. • Oils, fuels, and other toxicants spilled or deposited near the project site shall be removed and disposed of according to applicable laws and regulations. • Establish grass or other vegetative cover over areas that have been disturbed by construction as soon as possible after disturbance to establish vegetative cover. This will reduce erosion by slowing runoff velocities, enhancing infiltration and transpiration, trapping sediment and other particulates, and protecting soil from raindrop impact. <p>The Lead Agency and/or its contractors shall implement a monitoring program to verify BMP effectiveness. The monitoring program shall begin at the outset of construction and terminate upon completion of the project.</p>	

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		<p>HYDRO-3: Implement a Hazardous Material Spill Prevention Control and Countermeasure Plan.</p> <p>A Hazardous Material Spill Prevention Control and Countermeasure Plan would be prepared as part of the NPDES General Construction Permit to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction of the project. This plan will describe storage procedures and construction site housekeeping practices and identify the parties responsible for monitoring and spill response. Routine inspections and monitoring of best management practices would ensure minimal impacts to the environment occur. Commonly practiced best management practices include use of containment devices for hazardous materials, training of construction staff regarding safety practices to reduce the chance for spills or accidents, and use of nontoxic substances where feasible. The plan also would describe actions required if a reportable spill occurs, such as which authorities to notify and the proper clean-up procedures. The Hazardous Material Spill Prevention Control and Countermeasure Plan would contain standards considered sufficiently protective such that significant adverse impacts on surface and groundwater quality would be avoided. The plan shall be completed before any construction activities begin.</p>	
<p>Temporary alteration of drainage patterns would occur during Phase II construction. Construction activities in Phase II could require dewatering and discharge to adjacent surface waters, thus coverage would need to be obtained under an individual NPDES dewatering permit. The LARWQCB will be consulted by the project proponent to obtain the permit. The permit would contain standards considered sufficiently protective such that significant adverse impacts on surface water quality would be avoided.</p>	<p>Less than Significant</p>	<p>No mitigation is required.</p>	<p>Less than Significant</p>

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
<p>Biological Resources: (Potential construction phase impacts to biological resources are detailed under the Chapter 6 heading above.)</p>			
<p>Cultural Resources: (Potential construction phase impacts to biological resources are detailed under the Chapter 7 heading above.)</p>			
<p>Noise: Temporary increases in noise levels during project construction.</p>	<p>Significant</p>	<p>N1: Use of mufflers. Construction contracts shall specify that all construction equipment shall be equipped with mufflers and other suitable noise attenuation devices.</p> <p>N2: Notice of construction schedule and noise “hotline.” All residential units located within 500 feet of the construction site shall be sent a notice regarding the construction schedule of the proposed project. A clearly legible sign shall also be posted at the construction site. All notices and the signs shall indicate the expected dates and duration of construction activities, as well as provide a telephone number that residents can call to resolve any concerns about construction noise. The Lead Agency shall be responsible for responding to any local complaints about construction noise. The Lead Agency (or designee) would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and would be required to implement reasonable measures such that the complaint is resolved.</p> <p>N3: Limits of hours of construction. Pursuant to the Noise Control Ordinance of the City of Malibu, Section 8.24.050G, construction activities shall be prohibited during the hours between 7:00 p.m. and 7:00 a.m. during the weekdays and any time on Sundays or holidays. All construction related to the proposed project would take place between the hours defined by the Ordinance. Additionally, construction activities shall be coordinated with Adamson House staff to ensure that potentially disturbing construction activities do not occur during planned events at the Adamson House, such as Saturday weddings.</p>	<p>Significant</p>

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
<p>Traffic and Circulation: Construction of the proposed project would not generate a substantial number of construction-related truck trips or construction worker trips. All heavy truck traffic will follow designated truck routes, to be coordinated with the City of Malibu and Caltrans, as required. Construction equipment staging areas and access will also be developed in consultation with the City of Malibu. Beach access will be maintained at all times during construction and alternate parking will be available during construction of the new parking lot.</p>	Less than Significant	No mitigation is required.	Less than Significant
DEIR Chapter 9 – Effects not considered significant			
<p>Aesthetics: The project will not result in new sources of light or glare or otherwise result in adverse aesthetic impacts. Improvements to the lagoon, including new boardwalks improved habitat, and educational displays, would result in beneficial aesthetic effects.</p>	No Impact	No mitigation is required.	No Impact
<p>Agricultural Resources: No farmland exists on, or within the vicinity of Malibu Lagoon.</p>	No Impact	No mitigation is required.	No Impact
<p>Air Quality: Operation of the proposed project would not result in new vehicle trip generation. The number of parking spaces would also remain the same. The project has no other components that could reasonably be expected to result in adverse air quality effects.</p>	Less than Significant	No mitigation is required.	Less than Significant
<p>Geology and Soils: As part of the restoration process, topsoil salvage and management of vegetative communities would occur. The proposed project would not result in increased exposure of people to geologic hazards.</p>	Less than Significant	No mitigation is required.	Less than Significant

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
Hazardous Materials and Public Health (Vector Control): The proposed project would increase tidal flushing and improve water circulation, which would reduce, if not eliminate, areas of stagnant water.	Beneficial Impact	No mitigation is required.	Beneficial Impact
Mineral Resources: The site does not lie within an area classified by the Surface mining and Reclamation Act as a production-consumption region for mineral resources. The project would not involve the extraction of mineral resources.	No Impact	No mitigation is required.	No Impact
Noise: Post-construction there would be no increase in ambient noise levels. No new vehicle trips are anticipated as a result of the project and no other project components can reasonably be expected to result in substantial noise increases.	No Impact	No mitigation is required.	No Impact
Population and Housing: The project would not result in a population increase or any increase in demand for housing.	No Impact	No mitigation is required.	No Impact
Public Services: The project would not result in increase in demand for public services or facilities.	No Impact	No mitigation is required.	No Impact
Recreation: The improvements such as interpretive displays and panels, as well as multiple interpretive nodes/loops, would serve to enhance the educational and recreational uses of the site.	Beneficial Impact	No mitigation is required.	Beneficial Impact
Transportation/Circulation (Post-Construction): Operation of the proposed project would not result in any new vehicle trips since the existing use of the lagoon would remain unchanged. Parking, circulation, and access improvements would have negligible effects.	No Impact	No mitigation is required.	No Impact
Utilities and Service Systems: The project would not result in increased demand for utilities or service systems, including water supply, wastewater (septic/sewer), and solid waste.	No Impact	No mitigation is required.	No Impact

Mitigation Monitoring and Reporting

The Mitigation Monitoring and Reporting Program (MMRP) is a CEQA-mandated outcome of the EIR process undertaken for the proposed project. The results of the environmental analyses, including proposed mitigation measures, are documented in the Final EIR for the proposed project.

CEQA requires that agencies adopting EIRs take affirmative steps to determine that approved mitigation measures are implemented subsequent to project approval.

Effective January 1, 1989, CEQA was amended to add Section 21081.6, implementing Assembly Bill (AB) 3180. As part of CEQA (state-mandated) environmental review procedures, Section 21081.6 requires a public agency to adopt a monitoring and reporting program for assessing and ensuring efficacy of any mitigation measures applied to the proposed project. Specifically, the lead or responsible agency must adopt a reporting or monitoring program for mitigation measures incorporated into a project or imposed as conditions of approval. The program must be designed to ensure compliance during project implementation. As stated in Public Resources Code, Section 21081.6 (a) (1):

“The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation. For those changes which have been required or incorporated into the project at the request of a responsible agency or a public agency having jurisdiction by law over natural resources affected by the project, that agency shall, if so requested by the lead agency or a responsible agency, prepare and submit a proposed reporting or monitoring program.”

AB 3180 provides general guidelines for implementing monitoring and reporting programs (MMRP). Specific reporting and/or monitoring requirements, to be enforced during project implementation, shall be defined prior to final approval of the proposal by the responsible decision maker(s). In response to established CEQA requirements and those of AB 3180 (Public Resources Code Section 21000 et seq.), the proposed MMRP for the Malibu Lagoon Restoration and Enhancement Plan shall be submitted for consideration by the decision makers prior to completion of the environmental review process.

Table 2-2 is the final Mitigation Monitoring and Reporting matrix. The table lists each of the mitigation measures proposed in the EIR and specifies the following monitoring requirements for each:

- Party Responsible for Implementation of Mitigation,
- Implementation Phase,

- Party Responsible for Monitoring Activity,
- Monitoring Activity,
- Monitoring Period,
- Monitoring Frequency, and
- Outside Agency Coordination.

Table 2-2. Mitigation Monitoring and Reporting

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>BIO-1 Southern Steelhead Trout. Construction and lagoon excavation may occur during steelhead migration. In order to avoid direct impacts to steelhead, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.</p> <p>In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of similar tools. In the event that water must be pumped from these areas during construction, it shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be reflooded in a manner that minimizes disturbance of the lagoon salinity stratification and substrate and the release of sediment.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> Phase 2 Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. <p>Monitoring Period</p> <ul style="list-style-type: none"> Phase 2 Construction <p>Frequency</p> <ul style="list-style-type: none"> Once prior to initial lagoon earthwork in goby habitat area and continuing as determined necessary by biologist. 	<p>Potential coordination with CDFG, NOAA/NMFS, and USFWS</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>Reinundation of the western lagoon may provide refuge areas for fish during construction activities in the main lagoon. Block netting and barriers shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS-approved fisheries biologist would be conducted during any channel or bank disturbance. Pages 100 and 101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outline a possible construction sequence in more detail that incorporates several of these ideas.</p>			
<p>BIO-2 Tidewater Goby. Construction of the restoration project shall be timed to minimize disturbance of the western shoreline of the main lagoon when larval tidewater gobies are using the near-shore habitat. In order to avoid direct impacts to gobies, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.</p> <p>In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts to gobies shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of similar tools. In the event that water must be removed from these areas during construction, it</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> Phase 2 Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. <p>Monitoring Period</p> <ul style="list-style-type: none"> Phase 2 Construction <p>Frequency</p> <ul style="list-style-type: none"> Once prior to initial lagoon earthwork in goby habitat area and continuing as determined necessary by biologist. 	<p>Potential coordination with CDFG and USFWS</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be reflooded in a manner that minimizes disturbance of the lagoon salinity stratification and substrate and the release of sediment.</p> <p>Construction in the main lagoon shall occur outside of the May 1 through November 1 breeding season for the tidewater gobies. Reinundation of the western lagoon may provide refuge areas for fish during construction activities in the main lagoon. Block netting shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS approved fisheries biologist would be conducted during any channel or bank disturbance. Pages 100-101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outlines a possible construction sequence in more detail that incorporates many of these ideas.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. 	<p>Potential coordination with CDFG and USFWS</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
BIO-4 Western Snowy Plover. Schedule construction activities and ground disturbance in suitable/occupied habitat to avoid the western snowy plover breeding season from mid-March to August 30. On-site monitoring by a USFWS-approved biologist would be conducted during any disturbance within suitable/occupied habitat for this species.	Responsible Party(s) <ul style="list-style-type: none"> • State Parks Phase <ul style="list-style-type: none"> • All Construction 	Monitoring Period <ul style="list-style-type: none"> • All Construction Frequency <ul style="list-style-type: none"> • Once during initial lagoon earthwork and continuing as determined necessary by biologist. Responsible Party(s) <ul style="list-style-type: none"> • State Parks Activity <ul style="list-style-type: none"> • Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. Monitoring Period <ul style="list-style-type: none"> • All Construction Frequency <ul style="list-style-type: none"> • Once during initial lagoon earthwork and continuing as determined necessary by biologist. 	Potential coordination with CDFG and USFWS
BIO-5 Heermann’s Gull. On-site monitoring by a USFWS-approved biologist would be conducted during any disturbance within suitable/occupied habitat for this species.	Responsible Party(s) <ul style="list-style-type: none"> • State Parks Phase <ul style="list-style-type: none"> • All Construction 	Responsible Party(s) <ul style="list-style-type: none"> • State Parks Activity <ul style="list-style-type: none"> • Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. Monitoring Period <ul style="list-style-type: none"> • All Construction Frequency <ul style="list-style-type: none"> • Once during initial lagoon earthwork and continuing as determined necessary by biologist.. 	Potential coordination with CDFG and USFWS

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>BIO-6 Elegant Tern. On-site monitoring by a USFWS-approved biologist would be conducted during any disturbance within suitable/occupied habitat for this species.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. <p>Monitoring Period</p> <ul style="list-style-type: none"> • All Construction <p>Frequency</p> <ul style="list-style-type: none"> • Once during initial lagoon earthwork and continuing as determined necessary by biologist.. 	<p>Potential coordination with CDFG and USFWS</p>
<p>BIO-7 California Least Tern. Schedule construction activities and ground disturbance to avoid the California least tern breeding season and post-breeding season foraging (July to August). On-site monitoring by a USFWS-approved biologist would be conducted during any disturbance within suitable/occupied habitat for this species.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Retain USFWS-approved biologist to monitor lagoon earthwork and make determination about need for further monitoring as construction continues. <p>Monitoring Period</p> <ul style="list-style-type: none"> • All Construction <p>Frequency</p> <ul style="list-style-type: none"> • Once during initial lagoon earthwork and continuing as determined necessary by biologist.. 	<p>Potential coordination with CDFG and USFWS</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>HYDRO-1: Maintenance of Stormwater System. Permeable tiles, drainage swales, pumps, pipelines, and any associated equipment must be maintained on a regular basis to ensure full functioning. Maintenance may include removal of fine sediments from tile gaps for proper infiltration and periodic sediment removal from drainage swales for capacity maintenance. The project manager will ensure that all components of the storm drainage system are maintained to design and manufacturer specifications on a regular basis.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • Post-construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Inspection and maintenance of permeable parking lot materials, drainage swales, and other stormwater components. <p>Monitoring Period</p> <ul style="list-style-type: none"> • Post-construction <p>Frequency</p> <ul style="list-style-type: none"> • Monthly, with increased frequency as needed during winter months and prior to anticipated storm events. 	<p>None.</p>
<p>HYDRO-2: Implement Best Management Practices to Control Discharge of Construction-Related Pollutants to Surface Waters. Because project construction will cover an area greater than 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared by the Lead Agency or its contractor as required by the regional water quality control board (RWQCB) under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. The SWPPP shall meet the requirements of the RWQCB as well as any City and County requirements.</p> <p>The SWPPP will identify best management practices (BMPs) to maintain water quality. The final selection and design of erosion and sediment controls shall be subject to approval by the Lead Agency. BMPs in the SWPPP may include, but is not limited to, the following elements:</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • Pre-construction; construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Prepare SWPPP as indicated and implement BMPs as required. <p>Monitoring Period</p> <ul style="list-style-type: none"> • Construction <p>Frequency</p> <ul style="list-style-type: none"> • As specified for various BMPs 	<p>Regional Water Quality Control Board</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<ul style="list-style-type: none"> • Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed for disturbed areas. • Earth dikes, drainage swales, and ditches shall be provided to intercept, divert, and convey surface runoff and sheet flow; prevent erosion; and reduce pollutant loading. Specific areas that may need such measures shall be identified on the construction drawings. • Roads used during construction shall be continuously swept and cleaned of accumulated earth and debris in the construction zone during project construction, particularly before predicted rainfall events. • Excavated materials deposited or stored on-site temporarily shall not be placed in or adjacent to open water channels and shall be wetted and covered as necessary to prevent runoff and erosion. • Oils, fuels, and other toxicants spilled or deposited near the project site shall be removed and disposed of according to applicable laws and regulations. • Establish grass or other vegetative cover over areas that have been disturbed by construction as soon as possible after disturbance to establish vegetative cover. This will reduce erosion by slowing runoff velocities, enhancing infiltration and transpiration, trapping sediment and other particulates, and protecting soil from raindrop impact. 			

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>The Lead Agency and/or its contractors shall implement a monitoring program to verify BMP effectiveness. The monitoring program shall begin at the outset of construction and terminate upon completion of the project.</p>			
<p>HYDRO-3: Implement a Hazardous Material Spill Prevention Control and Countermeasure Plan. A Hazardous Material Spill Prevention Control and Countermeasure Plan would be prepared as part of the NPDES General Construction Permit to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction of the project. This plan will describe storage procedures and construction site housekeeping practices and identify the parties responsible for monitoring and spill response. Routine inspections and monitoring of best management practices would ensure minimal impacts to the environment occur. Commonly practiced best management practices include use of containment devices for hazardous materials, training of construction staff regarding safety practices to reduce the chance for spills or accidents, and use of nontoxic substances where feasible. The plan also would describe actions required if a reportable spill occurs, such as which authorities to notify and the proper clean-up procedures. The Hazardous Material Spill Prevention Control and Countermeasure Plan would contain standards considered sufficiently protective such that significant adverse impacts on surface and groundwater quality would be avoided. The plan shall be completed before any construction activities begin.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Prepare and implement various components of Plan. <p>Monitoring Period</p> <ul style="list-style-type: none"> • Construction <p>Frequency</p> <ul style="list-style-type: none"> • As specified in approved plan. 	<p>Regional Water Quality Control Board</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>AQ-1: Dust sweeping. The construction area and vicinity (driveways, access roads, and staging areas) shall be swept with water sweepers on a daily basis or as necessary to ensure there is no visible dust.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Ensure construction area is swept or watered regularly. <p>Monitoring Period</p> <ul style="list-style-type: none"> • All Construction <p>Frequency</p> <ul style="list-style-type: none"> • Daily 	<p>None</p>
<p>AQ-2 Covering or watering of stockpiles. On-site stockpiles of debris, dirt, or rusty material shall be covered or watered at least twice daily to prevent fugitive dust. All unpaved roads, parking, and staging areas shall be watered at least once every two hours of active operations.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Ensure all stockpiles are covered or watered regularly. <p>Monitoring Period</p> <ul style="list-style-type: none"> • All Construction <p>Frequency</p> <ul style="list-style-type: none"> • Daily 	<p>None</p>
<p>AQ-3 Covering of Haul Trucks. All haul trucks hauling soil, sand, and other loose materials shall either be covered or maintain two feet of freeboard.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Monitor haul truck activity to ensure compliance. <p>Monitoring Period</p> <ul style="list-style-type: none"> • All Construction <p>Frequency</p> <ul style="list-style-type: none"> • Daily 	<p>None</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>CR-1 Cultural Resources Testing in Area Adjacent to CA-LAN-264. Cultural resources, including CA-LAN-264 and the historic Adamson House grounds and ancillary structures, will be avoided to the extent possible. The hydrology of the lagoon will not be changed such that the boathouse or grounds are at greater risk of flood or construction impacts.</p> <p>Cultural resources excavations will be undertaken prior to any ground-disturbing activities along the eastern bank of the main lagoon channel adjacent to CA-LAN-264 if any project-related earthwork occurs within 100 feet of the known boundary of CA-LAN-264. Test excavations shall not take place within the known boundaries of CA-LAN-264 but adjacent to the boundaries if project construction would require any ground-disturbing activities within 100 feet of the known site boundary.</p> <p>Because sensitivity is moderate to high for cultural resources, including human remains, to be present along this edge of the project area, a subsurface testing program should be implemented to identify if resources are present and evaluate potentially NRHP-eligible resources. This should be undertaken if any project related construction comes within 100 feet of the known boundary of CA-LAN-264 (See Dillon 1987:45).</p> <p>If subsurface testing identifies intact, significant archaeological resources within the project area that cannot be avoided, the project would have an adverse effect. Development of measures to mitigate adverse effects would be necessary and a Memorandum of Agreement would be required to complete Section 106 consultation.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> Phase 2 Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Archaeological monitoring of earthwork <p>Monitoring Period</p> <ul style="list-style-type: none"> Phase 2 Construction <p>Frequency</p> <ul style="list-style-type: none"> Daily for any earthwork within 100 feet of known boundary of CA-LAN-264. 	<p>Native American Consultation; Possible SHPO</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>The preconstruction testing program should include, but need not be limited to:</p>			
<ul style="list-style-type: none"> • development of a testing strategy to identify subsurface archaeological deposits, including further research on previous investigations and regarding previous lagoon excavations, in an effort to refine the scope of any field effort; • evaluation of significance and integrity of exposed archaeological deposits (according to the National Historic Preservation Act [NHPA], NRHP, and CRHR criteria) if present, in consultation with the State Historic Preservation Officer (SHPO); and • consultation with local Native Americans if prehistoric or ethnohistoric resources are identified. 			
<p>Upon identification of any significant prehistoric or historical archaeological resources, it will be necessary to avoid these resources during project development, or to formulate a treatment plan to mitigate adverse effects. A treatment plan, adopted within a Memorandum of Agreement, to be negotiated in consultation with the SHPO, would likely include the following:</p>			
<ul style="list-style-type: none"> • an acceptable data recovery plan stating specific research goals and questions that are to be addressed if archaeological deposits are to be recovered, • postfield artifact processing and analysis; • report preparation in accordance with the guidelines of DPR, and • permanent curation of artifacts and documents in a repository consistent with the National Park Service guidelines for the 			

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>curation of archaeological collections (36 Code of Federal Regulations [CFR79]).</p> <p>Feature recovery should employ standard archaeological excavation techniques. The testing and evaluation plan should be designed and implemented by a qualified Prehistorical Archaeologist, and if discoveries warrant, a qualified Historical Archaeologist.</p> <p>Both the testing and evaluation plan and the data recovery strategy should be developed in consultation with the project proponent and interested local Native American groups. It should state that Native American human remains will be treated in compliance with Health and Safety Code, Sections 7050.5, 8010, and 8011 and Public Resources Code, Section 5097.98. Given the potential for encountering Native American artifacts, a Native American should monitor all subsurface excavations.</p>			
<p>CR-2 Cultural Resources Monitoring in Area Adjacent to CA-LAN-264. Cultural resources monitoring is recommended during any ground disturbing activities along the eastern bank of the main lagoon channel adjacent to CA-LAN-264. Monitoring will be conducted if conditions allow for observation of spoils. Monitoring of dredging is probably not feasible given underwater activity would not be visible. However, underwater cultural sites may be present, and the material dredged will be inspected for the presence or absence of cultural material. The remainder of the project area may be monitored if notable cultural materials are discovered, or monitoring may be further limited if the monitoring area appears previously</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> Phase 2 Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Archaeological monitoring of earthwork <p>Monitoring Period</p> <ul style="list-style-type: none"> Phase 2 Construction <p>Frequency</p> <ul style="list-style-type: none"> Daily for any earthwork within 100 feet of known boundary of CA-LAN-264. 	<p>Native American Consultation; Possible SHPO</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>disturbed (as may be the case in areas where the California Department of Transportation (Caltrans) has deposited fill material and rip rap). If prehistoric cultural resources are discovered in this area during monitoring or other construction, all work will be halted in the vicinity of the archaeological discovery until a qualified archaeologist can visit the site of discovery and assess the significance of the archaeological discovery. Further treatment may be required, including site recordation, excavation, site evaluation, and data recovery.</p>			
<p>CR-3 Stop Work If Cultural Resources Are Discovered during Ground-Disturbing Activities. If buried cultural resources—such as flaked or ground stone, historic debris, building foundations, shellfish remains or non-human bone—are inadvertently discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a State Parks archaeologist or designee can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include: development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs, such as excavation or detailed documentation. Avoidance of cultural remains shall be the top priority at all times.</p> <p>If cultural resources are discovered during construction activities, the construction contractor will verify that work is halted until appropriate site-specific treatment measures, such as those listed above, are implemented.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • Phase 2 Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Archaeological monitoring of earthwork <p>Monitoring Period</p> <ul style="list-style-type: none"> • Phase 2 Construction <p>Frequency</p> <ul style="list-style-type: none"> • Daily for any earthwork within 100 feet of known boundary of CA-LAN-264. 	<p>Native American Consultation; Possible SHPO</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>CR-4 Comply with State Laws Pertaining to the Discovery of Human Remains. If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary to comply with state laws relating to the disposition of Native American burials that fall within the jurisdiction of the California Native American Heritage Commission (Public Resources Code Section 5097). Construction work shall not continue within 100 feet of a location where human skeletal remains are found.</p> <p>According to California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American.</p> <p>If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission to determine the most likely living descendant(s). The most likely living descendant shall determine the most appropriate means of treating the human remains and any associated grave artifacts, and shall oversee disposition of the human remains and associated artifacts by the project archaeologists. This impact would be significant, but implementation of the mitigation measures above would reduce this impact to a less-than-significant level.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Phase</p> <ul style="list-style-type: none"> • Phase 2 Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> • State Parks <p>Activity</p> <ul style="list-style-type: none"> • Archaeological monitoring of earthwork <p>Monitoring Period</p> <ul style="list-style-type: none"> • Phase 2 Construction <p>Frequency</p> <ul style="list-style-type: none"> • Daily for any earthwork within 100 feet of known boundary of CA-LAN-264. 	<p>Native American Consultation; Possible SHPO</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>N-1 Use of Mufflers. Construction contracts shall specify that all construction equipment shall be equipped with mufflers and other suitable noise attenuation devices.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Ensure use of mufflers and other attenuation devices. <p>Monitoring Period</p> <ul style="list-style-type: none"> All Construction <p>Frequency</p> <ul style="list-style-type: none"> Daily 	<p>None</p>
<p>N-2 Notice of Construction Schedule and Noise “Hotline.” All residential units located within 500 feet of the construction site shall be sent a notice regarding the construction schedule of the proposed project. A clearly legible sign shall also be posted at the construction site. All notices and the signs shall indicate the expected dates and duration of construction activities, as well as provide a telephone number that residents can call to resolve any concerns about construction noise.</p> <p>The Lead Agency shall be responsible for responding to any local complaints about construction noise. The Lead Agency (or designee) would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and would be required to implement reasonable measures such that the complaint is resolved.</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Send notices, post sign, and designate a community liaison and phone number to respond to any noise concerns. <p>Monitoring Period</p> <ul style="list-style-type: none"> All Construction <p>Frequency</p> <ul style="list-style-type: none"> Daily 	<p>None</p>
<p>N-3 Limits of hours of construction. Pursuant to the Noise Control Ordinance of the City of Malibu, Section 8.24.050G, construction activities shall be prohibited during the hours between 7:00 p.m. and 7:00 a.m. during the weekdays and any time on</p>	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Phase</p> <ul style="list-style-type: none"> All Construction 	<p>Responsible Party(s)</p> <ul style="list-style-type: none"> State Parks <p>Activity</p> <ul style="list-style-type: none"> Ensure adherence to construction hours. 	<p>None</p>

MITIGATION MEASURE	IMPLEMENTATION	MONITORING	OUTSIDE AGENCY COORDINATION
<p>Sundays or holidays. All construction related to the proposed project would take place between the hours defined by the Ordinance.</p>		<p>Monitoring Period</p> <ul style="list-style-type: none"> • All Construction 	
<p>Additionally, construction activities shall be coordinated with Adamson House staff to ensure that potentially disturbing construction activities do not occur during planned events at the Adamson House, such as Saturday weddings.</p>		<p>Frequency</p> <ul style="list-style-type: none"> • Daily 	

Findings of Fact and Statement of Overriding Considerations

The California Environmental Quality Act (CEQA) requires that a public agency, prior to approving a project, identify significant impacts of the project and make one or more of three written findings for each of the significant impacts. The first possible finding is that “[c]hanges or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR” (*CEQA Guidelines*, Section 15091(a)(1)). The second possible finding is that “[s]uch changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency” (*CEQA Guidelines*, Section 15901(a)(2)). The third possible finding is that “[s]pecific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible mitigation measures or project alternatives identified in the final EIR” (*CEQA Guidelines*, Section 15901(a)(3)).

With respect to a project for which significant impacts are not avoided or substantially lessened, a public agency, after adopting proper findings, may nevertheless approve the project if the agency first adopts a statement of overriding considerations setting forth the specific reasons why the agency found that the project's "benefits" rendered "acceptable" its "unavoidable adverse environmental effects." (*CEQA Guidelines*, Sections 15093, 15043, subdivision (b); see also Public Resources Code Section 21081, subdivision (b).) The California Supreme Court has stated that, "[t]he wisdom of approving . . . any development project, a delicate task which requires a balancing of interests, is necessarily left to the sound discretion of the local officials and their constituents who are responsible for such decisions. The law as we interpret and apply it simply requires that those decisions be informed, and therefore balanced." (*Goleta II*, 52 Cal. 3d 553, 576.)

A Findings of Fact and Statement of Overriding Considerations report was prepared for this project as a companion document to the Malibu Lagoon Restoration and Enhancement Plan Final EIR. Findings were made for each potentially significant effect associated with the proposed project (as identified in this EIR). The findings demonstrate that all but one potentially significant impact (temporary and intermittent construction noise) could be reduced to a level of insignificance with the incorporation of mitigation measures. The rationale used to make these findings is provided in the following sections of this FEIR:

- Biological Resources – See Chapter 6 of this FEIR
- Cultural Resources – See Chapter 7 of this FEIR

- Hydrology and Water Quality – See Chapter 5 of this FEIR
- Construction Noise - See Chapter 8 of this FEIR

Accordingly, the California Department of Parks and Recreation (DPR) prepared a Statement of Overriding Considerations, acknowledging the potentially significant and unavoidable (albeit temporary and intermittent) construction noise impact that may result from implementation of the project. However, having (1) adopted all feasible mitigation measures; (2) rejected the alternatives to the project discussed above; (3) recognized all significant, unavoidable impacts; and (4) balanced the benefits of the proposed project against the significant and unavoidable effects, DPR made a determination that the benefits of the project to the public outweigh and override the potentially significant unavoidable construction phase noise impact.

A copy of the Findings of Fact and Statement of Overriding Considerations is available for public review at the DPR Angeles District office located at 1925 Las Virgenes Road, Calabasas, California 91302. DPR is the custodian of record for the proposed project and EIR.

Chapter 3

Project Description

Introduction

This chapter describes the proposed *Malibu Lagoon Restoration and Enhancement Plan* (plan or project). The project description provided below highlights the key features of the plan. The plan itself, prepared by Moffatt & Nichol in association with Heal the Bay (June 2005) for California State Parks and the Coastal Conservancy, is included in its entirety in Appendix A and should be considered a companion document to this EIR as it inherently represents the most thorough description of the proposed actions.

In accordance with the requirements of CEQA (Section 15124), the project description provides information about location and boundaries of the proposed project, a statement of objectives, and a general description of the various characteristics of the project. A brief summary of the intended uses of the EIR is also provided.

Project Background

Southern California has lost approximately 95 percent of its historic coastal wetlands. As a result of urban encroachments, the lagoon as we see it today is a very small portion of its historic area. The PCH bridge has dissected and constricted the lagoon surface area, and a significant portion of the once low-lying areas near the mouth of Malibu Creek were filled in the 1940s and 1950s. By the 1970s the site was completely filled and was covered by two baseball fields.

Increased urbanization and imported water upstream in the Malibu Creek Watershed has increased the volume of water transported into the lagoon and urban pollution has greatly diminished the quality of the water through inputs of nutrients, sediments, and pollutants.

Several restoration efforts have been made in the past. In 1983, the California Department of Parks and Recreation (DPR) initiated a restoration of the lagoon, which involved the excavation of three channels, seeding with salt marsh plants, and creation of a series of boardwalks to allow for public access. In 1996, the California Department of Transportation (Caltrans) funded a restoration plan to

mitigate for impacts incurred during the Malibu Lagoon PCH Bridge Replacement Project. This restoration project was conducted by the DPR and RCDSMM and included the very successful tidewater goby habitat enhancement project and the revegetation of areas disturbed by construction activities with native species, including extensive removal of non-native species.

In the late 1990s, the Coastal Conservancy funded a study by UCLA to identify the status of the ecological health and water quality in the lower creek and the lagoon systems and to recommend best management practices and restoration options.

Project Purpose, Need, and Objectives

Since the 1850s, 90 percent of California's original coastal wetland acreage has disappeared, and many of the remaining wetlands are in danger of being further degraded or destroyed due to landfill, diking, dredging, pollution, and other human disturbances. However, a growing awareness of the importance of this habitat has led to efforts to protect existing wetlands, and to restore those that have been degraded.¹

The purpose of the plan is to restore and enhance the ecological conditions of the lagoon and improve public access and education about the lagoon. The plan presents information regarding the current condition of the lagoon, goals and strategies for the restoration, and implementation of a monitoring plan. Essentially, the plan offers strategies to enhance the lagoon as one of the few remaining California coastal wetlands, prevent further deterioration of the lagoon, improve visitors' experience, and educate the public about the lagoon's ecosystem processes. The project will increase wetlands (marsh) habitat at the existing lagoon, enhance tidal influence, and improve circulation, remove exotic invasive vegetation species, and increase native vegetation while enhancing the visitor and recreational experience.

The Lead Agency has identified the following major objectives for the proposed project:

- Decrease urban runoff from surrounding sources into the lagoon to improve its water quality and decrease eutrophication.
- Increase circulation of water during open and closed conditions.
- Restore habitat by re-establishing suitable soil conditions and native plant species and removing non-native species.
- Relocate existing parking lot to increase habitat size and utilize permeable surfaces.

¹ California's Coastal Wetlands: <http://ceres.ca.gov/ceres/calweb/coastal/wetlands.html>.

² Over-enrichment of a water body with nutrients, resulting in excessive growth of organisms and depletion of dissolved oxygen concentration.

- Evaluate, record, and analyze existing and changing ecological conditions of the lagoon using physical, chemical, and biological parameters to allow agencies, organizations, and stakeholders to monitor progress towards restoration goals.
- Provide improved visitor and educational amenities.

Project Location and Setting

Physical Setting

Malibu Lagoon is a 31-acre shallow water embayment occurring at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay and within Malibu Lagoon State Beach. The lagoon empties into the Pacific Ocean at Malibu Surfrider Beach (See Figures 3-1 and 3-2). The lagoon is located generally south of the intersection of PCH and Cross Creek Road in the City of Malibu. Existing land uses on the project site are primarily recreational and supportive of open space and habitat preservation. Onsite amenities include a surface parking lot, walking and beach access trails, a picnic area, and portable restroom facilities.

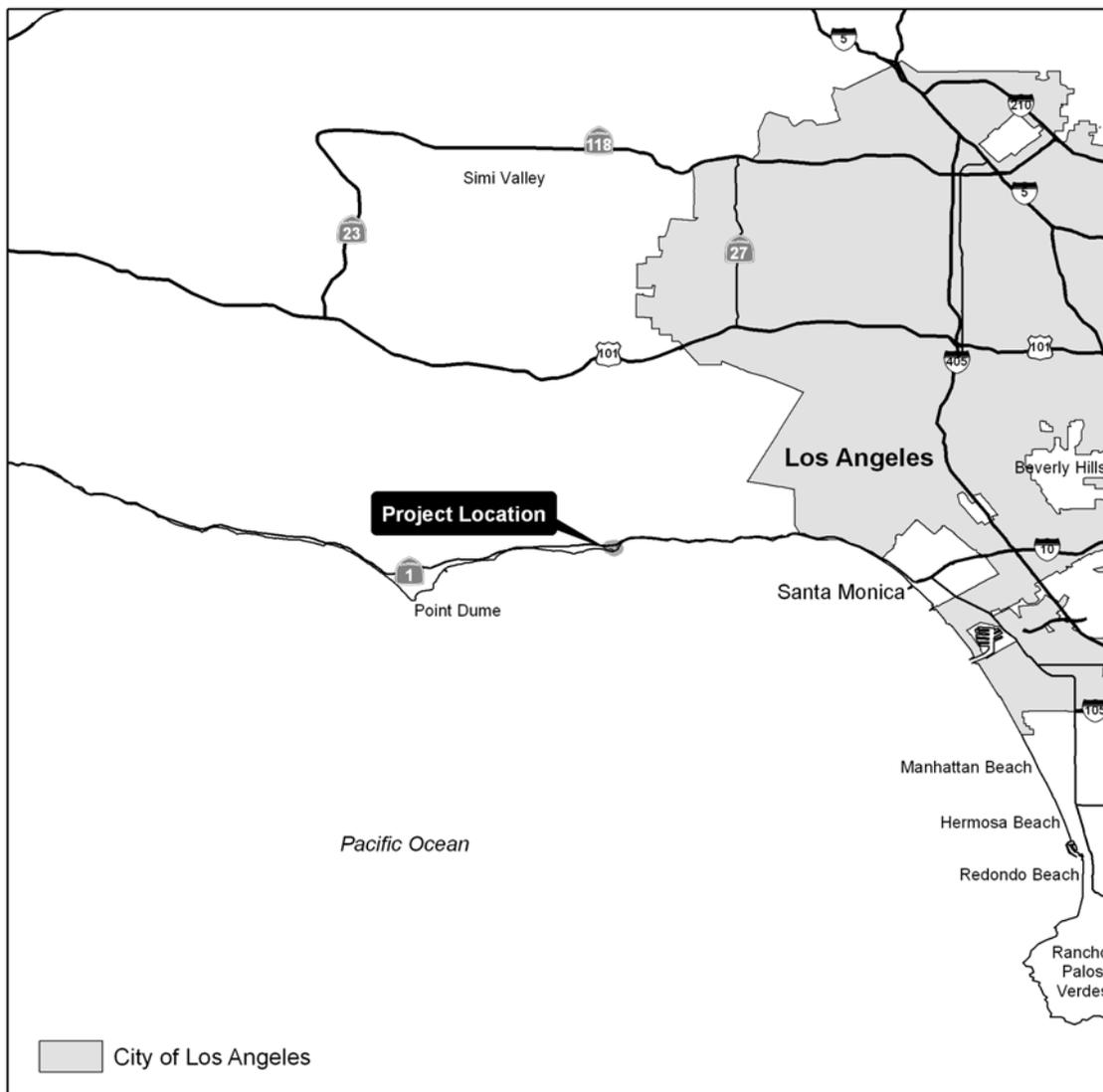
Surrounding Land Uses

The area in the immediate vicinity of the lagoon contains a mix of land uses. Commercial uses and civic center offices are located north of the project site, across PCH. This commercial and civic area is contained within the Malibu Land Use Plan Civic Center Overlay Boundary. Malibu Creek also extends to the north of the site. Adjacent to the east of the lagoon, and within Malibu Lagoon State Beach, is the National Register-listed historic Adamson House. Immediately to the west of the site is a fenced private golf course, and bordering on the southwest is a strip of medium density single-family residences with beach frontage (Malibu Colony). Additional recreational uses are located to the south at Malibu Lagoon State Beach/Surfrider Beach and the Pacific Ocean.

³ City of Malibu General Plan, November 1995.

⁴ City of Malibu Local Coastal Program Land Use Plan, September 2002.

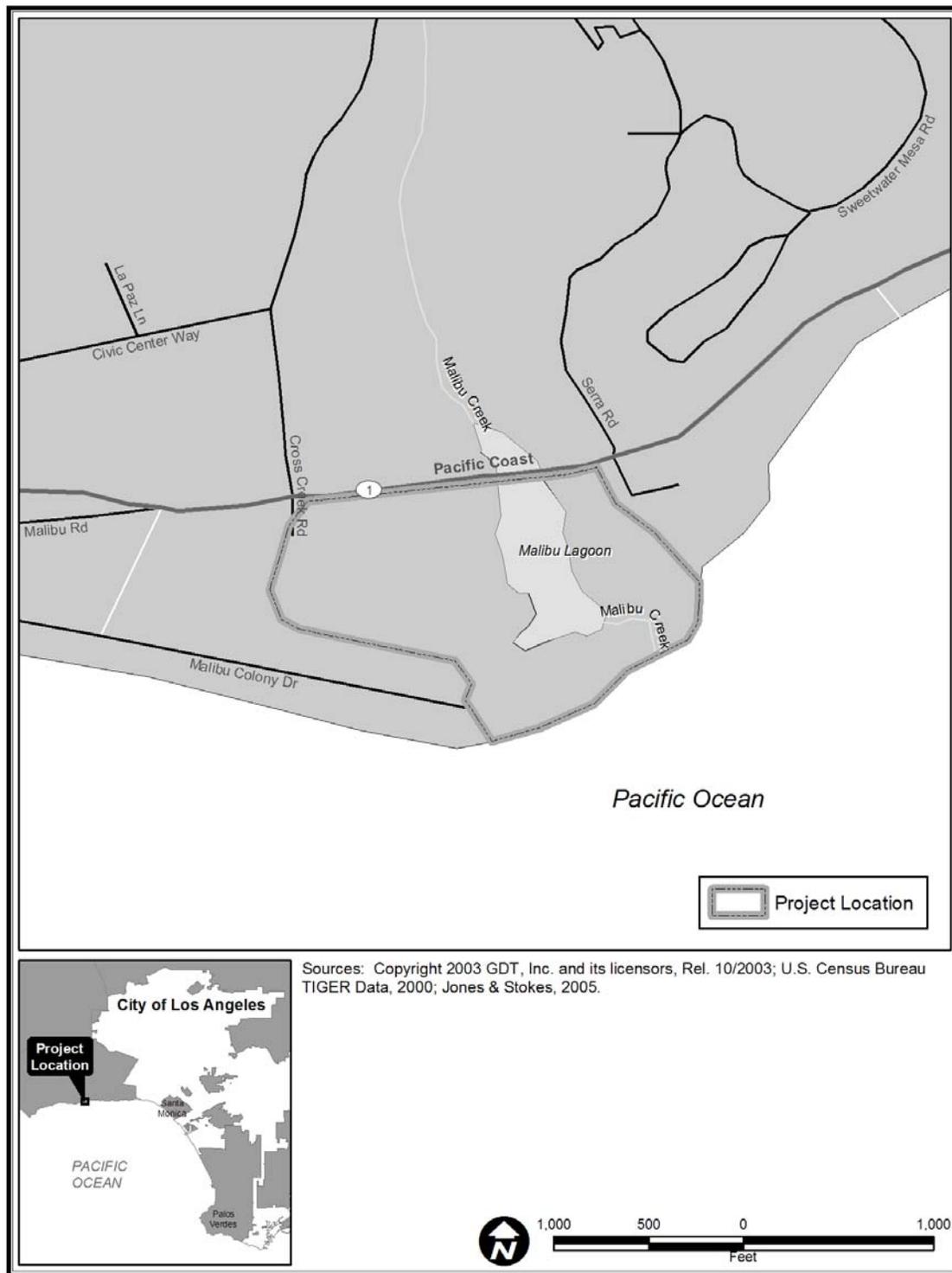
Figure 3-1. Regional Location Map



Sources: U.S. Census TIGER Data, 2000; Jones & Stokes, 2005.



Figure 3-2. Project Vicinity Map



Proposed Project

Based on the findings of the *Final Alternatives Analysis for the Malibu Lagoon Restoration Feasibility Study*, and discussions amongst DPR, the Coastal Conservancy, the LRWG, and LTAC, Alternative 1.5, the Modified Restore and Enhance Alternative, was selected as the proposed project. Alternative 1.5 embodies the lagoon restoration goals with the least amount of impacts to the existing lagoon ecosystem (see Figure 3-3). Please see Chapter 11 for details of other alternatives to the project that were considered. The *Final Alternatives Analysis* document is available online at: <http://www.healthebay.org/currentissues/mlhep/default.asp>.

Major components of the design are explained below.

Parking Lot and Staging Lawn

The existing parking lot would be relocated to the north and west to be adjacent to the PCH. The new parking lot and staging areas would be created with runoff treatment controls, including permeable pavement or other similar permeable substances, appropriate native vegetation, and would include a staging area to enhance existing educational and recreational uses of the site. The current number of parking spaces would remain and new interpretive displays and panels would be installed.

Main Channel

The main channel would remain substantially “as is.” The western edge of the main lagoon at the interface with the western arms complex would be reconfigured in the form of a naturalized slope to provide a degree of separation between main lagoon and west channel system.

Eastern Channel

The existing boathouse channel would be deepened and recontoured to create a new avian island along the bank of the Adamson House grounds. This would create additional mudflat habitat and promote additional water circulation around the new island.

West Lagoon Complex

The project presents a comprehensive approach to restore and enhance the ecological structure and function of the lagoon, as well as to enhance visitors’ experience through improvements to access and interpretation.

Figure 3-3. Proposed Project Plan



Project Implementation and Management Approach

The project employs a holistic approach to habitat restoration. The overall restoration plan has individual elements such as the Water Management Plan, Habitat Plan, Access, Education, and Interpretation Plan, and Monitoring Plan. The salient features of this holistic approach are listed below:

Water Management Plan

The Water Management Plan is designed to eliminate all polluted runoff discharges to the lagoon in order to improve lagoon water quality, and to improve and maintain circulation within the lagoon under all conditions. Direct surface discharges to the lagoon can occur from storm water and from irrigation. In order to manage the storm water, several strategies may be employed including:

Permeable Pavement

The parking lot and entrance road will be constructed with permeable materials to allow water to percolate into underlying soil and eventually the groundwater zone.

Drainage Swales

Drainage swales may be installed along the perimeter of hardscape areas such as the parking lot to intercept surface runoff that is not infiltrated into the parking lot. A swale of approximate size three feet deep by nine feet wide may be constructed. The exact location of the swales is not known at this point in project development. The drainage swales are intended to be large enough to hold runoff from the 100-year storm before it begins to overflow. The habitat formed with the swales would be designed to be complementary to the wetland.

Redirection of Storm Water

In order to redirect storm water away from the lagoon and towards other appropriate drainage facilities, two options are under consideration. One option would be to downward slope the parking lot towards the north, such that the run-off flows in a direction opposite to the lagoon. Such run-off could be conveyed to a swale or other conveyance feature (trench or pipe) to move farther away from the lagoon. The other option would be to route the drainage westward toward the collection sump for the City of Malibu's future force main line along Malibu Road. The run-off

from the future parking lot could be routed to the sump near Malibu Colony at the south end of the future force line, and then be included in water pumped upstream toward the future treatment plant near Cross Creek Road and Civic Center Way. Four drains currently exist from private homes in the Colony that shall be incorporated into the future treatment plant.

Irrigation

Water can be inadvertently contributed to the lagoon by temporary and permanent irrigation of plantings at landscaped areas. As the lagoon is a natural habitat area, permanent irrigation will not be implemented. Supplemental irrigation, either passive or active, may be installed. Active irrigation would include implementation of a temporary irrigation system (overhead spray, drip, tended watering, or a combination of these methods) to assist in establishment of plant materials. A passive method would involve a hydrophilic amendment to be used in the planting soils or as a binding agent for seed.

Circulation

Water within the lagoon needs to circulate to remain of suitable quality for use as habitat. A monitoring system would be installed to compare water quality data pre- and post-restoration.

Habitat Plan

The Habitat Plan addresses the initial enhancement and establishment of habitats within the restored lagoon system as well as the on-going maintenance and management activities required to ensure that restoration habitat objectives are achieved.

The habitat design would include the following features:

Slopes and Sediment Types

Habitat restoration within the restored lagoon is highly dependent upon development of suitable hydrologic soil conditions and the availability of desirable reproductive plant materials to colonize the restoration areas. To accomplish the desired restoration, appropriate considerations to elevations, slopes, and sediment characteristics would be made.

Topsoil and Sediment Salvage and Management

Development of habitat designs would necessitate stockpiling and reuse of suitable sediments to obtain the physical and chemical conditions to support the desired biological communities.

Restoration Planting and Natural Establishment

Depending on the habitat type (Marsh, Nontidal Southern Coastal Salt Marsh, Riparian, Coastal Dune/Bluff Scrub), a suitable restoration approach would be chosen (natural recruitment and salvaged plant transplants, natural recruitment, seeding and container planting). Many of the desired species that exist in lagoon habitats would be salvaged and transplants may be undertaken to minimize the need for new plantings.

Maintaining Unvegetated Habitat Areas

Undesirable vegetation would be regularly removed from the naturally open unvegetated habitat areas, such as mudflats, channels, exposed avian islands, beaches, and dunes.

Minimizing Habitat Losses from Seasonal Inundation

In order to minimize habitat loss as a result of seasonal inundation, a variety of measures may be undertaken including developing an undulating topography within the seasonally inundated habitats, incorporating vegetation that tolerates prolonged exposure to anoxic soil conditions and promotes increased oxygenation of waters during inundation periods.

Long-term Habitat Maintenance

Protection against invasive exotic species would require on-going exotic plant control efforts. In addition to threats of exotic species invasion, high nutrient loading within the lagoon would need to be controlled.

Access, Education, and Interpretation Plan

This plan includes proposed relocation of the parking lot along PCH, and provision of multiple interpretive nodes and areas for educational programs. This would allow for more ground surface area for wetland habitat restoration. The existing parking capacity would remain unchanged due to relocation of the parking lot. A new bus and Park Link shuttle stop would be reconfigured based on the new location of the parking lot. In addition, the existing trail along the perimeter of the western arms complex would be improved for use as the primary beach access trail. Three primary interpretive nodes would be provided near the parking area.

Some of the additional features of the plan include provision of storage and restroom facilities near entry parking circle, enhanced access to the east lagoon over PCH Bridge with interpretive signage and graphics, and an interpretive overlook at Adamson House boat dock.

Monitoring Plan

In order to measure improvements in the lagoon system, the monitoring plan aims to standardize sampling protocols, select monitoring parameters, and acquire a reliable baseline dataset.

Construction Scenario

Construction of the project would occur in two phases. The first phase of construction involves relocation of the existing parking lot closer to the park entrance and PCH. During this phase, the existing parking lot, which is located at the northern portion of the project site, would be removed. The northwestern portion of the project site, adjacent to PCH, would be graded and paved for the new parking lot. The first phase of construction would occur between November 2006 and January 2007.

The second phase of construction would occur at the lagoon. Construction activities at the lagoon would primarily involve earthwork. The second phase of construction would begin after completion of the Phase 1 parking lot construction in 2007.

The CEQA Environmental Review Process

CEQA requires the preparation of an EIR when there is substantial evidence that a project may have a significant effect on the environment. The purpose of an EIR is to provide decision makers, public agencies, and the general public with an objective and informational document that fully discloses the potential environmental effects of the proposed project.

The EIR process is specially designed to facilitate the objective evaluation of potentially significant direct, indirect, and cumulative impacts of the proposed project and identify potentially feasible mitigation measures and alternatives that reduce or avoid the project's significant effects. In addition, CEQA specifically requires that an EIR identify those adverse impacts determined to be significant after mitigation.

In accordance with CEQA and the State CEQA Guidelines, which are found in Title 14 of the California Code of Regulations, commencing with Section 15000, a Notice of Preparation of a Draft Environmental Impact Report (NOP) was distributed on October 28, 2005, to the State Office of Planning and Research and responsible and trustee agencies as well as private organizations and individuals that may have an interest in the proposed project. The NOP was also published in the *Malibu Times* and *Malibu Surfside News* on October 27, 2005.

The purpose of the NOP was to provide notification that DPR, as lead agency, planned to prepare an EIR for the proposed project and solicit guidance on the scope and content of the EIR. The NOP presented a description of the proposed project, potential environmental effects, instructions on how to provide comments, and the date, time, and location of the public scoping meeting that was held at Malibu City Hall the evening of November 16, 2005. The NOP and copies of all letters received in response to the NOP are included in Appendix B.

Approximately 15 persons attended the scoping meeting. An overview and history of the lagoon, the proposed Plan, and CEQA requirements were presented. The presentation included a chronology of preceding lagoon restoration actions that ultimately led to the development the proposed Plan. During the public comment portion of the meeting, questions were raised concerning construction phase beach access, biological impacts, and the methodology used to determine impacts. All questions and concerns raised at the scoping meeting have been addressed in this EIR.

As the lead agency under CEQA, DPR directed the preparation of this EIR through the use of professional environmental services contractors. This EIR, however, reflects the independent judgment of DPR and is intended to comply with CEQA and the State CEQA Guidelines (see Public Resources Code, §21100; State CEQA Guidelines, §§15120–15132).

The Draft EIR was circulated for public review and comment for a period of 45 days (January 20, 2006, through March 6, 2006). During that period, comments from the general public, organizations, and agencies regarding environmental issues raised in the Draft EIR and the Draft EIR's accuracy and completeness were submitted to DPR.

Upon completion of the public review period, a Final EIR was prepared. The Final EIR includes the comments on the Draft EIR received during the formal public review period as well as responses to those comments (see Chapter 13 for all comment letters received and DPR responses).

Pursuant to Section 21081.6 of the Public Resources Code, public agencies, when approving a project, must also adopt a monitoring or reporting program for the changes that were incorporated into the project or made a condition of project approval in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program is adopted at the time of project approval and must be designed to ensure compliance during project implementation. The mitigation monitoring program for the project is included in Chapter 2 of this EIR (see Table 2-2).

Finally, prior to approval of the proposed project, CEQA also requires DPR to adopt “findings” with respect to each significant environmental effect identified in the EIR (Public Resources Code, §21081; State CEQA Guidelines, §15091). A Findings of Fact and Statement of

Overriding Considerations report was prepared for this project as a companion document to the Malibu Lagoon Restoration and Enhancement Plan Final EIR. Findings were made for each potentially significant effect associated with the proposed project (as identified in this EIR). The findings demonstrate that all but one potentially significant impact (temporary and intermittent construction noise) could be reduced to a level of insignificance with the incorporation of mitigation measures.

Accordingly, DPR prepared a Statement of Overriding Considerations, acknowledging the potentially significant and unavoidable (albeit temporary and intermittent) construction noise impact that may result from implementation of the project. However, having (1) adopted all feasible mitigation measures; (2) rejected the alternatives to the project discussed above; (3) recognized all significant, unavoidable impacts; and (4) balanced the benefits of the proposed project against the significant and unavoidable effects, DPR made a determination that the benefits of the project to the public outweigh and override the potentially significant unavoidable construction phase noise impact.

A copy of the Findings of Fact and Statement of Overriding Considerations is available for public review at the DPR Angeles District office located at 1925 Las Virgenes Road, Calabasas, California 91302. DPR is the custodian of record for the proposed project and EIR.

Intended Uses of the EIR

According to Section 15121 of the State CEQA Guidelines, an EIR is a public document used by a public agency to analyze the potentially significant environmental effects of a proposed project, identify alternatives, and disclose possible ways to reduce or avoid possible environmental damage. As an informational document, an EIR does not recommend approval or denial of the project. The main purpose of an EIR is to inform governmental decision makers and the public about potential environmental impacts of the project.

Accordingly, this EIR will be used by DPR, as the lead agency under CEQA, in making decisions with regard to approval of the project and its implementation.

The information in this EIR may also be used by other agencies identified below in deciding whether to grant permits or approvals necessary to construct or operate the proposed project:

- The Army Corps of Engineers would issue permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors.

- The CDFG would issue a Streambed Alteration Agreement pursuant to Section 1601 of the California Fish and Game Code.
- The CCC would issue a Coastal Development Permit pursuant to the California Coastal Act of 1976.
- The Los Angeles RWQCB would issue a Water Quality Certification pursuant to Section 401 of the Clean Water Act.
- The City of Malibu would issue a Coastal Development Permit for construction of the Phase 1 parking lot improvements within City jurisdiction.
- An encroachment permit for work within Caltrans ROW may also be required.

Organization of the EIR

- Chapter 1 of this EIR provides an introduction to the project. This chapter provides an overview of the CEQA process and the agencies involved.
- Chapter 2 of this EIR is the summary chapter that provides an overview of the detailed information contained in subsequent chapters. The summary includes a table that summarizes the potential environmental impacts in each resource area, the significance determination, mitigation measures, and the level of significance after mitigation for those impacts.
- Chapter 3 of this EIR provides a detailed description of the proposed project as well as the project objectives, location, characteristics, and construction scenario. A description of the intended uses of the EIR and public agency actions, and this section describing the organization of the EIR.
- Chapter 4 of this EIR describes the project's relationship to local and regional planning documents.
- Chapter 5 of this EIR describes the potential environmental effects to hydrology and water quality including a discussion of the environmental setting for the resource, environmental impacts as a result of the project, and required mitigation measures.
- Chapter 6 of this EIR describes the potential environmental effects to biological resources, including a discussion of the environmental setting for the resource, environmental impacts as a result of the project, and required mitigation measures.
- Chapter 7 of this EIR describes the potential environmental effects to cultural resources, including a discussion of the environmental setting for the resource, environmental impacts as a result of the project, and required mitigation measures.
- Chapter 8 of this EIR describes the project's potential construction effects in the areas of air quality, biological resources, cultural

resources, hydrology and water quality, noise, and traffic and circulation. Mitigation measures are listed as requirements to reduce temporary construction impacts.

- Chapter 9 of this EIR describes the effects considered not significant under CEQA. Because an Initial Study was not prepared prior to initiating the EIR analysis, Chapter 9 describes all the environmental topic areas that bear little relation to the project, such as agricultural resources, mineral resources, and aesthetics.
- Chapter 10 of this EIR provides an overview of the potential cumulative environmental effects of the proposed project when considered together with other development projects in the area.
- Chapter 11 of this EIR describes and analyzes the No-Project Alternative and other alternatives that were considered during the planning process. It also identifies the environmentally superior alternative.
- Chapter 12 provides sources and references used in the preparation of this EIR.
- Chapter 13 contains all comment letters received during the Draft EIR comment period, as well as DPR's responses to those comments.

Appendices to the EIR follow Chapter 13, including the full text of the Restoration Plan, public notices, and technical calculations.

Consistency with Local and Regional Plans

Setting

Existing Land Uses and Plan Designations

On-site

The project site comprises the entire 31-acre Malibu Lagoon, a shallow water embayment occurring at the terminus of the Malibu Creek watershed, emptying seaward of PCH at Malibu Surfrider Beach. The lagoon is within Malibu Lagoon State Beach, which is owned and operated by DPR, except for the sandy beach area that is operated by Los Angeles County Beaches and Harbors. Existing land uses on the project site are primarily recreational and supportive of open space and habitat preservation. Onsite amenities include a surface parking lot, walking and beach access trails, a picnic area, restroom facilities, and State Park facilitated tours and activities.¹

Adjacent

The area in the immediate vicinity of the lagoon contains a mix of land uses. Commercial uses and civic center offices are located north of the project site, across PCH. This commercial and civic area is contained within the Malibu LUP Civic Center Overlay Boundary. Malibu Creek also extends to the north of the site. Adjacent to the east of the lagoon is the National Register-listed historic Adamson House, which is located within Malibu Lagoon State Beach. Immediately to the west of the site is a fenced private golf course, and bordering on the southwest is a strip of medium density single-family residences with beach frontage (Malibu Colony). Additional recreational uses are located to the south at Malibu Lagoon State Beach/Surfrider Beach and the Pacific Ocean.

¹ California Department of Parks and Recreation web site, Malibu Lagoon State Beach. Available: <http://www.parks.ca.gov/?page_id=835>. Accessed: September 2005.

Major highways and transportation facilities in the vicinity of the site include PCH (Highway 1), the main transportation corridor serving the community, and Malibu Canyon Road (located to the west).

Land Use Policies and Plans

Several land use plans are applicable to the study area in which the project site lies. A brief description of the purposes, goals, and policies for each of these planning documents follows. It should be noted that, as a state agency, DPR is not subject to local zoning requirements and other plans and ordinances. However, as the applicable City of Malibu plans, policies, goals, and zoning designations are wholly consistent with the proposed project, they are included in this chapter for the benefit of the reader.

South Coast Air Quality Management Plan

The 1999 Air Quality Management Plan (AQMP) was prepared by SCAG and the SCAQMD to meet state and federal air quality standards for the South Coast Air Basin. The South Coast Air Basin encompasses 6,600 square miles and includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Air pollution in the region has been significantly reduced as a result of pollution control measures. Future pollution emissions forecasts are based on SCAG economic growth projections and California Energy Commission forecasts. The 2010 pollution projections are all substantially less than the 1990 levels. Projected future reductions in pollutant emissions will be achieved through a series of stationary and mobile source controls.

City of Malibu General Plan

The Malibu General Plan (November 1995) provides an analysis of existing conditions in the City, examines trends, issues and concerns affecting the region, and provides policies to guide development. The General Plan serves as the major tool for directing the City's growth while maintaining an attractive, viable, and safe environment. The General Plan states that the City is committed to the preservation of its natural and cultural resources. Seven state-mandated elements comprise the comprehensive general plan. Applicable elements are listed below.

Land Use Element

The General Plan Land Use Element serves as a guide for future development within the City. It includes a Land Use Policy Map that prescribes the location and distribution of land use types and intensities throughout the City and a statement of the City's goals, objectives, and policies related to land use planning. The land use designations are

complementary and consistent with the City's zoning designations and those outlined in the Malibu Local Coastal Program Land Use Plan.

Goals outlined in the Land Use element that are related to the proposed lagoon restoration include: protection and enhancement of natural and environmental resources; and recreational opportunities consistent with the protection of natural resources.

Specific policies related to the proposed project are presented in Table 4-1 at the end of this chapter.

Open Space and Recreation Element

The General Plan Open Space and Recreation Element contains an analysis of the open space lands and an action program for their preservation and conservation, scenic enjoyment, recreation and the use of natural resources. The overarching goals applicable to the project, as outlined in this element, include: an abundance of open space contributing to a rural and natural environment; and diverse opportunities for recreation and leisure. Table 4-1 lists the specific Open Space & Recreation policies related to the proposed project.

Conservation Element

The General Plan Conservation Element contains a plan for the conservation of natural resources within the City and adjacent areas. Its overarching goals are to preserve and protect natural, cultural, energy, and water resources, and to reduce solid waste. Consistent with these goals, it serves as a guide for the conservation, protection, restoration, and management of the City's existing natural resources by establishing policies that promote intelligent resource management. Related policies are listed in Table 4-1.

California Coastal Act

The City of Malibu is located within the Coastal Zone as defined by the California Coastal Act of 1976. The Coastal Act requires each community within the coastal zone to prepare a Local Coastal Program (LCP), including a LUP to protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural resources (see description of the Malibu LCP below). The Coastal Act policies (Coastal Resources Planning and Management Policies as set forth in Chapter 3 of the Coastal Act) are the basis for all LCPs and are incorporated into the Malibu LCP by reference. These policies address public access, recreation, marine environment, land resources, development, and industrial development. Applicable Coastal Act policies are listed in Table 4-1.

City of Malibu Local Coastal Program

The Coastal Commission Certified Malibu LCP (adopted by the California Coastal Commission on September 13, 2002) consists of the LUP, Local Implementation Plan, and includes zoning ordinances, zoning district maps, and sensitive coastal resource area maps

(Environmentally Sensitive Habitat Areas or ESHA's). The overarching goal and intent of the Land Use Plan policies is to ensure that the LCP LUP provides for protection, provision, and enhancement of public access and recreation opportunities in the City consistent with the goals, objectives, and policies of the California Coastal Act. The LCP LUP reflects the goals and preferences of the City as set forth in its General Plan. Applicable land use plan policies are shown in Table 4-1 at the end of this chapter.

California Department of Parks & Recreation Malibu Lagoon State Beach Resource Management Plan and General Development Plan

The Malibu Lagoon State Beach Resource Management Plan and General Development (April, 1978) aims to provide policies for preservation, interpretation, and public use of natural and cultural resource values within State Beach and Lagoon unit. The Plan includes management and development policies intended to enhance and perpetuate scenic, natural, and cultural values while providing for appropriate public use and recreation opportunities that will complement and preserve the resources present. The Plan also mentions specific improvements intended to restore and enhance the lagoon and marsh. Applicable development plans and resource policies are shown in Table 4-1 at the end of this chapter.

Impacts and Mitigation Measures

Thresholds of Significance

For the purposes of the analysis in this EIR, the proposed project would have a significant environmental impact on land use and planning if it would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation to an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Consistency with Existing Land Uses and Local Plans

Land uses surrounding the proposed project area include single-family residential, public open space, and visitor-serving commercial.

Restoration and enhancement projects would be compatible with these surrounding uses, as the onsite uses would not be changed, and onsite amenities would be minimally altered.

The consistency of the project with the Malibu General Plan, California Coastal Act, Malibu Local Coastal Program, and Malibu Lagoon State Beach Resource Management & Development Plan is summarized in Table 4-1 at the end of this chapter. As shown in the table, the project would be supportive of, and consistent with, the relevant policies and objectives in the aforementioned plans.

Consistency with Zoning Designations

The project area falls within the OS Malibu zoning land use classifications. The OS zone allows public beaches and parks and “establishes provisions for passive recreational activity and enjoyment and preservation of the city’s natural resources...”² The Malibu General Plan Land Use element and the Malibu LCP LUP designate the project area as OS as well. According to the General Plan Land Use Element text, “...the OS designation provides for publicly owned land which is dedicated to recreation or preservation of the City’s natural resources, including public beaches, park lands and preserves.”

Accordingly, the proposed project would not materially conflict with the Malibu General Plan, Malibu LCP LUP, and zoning land uses because (1) the lagoon (project site) is currently designated for use as a public beach, (2) the project would not require a zoning or land use change, and (3) the restoration plan does not propose expansion outside the existing Malibu Lagoon State Beach footprint. While DPR as a state agency is not subject to City zoning requirements and other local plans and ordinances, it is nevertheless consistent with these designations. No impacts would occur.

Impacts and Mitigation Measures

The proposed project is consistent with existing zoning and land use policies and is compatible with existing land uses; thus, no impacts would result, and no mitigation measures are required.

² City of Malibu Municipal Code, Zoning Ordinance. Available: <<http://municipalcodes.lexisnexis.com/codes/malibu/>>. Accessed: September 2005.

Table 4-1. Comparison of the Proposed Project with Local Plans

Objectives and Policies	Finding	Discussion
<u>Malibu General Plan – Land Use Element</u>		
<i>LU Policy 3.1.2: The City shall encourage appropriate passive uses of parks and beaches such as biking, bird watching, hiking, horseback riding, kayaking, scientific study, surfing, swimming and tide pool viewing.</i>	Consistent with this policy	Existing facilities would continue to provide appropriate passive uses. The project would not introduce new, active uses.
<u>Malibu General Plan – Conservation Element</u>		
<i>CON Policy 1.1.4: The City shall protect Environmentally Sensitive Habitat Areas (ESHA's) as a priority over development and against any significant disruption of habitat values.</i>	Consistent with this policy	The proposed project area is within an LCP-designated ESHA. The proposed project would directly improve the existing lagoon habitat, and would not result in development or significant habitat disruption.
<i>CON Policy 1.1.5: The City shall protect and reclaim Malibu's threatened natural resources such as the beaches, estuaries marine life, ocean tidepools, streams, waterfalls, wetlands, wildlife and plant life and their habitats.</i>	Consistent with this policy	The proposed project includes activities that would directly restore, enhance and manage Malibu Lagoon and its associated habitat.
<i>CON Policy 1.1.7: The City shall promote and maintain programs for interagency cooperation, both public and private, to accomplish comprehensive natural resource management.</i>	Consistent with this policy	The City has and continues to be involved in the project as a Responsible Agency.
<i>CON Implementation Measure 4: Develop and adopt a watershed-wide cooperative program committed to the protection of natural resources, with Malibu Creek as the most immediate priority. The programs shall seek the cooperation of adjacent jurisdictions in order to create uniform practices and protection measures.</i>	Consistent with this policy	The City has and continues to be involved in the project as a Responsible Agency.
<i>CON Policy 1.2.2: The City shall protect, preserve and reclaim very threatened plant community types that occur in Malibu, as inventoried by the Department of Fish and Game with special emphasis on these: Southern Coastal Bluff Scrub; Southern Dune Scrub; Valley Needlegrass Grassland; Southern Foredunes (Broadbeach); Venturan Coastal Sage Scrub; Coastal Brackish Marsh (Malibu Creek and Lagoon); Coastal and Valley Freshwater Marsh; Southern Willow Scrub; California Walnut Woodland and Valley Oak Woodland.</i>	Consistent with this policy	The City has and continues to be involved in the project as a Responsible Agency.

Objectives and Policies	Finding	Discussion
<i>CON Policy 1.3.4: The City shall protect and support restoration of all kelpbeds, wetlands, creeks and estuaries of Malibu.</i>	Consistent with this policy	The proposed project is intended to restore and protect Malibu Lagoon. The City of Malibu supports the proposed effort.
<i>CON Policy 1.3.6: The City shall take the lead to reclaim and preserve the natural state of the Malibu Lagoon.</i>	Consistent with this policy	City has and continues to be involved in planning efforts with other agencies to restore and enhance the lagoon.
<i>CON Implementation Measure 60: Develop a plan for restoration of the Malibu Lagoon addressing the advantage of (a) constructing additional wetlands; (b) widening the existing estuary; (c) establishing receiving water standards; (d) requiring a drainage system for the Civic Center Area and other areas currently draining into the estuary and lower creek.</i>	Consistent with this policy	City has and continues to be involved in planning efforts with other agencies to restore and enhance the lagoon.
<u>Malibu General Plan – Open Space and Recreation Element</u>		
<i>OS Policy 1.1.3: The City shall preserve, protect, and enhance the character and visual quality of natural open space as a scenic resource of great value and importance to the quality of life of residents and to the enhancement of the scenic experience of visitors.</i>	Consistent with this policy	The proposed project would improve the visual quality of Malibu Lagoon. The lagoon would continue to be a scenic resource to visitors and adjacent residents.
<i>OS Policy 2.1.3: The City shall preserve, protect, and maintain parks to assure continued enjoyment for future generations.</i>	Consistent with this policy	Restoration activities proposed under the Plan would provide needed improvements and maintenance—including habitat enhancement—to the existing state park area.
<i>OS Policy 3.3.1: The City shall work to ensure that public access is consistent with conservation.</i>	Consistent with this policy	The proposed project would include improvements to onsite trails and walkways consistent with conservation goals. Public coastal access would not be affected.
<u>California Coastal Act</u>		
<i>Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.</i>	Consistent with this policy	The purpose and intent of the proposed project is to maintain, enhance and restore Malibu Lagoon and its surrounding habitat.

