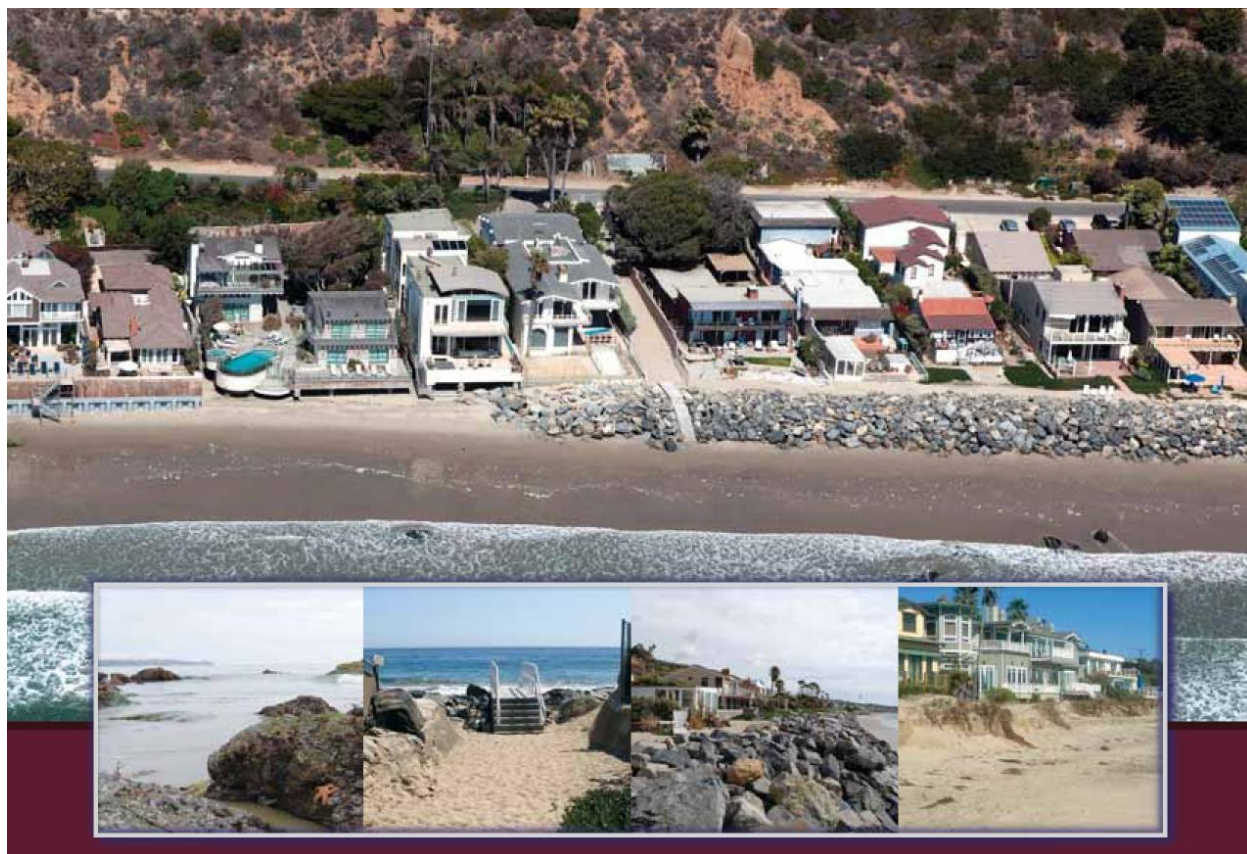




# PROJECT UPDATE TO THE REVISED ANALYSIS OF IMPACTS TO PUBLIC TRUST RESOURCES AND VALUES

## BROAD BEACH RESTORATION PROJECT (ALTERNATIVE 4c)

August 2016



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## LIST OF ACRONYMS AND ABBREVIATIONS

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APTR	Analysis of Impacts to Public Trust Resources and Values
Alt	Alternative
AMM	Avoidance and Minimization Measures
BBGHAD	Broad Beach Geologic Hazard Abatement District
BHMP	Beach Habitat Management Plan
BMP	Best Management Practices
BNC	Beach Nourishment Control
CARB	California Air Resources Board
CCA	California Coastal Act
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CSLC	California State Lands Commission
cy	cubic yard
GHAD	Geologic Hazard Abatement District
ESHA	Environmentally Sensitive Habitat Areas
GHG	Greenhouse Gas
MDP	Master Drainage Plan
Mi	Minor Adverse Impact
MIP	Monitoring Implementation Program
Mj	Major Adverse Impact
MLPA	Marine Life Protection Act
N	Negligible Impact
NMFS	National Marine Fisheries Service
NO <sub>x</sub>	Nitrogen Oxides
PCH	Pacific Coast Highway
PM	Particulate Matter
SCAQMD	South Coast Air Quality Management District
SLR	Sea Level Rise
SPCCP	Spill Prevention Control and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VCAPCD	Ventura County Air Pollution Control District
VOCs	Volatile Organic

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## EXECUTIVE SUMMARY

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The following is a Project Update to the California State Lands Commission's (CSLC) July 2014 Revised Analysis of Impacts to Public Trust Resources and Values (Revised APTR) for the proposed Broad Beach Restoration Project (Project). The Broad Beach Geologic Hazard Abatement District (BBGHAD or Applicant) is seeking approval from the CSLC, through issuance of a lease, for portions of the proposed Project or Project alternatives on State sovereign lands in Malibu, Los Angeles County (Figure 1-1). The Project, as proposed by the BBGHAD, consists generally of the following elements:

- Use and maintenance of portions of an existing rock revetment shoreline protective structure on sovereign lands under the CSLC's jurisdiction;
- Relocation of portions of an existing rock revetment shoreline protective structure;
- Placement of sand for initial beach nourishment and dune construction; and
- Placement of sand for subsequent beach nourishment events and backpassing of sand.

This Project Update provides additional information regarding the potential Public Trust impacts associated with the Applicant's current proposal (hereafter referred to as Alternative 4c). While Alternative 4c still seeks to restore the beach and dunes, it would reduce the initial nourishment volume from 600,000 cubic yards (cy) to 300,000 cy with a robust monitoring program that will provide decision-making agencies with information on the beach's optimum equilibrium profile. This information will allow an adaptive management approach to ensure that the Project goals and the broader public trust interests are properly balanced in the best interests of the State. In comparison to the Revised APTR Project Description, most of the initial project impacts are reduced; however, Alternative 4c may result in the placement of a greater total volume of sand, over a 10-year period, than was contemplated in the original APTR. Consequently, the intensity of impacts to Public Trust resources associated with sand importation and beach nourishment/renourishment could increase over the 10-year period.

On October 9, 2015, the California Coastal Commission (CCC) approved a Coastal Development Permit (CDP) for the Project that included many of the proposed elements of Alternative 4c (<http://documents.coastal.ca.gov/reports/2015/10/f8a-10-2015.pdf>).

To limit beach nourishment related impacts under Alternative 4c, staff is recommending the Revised Avoidance and Minimization Measures (AMMs) Monitoring Implementation Program provided in Appendix B. Modifications to some AMMs were made for applicability to Alternative 4c, consistency with the CCC CDP, and through consultation with other State and federal agencies.



## 1.0 INTRODUCTION

The following is a Project Update to the California State Lands Commission's (CSLC) July 2014 Revised Analysis of Impacts to Public Trust Resources and Values (Revised APTR) for the proposed Broad Beach Restoration Project (Project). The Broad Beach Geologic Hazard Abatement District (BBGHAD or Applicant) is seeking approval from the CSLC, through the issuance of a lease, for the portions of the proposed Project or Project alternatives on State sovereign lands in Malibu, Los Angeles County (Figure 1-1). The Project, as proposed by the BBGHAD, consists generally of the following elements:

- Use and maintenance of portions of an existing rock revetment shoreline protective structure on sovereign lands under the CSLC's jurisdiction;
- Relocation of portions of an existing rock revetment protective structure;
- Placement of sand for initial beach nourishment and dune construction; and
- Placement of sand for subsequent beach nourishment events and backpassing of sand.



