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Th17a

ADDENDUM

DATE: December 8, 2014

TO: Commissioners and Interested Parties

FROM: South Central Coast District Staff

SUBJECT: Agenda Item 17a, Thursday, December 11, 2014, Coastal Development Permit 4-12-043 (Broad Beach Geologic Hazard Abatement District)

The purpose of this addendum is to make corrections/revisions to the staff report, include and respond to correspondence received to date, and attach documentation regarding Ex Parte Communications from Commissioners.

A. Revisions/Corrections to the Staff Report

The following revisions to the findings and special conditions of the report are made as follows(language to be inserted is shown underlined and language to be deleted is shown in ~~line out~~):

1. The following text discussing shoreline armoring impacts shall be added after the second full paragraph on page 52 of the staff report (in addition the related Exhibit 2 of this addendum shall be added as Exhibit 22 of the staff report):

   As noted previously, the revetment will cover 3.02 acres of beach, some that is public trust land, some that is, for now, private property and some that is private property subject to public easements, deed restrictions, and permit conditions granting public access. The revetment will also prevent the inland migration of the beach (often referred to as passive erosion), at an average retreat rate of 2 feet per year, as determined by the applicants' coastal engineer. Dr. Ewing has reviewed the various coastal studies for this section of coast and concurred with the provided average retreat rate.

   At Broad Beach the mean high tide line (MHTL) defines the landward boundary of public trust land. Exhibit 22 shows the surveyed MHTL for both 2009 and 2010 for the Broad Beach area. The changes in the MHTL locations show a one year trend that closely tracks the average annual retreat rate. While most years will not track the average retreat rate as closely as this, nevertheless, over multiple years (5 to 10 or more), the actual retreat should be well-represented by the average annual retreat. As such, the 2010 MHTL would be approximately 28 feet farther inland over a 10-year the proposed project life (including the 4 years that the emergency revetment has been in place) and 48 feet farther inland over a 20-year project life. For the 4,150-foot long revetment, the public trust lands would have

expanded by 25,200 sq. ft. (0.58 acres) during the time that the emergency revetment has been in place, by an additional 83,000 sq. ft. (1.9 acres) during the 10-year project life or an additional 166,000 sq. ft. (3.8 acres) during the 20-year project life.

The revetment will also prevent erosion from contributing inland sand to the littoral cell. With an average back beach elevation of 15 feet (based on project plans provided by the applicant), and an average composition of the back dune material of 95% sand (based on provided grain size analysis in Figure 11 of Exhibit 20 "Dr. Jonna Engel Memo" of this staff report), 2-feet of erosion of the back dunes each year would contribute 28.5 cu. ft. of sand (1.056 cubic yards) per foot of beach per year. For the 4,150- foot long revetment, the littoral sand contributions would have been approximately 17,530 cu. yds. of sand during the time that the emergency revetment has been in place, an additional 43,800 cu. yds. during the 10-year project life or an additional 87,650 cu. yds. during the 20-year project life. .In addition to the volume of sand trapping inland of the revetment, the revetment will accelerate beach scour seaward of the structure. While this sand will remain within the littoral cell, the revetment will cause localized sand losses that, while attributable to the structure, cannot be quantified. Additional sand will be used by the applicants for visual treatment to cover the revetment and to enhance and expand the dune system.

2. The following text discussing alternatives to avoid or minimize adverse impacts from the rock revetment shall be added before the first full sentence page 60 of the staff report:

The quantifiable impacts from the revetment will be encroachment onto the beach, preclusion of passive erosion landward of the revetment through fixing the back beach location, and denial of sand to the littoral cell. The as-built emergency revetment has resulted in the encroachment on 3.02 acres of beach, losses of 0.58 acres of inland migration of the MHTL and denial of 17,530 cu. yds. of sand to the littoral cell. The proposed project would maintain the 3.02 acres of encroachment, result in an additional loss of 1.9 acres of beach area that would have become public as a result of the inland migration of the MHTL for a 10-year project life (or 3.8 acres for a 20-year project life), and denial of 43,800 cu. yds. of sand to the littoral cell for a 10-year project life (or 87,650 cu. yds. for a 20-year project life) that would have been available if not for the revetment. Total impacts from the as-built emergency revetment to date and an additional 10-year project life would be 3.02 acres of direct encroachment onto the beach, loss of 2.48 acres of inland migration of the MHTL and denial of 61,330 cu. yds. of sand to the littoral cell. Total impacts from the as-built emergency revetment to date and an additional 20-year project life would be 3.02 acres of direct encroachment onto the beach, loss of 4.38 acres of inland migration of the MHTL and denial of 105,130 cu. yds. of sand to the littoral cell.

In most situations, the land impacts from a revetment resulting from encroachment and passive erosion are mitigated by an in-lieu fee for recreational and access losses. However, in-kind mitigation is always preferred and in this situation, there is additional land inland of the proposed revetment location that can provide for direct mitigation. As discussed below, the revetment can be relocated landward. Approximately 2,000 feet of the revetment can be relocated landward by up to 75 of 85 feet. This will provide approximately 160,000 sq. ft.

(3.67 acres) of new beach areas, mitigating, in-kind, for much of the passive erosion and encroachment loss.

3. The following text discussing sediment options for Broad Beach nourishment materials shall be added after the first paragraph on Page 74 of the staff report:

The applicant has identified three inland sources of sand that could be used for beach nourishment. The potential quarry sources are CEMEX, Grimes Rock and the Gillibrand. According to the applicant's October 2013 Revised Sampling and Analysis Plan and Test Results Report (SAP), "Grimes Rock and CEMEX each possess the capacity to provide the quantity of sand required for the project (600,000 cy of material)." Gillibrand does not have the capacity to provide the total quality of sand, even at the smaller project size of 300,000 cubic yards; however, it could provide a portion of the needed beach sand or could provide the quantity of sand needed for a small-scale interim nourishment event. The characteristics of the various sand material and general quarry information, as excerpted from the SAP (October 2013) are summarized in the following Table: Different Sand Sources. Information from Broad Beach and Zuma are also provided for information on the current site conditions.

Different Sand Sources

	CEMEX	Grimes Rock	Gillibrand(1)	Broad Beach	Zuma
Grain size d_{50}	0.95mm (5/2013) 0.85 mm (10/2013)	0.60 mm (5/2013) 0.47 mm (10/2013)	1.00 mm	0.25 (dry beach) 0.32 (dunes)	0.4 mm
Stockpile Area	1.2 acres	0.22 acres	2.6 acres	NA	NA
Coarse Sand (2)	21%	10%	1%	ND	ND
Medium Sand (2)	59%	71%	99%	ND	ND
Fine Sand (2)	12%	12%	0%	ND	ND
Silts & Clays (2)	8%	7%	0%	ND	ND

(1) Table 2 of the SAP (October 2013) states that only 66% of the sand from Gillibrand is in the medium sand size; however, Figure 14, the Composite Grain Size Envelope for Broad Beach vs. P.B. Gillibrand shows that 99% of the sand is medium, with 80% of the sampled sand having a diameter greater than a 0.7 mm.

(2) The sand classifications are based upon the Unified Soil Classification, as follows:

Coarse Sand – 2.0 mm – 4.76 mm
Medium Sand – 0.42 mm – 2.0 mm
Fine sand – 0.074 mm – 0.42 mm
Silts and clays – less than 0.074 mm

The above table provides two separate d_{50} values for the sand from both CEMEX and Grimes Rock. Subsequent to taking samples from all three quarries in May 2013, the

applicant's consultant learned that both CEMEX and Grimes Rock had both relocated the cut locations in their quarry sites and that each quarry intended to work these new locations for well into the future. Additional sediment samples were obtained for the new cut locations and in both cases, the median grain size for the October 2013 samples dropped by approximately 0.1 mm in size, bringing both sites closer to the median grain size of the sand currently found on Broad Beach. The lack of fine sand, silts and clays in the Gillibrand was not explained, but, based on visual observations of the sand by the Commission's coastal engineer, it is her opinion that the lack of fine material is likely due to a washing process that occurred prior to placing the sand into the stockpile from which the sample was obtained.

Special Condition Eight (8) would limit the proposed nourishment material to have a d_{50} between 0.24 mm and 0.6 mm. The 0.24 mm limit is the median diameter of the sand that is now present on Broad Beach and the 0.60 limit is the upper value of the sand material available from Grimes Rock. As demonstrated by the provided sediment grain size analysis, sand between 0.24 mm and 0.60 mm can be provided through the identified quarry options and it can be available to the site for the proposed nourishment effort. Also, there would not be the need for special and potentially costly sieving or sand washing to meet this size constraint.

The options for use of a larger or coarser sand material than native will modify the existing beach characteristics slightly. The larger grain size will establish a slightly steeper shore face and should allow the nourished sand to remain on the beach area for a longer time period than the native sand. Also, the difference in grain size is not so large that distinct zones of coarser and finer material would develop on the beach face, such as can be observed on mixed sand and cobble beaches.

The applicant has proposed to use sand with a median grain size of up to 0.85mm, since sand of such coarseness would allow greater flexibility in sand acquisitions, allowing sand from Grimes alone, CEMEX alone, Grimes and CEMEX mixed, Grimes and Gillibrand mixed, or, Grimes, CEMEX and Gillibrand mixed. Sand with a median grain size of up to 0.85 mm would also remain on the beach longer than the native sand and presumable longer than sand with a median grain size of 0.6 mm. The idea that coarser sand will remain in a beach longer than finer sand is not a new concept. The sand composition and beach profile reflect the sand available in the littoral cell and the wave conditions that work and transport sand within the littoral cell. Eventually, the grain sizes may become so large than the material is no longer considered sand and it will move only during extreme wave and storm conditions. Such a change in the beach character would not result either from the introduction of coarser sand with either a maximum median grain size of either 0.60 mm or 0.85 mm.

The applicant has provided analysis of the coarser sand performance[i]. This analysis examines the change in diffusion for the more coarse sand with a d_{50} of 0.85 mm and shown that its longevity performance will be better than sand with a d_{50} of 0.24 mm and there will be less need for maintenance. It also examines the underfoot feel and impacts to surfing,

notes that the sand just downcoast at Zuma has coarser sand (with a d_{50} of 0.4 mm) and also provides details about already approved nourishment of other beaches in southern California that have used coarser than native sand. Those examples cover beaches with a native grain size similar to that at Broad Beach and with coarser nourishment sand that has a d_{50} less than or up to 0.60 mm. Some of the same sites noted in the Moffatt-Nichol report on Coarser than Native Grain Size are:

- 75,000 cubic yards (cy) at Seal Beach in 2009 (native beach sand = 0.35 mm; beach fill = 0.42 mm);
- 2 million cy at Surfside Colony/Sunset Beach in 2009/2010 (native sand = 0.25 mm; beach fill = 0.42 mm);
- 2.1 million cy by SANDAG in 2001 (native beaches = 0.25 mm; beach fill at 6 of 12 sites was 0.62 mm); and
- 1.5 million cy by SANDAG in 2012 (native beaches = 0.25 mm; beach fill was up to 0.61 mm).

Based on the evidence supplied by the Applicant, the use of 0.85 mm median diameter sand is not within the routine "coarser than native" nourishment efforts.

The sand used for beach nourishment would also be used for dune nourishment or might be carried onto the dune by waves and Aeolian (wind) transport. The dune configuration has not been analyzed for various sand diameters and there has been no analysis of the improvements and beach changes that would result between nourishment of 0.6 mm and 0.85 mm. Given that the coarser than native examples provided by the applicant have had a "coarser" limit of about 0.6 mm or less, and given that the coarser sand present at Zuma is only 0.4 mm, the limit of grain for the nourishment to be between 0.24 mm and 0.60 mm is already in excess of the sand coarseness identified at Zuma Beach, and is at the upper limit of the difference between native and coarse nourishment sand used in recent nourishment efforts. Special Condition 8 will allow for the use of quarry sand in the nourishment effort, without requiring additional treatment, and will provide for a somewhat greater longevity of the nourishment sand over the native sand, without pushing the limits for coarser sand beyond what exists locally or have been used in other southern California nourishment projects.

4. **Minor Corrections:**

In order to correct minor and inadvertent typographical errors in the report; the following revisions are made:

- Page 12, Special Condition 4.A.5., Line 4 shall be revised to state "no further seaward than the wetted bound. No more than ~~2~~ *7* feet of dry sand, by depth…"

- Page 13, Special Condition 4 B.3.(ii) shall be revised to state "Results from sediment sampling and testing, following requirements of Special Condition ~~7~~ *8*."

- Page 13, Special Condition 4 C,i. shall be revised to state "*Periodic Beach Profile Surveys*: A licensed surveyor or engineer shall survey full beach profiles for each of the 17 identified beach profile transect lines at Broad Beach and Zuma Beach (412.5, 412.3, 412, 411.7, 411, 410, 409, 408, ~~416, 414, 412, 411~~, 406, 404, 402, 400, 398, 396, and 394, as shown on Exhibit 12)."

- Page 24, Special Condition 7.A. (Lines 6 and 7) shall be revised to state "construction activities related to ~~the permeable pier sand retention system, the seasonal beach berm~~ the revetment relocation and/or any beach nourishment activities (initial nourishment, renourishment, and interim sand all using coarser than native sand, and back-passing) on the project site."

- Page 40. The first footnote (Footnote 1) on Page 40 of the staff report shall be replaced in its entirety with the following:

  [1] The BBGHAD approved the project without conducting review under the California Environmental Quality Act (CEQA). The BBGHAD relied on Public Resources Code Section 26559 to file a Notice of Exemption from the California Environmental Quality Act.

- Page 49, the following text shall be added to the end of the Paragraph 2: "The Coastal Commission's Draft Sea Level Rise Policy Guidance, released for public review October 14, 2013 and presented at Commission hearings in December 2013 and January 2014, discusses many of the concerns related to sea level rise along the California coast and it provides both general and specific approaches for the review, analysis, siting and design of both new development and shoreline armoring to minimize current and future risks related to rising sea level."

- Page 51/52, The last partial sentence on Page 51 and first partial sentence on Page 52 shall be revised as follows: "Thus, in addition to the loss of public sandy beach area from the direct occupation of the revetment itself (approximately ~~3.2~~ 3.02 acres in area) since the back of the beach has been effectively "fixed" by the revetment, the revetment will also result in the loss of area of beach area for public use landward of the revetment that would have become available for public use as the shoreline continued to erode and the mean high tide line would have continued to move landward.

- Page 52 (Lines 5 – 8) shall be revised as follows: "Thus, given the historical average rate of 2 ft. of shoreline erosion per year, over the project life of ~~the rock revetment, typically~~ 10 or 20 ~~– 50~~ years ~~or more~~, the proposed revetment would result in the expected loss of another 20 to 40 ~~to 100~~ ft. of beach over the full 4150 foot length of the revetment ~~area~~ that would otherwise be available for public use."

- Page 66. The second sentence of the last paragraph on Page 66 shall be revised as follows: In addition, the City of Malibu LCP, which is used as guidance in this permit action, requires that new shoreline protective structures be located as far landward as

feasible to protect existing development, taking into account effects of accelerated sea level rise.

- Page 68. The following text shall be inserted after the 3rd sentence in the 1st paragraph on Page 68 as follows: "Sea level rise will cause an increase in beach retreat and passive erosion over what has happened historically. Monitoring shoreline change will be necessary to understand changing beach conditions and to determine if a new retreat rate will be more appropriate for future project analysis, after the initial permit period."

- Page 68. The second to last sentence in Paragraph 1 on Page 68 shall be revised as follows: "Moreover, to ensure that this critical information regarding potential impacts to marine resources is recorded and reported to the Executive Director for consideration of future project approvals, **Special Conditions Four (4) and Six (6)** requires that extensive monitoring of the effects of the project on shoreline processes be implemented to assess the effects of the ~~permeable pier sand retention system and~~ beach nourishment program (initial nourishment, renourishment, and interim sand all using coarser than native sand, and back-passing) for the term of this permit."

- Page 69. The second sentence of the last paragraph on Page 69 shall be revised as follows: "In order to analyze the potential effects of the proposed beach nourishment project ~~permeable pier sand retention system~~, the applicant utilized GENESIS (Generalized Model for Simulating Shoreline Change) which was developed by the United States Army Corps of Engineers (USACE) Coastal Engineering Research Center.

- Page 74, The second sentence of Paragraph 3 on Page 74 shall be revised as follows: "~~However, Dr. Ewing notes that the applicants have not performed any specific analysis of the beach changes that would result using nourishment material with a median grain size between 0.60 mm and 1.00 mm~~The applicants' consultants modeled the nourishment duration for the native sand and for a 0.85 mm median grain size, the upper limit of the sand available from the CEMEX quarry. The 0.85 median grain size was modeled to examine the effects of the two primary sand sources, or a blend of the three sources. There was no grain size optimization or determination of when the benefits of a larger grain size drop or greatly diminish. Based on the analysis submitted by the applicant, there is no evidence that a change in maximum allowable grain size from 0.85 to 0.6 would significantly change the duration of the proposed nourishment efforts."

- Page 75. The first full sentence on page 75 shall be revised as follows: "Therefore, to ensure that all future ~~dredged~~ nourishment material is physically and chemically compatible with the proposed deposition site and suitable for beach nourishment, the Commission finds it necessary to require **Special Condition Eight (8)** which requires the applicant to test the physical and chemical characteristics of representative samples of the ~~dredging~~ quarry areas consistent with U.S. Army Corps of Engineers (Army Corps), Environmental Protection Agency (EPA), and State Water Resources Control Board and California Regional Water Quality Control Board (RWQCB) criteria for beach

replenishment and dredging and disposal in intertidal areas prior to the commencement of dredging activities each year.

- Page 129. The following text shall be added prior to the last sentence of the second paragraph on Page 129: "The easements are held by the State Lands Commission and will continue in effect. Nothing in this permit should be read as an implicit amendment of any prior CDP requiring lateral access."

- Page 139. The last sentence of the first paragraph on Page 139 shall be revised as follows: "Moreover, to ensure that this critical information regarding potential impacts to marine resources is recorded and reported to the Executive Director for consideration of future project approvals, **Special Conditions Four (4)** requires extensive monitoring of the effects of the project on shoreline processes be implemented to assess the effects of the rock revetment ~~permeable pier sand retention system~~ and beach nourishment program for the term of this permit.

B. Revisions/Corrections to Memorandum by Dr. Jonna Engel dated November 25, 2014 and included as Exhibit 20 of the staff report.

The following revisions to Dr. Jonna Engel's November 25, 2014 Memorandum, *Potential Impacts of the Broad Beach Geologic Hazard Abatement District Proposed Project on Terrestrial and Marine Resources In and Adjacent to the Project Footprint, Broad Beach, Malibu, California,* are made as follows (language to be inserted is shown **underlined** and language to be deleted is shown in ~~line out~~):

1. In order to better describe the diversity of southern California beach ecosystems and to correct a typographical error the following text addition and correction is made to the last paragraph on page eight:

   Southern California sandy beaches can support some of the most diverse invertebrate communities ever reported for this coastal habitat[1]. **According to Dugan and Hubbard:**

   Recent comparisons have shown that California's sandy beaches support some of the most diverse intertidal invertebrate communities ever reported for beach ecosystems with >45 species found in single surveys on a variety of beaches and >105 species recorded in southern and central regions (Straughan 1983, Dugan et al. 2000, 2003, Schooler et al. 2013, in prep.). Crustaceans, polychaete worms and mollusks are major intertidal invertebrate groups on California beaches and elsewhere. Endemic insects, including a number of flightless beetles, form an important element of the diversity of California's beaches. It is highly likely that numerous additional species are present on

[1] Dugan, J.E., Hubbard, D.M., Engle, J.M., Martin, D.L., Richards, D.M., Davis, G.E., Lafferty, K.D., and R.F. Ambrose. 2000. Macrofauna communities of exposed sandy beaches on the Southern California mainland and Channel Islands. Fifth California Islands Symposium, OCS Study, MMS 99-0038: 339-346.

California beaches but identification of several important taxa, including infaunal polychaete worms and wrack-associated insects are presently limited by taxonomic knowledge. [2] The ~~abundance~~ **abundant** invertebrate populations of beaches provide prey for a remarkably rich assemblage of shorebirds averaging > 100 birds per kilometer year round for some southern California beaches[3].

2. In order to correct an typographical error in the second sentence of the second paragraph on page ten the following revision is made:

   This area, exposed for part of the day and covered for the rest, is characterized by marine organisms adapted to physical ~~duturbance~~ **disturbance**, severe temperature fluctuations, and predators from both terrestrial and marine environments.

3. In order to correct a typographical error in the third paragraph on page fourteen the following revision is made:

   (4) The sand moisture/nutrient content needed to establish and sustain native ~~veg~~ **vegetation** will likely be strongly affected by presence of the rock revetment- also impeding the establishment of vegetation. Dune and coastal strand ~~veg~~ **vegetation** rely on very long root networks to anchor plants and reach water ~~etc~~. The rock revetment may not allow this, and
   ….

4. In order to correct mathematical errors and to clarify information, the last paragraph on page twenty-one is revised as follows:

   The existing sand at Broad Beach is ~~very~~ well sorted with a sand grain size range of **0.15 mm (D05)**, 0.20 mm (D16)**,** ~~to~~ 0.40 mm (D84)**, and 0.50 mm (D95)** ~~and~~ **with** a ~~mean~~ **median** grain size of 0.25 mm (D50). The percent fines range from 0.4 to 5.0% and the ~~mean~~ sand sorting value is ~~0.20 mm~~ **0.10 mm**[4,5] (Figure 8). **The source sand proposed by the applicant from the inland quarries, on the other hand, is poorly sorted.** ~~The source sand proposed by the applicant from~~ **T**he Cemex quarry has a sand grain size range of **0.07 mm (D05),** 0.20 **mm** (D16), ~~to~~ 3.0 mm (D84), **and 4.0 mm (D95) with** ~~and~~ a median grain size of 0.85 mm (D50). The ~~mean~~ sand sorting value of the Cemex sand is ~~2.80 mm~~ **1.3 mm** (Figure 9). ~~The source sand proposed by the applicant from~~ **T**he Grimes quarry has a sand grain size range **of 0.07 mm (D05) ,** 0.20 (D16)**,** ~~to~~ 2.0 mm (D84), **and 3.0mm (D95) with** ~~and~~ a median grain size of 0.47 mm (D50). The ~~mean~~ sand sorting value of the ~~Cemex~~ Grimes sand is ~~1.80 mm~~ **0.90 mm** (Figure 10). The **D05**, D16, D50, D84, **and D95** values for existing sand at Broad Beach and the source

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[2] **Dugan & Hubbard. 2014. Op. Cit.**

[3] Hubbard, D.M., and J.E. Dugan. 2003. Shorebird use of an exposed sandy beach in southern California. Estuar. Coastl. Shelf Sci. 58S: 169-182.

[4] ~~Mean sediment sorting value is the difference between the D84 and the D16. This is a measure of the standard deviation.~~

[5] **Calculated using the Inclusive Graphic Standard Deviation (Folk) given by the formula: (mm84 -mm16)/4 + (mm95 -mm5)/6.6. This formula includes 90% of the distribution and is the best overall measure of sorting.**

sand at the Cemex and Grimes quarries come from appendix A of the Moffat and Nichol, Nov. 2013, *Upland Sand Source: Coarser-Than-Native Grain Size Impact Analysis* report (Figure 11). **While Moffat and Nichol's, Nov. 2013 report identifies the median[6] grain size or D50 value for Broad Beach sand, the Cemex quarry sand, and the Grimes quarry sand (0.25 mm, 0.85 mm, and 0.47 mm, respectively), they do not report the mean[7] grain size, which is a larger number for each of the three areas at 0.28 mm for Broad Beach sand, 1.35 mm for Cemex sand, and 0.89 mm for Grimes sand[8].** ~~All one has to do to understand how poorly sorted the proposed source sand is compared to the existing sand at Broad Beach is look at~~ **T**he 20X photos of the respective sand (Figures 8, 9, 10) is a good way to visualize the difference between the well sorted Broad Beach sand compared to the poorly sorted Cemex and Grimes sand[9]. In addition, the ~~mean~~ sand sorting values for the source sand from both quarries ~~doesn't even fit on the~~ **is beyond the scale (**x-axis**)** ~~scale~~ on the graph of species richness vs. mean sediment sorting ~~that depicts results from the recent southern California MPA beach studies~~ (Figure 7).

5. In addition, to correct a typographical error, the first sentence of the second paragraph on page twenty-three is revised as follows:

   The modeling of the proposed project estimates that direct burial will permanently impact ~~0~~ **5.23** acres and temporarily impact 34 acres of beach and nearshore marine habitats.

C. RESPONSE TO APPLICANT'S LETTER DATED DECEMBER 5, 2014

In a letter dated December 5, 2014, which has been included in the addendum for this item as **Exhibit 3**, the applicant indicates that they object to several special conditions regarding the requirement to relocate a portion of the rock revetment landward, the 10-year duration of authorization; the requirement of lateral public access on site; revisions to the footprint of beach nourishment; and the requirements for certain changes to the proposed adaptive management and monitoring provisions.

1. In regard to the applicant's first issue, the applicant asserts that Special Condition One (1) which requires the revetment to be pulled back closer to the existing septic leach fields at the down-coast end of the project reach where there is significant area between the landward edge of the emergency revetment and residential development "does NOT protect against leach field damage from flooding…does not

[6] Definition of median: In a series of numerical values, the point above which the number of individuals in the series equals the number below it.

[7] Definition of mean (or average): The mean is calculated by summing all the individual items or observations of a sample and dividing the sum by the number total number of items or observations in the sample.

[8] The mean grain size was calculated using a formula that is a quick approximation for mean: (D16 + D50 +D84)/3

[9] URS. August 2013. Malibu Beach Sand Replenishment Sand Grain Angularity Analysis Malibu, California. URS Project No. 03003261. Letter Report to Chris Webb, Moffat and Nichol.

account for the existence of reserve replacement leach fields as required by the Malibu Local Coastal Plan…[and] is inappropriate confiscation of private property…".

In response, staff notes that each of these issues have already been responded to in detail in the staff report. Specifically, as discussed on pages 64-67 of the staff report, the approximately 1,960 linear ft. portion of the revetment at the eastern (downcoast) end of the project reach is located in an area where the beach widens significantly and the seaward toe of the rock revetment is located as much as 160 – 200 ft. seaward of many of the residences and the landward edge of the as-built rock revetment is located approximately 80 – 100 ft. seaward of the majority of the septic system leach fields within this area. Thus, there is an opportunity to relocate the rock revetment at this eastern (downcoast) end of the beach significantly landward. Special Condition One (1) would relocate the rock revetment landward to the line of the existing septic systems with the provision of a minimal 15 ft. setback between the seaward limit of the leach fields and the landward edge of the rock revetment as generally shown on Exhibit 8 of the staff report.

In regards to potential wave-caused damage to existing septic systems, it should be noted that no damage is expected if the applicant is able to maintain an adequately wide beach seaward of the rock revetment through beach nourishment and backpassing measures. Moreover, even if the applicant fails to maintain an adequately wide beach seaward of the revetment, Dr. Ewing, the Commission's Staff Engineer finds that although some potential risk remains that some of the onsite wastewater treatment systems may subject to overtopping or salt water flooding with a setback of 15 ft. of separation between the rock revetment and the seaward extent of the leach fields, a feasible solution to provide protection, if necessary, would be to provide additional erosion control measures such as a gravel overlayer to the leach field to reduce scour, or install subsurface drainage improvements to reduce salt water flooding. Thus, staff continues to recommend that the downcoast portion of the rock revetment be relocated landward with no more than a 15 ft. setback from the existing septic system leach fields. Moreover, the relocation of the proposed rock revetment (which is intended to protect structures that qualify for such protection under Section 30235 of the Coastal Act) as landward as feasible to reduce impacts of the revetment on the environment and on public lands does not constitute a "confiscation" of private property just because some private property will be on the seaward side of the revetment. Rather, it is a feasible alternative necessary to ensure that the project will minimize adverse impacts to shoreline sand supply, coastal processes, public access and recreation, consistent with Chapter 3 policies of the Coastal Act.

Further, the applicant incorrectly asserts that areas of the beach shown as "future" leach fields which are shown on the applicants plans as potential future expansion/replacement areas for septic systems must be protected through the use of a shoreline protective device. As discussed in detail in the staff report although the existing septic systems constitute "existing" development which may be protected pursuant to Section 30235 of the Coastal Act, the future construction of a new expansion or replacement leach field on these properties does not constitute existing development and therefore, does not constitute development entitled to be protected pursuant to shoreline protection. In the event that a leach field reaches filtration capacity and the

construction of a new replacement "future" leach field would require the construction of a shoreline protection device, it is feasible to replace the existing leach field with a new field in the same footprint by excavating the existing leach field area and replacing with clean sand.

2. *In regard to the applicant's second issue, the applicant objects to Special Condition 12 which puts property owners on notice that any future substantial redevelopment of any property (such as the demolition and reconstruction of an existing residence) located landward of the approved revetment must be constructed in a manner to ensure its geologic and engineering stability without reliance upon the rock revetment. The applicant asserts that the "effect of this condition is that any remodeling or construction cannot take advantage of the revetment for which the homeowner has paid." The applicant also asserts that property owners who redevelop would not be permitted a revetment or that portion of the revetment would be required to be dismantled "piece by piece".*

In response, staff notes that this issue has already been addressed in the staff report and that LUP Policy 4.33 and IP Sections 10.4.H and 10.4.I of the City of Malibu's adopted LCP specifically require all new beachfront development shall be sized, sited and designed to minimize risk from wave-caused erosion hazards without requiring a shoreline protective device at any time during the life of the development. Thus, Special Condition Twelve (12) is necessary to provide notice to property owners that new development or substantial redevelopment on site must be designed in a manner that complies with the above referenced provisions of the certified LCP as well as the Coastal Act. However, Special Condition Twelve (12) does not require that the approved rock revetment be removed from properties as redevelopment occurs or that removal would occur prior to the 10-year term of this coastal permit as incorrectly asserted by the applicant.

Further, staff notes that Special Condition Two (2) specifically provides for a limited ten year authorization to allow the Commission to support an adaptive management approach to shoreline erosion at Broach Beach, providing protection to existing development but not authorizing *permanent* shoreline structures for development not entitled to such protection. Moreover, the City of Malibu LCP requires that shoreline homes be moved as far landward as possible and elevated on caissons when they redevelop so as to minimize or not require at all any shoreline protection at the beach level. To support this adaptive approach, Special Condition Twelve (1) is necessary to ensure that the Commission is only authorizing the revetment to protect the eligible development that exists today, and that the BBGHAD and participating members assume the risks of developing in this hazardous location. At some point in the coming decades it may be that all of the homes along Broad Beach would no longer have need for shoreline protection such as the proposed revetment because they would be elevated through the redevelopment process above flood levels along the back of Broad Beach. This would enable the revetment to be removed in the event that the beach replenishment component was no longer functioning as planned, and allow maximum opportunities for maintaining the public beach and allowing for reestablishment of more natural sand migration patterns.

3. In regard to the applicant's third issue, the applicant objects to Special Conditions 13 and 14 which provides public access between the mean high tide and a line running

parallel to the mean high tide line 25 feet inland[ii] (that would be ambulatory back to the toe of the revetment if the beach erodes), and a "back up"10 ft. wide lateral public access path immediately along or landward of the revetment in the event that no dry sandy beach is available for public access seaward of the revetment. The applicant asserts that the BBGHAD does not have the legal authority to grant easements and that the Commission does not have the authority to required "vertical access from the beach to their residence" and that the proposed dune restoration required by Special Conditions 1, 5, and 13 would "compromise public safety by burying portions of septic systems.

In response, staff notes that this issue has already been addressed in the staff report. As discussed in detail in the report, Special Conditions 13 and 14 are necessary to mitigate the adverse impact to public access and recreation that have already occurred, and will continue to occur in the future, as a result of the existing as-built emergency rock revetment. As further discussed in the staff report, it is feasible for the BBGHAD to comply with these conditions either by demonstrating that the BBGHAD has acquired the requisite property interests by exercising its eminent domain authority pursuant to Public Resources Code Section 26576 or by demonstrating that each affected landowner has executed the required access documents. While the BBGHAD's Plan of Control currently waives its power of eminent domain, the Plan of Control can be amended, if BBGHAD chooses to comply with Special Conditions 13 and 14 by exercise of its eminent domain authority. In regards to the applicant's incorrect assertion that Special Condition Thirteen (13) and Fourteen (14) provide public access between the mean high tide and the toe of the dune restoration, as clearly stated in the special conditions and in the staff report, there are 2 separate public access easements/areas that only come into effect if the beach renourishment and sand backpassing fails to maintain the beach seaward of the revetment. Special Condition Thirteen (13) provides lateral public access and passive recreational use over the entirety of the area running parallel to the shore and extending landward 25 feet from the ambulatory mean high tide line as generally shown on Exhibit 1 of this Addendum (to be included as Exhibit 21 of the staff report). After the nourishment, if those 25 feet consist of state tidelands, then no easement will take effect. An easement will only take effect if and when the ambulatory mean high tide line comes within 25 feet seaward of the 2010 mean high tide line surveyed by the State Lands Commission.

With regard to the applicant's incorrect assertion that the dune restoration program required by Special Conditions 1, 5, and 13 would "bury" portions of septic systems, staff notes that Special Condition Five (5) specifically provides that grading and beach fill for dune creation would not be allowed within the sandy beach areas where existing septic leach fields are located. In fact, Special Condition Five (5) specifically requires that any restoration in areas where septic systems or leach fields are located within the required dune restoration area (pursuant to Exhibit 9 of the staff report) shall be limited to revegetation with native dune plant species and mounding techniques using minor amounts of sand fill material only without the use of heavy equipment in order to avoid any potential damage to existing septic systems.

In addition, the applicant also asserts that the above referenced special conditions would limit the number of private trails from the residences on site to the beach to no more than one trail for

every two homes and that these trails would "serve as vertical access to their homes". The applicant is correct that Special Condition Five would limit the number of new private trails through the restored dune field in order to minimize adverse impacts to ESHA. However, the applicant is mistaken that any of the above referenced conditions would require vertical public access. No such condition is required and all areas landward of the lateral public access areas on site required pursuant to Special Conditions 13 and 14 would remain private. In fact, Special Condition 5 and 15 specifically allow for the installation of signage that would indicate that the areas of each property landward of the 10 ft. wide path along the top of the revetment is private property.

4. *In regard to the applicant's fourth issue, the applicant asserts that the limitations on beach nourishment at the western (upcoast) end of the project reach would impact "the financial feasibility" of the project and decrease the longevity of the overall project.*

In response, staff notes that this issue has already been addressed in the staff report. As discussed in detail in the report, the proposed placement of nourishment materials along the western (upcoast) end of the project reach would result in significant adverse impacts to sensitive rocky intertidal habitat areas. Thus, Special Condition One (1) requires a modification to the applicant's proposed alternative 4B nourishment footprint, which reduces the initial placement of sand by half; and that sand placement at the up-coast end be further limited to protect inter-tidal habitat resources. This reduction will minimize habitat impacts while still creating a dry sandy beach area ranging from 50-75 feet. As discussed in the staff report, even with this change, the applicant will still be allowed to place 300,000 cu. yds. of material along almost one mile of beach and Dr. Ewing believes that a nourishment project of 300,000 cubic yards of nourishment sand focused on the remaining project area, with backpassing, small-scale interim sand additions and a shorter interval between renourishment events will still provide significant shore protection and recreational beach area while minimizing adverse impacts to marine resources and avoiding direct placement of sand fill in rocky intertidal habitat.

5. *In regard to the applicant's fifth issue, the applicant asserts that the monitoring requirements pursuant to Special Conditions 4 (Adaptive Management Plan), 5 (Dune Habitat Restoration and Monitoring Program, 6 (Long-term Marine Resources Monitoring, Reporting, and Mitigation Plan), and 15 (Public Access Management Plan) are infeasible due to cost, which they calculate as requiring $18 million dollars to implement.*

In response, staff notes that the applicant did not provide any analysis of how they calculated their estimate of monitoring costs; thus, no evidence has been presented to support the accuracy of their calculation or that the required monitoring is not feasible. Moreover, given the dynamic ever changing nature of the beach morphology and coastal process acting on this beach it is very difficult to model or predict how the beach nourishment program will perform over time as well as predict if unanticipated changes could result in adverse impacts to marine resources and habitats. Thus, to ensure that this critical information regarding potential impacts to marine resources is recorded and reported to the Executive Director for consideration of future project approvals, the monitoring required by the above referenced special conditions are necessary to

investigate shoreline and marine habitat conditions, report any changes and respond promptly and pro-actively to these changes.

In addition, staff notes that project monitoring has often been part of large coastal projects or projects where the effects cannot be fully anticipated with strong certainty. The applicant suggests that the required monitoring, including for the Adaptive Management Plan required pursuant to Special Condition Four (4) will be too costly; however, the monitoring that is outlined in this condition is for monitoring or adaptive project management is generally consistent with the monitoring measures that have been provided by the applicant including both pre- and post- project monitoring were included in the July 2010 Moffatt-Nichol Broad Beach Restoration Project, Phase 1 Report. Monitoring details for full depth profiles, the use of back-passing and triggers for renourishment were included in the December 21, 2012 Revised Project Description and other subsequent project descriptions. The elements of the Adaptive Management and Monitoring Plan were also presented as recently as November 5, 2014, in a memo from the Broad Beach Geologic Hazard Abatement District ("BBGHAD") to the California Coastal Commission ("CCC") Staff. Special Condition 4 repeats and provides clarity to the management and monitoring included in this memo. Some of the adaptive management actions in the submitted materials were too vague for regulatory purposes (for example, part of the trigger for the small scale interim renourishment events was that "there is insufficient beach width to backpass from the eastern end of Broad Beach") without providing a specific trigger for action; therefore Special Condition Four (4) also adds greater specificity where needed.

The applicant also suggests that the monitoring for the Long-Term Marine Resources Monitoring required pursuant to Special Condition Six (6) will be too costly; however, the monitoring that is outlined in this condition is for monitoring that is generally consistent with the monitoring measures that have already been provided by the applicant including multi-spectral aerial surveys, sidescan sonar surveys, and field sampling. Furthermore, Special Condition Six (6) does not specify the monitoring methods or schedule to be employed; rather, the condition specifies that the final monitoring design shall meet the monitoring objectives laid out in the condition, specifically that the monitoring is designed to monitor for and quantify potential direct and indirect adverse impacts upon one or more of the marine habitats in and adjacent to the proposed project. Regarding methods, Section 4 'Monitoring Methods', of the condition states "[a]t a minimum, the applicant shall consider using the following methods in the final 'Marine Habitat Monitoring and Mitigation Plan'. The monitoring methods and schedule shall be developed in close consultation with the Science Advisory Panel (SAP) for the review and approval of the Executive Director."

The requirement that a Science Advisory Panel, composed of a minimum of three marine scientists with expertise on nearshore habitats , including at least one member with expertise in experimental design and biostatistics, be established by the Commission, was considered imperative because of the large scale of the project, the considerable uncertainty of project outcomes, the potential for adverse impacts and the potential need for mitigation, and the proximity of the project in and adjacent to an ASBS and MPA. Establishment of a SAP was also a recommendation of several agencies including the California State Lands Commission, the

California Department of Fish and Wildlife, the National Marine Fisheries Service, and the State Water Resources Control Board.

D. EX PARTE

Five Ex Parte communications (3 from Commission Zimmer and 2 from Commissioners Kinsey and Turnbull Sanders) which have been included in the record since the staff report was prepared and are included as **Exhibit 8** of this addendum.

E. OTHER CORRESPONDENCE

At the time that this addendum was prepared, correspondence has been received from 9 interested parties including: 2 letters in support of the project as proposed, 4 letters in support of the staff recommendation and the conditions of approval, 2 letters of objection to the project, and 1 letter of interest (neutral position).

The two letters in support of the proposed project from property owners (Danny and Diana Klein and Fred Sands) on Broad Beach but raising objections to one or more of the special conditions have been included as **Exhibit 4**. These letters raise similar or identical issues raised by the letter from the applicant that has been included as Exhibit 3 and which has already been addressed in detail in this addendum and in the staff report.

In addition, four letters in support of the staff recommendation and the conditions of approval have been received from The Bay Foundation and three property owners on Broad Beach including D&L Property Trust, Paul Owhadi, and Max Factor III and Jane Arnault. Each of these letters has been included as **Exhibit 5** of the addendum.

Further, two letters in opposition to the project and requesting that the project be denied by the Commission have been received from Dr. Jennifer Dugan and the City of Moorpark, which have been included as **Exhibit 6** of this addendum. The letter from Dr. Dugan raises objections to the project primarily based on the potential biological impacts that may result to the marine and beach environment. The issues raised in Dr. Dugan's letter have been addressed in the staff report. The letter from the City of Moorpark raises issues primarily in regard to the traffic impacts within the City of Moorpark and Ventura County that would occur as a result of the truck trips required to import sand to the project site. The issues raised by the City of Moorpark primarily relate to impacts that would occur outside the Coastal Zone and which are not within the Commission's jurisdiction.

Finally, one letter of interest from the representatives of Trancas PCH, LLC, a property owner on Broad Beach located downcoast of the as-built rock revetment indicates that they remain neutral regarding the project but that they are generally in agreement with the conditions of approval and suggesting additional monitoring and timing requirements (**Exhibit 7** of this addendum).

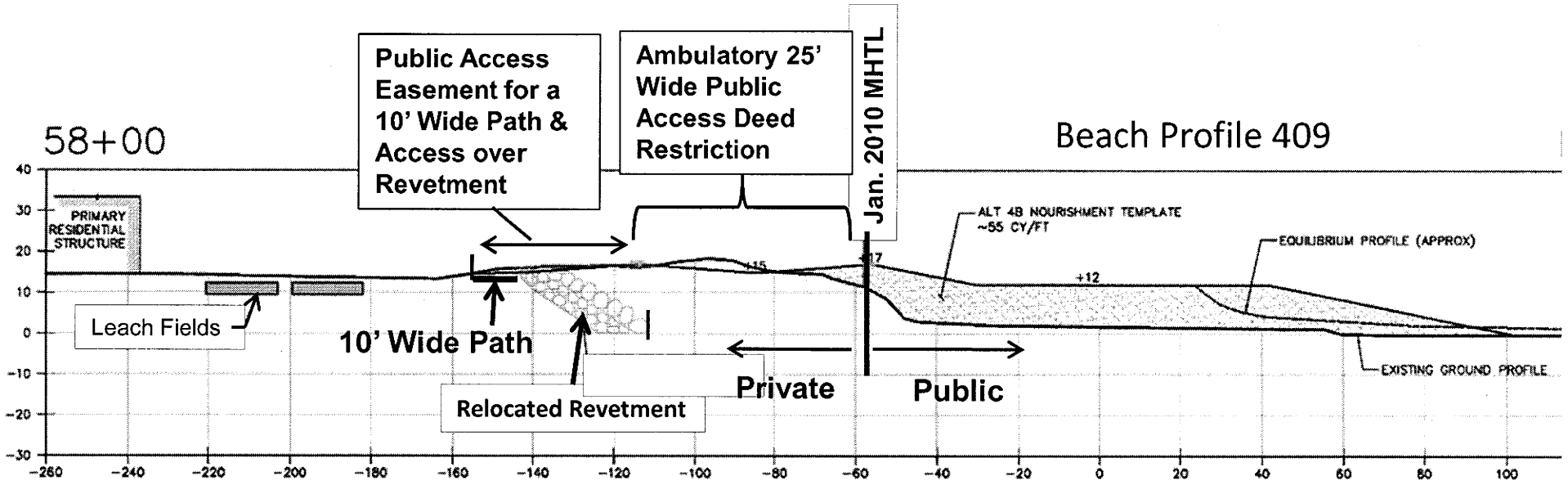
[i] Moffatt-Nichol Consultants (November 2013) Upland Sand Source. Coarser-than-Native Grain Size Impact Analysis, prepared for: Broad Beach Geologic Hazard Abatement District.

[ii] The applicant's letter mischaracterizes the area proposed for public access as between the mean high tide line and the toe of the proposed dune restoration.

Exhibit 1

Typical Cross Section of Revetment Showing Required Public Access

Note: This Exhibit to be added as "Exhibit 21" to the Exhibits of the Staff Report



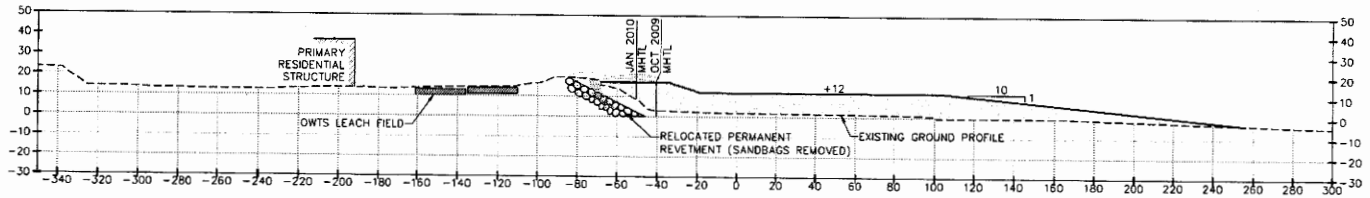
Beach and Dune Cross Section – Public Access

Exhibit 2

Typical Profile of Revetment and Proposed Beach Nourishment

Note: This Exhibit to be added as "Exhibit 22" to the Exhibits of the Staff Report

52+50



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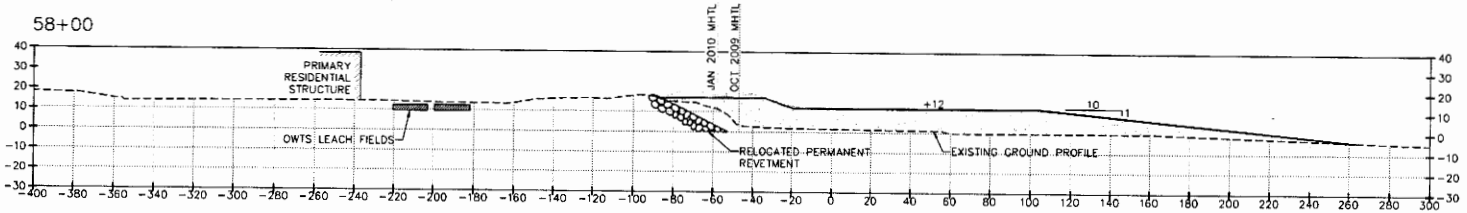
58+00



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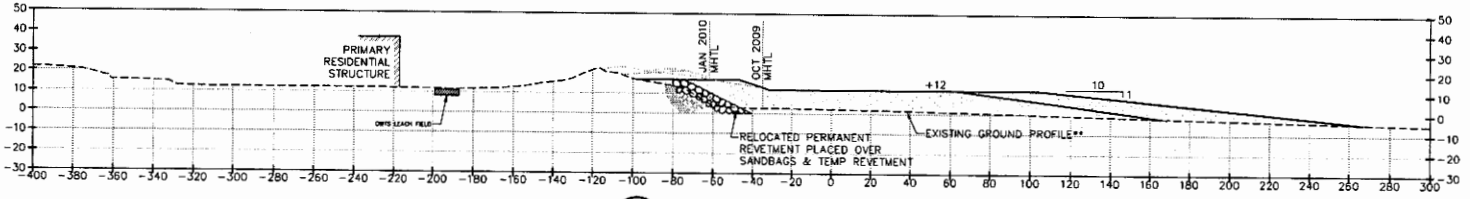

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DIGALERT
DIAL TOLL FREE
1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

30' 0' 30' 60'
SCALE: 1"=30'

NO.	REVISION	BY	DATE

MOFFATT & NICHOL

DESIGNED BY Craig Frampton | CHECKED BY Aaron Holloway, P.E.
DRAWN BY Gil Lu | IN CHARGE Russell Boudreau, P.E.

BROAD BEACH RESTORATION PROJECT
California State Lands Commission

TYPICAL SECTION ALT - A
STA 52+50.00 - 67+00.00

SCALE 1"=30' | DATE 11/21/2012
JOB NO. 6935-02
SHEET 9 OF 9
XS-A3

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

FINAL
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X
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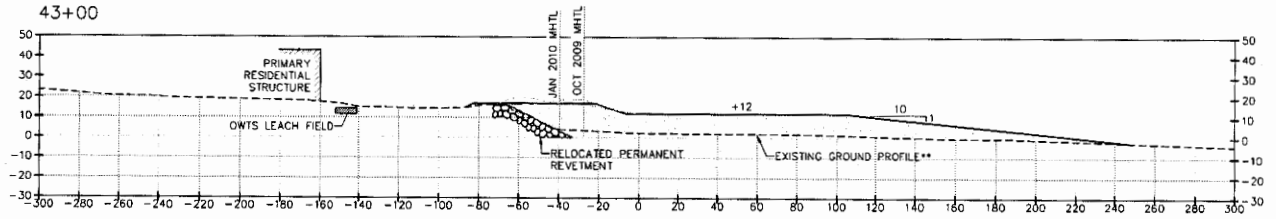
CONCEPT
STATUS



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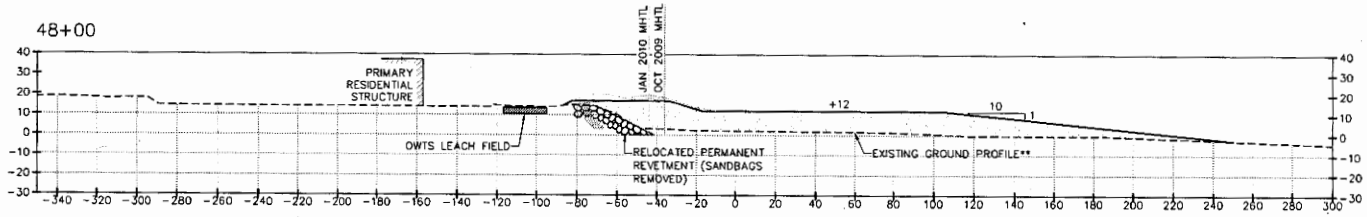

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BROAD BEACH RESTORATION PROJECT
California State Lands Commission

TYPICAL SECTION ALT - A
STA 35+40.00 - 48+00.00

SCALE 1"=30' | DATE 11/21/2012
JOB NO. 6935-02
SHEET 8 OF 9
XS-A2

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FINAL
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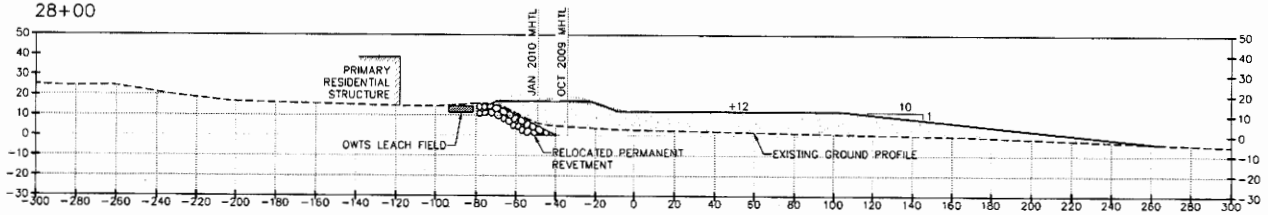
50%
CONCEPT
STATUS

28+00



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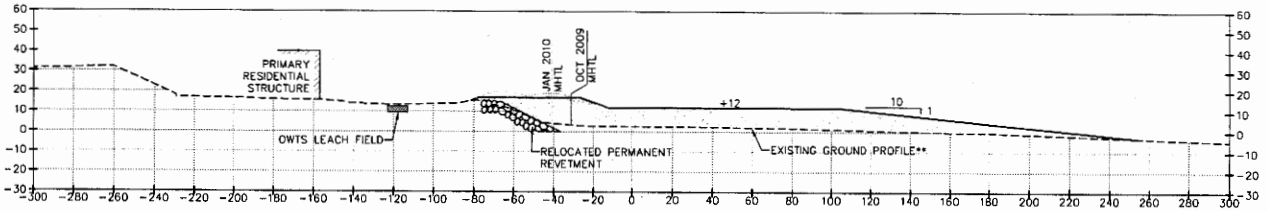

B XS-A1 SECTION
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UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

30' 0' 30' 60'
SCALE: 1"=30'

NO.	REVISION	BY	DATE

MOFFATT & NICHOL

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BROAD BEACH RESTORATION PROJECT
California State Lands Commission

TYPICAL SECTION ALT - A
STA 28+00.00 TO STA 35+40.00

SCALE 1"=30' | DATE 11/21/2012
JOB NO. 6935-02
SHEET 7 OF 9
XS-A1

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

Exhibit 3

Letter from Broad Beach Geologic Hazard Abatement District dated December 5, 2014

BROAD BEACH GEOLOGIC HAZARD ABATEMENT DISTRICT

December 5, 2014

VIA E-MAIL AND HAND DELIVERY OR FEDEX

Hon. Steve Kinsey, Chair
Effie Turnbull-Sanders
Wendy Mitchell
Hon. Martha McClure
Hon. Erik Howell
Dayna Bochco
Mary Shallenberger
Mark Vargas
Hon. Carole Groom
Hon. Gregory Cox
Jana Zimmer

Re: Broad Beach Geologic Hazard Abatement District
CCC Consideration: December 11, 2014; Agenda Item 17(a)
CDP APPLICATION NO. 4-12-043

Dear Chair Kinsey and Commissioners:

We realize that many projects come before you. This project may be unique as it will restore and expand an eroded public beach, at private expense, with lateral access to all for the length of the permit. The Broad Beach Geologic Hazard Abatement District ("BBGHAD"), an assessment district comprised of 121 property owners, proposes to restore a full mile of sandy beach in Malibu, CA (located next to the public Zuma beach)—a beach where there is now only partial deeded public lateral access over private property. There will be no public expense; only benefits. The journey to this point has been difficult. We have had to satisfy multiple state and local jurisdictions, often with conflicting wants and needs.