Objectives and Policies	Finding	Discussion
<p><i>Section 30231. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.</i></p>	<p>Consistent with this policy</p>	<p>The Plan includes a water management component that would manage drainage from parking lot/public use areas to restored areas. Best Management Practices would be included to enhance water quality in the lagoon. Circulation within the lagoon would be closely monitored and evaluated.</p>
<p><i>Section 30240. (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.</i></p>	<p>Consistent with this policy</p>	<p>The project area is within an LCP-designated ESHA. The proposed project would not significantly disrupt habitat values, nor introduce unallowable uses, but is directly aimed at improving and enhancing the overall habitat area. The Plan would have a beneficial effect on existing ESHAs.</p>
<p><i>Section 30251. The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.</i></p>	<p>Consistent with this policy</p>	<p>The scenic and visual quality of the project area would be enhanced by the proposed restoration activities. The proposed project would not alter landforms nor disrupt existing views.</p>

Objectives and Policies	Finding	Discussion
<u>Malibu Local Coastal Program (LCP) Land Use Plan</u>		
<i>Chapter 2: Public Access & Recreation:</i>		
<i>Policy 2.17: Recreation and access opportunities at existing public beaches and parks shall be protected, and where feasible, enhanced as an important coastal resource. Public beaches and parks shall maintain lower-cost user fees and parking fees, and maximize hours of use to the extent feasible, in order to maximize public access and recreation opportunities. Limitations on time of use or increases in use fees or parking fees, which effect the intensity of use, shall be subject to a coastal development permit.</i>	Consistent with this policy	The proposed project would include improvements to onsite trails and walkways consistent with conservation goals. Public coastal access would not be affected. Park hours and useage fees would not be affected.
<i>Chapter 3: Marine and Land Resources:</i>		
<i>Policy 3.25: New development, including, but not limited to, vegetation removal, vegetation thinning, or planting of non-native or invasive vegetation shall not be permitted in required ESHA or park buffer areas, except for that case addressed in Policy 3.27. Habitat restoration and invasive plant eradication may be permitted within required buffer areas if designed to protect and enhance habitat values.</i>	Consistent with this policy	Exotic/invasive vegetation removal would be part of the habitat restoration efforts of the proposed Plan.
<i>Policy 3.32 Channelizations or other substantial alterations of streams shall be prohibited except for: ... 3) the improvement of fish and wildlife habitat... Any channelization or stream alteration permitted...shall minimize impacts to coastal resources, including the depletion of groundwater, and shall include maximum feasible mitigation measures to mitigate unavoidable impacts. Bioengineering alternatives shall be preferred for flood protection over “hard” solutions such as concrete or riprap channels.</i>	Consistent with this policy	The Plan proposes to deepen an existing channel in the eastern portion of the lagoon, and create a new channel for water entry and exit in the western portion of the lagoon. These proposed channel alterations would improve water circulation and quality, thereby improving fish and wildlife habitat.
<i>Policy 3.45 All new development shall be sited and designed so as to minimize grading, alteration of physical features, and vegetation clearance in order to prevent soil erosion, stream siltation, reduced water percolation, increased runoff, and adverse impacts on plant and animal life and prevent net increases in baseline flows for any receiving waterbody.</i>	Consistent with this policy	The proposed project is intended to restore and improve existing natural resources, reduce polluted runoff, and provide beneficial effects to plant and animal life.

Objectives and Policies	Finding	Discussion
<i>Policy 3.82 Near shore shallow fish habitats and shore fishing areas shall be preserved, and where appropriate and feasible, enhanced.</i>	Consistent with this policy	The proposed project is intended to restore and protect Malibu Lagoon.
<i>Policy 3.87 The biological productivity and the quality of wetlands shall be protected and, where feasible, restored.</i>	Consistent with this policy	The proposed project is intended to restore and protect the Malibu Lagoon.
<i>Policy 3.89 The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes may be permitted in accordance with all policies of the LCP, where there is no feasible less environmentally damaging alternative and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:...</i> · Restoration purposes... Other uses specified in Section 30233 of the Coastal Act may only be allowed pursuant to an LCP amendment.	Consistent with this policy	The Plan proposes to deepen an existing channel in the eastern portion of the lagoon, and create a new channel for water entry and exit in the western portion of the lagoon. These proposed channel alterations would improve water circulation and quality, thereby improving fish and wildlife habitat.
<i>Policy 3.93 A lagoon management plan should be developed for Malibu Lagoon, in consultation with all applicable resource management agencies. The plan shall address the following at a minimum:</i>	Consistent with this policy	This EIR evaluates the proposed Malibu Lagoon Restoration and Enhancement Plan.
<ul style="list-style-type: none"> · <i>Biological study of the lagoon habitat, including identification of all rare, threatened, and endangered species.</i> · <i>Lagoon hydrology.</i> · <i>Water quality sampling study.</i> · <i>Identification of the water levels appropriate and necessary for protection of the various species.</i> · <i>Measures to protect endangered species.</i> · <i>Water quality protection and enhancement measures.</i> · <i>Identification of potential impacts from breaching or water level management, including reduction of certain kinds or areas of habitat.</i> · <i>Identification of project alternatives to the proposed breaching or water level management designed to avoid and minimize impacts to sensitive resources.</i> · <i>Mitigation measures necessary to offset unavoidable impacts from the proposed breaching or water level management.</i> 		

Objectives and Policies	Finding	Discussion
<p>· <i>Monitoring plan to monitor the management area to evaluate the health of the wetland, assess adverse impacts resulting from breaching or water level management, and to identify project corrections.</i></p>		
<p><u>Archaeology:</u></p>		
<p><i>Policy 5.61 Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.</i></p>	<p>Consistent with this policy</p>	<p>The project study area is immediately adjacent to a historic site and could potentially contain archaeological or paleontological resources. All applicable mitigation and monitoring measures would be incorporated during restoration activities.</p>
<p><i>Policy 5.62 The City should coordinate with appropriate agencies, such as the UCLA Archaeological Center, to identify archaeologically sensitive areas. Such information should be kept confidential to protect archaeological resources.</i></p>	<p>Consistent with this policy</p>	<p>The project study area is immediately adjacent to a historic site and could potentially contain archaeological or paleontological resources. All applicable mitigation and monitoring measures would be incorporated during restoration activities.</p>
<p><u>Ch. 6. Visual /Scenic Resources</u></p>		
<p><i>Policy 6.5 New development shall be sited and designed to minimize adverse impacts on scenic areas visible from scenic roads or public viewing areas to the maximum feasible extent. If there is no feasible building site location on the proposed project site where development would not be visible, then the development shall be sited and designed to minimize impacts on scenic areas visible from scenic highways or public viewing areas, through measures including, but not limited to, siting development in the least visible portion of the site, breaking up the mass of new structures, designing structures to blend into the natural hillside setting, restricting the building maximum size, reducing maximum height standards, clustering development, minimizing grading, incorporating landscape elements, and where appropriate, berming.</i></p>	<p>Consistent with this policy</p>	<p>The project area is adjacent to and visible from Pacific Coast Highway, a designated scenic highway. The proposed Plan would not include alterations that would adversely affect any visual or scenic resources.</p>
<p><i>Policy 6.27 New development shall minimize removal of natural vegetation. Existing native trees and plants shall be preserved on the site, consistent with Policy 3.60.</i></p>	<p>Consistent with this policy</p>	<p>Exotic/invasive vegetation removal would be part of the habitat restoration efforts of the proposed Plan. Selected native plants, such as those not belonging in lagoons, may be removed. Other native plants may be removed where necessary to accomplish successful wetland expansion and provide long-term</p>

Objectives and Policies	Finding	Discussion
		habitat enhancement. Otherwise, native plants shall be protected.
<u>Malibu Lagoon State Beach Resource Management Plan & Development Plan</u>		
<i>Resource Management Policy – Natural Values</i>		
2. <i>The Saltwater marsh and lagoon shall be reserved for a wildlife sanctuary, primarily to perpetuate this disappearing habitat and the species that use this area. Visitor use within this area shall be restricted to designated locations and observation points, so the habitat will not be destroyed or the animals disturbed. Domestic animals should not be allowed in this area...</i>	Consistent with this policy	The proposed project would include improvements to onsite trails and walkways consistent with conservation goals. Public coastal access would not be affected.
3. <i>Native plants should be encouraged in natural areas, and aggressive exotic plants should be removed if they restrict the growth of native plants.</i>	Consistent with this policy	Exotic/invasive vegetation removal would be part of the habitat restoration efforts of the proposed Plan. Selected native plants, such as those not belonging in lagoons, may be removed. Other native plants may be removed where necessary to accomplish successful wetland expansion and provide long-term habitat enhancement. Otherwise, native plants shall be protected.
4. <i>The lagoon water level shall be controlled through adoption of a management program that will determine how and when the lagoon shall be opened to the sea. This plan shall be based on solving problems associated with the lagoon water levels, to the best interests of all people concerned.</i>	Consistent with this policy	The Plan proposes to deepen an existing channel in the eastern portion of the lagoon, and create a new channel for water entry and exit in the western portion of the lagoon. These proposed channel alterations would improve water circulation and quality, thereby improving fish and wildlife habitat. All channel and lagoon alterations would be carefully monitored.
5. <i>The area should be managed so that it remains a beautiful and scenic open-space unit.</i>	Consistent with this policy	The purpose of the proposed project is to restore and protect Malibu Lagoon.
<i>Resource Management Policy – Cultural Values</i>		
1. <i>Before any development that may affect cultural resources, a thorough study will be conducted. The correct construction and use period of each structure will be determined, both as an individual entity and as it relates to the total cultural environment. Research and archaeological investigation will be parts of this study.</i>	Consistent with this policy	The project is immediately adjacent to a historic site that could contain archaeological or paleontological resources. Project-specific mitigation and monitoring measures would be incorporated during restoration activities to ensure this site is protected (see Chapter 7, Cultural Resources).
4. <i>The prehistoric site (CA:LAN:264) and the historic site are one and the same. The prehistoric site is of vast significance, and careful study of the site may produce needed</i>	Consistent with this policy.	The project is immediately adjacent to this historic site. Project-specific mitigation and monitoring measures would be incorporated during

Objectives and Policies	Finding	Discussion
<p><i>information in defining the lifestyles of the Chumash Indians. Proper care and sensitivity to the site must be demonstrated at all times. Any future sites which are discovered on existing State Park System property, or which are subsequently acquired, shall be carefully recorded and protected.</i></p>		<p>restoration activities to ensure this site is protected (see Chapter 7, Cultural Resources).</p>
<p><i>Development Plan</i></p> <p><i>It has long been recognized that the lagoon systems are not functioning properly under current conditions. Human and other uses not conducive to maintenance of marsh environments have resulted in the disappearance of certain wildlife and plant species. It is for this reason that alterations to the marsh environment are proposed.</i></p> <p><i>Drainage improvements would include restoring and enlarging the saltwater marsh. Tidal waters will be allowed to penetrate deeper into the backlands, by means of graded-out channels. Pickleweed (salicornia) is to be planted or replanted in appropriate locations a 1.2 meter (4-foot)-high restraining fence could further control human penetration through these wetlands; compatible native plantings would make its presence less obvious.</i></p>	<p>Consistent with this policy</p>	<p>The Plan proposes to deepen an existing channel in the eastern portion of the lagoon, and create a new channel for water entry and exit in the western portion of the lagoon. These proposed channel alterations would improve water circulation and quality, thereby improving fish and wildlife habitat. All channel and lagoon alterations would be carefully monitored.</p>
<p><i>The department... recommends that the area be classified a natural preserve within the proposed boundaries.</i></p>	<p>Consistent with this policy</p>	<p>The purpose of the proposed project is to restore and protect Malibu Lagoon and would not involve any land use changes. The lagoon would continue to be a protected resource.</p>
<p><i>The interpretive facility will...explain the ecosystems and functions of the lagoon.</i></p>	<p>Consistent with this policy</p>	<p>The proposed project will include improved, non-intrusive interpretive areas and observation points.</p>

Chapter 5

Hydrology and Water Quality

Setting

Watershed and Lagoon Setting

Malibu Lagoon is located at the southern extent (or mouth) of the Malibu Creek watershed (Figure 5-1). The Malibu Creek watershed covers approximately 110 square miles, is the second largest watershed draining into Santa Monica Bay, and the largest draining from the Santa Monica Mountains.

As described below, the hydrology and physical processes influencing the lagoon are complex and involve several sources. The Malibu Creek watershed contributes streamflow, groundwater, sediment, nutrients, and other water constituents downstream to the lagoon. As such, any assessment of lagoon management or restoration activities should include consideration of the hydrologic contributions to the lagoon from the upstream watershed as well as discharges from the lagoon to the immediate coastal environment.

The Malibu Creek watershed can be divided into two general sub-basin areas. The upper watershed is considered as the area upstream of the Cold Creek stream confluence and Malibu Canyon. The northwestern portion of the upper watershed (north of Hwy 101) includes several north-south oriented tributary streams such as Las Virgenes Creek, Chesebro Canyon, Palo Comado Canyon, Medea Creek, and Lindero Canyon. Farther to the east, the headwaters of the main arm of Malibu Creek extend and drain the north slope of the Santa Monica Mountains. Hydrologically, these headwater tributaries are important to the overall Malibu Creek system, and do affect the flows that reach the lagoon downstream.

Vegetation in the upper watershed headwater areas typically consists of (or once consisted of) oak-grassland type landscapes in the northern tributary areas and more of a chaparral/oak woodland landscape along the north slope of the Santa Monica Mountains. The vegetative cover has several important hydrologic influences on the creek system, including rainfall interception and infiltration. Perhaps most importantly though is the fire regime that periodically burns the grassland/chaparral hillslopes.

Figure 5-1. Malibu Creek Watershed



Figure 5-1
Malibu Creek Watershed Boundary

When this occurs, erosion and runoff potential greatly increases as was recently observed in the Malibu Creek and Big Sycamore Canyon watersheds following the fires of November 1993 (Schwarz 1995). Such post-fire erosion conditions can deliver large amounts of sediment to the Lagoon in brief episodic events.

Soils in the upper watershed are variably sandy, silty, clayey, or loams depending upon the source geology. The northern watershed areas are generally underlain with sandstone and shale Tertiary (Miocene) sedimentary rocks of the Upper Topanga and Monterey Formations. Variable grazing activity has occurred there since the 19th century.

In the last 50 years, and particularly the last 25 years, many of these northern headwater areas have been developed as residential neighborhoods. This has increased the degree of impervious surface in the upper watershed, which has increased stormflow discharges downstream into the lagoon. Other hydrologic changes in the upper watershed include increased dry season flows (mostly from irrigation used from imported water sources). These increased dry season flows have resulted in generally higher streamflow input into the lagoon during the summer months.

The Las Virgenes Municipal Water District and Triunfo Sanitation District operate the Tapia Water Reclamation Facility, located just upstream of Malibu Lagoon (near the intersection of Malibu Canyon Rd. and Piuma Rd.). This plant handles about 9 million gallons of wastewater daily for 85,000 residents of western Los Angeles and eastern Ventura counties (see <http://www.lvmwd.dst.ca.us/index.html>). Water is treated to a “tertiary” level that is certified safe for irrigation and some indoor uses such as flushing, etc. Under permit requirements by the Los Angeles RWQCB, the Tapia plant cannot discharge into Malibu Creek between April 15 and November 15 each year.

The lower watershed includes the steep and rugged Malibu Canyon, which cuts through the central axis (strike) of the Santa Monica Mountains. Downstream of Malibu Canyon, the watershed emerges onto a coastal plain where channel slopes and flow velocities reduce and the Malibu Creek fluvial system begins to transition to a coastal estuarine lagoon system.

Historically, the Malibu estuarine-lagoon system was typically larger (in expanse) than its current relatively narrow position at the eastern extent of the Malibu plain area. This is seen through historic aerial photos since the 1920s (Ambrose and Orme 2000) as well as the record of stream and lagoonal sediments that are found in the Malibu plain area indicating the lagoon had a larger spatial range. Similar to today, the historic size of the lagoon would have been influenced by governing physical processes and would have ranged in size from small to large depending on influencing hydrologic conditions.

Hydrologic Processes

Seasonal Lagoon and Hydrologic Inputs/Outputs

As a transitional river-mouth type estuarine lagoon, the hydro-geomorphology of the lagoon can be generally described according to a two-season system, under either wetter winter conditions or drier summer conditions. More precisely, the lagoon form reflects the relative balance of three governing forces: streamflow, tides, and waves.

In the wetter winter months when streamflows in Malibu Creek are greater, moderate runoff and flows can maintain an open outlet channel to the coast. When winter runoff is punctuated by particularly large flow events, such flows can open the river-mouth by removing a portion or the entire barrier beach. This was observed in the winter of 1997–98 (Schwarz 1999) and to a lesser degree in other recent strong winter flow events.

In the days/weeks following winter storms, or between storms, streamflow hydrographs recede into lower baseflow conditions. The hydrologic result of such “lulls” is that waves and tides are able to enter the lagoon and circulate more saline ocean water back into the lagoon and its side channels. During drier winter seasons or extended years of relative aridity, such a broad lagoon opening may not occur at all.

Towards the spring months and into the drier summer months, the relative force of streamflow decreases in comparison to coastal processes (waves, tides). As a result, beach sands are deposited onto the barrier beach and ebb/flood tidal sand deltas; the barrier beach crest heightens and moves inland; and the tidal inlet channel may narrow, migrate eastward with the longshore current, and potentially close. As a result of these processes, the dry season lagoon typically experiences increasingly less circulation of coastal water. If the barrier beach entirely seals itself, pinching off the tidal inlet channel, a closed lagoon situation occurs with essentially static water behind the barrier beach.

Due to increases in dry season runoff in the Malibu Creek watershed (as well as immediately local sources in the Malibu plain area), water surface elevations in a closed lagoon condition can raise lagoon water levels to nearly overtop the barrier beach crest, and may cause local septic/sewer back up in the immediate lagoon area. When this occurs, summer breaching of the closed lagoon has occurred through various means, including:

- mechanical breaching by equipment under local DPR authority and supervision;
- informal breaching by local beach goers who can successfully breach the barrier through starting a small initial channel; or

- breaching by natural processes such as strong waves hitting the closed barrier during a falling high tide when head difference between the closed lagoon and coast are greatest.

It is important to note that specific lagoon conditions in any given year reflect the overall balance of these governing forces described above (streamflow, waves, tides, local inflow from immediate lagoon surroundings, breaching activities, etc.). Lagoon hydrology and geomorphic form can thus be considered as a range between two endpoints: the fully open estuary with no barrier beach and a fully closed lagoon with no tidal inlet channel. Most often, the lagoon operates in the mid-range of such a two-season spectrum, functioning with some degree of streamflow, some degree of tidal exchange with the coast, and some degree of internal circulation.

Flooding

Flooding adjacent to the lagoon can potentially occur due to the same general governing forces described above. In the winter season, high stormflows can raise lagoon water levels to inundate surrounding areas, though typically, under very large events, the removal of a portion (or all) of the barrier beach will enable stormflows to reach (and exit at) the coast.

The timing of stormflows arriving from the creek to the coast in relation to the tide is a potentially important factor in local flooding. Stormflows reaching the lagoon during very high tides are held up (or “back-watered”) and this process can cause local flooding in the immediate lagoon surroundings. Other potential threats from flooding can occur upstream, north of the relatively new Pacific Coast Hwy bridge (re-built in the mid/late 1990s) where high stormflows on Malibu Creek have caused some local bank erosion, along the west bank near Cross Creek Shopping Center as well as on the more vegetated east bank.

As seen in historical aerial photos (such as following the large floods of March 1938), past large river flows inundated much of the current Malibu plain area. Future large flows could potentially overtop the banks of Malibu Creek upstream of the lagoon, or create a channel avulsion (cutting of new channel path) and potentially flood areas west or east of the current river/lagoon alignment.

Groundwater and Water Balance

An estimated water budget for the lagoon under closed summer conditions was provided by Stone Environmental (2004). In this accounting, 92% of the Lagoon inflow came from stream sources and 8% came from groundwater sources. In terms of outflow, 2% was evaporated while 98% was lost through beach percolation.

Water Quality

Watershed Inputs

Water quality within the lagoon is influenced by land uses both upstream and adjacent to the lagoon, including surface water runoff, discharges from Tapia Wastewater Treatment Plant, and seepage from septic systems. Additionally, because the lagoon is tidal, oceanic waters also influence water quality within the lagoon. Primary water quality constituents of concern to beneficial uses of the lagoon are sediment, nutrients, and bacteria.

Sediment

Depending upon winter storm events and flow conditions, much of the sediment that is transported from the watershed is deposited into the main body of the lagoon. If stormflows are large enough and a sizable breach in the barrier beach occurs, the sediment may be transported directly to the coastal zone. Of the sediment that is not carried into the coastal zone, much of the finer sediments are redistributed into the quieter settling areas of the three western channels.

Bed elevation monitoring has shown that the lagoon bed has accreted since the late 1990s (Moffatt & Nichol 2005). This accretion has reduced the storage volume of the lagoon by 10.6 acre-feet between 1998 and 2004 and has caused the bed to become perched above mean sea level (Moffatt & Nichol 2005). This condition interferes with tidal actions and stormflows, which would normally flush fine-grained sediments out to sea, particularly when the lagoon mouth is open.

Sedimentation is particularly evident in the western arms of the lagoon, where nitrogen and phosphorus concentrations increase within the fine-grained particles, contributing to formation of eutrophic conditions in the lagoon. Additionally, the aggraded condition of the west portion of the lagoon results in a shallower water column that in turn increases water temperature.

Nutrients

Malibu Lagoon is included on the federal 303(d) list of impaired water bodies due to excessive nutrients from surrounding land uses, which causes eutrophication and subsequent impairment of beneficial uses. According to Sutula et al. and Ambrose and Orme, the sources of nitrogen to the lagoon are:

- septic systems, upland systems, and surface runoff (77%);
- sediment release (17%); and
- other sources (6%).

Sources of phosphorus to the lagoon are:

- septic systems, upland systems, and surface runoff (95%); and
- sediment release (5%)

Seasonal changes in circulation and sedimentation affect the concentration of nitrogen and phosphorus in the lagoon. For example, nitrogen and phosphorus loading and concentrations in the winter are double that in the summer (Moffatt & Nichol 2005). Increased water temperatures and light availability during summer months promote an exponential increase in photosynthetic rates within the lagoon.

During the summer months, when the mouth of the lagoon typically closes, water quality in the lagoon worsens due to reduced circulation, warmer temperatures, and reduced dilution in the more stagnant closed lagoon setting. Stored nitrogen and phosphorus from the winter, combined with these summer conditions, results in nuisance algal blooms, low dissolved oxygen levels, odors, and fish kills; ultimately resulting in impairment of beneficial uses.

Bacteria

The lagoon is included on the federal 303(d) list of impaired water bodies due to excessive coliform bacteria, which affects recreational beneficial uses. The bacteria TMDL for the Malibu Creek Watershed estimates that 158,000 billion counts of fecal coliform are annually present in the lagoon, which are transported from surrounding sources including wastewater treatment discharge and septic systems. By reducing the fecal coliform concentrations in septic systems and leach fields, an 86% loading reduction to 21,800 billion counts per year in the lagoon can be achieved (USEPA 2003b).

Regulatory Setting

The following sections briefly describe federal and state water quality control programs, plans, and policies that are applicable to the project site and environs.

Clean Water Act

There are several sections of the federal Clean Water Act (CWA) that pertain to regulating impacts on waters of the United States. Section 101 specifies the objectives of CWA implemented largely through Title III (Standards and Enforcement) and Section 301 (Prohibitions). The discharge of dredged or fill material into waters of the United States is subject to permitting specified under Title IV (Permits and Licenses) of CWA and specifically under Section 404 of

the act (Discharges of Dredge or Fill Material). Section 401 (Certification) specifies additional requirements for permit review, particularly at the state level.

Section 303—TMDL Program

The State of California adopts water quality standards to protect beneficial uses of state waters as required by Section 303 of the CWA and the state's Porter-Cologne Water Quality Control Act of 1969. Section 303(d) of CWA established the total maximum daily load (TMDL) process to guide the application of state water quality standards (see discussion of state water quality standards below).

To identify candidate water bodies for TMDL analysis, a list of water quality-limited segments is generated. These segments are impaired by the presence of pollutants, including sediment, and have no additional assimilative capacity for these pollutants. Malibu Beach, Malibu Creek, and Malibu Lagoon are listed as impaired water bodies under Section 303(d) of CWA. Malibu Lagoon is listed as impaired by enteric viruses, eutrophication, high coliform counts, pH, and also includes a shellfish harvesting advisory and swimming restrictions. Malibu Beach is listed as impaired by DDT and PCBs (fish consumption advisories), high coliform counts, and beach closures; Malibu Creek is listed as impaired by high coliform counts, nutrients (algae), scum/unnatural foam, and is also a fish barrier.

TMDLs to address nutrients and bacteria impairment within the Malibu Creek watershed, including the lagoon, were adopted in 2003 (EPA 2003a and b respectively). TMDLs to address other impairments in the watershed and surrounding beaches are currently under development.

TMDL for Nutrients in the Malibu Creek Watershed

The numeric targets established in US EPA (2003a) consider seasonal variations in nutrient concentrations, as well as waterbody types. The numeric targets for nitrogen and phosphorus in the Malibu Creek watershed, shown below, were established to prevent and reduce the nutrient impairment.

Summer (April 15 to November 15)		Winter (November 16 to April 14)
Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)
1.0	0.1	8.0

TMDL for Bacteria in the Malibu Creek Watershed

Bacteriological numeric targets to protect water contact recreational use in the lagoon, as established in US EPA (2003b), are as follows:

Parameter	Geometric Mean	Single Sample
Total	1,000	10,000 or 1,000 <i>if</i> FC/TC >1.0
Fecal	200	400
<i>Enterococcus</i>	35	104

Section 401—Water Quality Certification

Section 401 of CWA requires that an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant obtain a Water Quality Certification (or waiver). Water Quality Certifications are issued by Regional Water Quality Control Boards in California. The Los Angeles RWQCB has jurisdiction over the project area. Under the CWA, the state (as implemented by the relevant board) must issue or waive Section 401 Water Quality Certification for the project to be permitted under Section 404.

Water Quality Certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States. Construction of the proposed project would require 401 certification for the project if Section 404 is triggered.

Section 402—NPDES Program

The 1972 amendments to the Federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources (Section 402). The 1987 amendments to the CWA created a new section of the CWA devoted to stormwater permitting (Section 402[p]).

The U.S. Environmental Protection Agency (EPA) has granted the State of California primacy in administering and enforcing the provisions of the CWA and the NPDES Permit Program. The NPDES Permit Program is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States.

The State Water Resources Control Board (SWRCB) issues both general and individual permits for certain activities. Relevant general and individual NPDES permits are discussed below.

Construction Activities

Construction activities are regulated under the NPDES General Permit for Discharges of Storm Water Runoff associated with Construction Activity (General Construction Permit), provided that the total amount of ground disturbance during construction exceeds one acre.

The appropriate Regional Water Quality Control Board enforces the General Construction Permit. Coverage under a General Construction Permit requires the preparation of a stormwater pollution prevention plan (SWPPP) and submittal of a notice of intent (NOI). The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater

discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, a detailed construction timeline, and a best management practices monitoring and maintenance schedule. The NOI includes site-specific information and the certification of compliance with the terms of the General Construction Permit.

Dewatering Activities

Small amounts of construction-related dewatering are covered under the General Construction Permit. However, the RWQCB may require that an individual NPDES permit and Waste Discharge Requirement (WDR) be obtained for dewatering activities.

Section 404

Section 404 of the CWA regulates the discharge of dredged and fill materials into waters of the United States, which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from the U.S. Army Corps of Engineers for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity.

Before any actions that may impact surface waters are carried out, a delineation of jurisdictional waters of the United States must be completed following U.S. Army Corps of Engineers protocols (Environmental Laboratory 1987) to determine whether the project area encompasses wetlands or other waters of the United States that qualify for CWA protection. These include any or all of the following:

- areas within the ordinary high water mark of a stream, including nonperennial streams with a defined bed and bank, and any stream channel that conveys natural runoff, even if it has been realigned; or
- seasonal and perennial wetlands, including coastal wetlands.

Wetlands are defined for regulatory purposes as areas “inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3, 40 CFR 230.3).

Under the Section 404 permit program, general permits (known as nationwide permits) have been adopted, and coverage under nationwide permits is possible when the amount of fill is relatively small (usually less than 0.5 acre). Projects that do not qualify for a nationwide permit must obtain an individual permit, which has a longer and more involved permitting process.

Regulations Covering Development on Floodplains

Federal Flood Insurance Program

Alarmed by increasing costs of disaster relief, Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The intent of these acts was to reduce the need for large, publicly funded flood control structures and disaster relief by restricting development on floodplains.

FEMA (Federal Emergency Management Agency) administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues Flood Insurance Rate Maps (FIRM) for communities participating in the National Flood Insurance Program. These maps delineate flood hazard zones in the community. The locations of FEMA-designated floodplains in the proposed project area are included in the discussion of physical setting below.

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act established SWRCB and divided the state into nine regional basins, each with a regional water quality control board. SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, while the regional boards are responsible for developing and enforcing water quality objectives and implementation plans. The project area is within the jurisdiction of the Los Angeles Regional Water Quality Control Board (RWQCB).

The Act authorizes SWRCB to enact state policies regarding water quality in accordance with Section 303 of CWA. In addition, the act authorizes SWRCB to issue WDRs for projects that would discharge to state waters. The Porter-Cologne Water Quality Control Act requires that SWRCB or the regional water quality control board adopt water quality control plans (basin plans) for the protection of water quality. A basin plan must:

- identify beneficial uses of water to be protected;
- establish water quality objectives for the reasonable protection of the beneficial uses; and
- establish a program of implementation for achieving the water quality objectives.

Basin plans also provide the technical basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. Basin plans are updated and reviewed every three years in accordance with Article 3 of Porter-Cologne Water Quality Control Act and Section 303(c) of CWA. The Los Angeles RWQCB adopted a revised basin plan on June 13, 1994. The basin plan designates beneficial uses and establishes water quality objectives for groundwater and surface water within the Los Angeles region, including the coastal watersheds of Los Angeles and Ventura Counties.

Streambed Alteration Agreement

The CDFG regulates streambed alterations in accordance with Fish and Game Code Sections 1601–1616: Streambed Alterations. Whenever a project proposes to alter a streambed, channel, or bank, an agreement with the CDFG is required.

The agreement is a legally binding document that describes measures agreed to by both parties to reduce risks to fish and wildlife in the stream system during the project. This is a separate process from CEQA approval but is usually coordinated with CEQA compliance. Agreements typically have less procedural and legal requirements than CEQA in order to work with small-scale projects that are important to fish. Time frames for agreements are 30 days for the CDFG to determine the completeness of an application and an additional 60 days to provide a draft agreement to the applicant.

City of Malibu and Coastal Act Policies

The City of Malibu General Plan (City of Malibu 1995) includes goals and policies related to water quality and surface runoff. It should be noted that, as a state agency, DPR is not subject to local plans and policies. However, as the relevant City of Malibu plans, policies, and goals are wholly consistent with the proposed project, they are included in this chapter for the benefit of the reader.

The following goals, policies, and implementation measures from both the Conservation Element and the Land Use Element are relevant to the proposed project.

Conservation Policy 1.3.11 (also Land Use Policy 1.1.3): The City shall control surface runoff and associated pollutant loads into coastal waters, wetlands, and riparian areas.

Land Use Goal 1: The natural and environmental resources of Malibu are protected and enhanced.

Land Use Implementation Measure 4: Regulate grading and excavation to minimize impacts of construction on water quality and natural resources. These regulations shall require the use of best management practices (BMPs) to control erosion and manage stormwater. These BMPs may include the use of seasonal and mandatory year round control measures such as tarps, sandbag dams, onsite retention of first flush rain, temporary drainage courses and erosion control measures, de-silting ponds, sediment traps, filter fencing, straw bales, and catch basin filtration.

Land Use Implementation Measure 6: Evaluate any increase in peak flow rate from surface runoff for proposed development and mitigate any adverse impacts to property or the environment. Require a drainage control system, including onsite retention or detention where appropriate for all new development. Storm runoff control systems shall be designed to ensure that the maximum rate of stormwater runoff does not exceed peak level that existed prior to development.

Land Use Implementation Measure 7: Prohibit grading during the rainy season (from November 1 to March 31) in areas which might affect Resource Protection Areas (RPAs) unless a delay in grading until after the rainy season is determined to be more environmentally damaging. Where grading is permitted during the rainy season, sediment basins (including debris basins, desilting basins, or silt traps) shall be required on the project site prior to or concurrent with the initial grading operations and maintained through the development process.

The project area is located with the California Coastal Zone, as defined by the California Coastal Act. The Coastal Act requires that its goals and policies be implemented by local government through the LCP process. The City of Malibu LCP is discussed in detail in Chapter 4, Consistency with Local and Regional Plans. Water quality goals and policies that are relevant to the proposed project are as follows:

Policy 3.95: New development shall be sited and designed to protect water quality and minimize impacts to coastal waters by incorporating measures designed to ensure the following:

- Protecting areas that provide important water quality benefits, areas necessary to maintain riparian and aquatic biota and/or that are susceptible to erosion and sediment loss.
- Limiting increases of impervious surfaces.
- Limiting land disturbance activities such as clearing and grading, and cut-and-fill to reduce erosion and sediment loss.
- Limiting disturbance of natural drainage features and vegetation.

Policy 3.120: New development shall protect the absorption, purifying, and retentive functions of natural functions that exist on the site. Where feasible, drainage plans shall be designed to complement and utilize existing drainage patterns and systems, conveying drainage from the developed area of the site in a non-erosive manner. Disturbed or degraded natural drainage systems shall be restored, where feasible, except where there are geologic or public safety concerns.

Impacts and Mitigation Measures

Thresholds of Significance

Based on Appendix G of the State CEQA Guidelines and professional judgment, the proposed project would result in a significant impact on hydrology or water quality if it would:

- violate any water quality standards or waste discharge requirements;

- otherwise substantially degrade water quality;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate of surface runoff in a manner that causes flooding on or off site, creating or contributing to an existing local or regional flooding problem;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;
- place within a 100-year flood hazard area structures that would impede or redirect floodflows; or
- contribute to inundation by seiche, tsunami, or mudflow.

Impacts and Mitigation Measures

Construction phase hydrology and water quality impacts (Impacts HYDRO-8 through HYDRO-10) and associated mitigation measures are discussed separately in Chapter 8, Construction Effects.

Impact HYDRO-1: Improved water quality due to increased circulation within the lagoon system.

Lagoon waters do not effectively circulate when the mouth is closed, occurring roughly from May to October each year (Sutula et al. 2004). Low dry season flows entering from upstream are unable to promote any perceptible lagoon circulation because the lagoon is configured with the main body as a broad basin that receives and dissipates any imparted current, by which circulation into the existing western lagoon arms is diminished. Also, vegetative growth within the lagoon reduces potential circulation.

Observations during closed conditions show no effective surface water movement other than minor surface movement across the lagoon from west to east in the afternoon from the prevailing breeze (Moffat & Nichol 2005). Poor circulation contributes to formation of eutrophic conditions in the lagoon, which

in turn degrades water quality and aquatic habitat. Because the lagoon has aggraded with sediment and the water contains high concentrations of nutrients from upstream sources, reduced flow circulation results in increased water temperatures which, when combined with high nutrient concentrations, creates growth of aquatic vegetation that fosters coliform bacteria.

Eutrophic conditions are not aesthetically pleasing, produce undesirable odors, and result in beach closures, all of which negatively affect recreational use of the lagoon. Poor lagoon circulation and resulting reduced water quality conditions thus negatively affect biological and recreational beneficial uses of the lagoon.

As part of the proposed project, a new, deepened channel would be created along the southern edge of the west lagoon and the existing boat channel on the eastern edge of the lagoon would be deepened and recontoured. The new channel in the west lagoon would serve as a single main entrance and exit for water conveyed into and out of the west lagoon. Under open conditions, the proposed project would significantly improve tidal circulation into and out of the western arms, as the feeder channel is sized appropriately to convey tidal discharge constantly throughout its reach.

Storm flow circulation would also be improved under the proposed project because it would allow storm flows into and out of the western arms as needed, without severely high flow velocities to cause damage. Under closed conditions, the new channel in the western portion of the lagoon would allow for increased wind wave generation and probable wind-generated return currents that would result in improved circulation within the system.

Although the restoration plan would improve lagoon geometry and orientation to create more favorable circulation conditions, upstream sources of high nitrogen and phosphorus concentrations would potentially continue to be delivered to the lagoon. As such, control of the sources of such pollutants is beyond the scope of the current restoration project. However, the proposed project would reduce the conditions for eutrophic conditions to develop in the lagoon itself and is therefore considered beneficial.

Consequently, biological and recreational beneficial uses of the lagoon would potentially improve to a level that would meet water quality standards, including the TMDL targets for bacteria. However, due to upstream sources of nitrogen and phosphorus, the proposed project would potentially not improve or contribute to the concentration of nutrients in the lagoon to a level such that the TMDL targets for nitrogen and phosphorus would be met.

Overall, the proposed project would result in beneficial impacts to water quality within the lagoon system. No mitigation is required.

Impact HYDRO-2: Altered surface drainage and associated flood flow patterns from proposed parking lot.

Presently, storm water runoff originates from the impervious surfaces of PCH and the visitor parking area and flows to the lagoon. The existing quantity of impervious surfaces at the project site encompasses 1.73 acres (Moffatt & Nichol 2005).

The proposed parking area would be approximately the same size; thus, a similar quantity of storm runoff would be expected. However, the proposed parking area would be constructed of pervious materials, which would only allow surface runoff during 50-year or larger storm events. Consequently, for the majority of storm events at the site, runoff would be retained and absorbed within the pervious tiles instead of flowing directly to the lagoon.

Additionally, vegetated drainage swales would be installed along the perimeter of the parking lot area. These swales would be designed to capture runoff from the 100-year storm event. All potential runoff would be redirected away from the lagoon.

The proposed parking lot would reduce the potential for localized flooding, improve the quality of surface runoff, and benefit water quality within the lagoon. While the project would thus result in beneficial impacts, the following mitigation measure is required to ensure long-term proper functioning of the various storm water management components.

Mitigation Measure HYDRO-1: Maintenance of stormwater system.

Permeable tiles, drainage swales, pumps, pipelines, and any associated equipment must be maintained on a regular basis to ensure full functioning. Maintenance may include removal of fine sediments from tile gaps for proper infiltration and periodic sediment removal from drainage swales for capacity maintenance. The project manager will ensure that all components of the storm drainage system are maintained to design and manufacturer specifications on a regular basis.

Impact HYDRO-3: Effects of sediment delivery on beach replenishment and nearshore coastal habitat.

No significant changes to beach formation processes or the nearshore coastal environment are anticipated because of changes in sediment discharge.

The planned restoration involves reconfiguring and reorientation of the western lagoon arm. Currently, the mouths of the western arm are situated to receive sediment-laden storm flows, but are mostly sheltered from scouring by tides or stormflows due to their lack of hydraulic connectivity. As such, deposited sediment is not readily scoured and removed.

Under the proposed project, the inlet channel to the western arm would be relocated southward and positioned to reduce the western arm exposure to sedimentation during and following storms. As such, it is anticipated that more storm delivered sediments would be transported directly to the main lagoon, and subsequently be available to the coastal zone for either beach nourishment or subsequent down-coast transport.

In considering potential impacts to the barrier beach, it is useful to recognize that the beach is a depositional feature comprised of sands (ranging in size from finer sands [0.1 mm] to coarser sands [2 mm]) where geomorphic processes selectively sort these beach sands from finer and coarser materials. Typically, the finer silts and muds are either temporarily stored/deposited in the lagoon or carried out to sea. Coarser gravels and boulders may likewise be stored in the main lagoon in bar forms (Schwarz 1999); or under large stormflow conditions may be delivered directly through a large breach in the barrier beach to the coastal zone.

The proposed project is not likely to significantly alter sand related depositional processes and therefore it is not considered to cause a significant impact to the barrier beach. Changes to the proposed inlet of the western arm may concentrate flows and possibly increase local scour and delivery of sands to/from the flood tide and ebb tide deltaic sand lobes associated with the barrier beach.

As the Malibu watershed system is highly variable annually, outcomes of individual storm events are difficult to predict or determine. However, the general form of the estuarine lagoon suggests that even following such large geomorphic events, natural feedback processes occur, which return the lagoon to its general form as a water feature that is transitional between the upstream river and downstream coast. Potential impacts would be less than significant and no mitigation measures are necessary.

Impact HYDRO-4: Effects on tidal lagoon opening and closure.

The sandbar at the mouth of the lagoon typically forms in May or June and may proceed through a series of natural closures and breaches until a sustained closure is endured through the summer and early fall (Moffat & Nichol 2005). The timing and duration of summer closures is dependent upon a number of factors including previous winter rainfall (streamflow magnitude and duration), Malibu Creek water table base flows, longshore sand transport, and tidal and swell dynamics of the Pacific Ocean.

In late fall, once flows in Malibu Creek become high enough to fill the lagoon and overtop the beach berm, flows once again reach the ocean and open the lagoon, quickly scouring a channel through the sand. The exact dates associated with lagoon openings and closures vary due to the variability in annual flow conditions into (and out of) Malibu Creek.

While the proposed project will alter the geometry, volume, and orientation of the lagoon, it will not significantly affect the mass water balance of the watershed that is the principal influence behind the lagoon being either open or closed. The proposed project is not anticipated to alter these seasonal patterns or the processes driving lagoon opening and closure, and hence no significant changes to this process are anticipated. However, once in a closed lagoon situation, the proposed project would provide a larger lagoon geometry to contain summer dry season flows. Thus the project is expected to result in a beneficial impact and no mitigation measures are required.

Impact HYDRO-5: Potential to expose people or structures to risk of flooding or impede 100-yr floodflows.

Presently, there is no significant risk of loss, injury, or death from flood flows in the immediate project area, except when large storm events occur during very high tides. The proposed project would result in reduced flood hazard risk to people and structures surrounding the lagoon through increased lagoon capacity from the reconfigured channels. The storm water system implemented for the realigned parking area would reduce and redirect stormflows in an improved manner compared to existing conditions. Consequently, a beneficial impact would result from the proposed project.

Impact HYDRO-6: Potential to alter groundwater functioning.

The proposed project would involve reconfiguration of surface water runoff and lagoon morphology. The existing groundwater supply, recharge, and groundwater table would be potentially affected at a minor level due to altered circulation and surface drainage. However, a significant change to groundwater would be immeasurable. Consequently, the proposed project would have a less-than-significant impact on groundwater in the project area. No mitigation is necessary.

Impact HYDRO-7: Potential to contribute to inundation by seiche, tsunami, or mudflow.

Based on the project's location and extent, with its focus on the peripheral areas of the lagoon (either on the western arm or eastern boat-house channel), the proposed project would not alter the existing potential for the area to be inundated by coastal processes of seiche or tsunami, or more hillslope related mudflow processes. Consequently, potential impacts would be less than significant. No mitigation is necessary.

Chapter 6

Biological Resources

Setting

Malibu Lagoon is a 31-acre shallow water embayment occurring at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay. Malibu Creek runs north-to-south through Malibu Canyon and then empties into the lagoon, contributing freshwater, sediment, nutrients, and urban runoff into the lagoon. Malibu Lagoon empties into the Pacific Ocean at the world famous Surfrider Beach, located along the 23000 block of PCH in the City of Malibu, California.

Historically, the lagoon extended beyond its current boundaries. While urban development has reduced the size of the lagoon, recent restoration projects have been implemented to restore some of these areas. The lagoon is primarily surrounded by development, with Malibu Creek and PCH to the north and Surfrider Beach and the Pacific Ocean to the south.

Soils occurring within and surrounding the lagoon are typical of a coastal valley floor alluvial landform and include Elder sandy loam, Sorrento loam, riverwash, and coastal beach. Imported fill material, including chunks of asphalt also exist within the lagoon structure.

Biological Communities

Vegetation Communities

The habitat conditions within the lagoon are primarily dictated by elevation and hydrology. A field survey was conducted in 2004 to map the existing vegetation communities within the lagoon (Merkel 2004; Figure 6-1 and Table 6-1). Increasing human population and urban development have subjected the lagoon and the surrounding wetlands to considerable disturbance. While this has generally resulted in ecological degradation of the wetland, previous restoration efforts have successfully restored some of the habitat.

Figure 6-1. Malibu Lagoon Vegetation Communities



In addition to expanding the functional area of the lagoon, past restoration efforts have included several revegetation efforts. While the success of many restoration efforts at the lagoon is evidenced by their continued persistence, the resulting mosaic of vegetation communities is often difficult to describe using common habitat classification systems (such as Holland or Sawyer and Keeler-Wolf).

Seventeen vegetation communities and habitats were mapped at the lagoon including: southern willow scrub; atriplex scrub; baccharis scrub; mule fat scrub; Venturan coastal sage scrub; mixed scrub; southern coastal salt marsh; coastal and valley freshwater marsh; brackish marsh; southern sycamore alder riparian woodland (planted as landscaping); disturbed coastal dunes; non-native grassland; disturbed habitat; mud flat; sand beach/sand bar; open water; and urban/developed land (Merkel 2004; Figure 6-1 and Table 6-1).

Table 6-1. Existing Vegetation Communities at Malibu Lagoon

Vegetation Type	Acres
Southern willow scrub	0.52
Atriplex scrub	1.54
Baccharis scrub	0.54
Mule fat scrub	1.40
Venturan coastal sage scrub	0.04
Mixed scrub	0.58
Southern coastal salt marsh	4.98
Brackish marsh	0.22
Coastal and valley freshwater marsh	0.83
Southern sycamore-alder riparian woodland	0.16
Disturbed coastal dunes	0.06
Non-native grassland	0.12
Disturbed habitat	0.01
Mud flat	3.96
Sand beach/sand bar	7.27
Open water	11.65
Urban/developed land	2.49
TOTAL	36.37

Southern Willow Scrub

Southern willow scrub is located in the northwestern portion of the project area, near the State Beach parking lot. This habitat generally consists of mature arroyo willow (*Salix lasiolepis*), with occasional mule fat (*Baccharis salicifolia*) and quail saltbush (*Atriplex lentiformis* ssp. *lentiformis*). The southern willow scrub immediately adjacent to the parking lot entrance may have been planted and sustained by irrigation or runoff from PCH, rather than by Malibu Lagoon.

Atriplex Scrub

This habitat is found primarily along the trails leading from the parking lot to the beach and is composed predominantly of saltbush (*Atriplex* sp.), with occasional coyote brush (*Baccharis pilularis*), mule fat, toyon (*Heteromeles arbutifolia*), California sagebrush (*Artemisia californica*), and elderberry (*Sambucus mexicana*).

Also occurring within this vegetation community are giant coreopsis (*Coreopsis gigantea*) and showy island snapdragon (*Galvesia speciosa*), non-native species naturally occurring on the Channel Islands, but frequently included in revegetation programs. Other non-native elements include Myoporum (*Myoporum laetum*), black mustard (*Brassica nigra*), and hottentot fig (*Carpobrotus edulis*).

The quail saltbush generally forms dense shrubs, several meters in height and width, and occurs in drier, high areas fringing the marsh and access trails. The large area of atriplex scrub occurs in sandy soils immediately north of the beach, on the south side of the lagoon. The quail saltbush is very tall and occasionally interspersed by California sagebrush and coyote brush.

Baccharis Scrub

This upland vegetation community is located along the western edge of the project area, to the east of the access road that skirts the lagoon. The habitat is dominated by coyote brush, and also includes mule fat, quail saltbush, and St. Catherine's lace (*Eriogonum giganteum*). St. Catherine's lace is native to the Channel Islands and was likely planted at the lagoon as part of previous revegetation efforts.

Mule Fat Scrub

Areas dominated by mule fat scrub occur on the margins of the lagoon in between areas of southern willow scrub, baccharis scrub, and atriplex scrub. The mule fat is interspersed with quail saltbush and coyote brush. There is also a large area of mule fat scrub along the trail leading from the parking lot to the beach, which may have been part of earlier revegetation efforts. The mule fat scrub located north of the parking lot entrance may have been planted and may be sustained by irrigation or runoff from PCH, rather than by the lagoon.

Venturan Coastal Sage Scrub

This vegetation type occurs only in very small amounts, primarily along the trail leading to the beach. These areas were likely planted as part of past restoration efforts. Dominant species include California sagebrush and St. Catherine's lace, with giant coreopsis and showy island snapdragon also present. North of the parking lot is another small area of coastal sage scrub composed nearly entirely of laurel sumac (*Malosma laurina*).

Mixed Scrub

This vegetation type has been used to map slightly atypical areas north of the access road on the southwest side of the lagoon. This area contains a variable mix of predominantly native species, with elements of at least four of the vegetation communities described above. The two dominant species within this vegetation community are coyote brush and mule fat, with quail saltbush being the next most abundant shrub.

Other species located within this vegetation community include St. Catherine's lace, lemonadeberry (*Rhus integrifolia*), western ragweed (*Ambrosia psilostachya*) and California sagebrush. This variety of co-occurring species (such as mule fat, which is a wetland indicator species, and coastal sage scrub elements, an upland habitat) again suggests that this may be the site of past restoration efforts. Degraded fencing and irrigation materials are also evident in these areas.

Southern Coastal Salt Marsh

Southern coastal salt marsh is the most abundant, vegetated habitat within Malibu Lagoon. This habitat is dominated by salt grass (*Distichlis spicata*), pickleweed (*Salicornia virginica*), and marsh jaumea (*Jaumea carnosa*). Other common species include salt marsh dodder (*Cuscuta californica*) and alkali heath (*Frankenia salina*).

This vegetation type occurs at the lowest elevations, generally fringing the mudflat. This habitat likely expands and contracts over time with seasonal inundation and dewatering of the lagoon. Slightly higher portions of the coastal salt marsh that would less frequently experience inundation also support areas of quail saltbush shrubs.

In many places the coastal salt marsh is infested by invasive exotics, primarily perennial pepperweed (*Lepidium latifolium*). The marsh also supports occasional patches of the invasive exotic hottentot fig (*Carpobrotus edulis*), black mustard (*Brassica nigra*), and giant reed (*Arundo donax*).

Coastal and Valley Freshwater Marsh

Coastal and valley freshwater marsh occurs primarily in a large area south of the parking lot, fringing pools of open freshwater. This vegetation type is predominantly composed of two species of bulrush (*Scirpus californicus* and *Scirpus acutus*) and forms tall dense stands of vegetation. A few additional small areas of freshwater marsh are also located near freshwater sources, such as the drain outlet in the southwest corner of the lagoon.

Brackish Marsh

Brackish marsh is located on the east shore of the lagoon, immediately above the mudflat. The mixture of salt marsh and freshwater marsh species reflects the variable salinities that occur in the lagoon as a result of variable hydrological conditions. This area is dominated by salt grass, regularly interspersed with bulrush.

Other species noted within this vegetation community include jaumea, pickleweed, salt marsh dodder, and mule fat. A patch of salt cedar (*Monanthochloe littoralis*), an invasive exotic, was found adjacent to the fence bordering the lagoon. Perennial pepperweed (an invasive species) also occurs in the brackish marsh.

Southern Sycamore-Alder Riparian Woodland

This vegetation type is located immediately south of the parking lot and makes up a very small portion of the project area. This area features large, mature trees, primarily sycamore (*Platanus racemosa*) and occasional California black walnut (*Juglans californica*; a California Native Plant Society [CNPS] List 4 species) and white alder (*Alnus rhombifolia*). This area was likely planted using species found in the riparian forest upstream, and may receive supplemental water from irrigation or parking lot runoff.

Disturbed Coastal Dunes

A small area of disturbed coastal sand dune is located at the far eastern edge of the survey site, above the exposed mud flat. Species occurring within this vegetation community include pink sand verbena (*Abronia umbellata*), silver beach bur (*Ambrosia chamissonis*), hottentot fig, and Bermuda grass (*Cynodon dactylon*).

Non-native Grassland

Non-native grassland is located in a very small area near the edge of the trail south of the parking lot. This is a highly disturbed area vegetated predominantly by weedy bromes (*Bromus madritensis* L. ssp. *rubens*, *B. diandrus*, and *B. hordeaceus*), as well as wild oat (*Avena fatua*). A small number of western ragweed are also mixed with the grasses.

Disturbed Habitat

Disturbed habitat has been used to characterize a small patch of bare ground immediately south of the parking lot entrance road. It is predominantly bare ground supporting no distinct vegetation community.

Mud Flat

Due to the recent breach of the sand berm at the mouth of Malibu Lagoon, the majority of the areas previously inundated were exposed mud flat at the time of the 2004 surveys. Areas mapped as mud flat were unvegetated. While mud flats are typically characterized by finer grained, less mobile sediment particles, in this instance the exact location where mud flat transitioned into sand bar and sand beach was difficult to pinpoint. Therefore, in general, all areas that had been previously inundated and were unvegetated are classified as mudflat, regardless of their constituent grain size.

Sand Beach/Sand Bar

Areas clearly composed of coarser grained particles, resulting from higher energy transport of sand near the mouth of the Lagoon, are classified as sand bar. Large, unvegetated areas of open beach are classified as sand beach.

Open Water

All unvegetated areas that had not been de-watered by the breach of the sand berm are classified as open water. Open water is generally very shallow and persists only in the deeper channels of the lagoon basins. Although this habitat accounts for the largest acreage in the survey area, this area will fluctuate significantly based on hydrological conditions (See Chapter 5, Hydrology and Water Quality). Loss of open water through drainage will be balanced by an increase in mud flat.

Urban/Developed

The areas designated as Urban/Developed comprise the paved parking lot, access roads, access trails, and the grassy park area off the parking lot.

Wetlands and Jurisdictional Non-wetland Waters

Waters under the regulatory authority of the Corps, CCC, CDFG, and RWQCB have been delineated within the lagoon. While much of the lagoon is highly degraded, a significant portion of the project area supports jurisdictional wetlands and other waters (Merkel 2004).

The Corps, through the authority Section 404 of the CWA, is the primary agency involved in wetland regulation. The EPA has the authority to veto any decision by the Corps on 404-permit issuance, as the EPA has the ultimate authority over enforcement of wetland regulations. Prior to the issuance of a Section 404 permit by the Corps, the RWQCB must issue a Section 401 water quality certification or waiver. In this way, the RWQCB regulates actions permitted by the Corps under Section 404 of the CWA. In

addition, the USFWS must be consulted and may also take jurisdiction if any wetland impacts could affect federally endangered species.

The Corps has jurisdiction over “waters of the U.S.,” including wetlands as defined by Section 404 of the CWA. Not all waters of the U.S. are wetlands and not all wetlands are under Corps jurisdiction. The term “waters of the U.S.” covers many types of waters, including: waters currently or historically used in interstate or foreign commerce, including all waters subject to the ebb and flow of tides; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, etc., the use, degradation, or destruction of which could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the U.S.; tributaries of waters of the U.S.; territorial seas; and wetlands adjacent to waters of the U.S. (USACE 1987). Regulated waters of the U.S. do not include isolated waters. However, isolated waters may be regulated by the RWQCB and the CDFG under the Porter-Cologne Act and the California Fish and Game Code, respectively.

The CDFG has jurisdiction covering lakes, rivers, and streams. Jurisdiction extends across the bed, banks, and channel of these features and includes areas beneath a riparian canopy, even if the canopy areas are well away from the stream channel (such as in oak riparian areas). More typically, the jurisdiction over streambeds is applied from the top of one channel bank to the top of the opposite bank.

The CCC regulates wetlands occurring throughout the California coastal zone, which includes Malibu Lagoon through the Coastal Development Permit (CDP) Process. The California Coastal Act defines “wetland” in Section 30121 of the California Coastal Act as follows: Wetland means lands within the coastal zone that may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats and fens.

The CCC uses the same three-criteria system for defining wetlands as the Corps, and like the CDFG, only one of the three criteria needs to be present for an area to be classified as a wetland. Unlike the CDFG, the CCC’s jurisdiction extends beyond streambeds to include all tidal areas; however, jurisdiction is limited to areas within the coastal zone.

Hydrophytic Vegetation

Vegetation communities which meet the criteria of wetland-associated vegetation are dominated by a preponderance (>50%) of species classified as obligate wetland plants (OBL), facultative wetland plants (FACW), or facultative plants (FAC) based on the *National List of Plant Species that Occur in Wetlands* (U.S. Fish & Wildlife Service 1988). Obligate wetland plants are defined as occurring almost always in

wetlands (estimated probability >99%) under natural conditions. Facultative wetland plants are defined as occurring usually in wetlands (estimated probability 67% to 99%). Facultative plants are defined as having a similar likelihood of occurring in both wetlands and nonwetlands (estimated probability 33% to 67%).

Hydrology

Wetland hydrology was indicated by the presence of surficial characteristics or sub-surficial hydric characteristics. Surficial hydrology was determined through visual observation of surface flow, drainage patterns, watermarks, and/or drift lines. Sub-surficial characteristics included saturated soils or presence of free water in the test pit.

Although non-wetland waters of the U.S./streambeds lack wetland vegetation, they do exhibit wetland hydrologic characteristics.

Hydric Soils

To confirm the presence of hydric soils, samples taken from various depths were examined for physical and chemical evidence of hydric conditions. The color of excavated soils was evaluated using the chroma index from the Munsell Soil Color Charts (Munsell Color 2000). Low-chroma color or gleyed soils are indicators of hydric soils under normal conditions. Additional indicators of hydric soils such as vertical streaking, high organic matter content in the surface horizon, mottling, and sulfidic odor were also evaluated during the delineation.

In general the jurisdictional wetlands include all areas mapped as southern willow scrub, mule fat scrub, southern coastal salt marsh, coastal and valley freshwater marsh, and brackish marsh, with the exceptions noted below (Merkel 2004; Figure 6-1; Table 6-2).

CCC and CDFG jurisdictional boundaries have the most overlap, with deviations only at the mouth of the lagoon and near the State Park parking lot. Although CCC follows the same requirement as CDFG, needing only one of the three criteria for an area to be classified as a wetland, the CCC's jurisdiction extends beyond streambed to include areas of wetland vegetation that are not necessarily dependent on the streambed or adjacent riparian area. Therefore the areas vegetated by mule fat scrub and southern willow scrub north of the parking lot (likely supported by runoff or irrigation rather than Malibu Lagoon) are within CCC jurisdiction only. The other variation in jurisdiction between CDFG and CCC is at the mouth of the lagoon, where CCC continues seaward while CDFG is limited to non-tidal waters.

Table 6-2. Jurisdictional Wetlands and Non-wetland Waters/Streambeds within the Project Area

Wetland Habitat Type	USACE Jurisdiction (acre)	CDFG Jurisdiction (acre)	CCC Jurisdiction (acre)
Southern willow scrub	0.42	0.42	0.52
Atriplex scrub	0.20	0.20	0.20
Baccharis scrub	0.00	0.00	0.00
Mule fat scrub	0.98	1.09	1.40
Venturan coastal sage scrub	0.00	0.00	0.00
Mixed scrub	0.00	0.00	0.00
Southern coastal salt marsh	4.95	4.98	4.98
Brackish marsh	0.22	0.22	0.22
Coastal and valley freshwater marsh	0.83	0.83	0.83
Southern sycamore-alder riparian woodland	0.00	0.16	0.16
Disturbed coastal dunes	0.00	0.00	0.00
Non-native grassland	0.00	0.00	0.00
Disturbed habitat	0.00	0.00	0.00
Mud flat	3.96	3.96	3.96
Sand beach/sand bar	7.27	2.75	7.27
Open water	11.65	11.09	11.65
Urban/developed land*	0.00	0.00	0.00
Total Jurisdictional Waters/Streambed	30.48	25.70	31.19

The Corps jurisdiction deviates from the CDFG and CCC boundary in areas where all three criteria were not met. In the western portion of the lagoon there were areas dominated by wetland indicator species such as mule fat or western sycamores; however, they did not meet the hydric soils criterion.

Common Wildlife Species

Past studies of Malibu Lagoon have identified 200 species of birds (Cooper 2005), 33 species of fish (Dagit & Swift 2005), 1 species of mammal (Natural Resources Assessment, Inc. 2005), 4 species of reptiles and amphibians (Hovore & Associates 2005), and 97 species of invertebrates in the project area (Hovore & Associates 2005). For more detail, existing habitat types, wetland delineation, and alternatives considered, please see the Alternatives Analysis and its appendices.

Several species of aquatic birds have been observed in the lagoon including gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Passerella melodia*), black phoebe (*Sayornis nigricans*), pied-billed grebe (*Podilymbus podiceps*), black-necked stilt (*Himantopus mexicanus*), black-crowned night heron (*Nycticorax nycticorax*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and green heron (*Butorides virescens*).

Upland bird species including California towhee (*Pipilo crissalis*), Anna's hummingbird (*Calypte anna*), bushtit (*Psaltriparus minimus*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), western scrub-jay (*Aphelocoma californica*), and house finch (*Carpodacus mexicanus*) have been observed in the upland habitats surrounding the lagoon, which consists predominantly of Venturan coastal sage scrub and mixed scrub habitats.

Lagoon habitats do not support many mammal or reptile species. Most of the available scrub habitat is very dense at ground level as well as higher up, and the southern coastal salt marsh is almost entirely covered by jaumea with very little bare ground exposed. Small mammals generally prefer more open scrub habitats with low openings and sparse ground cover. In addition, the lagoon is almost entirely surrounded by either water (open ocean) or development (housing and commercial).

Some common mammals that are known to occur at the lagoon include mule deer (*Odocoileus hemionus californicus*), Audubon's rabbit (*Sylvilagus auduboni*), and coyote (*Canis latrans*). One mammal was caught during the 2005 mammal trapping effort: black rat (*Rattus rattus*). It is possible that other species, such as the deer mouse (*Peromyscus maniculatus*) and the meadow mouse (*Microtus californica*), are present in the lagoon, but are at such low numbers that capture is difficult.

The surrounding vegetation supports a few common species of reptiles, such as western fence lizard (*Sceloporus occidentalis*) and side-blotched lizard (*Uta stansburiana*).

The project area provides habitat for a variety of invertebrates (e.g., earwigs, grasshoppers, butterflies, ants, spiders, etc.) including but not limited to ring-legged earwig (*Euborellia annulipes*), field cricket (*Gryllus* sp.), green stinkbug (*Chlorochroa* sp.), western tiger swallowtail (*Papilio rutulus*), common sand beetle (*Coelus ciliatus*), Argentine ant (*Linepithema humile*), and black widow (*Latrodectus hesperus*).

Several fish species are resident within the lagoon and vary depending on the season and status of the lagoon entrance condition. Common species captured during the 2005 surveys include topmelt (*Atherinops* sp.), carp (*Cyprinus carpio*), California killifish (*Fundulus parvipinnis*), mosquito fish (*Gambusia affinis*), longjaw (*Gillichthys mirabilis*), and opaleye (*Girella nigricans*).

Special-Status Species

Sensitive Plant Species

No federally or state listed plant species were observed within the project area during any of the biological surveys (Wishner 2005). One CNPS List 4 species, California black walnut, was observed during the 2004 vegetation mapping effort (Merkel 2004). Special status plant species with potential to occur in the project area were identified through a search of the California Natural Diversity Data Base (CNDDDB) and include Braunton's milk vetch (*Astragalus brauntonii*) and Lyon's pentachaeta (*Pentachaeta lyonii*) (CNDDDB 2004). These species and their potential to occur within the project area are discussed below.

California Black Walnut

California black walnut, a CNPS List 4 species, is typically associated with chaparral, coastal scrub, and cismontane woodland habitats on slopes and in canyons. This species was observed within the southern sycamore-alder riparian woodland during the 2004 vegetation mapping effort (Merkel 2004).

Braunton's Milk Vetch

This federally endangered and CNPS List 1B species is associated with closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grasslands (CNDDDB 2004). While this species was observed in Malibu Lagoon in 1984, it has not been reported since and is assumed to have been extirpated from the area. Therefore, this species is not expected to occur within the project area. As part of the restoration, Braunton's Milk Vetch will be re-established in the appropriate habitat area of the restoration project.

Lyon's Pentachaeta

This federally endangered, state endangered, and CNPS List 1B species is associated with chaparral and valley and foothill grasslands, usually

along the edges of firebreaks. This species was observed along Malibu Creek in 1979 but is now presumed missing from the area. Therefore, this species is not anticipated to occur in the project area and would be highly unlikely to occur in seasonal lagoon habitats.

Santa Monica Mountains Dudleya

This federally threatened and CNPS List 1B species is associated with chaparral and coastal scrub habitats. This species was observed in Malibu Canyon in 1980 but is now presumed missing from the area. Therefore, this species is not expected to occur within the project area and would be highly unlikely to occur in seasonal lagoon habitats.

Marcrescent Dudleya

This federally threatened, state rare, and CNPS List 1B species is typically found in chaparral on sheer rock surfaces and rocky volcanic cliffs. This species was observed along Malibu Creek in 1979 but is now presumed missing from the area. Therefore, this species is not expected to occur within the project area and would be highly unlikely to occur in seasonal lagoon habitats.

Sensitive Wildlife Species

Arthropod Species

While not observed within the project area during the field surveys, a number of agency-listed sensitive arthropod species occur within the coastal portion of the Santa Monica Mountains, including: Trask's shoulderband snail (*Helminthoglypta traskii*), wandering (salt marsh) skipper butterfly (*Panoquina errans*; The Nature Conservancy G2¹ listed species; IUCN Red List near threatened), Busck's gallmoth (*Carolella busckana*; DFG special animal list), Belkin's dune tabanid (*Brennania belkini*; IUCN Red List vulnerable), globose dune beetle (*Coelus globosus*; IUCN Red List vulnerable), Santa Monica Mountains shieldback katydid (*Neduba longipennis*; IUCN Red List critically endangered, proposed federally endangered), and sandy beach tiger beetle (*Cicindela hirticollis gravida*; DFG special animal list, proposed federally endangered) (Hovore & Associates 2005).

Huffman (2002, *Santa Monica Bay Audubon Soc. newsletter*, Vol. 26(1)), reports seeing wandering (salt marsh) skipper at Malibu Lagoon, and while this record remains to be verified, the species may occasionally wander into the project area; its host plant (*Distichlis spicata* and other grasses) is present.

The other species likely would not occur within the project area, primarily because the natural, native habitat values are either lacking or retorted and degraded, or their specific host plants or substrate associations are lacking.

¹ Imperiled globally because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range. (Endangered throughout its range).

Fish

Several sensitive fish species are known from Malibu Lagoon, either historically or presently. These include Pacific Lamprey (*Lampetra tridentata*), southern steelhead trout (*Oncorhynchus mykiss*), arroyo chub (*Gila orcutti*) and Coho salmon (*Oncorhynchus kisutch*). In addition, the tidewater goby (*Eucyclogobius newberryi*) was historically present and re-introduced to the lagoon in 1991. These species and their potential to occur in the project area are discussed below.

Pacific Lamprey. Pacific lampreys are anadromous. The adults enter streams to spawn in November to March, dying shortly after they lay eggs in gravelly areas of the stream. The young, known as ammocoetes, hatch out within two to three weeks and remain in fresh water for an unknown time period, perhaps as long as four to six years. They burrow in soft substrates in well-oxygenated areas, and filter feed on detritus. Pacific lamprey eventually migrate to the ocean and eventually return as adults to spawn.

Populations of Pacific lampreys have declined due to a combination of habitat loss, restricted migratory opportunities, changes in sedimentation and water quality and competition or predation by introduced species. Lampreys, including *L tridentata*, the species found locally, have been petitioned for listing through the U.S. Fish and Wildlife Service (USFWS).

While much of Malibu Creek historically contained suitable habitat and lampreys were present, adults have not been found during any of the surveys since the 1980s (Dagit and Swift 2005).

Southern Steelhead Trout. Estuaries are known to be important transitional habitats for steelhead smolts leaving their natal stream and heading out to sea, as well as critical migratory passageways for adults coming in to spawn during storm events (Swift 1975). In Santa Monica Bay, steelhead typically enter the creeks during winter storms, spawn and either return to the sea while flows are still high, or remain in the creek during the subsequent summer and fall. Patterns of steelhead presence and reproduction in Malibu Creek have been sporadically studied since the 1980s, and monthly snorkel surveys are planned through June 2007.

No steelhead adults or smolts have been documented by any of the fish surveys in the lagoon. During the 2005 surveys, both surface and bottom water temperatures were between 21⁰C and 34.7⁰C. Although able to tolerate temperature spikes into the mid-20s, steelhead prefer to inhabit cooler waters. The temperature limitations of the lagoon could be a major reason for their absence this season (Dagit and Swift 2005). While not observed within the project area during any of the surveys, steelhead are known to occur upstream within Malibu Creek (Dagit et. al. 2005) and could occur within the project area due to the presence of suitable habitat.

Arroyo Chub. This CDFG Species of Special Concern is associated with slow-moving stream sections with mud or sand bottoms and feeds on aquatic vegetation and associated invertebrates. While potentially suitable habitat for this species occurs within the vicinity of the project area, the arroyo chub was not observed during any of the surveys conducted.