**FIGURE 1-1**



## 1.1 BACKGROUND AND PURPOSE

The Revised APTR analyzed the proposed Project and nine Project alternatives with a goal of avoiding or minimizing adverse effects to Public Trust resources and values while meeting the Applicant's basic Project objectives, so that the CSLC, other decision-makers, and interested parties can weigh the benefits with potential adverse effects for each alternative while making a determination about Project approval. The Project alternatives evaluated in the Revised APTR included changes in the location, type and design of coastal protection structure (e.g., relocated or reinforced revetment, seawall construction); removal or shortening of the revetment; and differing approaches to the extent and frequency of beach nourishment and dune construction. Each of the nine alternatives was analyzed for potential adverse effects on Public Trust resources and values, and then compared to the adverse effects associated with the Project.

The purpose of this Project Update is to provide information to the CSLC regarding the potential Public Trust impacts associated with the Applicant's current proposal for a new Project alternative, hereinafter referred to as Alternative 4c. **This Project Update report and original Revised APTR serve solely as informational documents to assist the CSLC in deciding whether to issue a lease for portions of the Project or Project alternatives within its jurisdiction.**<sup>1</sup>

The Applicant is currently investigating several new potential sand sources for proposed beach nourishment, including a source consisting of river sediments within the Calleguas Creek channel downstream of Upland Road in the city of Camarillo. As of July 2016, the Applicant has not proposed any additional sand sources beyond the sand sources evaluated in the July 2014 Revised APTR.

On October 9, 2015, the California Coastal Commission (CCC) approved a Coastal Development Permit (CDP) for the Project that included many of the proposed elements of Alternative 4c (<http://documents.coastal.ca.gov/reports/2015/10/f8a-10-2015.pdf>). Some of the key special conditions included the following:

- A 10-year permit term;
- A requirement to maintain beach width based on triggers for renourishment and backpassing events. This includes major nourishment of 300,000 cubic yards (cy), backpassing up to 25,000 cy, and interim nourishments up to 75,000 cy;

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<sup>1</sup> Generally, the CSLC relies on an environmental review pursuant to the California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.) to assess a project's impacts to its lands and associated resources and uses. However, implementation of the Project by the BBGHAD is statutorily exempt from CEQA as an "[i]mprovement caused to be undertaken ... and all activities in furtherance thereof or in connection therewith, shall be deemed to be specific actions necessary to prevent or mitigate an emergency...." (Pub. Resources Code, §§ 26601 & 21080, subd. (b)(4).) This statutory exemption precludes the CSLC from conducting a review under CEQA.

- Development of a Science Advisory Panel to oversee development and implementation of a Marine Habitat Monitoring and Mitigation Plan (Marine Plan);
- Development of a Dune Habitat Restoration and Monitoring Program;
- A comprehensive monitoring and reporting program for beach profile characteristics, beach erosion rates, and affected resources;
- An Adaptive Management and Reporting Plan;
- Authorization for the Applicant's proposed inland location of the relocated portion of the revetment;
- A Sediment Sampling and Analysis Plan;
- A Public Access Management Program; and
- A Septic Conversion Implementation Study.

The CDP authorizes 300,000 cy at year 1 for beach and dune construction. Backpassing is required when trigger conditions have been reached and cannot occur more than once annually. Interim nourishment up to 75,000 cy is required when trigger conditions have been reached and cannot occur more than once annually or pursuant to other permit conditions. Major nourishment of 300,000 cy is required when trigger conditions are reached and sufficient sand is not available for backpassing and interim nourishment, or these options are not authorized pursuant to other permit conditions. As explained in the Alternative 4c description, up to three major nourishment events are anticipated over the 10-year permit term; at year 1, approximately year 5 and approximately year 10. It is unknown how many interim or major nourishment events will be needed over the 10 year permit term, as required by the triggers. However, assuming three major nourishment events and frequent or annual interim nourishment is needed, due to frequent and extreme erosion events, the CDP allows flexibility for approximately 1,500,000 cy of sand over the 10-year permit, in conformance with other permit conditions. Annual surveys, monitoring, and reporting of beach profile conditions and environmental impacts are also intended to guide nourishment and backpassing events. This information will allow for adjustments to these activities and adaptive management measures to be implemented to offset any observed or unanticipated adverse impacts. Further, the permit requires monitoring and mitigation plans for marine and dune resources to be developed and implemented through technical working groups composed of science professionals with expertise in Broad Beach marine and dune resources as explained below.

The CCC has formed a science advisory panel (SAP) in consultation with State and federal agencies with marine resource jurisdiction over the Project consisting of marine science professionals with expertise in marine resources to review and guide development of the Marine Plan and oversee marine habitat monitoring and any

1 required mitigation. The SAP is intended to provide ongoing oversight of the Marine  
2 Plan through the 10-year term of the CDP and provide recommendations for adaptive  
3 management actions and mitigation measures to offset observed and unanticipated  
4 impacts on marine resources. The SAP shall review monitoring results and annual  
5 reports to advise the CCC (and consult with CSLC) on recommended actions. A CCC  
6 approved Final Marine Plan is required prior to permit issuance of the CDP and Project  
7 construction. The mitigation ratio for impacts upon subtidal and intertidal rocky habitat  
8 shall be mitigated at a minimum of 4:1. Adverse impacts upon eelgrass shall be  
9 mitigated according to the California Eelgrass Mitigation Policy. Upon detection of  
10 adverse impacts upon one or more other habitat types, the Applicant, in consultation  
11 with the SAP, shall develop a habitat specific mitigation plan for each impacted habitat  
12 that will provide the overall framework to guide the mitigation work, for review and  
13 approval of the Executive Director. A report at the end of 5 years shall determine  
14 whether adverse impacts to marine habitats have occurred as a result of the Project as  
15 required pursuant to Special Condition 2C of the permit. If adverse impacts are  
16 detected, that is when the need for mitigation will be determined. The revised mitigation  
17 and monitoring program shall be processed as an amendment to the CDP unless the  
18 Executive Director determines that no permit amendment is required.

19 The CCC is also requiring a Dune Habitat Restoration and Monitoring Program, which  
20 includes development of a Restoration and Enhancement Plan, Monitoring Program,  
21 and open space restrictions. A technical working group of science professionals with  
22 expertise in dune ecology has been assembled to guide development and oversight of  
23 the Restoration and Enhancement Plan in coordination with other public agencies with  
24 jurisdiction over dune resources at Broad Beach. The CSLC staff is actively participating  
25 in both of the CCC's marine habitat and dune restoration planning processes to  
26 streamline CSLC requirements for marine and dune habitat impacts for Alternative 4c  
27 as identified in the CSLC's Monitoring Implementation Program, Section 3.

## 28 **1.2 NEW PROJECT ALTERNATIVE—ALTERNATIVE 4C**

29 Alternative 4c was not formally analyzed in the Revised APTR; however, it is a  
30 combination of concept and design elements of Alternatives 2, 3, 4, and 8 of the  
31 Revised APTR. In comparison to the Revised APTR Project description, Alternative 4c  
32 would relocate a significant portion of the revetment landward off of State land, modify  
33 the nourishment program by providing for the deposition of smaller volumes of sand on  
34 a more frequent basis, and reduce direct and indirect fill of the intertidal (high to low  
35 tide) and subtidal zones to protect sensitive marine resources on the west end of Broad  
36 Beach. A diagram of Alternative 4c is provided in Figures 1-2, 1-3, and 1-4.