Your staff has worked diligently with the expressed desire to see the project permitted. Unfortunately, the staff has recommended an approval with conditions no reasonable homeowner could or should agree to. Simply, the applicant either has no authority to agree to the most onerous conditions or could never obtain the support of its members to do so.

The "no project" alternative is not a pleasant prospect. The emergency revetment will remain so long as the emergency exists. Without the project, there would be no beach or dune restoration and no passable beach. Even if the beach becomes passable, there is no deeded lateral access over private lands for the entire beach. To date, the BBGHAD has incurred over $8,000,000 in costs out of a $20,000,000 budget without this commission even having the opportunity to consider the project.

We address here the primary open issues with the recently released CCC staff report. For over three years, BBGHAD representatives have negotiated with the staff. Only a week or so

ago, we thought that we had a mutual understating of the handful of open issues. The staff report content came as a surprise and disappointment. It revived issues thought to be resolved, and added new ones as well.

Given the time spent, the costs incurred, and increasing costs of time and material to complete the project, time is now of the essence in obtaining a CCC permit which will gain acceptance of the commission and the affected residents alike.

We present the most salient remaining issues as we understand the staff report and our specific requests of the Commission. The issues are:

1. Revetment Alignment & Duration.

   a. Revetment Alignment.

CCC Staff Report:

The staff proposes that the current emergency revetment approved by the CCC and constructed at great cost under an existing emergency permit (which emergency exists to this date) be moved significantly landward to a location as described in Exh. 8 to the staff report. This move would only provide for a 15' buffer from existing septics. There are many reasons why the staff proposed revetment line is not feasible and poses an unacceptable risk to the environment and the residences.

BBGHAD Position:

- The proposed relocation does NOT protect against leach field damage from flooding when waves overtop the revetment. Therefore, the risk of sewage spill is heightened where (to our knowledge) none has occurred.

- The CCC staff's proposed alignment does not account for the existence of reserve replacement leach fields as **required** by the Malibu Local Coastal Plan, many of which are located seaward of existing leach fields. Malibu Local Implementation Plan, Section 18.7(Q). When a property owner proposes an otherwise appropriate development that prevents the owner's ability to provide a 100% reserve septic area, the City of Malibu requires the recording of a covenant that specifies, among other points, the owner's assumption of risk for not providing the reserve area. See, e.g., Los Angeles County Recorder Document No. 20131460143. The dedicated reserve leach field areas of many of the residences lie within the footprint of the CCC staff's proposed relocated revetment (See, e.g., Staff Report, Exh. 8, 30970 Broad Beach Road), and none of these property owners have waived the LIP's reserve field requirements. The CCC staff's proposed revetment alignment ignores the Malibu LIP and, if effectuated, would compromise the safety of these parcels.

- The proposed landward relocation of the existing revetment is between 20' and 110' per home depending on each home's location. The extent of the pullback increases as the alignment moves from approximately 30940 Broad Beach Rd. to the east end of the current revetment. The excessive revetment movement recommended by staff is an inappropriate confiscation of private property without legal justification.

We are confident that the BBGHAD's proposed revetment location satisfies the LCP requirement that shoreline protective devices be located as far landward as feasible. Malibu LCP, Section 10.3(A)(5). It also meets the requirements of the State Lands Commission staff (and we believe its commissioners). We note that, even under the survey relied on by the State Lands Commission (which we contest but accept for the life of the project), the revetment relocation which has been agreed to by the BBGHAD Board exceeds the size of the encroachment on public land as claimed by State Lands Commission staff (the BBGHAD asserts that, according to surveys taken in normal beach conditions, including the current official 18 year survey, there is no encroachment on public land). Of course, another consideration is the project's creation of a new public beach where none now exists.

b. Revetment Duration.

CCC Staff Report: Duration of Revetment

The staff report provides that all future property redevelopment within the span of the revetment shall be to standards that do NOT require a shoreline protective device. Staff Report, p. 4 and p. 31, Special Condition 12.

BBGHAD Position:

- The effect of this condition is that any remodeling or construction cannot take advantage of the revetment for which the homeowner has paid. An existing owner who is being assessed for the project, and will be for many years in the future, may not benefit if he or she remodels or rebuilds. Moreover, property owners who redevelop would not be permitted a revetment to protect their remodeled home. Indeed, the remaining revetments on adjacent homes will become a threat to theirs.

- It appears that the staff has designed these conditions to turn a 10-year Project into one where the revetment will be dismantled piece by piece— or as a whole if the CCC deems in the future that a critical mass of homes have been built to standards which do not need shoreline protective devices. If the revetment is removed piece by piece, the result would be a checkerboard revetment that assures wave wash up damage (end effects) to the remaining "original" homes. In either event, homeowners would be saddled with incredibly expensive temporary shoreline protection and the corresponding need and cost for perpetual sand renourishment. This dim prospect, coupled with the staff's demands for an Executive Officer review at five (5) year intervals and a new full CDP application at 10-year intervals (yet another BBGHAD cost), presents a weak value proposition and

represents unfair, unsound planning. The proposed condition virtually ensures lack of support for the Project.

- The BBGHAD should not be subject to relocation for at least 10 years, the duration of the CDP. The BBGHAD has no legal authority to agree to measures affecting future development plans of its members.

2. Proposed Easements & Related Issues.

a. Public Access on Private Lands.

CCC Staff Report:

1. The staff report asks for "unambiguous public access" between the MHTL and the toe of the proposed dune restoration that would be ambulatory back to the toe of the revetment if necessary (Staff Report, bottom of p. 4) and implemented through deed restrictions on every parcel landward of revetment. Thus, assuming the revetment is pulled back landward of the pre-nourishment MHTL, all private property between the new revetment alignment and the MHTL would be subject to this lateral access easement.

2. As a "back up", the staff asks for a lateral public access easement along the land side of the revetment if public access not available on beach. Staff Report, p. 5; Special Condition 14. The staff report asks the BBGHAD and BBGHAD owners to provide a 10' wide public pedestrian path located immediately landward of the entire length of the revetment (included pulled back area). All easements must be recorded before a CDP is issued.

3. In addition to the "lateral access pathway" on the inside of the revetment, the BBGHAD is required to build access stairways extending from 10' wide public pedestrian paths to the toe of the revetment below and to be aligned/merged with the property owners' paths from their homes to the beach. Special Condition 1, Part 4 and Special Condition 5.A.5. The number and location of these "stairways" shall align with the paths from the residences to the beach. Special Condition 5, Part 5. The "stairways" shall be constructed by reconfiguring existing stones within the revetment and no handrails will be allowed.

4. The easements specified in 1-3 above shall provide for the public's right to pass and repass on private property on the land side of the revetment if and when either of the following conditions occur: (1) less than 10' of dry sand beach exists seaward of the seaward toe of the revetment at any point along the revetment, or (2) any circumstance occurs which prohibits the public's use, access, and enjoyment of the area subject to the deed restriction (such as an oil spill).

BBGHAD Position:

- The BBGHAD does not have legal authority to grant easements which laterally traverse all of the residences served by the revetment. Indeed, the requirement of unanimity is a functional impossibility given some homeowners' opposition to the project.

- The CCC has no legal authority to require anyone to provide vertical access from the beach to their residence. As the lines between public and private property become invisible, the privacy and safety of homeowners and their families will be put at risk.

The BBGHAD has offered, subject to financial commitment of the BBGHAD owners, to maintain nourishment on the beach and periodic back passing to enhance the prospect or lateral beach access. That is a reasonable requirement.

b. Dune Protection Easement.

CCC Staff Report:

The staff report requires the creation of a dune protection buffer easement area. Staff Report, pp. 31-32; see also, Special Condition 14. This restricted area shall extend from the seaward toe of the revetment to the ambulatory seaward-most limit of dune vegetation as required by Special Condition 5. Special Condition 5 governs uses within this "Dune and dune buffer area". All property owners between 31346 and 30760 BB Road (span of the revetment) must record an easement on their properties (before CDP is issued) to protect this area and essentially render it off limits to all people— property owners and visitors alike.

The dune protection buffer easement specified in the staff report bars access to the dune protection buffer area unless the beach area seaward of the first line of dune vegetation becomes impassable due to high tides, steep scarp formation, or other reason(s) preventing beach access. In such a case, the public shall pass along the top of the seaward-most dune formation. Staff Report, p. 32.

BBGHAD Position:

- This issue, like many of the others, was never discussed prior to the issuance of the staff report. The BBGHAD does not have authority to grant easements across private parcels.

- There is no need for such an easement. Because this area is already a protected ESHA under the Malibu LCP, no further regulation is required. The project will restore these dunes with native plants.

- The staff's proposed relocated dune area is significantly landward from that proposed by the BBGHAD. The BBGHAD is not fundamentally opposed to the creation of a dune protection area as described in the BBGHAD's CDP application. However, the staff's

proposed dune area extends significantly landward and compromises public safety by burying portions of septic systems.

c. Property Owner Beach Access.

CCC Staff Report:

The staff report provides for one shared private access path for every two residences. These paths are to merge with 10 foot wide pedestrian paths from the beach landward onto private property.

BBGHAD Position:

Beach front homeowners uniformly have modest paths from their homes to the beach; they range from 2-3 feet wide. That has been the case for over 40 years. They should remain as such, and not be forced to render their homes less useable and valuable by tying them into new public access from the beach over the dunes and onto home site paths. Some reduction of the number of paths through sharing by adjacent homeowners will be acceptable. But, they are not to serve as vertical access to their homes or connectors to 10' wide vertical accesses from the beach to the homes.

3. Nourishment at West End.

CCC Staff Report:

CCC staff wants no new public beach renourishment west of 31380 Broad Beach Rd. Staff Report, pp. 72-73; see also, Special Condition 1. This precludes sand nourishment in alleged habitat areas of Lechuza Cove and the newly identified and often sand covered "boulder field" that extends from approximately 31444 to 31380 Broad Beach Road. The CCC staff does not accept the BBGHAD's proposed intertidal impact criteria of 1' of burial for 1 year. CCC staff does not propose a different standard, but concludes that permanent impacts to some organisms and habitat are likely to occur with sand burial "well below" the BBGHAD's proposed standard. Staff Report, p. 91.

BBGHAD Position:

Limitation of the nourishment affects protection of the sand coverage of the revetment and drastically impacts the financial feasibility of the project. CCC staff raised need to protect the "boulder field" at the late date of October 14, 2014, three full years into the project. This "boulder field" is already seasonally buried and no significant habitat protection is gained by avoiding this area. The BBGHAD proposes to limit placement of sand to 31502 Victoria Point, and no nourishment west of this address. The BBGHAD's proposed intertidal impact criteria of 1' of burial for 1 year serves as the standard for previous major southern California nourishment projects. We hope that further compromise can be achieved, perhaps by allowing no more than a

40' strip of sand up to 31502 Victoria Point, which would increase the longevity of the overall nourishment and not adversely impact significant intertidal habitat.

4. Adaptive Management & Monitoring.

CCC Staff Report:

The staff report wants to condition the issuance of the permit on the following: An Adaptive Management and Monitoring Plan (Staff Report, pp. 11-17); Dune Habitat Restoration and Monitoring Plan; Long-term Marine Resources Monitoring, Reporting, and Mitigation Plan; Public Access Management Program (Staff Report, pp. 33-34); and Science Advisory Panel ("SAP") (3 marine scientists chosen by CCC to review all the monitoring reports) (Staff Report, pp. 20-21). The CCC's Executive Officer must approve all of these plans before the CDP becomes effective. The staff requires the BBGHAD to pay up to $180,000 per year to fund the SAP. Also, the CCC reserves right to insist on additional mitigation pending CDP year 5 "review" by CCC Executive Officer.

BBGHAD Position:

The BBGHAD agrees to monitor and manage the project and its effects in a thorough manner. However, the extent of the staff monitoring program was never before shared with us until its report was issued. Had it been, we would never have continued with our application. We understood that the staff's request would be consistent with other beach restoration projects. Our understanding is that reasonable monitoring would approximate $100,000-$200,000 per year based on previous, large scale southern California beach nourishments. We estimate the cost of the staffs proposed monitoring and management plans at some $18 million over the 10-year life of the requested CDP. In fact, the cost of the CCC staff's proposed monitoring program exceeds the cost of every other project component.

We estimate the following costs to perform the staff's monitoring plans over the 10- year CDP duration:

-- Adaptive Management and Monitoring Plan:		$1,100,000
-- Dune Habitat Restoration and Monitoring Plan:		$1,700,000
-- Long-term Marine Resources Monitoring, Reporting, and Mitigation Plan:		$11,500,000
-- Public Access Management Program:		$300,000
-- Science Advisory Panel ("SAP") $180,000 per year = $1,800,000 over 10 years plus 3 increase:		$2,100,000
-- BBGHAD Consultants to coordinate monitoring		$1,500,000
	TOTAL	$18,200,000

We cannot and will not incur an additional $18,000,000 of debt to monitor the project. Instead, we will commit to fund the CCC with $1,500,000 over the life of the project to monitor the project as it deems fit.

CLOSING COMMENTS

1. For your assistance, we have attached a PowerPoint presentation outlining the Project's history, the BBGHAD's major concessions to date, the areas of major difference between the BBGHAD and CCC staff, and our proposed resolution of the major issues.

2. Other issues concern the BBGHAD, which we will specify in further detail during our December 11 presentation to the Commission.

We appreciate your attention to this matter, and look forward to your leadership on this important project. The BBGHAD remains hopeful that a viable project can be realized from all concerned.

Very truly yours,

BBGHAD BOARD OF DIRECTORS

Norton Karno, Chair
Marshall Grossman, Vice Chair

Enclosure

cc: Charles Lester
Jack Ainsworth
Janelle Beland
Jennifer Lucchesi
Dale Jones

Exhibit 4

2 Letters in Support of the Proposed Project with Objections to Required Conditions of Approval

REGARDING BROAD BEACH
RESTORATION PROJECT
DEC 11TH
AGENDA ITEM 17A

ATTN: MR. CHARLES LESTER
EXECUTIVE DIRECTOR
CALIFORNIA COASTAL COMMISSION
415 FREMONT ST
SUITE #2000
SAN FRANCISCO, CA 94105

MY NAME IS DANNY KLEIN
I AM A HOMEOWNER AT
30760 BROAD BEACH RD
MALIBU, CA 90265
THIS LETTER IS TO INFORM YOU THE "I ABSOLUTELY" OBJECT TO:

1. ROCK REVETMENT MOVEMENT BACK 60' TOWARD MY HOME
2. I ALSO OBJECT TO LATERAL ACCESS BEING GIVEN IN BACK OF MY ROCK REVETMENT.

THE ABOVE MENTIONED IS VERY CLEARLY THOUGHT OUT BY MYSELF AND MY WIFE.

THANK YOU,

DANNY KLEIN
DIANA KLEIN

Fred C. Sands

V. Tva

Broad Beach Restoration Project
Agenda No.: 17(a), 4-12-043
Fred Sands, in favor

December 4, 2014

VIA FEDEX

Mr. Charles Lester, Executive Director

Commissioners:
Ms. Dayna Bochco
Mr. Greg Cox
Ms. Carole Groom
Mr. Steve Kinsey
Ms. Wendy Mitchell
Ms. Mary K. Shallenberger
Mr. Mark Vargas
Ms. Janna Zimmer

CALIFORNIA COASTAL COMMISSION
45 Fremont Street, Suite 2000
San Francisco, CA 94105

Re: Broad Beach Restoration Project / California Coastal Commission Hearing
Agenda Item: 17(a) / December 11, 2014

Gentlepersons,

I own the property at 31038 Broad Beach Road. I do have grave concerns about the safety of those using the public access without knowledge of what happens at various times of the day regarding the lack of sand.

My family often sees people entering the public access area. In many cases they are older people. When they go out to the beach, there is a beach of perhaps three feet and they take a walk, and then 45 minutes later or perhaps an hour later, there is no beach. It is possible that someone will drown if they don't know the beach could go away at any time and it often does.

I have a 14 year old daughter who is quite athletic, but I hesitate letting her go on the beach by herself, not because of dangerous people, but the fact that the beach often disappears.

11611 San Vicente Boulevard, 10th Floor • Los Angeles, California 90049
Telephone 310.820.0044 • Fax 310.207.0035 • fsands@vintagecapitalgroup.com

While I do not address the specifics of the application and staff response here, I would like to say that I do not feel that the extreme revetment pullback that the Staff has proposed in response to the BBGHAD application is correct. I appreciate the many hours the Staff has put into considering all aspects of the application, but this specific proposed action, as well as proposed lateral public access on the landward side of the revetment, as I currently understand it, would seem to intrude on the property rights of homeowners and does not seem appropriate in its present form.

I strongly urge you to keep the public safe as well as the homeowners and support the beach replacement.

Should you have any questions, please feel free to contact me by email or telephone. The following is my contact information:

Fred Sands
Tel: (310) 820-0044
Email: fsands@vintagecapitalgroup.com

Sincerely,

Fred Sands (md)

Fred Sands

FS/md

Dictated but not read

Exhibit 5

4 Letters in Support of Staff Recommendation Regarding the Project

P.O. BOX 13336
LOS ANGELES, CA 90013

THE BAY FOUNDATION

(888) 301-2527
santamonicabay.org

December 9, 2014

California Coastal Commission
South Central Coast Area
89 South California St., Suite 200
Ventura, CA 93001

Re: Comments on Item Th17a

Dear Chair Kinsey and Commissioners:

The mission of The Bay Foundation "is to restore and enhance the Santa Monica Bay through actions and partnerships that improve water quality, conserve and rehabilitate natural resources, and protect the Bay's benefits and values." Our geopolitical boundary starts, along the coast, in the west at the Ventura - Los Angeles County line and, ends, in the east at Point Fermin. Our guiding strategic document to achieve our mission is the Santa Monica Bay Restoration Commission's Santa Monica Bay Restoration Plan. The plan relates to aspects of the proposed project TH17a through Goals 7, 8, 9, and 13 and more specific objectives under these goals; these are:

Goal 7: Restore wetlands, streams, and riparian zones

Objective 7.8: Restore Trancas Lagoon

Goal 8: Restore coastal bluffs, dunes, and sandy beaches

Objective 8.2: Protect and manage sandy intertidal habitats

Goal 9: Restore rocky intertidal and subtidal habitats

Objective 9.2: Protect and manage rocky intertidal habitat

Objective 9.4: Assess and protect seagrass habitat

Goal 13: Increase public access to beaches and open space

Objective 13.4: Increase public access to Santa Monica Bay beaches

The Bay Foundation appreciates the complex nature of the project and supports the staff report encompassing their changes to the applicant's alternative (4B). The approaches outlined by staff allow for several objectives to be met, namely; the protection of the private structures landward of the beach, increased lateral access and the maintenance of existing vertical access to the beach for the public, while being protective of existing marine, nearshore, and intertidal habitats from direct and indirect burial due to the initial beach nourishment and backpassing.

The success of this project, as amended by staff, will rely on monitoring and expert guidance to inform adaptive management actions based upon identified metrics and triggers outlined in the staff report. This The Bay Foundation strongly supports, (the monitor - inform - adapt rubric), as it consistent with our practices and approach to resource management. The Bay Foundation has had demonstrable success in applying this approach in executing many resource management and habitat restoration projects. Our restoration efforts are developed and informed with the input from our Technical Advisory Committee and Marine Resources Advisory Committee with subsequent long-term monitoring to assure the results of the projects are as designed.

In conclusion, thank you for the opportunity to comment on this important project and if we can be of further support to this project please do not hesitate to ask.

Sincerely,

Tom Ford, Executive Director
The Bay Foundation

AGENDA ITEM: (17(a))
Property Owner: D & L Property Trust

D & L PROPERTY TRUST
c/o TMG
8383 Wilshire Blvd.,#400
Beverly Hills, CA 90211

December 5, 2014

RE: Property Owner
31054 Broad Beach Road
Malibu, CA 90265

Mr. Charles Lester
CCC
45 Fremont St, Suite 2000
San Francisco, CA 94105

Dear Mr. Lester:

As we are unable to attend the California Coastal Commission (CCC) review of the Broad Beach Sand and Dune Restoration Project (Project) on December 11, 2014, we respectfully write this letter to voice our support of the **Coastal Development Permit No. 4-12-043** pursuant to the staff recommendation; **a YES VOTE.**

Broad Beach was originally named for the great expanse of sand between dry land and the Pacific Ocean. Growing up in Southern California, we had pride in our beaches.

After many years of research and study, and as we sadly watched our Broad Beach disappear in front of all our homes on Broad Beach Road, we know it is urgent that a CCC Coastal Development Permit, that is acceptable to the BBGHAD and it's constituents, be APPROVED; a YES VOTE.

We urgently continue to support the project and look forward to the Resolution as stated in the 17a Staff Report.

Sincerely,
D & L Property Trust
D & L Property Trust
31054 Broad Beach Road

December 5, 2014

Charles Lester
California Coastal Commission
45 Fremont Street, Suite 200
San Francisco, CA 94105
Via email: clester@coastal.ca.gov

RE: BBGHAD Project – Malibu, CA

Dear Mr. Lester,

Please be advised that the undersigned is a real estate developer with many years of experience within the public and private sectors. I represent HERNDON PARTNERS LLC and JMC INTERNATIONAL LLC, the legal owners of 31504 and 31502 Victoria Point Road, Malibu, California, respectively. From the inception of the GHAD project we have adamantly objected to the inclusion of the beachfront parcels within the Victoria Point subdivision. It would now appear that the Coastal Commission staff is also in support of our position in that regard. It is evident that the only motivation in forcefully including the beachfront parcels in the Victoria Point subdivision as part of the project is solely to subsidize the cost of the revetment of Broad Beach for the benefit of those 78 homeowners behind the emergency revetment. It is my understanding that foreign sand is being brought from inland that is completely unassociated with the seafront, therefore posing a threat of contamination and destruction of the beachfront environment.

GHAD is a limited purpose agency whose sole focus should be and remain only on the 78 properties behind the emergency revetment. Under no circumstance should they be involved with homes outside of that jurisdiction and must exclude all beachfront parcels within Victoria Point Road. They should not be given the ability to make any changes that will have negative impacts on the pristine cove located at Lechuza Point, currently serving as a habitat for the local marine life, and its surrounding areas. GHAD's proposal will severely decimate the valuable California wildlife and sea reserves if the project includes altering of the cove located at Lechuza Point and the inclusion of the beachfront adjacent to the parcels on Victoria Point Road located above the sea level.

We respectfully request that the CCC direct BBGHAD to exclude all parcels on Victoria Point Road from the project and that no alteration shall be made to the cove located at Lechuza Point and its surroundings. We also request that CCC direct BBGHAD not be empowered to levy any assessment on owners of various parcels not included within the GHAD project area.

Paul Owhadi
JMC INTERNATIONAL LLC
HERNDON PARTNERS LLC

29160 Heathercliff Road | Suite 111 | Malibu CA 90265
T: 424.234.5555 | F: 424.234.5467

UNQUALIFIED SUPPORT FOR THE STAFF REPORT on Agenda Item No: Th 17a

Permit Number: 4-12-043 Broad Beach Geologic Hazard Abatement District

A Plea for No Sand in the Cove on the West End of Broad Beach extending to the Boulder Field or at least beyond our house. "Imported Sand" in these two areas is unnecessary; and it destroys sensitive and beautiful coastal habitats for private gain.

My wife and I are residents of 31460 Broad Beach Road at the West End of the BB-GHAD. We purchased our home in 1993; and we have been full time Broad Beach residents since 1994.

We are very concerned about the proposal by the BB-GHAD to import thousands of cubic yards of sand to place in front of our home and throughout the West End of Broad Beach (the Cove through the Boulder Field area) with its sensitive coastline environmental areas.

Our situation in the West End is very different from that of the Central and Eastern portions of Broad Beach. Homeowners in the Central and Easterly portions currently have a revetment to protect their homes and their septic systems, as well as to enhance the economic value of their houses.

We understand the desire of some homeowners to improve their homes' values by restoring the sand dunes that once graced the central portion of the beach; or, in other cases, by importing thousands of cubic feet of sand to create a broad sandy beach even though that beach did not exist during the past two or more decades for much of the West End. That is an economic development issue of personal interest to those homeowners and is not an issue for us.

Practically speaking, our situation in the West End of Broad Beach is very different:

1. We do not rely on sand dunes to protect our house;

2. Our house is built on pilings into the bedrock with a retaining wall (all appropriately permitted by the Coastal Commission and the City of Malibu City);

3. We are on a sewer system already, and we do not pollute the ocean;

4. The sand level in front of our house cyclically rises and falls in height (we measure this clearly on our pilings). When the sand is low we have beautiful algae-covered rocks and small boulders with tide pools and marine life; and when it is high we have lovely sand and beach.

5. The public has always had lateral access in front of our homes at the West End.

Imported sand at our end of the beach results in a detriment to the public and Nature as the imported sand covers the existing ecologic systems that Nature now provides.

We have argued from the beginning of the political movement to form the BB GHAD that we do not belong in the BB GHAD. We do understand that owners to the east of us need something to protect their homes. But the reality is that West End homeowners are largely included in the BB GHAD because of two reasons:

One, the BB GHAD would like to locate at the West End a reservoir of sand covering the cove and boulder fields because it will lessen their need to replenish sand lost as the imported sand drifts east and south over time with the tides; and

Two, the inclusion in the BB GHAD of 20 or so West End homes that do not need imported sand allows the remaining homeowners to the East and South of us to have lower tax assessments.

Each of the above two reasons are simply a political strategy that operates to the detriment of Nature, the Public and the West End homeowners while benefiting the Central and Eastern homeowners who would like to have an enhanced beach at a lower tax assessment to themselves (than were these homeowners to pay for their own sand without the subsidy paid by homeowners in the Cove and West End.)

We have paid over half a million dollars to protect our home (i.e. for a permitted retaining wall, carbon-wrapped pillars/columns into bedrock, sewer system costs, and so on). Imported sand is redundant protection and an unfair tax on us as there is no extra benefit, just extra cost.

By Law, the BBGHAD is supposed to supply proportionate benefit to all members.

We ask that the Coastal Commission determine that importing sand to cover this environmentally sensitive area in the West End is not in the interests of the public or of the State itself which has the responsibility to preserve and protect our coastline from unneeded and destructive private development.

The tide pools, grasses and algae-covered boulders serve as a fascinating home for shoreline marine life, including multi-colored star fish and sea anemone that open and close around a child's finger. We feel that the enjoyment of this sanctuary by the public should not be destroyed by thousands of cubic yards of sand largely for the purpose of having a reliable storage area for sand to replenish the sand lost annually in the Central and East End of the beach from storm and wave action. Because the West End cove is protected by the rock out cropping between Sea Level Beach and

Broad Beach, we have reliable tide pools pretty much year round in the Cove extending to the front of our house (two houses east of the Owhadi House that sticks out).

Accompanying this letter are several photos taken during the first week of November, 2014, plus a photo of a boulder outcropping in front of 31430 Broad Beach Road. As one can plainly observe, there are probably twenty (20) multi-colored star fish piled on top of each other enjoying the regular wave action. Other photos included show the vegetation that is constantly changing and growing in, on and around the boulder out cropping(s). We did not include pictures of the tide pools that are so evident throughout the West End cove area; however, we would be glad to supply more current photos if you wish.

<u>CONCLUSION</u>: Why destroy the magnificent West End cove and boulder field that is so valuable to those who visit this end of the beach?

As indicated herein, (i) not to protect septic systems since these are not located in this area, (ii) not to protect the West End homes since these homes are secure in their present foundations, (iii) not to restore dunes, since the dunes did not exist in modern memory in front of these homes, (iv) not to create public access since public access already exists and is commonly utilized, particularly at low tides and (v) surely not to create a West End sand storage area (a warehouse for sand) to replenish the sand in the Central portion of the beach, when that can be handled directly without destroying the natural beauty of our West End environment.

The most obvious answer is that the push to destroy the Cove and Boulder Field environments NOW reduces the costs and improves the efficiency of the imported dunes project to benefit the Central and East End homeowners. That is NOT a basis for the California Coastal Commission to depart from its Mission.

We request that you will not permit sand to be placed in front of our house at 31460 Broad Beach Road which is two houses eastward of the Owhadi house which juts out way beyond the string line for the rest of homes. We request that you save the rocks, boulders, tide pools and magnificent shoreline environment which they support. Thank you.

Sincerely,

MaxFactor III **and** E Jane Arnault Dec. 2.2014

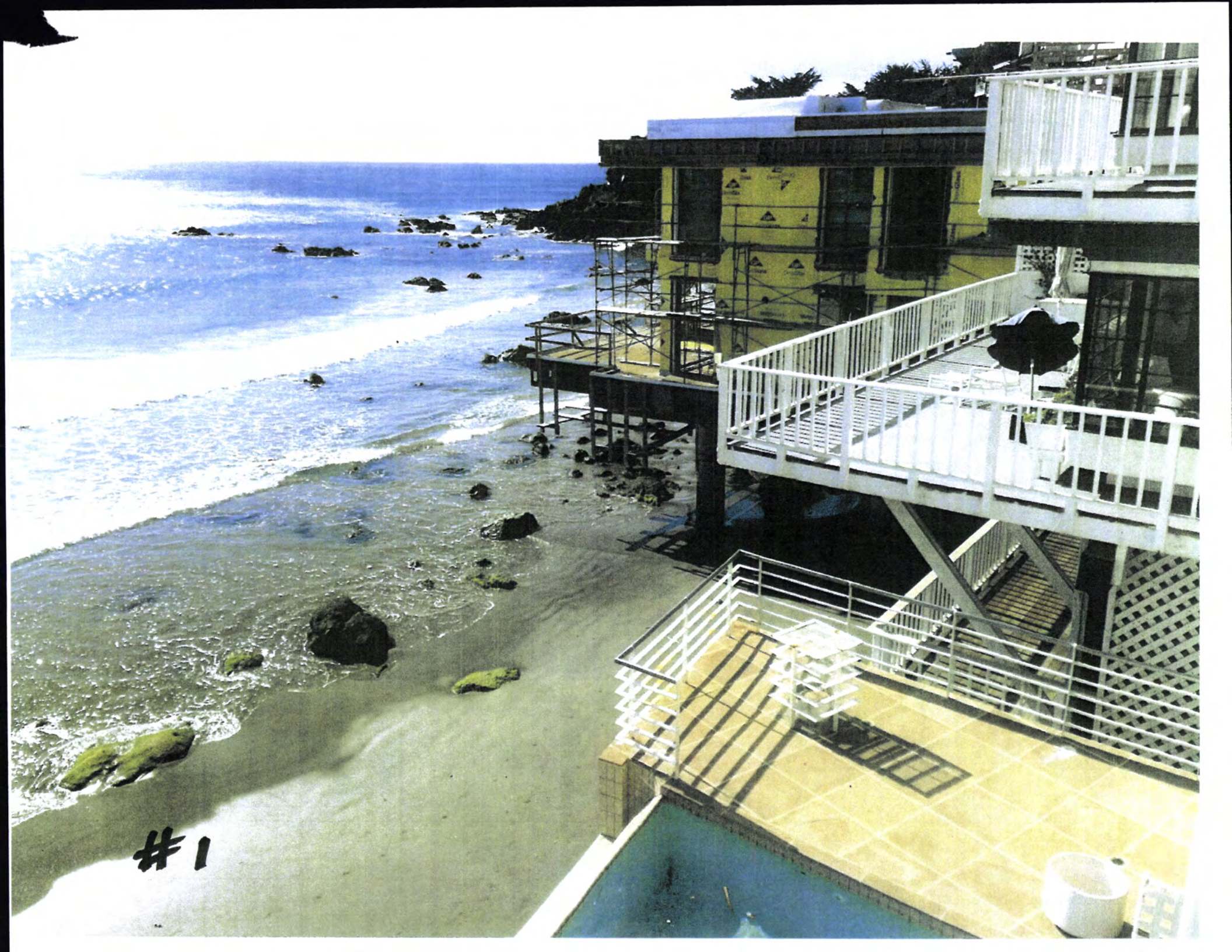
Max Factor III **E. Jane Arnault** **Date**

SEVEN EXHIBITS - 31460 BROAD BEACH ROAD
AGENDA ITEM NO. "Th 17a"

#1 FROM OUR HOME LOOKING WEST (TOWARDS POINT LECHUZA)
#2 FROM OUR HOME LOOKING WEST
#3 DIRECTLY IN FRONT OF OUR HOME, 31460 BROAD BEACH RD.
#4 FROM OUR HOME LOOKING EAST TOWARD BOULDER FIELD(S)
#5 FROM beach just East of our HOME
#6 FROM beach just East of our HOME
#7 MULTI-COLORED STAR FISH at base of boulder

NOTE: Pictures #1 through #6 Taken in November 2014
Picture #7 Taken by a visitor to our home a couple of years ago.

UNQUALIFIED SUPPORT FOR STAFF REPORT - Item No. Th 17a
12-2-2014


#1


#2


#3


#5


#6

Exhibit 6

2 Letters of Opposition to the Project and Request for Denial

December 7, 2014

Hon. Steve Kinsey, Chair
Effie Turnbull-Sanders
Wendy Mitchell
Hon. Martha McClure
Hon. Erik Howell
Dayna Bochco
Mary Shallenberger
Mark Vargas
Hon. Carole Groom
Hon. Gregory Cox
Jana Zimmer

Re: CDP Application no. 4-12-043: Broad Beach, Malibu, CA
CCC Meeting: December 11, 2014, Agenda item 17 a

Dear Chair Kinsey and Commissioners,

Thank you for the opportunity to provide comments on the project in CDP Application no 4-12-043 proposed by the Broad Beach Geologic Hazard Abatement District (GHAB)

The project proposed by Broad Beach GHAB entails two components, 1) making an existing 4,150 ft intertidal revetment permanent and 2) conducting a major beach filling project over 10 years using fill sand that is not compatible with the native sand. Each of these components is associated with significant ecological impacts to coastal ecosystems in the project area that are not consistent with the Coastal Act. The project footprint is located entirely within a recently designated marine protected area, the Pt Dume SMCA that contains a mosaic of sensitive intertidal and subtidal habitats, including kelp forest, rocky reefs, intertidal reefs and tidepools, surfgrass, fine sandy beach and sandy surf zone and subtidal benthos. The eastern portion of the site supported coastal strand and dunes until the emergency revetment was installed. I urge the Commissioners to vote to uphold the Coastal Act and protect these vital coastal resources by asking the applicant to develop project alternatives that will cause significantly lower risk of lasting environmental damage and impacts than those currently under consideration.

Coastal armoring structures, such as the revetment proposed for permanent placement at Broad Beach, cause long term ecological impacts to beach and dune ecosystems. By restricting retreat of the shoreline and covering habitat, the emergency intertidal revetment has already caused major environmental impacts to the beach and dune ecosystems at Broad Beach. These include greatly reduced beach widths, the loss of intertidal, coastal strand and dune habitats, and significant declines in biodiversity and ecosystem functions. Furthermore, the loss of the upper beach, strand and dune zones caused by the revetment in its current location restricts the ability of the beach to accumulate new sand that can form protective berms and dunes to buffer erosive forces, further exacerbating the narrowing of the beach.

Reducing the interaction of the revetment with waves and tides by moving the revetment landward could reduce some of the impacts to intertidal zones but will not reduce its impact on coastal dunes, a rare habitat in southern California. The loss of dunes and beach habitat caused by being directly covered by the revetment is significant in itself. Furthermore sustainable, functioning coastal dunes are actively linked to beaches by physical exchanges and ecological processes. The emergency revetment on Broad Beach disrupts this connectivity, greatly reducing the viability of both the beach and the dunes.

The applicant proposes that this large revetment be left in place and covered with sand. This action does not represent a coastal dune restoration as suggested by the applicant. Covering the revetment with sand will not create an ecologically functioning habitat that is comparable to the coastal dunes that existed previously at Broad Beach and importantly will not restore the connectivity that is required to sustain the dunes or the beach.

Much of the rationale for the revetment and its location on the intertidal profile appears to be associated with the protection of existing leach fields for beachfront properties. This is appears to be a situation that could be remedied by other means, such as connecting the homes to a municipal waste water system and removing the leach fields. This action could carry the additional benefit of reducing inputs from septic systems to nearshore waters in the neighborhood and could enhance water quality.

It is globally recognized that beach nourishment can cause significant and lasting environmental impacts to coastal habitats. A suite of best practices for reducing the ecological impacts of beach nourishment has been established and these practices are readily available for application to individual projects. I suggest that these best practices should be used in beach fill projects on the California coast, particularly in areas with marine protected areas and sensitive habitats, such as Broad Beach.

For beach ecosystems, a first principle in best practices is that the sand characteristics of fill sand should match the natural sand supply of the recipient beach as closely as possible. This major principle is recognized globally as well as by US regulatory agencies and is well supported by scientific studies on the ecological impacts of nourishment. The proposed beach fill component of this project fails to meet the standard of matching sand characteristics, particularly in sand grain size. The grain size proposed is many times larger than that of any of the beaches in the Malibu littoral cell and will drastically alter the characteristics of intertidal and subtidal sandy habitats at Broad Beach. The extremely large grain size proposed for the fill sand will exclude the majority of burrowing invertebrate species native to the Malibu littoral cell and greatly reduce biodiversity and the prey resources available to birds and fish.

Disturbance, crushing and burial associated with beach nourishment projects causes numerous severe ecological impacts to a wide variety of coastal ecosystems. Recovery of these impacted ecosystems can be protracted, requiring years. When the size of the fill sand is incompatible with the native biotic community, as is the case for this project, full recovery of biota in sandy habitats may not occur until the grain size is modified to compatible levels. At Broad Beach, this return to compatible grain size could require decades.

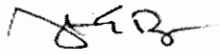
The disturbance and ecological impacts of the large beach fill proposed for this project on intertidal and subtidal biota will be severe. Impacts of sand burial on the diverse biota of rocky reefs, kelp forests and tidepools are not well understood in California. The belief that the intertidal communities of sandy beaches can recover quickly from disturbance is not well supported by science on the California coast. This means that rapid recovery of impacted rocky and sandy ecosystems cannot be assumed. Mitigation for these impacts, including the alteration of habitats, loss of intertidal and subtidal biota, reductions in wildlife support, and the loss of other ecological functions need to be addressed and included in the project plan and costs.

The lack of detailed knowledge suitable for predicting the ecological impacts of beach filling in California has hampered the ability to make the most environmentally informed decisions on these types of projects, to design projects to have lower impacts or to mitigate these impacts. I commend the CCC staff on developing a condition requiring a robust biological monitoring program for this project.

Given the slow recovery of many coastal ecosystems from nourishment impacts, the frequency of the disturbance posed by sand bypassing and additional filling in the proposed project is an important consideration. More detail is needed on the extent and method of additional filling and bypassing proposed in order to evaluate potential impacts.

In summary, I hope you will to vote to protect and preserve California's coastal resources and deny this project in its current form. Thank you for the opportunity to comment on this project and for your consideration of my input. I appreciate the challenges you face and am very grateful for your work to balance the needs of seaside residents with the highest level of protection of our coastal resources on the California coast.

Sincerely,



Jenifer Dugan, Ph.D
Marine Ecologist
UC Santa Barbara

cc: Jack Ainsworth
Steve Hudson

CITY OF MOORPARK

799 Moorpark Avenue, Moorpark, California 93021 | Phone (805) 517-6222 | Fax (805) 532-2528

OFFICE OF THE MAYOR

Th17a

December 8, 2014

VIA ELECTRONIC MAIL & U.S. MAIL

Chair Steve Kinsey and Honorable Commissioners
California Coastal Commission
South Central Coast District Office
89 South California Street, Suite 200
Ventura, CA 93001-2801

RE: Request that the Coastal Commission deny the Broad Beach Shoreline Protection and Sand Replenishment Project Unless an Agreement on Truck Haul Routes is Reached between the Broad Beach GHAD and the City of Moorpark

Agenda Item No. 17a for December 11, 2014 (Broad Beach GHAD, Malibu)

Dear Chairman Kinsey and Commissioners:

As Mayor of the City of Moorpark ("Moorpark"), I write on behalf of myself and the Moorpark City Council, to respectfully request that the Coastal Commission ("Commission") deny the Broad Beach Shoreline Protection and Sand Replenishment Project ("Project"), unless, prior to the Commission's consideration of this Project on December 11, 2014, Moorpark is able to reach a written agreement with the project's sponsor, the Broad Beach Geologic Hazard Abatement District ("GHAD"), to resolve and address the Project's significant impacts on Moorpark.

In my letter to you of July 25, 2014, included as staff report Exhibit 19 and incorporated herein by reference, and further supported by letter from State Senator Fran Pavley of July 7, 2014, also included as staff report Exhibit 19, Moorpark articulated its significant concerns about the environmental and safety hazards posed by the Project on Moorpark and its residents.

To briefly summarize, the Broad Beach GHAD originally proposed using Walnut Canyon Road, Moorpark Avenue, and the portion of Grimes Canyon Road south of Broadway Road in Moorpark ("southerly routes") as haul routes for the approximately 86,000 one-way truck trips from the Grimes Rock and CEMEX sand quarries north of Moorpark to Broad Beach. Hauling operations will take place between 7:00 a.m. and 9:00 p.m., five days per week. Although the Broad Beach GHAD's Project description now proposes

routes north of Moorpark that avoid the City, the Commission's conditions of approval do not require use of those northerly routes and the Broad Beach GHAD is not bound to use those northerly routes.

The significant impacts on Moorpark from the use of the southerly routes to and from the quarries, include, but are not limited to: a disproportionate impact on the lower-income, disadvantaged and Latino community through which the trucks would travel; dangers caused to school children arising from the existence of eight school bus stops located along Grimes Canyon Road, the lack of sidewalks along portions of those roads which are used by school children to walk to and from two elementary schools, a middle school, the City library, local parks and other uses in close proximity to those routes; the sand, dust and other particulate matter emanating from the trucks that contribute to air pollution and may cause excess debris along local roads; the noise pollution from the high volume of trucks and times of day of the hauling operation; and the fact that both routes would cross active railroad tracks used by Amtrak and Metrolink trains as well as freight trains.

Representatives of the Broad Beach GHAD initially met with Moorpark staff on June 16, 2014, to hear Moorpark's concerns and to discuss potential solutions. Broad Beach GHAD representatives have orally agreed to use northerly routes to and from the Grimes Rock quarry and from the CEMEX quarry that would avoid Moorpark altogether, except in cases of emergency. However, Moorpark had been waiting since September 12th, the date of the last meeting between the parties, for the Broad Beach GHAD to follow-up and set additional meetings with the City and to come up with meaningful and workable means to monitor and enforce the proposed truck route limitations. Finally, on December 4, 2014, after repeated requests, Moorpark received its first follow-up response from Broad Beach GHAD.

While we are working with the Broad Beach GHAD to quickly resolve this matter prior to the Commission's December 11th meeting, the issues with Moorpark are not yet resolved and there is no agreement yet between the two entities. Last week, the City provided the Broad Beach GHAD with a list of proposed terms for inclusion in any agreement, as well as a proposed draft agreement and we have been in negotiations with the Broad Beach GHAD on these terms over the last several days. In the event we resolve this matter and obtain a written agreement with the Broad Beach GHAD prior to your December 11th meeting, we will provide an update on the status of that agreement and our position on the Project.

However, unless and until there is an agreement resolving these issues, Moorpark maintains its objection to the Project, plans to attend your December 11th meeting to voice our objections and to exhaust the City's administrative remedies, and to ask the Commission to deny the Project. Moorpark had hoped that in the absence of an agreement directly with the Broad Beach GHAD, that the Commission would address Moorpark's concerns through project conditions. The City is frankly disappointed that that none of these issues and impacts are disclosed, analyzed or addressed in the Commission's staff report, and that no conditions have been imposed to address these impacts. The City believes that this Project should be subject to comprehensive environmental review, and that it is inappropriate to avoid disclosure, consideration and

mitigation of these significant impacts on the City. In the absence of project conditions or an agreement with the Broad Beach GHAD to address the impacts on the City, the Project will cause impacts in the City that should be abated pursuant to statutory and common law public nuisance doctrines and remedies.

For all these reasons, we respectfully request the Commission to deny the Broad Beach Project item, TH17a, and not consider an approval action on this project in the future unlessMoorpark and the Broad Beach GHAD have entered into a written agreement regarding the Project's truck routes.

Thank you for your attention to this matter.

Sincerely,

Janice Parvin
Mayor

cc: Chairman Karno and Members of the Board of Directors, Broad Beach GHAD
Mark Goss, Broad Beach GHAD Project Manager
Kenneth Ehrlich, Broad Beach GHAD Project Counsel
Honorable Members of the Moorpark City Council
Steven Kueny, City Manager
David Bobardt, Community Development Director
Kevin G. Ennis, City Attorney

Exhibit 7

1 Letter of Interest
(Neutral Position)

ARMBRUSTER GOLDSMITH & DELVAC LLP
LAND USE ENTITLEMENTS□LITIGATION □MUNICIPAL ADVOCACY

DAVE RAND

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LOS ANGELES, CA 90049

Tel: (310) 209-8800
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E-MAIL: Dave@AGD-LandUse.com

WEB: www.AGD-LandUse.com

December 9, 2014

VIA E-MAIL

Mr. Jack Ainsworth
Senior Deputy Director
California Coastal Commission
89 S. California St. #200
Ventura, CA 93001

jainsworth@coastal.ca.gov

Re: Application No. 4-12-043 (Broad Beach Geologic Hazard Abatement District, Malibu – Special Condition No.16).

Dear Mr. Ainsworth:

We represent Trancas PCH, LLC ("Trancas") which owns approximately 36 acres of flat, vacant property located at 6155 Trancas Canyon Road, across the street from Broad Beach in the City of Malibu (the "Site"). Trancas is considering development of a multi-family residential project at the Site that includes both market rate and deed restricted affordable housing units (the "Project"). Any Project proposed at the Site would include an on-site wastewater treatment facility to serve the subdivision.

Trancas has no position on the Broad Beach Geological Hazards Abatement District's (the "Applicant") request for a Coastal Development Permit ("CDP") to authorize a rock revetment and beach nourishment and sand dune restoration program at Broad Beach. We agree with Costal Commission staff that the CDP application presents a unique opportunity to address not only public access issues along Broad Beach, but also ongoing degradation to coastal resources caused by Broad Beach's existing septic tank leach fields.

Special Condition No. 16 seeks to address this concern by requiring the Applicant to study the feasibility of removing onsite wastewater treatment systems ("OWTS") from the beach and connecting the residences to a new inland, state of the art package sewage treatment facility. This would significantly improve conditions for sensitive marine resources by reducing (if not eliminating) septic discharge of effluent into the ocean.

As the staff report notes, the existing public Trancas Water Pollution Control Plant (used by homeowners west of Point Lechuza) is currently operating at 75 percent capacity and does not offer a viable alternative for Broach Beach homeowners. Thus, the best hope for removing Broach Beach's harmful septic tanks is development of a ***new*** off-site, inland treatment facility within close proximity. As it turns out, Trancas has already spent considerable time and effort studying the feasibility of developing and operating such a facility at its Site (see attached letter from Questa Engineering). The Trancas Site – with an abundance of flat, undeveloped land located directly across the street from Broad Beach – is uniquely positioned to accommodate such a "community" treatment facility. As suggested in the staff report, Trancas is open to expanding the contemplated facility to serve Broad Beach homeowners in addition to the proposed residential subdivision. Along with improving marine water quality and habitat conditions, development of a treatment facility on the Trancas site would ultimately enable removal (or at minimum meaningful landward relocation) of the subject rock revetment – allowing greater public access along Broad Beach.

Although we completely agree with the spirit of Special Condition 16 – we respectfully request that the Commission accelerate the timing of the required feasibility study. In light of the substantial work and analysis already performed regarding development of a treatment plant on the Trancas Site, we suggest modifying Special Condition 16 to require the Applicant to submit the feasibility study to Commission staff within 3 years (as opposed to 10 years as recommended in the staff report). Having already identified a potential Site for the treatment facility, why wait a decade to address these pressing environmental issues? We also request that the Commission require the Applicant to report bi-annually to the Commission regarding the progress of the feasibility study, until its completion.

We again applaud Commission staff for its forward thinking approach towards the Broad Beach CDP. As Trancas prepares its plans for the Site, it looks forward to working with the Applicant, the Commission and staff, the City of Malibu and other stakeholders to develop an environmentally superior, economically viable long term solution to Broad Beach's current water quality problems.

Thank you in advance for your consideration of this letter and please do not hesitate to contact me if you have any questions.

Sincerely,

Dave Rand

cc: David Wilstein, Trancas PCH, LLC

QUESTA ENGINEERING CORP.

Civil, Environmental & Water Resources

The following summarizes the various investigative work and studies completed by Todd Engineers and Questa Engineering from 1999 to present regarding soils, hydrogeology, groundwater flow, wastewater treatment, dispersal and recycling, in connection with the evaluation of potential development and wastewater management scenarios for the Trancas PCH property and vicinity.

HYDROGEOLOGIC SITE INVESTIGATIONS AND ANALYSES (by Todd Engineers)

- Geologic field mapping of 36-acre site and surrounding lands
- Drilling, logging, and testing of 50 deep borings
- Logging of 5 backhoe trenches
- Seismic refraction survey for depth to bedrock determinations
- 19 deep percolation tests for seepage pits; 30 shallow infiltration tests for surface and subsurface irrigation
- Drilling and testing of 7 monitoring wells
- Several years of water level and water quality monitoring
- Aquifer testing and groundwater flow model to assess local and regional water table changes in response to various wastewater treatment scenarios, including discharges from Trancas PCH site and from other existing development in the Trancas-Broad Beach area.

WASTEWATER ENGINEERING FEASIBILITY ANALYSIS (by Questa Engineering)

- Formulate and analyze wastewater treatment and dispersal plans for various development and wastewater management scenarios, including:
  - Individual residential septic systems;
  - Trancas PCH townhouse development with onsite package treatment plant and water recycling for landscape irrigation;
  - Community wastewater treatment and recycling on Trancas PCH property, jointly serving townhouse project and offsite connections from Broad Beach.
- Identify and develop estimates of water recycling capacity for Trancas PCH property, City property and other lands in the area.
- Construct detailed water balance-groundwater recharge studies to assess and compare potential water recycling benefits, groundwater recharge volumes and water quality improvements associated with community wastewater management approach for the Trancas-Broad Beach area.

Norman N. Hantzsche, PE
Principal/Managing Engineer

Box 70356, 1220 Brickyard Cove Rd. Suite 206 Pt. Richmond, CA 94807 *T:* 510/236.6114 *F:* 510/236.2423 *E:* Questa@QuestaEC.com

Exhibit 8

Ex Parte Communications by Commissioners

FORM FOR DISCLOSURE
OF EX PARTE
COMMUNICATION

Date and time of communication:	**December 2, 2014 4:00pm**
Location of communication:	**San Rafael, CA**
Person(s) initiating communication:	**David Neish, Dave Neish Jr.**
Person(s) receiving communication:	**Steve Kinsey**
Name or description of project:	**Broad Beach Sand Replenishment**

Detailed substantive description of content of communication:

Applicants' representatives provided an overview of the project plan and discussed the application history to date. The discussion included: the formation and the history of the Broad Beach Geological Hazard Abatement District (BBGHAD), a review of the beach erosion that has occurred over the last 40 years, the placement of an emergency revetment that was placed on the beach to protect existing properties, the identification of the agencies that are involved in the sand replenishment process, and the history of the issues that the Applicant has been working with the CCC Staff on and the status of those issues.

Staff issues that were discussed included: the possible relocation of the existing revetment, The potential to relocate existing septic systems that exist on some of the Broad Beach properties, the composition of the imported sand that would be placed on the Beach, the amount of imported sand that would be placed on the Beach, and the impacts associated with the intertidal habitat that has occurred on the western end of Broad Beach due to the erosion that has taken place over the recent decades.

The applicants provided a draft executive summary that explained how the BBGHAD project team differed from the CCC Staff on key issues of disagreement. Discussed was presenting these issues before the Commission which included the relocation of the revetment, the dune habitat restoration, placement of sand in the boulder field, and the monitoring costs. .