Coho Salmon. This federally threatened and state endangered species requires beds of loose, silt-free, coarse gravel for spawning. Habitat requirements also include cover, cool water and sufficient dissolved oxygen. While potentially suitable habitat for this species occurs within the vicinity of the project area, the Coho salmon was not observed during any of the surveys conducted.

Tidewater Goby. This federally endangered species and CDFG Species of Special Concern was historically known to occur within the lagoon. However, studies conducted between the late 1960s and the early 1990s indicated that this species had been extirpated from the area since at least 1970. Current studies have documented the recovery of this species since its re-introduction in 1991, and indicate that the area on the west side of the lagoon both up and downstream of the PCH bridge consistently hosts gobies year round, with size classes and densities varying seasonally (Dagit and Swift 2005).

Amphibians and Reptiles

Sensitive amphibians and reptiles were not observed within the project area during any of the biological surveys (Hovore & Associates 2005). Sensitive amphibians and reptiles known to occur in the vicinity of the project area and their potential to occur within the project area are discussed below.

Coast Range Newt (Taricha t. torosa). This species persists in scattered metapopulations within the upper portions of several drainages on the coastal slope of the Santa Monica Mountains, but has suffered declines due to a variety of anthropogenic effects, including introduced predators (crayfish), changes to creek morphology, roadkill mortality, and post-fire creekbed siltation. It occurred historically within lower Malibu Creek (Hovore 2005) and persists within the canyon within Malibu Creek State Park. However, physical and chemical characteristics of the creek channels within the project area are wholly unsuited to use by coast range newt, which would be highly unlikely to occur in seasonal lagoon habitats.

Silvery Legless Lizard. Legless lizards, a CDFG Species of Special Concern, are much more common than historic accounts would indicate (Hovore 2005), but their fossorial, secretive behavior makes them difficult to census. Although not observed within the project area, this species has potential to occur as areas of loamy soils with dense cover (such as the southern willow scrub near the bridge) and vegetated areas of remnant dune sand provide suitable habitat.

Two-striped Garter Snake. The two-striped garter snake is a CDFG Species of Special Concern known to occur from Coastal California from the vicinity of Salinas to Northwest Baja. Highly aquatic, this species is most commonly found in or near permanent water. It can occasionally be found in small and intermittent streams with rocky beds. Although not observed within the project area, this species has potential to occur.

Birds

Five bird species recorded during the 2005 breeding surveys are considered “sensitive,” in that they are protected by state and/or federal endangered species acts; because they are recognized as threatened or near-threatened by the International Union for Conservation of Nature and Natural Resources (IUCN); or because they are being considered for listing as California Bird Species of Special Concern (Cooper Ecological Monitoring, Inc. 2005).

None nest at the site or in the area, although two have done so in recent history and could conceivably do so again with improved habitat management. One sensitive bird species was also recorded during the 2005 mammal surveys. Sensitive wildlife species observed or detected within the project area include: savannah sparrow (*Passerculus sandwichensis*), California brown pelican (*Pelecanus occidentalis californicus*), western snowy plover (*Charadrius alexandrinus nivosus*), Heermann’s gull (*Larus heermanni*), elegant tern (*Sterna elegans*), and California least tern (*Sterna antillarum browni*).

California Brown Pelican. This federal and state endangered species is a post-breeding dispersant from large breeding colonies in western Mexico, particularly on desert islands in the Sea of Cortez. Rather than flying south for the winter after nesting like most temperate-zone migrants, this species actually flies north, up the coast of California. Their nesting season extends from early winter into spring, so numbers in southern California peak in mid-summer. Up to 210 California brown pelicans were observed at Malibu Lagoon during surveys conducted in 2005, generally roosting along the sand spit separating the lagoon from the sea or on the island in the middle of the lagoon exposed by low tide (until flushed by people); this species does not nest within the project area.

Western Snowy Plover. Two hatch-year (born this spring) western snowy plovers were present briefly along the southern edge of Malibu Lagoon on June 14, 2005, but were soon flushed by people and did not return during the survey. This CDFG Species of Special Concern and federally threatened species was formerly a common nester and winterer along the coast of southern California, and still uses Malibu Lagoon as a major local wintering site. However, due to beach-grooming and disturbance by dogs and people, this species no longer nests in Los Angeles County.

Heermann's Gull. This species, listed on the IUCN Red List as Near Threatened, is a post-breeding dispersant from large breeding colonies in western Mexico, particularly on desert islands in the Sea of Cortez. Rather than flying south for the winter after nesting like most temperate-zone migrants, this species actually flies north, up the coast of California. Their nesting season extends from early winter into spring, so numbers of this species in southern California peak in mid-summer. Heermann's Gulls were invariably found roosting on the sand spit or the beach—this strictly coastal bird is rarely found more than a few meters inland. Up to 70 individuals were tallied during the 2005 surveys, almost all adults (juveniles arrive somewhat later in the summer); this species does not nest within the project area.

Elegant Tern. This CDFG Species of Special Concern is a post-breeding dispersant from large breeding colonies in western Mexico, particularly on desert islands in the Sea of Cortez. Rather than flying south for the winter after nesting like most temperate-zone migrants, this species actually flies north, up the coast of California. Their nesting season extends from early winter into spring, so numbers of this species in southern California peak in mid-summer. The elegant tern can be numerous at Malibu Lagoon, but during the 2005 surveys, only a handful were observed (except for 30 birds early morning on June 3, 2005); this species does not nest within the project area. This tern has recently colonized Los Angeles County as a breeder (Terminal Island; Cooper 2004), and it is possible that some of the birds observed are from these colonies.

California Least Tern. This federal and state endangered species was formerly a common nester on local beaches and is now confined to a handful of protected sites, mainly islands of dirt fill in harbors and bays. The California least tern winters at sea off the west coast of Mexico and Central America. On July 13–14, 2005, a large concentration (up to 42 birds) was present at Malibu Lagoon, roosting along the southern shore and foraging in the main body of the lagoon, with smaller numbers feeding in the west basin. On both days, a total of 14 hatch-year birds were present with adults, many of which were banded. It is likely these were birds from a colony near Terminal Island, Los Angeles Harbor, where several hundred birds were monitored and banded this year (Cooper 2005).

Impacts and Mitigation Measures

Thresholds of Significance

Criteria or thresholds for determining the significance of an impact are presented in the following sections to clarify and quantify, to the extent feasible, at what point an impact to a biological resource is considered significant.

The significance of impacts to flora and fauna observed or expected at the site was determined based on the sensitivity of the resource and the extent of the impact. Sensitive species are defined by State CEQA Guidelines § 15380 as species that are listed by either the state or federal government as endangered, rare, or threatened. This section goes on to state that species need not be officially listed by the state or federal government to be considered sensitive. This is an ecological restoration where resource protection is the highest priority. Therefore, for the purposes of this analysis, sensitive species are those that are recognized by a government agency or conservation or scientific group as being depleted, potentially depleted, declining, rare, locally endemic, endangered, or threatened.

Also included are any species nominated for, or placed on a state or federal rare, endangered, or threatened species list. Habitats supporting species listed as rare, endangered, or threatened by the agencies that enforce the California Endangered Species Act (CESA) or Federal Endangered Species Act (FESA) are also regarded as sensitive resources.

According to Appendix G of the State CEQA Guidelines, a project would normally have a significant effect on a biological resource if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to marsh, riparian scrub, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provision of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan.

Impacts and Mitigation Measures

Potential impacts to the various biological resources described in the previous pages are discussed below. For those resources that could potentially be significantly impacted, mitigation measures are identified that will result in avoidance of the impact, or reduction of the impact to a less-than-significant level.

As final construction-level plans have not yet been completed, quantifying effects to individual vegetation communities and species is not feasible. However, by combining the existing mapped vegetative communities into fewer more general modeled habitat classes, an accurate estimate of changes in wetland habitat area is possible.

Tables 6-3 and 6-4 indicate changes in acreages for each modeled habitat class under both open (Table 6-3) and closed (Table 6-4) lagoon conditions. It must be noted that the habitat acreages are modeled based on specific set elevations necessary for modeling. In reality, these elevations are dynamic and thus the actual acreages will fluctuate within a given range. Because of this fact, it is most appropriate to look at total changes to marsh habitat, rather than individual changes to the various wetland habitat components. As shown in Table 6-3, under open lagoon conditions, total marsh habitat will increase from approximately 6 acres to approximately 13 acres (115% increase).

Total available subtidal and intertidal habitat will increase approximately 4 acres or approximately 15% during open conditions, while total submerged habitat (elevation -2 feet to 0 feet) would increase from approximately 13 acres under existing conditions to approximately 14 acres under project conditions. During closed lagoon conditions with water level at +5 feet, all tidally influenced habitat is submerged under both existing and project scenarios. Since total tidally influenced habitat is increased by over 4 acres under project conditions, so too is total submerged habitat increased. This increase in submerged habitat under both open and closed lagoon conditions is expected to benefit fish species.

Thus, while it is not known with certainty the extent that individual vegetation species may be temporarily disturbed, reduced in population, or increased in population, the overall marsh habitat will be dramatically increased and long-term beneficial impacts will result.

A detailed planting plan will be developed during the final design stage of the project. This plan will estimate how much of each species will be planted. However, as natural processes are favored, natural recruitment of vegetation and subsequent succession will play a large part in the eventual species composition in the wetland habitat.

Table 6-3. Entire Lagoon: Open Conditions at Water Level of 1 Foot below MSL

Habitat Type	Elevation	Existing Acres	With-Project Acres
Subtidal Gravel/Sand Bar	-2 – -1	0.13	0.08
Intertidal Gravel/Sand Bar	-1 – 4	12.55	13.79
Sand Beach	4 – 6	1.95	1.23
Subtidal Softbottom	-2 – 0	0.51	0.24
Mudflat	0 – 1	4.77	1.52
Brackish Marsh	1 – 3	0.17	3.83
Freshwater Marsh	3 – 5	0.81	5.68
Alkali Meadow	5 – 7	4.95	3.26
Salt Panne	varies	0.00	0.00
Available marsh habitat		5.93	12.76
Percent marsh habitat		18%	39%
Coastal Dune/Bluff Scrub	7 – 9	1.32	1.25
Uplands	> 9	0.54	0.58
Roads/Parking/Disturbed/Trails		2.02	1.13
Turf & Ornamental		0.89	0.00
Riparian		1.97	0.00
Available non-marsh habitat		5.42	1.71
Total Area		32.59	32.59

Source: Moffatt & Nichol and Heal the Bay 2005.

Table 6-4. Entire Lagoon: Closed Conditions at Water Level of 5 Feet above MSL

Habitat Type	Elevation	Existing Acres	With-Project Acres
Subtidal Gravel/Sand Bar	-2 – -1	Submerged	Submerged
Intertidal Gravel/Sand Bar	-1 – 4	Submerged	Submerged
Sand Beach	4 – 6	Submerged	Submerged
Subtidal Softbottom	-2 – 0	Submerged	Submerged
Mudflat	0 – 1	Submerged	Submerged
Brackish Marsh	1 – 3	Submerged	Submerged
Freshwater Marsh	3 – 5	Submerged	Submerged
Alkali Meadow	5 – 7	4.95	3.26
Coastal Dune/Bluff Scrub	7 – 9	1.32	1.25
Salt Panne	varies	0.00	0.00
Available marsh habitat		6.27	4.51
Coastal Dune/Bluff Scrub	7 – 9	1.32	1.25
Uplands	> 9	0.54	0.58
Roads/Parking/Disturbed/Trails		2.02	1.13
Turf & Ornamental		0.89	0.00
Riparian		1.97	0.00
Available non-marsh habitat		6.74	2.96

Source: Moffatt & Nichol and Heal the Bay 2005.

Impact BIO-1: Implementation of the project (i.e., changes to the lagoon configuration, improvements to slopes, etc.) would remove southern willow scrub vegetation.

The project would result in impacts to southern willow scrub. Impacts to this riparian habitat, which falls under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, at least a portion of this plant community is being sustained by artificial freshwater inputs such as supplemental irrigation associated with plantings from past restoration efforts and surface runoff from the parking lot and PCH. Furthermore, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated riparian vegetation.

While post-project acreages of southern willow scrub may be reduced from identified pre-project acreages, post-project acreages of wetland habitat would be increased and the functions and values of the biological resources within the lagoon, including riparian vegetation and USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to southern willow scrub are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-2: Implementation of the project would remove atriplex scrub vegetation.

The project would result in impacts to atriplex scrub. Impacts to this riparian habitat, which falls under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, this plant community contains Swamp saltbush (*Atriplex amnicola*) which is native to Australia and is known to be invasive in wetlands once it is established. It is not known for sure whether or not this species was mistakenly included into restoration plantings as an

endemic, or if it subsequently colonized the area after restoration plantings were installed. Either way, its presence is undesirable. Furthermore, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated riparian vegetation.

While post-project acreages of atriplex scrub may be reduced from identified pre-project acreages, post-project acreages of wetland habitat would be increased and the functions and values of the biological resources within the lagoon, including riparian vegetation and USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to atriplex scrub are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-3: Implementation of the project would remove baccharis scrub.

The project would result in impacts to baccharis scrub. Impacts to this upland habitat may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and surrounding upland vegetation.

While post-project acreages of baccharis scrub may be reduced from identified pre-project acreages, this outcome is consistent with project goals. Much of the upland vegetation in the lagoon is supported now by artificially raised elevations in the lagoon area from a previous land use as a fill disposal site by Cal Trans. Although some of this fill was removed during a previous restoration effort, much still remains. It is anticipated that when these elevations are lowered to a more historically accurate level by removing additional fill, much of the area currently supporting upland vegetation will revert to wetland species more suited to lower elevations typical in an undisturbed lagoon system. Therefore, impacts to baccharis scrub are considered less than significant. No mitigation is required.

Impact BIO-4: Implementation of the project would remove mule fat scrub.

The project would result in impacts to mule fat scrub. Impacts to this riparian habitat, which falls under the jurisdiction of the

USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, at least a portion of this plant community is being sustained by artificial freshwater inputs such as supplemental irrigation associated with plantings from past restoration efforts and surface runoff from the parking lot and PCH. Furthermore, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated wetland habitat.

While post-project acreages of mule fat scrub may be reduced from identified pre-project acreages, post-project acreages of wetland habitat would be increased and the functions and values of the biological resources within the lagoon, including USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to mule fat scrub are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-5: Implementation of the project would remove Venturan coastal sage scrub.

The project would result in impacts to Venturan coastal sage scrub. Impacts to this upland habitat may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its wetland habitat.

While post-project acreages of Venturan coastal sage scrub may be reduced from identified pre-project acreages, this outcome is consistent with project goals. Much of the upland vegetation in the lagoon is supported now by artificially raised elevations in the lagoon area from a previous land use as a fill disposal site by Cal Trans. Although some of this fill was removed during a previous restoration effort, much still remains. It is anticipated that when these elevations are lowered to a more historically accurate level by removing additional fill, much of the area currently supporting upland vegetation will revert to wetland species more suited to lower elevations typical in an undisturbed lagoon system. Therefore, impacts to Venturan coastal sage scrub are considered less than significant. No mitigation is required.

Impact BIO-6: Implementation of the project would remove mixed scrub.

The project would result in impacts to mixed scrub. Areas that were classified as mixed scrub did not show any one dominant habitat type. Rather they consisted of a mosaic of opportunistic plant species from several different habitat types. Impacts to mixed scrub are considered less than significant since it is not well defined as an intact plant community. No mitigation is required.

Impact BIO-7: Implementation of the project would remove southern coastal salt marsh.

The project would result in temporary impacts to southern coastal salt marsh. Impacts to this riparian habitat, which falls under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated wetland habitat.

Post-project acreages of southern coastal salt marsh will be substantially increased from identified pre-project acreages. Total marsh habitat is expected to more than double from approximately 6 acres under existing conditions to approximately 13 acres after the project is implemented. Overall post-project acreages of wetland habitat would be increased and the functions and values of the biological resources within the lagoon, including USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to southern coastal salt marsh are beneficial. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-8: Implementation of the project would remove brackish marsh.

The project would result in impacts to brackish marsh. Impacts to this riparian habitat, which falls under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts

may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated wetland habitat.

While post-project acreages of brackish marsh may be reduced from identified pre-project acreages, total post-project acreages of wetland habitats would be increased and the functions and values of the biological resources within the lagoon, including USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to brackish marsh are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-9: Implementation of the project would remove coastal and valley freshwater marsh.

The project would result in impacts to coastal and valley freshwater marsh. Impacts to this riparian habitat, which falls under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, at least a portion of this plant community is being sustained by artificial freshwater inputs such as supplemental irrigation associated with plantings from past restoration efforts and surface runoff from the parking lot and PCH. Furthermore, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated wetland habitat.

While post-project acreages of coastal and valley freshwater marsh may be reduced from identified pre-project acreages, total post-project acreages of wetland habitat would be increased and the functions and values of the biological resources within the lagoon, including USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to coastal and valley freshwater marsh are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-10: Implementation of the project would remove southern sycamore-alder riparian woodland.

The project would result in impacts to southern sycamore-alder riparian woodland. Impacts to this riparian habitat, which falls under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, this plant community was installed as a landscape element for the parking lot and interpretive lawn area in the 1980's and is supported by fresh water irrigation as well as surface runoff from the existing parking lot. This landscape element lacks herbaceous riparian understory that one might expect in a more natural southern sycamore-alder riparian woodland and it is unlikely that it would persist in a more natural water regime that is driven by natural lagoon processes rather than by artificial freshwater inputs such as supplemental irrigation and surface runoff.

In addition, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated riparian vegetation. While post-project acreages of southern sycamore-alder riparian woodland may be reduced from identified pre-project acreages, post-project acreages of wetland habitat would be increased and the functions and values of the biological resources within the lagoon, including riparian vegetation and USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project.

Therefore, impacts to southern sycamore-alder riparian woodland are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-11: Implementation of the project would remove non-native grassland.

The project would result in impacts to non-native grassland. This vegetation community is comprised of undesirable non-native plant species that are considered invasive. It is anticipated that post-project acreages of non-native grassland would be decreased from identified pre-project acreages. This outcome is consistent with project goals to improve the integrity of appropriate native plant communities and to eliminate non-native vegetation within the lagoon area. Therefore,

impacts to non-native grassland are considered less than significant. No mitigation is required.

Impact BIO-12: Post-construction acreage of marsh and mudflat would increase.

The project would result in an increase in marsh and mudflat acreage (see Table 6-3) and thus a beneficial impact. These increases are the most substantial component of the overall increase in wetland habitat. Beneficial impacts would result and no mitigation is necessary.

Impact BIO-13: Implementation of the project would impact sand beach/sand bar.

The project would result in impacts to sand beach/sand bar. Impacts to areas classified as sand beach/sand bar, which fall under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated riparian vegetation. It is anticipated that post-project acreages of sand beach/sand bar would be increased from identified pre-project acreages. In addition, the functions and values of the biological resources within the Lagoon would be improved as a result of implementation of the project.

Therefore, impacts to sand beach/sand bar are considered less than significant. No mitigation is required. However, permits and/or approvals from the USACE/RWQCB, CDFG, and the CCC would be required for impacts to resources under their jurisdiction.

Impact BIO-14: Implementation of the project would impact open water.

The project would result in impacts to open water. Impacts to areas classified as open water, which fall under the jurisdiction of the USACE/RWQCB, CDFG, and CCC, may have a short-term adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or the USFWS. These impacts may have a short-term adverse effect on federally protected wetlands as defined by Section 404 of the CWA.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated riparian vegetation. Post-project acreages of open water would likely be increased from identified pre-project acreages. In addition, the functions and values of the biological resources within the lagoon, including riparian vegetation and USACE/RWQCB, CDFG, and CCC jurisdictional resources, would be improved as a result of implementation of the project. Therefore, impacts to open water are considered less than significant. No mitigation is required.

Impact BIO-15: Implementation of the project could result in impacts to common wildlife species found to occur in the project area.

The project, through direct impacts and/or temporary loss of habitat, could result in impacts to common wildlife species (i.e., birds, fish, mammals, reptiles, amphibians, and invertebrates) found to occur in the project area. Temporary disturbances to wildlife species and habitat due to construction would be adverse, but are less than significant given the temporary and intermittent nature of the impact. No mitigation is required.

Impact BIO-16: Implementation of the project could result in impacts to California black walnut.

The project, through direct or indirect impacts, could result in the loss of California black walnut trees. Impacts to this species could have an adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS. However, impacts to this species would not be considered significant as the individual black walnuts observed in the southern sycamore-alder riparian woodland during the 2004 vegetation mapping (Merkel 2004) do not represent a significant population of this CNPS List 4 species.

Impact BIO-17: Implementation of the project could result in impacts to the wandering (salt marsh) skipper.

The project, through direct impacts and/or temporary loss of habitat (and host plants), could result in impacts to the wandering (salt marsh) skipper. Impacts to this species would have a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS. However, impacts to this species would not be considered

significant as direct impacts are anticipated to be minimal and as pre-and post-project acreages of suitable habitat for this species would be similar if not identical.

Impact BIO-18: Implementation of the project could result in impacts to southern steelhead trout.

The project, through direct impacts and/or temporary loss of habitat, could result in impacts to southern steelhead trout. Impacts to this species would have a short-term adverse effect on a species identified as a candidate, sensitive, or special status species on local or regional plans, policies or regulations, or by the CDFG, USFWS, or NOAA/NMFS. Impacts to this species may temporarily interfere with the movement of a native resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors.

The project has been designed to ensure that seasonal lagoon openings be maintained to allow interchange of steelhead with coastal waters. Therefore, the project would not effect a detectible change on the suitability of the lagoon to support steelhead migration. Improvements to lagoon water quality, particularly improved dissolved oxygen levels may provide some increased availability of habitat for steelhead juveniles; however, it is not anticipated that lower portions of the lagoon would be used differently by steelhead following enhancement. Therefore, impacts are not significant and mitigation is not required. However, potential direct impacts to this species may be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1: Southern Steelhead Trout.

- Construction and lagoon excavation may occur during steelhead migration. In order to avoid direct impacts to steelhead, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.
- In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of

similar tools. In the event that water must be pumped from these areas during construction, it shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be reflooded in a manner that minimizes disturbance of the lagoon salinity stratification and substrate and the release of sediment.

- Reinundation of the western lagoon may provide refuge areas for fish during construction activities in the main lagoon. Block netting and barriers shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS-approved fisheries biologist would be conducted during any channel or bank disturbance. Pages 100 and 101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outline a possible construction sequence in more detail that incorporates several of these ideas.

Impact BIO-19: Implementation of the project would result in impacts to the tidewater goby.

The project, through direct impacts and/or temporary loss of habitat, would result in impacts to the tidewater goby. Impacts to this species would have a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS. Impacts to this species may temporarily interfere with the movement of a native resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors.

The project, while not specifically designed to improve tidewater goby habitat, was designed to ensure that no significant impact would occur to the main lagoon goby habitat due to implementation of the project and was designed to benefit gobies within the more protected refugia habitats away from the main lagoon.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species may be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-2: Tidewater Goby.

- Construction of the restoration project shall be timed to minimize disturbance of the western shoreline of the main lagoon when larval tidewater gobies are using the near-shore

habitat. In order to avoid direct impacts to gobies, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.

- In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts to gobies shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of similar tools. In the event that water must be removed from these areas during construction, it shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be re-flooded in a manner that minimizes disturbance of the lagoon salinity stratification and substrate and the release of sediment.
- Construction in the main lagoon shall occur outside of the May 1 through November 1 breeding season for the tidewater gobies. Re-inundation of the western lagoon may provide refuge areas for fish during construction activities in the main lagoon. Block netting shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS-approved fisheries biologist would be conducted during any channel or bank disturbance. Pages 100 and 101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outline a possible construction sequence in more detail that incorporates many of these ideas.

Impact BIO-20: Implementation of the project could result in impacts to the California brown pelican.

The project, through direct impacts and /or temporary loss of habitat, could result in impacts to the California Brown Pelican. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the

lagoon and its associated vegetation communities. Moreover, no work will be done in the main lagoon channel that the Brown Pelican uses for roosting habitat - specifically the snags and high sand bar. Post-project acreages of suitable habitat for the California brown pelican would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-3: California Brown Pelican.

On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Impact BIO-21: Implementation of the project could result in impacts to the western snowy plover.

The project, through direct impacts and /or temporary loss of habitat, could result in impacts to the western snowy plover. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated vegetation communities. Post-project acreages of suitable habitat for the western snowy plover would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-4: Western Snowy Plover.

Schedule construction activities and ground disturbance in suitable/occupied habitat to avoid the western snowy plover breeding season from mid-March to August 30. On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Impact BIO-22: Implementation of the project could result in impacts to Heermann's Gull.

The project, through direct impacts and/or temporary loss of habitat, could result in impacts to Heermann's gull. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated vegetation communities. Moreover, no work will be done in the main lagoon channel that the Heermann's Gull uses for roosting habitat - specifically the snags and high sand bar. The project will also create protected islands, providing additional habitat for this species. Post-project acreages of suitable habitat for Heermann's gull would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-5: Heermann's Gull.

On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Impact BIO-23: Implementation of the project could result in impacts to the elegant tern.

The project, through direct impacts and/or temporary loss of habitat, could result in impacts to the elegant tern. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated vegetation communities. Moreover, no work will be done in the main lagoon channel that the elegant tern uses for roosting habitat - specifically the snags and high sand bar. The project will also create protected islands, providing additional habitat for this species. Post-project acreages of suitable habitat for the elegant tern would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-6: Elegant Tern.

On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Impact BIO-24: Implementation of the project could result in impacts to the California least tern.

The project, through direct impacts and/or temporary loss of habitat, could result in impacts to the California least tern. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated vegetation communities. Moreover, no work will be done in the main lagoon channel that the least tern uses for roosting habitat - specifically the snags and high sand bar. The project will also create protected islands, providing additional habitat for this species. Post-project acreages of suitable habitat for the California least tern would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-7: California Least Tern.

Schedule construction activities and ground disturbance to avoid the California least tern breeding season and post-breeding season foraging (July to August). On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Post-construction Impacts and Mitigation Measures

Long-term components of the proposed project include the following:

1. Water Management Plan
 - a. A water management plan is incorporated into the project to manage drainage from the parking lot and public use areas to restored habitat areas. It includes Best Management Practices (BMPs) to enhance water quality in the lagoon.
 - b. Circulation of water within the lagoon will be closely monitored and evaluated. The Water Management Plan includes performance criteria and adaptive management options so the plan can be revised if needed to ensure long-term restoration integrity and success.
2. Habitat Plan
 - a. A detailed habitat enhancement and management plan has been incorporated into the project to specify implementation practices and maintenance requirements. The Habitat Plan defines vegetative communities that will be established or enhanced as part of the restoration process. This plan addresses the establishment or enhancement of rare, endangered and regionally uncommon plants and animals that are appropriate for this site and uses an adaptive management framework to ensure long-term restoration integrity and success.
3. Monitoring Plan.
 - a. A detailed monitoring plan has been incorporated into the project to set out a project of field observations and monitoring to be undertaken prior to, during and following implementation. Specific monitoring tasks and decision-points are specified to feed into an adaptive management framework to ensure long-term restoration integrity and success. The Monitoring Plan includes habitat (flora and fauna), water quality (both open and closed conditions), sediment quality (sampling of grain size), and bathymetry (lagoon topography).

These plans would ensure that significant post-construction impacts do not occur as a result of implementation of the project. Therefore, additional mitigation is not required.

Chapter 7

Cultural Resources

Setting

Environmental Setting

Malibu Lagoon is located at the mouth of Malibu Creek, with the majority of the project area consisting of low-lying islands and tidal marsh surrounded by waters of the lagoon and creek. The Pacific lies to the south. Broad low lying delta sediments lie to the west of the project area, and it is probable that the lagoon has migrated within this delta setting over time. Elevation in the project area ranges from sea level to just above 25 feet above mean sea level. Slightly elevated beach front land exists along the eastern and western edges of the lagoon, and these areas have been available for human occupation and use—such as the Adamson House, situated at a little over 25 feet AMSL on the east side of the lagoon.

Historically, the lagoon extended beyond its current boundaries, but a significant portion of the once low-lying areas near the mouth of Malibu Creek were filled in the 1940s and 1950s. As a result of urban encroachments, the lagoon as we see it today is a very small portion of its historic area. The PCH Bridge has dissected and constricted the lagoon surface area. By the 1970s the project site was completely filled and was covered by two baseball fields. Soils occurring within and surrounding the lagoon are typical of a coastal valley floor alluvial landform and include Elder sandy loam, Sorrento loam, riverwash, and coastal beach.

Vegetation within the project area consists of various types of coastal scrub, and salt, brackish and freshwater marsh habitats, with many non-native and ruderal species. Malibu Lagoon supports numerous bird and invertebrate species. Lagoon habitats do not support many mammal or reptile species; however, fish are resident within the lagoon, and sea mammals also may have been present prior to extensive development (Merkel & Associates 2004).

In the past, several restoration efforts have been made. In 1983, the DPR initiated a restoration of the lagoon, which involved the excavation of three channels seeded with salt marsh plants. A series of boardwalks were created to allow for public access. In 1996, Caltrans funded a restoration plan to mitigate for impacts incurred during the Malibu Lagoon/PCH Bridge Replacement Project.

Cultural Setting

The following sections provide a context for human occupation and use of Malibu Lagoon. Discussion of the historic period occupation of Rancho Malibu and parts of the Chumash ethnography presented here are summarized from that presented in “The History of Malibu” (Malibu Lagoon Museum 2005).

Prehistoric Setting

California was first occupied prehistorically about 12,000 years (Moratto 1984). Archaeological research indicates that human populations extensively occupied the coastal regions of California more than 9,000 years ago (Padre Associates 2002). Research in the region occupied by the Chumash has produced a generally agreed on chronology (King 1990). This chronology is described briefly below.

Early Period (ca 8000 to 3350 B.P. [6000 to 1150 B.C.]

The Early Period has been divided into three phases, X, Y, and Z, with a gap between the X and Y phases. Early Period settlements appear to be residential base camps, and are usually located on hilltops or knolls.

The X Phase extends from 8000 B.P. to 7000 B.P. This phase is characterized by the use of large flake and core tools, millingstones and manos, combined with a lack of bone and shell tools, and ornamentation. Millingstones indicate grinding of hard seeds, probably gathered from sage plants.

Between 7000 B. P. and 5500 B.P., little is known about the region due to a lack of sites dating to this time period. This corresponds in time to the peak of the Xerothermic, a warm, dry climatic episode in the western United States (Axelrod 1981).

During the subsequent Y and Z phases, sites are once again present in the area. Mortars and pestles, appear at the beginning of Phase Y, indicating the addition of acorn processing to the subsistence base.

Middle Period (3350 to 800 B.P. [1150 B.C. to A.D. 1200])

The Middle Period is characterized by a shift in subsistence practices, with a more generalized hunting-maritime-gathering adaptation replacing a focus on plant gathering and the use of hard seeds. The predominance of the mortar and pestle among milling tools indicates increased exploitation and dependence on acorns (Glassow and Wilcoxon 1988). Social aspects that develop during this period, as evidenced by mortuary data, include inherited leadership, status differentiation, and religious specialization.

Villages of this period were permanently occupied and some satellite sites became differentiated in size and purpose. Middle Period sites are distinguishable into sub-phases by different types of bead and projectile points along with other diagnostic artifacts. Middle Period sites tend to be small and often contain artifacts that are lighter and more portable than those from earlier sites (Padre Associates 2002).

Late Period (850 to 150 B.P. [AD 1200 to AD 1800])

The full development of Chumash culture, one of the most socially and economically complex hunting and gathering groups in North America, occurred during the Late Period (Arnold 1987). This period is marked by a dramatic increase in population along the southern California coast. The development of a highly effective maritime subsistence pattern utilizing exploitation of fish, shellfish, sea mammals, and waterfowl enabled villages of nearly 1,000 individuals to develop. These were the most populous aboriginal settlements west of the Mississippi River (Morrato 1984). These Chumash villages, also known as rancherias, were usually situated near the confluence of several watercourses or at ecotones. Permanent inland settlements subsisted on variety of resources including acorns, seed plants, rabbits, and deer. The smaller inland villages were economically allied with the larger coastal villages (Padre Associates 2002)

Ethnographic Setting

Malibu Lagoon is situated within the territory of the Chumash Native American group. The Chumash occupied the region from San Luis Obispo to Malibu Canyon on the coast, the four northern Channel Islands, and inland as far as the western edge of the San Joaquin Valley (Grant 1978). The Chumash are subdivided into subgroups based on six distinct language dialects: Barbareno, Ventureno, Purisimeno, Ynezeno, Obispeno, and Island. The project area is situated within the territory of the Ventureno, a Coastal Chumash group (Grant 1978). The name is derived from the nearest mission, San Buenaventura. A Chumash village, *Humaliwo*, was located beyond the northeastern side of the lagoon on a small rise overlooking the lagoon and the ocean. This is now the site of the Adamson House.

The Chumash were very advanced in their culture, social organization, religious beliefs, and art and material object production (Morrato 1984). Class differentiation, inherited chieftainship, and intervillage alliances were all components of Chumash society. They were excellent craftsmen, and were known for well-made tools, bowls, and baskets. Of note are bowls and carvings of killer whales and other forms of sea life and effigies made from steatite. Sometimes the bowls were inlaid with colorful abalone shells. Other implements were made of sandstone, including large bowls. Flint, chert, and obsidian were used to make projectile points, drills, scrapers, choppers, and knives.

Baskets made by the Chumash were outstanding in workmanship and design. Baskets were used for gathering of seeds, bulbs, and roots. Water was stored and carried in baskets waterproofed on the inside with naturally occurring tar, called asphaltum. Asphaltum was extensively used by the Chumash to caulk canoes or “tomols,” seal water baskets, attach shell inlay to bowls, and fasten arrow and spear points to shafts.

Fish hooks were made of abalone shell. The major use for the shell, however, was for decoration. It was lavishly inlaid on stone, bone, and wood. The surface to be decorated received a coating of asphalt onto which was pressed the shell inlay. Giant Pismo clams were used for beads and money. Many tiny drilled shell beads were manufactured, for use as decoration and a means of exchange.

Bone was used by the Chumash for many artifacts. It was extensively used for necklaces, especially as long tubular beads. Flutes and whistles were also made of bone, usually of deer tibia. Whalebone was used for many tasks including wedges to split wooden planks, and bars to pry abalone loose from coastal rocks. A notable technological achievement of the Chumash was the planked canoe or “tomol.” These were made of several planks sewn together at the seams with very strong twine and the joints sealed with asphaltum. For more information on Chumash history and culture in and around the project site, one can visit the Wishtoyo Foundation website at www.wishtoyo.org.

Humaliwo village was one of the most important Chumash villages along the coast. Extensive cultural remains are present at this site, as well as numerous human burials. The archaeological site CA-LAN-264 encompasses the village of *Humaliwo* as well as prehistoric components that date back at least 3000 years. Portions of the site may date as far back as 7000 years B.P. (Gamble et al 1995, 1996).

The site was originally recorded in 1959, and several excavations took place at the site in the 1960s and 1970s. The site consists of five components: an Early/Middle Period deposit, a Middle Period deposit, a Middle Period cemetery, a Late Period deposit, and an historic era cemetery. Numerous artifacts and other cultural materials have been collected from the site, which consists of an extensive shell midden. The site includes more than 200 burials, some with tomols. Some burials

include numerous shell and glass beads, fish and whale effigies (Gamble et al 1995, 1996).

Historic Setting

The first recorded European activity at Malibu Lagoon occurred in 1542, when Spanish sailor Juan Cabrillo anchored there to obtain fresh water. Sailing northward up the California coast, he anchored on October 10th in the small bay at Malibu Lagoon, and claimed this landfall for the King of Spain. He stayed until October 13th, filling his water casks and naming this tranquil lagoon and beach in his log the "Pueblo de las Canoas" (Town of the Canoes), because of the many canoes which came to visit his ships from the adjacent village.

The first Franciscan mission in Chumash territory was built at San Luis Obispo in 1772. Four additional missions were built in this cultural area at San Buenaventura (1782), Santa Barbara (1786), La Purisima Concepcion (1787), and Santa Ynez (1804). Inhabitants of *Humaliwo* were recruited into these missions. By 1805, all native inhabitants of the village had been pressed into the Mission system, either at Mission San Fernando or Mission San Buenaventura, and *Humaliwo* was abandoned (Gamble et al 1995, 1996).

An expedition led by Spanish explorer Juan Bautista de Anza camped at Malibu Creek on February 22, 1776. One member of this expedition, Jose Bartolome Tapia, rode down the canyon to the beach, to explore the area. The Tapia family ultimately settled in Northern California, where Jose Tapia became *mayordomo* of San Luis Obispo Mission Rancho. In 1800, Jose Tapia and his family returned to southern California and began farming near San Gabriel. Tapia then applied for a grant of the land he had seen in 1776, and due to his previous service in the army, was awarded an area of about 13,330 acres, named Rancho Topanga Malibu Sequit. Tapia lived with his wife and family on Vaquero Flats in Rancho Malibu raising cattle until his death on April 18, 1824. The widow of Jose Tapia owned the Rancho until 1848, when it was sold to Leon Victor Prudhomme, who had married her granddaughter Maria Tapia.

Prudhomme had acquired the property during the transition period between Mexican rule and United States administration of California. When the U.S. Land Commission began hearings in 1852, Prudhomme put in his claim for the Rancho Malibu. No documents could be produced actually proving the early-day grant of Malibu to Jose Tapia. A search of the Surveyor General's office in San Francisco proved futile, and in 1854 the Commissioners turned down Prudhomme's claim.

Prudhomme remained on the land although he did not have clear title. This was the era of the California gold rush, and the rancho's cattle brought high prices when driven north to the mining camps. By 1857, however, a panic and financial depression had hit California. Prudhomme was discouraged and sought a buyer for his rancho.

In 1857 Don Mateo Keller, born Matthew Keller in Ireland in 1811, paid the Prudhommes \$1,400, or about 10 cents an acre, for the entire rancho. With new evidence and better lawyers, Keller's claim to Rancho Malibu was confirmed on October 24, 1864. Matthew Keller died in 1881 and his son, Henry Keller, succeeded his father as owner of the Rancho

In 1892 Frederick Hastings Rindge, a Harvard graduate who inherited two million dollars on his 29th birthday, bought the Rancho Topanga Malibu Sequit from Henry Keller. Rindge, a poet as well as a businessman, was drawn to the extraordinary setting of the rancho, which he described in his self-published book, *Happy Days in Southern California*. Rindge, his wife, May, and their three children resided in Santa Monica; Rindge became a prominent local businessman, as the founder of the Conservative Life Insurance Company (later Pacific Mutual), and the Los Angeles Edison Electric Company.

In 1903 Frederick Rindge began plans to construct a railroad on the Rancho Malibu, to be called the Hueneme, Malibu and Port Los Angeles Railway, in order to deter threats he believed stemmed from the Southern Pacific Railroad's presence in Southern California. Before the work began, Rindge died suddenly in 1905. After his death, his widow May Rindge spent the next twenty-odd years building the railway and fighting the Southern Pacific. Although Mrs. Rindge prevented the railroad from crossing her ranch, she was unable to stop the State of California from constructing and opening the State Highway (now Pacific Coast Highway) in 1928.

Residential and commercial development in Malibu began in 1929, after the establishment of the State Highway. May Rindge, and later her daughter Rhoda Rindge Adamson, through their Marblehead Land Company gradually sold off parcels of the property that reduced the family's land holdings to 4,000 acres by 1962. Four years later, the family's holding company, the Adamson Companies, donated 138 acres to Pepperdine University.

The Adamsons built a beach house in 1929 on land given to them by May Rindge. The site, on the south side of the lagoon within the project area, was called Vaquero Hill because a cowboy shack once stood there. They used the home as a beach house maintaining their permanent home in the Hancock Park area of Los Angeles from 1924 to 1936. In 1936 the beach home became their permanent residence.

After the death of Rhoda Rindge Adamson in 1962, State Parks worked with the Adamson descendents to acquire the property due to their ownership of the popular Surfrider Beach located just to the north. State Parks acquired the Adamson House in 1968. State Parks staff recognized the unique architectural and archaeological significance of the property as well as the challenges for long-term maintenance of the house, buildings, and grounds. With support from the newly formed Malibu Historical Society, the historical significance of the house and grounds were recognized. In 1977 the Society's efforts got the property

successfully placed on the National Register of Historic Places (NRHP). The house, boat house, landscape features, and manicured grounds surrounding the property are all considered contributing elements of the historic property. The House is also listed as California Historical Landmark No. 966. The Adamson House currently is home to the Malibu Lagoon Museum.

Regulatory Framework

California Environmental Quality Act

According to CEQA (Public Resources Code [PRC], Section 21084.1), historical resources include any resource listed, or determined to be eligible for listing, in the California Register of Historical Resources (California Register). Properties listed in or determined eligible for listing in the National Register, such as those identified in the Section 106 process, are automatically listed in the California Register. Therefore, all “historic properties” under federal preservation law are automatically “historical resources” under state preservation law (see PRC 5024 below). Historical resources are also presumed to be significant if they are included in a local register of historical resources or identified as significant in a qualified historical resource survey.

As defined under state law in Title 14 CCR §4850, the term “historical resource” means “any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or which is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural history of California.” Architectural resources generally include man-made features that compose the recognizable, built environment. This category typically includes extant, aboveground buildings and structures that date from the earliest European colonial settlements until the present day.

For the purposes of CEQA, “historical resource” is further defined under PRC §15064.5 as a “resource listed in, or determined eligible for listing in the California Register.” Section 15064.5 of the *State CEQA Guidelines* sets forth the criteria and procedures for determining significant historical resources and the potential effects of a project on such resources.

Generally, a cultural resource shall be considered by the lead state agency to be “historically significant” if the resource meets any of the criteria for listing on the California Register, including the following:

- the resource is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- the resource is associated with the lives of persons important in our past;

- the resource embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of an important creative individual or possesses high artistic values; or
- the resource has yielded, or may be likely to yield, information important in prehistory or history.

The cited statutes and guidelines specify how cultural resources are to be managed in the context of projects such as the proposed Project. Briefly, archival research and field surveys must be conducted, and identified cultural resources must be inventoried and evaluated in prescribed ways.

California Health and Safety Code

Human remains are sometimes found in isolation or associated with archaeological sites. According to CEQA, “archaeological sites known to contain human remains shall be treated in accordance with the provisions of State Health and Safety Code Section 7050.5.” The protection of human remains is also ensured by California Public Resources Codes, Section 5097.94, 5097.98, and 5097.99.

If human remains are exposed during construction, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. Construction must halt in the area of the discovery of human remains, the project proponent must assure that the area is protected, and consultation and treatment shall occur as prescribed by law.

California State Parks Policy Under PRC 5024

PRC 5024(a) requires each state agency “to formulate policies to preserve and maintain, when prudent and feasible, all state-owned historical resources under its jurisdiction.” PRC 5024.5 mandates that each state agency assure that its actions do not adversely impact significant resources without consultation with the SHPO.

DPR’s obligation to “administer the cultural and historic properties under its control in a spirit of stewardship and trusteeship for future generations” is also set out in Executive Order W-26-92, issued by the Governor on April 8, 1992. The Executive Order mandates that all state agencies establish policies, plans and programs in such a way that historical resources are protected, that they ensure that such resources are given full consideration in planning decisions, and that they institute procedures to these ends in consultation with the SHPO.

The Department’s procedures and policies are established to meet DPR’s responsibilities under the above mentioned laws. They are implemented through a Memorandum of Understanding (MOU) with the SHPO. The MOU delegates to DPR for the SHPO’s regular oversight responsibilities

for projects that might affect historical resources under State Parks ownership and purview. These procedures define that internal review process, its limitations, and its articulation with other laws and standards. Practical and effective performance under the procedures is the mandated prerequisite for this delegation to DPR.

Study Methods

Record Search and Literature Review

Lists from various national, state, and local agencies were consulted for identification of resources of known architectural or historical importance within the study area. These lists included the National Register, California Historical Landmarks, California Points of Historic Interest, State Office of Historic Preservation Historic Resources Inventory, and the City of Los Angeles List of Historic-Cultural Monuments, and a review of Gebhard and Winter's *Los Angeles: An Architectural Guide*.

Additional information was obtained as a result of the records search performed on November 10, 2005, by the South Central Coastal Information Center at California State University, Fullerton. The results indicated that 16 archaeological sites, 15 prehistoric and one historic, have been recorded within a mile of the project area. One of these, the *Humaliwo* village site, CA-LAN-264, is partially within the project area, on the northeast side of the lagoon. This Chumash village site is listed on the National Register of Historic Places. Ninety-three previous archaeological investigations have taken place within a mile of the project area; of these 20 are located within the project area.

A copy of the 1903 15-minute Calabasas topographic map, as well as depicting a larger extent of the lagoon to the west, also shows four structures on the northeastern edge of the lagoon, in the area that would become the Adamson estate. These are presumably the "cowboy shacks" and associated buildings that stood at the edge of the sea prior to the construction of the Adamson House.

Native American Consultation

It is the policy of DPR to maintain open communication and ongoing consultation with Native American groups in California. DPR recognizes its special responsibility as the steward of many sites of cultural significance to living Native peoples in California. Therefore, in promulgating its policies and implementing projects that may have significant impacts to Native American sites within the State Park System, DPR actively consults with Native American groups.

The Native American Heritage Commission (NAHC) was contacted regarding the project in October and November 2005. A reply from the

NAHC on November 10, 2005 indicated that no sacred lands are recorded in the Sacred Lands files. The NAHC also provided a list of Native American groups and individuals who might have knowledge of cultural resources in the project area. Twelve of these groups and individuals were contacted by letter on November 22, 2005.

Two replies were received, both by telephone. Both Native American individuals indicated that CA-LAN-264 was a very sensitive resource, and requested continued contact regarding the project, and Native American monitoring at the site area during project construction. One Native American individual indicated they may have re-buried human remains at the *Humaliwo*, and requested a walkover tour of the project area to ascertain if this memory is correct. This individual indicated that forms that should have been filed with the NAHC regarding reburial may not have been files, thus the negative results of the NAHC review of the Sacred Lands file.

Efforts will continue to contact the remaining 10 individuals on the list provided by the NAHC. Follow-up calls will be conducted by a State Parks archaeologist or designee, and consultation will continue as long as designated Native American individuals or groups request it.

Field Surveys

A field survey to identify historical and architectural resources that may be affected by the proposed project was undertaken by professionals meeting the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9). The survey applied National and California Register criteria to previously documented historic and architectural resources and to all newly identified buildings more than 50 years of age within the study area. It must be noted that the project area extends only to the edge of Malibu Lagoon, and thus CA-LAN-264 as mapped (Dillon 1987) and the Adamson House and grounds are not within the project site. Final construction plans will be designed to avoid effects to landscape features of the Adamson House and grounds, and to avoid the known area of CA-LAN-264.

A reconnaissance survey—an unsystematic walkover of the project area based on surface visibility—was used in an attempt to identify prehistoric and historical archaeological resources. The vast majority of the project site is under water, and the muddy lagoon edges were surveyed only as feasible. This walkover was conducted on November 5, 2005. Because of dense vegetation in the project area, surface visibility was very limited. Modern development in the project area, e.g., roads, parking lots, lawns, also obscured visibility, and due to these factors a systematic survey was not conducted.

Flower beds, eroded areas, and other open areas west of the Adamson House, which are outside of the project site, were also examined. Black, sandy soil was observed in these areas, which are mapped as part of the midden deposits for *Humaliwo*. No evidence was observed of the

remains of the structures present in the area prior to construction of the Adamson House.

Study Findings

Archaeological Resources Identified

No prehistoric or historical archaeological resources were observed during a pedestrian walk over of the project area. One National Register listed site, CA-LAN-264, *Humaliwo*, is located adjacent to the project area at the site of the Adamson House. The Malibu site has been excavated several times in the past, particularly by UCLA teams in the 1960s and 1970s. The site lies on the east side of Malibu Lagoon, encompassing the Adamson House location, part of the Surfrider Beach parking lot, and an area north of PCH.

Within the grounds of the Adamson House, archaeological deposits are over 15 feet thick and consist primarily of shell midden, as was observed in the open areas of the Adamson grounds. Within the parking lot area of Surfrider Beach and the south shoulder of PCH, a prehistoric cemetery has been found; north of PCH a proto-historic cemetery was located. More than 200 burials have been removed from the site (Dillon 1987:44). Much of this work was poorly reported in the past, and details on archaeological work undertaken, if any, adjacent to the project area, were not available for this project at the Archaeological Information Center. However, State Parks has prepared a series of summary documents for this site, which can be accessed at State Parks. These records and reports are located in State Parks' Southern Service Center office in San Diego.

The project area was mapped in relation to the known boundaries of CA-LAN-264, and the site lies immediately east of the main lagoon channel, adjacent to the Adamson House boat house. This part of the site has been disturbed by landscaping and grading for the Adamson House grounds, but it is possible that prehistoric deposits remain intact.

Architectural Resources Identified

Results of the identification effort indicate there is one historic architectural resource that may be affected by the project. The Adamson House was listed on the National Register of Historic Places [period of significance 1929–1949] on October 10, 1977. It is California Historical Landmark No. 966. No other architectural resources would be affected by the proposed project.

The Adamson House is renowned for its display of Malibu tiles, which came from the Rindge/Adamson family's Malibu Potteries, originally located nearby. May Rindge commissioned the house in 1929 as a gift to her daughter, Rhoda, who had married Merritt Adamson in 1915. She

hired architect Stiles O. Clements, renowned for his commercial work with the firm Morgan, Walls and Clements, to construct the Mediterranean Revival-style residence, with its Moorish and Spanish details such as red tile roofs, white stucco walls, iron grilles, balconies and patios.

The historical property also includes several outbuildings including a guest house, boat house, pool house, lath house, shop and kennels. Contributing historic landscape features include the surrounding earthwork topography, numerous examples of exotic vegetation, pathways, motor drive, exterior property wall (which extends down coast to the historic Malibu Pier) and numerous pieces of decorative landscape furniture and objects. Almost all of which Stiles O. Clements designed as one with the Adamson House.

The Adamson family inhabited the house from 1936 until 1962. In 1968 the State of California acquired the Adamson House property for \$2.7 million. The house was successfully placed on the National Register of Historic Places in 1977.

Impacts and Mitigation Measures

Thresholds of Significance

Section 15064.5(b) of the State CEQA Guidelines, entitled “Determining the Significance of Impacts on Historical and Unique Archaeological Resources,” would apply to historical resources that are found eligible for the California Register or meet the other significance criteria in Section 15064.5(a) of the guidelines. Section 15064.5(b) of the guidelines is as follows:

A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

1. Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
2. The significance of an historical resource is materially impaired when a project:
 - a. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
 - b. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources

- pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- c. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.
3. Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on historical architectural resources.

Construction Impacts and Mitigation Measures

The existing boat house channel would be deepened and recontoured to create a new avian inland along the western bank of the Adamson House grounds. The proposed work would not cause any alteration or destruction of the boat house building, nor would any historic landscape features of the Adamson House grounds be directly affected by the proposed project.

While the “immediate surroundings” of the Adamson House would be altered, the overall restoration plan would not materially impair the significance of the property and grounds. The existing setting of the Adamson House is contextually related to the lagoon, and the proposed restoration is compatible in use and association.

The parking lot and staging lawn would be relocated to the north and west and be adjacent to PCH. As a result of the application of the State CEQA Guidelines criteria for determining impacts on historical resources, the proposed project would alter the “immediate surroundings” of the Adamson House and its contributing buildings, but this would not change or materially impair its significance or the significance of any of its contributing architectural or historic landscape features.

As regards the Adamson House and its associated historic landscape, the proposed project would not “cause a substantial adverse change in the significance of an historical resource ... [meaning] physical demolition,

destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.” The Adamson House would remain on the National Register after implementation of the proposed project; therefore, its significance would not be changed or materially impaired.

No significant adverse impacts were identified to historical architectural resources, including the Adamson House and its contributing buildings and landscape features; therefore, no mitigation measures are required or proposed to reduce significant impacts.

Although one known prehistoric archaeological site, CA-LAN-264, has been recorded within the vicinity of the project site, no evidence of this site was observed during surveys within and immediately adjacent to the project site. However, portions of this site or of other unknown archaeological resources, including human remains, could be buried within main channel lagoon sediment adjacent to the site. As such, unknown cultural materials could be exposed or damaged by project-related earth moving. This potential damage or destruction to a significant historical resources, if not mitigated, could result in a substantial adverse change in the significance of an historical archaeological resource and thus may have a significant effect on the environment.

Therefore, the following mitigation measures are required to account for three circumstances: 1) the potential to impact CA-LAN-264; 2) unanticipated discoveries of cultural resources; and 3) unanticipated discoveries of human remains.

Impact CR-1: Potential for Impacts to CA-LAN-264

Prehistoric site *Humaliwo*, CA-LAN-264, is listed on the National Register of Historic Places, which makes it eligible for listing on the CRHR. As noted above, the proposed project does not include any earthwork or disturbance within the mapped boundaries of CA-LAN-264. However, disturbances to as yet unknown buried resources immediately outside the mapped boundaries would have an adverse effect and would be considered a significant impact. Implementation of the mitigation measure below will reduce potential impacts to less-than-significant levels.

Mitigation Measure CR-1: Cultural Resources Testing in area adjacent to CA-LAN-264

Cultural resources, including CA-LAN-264 and the historic Adamson House grounds and ancillary structures, will be avoided to the extent possible. The hydrology of the lagoon will not be changed such that the boathouse or grounds are at greater risk of flood or construction impacts.

Cultural resources excavations will be undertaken prior to any ground-disturbing activities along the eastern bank of the main lagoon

channel adjacent to CA-LAN-264 if any project-related earthwork occurs within 100 feet of the known boundary of CA-LAN-264. Test excavations shall not take place within the known boundaries of CA-LAN-264 but adjacent to the boundaries if project construction would require any ground-disturbing activities within 100 feet of the known site boundary.

Because sensitivity is moderate to high for cultural resources, including human remains, to be present along this edge of the project area, a subsurface testing program should be implemented to identify if resources are present and evaluate potential NRHP-eligible resources.

If subsurface testing identifies intact, significant archaeological resources within the project area that cannot be avoided, the project would have an adverse effect. Development of measures to mitigate adverse effects would be necessary and a Memorandum of Agreement would be required to complete Section 106 consultation, reduction of significant adverse impacts under CEQA and compliance with PRC 5024.5.

The preconstruction testing program should include, but need not be limited to:

- development of a testing strategy to identify subsurface archaeological deposits, including further research on previous investigations and regarding previous lagoon excavations, in an effort to refine the scope of any field effort;
- evaluation of significance and integrity of exposed archaeological deposits (according to the National Historic Preservation Act [NHPA], NRHP, and CRHR criteria), if present, in consultation with the State Historic Preservation Officer (SHPO); and
- consultation with local Native Americans if prehistoric or ethnohistoric resources are identified.

Upon identification of any significant prehistoric or historical archaeological resources, it will be necessary to avoid these resources during project development, or to formulate a treatment plan to mitigate adverse effects. A treatment plan, adopted within a Memorandum of Agreement, to be negotiated in consultation with the SHPO, would likely include the following:

- an acceptable data recovery plan stating specific research goals and questions that are to be addressed if archaeological deposits are to be recovered,
- postfield artifact processing and analysis,
- report preparation in accordance with the guidelines of DPR, and
- permanent curation of artifacts and documents in a repository consistent with the National Park Service guidelines for the curation

of archaeological collections (36 Code of Federal Regulations [CFR] 79).

Feature recovery should employ standard archaeological excavation techniques. The testing and evaluation plan should be designed and implemented by a qualified Prehistorical Archaeologist and, if discoveries warrant, a qualified Historical Archaeologist.

Both the testing and evaluation plan and the data recovery strategy shall be developed and implemented in consultation with interested local Native American groups. Plans shall state that Native American human remains will be treated in compliance with Health and Safety Code, Sections 7050.5, 8010, and 8011 and Public Resources Code, Section 5097.98.

Mitigation Measure CR-2: Cultural Resources Monitoring in area adjacent to CA-LAN-264

Cultural resources monitoring by State Parks archaeologists or designees shall be conducted during any ground disturbing activities along the eastern bank of the main lagoon channel adjacent to CA-LAN-264. Monitoring will be conducted if conditions allow for observation of spoils. Monitoring of dredging is probably not feasible given underwater activity would not be visible. However, underwater cultural sites may be present, and the material dredged will be inspected for the presence or absence of cultural material. The remainder of the project area may be monitored if notable cultural materials are discovered, or monitoring may be further limited if the monitoring area appears previously disturbed (as may be the case in areas where the California Department of Transportation (Caltrans) has deposited fill material and riprap).

If prehistoric cultural resources are discovered in this area during monitoring or other construction, all work shall be halted in the vicinity of the archaeological discovery until a State Parks archaeologist or designee can visit the site of discovery and assess the significance of the archaeological discovery. Further treatment may be required, including modification of plans to avoid impacts to the site, site recordation, excavation, site evaluation, and data recovery. Avoidance of cultural resources shall be the top priority at all situations.

Impact CR-2: Potential for Ground-Disturbing Activities to Damage Previously Unidentified Buried Cultural Resource Sites

Buried cultural resources that were not identified during field surveys could be inadvertently unearthed during ground-disturbing activities that could result in the demolition or substantial damage to significant cultural resources. Avoidance or reduction of this potentially significant

impact on buried or otherwise unidentified cultural resources would be achieved by implementing the following mitigation measure.

Mitigation Measure CR-3: Stop Work if Cultural Resources Are Discovered during Ground-Disturbing Activities.

If buried cultural resources—such as flaked or ground stone, historic debris, building foundations, shellfish remains or non-human bone—are inadvertently discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a State Parks archaeologist or designee can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs, such as excavation or detailed documentation. Avoidance of cultural remains shall be the top priority at all times.

If cultural resources are discovered during construction activities, the construction contractor will verify that work is halted until appropriate site-specific treatment measures, such as those listed above, are implemented.

Impact CR-3: Potential to Damage Previously Unidentified Human Remains

No human remains are known to exist within the project site. Further, archaeological testing would occur prior to construction activities to ensure avoidance of any remains or other significant cultural resources (see Mitigation Measure CR-1 above). However, due to the location of the project site in proximity to the *Humaliwo* village site (CA-LAN-264), potential will remain, however slight, that buried human remains that were not previously identified could be discovered. The following mitigation measure is required to ensure proper adherence to state laws regarding accidental discovery of human remains. Implementation would ensure that any potential impacts are reduced to less-than-significant levels.

Mitigation Measure CR-4: Comply with State Laws Pertaining to the Discovery of Human Remains.

If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary to comply with state laws relating to the disposition of Native American burials that fall within the jurisdiction of the California Native American Heritage Commission (Public Resources Code Section 5097). Construction work shall not continue within 100 feet of a location where human skeletal remains are found.

According to California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American.

If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission to determine the most likely living descendant(s). The most likely living descendant shall determine the most appropriate means of treating the human remains and any associated grave artifacts, and shall oversee disposition of the human remains and associated artifacts by the project archaeologists. This impact would be significant, but implementation of the mitigation measures above would reduce this impact to a less-than-significant level.

Post-construction Impacts and Mitigation Measures

Once completed, the proposed project would have no operational components that could result in impacts to cultural resources. No impacts would occur and no mitigation measures are required.

Chapter 8

Construction Effects

Introduction

This chapter presents impacts associated with the construction of the proposed project, which would occur in two phases. The first phase of construction involves relocation of the existing parking lot closer to the park entrance and PCH. During this phase, the existing parking lot, which is located at the northern portion of the project site, would be removed. The northwestern portion of the project site, adjacent to PCH, would be graded and paved for the new parking lot. The first phase of construction is anticipated to occur between November 2006 and January 2007.

The second phase of construction would occur in the western arms of the lagoon and in a small location on the eastern shore adjacent to the Adamson House boat dock. Construction activities in the lagoon primarily involves earthwork. The second phase of construction is expected to begin in late August 2007 and continue through October 2007. There would be no construction in 2008.

As construction activities for the proposed project would last for a few months, the impacts discussed in this section would be temporary and intermittent. Where applicable, mitigation measures are proposed to reduce construction-related impacts.

Please also refer to Chapter 9, Effects Determined Not Significant, for discussions of both construction and long-term effects associated with topic areas that were found to have little or no relation to this project, such as mineral resources, hazardous materials, and utilities.

Air Quality

Impact AQ-1: Pollutant emissions during Phase I and Phase II construction.

Construction activities would temporarily generate pollutant emissions. Pollutant emissions are typically generated from dust, fumes, and equipment exhaust, and vehicle exhaust. The amount of emissions

generated would vary depending on the type of construction activity that is involved.

During the first phase of construction, pollutant emissions would be generated from the following construction activities: (1) demolition of existing parking lot, (2) grading, (3) construction workers traveling to and from the project site, (4) delivery and hauling of construction supplies and debris to and from the project site, and (5) fuel combustion by on-site construction equipment.

During the second phase of construction, pollutant emissions would be generated from the following construction activities: (1) excavation, (2) hauling of excavated soil from the project site, (3) construction workers traveling to and from the project site, (4) delivery and hauling of construction supplies to and from the project site, and (5) fuel combustion by on-site construction equipment.

The South Coast Air Quality Management District (SCAQMD), the local agency that monitors air quality within the project area, has established thresholds for carbon monoxide (CO), reactive organic compounds (ROC), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and particulate matter less than 10 microns in diameter (PM₁₀) for construction activities. The SCAQMD construction thresholds are shown in Table 8-1. The proposed project would have a significant impact if daily construction emissions were to exceed SCAQMD construction emissions thresholds shown in Table 8-1.

Table 8-1: SCAQMD Daily Construction Emissions Thresholds

Criteria Pollutant	Pounds Per Day
Reactive Organic Compounds (ROC)	75
Nitrogen Oxides (NO _x)	100
Carbon Monoxide (CO)	550
Sulfur Oxides (SO _x)	150
Particulates (PM ₁₀)	150

Source: South Coast Air Quality Management District

The California Air Resources Board (CARB) URBEMIS 2002 model was used to estimate daily construction emissions for the proposed project. Table 8-2 shows the estimated daily emissions during construction of the parking lot and the lagoon. As shown, estimated daily construction emissions are not anticipated to exceed any of the SCAQMD construction thresholds, and a less-than-significant impact is anticipated.

Table 8-2: Estimated Daily Maximum Construction Emissions

Construction Activity	Pounds Per Day				
	ROC	NO _x	CO	SO _x	PM ₁₀ /a/
SCAQMD Threshold	75	100	550	150	150
<u>Phase I- Construction at the Parking Lot</u>					
Demolition	2	21	14	<1	3
Grading	4	22	31	<1	3
Exceed Threshold?	No	No	No	No	No
<u>Phase II- Construction at the Lagoon</u>					
Earthwork	9	57	75	<1	17
Exceed Threshold?	No	No	No	No	No

/a/ Assumes proper implementation of SCAQMD Rule 403.
Source: TAHA, 2005 (see Appendix C for model worksheets)

Daily PM₁₀ emissions during grading for the proposed project assume proper implementation of SCAQMD Rule 403.¹ Rule 403 applies to any activity or man-made condition capable of generating fugitive dust. It requires the use of control measures that would reduce or mitigate fugitive dust emissions. Due to the fact that the soil in and around the lagoon has a high moisture content, fugitive dust emissions will be very low during construction activities. Nevertheless, implementation of mitigation measures AQ-1 through AQ-3 (listed below) would ensure adherence to Rule 403 and minimize fugitive dust emissions to the maximum extent feasible.

Mitigation Measure AQ-1: Dust sweeping.

The construction area and vicinity (driveways, access roads, and staging areas) shall be swept with water sweepers on a daily basis or as necessary to ensure there is no visible dust.

Mitigation Measure AQ-2: Covering or watering of stockpiles.

On-site stockpiles of debris, dirt or rusty material shall be covered or watered at least twice daily to prevent fugitive dust.

¹ Implementation of Rule 403 is estimated to reduce dust and PM₁₀ emissions by up to 59 percent during the grading phase. The resulting daily PM₁₀ emissions, shown in Table 8-2, would not exceed the SCAQMD significance threshold of 150 pounds per day.

Mitigation Measure AQ-3: Covering of haul trucks.

All haul trucks hauling soil, sand, and other loose materials shall either be covered or maintain two feet of freeboard.

As shown in Table 8-2, the estimated daily emissions during construction of the proposed project would not exceed any of the SCAQMD thresholds. Thus, less-than-significant impacts on air quality are anticipated to occur during project construction.

Consistency with Local and Regional Plans

No changes to existing land uses would occur during construction of the project and no impacts would result. Please refer to Chapter 4 for a detailed discussion of the project's consistency with local and regional planning documents.

Construction activities are inherently incompatible with sensitive land uses such as residences, due to unavoidable issues of noise, dust, and the potential for temporary traffic delays. These issues and others are described in other sections of this chapter. All construction activities would be mitigated to reduce the level of impact and all impacts described would be of a temporary and intermittent nature.

Hydrology and Water Quality

Impact HYDRO-8: Release of construction-related sediment from access roads, staging areas, ground-disturbing activities and stockpiles during Phase I and Phase II construction.

Phase I of the project construction includes removal of the existing pavement at the parking area and visitor kiosk and construction of a new parking area within the same general area of the project site. Both the existing and new parking areas would cover approximately the same amount of land - a little more than one acre. These activities would occur outside of the direct influence of the lagoon.

Phase II project construction would require ground-disturbing activities within channels of the lagoon itself. Deposition of sediment to the lagoon would exacerbate the existing nutrient impairment in the lagoon. Due to the size of the construction area and the potential for water quality degradation, release of construction-related sediment would create a potentially significant impact on water quality in the lagoon. However, implementation of mitigation measure HYDRO-2 would reduce this impact to a less-than-significant level.

Mitigation Measure HYDRO-2: Implement Best Management Practices to Control Discharge of Construction-Related Pollutants to Surface Waters.

Because project construction would cover an area greater than one acre, a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the Lead Agency or its contractor as required by the RWQCB under the NPDES General Construction Permit. The SWPPP shall meet the requirements of the RWQCB as well as any City and County requirements.

The SWPPP shall identify Best Management Practices (BMPs) to maintain water quality. The final selection and design of erosion and sediment controls shall be subject to approval by the Lead Agency. BMPs in the SWPPP may include, but are not limited to, the following elements:

- Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed for disturbed areas.
- Earth dikes, drainage swales, and ditches shall be provided to intercept, divert, and convey surface runoff and sheet flow, prevent erosion, and reduce pollutant loading. Specific areas that may need such measures shall be identified on the construction drawings.
- Roads used during construction shall be swept and cleaned of accumulated earth and debris in the construction zone during project construction, particularly before predicted rainfall events.
- Excavated materials deposited or stored onsite temporarily shall not be placed in or adjacent to open water channels and shall be wetted and covered as necessary to prevent runoff and erosion.
- Oils, fuels, and other toxicants spilled or deposited near the project site shall be removed and disposed of according to applicable laws and regulations.
- Fueling areas will be designated to afford separation from surface waters during fueling activity to prevent accidental spills from reaching the lagoon.
- Establish native grass or other vegetative cover over areas that have been disturbed by construction as soon as possible after disturbance to establish vegetative cover. This will reduce erosion by slowing runoff velocities, enhancing infiltration and transpiration, trapping sediment and other particulates, and protecting soil from raindrop impact.

The Lead Agency and/or its contractors shall implement a monitoring program to verify BMP effectiveness. The monitoring program shall begin at the outset of construction and terminate upon completion of the

project. Implementation of the mitigation measure above will reduce impacts to less-than-significant levels.

Impact HYDRO-9: Release of construction-related hazardous materials during Phase I and Phase II construction.

Fuels, oils, lubricants, and other hazardous materials with the potential to degrade water quality may be released from equipment during construction. Excavation equipment, generators, and other construction equipment would use these hazardous materials on a regular basis during construction. If a fuel tank or an oil line were ruptured, the surrounding environment would be at risk. Impacts are considered to be less than significant with implementation of mitigation measure HYDRO-3.

Mitigation Measure HYDRO-3: Implement a Hazardous Material Spill Prevention Control and Countermeasure Plan.

A Hazardous Material Spill Prevention Control and Countermeasure Plan shall be prepared as part of the NPDES General Construction Permit to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction of the project. This plan shall describe storage procedures and construction site housekeeping practices and identify the parties responsible for monitoring and spill response. Routine inspections and monitoring of best management practices shall ensure minimal impacts to the environment occur.

Commonly practiced best management practices include use of containment devices for hazardous materials, training of construction staff regarding safety practices to reduce the chance for spills or accidents, and use of nontoxic substances where feasible. The plan also shall describe actions required if a reportable spill occurs, such as which authorities to notify and the proper clean-up procedures. The Hazardous Material Spill Control and Countermeasure Plan shall contain standards considered sufficiently protective such that significant adverse impacts on surface and groundwater quality would be avoided. The plan shall be completed before any construction activities begin. Implementation of the mitigation measure above will reduce impacts to less-than-significant levels.

Impact HYDRO-10: Temporary alteration of drainage patterns during Phase II construction.