37 Similar to Alternative 4, Alternative 4c is intended to restore the beach and dunes while  
38 providing information on the beach's optimum equilibrium profile. This information would  
39 allow adaptive management to best implement long-term shoreline protection and

1 beach restoration goals on Broad Beach and in the sub-littoral cell. By employing  
2 nourishment events of reduced volume, Alternative 4c may reduce the volume of sand  
3 lost offshore from post-construction beaches, as nourishment volumes can be best  
4 adapted to reflect the equilibrium beach. Some of the key differences with Alternative 4c  
5 include the following (see Table 1-1 and Appendix A, Broad Beach Geologic Hazard  
6 Abatement District Project Description for New Alternative 4c).

- 7 • Initial importation of 300,000 cy of sand for beach and dune construction;  
8 importation of 300,000 cy of sand at approximately year 5 for second beach  
9 nourishment. In the event of severe beach erosion, the BBGHAD proposes  
10 additional nourishments of 300,000 cy of sand more frequently than every 5  
11 years, in addition to or in lieu of Interim Nourishments and Erosion Nourishments.
- 12 • Small-scale Interim Nourishments of up to 75,000 cy (per year) of imported sand  
13 in the event that insufficient material exists to facilitate backpassing.
- 14 • Up to three Erosion Nourishment events per 10-year period using a maximum of  
15 75,000 cy of imported sand, in addition to Interim Nourishments, if severe beach  
16 erosion events are encountered.
- 17 • Backpassing no more than once per year.
- 18 • Reduction in total area of beach and sand dunes from 46 acres to approximately  
19 27 acres.
- 20 • A range of dry sandy post-construction beach widths of 52 to 70 feet.
- 21 • A range of post-construction dune sand widths of 30 feet at the west end to 190  
22 feet at the east end.
- 23 • Encroachment of the rock revetment on State land (seaward of CSLC's January  
24 2010 mean high tide line) reduced to approximately 0.54 acre, due to the  
25 relocated portion of the revetment.
- 26 • Reduction in number of lateral access easements fully covered and with partial  
27 encroachment by the rock revetment to 24, due to the relocated portion of  
28 revetment.
- 29 • Elimination of sand fill west of 31380 Broad Beach Road.
- 30 • Steeper toe of constructed beach berm slope (5:1, 5 horizontal feet for 1 foot  
31 elevation change) with reduced beach width.
- 32 • Reduction of truck trips for individual nourishment events, but potential increase  
33 in frequency of truck trips due to increased number of smaller scale nourishment  
34 events.

**Table 1-1. Broad Beach Restoration Project By the Numbers (Alternative 4c)**

Project Setting	
Beach length (from Lechuza Point to Trancas Creek Lagoon)	~6,200 feet
Estimated volume of sand lost from Broad Beach: 1974-2009	± 600,000 cy
Current sand loss rate at Broad Beach	40,000-45,000 cy/yr
Number of lots bordering Broad Beach	121
Number of residences bordering Broad Beach	109
Number of residences located landward of existing revetment	76
Number of Lateral Access Easements (LAEs) on Broad Beach	51
Number of vertical public access ways (from street to Broad Beach)	2
Existing Temporary Emergency Rock Revetment Data	
Number of acres of beach covered by revetment	~3.02 acres
Length	4,100 feet
Width	22-38 feet
Height (average above MLLW where revetment exists)	12-15 feet
Volume of boulders used to build revetment <sup>1</sup>	36,000 tons
Acres of Public Trust lands under CSLC jurisdiction covered by revetment <sup>2</sup>	1.16 acres
Acres of LAEs covered or impacted by revetment <sup>2</sup>	0.73-1.04 acre
Estimated Project Size and Acreage	
Total area of beach and sand dunes proposed for restoration	27 acres
Total volume of sand: initial restoration work	300,000 cy
Volume of sand per interim nourishment event	up to 75,000 cy
Width of restored dry sandy post-construction beach	± 70 feet
Width of restored post-construction sand dune	± 50-130 feet
Height of restored post-construction sand dune	≤ 17 feet
Area required for staging: Zuma Beach Parking Lot	1.4-1.9 acres
Area required for sand stockpile: Zuma Beach (along 1,000 feet of beach)	5 acres
Estimated Project Timing (Beach Nourishment and Dune Construction Elements)	
Project life (after initial restoration and supplementary renourishment)	10 years
Approximate interval between major renourishment cycles	± 5 years
Project duration (Construction activities)	8 months (total)
• Revetment relocation	1-2 months
• Beach nourishment and dune construction	5 months
• Planting, fencing, signage, and irrigation placement in dune systems	1 month
Construction Staging and Sand Transport Information: Initial Nourishment Project	
Duration of hauling of inland quarry material to Broad Beach	4 months
Number of truck trips required between inland quarries and Broad Beach.	~21,500 <sup>3</sup>
Estimated distance between quarry sand sources and Project site	~40-45 miles
<b>Acronyms:</b> cy=cubic yards; MLLW=Mean Lower Low Water; yr=year.	
<sup>1</sup> Larger (> 2-ton) boulders are located at the revetment's west end (due to increased erosion hazard).	
<sup>2</sup> Based on Mean High Tide Line (MHTL) survey conducted in January 2010.	
<sup>3</sup> Number is based on 300,000 cy of sand being transported by trucks with a 14-cy carrying capacity.	