12/3/14
Date

Signature of Commissioner

FORM FOR DISCLOSURE

OF EX PARTE

COMMUNICATION

Date and time of communication:	**August 27, 2014 12:30 pm**
Location of communication:	**Los Angeles, CA**
Person(s) initiating communication:	**David Neish, Dave Neish Jr., and Mark Goss**
Person(s) receiving communication:	**Effie Turnbull Sanders**
Name or description of project:	**Broad Beach Sand Replenishment**

Detailed substantive description of content of communication:

Applicants' project team provided an overview of the project plan and discussed the application history to date. The discussion included: the formation and the history of the Broad Beach Geological Hazard Abatement District (BBGHAD), a review of the beach erosion that has occurred over the last 40 years, the placement of an emergency revetment that was placed on the beach to protect existing properties, the identification of the agencies that are involved in the sand replenishment process, and the history of the issues that the Applicant has been working with the CCC Staff on and the status of those issues.

Staff issues that were discussed included: the possible relocation of the existing revetment, The potential to relocate existing septic systems that exist on some of the Broad Beach properties, the composition of the imported sand that would be placed on the Beach, the amount of imported sand that would be placed on the Beach, and the impacts associated with the intertidal habitat that has occurred on the western end of Broad Beach due to the erosion that has taken place over the recent decades.

The applicants indicated that they are currently working with Staff in hopes of resolving these issues prior to the application coming before the Commission .It was indicated that the matter most likely would be coming before the Commission at either the October or November hearings.

Sept 1, 2014
Date

Signature of Commissioner

Name or description of project: Broad Beach revetment **4-12-043 (Broad Beach Geologic Hazard Abatement District)**

Date and time of receipt of communication: December 8, 2014 11:15-11:55 a.m.

Location of communication: Santa Barbara

Type of communication (letter, facsimile, etc.): telecon

Person(s) initiating communication:
Stephanie Sekich, Surfrider
Dana Murray, Heal the Bay
Gia Brazil, Ocean Conservancy

Stephanie: they will give the historical understanding of Broad Beach. As the staff report recognized – Broad Beach is a misnomer, its never been a wide beach. This is important because the applicant is having an illusion of how big the beach should be. In 2010 there was El Nino, King Tides, making the revetment necessary. Board Beach is a poster child: extreme condition. The ultimate goal of the sea level rise work the State is doing is to remove revetments. That is not possible now, but in 30 years it will be the only option. The revetment only exacerbates erosion.

Staff is recommend that 2000 linear feet be moved landward, and they support that. They (Heal the Bay) have met with the GHAD, they all agree there is a major problem. The homeowners have asked the NGOs what they think is a reasonable solution. They have been working on this issue for roughly 8 years, have submitted copious letters to SLC. They are pleased that their recommendations to State Lands are mimicked in this staff report.

It's a double edged sword. By not removing some of the revetment in this case, it prejudices the future sea level rise guidance document. Removing 2000 feet is very progressive, and they think that is consistent with and complements the work we are trying to do with the sea level rise guidance, as well as the recommendation to elevate certain homes on caissons, and in some parcels there is room to do managed retreat. But the staff report also assumes that these things are cost prohibitive. It is impossible to speculate what they are spending now, and how that corresponds to property values and in relation to the cost of caissons.

Their view is that when people buy property in a precarious location, they have to spend what it takes to protect it.

One of the feasibility studies is to look at the septic, and second is to look at long term solutions: caissons, and managed retreat. One of their specific recommendations is to complete the studies in 5 years, and in the second 5 years, to actually go through the permitting and implement. The LCP already requires that on redevelopment these things be considered.

They know that the GHAD has objected to the cost of the monitoring. Dana: coming from a marine science background, she would like to see that cost itemized. But also, its not only

an MPA, its also a fish habitat. So by proposing to protect private structures at the cost of public resources, it obviously needs to be addressed.

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They understand 'adaptive management' is needed– with all the interruptions to the natural system, they need ongoing monitoring. They have physical monitoring, and then there is the ecological monitoring. How are the habitats doing, how is the marine life impacted over time. One of their suggestions is, now they are only recommending that the ecological impacts be looked at year 5. They would like that done in 2 or year 3.

We talked about what is Plan B, ultimately? They see it as remove the whole revetment and do soft structures offshore, and where possible, moving homes landward.

It is important that this revetment is not approved permanently. It was approved under an emergency permit. This is only a temporary approval to allow it. You really cant mitigate for these effects. The revetment is to protect the septic systems, which really should not be there anyway. Both staff and Engel state that if the revetment is taken out entirely, it would help the erosion problem.

They stressed that the number one reason the revetment is there is to protect the septic systems. If they can't take out the entire revetment, take out the eastern part. The State lands Commission EIR considered an alternative of building large dunes, but the homeowners rejected that because their private views would be impaired. However that alternative is not discussed in the staff report.

Surfrider: They have a concern on the grain size of the sand. Engel wrote a memo, it is extremely clear why the grain size they have chosen is inappropriate for the habitat. The larger grain size is more porous, it helps erode beach. Large grains produce a steep face They can get smaller grain size. Their logic is that if you get larger sand it will stay on the beach longer.

They are very pleased with the conditions for public access easements. The backup plan for access is that they maintain a path on the landward side of the revetment. They think this is a reasonable solution.

December 8, 2014
/s/ Jana Zimmer

FORM FOR DISCLOSURE OF EX PARTE COMMUNICATIONS

Name or description of project: Broad Beach revetment **4-12-043 (Broad Beach Geologic Hazard Abatement District)**

Date and time of receipt of communication: December 8, 2014 10:30-11:15 a.m.

Location of communication: Santa Barbara

Type of communication (letter, facsimile, etc.): telecon

Person(s) initiating communication:

Dave Neish, Ken Ehrlich and Mark Goss, Broad Beach GHAD

Ehrlich: the staff report was voluminous, there were a number of things that were surprising, some they thought they had resolution, but it was inconsistent with what they thought had been negotiated.. Their letter of Dec. 5 outlines four major points:

1. Location of the push back of the revetment

There were extensive negotiations with all four of the permitting agencies, State Lands staff to put the revetment so that it protects the homes and is not onerous to homeowners, in terms of taking land away from them, but also assuring themselves that they are not on public property. SLC gave them a line, slightly landward in some places, and toward Zuma it hugs the houses more. Staff said it has to be as much as 110 feet past the State lands line. Troublesome because because homeowners would have a revetment up into their back yards, and if there were wave uprush and erosion, the wave uprush would infiltrate the septic systems both existing and future. They feel that is a safety issue and an excessive pushback.

Ken: the mean high tide line is the public/private boundary. When they got the emergency permit in 2010, they did a survey completed in October 2009. That survey was taken on a regular day. According to the surveyors, it qualified as an appropriate survey. The day before the construction started, in January SLC did their own survey, it was a stormy, violent day, and they believe the MHTL looked to be further inland. It is a difference of 10-15 feet. No surveys done since then. They want to put that disagreement aside. When they were negotiating with SLC on the lease, they agreed to suspend that disagreement, and they used the SLC survey to establish the line for purposes of the lease. They agreed to pull back the revetment .85 Acre along the 4100 feet.

They contend that CCC staff is interpreting literally and aggressively the LCP that says shoreline protective devices must go as close as feasible to the structures to be protected. They claim that our staff does not account for future systems, meaning expansion areas or new leach fields. Malibu requires a 100% redundancy in their septic systems. Although staff took into consideration what is existing, in their view they did not take into consideration any futures. They know that in some cases those mapped future leach fields are being used, and are already existing. One of their contentions is that if the beach significantly erodes, and if backpassing the sand does not keep the beach wide enough, if there is a 10-20 foot uprush, it will invade some of the future leach fields. Then they will have raw sewage backwashed into the ocean.

They contend that if it is new development, and/or redevelopment that adds to the septic demand, this policy to require 100% expansion kicks in. The policy impetus for that provision came from the RWQCB. Typically they require 100-200% expansion area. In Malibu, the City will hand them a covenant that puts the world on notice that the owner will indemnify the City, and agrees that the house is no longer habitable unless they can repair/expand the septic.

What the water board is doing in Malibu, in the Civic Center there is a consent decree to convert the Civic Center to a package plant, and to expand to residential on a time table. Broad Beach is 15 miles away. The water board is doing an inch by inch process to move property off septic.

They propose, at the end of the ten year permit life, to study the feasibility of abandoning the septic systems.

2. Easement and lateral access

GHAD does not have the authority to grant easements. They have spent $8.5 million because there is an appetite among the homeowners to put sand on the beach. They are creating a beach of a diminished amount, and that will give the public lateral access. They cant guarantee it because they cant guarantee what an assessment vote would be. But they have clearly demonstrated that the property values go up when there is a beach.

The staff proposal for access is a deal killer. They thought it was off the table. They had conversation about lateral access for some time, there was some discussion.

They are creating a beach at private expense where none currently exists.

They agreed that if they had retained the power of eminent domain, they would have the ability to condemn access easements. But the owners said, the only project they wanted is to put sand on the beach, so there was never any assessment money put aside to pay fair value for it.
It was rescinded at the beginning. So the GHAD has no ability to bind its owners to record easements.

3. Nourishment of west end

They had compromised on a number of homes given there are intertidal habitats there, they agreed with the science. Very late, a 'boulder field' was introduced, there was some algae. It takes another 11-13 homes out of the project. The less sand you put, the shorter period of time it stays. They have looked at the science to see that the boulder fields are buried seasonally anyway. Nothing different would occur if it was nourished or not nourished. In continuing attempt at compromise, they have said alright, let us put at least 40 feet of sand in front of those homes that staff believes will impact the boulder field.

4. Monitoring program

They believe the monitoring plan is incredibly onerous, they will come with a plan for $2-3 million. It feels like the staff has suggested that the GHAD fund a research project that goes beyond what would be needed to monitor the success or failure of their project. They would be at between $17-18 million dollars over the course of 10 years. The monitoring program would be the most expensive component. They believe this came out of the clear blue sky. Every other beach nourishment project has been different: SANDAG in San

Diego was $500,000 for the total life of their permit. They believe that the habitat at the west end warrants a greater investment.

Mark: it feels that the project is being held to different standards. The one foot of burial. They don't have another standard, but they don't like it. Another example is sand size. They had sand similar to the SANDAG project. They think they are being a litmus test for every new standard that staff has come across.

12/8/14
Jana Zimmer

Received
SEP 23 2014 BR
California Coastal Commission
South Central Coast District

FORM FOR DISCLOSURE OF EX PARTE COMMUNICATIONS

Name or description of project, LPC, etc: Broad Beach GHAD Beach revetment/replenishment

Date and time of receipt of communication: September 16, 2014

Location of communication: Malibu

Type: Site visit

Persons Initiating Communication: Dave Neish Jr and Senior, lawyer Ken Ehrlich, and Mark Goss, project manager for applicant BBGHAD (Broad Beach Geological Abatement District).

Date: September 16, 2014 2:00-3:15 pm

I met along with Commissioner Bochco with representatives of the applicant. In the clubhouse/events center, at Broad Beach of the homeowners. Mr. Erhlich was the primary person making the presentation. He provided a briefing packet which has also been provided to staff. They hope that the matter will be on the October Agenda.

We then viewed, from the clubhouse terrace and from the westerly public access point extent of the existing revetment, which was installed pursuant to an emergency permit in 2010 to protect 78 (of 114) homes. There was a previous emergency action in 2009-10 where temporary geotextile (sandbag) revetment was attempted as a 'soft' solution, which failed. The Geologic Hazard Abatement District was formed per state law to provide a way forward for the homeowners affected through the multiple agency permitting process. The project is to retain the revetment, and cover it with sand through a beach nourishment project. The end result will be a public beach approximately 60 feet in width, (previously had been proposed to be wider) and the revetment will be covered with a dune restoration project which will be newly created ESHA. They intend to retain an existing rock revetment.

The applicant is the GHAD, not the individual homeowners. The GHAD is considered a 'public' agency, but the restoration will be 100% privately funded, they have approved a $400 per linear frontage foot per year assessment to fund a $20,000,000 restoration project. They have spent $8 million to date on permitting from numerous agencies. The proposal is to nourish 10 years of beach and habitat restoration, and to renourish in 10 years again for a total 20 years. There is some unpermitted development at the west end that they ask to be retained. They want to retain the 'buried' permanent revetment for future storm protection. The staging area for the initial nourishment will be the parking

area of Zuma Beach, after Labor Day, so they are anxious to and hope to begin in 2015, because the cost will go up after that.

Due to concerns about impacts to the MPA offshore , the project will bring 600,000 cy. sand from Moorpark area, rather than offshore. Their map of routes and sand source sites indicates that the rock will come from Grime Rock Sand Quarry and Cemex Quarry through Ventura County to the Pacific Coast Highway from Hueneme to the Broad Beach site. And from the Gillibrand Quarry. CalTrans will be addressing the routes. Number of trucks and routes were not specifically discussed. The project is being revised per staff concerns to eliminate sand replenishment at the far western end, (where staff has identified significant tidepool habitat) that will in turn result in about 14 homeowners not being assessed for the work. The conditions will run to the GHAD, not the homeowners. The GHAD can be voted out of existence, but not the assessments.

They stressed that existing public vertical access from two points which are already County of LA access points, in addition to continuation of lateral access from Zuma Beach will be maintained and restored. They acknowledged that in the past (the 1980's) there were issues with Broad Beach homeowners seeking to monitor and create the impression of a private beach, but they assert that those days are over; that the problems we hear of in Malibu with homeowners trying to prevent public parking in public roadways (like Broad Beach Road) through fake parking signs and orange cones is not occurring in this area. They stated that the public would be able to park along Broad Beach Road as that is a public road, or walk up from Zuma Beach.

The project was represented as restoration of a beach that did exist in 1972, but has been eroded away, that there has been a significant loss of sand over the last 40 years. The homeowners are concerned that the beach has disappeared and that has affected the marketability and value of their homes. But they understand that the beach that is to be created in connection with retention of the revetment is intended to be and will be public, as it is entirely seaward of the mean high tide line, and therefore is public property now per State Lands Commission. The sand is to be deposited on public property, and therefore there will be no issue with having to require lateral access rights for the public. They discussed that the restored dune area is intended to be ESH, and serve as a buffer between the homes and the public beach.

We discussed briefly why offshore borrow sites were acceptable in other areas, but not here. Speculated that there is an MPA directly involved here, but unclear whether as directly in southern areas like Solana/Encinitas. They provided a list of examples of successful beach nourishment but we did not discuss. Goleta Beach is on the list.

We talked about the septic systems. Some are seaward of the homes, between the home and the rock revetment, some in courtyards, some landward. They stated that the GHAD is the applicant, not the homeowners, and they would oppose a condition to move the septic as part of this permit. They want to leave the septic issue for planning by year 10, and to be off septic by year 20. The nearest treatment plant is at capacity (Malibu West); the City of Malibu has a sewage plant project in the works. They stated that the GHAD

does not have the power of eminent domain to acquire a site for a treatment plant because they voted not to retain it.

They have met with numerous NGO's. Some do not want any hard structure anywhere. Others are more concerned with habitat impacts.

September 23, 2014 /s/ Jana Zimmer

CALIFORNIA COASTAL COMMISSION
SOUTH CENTRAL COAST AREA
89 SOUTH CALIFORNIA ST., SUITE 200
VENTURA, CA 93001
(805) 585-1800

Th 17a

Filed:	4/4/14
180th Day:	10/1/14 (Waived)
270th Day:	12/29/14
Staff:	Staff
Staff Report:	11/26/14
Hearing Date:	12/11/14

STAFF REPORT: REGULAR CALENDAR

Application No.: **4-12-043**

Applicant: **Broad Beach Geologic Hazard Abatement District**

Agents: **Moffat and Nichol Engineers**

Project Location: **30708 Broad Beach Road to 6526 Lechuza Point Road, Malibu; Los Angeles County.**

Project Description: **Authorization of an approximately 4,150 ft. long, 12-15 ft. high, as-built, rock revetment constructed pursuant to two emergency coastal development permits. In addition, the project includes implementation of a beach nourishment program for a period of 20 years involving deposition of 600,000 cu. yds. of sand on the beach from inland sand quarries during the first year and approximately 450,000 cu. yds. of sand during the tenth year of the program; periodic sand backpassing operations to occur no more than once per year, and dune habitat restoration. Described in more detail in Section IV. A below).**

SUMMARY OF STAFF RECOMMENDATION

Commission staff is recommending conditional approval of the Broad Beach Geological Hazards Abatement District's (BBGHAD) proposed revetment, beach nourishment, and dune restoration project at Broad Beach in the City of Malibu in Los Angeles County. The recommended approval is limited to 10 years with conditions to address coastal hazards and impacts to public access, marine, beach and dune habitats, and visual resources. The approval also includes a comprehensive implementation and monitoring program, including providing for adaptive management at Broad Beach considering project uncertainties and projected global sea level rise.

Project Description and Background

The BBGHAD proposes to permanently retain an approximate 4,150 foot long rock revetment that was temporarily authorized and constructed under Coastal Commission emergency permits in January of 2010. The BBGHAD also proposes a twenty-year beach nourishment and dune restoration program on top and in front of portions of the revetment that includes deposition of 600,000 cubic yards of sand from inland sand quarries in year zero and another 450,000 cubic yards in year ten. The applicant has also analyzed an alternative (4B) that would place 300,000 cubic yards of sand in each of years zero, five, ten, and fifteen. Both alternatives include periodic back-passing of sand from the down to up-coast end of the beach no more than once a year.

The BBGHAD encompasses the entirety of Broad Beach, including 114 individual property owners with homes on 122 single-family residential parcels. Approximately 86 homes were present prior to the establishment of coastal permit requirements in 1972 under Proposition 20. Forty-six of those homes are located behind the proposed revetment. Many of the existing homes were either constructed or substantially improved with permits issued by the Coastal Commission or the City of Malibu after 1972. Fifty-one of the parcels have restrictions protecting public lateral beach access, thirty-two of which are directly underneath or landward of the revetment. Thirty-six of the parcels have easements held by the State Lands Commission (SLC), twenty of which are in the revetment area. Another eleven 11 of the existing residences have "no future seawall" conditions required by the Commission or the City of Malibu. Seven of these eleven residences are located behind the proposed revetment. The offshore and beach areas below mean high tide at Broad Beach are in the Point Dume State Marine Conservation Area MPA and a State Water Resources Control Board designated Area of Special Biological Significance (ASBS).

Broad Beach Erosion and Project Impacts

Although the width of Broad Beach has varied over the last century, evidence shows that the beach is receding about an average of 2 feet per year since 1970. And while sea level rise over the proposed 20 years of the beach replenishment may only range from 3.4 to 17.9 inches (with a projected value of 8.5 inches), the SLC analysis of public trust resources concludes that erosion rates at Broad Beach may be accelerating, and certainly over the longer run (after 2050) sea level rise will become a significant erosion challenge. In recent years the erosional trend at Broad Beach has placed the existing beach-level residential development directly in danger, and several homes were lost in the 1998-99 El Nino year and at least one home was significantly damaged in the 2009-10 storm events that led to the construction of the emergency revetment.

The proposed BBGHAD revetment results in significant public access and beach resource impacts that typically follow from shoreline structure projects on eroding shorelines. It causes the direct passive erosion loss of the fronting beach due to the fixing of the back beach and the resulting inability of the beach to naturally retreat. It also prevents the erosion of beach and bluff sand that would otherwise naturally nourish local and regional beaches. The revetment has been blocking lateral public access in front of the revetment for almost five years at high and even mid-range tides (the applicant describes Broad Beach currently as a "narrow, 'low-tide beach"). And, the revetment is sitting on approximately 3.02 acres of beach, including directly encroaching on approximately between 1.5 and 2 acres of public tidelines and existing SLC

public access easements. The revetment also is visually unattractive. Finally, due to the loss of the beach, the revetment causes the direct loss of dry and wet sand beach habitat resources.

To their credit, and in recognition of the severe impacts of the revetment, the Broad Beach homeowners formed the BBGHAD, voting to assess themselves $20 million dollars over 20 years to finance a beach replenishment program along with the revetment to assure protection of their homes and rebuild Broad Beach for public benefit. If successful, the BBGHAD hopes to continuously maintain a sandy beach and dune field that will provide public beach access and restore beach and dune habitats. The beach replenishment and restoration program will also cover and thus mitigate the visual impacts of the rock revetment.

The proposed beach restoration could significantly offset the impacts of the revetment, but there is substantial uncertainty about how it will perform. The SLC analysis of public trust resource impacts concludes that with projected sea level rise, the proposed beach restoration is mostly likely to last 10-20 years. However, it could be shorter, and a series of significant storms or El Nino year could seriously and quickly degrade the beach restoration. In addition, as proposed, the sand replenishment will use sand with a larger average grain size, and of a different color, than is currently found at Broad Beach. These differences will change both the aesthetic character of Broad Beach and potentially the habitat values of the beach area. And, the placement of sand will have direct and indirect impacts of covering existing habitats, including existing rocky intertidal areas at the up coast end of the project area. The proposed replenishment will also be accomplished by trucking in 43,000 truck trips loads of sand across local highways and streets (840 truck trips/day for approximately 5 months), and construction staging in a public access parking lot on nearby Zuma County Beach.

Coastal Act Consistency and Conditions of Approval

The BBGHAD project raises fundamental questions about how to address significant coastal hazard risks to development while protecting other coastal resources, including public beach access and recreation and natural shoreline habitat and aesthetic values. Staff recommends that the Commission find that many of the homes in the BBGHAD as they exist today are entitled to shoreline protection under Coastal Act section 30235 because they are in danger from erosion. Other homes, though, were built or improved with coastal development permits subject to the section 30253 requirement that new development not require future shoreline protection; some properties even have Commission-required recorded prohibitions against future protection like the proposed revetment. Thus, some homes are not necessarily entitled to, or in some cases are affirmatively prohibited from, receiving authorization of a shoreline protective device under the Coastal Act.

Unfortunately the proposed revetment ultimately would likely not protect those homes that are entitled to protection if there were physical gaps in the revetment in front those intermingled homes that are not entitled to protection. Erosion would be exacerbated in these gaps, ultimately wrapping around and undermining the revetment. In the alternative, the Commission could consider requiring that existing homes in danger be relocated further inland, but there is very little room on some of the lots to make this a viable strategy over the longer run given the on-going erosion at Broad Beach. Existing structures could also potentially be raised to safer elevations on deep-seated caissons, as is required under the City's LCP when homes along Broad

Beach are redeveloped (and some have been), but this alternative is extremely expensive and the Commission would need to require that many endangered structures essentially be entirely reconstructed on new elevated caisson foundations.

The BBGHAD project raises significant conflicts with the Coastal Act's hazards, public access and recreation, habitat protection, and visual resource policies. However, the proposed beach replenishment and dune restoration component offsets these inconsistencies by seeking to bury the revetment and restore the beach to create a condition as if the revetment were not there at all. If successful, this component would address many of the beach resource and aesthetic impacts caused by the revetment. Unfortunately there is significant uncertainty about how long the restored beach will remain given on-going erosion and potentially more-erosive storm events. It is possible that the beach would be substantially reduced or even completely gone in places, and the revetment exposed, within several years of the initial replenishment. The BBGHAD is proposing to do a second major replenishment in year ten to address this concern. Nonetheless, because of the significant uncertainty of restoration success, staff recommends that the Commission limit the authorization of the revetment and beach restoration to ten years, with additional beach nourishment of up to 300,000 c. yds. subject to the requirements of an Adaptive Management Plan with on-going monitoring and assessment. In the event that the project performs as planned, including continuing to provide public beach access and avoiding significant environmental impacts, the Commission may extend its authorization of the revetment and beach restoration program in ten years' time.

A limited ten year authorization allows the Commission to support an adaptive management approach to shoreline erosion at Broach Beach, providing protection to existing development but not authorizing *permanent* shoreline structures for development not entitled to such protection. Further, the City of Malibu LCP requires that shoreline homes be moved as far landward as possible and elevated on caissons when they redevelop so as to minimize or not require at all any shoreline protection at the beach level. To support this adaptive approach, staff also recommends that the Commission clearly authorize the revetment only to protect the eligible development that exists today, and that the BBGHAD and participating members assume the risks of developing in this hazardous location. At some point in the coming decades it may be that all of the homes along Broad Beach would no longer have need for shoreline protection such as the proposed revetment because they would be elevated through the redevelopment process above flood levels along the back of Broad Beach. This would enable the revetment to be removed in the event that the beach replenishment component was no longer functioning as planned, and allow maximum opportunities for maintaining the public beach. Of course, as time passes and sea level rise accelerates, it will likely become increasingly difficult to maintain Broad Beach through artificial replenishment. If and when this reality comes to pass, it will need to be addressed by the Broad Beach homeowners, the City of Malibu, and the State in later phases of development review and adaptive management.

Staff is recommending a variety of other conditions to address the impacts of the BBGHAD project. Most important, staff recommends that the BBGHAD address the uncertainty of maintaining public beach access in two primary ways. First, staff recommends a condition to provide unambiguous public access between the mean high tide and the toe of the proposed dune restoration that would be ambulatory back to the toe of the revetment if necessary. Providing a

clear and consistent area of public access seaward of the revetment is one of the stated goals of the BBGHAD, and a critical measure to address Coastal Act public access and recreation policies. Staff recommends that this requirement be implemented through a deed restriction recorded on each separate property governed by the BBGHAD. Staff is also recommending the submittal of a final beach adaptive management plan that requires additional nourishment of the beach should the beach recede to within 30 feet of the revetment at a designated point.

Second, staff recommends that the BBGHAD assure a "back up" lateral public access easement along or just behind the revetment in the event that public access is not available on the beach in front of the revetment. Given the historic difficulties and conflict surrounding public and private rights at Broad Beach, this requirement is structured as either a direct dedication to the Mountains Recreation and Conservation Authority, in order to provide an unambiguous and effective mechanism for potential future enforcement of this backup plan for public access. This requirement to provide alternative access would only be triggered in the event that the planned beach restoration fails to maintain public access on the dry sandy beach seaward of the revetment as proposed by the BBGHAD.

Public access impacts are also being addressed by the BBGHAD proposal to pull the revetment back closer to the existing septic leach fields at the down-coast end of the project where there is significant area between the landward edge of the emergency revetment and residential development. Staff supports this relocation, and is recommending a slight expansion of this pull-back to further maximize beach area for public access and recreation (as required by the Malibu LCP). Finally, other recommended conditions address the need for clear on-going public access signage and management to assure maximum public access to and along Broad Beach. Staff also recommends that the BBGHAD evaluate and develop a plan to anticipate the potential removal of beach septic systems and hooking up of Broad Beach homes to a local community wastewater treatment system. This potentially feasible alternative would provide even more beach area for adaptation to coastal hazards and protection of beach resources over time. It would also have the secondary benefit of eliminating septic discharges taking place directly under Broad Beach.

Concerning marine, beach, and dune habitat impacts, staff recommends that the Commission approve a modification to the applicant's proposed alternative 4B nourishment footprint, which reduces the initial placement of sand by half; and that sand placement at the up-coast end be further limited to protect inter-tidal habitat resources. This reduction will minimize habitat impacts while still creating a dry sandy beach area ranging from 50-75 feet. Staff also recommends some areas of additional dune restoration to fully mitigate the loss of dune habitat resources from the project. This restored dune will be considered ESHA and off-limits to public access except as may be necessary only at the dune seaward margin as the beach erodes. The BBGHAD has also proposed comprehensive monitoring of various project components, and staff is recommending various refinements to assure adequate feedback loops over the first ten years of project implementation. This includes a five year review to provide for "mid-course corrections" if necessary for any unanticipated significant impacts.

Finally, given the potential for disagreement and the many parties involved, staff is recommending that the BBGHAD indemnify the Commission for any future litigation costs related to its action.

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I. MOTION AND RESOLUTION

The staff recommends that the Commission adopt the following resolution:

Motion:

*I move that the Commission **approve** Coastal Development Permit No. 4-12-043 pursuant to the staff recommendation.*

Staff recommends a **YES** vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and the policies of the certified Local Coastal Program for the City of Malibu.. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation.** Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

1. Final Revised Plans

A. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, two (2) sets of Final Revised Plans, prepared and stamped by a registered engineer. The Final Revised Plans shall demonstrate the following:

(1) Landward Relocation of Revetment. Landward re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment (including all portions of the proposed rock revetment and sand bag wall between 31350 Broad Beach Road and 30760 Broad Beach Road) as generally depicted in Exhibit 8. The relocated revetment shall be configured in a manner that maintains a relatively straight or gently curving line as generally depicted in Exhibit 8. The realigned revetment shall maintain a 15 foot setback from existing leach fields (excluding any "future" leach fields that had not yet been built at the time this application was submitted to the Commission). All portions of the relocated revetment shall be configured as a single contiguous structure without any gaps or breaks (including the property at 30822 Broad Beach Road) and shall generally utilize the same design as the existing, as-built revetment. Minor modifications to the design to ensure structural stability may be implemented subject to the review and approval of the Executive Director. No portion of the revetment shall extend further upcoast than 31350 Broad Beach Road, nor further downcoast than 30760 Broad Beach Road.

(2) Reduction in Beach Nourishment/Beach Width. The total amount of beach/dune nourishment material for the initial nourishment event, and each separate renourishment event shall not exceed 300,000 cu. yds. of sand for each event. The footprint for beach nourishment/beach width shall be reduced accordingly to provide for an approximately up to 50 ft. wide dry beach at the westernmost placement area and 60 to 75 ft. wide dry sand beach seaward of the toe of the reconstructed dunes on site, as generally consistent with Exhibit 9 with the exception that no beach nourishment shall occur upcoast of the property at 31380 Broad Beach Road.

(3) Dune Restoration. The dune restoration and enhancement area as generally shown on Exhibit 9, shall be revised consistent with all provisions of the Revised Final Dune ESHA Habitat Creation/Restoration Plan required pursuant to Special Condition 5, as generally shown on Exhibit 9.

(4) Public Access. Designate a 10 ft. wide public pedestrian path located immediately landward of the entire length of the rock revetment, including the portion of the revetment to be relocated/reconfigured pursuant to Part A.1 of this condition, as generally

depicted in Exhibit 8. The pathway shall utilize a sand surface only. The plans shall depict this path as a 'public accessway' available for public use when there are no areas of dry beach seaward of the revetment available for pass and repass, consistent with the terms of Special Condition 14 below. In addition, access stairways (for the provision of both public and private access) shall be shown extending from the 10 ft. wide public pedestrian path to the toe of the rock revetment below. The number and location of the access stairways shall generally align with the shared private beach access paths allowed on site consistent with Special Condition 5, Part 5. All such access stairways shall be designed and constructed by reconfiguring existing stones within the revetment to form steps. No handrails shall be installed.

B. The Permittee shall undertake the development in accordance with the final approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No changes to the plans shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

2. Development Authorization Period

A. This CDP authorizes the approved development on a temporary basis only for a period of ten (10) years from the date of Commission action (i.e., until December 11, 2024). After such time, the authorization for continuation and/or retention of any development approved as part of this permit (including, but not limited to, the rock revetment and beach re-nourishment/backpassing activities) shall cease.

B. No later than six months prior to the end of the ten year term of this permit, the Permittee or successor in interest shall submit a complete coastal development permit application for the re-authorization of the beach nourishment program and to retain the rock revetment for an additional ten (10) year term, if necessary, to protect existing development at risk from wave hazards and tidal action. The application shall include the results of the required annual and five year biological and physical beach monitoring reports and the alternative sewage treatment feasibility study, required pursuant to Special Conditions 4, 5, 6, 7 & 16 of this permit, in order to evaluate the effectiveness and impacts of the project; address changed circumstances and/or unanticipated impacts; consider modifications to the location and design of the sand fill area; and consider additional mitigation measures necessary to compensate for any adverse impacts to marine and/or upland coastal resources/habitats resulting from the continued retention of the rock revetment and implementation of the Adaptive Beach Nourishment and Management Program. Failure to obtain a new coastal development permit for an additional term to retain the rock revetment and continue the Adaptive Beach Nourishment and Management Program shall constitute a violation of the terms and conditions of this coastal development permit, unless the Executive Director grants additional time for good cause.

C. Five (5) years from the date of issuance of this coastal development permit, the applicant shall submit a report to the Executive Director, documenting the status of the

project and the Beach Nourishment and Management Program. The report shall summarize the results and findings of the annual physical and biological monitoring reports and the status of alternative sewage treatment feasibility study as required pursuant to Special Conditions 4, 5, 6, 7 &16 Should the monitoring reports reveal any unanticipated significant adverse resource/ habitat or public access impacts not addressed in the initial Commission authorization, and/or that the Beach Nourishment and Management Program is not maintaining a thirty foot wide sandy beach fronting the approved revetment, the Executive Director may require the submittal of a permit amendment for the review and approval by the Commission to address and evaluate mitigation measures to compensate for any adverse resource/habitat impacts, public access impacts, and/or require any mid-course corrections or adjustments to the Beach Nourishment and Management Program. Significant impacts shall be understood to be greater than de minimis increases over previously identified impacts based on the approved monitoring program.

D. The coastal development permit application submitted by the permittee for an additional ten (10) year term, pursuant to Part B of this special condition, shall include a complete evaluation of all feasible alternatives to the retention of the rock revetment in its current location, including, but not limited to, landward relocation of part or all of the revetment and removal of part or all of the revetment; construction of an alternative type/location of shoreline protective device; removal of the existing septic systems and connection to a new or upgraded package sewage treatment plant based on the findings of feasibility study required pursuant to Special Condition 16; relocation of existing septic systems further landward using alternative wastewater treatment systems; and options for removal and/or landward relocation of existing private residential development. The information concerning these alternatives must be sufficiently detailed to enable the Coastal Commission to coequally evaluate the feasibility of each alternative for addressing site shoreline protection, public access, and sensitive resource issues under the Coastal Act and the City of Malibu Local Coastal Program.

3. Implementation of Project Improvements & Removal of Unpermitted Development

A. The applicant shall implement and complete the landward re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment (including all portions of the proposed rock revetment between 31350 Broad Beach Road and 30760 Broad Beach Road) consistent with the requirements of Special Condition 1.A.1. within 1 year of the issuance of this permit. The Executive Director may grant additional time for good cause. All sandbags that were included in the construction of this portion of the revetment shall be removed from the beach and are not to be used in the reconstruction of the rock revetment, which shall be composed entirely of rock.

B. The applicant shall construct the access stairways (for the provision of both public and private access) consistent with the requirements of Special Condition 1, Part 4 and Special Condition 5.A.5 concurrent with the re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment required pursuant to Part A of this condition. The Executive Director may grant additional time for good cause.

C. The applicant shall remove and dispose of, in accordance with all applicable laws, all unpermitted private stairways (approximately 40), sandbags and remnants of all materials such as plastic and fiber netting that made up the sand bags located both seaward and landward of the existing revetment, unpermitted wooden decks located atop or adjacent to the revetment, and "no trespassing" or "private property" signs or other signs that discourage or mislead the public from using public areas on and adjacent to the approved rock revetment concurrent with or prior to the re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment required pursuant to Part A of this condition, unless additional time is granted by the Executive Director for good cause.

4. Final Adaptive Management and Monitoring Plan

Prior to issuance of the Coastal Development Permit, the applicant shall submit, for the review and approval of the Executive Director, a Final Adaptive Management and Monitoring Plan. The final plan shall be prepared by a qualified engineer with experience in coastal engineering and incorporate all provisions of the Final Backpassing Guidelines (as presented in the Project Description 12/21/12), except that it shall be consistent with the following revisions:

A. Backpassing Provisions and Triggers

Sand Back Passing activities shall be implemented consistent with the following provisions:

1. *Limits of Back Passing:* Source and receiver locations shall be generally identified based upon the approved nourishment limits (as identified in Special Condition 1).
2. *Methods of Backpassing:* Equipment for backpassing shall be identified. Mechanical equipment shall be minimized, and limited to the use of scrapers, or bulldozers.
3. *Backpassing Transport Routes:* The general routes that will be used for taking sand from the source site to the receiver sites shall be identified.
4. *Backpassing Triggers:* Backpassing shall be undertaken at most once per year, and only if the recorded dry beach berm width at Profile 411 is 50 feet or less for three (3) consecutive months.
5. *Limits on Source Sites for Backpassing Sand:* Source areas shall extend no further west than Profile 410, no further east than the limits of the approved nourishment area (as identified by Special Condition #1), at least 10 feet seaward of the dune toe and no further seaward than the wetted bound. No more than 2 feet of sand, by depth shall be taken from any location, and the maximum backpassing volume shall be 25,000 cubic yards per backpassing event. *Reporting*: Within 30 days of each backpassing event, the Permittee shall provide the planning staff of the California Coastal Commission's South Central Coast District Office with a written summary of the backpassing event, including a map or aerial photograph that shows both the scraped areas and the placement areas, information on the surface areas and depths of the scraping and the volumes of sand removed, areas and depths of sand placed and volumes of sand placed. If sand is placed on a dune, the method of placement shall be described.

6. Backpassing Evaluation: After three backpassing events, the Permittee shall prepare a short evaluation report on the effectiveness of the backpassing and providing, if necessary, recommendations for revisions to the Backpassing Plan. No changes to the Backpassing program shall be implemented without written concurrence from the Executive Director.

B. Small-scale Interim Renourishment or Major Renourishment Triggers

1. *Small-scale Interim Renourishment:* If the dry beach width at Profile 410 is narrower than 30 feet for 6 consecutive months, and is recorded by two (2) consecutive full beach profiles, AND, there is insufficient sand at the backpass source location to provide 10,000 cubic yards of backpassing sand, a small-scale interim renourishment event may be proposed. An interim renourishment plan, adding no more than 75,000 cubic yards of new sand may be proposed and small-scale nourishment shall be initiated in a time manner, such that the deficit conditions shall not persist for more than 6 months following the initial trigger period.
2. *Major Renourishment*: If the dry beach width at Profile 410 is narrower than 30 feet for 12 consecutive months, and is recorded by three (3) consecutive full beach profiles, AND, there is insufficient sand at the backpass source location to provide 10,000 cubic yards of backpassing sand, a major renourishment event, adding an additional 300,000 cubic yards of new sand shall be proposed and nourishment shall be initiated within the approved project reach in a time manner, such that the deficit conditions shall not persist for more than 4 months following the initial trigger period.
3. *Renourishment Plan*: For either small-scale interim renourishment or major renourishment within the project reach, the permittee shall provide a renourishment plan, for review and approval of the Executive Director that shall include the following:
   (i) Source and quality of renourishment sand,
   (ii) Results from sediment sampling and testing, following requirements of Special Condition 7.

C. **MONITORING AND REPORTING REQUIREMENTS:**

The Final Adaptive Management Plan shall be revised to acknowledge the prior baseline beach monitoring study conducted by the applicant's consulting coastal engineer (which has been in progress for several years now) and shall be continued throughout the duration of the ten year term of this permit, as specified below. In addition, the Plan shall also provide that the applicant shall conduct monitoring to provide an annual assessment of the shoreline morphology, beach profile, and beach width consistent with the following provisions:

i. *Periodic Beach Profile Surveys*: A licensed surveyor or engineer shall survey full beach profiles for each of the 17 identified beach profile transect lines at Broad Beach and Zuma Beach (412.5, 412.3, 412, 411.7, 411, 410, 409, 408, 416, 414, 412, 411, 398, 396, and 394, as shown on Exhibit 12) on a semi-annual basis each spring and fall season for one year prior to the commencement of development and for a period of 10 years after initial construction. Each the beach profile transects shall be established with a permanent location that can be identified by Baseline Survey

Markers and GPS coordinates. The landward limit of the full beach profile shall extend at least 10 feet inland of the inlandmost position of the revetment, and the seaward limit of the full beach profile shall be out to the depth of closure (approximately -40 ft., MSL).

ii. *Beach Berm Width Measurements*: Beach berm width measurements will be performed by the applicant using a tape measure and a differentially corrected digital global positioning system (GPS) unit to record the beach width on a monthly basis for at least one year prior to the commencement of development and for a period of 10 years after initial construction. Measurements will occur from the Baseline Survey Marker out to the wetted bound (seaward limit of the dry beach area) and shall be performed at the same locations each month and in essentially the same location as the beach profile surveys (412, 411, 410, 409, and 408, or equivalent locations identifiable through fixed structures such as access stairs, offsets from storm drains, etc.). The beach berm width measurements shall be recorded each month and results shall be included in the annual post-construction reporting. The date, time and tidal conditions for all measurements shall be recorded and signed by the person(s) who has undertaken the measurements.

iii. *Wetted Bound Surveys:* The location of the wetted bound, from Point Lechuza to the eastern limit of the revetment or nourishment, whichever is farther east, shall be recorded monthly, at the same time as the beach berm width measurements and plots of each wetter bound survey shall be prepared and included in the annual post-construction reporting. The date, time and tidal conditions for all wetted bound plots shall be recorded and signed by the person(s) who has undertaken the survey.

iv. Trancas Estuary Mouth Changes: The applicant shall conduct visual surveys of the Trancas estuary mouth on a monthly basis for the purpose of recording changes in the estuary system and morphology of the estuary mouth.

v. *Aerial Photography*: Aerial photographs of the subject reach (covering, at a minimum, the entire project reach and all 9 transect locations shall be taken concurrent with the fall season beach profile on an annual basis to provide a continuous assessment of the shoreline for one year prior to the commencement of development and for a period of 10 years after initial construction.

vi. *Post-Construction Reporting Requirements*: The applicant shall submit an annual monitoring report, for the review and approval of the Executive Director, for a period of 10 years after initial construction is complete. The monitoring report shall be submitted on annual basis and shall include all survey data (full beach profile surveys, beach berm width measurements, wetted bound surveys, Trancas estuary mouth changes, and aerial photographs) and a written report prepared by a qualified coastal engineer indicating the results of the shoreline profile and beach width monitoring program. The monitoring report shall include conclusions regarding the level of success of the project, a detailed analysis of any change in shoreline position, increase or decrease in beach widths and footprint of dune systems within the project reach, details on any nourishment efforts undertaken during the year with the volume and placement location specified, and any back passing operations that took place. The applicant shall post each monitoring report, on an annual basis, on the City of

Malibu's publicly accessible web site for review by interested public. More specifically, the report shall include, but not be limited to, the following:

- Quantification of the volumetric change in the beach and dune for each survey period, using the pre-project condition (2014) as the baseline.
- Analysis of the seasonal and interannual changes in width and length of dry beach, subaerial and nearshore slope, offshore extent of nourished toe for profiles within the nourishment area, and overall volume of sand in the profile; changes in dune profile; and, estimates of the rate and extent of transport of material up- and down-coast from the beach nourishment receiver site.
- Comparison of the actual changes to the shoreline in relation to the predicted changes that were anticipated based on the results of the Pre-construction numerical and physical modeling.
- Analysis of the expected time period over which the beach benefits related to the initial nourishment volume can be identified as distinct from background conditions; and qualify any abnormal wave and current conditions that could account for changes to the beach outside what was anticipated.
- Provision of cumulative data detailing the annual quantity and placement of material, including interaction of the replenishment project with other beach replenishment projects or other shoreline projects that occur in the project area or in the same littoral cell.
- Utilization of aerial photographs, to the extent feasible, to prepare a summary of beach width and dune profile changes.
- Conclusions regarding the level of success and any adverse effects, including any observed beach/dune erosion and any changes in the frequency that the Trancas Estuary mouth opens and closes and/or changes to the duration the estuary mouth remains open/closed. The report shall include a brief history of all previous years' monitoring results to track changes in shoreline, dunes, and estuary mouth conditions.

5. Final Revised Dune Habitat Restoration and Monitoring Program

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the Permittee shall submit, for the review and approval of the Executive Director, two (2) copies of a Final Revised Dune Habitat Restoration and Enhancement Program. The Program shall provide for the restoration and enhancement of coastal strand and southern foredune habitat on-site, at a minimum ratio of 3:1 or greater, as mitigation for impacts to existing dune habitat that resulted from the installation of the as-built sandbag and rock revetments on-site (3.62 acres). The Program shall be prepared by a qualified biologist(s), ecologist(s), or resource specialist(s), hereafter, referred to as the environmental resource specialist(s), with experience in the field of dune restoration, beach ecology, and marine biology. The permittee shall provide the environmental resource specialist's qualifications, for the review and approval of the Executive Director, prior to Program development. The Program shall be in substantial conformance with

the "Conceptual Foredune Creation and Enhancement Plan," by WRA Environmental Consultants, dated October 15, 2013, but shall be revised to provide for the following requirements:

A. Dune Habitat Restoration and Enhancement Plan

1. **Restoration/Enhancement Area Footprint.** The dune habitat restoration/enhancement area on-site shall generally include a footprint that extends from the property at 31350 Broad Beach Road to the property at 30708 Broad Beach Road, and that begins as far landward as feasible (at a stringline of approved development across the subject properties) and extends seaward to the expected maximum wave uprush limit. The stringline of approved development that is to be the landward limit of the dune restoration/enhancement area shall be generally located at the seaward edge of any legally existing residential structures, patios/decks. Sandy beach areas where existing septic leach fields are located seaward of the stringline shall be revegetated with native dune plant species and mounding techniques using minor amounts of sand fill material without the use of heavy equipment. The stringline for the landward limit of dune restoration shall be configured in a manner that maintains a relatively straight or gently curving line as generally depicted in Exhibit 9. Short segments of the landward limit of the dune restoration stringline may be located further seaward if necessary to avoid creating sharp angles in the configuration of the dune restoration area. Restoration/enhancement of the landwardmost areas within the above described dune habitat restoration/enhancement area shall be prioritized.

2. **Dune Specifications.** The dune habitat restoration/enhancement area shall be designed and contoured based on natural dune morphology (using historical records of the area and the most proximal reference site(s)). The footprint and the number of dune ridges shall increase from west (upcoast) to east (downcoast) across the restoration area. For instance, there shall be one dune ridge at the west (upcoast) end of the restoration area, transitioning to two and, if adequate area is available, three ridges, at the east (downcoast) end. The restored and enhanced dunes shall be oriented parallel to the shore with dune faces that have a slope no steeper than 3:1. The Plan shall include a grading plan that includes a detailed description of dune restoration and enhancement (dune creation) timing, phasing, daily schedule aspirations, methods including equipment to be used, staging area location(s), and relationship to the beach nourishment program. All grading plan activities shall be designed and executed in the least environmentally damaging manner. The plan must include an explanation of how the grading activities meet these requirements. For the portion of the restoration/enhancement area between the top of revetment and the stringline of approved development pursuant to Subsection 1 above, restoration shall be limited to minor mounding, removal of non-natives and invasive plant species, and planting of native plant species (without the use of significant grading or sand placement) where existing septic leach fields are located.

   The dune habitat restoration/enhancement plan design shall include Best Management Practices to maximize the success of restoring and enhancing natural dune system physical and biological processes and functions. Discontinuous sand fencing that is placed perpendicular to the prevailing wind direction shall be temporarily employed to

facilitate establishment of dune hummocks. In addition to sand fencing, the design shall include strategic placement of native dune vegetation for dune hummock establishment. Temporary sand fencing and strategic planting, rather than motorized equipment, shall be employed to establish a natural pattern of dune hummocks. Drainage/runoff control measures and creation of dune swales (low areas between dune ridges) shall also be used to function as natural drainage devices within the dune system.

3. **Dune Sand Source and Composition.** Sand source and composition within the dune habitat restoration/enhancement area shall be consistent with the specifications of Special Condition 8 (Sediment Analysis and Monitoring).Existing native beach sand in the project area that is excavated for relocation of any portion of the as-built emergency rock revetment (pursuant to Special Condition 1) shall be temporarily stockpiled during beach nourishment and construction activities and then applied as a top layer on the restored dunes to facilitate successful reestablishment of dune vegetation on site. Prior to application of the native sand on the restored dunes, non-native and invasive plant species shall be removed to the maximum extent feasible.

4. **Dune Planting.** The dune habitat restoration/enhancement plan shall include a planting plan using native coastal strand and southern foredune plant species (plant palette) including the number of container plants and amount (lbs.) of seeds, source of plant material, provision for collection, storage, propagation and use of existing native plants, and plant installation methods. The plant palette shall be made up exclusively of native plants appropriate to the habitats and region, grown from seeds or vegetative materials obtained from the site or from an appropriate nearby beach location to maintain the genetic integrity of the area. No horticultural varieties, and no coastal bluff or back dune species shall be used (e.g. *Artemisia californica, Ericameria ericoides, Eriogonum parvifolium, Perritoma arborea, Rhus intergrifolia*). The plan shall also include an exhibit that shows the planned locations, numbers, and spacing of the individual plant species, i.e. that depicts their distribution and abundance across the restoration area. The plan shall include sufficient planting plan technical detail including a description of planned site preparation, method and location of exotic species removal (all non-native plant material shall be removed from the restoration/enhancement area including *Carpobrotus edulis*, highway iceplant), timing of planting, temporary irrigation plans if necessary, and maintenance timing and techniques. The abundance, distribution, and percent cover of native coastal strand and southern foredune plant species shall be based on historical records, the literature, and/or the most proximal reference site(s).

5. **Access Paths and Fencing.** The dune habitat restoration/enhancement plan shall incorporate a maximum of one shared private beach access path (sand surface only) for every two residences adjacent to the restoration area. The shared private beach access paths shall extend through the restored dune system out to the shore from the private properties and the paths shall not exceed 3 feet in width, with the exception that the Malibu West Beach Club located at 30756 Broad Beach Road may maintain its own separate 10 ft. wide beach access path. Further, the dune restoration/enhancement area shall incorporate a 10 foot wide pedestrian path (sand surface only) located immediately landward of the entire length of the approved rock revetment, as relocated/reconfigured

pursuant to Special Condition 1 above.. Each path may be bordered by symbolic post and cable fencing to maintain dune processes to the greatest extent possible (e.g. water, sand, plant, and animal movement/dispersal). No fencing, other than necessary sand fencing as provided in subpart 2 above, shall be placed seaward of the revetment.

6. **Signage.** Signs shall be installed and maintained in conspicuous locations along the approved accessways adjacent to the restoration/enhancement area to notify the public and residents that the area is a sensitive habitat restoration area and to keep out of the dune restoration areas. The signs shall indicate "Habitat Restoration In Progress: Please Keep Out of Dune Restoration Area", or alternative language that is substantially similar. Interpretive signage shall also be placed within or adjacent to the two Los Angeles County vertical public accessways generally describing the approved project, including identification of sensitive habitats in the area; the public access features/requirements incorporated into the project and the role of various Local/State/Federal agencies and stakeholder groups who contributed to the formation of the project. The signage shall blend in with the surrounding natural environment and not detract from the character of the area, and with the exception of signage approved pursuant to Special Condition 14, in no instance shall signs be posted which read "*Private Beach*" or "*Private Property*." The location, size, design, and content of all signs to be installed shall be specified in the plan, for the review and approval of the Executive Director. Signs that become subject to erosion shall be relocated or removed.

7. **Maintenance.** The plan shall include provisions for on-going maintenance and/or management of the dune habitat restoration/enhancement area for the term of this coastal development permit. At a minimum, semi-annual maintenance and/or management activities shall include, as necessary, debris removal, periodic weeding of invasive and non-native vegetation and replacement planting consistent with the approved plan.

8. **Implementation.** The approved dune habitat restoration/enhancement plan shall be implemented within 90 days of the completion of initial beach nourishment activities. The Executive Director may grant additional time for good cause.

B. Monitoring Program

A monitoring program shall be designed and implemented to provide data that will guide the dune habitat and enhancement plan and direct any adaptive management actions that will increase the likelihood that the enhancement and restoration will be successful. The monitoring program shall provide, at a minimum, for the following:

1. Performance Standards: Determination of annual and final performance standards selected based on a reference site (s) and/or the literature. The performance standards shall relate logically to the goals of the dune habitat restoration and enhancement plan and include standards for special status species, species diversity, vegetative cover, and approximate dispersion patterns of major species. Native plant cover shall not exceed that found in southern California coastal strand and southern foredune natural habitats. The rationale for the selection of each performance standard must be explained.

2. Procedure for Judging Success: Detailed description of the qualitative and quantitative sampling methods and statistics intended to be used to monitor dune habitat restoration and enhancement shall be provided.

3. Initial Monitoring Report: Submission of a written report, prepared by a qualified environmental resource specialist, upon completion of the initial dune habitat restoration and enhancement work, for the review and approval of the Executive Director. The report shall document completion of the initial work and include photographs taken from pre-designated sites (annotated to a copy of the site plans).

4. Interim Monitoring Reports: After initial dune habitat restoration and enhancement work is completed, the applicant shall submit, by no later than December 31st each year, for the review and approval of the Executive Director, annual monitoring reports prepared by a qualified environmental resource specialist indicating the progress and relative success or failure of the dune habitat restoration and enhancement. These reports shall also include recommendations for modifications or new approaches that would help the project meet the performance standards. These report shall also include photographs taken from pre-designated sites (annotated to a copy of the site plans) indicating the dune habitat restoration and enhancement progress at each of the sites. Each report shall be cumulative and shall summarize all previous results. Each report shall also include a "Performance Evaluation" section where information and results from the monitoring program are used to evaluate the status of the dune habitat restoration and enhancement project in relation to the interim and final performance standards.