Construction activities in Phase II could require large amounts of dewatering and discharge to adjacent surface waters, thus coverage would need to be obtained under an individual NPDES dewatering

permit. The LARWQCB will be consulted by the project proponent to obtain the permit.

In accordance with the permit, the dewatering collection and disposal methods would be identified for all project components. Receiving waters would be maintained through appropriate treatment measures identified in the permit. These may include utilization of settling ponds or screens to reduce suspended sediment loads, if necessary due to contaminated groundwater, use of onsite treatment systems for contaminant removal prior to discharge, and water quality monitoring.

In either case, these general permits contain standards considered sufficiently protective such that significant adverse impacts on surface water quality would be avoided. Potential impacts are expected to be less than significant. No mitigation measures are necessary.

Biological Resources

Potential impacts to sensitive biological resources during project construction are thoroughly detailed in Chapter 6 of this EIR, Biological Resources.

In summary, construction impacts to biological resources could include: (1) the removal or disturbance of southern willow scrub vegetation, atriplex scrub vegetation, baccharis scrub, mule fat scrub, Venturan coastal sage scrub, mixed scrub, southern coastal salt marsh, brackish marsh, coastal and valley freshwater marsh; (2) potential impacts to mud flat, sand beach/sand bar, open water, common wildlife species found to occur within the project area, California black walnut, wandering skipper, and southern steelhead trout; and (3) potentially significant direct impacts to tidewater goby, California brown pelican, western snowy plover, Heermann's Gull, elegant tern, and California least tern.

Mitigation measures are identified in Chapter 6 that would avoid the impact or reduce the significance of impacts to less-than-significant levels.

Cultural Resources

Potential impacts to sensitive cultural resources during project construction are identified in Chapter 7 of this EIR, Cultural Resources.

The project has potential to unearth as yet unknown significant resources during earthwork in specified areas adjacent to the Adamson House. However, mitigation measures are identified in Chapter 7 that would reduce potential project impacts to less-than-significant levels.

Noise

Impact N-1: Temporary increases in noise levels during project construction.

Construction of the proposed project would result in temporary increases in ambient noise levels on the project site and its vicinity on an intermittent basis. The project site is located within the City of Malibu, which does not have noise standards for construction. Rather, the City prohibits construction activities to occur between the hours of 7:00 p.m. and 7:00 a.m. during the weekdays and any time on Sundays or holidays (Noise Control Ordinance of the City of Malibu, Section 8.24.050G). Cities, such as Los Angeles and Beverly Hills, typically use a five-decibel increase over existing ambient noise level as the significance criteria for construction.

Additionally, studies have shown that a change of at least five decibels would be noticeable and would likely evoke a community reaction. Thus, a five-decibel or more increase over the current ambient exterior noise level at the affected noise sensitive receptor is used as the significance criterion to evaluate construction noise impacts for the proposed project.²

The nearest sensitive receptor to the project site is Malibu Colony, a residential community that adjoins the project site to the southwest. The increase in noise levels during construction on the project site could result in temporary annoyance to those residents of Malibu Colony immediately adjacent to the lagoon.

To establish a baseline from which to evaluate construction noise impacts, noise measurements were taken at the southern perimeter of the project site, near Malibu Colony, using a Quest Q-400 Noise Dosimeter during the hours between 10:15 a.m. -11:15 a.m. on September 13, 2005. The sound measurements indicate that the existing ambient sound level is approximately 58 decibels (dBA) (L_{eq}) at the southwestern portion of the project site and approximately 59 dBA (L_{eq}) at the southern portion of the project site near the eastern end of Malibu Colony.³

Construction activities will likely require the use of numerous noise-generating equipment, such as pavers, backhoes, and loaders. During construction, it is likely that more than one piece of construction equipment would be operating at the same time. Additionally, noise levels would fluctuate depending on the construction phase, equipment

² Land uses that are considered sensitive to noise impacts are referred to as “sensitive receptors.” Noise sensitive receptors consist of, but are not limited to, schools, residences, libraries, hospitals, and other care facilities.

³ L_{eq} is the average noise level on an energy basis for any specific time period. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as a “noise average” or the level of a continuous noise that has the same energy content as the fluctuating noise level.

type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers.

Based on surveys conducted by the United States Environmental Protection Agency (USEPA), the typical overall exterior noise level that would be expected during ground clearing is 84 dBA. The typical overall noise level that would be expected during grading and excavation is approximately 89 dBA. It should be noted that these noise levels are based on surveys conducted by the USEPA in the early 1970's. Since 1970, regulations have been enforced to improve noise generated by certain types of construction equipment to meet worker noise exposure standards. However, many older pieces of equipment are still in use. Thus, the construction noise levels that were collected by the USEPA represent worst-case conditions. Actual noise levels generated by construction activities are expected to be markedly lower.

To ascertain worst-case noise impacts at Malibu Colony residences that adjoin the project site to the south, construction noise was modeled by introducing the noise level associated with the grading/excavation phase of construction. The noise source is assumed to be active for 40 percent of the eight-hour work day (consistent with the USEPA studies of construction noise), generating a noise level of 89 dBA at a reference distance of 50 feet.

Sound levels during the construction period at Malibu Colony residences to the south of the project site were calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level. The estimated outdoor construction noise levels at sensitive receptors are shown in Table 8-3.

Table 8-3: Outdoor Construction Noise Impacts

Noise Receptor	Distance (feet) /a/	Maximum Outdoor Construction Noise Level (dBA) /b/	Existing Ambient (dBA, Leq) /c/	New Ambient (dBA, Leq) /d/	Increase
<u>Phase I - Construction at the Parking Lot</u>					
Malibu Colony Residences adjacent to the southwestern portion of the project site	170	78	58	71	13
Residences at the eastern end of Malibu Colony adjacent to the project site	230	76	59	68	9
<u>Phase II - Construction at the Lagoon</u>					
Malibu Colony Residences adjacent to the southwestern portion of the project site	50	89	58	81	23
Residences at the eastern end of Malibu Colony adjacent to the project site	20	93	59	85	26
/a/ Distance of receptor to construction noise source.					
/b/ Construction noise source's sound level at receptor location, with distance adjustment.					
/c/ Pre-construction activity ambient sound level at receptor location.					
/d/ New sound level at receptor location during construction, including noise from construction activity.					
Source: TAHA, 2005 (See Appendix C for modeling worksheets)					

Currently, vegetation and fencing are located along the southern perimeter of the project site. Barriers, such as walls, dense trees, and berms, that break the line-of-sight between the noise source and the receiver would reduce noise levels from the source since sound waves can only reach the receiver by bending over the top of the barrier (diffraction). The vegetation and fencing along the southern perimeter of the project site do not completely break the line of sight between the residences at Malibu Colony and the project site.⁴ As such, construction noise levels shown in Table 8-3 do not take into account noise attenuation that could occur due to the existing vegetation and fencing along the western perimeter of the project site.

As shown in Table 8-3, construction activities at the project site would incrementally increase exterior ambient noise levels by 9 to 26 dBA, which would exceed the significance threshold of a 5 dBA or more increase. Thus, a significant, albeit temporary and intermittent, impact could result.

⁴ Line-of-sight is an unobstructed visual path between the noise source and the noise receptor.

Mitigation Measure N-1: Use of mufflers.

Construction contracts shall specify that all construction equipment shall be equipped with mufflers and other suitable noise attenuation devices.

Mitigation Measure N-2: Notice of construction schedule and noise “hotline.”

All residential units located within 500 feet of the construction site shall be sent a notice regarding the construction schedule of the proposed project. A clearly legible sign shall also be posted at the construction site. All notices and the signs shall indicate the expected dates and duration of construction activities, as well as provide a telephone number that residents can call to resolve any concerns about construction noise.

The Lead Agency shall be responsible for responding to any local complaints about construction noise. The Lead Agency (or designee) would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and would be required to implement reasonable measures such that the complaint is resolved.

Mitigation Measure N-3: Limits of hours of construction.

Pursuant to the Noise Control Ordinance of the City of Malibu, Section 8.24.050G, construction activities shall be prohibited during the hours between 7:00 p.m. and 7:00 a.m. during the weekdays and any time on Sundays or holidays. All construction related to the proposed project would take place between the hours defined by the Ordinance. Additionally, construction activities shall be coordinated with Adamson House staff to ensure that potentially disturbing construction activities do not occur during planned events at the Adamson House, such as Saturday weddings.

As previously indicated, machines equipped with mufflers have reduced noise levels. The sound level reduction can range from five to ten decibels. With muffler utilization, less-than-significant impacts are expected at homes greater than 50 feet from construction activities. Homes within 50 feet of active construction may still experience noise level increases that exceed 5 dBA and thus a significant, albeit temporary and intermittent, impact would remain.

As noted earlier, this noise analysis assumes worst-case conditions and does not account for likely attenuation due to existing noise barriers such as the landscaped fencing and other homes. It is possible that no significant noise impacts would occur during construction. However, due to the lack of detailed construction scenario data available at this time and the complex topographical nature of the project site and surroundings, less-than-significant noise levels during construction can neither be quantitatively demonstrated, nor guaranteed. Thus, this

analysis concludes that significant unavoidable construction noise impacts could occur.

Traffic and Circulation

Construction of the proposed project would not generate a substantial number of construction-related truck trips or construction worker trips. The air quality analysis assumed that Phase I of the project (parking lot relocation) would generate approximately 8.3 truck trips (round trips) per day for export of construction debris and that Phase II of the project (lagoon improvements) would generate approximately 8.2 truck trips (round trips) per day for export of excavated materials. Similarly, construction worker trips are anticipated to be minimal and are not anticipated to affect the levels of service at local intersections and roadway segments.

All heavy truck traffic will follow designated truck routes, to be coordinated with the City of Malibu and Caltrans, as required. Construction equipment staging areas and access will also be developed in consultation with the City of Malibu. As such, there would be no changes to traffic movement and circulation on PCH and local streets (particularly on the residential streets immediately west and south of the project site).

Additionally, construction of the proposed project would not affect beach access. The emergency access road on the east side of the lagoon would be maintained at all times to provide beach access. There is additional beach access east of the Adamson House within a short walk of the existing lagoon parking lot that will not be affected by construction either.

Construction of the new parking lot would result in temporary loss of on-site parking, however, construction of the parking lot is to take place during the winter months when demand for parking is lowest. Furthermore, ample parking is available in a surface parking lot adjacent to the Adamson House immediately adjacent to the east of the lagoon and adjacent on-street parking is available to serve beach visitors as well. Therefore, no significant traffic, circulation, access, or parking impacts associated with project construction are anticipated.

Chapter 9

Effects Considered Not Significant

Introduction

In accordance with CEQA Guidelines Section 15128, an EIR shall contain a statement briefly indicating the reasons why certain effects of the project were determined not to be significant and were, therefore, not discussed in detail in the EIR. Accordingly, this chapter presents the CEQA Checklist topics that have been considered not significant for the proposed project and, as such, have been excluded from further analysis in this EIR. The following presents a brief discussion of why each topic was considered not significant.

CEQA Topics Considered Not Significant

Aesthetics, Glare, and Lighting

Completion of the proposed restoration plan would introduce new parking and visitor/educational facilities and would include activities that would restore and enhance the existing natural features of the lagoon area through vegetation management (including invasive/exotic vegetation removal), channel enhancement, and habitat improvement.

In addition to vegetative restoration, appropriate considerations to elevations, slopes, and sediment characteristics would be made, resulting in landscaped areas that would contribute to the aesthetic quality of the lagoon. The proposed activities would be small in scale and would not substantially alter views of the lagoon and wetland area from vista points and residential properties surrounding the site. Therefore, no significant impact to aesthetics would occur.

Construction of the project will cause a temporary aesthetic impact. Previously vegetated wetlands will temporarily be devoid of vegetation during and after grading until the new vegetation is established. This temporary impact is expected to last approximately six months. This impact will be less noticeable during times of high tide when much of the wetland will be underwater.

Aesthetic impacts resulting from moving the parking lot closer to PCH will be longer lasting until screening vegetation is mature enough to block views of the parking lot. Appropriate temporary screening will be installed as necessary to further minimize aesthetic impacts. As these aesthetic impacts would be temporary and of limited scope, they are not considered significant under CEQA. Because the wetland ecosystem will be expanded and the lagoon restored, long-term project effects to the aesthetics of the lagoon would be beneficial.

The existing and proposed natural and built features of the lagoon area currently have very little potential to significantly affect adjacent properties due to glare. Glare is a result of sharply reflected light caused by sunlight or artificial light reflecting from highly finished surfaces, such as window glass or brightly colored surfaces. The sparse built features on-site are or would be constructed of either wood, pavement, and other materials that carry little to no potential for significant glare effects.

No new sources of light would result from implementation of the project so no lighting impacts would occur.

Agricultural Resources

No farmland exists on or within the vicinity of the lagoon. The site is zoned as Public Open Space and is not used for agricultural purposes. In addition, the lagoon is not under a Williamson Act agricultural contract.¹ Therefore, no impact to agricultural resources would occur.

Air Quality (Post-construction)

The proposed project is not expected to result in an increase in vehicle trips since the existing use of the lagoon would remain the same, and the relocated parking lot would have about the same number of parking spaces as the existing parking lot. As such, daily operational emissions from vehicles would remain the same as existing conditions, and no air quality impacts associated with the completed project would occur. Please refer to Chapter 8 for a discussion of potential Air Quality effects during construction.

Geology and Soils

The proposed project would not result in increased exposure of people to geologic hazards. The reconfiguration of the channels and the creation of the avian islands would be beneficial to the ecology of the lagoon and its biological inhabitants. In addition, as part of the restoration process, a Habitat Plan is provided that will provide details for slopes, drainage, topsoil salvage, and management of vegetative communities. A Monitoring Plan will provide specific monitoring tasks for an adaptive

¹ City of Malibu, *Malibu Zoning*, <http://www.ci.malibu.ca.us/download/index.cfm?fuseaction=download&cid=5122>, last revised 2005.

management framework, including those for bathymetry (lagoon topography). Therefore, no significant impact to geology or soils would occur.

Mineral Resources

According to the Conservation Element of the Malibu General Plan, mineral resources are not known to exist on the lagoon or other areas in Malibu.² Further, the California Geological Survey (formerly the California Division of Mines and Geology) indicates that Malibu is not an area classified by the Surface Mining and Reclamation Act (SMARA) as a production-consumption region for mineral resources.³

The lagoon is an ecological and recreational resource that is protected by the California Coastal Act from mining operations and development and the proposed project does not involve the extraction of mineral resources.⁴ Therefore, no impact to mineral resources would occur.

Noise

The existing use of the lagoon would remain the same, and operation of the proposed project would not generate any new vehicle trips. The related parking lot would have about the same number of parking spaces as the existing parking lot. As such, the proposed project would not introduce new sources of vehicle noise. It is anticipated that noise levels would remain similar to existing conditions. Therefore, no impact on existing ambient noise levels would occur.

Population and Housing

The proposed project is a restoration and enhancement plan for Malibu lagoon and does not involve a housing component that would generate a population increase or any other component that could reasonably be expected to result in a population change or demand for housing. Therefore, no impacts to population or housing would occur.

Hazardous Materials and Public Health (Vector Control)

Construction of the proposed project has the potential to result in potential hazardous substances spills during construction equipment operation. However, compliance with applicable federal, state, and local

² City of Malibu, Malibu General Plan Conservation Element, November 1995.

³ California Department of Conservation, Division of Mines and Geology, *Publications of the SMARA Mineral Land Classification Project Dealing With Mineral Resources in California*, http://www.consrv.ca.gov/CGS/minerals/mlc/SMARA_pubs_2001.pdf, 2001.

⁴ City of Malibu, *City of Malibu LCP Land Use Plan*, <http://www.ci.malibu.ca.us/download/index.cfm?fuseaction=download&cid=1577>, last revised September 13, 2002.

regulations would reduce the likelihood of the occurrence of potentially significant impacts. Therefore, the proposed project would have a less-than-significant impact related to hazardous materials.

Similarly, operation of the proposed project would not result in any health risks associated with the use or generation of hazardous materials. The proposed project would include implementation of a Water Management Plan, which is designed to eliminate all polluted runoff source discharges to the lagoon to benefit lagoon water quality and maintain improved circulation within the lagoon under both open and closed conditions.

Currently, direct surface discharges to the lagoon result from storm water and irrigation. In order to redirect storm water away from the lagoon and towards other appropriate drainage facilities, the proposed project considers two options: (1) to downward slope the parking lot towards the north, such that the run-off flows in a direction opposite of the lagoon, and (2) to route the drainage westward toward the collection sump for the City of Malibu's future force main line along Malibu Road.

Vector Control

Due to the most recent West Nile Virus epidemic, the following discussion briefly addresses the health impacts associated with vector-transmitted diseases, specifically those associated with mosquitoes. With just one bite, mosquitoes can transmit the West Nile Virus and other viruses that can cause encephalitis. Stagnant water can serve as a breeding ground for mosquitoes to lay their eggs.

According to the Los Angeles County West Vector and Vector Borne Disease Control District, mosquito and vector control is necessary on a continuous routine and area-wide basis to protect the health and enhance the economic development, recreational use, and enjoyment of outdoor living.⁵

As identified in Chapter 3, Project Description, one of the main purposes of the proposed project is to restore and enhance the ecological conditions of the lagoon, and one of the objectives is to increase circulation of water during open and closed conditions of the lagoon. Recognizing that the lagoon currently has substantial areas of stagnant water and is a breeding ground for mosquitoes, the proposed project would aid abatement of this condition by increasing tidal flushing and improving water circulation. Therefore, the proposed project would result in a beneficial impact on public health, as it would reduce areas of potential breeding ground for mosquitoes. However, these breeding grounds would not be eliminated due to the wetland nature of the lagoon.

⁵ Los Angeles County West Vector & Vector Borne Disease Control District, Vector Control, <http://www.lawestvector.org/vectorcontrol.htm>, accessed November 17, 2005.

Public Services

The proposed project is a restoration and enhancement plan for Malibu Lagoon and does not include housing or any other component that could reasonably be expected to generate a population increase. As a result, there would be no corresponding increase in demand for public services or facilities. Therefore, no impact to public services would occur.

Recreation

The proposed project would not result in an increased demand for recreational resources. Rather, as part of the proposed project, a staging area with interpretive displays and panels (located in the new parking lot area), as well as multiple interpretive nodes/loops, would serve to enhance the educational and recreational uses of the site. Visitor access improvements to encourage the use of this State park would also be included as part of the project. Therefore, a beneficial impact to recreation is anticipated.

Traffic and Circulation (Post-Construction)

Operation of the proposed project is not anticipated to generate any new vehicle trips since the existing use of the lagoon would remain the same. The relocated parking lot would have about the same number of parking spaces as the existing parking lot, and access to the relocated parking lot would be the same as existing off of PCH, opposite Cross Creek Road. As such, no changes to traffic movement and circulation on PCH, local streets, and beach access would occur (particularly on the residential streets immediately west and south of the project site and the access road from the site entrance to the beach along the western boundary of the project site). Therefore, daily vehicle trips would remain the same as existing conditions, and no traffic or circulation impacts would occur. Please refer to Chapter 8 for the discussion of potential traffic effects during construction.

Utilities and Service Systems

The proposed project is a restoration and enhancement plan for Malibu Lagoon and does not involve housing or any other component that could reasonably be expected to generate a population increase. As a result, there would be no increase in demand for utilities or service systems, including water supply, wastewater (septic/sewer), and solid waste.

Notably, the proposed project would include a Water Management Plan for the management of drainage from the parking lot and public use areas to restored habitat areas. This plan would provide suggestions for storm water management that would result in increased percolation of storm drainage and, possibly, more efficient conveyance to a drainage system to the future City treatment plant. No significant impact to utilities or service systems would occur.

Chapter 10

Cumulative Impacts

Introduction

According to Section 15355 of the *State CEQA Guidelines*, cumulative impacts refer to:

Two or more individual effects which, when considered together are considerable or which compound or increase other environmental effects. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Furthermore, Section 15130(a) of the *State CEQA Guidelines* states that:

An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable....When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR....An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact....

The provisions of the *State CEQA Guidelines*, Section 15130(b), subdivisions (b)(1) through (b)(3) list the "necessary elements" that define "an adequate discussion of significant cumulative impacts." According to Section 15130 (b)(1) of the *State CEQA Guidelines*, either a list of past, present, and probable future projects producing related or cumulative impacts or a summary of growth projections in an adopted general plan or related planning document may be used as the basis for the cumulative impacts discussion.

Table 10-1 lists the related projects in the general vicinity of the proposed project. This list was provided by the City of Malibu and includes projects that are proposed, in the planning stage, are under construction, or have recently completed construction. Figure 10-1 shows the general locations of the related projects.

The cumulative impacts for each environmental focus of the project are discussed below.

Consistency with Local and Regional Plans

As described in Chapter 4, the project complies with local plans, land use and zoning designations. It is expected that most related projects would be required to comply with adopted land use plans and zoning requirements as well. It is also anticipated that related projects would generally be consistent with the overall land use policies and goals of the City of Malibu General Plan. No significant cumulative land use impacts would occur as a result of implementation of the project.

Cultural Resources

The geographic scope of the area affected by potential cumulative archaeological impacts is defined by the cultural setting and ethnographic territory of the prehistoric and historic peoples who have occupied this area of southern California. As detailed in Chapter 7, this region of Los Angeles County was part of the territory of the Chumash Native American people. Related projects in the project area and other development in the county could result in the progressive loss of as-yet-unrecorded archaeological resources. This loss, without proper mitigation, would be an adverse cumulative impact.

Construction activities associated with related projects could contribute to the progressive loss of archaeological resources and result in significant cumulative impacts under CEQA. The proposed project also has potential to disturb or destroy archaeological resources that may exist in the proposed project. Thus, the combined effects of the proposed and related projects could result in significant cumulative impacts to archaeological resources. The proposed project includes mitigation that would reduce potential impacts and contributions to cumulative impacts to less-than-significant levels. Similar measures may also be implemented for other related projects that have the potential to affect archaeological resources.

No significant adverse impacts were identified on historical resources, including the Adamson House and its contributing elements; therefore, the proposed project would not add to cumulative impacts caused by other related projects.

Table 10-1. Related Projects and Cumulative Development

ID #	Project	Description
1	Rancho Malibu Hotel	Hotel (146 rooms), Health Club (6,052 sf), Cultural Center (9,000 sf).
2	Pepperdine University Upper Campus	384,800 sf
3	Forge Lodge	28 rooms - bed and breakfast lodge with a dedicated kitchen facility. The lodge will consist of eight, four-unit, two-story buildings designed in a Mediterranean Revival style architecture consistent with the character of the existing Beurivage Restaurant.
4	Pepperdine Office Development	65,000 sf office
5	Proposed Senior Housing	36 units
6	Single Family Housing Development	8 units
7	Adamson Self-Storage	56,600 sf self-storage
8	Schultz – Office and Retail (Pharmacy)	Office (20,850 sf) and Retail (18,000 sf)
9	Yamaguchi - Office and Retail	Office (67,000 sf) and Retail (42,271 sf)
10	Residential	6 units
11	Office	13,500 sf
12	Malibu Pier - Restaurant/Retail	10,237 sf
13	Windsail	Restaurant (7,275 sf), Community Room (980 sf) and Day Spa (1,300 sf)
14	Office	10,000 sf
15	La Paz Ranch	Commercial development project on 15.28 acres

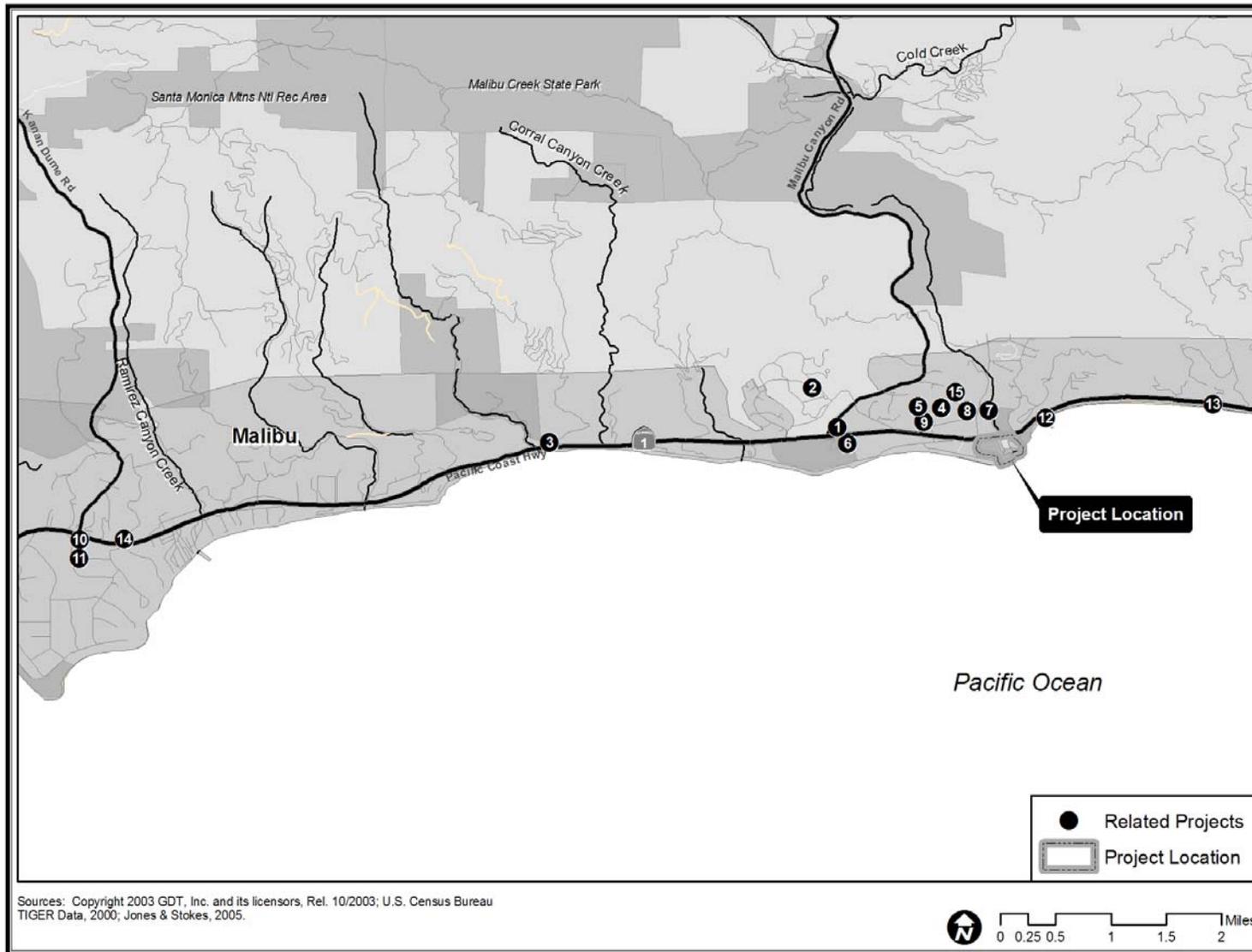
Source: City of Malibu, December 2005.

Hydrology and Water Quality

The primary objective of the proposed project is restoration of habitat and improvement of water quality in Malibu Lagoon. Increased water circulation, reduced and redirected storm water runoff, and restoration of native plant and wildlife habitat from implementation of the proposed project would beneficially impact hydrology and water quality of the lagoon after restoration is complete.

In conjunction with improved treatment and discharge operations at the Tapia Wastewater Treatment Plant and watershed-wide efforts to reduce the nutrient and bacterial load and improve aquatic habitat in the Malibu Creek watershed, it is anticipated that the proposed project would have the potential to significantly improve water quality conditions to a level that would meet TMDL target requirements.

Figure 10-1. Related Projects



Additionally, the Army Corps of Engineers plans to remove Ringe Dam, a project that ultimately would contribute to restoration of flow and water quality conditions in the watershed. The storage capacity of the lagoon would increase after completion of the proposed project, thus removal of the Ringe Dam is not expected to increase the potential for flooding in the vicinity of the lagoon. However, a plug of sediment could be released during dam removal activities. This sediment could transport to and deposit in the lagoon. Consequently, improper handling of sediments during dam removal would threaten the proposed project.

Potential impacts from the dam removal project would be avoided or mitigated through compliance with permit conditions and mitigation measures required as part of environmental impact analysis of the project. These measures would adequately protect against potential impacts to Malibu Lagoon. Overall, the proposed project would contribute to cumulatively beneficial impacts on hydrology and water quality in the watershed and lagoon.

Biological Resources

When analyzing cumulative impacts to wetlands, waters and aquatic species it is important to consider impacts within the watershed in which the project is located, as impacts outside of the watershed will be much less relevant. The analysis of cumulative impacts on sensitive species should take into account the distribution of these species and the distribution of the reproducing population.

Sensitive Habitats

Impacts to sensitive habitats associated with the proposed project include southern willow scrub, atriplex scrub, baccharis scrub, mule fat scrub, Venturan coastal sage scrub, mixed scrub, southern coastal salt marsh, brackish marsh, coastal and valley freshwater marsh, southern sycamore-alder riparian woodland, non-native grassland, mud flat, sand beach/sand bar, and open water.

While recent and foreseeable projects in the Malibu area may result in significant cumulative impacts to sensitive vegetation communities, including vegetation communities located within the project area (i.e., southern willow scrub, mule fat scrub, mixed chaparral etc.), implementation of the proposed project would not contribute to any significant cumulative impact as it will result in long-term benefits to vegetation communities located within the project area. In addition, implementation of the project would result in an increase in native (wetland and upland) vegetation communities and a decrease in disturbed and developed areas.

Sensitive Plants

The proposed project would not result in impacts to sensitive plant species as none were observed during any of the biological surveys. Therefore, the plan would not contribute to any significant cumulative impact to sensitive plant species.

Sensitive Wildlife

Malibu Lagoon supports important populations of several sensitive wildlife species including wandering (salt marsh) skipper, southern steelhead trout, tidewater goby, California brown pelican, western snowy plover, Heermann's gull, elegant tern, and the California least tern. While recent and foreseeable projects in the Malibu area may result in significant cumulative impacts to sensitive wildlife species, including those located within the plan area, implementation of the project would not contribute to any significant cumulative impact as it will result in long-term benefits to sensitive wildlife species and habitat within the plan area.

Construction Effects

The related projects listed in Table 10-1 are in various phases of development. It is possible that construction for one or more of the listed projects would overlap with the construction for the proposed project. As a result, there could be short-term noise, air quality, construction traffic and aesthetic effects. However, given the small scale of construction associated with the proposed project, and the short duration of these impacts, these would not be considered cumulatively significant.

Chapter 11

Alternatives Considered

Introduction

CEQA requires that an EIR describe a range of reasonable alternatives to the proposed project or to the location of the project that could feasibly avoid or lessen any significant environmental impacts, while substantially attaining the basic objectives of the project. An EIR should also evaluate the comparative merits of the alternatives. This chapter sets forth potential alternatives to the proposed project and evaluates them as required by CEQA.

Key provisions of the *State CEQA Guidelines* (Section 15126.6) pertaining to the alternatives analysis are summarized below.

The discussion of alternatives shall focus on alternatives to the proposed project or its location that are capable of avoiding or substantially lessening any significant effects of the proposed project, even if those alternatives would impede to some degree the attainment of the proposed project objectives or would be more costly.

The No-Project Alternative shall be evaluated along with its impact. The No-Project analysis shall discuss the existing conditions at the time the NOP is published as well as what would be reasonably expected to occur in the foreseeable future if the proposed project were not approved based on current plans and consistent with available infrastructure and community services.

The range of alternatives required in an EIR is governed by a “rule of reason”; therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the proposed project.

For alternative locations, only locations that would avoid or substantially lessen any of the significant effects of the proposed project need be considered for inclusion in the EIR.

An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

The range of feasible alternatives is selected and discussed in a manner designed to foster meaningful public participation and informed decision making. Among the factors that may be taken into account when addressing the feasibility of alternatives (as described in the *State CEQA Guidelines*, Section 15126.6(f)(1)) are environmental impacts, site suitability, economic viability, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the proponent could reasonably acquire, control, or otherwise have access to the alternative site.

Proposed Project Goals and Objectives

The purpose of the proposed project is to restore and enhance the ecological conditions of Malibu Lagoon and improve public access and education about the lagoon. The plan presents information regarding the current condition of the lagoon, goals and strategies for the restoration, and implementation and monitoring details, which are the result of extensive discussion and cooperation between the Coastal Conservancy and DPR, along with the Lagoon Technical Advisory Committee and Lagoon Restoration Working group.

The Lead Agency has identified the following major objectives for the proposed project:

- Decrease urban runoff from surrounding sources into the lagoon to improve its water quality and decrease eutrophication.
- Increase circulation of water during open and closed conditions.
- Restore habitat by re-establishing suitable soil conditions and native plant species and removing non-native species.
- Relocate existing parking lot to increase habitat size and utilize permeable surfaces.
- Evaluate, record, and analyze existing and changing ecological conditions of the lagoon using physical, chemical, and biological parameters to allow agencies, organizations, and stakeholders to monitor progress towards restoration goals.

Alternatives Considered

The alternatives considered in this chapter are detailed in the *Malibu Lagoon Restoration Feasibility Study Final Alternatives Analysis* (March 2005), prepared by Moffat and Nichol in association with Heal the Bay. The purpose of the *Alternatives Analysis* was to narrow down a range of alternatives that would achieve the desired restoration goals as defined by the Malibu Lagoon Task Force. The alternatives were developed and evaluated according to how effective they address the following issues: circulation, sedimentation, nutrient cycling, eutrophication, and habitat.

The *Final Alternatives Analysis* document can be viewed online at:
<http://www.healthebay.org/currentissues/mlhep/default.asp>.

All of the considered alternatives were tested for their performance in relation to existing conditions as well as one another in order to quantify potential benefits. Alternative 1.5 from the *Alternatives Analysis* was ultimately found to be the best option and was thus carried forward as the proposed project and subject of this EIR as the alternative that would best achieve the desired goals, while resulting in the least amount of impact to the existing lagoon habitat.

Evaluation of Alternatives to the Proposed Project

For each alternative described below, a summary discussion¹ is provided of that alternative's potential impacts. A summary comparison of alternatives is also provided in Table 11-1 below. The table compares each of the project alternatives to the proposed project and states whether the alternative would result in a similar, greater, or lesser impact than the proposed project for each impact category.

Table 11-1. Comparative Environmental Analysis of Alternatives

Resource Area	Proposed Project (after mitigation)	ALTERNATIVES TO THE PROPOSED PROJECT			
		No Project/ No Build	Enhancement (1.0)	Restore/Enhance Modified with the North Channel (1.75)	Restore and Enhance Alternative (2.0)
Cultural resources	Less-Than-Significant Impact	No Impact	Similar Impact	Similar Impact	Similar Impact
Biological Resources	Beneficial Impact	No Impact	Lesser Beneficial Impact	Similar Beneficial Impact	Similar Beneficial Impact
Hydrology and Water Quality	Beneficial Impact	Negative impact	Potentially Negative Impact	Greater Beneficial Impact	Similar Beneficial Impact
Consistency With Local and Regional Plans	No impact	No Impact	No Impact	No Impact	No Impact
Construction Effects	Significant Impact (Noise Only)	No Impact	Lesser Impact	Similar Impact	Similar Impact

Source: Jones & Stokes, 2005.

¹ In accordance with the *State CEQA Guidelines*, Section 15626.6(d), the discussion of the environmental effects of the alternatives may be less than that provided for the proposed project

More detailed discussions of the impacts of each alternative follow the summary table. In all cases, the comparison of impacts assumes that all feasible mitigation measures as identified in this document have been implemented for the impacts resulting from the proposed project. Similarly, in all cases where it can be safely assumed that there are feasible mitigation measures for impacts caused by the alternative, it is assumed that those mitigation measures would be implemented as well.

No-Project Alternative

Section 15126.6 (e) of the *State CEQA Guidelines* requires the analysis of a No-Project Alternative. This No-Project analysis must discuss the existing condition as well as what would be reasonably expected to occur in the foreseeable future if the proposed project were not to be approved based on current plans, site zoning, and consistent with available infrastructure and community services. Because the proposed project is a development proposed project, Section 15126.6(e)(3)(B) of the *State CEQA Guidelines* is directly applicable.

If the proposed project is a development proposed project on an identifiable property, the No-Project Alternative is the circumstance under which the proposed project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects that would occur if the proposed project were approved.

If disapproval of the proposed project under consideration would result in predictable actions by others, such as the proposal of some other proposed project, this no-project consequence should be discussed. In certain instances, the No-Project Alternative means “no build” wherein the existing environmental setting is maintained. However, where failure to proceed with the proposed project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the proposed project’s non-approval and should not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.

Under the No-Project Alternative, implementation of the Restoration and Enhancement Plan would not occur. The parking lot and lagoon would remain and continue to be used by the public in its existing state. As a consequence, the No-Project Alternative would not result in any of the beneficial effects of the proposed project.

Biological Resources: The No-Project Alternative would not remove any trees or vegetation or affect any nesting birds (a potentially significant but mitigable effect) as would occur under the proposed project. Biological restoration goals would not be achieved and habitat conditions would likely continue to degrade.

Cultural Resources: Since no new construction and no earth-moving would occur under this alternative, no impacts would occur to cultural resources.

Hydrology and Water Quality: Under the No Project Alternative, water quality would continue to degrade as sediment carried from storm flows is deposited in the lagoon area, thus contributing to aggradation and formation of eutrophic conditions. The No Project Alternative would not contribute to compliance with TMDL targets for nutrients and bacteria, thus, water quality would remain impaired and likely worsen over time.

Consistency With Local and Regional Plans: Since no new construction and no changes in land use would occur under this alternative, no land use impacts would occur.

Construction Effects: Under the No-Project Alternative the physical landscape of the area would not be altered. Therefore there will be no construction effects resulting from implementation of the No-Project Alternative.

Alternative 1: Enhancement Alternative

The Enhancement Alternative (see Figures 11-1 and 11-2) was designed with the intent to improve existing conditions in the western lagoon arms with the least cost and least degree of disturbance to the existing lagoon habitat. The elevations of the channels in the western portion of the lagoon are too high to allow for inundation at ocean tidal elevations below mean sea level when the barrier beach berm is open. In addition the western channels are too narrow, constricted, and isolated from one another to allow for adequate circulation of lagoon water. The existing topography has resulted in an overabundance of upland habitat.

The enhancement alternative would lower the existing channels elevations, thus allowing for an increase tide inundation during open conditions. Topography of the channels and islands in the western lagoon would be lowered to accommodate vegetation types typically associated with coastal estuaries. Channel widths and depths would be increased and channels would be connected to remove existing dead ends.

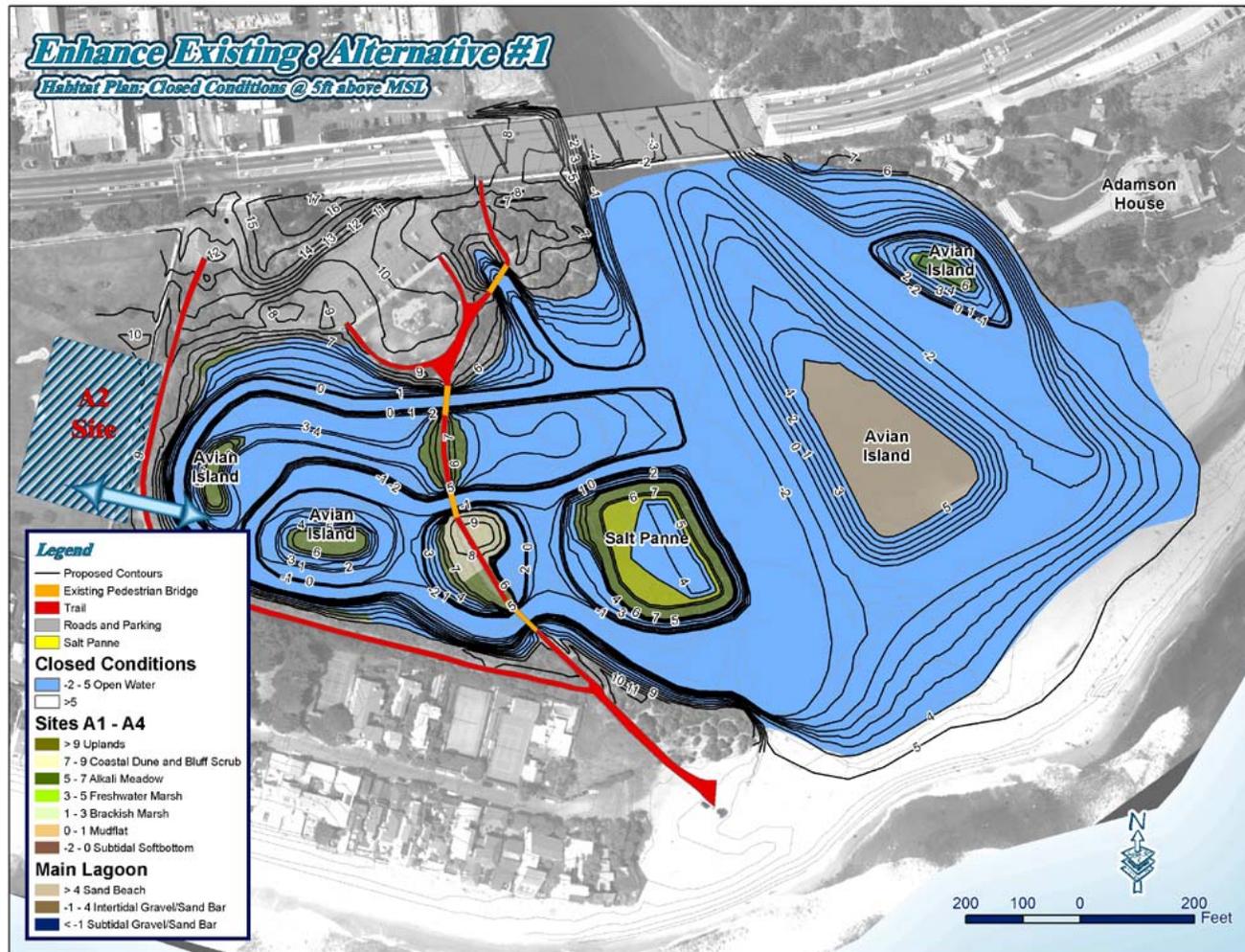
Alternative 1 does not include improvements to the parking lot area or educational components.

Further discussion of Alternative 1 can be found in the *Malibu Lagoon Restoration Feasibility Study Final Alternatives Analysis* on pages 44 and 45.

Figure 11-1. Alternative 1: Habitat Plan Open Conditions at 1 Foot below MSL



Figure 11-2. Alternative 1: Habitat Plan Closed Conditions at 5 Feet above MSL



This alternative intends to:

- Improve circulation by expanding and deepening of existing channels in the western arms;
- Remove dead ends by connecting the A (north) channel to the C (south) Channel;
- Establish more appropriate marsh vegetation by lowering the elevation of western channels and islands to minimize upland habitat;
- Increase lagoon holding capacity during closed conditions;
- Provide additional bird habitat and minimize the need to export soils offsite by expansion of the mid-stream bar in the main lagoon body (no structural engineering is proposed to protect this bar).
- Provide unvegetated avian areas through the creation of a salt panne. The salt panne is intended to create an unvegetated area that uses a depression to capture water that will subsequently evaporate leaving behind higher salts in the soils that will minimize vegetative growth; and
- Minimize cost and disruption to existing lagoon habitats.

Biological Resources: Alternative 1 has the least capacity to accomplish desirable changes as it maintains, to a great extent, the existing lagoon platform, while providing for slight modifications to site elevation. This alternative would result in some improvements to the circulation and habitat quality within the lagoon. However, it would result in only a minor overall increase of an estimated 0.53-acre of wetland habitat.

Jurisdictional wetland impacts would occur as a result of reworking existing wetlands and uplands to restore or create new wetland and upland habitats. Although the overall footprint of change for Alternative 1 may be less than that occurring for the other alternatives, this alternative includes deepening and expansion of the main lagoon channels and reduction of upland elevations with deposition of material on the central lagoon shoal. As a result, this alternative would also result in extensive construction period modification to the existing wetland.

Alternative 1 provides a greater opportunity for the development of avian loafing and roosting islands due partly to the incorporation of smaller islands nearer to shorelines. The island would be incorporated within an area of the main lagoon to provide for avian nesting opportunities. This island would be protected from human impacts that threaten the barrier beach avian area during the summer season and the island would not be subject to losses in the event of unseasonable summer breaching and barrier breach erosion. As such, this island is ideally suited to be configured to optimize suitability for nesting by such species as the snowy plover. Alternative 1 provides adequate protected habitat that would meet the requirements for gobies.

Cultural Resources: Although the overall footprint of change for Alternative 1 may be less than that occurring for the other alternatives it would require an extensive construction period modification to the existing wetland. Earth moving in the project area could encounter buried cultural resources and construction adjacent to the east side of the lagoon (Adamson House) could impact as yet unknown buried cultural resources associated with Humaliwo, CA-LAN-264, including human remains. However impacts would be reduced to less than significant through mitigation measures CR-1, CR-2, and CR-3.

Hydrology and Water Quality: Alternative 1 would minimally improve hydrology and water conditions in the lagoon. Creation of a mid-stream bar for additional bird habitat could worsen circulation conditions and increase sedimentation in the lagoon area. As a result, the concentration of nutrients could increase, thus promoting formation of eutrophic conditions. Therefore, this alternative could negatively contribute to impaired hydrology and water quality conditions in the lagoon.

Consistency With Local and Regional Plans: Alternative 1 would not materially conflict with the Malibu General Plan, Malibu LCP Land Use Plan, and zoning land uses because (1) the lagoon is currently designated for use as a public park/beach, (2) the project would not require a zoning or land use change, and (3) the restoration plan does not propose expansion outside the existing Malibu Lagoon State Park footprint. Thus, the Alternative 1 is consistent with all applicable land uses and zoning designations.

Construction Impacts: Construction impacts for Alternative 1 would be less adverse than the proposed project due to the elimination of the Phase 1 parking lot redevelopment component.

Alternative 1.75: Restore/Enhance Modify with the North Channel

The Restore/Enhance Modify with the North Channel (see Figures 11-3 and 11-4) is a variation of the proposed project that includes the North Channel connection as an adaptive management tool. The North Channel may further improve flushing through the upper western arms and circulation during closed conditions. Further discussion of Alternative 1.75 can be found in the *Alternatives Analysis* on page 52.

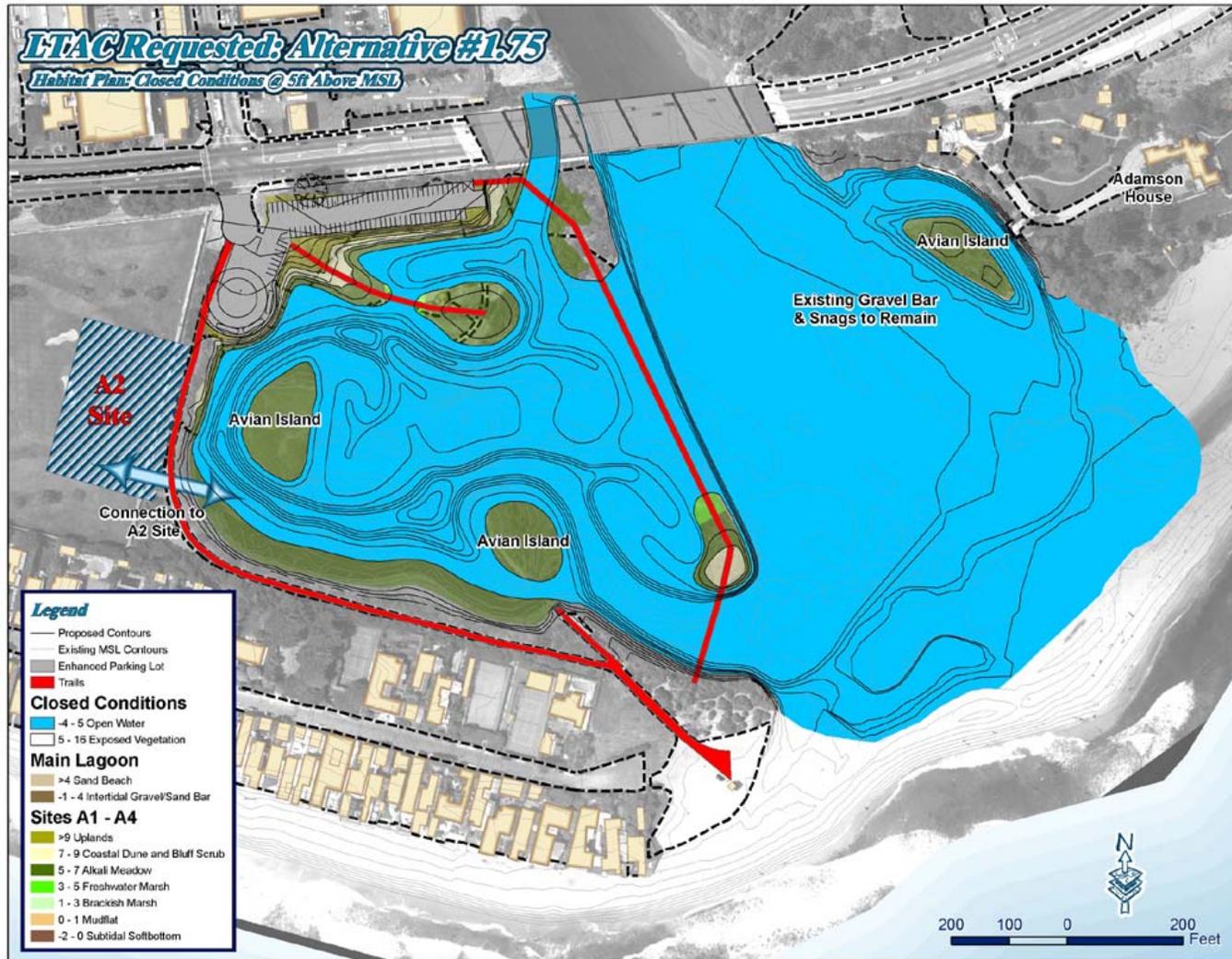
Alternative 1.75 was intended to achieve:

- Tidal influence created by a single main channel with a naturalized dendritic planform more indicative of natural systems;

Figure 11-3. Alternative 1.75: Habitat Plan Open Conditions at 1 Foot below MSL



Figure 11-4. Alternative 1.75: Habitat Plan Closed Conditions at 5 Feet above MSL



- Increased tidal flushing during open conditions by deepening of the west lagoon (no work is proposed in the main lagoon). This will also increase holding capacity (storage volume);
- Enhanced and increased salt marsh environment during open conditions and maximized wind fetch to enhance wind-driven circulation during closed conditions;
- Permanent avian islands. These islands will be designed to afford better protection from predators and will be optimized to suit avian enhancement goals;
- Expanded wetland and marsh acreage by relocating the existing parking lot into degraded upland habitat. The new parking lot will be designed to be permeable to maximize water quality enhancements through naturalized filtration/infiltration;
- Increased flushing of sediments through the connection of the new North Channel;
- Opportunities for new visitor facilities and educational resources.

Biological Resources: Improved water circulation predicted for Alternative 1.75 is expected to improve goby refuge habitat during catastrophic breach events by minimizing anoxic conditions in deeper pools and isolated channels. Alternative 1.75 provides adequate protected habitat that would meet the requirements for gobies.

Alternative 1.75 would result in an increase of 1.78 acres of wetland habitat, which is 0.04 acres less than the proposed project.

Cultural Resources: Alternative 1.75 and the proposed project are the least impacting alternatives in regards to overall earthwork and construction impacts. Alternative 1.75 will have 37,571 cubic yards of cut and 16,329 cubic yards of fill compared to the proposed program that will result in 34,793 cubic yards of cut and 16,329 cubic yards of fill. However, earth moving in the project area could encounter buried cultural resources; construction adjacent to the east (Adamson House) side of the lagoon could impact as yet unknown buried cultural resources associated with Humaliwo, CA-LAN-264, including human remains. However impacts would be reduced to less than significant through mitigation measures CR-1, CR-2, and CR-3.

Hydrology and Water Quality: Alternative 1.75 would have the greatest beneficial impact on the lagoon in terms of hydrology and water quality. Compared to the other alternatives, Alternative 1.75 would have the most positive effects on the lagoon due to increased circulation, holding capacity, scour potential, and consequent reduced eutrophic conditions. During open and closed lagoon conditions, this alternative would provide optimal water circulation. This translates to increased scour and reduced sedimentation during stormflows. Consequently, the potential for formation of eutrophic conditions would be reduced due to

improved nutrient cycling. Alternative 1.75 would optimally restore hydrology and water quality in the lagoon.

Consistency with Local and Regional Plans: Alternative 1.75 would not materially conflict with the Malibu General Plan, Malibu LCP Land Use Plan, and zoning land uses because (1) the lagoon (project site) is currently designated for use as a public park/beach, (2) the project would not require a zoning or land use change, and (3) the restoration plan does not propose expansion outside the existing Malibu Lagoon State Park footprint. Thus, Alternative 1.75 is consistent with all applicable land uses and zoning designations.

Construction Effects: Construction impacts for alternative 1.75 would be similar to those of the proposed project.

Alternative 2.0: Restore and Enhance Alternative

The Restore and Enhance Alternative (see Figures 11-5 and 11-6) intends to restore and enhance those areas that have diminished in functions or are in a currently degraded state.

The proposed new North Channel connection is meant to convey an appropriate source of drainage from upstream that could include the Cross Creek storm drain, the main creek, or both. The North Channel would act as a connection between the upper end of the western arm to the Cross Creek storm drain, the main creek or both under a western bent on the PCH Bridge. The purpose is to convey a limited stormflow discharge into the upstream end of the western arms to flush fine sediment from the western lagoon. Further discussion of Alternative 2 can be found in the *Alternatives Analysis* on pages 48 and 49.

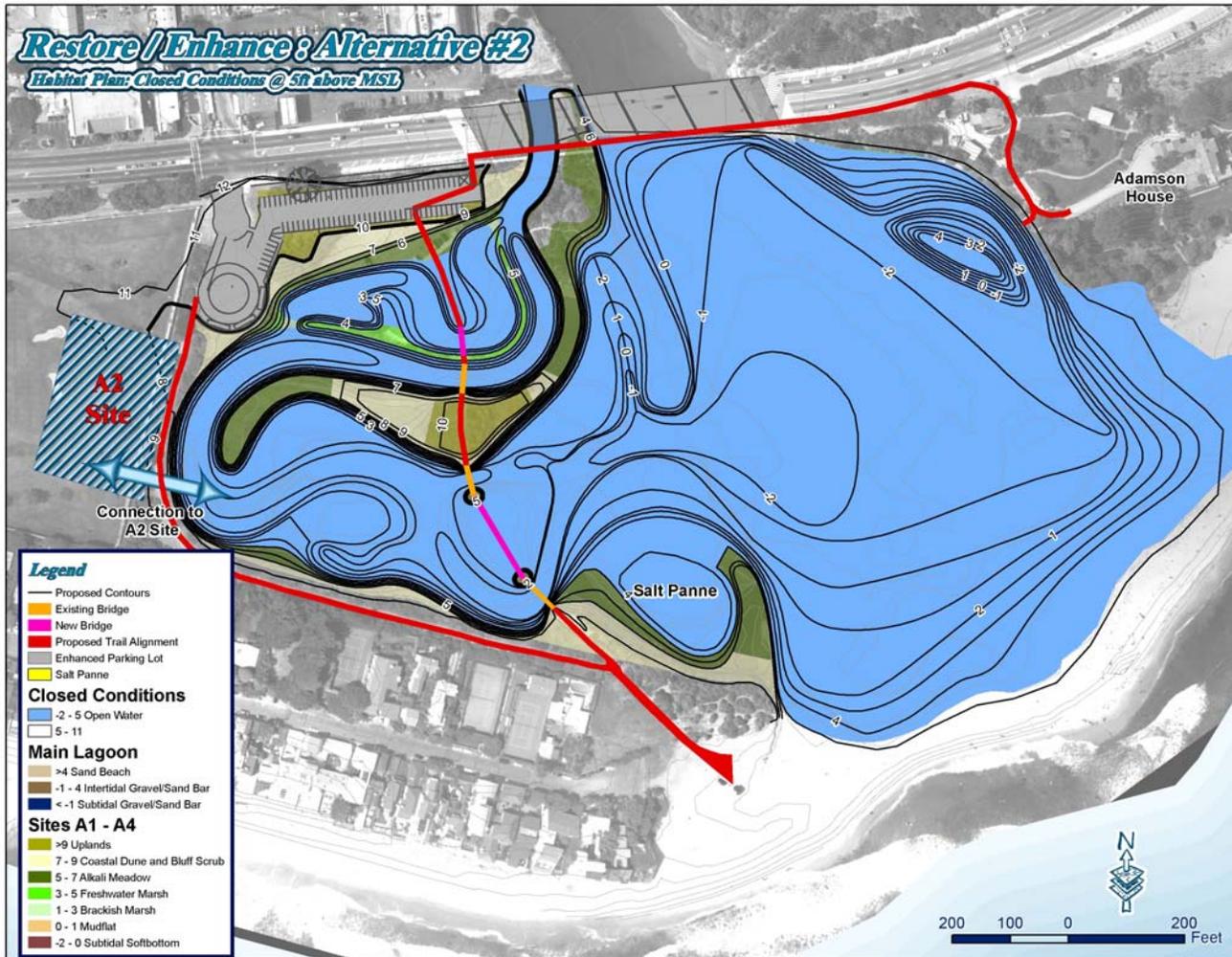
Alternative 2.0 was intended to achieve:

- Tidal influence created by a single sinuous main channel;
- Increased tidal flushing during open conditions by deepening of the west lagoon (no work is proposed in the main lagoon). This would also increase holding capacity (storage volume);
- Enhanced and increased salt marsh environment during open conditions and maximized wind fetch to enhance wind-driven circulation during closed conditions; and
- Unvegetated avian areas through the creation of a salt panne. The salt panne is intended to create an unvegetated area that uses a depression to capture water that would subsequently evaporate leaving behind higher salts in the soils that would minimize vegetative growth.

Figure 11-5. Alternative 2: Habitat Plan Open Conditions at 1 Foot below MSL



Figure 11-6. Alternative 2: Habitat Plan Closed Conditions at 5 Feet above MSL



Biological Resources: Alternative 2 would result in an estimated 1.22-acre increase in wetland habitat, which is 0.6 acres less than the proposed project. The proposed project and Alternative 2 provide the greatest potential for reworking site conditions to achieve desired vegetation improvements. Alternative 2 in addition to all of the alternatives provides adequate protected habitat that would meet the requirements for gobies.

Cultural Resources: More excavation (54,139 cubic yards of cut and 15,772 cubic yards of fill) would occur with Alternative 2 as the west arm channel is larger and deeper than other alternatives, and the bar at the main lagoon is removed thus causing a greater level of impact. Again, this earth moving could encounter buried cultural resources; construction adjacent to the east (Adamson House) side of the lagoon could impact as yet unknown buried cultural resources associated with Humaliwo, CA-LAN-264, including human remains. However impacts would be reduced to less than significant through mitigation measures CR-1, CR-2, and CR-3.

Hydrology and Water Quality: Alternative 2 would maximize circulation and encourage flushing of sediment from the lagoon area during storm events. Water quality benefits from this alternative would involve potential reduction in nutrient concentrations, thus decreasing the formation of eutrophic conditions. When compared to existing conditions, Alternative 2 would improve hydrologic and water quality conditions. In comparison to the proposed project, Alternative 2 would improve conditions when the lagoon is open, but have a lesser beneficial impact on closed lagoon conditions.

Consistency with Local and Regional Plans: Alternative 2 would not materially conflict with the Malibu General Plan, Malibu LCP Land Use Plan, and zoning land uses because (1) the lagoon (project site) is currently designated for use as a public park/beach, (2) the project would not require a zoning or land use change, and (3) the restoration plan does not propose expansion outside the existing Malibu Lagoon State Park footprint. Thus, Alternative 2 is consistent with all applicable land uses and zoning designations.

Construction Effects: Construction impacts for Alternative 2 would be similar to those of the proposed project.

Environmentally Superior Alternative

The environmentally superior alternative would be the No-Project Alternative because of the absence of any potential short-term environmental impacts. However, as discussed above, the No-Project Alternative would not fulfill any of the project objectives. Under the No-Project Alternative, the lagoon would not be restored, and consequently, the long term overall health of the habitat would be impaired.

According to the *State CEQA Guidelines*, if the environmentally superior alternative is the No-Project Alternative, the EIR shall identify an environmentally superior alternative among the other alternatives. Based on the analysis presented above and summarized in Table 11-1, Alternative 1.75 would be the environmentally superior alternative. However, there is uncertainty as to whether Alternative 1.75 possesses the magnitude of the beneficial effects.

Chapter 12

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Chapter 13

Comments and Responses

Introduction

The Draft EIR for the Malibu Lagoon Restoration and Enhancement Plan was completed in January 2006. Subsequently, a Notice of Availability (NOA) was published in the *Malibu Times* and mailed to all interested parties and agencies in order to solicit comments on the document (a copy of the NOA is contained in Appendix B). The comment period on the Draft EIR began January 20, 2006, and ended March 6, 2006.

A total of nine letters were received by the lead agency during the comment period (see Table 13-1). These included both mailed letters and emails.

Responses were developed that either answer questions raised, clarify information contained in the Draft EIR, or refer the commenter to the appropriate location in the EIR where detailed information about the issue raised is located.

Comments and Responses to Comments

Each comment letter was assigned a tracking number, shown in Table 13-1. Individual comments raised in letters were also numbered in the right margin of the comment letter. Reproductions of each letter showing the individual comment numbering are contained in the following pages. Lead agency responses immediately follow each comment letter, with responses numbered to correspond to the specific comments within each letter.

Table 13-1. Commenters

Comment Number	Name	Affiliation
1	Rodney R. McInnis	Regional Administrator, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
2	Antal J. Szijj	Acting Chief, North Coast Section, Regulatory Branch, Department of the Army, Los Angeles District, Corps of Engineers
3	Cheryl J. Powell	IGR/CEQA Program Manager, California Department of Transportation, District 7, Regional Planning, IGR/CEQA Branch
4	Brian Wallace	Associate Regional Planner, Intergovernmental Review, Southern California Association of Governments
5	Bryan Moscardini	Park Project Coordinator, County of Los Angeles, Department of Parks and Recreation
6	Angela Mooney-D'Arcy	Director, Cultural Resource Programs, Wishtoyo Foundation
7	Robert S. Hertz	President, Board of Directors, Malibu Lagoon Museum
8	Chuck Almdale	Field Trip Chairman, on behalf of Santa Monica Bay Audubon Society
9	Karen Martin, Ph.D.	Professor of Biology, Pepperdine University

FROM :

FAX NO. : 8188806165

Mar. 06 2006

Comment Letter 1

MAR. 6. 2006 2:23PM

NO. 975 P. 2/5



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 Southeast Region
 501 West Ocean Boulevard, Suite 4200
 Long Beach, California 90802-4218

MAR -- 6 2006

F/SWR4:WBC

California Department of Parks & Recreation
 Angeles District Headquarters
 Attn: Suzanne Goode, District Environmental Coordinator
 1925 Las Virgenes Road
 Calabasas, California 91302

Dear Ms. Goode:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Draft Environmental Impact Report (DEIR) for the Malibu Lagoon Restoration and Enhancement Plan (Plan). NMFS is providing comments pursuant to our responsibilities under the Endangered Species Act (ESA), Fish and Wildlife Coordination Act (FWCA), and the Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The California Department of Parks and Recreation (DPR), the Resource Conservation District of the Santa Monica Mountains (RCDSMM), and the California State Coastal Conservancy (Coastal Conservancy) are proposing the Plan with the intent to restore and enhance the natural structure and function of the lagoon ecosystem, including water quality, circulation, habitat, and biodiversity, and to enhance public access and education opportunities. Implementation of the Plan is expected to increase wetlands habitat at the existing lagoon, enhance tidal influence, and improve circulation, remove exotic invasive vegetation species, and increase native vegetation while enhancing the visitor and recreational experience.

Fish and Wildlife Coordination Act Comments

The purpose of FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with, other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C. 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments to federal action agencies for the purpose of conserving fish and wildlife resources. As mentioned in the DEIR, the Plan will require permits from the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbor Act. Therefore, NMFS will likely provide recommendations and comments during the Corps permit process. In order to streamline this process, NMFS is offering the following comments regarding the DEIR.

According to Table 6-3 on page 6-20 of the DEIR, the habitat acreages that are expected to increase are sand beach (+2.5 acres), mudflat (+.82 acres), and marsh (+4.1 acres). However,

1-1



FROM :

FAX NO. :8188806165

Mar. 06 2006

MAR. 6.2005 2:23PM

NO. 975 P. 3/5

subtidal areas are expected to decrease. Given the importance of subtidal habitat to fishery resources, NMFS is concerned with this expected reduction and requests an explanation for the rationale behind this reduction. Moreover, NMFS believes the Plan should evaluate options to provide additional aquatic habitat and/or enhance aquatic habitat for fishery resources (a.g., deepen the lagoon, incorporate large woody debris and snags, additional channels, etc.).

1-1

The three marsh types identified in the DEIR are southern coastal salt marsh, brackish marsh, and coastal and valley freshwater marsh. Although the DEIR states that 'marsh' habitat will increase, it does not provide a clear description of what types of marsh habitat will increase. Under Impact BIO-7, the DEIR states that the implementation of the project would remove southern coastal salt marsh. Given the ecological functions provided by southern coastal salt marsh to fishery resources, NMFS is concerned by any potential reductions in this habitat type. Therefore, NMFS requests further explanation as to what specific habitat types are expected to change and whether a net loss to coastal salt marsh will result as a consequence of the Plan.

1-2

Essential Fish Habitat Comments

Pursuant to the MSA, each Federal agency is mandated to consult with the NMFS (as delegated by the Secretary of Commerce) with respect to any action authorized, funded, or undertaken, or proposed to be, by such agency that may adversely any EFH under this Act. 16 U.S.C. §1855(b)(2). The MSA further mandates that where NMFS receives information from a Fishery Management Council or federal or state agency or determines from other sources that an action authorized, funded, or undertaken, or proposed to be, by any federal or state agency would adversely effect any EFH identified under this Act, NOAA Fisheries has an obligation to recommend to such agency measures that can be taken by such agency to conserve EFH. 16 U.S.C. §1855(4)(A). The term "adverse effect" is interpreted at 50 C.F.R. §600.810(a) as any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce quantity and/or quality of EFH. In addition, adverse effects to EFH may result from actions occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

If NMFS determines that an action would adversely affect EFH and subsequently recommends measures to conserve such habitat, the MSA proscribes that the federal action agency that receives the conservation recommendation must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the federal agency must explain its reasons for not following the recommendations. 16 U.S.C. §1855(b)(4)(B).

The Plan is proposed to occur in areas designated as EFH for various federally managed fish species under the Coastal Pelagics and Pacific Groundfish Fishery Management Plans. Therefore, NMFS expects to consult on the Plan relative to EFH during the Corps permitting process and provide any EFH Conservation Recommendations that NMFS may deem necessary

1-3

FROM :

FAX NO. : 8188805165

Mar. 06 2006

Comment Letter 1

MAR. 6. 2006 2:24PM

NO. 975 P. 4/5

3

to avoid, minimize, mitigate, or otherwise offset adverse effects to EFH. NMFS is hopeful that the Plan will ultimately have a positive effect on EFH. However, NMFS believes the potential reduction in subtidal habitat and/or salt marsh identified in the DEIR may adversely affect EFH. If the Corps also believes the Plan may adversely affect EFH, then an EFH Assessment is necessary for consultation initiation. As set forth in the regulations, EFH Assessments must include (1) a description of the proposed action; (2) an analysis of the effects, including cumulative effects, of the action on EFH, the managed species, and associated species by life history stage; (3) the federal agency's views regarding the effects of the action on EFH; and (4) proposed mitigation, if applicable. If appropriate, the assessment should also include: the results of an on-site inspection; the views of recognized experts on the habitat or species effects; a literature review; an analysis of alternatives to the proposed action; and any other relevant information.

1-3

Obviously, much of the information contained in the DEIR could be utilized in the EFH Assessment. However, NMFS encourages the DPR, RCDSSM, and the Coastal Conservancy to assist the Corps by providing additional information addressing the following specific issues. First, a more detailed discussion of prior fish surveys and utilization would be useful. Secondly, an analysis focusing on the effects of potential reductions in subtidal habitat and/or salt marsh habitat should be included. Lastly, a discussion of the potential positive impacts the project may have on EFH should be included, as positive impacts could potentially offset any identified adverse impacts.

1-4

Endangered Species Act Comments

Regarding the federally listed endangered steelhead trout (*Oncorhynchus mykiss*), Malibu Creek is a functioning steelhead stream, and is one of the few streams in Southern California that has a self-sustaining steelhead population. NMFS believes that steelhead may occur within the project area due to the suitable habitat and proximity to the migratory corridor. Therefore, NMFS believes the Plan should minimize effects to Malibu Creek steelhead initially by modifying work schedules for construction activities in the main lagoon such that restoration work does not interfere with migrating steelhead during migration periods. Migration of adult and juvenile steelhead in and out of Malibu Creek normally occurs between January and mid-June. Although the DEIR states that impacts to steelhead would be minimized by creating berms and/or setting blocknets to provide a barrier between steelhead and construction activities, the DEIR provides no schedule for actual work, and no rationale for why restoration and construction activities need to occur during the winter and spring migration periods. Best management practices typically employed by public and private entities during construction and restoration activities include avoiding work during steelhead migration windows.