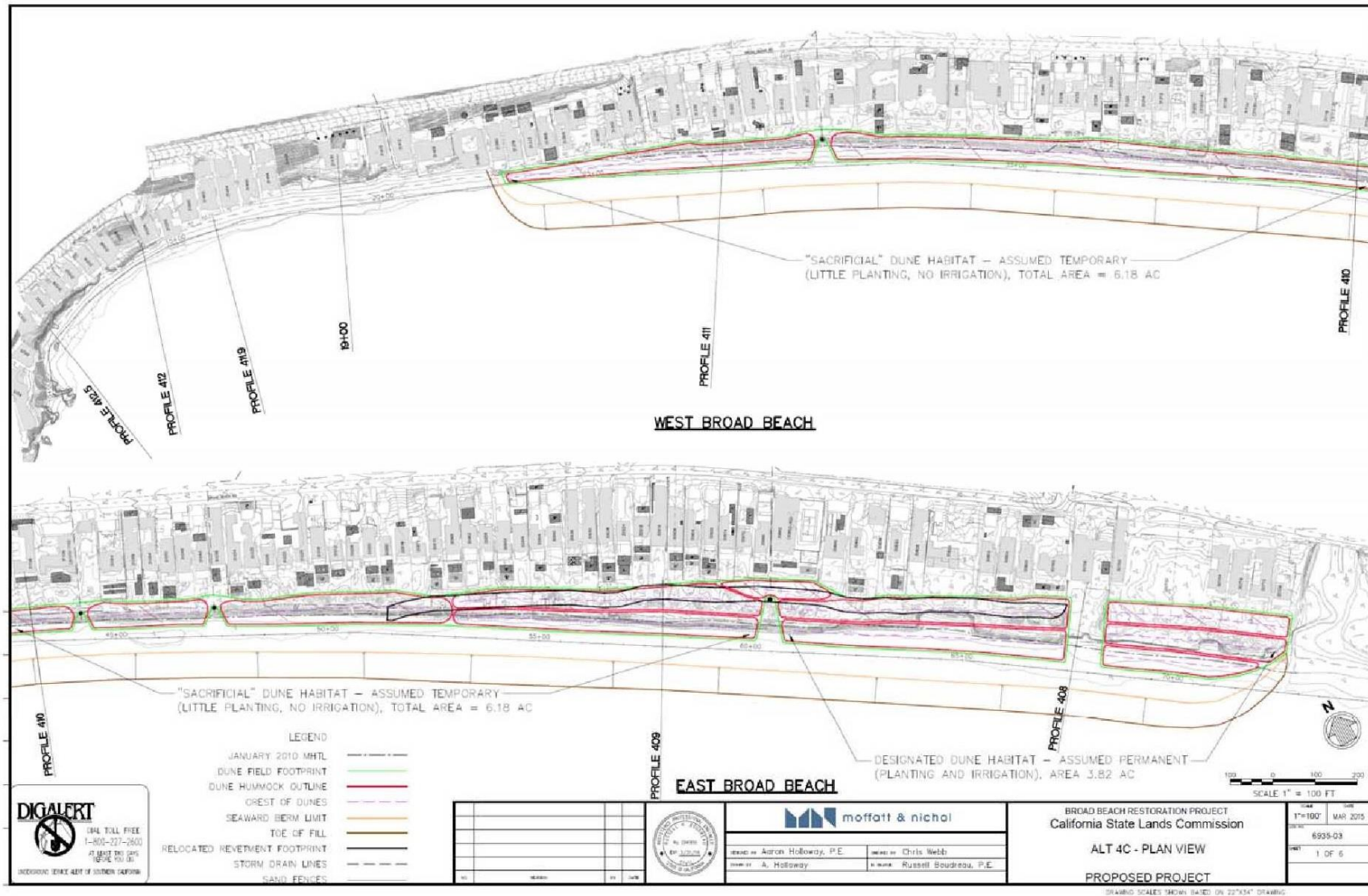


Figure 1-2. Plan View of Alternative 4c



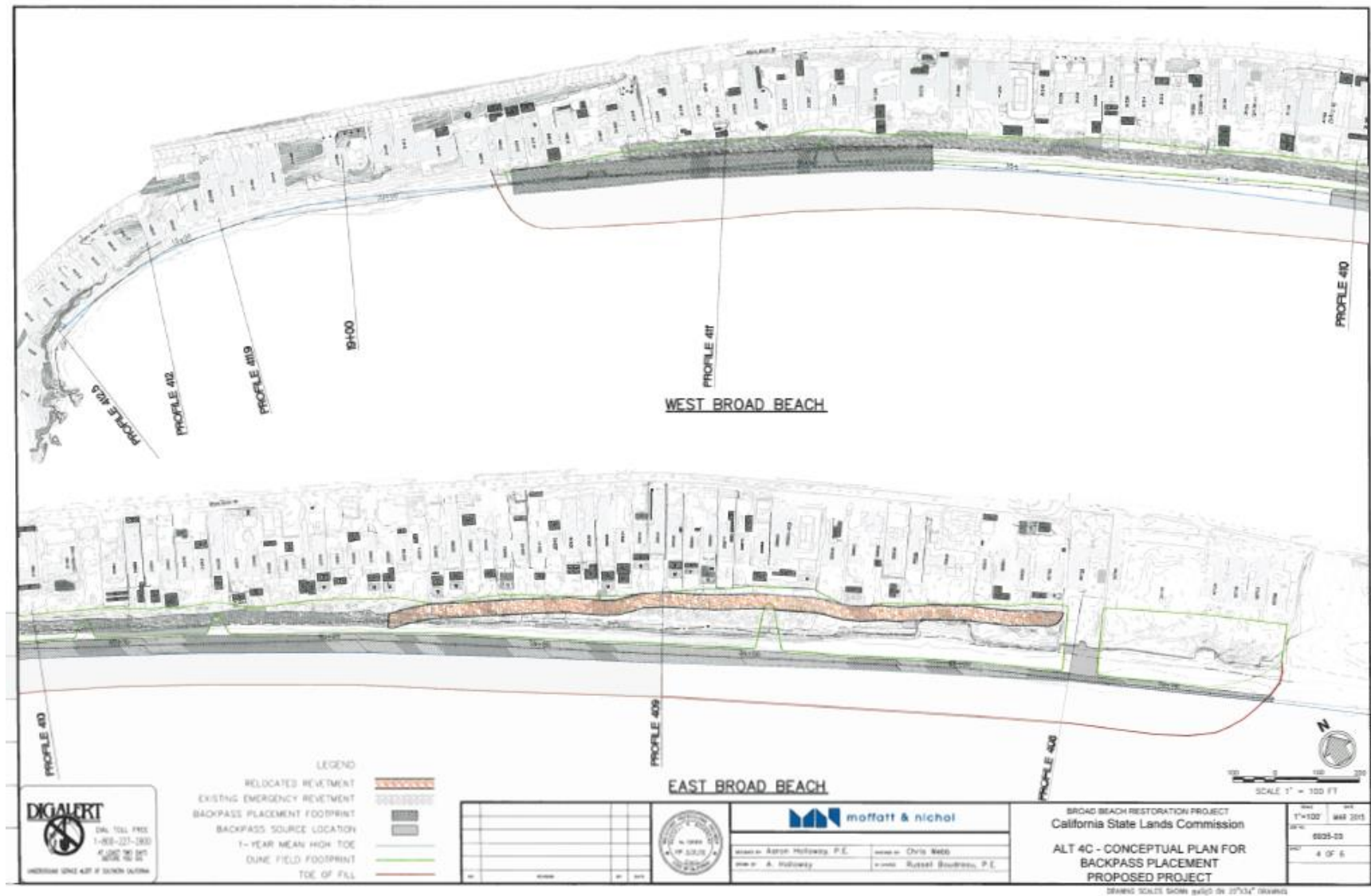


Figure 1-3 Backpassing Plan

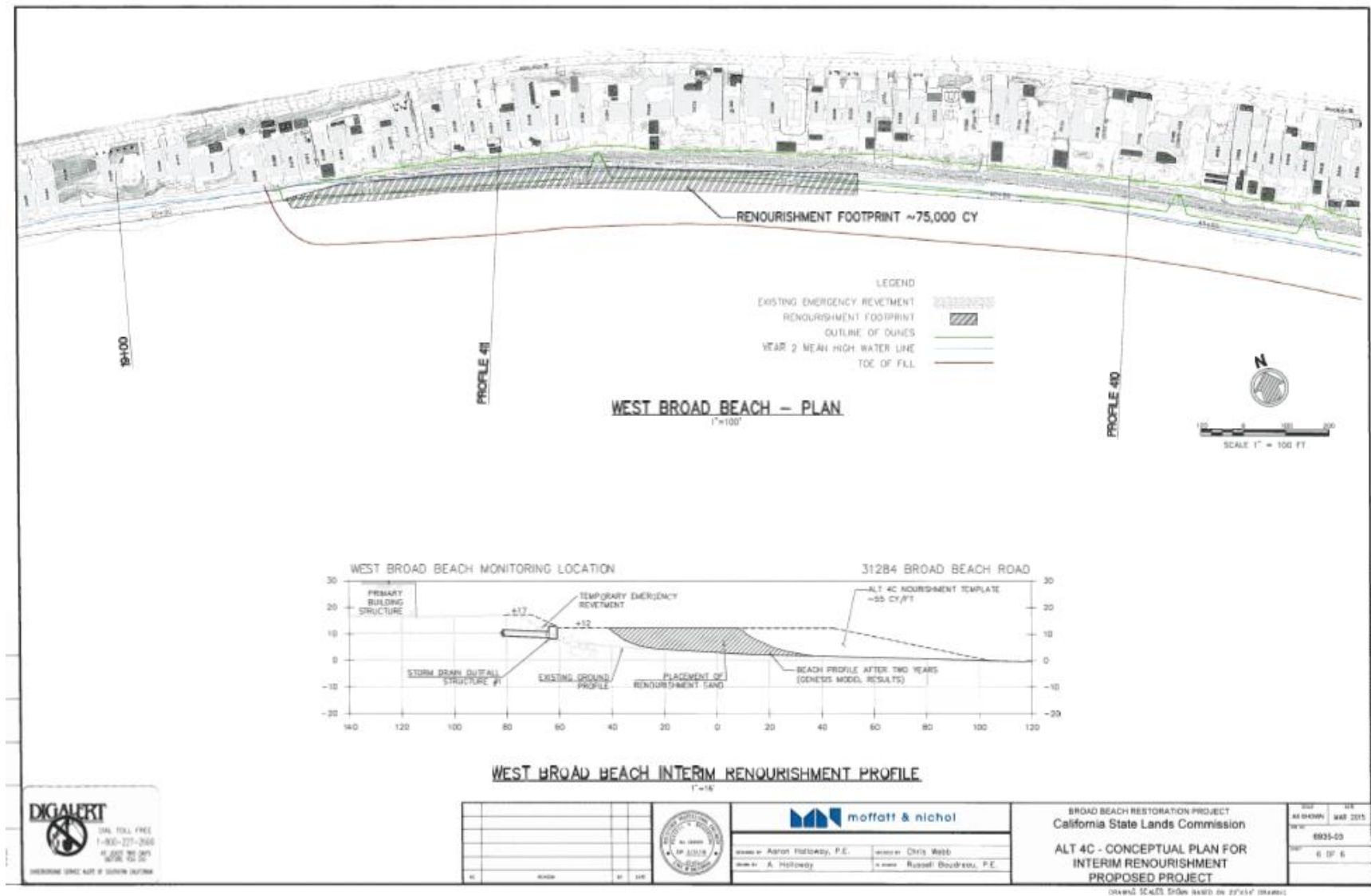


Figure 1-4 Interim Nourishment Plan

## 2.0 ALTERNATIVE 4C ANALYSIS

The Revised APTR Project description proposed a primary nourishment event of 600,000 cy and a second beach nourishment event of 450,000 cy of sand at approximately 10 years. Although the Public Trust impact analysis of the Revised APTR is for a 20-year period, the Project description did contemplate the potential for a second nourishment event by or before the 10-year mark. Therefore, the following impact analysis comparison considers the potential for up to 1,050,000 cy of imported sand with the Revised APTR Project description within a 10-year period. Further, the CSLC will be considering a 10-year lease, rather than the proposed 20-year project life. Therefore, the following impact analysis focuses on a 10-year lease term.

### 2.1 CONSTRUCTION IMPACTS

In comparison to the Revised APTR Project Description, the potential increase in impact intensity for Public Trust resources with Alternative 4c is primarily (but not exclusively) correlated with the potential for increased sand importation and beach nourishment construction activity over a 10-year period. Therefore, an increase in beach nourishment activity under Alternative 4c equates to an increase with the following activities and potential impacts.

- Increased truck trips: increased traffic congestion, increased traffic hazards, potential for increased conflicts with sensitive land uses, increased air quality and GHG emissions, potential for increased use of public parking areas along Pacific Coast Highway providing public access to the Pacific Ocean by project trucks.
- Increased beach nourishment construction impacts: air emissions, GHG emissions, water quality impacts, noise impacts, scenic impacts, recreation and public access impacts, increased potential for oil/fuel spills from construction equipment, increased use of Zuma Beach parking lot and beach for construction staging, increased construction access across beach zone of Trancas estuary mouth, etc.
- Biological impacts: potential for more frequent and prolonged disturbance to marine and terrestrial biological resources from construction activity and direct and indirect sand burial.

Table 2-1 provides a quantitative comparison of beach nourishment and backpassing activities between the Revised APTR Project description and Alternative 4c as authorized by the California Coastal Commission's CDP. As illustrated in Table 2-1 under Alternative 4c, the volume of imported sand that may be needed in addition to proposed nourishment volumes to maintain beach width and lateral public access on the seaward side of the rock revetment is unknown.

**Table 2-1. 10-Year Beach Nourishment and Backpassing Comparison of Revised APTR Project Description and Alternative 4c as Authorized by CDP**

Beach Nourishment and Backpassing Activities	Revised APTR Project Description (PD)	Alternative 4c	
		CDP Authorized Nourishment Volume and Backpassing	In Addition to Proposed Nourishment Volumes of Revised APTR PD
First 5-Year Period			
Major Nourishment	Year 1; 600,000 cy	Year 1; 300,000 cy	No nourishment volume increase
Backpassing	Five annual events	Variable	No nourishment volume increase; see CDP Special Condition 4(A)
Interim Renourishment	Not contemplated	Variable	Up to 75,000 cy per event; see CDP Special Condition 4(B)(1)
Subsequent Major Renourishment	Not contemplated	Variable	Up to 300,000 cy; see CDP Special Condition 4(B)(2).
Total Imported Sand First 5 Years	600,000 cy	Variable	>300,000 cy with interim renourishments; potentially >600,000 cy with major and interim renourishments.*
Second 5-Year Period			