5. Final Report: Prior to the date that authorization for the approved development expires, a final dune habitat restoration and enhancement report shall be submitted for the review and approval of the Executive Director. If the report indicates that the dune habitat restoration and enhancement project has, in part, or in whole, been unsuccessful, based on the specified performance standards, the applicant(s) shall submit within 90 days a revised or supplemental restoration program to compensate for those portions of the original program that did not meet the approved performance standard (s), and shall implement the measures that must be taken to reach the specified performance standard. The revised or supplemental program shall be processed as an amendment to this permit

C. Dune Habitat Restoration Area and Open Space Restrictions:

1. No development, as defined in Section 30106 of the Coastal Act, shall occur within the final approved Dune Habitat Restoration and Enhancement Plan Area (Open Space Area) pursuant to Special Condition 5 of this permit except as otherwise specified pursuant to this condition. It is recognized that the seaward limit of the dune system and dune vegetation within the approved restoration area is ambulatory in nature and that, therefore, the seaward extent of the area subject to this open space restriction is also ambulatory in nature. This restriction shall in no way be interpreted to limit or restrict the area of beach available for lateral or vertical public access consistent with existing public access rights and Special Conditions 13 and 14 of this permit. Development

allowed within Dune Habitat Restoration and Enhancement Plan Area (Open Space Area) shall be limited to:

i. Dune habitat restoration undertaken in accordance with the final approved dune habitat restoration and enhancement plan approved pursuant to Special Condition 5.

ii. Maintenance of existing drainage improvements

iii. Construction and maintenance of the approved rock revetment, beach nourishment/renourishment (including backpassing activities), drainage and polluted runoff control activities, public and private access paths, and other public access improvements (including fencing and signage) required and approved pursuant to Special Conditions 1, 3, and 13-15 of this permit.

2. Prior to issuance of the Coastal Development Permit, the applicant shall submit a written agreement, in a form and content acceptable to the Executive Director, incorporating all of the above terms of this condition.

D. The Permittee shall undertake development in accordance with the final approved plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Coastal Commission - approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is legally required.

6. Long-Term Marine Resources Monitoring, Reporting, and Mitigation plan

A. Prior to issuance of the Coastal Development Permit, the applicant shall submit to the Executive Director, for review and written approval, a final "Marine Habitat Monitoring and Mitigation Plan" for biological resources including subtidal rocky habitats (e.g. kelp forest, rocky reef, surfgrass), subtidal habitats comprised of unconsolidated sediment (e.g. eelgrass, sand dollar beds, pismo clam beds), rocky intertidal habitats (bedrock, boulders, cobble, surfgrass) and supralittoral and intertidal sandy beach habitats. The monitoring and mitigation plan shall provide an overall framework to guide monitoring of these marine habitats in and immediately adjacent to the project footprint as well as marine habitat reference sites, and provide mitigation options for potential impacts to subtidal and intertidal marine habitats. The monitoring and mitigation plan shall be developed in consultation with state and federal agencies including the California Department of Fish and Wildlife, State Water Resources Control Board, California State Lands Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Army Corp of Engineers, and the Environmental Protection Agency. A Science Advisory Panel (SAP) will be established to oversee marine habitat monitoring and any required mitigation. The SAP will review and guide development of the marine habitat monitoring and mitigation plan and advise the Executive Director regarding final plan approval.

B. Science Advisory Panel

An expert panel consisting of a minimum of three marine scientists with expertise on nearshore habitats, including at least one member with expertise in experimental design and biostatistics, shall be established by the Commission. The panel shall be paid by the applicant through the

Commission. The Science Advisory Panel (SAP) shall review and guide development of the final marine habitat monitoring and mitigation plan including the selection of reference sites, sampling methodology, analytical techniques, criteria for determination of adverse impacts, and mitigation options for the various marine habitats. The SAP shall also review the monitoring results and annual reports as they come in and advise the Executive Director regarding project status and potential adaptive management actions. If marine habitat monitoring demonstrates that there have been adverse impacts to one or more marine habitats, the SAP shall review and guide development of specific habitat mitigation and monitoring plans.

C. Science Advisory Panel Administrative Structure

Costs for participation of the SAP shall include travel, per diem, meeting time, and reasonable preparation time. The amount of funding will based on a SAP budget prepared by the Executive Director in consultation with the applicant. The final SAP budget and funding shall be approved by the Executive Director and applicant prior to issuance of the Coastal Development Permit. In the event that agreement on a SAP budget and work program cannot be reached between the Executive Director and the applicant, the matter will be brought before the Commission for a final resolution. Total costs for such advisory panel shall not exceed $180,000 per year adjusted annually by any increase in the consumer price index applicable to California.

D. Marine Habitat Monitoring Plan

The marine habitat monitoring plan shall describe the sampling methodology, analytical techniques, and criteria for determining whether the implementation of the approved project has adverse impacts upon the respective marine habitats and shall include, at a minimum, the following:

1. Existing Conditions

The Plan shall include a description and historical review of the marine resources located within the project area including subtidal rocky habitats (e.g., kelp forest, rocky reef, surfgrass), subtidal habitats comprised of unconsolidated sediment (e.g., eelgrass, sand dollar beds), rocky intertidal habitats (Lechuza Point and boulder field) and sandy beach habitats in the vicinity of the beach replenishment project. The historical review must include a summary of past quantitative sampling and survey work (e.g. yearly kelp canopy areal extent data from 1984 to present, and Partnership for Interdisciplinary Studies of Coastal Oceans, State Water Resources Control Board Areas of Special Biological Significance, Marine Protected Area Monitoring Enterprise, and Multi-Agency Rocky Intertidal Network survey work) conducted on these habitats in order to document trends in species composition, habitat areal extent, and temporal changes for comparison with the post-project marine habitat monitoring findings.

2. Monitoring Objectives

The monitoring objectives must include:

a. Fine scale mapping of the marine habitats listed in section A above,

b. Identification of any adverse impacts to the sandy beach ecosystem resulting from sand replenishment with source sand that does not match existing beach sand,

c. Identification of direct or indirect adverse impacts to subtidal or intertidal habitats resulting from the proposed project,

d. Identification of likely causes of any documented adverse impacts (burial, scouring, turbidity, sand grain size, etc.),
e. Recommendations for adaptive management (e.g., future sand replenishment grain size adjustments, volume of future sand replenishment, sand placement adjustments) to avoid continuing adverse impacts, if adverse impacts are detected.

3. Monitoring Design
Monitoring must be divided into two distinct phases utilizing the same monitoring design:
a. Spring and fall pre-construction monitoring initiated one year prior to project construction. If two seasons of pre-construction monitoring are not feasible, pre-construction spring monitoring must be conducted. The purpose of pre-construction monitoring is to establish pre-project ecological (physical and biological) baseline conditions.

b. Post-construction monitoring for 10 years (life of the permit) after construction is complete. The highly dynamic nature of the nearshore marine ecosystem and the potential for one or more marine habitats to be adversely impacted by the project must be considered in determining the frequency of monitoring (i.e. the frequency of the respective methods employed for monitoring).

4. Monitoring Methods
The plan must include monitoring methods and a schedule for their execution with the intention of meeting the monitoring objectives; specifically, methods to monitor for and quantify potential direct and indirect adverse impacts upon one or more of the marine habitats listed in section A above. At a minimum, the applicant shall consider using the following methods in the final "Marine Habitat Monitoring and Mitigation Plan". The monitoring methods and schedule shall be developed in close consultation with the SAP for the review and approval of the Executive Director.

a. Remote Sensing
Remote sensing techniques shall be employed to map rocky subtidal (with and without kelp) and rocky intertidal (with and without surfgrass) habitats in the project area and a minimum of two reference site outside the influence of the project area with the highest accuracy possible.

i. Multi-Spectral Aerial Surveys
Multi-spectral aerial surveys, similar to that employed by the applicant in July 2014, using an airplane fitted with specialized camera equipment designed to capture imagery within a specific array of spectral bands optimized to discern coastal marine habitats including kelp forest, understory canopy algae, eelgrass, and surfgrass. Survey results shall be groundtruthed.

ii. Multi-beam and Sidescan Sonar
Multi-beam and sidescan sonar surveys, similar to that conducted by the applicant in May 2014, to distinguish surficial features and to map nearshore marine benthic habitat types.

b. Subtidal and Intertidal Field Monitoring
The subtidal and intertidal monitoring methods employed must be capable of discriminating between habitats influenced by sand inundation and habitats rarely or never influenced by sand

inundation, the length of time respective habitats have been inundated with sand, and the sand source (natural or project derived). The subtidal marine habitats that must be monitored are rocky bottom (with and without kelp) and unconsolidated substrates (with and without eelgrass). The intertidal habitats that must be monitored are Lechuza Point and the boulder field east of Lechuza Point and the sandy beach A minimum of two reference sites for each of the above habitat types must be monitored. The reference sites should be as close as possible to the potential impact area within an area outside the project's influence.

The marine habitat monitoring locations in the immediate project area must be established based on the project footprint and model-predicted sedimentation patterns, after consultation with the applicant, resource agencies, and the SAP. Reference site locations must be based on similarity to the respective marine habitats in the project area and proximity to the study area, after consultation with the applicant, resource agencies, and the SAP. Eelgrass mapping must be in substantial conformance with NOAA's California Eelgrass Mitigation Policy and Implementing Guidelines published in October 2014.

In order to assess whether the macroinvertebrate assemblage that colonizes Broad Beach following sand replenishment is what would be there but for on-going disturbance, a minimum of two undisturbed beaches within the Malibu littoral cell, as well as the section of Broad Beach in the project footprint, must be monitored. The undisturbed beaches must be chosen based on having sand characteristics as similar as possible to the existing Broad Beach sand (well sorted, D50 =0.25), having similar geomorphology (intermediate dissipative beaches) that face in the same general direction, and having the same general wave regime. In addition to these beaches, the section of Broad Beach west of the replenishment project and Zuma Beach east of the replenishment project must be monitored.

The beach monitoring methods must be capable of determining; 1) whether the portion of Broad Beach covered by quarry sand develops a sandy beach macroinvertebrate fauna similar to the reference beaches, and, 2) whether the project adversely impacts the beach ecosystem west and east of the project. The beach monitoring methods must be designed to identify approximately 80% of the organisms present; in order to capture this percentage of the community, approximately 3 square meters of surface area must be surveyed (Schlacher et al. 2008). In order to compare results to past surveys, the beach sampling must employ 10 cm diameter by 20 cm deep cores and sieve the samples using a 1.5mm/1.0mm aperture sieve. This monitoring shall be conducted before construction in the spring and fall and semi-annually in spring and fall for the life of the project at the replenished beach, the reference beaches and the beach west of the replenished beach and the beach east of the replenished beach.

The subtidal and intertidal monitoring must be designed to pick up, at a minimum, a 20% change between the respective impact and reference sites. That is, the monitoring must be designed to have an 80% chance of picking up a 20% change. This is sometimes referred to as the 20, 20, 20 rule where Type I error (the null hypothesis is true but rejected) or alpha is set at .20, Type II error (the null hypothesis is false but accepted) or beta is set at .20, and power is equal to 1-beta or .80.

5. Criteria for Detecting Adverse Impacts

The Plan must include criteria for determining whether the project has resulted in direct or indirect adverse impacts upon one or more of the marine habitats described in Section A, above. The criteria must be amenable to quantitative assessment and must include estimates of the areas of kelp forest, eelgrass, and surfgrass lost as a result of the project.

6**. Monitoring Reports**
Annual reports that review the results of past monitoring and report on the most recent work must be submitted no later than December 31st of each year for review by the SAP and review and approval by the Executive Director. A report at the end of 5 years shall determine whether adverse impacts to marine habitats have occurred as a result of the project as required pursuant to special condition 2C. If adverse impacts are detected that is when the need for mitigation will be determined. If mitigation is deemed necessary a permit amendment for submission to the Commission will be required.

E. Marine Habitat Mitigation and Monitoring
If adverse impacts are detected, mitigation will be required. The mitigation ratio for impacts upon subtidal rocky or intertidal rocky habitat shall be mitigated at a minimum of 4:1 because of the uncertainty and difficulty of mitigating for these habitats. Adverse impacts upon eelgrass shall be mitigated according to the California Eelgrass Mitigation Policy.

Upon detection of adverse impacts upon one or more habitats, the applicant, in consultation with the SAP, shall develop a habitat specific mitigation plan for each impacted habitat that will provide the overall framework to guide the mitigation work, for review and approval of the Executive Director. The revised mitigation and monitoring program shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is required.

7. Biological Monitoring During Construction and Pre-Construction Surveys

The applicant shall retain the services of a qualified biologist or environmental resources specialist (hereinafter, "environmental resources specialist") with appropriate qualifications acceptable to the Executive Director, to monitor the site during construction and beach nourishment activities and conduct sensitive species pre-construction surveys. Prior to the commencement of development, the applicant shall submit the contact information of all monitors with a description of their duties and their on-site schedule to the Executive Director for review and approval. The applicant shall ensure that the Environmental Specialist shall perform all of the following duties, and the applicant shall observe the following requirements:

A. The environmental resource specialists shall: (1) conduct a survey of the project site to determine presence and behavior of sensitive species one day prior to commencement of any construction activities and/or the commencement of any beach nourishment/backpassing activities on the project site, (2) immediately report the results of the survey to the applicant and the Commission, and (3) monitor the site during all construction activities related to the permeable pier sand retention system, the seasonal beach berm, and/or the of any beach nourishment activities on the project site.

B. In the event that the environmental resources specialist reports finding that any sensitive wildlife species (including but not limited to western snowy plover or California grunion) exhibit reproductive or nesting behavior, the applicant shall cease work and immediately notify the Executive Director and local resource agencies. Project activities shall resume only upon written approval of the Executive Director.

C. Prior to construction activities and/or the commencement of any beach nourishment/backpassing activities, the applicant shall have the environmental resource specialist conduct a survey of the project site, to determine presence of California grunion during the seasonally predicted run period and egg incubation period, as identified by the California Department of Fish and Game. If the environmental resources specialist determines that any grunion spawning activity is occurring and/or that grunion are present in or adjacent to the project site, then no construction, maintenance, grading, or grooming activities shall occur on, or adjacent to, the area of the beach where grunion have been observed to spawn until the next predicted run in which no grunion are observed. Surveys shall be conducted for all seasonally predicted run periods in which material is proposed to be placed at any of the above sites. If the applicant is in the process of placing material, the material shall be graded and groomed to contours that will enhance the habitat for grunion prior to the run period. Furthermore, placement activities shall cease in order to determine whether grunion are using the beach during the following run period. The applicant shall have the environmental resource specialist provide inspection reports after each grunion run observed and shall provide copies of such reports to the Executive Director and to the California Department of Fish and Wildlife.

D. Prior to initiation of daily project activities, the resource specialist shall examine the beach area to preclude impacts to sensitive species. Project activities, shall not occur until any sensitive species (e.g., western snowy plovers, etc.) have left the project area or its vicinity. In the event that the environmental resource specialist determines that any sensitive wildlife species exhibit reproductive or nesting behavior, the applicant shall cease work, and shall immediately notify the Executive Director and local resource agencies. Project activities shall resume only upon written approval of the Executive Director. The applicant shall cease work should any breach in permit compliance occur or if any unforeseen sensitive habitat issues arise. The environmental resource specialist(s) shall require the applicant to cease work should any breach in permit compliance occur or if any unforeseen sensitive habitat issues arise. The environmental resource specialist(s) shall also immediately notify the Executive Director if development activities outside of the scope of this coastal development permit occur. If significant impacts or damage occur to sensitive wildlife species, the applicant shall be required to submit a revised, or supplemental program to adequately mitigate such impacts.

E. Turbidity. The environmental resource specialist shall visually monitor and document the turbidity of coastal waters during all beach nourishment or backpassing activities. The extent and duration of turbidity plumes shall be recorded and mapped by the monitor during each day of disposal activities. If the turbidity plume is observed to reach kelp beds or eelgrass beds, beach nourishment or backpassing shall be terminated until the turbidity plume has dissipated. If turbidity levels are significantly above ambient levels for more than three (3) consecutive days, then the rate of sand placement shall be reduced so that

large, long lasting turbidity plumes are no longer created. After all sand placement operations have ceased, the applicant shall monitor and document the extent and duration of any lasting turbidity plume. The final results of all turbidity monitoring shall be reported to the Commission within 30 days following each beach nourishment and backpassing operation.

F. The applicant shall submit documentation prepared by the environmental resource specialist which indicates the results of each pre-construction survey, including if any sensitive species were observed and associated behaviors or activities. Location of any nests observed shall be mapped.

8. Sediment Analysis and Testing

A. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, an engineer(s) or environmental professional(s), with appropriate qualifications acceptable to the Executive Director, shall prepare a Sampling and Analysis Plan for the review and approval of the Executive Director. The Sampling and Analysis Plan shall address the physical and chemical sediment testing at the source site, and shall be consistent with the following:

(1) Sampling Frequency – Samples shall be collected throughout the source area, with one (1) sample per 0.5 acres, and a minimum of five (5) samples per source site for contaminant testing and a minimum of four (4) samples per source stockpile site for testing grain size, color, particle shape, and debris. Stockpile areas shall be divided into relatively equal areas (such as quadrants or cells) to provide representative samples of the source sand. The stockpile sampling depth shall extend approximately one-foot (1-ft) beyond the anticipated stockpile height. At a minimum, sample quantities shall be sufficient for appropriate testing; archive samples for chemical testing shall be maintained; archive samples for grain size testing are optional.

(2) Contaminants -- Based on U.S. EPA Tier I analyses results, Tier II bulk chemical analysis shall be conducted on representative composite samples of each source material proposed for placement at the Broad Beach deposition site. The material shall be analyzed for consistency with EPA, ACOE, State Water Resources Control Board and RWQCB requirements for beach replenishment. At a minimum, the chemical analysis shall be conducted consistent with the joint EPA/Corps *Inland Testing Manual*. If the ACOE / EPA, State Water Resources Board or RWQCB determine that the sediment exceeds Effects Range Medium (ER-M) contaminant threshold levels as specified by the U.S. EPA, the materials shall not be placed at the site.

(3) Grain Size – Grain size analysis shall be conducted on the representative stockpile samples, using a single composite sample prepared with equal volumes from each representative sampling site. Samples shall be sieved, consistent with the American Society for Testing and Materials (ASTM) D 422-63 (Standard Test Method of Particle Size Analysis of Soils, ASTM, 2007 or as updated). Gradation curves shall be generated for each composite representative stockpile site to

develop the d_{84}, d_{50} and d_{16} for visual and quantitative comparison with the established Broad Beach grain size envelope and the grain size limitations identified in Part C (Deposition of Source Material) of this condition.

(4) Color -- Color classification shall be conducted on representative samples of each source material proposed for placement at Broad Beach. The color shall reasonably match the color of the receiving beach after reworking by wave action.

(5) Particle Shape – Particle shape classification shall be conducted on representative samples of each source material proposed for placement at Broad Beach. For beach replenishment, 90% or more of the source material shall consist of rounded particles (i.e., maximum of 10% angular particles).

(6) Debris Content – A visual inspection of the source location shall be conducted to determine the presence and types of debris such as trash, wood, or vegetation. The amount of debris within the material shall be estimated, as a percentage of the total amount of source material. Prior to placement of source material at Broad Beach, all such debris material shall be separated from the sand material (by mechanical screening, manual removal or other means) and taken to a proper disposal site authorized to receive such material.

(7) Compactability – Chemical and visual inspections of the source location shall be conducted to determine the presence of elements such as iron oxides which can compact to form a hardpan surface. Source material with compactable material shall be considered for placement below the mean high tide only.

B. Results from sediment testing for contaminants, grain size, color, particle shape, debris content, and compactability shall be provided to the Executive Director for review and approval prior to each separate placement of sand at the approved Broad Beach nourishment area.

C. Deposition of source material shall occur consistent with the following:

(1) Source material that does not meet the applicable physical, chemical, color, particle shape, debris, and/or compactability standards for beach replenishment shall not be used. Specifically, the source material must meet the following specifications:

a. The source material to be used for beach nourishment purposes can only contain no more than 10% fine material that is 0.074mm in size or smaller.
b. The source material to be used for beach nourishment purposes can contain no more than 10% coarse material greater than 2.0 mm in size, and no more than 1% of material that is 4.76mm and larger.
c. The D_{50} for the source material to be used for beach nourishment and dune creation purposes must be within the range of 0.25 mm to 0.6 mm.

(2) Each report on sediment analysis shall include confirmation by the U.S. Army Corps of Engineers and California Regional Water Quality Control Board that the material proposed for beach replenishment meets the minimum criteria necessary for placement on a sandy beach. If deemed necessary by the Regional Water Quality Control Board, the analysis will also include such confirmation from the State Water

Resources Control Board regarding consistency with the 2012 Ocean Plan and any other regulations applicable in an Area of Special Biological Significance.

9. Construction and Operational Timing Constraints

It shall be the applicant's responsibility to assure that the following timing restrictions are observed, both concurrent with, and after completion of, all project operations:

a. All project activities, with the exception of monitoring, shall occur Monday through Friday, excluding state holidays. No work shall occur on Saturday or Sunday.

b. All work shall take place during daylight hours, except for truck arrival and departure within the limits of the existing Zuma Beach parking lot, which may occur until 9pm at night. The lighting of the beach area is prohibited unless, due to extenuating circumstances, the Executive Director authorizes non-daylight work and/or beach lighting.

c. All construction operations, including operation of equipment, material placement, placement or removal of equipment or facilities, restricting public access, and backpassing/beach renourishment or other activities (with the exception of habitat restoration/revegetation) shall be prohibited as follows:

   i. From the Friday prior to Memorial Day in May through Labor Day in September to avoid impacts on public recreational use of the beach and other public amenities in the project vicinity, unless, due to extenuating circumstances, the Executive director authorizes such work.

   ii. On any part of the beach and shorefront in the project area when California grunion (including eggs) are present during any run periods and corresponding egg incubation periods, as documented by the surveys conducted pursuant to Special Condition 7, to avoid impact on the spawning of the California Grunion.

   iii. On any part of the beach and shorefront in the project area when western snowy plover are present, as identified by the surveys conducted pursuant to Special Condition 7, to avoid adverse effects to western snowy plovers.

10. Construction and Operational Responsibilities

It shall be the applicant's responsibility to assure that the following requirements are observed both concurrent with, and after completion of, all project operations:

a. All construction materials and equipment placed on the beach during daylight construction hours shall be stored beyond the reach of tidal waters. All construction materials and equipment shall be removed in their entirety from the beach area by sunset each day that work occurs.

b. Staging areas shall be used only during active construction operations and will not be used to store materials or equipment between renourishment/backpassing operations.

c. During construction, washing of trucks, paint, equipment, or similar activities shall occur only in areas where polluted water and materials can be contained for subsequent removal from the site. Wash water shall not be discharged to the storm drains, street, drainage ditches, creeks, or wetlands. Areas designated for washing functions shall be at least 100 feet from any storm drain, water body or sensitive biological resources. The location(s) of the washout area(s) shall be clearly noted at the construction site with signs. In addition, construction materials and waste such as paint, mortar, concrete slurry, fuels, etc. shall be stored, handled, and disposed of in a manner which prevents storm water contamination.

d. Construction debris and sediment shall be removed from construction areas as necessary to prevent the accumulation of sediment and other debris which may be discharged into coastal waters. Any and all debris resulting from construction activities shall be removed from the project site within 24 hours. Debris shall be disposed at a debris disposal site outside of the coastal zone or at a location within the coastal zone authorized to receive such material.

e. At the completion of the initial beach nourishment operation and any future beach supplemental beach nourishment and backpassing activities, the sand deposited on the beach shall be graded and groomed to natural beach contours to restore the shoreline habitat and to facilitate recreational use at least one month prior to Memorial Day in May. Disturbance to wrack and coastal strand habitat shall be minimized to the extent feasible.

f. During all beach nourishment activities authorized pursuant to this permit, the applicant shall be responsible for removing all unsuitable material or debris within the area of placement should the material be found to be unsuitable for any reason, at any time, when the presence of such unsuitable material/debris can reasonably be attributed to the placement material. Debris shall be disposed at a debris disposal site outside of the Coastal Zone or at a location within the Coastal Zone authorized to receive such material.

g. The Permittee shall notify planning staff of the California Coastal Commission's South Central Coast District Office at least 3 working days in advance of commencement of any construction/nourishment/backpassing activities, and immediately upon completion of such activities.

11. Future Maintenance Authorized

By acceptance of this permit, the applicant acknowledges and agrees to the following:

A. Future maintenance and repair of the rock revetment between 31350 Broad Beach Road and 30760 Broad Beach Road) may be completed without a new coastal development permit for a period of 10 years commencing from the date of Commission action on this permit (until December 11, 2024) consistent with the following limitations (any other proposed maintenance or repair, and any maintenance or repair of the rock revetment after December 11, 2024, may require the issuance of a new coastal development permit from the California Coastal Commission):

1 Prior to the commencement of any such repair or maintenance work, the applicant must obtain written authorization from the Executive Director of the California Coastal

Commission. The permittee shall submit a written report prepared by a professional engineer, for the review and approval of the Executive Director, identifying the proposed maintenance and repair work, method for performing work, analysis of the necessity for the work, and a quantification of any additional rock to be added to the revetment. The maintenance and repair report shall be submitted at least 60 days in advance of the proposed work to allow time for review by the Executive Director. The Executive Director's review will be for the purpose of ensuring that the nature of the work, the method proposed for the work, and all other aspects of the proposed work is consistent with the provisions of this condition, including Subparts A2, A3, A4, and A5 of this condition listed below.

2. No future repair or maintenance, enhancement, reinforcement, or any other activity affecting the rock revetment shall be undertaken if such activity extends the seaward footprint of the subject shoreline protective device. No rock shall be placed seaward of the approved toe of the revetment and no increase in the approved height of the revetment shall occur. Any debris, rock, or other materials which become dislodged after completion through weathering, wave action or settlement shall be removed from the beach or deposited on the revetment on an as-needed basis as soon as feasible after discovery. The rock revetment may be maintained in its approved size, location, and configuration, no expansion to the size, height, or footprint of the revetment shall be allowed. The importation of a minor amount of new rock may be allowed if necessary to maintain the design size, height, footprint of the approved revetment although in no event shall more than 3,600 tons of new armor stone (approximately 10% of the approved volume of the revetment) be imported for any individual repair project. The addition of more than 3,600 tons of new armor stone for any individual repair project shall require a new coastal development permit and is not exempt pursuant to this condition.

3. Maintenance or repair work shall only occur during the late fall or winter season from October 1 to March 15. Any repair or maintenance of the shoreline protective device between March 16 and September 30 shall require a new coastal development permit and is not exempt pursuant to this condition, with the exception that removal of any debris, rock or other material from the sandy beach that becomes displaced from the revetment and will be deposited on the revetment or exported to an offsite disposal area shall occur on an as-needed basis, regardless of the time of the year and without the requirement for submitting a written report 60 days in advance of the work or for prior written authorization from the Executive Director.

4. Maintenance or repair work shall be completed incorporating all feasible Best Management practices. No machinery shall be allowed in the active surf zone at any time. The permittee shall remove from the beach any and all debris that results from the construction/repair work period.

5. The applicant shall, by accepting the written authorization from the Executive Director, shall agree and ensure that the project contractor shall comply with the following construction-related requirements:

(a) No construction materials, debris, or waste shall be placed or stored where it may be subject to wave erosion and dispersion;
(b) Any and all debris resulting from construction activities shall be removed from the beach prior to the end of each work day;
(c) No machinery or mechanized equipment shall be allowed at any time within the active surf zone, except for that necessary to remove the errant rocks from the beach seaward of the revetment;
(d) All excavated beach sand shall be redeposited on the beach.

B. The applicant shall be responsible for maintenance, repair, and replacement of the access stairways (for the provision of both public and private access) that extending from the 10 ft. wide public pedestrian path to the toe of the rock revetment below required pursuant to Special Condition 1, Part 1 and Special Condition 3, Part B. . Such maintenance shall occur on as needed basis, in perpetuity for the life of the rock revetment, in order to ensure the public's ability to use the stairways.

12. Future Development of the Site

Any future redevelopment of any property located landward of the revetment alignment as stipulated in Special Condition No. 1 (i.e. 31350 Broad Beach Road to 30708 Broad Beach Rd.) shall not rely on the permitted revetment to establish geologic stability or protection from hazards. Redevelopment on all properties within the area that is subject to this coastal development permit shall be sited and designed to ensure geologic and engineering stability without reliance on shoreline or bluff protective devices consistent with development standards and policies of the City of Malibu LCP. As used in this condition, "redevelopment" is defined to include: (1) additions, or; (2) expansions, or; (3) demolition, renovation or replacement that would result in alteration to 50 percent or more of an existing structure, structural walls or structural foundations or (4) demolition, renovation or replacement of less than 50 percent of an existing structure where the proposed remodel or addition would result in a combined alteration of 50 percent or more of the structure from its condition as of December 11, 2014.

13. Dune Protection and Public Beach Access Areas

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall cause the execution and recordation of a deed restriction, in form and content acceptable to the Executive Director, that irrevocably (1) protects the dune protection buffer area required pursuant to Special Condition 5 of this permit and (2) grants the public the right of lateral public access and passive recreational use along the shoreline during the period that the revetment authorized by this permit or any part thereof remains in existence, in each case as described below. The deed restriction shall be recorded against the properties that extend from 31350 to 30760 Broad Beach Road, inclusive, and it shall be recorded against all parcels identified on the APN map attached as Exhibit 18. The dune protection buffer area shall extend from the seaward toe of the approved rock revetment to the ambulatory seaward most limit of dune vegetation as required in Special Condition 5. Only uses allowed by Special Condition 5 will be permitted in the dune protection buffer area.

The deed restriction shall memorialize a public right of lateral public access and passive recreational use over the entirety of the area running parallel to the shore and extending landward 25 feet from the post-nourishment ambulatory mean high tide line if and when the ambulatory mean high tide line comes within 25 feet seaward of the 2010 mean high tide line surveyed by the California State Lands Commission. If and as the ambulatory mean high tide line moves landward then that landward edge of the public access and recreational use area will move inland commensurate with the movement of the ambulatory mean high tide line such that the then-ambulatory public access and recreational use area continues to extend 25 feet inland from the then-current mean high tide line. Should the mean high tide line migrate inland to a point where there is no longer at least 10 feet of dry sandy beach seaward of the toe of the approved revetment for safe lateral public access, then the lateral public access provisions of the easement required pursuant to **Special Condition 14** of this permit shall take effect.

Public access shall not be allowed within the dune protection buffer area unless the beach area seaward of the first line of dune vegetation is impassible due to high tides, formation of a steep scarp or some other reason, in which case the public shall be able to pass and repass along the top of the seaward most dune formation. The deed restriction implementing this condition may be executed by each affected landowner or by the permittee if it demonstrates to the satisfaction of the Executive Director that it has acquired fee title by exercising its eminent domain authority. Alternatively, permittee may implement this condition by dedicating an easement to the extent the permittee satisfies the prior-stated criterion for each area over which it proposes to record the deed restriction. The deed restriction (or easement, if applicable) shall be recorded free of prior liens and encumbrances, except for tax liens, that the Executive Director determines may affect the interest being conveyed, and shall include legal descriptions and graphic depictions of the legal parcels subject to the permit and a metes and bounds legal description and graphic depiction of the restricted areas described in this condition prepared by a licensed surveyor and based on an onsite inspection.

14. Dedication of a Lateral Public Access Easement(s) and Declaration of Restrictions-Revetment and Lateral Access Pathway

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant and/or property owners located between 31340 to 30760 Broad Beach Road shall execute and record a document(s) in a form and content acceptable to the Executive Director, granting to the Mountains Recreation and Conservation Authority ("MRCA"), or another public agency acceptable to the Executive Director, on behalf of the people of the State of California ("grantee") a lateral public access easement(s) over the entire length of the approved revetment between 31340 to 30760 Broad Beach Road that encompasses the entire area between the seaward toe of the revetment and a line parallel and ten feet inland from the landward edge of the approved revetment for a public access pathway, as generally illustrated on Exhibit 8. The permittee shall demonstrate to the satisfaction of the Executive Director that it has the authority to convey/grant the easement interest either 1) by demonstrating that it has acquired fee title by exercising its eminent domain authority pursuant to Public Resources Code Section 26576; or 2) by demonstrating that each affected landowner has executed the grant; or 3) some combination thereof.

The access easement(s) shall provide that the public's right to pass and repass may only be exercised if and when any of the following conditions are occurring, and only for the duration of time that any of the following conditions are occurring:

1) Less than ten feet of dry sandy beach exists seaward of the seaward toe of the revetment at any point along the revetment; or
2) any circumstance occurs (for example but not limited to an oil spill) which prohibits the public's use, access, and enjoyment of the area subject to the deed restriction described in Special Condition 13.

The recorded easement document(s) shall include a formal legal description of the entire property; and a metes and bounds legal description and graphic depiction, prepared by a licensed surveyor, of the portion of the lateral access easement area on the properties held by the applicant/property owners, as generally shown on Exhibit 8,. The recorded document shall reflect that no development shall occur within the public access easement area except for signage, symbolic fencing, and minor improvements to the public access pathway. The grant of easement(s) shall be recorded free of prior liens and encumbrances which the Executive Director determines may affect the interest being conveyed, and shall run with the land in favor of the grantee on behalf of the people of the State of California, binding all successors and assigns.

15. Public Access Management Program

Prior to the issuance of the coastal development permit, the applicant shall submit, for the review and approval of the Executive Director, a Public Access Management Program that provides for the following:

A. Public Access Provisions During Construction Activities

1. The Public Access Management Program shall include a plan for ensuring safe public access to or around construction areas, beach deposition sites, and/or staging areas shall be maintained during all project operations. The plan shall include a description of the methods (including signs, fencing, posting of security guards, etc.) by which safe public access to or around construction areas, beach deposition sites, and/or staging areas shall be maintained during all project operations. In the event that Broad Beach must be closed to pedestrian use during active beach nourishment/renourishment operations only, then signage shall be installed indicating alternative beach access points along Broad Beach available for public access. The applicant shall maintain public access pursuant to the approved version of the report. Any proposed changes to the approved program shall be reported to the Executive Director. No change to the program shall occur without a Commission-approved amendment to the permit unless the Executive Director determines that no such amendment is required.
2. The program shall include all necessary temporary access provisions, including any necessary traffic control and crosswalk improvements, to maintain public pedestrian access between Zuma County Beach and the Trancas Market Property along the

shoulder of Pacific Coast Highway immediately landward of the project site and staging area. Any temporary pedestrian access improvements within the highway right-of-way must be reviewed and approved by the California Department of Transportation (Cal Trans).

3. Where public parking areas are used for staging or storage of equipment and materials, unless there is no feasible alternative, the minimum number of public parking spaces (on and off-street) that are required at each receiver site for the staging of equipment, machinery and employee parking shall be used. At each site, the number of public parking spaces utilized shall be the minimum necessary to implement the project.

4. The applicant shall post each construction site with a notice indicating the expected dates of construction and/or beach closures.

B. Symbolic Public Access Fencing and Signage Plan

1. The Public Access Management Program shall include a Symbolic Public Access Fencing and Signage Plan that provides for the installation of symbolic post and cable fencing along the landward limit of the ten foot wide public access path located immediately landward of the approved rock revetment. The post and cable fencing shall be no more than 42 inches in height and designed to be removable in the event of wave uprush. The symbolic post and cable fencing shall be installed by the applicant in a manner consistent with the approved plan within 30 days of the identified criteria requiring opening of the path to the public pursuant to the provisions of Special Condition 14, and in no event later than within 30 days from the date of notification if notified in writing by either the Executive Director of the California Coastal Commission or the easement holder that the identified criteria requiring opening of the path to the public pursuant to the provisions of Special Condition 14 have been met. The Executive Director may grant additional time for good cause.

2. The Plan shall include the provision for the installation of signage to be incorporated into the design of the symbolic post and cable fencing adequate to inform the public of their right to utilize all public access areas on site (including the recorded lateral public access path immediately landward of the revetment, the portion of the sandy beach between the mean high tide line and the toe of the revetment, and the public access stairways required pursuant to Special Conditions 1 and 4). At a minimum, the Program shall provide for the installation of signs to be installed within 300 ft. intervals along the 10 ft. wide path and at both the western (upcoast) end and eastern (downcoast) end of the 10 ft. wide public path and adjacent to each of the two Los Angeles County public vertical accessways on site.

3. The plan shall show the location, size, design, and content of all signs. The applicant acknowledges and agrees that no signs shall be posted on the sandy beach, the rock revetment, or along the identified public access areas unless specifically authorized by the approved signage plan, a separate coastal development permit, or an amendment to this coastal permit. The signs may indicate that the areas of the site located landward of the public access areas are sensitive dune habitat and/or private property. No signs that restrict public access to State tidelands, public vertical or lateral access easement areas, or which purport to identify the boundary between State tidelands and private

property shall be permitted. The applicant shall be responsible for removal of any such sign that comes to be installed that is inconsistent with these sign restrictions. Approved signage shall be installed concurrent with the installation of the symbolic public access fencing required pursuant to Part B.1 of this condition.

4. The permittee shall install all symbolic fencing signs in accordance with the approved plans. The permittee, or its successor in interest, shall maintain the approved fencing and signs in good condition for the life of the project and replace when necessary.

C. Maintenance of Existing Public Vertical Access Improvements:

The applicant shall be responsible for the cost, construction, and maintenance of any new improvements (including but not limited to repairs or modifications of the two existing public access stairways that have been previously constructed over the as-built rock revetment) within the two existing vertical public access rights-of-way necessary to maintain safe public pedestrian access from Broad Beach Road to the sandy beach as required by the Executive Director and Los Angeles County Department of Beaches substantially similar to the public access that exists on site at the time of Commission action on this permit. If any such improvements, or changes over time, are necessary to maintain safe and adequate public pedestrian access, then the applicant shall submit a detailed construction plan for the review and approval of both the Executive Director and Los Angeles County Department of Beaches and Harbors and comply with any requirements imposed by those entities.

16. Feasibility Study for the Removal of Existing Residential On-site Waste Water Treatment Systems.

Prior to the end of the ten (10) year term of this Coastal Development Permit, and as part of the coastal development permit for re-authorization of the project, the applicant shall submit to the Executive Director, a detailed study, prepared by a licensed civil/sanitary engineer or other qualified professional, analyzing the feasibility of removing the existing on-site waste water treatment systems currently serving the residences within the Geologic Hazard Abatement District boundaries and connection of those residences to a new package sewage treatment facility or to an upgraded existing package sewage treatment facility. The feasibility study shall include an analysis and technical engineering details and requirements for the removal of the existing on-site waste water treatment systems within the District boundaries and conceptual design plans for either a new package sewage treatment plant or the upgrade of an existing treatment plant, such as the Trancas Canyon Package Sewage Treatment Plant. The feasibility study shall also include an analysis of permitting and regulatory requirements, potential environmental impacts, necessary infrastructure upgrades; alternative locations and technologies for a package sewage treatment plant; preliminary budget, including any land acquisition costs and a preliminary construction schedule/time line.

The feasibility study shall be prepared in consultation with the Regional Water Quality Control Board, the City of Malibu and the County of Los Angeles if applicable. Five years from the issuance of the coastal development permit the applicant shall submit to the Executive Director a progress report on the status of the feasibility study.

17. Required Approvals

Prior to the issuance of this permit, the applicant shall provide evidence, for the review and approval of the Executive Director, that they have obtained all other necessary State and local government permits that may be necessary for all aspects of the proposed project including, but not limited to, permits, leases, or approvals from the California State Lands Commission, California Department of Fish and Wildlife, State Water Resources Control Board, Regional Water Quality Control Board, South Coast Air Quality Management District, California Department of Transportation, and authorization for all staging and stockpile areas within Zuma Beach County Park from Los Angeles County Department of Beaches and Harbors, unless evidence is submitted that such approval(s) are not required. In addition, by acceptance of this permit, the applicant agrees to obtain all necessary Federal permits, consultations, or approvals that may be necessary for all aspects of the proposed project (including, but not limited to, the U.S. Army Corps of Engineers, and National Marine Fishery Service).

18. Assumption of Risk, Waiver of Liability and Indemnity

By acceptance of this permit, the applicant acknowledges and agrees (i) that the site may be subject to hazards from erosion, liquefaction, waves, flooding, and sea level rise; (ii) to assume the risks to the applicant and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

Prior to issuance of the Coastal Development Permit, the applicant shall submit a written agreement, in a form and content acceptable to the Executive Director, incorporating all of the above terms of this condition.

19. Indemnification by Applicant

Liability for Costs and Attorney's Fees: By acceptance of this permit, the Applicant/Permittee agrees to reimburse the Coastal Commission in full for all Coastal Commission costs and attorney's fees -- including (1) those charged by the Office of the Attorney General, and (2) any court costs and attorney's fees that the Coastal Commission may be required by a court to pay -- that the Coastal Commission incurs in connection with the defense of any action brought by a party other than the Applicant/Permittee against the Coastal Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit. The Coastal Commission retains complete authority to conduct and direct the defense of any such action against the Coastal Commission.

20. Condition Compliance

Within 18 months of Commission action on this coastal development permit application, or within such additional time as the Executive Director may grant for good cause, the applicant shall satisfy all requirements specified in the conditions hereto that the applicant is required to satisfy prior to

issuance of this permit. Failure to comply with this requirement may result in the institution of enforcement action under the provisions Chapter 9 of the Coastal Act.

IV. FINDINGS AND DECLARATIONS

The Commission hereby finds and declares:

A. PROJECT DESCRIPTION AND BACKGROUND

1. Project Description and Location

The applicant is requesting authorization of an approximately 4,150 ft. long, 12-15 ft. high, 22-38 ft. wide , as-built, rock revetment consisting of approximately 36,000 tons of rock which was previously constructed in 2010 pursuant to two emergency coastal development permits. In addition, the project includes implementation of a beach nourishment program for a period of 20 years involving deposition of 600,000 cu. yds. of sand on the beach from inland sand quarries during the first year and approximately 450,000 cu. yds. of sand during the tenth year of the program; periodic sand back-passing operations to occur no more than once per year, and dune habitat restoration.

The project site is located along an approximately 1.16 mile long reach of Broad Beach between Pacific Coast Highway, Broad Beach Road, and the ocean in western Malibu (Exhibit 1). The subject area is characterized as a built-out portion of Malibu consisting of beachfront residential development. Zuma Beach County Park, which is heavily used by beachgoers, is located approximately 150 ft. to the east of the subject site. Broad Beach is also subject to significant use by beachgoers who access the beach from Zuma Beach County Park or from the two Los Angeles County-owned public vertical accessways along Broad Beach within the project reach.

Broad Beach was historically a wide beach which supported an active dune system, identified as an environmentally sensitive habitat area in both the Malibu/Santa Monica Mountains Land Use Plan, certified by the Commission in 1986, as well as the City of Malibu's certified Local Coastal Program (LCP) which was adopted by the Commission in 2002. However, in recent years, Broad Beach has been subject to periodic erosional events which appear to have increased in both frequency and duration and have endangered existing residential development located along portions of the beach that were historically considered safe. Although the dune system on the subject site has been highly disturbed from past residential development, unpermitted landscaping, backyard improvements, and wave erosion, the Commission has consistently found that coastal dunes such as those at Broad Beach are rare and meet the definition of ESHA. Broad Beach is unique in that it is the only area along the Malibu coastline where a system of vegetated sand dunes is found. Native sand dune species found on the dune system which are characteristic of dune habitat include: Silver Beach Bur, Pink sand verbena, beach salt bush, and beach evening primrose. The Commission further notes that the Broad Beach dunes have been classified as "Southern Foredune" in the Holland community classification system by the California Department of Fish and Game and that such communities are listed as "very

threatened" by the State of California. In addition, the subject area contains a broad array of other sensitive habitats and species, including, but not limited to rocky reefs and tide pools, kelp forests, pismo clam and sand dollar beds, coastal foredune habitat, and the Trancas Creek estuary.

The off shore marine area and beach area below the mean high tide line at Broad Beach lies within a Marine Protected Area (MPA) known as the Point Dume State Marine Life Protection Area (SMCA). This area is also adjacent to the Point Dume State Marine Reserve (SMR), which begins at Westward Beach and continues around Point Dume to the west end of Paradise Cove. The purpose of these MPAs was to ensure the long-term ecological viability and biological productivity of marine and estuarine ecosystems and preserve cultural resources for future generations. These adjoining MPAs became effective on January 1, 2012. Within the Point Dume SMCA fishing activities are restricted to recreation fishing very limited commercial fishing. In the Point Dume SMR taking of fish is prohibited all together.

The Broad Beach area is also located in an area designated as an Area of Special Biological Significance (ASBS). In the 1970's, California designated 34 regions along the coast as ASBs in an effort to preserve biologically unique and sensitive marine ecosystems for future generations. ASBS are designated by the State Water Resources Control Board (SWRCB) to protect species or biological communities from undesirable alterations in natural water quality (McArdle 1997). This designation recognizes that certain biological communities, because of their fragility or value, deserve special protection. Under the California Ocean Plan (COP), the discharge of wastes to ocean waters in these areas is generally prohibited. The COP states: "Waste shall be discharged a sufficient distance from areas designated as being of special biological significance to assure maintenance of natural water quality conditions in these areas" (State Water Board 1972).

The width of the shoreline within the project area has varied over the past century and half, with wave action occurring at the base of the coastal sea bluff located landward of Broad Beach Road as recently as the 19th century. The western (upcoast) segment of the project reach (that portion located immediately downcoast of Lechuza Point) has historically maintained a narrower shoreline profile than other segments of Broad Beach. A review of historical records and aerial photographs shows that the beach on site was at its widest point over the last century in 1970 with a yearly average of 60 feet landward of the mean high tide line. However, this widened condition in the 1970's constitutes a relatively brief anomalous period given that beach widths on site were substantially narrower prior to the 1970's. Beginning in approximately1974, the Broad Beach shoreline began to recede, and developed what is described as a negative sand budget. The sand budget turned negative in 1974, accelerating to approximately 35,000 cu. yds. per year from 2004 to 2009 and to 45,000 cubic yards 45,000 cy. yds. per year from 2009 to 2012. From 1974- 2007, the applicant's engineering consultants have estimated that the beach has lost approximately 600,000 cu. yds. of sand. In addition, the 1997 – 1998 El Nino storm season resulted in significant erosion of the beach and homes on the western end of the beach were damaged.

In response to shoreline erosion, in 2008, and again in 2009, the homeowners began constructing large sand bag walls to protect their properties. Although some homeowners obtained emergency coastal development permits from the City of Malibu the majority of the homeowners constructed these sand bag seawalls without benefit of either an emergency coastal development permit or a regular coastal development permit from either the City of Malibu or the Coastal Commission. In January 2010, the Trancas Property Owners Association obtained emergency permits from both the California Coastal Commission (CDPs 4-10-003-G and 4-10-029-G) and the City of Malibu for the temporary authorization of the 4,150 linear ft. long rock revetment on 79 of the properties within the Project Reach, extending from 31346 – 30760 Broad Beach Road.

The majority of the residences were constructed prior to the Coastal Act on conventional at grade concrete foundations and rely on septic systems and leach fields located on the sandy beach and dune areas seaward of homes. Thus, protection of these residences on at grade foundations with septic systems and leach fields located a significant distances seaward of the residences was a principle factor driving the location of the sand bags, which were installed in approximately the same location as the current footprint of the revetment seaward of more than 70 homes.

As proposed, the applicant is requesting permanent authorization of the as-built emergency rock revetment that was permitted on a temporary basis in the Commission's 2010 emergency permit action. In addition, due to emergency conditions that existed at the time of construction, the temporary sand bag walls were never removed and the rock revetment was constructed immediately seaward of the sand bags. Thus, the proposed project also includes the request for permanent authorization of the approximately 4,100 linear ft. sand bag wall on site which has been incorporated into the design of the rock revetment.

The proposed project also consists of the importation of 600,000 cu. yds. of sand material from sand quarries located approximately 40-45 miles inland of the project site. Trucking operations to import sand material would require approximately 43,000 truck trips. Approximately 500,000 cu. yds. of sand would be used to create a widened beach on site and approximately 100,000 cu. yds. of sand would be used to construct/restore the dune system on site. Heavy equipment consisting of scrapers, large 40 ton-capacity trucks, and bulldozers would be used to distribute the imported sand along the beach within the project reach. As proposed, the reconstructed/post-nourishment combined beach and dune system would extend approximately 250 ft. (at its widest point) seaward from the top of the as-built revetment to the surf zone with approximately 65-110 ft. of beach area located seaward of the constructed toe of the dunes.

The project also includes back-passing operations (transporting sand from wider downcoast areas of the beach to upcoast areas of the beach) on an annual basis for a period of 20 years, if needed for the purpose of maintaining adequate beach width for a prolonged period of time. As proposed, the applicant would conduct a single renourishment of the beach 10 years after the initial nourishment had been completed. As designed, the proposed rock revetment would be buried beneath at least 4-8 ft. of imported sand material and the reconstructed dunes on site would be revegetated with native dune plant species.

Finally, there are a number of private beach access stairways that have been built on top of and over the as-built emergency permit without the benefit of a coastal development permit. The applicant is proposing to remove all unpermitted stairways from the emergency revetment as part of the project proposal.

2. Broad Beach Geologic Hazard Abatement District

As proposed, the project area includes 121 separate private properties (the rock revetment would be located on 79 properties and beach nourishment would occur on all 121 properties). The applicant for this project is a Geologic Hazard Abatement District (GHAD), formed as a 'subdivision of the state' (and not a special district) under Sections 26500 et seq. of the California Public Resources Code. GHADs can be formed and legally authorized to undertake those improvements which would be deemed specific actions necessary to prevent or mitigate an emergency.[1] Under GHAD law 'improvements' are defined as: "*any activity that is necessary or incidental to the prevention, mitigation, abatement, or control of a geologic hazard, including, but not limited to, all of the following:*

> *(a) Acquisition of property or any interest therein*
>
> *(b) Construction*
>
> *(c) Maintenance*
>
> *(d) Preparation of geologic reports required pursuant to Section 2623 for multiple projects within an earthquake fault zone or zones*
>
> *(e) Issuance and servicing of bonds, notes, or debentures issued to finance the costs of the improvements specified in subdivisions (a), (b), (c), and (d) (Section 26505).*

In this case, the Broad Beach GHAD was formed to abate or mitigate the following main geologic hazards that the specific project area is subject to: (1) beach/dune erosion and (2) damage to residential properties from flooding due to wave action.

Section 26580 of the Public Resources Code gives the GHAD the power to "acquire, construct, operate, manage, or maintain improvements on public or private lands. Such improvements shall be with the consent of the owner, unless effected by the exercise of eminent domain pursuant to Section 26576." Hence, a GHAD has the authority to exercise the power of eminent domain, with an option not to exercise such power. There are no provisions of GHAD law suggesting a decision on eminent domain power, once included in the GHAD's governing document (the "Plan of Control" required by Public Resources Code Section 26509), cannot be changed by later amending the Plan of Control., In this case, the Broad Beach GHAD Plan of Control waives the

[1] "Emergency" under GHAD law is defined with respect to the definition of "emergency" in the California Environmental Quality Act. (CEQA, See Pub. Res. Code §26559, referencing Pub. Res. Code §21080(b)(4)..) Thus, at least certain aspects of projects proposed by a GHAD (such as formation of a district and annexation of territory) are exempt from CEQA. (Pub. Res. Code §26559)

power of eminent domain. Several special conditions give the GHAD the option of either exercising eminent domain to acquire certain interests in real property necessary to effectuate the project, or to continue in the current form, which would require acquisition of such interests through negotiations with each individual property owner in the district. Additionally, Section 26580.1 states that, "the district may make improvements to existing public or private structures where the board of directors determines that it is in the public interest to do so."

The intent of a GHAD is to authorize a group of owners of private properties and/or larger expanses of land to organize and gain some governmental powers to abate, mitigate, and manage the hazards to which the area is subject. The legal structure of a GHAD seeks to allow for more expedient and wholesale action than singular private property owners could effectuate on an individual basis. Additionally, given the unexpected and evolving nature of hazards in general, GHAD law also allows for flexibility in each GHAD structure and management to allow the entity to best address the unique hazards it faces. To allow for this, GHAD law authorizes the GHAD Board of Directors to pass resolutions which modify or restrict the powers of the GHAD itself, most importantly with respect to eminent domain powers. However, once passed, these resolutions can always be reversed by another majority action of the board.

A GHAD may consist of two or more properties. While the properties within a GHAD are typically comprised of contiguous properties, they are not required to be contiguous under law and can also include scattered properties within a general area that are subject to the same hazard(s). (Pub. Res. Code §26530.) The area, landscape and properties within a GHAD may face varying levels or types of hazards that require different kinds or degrees of improvements to address. As such, GHAD law does not require each legal property within a GHAD to receive an equal benefit from the improvements proposed. Instead, Public Resources Code Section 26534 states that: "All lands within a district shall be *specially benefitted* by construction proposed in a plan of control approved by the legislative body". (Emphasis added.)