1-5

In addition, NMFS believes additional discussion should be provided for why the natural breaching of the lagoon, which is necessary for seasonal steelhead immigration and emigration, would not be compromised by lagoon modification. Lastly, if feasible, the Plan should provide more aquatic habitat for migrating and rearing steelhead and should enhance the aquatic habitat (e.g., deepen the lagoon, incorporate large woody debris and snags) to provide steelhead more cover and refuge from avian predators, which may cause significant mortality on migrating and rearing juvenile steelhead in the lagoon.

1-6

FROM :

FAX NO. :8188886165

Mar. 06 2006

Comment Letter 1

MAR. 6. 2006 2:24PM

NO. 975 P. 5/5

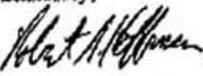
4

Lastly, because the proposed action may adversely affect endangered steelhead, formal consultation under section 7 of the ESA is required where a federal action exists (e.g., issuance of a permit from the Army Corps of Engineers). If no federal action is associated with the proposed action, then the project proponent should consult with NMFS under section 10 of the ESA.

1-7

NMFS appreciates the opportunity to comment on this DEIR and is supportive of the goals and objectives identified in the Plan. If you have any questions related to the FWCA or EFH comments, please contact Bryant Chesney at 562-980-4037 or Bryant.Chesney@noaa.gov. Questions related to ESA comments should be directed to Stan Glowacki at 562-980-6061 or Stan.Glowacki@noaa.gov.

Sincerely,

for 
Rodney R. Malinnis
Regional Administrator

California Department of Parks and Recreation Response to Comment Letter 1

Response 1-1: The data contained in the “With Project” columns of Tables 6-3 and 6-4 of the Draft EIR is incorrect and thus misstates expected effects. The corrected numbers have been included in newly formatted Tables 6-3 and 6-4 in Chapter 6. The revised tables more accurately demonstrate the beneficial changes to lagoon habitat, and specifically to subtidal and marsh habitat that is of critical concern to the National Marine Fisheries Service. The corrected tables do not significantly change the overall findings of the EIR, but rather serve to clarify and further support the conclusions that marsh habitat (including subtidal) will be significantly increased. The revised tables are included below for ease of reference and also are found in Chapter 6 of the EIR in place of the tables that were included in the Draft EIR.

Table 6-3. Entire Lagoon: Open Conditions at Water Level of 1 Foot below MSL

Habitat Type	Elevation	Existing	With-Project
		Acres	Acres
Subtidal Gravel/Sand Bar	-2 – -1	0.13	0.08
Intertidal Gravel/Sand Bar	-1 – 4	12.55	13.79
Sand Beach	4 – 6	1.95	1.23
Subtidal Softbottom	-2 – 0	0.51	0.24
Mudflat	0 – 1	4.77	1.52
Brackish Marsh	1 – 3	0.17	3.83
Freshwater Marsh	3 – 5	0.81	5.68
Alkali Meadow	5 – 7	4.95	3.26
Salt Panne	varies	0.00	0.00
Available marsh habitat		5.93	12.76
Percent marsh habitat		18%	39%
Coastal Dune/Bluff Scrub	7 – 9	1.32	1.25
Uplands	> 9	0.54	0.58
Roads/Parking/Disturbed/Trails		2.02	1.13
Turf & Ornamental		0.89	0.00
Riparian		1.97	0.00
Available non-marsh habitat		5.42	1.71
Total Area		32.59	32.59

Source: Moffatt & Nichol and Heal the Bay 2005.

Table 6-4. Entire Lagoon: Closed Conditions at Water Level of 5 Feet above MSL

Habitat Type	Elevation	Existing	With-Project
		Acres	Acres
Subtidal Gravel/Sand Bar	-2 – -1	Submerged	Submerged
Intertidal Gravel/Sand Bar	-1 – 4	Submerged	Submerged
Sand Beach	4 – 6	Submerged	Submerged
Subtidal Softbottom	-2 – 0	Submerged	Submerged
Mudflat	0 – 1	Submerged	Submerged
Brackish Marsh	1 – 3	Submerged	Submerged
Freshwater Marsh	3 – 5	Submerged	Submerged
Alkali Meadow	5 – 7	4.95	3.26
Coastal Dune/Bluff Scrub	7 – 9	1.32	1.25
Salt Panne	varies	0.00	0.00
Available marsh habitat		6.27	4.51
Coastal Dune/Bluff Scrub	7 – 9	1.32	1.25
Uplands	> 9	0.54	0.58
Roads/Parking/Disturbed/Trails		2.02	1.13
Turf & Ornamental		0.89	0.00
Riparian		1.97	0.00
Available non-marsh habitat		6.74	2.96

Source: Moffatt & Nichol and Heal the Bay 2005.

Tables 6-3 and 6-4 indicate changes in acreages for each modeled habitat class under both open (Table 6-3) and closed (Table 6-4) lagoon conditions. It must be noted that the habitat acreages are modeled based on specific set elevations necessary for modeling. In reality, these elevations are dynamic and thus the actual acreages will fluctuate within a given range. Because of this fact, it is most appropriate to look at total changes to marsh habitat, rather than individual changes to the various wetland habitat components. As shown in Table 6-3, under open lagoon conditions, total marsh habitat will increase from approximately 6 acres to approximately 13 acres (115% increase).

Total available subtidal and intertidal habitat will increase approximately 4 acres or approximately 15% during open conditions, while total submerged habitat (elevation –2 feet to 0 feet) would increase from approximately 13 acres under existing conditions to approximately 14 acres under project conditions. During closed lagoon conditions with water level at +5 feet, all tidally influenced habitat is submerged under both existing and project scenarios. Since total tidally influenced habitat

is increased by over 4 acres under project conditions, so too is total submerged habitat increased. This increase in submerged habitat under both open and closed lagoon conditions is expected to benefit fish species.

Other recommendations of NMFS regarding improvements to aquatic habitat have been considered throughout the extensive planning process of the project. Lagoon capacity will be increased by consolidating the existing western channels into one deeper channel. Circulation within the lagoon will also be improved by removing “dead ends” in channels that lead to collection of fine sediments. Because nutrients bond to fine sediments, increased flushing of fine sediments will also reduce harmful nutrient levels that currently result in excessive growth of submerged aquatic vegetation and depletion of dissolved oxygen concentration.

Additionally, the improved circulation was designed to flush fine sediments and increase the grain size to more sandy substrate in the western arms, which will lower turbidity in the lagoon during non-storm flows and reduce the ability of fine sediments to heat up lagoon water. Deeper channels should also provide cooler temperatures. Also the naturalized branching dendritic channel will provide more habitat complexity than the current steep walled channels. The dendritic channels will form undercuts and other habitat complexity that does not currently exist. Further, the secondary (tributary) branches will provide substantially more areas of greater habitat diversity than the current configuration.

The current California Department of Parks and Recreation (DPR) policy is to leave all natural snags and large habitat-forming substrates in the main lagoon. This policy will continue. Woody debris and snags will continue to be naturally occurring features of the lagoon, however, artificially placed features will not be undertaken in the main lagoon channel.

Response 1-2: Please refer to response 1-1 above and Tables 6-3 and 6-4. Impact BIO-7 has been revised in Chapter 6 of the Final EIR to reflect the corrected data and clarify that southern coastal salt marsh will significantly *increase* with implementation of the project.

Response 1-3: Please refer to response 1-1 above. Subtidal habitat and salt marsh habitat will increase with implementation of the project. As such beneficial effects to EFH are expected.

Response 1-4: Please refer to response 1-1 above. DPR, the RCD, and the Coastal Conservancy will assist NMFS in its EFH Assessment as much as possible. Based on the corrected figures provided in Tables 6-3 and 6-4, it is believed that many positive impacts to EFH would result from the project.

Response 1-5: As described in Chapter 8 of the Draft EIR “Construction Effects,” the first phase of construction, which involves relocation of the existing parking lot, is anticipated to occur between November 2006 and January 2007. The second phase of construction would occur in the western arms of the lagoon and in a small location on the eastern shore adjacent to the Adamson House boat dock. Construction activities in the lagoon involve primarily earthwork and are expected to begin in late August 2007 and continue through October 2007. No construction is expected to occur in 2008.

Based on this proposed scenario, construction would not significantly interfere with steelhead migration. While some construction may occur during the month of January, it is expected that the latter half of January through mid-June would be free of heavy construction activity. Moreover, upstream migrating steelhead will most likely be in the main lagoon where no construction will be occurring. Nevertheless, DPR will continue to consult with NMFS, CDFG, and USFWS throughout development of final plans and permitting to ensure that potential effects to steelhead are reduced to the maximum extent feasible.

Please also note the following mitigation measure required in the Final EIR (and unchanged from the Draft EIR):

Mitigation Measure BIO-1: Southern Steelhead Trout.

- Construction and lagoon excavation may occur during steelhead migration. In order to avoid direct impacts to steelhead, wetland excavation shall occur such that grading activity and equipment are separated from surface connections to the existing lagoon by earthen berms. Groundwater that may accumulate in these excavated areas shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature.
- In certain circumstances, physical or biological constraints may make it infeasible for excavations to be separated by earthen berms from the main body of the existing lagoon. In these situations, impacts shall be avoided by separating construction activity from the main lagoon by the temporary placement of a cofferdam wall, silt curtains, and block nets or a combination of similar tools. In the event that water must be pumped from these areas during construction, it shall be returned to the lagoon, via pump, in a manner that eliminates sediment and the potential to disturb lagoon salinity stratification, substrate, and temperature. Fish salvage efforts shall be conducted for any surface water that must be separated from the main lagoon. After construction, the area shall be reflooded in a manner that minimizes disturbance of

the lagoon salinity stratification and substrate and the release of sediment.

Reinundation of the western lagoon may provide refuge areas for fish during construction activities in the main lagoon. Block netting and barriers shall be used to exclude adult gobies, migratory steelhead, and other fish from the work areas. On-site monitoring by a USFWS-approved fisheries biologist would be conducted during any channel or bank disturbance. Pages 100 and 101 of the Final Alternatives Analysis prepared by Moffatt and Nichol (March 2005) outline a possible construction sequence in more detail that incorporates several of these ideas.

Response 1-6: Please refer to response 1-1. Lagoon capacity will be increased by consolidating the existing western channels into one deeper channel. Circulation within the lagoon will also be improved by removing “dead ends” in channels that lead to collection of fine sediments. Because nutrients bond to fine sediments, increased flushing of fine sediments will also reduce harmful nutrient levels that currently result in excessive growth of submerged aquatic vegetation and depletion of dissolved oxygen concentration. Additionally, the final design of the lagoon will reflect a more organic and complex ecological system that is expected to naturally recruit debris, snags, and other opportunities for steelhead cover and refuge.

Response 1-7: Comment noted. DPR will consult with NMFS and the ACOE as necessary and required by law.



DEPARTMENT OF THE ARMY
 LOS ANGELES DISTRICT, CORPS OF ENGINEERS
 P.O BOX 532711
 LOS ANGELES, CALIFORNIA 90053-2325

REPLY TO
 ATTENTION OF:

March 9, 2006

Office of the Chief
 Regulatory Branch

Suzanne Goode
 California Department of Parks and Recreation
 1925 Las Virgenes Road
 Calabasas, California 91302

Dear Ms. Goode:

This comment letter is in response to the Malibu Lagoon Restoration and Enhancement Plan Draft Environmental Impact Report (DEIR) dated January 2006, proposed for Malibu Lagoon in the City of Malibu, Los Angeles County, California. As you know, the Corps assisted in pre-project planning as a member of the technical advisory committee and provided comments on the Notice of Preparation of an EIR. Based on our review of the DEIR and the Malibu Lagoon Restoration and Enhancement Plan (Plan), it appears that the proposed restoration activities would require a U.S. Army Corps of Engineers permit.

2-1

To facilitate Corps review and analysis of the proposed project pursuant to the Magnuson-Stevens Fishery Management and Conservation Act, the final EIR (FEIR) should include an Essential Fish Habitat assessment analyzing potential effects of the proposed project on species included in the Coastal Pelagic and Pacific Groundfish Management Plans. The FEIR should also address potential effects to submerged vegetation such as eelgrass (*Zostera marina*) and compliance with State and Federal protocols regarding control of non-native algae such as *Caulerpa taxifolia*.

2-2

In light of the presence of sensitive species and habitat in the project area, a detailed plan describing the methods proposed for temporary dewatering of the worksite will be required to facilitate the Corps' Endangered Species Act consultations with both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

2-3

The DEIR notes the potential need for long-term maintenance of the proposed stormwater management system, which includes activities potentially subject to Corps' jurisdiction. The FEIR should address the potential effects of this long-term maintenance on aquatic resources and sensitive species so that it may be included in Corps review and analysis.

2-4

As noted in the DEIR, the proposed project has the potential to disturb cultural resources including burials and artifacts associated with archaeological site CA-LAN-264, located at the eastern side of the lagoon. As you may be aware, the Corps is required to comply with Section 106 of the National Historic Preservation Act, which requires Federal agencies to take into

2-5

-2-

account the effects of their undertakings on historic properties and complete the 106 process prior to issuance of any license. To facilitate the Corps' Section 106 review, analysis, and compliance, Corps Regulatory staff and archaeologists should be consulted prior to implementation of mitigation measures CR-1 through CR-4.

2-5

The DEIR concludes that "significant, unavoidable construction noise impacts" would result from the proposed project. However, it is unclear why the DEIR uses an increase in noise level of five decibels over ambient as the criterion for significance. It is also unclear why the DEIR's analysis does not account for use of modern construction equipment and mufflers, but instead references EPA construction noise surveys from the early 1970s. The analysis also does not appear to consider the attenuation that would occur as a result of the existing barriers including walls, dense vegetation, and earthen berms separating the project site from residential areas. Based on maps in the DEIR, it appears that construction would generally occur no less than 20 meters from homes within Malibu Colony. When sound attenuation due to this distance, the presence of existing physical barriers, and the use of modern equipment and mufflers are considered, it seems likely that the temporary construction-related noise would be mitigated to less than significant levels.

2-6

Should you have any questions about this letter, please contact me at (805) 585-2146. Please refer to this letter and 200500120-JCM in your reply.

Sincerely,

Antal J. Szijj
Acting Chief, North Coast Section
Regulatory Branch

California Department of Parks and Recreation Response to Comment Letter 2

Response 2-1: The California Department of Parks and Recreation (DPR) acknowledges the Corps' participation in pre-project planning and appreciates their input and consultation throughout the environmental review process. DPR will continue to work with the Corps to assist them with the permitting process.

Response 2-2: DPR has consulted with the National Marine Fisheries Service (NMFS) division of the National Oceanic and Atmospheric Administration (NOAA). NMFS provided comments on the Draft EIR related to Essential Fish Habitat (EFH). Please refer to comment letter #1 and DPR responses (1-1 through 1-7) on the previous pages. The proposed project would improve EFS through improvement of eutrophic conditions in the lagoon. Improved circulation and increased dissolved oxygen concentrations will also help preclude growth of non-native algae.

Response 2-3: A detailed plan describing the methods proposed for temporary dewatering of the worksite, if and where necessary, will be prepared by the lead agency in order to facilitate the Corps' consultations with NMFS and USFWS.

Response 2-4: Maintenance of the stormwater management system is expected to be minor and non-intrusive and would mainly consist of regular cleaning and removal of debris. Heavy machinery would not be utilized in these minor maintenance efforts. As such, adverse effects to aquatic resources and/or sensitive species would not occur. The lead agency will be available to provide any additional information to the Corps as necessary for their environmental review and analysis.

Response 2-5: To facilitate the Corps' Section 106 review, analysis, and compliance related to culturally significant resources that may be affected by the proposed project, the lead agency will consult with the Corps' Regulatory staff and archaeologists prior to implementation of any cultural resource mitigation measures (CR-1 through CR-4).

Response 2-6: The five-decibel change threshold for construction noise impacts is not an adopted threshold of either the lead agency or any responsible or trustee agencies. However, it is a widely used industry threshold for evaluating the significance of construction noise impacts and thus was employed in the CEQA analysis in order to address construction concerns of adjacent residents. Construction of the proposed project would adhere to the City of Malibu's Noise Control Ordinance, which restricts hours of construction.

As discussed in Chapter 8 of the EIR, worst-case assumptions were applied in modeling the construction noise impacts. The EPA construction noise surveys from the 1970's are still commonly used in an effort to reflect worst-case noise levels. While noise attenuation of construction equipment has evolved over the last 30 years, many older pieces of construction equipment are still commonly employed for construction projects. As such, the noise levels presented in the EPA documents are still used to reflect worst-case modeling assessments. The comment accurately states that certain features are present between the Malibu Colony homes and the worksite that would attenuate noise. However, the vegetated fencing and other attenuating features do not contiguously block the line of sight between the homes and the project site. Thus, it could not be definitively quantified in the Draft EIR that noise level changes would remain below five decibels at all times.

The lead agency concurs that the likelihood of significant impacts is very low when the attenuation from physical barriers and the use of modern equipments and mufflers are considered. Moreover, any construction noise level increases that would potentially be greater than five decibels would be of a short-term and intermittent nature and no noise impacts would persist after completion of the project. The lead agency expects that given the short-term nature of construction noise, the low likelihood of significant noise increases, the low number of affected residents (less than 20 residences under worst-case scenario), and the adherence to the City's noise ordinance, the Corps will be able to reach a finding of no effect under their environmental review and analysis requirements pursuant to the National Environmental Policy Act (NEPA).

FROM :

FAX NO. :8188885165

Mar. 05 2006

STATE OF CALIFORNIA — BUSINESS TRANSPORTATION AND HOUSING AGENCY

ARNOLD SCHWARZBACHER, GOVERNOR

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, REGIONAL PLANNING
IGR/CEQA BRANCH
100 SOUTH MAIN STREET
LOS ANGELES, CA 90012-3606
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FAX (213) 897-1337



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February 21, 2006

Ms. Suzanne Goode
California State Department of Parks and Recreation
1925 Las Virgenes Road
Calabasas, CA 91302

Malibu Lagoon Restoration and Enhancement Plan
Draft Environmental Impact Report (DEIR)
SCH Number 2005101123
Vicinity LOS/1/46-47 IGR/CEQA # 060137/EK

Dear Ms. Goode:

We have received the CEQA Draft Environmental Impact Report, for the project referenced above right. The proposed project is to restore biological and physical functions of the Malibu Lagoon. For the California State Department of Transportation (Caltrans), we have at this time no further comments to follow our letter of November 17, 2005 on the Notice of Preparation.

If circumstances or plans involving this project change in any way that might impact our State facilities, please send us word.

If you have any questions on this or our previous letter, refer to our internal IGR/CEQA Record Number for this letter of 060137/EK; and please do not hesitate to contact our review coordinator Edwin Kampmann at (213) 897-1346 or to contact me at (213) 897-3747.

Sincerely,

CHERYL J. POWELL
IGR/CEQA Program Manager

cc: Mr. Scott Morgan, State Clearinghouse

RECEIVED ON

FEB 23 2006

California State Parks
Resident District

3-1

"Caltrans Improves mobility across California"

California Department of Parks and Recreation Response to Comment Letter 3

Response 3-1: Caltrans submitted a comment letter in response to the Notice of Preparation (NOP) that was issued prior to preparation of this document in order to solicit input from the agency (see NOP letters in Appendix B). The issues and concerns that Caltrans expressed in their NOP response were fully addressed and resolved in the Draft EIR. The California Department of Parks and Recreation (DPR) acknowledges that Caltrans has no comments on the Draft EIR and thanks them for their input on this important restoration project.

Comment Letter 4

FROM :

FAX NO. :8188806165

Mar. 06 2006



SOUTHERN CALIFORNIA
ASSOCIATION OF GOVERNMENTS
Main Office
818 West Seventh Street
12th Floor
Los Angeles, California
90017-3435
t (213) 236-1810
f (213) 236-1815
www.scag.ca.gov

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• Stan Corral, La Habra Heights • Margaret Clark,
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Ron Edwards, Long Beach • Donald Gault, Orange
• Eric Gault, Los Angeles • Wesley Gorman, Los
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Los Angeles • Ina-Gale Hall, Long Beach • Keith W.
Hicks, Azusa • Jeff Hinder, Los Angeles • Tom
Ludwig, Los Angeles • Phyllis Lutz, Riverside •
Paul Mowbray, Ventura • Evyn O'Connor, Santa
Monica • Alan Palka, Los Angeles • Margaret
Parks, Los Angeles • Jan Potts, Los Angeles • Fil
Rosen, Los Angeles • Bill Rosenfeld, Los Angeles
• Greg Smith, Los Angeles • Bob Spivey, Santa R
Paul Taylor, Alameda • Sherry Taylor, Riverside •
Tami Ryan, Orange • Lonnie Teach, Anaheim
Mills • Los Angeles • Donald Nordman,
California • Jack Wilson, Los Angeles • Terry J.
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• Richard Chover, Anaheim • Gordon Cook,
Irvine • Richard Davis, Lake Forest • Alan
Paw, Los Alamitos • Tom Siegenfeld, Newport
Beach
Riverside County: Jeff Speer, Riverside County •
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Riverside • Greg Potts, Cathedral City • Bob
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Prize • Tim Rogers, Town of Apple Valley • Larry
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Orange County Transportation Authority: Los
Angeles County • Orange
Riverside County Transportation Commission:
Robin Lutz, Irvine
Ventura County Transportation Commission:
D-18 Mitchell, Moorpark

RECEIVED ON

FEB 08 2006

February 7, 2006

California State Parks
Angeles District

Ms. Suzanne Goode
1925 Las Virgenes Road
Calabasas, CA 91302

RE: SCAG Clearinghouse No. I 20060043 Malibu Lagoon Restoration and Enhancement Plan

Dear Ms. Goode:

Thank you for submitting the Malibu Lagoon Restoration and Enhancement Plan for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the Malibu Lagoon Restoration and Enhancement Plan, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's January 16-31, 2006 Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1851. Thank you.

Sincerely,

BRIAN WALLACE
Associate Regional Planner
Intergovernmental Review

Doc. #118353 lj

4-1

California Department of Parks and Recreation Response to Comment Letter 4

Response 4-1: SCAG reviewed the project and determined that it is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and the CEQA Guidelines and thus does not warrant comments. The California Department of Parks and Recreation (DPR) appreciates SCAG's review of the project.

Comment Letter 5

FROM : 03/07/2006 13:30 2134879380

FAX NO. : 8188806165

Mar. 08 2006

PARKS AND REC 4TH FL

PAGE 02/02



**COUNTY OF LOS ANGELES
DEPARTMENT OF PARKS AND RECREATION**
"Creating Community Through People, Parks and Programs"

Russ Guiney, Director

March 6, 2006

Suzanne Goode
State of California
Department of Parks and Recreation
1925 Las Virgenes Road
Calabasas, CA 91302

Post-It* Fax Note	7671	Date	3/7/06	# of pages	1
To	Sob Stark	From	S. Goode		
Co./Dept	Jones + Stokes	Co.	St. Parks		
Phone #		Phone #	818 8800364		
Fax #	213 627-6853	Fax #			

Dear Ms. Goode:

NOTICE OF AVAILABILITY-DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR) FOR THE PROPOSED MALIBU LAGOON RESTORATION PROJECT

The Notice of Availability of a DEIR for the Malibu Lagoon Restoration Project has been reviewed for potential impact on the facilities of this Department. Development of the project as described in the Notice will not impact facilities under the jurisdiction of this Department.

5-1

Thank you for including this Department in the review of this environmental document. If we may be of further assistance, please contact me at (213) 351-5133.

Sincerely,

Bryan Moscardini
Park Project Coordinator

BM(c:\response-state parks-malibu lagoon)

Planning and Development Agency • 510 Vermont Ave • Los Angeles, CA 90020 • (213) 351-5198

California Department of Parks and Recreation Response to Comment Letter 5

Response 5-1: The Los Angeles County Department of Parks and Recreation has determined that the project will not impact facilities under their jurisdiction. The California Department of Parks and Recreation (DPR) appreciates the agency's participation.



March 6, 2006

Suzanne Goode
 California Department of Recreation & Parks
 1925 Las Virgenes Road
 Calabasas, CA 91302
 sgood@parks.ca.gov

**Malibu Lagoon Restoration and Enhancement Plan Draft EIR
 SCH #2005101123**

Dear Ms. Goode:

We have received a copy of the Draft EIR for the Malibu Lagoon Restoration and Enhancement Plan released in January 2006. We thank you for the opportunity to offer our comments on the proposed course of action recommended in the draft EIR for this project. Wishtoyo has been actively involved in cultural and environmental resource protection in Malibu and surrounding traditional Chumash lands for nearly a decade. Given the importance of the area and the proximity of cultural resource sites to the Malibu Lagoon site, we strongly recommend a Chumash presence during all phases of this project. Our recommendations for the final EIR are as follows:

- | | | |
|----|---|-----|
| 1. | Invite and encourage the participation of Chumash cultural resource experts at all stages of the project. | 6-1 |
| 2. | Consult with the Elders Council of the federally recognized Chumash nation, the Santa Ynez Band of Mission Indians, and other knowledgeable Chumash community members to identify appropriate courses of action in the event of cultural resource discovery during the project. | 6-2 |
| 3. | If an archaeologist is called in to observe or participate in this project, the archaeologist hired should be Native American if at all possible and should be approved by the Chumash community. | 6-3 |
| 4. | In the event that cultural resources are uncovered during the course of this project, an area of land should be set aside as a cultural preserve to curate any non-funerary artifacts. | 6-4 |
| | | 6-5 |

Page 7-4 Ethnographic Setting

The word "canoe" should be replaced with the word "tomol" as this is the more accurate name for the water vessels used by the Chumash maritime people. Additionally, information regarding the Chumash as a maritime culture should be included in the ethnographic setting section.

6-6

1591 Spinnaker Drive, Suite 203 ~ Ventura, CA 93001 Tel: 805.658.1120 Fax: 805.658.1121
www.wishtoyo.org

Pages 7-9-10 Native American Consultation

As indicated in the EIR, very sensitive known cultural resources are in close proximity to the project site. Thus it is critical that every effort is made to consult with a broad base of the Chumash community. All Native American consultation efforts should also include consultation with the federally recognized Chumash tribe.

6-7

Page 7-14-16 Mitigation Measure CR-1: Potential for Impacts to CA-LAN-264

Due to the sensitivity of the site area, any cultural resource excavations and any test excavations should not take place without the presence of a Native American monitor on site. These resources need to be understood as cultural and not simply archaeological. Therefore, the mitigation measures should place site avoidance as the number one priority rather than data recovery strategy. Additionally, if artifacts are to be curated, preference should be given to tribal museums or the creation of a cultural preserve on the project site specifically for this purpose. We propose the boathouse adjacent to the project site as a potential curation site with stewardship being undertaken by a qualified Native American tribe or organization.

6-8

6-9

6-10

Page 7-16 Mitigation Measure CR-2: Cultural Resource Monitoring in the area adjacent to CA-LAN-264

Monitoring discussion should specifically include Native American monitors in the list of individuals and entities who might conduct cultural resource monitoring.

6-11

Again we appreciate the opportunity to comment on this valuable environmental project. Thank you for your time.

Sincerely,

Angela Mooney-D'Arcy
Director, Cultural Resource Programs
Wishtoyo Foundation

California Department of Parks and Recreation Response to Comment Letter 6

Response 6-1: The California Department of Parks and Recreation (DPR) appreciates the comments from the Wishtoyo Foundation and will keep them informed of project progress. DPR informed the Native American Heritage Commission (NAHC) of the proposed project prior to initiating work on the Draft EIR. NAHC submitted comments to DPR identifying 12 Native American contacts. The 12 individuals designated by the NAHC were contacted and will be informed of any work. This is consistent with the DPR guidelines discussed in Chapter 7 of the EIR.

Response 6-2: Throughout the EIR process, DPR has actively sought input and participation from all interested stakeholders, including Native Americans and the Chumash community, and looks forward to continuing in such fashion.

Response 6-3: Mitigation measures to avoid cultural resource impacts and treat any unforeseen finds have been carefully considered by DPR. Avoidance of resources is the top priority, and this is reflected in the cultural resource mitigation measures listed in Chapter 7 (see CR-1 through CR-4). Mitigation measure CR-3 clearly states that “avoidance of cultural remains shall be the top priority at all times.” If there is discovery of cultural resources or remains, all work will stop or be redirected until a state archaeologist can evaluate the discovery and provide a course of action according to DPR cultural resource protocols.

Response 6-4: A DPR archaeologist would evaluate or monitor the resources on-site with the assistance of the appropriate Native American monitor per DPR cultural resource protocols.

Response 6-5: In the event that cultural resources are discovered during construction of the project, avoidance of such resources will be top priority. See mitigation measure CR-3 in Chapter 7. Designation of a cultural preserve would require legal notification and direct action by DPR and the Recreation Commission.

Response 6-6: DPR encourages readers to visit the Wishtoyo Foundation website at www.wishtoyo.org to learn more about Chumash culture. DPR visited the Wishtoyo website and notes that “aps” are Chumash homes and “tomol” is the name for the water vessels used by the Chumash maritime people. These terms have been included in Chapter 7 of the Final EIR along with a footnote reference to the Wishtoyo Foundation web site.

Response 6-7: Please see responses 6-1 and 6-4 above. Every effort will be made to consult with NAHC-designated representatives of the federally recognized Chumash tribe.

Response 6-8: Please refer to responses 6-1, 6-4, and 6-5.

Response 6-9: Please refer to response 6-5.

Response 6-10: Please refer to response 6-5. The boathouse is a historic structure that does not meet the standards for curation of artifacts. DPR would be the steward of any artifacts found on-site. If the artifacts are associated with burial, funerary objects or of religious patrimony, Native American tribes can request that those items be returned to them for repatriation.

Response 6-11: Please refer to responses 6-1 and 6-4.



MALIBU LAGOON MUSEUM

23200 PACIFIC COAST HIGHWAY, MALIBU, CALIFORNIA 90265 - MAILING ADDRESS: P.O. BOX 291, MALIBU, CALIFORNIA 90265
(310) 456-8432

February 3, 2006

Craig Schuman (310-453-0395)
Heal the Bay
3220 Nebraska Avenue
Santa Monica, CA 90404

Subj: Response to Malibu Lagoon Restoration Feasibility Study: Final Alternatives Analysis 2005

Dear Mr. Schuman:

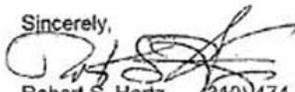
I am responding to this feasibility study as the President of the Board of Directors of the Malibu Lagoon Museum.

While I am concerned about the process of restoring the lagoon to an optimum status, my response is in regard to operational, maintenance, and information issues that will occur as a result of future closures and construction impacts. I did not get a sense of the timing of your project or whether it is contingent on future fundraising efforts.

Briefly my concerns relate to the following:

- The Malibu Lagoon Museum currently requests that visitors park in the lagoon state parking area where restrooms are located. The lot holds 70+ vehicles. (The lot nearest the Adamson House is a county parking lot.) Where would these vehicles be parked at a time when the entire lagoon is being renovated? 7-1
- Concurrently, the National Park Service, Santa Monica Mountains Conservancy, and California State Parks have designated the Malibu Lagoon parking lot as a major drop off/pick up site for users of a recreational shuttle (ParkLink) that will loop through the mountains and beaches of the Santa Monica Mountains. A future report should address the impacts of parking lot reconstruction and restroom facilities on that new effort. 7-2
- Recommend that any new signage along PCH and at Malibu Lagoon indicate the four state parks (Malibu Pier, Surfrider State Beach, Adamson House and Malibu Lagoon) and where state lots are located. The Malibu Lagoon Museum Decents could include information on the lagoon restoration project as it proceeds; therefore, updates on the project status and time frames should be furnished directly to that nonprofit organization. 7-3
- Replicas of the original Malibu Potteries tiles could be incorporated into your design plan as the concept of using the tiles in public projects and in private development is encouraged. In particular, I encourage the use of these tiles in any future design concept plan as a part of a connecting walkway and interpretive signage among the four park sites. I look forward to working with you on this project. 7-4

Sincerely,


Robert S. Hertz (310) 474-8419
360 Dalehurst Avenue
Los Angeles, CA 90024

California Department of Parks and Recreation Response to Comment Letter 7

Response 7-1: The California Department of Parks and Recreation (DPR) will continue to coordinate with the museum on issues of operations, maintenance, and construction issues. Construction scheduling is addressed in Chapter 8 of the EIR, along with potential construction impacts. Mitigation measure N-3 in particular requires that DPR coordinate with Adamson House staff to ensure that potentially disturbing construction activities do not occur during planned events, such as Saturday weddings.

Response 7-2: During Phase I of construction, the lagoon parking lot will not be available. As described on page 8-12 of the EIR, construction of the new parking lot would take place during the winter months when demand for parking is lowest. Furthermore, ample parking is available in the surface parking lot adjacent to the museum and adjacent on-street parking is available to serve visitors as well.

Response 7-3: DPR will coordinate with National Park Service and the Santa Monica Mountains Conservancy to ensure that construction of the parking lot would not pose any temporary issues related to ParkLink shuttle drop off and pick up operations.

Response 7-4: DPR will consider input from the museum regarding signage and allow for project information to be utilized by museum docents.

Response 7-5: Final design of the project has not yet occurred. Incorporation of replica Malibu Potteries tiles into the final project design will be considered as recommended.

Bob Stark

From: Chuck Almdale [chukar5@att.net]
Sent: Monday, March 06, 2006 11:36 AM
To: sgood@parks.ca.gov
Subject: Malibu Lagoon Restoration Plan - Comments

Suzanne: These are the comments. There is no attachment. Let me know if you need a fax.
 CVA

March 3, 2006

Suzanne Goode
 1925 Las Virgenes Road
 Calabasas, California, 91302.
 Fax: (818) 8806165

Dear Ms Goode,

In my capacity as field trip chairperson of the Santa Monica Bay Audubon Society, as well as past president and past conservation chairperson, please find below our organization's comments on the final plan. Our chapter has held monthly field trips at Malibu Lagoon for almost 30 years, and we are intimately involved with its past, present and future.

Snowy Plovers

I could find no comments on the Snowy Plovers, a Federal and California State listed Threatened Species. These (small 6.25" length) birds roost on the Surfrider beach nearly 10 months of the year, arriving as early as late July and leaving for their breeding grounds as late as early May. I personally have documented their presence on the beach in very close proximity to the Lagoon since December 1979. Records exist of the birds presence on the beach long before 1979.

These birds typically roost just behind the beach berm, the high point of the beach. They sit in little depressions such as human footprints in order to minimize their exposure to the wind. They are very cryptically colored, and people sauntering down the beach usually do not notice them until the birds flush. The birds are far more aware of us as potentially dangerous threat/predator than we are aware of them, and they are constantly disturbed by the activities of oblivious humans. They are nearly invisible to vehicle drivers such as lifeguards or beach cleaners who are far more attentive of swimmers and sunbathers. When not roosting, they feed nearby at the wrack line or on the damp sand exposed by the retreating tide.

There should be official recognition of their presence on the beach. We would like to see the following:

1. Protection of their roosting area. Signs should encircle the roosting area. Because the lagoon outlet frequently shifts location and the beach is subject to blowout by winter storms, signs should be movable rather than permanently placed. Each sign should say Snowy Plover Roosting Area, have a picture of the bird and state that it is a threatened and protected species.

2. Fencing should be supplied. It should be lightweight and movable. Sand drift fencing or perhaps even tape or rope strung between the signs would be suitable. The purpose would be to keep foot traffic out and let vehicle drivers know where NOT to drive.

3/6/2006

3. The roosting area should not be raked or cleaned by heavy equipment during the roosting season. Equipment can rake outside the roosting area. Volunteers can be found to clean by hand the roosting area on a regular basis, or it can be cleaned by "community service" people as are the highways. 8-4

4. Every effort should be made to educate the public in general and the beach personnel in particular as to the presence and needs of these birds. 8-5

Observation Platforms around the lagoon

The observation platforms should be placed on the lagoon side of the trails. It is counter-productive to place observation platforms on the side of the trail AWAY from the lagoon. This would cause foot traffic to pass between the platforms and the lagoon, in addition to unnecessarily increasing the viewing distance from the platform to the lagoon. I have led dozens - if not hundreds - of birding field trips at the lagoon and it simply makes no sense to place the platforms as currently planned. I have never seen observation blinds anywhere else in the world where foot paths were placed in FRONT of the blinds. Even if the blinds were raised six feet above the ground this would not make sense. 8-6

Least Terns

Least Terns - a Federal and California State listed Endangered Species - are found on the beach from May through August, primarily in May and July when they are migrating to and from their nesting grounds. It is possible that they might find the proposed nesting/roosting islands suitable for nesting. Obviously such potential nesting sites would have to remain "high and dry" during the nesting season (late May - early July). Damp sand will probably destroy the eggs, although I am not an expert on Least Tern Breeding Biology. They may prefer nesting on sand with gravel over simply gravel. 8-7

Sincerely yours,

Chuck Almdale
Field Trip Chairman
On behalf of the Santa Monica Bay Audubon Society
1433 11th St. #5
Santa Monica, Ca 90401-2910
310-393-6205
webinfo49@att.net

3/6/2006

California Department of Parks and Recreation Response to Comment Letter 8

Response 8-1: Discussion of the Western Snowy Plover and potential impacts to the species were thoroughly described in Chapter 6 of the Draft EIR (pp. 6-16 and 6-33). The discussions along with the proposed mitigation measure to ensure that plover's are not significantly impacted is included below for reference:

Western Snowy Plover. Two hatch-year (born this spring) western snowy plovers were present briefly along the southern edge of Malibu Lagoon on June 14, 2005, but were soon flushed by people and did not return during the survey. This CDFG Species of Special Concern and federally threatened species was formerly a common nester and winterer along the coast of southern California, and still uses Malibu Lagoon as a major local wintering site. However, due to beach-grooming and disturbance by dogs and people, this species no longer nests in Los Angeles County.

Impact BIO-21: Implementation of the project could result in impacts to the western snowy plover.

The project, through direct impacts and /or temporary loss of habitat, could result in impacts to the western snowy plover. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated vegetation communities. Post-project acreages of suitable habitat for the western snowy plover would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-3: Western Snowy Plover.

Schedule construction activities and ground disturbance in suitable/occupied habitat to avoid the western snowy plover breeding season from mid-March to August 30. On-site monitoring by a USFWS-

approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Response 8-2: See response 8-1 above. The California Department of Parks and Recreation (DPR) supports efforts to protect all wildlife, including the Western Snowy Plover. However, the sandy beach area is outside the boundaries of the project site. Potential snowy plover roosting areas would not be affected by the proposed project as no work would occur on the sandy beach. Signage, fencing, and other efforts to protect plovers on the beach are welcome recommendations and considerations, but are outside the scope of this project and the EIR.

Response 8-3: See response 8-2 above.

Response 8-4: See response 8-2 above.

Response 8-5: See response 8-2 above.

Response 8-6: DPR appreciates this comment and will consider it as final design for the project commences.

Response 8-7: Least Terns were thoroughly discussed and evaluated with regard to potential impacts from the project in the Draft EIR (pp. 6-17 and 6-35). The discussions along with the proposed mitigation measure to ensure that least terns are not significantly impacted is included below for reference:

California Least Tern. This federal and state endangered species was formerly a common nester on local beaches and is now confined to a handful of protected sites, mainly islands of dirt fill in harbors and bays. The California least tern winters at sea off the west coast of Mexico and Central America. On July 13–14, 2005, a large concentration (up to 42 birds) was present at Malibu Lagoon, roosting along the southern shore and foraging in the main body of the lagoon, with smaller numbers feeding in the west basin. On both days, a total of 14 hatch-year birds were present with adults, many of which were banded. It is likely these were birds from a colony near Terminal Island, Los Angeles Harbor, where several hundred birds were monitored and banded this year (Cooper 2005).

Impact BIO-24: Implementation of the project could result in impacts to the California least tern.

The project, through direct impacts and/or temporary loss of habitat, could result in impacts to the California least tern. Impacts to this species may result in a short-term adverse effect on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or the USFWS.

However, the project involves the restoration of the lagoon, which would include replanting of native species, removal of non-native species, and ongoing monitoring, and as such would result in long-term benefits to the lagoon and its associated vegetation communities. Moreover, no work will be done in the main lagoon channel that the least tern uses for roosting habitat - specifically the snags and high sand bar. The project will also create protected islands, providing additional habitat for this species. Post-project acreages of suitable habitat for the California least tern would likely be similar, if not identical, to pre-project acreages.

Therefore, temporary loss of suitable habitat for this species is not considered significant and no mitigation is required. However, potential direct impacts to this species would be significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-6: California Least Tern.

Schedule construction activities and ground disturbance to avoid the California least tern breeding season and post-breeding season foraging (July to August). On-site monitoring by a USFWS-approved biologist shall be conducted during any disturbance within suitable/occupied habitat for this species.

Comments on the Malibu Lagoon Restoration and Enhancement Plan

To: Suzanne Good, California State Parks

From: Karen Martin, Ph.D., Professor of Biology, Pepperdine University, Malibu, CA

Contact: kmartin@pepperdine.edu; 310-506-4808

Date: February 16, 2006

This is an ambitious and admirable plan for the restoration of an important coastal wetland. However, very little is said about monitoring the sandy beach habitat within the restoration area. In particular there is no discussion of California's famous beach spawning fish, the grunion *Leuresthes tenuis*, although Malibu Beach has been well known as an important spawning habitat for the California grunion for over 50 years.

9-1

Three management steps should be taken to protect and enhance the sandy beach habitat surrounding the interface of the lagoon and the ocean. These steps are part of best management protocols in use by sandy beach managers throughout the state of California. They are particularly important when the lagoon mouth is artificially opened.

Three Recommendations for protecting sandy beach habitat at Malibu Lagoon:

Recommendation 1) Minimize beach vehicular traffic. Identify specific parts of the beach that are off limits for beach maintenance vehicles and lifeguard trucks, except for emergencies.

9-2

a) From the wave-swept swash zone to the wrack line marking the highest tidal reach, the intertidal zone is the most important habitat for the sandy beach denizens. The swash zone actively wetted by waves at any given time contains sand crabs and other small, motile animals including worms, crustaceans, and molluscs. This is also the spawning site of the California Grunion, where incubating grunion eggs are buried beneath the surface in spring and summer. Vehicles should avoid the sandy intertidal zone all along the ocean front. The high tide line must be defined at its highest point during the semilunar syzygy tides of the full or new moon, rather than at the height of an intermediate daily high tide.

9-3

b) On either side of the lagoon mouth, the dry sand in the upper area of the beach is a roosting site and foraging area for Western snowy plovers, least terns, and other migrating shore birds. This area, above most of the wave action, could be colonized by salt-tolerant beach plants if undisturbed. Vehicular traffic should be minimal or nonexistent in these areas, especially when birds are present.

9-4

Recommendation 2) Monitor the grunion spawning runs throughout the spring and summer, particularly in the peak spawning time of April through June. Consider developing an educational interpretive program about the grunion.

9-5

a) Long term data on the spawning runs should be collected and archived with the protocols of the electronic database of the Grunion Greeters Project at Pepperdine

9-6

University, <http://www.Grunion.Org>. This is already in progress for beaches along the entire coast of California, including Malibu Surfrider Beach. 9-6

b) Consider developing an interpretive program for the grunion runs. Malibu Lagoon State Beach has occasionally been the site of a popular educational interpretive program about grunion in the past, but the program was marred by poor handling of the crowd and the absence of either an interpretive ranger or an enforcement officer during the actual runs. The result was massive disturbance to the fish and disruption of the runs, as well as disappointed observers. This site has the potential to provide an excellent public viewing area for grunion but careful planning must be done to protect the resource from negative human impact. 9-7

c) Monitor grunion eggs incubating on shore, and modify beach maintenance and management procedures during grunion season to protect the embryos. Recommendation 1 above is an important precaution in this regard. This is particularly critical when the lagoon mouth is artificially opened during spring and summer. It may be advisable to remove incubating embryos before work proceeds. 9-8

Recommendation 3) Adjust mechanized beach grooming procedures to allow accumulation of kelp wrack in some areas. Near the lagoon mouth, reduced mechanized grooming may increase habitat diversity and benefit animals and plants.

Surfrider Beach on the downcoast side of the Malibu Lagoon is frequently maintained by mechanized raking and grooming to remove trash, kelp, and debris. For habitat diversity, some areas on the beach should be designated where natural kelp wrack can accumulate. Wrack provides important nutrient subsidies for microfauna including many invertebrates that are eaten by shorebirds. Besides providing habitat for invertebrates and food resources for birds, these wrack accumulations may hasten colonization by dune plants. They help to stabilize the beach and reduce erosion by wind and foot traffic. 9-9

References:

Lavoie, D. 1985. Population dynamics and ecology of beach wrack macroinvertebrates of the central California coast, *Bull. So. Cal. Acad. Sci.* 84, 1-22.

Llewellyn, P. J. and S. E. Shackley, 1996. The effects of mechanical beach-cleaning on invertebrate populations. *British Wildlife* 7, 147-155.

Martin, K., Speer-Blank, T., Pommerening, R., Flannery, J., and Carpenter, K. 2006. Does beach grooming harm grunion eggs? *Shore and Beach* (in press).

California Department of Parks and Recreation Response to Comment Letter 9

Response 9-1: The California Department of Parks and Recreation (DPR) supports efforts to protect all wildlife, including the California Grunion. However, the sandy beach area and wave-swept swash zone to the wrack line is outside the boundaries of the project site. No work would occur on the sandy beach. The commenters recommendations for protecting sandy beach habitat are appreciated, but are outside the scope of this project and the EIR.

Response 9-2: See response 9-1 above. DPR does not operate any type of vehicle or equipment on the beach. Beach maintenance vehicles and lifeguard trucks are operated by the County of Los Angeles. Beach operations are outside of the jurisdiction of DPR and outside the scope of this project and EIR.

Response 9-3: See responses 9-1 and 9-2 above.

Response 9-4: See response 9-1 and 9-2 above and also responses 8-1, 8-2, and 8-7 on previous pages.

Response 9-5: See response 9-1 above.

Response 9-6: See response 9-1 above.

Response 9-7: DPR will consider developing an interpretive program for the grunion runs. However, such a program is outside the scope of this project and the EIR.

Response 9-8: See response 9-1 above.

Response 9-9: See response 9-2 above.

Appendix A

MALIBU LAGOON RESTORATION AND ENHANCEMENT PLAN



MALIBU LAGOON RESTORATION & ENHANCEMENT PLAN


**Coastal
Conservancy**
California State
Coastal Conservancy

Prepared for



California State
Department of
Parks and Recreation



Prepared by: Moffatt & Nichol

In Association With:  Heal the Bay

June 17, 2005

M&N File: 5381

**FINAL MALIBU LAGOON RESTORATION
AND ENHANCEMENT PLAN**

Prepared for the:

**California State Coastal Conservancy &
California State Department of Parks and Recreation**

Prepared by:

Moffatt & Nichol

3780 Kilroy Airport Way, Suite 600
Long Beach, California 90806-2457

In Association With:

Heal the Bay

June 17, 2005

M&N File: 5381

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EXECUTIVE SUMMARY

This Malibu Lagoon Restoration and Enhancement Plan presents detailed information to implement and monitor the preferred restoration alternative. The preferred alternative is Alternative 1.5, as specified in the Malibu Lagoon Feasibility Study Final Alternatives Analysis. Implementation details are provided in the form of plans for water management, habitat management, access, and monitoring to facilitate implementation of the monitoring program and subsequent environmental review and permitting. This document is intended to serve as a “living” document that is regularly updated as monitoring, planning and phased implementation proceed and new information is generated. It may be continually updated into perpetuity as monitoring and adaptive management occur.

Significant impairments currently exist at the lagoon primarily due to uncontrolled inflow of water from outside of its boundaries contributing pollutants and nutrients to the system, and poor circulation within its boundaries. The water management plan outlines restoration measures intended to control local outside inputs, such as storm drainage from the parking lot and irrigation from perimeter areas, as well as promote circulation of water within the lagoon. Storm drainage is to be managed by increasing percolation and drainage away from the lagoon. Measures include sloping the parking lot away from the lagoon to drain toward Pacific Coast Highway, using permeable pavement at the parking lot and entrance roads and vegetated swales along the parking lot perimeter. It may also be possible to divert and treat runoff by connecting to the City of Malibu storm drain force main to be installed in the near future. Circulation will be enhanced by reconfiguring the west lagoon to promote maximum tidal circulation during open conditions and maximize wind driven circulation during closed conditions. Circulation will be assessed by continuously monitoring and evaluating water movement within the lagoon to identify needed adaptive management improvements. Open and closed lagoon conditions are addressed, and the use of continuously monitoring gauges is specified. The plan includes performance criteria and adaptive management options so the plan can be revised if needed to ensure long-term restoration integrity and success.

Malibu Lagoon also experiences degraded habitat and invasion by non-native species due to anthropogenic disturbance and encroachment on the sensitive ecosystem of plants and animals. A Habitat Plan is provided specifying implementation practices and maintenance requirements for enhancement and management of the restored ecosystem. The plan defines vegetative communities that will be established and/or enhanced as part of the restoration process. Details are provided for slopes and drainage, topsoil salvage and management, planting and establishment, and maintenance for short- and long-term conditions. The plan utilizes an adaptive management framework to ensure long-term restoration integrity and success.

A Public Access, Education and Interpretation Plan is provided including a list of access options and creative ideas for implementation and management to enhance the educational and recreational user experience as determined from stakeholder input. The plan specifies a perimeter access plan at grade along the western edge of the western arms at the location of the existing

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vehicle access route. Multiple interpretive nodes and areas suitable for educational programs are identified, and multiple length interpretive loops are provided to allow for a variation of docent led activities with exposure to multiple habitat types. A significant element of the plan is the relocated parking area, moved back and elevated to a position along the Pacific Coast Highway to be acoustically and visually buffered by a proposed extension of the “Adamson wall.” Amenities of the access plan consist of a non-intrusion platform near the parking lot and Pacific Coast Highway, a view and access dock at the Adamson House, and a combination viewing and interpretive area called the “thick wall and duck blind” near the southwest perimeter to enable passive interaction without disturbance.

A detailed monitoring plan is provided setting out a program of field observations and monitoring to be undertaken prior to, during and following implementation. Specific monitoring tasks and decision-points are specified to feed into an adaptive management framework to ensure long-term restoration integrity and success. The Monitoring Plan will be used to assess floral and faunal assemblages, protect existing habitat, minimize impacts during restoration activities and document resource changes for application in future adaptive management programs. To achieve these objectives, the Monitoring Plan includes provisions for monitoring physical, chemical, and biological components. Required monitoring equipment, manpower, costs and schedules are provided in matrices at the end of this report.

Future tasks to be completed for restoration include monitoring, environmental review, permitting, final restoration design and phased restoration implementation. Specific stages consist of:

- Pre-restoration monitoring;
- Environmental review that will include additional data collection (includes public comments and hearings);
- Permitting by appropriate resource agencies (includes public comments);
- Final design for the restoration program that will likely include additional data collection and analyses;
- Phased restoration implementation; and
- On-going monitoring and adaptive management activities.

1.0 INTRODUCTION

Southern California has lost approximately 95% of its historic coastal wetlands. Previously viewed as poor quality habitats, the ecological importance of coastal estuaries and wetlands has recently been recognized. The highly urban setting of Southern California significantly limits coastal wetland creation, restoration and enhancement opportunities and Malibu Lagoon represents a unique opportunity to restore a valuable coastal wetland. The Malibu Lagoon Restoration and Enhancement Plan presents a comprehensive approach to restore and enhance the ecological structure and function of Malibu Lagoon, as well as to enhance the visitor's experience through improvements to access and interpretation. This plan is the result of two years of planning, design and evaluation and represents ecological solutions for this unique and valuable ecosystem. The Lagoon Technical Advisory Committee, California State Department of Parks and Recreation (State Parks), State Coastal Conservancy, and Lagoon Restoration Working Group have worked together to design a restoration alternative to restore the biological and physical functions to the lagoon while minimizing impacts to the existing system. Details of the restoration are described in this Restoration and Enhancement Plan that includes plans for management of water, habitat, and access, as well as a comprehensive monitoring plan.

1.1 BACKGROUND

Malibu Lagoon is a 31-acre shallow water embayment occurring at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay. Malibu Lagoon empties into the Pacific Ocean at world famous Malibu Surfrider Beach. World renowned as a surfing and recreational destination, Surfrider Beach receives approximately 1.5 million visitors every year.

Anthropogenic activities have significantly altered the physical configuration of Malibu Lagoon. The existing lagoon is only a very small portion of its historic area. Urban encroachment has occurred on all sides. The Pacific Coast Highway (PCH) Bridge has dissected and constricted the lagoon surface area, and a significant portion of the once low-lying tidally influenced areas near the mouth of the Malibu Creek were filled in the 1940's and 50's.. By the late 1970's the site was completely filled and housed two baseball fields. Urbanization upstream in the Malibu Creek Watershed has increased the volume of water transported into the lagoon and urban pollution has significantly diminished the quality of that water through inputs of nutrients, sediments, and pollutants.

In 1983, the California Department of Parks and Recreation initiated a restoration of the lagoon. The restoration involved the excavation of three distinct channels (designated as A, B and C Channels) in the western portion of the lagoon, oriented perpendicular to the natural flow path of the Creek as shown in Figure 1. The channels were seeded with salt marsh plants and series of boardwalks were created to allow access by the public. In 1996, the California Department of Transportation (Caltrans) funded a successful restoration program to mitigate for impacts incurred during the Malibu Lagoon Bridge Replacement Project. Specific restoration measures, coordinated by the Resource Conservation District of the Santa Monica Mountains and (State Parks, included the very successful tidewater goby habitat enhancement project and the

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revegetation of areas disturbed by construction activities with native species, including extensive removal of non-natives.

Despite these restoration efforts, the ecosystem of Malibu Lagoon remains degraded and in the late 1990's the California State Coastal Conservancy funded a study by UCLA (Ambrose and Orme 2000) to: 1) identify impacts to the ecological health and water quality in the lower creek and lagoon ecosystems and 2) provide recommendations on how to best manage these impacts. The study produced three categories of recommendations: 1) the installation of best management practices (BMPs) to improve water quality; 2) the creation of treatment wetlands to enhance the water quality of stormwater runoff; and 3) restoration of existing wetland habitat to enhance their ecological functioning.

Following a year long facilitation process, the restoration of the existing lagoon area and small parcel on the east side of the creek adjacent to the Adamson House was identified as the highest priority Short Term project by the Malibu Lagoon Task Force.

The restoration goals for Malibu Lagoon as identified by the Malibu Lagoon Task Force consist of:

- Salt Marsh Enhancement at Site A1 (West Arms)
 - Increase tidal flushing
 - Improve water circulation
 - Increase holding capacity
 - Reduce predator encroachment

- East Lagoon Restoration at Site A4 (Adjacent to Adamson House)
 - Regrade to restore typical salt marsh hydrology
 - Create nesting island for least terns and Snowy Plovers
 - Create channel connections to the lagoon

Based on the results of the Final Alternatives Analysis for the Malibu Lagoon Restoration Feasibility Study, the Lagoon Technical Advisory Committee, State Parks, and the State Coastal Conservancy, with substantial input from the Lagoon Restoration Working Group, recommend Alternative 1.5, the Modified Restore and Enhance Alternative shown in Figure 2, as the preferred restoration design for Malibu Lagoon. This restoration alternative is expected to most readily achieve the goals of restoration while introducing the least amount of impact to the existing lagoon ecosystem. Restoration efforts may be performed in succinct stages to minimize impacts to the existing wetland habitat and to provide refuge for species displaced by construction activities. A phased restoration implementation and long-term adaptive management approach will be implemented to maximize the ecosystem benefits of this project.

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Final Malibu Lagoon Restoration and Enhancement Plan

Alternative 1.5 Concept Plan

Figure 2

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Details of Alternative 1.5 and how this design is best suited to meet the goals of the restoration program are available in the Malibu Lagoon Restoration Feasibility Study Final Alternatives Analysis. This document is available online at <http://www.healthebay.org/currentissues/mlhep/default.asp>. Major components of this design are described below.

Parking Lot and Staging Lawn

The existing parking lot will be relocated to the north and west to be adjacent to PCH, the current parking lot entrance from PCH and Cross Creek Road, and the current western property line. The new parking lot and staging area will be created with runoff treatment controls, including permeable pavement or other similar substances, appropriate native vegetation, and will include a staging area to enhance existing educational and recreational uses of the site. The new parking lot will maximize the use of Best Management Practices (BMP) to minimize or eliminate runoff to enhance water quality in the Lagoon. The current number of parking spaces will remain and new interpretative displays and panels will be installed.

Main Channel

The Main Channel will remain substantially “as is.” The western edge of the main lagoon at the interface with the western arms complex will be reconfigured in the form of a naturalized slope to provide a degree of separation between the main lagoon and west channel system. All efforts should be made to allow the barrier berm to open and close naturally. Driving across the berm should be minimized and it is recommended that management of a section of the lagoon side of the berm be maintained to protect avian species from anthropogenic impacts during closed conditions.

East (A4)

The existing boat house channel will be deepened and recontoured to create a new avian island along the eastern bank of the Adamson House grounds. This work is expected to have a minimum impact on the existing habitat, will create additional mudflat habitat and promote additional water circulation around the new island.

West Lagoon Complex

A new channel will be created along the southern edge of the west lagoon to create a single main entrance and exit for water conveyed into and out of the west lagoon. This channel may be optimized to overlie the existing “C” channel to minimize the impact to existing habitat and will be designed to enable a future connection to the “golf course” parcel located adjacent and to the west of the lagoon. A naturalized slope separating the main channel from the west channel, with minimum elevation change, will be created using lagoon materials displaced by dredging of the new main west channel and those that currently exist along this edge. The main west channel will possess a natural dendritic planform to maximize tidally-influenced water inundation to the west channel and its fingers. Isolated bird islands will be created to provide refuge for foraging and/or loafing birds. These islands will be optimized to maximize the use of the existing wetland habitat to minimize impacts to the existing system.

1.2 PURPOSE OF THIS DOCUMENT

The Restoration and Enhancement plan is developed specific to the preferred alternative to facilitate the initiation of monitoring, environmental review, permitting, final restoration design and phased restoration implementation. These specific stages will include:

- Pre-restoration monitoring;
- Environmental review that will include additional data collection (includes public comments and hearings);
- Permitting by appropriate resource agencies and responsible permitting agencies (includes public comments);
- Final design for the restoration program that will likely include additional data collection and analyses;
- Phased restoration implementation; and
- On-going monitoring.

Under a Proposition 13 grant from the State Water Resources Control Board, the State Coastal Conservancy has secured funds to complete the initial stages of the project. The Resource Conservation District of the Santa Monica Mountains has been contracted to administer the project on behalf of State Parks, and will continue to work closely with the State Coastal Conservancy, the Lagoon Technical Advisory Committee and the Lagoon Restoration Working Group. The restoration design will evolve and be further optimized as it proceeds through the subsequent stages of permitting, final design, and phased implementation. The public will have opportunities to comment and provide input throughout the permitting and restoration design optimization stages.

To efficiently achieve the stages listed above, the Malibu Lagoon Restoration and Enhancement Plan specifies the following components:

1. Water Management Plan

- A water management plan is specified to manage drainage from the parking lot and public use areas to restored habitat areas. It includes Best Management Practices to enhance water quality in the lagoon.
- Circulation of water within the lagoon will be closely monitored and evaluated. The Water Management Plan includes performance criteria and adaptive management options so the plan can be revised if needed to ensure long-term restoration integrity and success.

2. Habitat Plan - A detailed habitat enhancement and management plan specifies implementation practices and maintenance requirements. The Habitat Plan defines vegetative communities that will be established or enhanced as part of the restoration process. This plan addresses the establishment or enhancement of habitat for rare, endangered and regionally uncommon plants and animals that are appropriate for this site

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and uses an adaptive management framework to ensure long-term restoration integrity and success.

3. Access, Education, and Interpretation Plan - A public access, education and interpretation plan is provided including a list of access options and creative ideas for implementation and management to enhance the educational and recreational user experience. The access plan considers stakeholder input, educational and recreational users of the site.
4. Monitoring Plan - A detailed monitoring plan is provided setting out a program of field observations and monitoring to be undertaken prior to, during and following implementation. Specific monitoring tasks and decision-points are specified to feed into an adaptive management framework to ensure long-term restoration integrity and success. The Monitoring Plan includes:
 - Habitat – flora and fauna;
 - Water quality – during both open and closed conditions;
 - Sediment Quality – sampling of grain size; and
 - Bathymetry – Lagoon topography.

2.0 WATER MANAGEMENT PLAN

The objectives of the water management plan are to eliminate all point source discharges to the lagoon to maximize lagoon water quality, and to improve and maintain circulation within the lagoon under all conditions. Direct surface discharges to the lagoon can occur from storm water and from irrigation. Circulation is influenced by hydraulic conditions at the lagoon. These processes are discussed below.

As this project site is high-profile, it is an opportunity to provide a widely-viewed water quality demonstration project for the public. The experience and information gained from this demonstration project site (i.e., in the form of tours and available educational materials) can be used by the fields of education, public works, restoration, and others for improvement of water quality at other locations.

2.1 STORM WATER MANAGEMENT

In the wet season, storm water runs off the existing surface of the parking lot, entry road, turf area and kiosk, and eventually flows toward the lagoon, as shown in Figure 3. Storm water can be better managed to minimize or even eliminate direct runoff to the lagoon. Several suggestions to improve storm water management are provided below. For each item below, water quality benefits are increased percolation of storm drainage and possibly more efficient conveyance to a drainage system to the future City treatment plant, both resulting in less direct runoff to the lagoon. Less runoff will reduce the inputs of pollutants to the lagoon such as metals, bacteria, total petroleum hydrocarbons, nutrients, oils and grease, and possibly others thereby maintaining higher lagoon water quality than currently exists.

2.1.1 Increased Permeable Surfaces

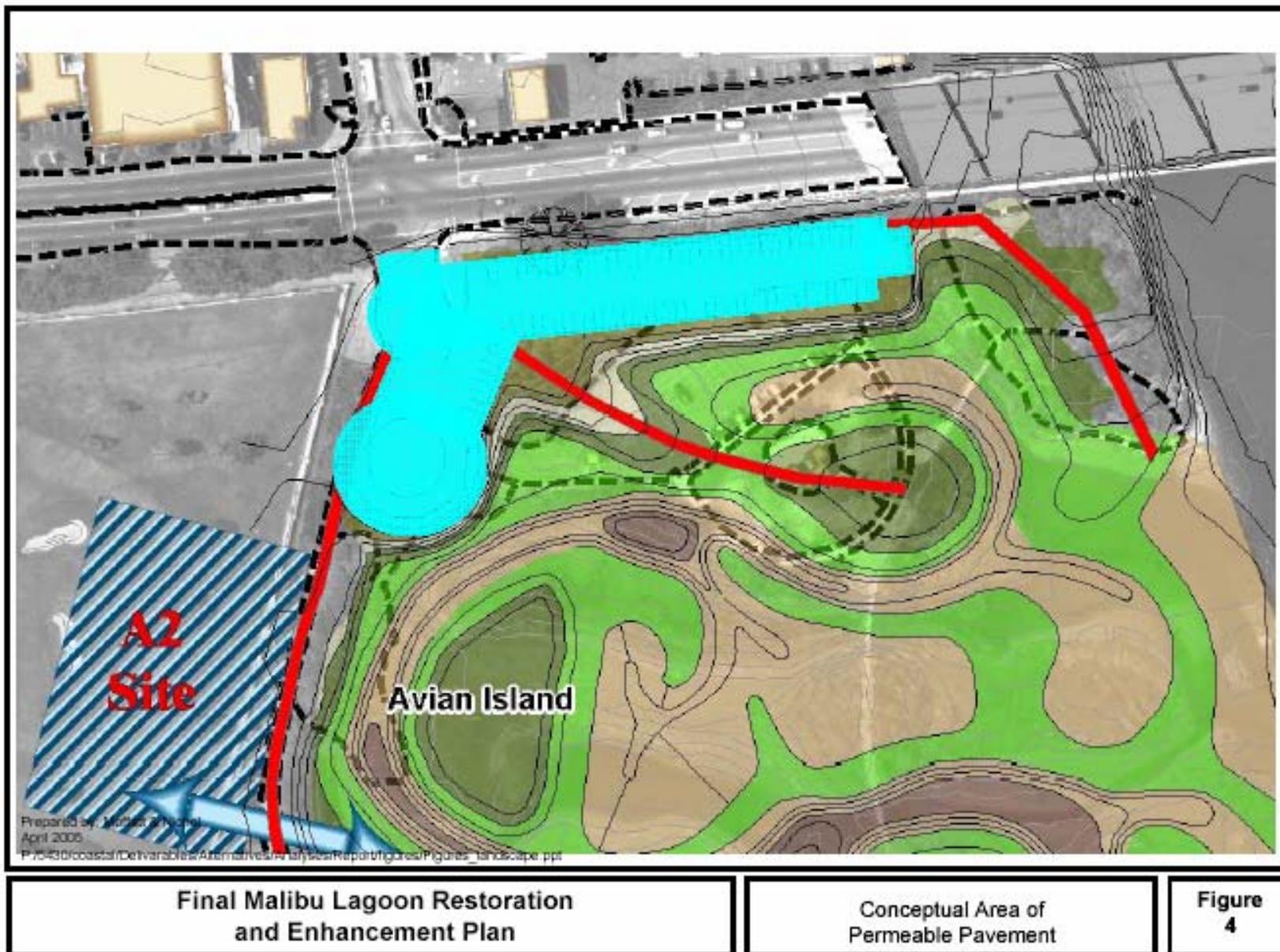
Permeable Pavement

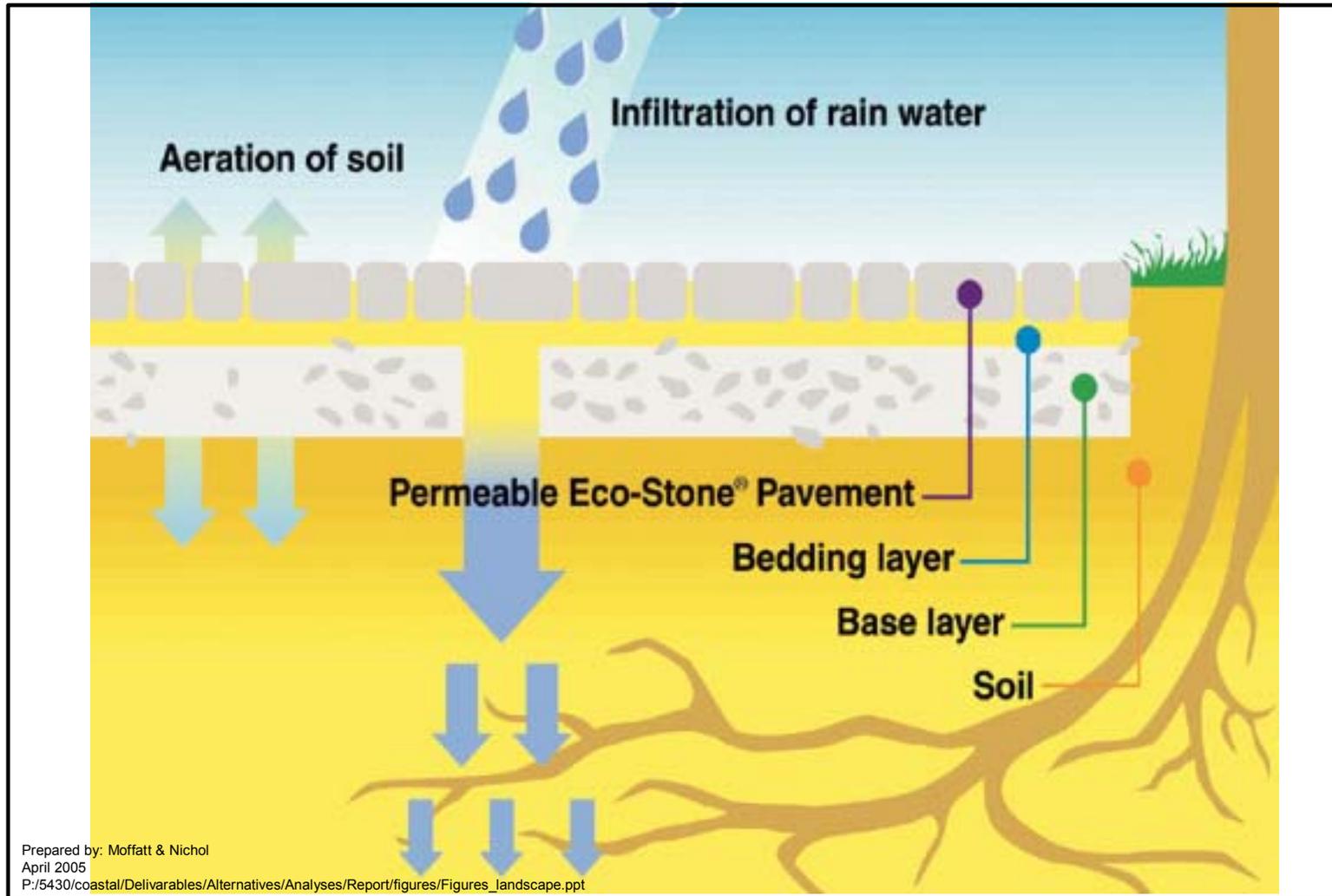
Permeable pavement is available for constructing a parking lot and entrance road that are more permeable than the asphalt and concrete that presently exist at the site. Figure 4 shows the recommended location for permeable pavement. Materials used to create this feature are permeable interlocking concrete pavements. These surfaces are constructed of individual paver stones interlocked, and shaped to provide gaps to allow infiltration between the stones into a porous base.