Backpassing	Five annual events	Variable	See above
Interim Renourishment	See Above	See Above	See Above
Subsequent Major Renourishment	450,000 cy	Variable; at least one subsequent major renourishment anticipated	See Above
Total Imported Sand Within Second 5 Years	Potentially 450,000 cy	Variable	Potentially >300,000 cy with interim renourishments and >450,000 cy with major and interim renourishments
Cumulative Total Over 10 Years	Potentially 1,050,000 cy	Variable	>600,000 cy with interim renourishments; potentially >1,050,000 cy with interim and major renourishments.
<b>Note:</b> * Impacts associated with the increased sand volume will be addressed through adaptive management of the project. The primary body responsible for this oversight is the Science Advisory Panel in collaboration with other state and federal agencies. See CDP/NOI condition 6(B) et seq.			

- 1 Any increase in imported sand volume above 600,000 cy within the first 5 years, and a
- 2 cumulative total of 1,050,000 cy within the second 5 years, represent an increase in
- 3 imported sand volume and nourishment activity under Alternative 4c, and therefore an
- 4 increase in the potential for nourishment related impacts, compared to the Revised
- 5 APTR Project description. To manage nourishment related impacts under Alternative 4c
- 6 to the level of impacts analyzed with the Revised APTR Project description, an adaptive
- 7 management approach is needed to monitor and control nourishment related impacts

over the 10-year lease term. To achieve this objective, staff is recommending (see Subsection 2.5 and Appendix B for further detail):

- Comprehensive field monitoring and reporting to identify any impacts and beach profile erosion rates and characteristics;
- Allowance for agency review prior to backpassing and nourishment events to address any prior observed impacts and ensure conformance with CDP/NOI Special Conditions and AMMs; and
- A lease term of 10 years.

This approach manages Alternative 4c as a pilot project to ensure that beach nourishment and related impacts are adaptively managed over the 10-year lease term.

Based on the analysis in the Revised APTR Project description and potential for increased beach nourishment activity with Alternative 4c, Table 2-2 provides an assessment of potential impact differences between the Revised APTR Project description and Alternative 4c. All of the potential impact changes with Alternative 4c are triggered by the potential for additional beach nourishment activities identified in the “In Addition to Proposed Nourishment Volumes of Revised APTR PD” column in Table 2-1. Table 2-2 only identifies the affected resources from the Revised APTR Project description with potential change in impact intensity or designation under Alternative 4c. Affected resources that already have a major adverse impact designation in the Revised APTR Project description that are applicable to Alternative 4c would remain the same, with potential for increased intensity. All other AMMs from the Revised APTR Project description that apply to Alternative 4c will also be maintained with the Monitoring Implementation Program. See Subsection 2.5 and Appendix B for further detail.

## 2.2 LONGER DURATION IMPACTS

Table 2-3 represents other potential impact changes under Alternative 4c that are not related to an increase in beach nourishment activity. These impacts are addressed below. As explained above, the following impact discussion only attempts to discuss new or unique changes associated with Alternative 4c in comparison to the Revised APTR Project Description. Therefore, the Public Trust impact analysis of this report defers to the impact analysis and AMMs of the Revised APTR Project Description for all other impacts that remain unchanged that are applicable to Alternative 4c. See Subsection 2.5 and Appendix B for further detail.