A GHAD has the authority to construct, maintain, and manage any improvements on public or private land that will abate or mitigate the hazards it faces. (Pub. Resources Code §26525.) Additionally, such improvements may be tailored to the needs of different properties and areas within the district to best address the varying levels and types of hazards posed to different segments of the shoreline. (Pub. Res. Code §26534) A GHAD can also modify its legal boundaries through the removal or addition of properties over time and may choose to seek dissolution from the Legislative Body that authorized it. (Pub. Res. Code Section 26567.1(a)(2).). A GHAD may not, however, allow a GHAD boundary that would bisect a parcel. (Pub. Res. Code. §26533.) Thus, in this case, the Broad Beach GHAD has the legal ability to implement the special conditions recommended in this staff report as an individual applicant for the term of the permit.

3. Past Commission Action

Broad Beach has been subject to several previous permit and enforcement actions by the Commission. During the 1997/1998 El Nino winter storm season, wave-caused erosion was endangering several homes along the upcoast portion of Broad Beach. A previous rock revetment was constructed on approximately a dozen lots at that time, although some of the

property owners obtained emergency coastal permits for the work granting temporary authorization at the time, others did not, and none of the property owners obtained a regular coastal development permit for permanent authorization, as required by the emergency permits.

For several years, the Trancas Property Owners Association (TPOA) installed numerous unpermitted private beach signs along the public portions of the approximately 1-mile stretch of Broad Beach. Additionally, the TPOA hired private guards to patrol the beach on All Terrain Vehicles (ATVs) and confront public beachgoers, restricting public access. In August , 2005, the Commission approved Cease and Desist Order No. CCC-05-CD-09, which required the TPOA to remove unpermitted development, cease and desist from placing, maintaining or conducting any unpermitted development on Broad Beach on either private and/or public property, and refrain from undertaking any activity that discourages or prevents use of public tidelands, public lateral access easements, or areas deed restricted for public access on Broad Beach, including the use of private security guards. In response to the Commission's order, the TPOA agreed to remove the unpermitted signs and stop using private ATV guard patrols.

In 2005, the Trancas Property Owners Association (TPOA) constructed an unpermitted berm, using sand excavated from the state tidelands, along the length of the beach and along the toe of the dunes. The TPOA indicated that the berm was constructed in response to continued shoreline erosion. The berm was partially placed in various lateral access easements and below the MHTL. In response, the Executive Director issued Executive Director Cease and Desist Order No. ED-05-CD-04,requiring removal of the berm and restoration of the beach.

In addition, in 2004 and 2005, the Commission took enforcement action to remove numerous unpermitted private beach signs which had been installed along the public portions of the approximately 1-mile stretch of Broad Beach by the Property Owners Association and the use of private guards, employed by the HOA, who were using All Terrain Vehicles to patrol the beach and who were confronting public beachgoers and restricting public access. In response to the Commission's enforcement Division's actions, the unpermitted signs were removed, ATV use was stopped, and the conflicts between private guards and members of the public was halted.

In February and March of 2006, eight months after the Executive Director issued Executive Director Cease and Desist Order (EDCDO) No. ED-05-CD-04 to the TPOA requiring the removal of the above described sand berm, several property owners placed rocks and sandbags along the beach in a similar location to that of the 2005 sand berm and, again, within lateral public access easements. A few of the property owners responded to Commission enforcement action by removing the revetments at that time, others did not.

Subsequently, in response to continued shoreline erosion, in 2008, and again in 2009, the Trancas Property Owners Association obtained emergency coastal permits from the City of Malibu for the installation of sand bag walls. Prior to the installation of the sand bags, Commission staff informed the TPOA that the development appeared to be located within the Commission's retained coastal development permit jurisdiction and; therefore, a CDP from the Commission would be required. However, the TPOA failed to apply for or obtain the required emergency permit for the sand bags from the Coastal Commission. The emergency permits issued by the City were valid for no more than a 90-day period of time. Although the

authorization period for these sand bag walls has expired, the sand bags were never removed by the TPOA.

In January 2010, the TPOA applied for and obtained Emergency Coastal Development Permits 4-10-003 and 4-10-029 for the construction of the 4,150 linear ft. long rock revetment. Due to the need for immediate action to prevent damage to the adjacent residences from wave-caused erosion, the applicants indicated that it was infeasible to remove the temporary sand bag walls that had been constructed on site. Thus, the rock revetment was constructed immediately seaward of the sand bag wall on site. The applicant is now requesting after-the-fact authorization of the sand bag walls as part of the permanent authorization of the rock revetment on site.

Further, the unpermitted rock revetment that was constructed during the 1997/1998 El Nino storm season (as described above) was removed and the rock material was re-utilized, in part, to construct the new 4,100 linear ft. rock revetment. Since the current rock revetment was installed in 2010, additional unpermitted development has occurred along the length of Broad Beach, including: 1) construction of private beach stairways across the revetment, composed of one or more of the following materials: sandbags, jute netting, rocks, cement, matting, metal, wood, and rope; 2) placement of sand, sandbags, dirt, and landscaping on and adjacent to the rock revetment, used to build up the yards of private residences; 3) construction of patios, sitting areas, and decks on and adjacent to the revetment; 4) placement of "private property" and "no trespassing" signs; and 5) removal of native dune vegetation and construction of walkways and patios in the dunes.

4. Standard of Review

The proposed project includes components that are located within the City of Malibu's Local Coastal Program (LCP) jurisdiction as well as components within the retained coastal development permit issuance jurisdiction of the Coastal Commission. The City of Malibu would typically review the coastal development permit application for the upland portions of the project within the City's LCP jurisdiction. However, Section 30601.3 of the Coastal Act authorizes the Commission to process a consolidated coastal development permit application, when its criteria are satisfied, for all aspects of a proposed project that would otherwise require a coastal development permit from both a local government with a certified local coastal program and the Commission.

The proposed development consists of the construction of a rock revetment, beach nourishment, and dune habitat reconstruction/re-establishment. Although portions of the project (primarily portions of the proposed revetment and the proposed beach/dune nourishment activities located seaward of the existing 'as-built' rock revetment) are located within the Commission's retained coastal development permit jurisdiction, the construction and replacement of the upland components of the project would be located in the City of Malibu's CDP jurisdiction. Typically, development located within a certified area requires a coastal development permit from the certified local government. However, in this case, the portions of the proposed project located within the Commission's retained permit jurisdiction is physically integrated with the development that would occur outside the area of retained permit jurisdiction (i.e. in the City's LCP jurisdiction).

Pursuant to Section 30601.3(a) (2), the applicant, appropriate local government, and the Commission may agree to consolidate a permit action for a project that spans local and state jurisdictions. In this case, the City of Malibu, in a letter to Commission staff dated January 27, 2012, requested that the Commission assume jurisdiction over all activities associated with the proposed project. The applicant both consented to, and facilitated this consolidated jurisdictional process. Further, public participation is not substantially impaired by the consolidated review in this case because portions of the project were reviewed by the City of Malibu in a public hearing process and an Initial Study and Mitigated Negative Declaration was prepared for this project in May 2012. Finally, the subject application will be noticed and heard consistent with the Coastal Commission's public hearing process, which facilitates both written and oral comment.
The standard of review for a consolidated coastal development permit application submitted pursuant to Section 30601.3(a) is the Chapter 3 policies of the Coastal Act (commencing with Section 30200) with the City of Malibu's certified Local Coastal Program used as guidance.

B. HAZARDS AND SHORELINE PROCESSES

In regards to the new construction of shoreline protective devices that may alter natural shoreline processes, Section **30235** of the Coastal Act, which is incorporated as part of the City of Malibu LCP, states:

> *Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.*

In addition, Section **30253** of the Coastal Act, which is incorporated as part of the City of Malibu LCP, states, in part, that new development shall:

> *(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*

Among other things, Coastal Act Section 30233(a), which is incorporated as part of the City of Malibu LCP, lists the type of development that is allowed to fill open coastal waters (as is proposed here). Section 30233(a) states:

> *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, 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:*

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.
(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.
(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.
(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.
(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.
(6) Restoration purposes.
(7) Nature study, aquaculture, or similar resource dependent activities.

In addition, the City of Malibu LCP includes the following provisions:

Applicable City of Malibu Land Use Plan Policies

LUP Policy 4.22:

Siting and design of new shoreline development and shoreline protective devices shall take into account anticipated future changes in sea level. In particular, an acceleration of the historic rate of sea level rise shall be considered. Development shall be set back a sufficient distance landward and elevated to a sufficient foundation height to eliminate or minimize to the maximum extent feasible hazards associated with anticipated sea level rise over the expected 100 year economic life of the structure.

LUP Policy 4.23

New development on a beach or oceanfront bluff shall be sited outside areas subject to hazards (beach or bluff erosion, inundation, wave uprush) at any time during the full projected 100-year economic life of the development. If complete avoidance of hazard areas is not feasible, all new beach or oceanfront bluff development shall be elevated above the base Flood Elevation (as defined by FEMA) and setback as far landward as possible. All development shall be setback a minimum of 10 feet landward of the most landward surveyed mean high tide line. Whichever setback method is most restrictive shall apply. Development plans shall consider hazards currently affecting the property as well as hazards that can be anticipated over the life of the structure.

LUP Policy 4.33:

All new beachfront and blufftop development shall be sized, sited and designed to minimize risk from wave run-up, flooding and beach and bluff erosion hazards without requiring a shoreline protection structure at any time during the life of the development.

LUP Policy 4.35:

All new beachfront development shall be required to utilize a foundation system adequate to protect the structure from wave and erosion hazard without necessitating the construction of a shoreline protection structure.

LUP Policy 4.36:

New development on or along the shoreline or a coastal bluff shall include, at a minimum, the use of secondary treatment waste disposal systems and shall site these new systems as far landward as possible in order to avoid the need for protective devices to the maximum extent feasible.

Applicable City of Malibu Implementation Plan Provisions

LIP Section 10.4.A:

Siting and design of new shoreline development and shoreline protective devices shall take into account anticipated future changes in sea level. In particular, an acceleration of the historic rate of sea level rise shall be considered and its potential impact on beach erosion, shoreline retreat, and bluff erosion rates shall be evaluated. Development shall be set back a sufficient distance landward and elevated to a sufficient finished floor height to eliminate or minimize to the maximum extent feasible hazards associated with anticipated sea level rise over the expected 100 year economic life of the structure.

LIP Section 10.4.B:

New development on a beach or oceanfront bluff shall be sited outside areas subject to hazards (beach or bluff erosion, inundation, wave run-up) at any time during the full projected 100 year economic life of the development. If complete avoidance of hazard areas is not feasible, all new beach or oceanfront bluff development shall be elevated above the base Flood Elevation (as defined by FEMA) and sited as far landward as possible to the maximum extent practicable.

All development shall be setback a minimum of 10 feet landward of the most landward surveyed mean high tide line. Whichever setback method is most restrictive shall apply. Development plans shall consider hazards currently affecting the property as well as hazards that can be anticipated over the life of the structure.

LIP Section 10.4.H:

All new beachfront and bluff-top development shall be sized, sited and designed to minimize risk from wave run-up, flooding and beach and bluff erosion hazards without requiring a shoreline protection structure at any time during the life of the development.

LIP Section 10.4.I:

All new beachfront development shall be required to utilize a foundation system adequate to protect the structure from wave and erosion hazard without necessitating the construction of a shoreline protection structure.

LIP Section 10.4.J:

New development shall include, at a minimum, the use of secondary treatment waste disposal systems and shall site these new systems as far landward as possible in order to avoid the need for protective devices to the maximum extent feasible.

LIP Section 10.4.K:

Shoreline and bluff protection structures shall not be permitted to protect new development, except when necessary to protect a new septic system and there is no feasible alternative that would allow residential development on the parcel. Septic systems shall be located as far landward as feasible. Shoreline and bluff protection structures may be permitted to protect existing structures that were legally constructed prior to the effective date of the Coastal Act, or that were permitted prior to certification of the Malibu LCP only when it can be demonstrated that existing structures are at risk from identified hazards, that the proposed protective device is the least environmentally damaging alternative and is designed to eliminate or mitigate adverse impacts to local shoreline sand supply and public access. Alternatives analysis shall include the relocation of existing development landward as well as the removal of portions of existing development. "Existing structures" for purposes of this policy shall consist only of enclosed buildings used for living space or required parking, e.g. residential dwelling, guesthouse, or garage, and shall not include accessory or ancillary structures such as decks, patios, pools, tennis courts, cabanas, stairs, landscaping etc.

LIP Section 10.4.L:

No shoreline protection structure shall be permitted for the sole purpose of protecting an ancillary or accessory structure. Such accessory structures shall be removed if it is determined that the structure is in danger from erosion, flooding or wave run-up. Such structures shall be considered threatened if the bluff edge encroaches to within 10 feet of the structure as a result of erosion, landslide or other form of bluff collapse. Accessory structures, including but not limited to, patios, stairs, recreational facilities, landscaping features, and similar design elements shall be constructed and designed to be removed or relocated in the event of threat from erosion, bluff failure or wave hazards.

LIP Section 10.6.C:

As a condition of approval of new development on a vacant beachfront or bluff-top lot, or where demolition and rebuilding is proposed, where geologic or engineering evaluations conclude that the development can be sited and designed so as to not require a shoreline protection structure as part of the proposed development or at any time during the life of the development, the property owner shall be required to record a deed restriction against the property that ensures that no shoreline protection structure shall be proposed or constructed to protect the development approved and which expressly waives any future right to construct such devices that may exist pursuant to Public Resources Code Section 30235.

Section 30253 of the Coastal Act, as incorporated in the City's LCP, mandates that new development minimize risks to life and property in areas of high geologic and flood hazard. In addition, Coastal Act Section 30235, as incorporated in the City's LCP, specifically provides that

shoreline protective devices must be permitted only when both of the following two criteria are met: (1) the device is required to serve coastal-dependent uses or to protect existing structures or public beaches provided that these areas/structures are in danger from erosion and (2) the device is designed to eliminate or mitigate adverse impacts on local shoreline sand supply. In addition to the construction of a rock revetment, the proposed project also includes the placement of sand for the purpose of beach nourishment in open coastal waters. Section 30233 of the Coastal Act identifies seven allowable uses for the dredging, diking, and filling of coastal waters. In regards to the beach nourishment activities, restoring beaches is one of the permitted uses in open coastal waters pursuant to Section 30233(a)(5); provided that the project is the least environmentally damaging alternative and any impacts have been mitigated.

The proposed project, including the construction of a 4,150 linear ft. rock revetment designed to be overlain by reconstructed dunes and the implementation of beach nourishment to substantially widen the beach with an annual backpassing program should be considered an experimental pilot project. The proposed beach nourishment component of the project, involving the proposed placement of 600,000 cu. yds. of sand, would provide a beach approximately 250 ft. in width (as measured from the top of the rock revetment to the water) and which would extend for the entire approximately 1.16 mile project reach from the mouth of Trancas Creek (at the downcoast end) to Lechuza Point (at the upcoast end). Sand for the beach widening would come from inland sand quarries located approximately 40-45 miles inland which would be trucked to the site.

Based on the information submitted by the applicant's geologic and engineering consultants, it is clear that at different periods of time, Broad Beach (also known as Trancas Beach) has been both much wider and more narrow than its current 2014 condition. Specifically, from the late 1960's to the late 1970's the beach extended seaward from its current shoreline position by more than 100 to 200 feet in some locations. Coincidentally, this period of 10 years or so, when the beach was at its widest point in at least the last 100 years or more, The beach reached a peak width in 1970 with a yearly average of 60 feet landward of the existing MHTL, although the beach has been receding since this time.

Between 1974 and 2009, approximately 600,000 cy of sand has been lost at Broad Beach, a majority of which moved east to nourish Zuma Beach and other locations down coast. The shoreline moved landward an average of 65 feet during that time period. The area of greatest beach erosion has occurred at the upcoast end of the project reach at Lechuza Point and tapered off at the downcoast end of the project reach at the mouth of Trancas Creek. Since the sand budget became negative in approximately 1974, the sand loss rate for Broad Beach has accelerated to approximately 35,000 cu. yds. of sand per year between 2004 and 2009 [2] and has further accelerated to approximately 45,000 cu. yds. per year between 2009 and 2012[3].

[2] (Everts Coastal 2009)

[3] (Everts Coastal 2014)

Therefore, while it is has at times been characterized as a wide beach, from the historical evidence and underlying geomorphological characteristics of the shoreline, it can be concluded that the 1960's-1970's period of maximum beach width was an anomalous condition, and not indicative of the average beach width over the past 100 years or so. Regardless, it is also clear that Broad Beach is currently subject to significant shoreline erosion that is expected to continue for the foreseeable future.

1. Sea Level Rise

Sea level has been rising slightly for many years. As an example, in the Santa Monica Bay area, the historic rate of sea level rise, based on tide gauge records, has been 1.8 mm/yr. or about 7 inches per century[4]. Recent satellite measurements have detected global sea level rise from 1993 to present of 3 mm/yr. or a significant increase above the historic trend observed from tide gauges. Recent observations of sea level along parts of the California coast have shown some anomalous trends, however; there is a growing body of evidence that there has been a slight increase in global temperature and that an accelerated rate of sea level rise can be expected to accompany this increase in temperature. Sea level rise is expected to increase significantly throughout the 21st century and some coastal experts have indicated that sea level rise of 3 to 5 feet or more could occur by the year 2100.[5]. Mean water level affects shoreline erosion in several ways and an increase in the average sea level will exacerbate all these conditions.

On the California coast the effect of a rise in sea level will be the landward migration of the intersection of the ocean with the shore. On a relatively flat beach, with a slope of 40:1, a simple geometric model of the coast indicated that every centimeter of sea level rise will result in a 40-centimeter landward movement of the ocean/beach interface. For fixed structures on the shoreline, such as a single family residence, pilings, or seawalls, an increase in sea level will increase the inundation of the structure. More of the structure will be inundated or underwater than are inundated now and the portions of the structure that are now underwater part of the time will be underwater more frequently.

Accompanying this rise in sea level will be increased wave heights and wave energy. Along much of the California coast, the bottom depth controls the nearshore wave heights, with bigger waves occurring in deeper water. Since wave energy increases with the square of the wave height, a small increase in wave height can cause a significant increase in wave energy and wave damage. Combined with the physical increase in water elevation, a small rise in sea level can expose previously protected back shore development to both inundation and wave attack, and

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[4] Lyles, S.D., L.E. Hickman and H.A. Debaugh (1988) *Sea Level Variations for the United States 1855 – 1986*. Rockville, MD: National Ocean Service.

[5] Cayan, D.R., M. Tyree, M. Dettinger, H. Hidalgo, T. Das, E. Maurer, P. Bromirski, N. Graham, and R.E. Flick, 2009. *Climate Change Scenarios and Sea Level Estimates for the California 2008 Climate Change Scenarios Assessment*, Draft Paper, CEC-500-2009-014-D, 62 pp, http://www.energy.ca.gov/2009publications/CEC-500-2009-014/CEC-500-2009-014-D.pdf.

those areas that are already exposed to wave attack will be exposed to more frequent wave attack with higher wave forces. Structures that are adequate for current storm conditions may not provide as much protection in the future.

2. Shoreline Armoring Impacts

Coastal Act Section 30235 acknowledges that shoreline armoring, including seawalls, revetments, cliff retaining walls, groins and other such structural or "hard" methods designed to forestall erosion also alter natural landforms and natural shoreline processes. Accordingly, Section 30235 limits the construction of shoreline protective works to those required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion. The Coastal Act provides these limitations because shoreline structures can have a variety of adverse impacts on coastal resources, including adverse effects on sand supply, public access, coastal views, natural landforms, and overall shoreline beach dynamics on and off site, ultimately resulting in the loss of beach.

Shoreline armoring or protection devices also directly interfere with public access to tidelands by impeding the ambulatory nature of the mean high tide line (the boundary between public and private lands) during high tide and severe storm events, and potentially throughout the entire winter season. The impact of a shoreline protective device on public access is most evident on a beach where wave run-up and the mean high tide line are frequently observed in an extreme landward position during storm events and the winter season. As the shoreline retreats landward due to the natural process of erosion, the boundary between public and private land also retreats landward. Construction of rock revetments and seawalls to protect private property fixes a boundary on the beach and prevents any current or future migration of the shoreline and mean high tide line landward, thus eliminating the distance between the high water mark and low water mark. As the distance between the high water mark and low water mark becomes obsolete the seawall effectively eliminates lateral access opportunities along the beach as the entire area below the fixed high tideline is inundated. The ultimate result of a fixed tideline boundary (which would otherwise normally migrate and retreat landward, while maintaining a passable distance between the high water mark and low water mark overtime) is a reduction or elimination of the area of sandy beach available for public access and recreation.

Interference by shoreline protective devices can result in a number of adverse effects on the dynamic shoreline system and the public's beach ownership interests. First, changes in the shoreline profile, particularly changes in the slope of the profile which results from a reduced beach berm width, alter the usable area under public ownership. A beach that rests either temporarily or permanently at a steeper angle than under natural conditions will have less horizontal distance between the mean low water and mean high water lines. This reduces the actual area in which the public can pass on their own property. The second effect on access is through a progressive loss of sand as shore material is not available to nourish the nearshore sand bar. The lack of an effective bar can allow such high wave energy on the shoreline that materials may be lost far offshore where it is no longer available to nourish the beach. This affects public access again through a loss of area between the mean high water line and the actual water. Third, shoreline protective devices such as revetments and bulkheads cumulatively affect

shoreline sand supply and public access by causing accelerated and increased erosion on adjacent public beaches. This effect may not become clear until such devices are constructed individually along a shoreline and they reach a public beach. In addition, if a seasonal eroded beach condition occurs with greater frequency due to the placement of a shoreline protective device on the subject site, then the subject beach would also accrete at a slower rate. Fourth, if not sited landward in a location that ensures that the seawall is only acted upon during severe storm events, beach scour during the winter season will be accelerated because there is less beach area to dissipate the wave's energy.

Shoreline protective devices such as seawalls, revetments, gunnite facings, groins et cetera are all physical structures that occupy space. When a shoreline protective device is placed on a beach area, the underlying beach area cannot be used as beach. This generally results in a loss of public access as well as a loss of sand-generating area. The area where the structure is placed will be altered from the time the protective device is constructed, and the extent or area occupied by the device will remain the same over time, until the structure is removed or moved from its initial location, or in the case of a revetment, as it spreads seaward over time. The beach area located beneath a shoreline protective device, referred to as the encroachment area, is the area of the structure's footprint.

Further, when a shoreline or beach segment is developed with a shoreline protective device, the natural exchange of material between the back beach, dune systems, foreshore and intertidal region can all be interrupted. The natural shoreline processes affecting the formation and retention of sandy beaches can be significantly altered by the construction of shoreline armoring structures depending on where these devices are located on the beach and the site specific geomorphological characteristics of the shoreline. There are effects that a shoreline protective structure has on a shoreline which can be quantified, including, (1) the loss of beach area on which the structure is located, (2) the long-term loss of beach which will result when the back beach location is fixed on an eroding shoreline (also known as passive erosion); and (3) the amount of material which would have been supplied to the beach if the back beach were allowed to erode naturally. As follows, the location and alignment of a shoreline protective device on a beach dictates the amount of material that would otherwise have been supplied to the beach seaward of the device. Thus, generally the Commission has found in past approvals of shoreline protective devices that the furthest landward location of a device is preferable to maximize the amount of sandy beach available for public access seaward of the device and to reduce impacts to the natural environments and natural sand exchange systems existing along a beach. While the location of the existing development along broad beach in between the sea cliff and the rest of the beach has already modified the normal sand interaction and movements along this shoreline, construction of a shoreline protective device in the proposed location would function to further divide portions of the existing beach and would 'fix' the back beach in a much further seaward location that that which currently exists without a shoreline protective device along the subject shoreline.

In this case, the applicant has submitted a Coastal Engineering Report by Moffatt & Nichol dated October 2013, which indicates that although the rate of erosion of the beach on site is increasing, the historical rate of erosion on Broad Beach since the 1970's has been approximately 2 ft. per year. Thus, in addition to the loss of public sandy beach area from the direct occupation of the

revetment itself (approximately 3.2 acres in area) since the back of the beach has been effectively "fixed" by the revetment, the revetment will also result in the loss of area of beach area for public use landward of the revetment that would have become available for public use as the shoreline continued to erode and the mean high tide line would have continued to move landward. Thus, given the historical average rate of 2 ft. of shoreline erosion per year over the life of the rock revetment, typically 20-50 years or more, the proposed revetment would result in the expected loss of another 40-100 ft. of beach area that would otherwise be available for public use.

Experts generally agree that where the shoreline is eroding and armoring is installed, as would be the case here, the armoring will eventually define the boundary between the sea and the upland. On an eroding shoreline fronted by a beach, the beach will be present as long as some sand is supplied to the shoreline and the beach is not submerged by sea level rise. As erosion proceeds, the beach also retreats. This process stops, however, when the retreating shoreline comes to a revetment or a seawall. While the shoreline on either side of the armor continues to retreat, shoreline retreat in front of the armor stops

In this case, the proposed revetment would occupy 3.02 acres of beach. Although the proposed revetment would be situated on a mix of public trust land, private property and public easements, it would effectively limit the amount of sand available to the public beach area as a whole and the overall shoreline width and shape. Moreover, Dr. Lesley Ewing, Commission's Staff Engineer, has determined that, in this case, the as-built rock revetment has fixed the location of the back of the beach which has resulted in the narrowing of the beach seaward of the revetment particularly during medium/high tide and high wave events since its construction in 2010. To illustrate this point, a photograph from a site visit by Commission staff to the project site after the construction of the revetment/sand bag wall on site is included as Exhibit 10 which clearly demonstrates this process at work. In addition, an aerial photograph of the entire project reach provided by the applicant's coastal engineer and included as Exhibit 3, also clearly demonstrates this same process as evidenced by the lack of dry beach area seaward of the as-built revetment on site during medium and higher tide conditions. Eventually, the shoreline fronting the armor protrudes into the water, with the mean high tide line fixed at the base of the structure. In the case of an eroding shoreline, this represents the loss of a beach as a direct result of the armor.

Thus, for the above cited reasons, the Commission finds that the existing as-built rock revetment has resulted in the narrowing of the beach on site which has adversely impacted shoreline sand supply and public access/recreation due to the loss of sandy beach area seaward of the revetment.

3. Proposed Shoreline Protection Device

The proposed project includes permanent retention of the emergency rock revetment, which was authorized on a temporary basis by the Commission in 2010. The emergency revetment is 4,100 ft. long, rises approximately 12-15 ft. above the low tide beach with an average crest elevation of 13 ft. above mean lower low water, and is 22 to 38 ft. wide at its base. The emergency revetment was constructed in April of 2010 with boulders with a size range of .5 to 2 tons to facilitate fast construction, and a shallow toe elevation to reduce the need for digging. Approximately 36,000 tons of rock were placed along 4,150 ft. of the shoreline, seaward of the stretch from 30760

Broad beach road to 31346 broad beach road with the exception that the property owner at 30822 Broad Beach road opted not to participate in the emergency revetment and, as such, maintains an approximately 100 ft. wide gap in front of the property, which would be retained as part of the applicants proposed project. Prior to construction of the emergency revetment much of the stretch of shoreline from 30760 Broad Beach road to 31346 broad beach road had already been armored with geotextile sand bag revetment walls which had been constructed pursuant to emergency coastal development permits issued by the City of Malibu (Exhibit 6).

However, the City's emergency permits authorized the sand bag walls on a temporary basis only for a period of only 90 days. During the emergency construction of the revetment in 2010, the applicant's coastal engineering consultants asserted that it was infeasible to remove these sand bag walls during construction of the new revetment due to timing constraints and the need for urgent action to protect existing development on the beach. As a result, these sand bag walls were left in place with the revetment constructed on top of or immediately seaward of them. The proposed project would permanently retain all of these sand bag walls in place underneath and landward of the emergency rock revetment.

The alignment of the existing rock revetment/sand bag wall occupies approximately 3.02 acre of beach and is situated closer to the stringline of development on the west (upcoast) end of the beach and much further seaward of the developed areas of the individual properties along the middle and east (downcoast) segments of the beach, where the beach widens significantly. Specifically, on the west (upcoast) end the distance between the homes and the revetment generally ranges from 80 ft. to 120 ft. and approximately 40 ft. along the more narrow eastern (upcoast) end. No shoreline protection was proposed west or upcoast of the property at 31346 Broad Beach Road because the residences at the furthest upcoast end of the beach are already protected by a mix of permitted and unpermitted seawalls, revetments, and bulkheads. The upcoast terminus of the as-built revetment extends partially onto the property at 31350 Broad Beach, where it abuts the existing vertical seawall on that property.. Thus, no additional shoreline protection is required for any properties on Broad Beach located upcoast of the as-built emergency revetment.

4. Need for Shoreline Protection at Broad Beach and Alternatives Analysis

Coastal Act Section 30235 acknowledges that seawalls, revetments, cliff retaining walls, groins and other such structural or "hard" methods designed to forestall erosion also alter natural landforms and natural shoreline processes. Accordingly, Section 30235 limits the construction of shoreline protective works to those required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion. The Coastal Act provides these limitations because shoreline structures can have a variety of negative impacts on coastal resources including adverse effects on sand supply, public access, coastal views, natural landforms, and overall shoreline beach dynamics on and off site, ultimately resulting in the loss of beach.

Specifically, Coastal Act Section 30235 provides that shoreline protection devices shall be permitted only when all of the following four criteria are met: (1) there is an existing structure, public beach area, or coastal dependent use; (2) the existing structure, public beach area, or

coastal dependent use is in danger from erosion; (3) shoreline-altering construction is required to protect the existing threatened structure or public beach area, or to serve the coastal dependent use; and (4) the required protection is designed to eliminate or mitigate its adverse impacts on shoreline sand supply. The first three questions relate to whether the proposed shoreline protection device is necessary, while the fourth question applies to avoiding or mitigating any unavoidable impacts from it. In addition, even where all four criteria are satisfied, and thus, shoreline protection devices must be permitted, the other policies in Chapter 3 of the Coastal Act do not become irrelevant, so the devices must be located, designed, and maintained in a manner that is consistent with those other policies to the extent possible.

a. Existing Development to be Protected:

In regards to the first question, the approximately 4,150 linear ft. rock revetment was constructed on the sandy beach seaward of 78 existing beachfront residences between 31350 Broad Beach Road and 30760 Broad Beach Road pursuant to Emergency Coastal Development Permit 4-10-003-G. Many of these properties were developed with leach fields and/or septic systems (or in a few cases, seepage pits) that were predominantly located seaward of the homes. As some of the historically developed properties have been redeveloped since the effective date of the Coastal Act, January 1, 1977, many of these permittee have been required to remove or relocate these systems landward of their residences and/or upgrade the septic system and leach fields that serve the new primary residences. As such, there is a mix of septic systems and leach fields built landward and seaward of the primary residences, in a patchwork along the subject shoreline.

For the purpose of authorizing new shoreline protective structures, such as the proposed rock revetment, the Coastal Act requires new development to be sited and constructed in a manner that minimizes risks to life and property in high geologic, flood, and fire hazard areas; that does not contribute significantly to erosion or destruction of the site or surrounding area; and that does not in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. (Pub. Resources Code Section 30253(a)-(b).) In its approval of a coastal development permit for new shoreline development, the Commission is required to find that the approved version of the project will not result in adverse impacts to public beach access, offshore recreational access, sand supply, visual resources, or natural landforms beyond what the Coastal Act allows. In other words, new development within the Coastal Zone that has been approved and constructed after the effective date of the Coastal Act should not require shoreline protection in order to "assure stability and structural integrity" (Id.) because it was constructed with adequate setbacks and/or other measures in order to negate the need or future armoring.

Coastal Act Section 30235 allows for the use of shoreline protection in certain circumstances (if warranted and otherwise consistent with Coastal Act policies) for "existing" structures. Coastal Act Section 30235 allows for the use of shoreline protection for "existing" structures when it is designed to eliminate or mitigate adverse effects on local shoreline sand supply. The Commission may also impose conditions to require compliance with other Coastal Act requirements. (*Ocean Harbor House Homeowners Association v. Cal. Coastal Comm.* (2008) 163 Cal.App.4th 215, 242; Pub. Resources Code Section 30607.) Here, 46 of the 78 residences that existed on properties located landward of the rock revetment were constructed prior to the Coastal Act. Twenty-five of these residences were authorized under the Coastal Act without a

waiver of rights to shoreline protection and 7 houses were permitted subject to a condition requiring waiver of rights to shoreline protection. As explained below, the 46 pre-Coastal Act houses are located in a patchwork manner along the entire length of Broad Beach. Only a revetment that runs the entire length of Broach Beach can provide effective protection for those houses.

As proposed, the rock revetment would be a continuous 4,150 linear ft. structure. The above referenced properties containing residences constructed pursuant to CDPs approved after the effective date of the Coastal Act and/or the properties where owners have waived any rights to a future shoreline protective device are located in a patchwork manner throughout the project reach. Thus, the as-built rock revetment may not be modified to remove shoreline protection on these properties without breaking up the continuous revetment into several smaller segments resulting in significant "edge effects" (which include increased scour and erosion where the revetment ends) wherever a gap in the revetment would occur. Thus, the Commission finds that in this unique case, in order to allow for a single, unbroken revetment that minimizes edge effects, it would be necessary to allow for the construction of the rock revetment on both those properties where waivers are in effect and those properties developed with residential structures after the effective date of the Coastal Act.

The Commission's approval of a continuous revetment does not in any way invalidate or override any previous permit conditions regarding the waiver of rights to shoreline protection. And finally, in a limited number of cases, the Commission and local governments with certified LCPs, have required applicants for immediate shoreline development (like blufftop or beachfront houses) to waive any right to a shoreline protective device, pursuant to Section 30235 of the Coastal Act, through recordation of a deed restriction on the subject property(ies). In other words, applicants are required to stipulate that the structures being permitted will not be considered existing structures, relative to their interpretation pursuant to Section 30235 of the Coastal Act, in the future because they have been sited and designed to not need shoreline armoring in the future.

Moreover, there is also a mix of accessory development on many of the properties within the subject area including patios, decks, "teahouses", gazebos, yard areas, and landscaped areas. Pursuant to Section 10.4.L of the City of Malibu's certified IP, accessory development, such as the patios, decks, "teahouses", gazebos, yard areas, and landscaped areas constitute development which is specifically not entitled to be protected pursuant to any form of shoreline protection, such as the proposed rock revetment. Section 10.4.L of the City's adopted IP states:

> *No shoreline protection structure shall be permitted for the sole purpose of protecting an ancillary or accessory structure. Such accessory structures shall be removed if it is determined that the structure is in danger from erosion, flooding or wave run-up. Such structures shall be considered threatened if the bluff edge encroaches to within 10 feet of the structure as a result of erosion, landslide or other form of bluff collapse. Accessory structures, including but not limited to, patios, stairs, recreational facilities, landscaping features, and similar design elements shall be constructed and designed to be removed or relocated in the event of threat from erosion, bluff failure or wave hazards.*

Thus, pursuant to the provisions of the City's adopted LCP, the patios, decks, yard areas/landscaped areas, "teahouses", gazebos, and other forms of accessory development on each site do not constitute development which is specifically not entitled to be protected pursuant to any form of shoreline protection. Regardless, for the above reasons, the Commission finds that the existing single family residences and septic systems within the project area, that were constructed prior to the effective date of the Coastal Act, clearly constitute development that may be protected by a shoreline protective as referenced by Section 30235.

b. Erosion Danger:

In regards to the second question, the applicant has also established that the existing development on site (including the single family residences and those septic systems located seaward of residences that were constructed prior to the effective date of the Coastal Act) are in danger of serious damage or destruction due to further wave attack and associated beach erosion. In this case, the problem of ongoing erosion at this beach has been previously acknowledged by the Commission in its approval of Emergency Coastal Development Permits 4-10-003-G and 4-10-029-G in 2010 which authorized the construction of the 4,150 linear ft. as-built rock revetment on site in response to previous wave caused erosive events.

Moreover, with global warming and sea level rise, increased relative wave heights and wave energy are expected. Along much of the California coast, the bottom depth controls the nearshore wave heights, with bigger waves occurring in deeper water. Since wave energy increases with the square of the wave height, a small increase in water depth and wave height can cause a significant increase in wave energy and wave damage. Thus, combined with the physical increase in water elevation, a small rise in sea level can expose previously safe backshore development to both inundation and wave attack, and those areas that are already exposed to wave attack will be exposed to more frequent wave attack with higher wave forces. Therefore, given the effects of expected sea level rise at the subject site, the upland areas of Broad Beach are expected to be subjected to greater wave action more frequently in the future.

The width of Broad Beach, has varied greatly in recent history and has been subject to fluctuation over time, with the widest recorded point occurring in the late 1960's- mid 1970's. The western (upcoast) segment of the project reach (that portion located immediately downcoast of Lechuza Point) has historically maintained a narrower shoreline profile than other segments of Broad Beach. A review of historical records and aerial photographs shows that the beach on site was at its widest point over the last century or so in the 1970's and reached its peak width in 1971. However, starting in 1974 the shoreline began to experience significant rates of erosion, and developed what is described as a negative sand budget. From 1974- 2007, the applicant's engineering consultants have estimated that the beach lost approximately 600,000 cu. yds. of sand material. Additionally, El Niño events in the 1980's, 1990's and 2000's subjected the shoreline to dramatic erosive episodes, exacerbating the naturally occurring 'negative sand budget'. A report submitted by the applicant (Gary Griggs, 2011) states that:

> *"The initial development of Broad Beach involved construction of homes and other improvements that encroached 200 to 250 feet onto the original beach and dunes, leaving only a narrow fronting beach with little seasonal buffer. With sea level rise and the associated process of shoreline retreat, we are seeing passive erosion of the active*

beach, which is caught between high tides and wave run-up and the shoreline protection structures. The beach and dunes can no longer retreat towards the old seacliff and have continued to narrow."

It is evident that the width of the subject shoreline has fluctuated back and forth over time and that the existing development along the shoreline has interfered with the natural flux of sand accumulation and loss. While there is a small possibility that at some point in the future the beach could naturally begin to widen again, it is not a likely possibility given expected sea level rise in this area and other extenuating factors. The applicant's coastal engineering consultants have indicated that the historic erosion rates on the subject shoreline range from 20,000 to 40,000 cy. yearly toward the east and included the loss of approximately 2 ft. of beach width per year; however, the calibrated future rate of erosion provided by the applicant's engineering consultants is between 50,000 to 100,000 cy. yearly toward the east.

Many of these properties were developed with leach fields and/or septic systems (or in a few cases, seepage pits) that were predominantly located seaward of the homes. As some of the historically developed properties have been redeveloped over time, they have been required to remove, relocate and/or upgrade the septic system and leach fields that serve the new primary residences. Most of the CDPs that were issued for such redevelopment projects required the new onsite wastewater treatment systems to be located landward of the proposed residences. Additionally, most homes that were built after the effective date of the Coastal Act on previously undeveloped lots within the project boundary were also required to locate their septic and leach fields landward of the proposed residence, consistent with 30253. As such there is a mix of septic systems and leach fields built landward and seaward of the primary residences, in a patchwork along the subject shoreline.

In addition, the project site has been subject to wave-caused erosional events in the past. During the 1997/1998 El Nino winter storm season, wave-caused erosion was endangering several homes along the upcoast portion of Broad Beach. An unpermitted rock revetment was constructed on approximately a dozen lots at that time, although some of the property owners obtained emergency coastal permits for the work granting temporary authorization at the time, others did not. The unpermitted rock revetment was removed by the applicant during the construction of the 4,150 linear ft. long rock revetment that is the subject of this application.

Subsequently, in response to continued shoreline erosion, in 2008, and again in 2009, the TPOA obtained emergency coastal permits from the City of Malibu for the installation of sand bag walls on many of the same properties where the as-built rock revetment is now located. In January 2010, the TPOA applied for and obtained Emergency Coastal Development Permits 4-10-003 and 4-10-029 for the construction of the 4,150 linear ft. long rock revetment. The TPOA's engineering consultants asserted at the time that the existing emergency sandbag wall protective works were in danger of failure and that a rock revetment was necessary to provide temporary emergency protection.

Thus, the Commission finds that there is adequate evidence to demonstrate that existing single family residences and septic systems within the project area, that were constructed prior to the

effective date of the Coastal Act within the project reach have been subject to potential damage from wave caused erosion.

c. Alternatives to Use of a Shoreline Protection Device:

The third criterion, pursuant to Section 30235, that must be met before approval of a shoreline protective device can be considered necessary is that the proposed device or shoreline-altering construction is required to protect the existing threatened structure or public beach area, or to serve the coastal dependent use. In other words, a shoreline protection device must be permitted if approval of such a device is the only feasible means of protecting the endangered existing development or costal dependent use. Further, a particular device may be approved only if it is found to be the only feasible means of providing protection or if there are multiple possible means, if it is the best alternative. Thus, when read in tandem with other applicable Coastal Act policies protecting coastal resources as cited in these findings, this evaluation relative to Section 30235 of the Coastal Act, is often conceptualized as a search for the least environmentally damaging feasible alternative that can serve to achieve the stated project goal of protecting the threatened structure, coastal-dependent use, or public beach. Other alternatives typically considered include: the "no project" alternative; abandonment of threatened structures or use areas; relocation of the threatened structures or use areas; sand replenishment programs; and combinations of each.

The applicant's Coastal Engineering Consultant, Moffatt & Nichol, has prepared an alternatives analysis identifying potential alternatives to the use of the rock revetment to protect the existing structures on site. In addition, a Revised Analysis of Impacts to Public Trust Resources and Values (APTR) has also been prepared by AMEC consultants for the California State Lands Commission dated July 2014, which considers a range of alternatives to the proposed project.

In regards to the "No Project" alternative, the applicant's coastal engineering consultants determined this alternative is infeasible as it would not meet the stated goals of the project to protect the existing residential development on site. Similarly, the applicant did not include an analysis of the abandonment of threatened structures for the same reason that the "No Project" alternative was not found to be feasible. The applicant included a brief analysis of a "Managed Retreat" alternative involving the landward relocation of existing residences and septic systems on each site and found that although this alternative would reduce or delay exposure of these structures to coastal erosion it would not meet the primary objective of providing long-term shoreline protection of the existing residences on site, particularly given the relatively limited area for retreat to occur given the location of the subject properties between the beach and Broad Beach Road.

In regards to the use of beach nourishment as an alternative to the use of the rock revetment, the proposed project already includes of the importation of 600,000 cu. yds. of sand material from sand quarries located approximately 40-45 miles inland of the project site. As proposed, the reconstructed/post-nourishment combined beach and dune system would extend approximately 250 ft. (at its widest point) seaward from the top of the as-built revetment to the surf zone with approximately 65-110 ft. of beach area located seaward of the constructed toe of the dunes.

The project also includes backpassing operations (transporting sand from wider downcoast areas of the beach to upcoast areas of the beach) on an annual basis for a period of 20 years, if needed for the purpose of maintaining adequate beach width for a prolonged period of time. As proposed, the applicant would conduct a single renourishment of the beach 10 years after the initial nourishment had been completed. As designed, the proposed rock revetment would be buried beneath at least 4-8 ft. of imported sand material and the reconstructed dunes on site would be revegetated with native dune plant species.

However, although the project, as proposed, includes the provision for substantial widening of the beach from nourishment activities, the applicant's coastal engineering consultants have also indicated that the beach is expected to be subject to continuing erosion and that the created or widened beach area seaward of the revetment could be entirely or substantially eroded within 3 - 8 years, and possibly even less time in the event of a significant storm or wave-caused erosion event. Thus, the applicant's coastal engineering consultants have concluded that the revetment is necessary to provide "backstop" protection in the event that the proposed beach nourishment/widened beach fails.

Given the dynamic ever changing nature of the beach morphology and coastal process acting on this beach it is very difficult to model or predict how the beach nourishment program will perform over time as well as predict if unanticipated changes could result in adverse impacts to marine resources and habitats. The Commission finds that the proposed project is, in part, an experimental effort or pilot project to create a widened sandy beach within the project reach to reduce the potential for periodic wave-caused erosion to upland areas of the site and enhance public access and recreational opportunities. Thus, in this case, the Commission finds that given the experimental nature of the proposed nourishment project and the dynamic variability of conditions in coastal areas, it is not possible to ensure that the proposed beach nourishment efforts will be adequate to establish and maintain the necessary beach width to protect the existing residential development on each site without the use of the proposed rock revetment to serve as "backstop" protection.

d. Alternatives to Avoid or Minimize Adverse Impacts From Rock Revetment

The fourth, and final, test of Section 30235 of the Coastal Act that must be met in order to require Commission approval is that a shoreline protective structure must be designed to eliminate or mitigate adverse impacts to local shoreline sand supply, coastal process, and public access/recreation. Specifically, in the event that it is determined that there is no alternative to the use of a shoreline protection device, then alternatives to the design and location of the device must be analyzed to ensure that adverse impacts to shoreline processes, sand supply, public access and recreation are minimized to the maximum extent feasible. In past Commission actions, the Commission has generally found that siting and designing the shoreline protection device to be located as far landward as feasible so that the device occupies less sandy beach and is acted upon by wave action less frequently is the preferred alternative to minimize adverse impacts to shoreline processes, sand supply, public access and recreation.

As discussed in more detail in the section above titled IV.B.1 of this report titled "Shoreline Armoring and Impacts", the existing as-built rock revetment on site has resulted in, and is

continuing to cause, adverse impacts to shoreline sand supply, coastal processes, and public access/recreation. In order to mitigate potential impacts to the sand supply, coastal processes, and public access and recreation associated with the proposed project there are two main factors to consider: (1) providing for beach nourishment to mitigate the impacts of the proposed revetment device and (2) siting the revetment in the landward most location feasible.

In regards to the first factor, in past permit actions involving the construction of a shoreline protection device, the Commission has typically required either beach nourishment or the provision of an in-lieu fee for the purpose of providing beach nourishment to offset adverse impacts to shoreline sand supply and coastal resources. In this particular case the applicant is already proposing to import 600,000 cu. yds. of sand for beach nourishment activities for the express purpose of creating a wider beach on site and enhance the effectiveness and longevity of the proposed rock revetment. As proposed, project would specifically include deposition of 600,000 cu. yds. of sand on the beach from inland sand quarries during the first year and approximately 450,000 cu. yds. of sand during the tenth year of the program. The applicant also proposed to conduct periodic sand back-passing operations to occur no more than once per year for a period of 20 years. Thus, as proposed, the project would include some mitigation for the adverse impacts to shoreline sand supply and coastal processes resulting from the rock revetment.

However, it is important to note that, while the applicant has submitted estimations, the anticipated longevity of the sand nourishment is uncertain. The applicant has submitted an analysis by their engineering consultants that anticipate that the nourished beach will be lost due to erosion within 3 to 8 years from completion of the project. The Engineering Analysis by Moffatt & Nichol dated October 2013 states:

> *The Genesis model predictions for a 600,000 cy [cu. yds.] beach nourishment assume the existing revetment is maintained in its current location…The rate of beach loss is greatest at the west end of Broad Beach and indicates the nourished beach may only last 3 to 5 years near Point Lechuza. In contrast, the model results suggest beach nourishment may last up to 7 or 8 years at the east end of Broad Beach.*

Thus, while the proposed sand nourishment will offset or partially offset the adverse effects to shoreline sand supply from the proposed rock revetment for the period of time that the nourishment material remains on the beach, it is expected that the nourishment sand will be lost over time and the revetment exposed both during and after the 20 year period that such nourishment activities are proposed. Further, although the applicant is requesting permanent authorization of the rock revetment pursuant to this application, the applicant is not committing to any future beach nourishment activities after 20 years. Thus, as proposed, although the benefits to shoreline sand supply from the proposed nourishment would be temporary for a period of 20 years, the adverse impacts resulting from the proposed authorization of the rock revetment would be permanent.

In regards to the second factor, the construction of the 4,150 linear ft. rock revetment was authorized through two emergency permits (CDPs 4-10-003-G and 4-10-029-G) in 2010, during a period of rapid and advancing erosion along the Broad Beach shoreline. Given the need for

immediate action in light of the emergency that was occurring at the time, it was not possible for the Commission to fully evaluate proposed configuration and location of the rock revetment. Thus, these emergency coastal development permits specifically authorized the emergency work on a temporary basis only in order to allow the applicant to prepare further studies of the shoreline processes at the subject site and evaluate long-term solutions, including solutions other than retention of the rock revetment and the relocation of the revetment to a further landward location which would be fully evaluated by the Commission in its review of the required follow-up regular coastal development permit application. This subject application for the permanent authorization of the rock revetment constitutes that required follow-up application for those emergency coastal development permits.

The alignment of the as-built 4,150 linear ft. rock revetment occupies approximately 3.02 acre of beach and is situated substantially closer to the stringline of existing residential development on the west (upcoast) end of the beach than the approximately 2,000 linear ft. portion of the revetment at the eastern (downcoast) end of the beach, where the beach widens significantly. In fact, the seaward toe of the rock revetment along the downcoast portion of the site is located between 160 – 200 ft. of many of the residences at the downcoast of the end of the beach. Although many of the residences utilize septic systems with leach fields located on the sandy beach seaward of the residence, the seaward toe of the rock revetment would still be generally located between 80 – 160 ft. seaward of these leach fields. Thus, given the large area of sandy beach located between the as-built rock revetment on the downcoast end of the site and the line of residential development (including the existing septic systems), it is clear that there is a feasible alternative to substantially relocate the approximately 2,000 linear ft. portion of the revetment at the eastern (downcoast) end of the beach further landward.

Thus, in its review of this pending application, Commission staff requested the applicant provide analysis of relocating the rock revetment as far landward as feasible to protect the residential development on site (single family residences and their associated septic systems) and reduction of quantity and footprint of fill material, and elimination of the placement of sand fill material at the western end of the beach (upcoast of the western terminus of the rock revetment) in order to avoid the filling of sensitive rocky intertidal habitat areas. As part of the coastal development permit application, the applicant's coastal engineering consultants, Moffatt & Nichol, submitted several project alternatives which examined different beach nourishment scenarios as well as several alternatives related to a more landward location for the rock revetment. In addition, the Revised Draft Analysis of Public Trust Resources (APTR) prepared by AMEC for the California State Lands Commission dated July 2014 also examined the applicant's identified alternatives. The alternatives identified by the applicant and APTR include:

1. Minor relocation of a more robust revetment landward of the mean high tide line with beach nourishment and dune restoration;
2. Relocation of a more robust revetment landward of existing lateral access easements with beach nourishment and dune restoration;
3. Replacement of revetment with further landward-located vertical seawall with beach nourishment and dune restoration;
4. Reduce beach nourishment volume with revetment in current location and dune restoration;

5. Beach nourishment and dune restoration with full removal of revetment; and
6. Landward relocation of more robust revetment along eastern portion of the project with beach nourishment and dune restoration.
7. Removal of emergency revetment on eastern (downcoast) end of beach with beach nourishment/dune restoration and both with and without replacement and relocation of existing leach fields further landward.
8. No beach nourishment at western end of beach (upcoast of revetment)
9. Reduced beach nourishment at western end of beach (upcoast of revetment).

The majority of the above referenced alternatives did not adequately address the above stated goals identified by Commission staff, including relocating the revetment as far landward as feasible, reduction of quantity and footprint of fill material, and eliminating fill of rock intertidal habitat at the western end of the beach, upcoast from the western terminus of the revetment in order to minimized impacts to coastal resources. For instance, the identified ***Alternative 1*** for the minor relocation of revetment immediately landward of the mean high tide line would only have relocated the majority of the revetment approximately 3–5 ft. further landward, although a small portion on the eastern (downcoast) end of the revetment would be located 15-20 ft. landward. Due to the relatively minor distance the revetment would be relocated under this alternative, this alternative would result in a very limited reduction to adverse impacts to shoreline process, sand supply, and public access/recreation while resulting in new impacts to the remaining sensitive dune habitat on site.

In addition, ***Alternatives 2, 6, and 7*** also similarly addressed the potential landward relocation of the revetment; however, each of these alternatives analyzed a location for the relocated revetment that would be further seaward than necessary. In contrast, ***Alternative 3*** showed the replacement of the revetment with a new vertical seawall in a much further landward location only approximately 6 ft. seaward of the existing ; however, it also incorrectly included protection for "Future" leach fields on site that do not currently exist. In the case of ***Alternative 3***, the use of a vertical seawall in this location was found to be less conducive to the success of the proposed dune habitat restoration program than the proposed rock revetment, which is designed to be covered by sand.

The applicant's engineering consultants found that ***Alternative 5***, involving removal of the revetment and use of nourishment only, would not provide the necessary protection for existing residential development on the beach in the event that the proposed nourishment failed to maintain an adequate beach width. In regards to changes to beach nourish amounts and footprints, Alternatives 4, 8, and 9 failed to analyze reductions in the quantity and footprint of the proposed beach nourishment fill adequate to avoid adverse impacts to the identified sensitive rocky intertidal areas located at the western (upcoast) end of the project reach.