The paver stones are placed over an 8 inch thick base layer of ½ inch crushed aggregate, under a 1 inch thick setting bed layer of 3/8 inch crushed rock chips. The crushed rock chips are also poured into the gaps between paving stones after the stones are laid. Storm water infiltrates through the gaps in the surface layer, and percolates through the coarse bedding material into the underlying soil and eventually the groundwater zone as shown generically in Figure 5, and for site-specific conditions in Figure 6.

One type of stones are manufactured by a company named Uni Eco-Stone, and sold locally by Acker Stone in Ontario, California. Other types of stones were investigated but this particular

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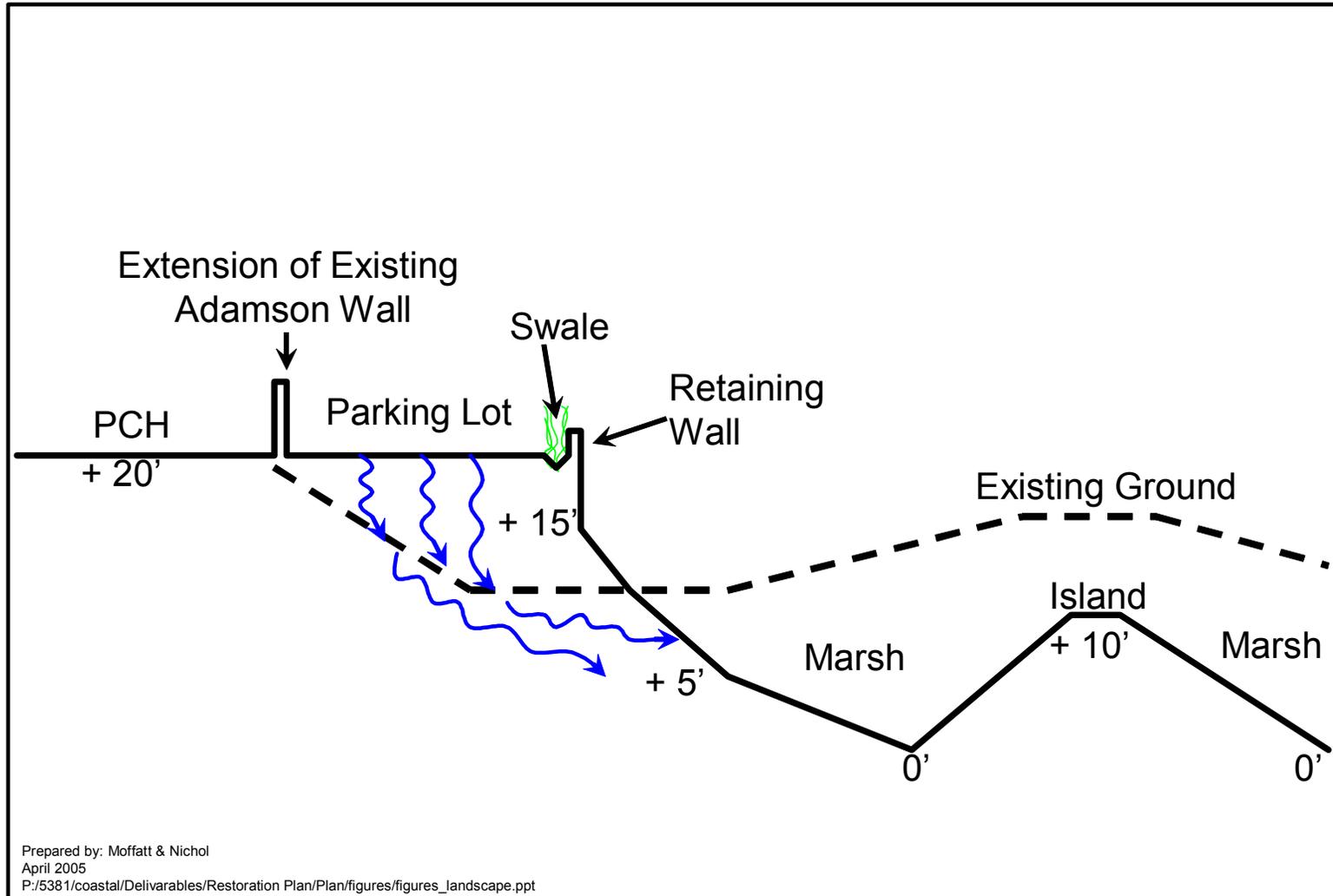


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Concept Cross-Section of Permeable Pavement

Figure 5

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Proposed Parking Lot
Cross-Section Looking East

**Figure
6**

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brand was most suitable for parking areas and is able to support the weight of buses and large vehicles. Guidelines for use of this material are provided in Appendix A.

The performance of the permeable pavement also depends on the quality of construction, and the extent of maintenance. Maintenance is required to reduce clogging of the coarse rock bed between and below the pavers by regular street sweeping. Sweeping at a frequency of every six months will prolong the life of the pavement.

The permeable pavement can percolate significant storms, depending on storm intensity. The manufacturer indicates that severe storms of up to the 50-year storm can be captured. Assuming that storm intensities will likely exceed the infiltration capacity of the permeable surface, additional measures to capture storm water are addressed below. The life of the permeable pavement is estimated to be approximately 15 years, based on construction, maintenance, and environmental conditions. When they no longer become effective, they should be entirely replaced rather than repaired.

Permeable pavements cost approximately double the cost of standard asphalt concrete parking lot surfaces. Standard parking cost \$5 per square foot to construct, and permeable pavement areas cost \$10 per square foot maximum to construct. The new parking lot at Malibu Lagoon as shown in Alternative 1.5 may be approximately 1 acre in area, or 45,000 square feet. Thus the cost to construct a standard new parking lot is approximately \$225,000 while the cost to construct a permeable pavement parking lot is approximately \$450,000 as shown in Table 1.

Table 1 - Malibu Parking Lot Construction Material Options

CONSTRUCTION MATERIAL OPTIONS	UNIT COST PER SQUARE FOOT	AREA IN SQUARE FEET	TOTAL CONSTRUCTION COST IN 2005 DOLLARS
Standard Asphalt/Concrete	\$5.00	45,000	\$250,000
Permeable Pavers	\$10.00	45,000	\$450,000

Drainage Swales

Another method of controlling and filtering drainage is use of drainage swales to promote infiltration and provide for additional habitat at the site. Drainage swales can be installed along the perimeter of hardscape areas such as the parking lot to intercept surface runoff that is not infiltrated into the parking lot.

A concept layout for swales is shown in Figures 7 and 8. The conceptual cross-section of the swale is shown in Figure 9, and is 3 feet deep and 9 feet wide with in a V-shaped cross-section. The side slopes are at 33 degrees, with changes of 1 foot vertically to 1.5 feet horizontally. These dimensions are applicable to future bioswales at the site for scenarios of the parking with and without permeable pavement. The bioswales are beneficial in either case and do not occupy a significant amount of surface area so they do not preclude other hard- or softscape from being

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installed at the parking lot area. The two layouts for bioswales depend on the slope of the parking lot surface. Swale scenario 1 is a relatively flat parking lot or one sloping slightly downward toward the south (lagoon-side) outfitted with swales running along the south and west perimeters of the site and within the turnabout. Swale scenario 2 is a parking lot sloping downward to the north away from the lagoon. The swales would be located along the north lot edge and within the turnabout.

The drainage swales are intended to be large enough to hold runoff from the 100-year storm before it begins to overflow. Water retained within the swales would gradually percolate. Habitat formed within the swales would be designed to be complementary to the wetland. Specific vegetation types will be determined upon final swale design.

Both swales and permeable pavement would be used in compliment with permeable surfaces around the parking area consisting of decomposed granite and native California bunchgrasses, rather than hardscape access areas such as sidewalks and turf as exists today. Figure 10 shows possible locations of these softscape features.

The costs of swales are less expensive than parking lot hardscape, as the cost is mainly attributed to earthwork and landscaping. Maintenance is required for weeding, removal of exotic species, and replanting of dead natives. Overall the costs of swales should be less than parking area hardscape (on the order of \$10,000 or less to install) and the benefits may be greater as both infiltration and habitat are enhanced.

2.1.2 Redirection of Storm Water Away From the Lagoon

In addition to creating greater impervious surfaces for storm water management, redirecting storm water away from the lagoon and toward other appropriate drainage facilities is an option to supplement the installation of permeable surfaces. Two options are described below and many more could be conceived.

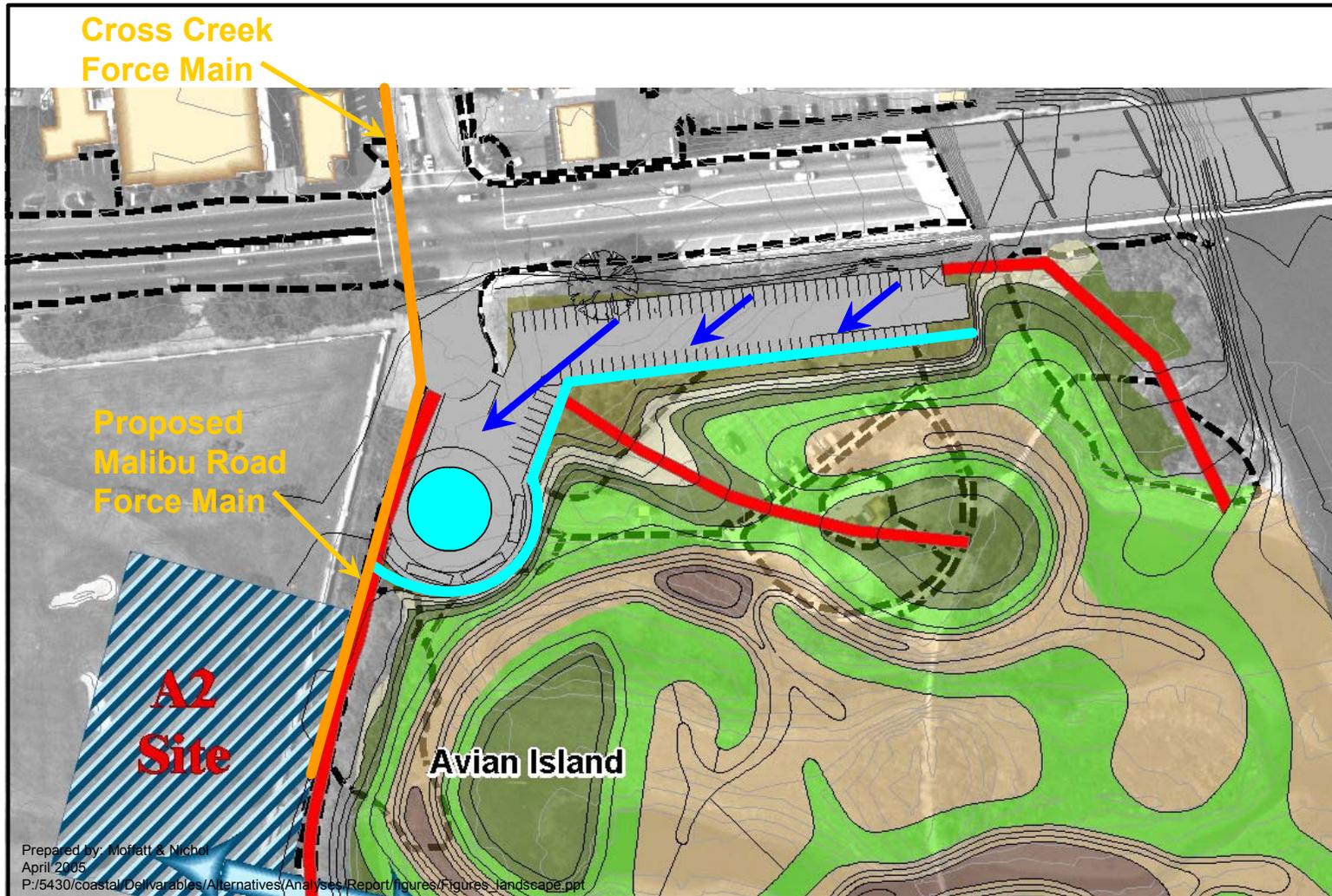
Slope the Parking Lot Toward PCH

The lagoon State Park parking lot could be sloped downward toward the north to promote drainage away from the lagoon rather than toward the lagoon as presently occurs. As shown in Figure 8, such drainage could be conveyed to a swale or other conveyance feature (trench or pipe) and conveyed farther away from the lagoon.

Route Parking Lot Drainage to the Future City Drainage System

Another option for managing storm water at the State Park is to route drainage westward toward the collection sump for the City's future force main line along Malibu Road. The City intends to install a treatment plant for storm water and dry weather flow near Cross Creek Road and Civic Center Way, with a force main line pumping water from near the Malibu Colony north to the plant, bypassing the State Park parking lot. Drainage off the future parking lot could be routed to the sump near Malibu Colony at the south end of the future force main line, and then be included in water pumped upstream toward the future treatment plant. The City indicated sufficient capacity exists to accommodate the parking lot drainage (Yugall Lall, Personal Communication, May 13, 2005)

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Final Malibu Lagoon Restoration and Enhancement Plan

Concept Drainage Bioswales at South Parking Lot Perimeter

Figure 7

Final Malibu Lagoon Restoration and Enhancement Plan
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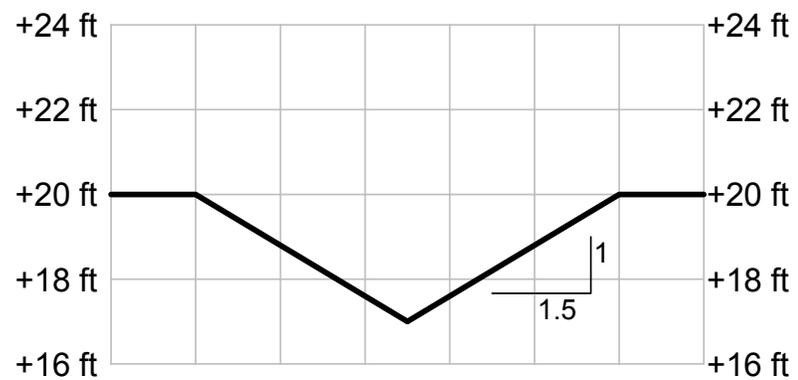


Final Malibu Lagoon Restoration
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Concept Drainage Bioswale at
North Parking Lot Perimeter

Figure
8

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Prepared by: Moffatt & Nichol
April 2005
P:/5381/coastal/Delivarables/Restoration Plan/Plan/figures/figures_landscape.ppt

**Final Malibu Lagoon Restoration
and Enhancement Plan**

Cross-Section of Concept Bioswale

**Figure
9**

Final Malibu Lagoon Restoration and Enhancement Plan
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Prepared by: [unreadable]
Date: [unreadable]
Project: [unreadable]

Final Malibu Lagoon Restoration and Enhancement Plan

Softscape Areas of Decomposed Granite and Native Growth

Figure 10

2.2 IRRIGATION

Nuisance water can also be inadvertently contributed to the lagoon by temporary and permanent irrigation of plantings at landscaped areas. As a natural habitat area, permanent irrigation should not be installed or used ever. In some instances supplemental irrigation is warranted to assist in the establishment of plants. The form of supplemental irrigation may be passive or active depending upon the final restoration design, seasonality of restoration work, and extent of habitat and anticipated duration of required irrigation. Active irrigation would include the implementation of a temporary irrigation system (overhead spray, drip, tended hand watering, or a combination of these methods) to assist in establishment of plant materials. For a passive system, a hydrophilic amendment would be used in the planting soils or as a binding agent for seed. Given the coastal location of the project site, coastal fog and high humidity provides adequate atmospheric moisture to support seed germination and surface soil moisture levels necessary for plant establishment during most portions of the year. This may be a viable alternative to installation of an irrigation system at the site. Use of turf at the site is also not recommended.

1. All temporary irrigation must be installed in shallow buried areas along the ground surface to avoid disturbance to wetland habitat yet still remain hidden.
2. Temporary irrigation should be automated, utilizing control clocks of current technology with multiple program and cycle features with battery backups.
3. No manual unattended irrigation should occur either with portable irrigation heads or manual control valves, except where a manual control valve also includes an automatic shut off timing device. Watering by hand-held hose should be permitted in all areas.
4. Temporary irrigation should include the following equipment:
 - a. High flow shut off valve or breakaway shut off valves;
 - b. Automatic Irrigation system;
 - c. Rain shut-off device;
 - d. Anti-drain valves to eliminate low head drainage; and
 - e. Master control valve located at the point of connection.
5. Approved backflow prevention devices should be required for all new temporary irrigation systems.
6. Minimize or eliminate the use of herbicides and pesticides to protect habitat. An integrated pest management (IPM) program should be developed and implemented to wholistically address the problems of pests and weeds.
7. Only apply pesticides/herbicides, if needed, consistent with State-wide policy regarding pest control in all State parks. This may be found on the State intranet website <http://search.parks.ca.gov/> and following on to "Department Policies" and then on to DOM (Department Operations Manual), and then to section 0700 "Pest Control."

8. All temporary irrigation must be inspected regularly to ensure appropriate function.
9. No reclaimed water may be used for temporary irrigation within the wetland.
10. Consider applying salt water irrigation to salt-tolerant habitat areas susceptible to weed infestation by non salt-tolerant weed species.
11. A contingency irrigation plan should be prepared prior to revegetation activities to facilitate rapid installation if the need arises.

2.3 CIRCULATION

Water within the lagoon needs to circulate to remain of suitable quality for use as habitat. Improvements to circulation from existing conditions are an important project objective and this plan sets forth steps to verify that circulation has improved and signals to indicate the need for system modifications to maintain improved conditions. Target circulation improvements are detailed for winter, summer open and closed lagoon conditions. Verification of circulation improvements requires monitoring that is addressed in this section, and in more detail in Section 5.0 of this document. The monitoring parameters specifically address the spatial and temporal variability of circulation within the lagoon and provide performance targets to facilitate future adaptive management modifications.

2.3.1 *Open Conditions*

Circulation improvement under open lagoon conditions will require comparison of existing conditions with expected restored conditions. There are two main approaches to this that can be implemented separately or together, depending on the desires of the landowner. One approach is to quantify tidal flushing and resulting water quality conditions. Another approach is to directly measure flow velocity continuously. Both approaches are described below.

Quantify Tidal Flushing and Resulting Water Quality

The effort to quantify tidal flushing and resulting water quality will directly relate circulation with water quality, and require more intensive analyses. This method consists of the following steps outlined below.

1. Create a rating curve that provides an estimate of the water depth to lagoon volume. This can be done using depth data from a stationary data logger (suggested to be the YSI 600XL or equivalent) at the western arms and the main lagoon, and using topography/bathymetry data recorded as periodic surveys of the lagoon. Both the use of the data loggers and surveys are addressed in more detail in Section 5.0, Monitoring Plan, of this document.
2. Create a simple water budget from the rating curve and other data (described below) that yields the volume of daily tidal exchange and the flow velocity. Daily tidal volume exchange indicates the rate of tidal flushing and water residence time in the lagoon. This volume of tidal turnover can be estimated for existing conditions and then compared to restored conditions to quantify the change in water turnover and relative age. Tidal flow velocity is a direct indicator of the scour of the tidal channels and resulting grain size. One project objective is to increase bed scour and grain size to reduce the sequestering of

nutrients and therefore improve water quality. The water budget and pertinent parameters can be estimated using the approach below.

- Track water volume changes over time (using depth and topography/bathymetry data) and plot relative to the tidal cycle at the mouth (using a tidal time series program such as WXTides or an equivalent).
 - Estimate flow velocities at certain locations using bathymetric channel cross-section data and volume changes over time from the real time water depth data. Alternatively, tidal flow velocities can be measured continuously using a meter located within the western arm. The meter could be one of several available from Sontec (see Appendix B for more information) or an equivalent supplier and described in more detail in Section 5.0. The advantage to their use is that flow velocities would be provided continuously and not have to be calculated by staff but would be directly provided by the gage, and that data are improved in quality compared to what can be estimated indirectly from other data. The drawback to their use is their relatively high cost, and the problem of securing the gage from theft, damage, and vandalism in this exposed public location. The gage can be insured against damage and theft, and could likely be secured and camouflaged to a certain extent to reduce public interest. The gage would also require regular monthly maintenance and data management. Other gages were investigated such as those by Marsh-McBirney but that supplier indicated they are not continuously recording gages and may not meet the measurement objectives, but could be used for periodic spot checks of velocity to supplement any calculations made by staff. Their gage information is in Appendix C.
3. Identify the extent of penetration of saline, oxygenated, and cooler (oceanic) water exchange in the western arm sites at various tide levels using water quality data loggers such as the YSI 600XL or equivalent described in Section 5.0.
 4. Quantify the critical tidal elevation that induces flushing of the western restored areas and the frequency of that tidal elevation.
 5. Determine the acceptability of the flushing condition based on water quality data collected as part of the monitoring program specified in Section 5.0.
 6. Install the monitoring system at least 1 year prior to restoration activities for data to compare to post-restoration conditions. Alternatively, the system could be installed after restoration, and conditions in restored areas compared to those in the main channel for the same time periods to enable inferences of acceptable differences between the two locations. This second option is less desirable than the option of installing a system prior to restoration.

2.3.2 Closed Conditions

Circulation under closed lagoon conditions will be more difficult to estimate due to the relatively low magnitude velocity of water motion. Circulation can be measured directly by various methods, or ascertained indirectly by measuring water quality parameters that are a function of circulation and other variables.

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Direct measurement of water movement can be measured using either a stationary continuously-reading velocity gage or hand-held instruments or both, or visually estimated using floats (such as fruit drops done for the Malibu Lagoon Feasibility Study). Circulation will be very slow and thus any sensor used will have to be very sensitive to make accurate measurements.

A suitable stationary sensor would be one of those offered by Sontec and described in Section 5.0 and Appendix B. It should be mounted within a suitable location within the western arms, such as the location used to estimate tidal flow velocities under open conditions. The initial location considered suitable is near the downstream end of existing C Channel. This location will also be the similar downstream end of the future channel.

Hand-held instruments can be obtained from similar suppliers (such as Marsh-McBirney) and even forestry supply stores. They are small meters suspended into the water by a line held by the user. These gages are fairly reliable and can be used to supplement data collected by a stationary continuous data logger.

Float-tracking studies can be used to estimate circulation in a rough fashion during certain events. They can supplement stationary measurements and even hand-held instruments by providing a synoptic view of lagoon water movement (simultaneously over the entire lagoon) over a relatively short time-frame such a one day. Float tracking is not as accurate as direct metered measurements, but can give a “big picture” view of the system and is therefore useful.

Indirect estimates of circulation can be obtained by measuring water quality parameters influenced by circulation such as dissolved oxygen (DO), water temperature, oxygen-reduction potential (ORP), and salinity throughout the water column and particularly within the bottom of the water column. These data will not provide direct indication of circulation, but their indicator status of the process of water exchange will confirm conclusions generated from measured data.

Improved circulation over time at the western arms compared to existing conditions can be inferred based on criteria such as the number of days at a given sample location and depth where:

- Dissolved oxygen is less than 3 milligrams per liter (mg/l);
- Water temp > 25°C; and
- ORP is < -100.

Alternatively, a relative comparison of the same parameters of water quality conditions in the western arms and in the main channel may be a better comparison as it will account for seasonal differences. This comparison also places the restored western arms area into context with the main channel.

It is important to note that until source reduction efforts are implemented, reductions of the magnitude and duration of eutrophic conditions within the closed Malibu Lagoon will be limited.

3.0 HABITAT PLAN

The Habitat Plan addresses the initial enhancement and establishment of habitats within the restored lagoon system as well as the on-going maintenance and management activities required to ensure that restoration habitat objectives are achieved. Adaptive management is an anticipated element of the Habitat Plan. Adaptive management will be required to respond to variability in the physical and chemical conditions manifested under the lagoon restoration plan.

3.1 HABITAT DESIGN

3.1.1 Slopes and Sediment Types

Habitat restoration within the restored lagoon is highly dependent upon development of suitable hydrologic and soil conditions and the availability of desirable reproductive plant materials to colonize the restoration areas. To accomplish the desired restoration, it will be necessary to design the site with appropriate consideration of elevations, slopes, and sediment characteristics. Table 2 outlines the general design slope, elevation, and sediment criteria of the habitats to be targeted in the project development. These criteria are provided at this stage to provide a design context, however further refinement will be required in project design and engineering in order to achieve habitat objectives.

Table 2 – Habitat Colonization Criteria

HABITAT TYPE	ELEVATION (FT. MSL)	SLOPE GUIDELINES	SEDIMENT CONDITIONS
Subtidal Gravel/Sand Bar	-2 to -1	Any slope, slopes will be dictated by the natural angle of repose following storm events and tidal action	Coarse sand and gravel typically greater than 2 mm grain size.
Intertidal Gravel/ Sand Bar	-1 to +4	Any slope, slopes will be dictated by the natural angle of repose following storm events and tidal action	Coarse sand and gravel typically greater than 2 mm grain size.
Sand Beach	+4 to +6	Any slope, slopes will be dictated by the natural angle of repose following storm events and tidal action	Sand typically between 0.1 mm and 2.0 mm grain size. Sands may be substantially derived from coastal beach sources
Subtidal Softbottom	-2 to 0	Any slope, slopes will be dictated by the natural angle of repose following storm events and tidal action	Muds to sands typically ranging from 0.001 to 2.0 mm. Coarser materials will be present in higher energy environments along the main channel through the lagoon

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HABITAT TYPE	ELEVATION (FT. MSL)	SLOPE GUIDELINES	SEDIMENT CONDITIONS
Mudflat	0 to +3	Shallow slopes typically less than 25:1. Within the western lagoon slopes may be steeper along channel fringes.	Sediments are anticipated to be very fine sands to muds (0.001 to 0.08mm). Areas are typically depositional with sediment of both organic and mineral origin being represented.
Marsh	+3 to +5	Shallow to moderate slopes typically less than 5:1. Where slopes are shallower than approximately 50:1, increased tidal channels may be required to reduce sediment saturation. All marsh areas must have positive drainage such that water does not pond at low tides to cause absence of vegetation (mudflat).	Sediments are muds to fine sands with moderate to moderately poor drainage. Grain size should average between approximately 0.01 mm and 0.08 mm.
Nontidal Southern Coastal Salt Marsh (Alkali Meadow)	+5 to +7	Shallow slopes typically less than 10:1. All areas must have positive drainage.	Sediments are muds to fine sands with moderate to moderately poor drainage. Grain size should average between approximately 0.01 mm and 0.08 mm.
Riparian	varies	Shallow to steep slopes typically between 2:1 and 10:1 located where consistent freshwater groundwater influence is found.	Sediments are well drained fine to coarse sands at freshwater inputs, including seeps.
Coastal Dune/Bluff Scrub	+7 to +9	Slopes vary considerably however for design, slopes should be designed between 4:1 and 10:1 for establishment, lower erosion, and maintenance.	Non-saline sands and low silt content sandy loam soils.

Design conditions are to be developed during final design using the general elevation, slope, and sediment criteria outlined above, along with a verification of the typical hydroperiod for the lagoon under the restored conditions and consideration of habitat transition and slope transition characteristics at a suitable design scale.

3.1.2 Topsoil and Sediment Salvage and Management

In developing habitat designs, it is anticipated that stockpiling and reusing suitable sediments will be necessary to obtain the physical and chemical conditions necessary to support desired biological communities. These aspects of the design must be integrated into the project engineering construction documents, and grading activities.

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Because of the highly variable sediment conditions within Malibu Lagoon, it would be very easy to restore the desirable lagoon contours and fail to establish suitable conditions within surface sediments that are necessary to support desired habitats. For this reason, it will be necessary to closely monitor sediment conditions, stockpile desirable surface sediments, and place surface materials within appropriate habitat types as the site grading is finalized. To aid in the salvage and replacement of sediments for surface caps within the various habitat types, the total volume of sediment necessary to create a 1-foot thick cap of each type of sediment required to achieve the desired habitat conditions has been determined based on preliminary site designs as shown in Table 3.

Table 3 – Volume of Earth Material Needed for Planting

HABITAT TYPE	ACRES	SEDIMENT TYPE	CU. YDS.
Sand Beach	4.45	D ₅₀ between 0.1 mm and 2.0 mm. Sands may be substantially derived from coastal beach sources	7,200
Mudflat	5.59	D ₅₀ between 0.001 to 0.08mm. High organics are okay.	9,000
Marsh	5.08	D ₅₀ between 0.01 mm and 0.08 mm.	8,200
Alkali Meadow	3.28	D ₅₀ between 0.01 mm and 0.08 mm.	5,300
Coastal Dune/Bluff Scrub	1.22	Non-saline sands and low silt content sandy loam soils.	2,000
TOTAL			31,700

While it is not necessary that all surface sediments be removed and replaced to construct suitable habitat areas, the volume of material required to achieve the desired surface sediment conditions should be tracked through construction to ensure that valuable and necessary sediments are not exported inadvertently.

Following final grading, it is likely that it will be necessary to adjust the drainage conditions of vegetated habitats to ensure positive drainage. It is likely that some delay will be required between grading and planting. Depending upon soil salinities, it may be necessary to leach soils prior to planting. This may be accomplished either by delaying planting through the rainy season or using irrigation.

Similarly, for habitats that are to be maintained as alkaline environments, it may be necessary to raise soil salinities to minimize invasion by undesirable weedy species. This may be accomplished through application of saltwater irrigation or retarding surface drainage and irrigating with brackish or freshwater at a rate that allows for high evaporative water loss.

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3.1.3 Restoration Planting and Natural Establishment

The restoration of Malibu Lagoon is anticipated to rely heavily on natural recruitment into the desired habitat zones combined with directed revegetation. This has become a standard approach to large-scale coastal habitat restoration in Southern California. The effectiveness of restoration using natural recruitment is dependent upon a number of factors. These include the availability of desirable reproductive plant materials within the system, the extent of undesirable reproductive plant material that may recruit, the suitability of the site to support consistent recruitment, the anticipated rate of habitat colonization and the acceptability of anticipated species distribution and ratios if natural colonization occurs. Within Malibu Lagoon, the process, rate, and outcome of natural vegetation colonization will vary by elevation and habitat type. For this reason, directed restoration is anticipated to be required in a number of areas. Directed restoration will rely on container plantings, salvage and replacement of desirable plants presently found in the lagoon, and application of seed.

For plan development, the anticipated approaches to vegetated habitat restoration are outlined in Table 4, reflecting the most likely restoration approaches contemplated at this time. During final design and engineering, further consideration of approach will be undertaken and methods may change.

Table 4 – Approach To Vegetated Habitat Restoration

HABITAT TYPE	RESTORATION APPROACH	IRRIGATION METHODS	LEADING FACTORS IN APPROACH
Marsh	Natural recruitment and salvaged plant transplants (below +4) Salvage plant and container planting (+3 to +5)	Natural hydrology	Low elevations will receive high seasonal inputs of marine water and saline toxicity may be expected to control cattail spread and promote dominance by native halophytes. At higher elevations, freshwater discharge may be expected to dominate even during winter periods and cattail marsh may persist throughout the year. Increased effort to plant halophytes and brackish marsh emergent species will allow establishment adequate to preclude cattail monocultures. Under both open and closed conditions adequate soil moistures are anticipated to support both recruitment and establishment of target vegetation.

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HABITAT TYPE	RESTORATION APPROACH	IRRIGATION METHODS	LEADING FACTORS IN APPROACH
Nontidal Southern Coastal Salt Marsh (Alkali Meadow)	Salvaged plant transplants Container plantings and seeding	Hydrophilic amendments Intermittent summer saltwater irrigation	Areas are subject to upland weed species invasion if salinities are low and primary space is available. Although positive drainage is required, relatively poor soil drainage caused by very flat slopes and fine-grained sediments will increase soil salinities to a point that will promote halophytes and kill weeds. Areas above regular inundation levels will receive poor recruitment by wetland plants predominantly dependent upon hydro-dispersal or wind dispersal to saturated soils. For this reason natural recruitment of target vegetation will be slow and weed recruitment will be high.
Riparian	Natural recruitment	Natural hydrology	Riparian vegetation is not specifically targeted in the restoration efforts but will be a resultant habitat where freshwater discharges occur along the wetland fringes above the higher tide lines. Natural recruitment of native willows and mulefat vegetation will occur where hydrology is acceptable. Promotion of hydrology will not foster long-term vegetation establishment since deeper rooting at the lagoon fringe will result in saline toxicity of plants once supplemental water is removed.
Coastal Dune/Bluff Scrub	Seeding and container planting	Hydrophilic amendments and potentially spray irrigation	Upland plant salvage and transplant is not typically efficient on a large restoration scale. Seeding of habitat is a proven technique for these habitat types, although container species often can be used to promote diversity through introduction of species that are poor recruiters from seed or which are typically out competed by dominant species of the habitat. Hydrophilic amendments may be adequate to establish upland habitats, however overhead irrigation may be required if sediments are saline.

Many of the desired species presently exist in the lagoon habitats that would be impacted by the proposed work and significant salvage and transplants may be undertaken to minimize the need for new plantings and to optimize the use of site native materials. A temporary on-site nursery area should be considered for the project. This would require the installation of a temporary overhead irrigation system using potable water. The system would be operated as needed to keep salvaged plants healthy until received sites are made available. Plant materials recommended to be used in the restoration of the lagoon are outlined in Table 5 below along

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with the preferred application methods. Container size will vary depending on species, season of planting and location within the restored wetland.

Table 5 – Recommended Plant Palette for Malibu Lagoon Restoration

PLANT NAME	HABITAT	PLANTING METHOD
Pickleweed (<i>Salicornia virginica</i>)	SCSM	seed & salvaged plant material
Parish's glasswort (<i>Salicornia subterminalis</i>)	SCSM	seed & salvaged plant material
Dwarf glasswort (<i>Salicornia bigelovii</i>)	SCSM	seed
Marsh jaumea (<i>Jaumea carnosa</i>)	SCSM	container
Saltwort (<i>Batis maritima</i>)	SCSM	container
Sea lavender (<i>Limonium californicum</i>)	SCSM	container
Alkali heath (<i>Frankenia salina</i>)	SCSM, AM	flat
Southwestern spiny rush (<i>Juncus acutus</i>)	SCSM, AM	container & seed
Salt-cedar (<i>Monanthoschloe littoralis</i>)	SCSM, AM	flat
Saltgrass (<i>Distichlis spicata</i>)	SCSM, AM	salvaged plant material
Salt marsh fleabane (<i>Pluchea odorata</i>)	AM	container
Purple sand verbena (<i>Abronia umbellata</i>)	CD/BS	seed
Silver beach bur (<i>Ambrosia chamissonis</i>)	CD/BS	seed
Beach primrose (<i>Camissonia cheiranthifolia</i>)	CD/BS	seed
Beach morning glory (<i>Calystegia soldanella</i>)	CD/BS	seed
Estuary sea-blite (<i>Suaeda esteroa</i>)	CD/BS	container
California box-thorn (<i>Lycium californicum</i>)	CD/BS	container
Dune buckwheat (<i>Eriogonum parvifolium</i>)	CD/BS	seed
Coyote bush (<i>Baccharis pilularis</i>)	CD/BS	seed
Bladderpod (<i>Isomeris arborea</i>)	CD/BS	container
Lemonadeberry (<i>Rhus integrifolia</i>)	CD/BS	container

SCSM-Southern California Coastal Salt Marsh; AM-Alkali Meadow; CD/BS-Coastal Dune/Bluff Scrub

3.2 INITIAL HABITAT RESTORATION

3.2.1 *Maintaining Unvegetated Habitat Areas*

The Malibu Lagoon restoration program incorporates both vegetated and unvegetated habitat areas. Included among the unvegetated habitat areas are frequently submerged habitats such as mudflats and channels as well as exposed avian islands, beaches, and dunes. The highest functionality of these habitats depends on maintaining their open nature. For frequently submerged habitats, this is accomplished naturally by maintaining very low oxidation-reduction potential (ORP) or high scour. However, for habitats located in areas of lower inundation frequency, opportunistic vegetation often consumes open ground rapidly. To combat the expansion of undesirable vegetation into the naturally open habitat areas, there are several approaches that may be taken.

For beach and dune habitats it is important to minimize the accumulation of fine sediments that retard water and nutrient drainage and impart sediment stability. Desirable dune vegetation is tolerant of very low nutrient supplies and shifting sediment conditions. Where sediments are stabilized, opportunistic and often invasive annuals and herbaceous perennial plants often become established. For this reason, development of dunes will only be highly successful in areas where fine sediments are not accreted, nutrient supplies are kept low, and sediments are unstable. Regular seasonal lagoon breaches and natural closure frequencies are suitable to maintain unvegetated beaches along the coastal fringe. For dunes, the lagoon breaches are too frequent for regular dune development along the barrier beach. Adjacent to the Malibu Colony fence line, the stability of the beach is high and it may not be possible to maintain the open vegetation of a natural dune system. This site may be suitable for development of a transitional upland area. However, there may be greater opportunity to support desirable conditions at the eastern end of the beach where a degraded dune system presently exists.

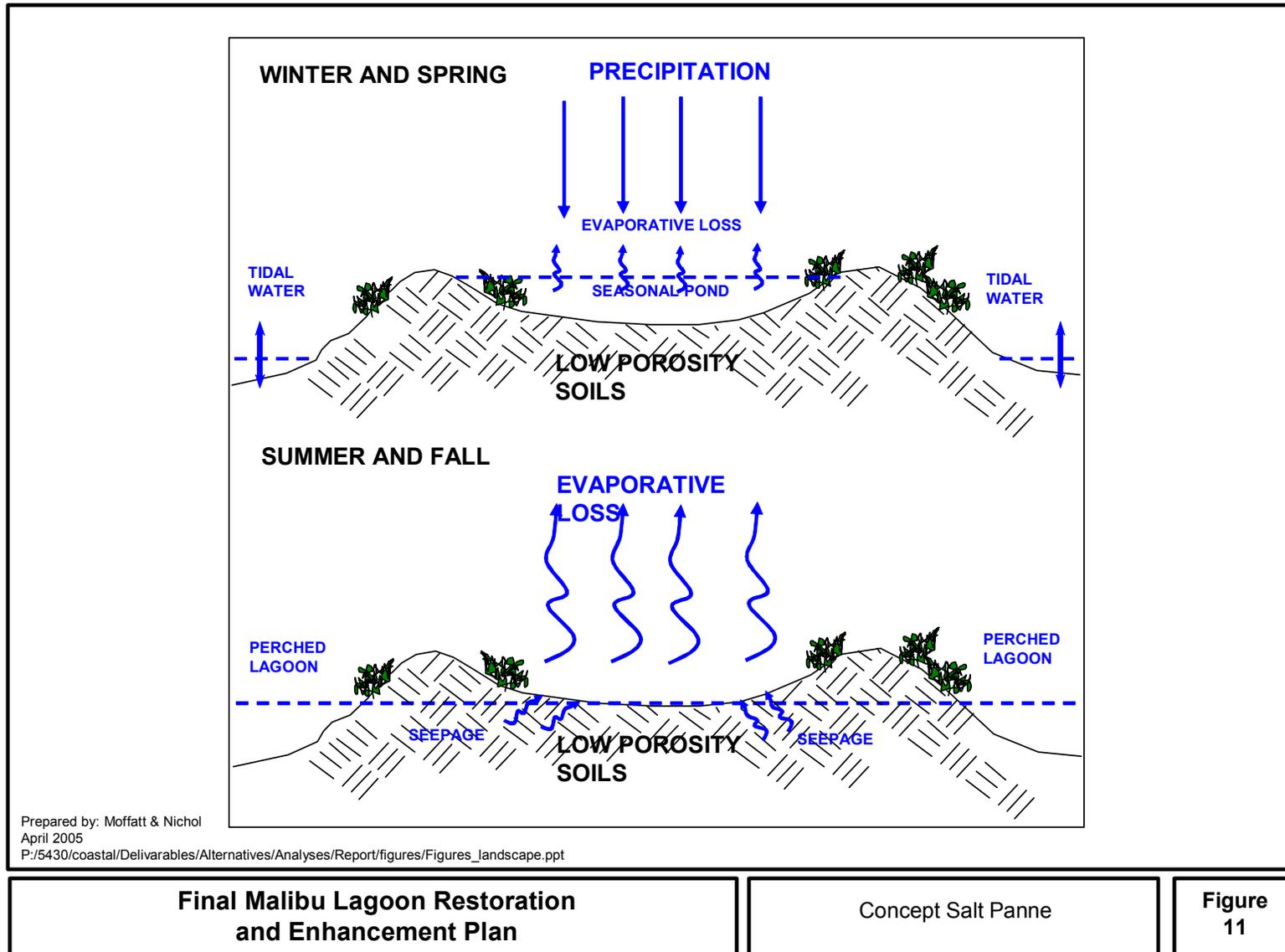
For avian islands it is desirable to maintain sparsely vegetated or unvegetated areas. This can be accomplished through two recommended methods. The first is to develop a site that lacks soil by using well-drained cobble and gravels with no fine sediments. An example of such an island is the mid-lagoon shoal that often forms as a result of major storm events. Over time, these islands eventually trap finer sediments and debris as well as receiving considerable nutrient inputs from bird wastes. As fine sediments and nutrient levels rise, sparse opportunistic vegetation becomes established. Over time, the islands will eventually be consumed by vegetation unless they are flushed of fine sediments either by storm flows, high water volume rinses, or mechanical reworking of the cobble and gravels on an as-needed basis. Such island cleaning may be required on a 2 to 10 year maintenance frequency. The second recommended approach to maintaining unvegetated or sparsely vegetated areas for avian islands is to reduce soil and surface drainage thus reducing sediment ORP and increase soil salinity. Following this approach, poorly drained soils are used to create the island surface and the top of the island is made to be slightly concave so that it holds water when flooded either by natural rainfall, artificial pumping, or infrequent inundation, generally through a controlled structure. By creating an internal basin, water loss principally occurs through evaporation and thus salts are concentrated on the island surface. This creates a salt panne environment that is sparsely vegetated by halophytes that are generally concentrated along the ponding edges.

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Operationally, the salt panne basins are seasonally flooded during the winter and spring periods and dry during the summer and fall periods. Such ponded areas are often used as foraging areas by small shorebirds because of the controlled shallow depths and the often high concentration of brine flies and other insect prey species. During the dry summer season these areas are often used as nesting sites by such species as avocets. Examples of these types of salt pannes often exist in areas of hydraulic fills around bays and estuaries of Southern California. They are also a common feature in natural flood deltas of estuaries where major storms have scoured out depressions in the high marsh plains (Tijuana River Estuary, Sweetwater River Marsh), however most of these historic deltas have been lost from the region and natural examples are limited today. Figure 11 below shows a conceptual salt panne.

To maintain low vegetation cover within the salt pannes, it may be necessary to seasonally pump salt water into the basins on an infrequent basis to increase salinity levels. This should not require annual actions and can be accomplished during periods of tidal opening with a small (1 or 2-inch) gas powered pump. An alternative approach would be to lower the basin floor to an elevation that exists at or below the normal high water level of the lagoon so that natural evaporation of seepage increases salinity levels in the basin. The schematic in Figure 11 below illustrates these concepts around the salt panne avian island configuration.

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3.2.2 Minimizing Habitat Losses from Seasonal Inundation

The same low oxidation-reduction potential that can be used to limit vegetation growth where it is undesirable, will also be of concern in vegetated habitats. Because of the long-term seasonal inundation of much of the lagoon habitat during the summer months, vegetation dieback can be expected in these areas. While it is not fully possible to correct the problems associated with long-term inundation on vegetation communities, it is possible to reduce the effects by taking the following steps:

- 1) Develop an undulating topography within the seasonally inundated habitats in order to ensure that the extent of inundation is varied across the terrain. This will ensure that not all vegetation is subject to the same potential risk of loss;
- 2) Incorporate vegetation that tolerates prolonged exposure to anoxic soil conditions into restoration efforts. Such species include: *Jaumea carnosa*, *Batis maritima*, and *Spartina foliosa*
- 3) Incorporate vegetation into restoration efforts that rapidly expands into unvegetated areas by seedling recruitment. Such species include: *Salicornia virginica* and *Salicornia bigelovii*.
- 4) Promote increased oxygenation of waters during inundation periods.

Lagoon water levels typically rise to a maximum elevation at the very end of the closed lagoon period. Water level data from others (M&N, 2005) indicates water levels stabilize at approximately +5 feet above mean sea level (msl) for the summer, then rise another one to two feet for approximately the last two to four weeks of the closed period water levels. This last short term rise in water level is caused by releases from upstream water impoundments such as the Tapia Plant. The lagoon habitat vegetation mosaic is adapted to maximum water levels at +5 feet msl. The short-term period of super water level elevations is too short to affect the distribution of vegetation and should not cause significant or long-term variations of lagoon habitat. No planning or design features are needed to address this condition.

3.3 ESTABLISHMENT MAINTENANCE

During early establishment of the restoration, it will be necessary to conduct maintenance that promotes the effective development of target habitats while preventing the establishment of non-target vegetation. Specifically, it is anticipated that it will be necessary to conduct focused invasive species removal from restoration areas. It may also be necessary to augment plantings of desirable target vegetation or conduct increased levels of maintenance to promote plant establishment or address identified problems.

In addition to normal establishment maintenance, adaptive management may be required to foster effective habitat development. It may be necessary to alter site topography or drainage, modify plant palettes to fit specific site conditions, or direct habitat restoration of a differing habitat zone. Adaptive management actions will be based on results from habitat monitoring, described later in Section 6.0.

3.4 LONG-TERM HABITAT MAINTENANCE

Malibu Lagoon is a system naturally characterized by alternate states of open tidal influence and closed brackish/freshwater pond conditions. As a result of the highly variable environmental conditions occurring within the lagoon, the lagoon is at great risk of invasion by opportunistic exotic species and the degradation of fringing habitats absent vigilant maintenance. Maintenance within the lagoon will require on-going exotic plant control efforts. The extent of such maintenance in the lagoon may be reduced if highly invasive exotic plants are controlled effectively in the watershed.

In addition to exotic species invasions within the lagoon, it is anticipated that high nutrient loading within the lagoon will continue to promote growth and expansion of opportunistic algae and fast growing vascular vegetation such as cattails over other species. The proliferation of ephemeral macroalgae and microalgae will further adversely effect oxygen levels within the lagoon and adversely impact aquatic animal communities as well as less competitive plants. The effective development of target aquatic habitats and associated communities is dependent upon both the improvement of existing lagoon environments and curtailing degradation from external sources, particularly the inputs of nutrients and control of exotic species in the watershed. Improvements to these external factors should be made a priority in a parallel effort to the lagoon restoration.

4.0 ACCESS, EDUCATION, AND INTERPRETATION PLAN

The access, education, and interpretation plan is shown in Figure 12. This plan provides for access at grade along the perimeter of the western arms complex at the location of the existing vehicle access route. Multiple interpretive nodes and areas suitable for educational programs have been identified, and multiple length interpretive loops provided to allow for a variation of docent led activities with exposure to multiple habitat types.

The most important element of the plan is the relocated parking area, moved back and elevated to a position along PCH that will be acoustically and visually buffered by a proposed extension of the “Adamson wall.” This move will:

- Expand the area available for habitat, and if stepped retaining walls at the south and east are provided along that edge, it will allow for an even greater area of shallow-slope wetland margins;
- Allow more ground surface area to be available for wetland habitat restoration, including installation of potential adaptive management options such as the North Channel, if needed in the future depending on the footprint of slopes shown in the plans;
- Make it possible to implement the best management practices in the construction of the new lot as discussed above;
- Create a new bus drop and parking zone in addition to providing car capacity equal to that of the existing lot;
- Provide an elevated platform for initial orientation (designed to be sufficiently sturdy to not shake under average wind conditions for stable bird viewing with telescopes);
- Make access to the PCH bridge easier and more clearly defined; and
- Make possible the installation of an ADA accessible viewing tower at an elevation above PCH bridge in order to experientially re-integrate the full tidal/lagoon system of Malibu Creek that is currently bisected and fragmented by the PCH bridge.

The access plan provides for different experiential, teaching and management opportunities, with a number of “add alternate” components.

4.1 PERIMETER ACCESS

This plan, shown in Figure 12, will provide a primary beach access trail that is directly accessible from the Cross Creek Road intersection and bus drop-off zone. This approach provides for three primary interpretive nodes near the parking area, and optional locations for additional nodes for instructive features, benches for wildlife viewing, picnicking, painting, etc.

Access to the interior of the system in this alternative is limited to a single path along the axis of the entry/drop-off zone along a gently sloping peninsula (area “2”) where the primary teaching can take place on picnic tables aligned along the trail, or in the optional amphitheater seating (north of trail axis at area “2”). The access continues across a short span, that could if designed

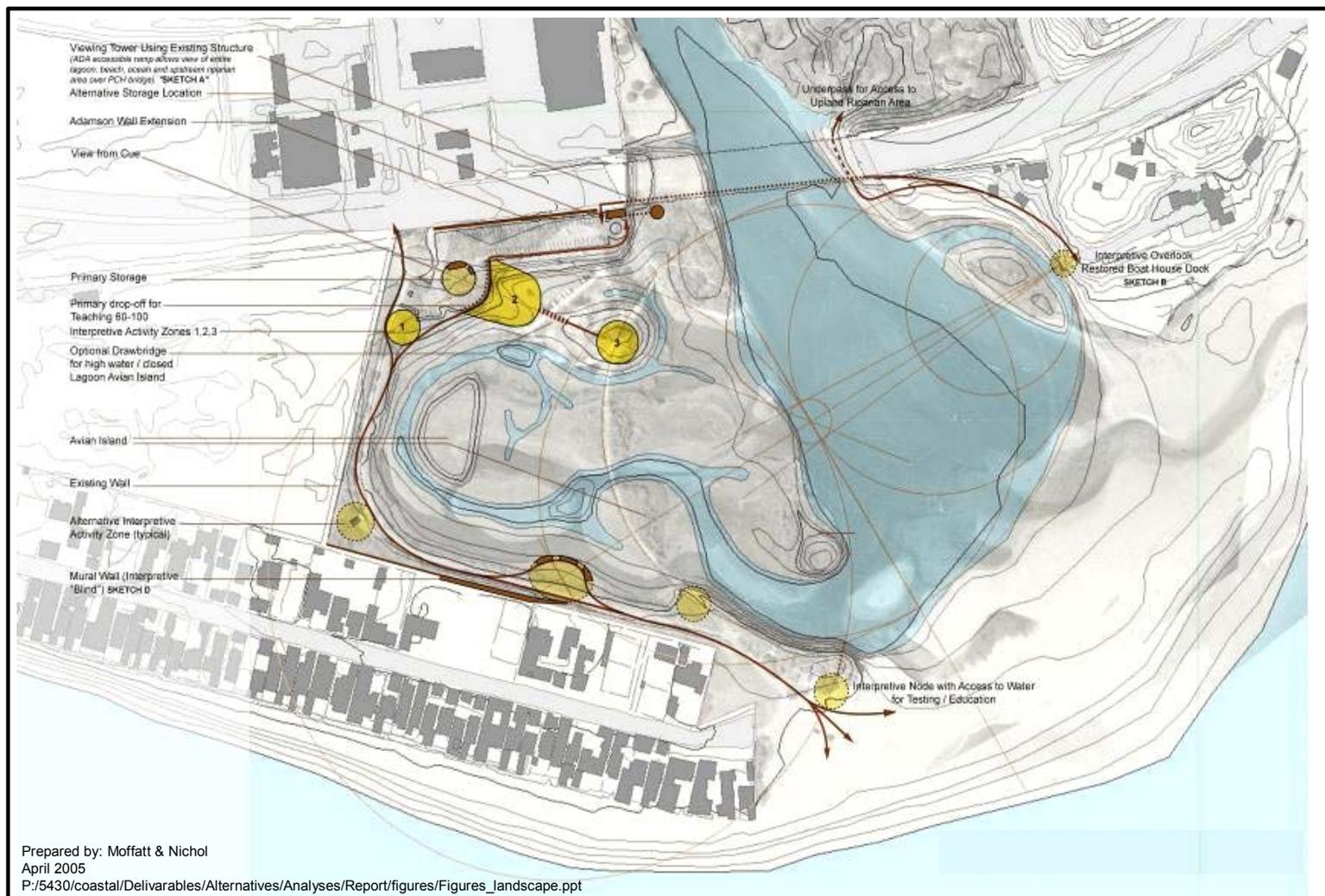
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as a drawbridge to allow for a seasonal island in the approximate location of the existing turf/interpretive kiosk zone at closed lagoon conditions. While this interpretive node is envisioned as a cleared gathering area within a dominant restored wetland habitat, the grading of the island could allow for some of the existing sycamores to be retained for shade within a small upland component. Figure 13 shows the overlook that could be created for minimal intrusion.

Additional features of this plan include:

- Storage and restroom facilities near entry parking circle;
- Orientation and interpretive node at perimeter trailhead (area “1”);
- Optional storage/restroom location built into “Adamson wall” at Lagoon Loop Trail gateway at east end of parking lot;
- Enhanced “Lagoon Loop Trail” access to the east lagoon over PCH bridge with interpretive signage and graphics;
- An underpass at the east abutment to provide improved access to the riparian habitat north of PCH and west of Serra Road;
- A loop trail extension arcing along the upland margin along the Adamson property (existing chain link is proposed for removal to allow for restoration and access);
- An interpretive overlook at a restored Adamson House dock shown in Figure 14 and boat house to introduce cultural tourists to the features of the nearby habitat island and lagoon system from the eastern vantage point;
- A continuation of the Lagoon Loop Trail to the beach below the Adamson House; and
- A possible mural wall separating the Colony properties from the perimeter trail as shown in Figure 15, including a “thick wall” element with integrated benches, interpretive displays including possible dioramas, and additional storage for teaching and testing equipment. The wall will arc toward the wetland margin to define a node within the access path defined on the opposite side by:
 - an “interpretive blind” concealing observers from the wetland complex and framing particular instructive views with integrated interpretive graphics (see sketches);
 - additional alternative Interpretive Activity Zone sites as appropriate to the docent led programs and to provide for expected user capacity for passive recreation (picnics, painting, study, etc); and
 - an improved self-contained restroom facility with vehicular access for servicing at the edge of the beach/upland area.

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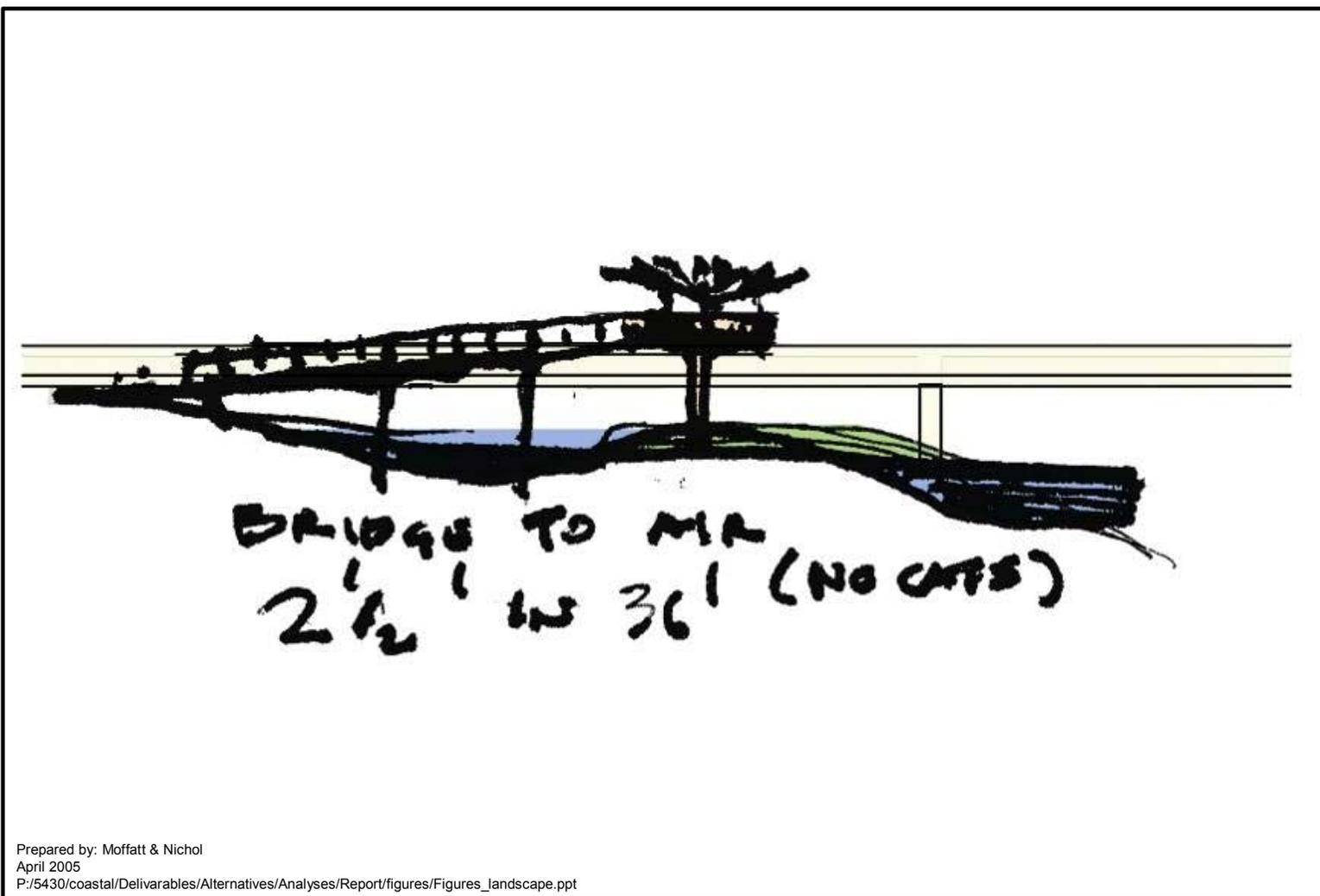


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Perimeter Access Plan

Figure 12

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Non-Intrusion Platform Option

**Figure
13**

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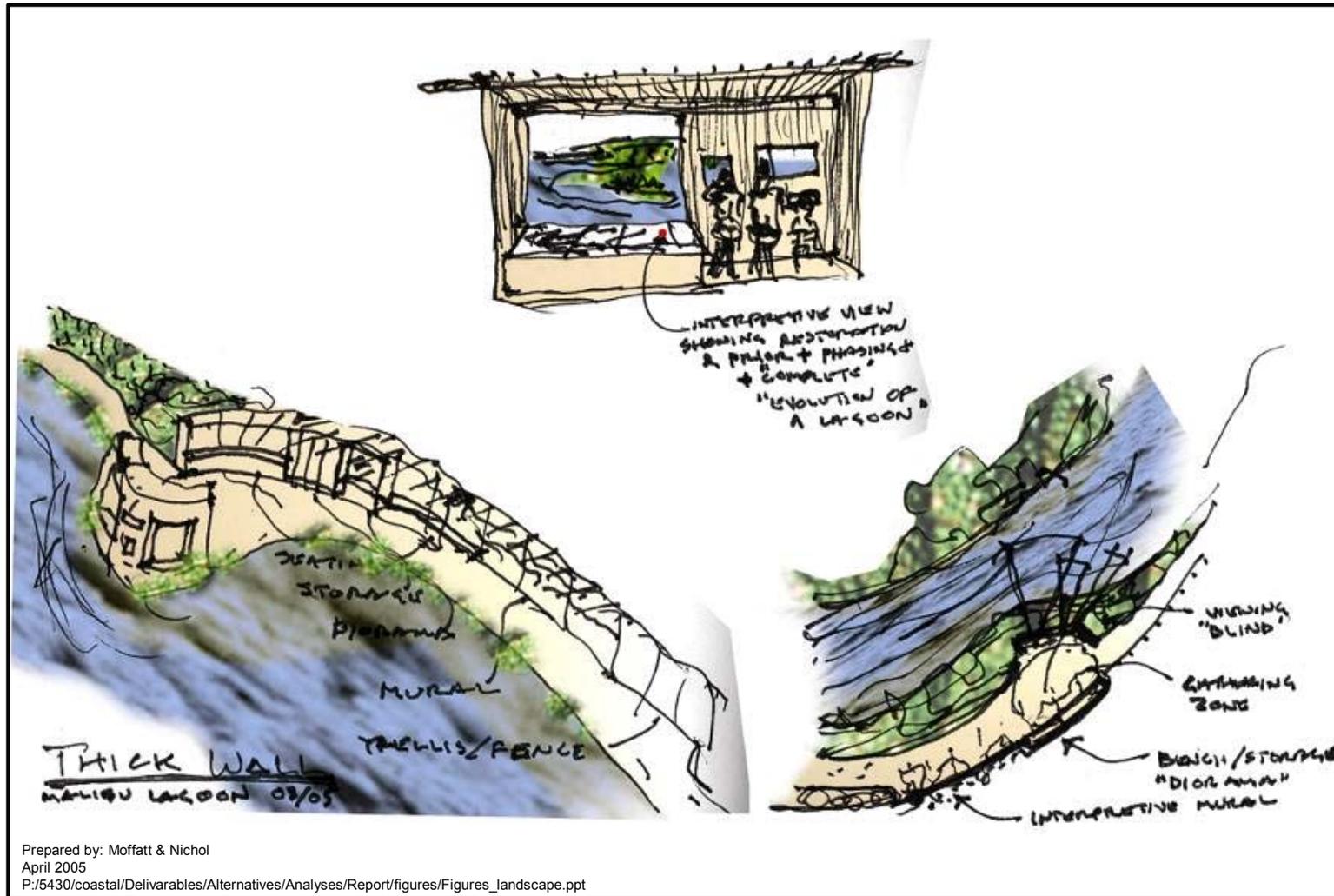
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April 2005
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Adamson Dock View

**Figure
14**

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The Thick Wall and the Duck Blind

**Figure
15**

5.0 MONITORING PLAN

5.1 PURPOSE OF THE LAGOON MONITORING PROGRAM

The Malibu Lagoon monitoring program will be used to assess the existing floral and faunal assemblages at the lagoon, protect existing habitat, minimize impacts and document resource changes for application in future restoration programs. The primary monitoring program objectives are as follows:

- Set the baseline of biological, physical and chemical conditions for analysis of the project under the California Environmental Quality Act (CEQA) to minimize impacts to existing habitat and to evaluate future restoration success;
- Facilitate an evaluation of the effectiveness of the restoration to provide habitat for fish and wildlife;
- Assess progress towards restoration goals;
- Document changes in the ecology of the lagoon environment over time;
- Provide timely identification of any problems with the physical, chemical, or biological development of the lagoon, and;
- Assist in providing a technical basis for resource management of the lagoon system by documenting maintenance needs and enhancement opportunities.

5.2 ANNUAL REPORTING

The lagoon-monitoring program consists of annual sampling activities completed during each year prior to and following lagoon restoration activities. The monitoring program has been tailored to provide useful information to assess restoration and make sound management decisions. The annual report provides a data presentation and analysis format for assessing the status of the restoration project and evaluating changes in the site over the course of the program. Each annual report is to include a compilation of information collected for the specific year of sampling as well as a cumulative reporting for all prior monitoring years. The report shall further provide an analysis of data for the specific year and a cumulative analysis of change in the system, making use of information from preceding years. The annual reports are to accomplish the following:

- Identify the investigations or sampling completed for the specific report year;
- Document studies and surveys conducted and summarize sampling methods;
- Summarize information gathered during the year and provide aggregate information on sampling completed to date;
- Summarize restoration activities conducted during the prior year and provide an outline for future restoration work to be completed;
- Present an analysis of the data collected and provide an evaluation of the ecological development of the lagoon system;
- Document habitat values achieved through restoration efforts, and;

- Make recommendations regarding beneficial changes and/or additions to monitoring methodology and data collection and analyses.

5.3 MONITORING PHILOSOPHY

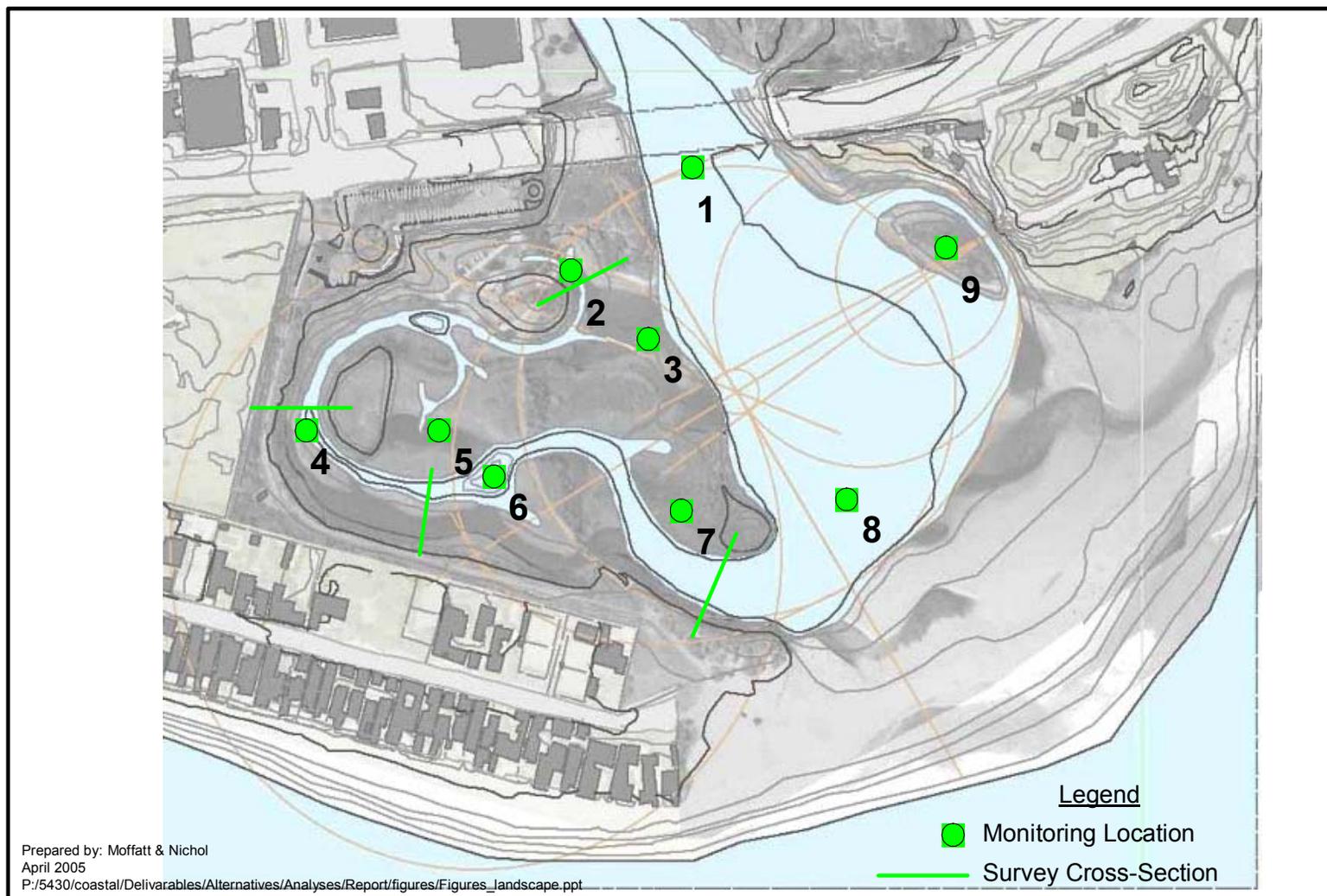
The following monitoring plan includes an array of physical, chemical and biological parameters that all address different functional aspects of a healthy and sustainable lagoon system. The key to restoration of Malibu Lagoon will be observable improvements in the physical and chemical conditions that facilitate biological stability by the reestablishment and persistence of species diversity and native organisms well beyond the first 5 years following construction. In order to confidently measure improvements in the system, the monitoring program needs to:

1. Standardize sampling protocols to account for the inherent temporal and spatial variations as much as possible;
2. Select monitoring parameters that will directly address restoration goals and intended successes;
3. Acquire a reliable baseline dataset; and
4. Maintain parameter and technique continuity throughout the monitoring program.

Understanding baseline conditions prior to ecological restoration is imperative to accurately and quantitatively assess the physical, chemical and biological changes as a result of restoration efforts. While a gamut of previous monitoring information exists on Malibu Lagoon, the spatial and temporal variability of previous sampling, as well as variations in techniques, would make it difficult to apply the previous data sets as baseline conditions from which to evaluate future restored conditions. The most robust assessment of restoration performance will be provided by a standardized monitoring program that provides baseline and post-restoration data using the same parameters, the same techniques, functionally similar spatial sampling locations and constrains the temporal variability of sampling as much as possible. The monitoring sites are provided in Figure 16. Sampling consistency with continual consideration of the inherent dynamic nature of coastal lagoons is the most effective means to obtain reliable evaluation of restoration success.