**Table 2-2. Beach Nourishment Impacts: Revised APTR Project Description Versus Alternative 4c**

<b>Revised APTR Project Description Impact</b>	<b>Alt. 4c Potential Impact Change Due to Increased Sand Importation and Beach Nourishment Activity<sup>1</sup></b>	<b>Alt. 4c Impact Triggers</b>	<b>Potential Impact Intensity Change<sup>2</sup></b>	<b>AMMs to Avoid Increased Impacts with Alt. 4c</b>
<b>Marine Biology</b>				
MB-6 Marine Bio. Impacts from Potential Fuel/Oil Releases	Potential increased risk of accidents/spills from increased use of construction equipment for nourishment activity	Increased use of construction equipment on beach	Potential Increase from Mi to Mj	Remain Mi with existing AMM TBIO-4a and CDP Special Conditions 7, 9, and 10
<b>Terrestrial Biology</b>				
TBIO-4 Terrestrial Bio. Impacts from Potential Fuel/Oil Releases	Potential increased risk of accidents/spills from increased use of construction equipment for nourishment activity	Increased use of construction equipment on beach	Potential increase from Mi to Mj	Remain Mi with AMMs TBIO-4a, TBIO-4b, and CDP Special Conditions 7, 9, and 10
TBIO-5 Down coast Impacts to Terrestrial Bio. Resources	Change in sand supply and down coast deposition across Trancas estuary mouth and Zuma Wetlands	Change in sand volume and frequency of supply to down coast beaches	Undetermined; remain Mi	Remain Mi with existing AMM TBIO-5a and CDP Special Conditions 4.C.(4) and (6)
<b>Marine Water Quality</b>				
MWQ-2 Beach Nourishment and Backpassing Impacts to Trancas Creek	Potential increase in nourishment construction activity/access across beach zone of Trancas estuary mouth; adverse impacts to breaching, tidal exchange, and water quality	Increased construction staging events at Zuma Beach Parking Lot	Potential increase from Mi to Mj	Remain Mi with existing AMMs MWQ-2, TBIO-5a, and CDP Special Conditions 4.C.(4) and (6)
<b>Recreation</b>				
REC-1 Initial Construction and Subsequent Construction Effects on Coastal Access and Recreation	Potential increase in public access restrictions and displacement of public parking at Zuma Beach parking lot and along Pacific Coast Highway from increased nourishment construction events/activities	Increased public access restrictions and displacement of public parking	Potential increase from Mi to Mj	Remain Mi with existing AMM REC-1 and CDP Special Condition 15.A



**Table 2-2. Beach Nourishment Impacts: Revised APTR Project Description Versus Alternative 4c**

<b>Revised APTR Project Description Impact</b>	<b>Alt. 4c Potential Impact Change Due to Increased Sand Importation and Beach Nourishment Activity<sup>1</sup></b>	<b>Alt. 4c Impact Triggers</b>	<b>Potential Impact Intensity Change<sup>2</sup></b>	<b>AMMs to Avoid Increased Impacts with Alt. 4c</b>
<b>Scenic Resources</b>				
SR-2 Visual Effects of Construction Activities at Broad Beach	Potential increase in nourishment construction events/activities	Increased nourishment construction events/activities	Potential increase from Mi to Mj	Remain Mi with existing AMMs SR-2a, SR-2b, and CDP Special Conditions 9.b. and 10.a
<b>Air Quality</b>				
AQ-2 Construction Impact of GHG Emissions <sup>3</sup>	Potential increase in GHG emissions from increased truck trips; increased use of construction equipment/activities for nourishment	Increased truck trips and construction activities with GHG emissions	Potential increase from N to Mi	Remain N
AQ-3 Construction Toxic Pollutant Emissions and Health Risk <sup>4</sup>	Potential increase in toxic pollutant emissions and health risk from increased truck trips and construction equipment/activities for nourishment	Increased truck trips and construction activities with toxic pollutant emissions	Potential increase from Mi to Mj	Remain Mi with existing AMMs AQ-1c, AQ-1d
<b>Traffic</b>				
TR-1 Construction Generated Traffic in Broad Beach Vicinity	Potential increase in truck trips along Pacific Coast Highway and Broad Beach vicinity for increased sand transport and nourishment events; increased use of Zuma Beach parking lot for construction staging	Increased truck trips and construction staging events at Zuma Beach parking lot	Potential increase from Mi to Mj	Remain Mi with existing AMM TR-1
TR-3 Increased Safety Risk in Broad Beach Vicinity	Potential increase in truck trips for increased sand transport and nourishment events; increased use of Zuma Beach parking lot for construction staging	Increased truck trips and construction staging events at Zuma Beach parking lot	Potential increase from Mi to Mj	Remain Mi with existing AMM TR-1

**Table 2-2. Beach Nourishment Impacts: Revised APTR Project Description Versus Alternative 4c**

Revised APTR Project Description Impact	Alt. 4c Potential Impact Change Due to Increased Sand Importation and Beach Nourishment Activity <sup>1</sup>	Alt. 4c Impact Triggers	Potential Impact Intensity Change <sup>2</sup>	AMMs to Avoid Increased Impacts with Alt. 4c
<b>Noise</b>				
N-1 Construction Impacts to Recreational Users	Potential increase in construction related noise at Broad Beach from increased beach nourishment construction events/activities	Increased use of construction equipment and activities	Potential increase from Mi to Mj	Remain Mi with existing AMMs N-1a, N-1b
<b>Hazards</b>				
HAZ-2 Hazardous Materials Release During Construction	Potential increased risk of hazardous materials releases from increased use of diesel/oil fueled vehicles and construction equipment for increased nourishment events and activities	Increased truck trips and use, maintenance, staging of diesel/oil fueled construction equipment	Potential increase from Mi to Mj	Remain Mi with existing AMM HAZ-2 and CDP Special Condition 10
HAZ-3 Hazardous Construction Conditions at Broad Beach	Potential increase in hazardous construction conditions at Broad Beach for the public from increased nourishment construction activity/events	Increased hazardous construction activities	Potential increase from Mi to Mj	Remain Mi with existing AMMs HAZ-3a, HAZ-3b, and CDP Special Condition 15
<p><b>Acronyms:</b> APTR=Analysis of Impacts to Public Trust Resources and Values; Alt=Alternative; AM-1=Adaptive Management 1; AMM=Avoidance and Minimization Measure; cy=cubic yards; GHG=Greenhouse Gas; Mi=Minor Adverse Impact; Mj=Major Adverse Impact; N=Negligible Impact;</p> <p><b>Notes:</b></p> <p><sup>1</sup> Increase in nourishment impacts driven by Table 2-1, Alt. 4c column "In Addition to Proposed Nourishment Volumes of Revised APTR PD"</p> <p><sup>2</sup> Potential impact change driven by &gt;600,000 cy nourishment within the first 5 years, and greater than a cumulative total of 1,050,000 cy within the second 5-year period.</p> <p><sup>3</sup> Additional GHG impact threshold of &gt;10,000 MT/Year CO<sub>2</sub>e (SCAQMD Threshold)</p> <p><sup>4</sup> Additional toxic pollutant emissions/health risk impact threshold of Maximum Incremental Cancer Risk ≥ 10 in 1 million</p>				

**Table 2-3. Comparison of Other Revised APTR Project Description and Alternative 4c Impacts**

Revised APTR Project Description Impact	Alt. 4c Potential Impact Change	Impact Threshold	Alt. 4c Impact Triggers	Potential Impact Change	New Alt. 4c AMM
CP/GEO-5 Impacts of Beach Nourishment/ Dune Creation on Coastal Processes	Increased slope of constructed beach berm toe (5:1) could affect wave dynamics and coastal processes differently; potential for accelerated short-term erosion	Through post-construction monitoring of beach profile, determine appropriate beach berm slope to minimize erosion and for optimum beach profile equilibrium conditions	Accelerated beach erosion and excessive loss of sand supply due to gradient of beach berm slope	Unknown if change from N	Determine through post-construction monitoring
CP/GEO-6 Impacts of Beach Nourishment/ Dune Creation on Wave Run-Up	Same as above for CP/GEO-5	Same as above for CP/GEO-6	Same as above for CP/GEO-6	Unknown if change from N	Determine through post-construction monitoring
SR-1 Visual Effects of Rock Revetment	Partial decreased visibility of rock revetment due to burial of relocated section of revetment below natural ground elevation	Substantial reduction in permanent visibility of rock revetment	Permanent decrease in visibility of rock revetment	Remain Mi	None; existing AMM TBIO-1a

### 2.2.1 Coastal Processes and Sea Level Rise (SLR)

Increased slope of the seaward toe (5:1) of the proposed beach profile under Alternative 4c, in comparison to the Revised APTR Project description's 10:1 slope (10 horizontal feet for 1 foot elevation change), could have different effects on coastal processes, beach erosion rates, wave dynamics (i.e., wave height, direction, run-up, and surf conditions), and beach equilibrium characteristics. It is unknown whether these effects are adverse or beneficial, and level of impact change in comparison to the Revised APTR Project description. However, with a steeper slope at the toe of the constructed beach berm, this may have potential for short-term accelerated erosion to the beach berm as coastal processes adjust the constructed beach towards equilibrium.