In respect to the alternative of relocating some or all portions of the as-built rock revetment further landward, the Commission notes that the presence of the septic systems with leach fields located on the sandy beach seaward of many of the residences is the principle factor in the determination of how far landward the revetment may be resited. In this case, 46 of the properties where the as-built revetment is located have septic system leach fields located on the sandy beach seaward of the existing residential structures. The majority of these septic system

leach fields generally extend approximately 40 - 70 ft. seaward of the residential structures. Coastal Commission have coordinated closely with City of Malibu Planning and Engineering staff regarding the required setbacks for septic systems from shoreline protection devices and City staff have indicated that the appropriate setback is no less than 5 ft. between any form long-term shoreline protective device and a septic system pursuant to the City's Environmental Health Division's Policies. In addition to meeting this provision of the City's Code, any new development must also be consistent with all provisions of the City's adopted LCP, which specifically provides that new shoreline protective devices shall be located as landward as feasible. Thus, pursuant to the City's typical requirements for septic systems, the rock revetment may be relocated as close as 5 ft. from the seaward of the septic system leach fields on each site. In this case, although the approximately 2,190 linear ft. upcoast end of the as-built rock revetment is located very close to the existing residential development on each site, the landward edge of the as-built revetment is located only approximately 5 – 20 ft. seaward of the leach fields on each property. Thus, it is not possible to relocate the revetment further landward on the western (upcoast) portion of the site given that this portion of the revetment is already located as landward as feasible.

However, the approximately 1,960 linear ft. portion of the revetment at the eastern (downcoast) end of the project reach is located in an area where the beach widens significantly. In fact, the seaward toe of the rock revetment along the downcoast portion of the site is located between 160 – 200 ft. of many of the residences at the downcoast of the end of the beach. Moreover, the landward edge of the as-built rock revetment is located approximately 80 – 100 ft. seaward of the majority of the septic system leach fields within this area. Thus, a feasible alternative would be to relocate the rock revetment landward to the line of the existing septic systems with the provision setback minimal 15 ft. setback or separation between the seaward limit of the leach fields and the landward edge of the rock revetment as generally shown on Exhibit 8. Although an even smaller 5 ft. setback between the revetment and leach fields would also be feasible and would serve to comply with the City of Malibu Environmental Health Review requirements, Commission staff is recommending the provision of a 15 ft. wide setback to allow for both the provision of the 10 ft. wide public access path on the landward side of the rock revetment pursuant to Special Conditions 1 and 14, as well as to provide for an adequate setback for geotechnical purposes.

Commission staff provided the above direction to the applicant regarding relocation of the as-built revetment further landward to the seaward extent of the existing septic systems with no more than a 15 ft. setback between the revetment and septic systems. In response, the applicant recently submitted a new revised alternative (***Alternative 6A)*** which would make provide for the relocation of approximately 1,280 linear ft. of the downcoast end of the revetment approximately 40 – 60 ft. further landward as shown on Exhibit 8. The applicants representatives have stated that although they are not proposing ***Alternative 6A***, the applicant would tentatively be in agreement with relocating a portion of the revetment consistent with this alternative if the Commission were to require it as a condition of approval of this permit. However, the applicant's ***Alternative 6A*** would neither relocate the revetment as far landward as the location identified by staff on Exhibit 8 nor would it relocate as long of a segment of the revetment. Under this new alternative by the applicant only approximately 1,280 linear ft. of the rock revetment (commencing at 30848 Broad Beach Road) would be resited to a location that would

still be approximately 40 -60 ft. seaward of the existing septic systems of the beach, and thus, approximately 25 – 45 ft. further seaward of the revetment location identified by staff in Exhibit 8. The applicant's engineering consultants have asserted that this relatively large distance of 40-60 ft. distance between the existing septic systems and the revetment is necessary to provide an adequate setback from potential wave uprush in the event that the proposed beach nourishment program fails to maintain an adequately wide beach and to provide protection for potential "future" leach fields that do not currently exist but which the applicant asserts might be constructed on the beach at some point in the future.

Specifically, one concern raised by the applicant regarding the size of the setback between the septic systems and leach fields and the revetment, is that these systems could be at-risk from extreme events and overtopping of the revetment by wave action. The proposed revetment and beach nourishment effort will greatly improve the protection of these existing systems above the unprotected condition. Nevertheless, some risks to the systems remain, including scour of the septic system or leach field by overtopping waves, or damage to the system if it is flooded by saltwater. Such overtopping is not expected unless the proposed nourishment project fails to maintain an adequately wide beach seaward of the relocated rock revetment.

As noted in the City of Malibu's Environmental Health Division's policies for properties with a long-term shore protection device:

> *The minimum horizontal distance between any portion of the onsite wastewater treatment system and the shoreline protection device, including returns shall not be less than five (5) feet measured horizontally.*

The required 5 ft. setback has been developed specifically to protect the onsite wastewater treatment system from possible scour inland of the shore protection. Although the Health Division's policies are not part of the adopted LCP, these policies are directly applicable to new onsite wastewater treatment systems on Broad Beach and provide guidance for the appropriate protection of the existing systems at Broad Beach. As such, the 15 ft. setback identified by Commission staff as appropriate between the onsite wastewater treatment system dispersal area and the shore protection device (the revetment) would exceeds the 5 ft. minimum setback required by the City and provides for more than adequate separation.

In addition, the City of Malibu's Environmental Health Division also has policies for the location of onsite treatment systems for properties without shoreline protection devices or with only temporary protection requiring the provision of a 15 ft. setback for new septic systems and leach fields from the maximum wave uprush scour line. In this case, although Special Condition Two (2) would limit the term of authorization for this coastal development permit, the proposed rock revetment is intended to function as a long-term shoreline protection solution, thus, the 15 ft. setback from the wave uprush limit for septic systems (as opposed to from the revetment itself) would not be applicable in this case). Regardless, the applicant's engineering consultants have noted that since the revetment is designed with a relatively low elevation to allow for dune construction, they believe the revetment is likely to be overtopped during certain storm events in the event that the proposed beach nourishment project fails to maintain an adequately wide beach

and that; therefore, the 15 ft. setback from the inland extent of the maximum run-up (which the applicant has delineated as being landward of the revetment) would be more protective and should be used. The applicant has provided site plans as part of their analysis of ***Alternative 6a*** that depict a possible inland relocation of the revetment that would provide for a 15 ft. setback from the maximum wave uprush limit effectively resulting in a configuration of the revetment that would, in most sections of the relocated segment, be approximately 40 to 60 ft. seaward of the septic system leach fields on site as shown on Exhibit 8.

Dr. Lesley Ewing has reviewed the applicant's alternative and noted that these plans show the inland extent of run-up and not of actual scour which would be farther seaward than the run-up extent. Moreover, based on her review of the project plans for this alternative, Dr. Ewing has concluded that since these properties will have shoreline protection (in the combined form of the rock revetment and beach nourishment project) the provision of a15 setback from the inland scour line is not appropriate in this case. The use of 15 ft. setback from the maximum wave uprush limit between onsite wastewater treatment system and the maximum run-up inland of the shore protection provides duplicative protection and there are other options to supplement the protection of the onsite wastewater treatment system that do not require a more seaward revetment location.

Thus, Dr. Ewing believes a 15 ft. setback between the rock revetment and the existing septic system leach fields on each site is appropriate in this case and this setback would be adequate to ensure protection of the existing leach fields, although some minor additional erosion control improvements may be necessary on certain sites such as the installation of a gravel or cobble blanket where leach fields are located. Specifically, Dr. Ewing finds that although some potential risk remains that some of the onsite wastewater treatment systems may subject to overtopping or salt water flooding with a setback of 15 ft. of separation between the rock revetment and the seaward extent of the leach fields, a feasible solution to provide protection, if necessary, would be to provide additional erosion control measures such as a gravel overlayer to the leach field to reduce scour, or install subsurface drainage improvements to reduce salt water flooding. Such site-specific options might be considered on a case-by-case basis for individual properties if such problems occur in the future. Based on her review of the project, Dr. Ewing determined that the more landward relocation of the revetment, as required pursuant to **Special Condition One (1)** will not interfere with the use of these potential site-specific erosion control measures. Dr. Ewing further concludes that given all of the project alternatives, a 15 ft. setback between the landward edge of the rock revetment and any leach fields (which will provided for a greater setback than the 10 ft. setback required pursuant to City of Malibu's Environmental Health Division's policies) would result in the least impact to coastal resources and be the most consistent with applicable Chapter 3 policies of the Coastal Act and the City of Malibu's LCP.

In addition, in their analysis of their revised alternative (***Alternative 6A***) the applicant failed to distinguish between existing septic leach fields and "future" leach fields which do not exist but are shown on the applicants plans as potential future expansion/replacement areas for septic systems. The applicant has asserted that property owners within the project reach have a right to develop these "future" leach fields. As discussed in detail in the above section titled Existing Development to be Protected (Section IV.B.3.a) although the existing septic systems constitute "existing" development which may be protected pursuant to Section 30235 of the Coastal Act,

the future construction of a new expansion or replacement leach field on these properties does not constitute existing development and; therefore, does not constitute development which is specifically entitled to be protected pursuant to any form of shoreline protection. Moreover, construction of a new or "future" leach field would require the issuance of a discretionary coastal development permit in which all feasible alternatives must be considered, including relocation of all septic system improvements to a further landward area of the site and/or rehabilitation and re-use of the existing leach field on site in order to avoid any further seaward encroachment by development on site.

Moreover, in past permit actions involving the redevelopment of existing residential properties, both the City of Malibu and the Coastal Commission have required that new septic systems (including leach fields be located as landward as feasible to minimize their encroachment onto the beach. In addition, the adopted LCP requires the use of alternative onsite wastewater treatment system (AOWTS) for new development on beachfront properties, such as the properties on Broad Beach, which typically occupies a smaller area of beach than traditional systems and provides a substantially higher level of effluent treatment. Moreover, neither the City nor the Commission has typically authorized "future" locations for leach fields, if such fields would result in additional encroachment onto a sandy beach, since these leach fields may be rehabilitated in place. Specifically, in the event that a leach field reaches filtration capacity it is feasible to excavate the leach field area and replace the footprint with a new volume of sand materials eliminating the need for the identification of a "future" field in a different location on the site. For instance, in 2010 and 2011, the City of Malibu approved CDPs 10-063 and 11-050 for the demolition of existing residences and construction of new residences oat 31260 and 31302 Broad Beach Road, within the area of Broad Beach that is subject to this application. In both of the coastal development permit actions, the City specifically required the applicants to submit project plans showing only a single Onsite Alternative Wasterwater Treatment System leach field in the most landward location feasible, with no provision for any "future" field on site.

Thus, in this case, the Commission finds that the revetment configuration identified by the applicant as ***Alternative 6A*** (Partial Revetment Pullback) would relocate the revetment as far landward as feasible. Under this alternative by the applicant only approximately 1,280 linear ft. of the rock revetment (commencing at 30848 Broad Beach Road) would be relocated to a location that would still be approximately 40 -60 ft. seaward of the existing septic systems of the beach (**Exhibit 8**). As shown on Exhibit 8, an additional approximately 680 linear ft. section of the revetment could also be relocated landward for a total pullback of approximately 1,960 linear ft. of revetment. Moreover, the revetment could be feasibly relocated approximately 25 – 45 ft. further seaward of the revetment location under Alternative 6A also as shown on Exhibit 8.

The Commission has in past permit actions required that shoreline protective structures be located as far landward as feasible in order minimize adverse impacts on the beach profile and public access. In addition, the City of Malibu LCP, which is used as guidance in this permit action, requires that new shoreline protective structures be located as far landward as feasible to protect existing development. In this case it is feasible to relocate a larger segment of the revetment further landward which will serve to minimize the potential adverse impacts of the revetment on shoreline sand supply, coastal processes, and public access recreation, as required

by Section 30235 of the Coastal Act. Therefore, **Special Condition 1** requires the landward re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment (including all portions of the proposed rock revetment between 31350 Broad Beach Road and 30760 Broad Beach Road) so that the landward edge of the revetment is setback approximately fifteen (15) ft. from existing, legally-established septic systems/leach fields (excluding any designated "future" leach fields that had not yet been built at the time this application was submitted to the Commission) as generally depicted in Exhibit 8. The relocated revetment shall be configured in a manner that maintains a relatively straight or gently curving line as generally depicted in Exhibit 8. Short segments of the revetment may be located more than 15 ft. seaward from the existing leach fields if necessary to avoid creating sharp angles in the configuration of the revetment. All portions of the relocated revetment shall be configured as a single contiguous structure without any gaps or breaks (including the property at 30822 Broad Beach Road) and shall generally utilize the same design, size, and dimensions as the existing, as-built revetment. No portion of the revetment shall extend further upcoast than 31350 Broad Beach Road, nor further downcoast than 30760 Broad Beach Road. Further, to ensure that the project is implemented in a manner consistent with the revised plans required pursuant to Special Condition One (1), **Special Condition Three (3)** requires that the applicant shall implement and complete the landward re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment (including all portions of the proposed rock revetment between 31350 Broad Beach Road and 30760 Broad Beach Road) consistent with the requirements of Special Condition 1.A.1. within 1 year of the issuance of this permit. The Executive Director may grant additional time for good cause.

Moreover, failure to maintain the approved revetment in good condition may result in adverse impacts to the marine/beach environment and public access/recreation if errant rocks migrated unintentionally onto the sandy beach or surf zone. In order to the approved revetment is adequately maintained, S**pecial Condition Eleven (11)** requires that such maintenance or repair occur in a timely manner incorporating all Best Management practices. This condition provides that it is the property owner's responsibility to maintain the revetment in a structurally sound manner. Removing or re-depositing any debris, rock or material that becomes shall occur on an as-needed basis after such displacement occurs.

In addition, the Commission finds that given the experimental nature of the proposed rock revetment/beach and dune nourishment plan and given the dynamic variability of conditions in coastal areas, it is not possible to ensure that the proposed beach nourishment efforts will be adequate to establish and maintain the desired beach width seaward of the proposed revetment or to prevent the revetment from becoming exposed. Therefore, **Special Condition Two (2)** limits the duration of the period of time that development an approved development on a temporary basis only for a period of ten (10) years from the date of Commission action. After such time, the authorization for continuation and/or retention of any development approved as part of this permit (including, but not limited to, the rock revetment and beach re-nourishment/backpassing activities) shall cease. **Special Condition Two (2)** further requires that prior to the date that authorization for the development expires (10 years from the date of Commission action), the applicant or successor in interest shall submit a complete coastal development permit application for the re-authorization of the beach nourishment program and to retain the rock revetment for an

additional ten (10) year term, if necessary, to protect existing development at risk from wave hazards and tidal action.

Further, **Special Condition Twelve** provides that any future redevelopment of any property located landward of the revetment alignment as stipulated in Special Condition One (1) (i.e. 31350 Broad Beach Road to 30708 Broad Beach Rd.) shall not rely on the permitted revetment to establish geologic stability or protection from hazards. Redevelopment on all properties within the area that is subject to this coastal development permit shall be sited and designed to ensure geologic and engineering stability without reliance on shoreline or bluff protective devices consistent with development standards and policies of the City of Malibu LCP. As used in this condition, "redevelopment" is defined to include: (1) additions, or; (2) expansions, or; (3) demolition, renovation or replacement that would result in alteration to 50 percent or more of an existing structure. Moreover, to ensure that this critical information regarding potential impacts to marine resources is recorded and reported to the Executive Director for consideration of future project approvals, **Special Conditions Four (4) and Six (6)** requires that extensive monitoring of the effects of the project on shoreline processes be implemented to assess the effects of the permeable pier sand retention system and beach nourishment program for the term of this permit. Further, to ensure that the project complies with all other regulatory requirements, **Special Condition Seventeen (17)** requires the applicant submit evidence to the Executive Director that all local, State and Federal permits necessary for the proposed project have been obtained.

In addition, Coastal Act section 30620(c)(1) authorizes the Commission to require applicants to reimburse the Commission for expenses incurred in processing CDP applications. *See also* 14 C.C.R. § 13055(e). Thus, the Commission is authorized to require reimbursement for expenses incurred in defending its action on the pending CDP application. Therefore, consistent with Section 30620(c), the Commission imposes **Special Condition Nineteen (19)**, requiring reimbursement of any costs and attorney's fees the Commission incurs "in connection with the defense of any action brought by a party other than the Applicant/Permittee challenging the approval or issuance of this permit."

In conclusion, the Commission finds that the proposed project, only as conditioned, will be consistent with provisions of Section 20235 of the California Coastal Act.

5. <u>Beach Nourishment Program</u>:

The project also includes the importation of 600,000 cu. yds. of material to provide donor material for beach nourishment on site. Beach nourishment to establish a wider sandy beach at the subject site will serve to enhance public recreational and access opportunities and provide greater protection of public property and infrastructure at risk from shoreline erosion. Section 30233 of the Coastal Act allows filling of coastal waters (or wetlands) only where feasible mitigation measures have been provided to minimize adverse environmental effects, and for only the following seven uses listed in Section 30233(a) of the Coastal Act:

> ***(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.***

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.
(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.
(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.
(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.
(6) Restoration purposes.
(7) Nature study, aquaculture, or similar resource dependent activities.

In this case, the proposed fill would restore former public beach areas where erosion has narrowed the width of the beach. Sand deposition for beach restoration is an allowable use of fill pursuant to Section 30233(a)(5) of the Coastal Act. Coastal Act Sections 30230 and 32031 also require that the proposed development be carried out in a manner that protects water quality, biological productivity and marine resources.

At erosional shorelines, such as the current condition at Broad Beach, the active dune (foredune) forms shift inland as the beach retreats. If there is no space for the dune to shift inland as the shoreline erodes, the dunes will not persist. Since 2005, wave-caused erosion, the construction of sandbag walls and the emergency rock revetment in 2010 resulted in the loss of a substantial area of beach and dune habitat along broad beach

In regards to the use of beach nourishment as an alternative to the use of the rock revetment, the proposed project already includes of the importation of 600,000 cu. yds. of sand material from sand quarries located approximately 40-45 miles inland of the project site. As proposed, the reconstructed/post-nourishment combined beach and dune system would extend approximately 250 ft. (at its widest point) seaward from the top of the as-built revetment to the surf zone with approximately 65-110 ft. of beach area located seaward of the constructed toe of the dunes.

The project also includes backpassing operations (transporting sand from wider downcoast areas of the beach to upcoast areas of the beach) on an annual basis for a period of 20 years, if needed for the purpose of maintaining adequate beach width for a prolonged period of time. As proposed, the applicant would conduct a single renourishment of the beach 10 years after the initial nourishment had been completed. As designed, the proposed rock revetment would be buried beneath at least 4-8 ft. of imported sand material and the reconstructed dunes on site would be revegetated with native dune plant species.

The applicant has submitted a coastal engineering analysis for the proposed project by Moffatt and Nichol analyzing how the proposed beach nourishment project is expected to function. In order to analyze the potential effects of the proposed permeable pier sand retention system, the applicant utilized GENESIS (Generalized Model for Simulating Shoreline Change) which was developed by the United States Army Corps or Engineers (USACE) Coastal Engineering Research Center. GENESIS is a computer program that predicts the shift in the position of the shoreline at mean sea level from a designated starting point, existing conditions in this case, in response to a proposed action. It utilizes data of existing shoreline conditions, wave conditions,

and proposed Project changes (beach fills and/or structures) to calculate sediment transport, consequent erosion and deposition, and resulting changes in shoreline position. Model predictions should be considered as trends (i.e., erosion, accretion, no change) to be evaluated at the first order for planning, rather than absolute, accurate shoreline positions for any sort of precise engineering design.

The modeling predictions for the proposed nourishment project determined that the nourished beach would be expected to be lost due to erosion within 3 to 8 years from completion of the project. The Engineering Analysis by Moffatt & Nichol dated October 2013 states:

> *The Genesis model predictions for a 600,000 cy [cu. yds.] beach nourishment assume the existing revetment is maintained in its current location…The rate of beach loss is greatest at the west end of Broad Beach and indicates the nourished beach may only last 3 to 5 years near Point Lechuza. In contrast, the model results suggest beach nourishment may last up to 7 or 8 years at the east end of Broad Beach.*

Thus, while the proposed sand nourishment will offset or partially offset the adverse effects to shoreline sand supply from the proposed rock revetment for the period of time that the nourishment material remains on the beach, it is expected that the nourishment sand will be lost over time and the revetment exposed both during and after the 20 year period that such nourishment activities are proposed. Further, although the applicant is requesting permanent authorization of the rock revetment pursuant to this application, the applicant is not committing to any future beach nourishment activities after 20 years. Thus, as proposed, although the benefits to shoreline sand supply from the proposed nourishment would be temporary for a period of 20 years, the adverse impacts resulting from the proposed authorization of the rock revetment would be permanent.

Moreover, Commission Staff Coastal Engineer, Dr. Lesley Ewing, has reviewed the results of the applicant's GENESIS modeling and concluded that the GENESIS modeling performed by the applicant's engineering consultants is generally adequate from an engineering perspective although it must also be acknowledged that all predictive models include some inherent possibility for error and cannot guarantee certainty in regards to predicting the effects of any project for specific year-to-year changes. Further, given the dynamic ever changing nature of the beach morphology and coastal process acting on this beach it is very difficult to model or predict how the beach nourishment program will perform over time as well as predict if unanticipated changes could result in adverse impacts to marine resources and habitats.

As proposed, the project would only provide for an initial nourishment of 600,000 cu. yds. of sand on the beach during the first year and a second approximately 450,000 cu. yds. of sand during the tenth year of the program. No additional nourishment activities are proposed although the applicant would conduct periodic sand back-passing operations to occur no more than once per year. However, as stated above, the applicant's engineering consultant has determined that the proposed initial nourishment may only be adequate to maintain an a widened beach area seaward of the revetment for 3-8 years within the project reach. Although not included as part of the proposed project, the applicant's representatives have indicated that the applicant would be tentatively in agreement with a revised nourishment schedule that would allow for a smaller

amount of nourishment (300,000 cu. yds.) to occur every 5 years for the 20 year term of the permit (consistent with ***Alternative 4b*** submitted by the applicant and described in detail in Section IV.B of this report). As discussed in detail in Section IV.B. (Marine Resources and Water Quality) of this report, in order to avoid or minimize adverse impacts to marine resources while still allowing for nourishment to occur, **Special Condition One (1)** requires a reduction in the amount of initial sand placement to no more than 300,000 cu. yds. of material.

However, given the experimental nature of this project and due to the fact that it is not possible to predict with certainty whether the proposed beach/dune nourishment program will serve to maintain a widened beach condition on site adequate to prevent erosion of all dry sandy beach areas seaward of the revetment and/or to prevent the revetment from becoming exposed. Therefore, in order to ensure that a an adequately wide beach area is maintained on site seaward of the revetment to avoid or minimize adverse impacts to coastal resources and scenic coastal views, Special Condition Four (4) requires the applicant the applicant submit, for the review and approval of the Executive Director, a Final Adaptive Management and Monitoring Plan that would require that renourishment on an as-needed basis (rather than once every ten years) if certain triggers are reached, including if the beach narrows to a specific identified threshold width. Specifically, Special Condition Four (4) requires that a s*mall-scale Interim* Renourishment would be required if the dry beach width at Profile 410 (as shown on Exhibit 12) is narrower than 30 feet for 6 consecutive months, and is recorded by two (2) consecutive full beach profiles, and, there is insufficient sand at the backpass source location for backpassing to occur. In addition, a *Major Renourishment* would be required if the dry beach width at Profile 410 is narrower than 30 feet for 12 consecutive months, and is recorded by three (3) consecutive full beach profiles, and, there is insufficient sand at the backpass source location for backpassing to occur. Further, Special Condition Four (4) provides for small-scale interim renourishment and major renourishment to occur on an as-needed basis to ensure that the protective beach and dune system that will be maintained at an adequate width, to the extent feasible.

Moreover, to ensure that this critical information regarding potential impacts to marine resources is recorded and reported to the Executive Director for consideration of future project approvals, **Special Condition Four (4)** requires that an extensive monitoring program be established to investigate shoreline conditions, report any changes and respond promptly and pro-actively to these changes**. Special Condition Four (4)** requires that the monitoring provisions of the Final Adaptive Management Plan be revised to require that all monitoring shall conducted for the life of the project. The applicant shall also be required to submit, on an annual basis, all survey data and a written report prepared by a qualified coastal engineer indicating the results of the shoreline profile and beach width monitoring program. The annual monitoring report shall include conclusions regarding the level of success of the project, a detailed analysis of any increase or decrease in beach widths and shoreline erosion rates, changes in the frequency and/or duration of all Trancas Creek lagoon mouth opening/closure events, details on any nourishment and/or backpassing efforts undertaken during the year with the volume and placement location specified.

Furthermore, to ensure that potential adverse effects to coastal resources areas are minimized, **Special Condition Two (2)** also requires that five (5) years from the date of issuance for this coastal development permit, the applicant shall submit a report to the Executive Director, documenting the status of the project and the Beach Nourishment and Management Program. The report shall summarize the results and findings of the annual physical and biological monitoring reports and the status of alternative sewage treatment feasibility study as required pursuant to Special Conditions 4, 5, 6, 7 & 16. Should the monitoring reports reveal any significant adverse resource/ habitat impacts, and/or the Beach Nourishment and Management Program is not performing as anticipated, the Executive Director may require the submittal of a permit amendment, to address and evaluate mitigation measures to compensate for any adverse resource/habitat impacts and/or require any mid-course corrections or adjustments to the Beach Nourishment and Management Program.

However, the Commission also finds that the marine and beach environment within the project site area are dynamic systems that are subject to potential changes over time as new species migrate into the area or as potential unidentified impacts from the proposed dredging operation may be discovered over time. Moreover, given the experimental nature of this project, it is not possible to ensure that the proposed beach nourishment efforts will be adequate to establish and maintain the desired beach width seaward of the proposed revetment or to prevent the revetment from becoming exposed. Therefore, **Special Condition Two (2)** also limits the duration of the period of time that development an approved development on a temporary basis only for a period of ten (10) years from the date of Commission action. After such time, the authorization for continuation and/or retention of any development approved as part of this permit (including, but not limited to, the rock revetment and beach re-nourishment/backpassing activities) shall cease. **Special Condition Two (2)** further requires that prior to the date that authorization for the development expires (10 years from the date of Commission action), the applicant or successor in interest shall submit a complete coastal development permit application for the re-authorization of the beach nourishment program and to retain the rock revetment for an additional ten(10) year term, if necessary, to protect existing development at risk from wave hazards and tidal action.

In addition, after consulting with Commission staff and various State and Federal resource agencies regarding the potential significant adverse habitat impacts associated with the placement of such a large amount of sand in the initial beach nourishment that would cover significant areas of rocky inter- and sub-tidal habitats particularly on the western end of the beach the applicant recently submitted a new alternative known as ***Alternative 4B*** which significantly reduces the amount of the initial sand fill for beach nourishment from 600,00 cu. yds. of sand to 300,000 cu. yds. However, for the reasons discussed in detail in Section IV.C (Marine Resources) of this report, even with the reduction in beach fill amounts identified by ***Alternative 4B,*** in order to avoid the impact of direct burial of marine resources, including sensitive rocky intertidal habitat, it is necessary to further reduce footprint of nourishment activities at the western (upcoast) end of the revetment pursuant to **Special Condition One (1).** **Special Condition One (1)** limits the both the amount of sediment/beach replenishment material and the footprint of deposition on Broad Beach to no more than 300,000 cu. yds. of material for

the initial nourishment event with no placement of sand upcoast of the property at 31380 Broad Beach Road.

The applicant's engineering consultants have asserted that the reduction in the western extent of sand placement pursuant to Special Condition One (1) would potentially undermine the success of the proposed nourishment project. this proposed project, as is true of many large scale projects, is multi-purpose and has multiple metrics for success. The proposed relocation of the westernmost limit for sand nourishment has been included to protect the ecological resources that are locations near to and west of the proposed nourishment limit. Such a project modification also necessitated a slight modification in other project goals and criteria for success. Moreover, Dr. Lesley Ewing, the Commission's Staff Engineer, has determined that although the change in sand placement location pursuant to Special Condition One (1) will reduce the volume of sand that will be placed or stored upcoast of 31380 Broad Beach Road, as noted by the modeling of sand transport, it is likely that natural wave action will move some sand to the beach and nearshore area west of 31380 Broad Beach Road, thus still providing for a small amount of sand to serve as feeder sand for times of eastern transport. In addition, the 300,000 cubic yards of sand will be available for transport within the rest of Broad Beach project area. This volume of sand can provide for a wider recreational beach at the central and eastern sections of the nourishment area, focusing the bulk of the recreational use away from the ecologically sensitive western shoreline area. The modifications to the sand placement will likely mean that it may not be possible to maintain sand cover over all the shore protection in the westernmost area, or that the shore protection in this area will be uncovered more quickly than in other locations.

Dr. Ewing also believes that a nourishment project of 300,000 cubic yards of nourishment sand focused on the west-central, central and eastern segments of the coast, with backpassing, small-scale interim sand additions and a shorter interval between renourishment events will still provide significant shore protection and recreational beach area. At Broad Beach the dominant downcoast transport direction is from west to east; however, as noted in the coastal engineering report, sand moved both up and down coast in the area and some of the nourishment sand will move westward and be stored for future eastward transport. Thus, Dr. Ewing has further determined that the western section of beach located upcoast of the property at 31380 Broad Beach Road where nourishment would not occur pursuant to Special Condition One (1) would be still be expected to widen slightly as a result of the downcoast beach nourishment operations; however, the beach will not be as wide as the nourished beach areas located downcoast and will not provide much additional protection to the development beyond the main defense for this area provided by the revetment and existing seawalls.

The westernmost section of the beach has been narrow for many years and the shoreline position had far less variability and sand loss that beach sections farther to the east. It is the beach areas to the east of this area that has experienced significant recent beach erosion and for which a wider beach will return the shoreline to the condition viewed as being the pre-erosion condition. While greater beach width at the westernmost section of beach might provide protection, Lechuza Point shelters this area from some storm events and the westernmost beach area has not relied upon a wide sand beach for protection.

Dr. Ewing concludes that the resulting section of the beach where nourishment will occur will still be approximately 1 mile in length and this is expected to be an adequate beach segment for undertaking beach nourishment as well as a backpassing program. The success of those efforts will not be put into jeopardy. As initially proposed, the beach areas would go through large 10-year cycles of widening and narrowing. The smaller sand volume, the back passing, the small-scale interim additions of sand and the more frequent renourishment intervals will provide for a more consistent inter-annual beach condition within the proposed project area.

In addition, the applicant has proposed use of much coarser sand (ranging in median grain size from 0.47 mm – 1.0 mm in diameter) for beach nourishment than the native sand currently found on Broad Beach (with a median grain size of 0.25 mm – 0.32 mm in diameter). The applicant's engineering consultants have stated that the use of the larger grain size is desirable from an engineering perspective in that sand nourishment is more likely to remain on the beach for a longer period of time. However, the coarser sand may affect which organisms will colonize the beach after the nourishment event. Further, the use of larger grain sizes will establish a slightly steeper shore face than the native sand. Thus, for the reasons discussed in detail in Section IV.C (Marine Resources) of this report, **Special Condition Eight (8)** has been required in order to minimize potential impacts to marine and coastal resources. This special condition would limit the allowed nourishment material to a median diameter (d50) between 0.24 mm and 0.6 mm. The 0.24 mm limit is the median diameter of the sand that is now present on Broad Beach and the 0.60 limit is the upper value of the sand material available from Grimes Rock where donor sand may feasibly be obtained.

The applicant's engineering consultants have indicated that any restriction in the allowable median grain size will adversely impact the ability of the nourishment project to maintain a widened beach condition for a longer duration of time. However, Dr. Ewing notes that the applicants have not performed any specific analysis of the beach changes that would result using nourishment material with a median grain size between 0.60 mm and 1.00 mm. Thus, based on the analysis submitted by the applicants engineering consultants it is not clear that the change in allowable grain size would significantly impact the expected duration of time that fill material would remain on the beach. However, given that the coarser than native examples provided by the applicant's engineering consultants had a "coarser" limit of about 0.60 mm or less, and given that the coarser sand present on the subject beach is only 0.24 mm in diameter, the grain size limit of 0.24 mm to 0.60 mm for the nourishment is already in excess of the sand coarseness identified on the subject site, and is at the upper limit of the difference between native and coarse nourishment sand used in recent nourishment efforts. Thus, the provisions required by **Special Condition 8** to limit the median grain size to more closely match the native sand on Broad Beach will still provide for a somewhat greater longevity of the nourishment sand over the native sand, without pushing the limits for an exceedingly coarser sand beyond what exists locally or have been used in other southern California nourishment projects.

Further, although the Applicant has previously tested the sediment in the areas proposed for sand acquisition and determined the material to be adequate for use for beach nourishment at the subject site, sediment conditions may be altered by a number of episodic factors, including heavy rainfall events or spills. Thus, the Commission finds that is not possible to ensure that chemical and contaminant levels of sediment will not change over time as the result of a single chemical

spill or contamination event. Therefore, to ensure that all future dredged material is physically and chemically compatible with the proposed deposition site and suitable for beach nourishment, the Commission finds it necessary to require **Special Condition Eight (8)** which requires the applicant to test the physical and chemical characteristics of representative samples of the dredging areas consistent with U.S. Army Corps of Engineers (Army Corps), Environmental Protection Agency (EPA), and State Water Resources Control Board and California Regional Water Quality Control Board (RWQCB) criteria for beach replenishment and dredging and disposal in intertidal areas prior to the commencement of dredging activities each year. In addition, **Special Condition Eight (8)** also ensures that dredged material meets minimum standards for particle sizes and distribution typically allowable for beach nourishment purposes.

In addition, the Commission notes, based on the information submitted by the applicant, that the proposed development is located in an area of the Coastal Zone which has been identified as subject to waves and surges, high surf conditions, erosion, and flooding. As such, the Commission notes that evidence exists that the project site is subject to potential risk. Although the proposed development is intended to reduce the potential for damage to park facilities on site from wave caused erosion, there remains some inherent risk to coastal development and the construction of any type of shoreline protective device. The Coastal Act recognizes that certain types of development, such as the proposed project, may involve the taking of some risk. Coastal Act policies require the Commission to establish the appropriate degree of risk acceptable for the proposed development and to determine who should assume the risk. When development in areas of identified hazards is proposed, the Commission considers the hazard associated with the project site and the potential cost to the public, as well as the individual's right to use his property. As such, the Commission finds that due to the unforeseen possibility of erosion, liquefaction, waves, flooding, and effects from sea level rise, the applicant shall assume these risks as a condition of approval. Therefore, **Special Condition Eighteen (18)** requires the applicant to waive any claim of liability against the Commission for damage to life or property which may occur as a result of the permitted development.

Therefore, for reasons discussed in the preceding section, the Commission finds that the proposed project, only as conditioned, is consistent with Coastal Act Sections 30233, 30235, and 30253.

C. MARINE RESOURCES AND WATER QUALITY

Section 30230 of the Coastal Act states:

> *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.*

Section 30231 of the Coastal Act states that:

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.

Section 30233 of the Coastal Act states that:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, 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:

(l) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the l9 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that not less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay, shall be designed and used for commercial fishing activities.

(d) Erosion control and flood control facilities constructed on water courses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.

Additionally, the certified City of Malibu Land Use Plan contains the following policies that serve as guidance:

3.1 As set forth in Policy 3.4, any marine area that meets the ESHA criteria, including Areas of Special Biological Significance and Marine Protected Areas (as designated by the California Department of Fish and Game) is ESHA, and shall be accorded all of the protections provided for ESHA in the LCP.

3.2 Marine ESHAs shall be protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. Residential, commercial, or institutional uses shall not be considered resource dependent uses.

3.3 Permitted land uses or developments shall have no significant adverse impacts on marine and beach ESHA.

3.4 Development on beach or ocean bluff areas adjacent to marine and beach habitats shall be sited and designed to prevent impacts that could significantly degrade the Environmentally Sensitive Habitats Areas. All uses shall be compatible with the maintenance of the biological productivity of such areas.

3.5 New development shall prevent or reduce non-point source pollution in the near shore environment through implementation of the non-point source pollution and private sewage disposal system policies.

3.6 Grading and landform alteration shall be limited to minimize impacts from erosion and sedimentation on marine resources.

3.7 Marine mammal habitats, including haul-out areas shall not be altered or disturbed by development of recreational facilities or any other new land uses.

3.8 Efforts by the California Department of Fish and Game and Regional Water Quality Control Board to increase monitoring to assess the conditions of near shore species, water quality and kelp beds, and to rehabilitate or enhance areas that have been degraded by human activities shall be encouraged and allowed.

3.9 Near shore shallow fish habitats and shore fishing areas shall be preserved, and where appropriate and feasible, enhanced.

The Coastal Act and City of Malibu Local Coastal Program (LCP) policies identified above require the protection of marine resources, particularly in areas of special biological significance. Marine resources must be maintained, enhanced or restored, as required by Section 30230 of the Coastal Act. Section 30230 further requires that special protection be given to areas and species of special biological or economic significance. Uses of the marine environment must be carried out in a manner that will sustain the biological productivity of coastal waters. The biological productivity and the quality of coastal waters appropriate to maintain optimum populations of marine organisms and for the protection of human health must be maintained. Development in areas adjacent to sensitive marine habitat areas, marine parks, sensitive habitats protected by federal or state laws, MPAs, and recreation areas, must be sited and designed to prevent impacts which would significantly degrade those areas. Certain types of development are allowed in open coastal waters where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects. The Coastal Act allows mineral extraction, including sand for restoring beaches in coastal waters, except in environmentally sensitive areas. Additionally, the material removed from erosion and flood control facilities on streams may be placed at appropriate points on the shoreline. While the Coastal Act does not specifically provide for the placement of sand from other sources, the Commission has consistently interpreted the restoration of beaches to be a permitted use in open coastal waters. In such projects, the Commission has addressed the impacts on marine resources by considering the timing of deposition of the material on the beach, the composition of the material, the location of the receiver beach, and the presence of environmentally sensitive resources.

Marine Resources at Broad Beach

The marine habitats in and immediately adjacent to the proposed project footprint include upper sandy beach, intertidal sandy beach, rocky intertidal (bedrock, boulders, cobble at Lechuza Point), intertidal boulder field, soft bottom subtidal that supports eelgrass beds and soft bottom epi- and infaunal invertebrates (e.g. sand dollar beds), hard bottom subtidal (bedrock and cobble rocky reef) that supports kelp beds and understory algae and invertebrates, as well as several special status species. While these habitats are treated separately here, they comprise a vital transition zone interconnected by complex physical and biological interactions that occur across variable spatial and temporal scales and that inexorably link terrestrial and marine ecosystems.

Significance of Resources
The Coastal Act requires that special protection be given to marine areas and species of special biological or economic significance. The significance of the marine resources in the Broad Beach and surrounding areas has long been recognized by State and Federal resource agencies, and local government.

Areas of Special Biological Significance
The California State Water Quality Control Board (Resolution No 74-28), designated certain Areas of Special Biological Significance (ASBS). The ASBS (most recently referred to as State Water Quality Protection Areas – Areas of Special Biological Significance) are intended to afford special protection to marine life through prohibition of waste discharged to ocean waters. The concept of "special biological significance" recognizes that certain biological communities, because of their value or fragility, deserve very special protection that consists of preservation and maintenance of natural water quality conditions.

Broad Beach is located within the Mugu Lagoon to Latigo Point ASBS (#24), which contains five major habitat types: a barrier beach, open coast kelp beds, open coast sandy beaches, semi protected kelp beds and submarine canyons, the combination of which is unique to all of southern California. The reconnaissance survey report prepared through an interagency effort between California Department of Fish and Game and the SWRCB for ASBS #24 (in March of 1979) states that the Trancas/Zuma beach is representative of these special open coast sandy beach habitats and possesses the most extensive untouched subtidal sand communities in the region. The survey report states that "the community structure of Trancas and Zuma is dominated by sand dollars, sea pansies, and pismo clams and the margins of the beach contain peculiar community interfaces between areas of rock and sand." The ASBS baseline report points out that the surfgrass (*Phyllospadix torreyi*), which commonly occupies these nearshore rock/sand interfaces and rocky intertidal zones is a very important member of the subtidal ASBS community and that its presence near the high energy surf zone tends to reduce wave energy, thus decreasing wave caused erosion. The report goes on to say that, "this true grass has roots which attach to the rocks; soil, which is rich in decaying organic material, accumulates around the roots. These soil areas contain a number of obligate understory species, including certain annelid worms (lumbrinereids) which clearly could not exist in these surf swept locations without the protection afforded by the surf grass roots. Other organisms have obligate relationships with the blades of this plant. [..] An important relationship has been demonstrated between surfgrass and the lobster, *Panulirus interruptus*." *Phyllospadix* surfgrass, acts as a nursery for juvenile lobster and is apparently very long lived, up to 50 years, and recruits slowly. The ASBS baseline report concludes that, "This species [phyllospadix surfgrass] therefore

warrants special protection from both physical removal and potential pollutants as it has a particularly important ecological role and is not easily replaced." Additionally, the report also identifies that there are extensive offshore rocky reefs at Lechuza point that support eel grass beds. Specifically it states that, "The bed at Lechuza Point has remained there for several years and is fairly large (2-5 meters wide x 40 meters long)."

Other sensitive and special resources identified in the Trancas Beach and Lechuza Point region include extensive sand dollar and pismo clam beds, tube worms, kelp forests, nearshore sand habitats, and sandy bottom habitats (offshore sands). The intent of the ASBS designation was to protect, maintain, and enhance these special marine resources and the overall water quality of the area. As such, this baseline report also included potential threats to the ASBS objectives. Of these, seepage from septic tank leaching along this stretch of the coast was identified as a primary threat to water quality and marine habitats. Additionally, the report also includes 'dredging and/or spoil disposal' as a potential point source pollution threat to the resources of the ASBS. The intent of the ASBS and the Ocean Plan is to maintain habitat integrity of these special marine resource areas even in those sections of the coast experiencing ongoing and intensifying coastal developments. This report was compiled and adopted long before the establishment of the Marine Protected Areas up and down California's coast, however, it includes the following statement, "Maintenance of habitat within the ASBS available for recolonization [of sensitive and valuable marine species] in the future is essential to assure continued recruitment and potential recovery of these species to their previous levels. In addition, this area can act as a reservoir for recruitment into nearby areas in which populations have been depleted by fishing pressure, adjacent land development and/or deteriorating water quality."

The protection of these ASBSs is regulated through the California Ocean Plan, which, exempts dredged material from the definition of 'waste'. However, because the sand materials proposed for deposition by the applicant is from an inland source, and not an offshore source, the deposition is subject to the specific requirements and restrictions of the Ocean Plan. As such, the sand deposition portion of the proposed project may require an exception to the Ocean Plan in order to proceed with the proposed deposition of "waste" within the ASBS area.

Marine Protected Areas

The Marine Life Protection Act (MLPA) of 1999 required the California Department of Fish and Wildlife to redesign its system of marine protected areas (MPAs) to increase the protection of the state's marine life, habitats, and ecosystems. For the purposes of MPA planning, a public-private partnership (MLPA Initiative) was established, and the state was split into five distinct regions (four coastal and the San Francisco Bay) each with its own MPA planning process. There are different classifications used in California's MPA network. This includes three MPA designations (State Marine Reserve, State Marine Conservation Area, State Marine Park), a marine recreational management area (State Marine Recreational Management Area), and special closures. Access into marine protected areas or marine managed areas for non-consumptive uses including but not limited to swimming, surfing, diving, boating, hiking, and walking is allowed unless otherwise specified in individual MPA regulations. Unless authorized by the Fish and Wildlife Commission or as a result of authorized fishing activities, the release of any fish or wildlife species, including domestic or domesticated species, or the introduction of

any plant species, is prohibited. The department may reintroduce endemic species to marine protected areas or marine managed areas for management purposes.

Broad Beach is located within the Point Dume State Marine Conservation Area. Each MPA has specific objectives designed to help achieve the goals of the MLPA. The Point Dume SMCA was established to protect "some of the most diverse habitats in Los Angeles County", including unique rocky reef structures, extensive kelp and surfgrass, diverse understory algal habitat, and the biological diversity associated with those habitats. Additionally, this SMCA was located within the ASBS to take advantage of the water quality protections provided through the Ocean Plan. Further, the Point Dume SMCA is part of a system of MPAs that function together to protect marine resources. According to the California Department of Fish and Wildlife:

> Point Dume SMCA/Point Dume SMR are an important cluster of MPAs that provide moderate or greater levels of key hard bottom habitats, including rocky shores, nearshore reefs (0-30meters(m)), 30m and deeper reefs, as well as biogenic habitats that are supported by nearshore reef habitats, including kelp and surfgrass. Moreover, the kelp and shallow 0-30m hard substrate habitats within these two MPAs facilitate dispersal and connectivity along the mainland between the Campus Point SMR and the cluster of MPAs off Palos Verdes (Point Vicente No Take SMCA and Abalone Cove SMCA).[6]

The specific protection provisions of the Point Dume SMCA state that the take of all living marine resources is prohibited except:

1. The recreational take by spearfishing of white sea bass and pelagic finfish is allowed.
2. The commercial take of swordfish by harpoon and coastal pelagic species by round haul net, brail gear, and light boat is allowed. Not more than five percent by weight of any commercial coastal pelagic species catch landed or possessed shall be other incidentally taken species.
3. Take pursuant to beach nourishment and other sediment management activities is allowed inside the conservation area pursuant to any required federal, state, and local permits, or as otherwise authorized by the department.

While the Point Dume SMCA regulations allow certain sand nourishment and other sediment management activities, significant burial of marine habitat is inconsistent with the intent of this provision. According to California Department of Fish and Wildlife staff: "The regulations that were established for the Point Dume SMCA do not have provisions to allow for significant or adverse impacts that would require compensatory mitigation within this area".[7]

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[6] California Department of Fish and Wildlife, Revised Analysis of Impacts to Public Trust Resources for the Broad Beach Restoration Project Letter, August 8, 2014

[7] Revised Analysis of Impacts to Public Trust Resources for the Broad Beach Restoration Project, letter to California State Lands Commission, dated August 11, 2014.

Essential Fish Habitat and Special Aquatic Sites

The areas offshore Broad Beach also include Essential Fish Habitat, as provided in the Magnuson-Stevens Fishery Conservation and Management Act. Essential fish habitat (EFH) is that habitat necessary for managed fish to complete their life cycle. It is defined as those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. Whenever federal agencies authorize, fund, or carry out actions that may adversely impact EFH, they must consult with the National Marine Fisheries Service.

Additionally, two of the of the six Special Aquatic Site types (sanctuaries/refuges and vegetated shallows), that are given special recognition under Clean Water Act regulations, occur at Broad Beach. [8] Special Aquatic Sites are defined as: "Geographic areas, large or small, possessing special ecological characteristics of productivity, habitat wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region". The Sanctuaries/Refuges designation applies to areas designated as such under state and federal laws or local ordinances. Vegetated Shallows are: "permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as turtle grass and eelgrass in estuarine or marine systems…"

Environmentally Sensitive Habitat Area

In recognition of the rarity and sensitivity of marine habitats, the City of Malibu Land Use Plan (Policy 3.74) states that: "All Areas of Special Biological Significance and Marine Protected Areas shall be considered ESHA and shall be accorded all protection provided for ESHA in the LCP." The LUP requires that marine ESHAs are protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. Further, the LUP requires that near shore shallow fish habitats and shore fishing areas must be preserved, and where appropriate and feasible, enhanced.

Proposed Project

The applicant proposes to retain the revetment in the existing location and place 600,000 cu. yds. of sand in a beach fill and to construct dunes over the top of the revetment. The proposed project would include the placement of sand fill in the upcoast areas of Broad Beach, all the way to Lechuza Point. At the westernmost end of the cove, the sand fill is proposed to extend approximately 162 feet seaward, including 107 feet of beach and a 56 foot wide dune form. Further downcoast, the width of the sand fill transitions to a width of approximately 263 feet, including 215 feet of beach and a 48 feet wide dune form. From the upcoast end of the revetment along the remainder of the project site, the proposed sand fill would be approximately 300 feet

[8] 40 CFR Part 230 –Section 404(b)(1) EPA and ACOE Guidelines for Specification of Disposal Sites for Dredge or Fill Material (EPA and ACOE) Subpart B – Compliance With the Guidelines, Subpart D-Potential Impacts on Biological Characteristics of the Aquatic Ecosystem, Subpart E. Potential Impacts on Special Aquatic Sites, Subpart H-Actions to Minimize Adverse Effects, Subpart J-Compensatory Mitigation for Losses of Aquatic Resources.

wide, with dune creation/restoration approximately 50 feet wide and located on and landward of the revetment.

The project also includes backpassing operations (transporting sand from wider downcoast areas of the beach to upcoast areas of the beach) on an annual basis for a period of 20 years, if needed for the purpose of maintaining adequate beach width for a prolonged period of time. As proposed, the applicant would conduct a single renourishment of the beach 10 years after the initial nourishment had been completed. As designed, the proposed rock revetment would be buried beneath at least 4-8 ft. of imported sand material and the reconstructed dunes on site would be revegetated with native dune plant species.

One of the biological resource concerns raised by the project is the potential for direct or indirect burial of organisms on the beach and in the nearshore environment by the placement of sand. Burial of habitats will result in mortality of species that cannot tolerate the amount of sand and/or are not sufficiently mobile to flee to other areas. These impacts could potentially shift population dynamics of the beach and nearshore ecosystems as well as affect available prey sources for nearshore fish and avian populations. If persistent over a long temporal scale or if impacts occur repeatedly, certain habitats will be lost within and adjacent to the impact area and converted to other habitat types. Additionally, significant shifts in grain size conditions could also alter the physical beach environment and result in diversity and abundance changes in the beach system species assemblage.

Based on detailed surveys of existing marine resources in the project area, the applicant's consultants have quantified the areas within various habitat categories that would be directly impacted by the sand fill aspect of the proposed project. The direct impacts are those resulting from sand burial within the proposed footprint of the beach nourishment. The applicant's consultants considered the direct fill of sand on both intertidal and subtidal sandy bottom to be a temporary impact, regardless of the depth of coverage. They argue that these habitats are adapted to periodic burial. Although the initial placement of many feet of fill in sandy habitats would result in substantial mortality of species, the applicant's consultants conclude that organisms would re-colonize these areas quickly.

The applicant's consultants also estimated potential indirect burial impacts by modelling the areas outside the sand placement footprint where sand is expected to migrate over time. Again, the applicant's consultants considered indirect impacts to sandy bottom habitats (both intertidal and subtidal) to be temporary for the reason described above. With regard to other habitat types, the applicant's agents have stated that the appropriate threshold for determining indirect permanent impacts to marine resources resulting from burial by sand is one foot of sand that buries rocky habitats for more than one year (1 foot/ 1 year). In other words, the applicant has asserted that rocky areas where sand burial resulting from the proposed beach fill would be less than 1 foot deep as measured 1 year after the placement of sand on the beach should not be considered a permanent impact.

Following are the applicant's consultants' estimates of the areas (in acres), by habitat type, that would potentially be impact directly or indirectly by the proposed project[9]:

	Direct Burial (acres)		Indirect Burial (acres)	
Habitat Type	**Permanent**	**Temporary***	**Permanent**	**Temporary***
Surfgrass	0.96	0	0.96	0.96
Kelp	0	0	1.70	3.50
Kelp attached to bedrock	0	0	0.88	2.30
Rocky Outcrop	0.02	0	0.02	0
Bedrock Intertidal	0.03	0	1.91	0
Bedrock Subtidal	0	0	0.08	0.16
Cobble/Rubble Intertidal	1.20	0	1.37	0
Cobble/Rubble Subtidal	0.06	0	2.60	2.80
Boulder Field	0.71	0	0	0.71
Sandy Bottom Intertidal	2.25	20.5	2.25	22.8
Sandy Bottom Subtidal	0	13.5	0	51.8
Total	5.23	34	11.77	85.03

* Temporary impact is defined by the applicant as habitat area buried by sand that is less than 1 foot deep at one year after the sand placement.

Exhibit 13 shows the applicant's estimate of areas of direct impact (proposed beach nourishment footprint), permanent indirect impacts, and temporary indirect impacts. The Commission's ecologist, Dr. Jonna Engel has prepared an analysis of the project: "Potential Impacts of the Broad Beach Geologic Hazard Abatement District Proposed Project on Terrestrial and Marine Resources In and Adjacent to Project Footprint, Broad Beach, Malibu, California" dated November 25, 2014. The Commission incorporates the findings of that analysis here as if set forth in full. The proposed project will have significant permanent impacts (loss of habitat/habitat conversion) to surfgrass, kelp forest, intertidal and subtidal hard and soft bottom habitats. While it is important to characterize the separate types of marine habitat that are present, it is also critical to note that these habitats are interconnected. When taken together, the permanent direct and indirect impact areas would result in the complete loss of a substantial portion of the sensitive habitats at the western end of Broad Beach, near Lechuza Point.