The monitoring plan presented herein has been designed to be consistent the Comparative Lagoon Ecological Assessment Project (CLEAP) currently being conducted in Santa Cruz County (2ND NATURE, 2004). The monitoring plan may be slightly modified in the future to be consistent with forthcoming restoration monitoring guidelines prepared by the Southern California Wetlands Recovery Project (www.scwrp.org).

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Monitoring Locations

Figure 16

5.4 RESTORATION GOALS

Based on the initial goals prepared by the Malibu Lagoon Task Force, a series of detailed restoration goals have been developed to set measurable targets for the restoration program.

5.4.1 Physical

1. Improve water circulation during all hydrologic conditions (i.e., storm flows, tidally dominated open conditions, and closed conditions). Circulation directly relates to the stability of the restored lagoon bathymetry and morphology (quantity of sedimentation dynamics), grain size distribution (quality of sediments), and water quality (temperature, dissolved oxygen, salinity, and ORP).
2. Provide an optimum three-dimensional lagoon geometry to provide for maximum water circulation under all conditions, and a desirable and diverse habitat mix.
3. Improve storm flow and tidal sediment discharge characteristics to reduce the erosion and accretion of sediments within the lagoon and the maintenance requirements to sustain a functional lagoon system.

5.4.2 Chemical

1. Reduce sediment nutrient content. Previous research has identified that increased grain size of lagoon substrate will decrease available summer nutrient loads regenerating from the lagoon sediments, thus reducing the potential for eutrophication and low dissolved oxygen conditions during warm months of the year (Sutula *et al.* 2004).
2. Increased circulation and water exchange during tidally dominated and closed conditions. Increased circulation and water exchange will improve temporal and spatial frequency of oxygenated water contact with surface sediments, thus increasing organic matter decomposition and increasing the transformation of ammonia to nitrate. This, in turn, will facilitate the permanent loss of nitrogen, the limiting nutrient, from the lagoon through denitrification and reduce its supply to the primary producer communities.

5.4.3 Biological

1. Protect existing natural biological communities represented within Malibu Lagoon during and following restoration.
2. Reduce the incidents and geographic limits of depressed dissolved oxygen levels that adversely affect native lagoon communities.
3. Reduce predator encroachment in the lagoon habitats by improving habitat isolation during open and closed lagoon conditions.
4. Expand desirable native habitats and reduce habitat dominance by exotic species.
5. Promote habitat suitability for threatened and endangered species by increasing the available slough channel refugia habitat with sandy bottom for tidewater gobies and providing increased isolation of island habitats for seasonal snowy plovers and least tern use.

The ability of the restoration efforts to attain improvements in lagoon water quality may be significantly limited by the extreme watershed loading of annual nutrients to Malibu Lagoon. As management efforts continue to focus on reducing nutrient loading, the water quality benefits of restoration efforts maybe more likely.

5.5 PARAMETER SELECTION

Monitoring parameters have been selected specifically to support the restoration needs for the lagoon and to evaluate the progress towards restoration goals. The needs for the project include both pre-action environmental and regulatory reviews as well as pre- and post-restoration monitoring to assess actions and guide management.

5.5.1 Pre-Restoration Monitoring To Inventory Existing Conditions To Facilitate Environmental Review And Permitting

Project review is required under the California Environmental Quality Act (CEQA) and for necessary permitting under the federal and state Endangered Species Acts (ESA, CESA), the Clean Water Act (CWA), the California Fish & Game Code, the California Coastal Act, and the Porter-Cologne Act. To support these review processes, it will be necessary to fully document resources that will be affected by the restoration activities. Much of the habitat and wetland mapping has been completed through the restoration planning process, however, additional biological data collection are necessary in two primary areas as specified below.

General Biological Resource Inventories

While Malibu Lagoon has been extensively studied over the past two decades, the most comprehensive inventories of species resources within the identified habitats are now ten years old and information cannot be relied on at this time to support a current evaluation of the potential effects of the restoration on existing communities. To provide a current baseline biological report and impact assessment, it will be necessary to conduct updated surveys of the plants, fish, and wildlife resources of the lagoon system. To a great extent, the work may be limited to verification and updates of data already collected and reported in prior studies. Using the habitat mapping work completed in 2004 as a baseline, resource inventories should identify species dominating the delimited habitats. These data will be important to evaluating the probable effects of project implementation on the biological resources of the lagoon. Surveys to be conducted should include the following:

1. Floristic Inventory – A one time floristic inventory should be conducted during the spring/early summer season (spring/summer seasons) to document the plants present within the lagoon environment and to link plants to previously mapped vegetation communities. The survey should be conducted by a qualified field botanist.
2. Fish Community Inventory – Species present within the lagoon are not anticipated to differ substantially from those detected during the completion of the Ambrose et al. 1995 studies. For this reason, no further broad scale surveys are warranted. However, see section on threatened and endangered species.
3. Avian Community Inventory – Resource inventory surveys of the lagoon that should be conducted to support environmental review and permitting should include a seasonal

survey of avian species that results in an inventory and count of species present as well as an identification of species use of the represented habitats. A comprehensive species list for the lagoon has previously been prepared and extensive surveys have been conducted (Garrett field notes 1980-1996, Manion and Dillingham 1989). Ambrose et al. (2005) began the process of linking avian guilds to habitats. A knowledgeable ornithologist with extensive experience at Malibu Lagoon should be retained to prepare a comprehensive avian species matrix that indicates important habitat usage, frequency of occurrence, and relative abundance. Combined with an updated survey, the habitat utilization matrix is expected to provide adequate information to support environmental assessments of the project effects on birds.

4. Mammalian Community Inventory – Comments have been made by the public regarding the general lack of information available regarding the mammalian fauna of Malibu Lagoon. Based on a concern that the inventories and environmental impact assessments be complete, it is recommended that a spring/summer season mammalian survey be conducted that would focus on identification of small mammal fauna that may exist in and around the lagoon. A multiple night small mammal trapping and bait station trackplate program should be implemented within all vegetated habitats represented in the lagoon. In addition, a survey should be conducted to identify mammal signs including scat and tracks for the purposes of developing an inventory of mammals present by represented habitat types.
5. Herpetofauna Surveys – Prior surveys of the lagoon have not focused on the presence of reptiles and amphibians. Given the perennial nature of Malibu Creek there is some potential for the lower creek and upper lagoon to support sensitive herpetofauna including southwestern arroyo toad, western pond turtle, and two striped garter snake. To determine the status of these species as well as more common reptiles and amphibians, it is recommended that a spring/summer season survey be conducted. This work could be conducted coincident with mammalian surveys and could employ the use of visual surveys, seining of quiescent waters, drift fences and pitfall traps, as well as nocturnal surveys for auditory and visual detection. Surveys should be conducted over multiple nights during warm periods. Depending upon rain events and temperature, it may be necessary to conduct surveys during spring as well as summer to effectively detect all sensitive species.
6. Terrestrial Entomological Surveys – Comprehensive surveys of terrestrial invertebrate fauna present at the lagoon would be costly and not particularly useful in analyzing the restoration effort effects. However, there are a number of sensitive species that are found in the region with potential to occur at the lagoon. These include salt marsh skipper, other lepidoptera, and various Cicindelid beetles. These species are best inventoried during the warm spring or early summer months during visual surveys of the site. Nocturnal surveys may be conducted using attractant techniques such as black lights, however, it is not expected that such methods will be required.

Threatened & Endangered Species Surveys

Malibu Lagoon is known to support year-round presence of tidewater gobies, seasonal presence of southern steelhead, and seasonal use by California least tern and western snowy plover. While the seasonal presence and habitat use around the lagoon is well known for listed avian

species, the habitat utilization of the lagoon by listed fish is less well known. In order to assess the potential for adverse effects and to minimize impacts to listed fish resulting from construction activities, a focused investigation should be undertaken to assess the distribution of tidewater gobies and steelhead in the lagoon. Updated surveys should be implemented during open and closed lagoon conditions. The surveys should include widespread seining of the lagoon to identify high use areas by gobies and to determine the presence or absence of southern steelhead throughout the year or the time period available prior to completion of the CEQA document. The results of these surveys should be used to plan construction phasing and impact minimization measures. Results should also be incorporated into the assessment of environmental impacts under CEQA and in the development of information necessary to support Endangered Species Act consultation.

5.5.2 Pre- and Post-Restoration Monitoring to Evaluate Restoration Success

Below are the monitoring parameters that have been selected to quantitatively address the ability of the restoration program progress towards the physical, chemical and biological goals of this project outlined in Section 5.4. Sampling protocols, sampling schedules and specific locations are provided below. These protocols are to be used as a guide for implementation of the monitoring program and may be subject to change. In addition to specific protocols, the frequency of monitoring is likely to change as it is anticipated to be more frequent immediately following restoration to detect short term recovery and then become less frequent to detect long-term changes.

Monitoring site locations are suggested in this document, but their exact locations may need to be modified over time. The goal of selecting final monitoring sites is to identify functionally equivalent sites for pre- and post-restoration monitoring. Planning of sites must demonstrate some functional similarity based on physical/chemical/biological rationale to allow the most reliable comparisons of data in the future.

The most cost effective, robust and reliable monitoring program would be best served under the oversight and with the expertise of professional personnel. Consistency and repeatability are the keys to useful monitoring data collection in the field. Data management and analysis should be performed by trained professionals who can provide insight to the nuances, trends and interpretation of the data.

It is anticipated that training of agency monitoring staff by professionals may be useful. The professionals will assist to establish the data management and database format techniques to be used for each these parameters. Training can also include establishing data recording, data management and procedures to provide for organized and consistent field data. The monitoring will require a strong commitment by the selected agency and personnel to render it effective. Protocols for each monitoring parameter are provided below.

Physical

Physical components to be monitored include those items described below.

Cross-Section Monitoring

For cross-section monitoring, four (4) permanent and repeatable cross-section locations will be monitored bi-annually during pre and post restoration. Horizontal and vertical locations of cross section end points will be fixed by monuments. Changes in bathymetry at 4 selected locations will be monitored over time. Estimates of sediment volume scour or deposition can be made from data, and cross sections can be used with water budget data to calculate inflowing/outflowing channel velocities through cross-sectional area. Cross-section monitoring should be performed at the end of the rainy season during open conditions (~April) and again prior to the wet season (~September).

Pre-restoration preparation: Semi-permanent monuments will be established by qualified staff with fence posts and eyelets at locations indicated in Table 7 and surveyed into an existing topographic map. Cross-sections will be obtained by attaching a taught survey tape to the monuments and recording channel depth and water elevation at equal increments across cross section to collect at least 20 data points. Field personnel must be prepared with hip waders or inflatable boat depending upon water level conditions.

Pre-restoration monitoring: Monitoring will continue following the sampling schedule until restoration construction ensues. Data will be recorded in a field notebook and entered into Microsoft Excel in a database format developed by the qualified staff.

Post-Restoration monitoring: Following construction, qualified staff will establish permanent monuments at the restored lagoon locations indicated in Table 7 and surveyed for vertical and horizontal locations. The monuments should be tied to the updated topographic survey once conducted. Monitoring techniques remain the same as above.

Continuous Water Surface Elevation And Flow Velocity Monitoring

Continuous water surface elevation monitoring will be accomplished by using meters. Deployable water quality instruments will be installed and maintained at 3 locations within Malibu Lagoon. The recommended instruments are equipped with water pressure transducers to allow continuous water depth measurements. The recommended instruments are used to measure additional water quality parameters. An example instrument is shown in Figures 17 and 18.

Water surface elevation monitoring will be used for various purposes, but one use is to estimate tidal flow velocity within channels. This method requires calculations to quantify velocities. Alternatively, a separate instrument can also be deployed to directly measure flow velocities and eliminate the need for the calculation. Both approaches are described below.

The parameters above (cross-sections and continuous water surface elevation monitoring) will allow the assessment of the spatial distribution of circulation and an evaluation of the circulation

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benefit restoration efforts provided during tidally-dominated conditions. The continuous depth data can be used to create a rating curve that relates the water depth to lagoon volume for both existing and anticipated restored conditions. Time series changes in water volume can be used to create a simple water budget of the lagoon. The water budget data will be applied to:

1. Track the water volume changes over time (depth data) related to the tidal cycle at the mouth (WXTides or some other tidal time series program) and evaluate tidal influence on lagoon circulation during tidally dominated conditions; and
2. Create a time series of estimated flow velocities at channel cross-section locations using water volume changes over time. These data, combined with the water quality time series from the data loggers, will allow for the quantification of the critical tidal elevation that induces flushing of the western restored areas and the frequency of that tidal elevation.

During closed lagoon conditions, the continuous depth data will be used to determine the lagoon volume filling rates, equilibrium lagoon water volumes and detailed data on sandbar dynamics. This information can be evaluated with tidal variations and surface water inflow hydrology to quantify specific parameters of the lagoon water budget during closed conditions.

Alternatively, a continuously-recording velocity meter can be installed near the downstream end of the western arm to record tidal flow currents. The type of meter can vary, but a Doppler-type of technology is recommended for semi-permanent deployment for the annual dry season.

Pre-restoration preparation: The qualified staffs will determine the most appropriate instrumentation necessary to collect in-situ velocity measurements. Options include manual pigmy meters or digital velocity meters.

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The YSI 600XLM

**Figure
17**

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Medium:	Fresh, sea or polluted water
Temperature:	-5 to +45°C
Computer interface:	RS232, SDI 12
Logging Memory:	384K, logs 150,000 readings
Software:	EcoWatch for WIndows 3.1 included: PC compatible, 3.4" disk drive, 386 processor or better, running Windows 3.1 or later, 4 MB RAM minimum, English and French
Size:	1.7" OD x 21.3" long (4.32 x 54.1cm)
Weight with batteries:	1.5 lbs (0.7 kg)
Internal power supply:	4 AA-size alkaline cells
External power supply:	12 VDC

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YSI 600XLM Specifications

**Figure
18**

Pre-restoration monitoring: Monitoring locations will correspond with the cross-section locations as presented in Table 7. Exact timing of each sampling will be determined by the qualified staff, taking into consideration, tides, stream discharge, weather, sand bar status and other relevant concerns. Velocity measurements are taken only during open sandbar conditions and during a falling tide. Velocity measurements will be collected at 4 equal distances across the cross section. Each location will include 3 measurements to quantify the vertical variations in velocity within the water column. The water depth at each site will be measured, divided by 3 and velocity measurements will be conducted in the middle of each third. Data will be recorded in a field notebook and entered into Microsoft Excel in a database format developed by the qualified staff.

Alternatively, direct flow velocity monitoring can be done continuously using a Doppler technology meter such as the Sontec Argonaut shown in Figures 19 and 20, and described in Appendix C.

Post-restoration monitoring: Monitoring locations will correspond with the cross-section locations in the restored lagoon as presented in Table 7. Field techniques will remain the same as used above.

Aerial Topographic Surveys

For aerial topographic surveys, surveys should be recorded to address lagoon circulation and sediment aggradation/degradation dynamics over the long-term. Their timing is immediately post-construction, then at 2.5 years post-construction, 5 years post-construction, 10 years post-construction, and every 10 years thereafter into perpetuity.

Pre-restoration preparation: No pre-restoration preparation is need as that was already completed for the Feasibility Study in 2004.

Pre-restoration monitoring: This may already be covered with the 2004 data. If construction occurs very soon (close to 2005) without significant changes on-site, rely on 2004 data. If changes occur such as parking lot installation ahead of other construction, and/or construction does not occur until 2010, then do the survey immediately pre-construction.

Post-restoration monitoring: Perform the survey immediately post-construction, then at 2.5 years post-construction, 5 years post-construction, 10 years post-construction, and every 10 years thereafter into perpetuity. Perform an aerial topographic survey at low tide in the Spring season of the identified year. If photographed in color, the aerial image may be useful for vegetation mapping as well. Hire a surveyor to perform the entire project. They set ground survey markers and fly over the site to create a topographic map from the aerial for dry land areas. Areas covered by water will require standard surveying of points by a crew in a boat or wading. More accurate estimates of sediment volume scour or deposition can be made from data for longer-time periods to identify trends in accretion or erosion. The resolution of the survey should be at 1 foot contour intervals, with points accurate to $\frac{1}{4}$ of foot.

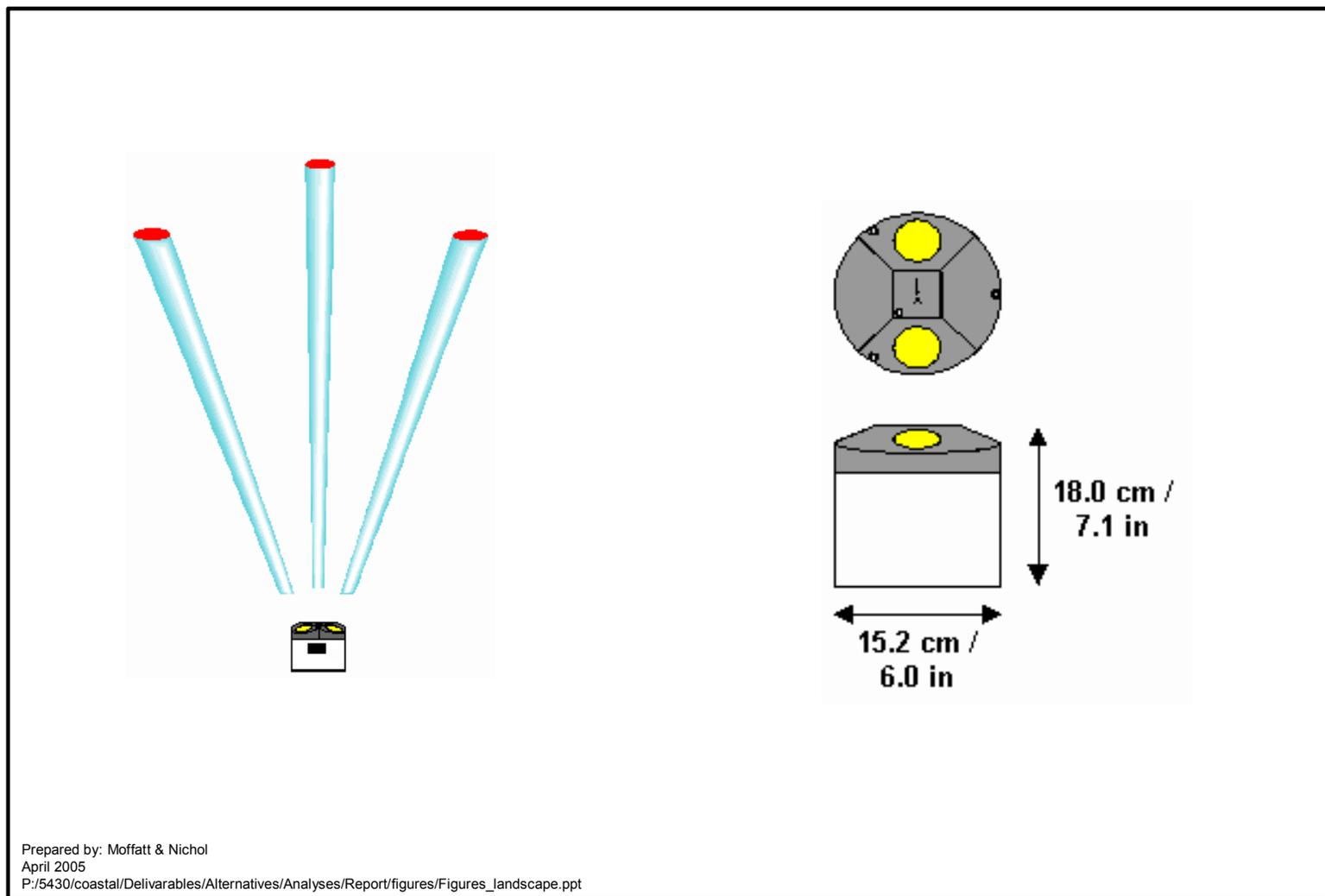


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The Argonaut-SL

**Figure
19**

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**Final Malibu Lagoon Restoration
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The Argonaut SL in Concept

**Figure
20**

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It may also be useful to perform a response survey immediately following severe storm flood events greater than the 25-year storm as determined by flow measurements from the Malibu Creek gage.

The survey should be conducted by a professional team to ensure surveys are repeatable over time. The first survey is the most expensive at nearly \$20,000, because all survey monuments need to be established. All subsequent surveys are lower, at nearly \$10,000. The costs are lower if clear water allows visual assessment of the lagoon bed thus reducing the need for ground shots.

Analysis of the change in sediment volumes throughout the site is to be done and should cost ~\$5,000 for a qualified individual to calculate the volume changes along cross-sections and interpret the data.

Sediment Sampling

Surface sediment samples (top 0-2 cm) will be collected bi-annually (end of April and end of September) at 4 locations within the lagoon (3 cross-section locations in the West Arm and one within the main channel) to evaluate the spatial circulation dynamics of the existing and restored lagoon. Sediment samples will be submitted to a laboratory for testing of grain size distribution and total organic carbon (TOC), total nitrogen (TN) and total phosphorous (TP) concentrations. The seasonal and temporal sediment sampling results will allow the evaluation of the storm flow capability to scour organic material from the previous summer, the distribution of storm flow deposition of sand and relative supply of nutrients emanating from the sediments. The results from the sediment sampling will be used to evaluate the success of the restoration and help guide adaptive management decisions.

Pre-restoration preparation: Qualified staff will coordinate sampling handling procedures and select the analytical facility to perform the grain size and nutrient analyses. Qualified staff will coordinate sample container obtainment based on analytical facility needs. A sampling apparatus will be constructed to allow sampling during times of site inundation. All samples will be analyzed for grain size distribution in order to obtain the following size distribution information for each sample:

- Greater than Sand: >2.0 mm
- Sand: .05 to 2.0 mm in diameter
- Silt: .002 to 0.5 mm in diameter
- Clay: less than .002 mm in diameter
- Average size (d50) (um)

Sediment samples will also be analyzed for total nitrogen, total organic carbon and total phosphorous concentrations.

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Pre-restoration monitoring: The 4 sediment sampling transects are indicated in Table 7 and correspond with the cross-section sites. In order to eliminate variability, a minimum of 5 sediment samples will be collected at each transect, sampling distinct habitat types (bank, bar, channel thalweg, and mudflat), and should be collected to represent the variation within the cross section. Sample locations should be marked by GPS and resampled at each sampling event regardless of inundation regime. Data from the analytical laboratory should be submitted directly to the qualified staff. Sampling should continue according to the schedule in Table 7 until construction commences.

Post-restoration monitoring: Following construction, sediment sampling should ensue at the restored sites and schedule presented in Table 7.

Photographic Point Time Series

Photographic points will be established at each of the terrestrial monitoring locations depicted in Figure 16. The direction and orientation of the photographs will remain consistent throughout the pre and post monitoring program. Photographs will be taken seasonally (4 times per year) and a photograph log will be maintained to qualitatively evaluate the visual changes within the lagoon over time. Information concerning climate, sandbar conditions, stream flow discharge, tidal heights, etc, will be noted along with date and time of each site photograph.

Pre-restoration preparation: The qualified staff and selected monitoring personnel will preview the site and establish the specific direction of each photographic point at the stations indicated in Figure 16 and Table 7. The qualified staff will generate a map to indicate the specific locations and directions of the photographic points. A photo logging, labeling and storage system will be developed by the qualified staff.

Pre-restoration monitoring: The photographic points will be monitored by the same personnel who maintain the continuous water quality instruments every 30-45 days.

Post-restoration monitoring: The photographic points will be monitored by the same personnel who maintain the continuous water quality instruments every 30-45 days.

Chemical

The following parameters will be monitored by trained professionals selected by the qualified staff team. The following monitoring requires a significant amount of specialized field equipment that most aquatic and habitat qualified staffs possess or should obtain to properly perform the monitoring requirements of this plan. Table 8 provides a list of the required equipment to perform monitoring components and the estimated associated costs.

Continuous Ancillary Water Quality (Water Temperature, DO, Salinity, Conductivity, pH, ORP)

The continuous water quality monitoring provides a number of benefits to accurately assess the dynamic nature of Malibu Lagoon. Due to the cost of these instruments and the seasonal water quality dynamics of lagoon environments, it may not be prudent to have them deployed during

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rainfall/runoff events (November through March) to reduce the probability of instrument loss. The instruments should be deployed and maintained continuously each year from April up until the first significant runoff event of the season. During tidally-dominated conditions, dissolved oxygen, temperature and salinity data collection at strategic locations will identify the extent of penetration of saline, oxygenated, and cooler (oceanic) water exchange in the western arm sites at various tidal elevations and cycles. The ancillary water quality data will also provide information on the biogeochemical cycling as a function of climate and season during open conditions. Deployment during open conditions must be done considering their potential for vandalism and/or theft. They must be secured and optimally be screened from sight, and possibly maintained covertly to minimize the potential for vandalism and/or theft.

During closed conditions, measurements of dissolved oxygen, water temperature, ORP and salinity in the bottom water column will be collected over the duration of closure at 3 locations, one in the main channel and two in the western arm area. To control for inter-annual variability, data in the restored areas will be compared to the main channel conditions as well as baseline (pre-restoration) conditions at the functionally similar sites. Water temperature is an indication of solar exposure and water circulation. Minimum and daily variation of ORP and DO values are direct proxies for biogeochemical cycling and aquatic habitat conditions. DO is significantly influenced by primary production and respiration rates and will provide data regarding the seasonal and spatial magnitude of eutrophic conditions. ORP is the ability of water to oxidize or reduce. The ORP is measured in millivolts (mV), with positive values indicating an oxidizing behavior and negative values indicating a reducing behavior. When DO values get very low, the relative negativity of ORP in an aquatic environment provides insight on the magnitude of anaerobic (reducing) conditions. Frequency and duration of critical conditions such as low dissolved oxygen levels, ORP values, and elevated water temperatures will be evaluated to assess restoration performance. Measurement of surface water temperatures at the automated sites will provide maximum daily surface temperatures and be compared with bottom water temperature time series to map the degree of thermal stratification in 3 locations over time.

Pre-restoration preparation: Additional equipment is required to perform and maintain continuous monitoring equipment, including 3 YSI 600XLM data loggers shown in Figures 17 and 18 and described in Appendix B, pH/ORP probes, calibration solutions, HoBo temperature loggers and hardware for proper and secure deployment. Equipment will be purchased with the intent that State Parks will need all necessary cables, software, calibration solutions and other components to maintain the instruments on a regular basis. State Parks will need a field laptop or palm pilot to download data files on site. Qualified staff will design and install the equipment hardware within the lagoon for proper instrumentation deployment. The qualified staff will remove the equipment hardware prior to construction, and store for reinstallation following restoration activities. One or more units may remain during construction if the unit does not impact construction and may provide valuable construction water quality monitoring data. The qualified staff will train the designated staff personnel on instrument maintenance, calibration, data management and storage.

Pre-restoration monitoring: The YSI 600XLM data loggers must be removed and serviced every 30-45 days for proper operation. The HoBo temperature loggers may need to be serviced every

6 months to ensure proper operation. Following the initial training by the qualified staff, maintenance of the automated instrumentation will be the responsibility of the staff personnel.

Post-restoration monitoring: Following construction, instruments will be reinstalled in the new locations designated in Table 7 by the qualified staff. The maintenance of the instruments post-construction will remain the responsibility of the staff personnel. Data sharing from the staff to the qualified staff will follow strict procedures to ensure all data is provided electronically to the qualified staff over the course of the monitoring.

Manual Water Quality Sampling

Vertical Profiles

Bi-annual vertical profiles (0.5 foot intervals) of ancillary water quality parameters (DO, temperature, pH, salinity) at 6 sites will allow the expansion of the spatial representation of the continuous data loggers in addition to providing a QA/QC method to ground truth the continuous datasets. Turbidity will be measured with a turbidity meter. This information complements the vertical profile, nutrient and chlorophyll sampling.

Pre-restoration preparation: Qualified staff will obtain the necessary equipment to perform vertical profile measurements of DO, temperature, pH, and salinity as shown in Table 8. Field data sheets and a data management database will be developed by the qualified staff to ensure proper data maintenance and field collection.

Pre-restoration monitoring : The location and timing of vertical profile sampling is provided in Table 7. Vertical profiles should be conducted at that same time of day for each monitoring event and efforts should be made to correlate the time of day to an outgoing tide during open sandbar conditions. At each of the 6 stations, ancillary water chemistry parameters (DO, temperature, salinity, and conductivity) are collected with a hand held multi-parameter probe from a floating platform (e.g., kayak, boat, inflatable raft, paddleboard) at 0.5 foot intervals by securing a weight to the YSI probe and measuring tape-marked depths. With every vertical profile, turbidity will be measured using a turbidity meter. Data sheets should used and data should be entered into the digital database upon return to the office.

Post-restoration monitoring: The same procedures will be conducted at the restored monitoring sites indicated on Table 7.

Surface And Bottom Water Nutrient Sampling

Bi-annual surface water (1 foot below surface) and bottom water samples will be collected at the 6 vertical profile sites. Surface water samples will be analyzed for nitrogen (N) and phosphorous (P) species and chlorophyll a. Bottom water samples will be analyzed for the suite of primary nutrient only (N and P). The surface water sampling will provide a dataset to evaluate the concentrations of total and biological available fractions of nutrients required for primary production. Surface water chlorophyll data will provide an indication of the primary producer metabolic inputs from phytoplankton and algal communities.

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The establishment of the temporal and spatial sampling protocols will allow continual monitoring of the water quality benefits of future source control efforts on the nutrient conditions within the Malibu Lagoon. The collection and evaluation of bottom water nutrient levels will allow a quantification of the degree of biogeochemical cycling occurring within the lagoon and additional data regarding the magnitude of surface sediment regeneration of nutrients. The seasonal and long term nutrient data will provide invaluable information on the long-term restoration of water quality within the Malibu Lagoon.

Pre-restoration preparation: Qualified staff will obtain the necessary equipment to conduct water quality monitoring Table 8. The vertical profile data base will include nutrient and chlorophyll sampling results at each station during each monitoring effort to ensure proper data management.

Pre-restoration monitoring: Surface water nutrient sample collection will be concurrent with vertical profiles at all 6 stations indicated in Table 7. Bottles will either be purchased or obtained from the analytical laboratory. Bottles are triple-rinsed instream, surface sample collected (do not fill completely), labeled with station, date and other relevant information and put on ice immediately until filtered or delivered to the laboratory. Samples must be filtered or delivered to the laboratory within 3 hours of collection. If filtered on site, personnel should use a 0.45 μM filter, Masterflex tubing, battery operated pump, to transfer the filtered sample to a pre-rinsed 30 ml bottles (or whatever volume is recommended by the analytical facility). Filtered samples are stored in a freezer until delivery to lab. Holding times of frozen filtered samples can be up to 28 days from date of collection. Chain of custody documenting sample label, date/time collected, and sample identification will accompany samples to the laboratory. At least one field replicate will be collected during each sampling effort to quantify field sampling precision. At each sampling location bottom water samples should be collected using a Van Dorn sampler and submitted for nutrient analyses. Samples are to be filtered and stored, or placed on ice and delivered to the laboratory in the same manner as surface samples.

All water samples should be submitted to an analytical laboratory for the following analyses:

- Total dissolved organic nitrogen (TKN);
- Dissolved nitrate (NO_3^-);
- Dissolve nitrite (NO_2^-);
- Dissolved ammonia (NH_4^+);
- Total dissolved phosphorous (TP);
- Soluble reactive phosphorous (SRP).

Additional surface water samples should be collected at each site in 250 mL amber bottles and submitted for chlorophyll a concentrations. Samples should be immediately placed on ice following collection. Samples must either be submitted to the laboratory with 3 hours or collection or filtered on-site. If filtered by field personnel, all filtration should occur away from direct sunlight. Watman 0.45 μM 25mm glass microfiber filters are placed on a screen using forceps. A carefully measured amount of sample (using a graduated cylinder) is added to a

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funnel filtration system designed with a hand pump to create a vacuum and slowly pull the sample through the filter. Following filtration, the volume of sample filtered is documented and the filter is removed with forceps and placed in aluminum foil for labeling (date, time, site, volume filtered) and storage (frozen at $< 4^{\circ}\text{C}$ until analysis within 28 days).

Post-restoration monitoring: The same procedures will be conducted at the restored monitoring sites indicated on Table 7.

Biological

Biological Components

SAV/Algal Percent Cover Monitoring

Submerged aquatic vegetation (SAV) and macroalgae are to be monitored at each of the non-marsh sampling stations (anticipated to include Stations 1-6 and 8). Monitoring shall be conducted during the months of April and September of each year preceding as well as for a period of five years post restoration. Each station will be represented by three replicate 1m^2 square enclosure randomly placed within 10 meters of the station coordinates. The percent algal and SAV covers will be individually estimated at each station. Depth to surface of SAV and location of algal in water column should be noted. Samples should be collected of each species observed, properly labeled and identified.

Pre-restoration preparation: Qualified staff will prepare field data sheets and photo identification cards to be completed and used during field monitoring. Qualified staff will prepare the database format to maintain field data in digital form.

Pre-restoration monitoring: SAV/algal surveys will be conducted in the locations according to the schedule presented in Table 7.

Post-restoration monitoring: The same procedures will be conducted at the restored monitoring sites indicated on Table 7.

Habitat/Vegetation

Permanent Transect Monitoring Program

At each Site 1-9, a baseline transect will be established perpendicular to the shoreline such that it crosses the maximum vertical range beginning at or near the identified station location. Points will be established along each baseline within each habitat zone represented on the transect. At each point a 20-meter (m) fiberglass measuring tape shall be extended away from the baseline, parallel to the shoreline. Transects will be marked with PVC stakes at the beginning of the survey program and coordinates will be obtained using a Differential GPS to aid in stake relocation or replacement if necessary during the course of monitoring.

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Along each transect, the percent cover of plant species and bare ground/open water shall be recorded. Cover of individual plant species shall be recorded for each meter along the 20-meter transect, and percent cover of plant species and bare ground/open water will be determined using the line-intercept method (PERL 1990). Plants and bare ground/open water are to be recorded only if a part of the plant or bare space falls underneath the visual line of the fiberglass measuring tape. The minimum unit of intercept recorded shall be one decimeter. Often, percent cover along a transect will exceed 100% due to overlapping canopy layers.

If resources are available, soil and/or water salinity shall also be determined along each sampling transect. Soil salinity are to be estimated using a 10-centimeter (cm) soil core. Water is to be filtered from soils using a syringe containing two No. 1 filter papers. Interstitial soil water will be pressed onto a salinity refractometer and salinity will be estimated to the nearest part per thousand (ppt). If a transect occurred in an open water area, water salinity shall be measured instead with the salinity refractometer. A 200 milliliter (ml) sediment sample is to be randomly collected along each transect, transported to the laboratory, and analyzed for grain size distribution and total organic carbon (TOC).

Vegetation Mapping: Utilization of Aerial Photography and Field Truthing

In order to facilitate vegetation mapping, as well as the long-term vegetation trend analyses, color infrared (CIR) aerial photography is to be used. The photography products provide a base-map for ongoing field studies, facilitate vegetation community and habitat association classification, and allow for analysis of change in each vegetation community. The CIR photography is to be acquired during flights conducted at low tides during open lagoon conditions in the later spring months. This allows photography of as much exposed intertidal habitat as possible. The imagery is to be acquired each year or at other regular intervals (such as every five to ten years) during the same approximate seasonal and tidal conditions to allow for a comparison of any changes that occur within the lagoon and provide the basis for long-term vegetation trend analysis. The aerial imagery can be acquired as part of the aerial survey for topography/bathymetry previously discussed. Both efforts should be combined to reduce costs and maximize effectiveness.

Using the aerial photograph and field truthing, the conditions within the lagoon should be mapped in a spatially rectified and consistent coordinate system using GIS to produce year to year maps of the lagoon and to identify any progressive changes in lagoon conditions.

Benthos

Benthic surveys are to be conducted at Stations 1 through 9. Station profiles are outlined as follows in Table 6 below.

Table 6 – Benthic Survey Station Profiles

STATION	TARGET ELEVATION (FEET MSL)	DESCRIPTION
1	0 feet or lower channel bottom	Upper main lagoon
2	+1 feet or lower channel bottom	Upper slough channel
3	+2 feet	Mudflat – central bar
4	0 feet or lower channel bottom	Middle slough channel
5	+2 feet	Mudflat – western arm
6	-2 feet or lower channel bottom	Lower slough channel
7	+4 feet	Seasonally inundated marsh
8	0 feet or lower channel bottom	Lower main lagoon
9	+4 feet	Seasonally inundated marsh

Benthic sampling shall be conducted in August of each year in order to characterize communities at the most stressful period of the year. Sampling shall be undertaken annually preceding and following restoration. A differential GPS will be used to accurately locate sampling stations during each of the sampling efforts. Following restoration, it may be necessary to relocate stations slightly in order to maintain desired reference elevations and habitat type equivalency. Once station relocation is conducted, monitoring station locations should be maintained to the greatest extent practical to maintain habitat equivalency in sampling. Field crews must possess a valid California scientific collectors permit issued by the California Department of Fish & Game.

At each station, three replicate cores shall be collected along the station's sampling isobath using a large (15 cm) diameter corer pushed 15 cm into the sediment surface. An additional core shall be collected at each benthic station and shall be used for analysis of TOC, sediment grain size analysis, and TKN.

Each of the three benthic sample replicates shall be rinsed through a 1.0 mm sieve. Organisms from each sample shall be preserved in a buffered 10% formalin:seawater mixture, and transported to the laboratory. Between three and ten days, samples will be rinsed and transferred to 70% ethanol for laboratory taxonomic analysis and for long-term archival of samples. Following sample transfer to alcohol, all individuals in each replicate sample are to be identified

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to the lowest practical taxonomic level (typically species) and then counted. The occurrence of nematodes, foraminiferans, and pelagic organisms not classified as infauna or which were too small to quantify shall be noted; however, these organisms are not to be quantified. The benthic community characterization shall principally be structured to provide an indication of the relative availability and abundance of infaunal and epifaunal organisms within the various regions of the lagoon and to provide a means to evaluate community profiles using such tools as a benthic response index (BRI).

Organisms shall be grouped by phylum and weighed to determine the wet weight biomass of each phylum in each replicate sample. Wet weight is to be determined by transferring organisms, including alcohol, onto a paper towel and blotted quickly to remove excess liquid from the animals. Organisms are then to be transferred to a tared weighing dish and weighed to the nearest 0.001g using an analytical balance. Samples shall be stored in 70% alcohol for future review.

Epibenthos

Epibenthic sampling shall be conducted coincident with fish communities studies described in the following section. The epibenthic invertebrate by-catch collected in the fish-sampling program will be identified and counted to characterize changes in the distribution, composition, and abundance of these organisms within the lagoon. For species that cannot be identified in the field, collections will be made for subsequent laboratory taxonomy. A voucher collection shall be prepared for invertebrate species. Collected and archived individuals shall be preserved in a 10% formalin:seawater mixture for 3 to 10 days prior to transfer to 70% ethanol for archival.

Pre-restoration preparation: The qualified staff will prepare field instructions, data sheets and site maps for the completion of field surveys. The qualified staff shall assist the volunteer field teams in the acquisition of appropriate sampling equipment and will train field teams in equipment use. Field survey teams shall be assembled from State Parks staff or local volunteers. Those participating in the taxonomic identification must be qualified to make accurate species identifications of most of the collected organisms to avoid large volumes of laboratory work.

Pre-restoration monitoring: The qualified staff will participate in a first survey event with staff and volunteers to establish survey protocols and resolve any unforeseen data collection or recording issues. Following a first field survey, staff and volunteers will conduct further surveys and will coordinate with the qualified staff as necessary to ensure consistent data collection methods are employed. For benthic samples and unidentifiable epibenthos, preserved samples shall be preserved in formalin, transferred to alcohol, and shipped to a qualified benthic laboratory to accomplish sorting, taxonomy and biomassing tasks.

Post-restoration monitoring: Following construction, staff and volunteers will continue annual field surveys for a period of five years and shall continue to use qualified benthic laboratory support services.

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Fish Communities

Four fish sampling stations are to be established within Malibu Lagoon to characterize fish communities in all aquatic environments represented in the system. A differential GPS will be used to accurately locate sampling stations during each of the sampling efforts. Fish sampling shall be undertaken at each station during daylight hours in late summer of each year. While sampling during other periods of the year would be expected to yield potentially different fish communities, the period of greatest concern relative to potential system stress is middle summer and as such this is the period of greatest interest in evaluating effectiveness of restoration efforts and necessity for implementation of adaptive management efforts. Implementation of the fish sampling efforts requires possession of a valid California scientific collectors permit issued by the California Department of Fish & Game and a California State Parks Department special use permit. In addition, given the reasonable expectation of capturing the federally-listed tidewater goby, a federal Endangered Species Act section 10(a) permit is required to conduct fish sampling in the lagoon.

Methods:

Using at least two 6 foot by 20 foot blocking nets, set up sampling areas in a minimum of 4 locations:

1. near the mouth of the lagoon
2. at the outlet of channel C
3. along the west edge near the bird peninsula
4. upstream of the PCH bridge on the west bank

A 4 foot by 10 foot 1/8th inch mesh minnow net affixed to 2 PVC poles is pulled across the water body, with the weighted bottom of the net kept firmly along the substrate, and the net angled to prevent fish from escaping. At the end of each pull, the net is raised and all fish species are counted, sized, and released. Distances for each seine pull vary depending on the locations. In creek channels, pulls start downstream and move upstream if the channel is small enough.

In addition to documenting numbers, size class, reproductive status of individuals and their characteristics, the location of the seine, direction of pull, distance seined, habitat characteristics are also noted.

At the start of each event, water quality observations are taken, including, depth, temperature, dissolved oxygen, salinity, pH, and in the case of creek channels, flow.

If a haul includes so many fish that keeping them in the net for counting is not possible, then buckets filled with water are used to sort each species before release.

Deliverables:

1. Excel spreadsheet with all field data
2. Report providing summary of all observations and recommendations for protecting the gobies during restoration implementation.
3. Map of seine locations and goby distribution areas.

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4. Electronic copies of all materials.

Pre-restoration preparation: The qualified staff will prepare survey instructions, data sheets and site maps for the completion of field surveys. The qualified staff shall assist the volunteer or staff field teams in the acquisition of appropriate sampling equipment and will train field teams in equipment use. Field survey teams shall be assembled from State Parks staff or local volunteers.

Pre-restoration monitoring: The qualified staff will participate in a first survey event with staff and volunteers to establish survey protocols and resolve any unforeseen data collection or recording issues. Following a first field survey, staff and volunteers will conduct further surveys and will coordinate as necessary to ensure consistent data collection methods are employed.

Post-restoration monitoring: Following construction, staff and volunteers will continue field surveys for a period of five years.

Avian Communities

A qualified ornithologists shall conduct general avian surveys during the months of January, April, July, and October. If resources are available, more frequent survey should be conducted. In addition, it would be beneficial to set up a program that promotes an ongoing archive database of filed sightings. For example, Cornell Laboratory of Ornithology's "eBird" project may be used as a centralized database of Malibu Lagoon bird sightings (see www.ebird.org). It is also important to include specific breeding bird surveys such as those outlined in the Breeding Bird Atlas, standard territory mapping procedures, and Audubon/Association of Field Ornithologists "Breeding Bird Census" techniques.

For general surveys, the lagoon is to be surveyed on foot using binoculars and spotting scopes. The entire lagoon is to be broken into 4 geographic zones defined as the Western Arm, the Main Lagoon, the East Shore and the berm/beach. The lagoon is to be surveyed twice, on two consecutive days during each of the quarterly survey events to minimize the probability of missing any species that may have not been present or not observed on a particular day. Surveys typically occur in the early morning and can be completed in several hours at this site. The survey team walks the zone that they are assigned to observe. They are to use existing trails for completion of surveys and shall reverse the direction of travel between the two survey dates. Surveys during open lagoon periods shall be conducted at approximately mean sea level tidal elevations. Data collected included species and individual counts, time of day, activities of the birds (e.g., foraging, flying, resting, and courting), and habitats in which the birds occurred (open water [> 1 foot depth], shallow water [< 1 foot depth], as well as habitat represented in the existing lagoon conditions or the restored conditions such as mudflat, sand beach, gravel shoals, salt marsh, brackish marsh, cattail/tule marsh, willow riparian, upland disturbed including landscaped park areas and hardscapes, and upland scrub.

The habitats utilized shall also be categorized as open shoreline, peninsulas, islands, and open water. Additional data collected shall include any factor affecting the behavior of birds, such as an injury or the presence of a predator. Weather conditions, including air temperature, wind

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speed, wind direction, cloud cover, precipitation, and water level, shall also be recorded once each hour through the course of the surveys. A count or approximation of the number of human visitors on the beach on an hourly basis and direct disturbances should also be noted (e.g. unrestrained dogs on the beach or in the lagoon, rock-throwing children, etc.).

After each survey, the data shall be entered into a database for subsequent analyses. All habitat, behavioral, and distributional observations shall be used to analyze avian use of the lagoon environments. The average bird counts by species over the two day survey period as well as raw data shall be included in a report to evaluate avian abundance and density within the lagoon and represented habitats during the survey interval.

Pre-restoration preparation: The qualified staff will prepare survey instructions, data sheets and site maps for the completion of field surveys. Field survey teams shall be assembled from State Parks staff or local volunteers.

Pre-restoration monitoring: The qualified staff will participate in a first survey event with staff and volunteers to establish survey protocols and resolve any unforeseen data collection or recording issues. Following a first field survey, staff and/or volunteers will conduct further surveys and will coordinate with the qualified staff as necessary to ensure consistent data collection methods are employed.

Post-restoration monitoring: Following construction, staff and/or volunteers will continue a minimum of quarterly field surveys for a period of five years.

5.6 PARAMETERS EVALUATED TO FACILITATE ADAPTIVE MANAGEMENT

The Malibu Lagoon Restoration Monitoring Plan has been designed to provide a management mechanism by which to evaluate the success of the Restoration implementation with respect to the goals stated in section 5.4 and to improve specified components of Lagoon function. A robust evaluation requires consistent data collection parameters and associated techniques during existing and restored conditions to allow confident conclusions that measured differences are due to Lagoon physical, chemical and ecological improvement and not an artifact of sampling variability.

In theory, constraining all spatial and temporal variability to confidently attribute measured change to restoration efforts should be feasible, but in many instances the complexity and dynamic nature of the seasonal lagoon will leave many questions unanswered. An expansive restoration monitoring program, as the one developed herein, will provide a diverse breadth of site-specific physical, chemical and biological information to both improve our understanding of the ecological function of these complex systems, as well as providing quantitative data from which evaluations of restoration, enhancement and source control actions can be assessed well into the future.

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Specific performance criteria to observe in post-restoration monitoring are provided below. Triggers and options for adaptive management are also included where appropriate, however, adaptive management options should not be constrained to those listed below.

Goal: Improved water circulation in restored areas over existing conditions.

Specific Lagoon Performance Criterion: The restoration effort expects that a tidal and hydrologic connection will be maintained between the western arm and main channel of the Lagoon. Development of a sand bar that isolates the western arms from the main channel should be removed as soon as feasible to restore intended water circulation. Continual occurrence of sandbar formation (3 times over a 6 year period) should signal the need for adaptive management alternatives and reevaluate lagoon hydrodynamics as a result of restoration.

Adaptive management may be needed to achieve and maintain desired lagoon circulation over time. Measurements of circulation and water quality parameters will indicate if the project is functioning as desired or if modifications are needed to improve the desired effect. Signals, or triggers, to indicate the need for adaptive management can vary from open to closed conditions.

Potential triggers for adaptive management that may be observable during open conditions are if:

- The west arm main channel closes off from the main lagoon by sedimentation, and/or
- Peak tidal flow velocity drops to less than 0.25 feet per second, and/or tide range drops to 1 foot during spring tides. This value is an estimate based on adequate tidal flushing measured at other sites (Carpinteria Marsh, Talbert Marsh, and Batiquitos Lagoon), and observations made at Malibu Lagoon in the summer of 2004 (M&N, 2005).

Potential adaptive management actions for open conditions include those listed below in order of preference:

- Do nothing and allow the entire lagoon to close and fill during summer, and monitor the natural breach the following fall season to identify if the sediment deposit is scoured; or
- Manually open the closure between the west lagoon and main lagoon with either hand-held equipment or larger earthmoving equipment such as a backhoe; and/or
- Create a connection to the main creek via an alternate path to route water through the West Arms to eventually breach the barrier to the main lagoon.

Potential triggers for adaptive management than may be observable during closed conditions include if:

- Water quality data indicate significant and persistent stratification of lagoon waters (either thermally or density driven, e.g., salinity differences) and indications of depressed bottom water DO and ORP values;
- Significant areas of algal mats form and persist for many days to weeks; and
- Lagoon stagnation is obvious and areas of the surface collect algal mats, debris, and scum.

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Potential adaptive management actions for closed conditions include those listed below in order of preference:

- Create a connection to the main creek via an alternate path to route water through the West Arms; and/or
- Consider installing circulation devices to move water artificially as a last resort if watershed sources of nutrient persist and nutrient loading to the lagoon remains a problem.

Specific Lagoon Performance Criterion: Results from the hydrologic monitoring should indicate sustained sediment transport velocities to mobilize and expel fine grained sediments from the west arm sampling locations during sufficiently high flow events. Residence of mainly sand size particles in the channels of the west arm areas should be consistently observed at the sampling sites. Grain size distribution (percent sand in the sample and/or of the median grain size, D_{50}) at each sampling location should increase by 20% (based on the judgment of the qualified project ecologist/scientist) from baseline monitoring conditions. Grain size distribution in west arms should be compared to results from main channel sites and should not result in less than 80% sand relative to main channel results for the same sampling period (also as judged by the qualified project ecologist/scientist). As judged by the qualified project ecologist/scientist, adaptive management alternatives should be seriously considered if any one of the following is observed in the grain size data:

1. If any one site fails the grain size criteria above for 6 consecutive samplings (3 consecutive years);
2. If any one site in the west arm has less than 60% of the sand fraction of the main channel for 4 consecutive samplings (2 consecutive years); or
3. If the average of any transect in the west arm contains predominantly (>50%) clay and silt-sized particles ($D_{50} < 50$ micrometers, μm) for 4 consecutive sampling efforts (2 consecutive years).

Time series velocity estimates from the water budget and the cross-sectional changes over time should be evaluated in concert with the sediment grain size data to provide additional insight to the broader temporal, spatial and physical mechanisms potentially responsible for the system's circulation performance. The grain size distribution data (especially for early spring data) should be evaluated in light of the Malibu Creek hydrology and climatic conditions during the wet months of the year. Annual precipitation totals, timing and magnitude of peak stream flows and estimates of annual peak reoccurrence intervals will allow more informed comparisons of grain size distributions across various water years.

Specific Lagoon Performance Criterion: Results from continuous water quality monitoring at 3 strategic locations should indicate an increase of tidal mixing and exchange during tidally-dominated, open lagoon conditions. The degree of tidal influx on the water quality of the western arm areas should be thoroughly investigated. The time series DO, temperature, ORP and salinity data will be evaluated in concert with tidal elevation data to determine the critical tidal elevation necessary to introduce relatively nutrient poor, cooler, higher DO water to the west arm

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locations. Although that tidal elevation may change over time, the intent is to identify a threshold tidal elevation condition that could be expected to promote flushing of the western arms that can be a benchmark over time. Significant changes in this threshold elevation (*e.g.*, by 50%) may signal significant changes occurring within the lagoon system.

The magnitude and frequency of observed water quality changes as a result of flushing should be linked to tidal elevations to improve the understanding of the existing and restoration hydrologic dynamics of Malibu Lagoon. At least 12 occurrences of DO, salinity, and water temperature differences during a flushing event (transition from low to high tide) should be recorded during tidally-dominated conditions each year and compared to both main channel results (monitoring station 1) for the same time period and with comparable data (same relative tidal flux) for pre- and post-restoration conditions.

As judged by the qualified project scientist, adaptive management should be considered if data described above indicate any of the following as measured by continuous water quality monitoring during open conditions:

1. 2 consecutive years where DO values do not increase in the bottom waters by an average of 20% at high tide relative to previous low tide values (over an 8-hour period) during maximum tidal elevations over 5 feet;
2. 2 consecutive years where minimum DO concentrations are more than 50% below those observed in the main channel during the same time periods during tidally-influenced conditions;
3. 2 consecutive years where overall DO concentrations do not show at least a 20% improvement during similar flushing events at the same site during restored, relative to existing conditions;
4. 2 consecutive years where average salinity values during tidal flushing events are less than 50% of the salinity observed in the main channel; and/or
5. 2 consecutive years where average bottom water/surface water temperature differences are more than 3 times greater than the gradients observed in the main channel.

The continuous water quality data record will provide numerous other comparisons of lagoon physical and chemical function during open conditions between existing and restored conditions, as well as spatially within the restored lagoon (main channel versus west arm sites). Standardizing the data for tidal variations will improve the validity of the comparisons.

Specific Lagoon Performance Criterion: Results from continuous water quality monitoring at 3 strategic locations should indicate an increase in water exchange (*e.g.*, mixing, movement, aeration, internal turnover) during closed lagoon conditions. Time series of water quality parameters provide insight to biogeochemical conditions and function. Improvements should occur in bottom water DO and ORP levels in the restored lagoon over existing conditions, as well as reductions in surface water temperatures in the western arms due to increased wind mixing and surface water movement. Water quality during closed conditions should be evaluated by comparing the frequency and duration of minimum DO and ORP values.

Site data should be compared to both baseline conditions at the analogous sites, as well as the use of the main channel water quality data as a reference to compare to the west arm restored area. Since closed lagoon conditions are most likely to have the poorest water quality conditions due to the excessive nutrient loading from surrounding land uses, the expectations for water quality improvements during this time should be limited. In the short-term (first 3 years), a 20% improvement in the frequency, duration and magnitude of the minimum DO, minimum ORP and maximum surface water temperatures relative the main channel conditions is feasible. Over the long-term (with progressive source control improvements), more significant improvements in the Lagoon water quality is likely.

Specific Lagoon Performance Criterion: Sediment nutrient (nitrogen, N, and phosphorous, P) concentrations influence biological activity and ultimately the Lagoon water quality and ecological health. Restoration efforts are expected to increase surface sediment grain size distribution throughout the west Lagoon, thus directly reducing the supply of N and P to primary producers from the sediment reservoir. The sediment nutrient data will directly complement the grain size distribution data to assess the performance of the restoration to reduce the supply of N and P. Adaptive management should be considered if:

1. The N and P sediment concentrations at any particular site are not reduced relative to existing conditions in the mean of sediment samples from any transect in the west lagoon following 4 consecutive restored monitoring efforts (2 consecutive years); ideally reductions should approach 30% relative to existing sediment quality.

Specific Lagoon Performance Criterion: Wetland vegetation communities should attain a percent cover of native species of 50% within 3 years and 90% within 5 years of restoration, as measured at vegetated habitats during peak growing conditions (late spring/early summer) prior to summer closure. If these goals are not attained, targeted studies should be performed to determine why goals are not being met and devise adaptive management solutions to achieve goals.

Specific Lagoon Performance Criterion: The abundance and diversity of fish and wetland avian species shall not decrease following restoration. Although a short-term decrease may be expected due to construction related impacts, fish and avian species should be at commensurate pre-restoration levels within 3 years of restoration activities. If these goals are not attained, targeted studies should be performed to determine why goals are not being met and devise adaptive management solutions to achieve goals.

5.7 QUALITY ASSURANCE / QUALITY CONTROL

A quality assurance/quality control program shall be undertaken for all aspects of the investigations conducted to ensure accuracy in field data collection, laboratory analysis, and data management. This program shall include pre- and post- calibration of sampling probes, review of datasets and removal of suspect data based on *a priori* data acceptance guidelines, consistent labeling of samples in the field, archival of laboratory samples and development and use of voucher collections and chain of custody forms, adherence to holding time requirements and adopted standard protocols for performance of tests and subsampling.

Final Malibu Lagoon Restoration and Enhancement Plan
June 17, 2005

All field and laboratory results are to be recorded on pre-printed data sheets along with collection location, time, gear type, sample number, replicate, and collectors. Whenever possible, samples are to be worked up in the field or immediately after sampling. Live specimens are then to be released back to the point of capture. Representative individuals that are difficult to identify shall be transported to the laboratory and identified utilizing field guides and a dissecting microscope. In the laboratory, the investigator, date of analysis, and sample parameters are again to be recorded on hard copy data sheets. A voucher collection of fish species shall be created for future reference. A master list of species collected and photograph identification cards shall be utilized in the field to determine which species should be added to the voucher collection. If a new or unknown species is captured, it shall be transported to the laboratory where it is to be preserved, labeled (with species name, date, time, and location of collection), and added to the voucher collection.

For taxonomic laboratories, after the initial laboratory sorting, a second party shall select 10% of the samples and re-sort them for accuracy. A sample sorting efficiency of 95% of total number of individuals shall be considered acceptable for each sample. If more than 5% of the organisms in a sample is missed during the initial sorting (i.e. less than a 95% sorting efficiency), samples shall be resorted. Taxonomic verifications shall be addressed through completion of an independent review by a second taxonomist.

Computer data entry shall be verified by comparing the number of lines of data entered against the field data sheets, filtering the data for unreasonable entries to available data fields, and through conducting a number of rapid plot comparison tests, such as length:weight ratios for fish, to search for spurious outliers in the data and potential entry errors.

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TABLE 7 - Sampling Frequency and Locations

COMPONENT	DATA USE	DATA APPLICATION	FIELD PERSONNEL	PRE-RESTORATION FREQUENCY	SITES	POST RESTORATION FREQUENCY	SITES
CEQA MONITORING							
General Biological Resource Inventories (floral, fish, avian, mammalian, herpetological, entomological); Threatened and endangered species	Quantify existing project conditions to establish the project baseline for analysis of impacts from restoration	Assess pre-project conditions for environmental review and permitting	State parks staff and qualified professionals	Spring and summer seasons prior to preparation of the CEQA document and permitting	The entire lagoon south of PCH bridge	Not applicable	All 9 sites

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COMPONENT	DATA USE	DATA APPLICATION	FIELD PERSONNEL	PRE-RESTORATION FREQUENCY	SITES	POST RESTORATION FREQUENCY	SITES
RESTORATION PERFORMANCE MONITORING							
PHYSICAL COMPONENTS							
HYDROLOGIC MONITORING							
Cross-section monitoring	<ol style="list-style-type: none"> 1. Water budget calculations to evaluate tidal circulation (volume flux and velocity time series) used for water level management 2. Time series of channel stability 3. Estimates of lagoon aggradation / degradation over time (sediment quantity) 	Baseline conditions, Restored conditions Facilitate adaptive management	Biannually by qualified staff, potential to train State Parks personnel to expand sampling resolution	At least twice per year (April/Sept); potentially monthly	4 sites - Sites 2, 4, 6, 7	At least twice per year in April/Sept; potentially monthly	4 sites - Sites 2, 4, 6, 7
Water level monitoring with continuous data loggers YSI 600XLM	<ol style="list-style-type: none"> 1. Water budget calculations to evaluate tidal circulation (volume flux and velocity time series) 2. Time series of lagoon channel stability at key locations 	Baseline conditions, Restored conditions Facilitate adaptive management	Trained by qualified staff, maintained by State Parks	April - Oct (30 min intervals) Instruments removed during storm flow conditions.	3 sites Sites 1, 2, 6	April - Oct (30 min intervals)	3 sites Sites 1, 2, 6

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Velocity measurements	Manual instruments or in-situ instrumentation to calibrate velocity time series from water budget calculations	Baseline conditions, Restored conditions, model estimate calibration	Biannually by qualified staff, potential to train State Parks personnel to expand sampling resolution	At least 2x per year (April/Sept) potentially monthly	4 sites (correspond to cross-sections) Sites 2, 4, 6, 7	At least 2x per year (April/Sept)	4 sites (correspond to cross-section locations) Sites 2, 4, 6, 7
SEDIMENT QUALITY AND QUANTITY							
Sediment sampling for grain size, TOC, and TN and TP	<ol style="list-style-type: none"> 1. Grain size distribution, infer circulation conditions both pre and post restoration 2. Evaluate seasonal sediment nutrient flux 	Baseline conditions, Restored conditions Facilitate adaptive management	Bi-annually by qualified staff	2x per year April/Sept	4 sites (5 samples per transect) Sites 2, 4, 7, 8	2x per year April/Sept	4 sites (5 samples per transect) Sites 2, 4, 7, 8
Aerial Topographic Mapping	<ol style="list-style-type: none"> 3. Sedimentation patterns and volumes throughout the lagoon 	Baseline conditions, Restored conditions Facilitate adaptive management	Once every 5 to 10 years by a professional aerial survey firm	One time during low water conditions (spring)	Entire Lagoon south of Pacific Coast Highway	One time during low water conditions (spring)	Entire Lagoon south of Pacific Coast Highway

Final Malibu Lagoon Restoration and Enhancement Plan
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COMPONENT	DATA USE	DATA APPLICATION	FIELD PERSONNEL	PRE-RESTORATION FREQUENCY	SITES	POST RESTORATION FREQUENCY	SITES
CHEMICAL COMPONENTS							
WATER QUALITY							
Water level monitoring. Continuous data loggers YSI 600XLM	<ol style="list-style-type: none"> 1. Daily and seasonal, min, max and variations (frequency, duration) of key water quality parameters (DO, water temp, ORP, pH and salinity). 2. Evaluate restoration impact on water quality conditions in very chemically dynamic system. 3. Tidal circulation. Daily and seasonal variations in dissolved oxygen, water temperature, salinity, pH, ORP as influenced by tidal cycles. 4. Closed lagoon water quality 	Baseline conditions, Restored conditions Facilitate adaptive management	Trained by qualified staff, maintained by State Parks	April - Oct (30 min intervals)	3 sites Sites 1, 2, 6	April - Oct (30 min intervals)	3 sites Sites 1, 2, 6

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Vertical Profiles (Ancillary parameters)	<ol style="list-style-type: none"> Expand the spatial (vertical in water column and horizontally throughout lagoon) representation of continuous water quality data. Calibration of continuous monitoring equipment 	Baseline conditions, Restored conditions Facilitate adaptive management	Bi-annually by qualified staff	2x per year April/Sept	6 sites Sites 1, 2, 4, 6, 7, 8	2x per year April/Sept	6 sites Sites 1, 2, 4, 6, 7, 8
Nutrient sampling Surface and bottom water samples: TKN TP Dissolved species include: Nitrate Nitrite Ammonia Soluble reactive phosphorous	<ol style="list-style-type: none"> Evaluate the degree and extent of biogeochemical nutrient cycling occurring in Malibu Lagoon, pre and post restoration. Begin a standardized long-term primary nutrient monitoring effort of specific constituents (N and P) for future watershed source control efforts. 	Baseline conditions, Restored conditions. Establish long-term nutrient monitoring in lagoon (key components of long-term water quality)	Bi-annually by qualified staff	2x per year April/Sept	6 sites Sites 1, 2, 4, 6, 7, 8	2x per year April/Sept	6 sites Sites 1, 2, 4, 6, 7, 8

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Chlorophyll sampling	<ol style="list-style-type: none"> Evaluate primary productivity contribution of phytoplankton Begin a standardized long-term chlorophyll monitoring effort to evaluate success of future watershed source control efforts. 	Baseline conditions, Restored conditions. Establish long-term nutrient monitoring in lagoon (key components of long-term water quality)	Bi-annually by qualified staff	2x per year April/Sept	6 sites Sites 1, 2, 4, 6, 7, 8	2x per year April/Sept	6 sites Sites 1, 2, 4, 6, 7, 8
Surface water temperature monitoring (HoBo data loggers)	Tidal and closed lagoon circulation. <ol style="list-style-type: none"> Daily and seasonal variations in surface water temperature as influence by local climate Time series of spatial lagoon differences in vertical water temperature gradients.	Baseline conditions, Restored conditions Facilitate adaptive management	Trained by qualified staff, maintained by State Parks	April - Oct (30 min intervals)	3 sites Sites 1, 2, 6	April - Oct (30 min intervals)	3 sites Sites 1, 2, 6

Final Malibu Lagoon Restoration and Enhancement Plan
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COMPONENT	DATA USE	DATA APPLICATION	FIELD PERSONNEL	PRE-RESTORATION FREQUENCY	SITES	POST RESTORATION FREQUENCY	SITES
BIOLOGICAL COMPONENTS							
SAV and Algal surveys	1. Mapping of seasonal and pre/post restoration distribution and species of fixed primary producer community 2. Evaluate quantitative changes in the coverage and biomass of SAV and algae during spring and mid-summer conditions	Baseline conditions, Restored conditions. Evaluate restoration success.	Bi-annually by qualified staff	2x per year April/Sept each year prior to restoration	7 sites Sites 1, 2, 3, 4, 5, 6, 8	2x per year April/Sept for the first 5 years following restoration	7 sites Sites 1, 2, 3, 4, 5, 6, 8

Final Malibu Lagoon Restoration and Enhancement Plan
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Vegetation/ habitat surveys	<ol style="list-style-type: none"> 1. General survey of lagoon habitats to map habitat changes and record any unexpected or undesirable changes such as erosion or sedimentation zones. 2. Transect surveys along established transects to track vegetation change within each target habitat type. 3. Mapping using aerial photography with color infrared imagery 	Baseline conditions, Restored conditions. Evaluate restoration success.	Annually by qualified staff	1 time per year during open lagoon conditions	Lagoon-wide habitat mapping with transect surveys performed at 9 sites Sites 1-9 in adjacent vegetated areas	1 time per year during open lagoon conditions for a period of 5 years following restoration	Lagoon-wide habitat mapping with transect surveys performed at 9 sites Sites 1-9 in adjacent vegetated areas
Benthos	Replicated cores taken at monitoring sites throughout the lagoon to track changes in benthic infauna from pre- to post-restoration	Baseline conditions, Restored conditions. Evaluate restoration success.	Annually by staff and/or volunteers with external taxonomic lab. services	1 time per year during September	Sites 1-9 in adjacent vegetated areas	1 time per year during September for a period of 5 years following restoration	Sites 1-9 in adjacent vegetated areas
Fish and Epibenthos	Replicated beach seine sampling at submerged stations throughout the lagoon to track changes in fish and epibenthos diversity, abundance, and distribution patterns pre- to post-restoration	Baseline conditions, Restored conditions. Evaluate restoration success.	Annually by staff and/or volunteers with external taxonomic lab. support as necessary	1 time per year during September	5 sites Sites 1, 2, 4, 6, and 8	1 time per year during September for a period of 5 years following restoration	5 sites Sites 1, 2, 4, 6, and 8

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Avian	Two day quarterly surveys of lagoon avifauna focusing on bird use of represented habitat areas.	Baseline conditions, Restored conditions. Evaluate restoration success.	Quarterly by staff/and or volunteers (or monthly with use of volunteer database)	Surveys conducted in January, April, July, and October	Lagoon-wide	Surveys conducted in January, April, July, and October for a period of 5 years following restoration	Lagoon-wide
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Final Malibu Lagoon Restoration and Enhancement Plan
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The most cost-effective and reliable monitoring program will rely primarily on seasonal sampling by the qualified staff or hired professionals. Hired professionals may own much of the field and additional monitoring equipment necessary to perform all aspects of the bi-annual monitoring components, which would be a significant cost savings for the project to not have to equip State Parks with extensive monitoring equipment. Hired professionals may also be appropriate to perform more specialized sampling efforts that include biannual vertical profiles, nutrient, chlorophyll, and phytoplankton sampling, sediment sampling and biological components. This monitoring approach would allow State Parks to participate in key elements of data collection, yet ensure detailed monitoring data is consistently collected from well-trained field professionals.