As analyzed with the Revised APTR Project description in Section 3.1, Coastal Processes, SLR, and Geology (Impact CP/GEO – 8, Impacts of SLR), SLR could incrementally contribute to the erosion rate of the project's widened beach over the duration of the project. SLR over the short- to mid-term horizon (i.e., 10 to 20 years) is projected to accelerate to approximately 5.8 inches by 2030 and 8.5 inches by 2040 (CCC 2013, National Research Council 2012). As analyzed with the Revised APTR Project description for a 20-year project with beach widths ranging from 90 to 230 feet seaward of the new dune system, Moffatt & Nichol (2013) estimated that under these projections, SLR over the next 20 years would contribute to approximately 3 to 15 feet of beach erosion along most of Broad Beach, where the slope was expected to be 10 horizontal feet to each vertical foot (10:1), and approximately 1 to 4.5 feet of erosion at the west end of Broad Beach where the slope was expected to be 3:1. In comparison to the Revised APTR Project description, Alternative 4c would have a 10-year project duration, with beach widths ranging from 52 to 70 feet. Since Alternative 4c would still increase and attempt to maintain beach width seaward of the new dune system through nourishment and backpassing activities and adaptive management efforts to monitor and manage the beach's optimum equilibrium profile, erosion attributable to SLR over the project life is expected to comprise a small portion of the erosion along Broad Beach. Therefore, Impact CP/GEO – 8, Impacts of SLR, is expected to remain negligible over the 10-year project life of Alternative 4c.

## **2.2.2 Scenic Resources**

Inland relocation of the approximate eastern half of the rock revetment and burial below natural ground elevation, with surface burial of dune sand, could result in decreased long-term visibility of the rock revetment in comparison to the Revised APTR Project description. This could result in a beneficial decrease in impact intensity for scenic resource impact SR-1, Visual Effects of Rock Revetment, particularly if improvements to upland residential land uses (i.e., removal of leach fields, building elevation improvements, etc.) could allow for removal of the rock revetment within or by the 10-year term of the lease.

## **2.3 BENEFICIAL IMPACTS**

### **2.3.1 Marine Biological Resources**

Alternative 4c is expected to reduce impacts to marine species and habitats from direct and indirect burial of sand and turbidity, through a reduction in nourishment volumes and beach width, avoidance of direct nourishment west of 31380 Broad Beach Road, and monitoring of marine resource impacts and adaptive management efforts to minimize and avoid impacts as the project moves forward. However, due to uncertainty over the extent of impacts to marine resources, Alternative 4c still has potential for major adverse impacts for marine biological resources, as described in impacts MB-2

and MB-4 of the Revised APTR Project description. The CDP/NOI conditions and the Science Advisory Panel, in coordination with the State Lands Commission, should provide sufficient oversight and responsiveness to reduce or avoid impacts based on the development and reporting anticipated in the monitoring plan.

### **2.3.2 Trancas Estuary Mouth**

Due to decreased beach width and nourishment volumes, Alternative 4c may have different effects on breaching, tidal exchange, and fish passage with the Trancas estuary mouth. It is unknown if these effects will be beneficial or adverse; therefore, this impact remains a minor adverse impact with inclusion of AMM, TBIO-5a.

### **2.3.3 Recreation and Public Access**

Due to potential increased frequency and volume of beach nourishment and adaptive management efforts to optimize beach profile management and sand supply, Alternative 4c may increase the beneficial recreational effects identified with recreation impact REC-3 of the Revised APTR Project description, by increasing the longevity of beach width and lateral public access on Broad Beach.

### **2.3.4 Scenic Resources**

As previously explained, Alternative 4c could result in a greater reduction in visibility of the rock revetment for a longer period of time due to inland relocation and burial.

## **2.4 ADVERSE IMPACTS**

### **2.4.1 Construction Impacts on Trancas Estuary Mouth and Coastal Processes**

Increased frequency of nourishment events would require construction equipment access across the beach zone of the Trancas estuary mouth. Decreased nourishment volumes may have reduced indirect nourishment benefits of Zuma Beach. Reduced nourishment volumes could reduce sand supply available for backpassing.

### **2.4.2 Marine and Terrestrial Biological Resources**

Mortality of macroinvertebrates, loss of beach wrack, and diminished value of beach habitat for foraging shorebirds could increase under Alternative 4c, as the beach could be disturbed more frequently by renourishment events. Additionally, more frequent use of construction equipment associated with renourishment events would increase the potential for accidents or spills from construction equipment, and could increase the frequency of temporary displacement of shorebirds and sensitive species.

### 2.4.3 Parking and Public Access

An increase in frequency and number of nourishment events will require more frequent use of Zuma Beach parking lot for construction staging, which could have conflicts with more frequent displacement of public parking and other uses of the parking lot and Zuma Beach, including public parking along Pacific Coast Highway (PCH) in the Broad Beach vicinity. For the remainder of the proposed truck route along PCH, more frequent truck trips could also increase the frequency of trucks use of public parking areas along PCH, which currently provide public access to the Pacific Ocean, as overflow parking areas while trucks wait to enter the Zuma Beach parking lot.

### 2.4.4 Construction Impacts

An increase in beach nourishment activity under Alternative 4c would likely increase the frequency of the construction related impacts previously discussed in Section 3.2 of the 2014 Revised APTR. Similarly, the possibility of exceeding 1,050,000 cy of sand pursuant to the CCC CDP/NOI would potentially increase the overall duration of construction-related impacts.

## 2.5 APPLICABILITY OF AMMs FOR ALTERNATIVE 4C

Unless noted in this section, all other impacts and AMMs from the Revised APTR Project Description that are applicable to Alternative 4c are included with the Revised AMM Monitoring Implementation Program provided in Appendix B, which includes modifications to some AMMs for applicability to Alternative 4c and consistency with the CCC CDP. Several AMMs from the Revised APTR are no longer applicable due to the new project design of Alternative 4c, conditions provided in the CCC CDP, and comments received with the Revised APTR. AMMs that are no longer applicable and removed from the Monitoring Implementation Program include the following: MB-2a, MB-2c, TBIO-1b, TBIO-5b, AQ-1a, AQ-1b, AQ-3, and N-1b. Table 2-4 below provides the 2014 Revised APTR AMMs, their applicability to Alternative 4c, and consistency with other agencies. In the context of Table 2-4, those AMM's applicable to Alternative 4c are identified as are existing permit conditions that may satisfy each AMM.

The California State Lands Commission (CSLC) will seek to ensure that the various areas identified in the Mitigation Implementation Plan (MIP) are met through either existing Avoidance and Minimization Measures (AMM) or through permitting conditions (like CCC CDP), in coordination with the entities listed in Table 1, Appendix B, to monitor implementation of the proposed project as approved by CCC and the Commission. These impact areas and AMMs are identified in the Revised Analysis of Impacts to Public Trust Resources and Values (APTR) and this Project Update.