Table 8 – Necessary Monitoring Equipment Summary and Estimated Costs

EQUIPMENT	AMOUNT NEEDED	ESTIMATED PURCHASE COST
Stadia Rod	1	\$175
Survey tape	1	\$75
Velocity meter	1	\$11,000 (possible rental)
Station monument hardware	1	\$350
YSI 600XLM (includes cables, software pH, ORP probes)	3	\$13,000
HoBo Temperature Loggers	3	\$250
Installation Hardware	3	\$300
Calibration solutions (YSI)	pH, ORP, conductivity standards	\$250
AA Batteries	Many (4 per YSI, changed every 30 days)	\$175/yr
Van Doren bottom water sampler	1	\$200
Sediment and water sample bottles	100	\$200 (may be supplied by laboratory)
Hand Held YSI 85	1	\$1,500 (possible rental)

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EQUIPMENT	AMOUNT NEEDED	ESTIMATED PURCHASE COST
Secchi Disk	1	\$60
Digital Scales (0-10,000 g)	1	\$180
Square Enclosure	1	\$120
100 m tape	1	\$70
1m2 quadrat	1	\$40
Color infrared imagery for vegetation mapping	Short-term: Once pre- restoration, Long-term: Every 5 to 10 years post- restoration	\$5,000 per event
Analytical Balance	1	\$4300
Benthic Corer	1	\$40
1.0mm sieves	1	\$200
Large beach seine	1	\$250
Small beach seine	1	\$140
Digital Scale (0.01g – 100g)	1	\$220
Digital Scale (1.0g – 1000g)	1	\$160
Spotting Scope	1	\$300
Binoculars	1	\$300
Boat/kayak, anchor, paddles	1	\$350
Hip Waders	2	\$200
Field Laptop or Palm Pilot	1	\$1500
Digital Camera	1	\$250

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ANALYTICAL NEEDS			
CONSTITUENT	PRICE PER SAMPLE	PROJECT SAMPLE NEED/YR	ANNUAL COST
Nutrient analyses (water)	\$100	28	\$3240
Chlorophyll a analyses	\$30	15	\$450
Sediment grain size analyses	\$100	24	\$1200
Aerial Topography	\$20,000; \$10,000 for survey, and \$5,000 for analysis of quantities	Immediate Pre-, Post Restoration; Every 5 to 10 years for the long-term for the data acquisition and analysis	\$30,000 for both pre- and post-restoration images; \$1,000 to \$2,000 per year for the long-term
Nutrient analyses (sediments)	\$60	24	\$1400
Phytoplankton taxonomist	\$100	12	\$1200
Benthic sorting and taxonomy	\$420	27	\$11,340
Consumable lab chemicals/supplies/disposal	\$8.50	64	\$544

6.0 REFERENCES

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Appendix B

**NOTICE OF AVAILABILITY,
NOTICE OF PREPARATION (NOP), AND
NOP COMMENT LETTERS**



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

**NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE
PROPOSED MALIBU LAGOON RESTORATION AND ENHANCEMENT PLAN**

ORIGINAL FILED

Date: January 20, 2006

JAN 20 2006

To: All Interested Parties

The California Department of Parks and Recreation (DPR) has prepared a Draft Environmental Impact Report (EIR) for the proposed project, in compliance with the California Environmental Quality Act (CEQA) and State CEQA Guidelines. DPR is the lead agency for the proposed project under CEQA.

PROJECT LOCATION: Malibu Lagoon is a 31-acre shallow water embayment located within Malibu Lagoon State Beach at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay. Malibu Lagoon empties into the Pacific Ocean at Malibu Surfrider Beach and is generally located south of the intersection of Pacific Coast Highway and Cross Creek Road in the City of Malibu. The project site is not located on any lists of hazardous sites enumerated under Section 65962.5 of the Government Code.

DESCRIPTION OF THE PROPOSED PROJECT: The Malibu Lagoon Restoration and Enhancement Plan (Plan) presents a comprehensive and adaptive management approach to restore and enhance the ecological structure and function of Malibu Lagoon, improve lagoon and coastal water quality, and enhance visitors' experience through improvements to access and interpretive displays. The Plan includes a water management component, a habitat and access plan, and a comprehensive long-term monitoring plan to ensure restoration goals are being achieved. The Plan was selected out of a range of alternatives for its ability to achieve restoration goals while minimizing short-term impacts to the existing system.

The restoration goals for the lagoon consist of: increased tidal flushing; improved water circulation; improved coastal water quality; increased holding capacity; reduced predator encroachment; restoration of typical salt marsh hydrology; increased wildlife habitat; creation of a nesting island for least terns and western snowy plovers; creation of channel connections to the lagoon; and integration of public access with habitat protection.

Major physical components of the Plan consist of: a relocated parking lot and staging area; implementation of Best Management Practices to minimize impacts of storm water runoff; slope improvements to the western edge of the lagoon; improvements to the existing boat house channel; and the creation of a new channel along the southern edge of the west lagoon.

LIKELY ENVIRONMENTAL EFFECTS: The proposed project is anticipated to result in impacts to biological resources, cultural resources, hydrology and water quality, and construction noise. Of these, only construction noise is estimated to remain significant after implementation of mitigation measures prescribed in the Draft EIR.

PUBLIC REVIEW PERIOD: The Draft EIR is being circulated for public review and comment for a period of 45 days, beginning January 20, 2006. Written comments on the Draft EIR should be mailed/faxed or e-mailed (with a contact name and mailing address) to Suzanne Goode at 1925 Las Virgenes Road, Calabasas, California, 91302. Fax: (818) 880-6165. E-mail: sgood@parks.ca.gov E-mails must include the project name, **Malibu Lagoon Restoration**, in the subject line and include contact information. Your views and comments on the Draft EIR are welcomed and encouraged. Written comments must be received no later than March 06, 2006.

Copies of the Draft EIR are available for review at the following locations during normal business hours:

California Department of Parks & Recreation
Angeles District Headquarters
1925 Las Virgenes Road
Calabasas, CA 91302

Malibu Library
23519 Civic Center Way
Malibu, CA 90265

Malibu City Hall
23555 Civic Center Way
Malibu, CA 90265

**State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION**



NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

Malibu Lagoon State Beach

PROJECT: Malibu Lagoon Restoration and Enhancement Plan

The California Department of Parks and Recreation is the Lead Agency under the requirements of the California Environmental Quality Act (CEQA) and is considering the preparation of an Environmental Impact Report (EIR) for the project identified above. We would like to know your views as to the scope and content of the EIR.

PROJECT LOCATION

Malibu Lagoon is a 31-acre shallow water embayment located within Malibu Lagoon State Beach at the terminus of the Malibu Creek Watershed, the second largest watershed draining into Santa Monica Bay. The project is generally located at Pacific Coast Highway and Cross Creek Road in the city of Malibu.

BACKGROUND

Urban encroachment has significantly altered the physical configuration of Malibu Lagoon, which now occupies a much smaller portion of its historic area. A significant portion of the once low-lying tidally-influenced areas near the mouth of Malibu Creek were filled in the 1940s and 1950s, and by the late 1970s, this area was completely filled and developed with two baseball fields. Urbanization upstream in the Malibu Creek Watershed has increased the volume of water transported into the lagoon, and urban pollution has significantly diminished the quality of transported water through inputs of nutrients, sediments, and pollutants. Despite restoration efforts over the last two decades, the ecosystem of Malibu Lagoon remains degraded. Recent studies identified impacts to the ecological health and water quality in the lower creek and lagoon ecosystems.

PROJECT DESCRIPTION

The Malibu Lagoon Restoration and Enhancement Plan (Plan) presents a comprehensive and adaptive management approach to restore and enhance the ecological structure and function of Malibu Lagoon, as well as to enhance visitors' experience through improvements to access and interpretation. The objective of the Plan is to restore the biological and physical functions of the lagoon to improve lagoon and coastal water quality, including management of water, habitat and access, while minimizing impacts to the existing system. The restoration goals for the lagoon consist of increased tidal flushing, improved water circulation, improved coastal water quality, increased holding capacity, reduced predator encroachment, restoration of typical salt marsh hydrology, increased wildlife habitat, creation of a nesting island for least terns and western snowy plovers, creation of channel connections to the lagoon, and integration of public access with habitat protection. Major components of the Plan consist of a relocated parking lot and

staging area, implementation of Best Management Practices to minimize impacts of storm water runoff, slope improvements to the western edge of the lagoon, improvements to the existing boat house channel and the creation of a new channel along the southern edge of the west lagoon. A comprehensive monitoring plan will be implemented throughout the project to ensure that Plan objectives are met and adverse impacts are avoided.

POTENTIAL ENVIRONMENTAL EFFECTS

Potential environmental effects are anticipated in the following categories: Biological Resources, Cultural Resources, Hydrology and Water Quality, and Construction Effects. An Initial Study was not prepared for this project, as preliminary review of the project scope indicated the necessity to prepare an EIR. Therefore, all other topics included in the CEQA Initial Study Checklist will be analyzed in the Draft EIR.

HOW TO COMMENT

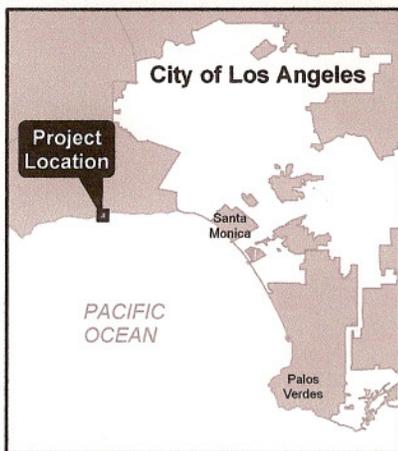
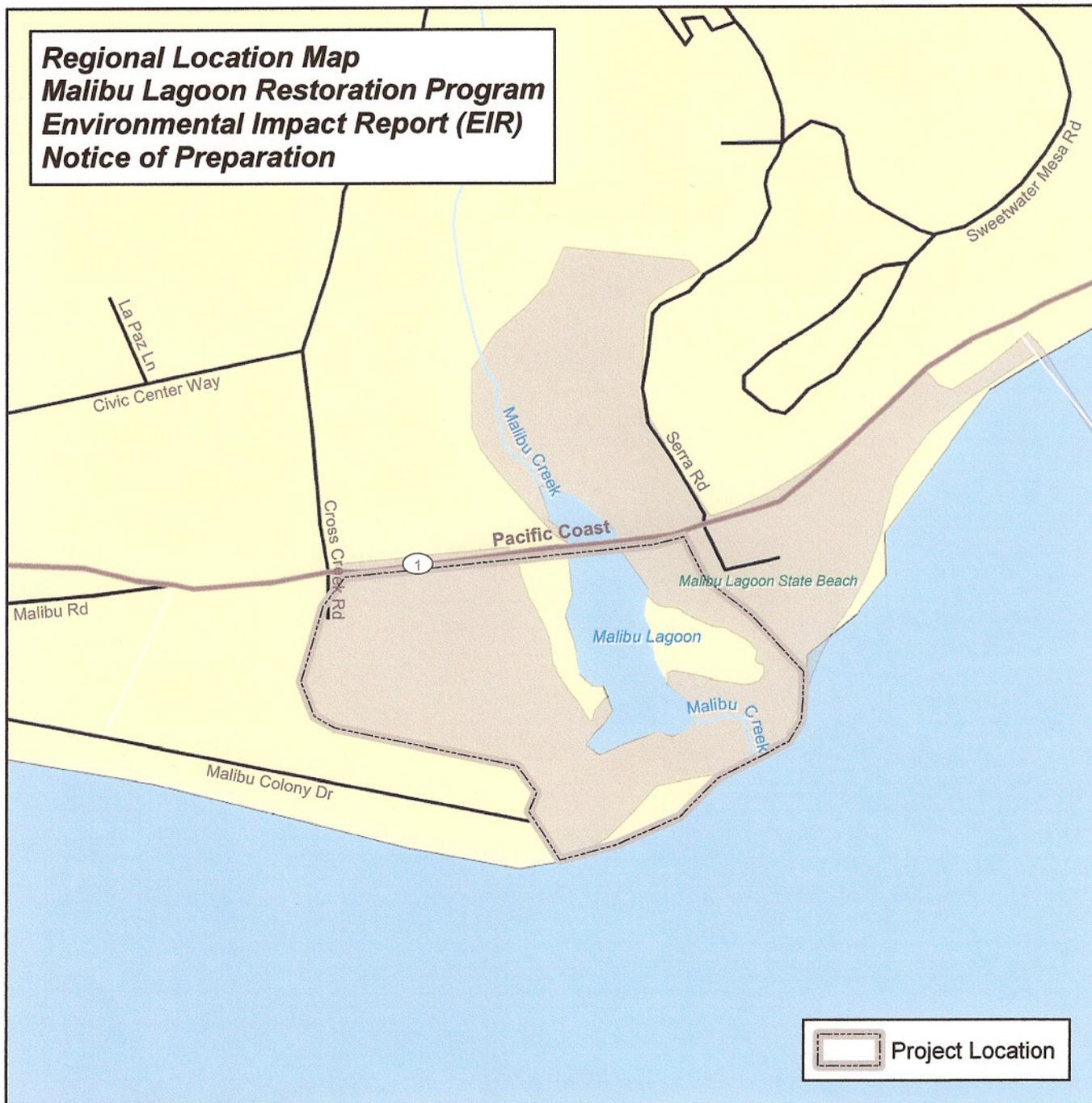
Due to time limits mandated by state law, response to this NOP must be received within 30 days of publication of this notice. The public comment period begins October 28, 2005 and extends through November 30, 2005. Please send written responses to:

Suzanne Goode

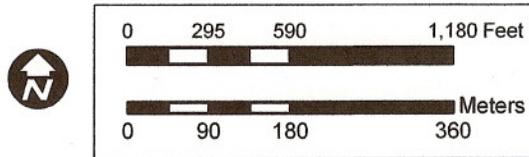
California Department of Recreation and Parks
1925 Las Virgenes Road
Calabasas, California, 91302

A public scoping meeting will be held on November 16, 2005 from 6 p.m. to 8 p.m. at Malibu City Hall located at 23815 Stuart Ranch Road, Malibu California.

The Draft EIR is scheduled for availability in December 2005. When completed, a notice will be published to alert the public of the availability of the Draft EIR and indicate where copies are available for review and how to comment.



Sources: Copyright 2003 GDT, Inc. and its licensors, Rel. 10/2003; U.S. Census Bureau TIGER Data, 2000; Jones & Stokes, 2005.





NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

PROJECT: Malibu Lagoon Restoration and Enhancement Plan

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NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

**PROJECT: Malibu Lagoon Restoration and Enhancement Plan**

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Urban encroachment has significantly altered the physical configuration of Malibu Lagoon, which now occupies a much smaller portion of its historic area. A significant portion of the once low-lying tidally-influenced areas near the mouth of Malibu Creek were filled in the 1940s and 1950s, and by the late 1970s, this area was completely filled and developed with two baseball fields. Urbanization upstream in the Malibu Creek Watershed has increased the volume of water transported into the lagoon, and urban pollution has significantly diminished the quality of transported water through inputs of nutrients, sediments, and pollutants. Despite restoration efforts over the last two decades, the ecosystem of Malibu Lagoon remains degraded. Recent studies identified impacts to the ecological health and water quality in the lower creek and lagoon ecosystems.

PROJECT DESCRIPTION

The Malibu Lagoon Restoration and Enhancement Plan (Plan) presents a comprehensive and adaptive management approach to restore and enhance the ecological structure and function of Malibu Lagoon, as well as to enhance visitors' experience through improvements to access and interpretation. The objective of the Plan is to restore the biological and physical functions of the lagoon to improve lagoon and coastal water quality, including management of water, habitat and access, while minimizing impacts to the existing system. The restoration goals for the lagoon consist of increased tidal flushing, improved water circulation, improved coastal water quality, increased holding capacity, reduced predator encroachment, restoration of typical salt marsh hydrology, increased wildlife habitat, creation of a nesting island for least terns and western snowy plovers, creation of channel connections to the lagoon, and integration of public access with habitat protection. Major components of the Plan consist of a relocated parking lot and staging area, implementation of Best Management Practices to minimize impacts of storm water runoff, slope improvements to the western edge of the lagoon, improvements to the existing boat house channel and the creation of a new channel along the southern edge of the west lagoon. A comprehensive monitoring plan will be implemented throughout the project to ensure that Plan objectives are met and adverse impacts are avoided.

POTENTIAL ENVIRONMENTAL EFFECTS

Potential environmental effects are anticipated in the following categories: Biological Resources, Cultural Resources, Hydrology and Water Quality, and Construction Effects. An Initial Study was not prepared for this project, as preliminary review of the project scope indicated the necessity to prepare an EIR. Therefore, all other topics included in the CEQA Initial Study Checklist will be analyzed in the Draft EIR.

HOW TO COMMENT

Due to time limits mandated by state law, response to this NOP must be received within 30 days of publication of this notice. The public comment period begins October 28, 2005 and extends through November 30, 2005. Please send written responses to:

Suzanne Goode
California Department of Recreation and Parks
1925 Las Virgenes Road
Calabasas, California, 91302

A public scoping meeting will be held on November 16, 2005 from 6 p.m. to 8 p.m. at Malibu City Hall located at 23815 Stuart Ranch Road, Malibu California.

The Draft EIR is scheduled for availability in December 2005. When completed, a notice will be published to alert the public of the availability of the Draft EIR and indicate where copies are available for review and how to comment.

Publish Date: October 27, 2005

State of California - The Resources Agency

ARNOLD SCHWARZENEGGER, *Governor***DEPARTMENT OF FISH AND GAME**<http://www.dfg.ca.gov>

South Coast Region

4949 Viewridge Avenue

San Diego, CA 92123

(858) 467-4201

**RECEIVED ON**NOV 15 2005 *Q*

November 7, 2005

*California State Parks
Angeles District*

Ms. Suzanne Goode
 Californial Department of Recreation and Parks
 1925 Las Virgenes Road
 Calabasas, California 91302

**Notice of Preparation of a Draft Environmental Impact Report for
 Malibu Lagoon Restoration and Enhancement Plan
 SCH# 20051011123, Los Angeles County**

Dear Ms. Goode:

The Department of Fish and Game (Department) has reviewed the above-referenced Notice of Preparation (NOP), relative to impacts to biological resources. The proposed project consists of the restoration and enhancement of the ecological structure and function of Malibu Lagoon located at the terminus of the Malibu Creek Watershed in the City of Malibu.

To enable Department staff to adequately review and comment on the proposed project we recommend the following information, where applicable, be included in the Draft Environmental Impact Report:

1. A complete, recent assessment of flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats.
 - a. A thorough recent assessment of rare plants and rare natural communities, following the Department's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities.
 - b. A complete, recent assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Recent, focused, species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and U.S. Fish and Wildlife Service.
 - c. Rare, threatened, and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380).

Suzanne Goode
November 7, 2005
Page 2

- d. The Department's Wildlife Habitat Data Analysis Branch in Sacramento should be contacted at (916) 322-2493 to obtain current information on any previously reported sensitive species and habitats, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code. Also, any Significant Ecological Areas (SEAs) or Environmentally Sensitive Habitats (ESHs) or any areas that are considered sensitive by the local jurisdiction that are located in or adjacent to the project area must be addressed.
2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts. This discussion should focus on maximizing avoidance, and minimizing impacts.
 - a. CEQA Guidelines, Section 15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region.
 - b. Project impacts should also be analyzed relative to their effects on off-site habitats and populations. Specifically, this should include nearby public lands, open space, adjacent natural habitats, and riparian ecosystems. Impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas, should be fully evaluated and provided. The analysis should also include a discussion of the potential for impacts resulting from such effects as increased vehicle traffic and outdoor artificial lighting.
 - c. A cumulative effects analysis should be developed as described under CEQA Guidelines, Section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.
 - d. Impacts to migratory wildlife affected by the project should be fully evaluated including proposals to removal/disturb native and ornamental landscaping and other nesting habitat for native birds. Impact evaluation may also include such elements as migratory butterfly roost sites and neo-tropical bird and waterfowl stop-over and staging sites. All migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of birds and their active nests, including raptors and other migratory nongame birds as listed under the MBTA.
 - e. Impacts to all habitats from City or County required Fuel Modification Zones (FMZ). Areas slated as mitigation for loss of habitat shall not occur within the FMZ.
 - f. Proposed project activities (including disturbances to vegetation) should take place outside of the breeding bird season (February 1- September 1) to avoid take (including disturbances which would cause abandonment of active nests containing eggs and/or young). If project activities cannot avoid the breeding bird season, nest surveys should be conducted and active nests should be avoided and provided with a minimum buffer as determined by a biological monitor (the Department recommends a minimum 500-foot buffer for all active raptor nests).
 3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated. A range of alternatives which avoid or

Suzanne Goode
November 7, 2005
Page 3

otherwise minimize impacts to sensitive biological resources including wetlands/riparian habitats, alluvial scrub, coastal sage scrub, Joshua tree woodlands, etc. should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.

- a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Compensation for unavoidable impacts through acquisition and protection of high quality habitat elsewhere should be addressed with offsite mitigation locations clearly identified.
 - b. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts.
 - c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.
4. A California Endangered Species Act (CESA) Permit must be obtained, if the project has the potential to result in "take" of species of plants or animals listed under CESA, either during construction or over the life of the project. CESA Permits are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to the proposed project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested:
- a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.
 - b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.
5. The Department opposes the elimination of watercourses (including concrete channels) and/or the canalization of natural and manmade drainages or conversion to subsurface drains. All wetlands and watercourses, whether intermittent, ephemeral, or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic habitat values and maintain their value to on-site and off-site wildlife populations. **The Department recommends a minimum natural buffer of 100 feet from the outside edge of the riparian zone on each side of a drainage.**
- a. The Department requires a Streambed Alteration Agreement (SAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant prior to any direct or indirect impact to a lake or stream bed, bank or channel or associated riparian resources. The Department's issuance of a SAA may be a project that is subject to CEQA. To facilitate our issuance of the Agreement when CEQA applies, the

Suzanne Goode
November 7, 2005
Page 4

Department as a responsible agency under CEQA may consider the local jurisdiction's (lead agency) document for the project. To minimize additional requirements by the Department under CEQA the document should fully identify the potential impacts to the lake, stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the Agreement. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources.

Thank you for this opportunity to provide comment. Please contact Mr. Scott Harris, Wildlife Biologist, at (626) 797-3170 if you should have any questions and for further coordination on the proposed project.

Sincerely,



Morgan Wehtje
Environmental Scientist IV

cc: Ms. Morgan Wehtje, Camarillo
Mr. Scott Harris, Pasadena
Mr. Ronnie Glick, Thousand Oaks
Mr. Maurice Cardenas, Ojai
HCP-Chron
Department of Fish and Game

State Clearinghouse, Sacramento

SPH:sph

Malibu Lagoon Restoration Plan 2005

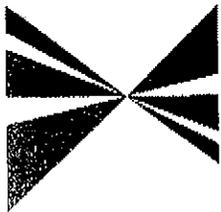
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November 15, 2005

NOV 16 2005

*California State Parks
Angeles District*

SOUTHERN CALIFORNIA

**ASSOCIATION of
GOVERNMENTS****Main Office**818 West Seventh Street
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Los Angeles, California
90017-3435

(213) 236-1800

(213) 236-1825

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• Alan Wagner, OntarioVentura County: Judy Mikels, Ventura County •
Glen Becerra, Simi Valley • Carl Morehouse, San
Buena Ventura • Paul Young, Port HuacamaOrange County Transportation Authority: Lou
Corra, County of OrangeRiverside County Transportation Commission:
Robin Lowe, HemetVentura County Transportation Commission:
Kelli Millhouse, MoorparkMs. Suzanne Goode
Department of Parks and Recreation
1925 Las Virgenes Road
Calabasas, CA 91302**RE: SCAG Clearinghouse No. I 20050700 Malibu Lagoon Restoration and
Enhancement Plan**

Dear Ms. Goode:

Thank you for submitting the **Malibu Lagoon Restoration and Enhancement Plan** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **Malibu Lagoon Restoration and Enhancement Plan**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **October 1-31, 2005 Intergovernmental Review Clearinghouse Report** for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1851. Thank you.

Sincerely,

BRIAN WALLACE
Associate Regional Planner
Intergovernmental Review

Doc #115891

1965 2005
40th Anniversary
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
Challengers

DEPARTMENT OF TRANSPORTATION

DISTRICT 7, REGIONAL PLANNING

IGR/CEQA BRANCH

100 SOUTH MAIN STREET

LOS ANGELES, CA 90012-3606

PHONE (213) 897-3747

FAX (213) 897-1337



*Flex your power!
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November 17, 2005

Ms. Suzanne Goode
California State Department of Parks and Recreation
1925 Las Virgenes Road
Calabasas, CA 91302

Malibu Lagoon Restoration and Enhancement Plan
Notice of Preparation (NOP) of Environmental
Impact Report SCH Number 2005101123
Vicinity LOS/1/46-47 IGR/CEQA # 051112/EK

Dear Ms. Goode:

We have received the CEQA Notice of Preparation, for the project referenced above right. The proposed project is to restore biological and physical functions of the Malibu Lagoon. For the California State Department of Transportation (Caltrans), we have the following comments.

The proposed project is adjacent to the State transportation facilities. Therefore we request that the project not result in any modification of water flow affecting Malibu Creek or Lagoon that would affect stability of the foundations of the SR-1 Pacific Coast Highway or its nearby bridge over the Lagoon. We further ask that any operations on its right-of-way or boundaries not adversely affect the operation of the State Highway. Please note that an Encroachment Permit is needed for any kind of encroachment (or effect) into, on, over or under State right-of-way, permanent or temporary. Should operations or effects on State right-of way be involved, you need to initiate contact with the District Seven Permits Office at the earliest appropriate time, to submit plans so that the Office could determine if a Permit is needed.

Regarding construction, we give this reminder, that transportation of special construction equipment and/or materials, which requires the use of oversized-transport vehicles on State highways would require a Caltrans Transportation Permit. We ask that the applicant avoid excessive or poorly timed truck platooning (caravans of trucks), even on a particular day when many truck trips per day to or from a location might be desirable. Since the project is adjacent to the State Highway, particular care in this regard is needed.

If you have any questions regarding our comments, refer to our internal IGR/CEQA Record Number 051112/EK; and please do not hesitate to contact our review coordinator Edwin Kampmann at (213) 897-1346 or to contact me at (213) 897-3747.

Sincerely,

CHERYL J. POWELL
IGR/CEQA Program Manager

cc: Mr. Scott Morgan, State Clearinghouse

"Caltrans improves mobility across California"



DEPARTMENT OF THE ARMY
 LOS ANGELES DISTRICT, CORPS OF ENGINEERS
 P.O BOX 532711
 LOS ANGELES, CALIFORNIA 90053-2325

REPLY TO
 ATTENTION OF:

November 30, 2005

Office of the Chief
 Regulatory Branch

RECEIVED ON

DEC 02 2005

*California State Parks
 Angeles District*

Suzanne Goode
 California Department of Parks and Recreation
 1925 Las Virgenes Road
 Calabasas, California 91302

Dear Ms. Goode:

This comment letter is in response to the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Malibu Lagoon Restoration and Enhancement Plan (Plan), proposed for Malibu Lagoon in the City of Malibu, Los Angeles County, California. As you know, the Corps assisted in pre-project planning as a member of the technical advisory committee. Based on our review of the NOP and the Plan, it appears that the proposed restoration activities would require a U.S. Army Corps of Engineers permit.

A Corps of Engineers permit is required for:

1. structures or work in or affecting "navigable waters of the United States" pursuant to Section 10 of the River and Harbor Act of 1899. Examples include, but are not limited to,
 - a. constructing a pier, revetment, bulkhead, jetty, aid to navigation, artificial reef or island, and any structures to be placed under or over a navigable water;
 - b. dredging, dredge disposal, filling and excavation;
2. the discharge of dredged or fill material into, including any redeposit of dredged material within, "waters of the United States" and adjacent wetlands pursuant to Section 404 of the Clean Water Act of 1972. Examples include, but are not limited to,
 - a. creating fills for residential or commercial development, placing bank protection, temporary or permanent stockpiling of excavated material, building road crossings, backfilling for utility line crossings and constructing outfall structures, dams, levees, groins, weirs, or other structures;
 - b. mechanized land clearing, grading which involves filling low areas or land leveling, ditching, channelizing and other excavation activities that would have the effect of destroying or degrading waters of the United States;

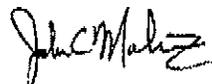
-2-

- c. allowing runoff or overflow from a contained land or water disposal area to re-enter a water of the United States;
 - d. placing pilings when such placement has or would have the effect of a discharge of fill material; or
3. any combination of the above.

To facilitate Corps review and analysis of the proposed project, the EIR should include a delineation of Corps jurisdiction throughout the entire project site demarcating both wetlands and non-wetland waters of the United States. The EIR should include an alternatives analysis consistent with requirements of the Section 404(b) (1) Guidelines [40 CFR Part 230] as well as an analysis of cumulative impacts within the Malibu Creek Watershed including the potential removal of Rindge Dam. Based on our review of the Plan, the Corps' scope of analysis will include the entire project site. Thus, analysis of potential effects to endangered species, critical habitat, and cultural and historical resources should include the entire project site. The EIR should address temporary, construction-related impacts as well as long-term impacts expected to result from the proposed project through a sequenced approach of avoidance, minimization, and compensation for unavoidable impacts.

Should you have any questions about this letter, please contact me at (805) 585-2146. Please refer to this letter and 200500120-JCM in your reply.

Sincerely,



Jack Malone, Ph.D
Regulatory Branch
Los Angeles District

Bob Stark

From: Marcia Hanscom [wetlandact@earthlink.net]
Sent: Wednesday, November 30, 2005 8:12 AM
To: Suzanne Goode
Cc: Mark Abramson; Marcia Hanscom
Subject: re: NOP comments

Dear Suzanne,

For the current NOP process for the Malibu Lagoon restoration proposal, please include the comments we submitted in writing in response at the public meeting held in Malibu where the final plan for the Malibu Lagoon restoration effort was presented by Moffat & Nichols and Heal the Bay. There are numerous substantive and specific comments in that letter from CLEAN and Wetlands Action Network which address issues that ought to be considered when determining the scope of the Environmental Impact Report (EIR.)

Should you need me to fax you over another copy of this letter, please provide me with your fax number.

Thank you.

Sincerely,
Marcia Hanscom
Executive Director
Wetlands Action Network

protecting & restoring wetlands
along the Pacific Migratory Pathways

&

Managing Director
CLEAN - Coastal Law Enforcement Action Network

322 Culver Blvd., # 317
Playa del Rey, CA 90293
(310) 821-9045
facsimile: (310) 448-1219

12/06/2005 11:05 FAX

002

Wetlands Action Network

protecting & restoring wetlands along the Pacific migratory pathways

PO Box 1145 • Malibu, CA 90265 (310) 821-9045

Coastal Law Enforcement Action Network

(CLEAN)

enforcing laws protecting the California coast

322 Culver Blvd., Suite 317 • Playa del Rey, CA 90293 (310) 821-9045

June 16, 2005

California State Parks
Ms. Suzanne Goode, Resource Ecologist
California Coastal Conservancy
Mr. Sam Schuchat, Executive Director

re: Malibu Lagoon and restoration plans

Dear State Parks & Coastal Conservancy officials:

Thank you for the opportunity to comment on the process and proposed course of action recommended by contractors to the State of California for Malibu Lagoon.

As you know, our organizations have been vitally involved and interested in the Malibu Lagoon ecosystem for some time. We have one of the most extensive libraries of historical information on the ecology of Malibu Lagoon, and our advising biologist, Robert Roy van de Hoek has been one of the most consistent and persistent observers and analysts of this ecosystem during the past decade.

12/06/2005 11:06 FAX

003

California State Parks/California Coastal Conservancy
comments from Wetlands Action Network & CLEAN
re: Malibu Lagoon
June 16, 2005
page 2

PREMATURE SELECTION OF PLAN

The first and foremost problem with the current plans is that a particular course of action (a specific project) has been selected by your contractors without knowing the current state of the ecosystem. This is a classic case of putting the cart before the horse. It appears that grant deadlines and grant workplans may be guiding the process, as opposed to having solid science leading the way.

No protocol surveys of birds, mammals, insects, reptiles or amphibians have been completed. No detailed, protocol surveys for plants has been completed either; only a "general" vegetation map is shown, ignoring the complexity and diversity of plant life and its ecological functions. In addition, inadequate fish surveys have been completed.

The amount of life that the plan would extinguish is not even known. In fact, it is not known which rare, threatened or endangered species in these categories are residing in which areas of the lagoon.

Therefore, it is completely premature to have selected a particular course of action without knowing first what is present and from there, deciding which species to manage for.

12/06/2005 11:06 FAX

004

California State Parks/California Coastal Conservancy
comments from Wetlands Action Network & CLEAN
re: Malibu Lagoon
June 16, 2005
page 3

Aldo Leopold said:

Only those who know the most about it can appreciate how little we know about it. The last word in ignorance is the man who says of an animal or plant: "What good is it?" If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.
(emphasis added)

KILLING NATIVE PLANTS AND ANIMALS IS NOT GENUINE RESTORATION

The Draft Malibu Lagoon Restoration & Enhancement Plan states that one of the three categories of recommendations from the UCLA study was "restoration of existing wetlands habitat to enhance their ecological functioning."

Dredging much of Malibu Lagoon for a project that will not appreciably cleanse the pollutants from the lagoon and that will destroy existing, functioning habitat that has achieved an equilibrium over the past 20+ years is contrary to this stated goal. Many of the species living in Malibu Lagoon will be killed during heavy equipment dredging and removing of habitat.

The City of Los Angeles planned to dredge Grand Canal Lagoon in a similarly uninformed project. A lawsuit against the Coastal Commission for approval of that project stopped and prevented a great loss of life and habitat.

12/06/2005 11:07 FAX

005

California State Parks/California Coastal Conservancy
comments from Wetlands Action Network & CLEAN
re: Malibu Lagoon
June 16, 2005
page 4

**NEED TO DETERMINE WHICH SPECIES ARE BEING
MANAGED FOR**

It is imperative that, after the protocol species surveys are completed, a determination is made as to which species are the keystone species of Malibu Lagoon. i.e., which species are the priorities for management planning and what recovery goals have been determined? Of course, this can not be done without completed surveys of the species currently living year-round and visiting Malibu Lagoon during migration (an entire year of all seasons of surveying is important in order to capture this data.) Then a review of the historical literature and scientific analysis of all of these factors will assist in recommendations to stakeholders and ecologists who can make an informed decision as to what the needs of those species are.

There are also opportunities for re-introduction of some species which historically were at Malibu Lagoon, but have been since extirpated.

California Native Plant Society, Sierra Club and Wetlands Action Network are recipients, for example, of settlement funds and approval from the California Department of Fish & Game to re-establish at Malibu Lagoon, the once-thought to be extinct Ventura Marsh Milkvetch (*Astragalus pycnostachys lanosissimus*.) Whatever plan is selected needs to consider this species introduction and make certain that proper habitat for that species is not ruined in the proposed project implementation.

12/08/2005 11:08 FAX

008

California State Parks/California Coastal Conservancy
comments from Wetlands Action Network & CLEAN
re: Malibu Lagoon
June 16, 2005
page 5

**ECOLOGY & STAKEHOLDERS NEED TO DETERMINE
COURSE OF ACTION**

Genuine restoration of any coastal wetland ecosystem needs to be informed by the ecology of the system currently in place, as well as the historical conditions, taking into account major changes in the current regime.

Ecology needs to be the driving force, not engineering. Engineered solutions to waterways are an outgoing mode of discipline and certainly need to not be leading the charge in determining a course of action.

Then, once the ecology, both present and historical are studied, known and understood, the stakeholders, with a heavy dose of ecological processes guiding them, can help decide which species will be managed for and what, if any, restoration enhancements are needed above the current equilibrium of ecological processes that are currently in place at Malibu Lagoon after some 20+ years.

Perhaps the mis-guided efforts of those who chose the "final alternative" were mis-informed by the UCLA study that recommended the restoration goals, which were largely approved and conceived by stakeholders that were seriously lacking in biological and ecological data and historical knowledge of the Malibu Lagoon ecosystem when the study was undertaken. Wetlands Action Network was involved in this process, and, in fact, because these topics were not adequately addressed in the UCLA study, which primarily focused on water quality, it was our understanding that no

12/06/2005 11:09 FAX

007

**California State Parks/California Coastal Conservancy
comments from Wetlands Action Network & CLEAN
re: Malibu Lagoon
June 16, 2005
page 6**

major restoration efforts were to be undertaken or even proposed for the lagoon until adequate protocol surveys were completed.

When the very first and only real opportunity for meaningful citizen and stakeholder input occurred in spring of 2004, there was clear consensus that no major machine-driven restoration would be taking place. The groups who gathered at Malibu City Hall that day determined that the only major activity that would require heavy machinery would be to tear up the existing sidewalks surrounding the lawn and the parking lot and move the parking lot closer to the street (Pacific Coast Highway.)

Otherwise, the major restoration efforts requested by the stakeholders included changing management practices on the sandy beach so as to encourage Snowy Plover nesting and possible Least Tern nesting, and removing non-native plants so that the wetland vegetation would be more appropriate to a coastal lagoon. This change in approximately 35% of the lagoon ecosystem vegetation would encourage more life consistent with coastal lagoon ecology, discourage homeless humans from living within inappropriate bushes and also discourage animals such as feral cats and raccoons from proliferating and, thus, causing un-due damage to bird and egg populations.

The products now being revealed as work products of the Technical Advisory Committee led by the State contractor, Heal the Bay, and the other state contractor Moffatt & Nichols Engineering, have departed in a major way and are a far cry from those recommend-

California State Parks/California Coastal Conservancy
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dations put forward by the citizens of Malibu and stakeholders of the Malibu Lagoon Task Force/Watershed Committee.

WATER QUALITY (which admittedly won't be helped much) AT THE EXPENSE OF HABITAT

There is quite a bit of focus in the reports on nutrients, sediments and water quality sampling. By the same token, there is a huge lack of biological understanding in the compilation of the report, which led to the inadequate informing of the recommendations.

While a few biological surveys are now being proposed after our voices had to be raised to a significant level to even be heard, they are severely lacking, as well as being proposed AFTER a course of action has ostensibly been selected. Again, this is backwards and not solid scientific decision-making.

Lacking, for instance, is any mention whatsoever of one of the most abundant types of species in any coastal wetland ~ insects ~ a crucial cog in the wheel of the lagoon ecosystem and vital to the determination as to what sort of restoration effort is desired.

In fact, there are definitely rare species of insects present at Malibu Lagoon, some of which could be severely impacted by the proposed plans.

Genuine restoration of Malibu Lagoon would take these species into account.

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(There are several other categories of species curiously missing from the plan, as well. Insects are only one type.)

The importance of insects in a coastal wetland ecosystem is explained:

"Although these insects are an important ecological component, they are seldom considered in environmental impact reports even though insects are near the base of most food chains and interact with almost all life forms in natural land communities.

They are essential food sources for birds and other vertebrates. They control vegetation and population numbers of other animals, including rodents and injurious insect species; and most importantly, they pollinate flowering plants, thus insuring their reproduction.

However, insects receive little attention by urban planners and natural resource managers because of their small size, extreme difficulty in identifying most species and the incorrect assumption that they are biologically and ecologically insignificant."

~ Chris Nagano, Charles Hogue, Roy Snelling and Julian Donaghue;
"The Insects and Related Terrestrial Arthropods of Ballona" in Ralph Schreiber, Ed., *Biota of the Ballona Ecosystem*, 1981.

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**BETTER USE FOR PUBLIC MONEYS THAT WILL RESULT IN
BETTER OUTCOME**

In the "Final Alternatives Analysis, dated March, 2005," the Executive Summary includes the following statement:

"Solving the habitat and water quality problems at the lagoon is not entirely possible without major improvements to the quality and/or quantity of incoming surface water and groundwater."

This is a key statement that explains clearly why the focus for bond or other public moneys for restoration of Malibu Lagoon ought to be on obtaining more public land for restoration upstream from the Lagoon, specifically in the Civic Center/Cross Creek area, and pursuing other water quality enhancements that will improve both the quality and quantity of incoming surface water and groundwater.

On page 102 of the Final Alternatives Analysis the recommended alternative (alternative 1.5) construction cost estimate is \$3.5 to 5.2 million. We would much rather see the bulk of this money go to purchase of more public land immediately upstream from the lagoon. There is a \$25 million crucial parcel of land for sale by Mr. Jerry Perenchio, and if \$1 million were to go for species surveys, nonnative plant removal, some limited plantings of more appropriate plants and moving the parking lot and adjacent sidewalks to minimize the impervious surface of the lagoon area, some \$2.5 to 4.2 million would be available to go toward land purchase, which would add significantly to cleaning up pollutants in the lagoon.

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**PESTICIDES/HERBICIDES NEED TO BE ELIMINATED, NOT
MINIMIZED**

Recent studies showing the impacts of pesticides and herbicides on Salmon, frogs and other species inform us that we still do not understand what these poisons do to the life cycle upon which we humans depend.

The California Coastal Commission has begun to determine that pesticides and herbicides are not to be used at all in the coastal zone on restoration projects. This particular lagoon has been so impaired for so long that it is crucial to eliminate the use of these poisons in management practices there. It is entirely possible to remove all non-native weeds by hand, and it is preferable, as volunteers from the community begin to appreciate the lagoon more as they are encouraged to work on removal of this inappropriate vegetative growth.

In addition, conditions placed on a permit for a private golf course adjacent to Malibu Lagoon required that many pesticides and herbicides be eliminated from the management of that golf course turf. The owner of the golf course was reluctant to completely eliminate fungicides due to the ongoing use of poisons at Malibu Lagoon. This public property needs to be an example to others in the area and not use these poisons.

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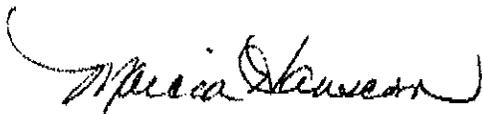
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ADDITIONAL COMMENTS ON PLANS

While there are numerous other comments that can and perhaps should be made in response to the recent reports on Malibu Lagoon proposed restoration plans, unless and until the above-detailed problems are fully and properly addressed, these comments would be akin to re-arranging the deck chairs on the Titanic.

The basic problems with the plans and premises for the proposed Malibu Lagoon "restoration" are great. Genuine restoration is what is called for. These plans will not accomplish that necessary goal.

With best regards,



Marcia Hanscom
Executive Director
Wetlands Action Network
Managing Director
Coastal Law Enforcement Action Network (CLEAN)



Robert Roy van de Hoek
Conservation Biologist

cc: California Senator Sheila Kuehl
California Assemblymember Fran Pavley
California Governor Arnold Schwarzenegger

Appendix C

CONSTRUCTION AIR QUALITY AND NOISE WORKSHEETS

CONSTRUCTION AIR QUALITY WORKSHEETS

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Highest 4 Daily Maximum Hourly Ozone Measurements

West Los Angeles-VA Hospital

Year:	2002		2003		2004	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Jul 25	0.118	Oct 26	0.134	Sep 7	0.107
Second High:	Oct 6	0.092	Aug 14	0.116	Sep 6	0.103
Third High:	Jun 5	0.091	Oct 27	0.116	May 3	0.099
Fourth High:	Jul 8	0.091	Aug 15	0.112	Sep 11	0.098
# Days Above Nat'l Standard:	0		1		0	
# Days Above State Standard:	1		11		5	
Year Coverage:	98		98		99	
	Go Backward One Year		New Top 4 Summary		Go Forward One Year	

Notes: All concentrations are expressed in parts per million.
 State exceedances are shown in **yellow**. National exceedances are shown in **orange**.
 National exceedances are also state exceedances.
 An exceedance is not necessarily a violation.
 Year Coverage indicates how complete monitoring was during the time of the year when concentrations are highest. 0 means there was no coverage; 100 means there was complete coverage.
 Blanks mean that there was insufficient data available to determine the value.

Switch:	8-Hour Ozone	PM10	PM2.5	Carbon Monoxide	Nitrogen Dioxide	Sulfur Dioxide	Hydrogen Sulfide
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Highest 4 Daily Maximum 8-Hour Carbon Monoxide Averages

West Los Angeles-VA Hospital

Year:	2002		2003		2004	
	Date	Measurement	Date	Measurement	Date	Measurement
National:						
First High:	Feb 7	2.73	Oct 24	2.79	Feb 17	2.33
Second High:	Feb 6	2.44	Jan 31	2.50	Dec 12	1.95
Third High:	Feb 7	2.38	Oct 21	2.46	Jan 9	1.83
Fourth High:	Jan 8	2.38	Oct 28	2.39	Jan 8	1.81
California:						
First High:	Feb 7	2.73	Oct 24	2.79	Feb 17	2.33
Second High:	Feb 6	2.44	Jan 30	2.50	Dec 11	1.95
Third High:	Jan 7	2.38	Oct 21	2.46	Jan 9	1.83
Fourth High:	Feb 5	2.38	Oct 27	2.39	Jan 8	1.81
# Days Above Nat'l Standard:		0		0		0
# Days Above State Standard:		0		0		0
Year Coverage:		95		97		96
	Go Backward One Year		New Top 4 Summary		Go Forward One Year	

Notes: All averages are expressed in parts per million.
 State exceedances are shown in **yellow**. National exceedances are shown in **orange**.
 An exceedance is not necessarily a violation.
 Year Coverage indicates how complete monitoring was during the time of the year when concentrations are highest. 0 means there was no coverage; 100 means there was complete coverage.
 Blanks mean that there was insufficient data available to determine the value.

Switch:	Hourly Ozone	8-Hour Ozone	PM10	PM2.5	Nitrogen Dioxide	Sulfur Dioxide	Hydrogen Sulfide
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Highest 4 Daily Maximum Hourly Nitrogen Dioxide Measurements

West Los Angeles-VA Hospital

Year:	2002		2003		2004	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Feb 7	0.113	Oct 28	0.119	Sep 23	0.086
Second High:	Oct 7	0.100	Oct 27	0.099	Sep 24	0.086
Third High:	Feb 5	0.090	Oct 26	0.091	Apr 25	0.082
Fourth High:	Jan 13	0.089	Oct 21	0.087	Sep 8	0.082
# Days Above State Standard:	0		0		0	
Annual Average:	0.024		0.023		0.020	
Year Coverage:	97		97		97	
	Go Backward One Year		New Top 4 Summary		Go Forward One Year	

Notes: All concentrations are expressed in parts per million.
 State exceedances are shown in **yellow**. National exceedances are shown in **orange**.
 An exceedance is not necessarily a violation.
 Year Coverage indicates how complete monitoring was during the time of the year when concentrations are highest. 0 means there was no coverage; 100 means there was complete coverage.
 Blanks mean that there was insufficient data available to determine the value.

Switch:	Hourly Ozone	8-Hour Ozone	PM10	PM2.5	Carbon Monoxide	Sulfur Dioxide	Hydrogen Sulfide
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Highest 4 Daily PM10 Measurements

Hawthorne

Year:	2002		2003		2004	
	Date	Measurement	Date	Measurement	Date	Measurement
National:						
First High:	Sep 5	121.0	Oct 24	58.0	Mar 16	52.0
Second High:	Jul 19	97.0	Feb 2	57.0	Mar 22	51.0
Third High:	Feb 13	58.0	Oct 6	55.0	Mar 28	42.0
Fourth High:	Jun 19	58.0	Mar 28	50.0	Mar 10	40.0
California:						
First High:	Sep 5	121.0	Oct 24	58.0	Mar 16	52.0
Second High:	Jul 19	97.0	Feb 2	57.0	Mar 22	51.0
Third High:	Feb 13	58.0	Oct 6	54.0	Mar 28	42.0
Fourth High:	Jun 19	57.0	Mar 28	50.0	Mar 10	40.0
Measured:						
# Days Above Nat'l Standard:		0		0		0
# Days Above State Standard:		12		3		2
Estimated:						
3-Yr Avg # Days Above Nat'l Std:		0.0		0.0		
# Days Above Nat'l Standard:		0.0		0.0		
# Days Above State Standard:		71.0		18.3		
National 3-Year Average:		37		35		
National Annual Average:		37.3		29.8		
State 3-Yr Maximum Average:		37		37		37
State Annual Average:		37.2		29.6		
Year Coverage:		100		100		33
	Go Backward One Year		New Top 4 Summary		Go Forward One Year	

Notes: All concentrations are expressed in micrograms per cubic meter.
 State exceedances are shown in **yellow**. National exceedances are shown in **orange**.
 An exceedance is not necessarily a violation.
 State and national statistics may differ for the following reasons:
 State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.
 State and national statistics may therefore be based on different samplers.
 State statistics for 1998 and later are based on *local* conditions (except for sites in the South Coast Air Basin, where State statistics for 2002 and later are based on *local* conditions).
 National statistics are based on *standard* conditions.
 State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
 Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.
 3-Year statistics represent the listed year and the 2 years before the listed year.
 Year Coverage indicates how complete monitoring was during the time of the year when concentrations are highest. 0 means there was no coverage; 100 means there was complete coverage.
 Blanks mean that there was insufficient data available to determine the value.

Switch:	Hourly Ozone	8-Hour Ozone	PM2.5	Carbon Monoxide	Nitrogen Dioxide	Sulfur Dioxide	Hydrogen Sulfide
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Air Resources Board



Highest 4 Maximum 24-Hour Sulfur Dioxide Averages

Hawthorne

Year:	2002		2003		2004	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Jul 23	0.007	Dec 3	0.004	Feb 11	0.004
Second High:	Jan 7	0.007	Sep 6	0.004	Jan 7	0.004
Third High:	Jan 10	0.006	Sep 5	0.004	Mar 11	0.003
Fourth High:	Jan 5	0.005	Jul 2	0.004	Mar 9	0.003
# Days Above Nat'l Standard:	0		0		0	
# Days Above State Standard:	0		0		0	
Annual Average:	0.001		0.001		0.001	
Year Coverage:	90		98		15	
	Go Backward One Year		New Top 4 Summary		Go Forward One Year	

Notes: All averages are expressed in parts per million.

State exceedances are shown in **yellow**. National exceedances are shown in **orange**.

National exceedances are also state exceedances.

An exceedance is not necessarily a violation.

Year Coverage indicates how complete monitoring was during the time of the year when concentrations are highest. 0 means there was no coverage; 100 means there was complete coverage.

Blanks mean that there was insufficient data available to determine the value.

Switch:	Hourly Ozone	8-Hour Ozone	PM10	PM2.5	Carbon Monoxide	Nitrogen Dioxide	Hydrogen Sulfide
Go to:	Data Statistics Home Page				Top 4 Summaries Start Page		

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\Parking Lot.urb
 Project Name: Malibu Lagoon- Parking Lot
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006 ***							
TOTALS (lbs/day, unmitigated)	3.64	22.04	31.36	0.10	5.39	0.81	4.58
TOTALS (lbs/day, mitigated)	3.64	22.04	31.36	0.10	2.73	0.81	1.92
					PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 ***							
TOTALS (lbs/day, unmitigated)	3.64	21.55	31.35	0.00	5.28	0.70	4.58
TOTALS (lbs/day, mitigated)	3.64	21.55	31.35	0.00	2.46	0.70	1.76

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\Parking Lot.urb
 Project Name: Malibu Lagoon- Parking Lot
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006 ***							
TOTALS (lbs/day, unmitigated)	3.64	22.04	31.36	0.10	5.39	0.81	4.58
TOTALS (lbs/day, mitigated)	3.64	22.04	31.36	0.10	2.73	0.81	1.92
					PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 ***							
TOTALS (lbs/day, unmitigated)	3.64	21.55	31.35	0.00	5.28	0.70	4.58
TOTALS (lbs/day, mitigated)	3.64	21.55	31.35	0.00	2.46	0.70	1.76

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\Parking Lot.urb
 Project Name: Malibu Lagoon- Parking Lot
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Tons/Year)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006 ***							
TOTALS (tpy, unmitigated)	0.07	0.48	0.60	0.00	0.10	0.01	0.09
TOTALS (tpy, mitigated)	0.07	0.48	0.60	0.00	0.05	0.01	0.04
					PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 ***							
TOTALS (tpy, unmitigated)	0.03	0.22	0.28	0.00	0.03	0.00	0.03
TOTALS (tpy, mitigated)	0.03	0.22	0.28	0.00	0.01	0.00	0.01

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\Parking Lot.urb
 Project Name: Malibu Lagoon- Parking Lot
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Winter)

Construction Start Month and Year: November, 2006
 Construction Duration: 3
 Total Land Use Area to be Developed: 1.03 acres
 Maximum Acreage Disturbed Per Day: 1.03 acres
 Single Family Units: 0 Multi-Family Units: 0
 Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	1.89	-	1.89
Off-Road Diesel	1.73	13.82	12.30	-	0.64	0.64	0.00
On-Road Diesel	0.32	7.17	1.19	0.10	0.17	0.14	0.03
Worker Trips	0.02	0.06	0.59	0.00	0.00	0.00	0.00
Maximum lbs/day	2.07	21.05	14.08	0.10	2.70	0.78	1.92
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	4.58	-	4.58
Off-Road Diesel	3.60	21.97	30.62	-	0.81	0.81	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.04	0.07	0.74	0.00	0.00	0.00	0.00
Maximum lbs/day	3.64	22.04	31.36	0.00	5.39	0.81	4.58
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	3.64	22.04	31.36	0.10	5.39	0.81	4.58
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	4.58	-	4.58
Off-Road Diesel	3.60	21.48	30.62	-	0.70	0.70	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.04	0.07	0.73	0.00	0.00	0.00	0.00
Maximum lbs/day	3.64	21.55	31.35	0.00	5.28	0.70	4.58
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.25	-	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	16.06	19.34	-	0.61	0.61	0.00
Asphalt On-Road Diesel	0.05	0.99	0.19	0.00	0.02	0.02	0.00
Asphalt Worker Trips	0.01	0.01	0.14	0.00	0.00	0.00	0.00
Maximum lbs/day	2.72	17.06	19.67	0.00	0.64	0.64	0.00
Max lbs/day all phases	3.64	21.55	31.35	0.00	5.28	0.70	4.58

Worker Trips	0.04	0.07	0.73	0.00	0.00	0.00	0.00
Maximum lbs/day	3.64	21.55	31.35	0.00	2.46	0.70	1.76
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.25	-	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	16.06	19.34	-	0.61	0.61	0.00
Asphalt On-Road Diesel	0.05	0.99	0.19	0.00	0.02	0.02	0.00
Asphalt Worker Trips	0.01	0.01	0.14	0.00	0.00	0.00	0.00
Maximum lbs/day	2.72	17.06	19.67	0.00	0.64	0.64	0.00
Max lbs/day all phases	3.64	21.55	31.35	0.00	2.46	0.70	1.76

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
 Phase 2: Unpaved Roads: Water all haul roads 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
 Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)

Phase 1 - Demolition Assumptions

Start Month/Year for Phase 1: Nov '06
 Phase 1 Duration: 0.5 months
 Building Volume Total (cubic feet): 45054.3076
 Building Volume Daily (cubic feet): 4505.0944
 On-Road Truck Travel (VMT): 249
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions

Start Month/Year for Phase 2: Nov '06
 Phase 2 Duration: 2.0 months
 On-Road Truck Travel (VMT): 0
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Excavators	180	0.580	8.0
1	Graders	174	0.575	8.0

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jan '07
 Phase 3 Duration: 0.5 months
 SubPhase Building Turned OFF
 SubPhase Architectural Coatings Turned OFF
 Start Month/Year for SubPhase Asphalt: Jan '07
 SubPhase Asphalt Duration: 0.5 months
 Acres to be Paved: 1.03
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

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File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\Parking Lot.url
 Project Name: Malibu Lagoon- Parking Lot
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Summer)

Construction Start Month and Year: November, 2006
 Construction Duration: 3
 Total Land Use Area to be Developed: 1.03 acres
 Maximum Acreage Disturbed Per Day: 1.03 acres
 Single Family Units: 0 Multi-Family Units: 0
 Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	1.89	-	1.89
Off-Road Diesel	1.73	13.82	12.30	-	0.64	0.64	0.00
On-Road Diesel	0.32	7.17	1.19	0.10	0.17	0.14	0.03
Worker Trips	0.02	0.06	0.59	0.00	0.00	0.00	0.00
Maximum lbs/day	2.07	21.05	14.08	0.10	2.70	0.78	1.92
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	4.58	-	4.58
Off-Road Diesel	3.60	21.97	30.62	-	0.81	0.81	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.04	0.07	0.74	0.00	0.00	0.00	0.00
Maximum lbs/day	3.64	22.04	31.36	0.00	5.39	0.81	4.58
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	3.64	22.04	31.36	0.10	5.39	0.81	4.58
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	4.58	-	4.58
Off-Road Diesel	3.60	21.48	30.62	-	0.70	0.70	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.04	0.07	0.73	0.00	0.00	0.00	0.00
Maximum lbs/day	3.64	21.55	31.35	0.00	5.28	0.70	4.58
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.25	-	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	16.06	19.34	-	0.61	0.61	0.00
Asphalt On-Road Diesel	0.05	0.99	0.19	0.00	0.02	0.02	0.00
Asphalt Worker Trips	0.01	0.01	0.14	0.00	0.00	0.00	0.00
Maximum lbs/day	2.72	17.06	19.67	0.00	0.64	0.64	0.00
Max lbs/day all phases	3.64	21.55	31.35	0.00	5.28	0.70	4.58

Worker Trips	0.04	0.07	0.73	0.00	0.00	0.00	0.00
Maximum lbs/day	3.64	21.55	31.35	0.00	2.46	0.70	1.76
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.25	-	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	16.06	19.34	-	0.61	0.61	0.00
Asphalt On-Road Diesel	0.05	0.99	0.19	0.00	0.02	0.02	0.00
Asphalt Worker Trips	0.01	0.01	0.14	0.00	0.00	0.00	0.00
Maximum lbs/day	2.72	17.06	19.67	0.00	0.64	0.64	0.00
Max lbs/day all phases	3.64	21.55	31.35	0.00	2.46	0.70	1.76

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
 Percent Reduction (ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)

Phase 2: Unpaved Roads: Water all haul roads 2x daily
 Percent Reduction (ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)

Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
 Percent Reduction (ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)

Phase 1 - Demolition Assumptions

Start Month/Year for Phase 1: Nov '06

Phase 1 Duration: 0.5 months

Building Volume Total (cubic feet): 45054.3076

Building Volume Daily (cubic feet): 4505.0944

On-Road Truck Travel (VMT): 249

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions

Start Month/Year for Phase 2: Nov '06

Phase 2 Duration: 2.0 months

On-Road Truck Travel (VMT): 0

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Excavators	180	0.580	8.0
1	Graders	174	0.575	8.0

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jan '07

Phase 3 Duration: 0.5 months

SubPhase Building Turned OFF

SubPhase Architectural Coatings Turned OFF

Start Month/Year for SubPhase Asphalt: Jan '07

SubPhase Asphalt Duration: 0.5 months

Acres to be Paved: 1.03

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\Parking Lot.urb
 Project Name: Malibu Lagoon- Parking Lot
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Tons/Year)

Construction Start Month and Year: November, 2006
 Construction Duration: 3
 Total Land Use Area to be Developed: 1.03 acres
 Maximum Acreage Disturbed Per Day: 1.03 acres
 Single Family Units: 0 Multi-Family Units: 0
 Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.01	-	0.01
Off-Road Diesel	0.01	0.08	0.07	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.04	0.01	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.01	0.12	0.08	0.00	0.01	0.00	0.01
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.08	-	0.08
Off-Road Diesel	0.06	0.36	0.51	-	0.01	0.01	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total tons/year	0.06	0.36	0.52	0.00	0.09	0.01	0.08
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total all phases tons/yr	0.07	0.48	0.60	0.00	0.10	0.01	0.09
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.03	-	0.03
Off-Road Diesel	0.02	0.12	0.17	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.02	0.12	0.17	0.00	0.03	0.00	0.03
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.01	0.09	0.11	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.01	0.10	0.11	0.00	0.00	0.00	0.00
Total all phases tons/yr	0.03	0.22	0.28	0.00	0.03	0.00	0.03

Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.02	0.12	0.17	0.00	0.01	0.00	0.01
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.01	0.09	0.11	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	0.01	0.10	0.11	0.00	0.00	0.00	0.00
Total all phases tons/yr	0.03	0.22	0.28	0.00	0.01	0.00	0.01

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)

Phase 2: Unpaved Roads: Water all haul roads 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)

Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)

Phase 1 - Demolition Assumptions

Start Month/Year for Phase 1: Nov '06

Phase 1 Duration: 0.5 months

Building Volume Total (cubic feet): 45054.3076

Building Volume Daily (cubic feet): 4505.0944

On-Road Truck Travel (VMT): 249

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions

Start Month/Year for Phase 2: Nov '06

Phase 2 Duration: 2.0 months

On-Road Truck Travel (VMT): 0

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Excavators	180	0.580	8.0
1	Graders	174	0.575	8.0

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jan '07

Phase 3 Duration: 0.5 months

SubPhase Building Turned OFF

SubPhase Architectural Coatings Turned OFF

Start Month/Year for SubPhase Asphalt: Jan '07

SubPhase Asphalt Duration: 0.5 months

Acres to be Paved: 1.03

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths

Site Grading Fugitive Dust Option changed from Level 1 to Level 2

Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
has been changed from off to on.

Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.

Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\The Lagoon.urb
Project Name: Malibu Lagoon- Lagoon
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day, unmitigated)	8.83	57.28	74.88	0.01	41.73	1.93	39.80
TOTALS (lbs/day, mitigated)	8.83	57.28	74.88	0.01	17.24	1.93	15.31

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day, unmitigated)	8.82	56.04	75.13	0.01	41.62	1.82	39.80
TOTALS (lbs/day, mitigated)	8.82	56.04	75.13	0.01	17.13	1.82	15.31

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\The Lagoon.urb
Project Name: Malibu Lagoon- Lagoon
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day, unmitigated)	8.83	57.28	74.88	0.01	41.73	1.93	39.80
TOTALS (lbs/day, mitigated)	8.83	57.28	74.88	0.01	17.24	1.93	15.31

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day, unmitigated)	8.82	56.04	75.13	0.01	41.62	1.82	39.80
TOTALS (lbs/day, mitigated)	8.82	56.04	75.13	0.01	17.13	1.82	15.31

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\The Lagoon.urt
 Project Name: Malibu Lagoon- Lagoon
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Winter)

Construction Start Month and Year: August, 2007
 Construction Duration: 5
 Total Land Use Area to be Developed: 29.97 acres
 Maximum Acreage Disturbed Per Day: 29.97 acres
 Single Family Units: 0 Multi-Family Units: 0
 Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	39.77	-	39.77
Off-Road Diesel	8.50	52.83	70.83	-	1.84	1.84	0.00
On-Road Diesel	0.19	4.28	0.72	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.33	0.00	0.02	0.01	0.01
Maximum lbs/day	8.83	57.28	74.88	0.01	41.73	1.93	39.80
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Max lbs/day all phases	8.83	57.28	74.88	0.01	41.73	1.93	39.80
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	39.77	-	39.77
Off-Road Diesel	8.50	51.97	71.17	-	1.73	1.73	0.00
On-Road Diesel	0.18	3.90	0.67	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.29	0.00	0.02	0.01	0.01
Maximum lbs/day	8.82	56.04	75.13	0.01	41.62	1.82	39.80
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	8.82	56.04	75.13	0.01	41.62	1.82	39.80

Phase 3 - Building Construction Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
 Start Month/Year for Phase 2: Aug '07
 Phase 2 Duration: 5 months
 On-Road Truck Travel (VMT): 164
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Excavators	180	0.580	8.0
2	Graders	174	0.575	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	15.28	-	15.28
Off-Road Diesel	8.50	52.83	70.83	-	1.84	1.84	0.00
On-Road Diesel	0.19	4.28	0.72	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.33	0.00	0.02	0.01	0.01
Maximum lbs/day	8.83	57.28	74.88	0.01	17.24	1.93	15.31
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Max lbs/day all phases	8.83	57.28	74.88	0.01	17.24	1.93	15.31
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	15.28	-	15.28
Off-Road Diesel	8.50	51.97	71.17	-	1.73	1.73	0.00
On-Road Diesel	0.18	3.90	0.67	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.29	0.00	0.02	0.01	0.01
Maximum lbs/day	8.82	56.04	75.13	0.01	17.13	1.82	15.31
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	8.82	56.04	75.13	0.01	17.13	1.82	15.31

Construction-Related Mitigation Measures

URBEMIS 2002 For Windows 7.5.0

File Name: J:\Projects\Malibu Lagoon Restoration Proj 2005-045\Air Quality\URBEMIS\The Lagoon.urb
 Project Name: Malibu Lagoon- Lagoon
 Project Location: South Coast Air Basin (Los Angeles area)
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Summer)

Construction Start Month and Year: August, 2007
 Construction Duration: 5
 Total Land Use Area to be Developed: 29.97 acres
 Maximum Acreage Disturbed Per Day: 29.97 acres
 Single Family Units: 0 Multi-Family Units: 0
 Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	39.77	-	39.77
Off-Road Diesel	8.50	52.83	70.83	-	1.84	1.84	0.00
On-Road Diesel	0.19	4.28	0.72	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.33	0.00	0.02	0.01	0.01
Maximum lbs/day	8.83	57.28	74.88	0.01	41.73	1.93	39.80
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Max lbs/day all phases	8.83	57.28	74.88	0.01	41.73	1.93	39.80
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	39.77	-	39.77
Off-Road Diesel	8.50	51.97	71.17	-	1.73	1.73	0.00
On-Road Diesel	0.18	3.90	0.67	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.29	0.00	0.02	0.01	0.01
Maximum lbs/day	8.82	56.04	75.13	0.01	41.62	1.82	39.80
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	8.82	56.04	75.13	0.01	41.62	1.82	39.80

Phase 3 - Building Construction Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
 Start Month/Year for Phase 2: Aug '07
 Phase 2 Duration: 5 months
 On-Road Truck Travel (VMT): 164
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Excavators	180	0.580	8.0
2	Graders	174	0.575	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	15.28	-	15.28
Off-Road Diesel	8.50	52.83	70.83	-	1.84	1.84	0.00
On-Road Diesel	0.19	4.28	0.72	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.33	0.00	0.02	0.01	0.01
Maximum lbs/day	8.83	57.28	74.88	0.01	17.24	1.93	15.31
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Max lbs/day all phases	8.83	57.28	74.88	0.01	17.24	1.93	15.31
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	15.28	-	15.28
Off-Road Diesel	8.50	51.97	71.17	-	1.73	1.73	0.00
On-Road Diesel	0.18	3.90	0.67	0.01	0.10	0.08	0.02
Worker Trips	0.14	0.17	3.29	0.00	0.02	0.01	0.01
Maximum lbs/day	8.82	56.04	75.13	0.01	17.13	1.82	15.31
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	8.82	56.04	75.13	0.01	17.13	1.82	15.31

Construction-Related Mitigation Measures

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Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
 Phase 2: Unpaved Roads: Water all haul roads 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
 Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
 Phase 3 - Building Construction Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
 Start Month/Year for Phase 2: Aug '07
 Phase 2 Duration: 5 months
 On-Road Truck Travel (VMT): 164
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Excavators	180	0.580	8.0
2	Graders	174	0.575	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

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Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
 Phase 2: Unpaved Roads: Water all haul roads 2x daily
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
 Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
 Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
 Phase 3 - Building Construction Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
 Start Month/Year for Phase 2: Aug '07
 Phase 2 Duration: 5 months
 On-Road Truck Travel (VMT): 164
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Excavators	180	0.580	8.0
2	Graders	174	0.575	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

CONSTRUCTION NOISE WORKSHEETS

CHANGE IN AMBIENT NOISE LEVEL MODEL	
Project Name:	Malibu Lagoon
Date:	10/31/05
Scenario / Noise Source:	Construction of Lagoon
Receptor	Southwestern portion of Site
Without Muffler	
Ambient Background Sound Level (dBA)	58.3
Line or Point Type	Point
Type of Propagation Path (Hard or Soft)	Hard
Reference Distance	50
Actual Receptor Distance from Source	50
Maximum Single Event Sound Level (dBA)	89
Number of Events during Period	1
Duration of Single Event (user defined units)	3.2
Total Time Period of Concern (user defined units)	8
New Ambient Sound Level at Receptor (dBA)	81
Change from Existing Sound Level (dBA)	23
Is Change Discernible (greater than or equal to 5 dBA)	YES

CHANGE IN AMBIENT NOISE LEVEL MODEL	
Project Name:	Malibu Lagoon
Date:	10/31/05
Scenario / Noise Source:	Construction of Lagoon
Receptor	Southern part of site, near eastern end of Malibu Colony
Without Muffler	
Ambient Background Sound Level (dBA)	58.6
Line or Point Type	Point
Type of Propagation Path (Hard or Soft)	Hard
Reference Distance	50
Actual Receptor Distance from Source	20
Maximum Single Event Sound Level (dBA)	85
Number of Events during Period	1
Duration of Single Event (user defined units)	3.2
Total Time Period of Concern (user defined units)	8
New Ambient Sound Level at Receptor (dBA)	85
Change from Existing Sound Level (dBA)	27
Is Change Discernible (greater than or equal to 5 dBA)	YES

CHANGE IN AMBIENT NOISE LEVEL MODEL	
Project Name:	Malibu Lagoon
Date:	10/31/05
Scenario / Noise Source:	Construction of Parking Lot
Receptor	Southwestern portion of site
Without Muffler	
Ambient Background Sound Level (dBA)	58.3
Line or Point Type	Point
Type of Propagation Path (Hard or Soft)	Hard
Reference Distance	50
Actual Receptor Distance from Source	170
Maximum Single Event Sound Level (dBA)	89
Number of Events during Period	1
Duration of Single Event (user defined units)	3.2
Total Time Period of Concern (user defined units)	8
New Ambient Sound Level at Receptor (dBA)	71
Change from Existing Sound Level (dBA)	12
Is Change Discernible (greater than or equal to 5 dBA)	YES

CHANGE IN AMBIENT NOISE LEVEL MODEL	
Project Name:	Malibu Lagoon
Date:	10/31/05
Scenario / Noise Source:	Construction of Parking Lot
Receptor	Southern part of site, near eastern end of Malibu Colony
Without Muffler	
Ambient Background Sound Level (dBA)	58.6
Line or Point Type	Point
Type of Propagation Path (Hard or Soft)	Hard
Reference Distance	50
Actual Receptor Distance from Source	230
Maximum Single Event Sound Level (dBA)	89
Number of Events during Period	1
Duration of Single Event (user defined units)	3.2
Total Time Period of Concern (user defined units)	8
New Ambient Sound Level at Receptor (dBA)	68
Change from Existing Sound Level (dBA)	10
Is Change Discernible (greater than or equal to 5 dBA)	YES