**Table 2-4. List of 2014 Revised APTR AMMs, their Applicability to Alternative 4c, and Other Agency Requirements**

2014 Revised APTR AMM *	AMM Applicability to Alt. 4c
<b><i>Recreation and Public Access</i></b>	
<b>AMM REC-1. Public Access during Construction and Renourishment</b>	AMM satisfied by CDP Special Condition 15A.
<b>AMM REC-2. Public Access during Backpassing</b>	AMM satisfied by CDP Special Condition 15A.
<b>AMM REC-3. Beach Profile Reporting</b>	AMM satisfied by CDP Special Condition 4C(6).
<b>AMM REC-4a. Requirement of Additional Nourishment</b>	AMM satisfied by CDP Special Condition 4B.
<b><i>Marine Biological Resources</i></b>	
<b>AMM MB-2b. Multi-Agency Collaboration for Sensitive Marine Habitat Impacts</b>	AMM satisfied by CDP Special Condition 6.
<b>AMM MB-3. Monitoring for Grunion</b>	AMM satisfied by CDP Special Condition 7C.
<b>AMM MB-5a. Backpassing Management Plan</b>	AMM satisfied by CDP Special Condition 4A.
<b>AMM MB-5c. Beach Habitat Management Plan</b>	AMM satisfied by CDP Special Conditions 4 and 4A.
<b><i>Terrestrial Biological Resources</i></b>	
<b>AMM TBIO-1a. Implementation of a Comprehensive Dune Restoration Plan</b>	AMM satisfied by CDP Special Condition 5.
<b>AMM TBIO-2a. California State Lands Commission (CSLC)-Approved Biologist and Biological Monitors for Construction Activities</b>	AMM satisfied by CDP Special Condition 7.
<b>AMM TBIO-2b. Sensitive Resources Impact Avoidance</b>	AMM satisfied by CDP Special Conditions 4A, 7, 9, 10.
<b>AMM TBIO-2c. Protect Stockpiles of Excavated Material</b>	AMM applicable to Alt. 4c. AMM satisfied by CDP Special Conditions 9 and 10 for sand stockpile location. Related to AMM AQ-1d.
<b>AMM TBIO-2d. Storage of Materials or Heavy Equipment Prohibited Outside of Staging Area</b>	AMM satisfied by CDP Special Condition 10.
<b>AMM TBIO-3a. Biologist and Biological Monitors for Backpassing Activities</b>	AMM satisfied by CDP Special Condition 7.
<b>AMM TBIO-3b. Avoidance of Sensitive Resource Zones and Vegetation</b>	AMM satisfied by CDP Special Conditions 4A, 7, 9, and 10.
<b>AMM TBIO-3c. Sensitive Biological Resources Report</b>	<b>Required at year 3.</b> AMM satisfied by CDP Special Conditions 4C(6), 5B(4), 6D(6), and 7.
<b>AMM TBIO-4a. Emergency Action Plan Measures Regarding Protection of Biological Resources</b>	AMM applicable to Alt. 4c. AMM measures partially satisfied by CDP Special Condition 7D.
<b>AMM TBIO-4b. Maintain Equipment and Adhere to Work Plan</b>	AMM applicable to Alt. 4c. Has similar requirements with CDP Special Condition 10.

**Table 2-4. List of 2014 Revised APTR AMMs, their Applicability to Alternative 4c, and Other Agency Requirements**

<b>2014 Revised APTR AMM *</b>	<b>AMM Applicability to Alt. 4c</b>
<b>AMM TBIO-5a. Maintain the Hydrology of Trancas Lagoon</b>	AMM applicable to Alt. 4c and AMM satisfied by CDP Special Conditions 4C(4) and (6).
<b>AMM TBIO-7. Restrict Access Across the Newly Restored Dune System</b>	AMM satisfied by CDP Special Condition 5A(5).
<b><i>Marine Water Quality</i></b>	
<b>AMM MWQ-1a. Prepare and Implement Turbidity Monitoring Plan</b>	AMM applicable to Alt. 4c. AMM satisfied by CDP Special Condition 7E. LARWQCB may issue comparable permit conditions.
<b>AMM MWQ-1b. Prepare Pollution Prevention Plan and Implement Best Management Practices (BMPs)</b>	AMM applicable to Alt. 4c. AMM satisfied by CDP Special Condition 10.
<b>AMM MWQ-2. Construction Limitations</b>	AMM applicable to Alt. 4c. Not specifically required by CDP.
<b><i>Scenic Resources</i></b>	
<b>AMM SR-2a. Shielded Lights during Night Operations</b>	AMM satisfied by CDP Special Condition 9b.
<b>AMM SR-2b. Nightly Equipment Removal</b>	AMM applicable to Alt. 4c and AMM satisfied by CDP Special Conditions 9b and 10a.
<b><i>Air Quality</i></b>	
<b>AMM AQ-1c. Nitrogen Oxides (NOx), Volatile Organic Compounds (VOCs), and Particulate Matter (PM) Control</b>	AMM applicable to Alt. 4c. Not required by CDP. AMM measures requested by SCAQMD and VCAPCD.
<b>AMM AQ-1d. Fugitive Dust Emission Control</b>	AMM applicable to Alt. 4c. Not required by CDP. Applicable to Rule 403 of SCAQMD fugitive dust controls.
<b><i>Traffic and Parking</i></b>	
<b>AMM TR-1. Traffic Management Plan</b>	AMM applicable to Alt. 4c. Not required by CDP. Caltrans and L.A. County Department of Beaches and Harbors may seek comparable conditions.
<b><i>Noise</i></b>	
<b>AMM N-1a. Use of Noise-Attenuating Devices on Construction Equipment</b>	AMM applicable to Alt. 4c. Not required by CDP. AMM measures may have applicability with City of Malibu and/or L.A. County noise standards.
<b>AMM N-1b. City of Malibu Approval for Exceedance of City Noise Ordinance</b>	AMM applicable to Alt. 4c. AMM likely satisfied by CDP Special Condition 17. ACOE and LARWQCB may seek comparable condition.
<b><i>Public Health and Safety Hazards</i></b>	
<b>AMM HAZ-2. Develop Hazardous Material Spill Prevention Control and Countermeasure Plan (SPCCP)</b>	AMM applicable to Alt. 4c. AMM may be satisfied by CDP Special Condition 10. LARWQCB may seek comparable condition.
<b>AMM HAZ-3a. Demarcation of Public Access Routes</b>	AMM applicable to Alt. 4c and satisfied by CDP Special Condition 15.

**Table 2-4. List of 2014 Revised APTR AMMs, their Applicability to Alternative 4c, and Other Agency Requirements**

<b>2014 Revised APTR AMM *</b>	<b>AMM Applicability to Alt. 4c</b>
<b>AMM HAZ-3b. Provision of Contact for Reporting Hazards</b>	AMM applicable to Alt. 4c. Not required by CDP. LARWQCB may seek comparable condition.
<b>AMM HAZ-4. Response to Sediment Contamination</b>	AMM applicable to Alt. 4c and satisfied by CDP Special Condition 8A(2).
<b><i>Utilities and Service Systems</i></b>	
<b>AMM UTL-3. Master Drainage Plan (MDP)</b>	AMM applicable to Alt. 4c. AMM not specifically required by CDP, but CDP does require maintenance of existing storm drains through Special Condition 5C(2).
<p><b>Note:</b> * See Appendix B for full descriptions of the AMMs.</p> <p><b>Acronyms:</b> ACOE=U.S. Army Corps of Engineers; AMM=Avoidance and Minimization Measure; Caltrans=California Department of Transportation; CDP=Coastal Development Permit; LARWQCB=Los Angeles Regional Water Quality Control Board; SCAQMD=South Coast Air Quality Management District; VCAPCD=Ventura County Air Pollution Control District.</p>	

### **3.0 PROJECT UPDATE PREPARATION SOURCES AND REFERENCES**

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#### **3.1 PROJECT UPDATE PREPARERS**

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#### **3.2 REFERENCES**

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# Appendix A:

## Project Description for Alternative 4c

### Broad Beach Restoration Project

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# Appendix B: 2016 Monitoring Implementation Program

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