In addition, there would be indirect impacts that the applicant has estimated to be temporary, based on the threshold of 1 ft. of sand burial after 1 year. In order to model the potential indirect impacts of the beach fill, it was necessary to choose a threshold whereby an impact would be identified. However, as discussed in greater detail below, the Commission's ecologists Dr. Jonna Engel and Dr. John Dixon have determined that this threshold would underestimate potential

[9] The values in this chart were compiled from tables of Estimated Predicted Temporary Impact of Direct Fill and Indirect Fill to Vicinity, prepared by Moffat & Nichol, June 26, 2014

indirect impacts because many of the marine resources onsite are acclimated to much narrower tolerances of sand burial. Furthermore, it is impossible to come up with a single threshold for temporary vs permanent impacts because the individual algal and invertebrate species inhabiting nearshore marine habitats are adapted to sand inundation to greater or lesser degrees and all respond differently. As such, using this threshold underestimates the areas that would be subject to permanent impact.

The proposed project will result in significant adverse impacts to marine resources. As proposed, marine resources on the project site would be diminished, not maintained, enhanced or restored, inconsistent with Section 30230 of the Coastal Act. Section 30230 also requires that special protection be given to areas and species of special biological or economic significance. State and Federal resource agencies have long recognized the special biological significance of the marine resources that exist on the project site, in particular the western area of the site. The project, as proposed, would not give special protection to this area or the marine species found there. The use of the marine environment on the project site for beach nourishment and the protection of residential development, as proposed, would not be carried out in a manner that would sustain the biological productivity of coastal waters or that would maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes. The biological productivity and the quality of coastal waters, appropriate to maintain optimum populations of marine organisms would not be maintained or restored by the proposed project, inconsistent with the requirements of Section 30231 of the Coastal Act. Further, the proposed project would not be consistent with the marine resource policies of the certified Malibu LCP that provide guidance. Specifically, the proposed project would not conform to Malibu LUP Policy 3.75 because the significant adverse impacts to marine habitat would not protect Marine ESHA (as designated by the LCP) against significant disruption of habitat values. Finally, the sand burial impacts would not preserve or enhance near shore shallow fish habitats which is inconsistent with Malibu LUP Policy 3.82.

Project Alternatives

As previously described, the applicant considered several project alternatives that include different siting, design, and sizing of the proposed revetment and beach fill. Additionally, at Commission staff's request, the applicant also considered additional alternatives that could reduce or minimize environmental impacts, involving the relocation or pull-back of the revetment further landward, the relocation and/or redesign of existing septic facilities, and the resizing of the proposed beach fill. Further, Commission staff has had numerous discussions with the applicant's representatives about minimizing the environmental impacts of the project to ensure consistency with the policies of the Coastal Act and the LCP. The applicant's agent has indicated that the applicant is agreeable to some changes, but will not accept other project modifications. Nonetheless, the applicant has not proposed to modify its project proposal. The following alternatives include modifications to the design of the proposed beach fill to address impacts to marine resources:

Alternative 4 considered a reduced beach nourishment volume project with dune restoration and retention of the revetment at the current location. With this alternative project, the total amount of sand fill placed at any one time would be reduced with the lineal extent remaining the same. The beach width would be reduced along the entire length. Sand fill would be placed in more

frequent events. The total volume of nourishment and dune restoration would be reduced to approximately 400,000 cu. yds. for the initial nourishment with the addition of a maximum of 150,000 cu. yds. 3-5 years later. At the westernmost end of the cove, the sand fill is proposed to extend approximately 130 feet seaward, including 74 feet of beach and a 56 foot wide dune form. In this alternative, the width of the beach fill increases gradually downcoast from the cove to the upcoast end of the revetment, without the large transition included in the proposed project design. From the upcoast end of the revetment along the remainder of the project site, the proposed sand fill would be approximately 246 feet wide, including the dune creation/restoration areas proposed to be approximately 48 feet wide and located on and landward of the revetment

Alternative 8 considered a project with no beach nourishment at West Broad Beach and retention of the revetment at the current location. With this alternative project, no beach nourishment or dune restoration would occur west of 31346 Broad Beach Road (west end of temporary revetment). In this alternative, the beach fill design does not transition or taper from a narrow width to the full width. Rather, the beach fill would begin exactly at the end of the existing revetment and extend to its full width. East of this location, the revetment, beach nourishment and dune restoration are the same as that for the proposed project. The total volume of nourishment and dune restoration would be reduced to about 460,000 cu. yd.

Alternative 9 considered a project with reduced beach nourishment at the western end of Broad Beach with retention of the revetment at the current location. With this alternative project, the beach nourishment west of 31346 Broad Beach Road (west end of temporary revetment) would be limited to about 60,000 cu. yds., or approximately 50 percent of the sand volume that would be placed in this area as part of the proposed project. At the westernmost end of the cove, the sand fill is proposed to extend approximately 80 feet seaward, including 60 feet of beach and a 80 foot wide dune form. This width of sand fill would extend downcoast to the property at 31346 Broad Beach Road. At this point, the sand fill would transition to the same width as the proposed project. East of this location the revetment, beach nourishment and dune restoration are the same as proposed for the project. The total volume of nourishment and dune restoration would be reduced to about 520,000 cu. yd.

Alternative 4B considers a project with a portion of the revetment located further landward (the revetment design is discussed in detail in Section B above), dune restoration and a phased beach nourishment component. With this alternative project, no beach nourishment or dune restoration would occur west of 31502 Victoria Point Road. The width of the sand fill on the far western portion of the beach transitions from about 100 feet of sand fill to no fill terminating about 450 feet east of Point Lechuza. This fill includes a sand dune/ berm feature located on the back of beach which is intended to act as a sand reservoir to feed the down coast areas with sand. The applicant's consultants have modelled the potential area of impact to marine resources, including direct burial resulting from the initial placement of the sand and indirect impacts resulting from burial by sand transported to marine habitat areas after the initial placement. Exhibit 14 shows the applicant's estimate of areas of direct impact (proposed beach nourishment footprint),

permanent indirect impacts, and temporary indirect impacts associated with Alternative 4B. Following are the marine habitat types and acreage of impacts that the applicant has estimated resulting from the Alternative 4B sand fill design:[10]

	Direct Burial (acres)		**Indirect Burial (acres)**	
Habitat Type	**Permanent**	**Temporary***	**Permanent**	**Temporary***
Surfgrass			<0.01	0.75
Kelp				0.01
Cobble/Rubble Intertidal	0.12		0.62	0.59
Cobble/Rubble Subtidal			0.08	1.21
Boulder Field		0.5	0.07	0.14
Sandy Bottom Intertidal		17.28		6.7
Sandy Bottom Subtidal				29
Total	0.12	17.78	0.78	38.4

* Temporary impact is defined by the applicant as habitat area buried by sand that is less than 1 foot deep at one year after the sand placement.

It should be noted that the applicant's consultants consider the sand on sand placement for sandy bottom, both intertidal and subtidal to be a temporary impact, regardless of the depth of coverage.

Direct Burial Impacts

Each of these four alternatives would reduce impacts to marine resources when compared to the applicant's proposed project. However, none of the alternatives would minimize the significant adverse impacts of beach nourishment on the marine resources present at Broad Beach to the maximum extent feasible. The Commission finds that it is particularly critical to employ siting and design alternatives to avoid impacts and minimize unavoidable impacts to sensitive resources in the marine environment. It is very difficult, costly, and time consuming to provide compensatory mitigation for such impacts through the creation or enhancement of in-kind habitat, and some types of habitat creation/enhancement may not be feasible.

In order to avoid the impact of direct burial of marine resources, the Commission finds it is necessary to require the applicant to revise the beach nourishment aspect of the project, as proposed, to eliminate any placement of sand upcoast of the property at 31380 Broad Beach Road (Exhibit 9). This location for the terminus of the sand fill was chosen because it will minimize impacts to marine resources and allow sand to be placed both over the existing revetment and for a distance of approximately 300 feet upcoast of the end of the revetment. To place sand fill any further upcoast than 31380 Broad Beach Road, even in an amount, depth, or width that is less than the proposed project, would result in direct burial of marine resources, in particular the boulder field habitat identified just seaward of the property at 31412 Broad Beach

[10] Broad Beach—Outline of Alternative 4B Impacts, Moffat & Nichol, November 18, 2014.

Road. **Special Condition No 1** requires the applicant to revise the project plans to reflect that no beach nourishment shall occur upcoast of the property at 31380 Broad Beach Road.

The applicant's consultants have asserted that the proposed project would restore the beach to a historic width and morphology that existed before the area was subject to beach erosion and negative sand budgets. They further assert that the marine resources in the western area of the project site are acclimated to shifting beach widths and sand amounts. However, as described above, the western (upcoast) segment of the project site (that portion located immediately downcoast of Lechuza Point) has historically maintained a narrower shoreline profile than other segments of Broad Beach. A review of historical records and aerial photographs shows that the beach on site was at its widest point over the last century or so in the early 1970's. However, this widened condition constitutes a relatively brief anomalous period given that beach widths on site were substantially narrower prior to the 1970's. Moreover, beginning in approximately 1974, the shoreline on site began to experience significant rates of erosion.

The applicant's agents have also stated that it is important to the success of the project that the proposed sand fill be anchored by Lechuza Point. They have stated that eliminating the upcoast portion of the sand nourishment will reduce the longevity of the beach. In addition to the fact that the volume of sand will be reduced, the applicant's consultants have asserted that the longevity would also be reduced because fill material is concentrated closer to the downcoast end of the beach. Finally, they state that a larger percentage of fill material would be lost to downcoast beaches, reducing the effectiveness of sand backpassing.

A nourishment project of 300,000 cubic yards of nourishment sand focused on the west-central, central and eastern segments of the coast (profiles 411 through 408), with backpassing, small-scale interim sand additions and a shorter interval between renourishment events will provide some shore protection and recreational beach area. At Broad Beach the dominant sand transport direction is downcoast from west to east; however, as noted in the coastal engineering report, sand moved both up and down coast in the area and some of the nourishment sand will move westward and be stored for future eastward transport. The western section of beach may widen slightly as an indirect result of the beach nourishment; however, the beach will not be as wide as the directly nourished beach areas and will not provide much additional protection to the development beyond the main defense for this area provided by the revetment and existing seawalls.

The westernmost section of the beach has been narrow for many years and the shoreline position has had far less variability and sand loss than beach sections farther to the east. It is the beach areas to the east of this area that have experienced significant recent beach erosion and for which a wider beach will return the shoreline to the condition viewed as being the pre-erosion condition. While greater beach width at the westernmost section of beach might provide protection, Lechuza Point shelters this area from some storm events and the westernmost beach area has not relied upon a wide sand beach for protection.

It has been asserted that the proposed reduction in the western extent of sand placement will undermine the success of the proposed project. However, this proposed project, as is true of many large scale projects, is multi-purpose and has multiple metrics for success. The proposed

relocation of the westernmost limit for sand nourishment has been included to protect the ecological resources that are located near to and west of the proposed nourishment limit. Such a project modification also necessitated a slight modification in other project goals and criteria for success. The change in sand placement location will reduce the volume of sand that will be placed or stored upcoast of 31380 Broad Beach Road. As noted by the modeling of sand transport, it is likely that natural wave action will move some sand to the beach and nearshore area west of 31380 Broad Beach Road, thus providing for a small amount of sand to serve as feeder sand for times of eastern transport. Yet, the 300,000 cubic yards of sand proposed for nourishment will be available for transport within the rest of Broad Beach project area. This reduced volume of sand will provide for a wider recreational beach at the central and eastern sections of the nourishment area, focusing the bulk of the recreational use away from the ecologically sensitive western shoreline area. The modifications to the sand placement will likely mean that it may not be possible to maintain sand cover over all the shore protection in the westernmost area, or that the shore protection in this area will be uncovered more quickly than in other locations.

The resulting nourishment section will be almost a mile long and this is an adequate beach segment for undertaking beach nourishment as well as a backpassing program. The success of those efforts will not be put into jeopardy. As initially proposed, the beach areas would go through large 10-year cycles of widening and narrowing. The smaller sand volume, the backpassing, the small-scale interim additions of sand and the more frequent renourishment intervals will provide for a more consistent inter-annual beach condition within the proposed project area.

Indirect Burial Impacts

Even though the direct burial of marine resources can be avoided by the revised beach fill required by **Special Condition No. 1**, indirect marine resource impacts cannot be completely avoided while still providing beach nourishment at the proposed project site. The potential impacts can be minimized through a reduction in the amount of sand placed on the beach. In order to minimize the indirect sand burial impacts on marine resources, the Commission finds it necessary to require the applicant to revise the proposed beach nourishment aspect of the project to include no more than 300,000 cu. yds. of sand (including beach nourishment and dune creation) at the initial nourishment and no more than 300,000 cu. yds. of additional sand nourishment, as outlined in the Adaptive Beach Management and Monitoring Plan, required pursuant to Special Condition 4 of this permit. **Special Condition No. 1** requires that the total amount of beach/dune nourishment material for the initial nourishment event, and each separate renourishment event shall not exceed 300,000 cu. yds. of sand for each event. Additionally, the footprint for beach nourishment/beach width must be reduced accordingly and as generally shown on Exhibit 9. This reduction in the sand fill placement to no more than 300,000 cu. yds. will reduce the footprint/beach width to the same footprint/beach width that is considered in the applicant's Alternative 4B.

The required reduction in the volume of sand placed and the concomitant reduction in beach width will serve to reduce the amount of sand that will migrate upcoast to the west and bury marine resources. As described above, the applicant's modelling of potential marine resource impacts for an alternative project that includes a reduction of sand volume to 300,000 cu. yds.

indicates that the alternative would significantly reduce the potential indirect burial of marine resources in the westernmost area of the project site. Nonetheless, given the proximity of the proposed beach nourishment to these areas, it is highly likely that significant adverse impacts will occur from indirect burial of marine habitats.

The applicant's agents have stated that the appropriate threshold for determining permanent impacts to marine resources resulting from burial by sand is one foot of sand that buries rocky habitats for more than one year (1 foot/ 1 year). In other words, the applicant has asserted that rocky areas where sand burial resulting from the proposed beach fill is less than 1 foot deep as measured 1 year after the placement of sand on the beach should not be considered a permanent impact. The applicant's consultants have stated with regard to the 1 foot at 1 year permanent impact threshold that: "This depth of coverage is based on model predictions and is identical to other large scale beach nourishment projects RBSP I and II, and USACE Feasibility Studies" and "It is noteworthy that similar assumptions were employed for RBSP I and were found to overestimate potential impacts".[11] However, the Commission did not make specific findings in these particular cases that it was appropriate to determine whether impacts to marine resources were temporary or permanent based on a 1 foot after 1 year threshold. Additionally, the site locations for beach nourishment in those cases did not contain the same types of sensitive resources present at Broad Beach and were significant distances from sensitive resources, so this is not a fair comparison. Rather, the Commission found that: "Sand is the predominant existing habitat at the proposed receiver sites, although most have bands of cobblestones"[12] and "The project has been designed to avoid sensitive marine resources by choosing both dredge sites and the receiver beaches in locations that do not contain biological resources such as reefs, surfgrass beds, and kelp canopies"[13].

In order to model the potential indirect impacts of the beach fill, it was necessary to choose a threshold whereby an impact would be identified. However, the Commission's ecologists Dr. Jonna Engel and Dr. John Dixon have determined that this threshold would underestimate potential indirect impacts because many of the marine resources onsite are acclimated to much narrower tolerances of sand burial. Furthermore, it is impossible to come up with a single threshold for temporary vs permanent impacts because the individual algal and invertebrate species inhabiting nearshore marine habitats are adapted to sand inundation survival to greater or lesser degrees and all respond differently. Dr. Jonna Engel has indicated [14]that very few peer-reviewed studies have been conducted on nearshore algal and invertebrate species' tolerance to

[11] Broad Beach Restoration Program Approach to Determination of Temporary and Permanent Impact Areas, Moffat & Nichol, July 3, 2014.
[12] Coastal Commission Staff Report Coastal Development Permit 6-00-038 (San Diego Association of Governments), November 2, 2000.
[13] Coastal Commission Staff Report Coastal Development Permit 6-11-018 (San Diego Association of Governments), June 2, 2011.
[14] Potential Impacts of the Broad Beach Geologic Hazard Abatement District Proposed Project on Terrestrial and Marine Resources In and Adjacent to Project Footprint, Broad Beach, Malibu, California, Jonna Engel, Ph.D., November 25, 2014

sand burial. The few that have been published suggest that for many species mortality occurs well before the applicant's threshold. For instance, research on the effect of short term (12 days) sediment burial on eelgrass (*Zostera marina*) showed that mortality was increased and productivity substantially reduced when only 25 percent of the plant height was buried. Further, when plants were buried to 75 percent of their height, all the plants died. The study results indicate that eelgrass can only tolerate short term burial that covers much less than the height of the plant. Similarly, research on the effect of sediment burial on surfgrass (*Phyllospadix torreyi* showed that short term burial (15 days) burial results in shoot mortality and reduced growth. A species that is often found in areas characterized by seasonal sand inundation is the aggregating anemone, *Anthopleura elegantissima.* It has been observed to resist shallow sand burial by extending its columns so that the oral disc and tentacles reach the surface[15]. However, Sebens suggested that survival of aggregating anemones buried deeper for 3 months or greater was due to body tissue metabolism[16]. The sand burial depth and length of time that would result in mortality is not known but is likely less than 1 foot for 1 year. Thus, permanent impacts to some organisms and habitat are likely to occur with sand burial well below the applicant's proposed threshold.

Impacts to Sandy Bottom Habitats

The applicant's consultants have argued that impacts to sandy bottom habitats, both intertidal and subtidal, resulting from sand burial are only temporary impacts, regardless of the depth of coverage. The applicant's consultants indicate that these habitat areas are acclimated to sand burial and disturbance. While it is acknowledged that organisms without sufficient mobility to avoid burial are likely to die, the applicant asserts that the created beach areas are likely to be recolonized in a fairly short period of time and that long term significant adverse impacts are unlikely to occur.

The Commission has typically found that placement of sand nourishment on sandy beach areas are unlikely to result in permanent to impacts to sandy habitats, so long as the project is designed to time the deposition of the material on the beach to protect sensitive resources and to match the composition of the material as close as feasible to the existing sand at the beach. In this case, the sand grain size proposed would be significantly coarser than that normally found at Broad Beach or at Zuma Beach (just downcoast). The applicant's proposed use of much coarser sand is by design so that sand nourishment is more likely to remain on the beach for a longer period of time. However, the coarser sand may affect which organisms will colonize the beach after the nourishment event. The Commission's ecologist, Dr. Jonna Engel has indicated that coarser sand and the resultant change in the steepness of the beach, as compared to the typical beach profile at Broad Beach (before erosion and the fixing of the back beach by the emergency revetment) may adversely affect the sandy bottom habitats. Specifically, she states the following[17]:

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[15] O'Brian and Littler. 1977.
[16] Sebens. 1980
[17] Potential Impacts of the Broad Beach Geologic Hazard Abatement District Proposed Project on Terrestrial and Marine Resources In and Adjacent to Project Footprint, Broad Beach, Malibu, California, Jonna Engel, Ph.D., November 25, 2014

Surf regime and sand grain characteristics allow beaches to be described in terms of dissipative and reflective beaches. Beach slope, sand grain size, and the wave-breaking and nearshore circulation patterns differ between dissipative and reflective beaches. Dissipative beaches have wide, high energy surf zones that dissipate large amounts of incoming wave energy before it reaches the intertidal swash zone. These wide flat beaches typically have very fine sand and laminar, long period swash climates[18]. Reflective beaches have very narrow surf zones where waves break near or directly on the shore and some wave energy is reflected seaward. Reflective beaches generally have coarse sediments, steep slopes, and short period, turbulent swash climates. The majority of beaches in California and across the globe are intermediate beaches that lie within the broad spectrum between dissipative and reflective types and represent a wide range of sizes and shapes as well as sand grain sizes. Sandy beaches may have seasonal shifts from reflective to dissipative in response to storm and swell conditions. However, a beach of coarse sediments may remain reflective and a fine-sand beach may remain dissipative regardless of wave conditions[19].

The structure of intertidal macroinvertebrate communities of open coast sandy beaches is thought to be largely controlled by physical processes such as sand grain size and dynamics and wave regime[20]. Many studies have demonstrated that along with other physical drivers such as tidal range, wave energy, and beach slope, sand grain size plays a major role in determining the community composition of sandy beach macroinvertebrates[21,22,23,24]. A number of studies of intertidal macroinvertebrate communities have found that abundance and biomass decrease exponentially and species richness decreases linearly across a continuum from dissipative to reflective beaches[25]

As a result of a steepened beach slope angle to a more reflective beach type, the species composition in sandy bottom intertidal and subtidal habitats may be less diverse. Additionally, the abundance of individual macroinvertebrate species may be greatly reduced, limiting the prey available to bird and fish. In this way, the burial impacts to sandy bottom habitat that the applicant predicts to be temporary become permanent because certain species cannot recolonize after beach conditions change. In order to ensure that impacts to sandy bottom habitats are minimized to the maximum extent feasible, the sand grain size used for beach renourishment should match the existing beach condition closely.

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[18] McArdle and McLachlan 1992
[19] Bryant 1982
[20] McLachlan, 1990
[21] Peterson et al. 2014
[22] Mclachlan and Dorvlo 2005
[23]Defeo and Mclachlan 2005
[24] Rodil and Lastra 2004
[25] Dugan et al. 2000

As previously described, the applicant has identified three inland sources of sand that could be used for beach nourishment. The potential quarry sources are CEMEX, Grimes Rock and the Gillibrand. According to the applicant's October 2013 Revised Sampling and Analysis Plan and Test Results Report (SAP), "Grimes Rock and CEMEX possess the capacity to provide the quantity of sand required for the project (600,000 cy of material)." Gillibrand does not have the capacity to provide the total quality of sand, even at the smaller project size of 300,000 cubic yards; however, it could provide a portion of the needed beach sand or could provide the quantity of sand needed for a small-scale interim nourishment event. The characteristics of the various sand material and general quarry information, as excerpted from the SAP (October 2013) are summarized in the table below. Information from Broad Beach and Zuma are also provided for information on the current site conditions.

	CEMEX	Grimes Rock	Gillibrand(1)	Broad Beach	Zuma
Grain size d_{50}	0.95mm (5/2013) 0.85 mm (10/2013)	0.60 mm (5/2013) 0.47 mm (10/2013)	1.00 mm	0.25 (dry beach) 0.32 (dunes)	0.4 mm
Stockpile Area	1.2 acres	0.22 acres	2.6 acres	NA	NA
Coarse Sand (2)	21%	10%	1%	ND	ND
Medium Sand (2)	59%	71%	99%	ND	ND
Fine Sand (2)	12%	12%	0%	ND	ND
Silts & Clays (2)	8%	7%	0%	ND	ND

(1) Table 2 of the SAP (October 2013) states that only 66% of the sand from Gillibrand is in the medium sand size; however, Figure 14, the Composite Grain Size Envelope for Broad Beach vs. P.B. Gillibrand shows that 99% of the sand is medium, with 80% of the sampled sand having a diameter greater than a 0.7 mm.

(2) The sand classifications are based upon the Unified Soil Classification, as follows[26]:
Coarse Sand – 2.0 mm – 4.76 mm
Medium Sand – 0.42 mm – 2.0 mm
Fine sand – 0.074 mm – 0.42 mm
Silts and clays – less than 0.074 mm

This table provides two separate d50 values for the sand from both CEMEX and Grimes Rock. Subsequent to taking samples from all three quarries in May 2013, the applicant's consultant learned that both CEMEX and Grimes Rock had both relocated the cut locations in their quarry

[26] While engineers tend to base sand classification on the Unified Soil Classification, biologists use the Wentworth sand classification scale where very fine and fine sand is 0.0625 to 0.25 mm in diameter, medium sand is 0.25 to 0.50 mm in diameter, and coarse and very coarse sand is 0.50 to 2.0 mm in diameter. The top size range for fine, medium, and coarse sand is much larger under the Unified Soil Classification system compared to the Wentworth Scale.

sites and that each quarry intended to work these new locations for well into the future. Additional sediment samples were obtained for the new cut locations and in both cases, the median grain size for the October 2013 samples dropped by approximately 0.1 mm in size, bringing both sites closer to the median grain size of the sand currently found on Broad Beach. The lack of fine sand, silts and clays in the Gillibrand was not explained, but, based on visual observations of the sand by the Commission's coastal engineer, Dr. Lesley Ewing, it is her opinion that the lack of fine material is likely due to a washing process that occurred prior to placing the sand into the stockpile from which the sample was obtained.

In order to minimize potential impacts to marine resources, the Commission finds it necessary to require **Special Condition 8**, which would limit the proposed nourishment material to have a d50 between 0.24 mm and 0.6 mm. The 0.24 mm limit is the median diameter of the sand that is now present on Broad Beach and the 0.60 limit is the upper value of the sand material available from Grimes Rock. As demonstrated by the provided sediment grain size analysis, sand between 0.24 mm and 0.60 mm can be provided through the identified quarry options and it can be available to the site for the proposed nourishment effort. Also, there would not be the need for special and potentially costly sieving or sand washing to meet this size constraint.

The options for use of a larger or coarser sand material than native will modify the existing beach characteristics slightly. The larger grain size will establish a slightly steeper shore face and should allow the nourished sand to remain on the beach area for a longer time period than the native sand. Also, the difference in grain size is not so large that distinct zones of coarser and finer material would develop on the beach face, such as can be observed on mixed sand and cobble beaches.

The applicant has proposed to use sand with a median grain size of up to 0.85mm, since sand of such coarseness would allow greater flexibility in sand acquisitions, allowing sand from Grimes alone, CEMEX alone, Grimes and CEMEX mixed, Grimes and Gillibrand mixed, or, Grimes, CEMEX and Gillibrand mixed. Sand with a median grain size of up to 0.85 mm would also remain on the beach longer than the native sand and presumable longer than sand with a median grain size of 0.6 mm. The idea that coarser sand will remain in a beach longer than finer sand is not a new concept. The sand composition and beach profile reflect the sand available in the littoral cell and the wave conditions that work and transport sand within the littoral cell. Eventually, the grain sizes may become so large than the material is no longer considered sand and it will move only during extreme wave and storm conditions. Such a change in the beach character would not result either from the introduction of coarser sand with either a maximum median grain size of either 0.60 mm or 0.85 mm.

The applicant has provided analysis of the coarser sand performance. This analysis examines the change in diffusion for the more coarse sand with a d50 of 0.85 mm and shown that its longevity performance will be better than sand with a d50 of 0.24 mm and there will be less need for maintenance. It also examines the underfoot feel and impacts to surfing, notes that the sand just downcoast at Zuma has coarser sand (with a d50 of 0.4 mm) and also provides details about already approved nourishment of other beaches in southern California that have used coarser than native sand. Those examples cover beaches with a native grain size similar to that at Broad

Beach and with coarser nourishment sand that has a d50 less than or up to 0.60 mm. Some of the same sites noted in the Moffatt-Nichol report on Coarser than Native Grain Size are:

- 75,000 cubic yards (cy) at Seal Beach in 2009 (native beach sand = 0.35 mm; beach fill = 0.42 mm);
- 2 million cy at Surfside Colony/Sunset Beach in 2009/2010 (native sand = 0.25 mm; beach fill = 0.42 mm);
- 2.1 million cy by SANDAG in 2001 (native beaches = 0.25 mm; beach fill at 6 of 12 sites was 0.62 mm); and
- 1.5 million cy by SANDAG in 2012 (native beaches = 0.25 mm; beach fill was up to 0.61 mm).

Based on the evidence supplied by the Applicant, the use of 0.85 mm median diameter sand is not within the routine "coarser than native" nourishment efforts.

The sand used for beach nourishment would also be used for dune nourishment or might be carried onto the dune by wave and wind transport. The dune configuration has not been analyzed for various sand diameters and there has been no analysis of the beach changes that would result between nourishment of 0.60 mm and 0.85 mm. Given that the coarser than native examples provided by the applicant have had a "coarser" limit of about 0.60 mm or less, and given that the coarser sand present at Zuma is only 0.40 mm, the grain size limit of 0.24 mm to 0.60 mm for the nourishment is already in excess of the sand coarseness identified at Zuma Beach, and is at the upper limit of the difference between native and coarse nourishment sand used in recent nourishment efforts. **Special Condition 8** will allow for the use of quarry sand in the nourishment effort, without requiring additional treatment, and will provide for a somewhat greater longevity of the nourishment sand over the native sand, without pushing the limits for an exceedingly coarser sand beyond what exists locally or have been used in other southern California nourishment projects.

Backpassing

The project also includes backpassing operations (transporting sand from wider downcoast areas of the beach to upcoast areas of the beach) on an annual basis for the life of the project, if needed for the purpose of maintaining adequate beach width for a prolonged period of time. The annual direct disturbance of beach and sandy bottom habitat may prevent re-establishment by many of the macroinvertebrate species that utilize this habitat. Sand crabs and other crustaceans, various polychaete worm species, amphipod species, Pismo clam and other clam species may be adversely impacted by the backpassing activity. Additionally, indirect sand burial impacts to marine resources may be prolonged by yearly burial or turbidity impacts from backpassing operations, although backpassing would involve much smaller amounts of sand movement. In order to minimize potential impacts to marine resources resulting from backpassing operations, the Commission finds it necessary to require limitations on the frequency of such backpassing and parameters for implementation. **Special Condition 4** limits backpassing to no more than one time per year, if certain criteria regarding loss of sand fill and beach width are met. Source areas for removing sand are limited to the western areas of Broad Beach. No backpassing may extend upcoast of 31380 Broad Beach Road, as limited by **Special Condition 1**.

Marine Resource Impact Monitoring and Mitigation

As conditioned, to revise the beach nourishment aspect of the proposed project, to 1) reduce the sand fill amount; 2) to place sand no further upcoast than 31380 Broad Beach Road; 3) to limit the proposed sand nourishment material to have a D 50 between 0.24 mm and 0.60 mm; and 4) to limit backpassing operations, significant adverse impacts to marine resources will be greatly reduced. However, there is still potential for impacts to occur. In some ways, the proposed project is a pilot project to study and learn how beach nourishment can function as a shoreline protection strategy while simultaneously imposing less than significant adverse ecological impacts. In order to allow for the beach nourishment aspect of the project to be carried out while ensuring that adverse impacts to marine resources are avoided where feasible and minimized, the Commission finds it necessary to require the applicant to carry out extensive marine habitat monitoring as part of the project to identify actual impacts. This is necessary both to provide evidence to inform the implementation of project modifications for future beach renourishment or other construction at Broad Beach and to ensure that mitigation of any impacts is provided by the applicant. **Special Condition No. 6** requires the applicant to finance a Scientific Advisory Panel (SAP) comprised of marine scientists who will consult in the preparation and review of monitoring protocols and reporting, as well as the design and implementation of habitat creation or enhancement projects designed to mitigate marine resource impacts identified through the monitoring. The mitigation program, if necessary, would be processed as an amendment to this permit.

Special Condition No. 6 includes the general monitoring requirements that must be included in the marine resource monitoring program. The specific monitoring requirements and methods will be determined by the applicant in close consultation with the SAP and presented in a Final Marine Habitat Monitoring and Mitigation Plan for review and approval of the Executive Director prior to issuance of the Coastal Development Permit for the project. **Special Condition 6** requires the applicant to monitor the project site and two reference sites with similar characteristics and containing similar habitats. The reference sites should be as close as possible to the potential impact area within an area outside the project's influence. The purpose of subtidal and intertidal field monitoring is to characterize the various habitats in the Broad Beach study area and to assess whether documented changes through time can be attributed to the project or are the result of more regional wide patterns. To accomplish this, the marine habitats in the study area that are at risk from the project and those on a minimum of two marine habitat reference sites must be monitored.

The use of multi-spectral aerial photography and sidescan sonar may be employed to identify changes in areal extent of habitat and depth of sand burial. Multi-spectral aerial surveys (as employed by the applicant's consultants in July 2014) may be conducted in the Broad Beach study area from an airplane fitted with specialized camera equipment designed to capture imagery within a specific array of spectral bands optimized to discern coastal marine habitats including kelp forest, understory canopy algae, eelgrass, and surfgrass. This technique is useful for surveying large study areas such as the Broad Beach nearshore area. The flights should be planned to occur, to the degree possible, during high visibility (clear water), calm ocean conditions, and clear air conditions. Multi-beam and sidescan sonar surveys (similar to the one

conducted by the applicant's consultants in May 2014) may be conducted in the Broad Beach study area to distinguish surficial features and to map nearshore marine benthic habitat types.

Employing both multi-spectral aerial and side scan sonar surveys would ensure that the most accurate representation of existing marine habitat conditions is captured because the two methods are complimentary. While multi-spectral aerial imagery is best at capturing surface and shallow water habitat imagery, it and is limited in its ability to penetrate the water column. Sidescan sonar is best at capturing benthic habitat imagery, but is limited in its ability to sample shallow water habitats. When using these remote sensing techniques, diver surveys are required to ground truth the results of this data.

Intensive intertidal sandy beach monitoring is required to assess the macroinvertebrate assemblage that colonizes Broad Beach following sand replenishment. The beach ecosystem at Broad Beach has been impacted over the years from both permitted and unpermitted development, including the 2010 emergency revetment, and therefore the current upper and intertidal beach communities are not what one would expect in absence of disturbance. In fact currently most of the beach system is gone. Therefore a minimum of two beaches most proximal to Broad Beach with similar sand envelopes (well sorted, D50 =0.25), exposure, wave regime, and beach morphology (intermediate dissipative beaches) must be identified and monitored through time for comparison to the macroinfaunal sand assemblage that establishes at Broad Beach following replenishment with the quarry sand. The beach system monitoring must also include monitoring the beaches just west of the project footprint and Zuma Beach, just east of the project footprint to study the indirect impacts of the project. The beach monitoring methods identified in the monitoring plan must be capable of determining; 1) whether the portion of Broad Beach covered by quarry sand develops a sandy beach macroinvertebrate fauna similar to the reference beaches, and, 2) whether the project adversely impacts the beach ecosystem west and east of the project.

The marine resource monitoring may be carried out bi-annually, with a spring survey and a fall survey conducted every year. Spring and fall represent the two most extreme seasons in terms of sand conditions. Winter storms typically result in sand being moved from onshore to offshore, so springtime is when the least amount of sand is expected to be on the beach. During the summer, the waves are smaller and have less energy and the general pattern is for sand to be built up onshore so fall is when the maximum amount of sand is expected to be on the beach. An annual report must be prepared by the applicant and submitted to Commission staff by the end of each year. Each year's monitoring reports will be reviewed by the Commission's ecologists in conjunction with the SAP to determine if mid-course corrections to back-passing or nourishment activities are necessary. A five year monitoring report is required to be prepared, compiling five years of monitoring data, which will be used to determine the areal extent, type, and significance of impacts to marine habitats. As discussed above, the applicant's agents have used a threshold for determining an impact to be that a marine habitat is buried by sand at a depth of 1 foot or more, for a period of 1 year or longer. The Commission does not agree that this is the appropriate standard to use to determine if a significant adverse impact has occurred. While it is true that marine habitats, by their very location in the marine environment are acclimated to varying amounts of seasonal sand movement and burial, most marine organisms in rocky intertidal and subtidal habitats would not survive sand burial depth that is far less than 1 ft. or duration that is

far less than 1 year. The Commission's ecologists Dr. Jonna Engel and Dr. John Dixon have stated that any reduction in the areal extent of any of the marine habitats on site is considered a permanent impact for which mitigation must be required. This standard is especially important given the project site's location in a marine protected area.

Special Condition 6 requires that all impacts to marine habitats identified through the monitoring must be mitigated by the applicant through the creation or enhancement of marine habitat that is the same type of habitat, where such in-kind mitigation is feasible for the type of habitat in question. Where in-kind habitat cannot be created, other types of habitat creation may be proposed by the applicant for the review of the SAP and the Executive Director. Any impact identified to marine habitats is required to be mitigated at no less than a ratio of 4:1, in other words 4 acres (or other measure) of habitat must be created to mitigate for every 1 acre of habitat that is impacted by the project. This ratio is required in recognition of the difficulty involved in creating/enhancing marine habitat and the uncertainty that such habitat creation/enhancement will be successful. Adverse impacts upon eelgrass shall be mitigated according to the California Eelgrass Mitigation Policy.

Upon detection of adverse impacts upon one or more habitats, the applicant, in consultation with the SAP, is required to develop a habitat specific mitigation plan for each impacted habitat that will provide the overall framework to guide the mitigation work, for review and approval of the Executive Director. The revised mitigation and monitoring program must be reviewed by the Commission as an amendment to the coastal development permit.

Turbidity

In addition to direct impacts from immediate sand burial, and indirect impacts from burial over time, there is also the potential of indirect impacts resulting from increased turbidity during construction of the sand fill. Temporary increases in turbidity and suspended solids decrease light penetration, causing a decline in primary productivity due to decreased photosynthesis by phytoplankton, inhibition of kelp and algae growth, and adverse impacts to marine organisms. Any appreciable turbidity increase may also cause clogging of gills and feeding apparatuses of fish and filter feeders. Turbidity impacts are anticipated to have the maximum concentrations generally restricted to the lower water column, and decreasing rapidly with distance due to settling and dilution. However, the impacts of beach fill placement activities (i.e., increased turbidity, sedimentation, dissolved oxygen reduction, burial of organisms) are expected to be relatively localized in nature and mobile organisms would likely relocate to an undisturbed area. Following deposition activities, organisms are expected to recolonize previously disturbed areas.

The composition (i.e., grain size) of the deposition material can affect the extent of the turbidity plume in the marine environment. For instance, material with higher fine-grained material content will contribute to higher rates of turbidity. In general, the higher the amount of coarse grained sand, the lower the turbidity and its associated impacts. As a result, the grain-size of the material is an important design characteristic of the project. In this case, turbidity plumes are expected to be minimized, as the proposed source material is sandy sediment which is coarser than the existing beach grain size with a low percentage of fines. Additionally, the sand will be trucked in and placed as dry material, further reducing the potential for the release of fines during construction. **Special Condition 8** requires that any source material used for beach

nourishment purposes can only contain no more than 10% fine material that is 0.074mm in size or smaller.

Additionally, in order to further ensure that potential impacts to marine habitats resulting from turbidity during construction are minimized, **Special Condition 7** requires a qualified biologist or resource specialist to monitor turbidity during all project construction activities. The qualified biologist or environmental resource specialist is required to visually monitor and document the turbidity of coastal waters during all sand nourishment or back-passing activities. The extent and duration of turbidity plumes shall be recorded and mapped by the monitor during each day of sand nourishment or back-passing activities. If the turbidity plume is observed to reach kelp beds or eelgrass beds, disposal shall be terminated until the turbidity plume has dissipated. If significant levels of turbidity above ambient levels lasts more than three (3) consecutive days, then the rate of disposal is required to be reduced so that large, long lasting turbidity plumes are no longer created. After all beach fill operations have ceased, the applicant is required to monitor and document the extent and duration of any lasting turbidity plume.

Other Sensitive Species

While it is unlikely that grunion are utilizing the existing beach because of the lack of sandy beach berm areas (resulting from beach erosion and presence of the revetment), there is a potential for grunion runs during the course of the project construction. Beach nourishment activities are not proposed to occur within the seasonally predicted run period and egg incubation period of the California grunion. However, the Commission notes that any potential placement of sand on the beach may result in adverse effects to grunion due to direct disturbance by construction activity and use of heavy equipment on the sandy beach as well as indirect impacts from smothering of eggs previously deposited on the sandy beach. Therefore, in order to ensure that any potential adverse effects to grunion are avoided, **Special Condition 9** prohibits any beach nourishment activities from occurring on any part of the beach and shorefront in the project area when California grunion (including eggs) are present during any run periods and corresponding egg incubation periods.

In addition, the western snowy plover, a bird species listed as federally threatened and as a state species of special concern, is known to occur in the project area. Critical habitat for the western snowy plover is designated at Zuma Beach and extends onto the downcoast area of Broad Beach. Zuma Beach supports the largest population of wintering snowy plovers in Los Angeles County. During construction of the emergency revetment in 2010, biological monitors observed snowy plovers on the sandbar at the mouth of Trancas Lagoon.[27] All construction operations, including operation of equipment, material placement, placement or removal of equipment or facilities, and backpassing/beach renourishment or other activities are prohibited pursuant to **Special Condition 9** on any part of the beach and shorefront in the project area when western snowy

[27] Revised Analysis of Impacts to Public Trust Resources and Values (APTR) for the Broad Beach Restoration Project, AMEC Environment and Infrastructure, July 2014

plover are present, as identified by the surveys conducted pursuant to **Special Condition 7**, to avoid adverse effects to western snowy plovers.

Further, in order to ensure that adverse impacts to the above referenced sensitive species are avoided, **Special Condition 7** also requires a qualified biological monitor to be present during all project activities. The monitor shall have the authority to cease operations should any breach in permit compliance occur or if any unforeseen sensitive habitat issues arise. If significant impacts or damage occur to sensitive wildlife species, the applicant shall be required to submit a revised, or supplemental program to adequately mitigate such impacts. The revised, or supplemental, program shall be processed as an amendment to this coastal development permit.

Water Quality and Construction Impacts

In addition to potential impacts to water quality resulting from increased turbidity, the proposed project could also result in impacts resulting from contamination of the sand used for beach nourishment. The source material is proposed to be from a quarry and the applicant's testing has indicated that no toxic materials or debris were present in the sand mining areas or stockpiles at any of the proposed sources. Nonetheless, debris such as trash, wood, or vegetation could be introduced at some point in the processing or transportation of the material. **Special Condition No. 8** requires that source material is sampled and tested to ensure that the delivered material is within the acceptable size ranges for nourishment material. If the material is not sand, not within the acceptable size range, or is contaminated, that material cannot be used for beach nourishment. If the source material contains debris, the debris must be removed or the material cannot be deposited at the site.

The marine environment would also be subject to potential adverse impacts as a result of project activities if sediment, debris, fuel, oil, or chemicals with hazardous properties are unintentionally released during construction or sand nourishment activities. Therefore, to ensure that construction material, debris, or other waste associated with project activities does not enter the water, the Commission finds **Special Condition 10** is necessary to define the applicant's responsibility to ensure proper disposal of solid debris and material unsuitable for placement into the marine environment. It is the applicant's responsibility to ensure that no construction materials, debris or other waste is placed or stored where it could be subject to wave erosion and dispersion. the applicant that any and all construction debris, sediment, or trash shall be properly contained and removed from construction areas within 24 hours. Further, construction equipment shall not be cleaned on the beach or in areas that drain to streams, wetlands, ocean, or sensitive habitat areas.

Feasibility Study for Alternative Waste Water Treatment

The existing residences along Broad Beach Road rely upon individual on-site waste water treatment systems (OWTSs) for the treatment and disposal of sewage effluent generated by these homes. The majority of these residences are on conventional OWTSs featuring septic tanks and leach fields that are located in most cases on the sandy beach or dune area seaward of the residences (Exhibit 8). The majority of the OWTSs were constructed many years ago when Broad Beach was a wide sandy beach and the systems were protected by a large dune field. The use of OWTSs on beaches in Malibu in such close proximity to the ocean has raised concerns

regarding potential adverse marine water quality impacts from the State Water Resources Control Board (SWRCB), the Los Angeles Regional Water Quality Control Board (LARWQCB) and NGO organizations such as Heal the Bay and the Surfrider Foundation. Such concerns have spurred the SWRCB & LARWQCB to begin the phase out septic systems in some areas of Malibu.

The Broad Beach area is located in an area designated as an Area of Special Biological Significance (ASBS). In the 1970's, California designated 34 regions along the coast as ASBSs in an effort to preserve biologically unique and sensitive marine ecosystems for future generations. ASBS were designated by the State Water Resources Control Board (SWRCB) to protect species or biological communities from undesirable alterations in natural water quality. This designation recognizes that certain biological communities, because of their fragility or value, deserve special protection. Under the California Ocean Plan (COP), the discharge of wastes to ocean waters in these areas is generally prohibited. The COP states: "Waste shall be discharged a sufficient distance from areas designated as being of special biological significance to assure maintenance of natural water quality conditions in these areas" (State Water Board 1972).

A number of leach fields for individual OWTSs on Broad Beach extend a considerable distance out onto the sandy beach and dune area, particularly on the wider eastern portion of the beach. Some of the existing leach fields extend as far as 80 feet seaward of the residences onto the beach/dune area. The location of these leach fields in such close proximity to the ocean and sensitive marine resources raises concerns regarding the discharge of effluent resulting from wave damage; malfunctions of the OWTSs; lack of adequate maintenance; and/or simply the loss of the effectiveness of the leach field system to adequately treat or filter the septic effluent over time. In addition, given the leach fields are located so far out on to the beach the proposed revetment must be located even further seaward in order to protect the existing leach fields from wave uprush. If not for these existing leach fields the proposed revetment could be located in a much further landward location fronting the residences. As previously mentioned above, a project alternative was explored that involved the removal of the existing OWTSs including the leach fields and replacing those systems with new modern tertiary OWTSs that would be located in a more landward location and utilize much smaller leach fields. Under this alternative the rock revetment could have been moved to a more landward location on the eastern portion of the beach. However, this alternative would have been difficult to achieve as part of this coastal development permit given the significant costs associated with the comprehensive removal and relocation of all of the existing OWTSs and simply the difficulties coordinating such an effort with such a large number of homeowners. More importantly such an alternative in most cases would have resulted in the new OWTSs and leach fields still located on the sandy beach fronting the residences which again raises the same marine water quality concerns as the existing systems and places these systems in a location that could be subject to future hazards from wave uprush exacerbated by rising sea levels and a rising ground water table within the 100 year life of the residences.

This project presents a unique opportunity to not only address the immediate beach erosion and public access issues at Broad Beach but also provides an opportunity to plan and adapt to shoreline erosion and hazards resulting from sea level rise in the longer term. One component of

this longer term planning approach is to explore the feasibility of removing the individual OWTSs from the beach and connecting the residences to a new state of the art package sewage treatment facility located in a more inland location which would significantly reduce or eliminate the potential for the discharge of septic effluent to reach ocean waters and thereby adversely impact sensitive marine resources. Removing this existing development from the beach and dune area would provide an opportunity for future planned retreat of the revetment on the wider eastern portion of Broad Beach. In addition, the older residences on Broad Beach constructed on at grade concrete slab foundation on this formerly wide beach are now being demolished and replaced with residences that are constructed on an elevated caisson grade beam foundation that eliminates the need for a shoreline protective device to protect the residence. The Malibu LCP specifically requires that new in-fill development on the beach must be supported on a caisson grade beam foundation that takes into account sea level rise over the next 100 years to ensure the residence would not need a shoreline protective structure. Therefore, at some point in the future all of the residences on Broad Beach will be supported on a caisson and grade beam foundation. If the residences were also connected to a package sewage treatment plant located off the beach then there would likely not be a need for a shoreline protective structure at least on the wider eastern portion of the beach.

The effluent from residences along Broad Beach Road west of Lechuza Point is currently collected through a public sewer line beneath Board Beach Road and treated at the Los Angeles County operated Trancas Waster Water Pollution Control Plant located across PCH, approximately 0.5 mile north of Broad Beach. The effluent is transported via a pipe in Broad Beach Road to the Los Angeles County Trancas Treatment Plant (Exhibit 15). Unfortunately when this sewer system was established in the 1960's, property owners along the majority of Broad Beach, opted out of receiving public waste water disposal services offered by the County. In order to connect to this system and receive public wastewater services today, property owners would need authorization, including accordance from the 177 homeowners within the Malibu West subdivision; approval by the Los Angeles County Board of Supervisors and the Local Agency Formation Commission; and LARWQCB review and approval. In addition, there is limited wastewater treatment capacity at the Trancas Treatment Plant, which is currently operating at about 75 percent of capacity. Given this high level of complexity, connecting to this sewer system may be difficult option to achieve.

However, the construction of a new state of the art package sewage treatment plant plan is also a possibility on vacant land located just inland of Pacific Coast Highway a short distance from Broad Beach. Consistent with Coastal Act and City of Malibu LCP policies related to the protection coastal water quality and marine resources (Sections 30231 & 30230), public access (Sections 30211 & 30212), and marine and terrestrial habitat protection (30240 & 30230) the removal of the individual OWTSs from the beach and connection to a package waste water treatment facility and the potential removal of at least a portion of the rock revetment would result in improved marine water quality and conditions for healthy subtidal and intertidal rocky habitats; enhanced public access on the beach by removing the shoreline protective structure; and would improve the beach and dune ecology by removing development that directly impacts these habitats.

Therefore, **Special Condition 16** requires the applicant to prepare a feasibility study, prior to the end of the ten year term of this coastal development permit, and as part of any future CDP application for reauthorization of this project, to determine if connection to a new or an existing package sewage treatment plant is a feasible alternative to individual OWTS currently serving the residences on Broad Beach. The feasibility study is required to include an analysis and technical engineering details and requirements for the removal of the existing on-site waste water treatment systems within the GHAD boundaries and conceptual design plans for either a new package sewage treatment plant or the upgrade of an existing treatment plant, such as the Trancas Canyon Treatment Plant. The feasibility study shall also include an analysis of permitting and regulatory requirements, potential environmental impacts, necessary infrastructure upgrades; alternative locations and technologies for a package sewage treatment plant; preliminary budget, including any land acquisition costs and a preliminary construction schedule/time line. Furthermore, the study shall be prepared in consultation with the Regional Water Quality Control Board, the City of Malibu and the County of Los Angeles if applicable. Finally, five years from the issuance of the coastal development permit the applicant shall submit to the Executive Director a progress report on the status of the feasibility study. The information in the study will be used to inform a future Commission on possible project alternatives or modifications through a new coastal development permit for reauthorization of the project at the end of the ten year term for this permit. Those alternatives shall include exploring the option of removing the individual OSWT from the beach and connection to a package sewage treatment plant and removal of portions or the entire rock revetment.

Other Approvals

In addition, the proposed project, as required to be modified, will involve work within the marine environment, areas within the Mugu Lagoon-Pt. Latigo ASBS, the Point Dume SMCA, Essential Fish Habitat, and Special Aquatic Areas. As such, the project will require a permit, lease, consultation, or approval from other state or federal agencies including, but not limited to, the United States Army Corps of Engineers, National Marine Fishery Service, California State Lands Commission, California Department of Fish and Wildlife, State Water Resources Control Board and the Regional Water Quality Control Board. Therefore, **Special Condition 17** requires that the applicant obtain all other State or Federal approvals that may be necessary for all aspects of the proposed project, or provide evidence that such approvals are not required.

Conclusion

As discussed in detail, the beach nourishment aspect of the project, as proposed to place 600,000 cu. yds. of sand fill in one nourishment event, including sand placement in the upcoast cove adjacent to Point Lechuza, would have significant adverse impacts to marine resources that would not be consistent with Sections 30230 or 30231 of the Coastal Act. As proposed, marine resources on the project site would be diminished, not maintained, enhanced or restored, as required by Section 30230 of the Coastal Act. Further, the impacts associated with the proposed project would not give special protection be given to areas and species of special biological or economic significance. The use of the marine environment on the project site for beach nourishment and the protection of residential development, as proposed, would not be carried out in a manner that would sustain the biological productivity of coastal waters or that would maintain healthy populations of all species of marine organisms adequate for long-term

commercial, recreational, scientific, and educational purposes, as required by Section 30231 of the Coastal Act.

In order to avoid, reduce, and minimize impacts to marine resources, the Commission requires conditions of approval to revise the beach nourishment aspect of the proposed project to 1) reduce the sand fill amount to no more than 300,000 cu. yds. in each nourishment event; 2) to place sand no further upcoast than 31380 Broad Beach Road, 3) to limit the proposed sand nourishment material to have a d50 between 0.24 mm and 0.6 mm; 4) to employ monitoring and best management practices during construction; 5) to carry out extensive marine habitat monitoring to identify actual impacts, according to a monitoring plan prepared in consultation with a Scientific Advisory Panel; 6) to modify the project through a CDP amendment to avoid and/or minimize impacts that are identified through monitoring; 7) to provide mitigation for any identified impacts at a ratio of 4 to 1; 8) to ensure turbidity is minimized and sensitive species are protected during construction; and 9) to study the feasibility of removing individual onsite wastewater treatment systems and removing the revetment. The Commission finds that only as so conditioned will the proposed project maintain marine resources and ensure that this use of marine environment will be carried out in a manner that will sustain the biological productivity of coastal waters or that would maintain healthy populations of all species of marine organisms. The Commission further finds that only as conditioned, will the project ensure that the biological productivity and the quality of coastal waters appropriate to maintain optimum populations of marine organisms and for the protection of human health will be maintained and, where feasible, restored. Finally, the Commission finds that, only as so conditioned, will the proposed project be consistent with the marine resource policies of the certified Malibu LCP that provide guidance. Specifically, as conditioned, the proposed project conforms to Malibu LUP Policy 3.75 that requires that Marine ESHA (as designated by the LCP) be protected against significant disruption of habitat values. Finally, as conditioned, the proposed project will preserve near shore shallow fish habitats, as required by Malibu LUP Policy 3.82.

Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Sections 30230, 30231, and 30233 of the Coastal Act, as well as the guidance policies of the certified City of Malibu Local Coastal Program.

D. ENVIRONMENTALLY SENSITIVE DUNE HABITAT AREAS

Applicable Coastal Act Policies

Section 30240 of the Coastal Act (incorporated into the City of Malibu's LCP) protects environmentally sensitive habitat areas (ESHA) by restricting development in and adjacent to ESHA. Section 30240 states:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such 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 such areas, and shall be compatible with the continuance of such habitat areas.

Section 30107.5 of the Coastal Act, defines an environmentally sensitive area as:

"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

Applicable City of Malibu Land Use Plan Policies

3.1 Areas in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments are Environmentally Sensitive Habitat Areas (ESHAs) and are generally shown on the LUP ESHA Map. The ESHAs in the City of Malibu are riparian areas, streams, native woodlands, native grasslands/savannas, chaparral, coastal sage scrub, dunes, bluffs, and wetlands, unless there is site-specific evidence that establishes that a habitat area is not especially valuable because of its special nature or role in the ecosystem. Regardless of whether streams and wetlands are designated as ESHA, the policies and standards in the LCP applicable to streams and wetlands shall apply. Existing, legally established agricultural uses, confined animal facilities, and fuel modification areas required by the Los Angeles County Fire Department for existing, legal structures do not meet the definition of ESHA.

3.4 Any area not designated on the LUP ESHA Map that meets the ESHA criteria is ESHA and shall be accorded all the protection provided for ESHA in the LCP. The following areas shall be considered ESHA, unless there is compelling site-specific evidence to the contrary:

a. Any habitat area that is rare or especially valuable from a local, regional, or statewide basis.

b. Areas that contribute to the viability of plant or animal species designated as rare, threatened, or endangered under State or Federal law.

c. Areas that contribute to the viability of species designated as Fully Protected or Species of Special Concern under State law or regulations.

d. Areas that contribute to the viability of plant species for which there is compelling evidence of rarity, for example, those designated 1b (Rare or endangered in California and elsewhere) or 2 (rare, threatened or endangered in California but more common elsewhere) by the California Native Plant Society.

3.14 New development shall be sited and designed to avoid impacts to ESHA. If there is no feasible alternative that can eliminate all impacts, then the alternative that would result in the fewest or least significant impacts shall be selected. Impacts to ESHA that cannot be avoided through the implementation of siting and design alternatives shall be fully mitigated, with priority given to on-site mitigation. Off-site mitigation

measures shall only be approved when it is not feasible to fully mitigate impacts on-site or where off-site mitigation is more protective in the context of a Natural Community Conservation Plan that is certified by the Commission as an amendment to the LCP. Mitigation shall not substitute for implementation of the project alternative that would avoid impacts to ESHA.

3.16 Dune ESHA shall be protected and, where feasible, enhanced. Vehicle traffic through dunes shall be prohibited. Where pedestrian access through dunes is permitted, well-defined footpaths or other means of directing use and minimizing adverse impacts shall be used. Nesting and roosting areas for sensitive birds such as Western snowy plovers and Least terns shall be protected by means, which may include, but are not limited to, fencing, signing, or seasonal access restrictions.

3.23 Development adjacent to ESHAs shall minimize impacts to habitat values or sensitive species to the maximum extent feasible. Native vegetation buffer areas shall be provided around ESHAs to serve as transitional habitat and provide distance and physical barriers to human intrusion. Buffers shall be of a sufficient size to ensure the biological integrity and preservation of the ESHA they are designed to protect. All buffers shall be a minimum of 100 feet in width, except for the case addressed in Policy 3.27.

3.31 Permitted development located within or adjacent to ESHA and/or parklands that adversely impact those areas may include open space or conservation restrictions or easements over ESHA, ESHA buffer, or parkland buffer in order to protect resources.

3.51 Disturbed areas ESHAs shall not be further degraded, and if feasible, restored. If new development removes or adversely impacts native vegetation, measures to restore any disturbed or degraded habitat on the property shall be included as mitigation.

Discussion

The project area is located along an approximately 1.16 mile long reach of Broad Beach between Pacific Coast Highway, Broad Beach Road, and the ocean in western Malibu. The subject area is characterized as a built-out portion of Malibu consisting of beachfront residential development. Point Lechuza is located at the northern end of the project area, and Trancas Creek/Lagoon and Zuma Beach is located at the southern end of the project area.

Broad Beach is unique in that it is the only area along the Malibu coastline where a system of vegetated sand dunes is found. Native sand dune plant species found on the dune system which are characteristic of dune habitat include: silver beach bur, pink sand verbena, beach salt bush, and beach evening primrose. Several sensitive wildlife species have been documented at Broad Beach including the western snowy plover (federally threatened and CDFW species of special concern), California brown pelican (CDFW fully protected species), California least tern (a federal and state endangered species), globose dune beetle (California Special Animal), Allen's hummingbird (USFWS Bird of Conservation Concern), silvery legless lizard (CDFW species of special concern), and sandy beach tiger beetle (California Special Animal).

Broad Beach was historically a wide beach which supported an active dune system, identified as an ESHA in both the Malibu/Santa Monica Mountains Land Use Plan, certified by the Commission in 1986, as well as the City of Malibu's certified Local Coastal Program (LCP) which was adopted by the Commission in 2002. However, in recent years, Broad Beach has been subject to periodic erosional events which appear to have increased in both frequency and duration and have endangered existing residential development located along portions of the beach that were historically considered safe. Although the dune system in the project area has been highly disturbed from past residential development, unpermitted landscaping, yard improvements, and wave erosion, the Commission has consistently found that coastal dunes such as those at Broad Beach are rare and meet the definition of environmentally sensitive habitat areas (ESHA). In addition, Policy 3.1 of the City of Malibu LCP identifies dunes as a habitat type that is considered ESHA.

The Commission further notes that the Broad Beach dunes have been classified as "Southern Foredunes" in the Holland community classification system by the California Department of Fish and Wildlife, and that such communities are listed as "very threatened" by the State of California. Southern foredunes also represent a habitat type identified as rare by the California Natural Diversity Data Base (CNNDB) and the California Native Plant Society (CNPS), and considered environmentally sensitive habitat areas (ESHA) in the City of Malibu LCP. These dunes are a remnant of a more widespread system that historically occurred along parts of the Malibu coastline and elsewhere in Southern California. California dune ecosystems have suffered a disproportionately high amount of human impact because the coast is a highly desirable area for residential settlements, industry, tourism, and recreation. As such, undisturbed coastal dunes are becoming rarer and rarer in California. Statewide, coastal dunes have been reduced to less than 25% of the area they originally occupied. The dunes that remain tend to reflect development impacts including non-native species invasion, erosion due to off-road vehicles and trampling, pollution, and loss of natural morphology due to destruction of vegetation. In spite of these impacts, many remaining dune communities continue to support an array of native plants and animals uniquely adapted to this transition zone between land and sea. In addition to their habitat and aesthetic values, dune ecosystems are recognized for providing important protection during storm events. Dunes provide a physical barrier against storm waves, reducing the risk of flooding for the natural and anthropogenic features behind them. Dunes are a dynamic buffer; eroding or growing as they are shaped by the seasonal dynamics of storms, wind, and wave action.

Revetment Related Impacts

In order to analyze impacts to foredune habitat in the project area that resulted from the placement of the as-built shoreline protective device (sand bag and rock revetment) that is proposed to be retained permanently as part of the project, the applicant's consultants prepared a foredune habitat impact analysis based on aerial surveys. The consultant's chose a baseline year of 2005 for the analysis since most pre-2010 shoreline stabilization materials were installed after 2005. The extent of foredune habitat present at Broad Beach in 2005 was estimated from false infrared aerial imagery of the site taken in 2005 as well as oblique aerial photographs. Based on this analysis, the consultant's estimated that 12.23 acres of foredune habitat occurred at Broad

Beach in 2005 within the project area. It was estimated that approximately 2.05 acres of that foredune habitat area was impacted by the installation of the sand bag revetments. However, some of this habitat may have been lost to shoreline erosion prior to sand bag revetment installation. And it was estimated that the proposed as-built rock revetment that was placed in 2010 impacted approximately 1.57 acres of additional foredune habitat. As such, placement of the sand bag and rock revetments is estimated to have resulted in the direct removal of approximately 3.62 acres of foredune habitat. However, additional temporary impacts to foredune habitat likely occurred as a result of installation and construction staging activities associated with placement of the revetments.

Further, revetment installation is also adversely affecting the functional value of the coastal dune system by disrupting coastal processes, such as the natural interchange of sand between the sandy beach and dunes and dune mobility by fixing this system's seaward edge. This major alteration of existing natural coastal processes in the area interferes with the ability of the dune system to contract or expand in response to long-term natural climatic cycles, such as changes in storms and wave activity, consequently altering the natural functioning of this system over the long-term. As such, the project has resulted and will continue to result in adverse impacts to the entire existing remnant dune habitat community landward of the as-built revetment that is proposed to be retained.

In this case, as discussed in detail in Section IV.B (Hazards and Shoreline Processes) of this report, a revetment is considered necessary to protect the existing residences and the associated existing septic systems between the properties at 31350 and 30760 Broad Beach Road. However, the proposed as-built rock revetment would effectively limit the amount of sand available to the public beach area as a whole and the overall shoreline width and shape. In order to mitigate potential impacts to the sand supply associated with the proposed project there are two main factors to consider: (1) siting the revetment in the landward most location feasible to free up as much sand as possible within the existing beach sand exchange system, and (2) a requirement for beach nourishment to mitigate the impacts of the proposed revetment device. First, the location and alignment of the revetment on the shoreline directly affects how much sand is available to naturally nourish and maintain the shoreline and beach. In this particular case it is also important to consider the sand exchange existing between the foreshore, sandy beach, and dune systems along Broad Beach. Coastal dunes exist in conjunction with the beach and are part of the sand sharing system that actively exchanges sand between the dune, beach, and the offshore bars. At erosional shorelines, such as the current condition at Broad Beach, the active dune (foredune) forms shift inland as the beach retreats. If there is no space for the dune to shift inland as the shoreline erodes, the dunes will not persist. Therefore, **Special Condition One (1)** is required, which would relocate approximately 2,000 linear ft. of the downcoast end of the rock revetment up to approximately 80 - 110 ft. further landward than the proposed location of the revetment so that the landward edge of the revetment extends no further seaward than approximately fifteen (15) ft. from existing, legally-established septic systems/leach fields (excluding any designated "future" leach fields that had not yet been built at the time this application was submitted to the Commission). This recommended alignment would make approximately 195,000 cubic yards more beach sand available within the beach sand exchange system than the proposed as-built revetment alignment. The recommended alignment would provide greater opportunity for

restoration of the dune system, even in the event that significant erosion of the nourished beach occurs.

Proposed Beach Nourishment and Dune Restoration

The applicant proposes to implement a beach nourishment program for a period of 20 years involving deposition of 600,000 cu. yds. of sand on the beach from inland sand quarries during the first year and approximately 450,000 cu. yds. of sand during the tenth year of the program; periodic sand backpassing operations to occur no more than once per year, and dune habitat restoration.

As proposed, the reconstructed/post-nourishment combined beach and dune system would extend approximately 250 ft. (at its widest point) seaward from the top of the as-built revetment to the surf zone with approximately 65-110 ft. of beach area located seaward of the constructed toe of the dunes. The applicant has prepared a "Conceptual Foredune Creation and Enhancement Plan," prepared by WRA, Inc., dated October 15, 2013. The dune system is proposed to be primarily constructed over and behind the existing emergency rock revetment. At the east end where no revetment is present, the dunes would be constructed on private land and existing public access easements landward of the MHTL. At the west end where there is no revetment and no dry sand beach remains, the dunes would be located primarily on public trust lands. The proposed dune system is proposed to be roughly 50 to 60 feet wide along most of the nourished beach and cover an approximately 10 acre area (Exhibit 7). The dunes would be constructed by creating a sand berm that runs along the length of the beach, with a minimum of 2 feet of sand over the rock revetment. The berm would extend approximately 30 to 50 feet inland and 0 to 10 feet seaward of the revetment, depending on location. The dune system would be constructed on top of this berm. The dunes are proposed to slope downward on the landward side of the revetment and tie into the existing grade where the dunes integrate with the backyards of the residences. In areas where a constructed dune abuts lower lying non-dune private properties, the dune would slope landward for 10 to 20 feet in a 3:1 slope. The sand dune system would typically include two rows of dunes that would range from 2 to 3 feet in height above the underlying sand berm, rising from 4 to 5 feet over the revetment. Individual dunes would range from 15 to 30 feet in width and have side slopes between 10 and 30 percent. Native habitat restoration would include planting species such as beach verbena, dune primrose and other characteristic species found in this community. Removal of non-native invasive species such as iceplant, pampas grass, myoporum and European dune grass from areas within and adjacent to the restored dunes is also proposed. The applicant has agreed to assume responsibility for the construction, planting, and maintenance of the restored dune system (BBGHAD Resolution No. 2012/06).

Although implementation of the applicant's proposed beach nourishment and dune restoration proposal will serve to substantially reduce adverse impacts to the functional value of the dune system, impacts to dune ESHA cannot be fully avoided. There has been significant temporal loss and diminishment of dune ESHA in this case as a result of the as-built revetment. Further, there will be significant construction related impacts to the dune system from beach nourishment and periodic backpassing and nourishment activities for the duration of the project. In addition, there is uncertainty regarding the success of the beach nourishment component of the project. As such,

the Commission finds that adequate mitigation shall be provided. Where there are unavoidable adverse impacts to ESHA, in past permit actions the Commission has required habitat mitigation at a ratio of 3:1. In this case, at a minimum, the direct removal of approximately 3.62 acres of foredune habitat from the placement of the sand bag and rock revetments shall be mitigated at a ratio of 3:1. This mitigation shall be provided on-site through the proposed beach nourishment and dune restoration and enhancement. However, modifications are required to the proposed beach nourishment and dune restoration components of the project in order to ensure that an adequate and appropriate area is restored/enhanced and that it is designed to mimic a natural dune system in habitat function and value. Therefore, **Special Condition Five (5)** requires that the applicant submit a final revised dune habitat restoration and enhancement program that would provide for the restoration and enhancement of coastal strand and southern foredune habitat on-site, at a minimum ratio of 3:1 or greater, as mitigation for impacts to existing dune habitat that resulted from the installation of the as-built sandbag and rock revetments on-site (3.62 acres). The approved dune habitat restoration/enhancement plan shall be implemented within 90 days of the completion of initial beach nourishment activities, however, the Executive Director may grant additional time for good cause. Special Condition 5 requires that the Program be in substantial conformance with the proposed "Conceptual Foredune Creation and Enhancement Plan," by WRA Environmental Consultants, dated October 15, 2013, but shall be revised to provide for the components discussed below.

The dune habitat restoration/enhancement area footprint shall extend from the property at 31350 Broad Beach Road to the property at 30708 Broad Beach Road, and that begins as far landward as feasible (at a stringline of approved development across the subject properties as generally depicted in Exhibit 9) and extends seaward to the expected maximum wave uprush limit. The stringline of approved development that is to be the landward limit of the dune restoration/enhancement area shall be generally located at the seaward edge of any legally existing residential structures, patios/decks. Sandy beach areas where existing septic leach fields are located seaward of the stringline shall be revegetated with native dune plant species and mounding techniques using minor amounts of sand fill material without the use of heavy equipment. Restoration/enhancement of the landwardmost areas within the above described dune habitat restoration/enhancement area shall be prioritized. The restoration area footprint requirement specified in Special Condition 5 includes all approved revetment and beach nourishment properties, with the exception of about a dozen properties at the upcoast end of the approved nourishment footprint where the highest degree of erosion is expected and where the area available for restoration is too narrow for a sustaining dune system. Also, the applicant has proposed to eliminate the approximately 100 foot wide Malibu West Beach Club property at the east end of Broad Beach (30756 Broad Beach Road) from the proposed dune restoration area to allow for recreational uses on their nourished sandy beach. However, the proposed 100 foot wide gap in the dune restoration area would significantly interrupt the natural dune building processes and habitat function at the east end of the project area. Therefore, Special Condition 5 requires that the restoration area footprint shall include the Malibu West Beach Club at 30756 Broad Beach Road, with the exception of a 10 foot wide access path as discussed below, in order to provide for a relatively continuous dune restoration area while accommodating a wider access path for the Club's recreational uses that receive more use than a typical single family residence.

In addition, Special Condition 5 specifies that the restoration area footprint shall begin as far landward as feasible, and prioritize the landwardmost areas, in order to minimize the area of restored dune system that may be lost due to erosion and/or approved backpassing activities. Further, enhancing the remnant dune areas landward of the approved revetment and nourishment areas by removing non-native/invasive plant species and revegetating with native plant species will also serve to minimize non-native/invasive plant species migration and colonization of the restored dune habitat and thereby maximize the success of the dune restoration.

As required by Special Condition 5, the dune habitat restoration/enhancement area shall be designed and contoured based on natural dune morphology (using historical records of the area and the most proximal reference site(s)). The footprint and the number of dune ridges shall increase from west (upcoast) to east (downcoast) across the restoration area. For instance, there shall be one dune ridge at the west (upcoast) end of the restoration area, transitioning to two and, if adequate area is available, three ridges, at the east (downcoast) end. The restored dunes shall be oriented parallel to the shore with dune faces that have a slope no steeper than 3:1. Discontinuous sand fencing that is placed perpendicular to the prevailing wind direction shall be temporarily employed to facilitate establishment of dune hummocks. In addition to sand fencing, the design shall include strategic placement of native dune vegetation for dune hummock establishment. Temporary sand fencing and strategic planting, rather than motorized equipment, shall be employed to establish a natural pattern of dune hummocks. Drainage/runoff control measures and creation of dune swales (low areas between dune ridges) shall also be used to function as natural drainage devices within the dune system. The dune habitat restoration/enhancement plan shall include a planting plan using native coastal strand and southern foredune plant species (plant palette) including the number of container plants and amount (lbs.) of seeds, source of plant material, provision for collection, storage, propagation and use of existing native plants, and plant installation methods. The plant palette shall be made up exclusively of native plants appropriate to the habitats and region, grown from seeds or vegetative materials obtained from the site or from an appropriate nearby beach location to maintain the genetic integrity of the area. The abundance, distribution, and percent cover of native coastal strand and southern foredune plant species shall be based on historical records, the literature, and/or the most proximal reference site(s).

In order to restore natural biological conditions and diversity and mimic natural sand conditions at Broad Beach to the maximum extent feasible, it is important that sand source and composition within the dune habitat restoration/enhancement area shall be consistent with the specifications of **Special Condition Eight (8)** (Sediment Analysis and Monitoring). Further, as detailed in Special Condition 5, existing native beach sand in the project area that is excavated for relocation of any portion of the as-built emergency rock revetment (pursuant to Special Condition 1) shall be temporarily stockpiled during beach nourishment and construction activities and then applied as a top layer on the restored dunes to facilitate successful reestablishment of dune vegetation on site. Prior to application of the native sand on the restored dunes, non-native and invasive plant species shall be removed to the maximum extent feasible.

In order to provide for private beach access between the existing residences and the shore while minimizing encroachments into the dune habitat restoration area, Special Condition 5 specifies that the dune habitat restoration/enhancement plan shall incorporate a maximum of one shared

private beach access path through the restored dune system (sand surface only and not to exceed 3 feet in width) for every two residences adjacent to the restoration area. However, the Malibu West Beach Club located at 30756 Broad Beach Road may maintain its own separate 10 ft. wide beach access path since the Beach Club receives more visitor use for beach recreation than a typical single family residence. Further, as discussed in Section IV.E of this report (Public Access and Recreation), the dune habitat restoration/enhancement plan shall also incorporate a 10 foot wide public pedestrian path located immediately landward of the entire length of the approved rock revetment (sand surface only).

Since the project will include restoration of a sensitive dune habitat area that is located at the interface of public and private accessways along the shore, Special Condition 5 is required to allow installation of limited signage along the approved accessways to notify the public and residents that the area is a sensitive habitat restoration area and to keep out of the dune restoration areas. The signs shall indicate "Habitat Restoration In Progress: Please Keep Out of Dune Restoration Area", or alternative language that is substantially similar. The signs will serve to minimize unauthorized encroachments into the restored dune system.

Special Condition 5 also requires the applicant to submit and implement a monitoring program to provide data that will guide the dune habitat and enhancement plan and direct any adaptive management actions that will increase the likelihood that the enhancement and restoration will be successful. The monitoring program shall include annual monitoring for the term of the permit and the submission of written reports. If the annual monitoring indicates that the restoration project has in part, or in whole, been unsuccessful, based on the approved performance standards, the applicant shall be required to submit a revised or supplemental program to compensate for those portions of the original program which were not successful. The revised, or supplemental dune restoration program shall be processed as an amendment to this Coastal Development Permit.

Further, in order to ensure that adverse effects to the dune habitat are minimized, Special Condition 5 also requires that the applicant submit a written agreement, in a form and content acceptable to the Executive Director, stating that no development shall occur within the final approved Dune Habitat Restoration and Enhancement Plan Area (Open Space Area) with the exception of dune restoration, maintenance of existing drainage improvements, and construction/maintenance of the approved revetment, beach nourishment/re-nourishment, drainage control, and approved public access improvements. It is recognized that the seaward limit of the dune system and dune vegetation within the approved restoration area is ambulatory in nature and that, therefore, the seaward extent of the area subject to this open space restriction is also ambulatory in nature.

The proposed beach nourishment component of the project includes an Adaptive Management Plan for long-term monitoring of beach width and profile and required actions to transport sand back up coast as needed through backpassing. Backpassing of sand to maintain beach widths and prolong the longevity of the nourishment would involve the use of heavy equipment (e.g., scrapers and bulldozers) to excavate sand from the downdrift, eastern segment of Broad Beach for transport updrift to the eroding segment on the west end of Broad Beach. It is anticipated that backpassing will occur on an annual basis for the duration of the project. Backpassing will result

in direct short-term impacts to the sandy beach and dune habitats by disturbance to infaunal species, beach wrack, and potentially the seaward portion of the restored dunes. However, over the longer-term, backpassing activities will serve to conserve a larger area of the newly created beach and dune habitats and slow their erosion. In order to minimize impacts to terrestrial habitats from backpassing, it is important to limit the location, timing, and duration of such activities. Therefore, **Special Condition Four (4)** limits backpassing to no more than once per year within the limits of the nourishment area and **Special Condition Nine (9)** limits backpassing activities to the fall/winter season, which will serve to avoid the beach's most biologically productive period as well as the peak season for public recreational use. Further, the haul route for the backpassing would occur at the seaward edge of the beach in order to minimize disturbance to the restored dunes.

While it is unlikely that grunion are utilizing the existing beach because of the lack of sandy beach berm areas (resulting from beach erosion and presence of the revetment), there is a potential for grunion runs during the course of the project construction. Beach nourishment activities are not proposed to occur within the seasonally predicted run period and egg incubation period of the California grunion. However, the Commission notes that any potential placement of sand on the beach may result in adverse effects to grunion due to direct disturbance by construction activity and use of heavy equipment on the sandy beach as well as indirect impacts from smothering of eggs previously deposited on the sandy beach. Therefore, in order to ensure that any potential adverse effects to grunion are avoided, **Special Condition Nine (9)** prohibits any beach nourishment activities from occurring on any part of the beach and shorefront in the project area when California grunion (including eggs) are present during any run periods and corresponding egg incubation periods.

In addition, the western snowy plover, a bird species listed as federally threatened and as a state species of special concern, is known to occur in the project area. Critical habitat for the western snowy plover is designated at Zuma Beach and extends onto the downcoast area of Broad Beach. Zuma Beach supports the largest population of wintering snowy plovers in Los Angeles County. During construction of the emergency revetment in 2010, biological monitors observed snowy plovers on the sandbar at the mouth of Trancas Lagoon. All construction operations, including operation of equipment, material placement, placement or removal of equipment or facilities, and backpassing/beach renourishment or other activities are prohibited pursuant to **Special Condition Nine (9)** on any part of the beach and shorefront in the project area when western snowy plover are present, as identified by pre-construction surveys required by Special Condition 7, to avoid adverse effects to western snowy plovers.

Trancas Creek/Lagoon is located at the eastern end of the project reach and is situated between the proposed nourishment site and the construction staging area for the nourishment site. Trancas Creek/Lagoon is identified as an ESHA under the Malibu LCP. Trancas Creek is defined as a seasonal creek, running only after heavy rains; in drier years, it does not run at all. Trancas Lagoon itself measures approximately 10 acres in area and supports a mix of southern coastal salt marsh and brackish and freshwater marsh habitats, with approximately 0.50 acre located seaward of Pacific Coast Highway. The lagoon is created by a sand berm, which limits tidal exchanges and causes the creek to pond during high seasonal flows or during times of tidal inundation or wave run-up. A jurisdictional wetland delineation was completed for the Trancas

Lagoon in 2002 and identified 0.92 acre and 450 linear feet of federal jurisdictional wetlands and waters of the U.S. The lagoon supports native species, such as California bulrush, pickleweed and alkali heath; non-native species, such as brass buttons and tamarisk; and substantial areas of open water. Wildlife species known to use the lagoon and the sandy beach in the immediate vicinity include common waterfowl, such as mallard, as well as a number of shorebirds, such as double-crested cormorant and gulls. Additionally, western snowy plover, a federally threatened species and a CDFW species of special concern, has federally designated critical overwintering and foraging habitat in the immediate vicinity of the lagoon and construction staging area. The southwestern pond turtle, a CDFW species of special concern, has not been observed at Broad Beach; however, this species has historically been documented in Trancas Canyon, upstream of the lagoon. This species would be highly unlikely in the lagoon seaward of the PCH bridge, but they can occur in brackish water and could occur just upstream of the bridge. The lagoon is not known to currently support any federally or State-listed fish, such as the tidewater goby or southern steelhead, both federally endangered species. No records for steelhead trout are found in Trancas since the 1980's. However, the National Park Service and the Resource Conservation District of the Santa Monica Mountains are currently working on a habitat restoration feasibility study for the lagoon with the hope of enhancing species diversity and restoring conditions favorable to listed species that were historically present.

The proposed beach nourishment footprint will taper off at the east end of Broad Beach and will not extend all the way to Trancas Creek or Trancas Lagoon; thus, it will not fill it. Therefore, it is anticipated that the proposed project will not interfere with the natural functioning of the creek. Beach nourishment will eventually result in a variable widening of the beach in front of the creek mouth but will not change the existing elevation of the barrier beach, so the existing condition of episodic breaching as part of lagoon processes will be maintained as a result of the project. Access between the proposed construction staging/storage area and Broad Beach would be along a defined travel route beginning at the southern edge of Zuma Beach Parking Lot 12 and sand storage areas and continuing west along the intertidal beach. The access route will occur seaward of any inundated portion of Trancas Lagoon, thereby minimizing potential impacts to this sensitive habitat. However, while heavy equipment could cross the sand bar fronting Trancas Lagoon throughout the majority of the construction period, during winter, high flows in Trancas Creek and/or large winter waves may cause this sandbar to breach. In order to safely cross and avoid impacts to Trancas Lagoon when the sand bar is breached, construction would be halted during periods when Trancas Creek is flowing to the ocean. Further, although special status fish species (e.g., southern steelhead) are not known to currently spawn in Trancas Lagoon, this halt in construction activities during periods of breaching would avoid adverse impacts to fish passage.

In order to ensure that adverse impacts to sensitive species are avoided, **Special Condition Seven (7)** requires a qualified biological monitor to be present during all project activities and that pre-construction surveys of sensitive species be conducted. In the event that the monitor finds that any sensitive wildlife species (including but not limited to western snowy plover or California grunion) exhibit reproductive or nesting behavior, the applicant shall cease work and immediately notify the Executive Director and local resource agencies. Project activities shall resume only upon written approval of the Executive Director. The monitor shall have the authority to cease operations should any breach in permit compliance occur or if any unforeseen

sensitive habitat issues arise. If significant impacts or damage occur to sensitive wildlife species, the applicant shall be required to submit a revised, or supplemental program to adequately mitigate such impacts. The revised, or supplemental, program shall be processed as an amendment to this coastal development permit.

Therefore, for the reasons discussed above, the Commission finds that the proposed amendment, as conditioned, is consistent with Section 30240 of the Coastal Act.

E. PUBLIC COASTAL ACCESS AND RECREATION

Applicable Coastal Act Policies

Coastal Act Section 30210

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Coastal Act Section 30211

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Coastal Act Section 30212

(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:

(1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,

(2) adequate access exists nearby, or,

(3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

(b) For purposes of this section, "new development" does not include:

(1) Replacement of any structure pursuant to the provisions of subdivision (g) of Section 30610.

(2) The demolition and reconstruction of a single-family residence; provided, that the reconstructed residence shall not exceed either the floor area, height or bulk of the former structure by more than 10 percent, and that the reconstructed residence shall be sited in the same location on the affected property as the former structure.

(3) Improvements to any structure which do not change the intensity of its use, which do not increase either the floor area, height, or bulk of the structure by more than l0 percent, which do not block or impede public access, and which do not result in a seaward encroachment by the structure.

(4) The reconstruction or repair of any seawall; provided, however, that the reconstructed or repaired seawall is not a seaward of the location of the former structure.

(5) Any repair or maintenance activity for which the commission has determined, pursuant to Section 30610, that a coastal development permit will be required unless the commission determines that the activity will have an adverse impact on lateral public access along the beach.

As used in this subdivision "bulk" means total interior cubic volume as measured from the exterior surface of the structure.

(c) Nothing in this division shall restrict public access nor shall it excuse the performance of duties and responsibilities of public agencies which are required by Sections 66478.1 to 66478.14, inclusive, of the Government Code and by Section 4 of Article X of the California Constitution.

Coastal Act Section 30213

Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

Applicable City of Malibu Land Use Plan Policies

2.1 *The shoreline, parklands, beaches and trails located within the City provide a wide range of recreational opportunities in natural settings which include hiking, equestrian activities, bicycling, camping, educational study, picnicking, and coastal access. These recreational opportunities shall be protected, and where feasible, expanded or enhanced as a resource of regional, state and national importance.*

2.2 *New development shall minimize impacts to public access to and along the shoreline and inland trails. The City shall assure that the recreational needs resulting from proposed development will not overload nearby coastal recreation*

areas by correlating the amount of development with local park acquisition and/or development plans with the provision of onsite recreational facilities to serve new development.

2.5 *New development shall be sited and designed to minimize impacts to public access and recreation along the shoreline and trails. If there is no feasible alternative that can eliminate or avoid all access impacts, then the alternative that would result in the least significant adverse impact shall be required. Impacts may be mitigated through the dedication of an access or trail easement where the project site encompasses an LCP mapped access or trail alignment, where the City, County, State, or other public agency has identified a trail used by the public, or where there is substantial evidence that prescriptive rights exist. Mitigation measures required for impacts to public access and recreational opportunities shall be implemented prior to or concurrent with construction of the approved development.*

2.6 *Mitigation shall not substitute for implementation of a feasible project alternative that would avoid impacts to public access.*

2.63 *Consistent with the policies below, maximum public access from the nearest public roadway to the shoreline and along the shoreline shall be provided in new development. Exceptions may occur only where (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources; (2) adequate access exists nearby, or; (3) agriculture would be adversely affected. Such access can be lateral and/or vertical. Lateral access is defined as an accessway that provides for public access and use along the shoreline. Vertical access is defined as an accessway which extends to the shoreline, or perpendicular to the shoreline in order to provide access from the first public road to the shoreline.*

2.64 *An Offer to Dedicate (OTD) an easement for lateral public access shall be required for all new oceanfronting development causing or contributing to adverse public access impacts. Such easement shall extend from the mean high tide line landward to a point fixed at the most seaward extent of development i.e. intersection of sand with toe of revetment, vertical face of seawall, drip line of deck, or toe of bluff.*

4.22 *Siting and design of new shoreline development and shoreline protective devices shall take into account anticipated future changes in sea level. In particular, an acceleration of the historic rate of sea level rise shall be considered. Development shall be set back a sufficient distance landward and elevated to a sufficient foundation height to eliminate or minimize to the maximum extent feasible hazards associated with anticipated sea level rise over the expected 100 year economic life of the structure.*

Applicable City of Malibu Implementation Plan Provisions

Section 12.4. - Access Required

As a condition of approval and prior to issuance of a permit or other authorization for any new development identified in A through D of this section, except as provided in Section 12.5 of the Malibu LIP, an offer to dedicate an easement or a grant of easement (or other legal mechanism pursuant to Section 12.7.1 (b) of the Malibu LIP) for one or more of the types of access identified in Section 12.2 (a-e) of the Malibu LIP shall be required and shall be supported by findings required by Sections 12.7.3-12.9 of the Malibu LIP; provided that no such condition of approval shall be imposed if the analysis required by Sections 12.7.3 (a) through (d) of the Malibu LIP establishes that the development will not adversely affect, either individually or cumulatively, the ability of the public to reach and use public tidelands and coastal resources or that the access dedication requirement will not alleviate the access burdens identified.

A. New development on any parcel or location specifically identified in the Land Use Plan or in the LCP zoning districts as appropriate for or containing an historically used or suitable public access trail or pathway.

B. New development between the nearest public roadway and the sea.

C. New development on any site where there is substantial evidence of a public right of access to or along the sea or public tidelands, a blufftop trail or an inland trail acquired through use or a public right of access through legislative authorization.

D. New development on any site where a trail, bluff top access or other recreational access is necessary to mitigate impacts of the development on public access where there is no feasible, less environmentally damaging, project alternative that would avoid impacts to public access.

Section 12.5. - Exceptions

Section 12.4 of the Malibu LIP shall apply except in the following instances:

A. Projects excepted from the definition of "new development" at Section 2.1 of the Malibu LIP.

B. Where findings required by Sections 12.7.3 and 12.8.1 of the Malibu LIP establish any of the following:

1. Public access is inconsistent with the public safety, military security needs, or protection of fragile coastal resources.

2. Adequate access exists nearby.

C. Exceptions identified in (b) shall be supported by written findings required by Section 12.9 of the Malibu LIP.

Section 12.6.1 Lateral Public Access

The public access required pursuant to Section 12.4 of the Malibu LIP shall conform to the standards and requirements set forth in Sections 12.6 through 12.7.2 of the Malibu LIP.

A. Minimum requirements. [Also to be used for blufftop access or trail access, as applicable.] A condition to require an offer to dedicate an easement or a grant of easement for lateral access as a condition of approval of a coastal development permit (or other authorization to proceed with development) pursuant to Section 12.4 of the Malibu LIP shall provide the public with the permanent right of lateral public access and passive recreational use along the shoreline (or public recreational area, bikeway, or blufftop area, as applicable); provided that in some cases controls on the time, place and manner of uses, such as limiting access to pass and repass or restricting .hours of use, may be justified by site characteristics including sensitive habitat values or fragile topographic features or by the need to protect the privacy of residential development.
…

Section 12.6.7 Legal description of an accessway: recordation

A. An access dedication (offer to dedicate or grant of easement) required pursuant to Section 12.4 of the Malibu LIP shall be described, in the condition of approval of the permit or other authorization for development in a manner that provides the public, the property owner, and the accepting agency with the maximum amount of certainty as to the location of the accessway. As part of the condition of approval, easements shall be described as follows: (I) for lateral access: along the entire width of the property from the mean high tide line landward to a point fixed at the most seaward extent of development (as applicable): the toe of the bluff, the intersection of sand with toe of revetment, the vertical face of seawall, or other appropriate boundary such as dripline of deck. On beachfront property containing dune ESHA the required easement for lateral public access shall be located along the entire width of the property from the mean high tide line landward to the ambulatory seawardmost limit of dune vegetation; (2) for blufftop access or trail access: extending inland from the bluff edge or along the alignment of a recreational trail; (3) for vertical access: extending from the road to the mean high tide line (or bluff edge).
…

Broad Beach is located in a region that is a highly desirable landscape for public recreational opportunities, for residents and visitors alike, due to its climate and the natural beauty of the ocean, beaches, and mountains. Broad Beach is located just upcoast from Zuma Beach County Park, which is the most heavily used public beach in the Malibu area. There are currently two Los Angeles County-owned public vertical accessways along Broad Beach within the project

reach. Many beachgoers who access the beach from Zuma Beach County Park, or the existing public vertical accessways along Broad Beach, often walk along the shoreline between Lechuza Point (upcoast of Broad Beach) and Point Dume (downcoast of Broad Beach). Recreational use of Broad Beach consists primarily of passive recreational uses such as walking, jogging, picnicking, sun bathing, dog walking, swimming, surfing, paddleboarding, bird watching, and tide pooling. Surfing along Broad Beach primarily occurs at shore breaks at the eastern portion of the beach, or at a point break near Lechuza Point that can occur during certain winter swells. However, Broad Beach generally contains less favorable conditions for surfing than other areas in Malibu, so lower numbers of surfers have been observed in this area. Free on-street parking is available along the northern side of Broad Beach Road, along Pacific Coast Highway by Zuma Beach and along the bluffs overlooking Broad Beach.

With limited exceptions not relevant here, the State owns all tidelands within the State, which are those lands located seaward of the mean high tide line as it exists from time to time. By virtue of its admission into the Union, California became the owner of all tidelands and all lands lying beneath inland navigable waters. These lands are held in the State's sovereign capacity and are subject to the common law public trust. The public trust doctrine restricts uses of sovereign lands to public trust purposes, such as navigation, fisheries, commerce, public access, water oriented recreation, open space, and environmental protection. The public trust doctrine also severely limits the ability of the State to alienate these sovereign lands into private ownership and use free of the public trust. Consequently, the Commission must avoid decisions that improperly compromise public ownership and use of sovereign tidelands.

Where development is proposed that may impair public use and ownership of tidelands, the development's proposed location in relation to tidelands must be considered. The legal boundary between public tidelands and private uplands is related to the ordinary high water mark (OHWM). In parts of California where the shoreline has not been affected by fill or artificial accretion, the ordinary high water mark of tidelands is determined by locating the existing "mean high tide line." The mean high tide line is the intersection of the elevation of mean high tide with the shore profile. Where the shore is composed of sandy beach whose profile changes as a result of wave action, the location at which the elevation of mean high tide line intersects the shore is subject to change. The result is that the mean high tide line (and therefore the boundary) is an "ambulatory" or moving line that moves seaward through the process known as accretion and landward through the process known as erosion.

Consequently, the position of the mean high tide line is ambulatory and fluctuates seasonally as high wave energy (usually but not necessarily) in the winter months causes the mean high tide line to move landward through erosion, and as milder wave conditions (generally associated with the summer) cause the mean high tide line to move seaward through accretion. In addition to ordinary seasonal changes, the location of the mean high tide line is affected by long term changes such as sea level rise and diminution of sand supply. On the open coast, including Broad Beach, the ambulatory nature of the MHTL, resulting from natural coastal processes such as coastal erosion and accretion, sea level fluctuations, and the physical configuration of the beach, creates a shifting public-private boundary.

To protect public tidelands when beachfront development is proposed, the Commission must consider (1) whether the development or some portion of it will encroach on public tidelands (i.e., will the development be located below the mean high tide line as it may exist at some point throughout the year) and (2) if not located on tidelands, whether the development will indirectly affect tidelands by causing physical impacts to tidelands.

As proposed, the applicant is requesting permanent authorization of the as-built 4,150 linear ft. emergency rock revetment constructed on 78 beachfront lots and public tidelands and that was permitted on a temporary basis in the Commission's 2010 emergency permit action. The applicant is also requesting permanent authorization of an as-built sand bag wall that was incorporated into the design of the rock revetment and the implementation of a beach nourishment program involving the placement of 600,000 cu. yds. of sand for approximately 6,000 linear ft. of beach on 121 beachfront lots and public tidelands. The project also includes an additional sand nourishment 10 years from the date of the initial beach nourishment involving 450,000 cu. yds. of sand. The State Lands Commission conducted a mean high tide line (MHTL) survey at Broad Beach in January 2010. Broad Beach currently supports approximately 27 acres of intertidal public trust land (as measured between the mean lower low water (MLLW) and the January 2010 MHTL) that is generally available for public use and enjoyment at lower tides, with the majority of these lands located seaward of the existing revetment. Based on the 2010 MHTL survey, approximately 0.86 acre of public land currently lies beneath the existing revetment[28]. As such, the as-built rock revetment currently encroaches on public tidelands and displaces lateral public access.

In addition, the Commission must also consider whether a project affects any public right to use shorelands that exist independently of the public's ownership of tidelands. In this case, the public has acquired numerous lateral public access easements and deed restrictions on adjoining private property as a result of permit conditions included in Coastal Development Permits issued by the Commission and the City of Malibu for new development on Broad Beach. Of the 121 private Broad Beach parcels within the project area, approximately 51 of those parcels have recorded easements, deed restrictions, or other legal documents providing the public with the right of lateral public access across the seaward edge of the private properties (as shown on Exhibit 16). The terms of these public access easements/restrictions vary, but they mainly consist of the area of sandy beach extending 25 feet inland from the MHTL or extending from the seaward extent of approved residential development and the MHTL. In total, 32 of the 51 recorded lateral accessways along Broad Beach lie beneath or landward of the proposed as-built revetment. The revetment, therefore, directly impacts an additional approximately 1 acre area of sandy beach designated for public access[29]. The State Lands Commission is the easement holder for all 20 of the 32 lateral accessways that were required as easements and which are impacted by the proposed as-built revetment (the remaining 12 lateral accessways within this area were

[28] California State Lands Commission (CSLC) Revised Analysis of Impacts to Public Trust Resources and Values for the Broad Beach Restoration Project (APTR) dated July 2014.
[29] Ibid.

implemented pursuant to deed restrictions and/or the terms of special conditions of previous coastal development permits).

As such, the majority of the proposed as-built revetment (2 acres of the approximately 3 acre revetment footprint) directly impacts public access and recreational use of public trust lands and existing lateral public access easement/restriction areas, and is expected to continue impacting public access over time. In addition to direct encroachment on lands to which the public has a right of access, a shoreline protective device has a number of other adverse effects on the dynamic shoreline system causing adverse impacts to public tidelands. First, changes in the shoreline profile, particularly changes in the slope of the profile, which results from reduced beach width, alter the usable area under public ownership. A beach that rests either temporarily or permanently at a steeper angle than under natural conditions will have less horizontal distance between the mean low water and mean high water lines. This reduces the actual area of public property available for public use. The second effect on access is through a progressive loss of sand as shore material is not available to nourish the bar. The lack of an effective bar can allow such high wave energy on the shoreline that materials may be lost far offshore where it is no longer available to nourish the beach. The effect of this on the public is again a loss of area between the mean high water line and the actual water. Third, shoreline protective devices such as revetments and bulkheads cumulatively affect public access by causing accelerated and increased erosion on adjacent public beaches. This effect may not become clear until such devices are constructed individually along a shoreline and they eventually affect the profile of a public beach. Fourth, if not sited landward in a location that insures that the revetment is only acted upon during severe storm events, beach scour during the winter season will be accelerated because there is less beach area to dissipate the wave energy. Finally, as mentioned, revetments and bulkheads interfere directly with public access by their occupation of beach area that will not only be unavailable during high tide and severe storm events but also potentially throughout the winter season.

In this case, as discussed in detail in Section IV.B (Hazards and Shoreline Processes) of this report, a revetment is considered necessary to protect the existing residences and the associated existing septic systems between the properties at 31350 and 30760 Broad Beach Road. However, the as-built rock revetment has resulted in the narrowing of the beach particularly during high tide and high wave events since its construction in 2010 and therefore has significantly reduced the amount of sand available to the public beach area as a whole and the overall shoreline width and shape (Exhibit 3).

In order to mitigate potential impacts to the sand supply associated with the proposed project there are two main factors to consider: (1) siting the revetment in the landward most location feasible to free up as much sand as possible within the existing beach sand exchange system, and (2) a requirement for beach nourishment to mitigate the impacts of the proposed revetment device. First, the location and alignment of the revetment on the shoreline directly affects how much sand is available to naturally nourish and maintain the shoreline and public beach area. In this particular case it is also important to consider the sand exchange existing between the foreshore, sandy beach, and dune systems along Broad Beach. Coastal dunes exist in conjunction with the beach and are part of the sand sharing system that actively exchanges sand between the dune, beach, and the offshore bars. At erosional shorelines, such as the current

condition at Broad Beach, the active dune (foredune) forms shift inland as the beach retreats. If there is no space for the dune to shift inland as the shoreline erodes, the dunes will not persist. The proposed as-built revetment is located at the seaward toe of the baseline pre-project dune habitat footprint (2005). Since 2005, the construction of sandbag revetment walls and the emergency rock revetment in 2010 removed the majority of the existing foredune habitat along Broad Beach. Additionally, a variety of unpermitted landscaping and accessory improvements by private homeowners has removed portions of remaining dune vegetation landward of the revetment as discussed in more detail in Section IV.G. of this report (Unpermitted Development).

The applicant proposes to implement a beach nourishment program for a period of 20 years involving deposition of 600,000 cu. yds. of sand on the beach from inland sand quarries during the first year and approximately 450,000 cu. yds. of sand during the tenth year of the program; periodic sand backpassing operations to occur no more than once per year, and dune habitat restoration. As proposed, the reconstructed/post-nourishment combined beach and dune system would extend approximately 250 ft. (at its widest point) seaward from the top of the as-built revetment to the surf zone with approximately 65-110 ft. of beach area located seaward of the constructed toe of the dunes. The proposed dune habitat restoration area is proposed to cover an approximately 10 acre area. However, as proposed, the dune system would be built on top of and extend both seaward and landward of the as-built rock revetment. In that alignment the revetment would interfere with the natural sand exchange between the new dune system and the beach and would limit the dunes' ability to shift seaward or landward with the changing shoreline width.

In addition, as all shoreline protective devices effectively 'set' the back beach and the mean high tide line, ultimately narrowing and restricting lateral beach access and sandy beach area available for public recreation, when approving such devices the Commission typically requires the provision of new public access amenities at or near the project site and/or payment of an in-lieu fee for beach nourishment to offset or mitigate these impacts.

In this particular case, the applicant is proposing significant beach nourishment in order to extend the sandy beach area seaward of the revetment and enhance the effectiveness and longevity of the shoreline protective device. This proposed nourishment component will introduce an equivalent amount of sandy material back into a system to mitigate the loss of sand that would be caused by a protective device. Depending on the rate of coastal erosion, the proposed sand nourishment would substantially expand the amount of time that Broad Beach could be accessed by the public and would increase the types of recreational activities that could be accommodated to include those that typically occur on dry sand beaches. The sand nourishment will also help buffer the erosive scour of wave action that would otherwise occur directly at the base of a shoreline protective device.

However, while the potential impacts to public shoreline sand supply and public access/recreation from the proposed rock revetment would be permanent, the public access benefits of nourishment, although substantial, will likely be transitory. The sand deposition will undergo immediate reworking by waves and tides that distribute the sand both offshore and alongshore until the beach profile reaches an equilibration shape (i.e. equilibrium erosion).

According to the applicant's modeling, this equilibrium erosion is anticipated to reduce the total beach and dune area by approximately 25-30 percent after the first year. It is anticipated that erosion of the beach area would continue despite backpassing and the applicant's modeling projects a worst-case scenario potential for a return to near-existing conditions within 5 years of the initial nourishment, particularly at the beach's west (upcoast) end, which is naturally more narrow than the other areas of beach within the project reach. This could result in coastal erosion eliminating the entire dry sandy beach and substantial loss of new sand dunes with potential for exposure of the revetment and the associated adverse effects of blocking public access to public trust lands. Yet it is important to note that while the applicant has submitted estimations, the anticipated longevity of the sand nourishment is uncertain over the limited term of the project. Further, given the limited term of the sand nourishment project, the long-term and persistent impacts of the shoreline protective device to sand supply and public access and recreation is not adequately addressed through the proposed re-nourishment program.

When impacts cannot be avoided and have been reduced to the maximum extent feasible, mitigation for any remaining adverse impacts of the revetment on public access and recreation must be required in order for the development to be consistent with the public access policies of the Coastal Act and the Malibu LCP. In past permit actions, the Commission has found that adverse impacts to shoreline processes from shoreline protective devices are greater the more frequently that they are subject to wave action. As such, the Malibu LCP requires (and the Commission has required in past permit actions) that all new development on a beach, including shoreline protection devices, be located as far landward as possible in order to reduce adverse impacts to the sand supply and public access/recreation resulting from the development. In this case, the proposed as-built revetment has not been sited as far landward as feasible in order to protect existing development.

Project alternatives submitted by the applicant address relocating the existing revetment to a further landward location than currently proposed as discussed in more detail in Section IV.B. (Hazards and Shoreline Processes) of this staff report. However, Commission staff is recommending that the eastern half of the revetment be located further landward than any of the applicant's project alternatives. Specifically, the alternative alignment recommended in **Special Condition One (1)** would relocate approximately 2,000 linear ft. of the downcoast end of the rock revetment up to approximately 20 - 110 ft. further landward than the proposed location of the revetment so that the landward edge of the revetment extends no further seaward than approximately fifteen (15) ft. from existing, legally-established septic systems/leach fields (excluding any designated "future" leach fields that had not yet been built at the time this application was submitted to the Commission) as generally depicted in Exhibit 8. This recommended alignment would make approximately 195,000 cubic yards more beach sand available within the beach sand exchange system than the proposed as-built revetment alignment. The recommended alignment would also significantly reduce impacts to sand supply and public access in the event that significant erosion of the nourished beach occurs. In addition, the Malibu LCP which serves as guidance includes provisions (Land Use Plan Policy 4.39 and Implementation Plan Section 10.4.M) that specifically require shoreline protective structures be sited as far landward as feasible to protect existing development. Thus, in this case, the Commission finds that further landward relocation of the as-built revetment would significantly

reduce impacts to shoreline processes or sand supply and would serve to minimize adverse impacts to public access and recreation.

As discussed in detail above, the construction of a shoreline protective device, such as the proposed rock revetment, even if relocated further landward pursuant to the provisions of Special Condition 1 would still result in some unavoidable potential adverse effects to coastal processes, shoreline sand supply, and public access/recreation. In addition, the public will lose access to Broad Beach during construction and subsequent nourishment and backpassing activities. The initial beach nourishment event is estimated to take approximately 8 months of active work and the subsequent re-nourishment after initial project implementation is estimated to at least several months of work. Backpassing operations would occur no more than once per year and would take up to several weeks to complete. Although work would be conducted in the fall/winter months to avoid the summer peak beach visitation period, public access would be restricted at Broad Beach during the construction and backpassing periods. Construction equipment and materials is proposed to be staged at Zuma Beach Parking Lot 12, located at the northernmost end of Zuma Beach (a Los Angeles County Beach Park) and immediately downcoast of the project area (Exhibit 17). Sand would be stockpiled and construction equipment would circulate along approximately 1,000 feet of Zuma Beach occupying an estimated 5 acres of dry sand beach berm. Lot 12 and the proposed Zuma Beach sand stockpile area will be periodically closed to the general public. As such, there will be significant temporary impacts to public access associated with the proposed project.

In past permit actions in Malibu, in order to address these impacts to public access and recreation, the Commission has required lateral public access easements along the shoreline between the ambulatory MHTL and the seawardmost extent of approved development, such as the face or toe of a shoreline protective device, or the dripline of the structure or deck, or the seaward extent of dune vegetation where there is dune habitat present. In fact, as listed and shown on the Public Access Map in the adopted City of Malibu LCP, the Commission and the City of Malibu have previously required more than 529 public lateral access easements or deed/condition restricted areas along the shoreline of beachfront lots to mitigate potential adverse impacts to shoreline processes and supply and public access/recreation. In addition, just within the project area itself, the Commission and the City of Malibu have previously required approximately 51 public lateral access easements or deed restricted areas along the shoreline of beachfront lots, many of which were required to mitigate potential adverse impacts to shoreline

processes and supply and public access/recreation[30]. In addition, Sections 12.6.1 and 12.6.7 of the Malibu LCP (which serves as guidance in this case) specifically require that an offer-to-dedicate a lateral public access easement be required under certain circumstances as a condition of approval for new development on the beach, and that such lateral easement extend along the entire width of the property from the ambulatory mean high tide line landward to a point fixed at the most seaward extent of development (as applicable): the toe of the bluff, the intersection of sand with toe of revetment, the vertical face of seawall, or other appropriate boundary such as dripline of deck.

Therefore, for all of the reasons discussed above, the Commission finds it necessary to require **Special Condition Thirteen (13)**, which requires the applicant to execute and record a deed restriction, in form and content acceptable to the Executive Director, that irrevocably grants the public the right of lateral public access and passive recreational use along the shoreline, except for the area of the dune protection buffer area described below, during the period that the revetment authorized by this CDP or any part thereof remains in existence. The deed restriction shall be recorded against the properties that extend from 31350 to 30760 Broad Beach Road, inclusive, and it shall be recorded against all parcels identified on the APN map attached as Exhibit 18a-e. The dune protection buffer area shall extend from the seaward toe of the approved revetment to the ambulatory seaward most limit of dune vegetation. The deed restriction shall memorialize a public right of lateral public access and passive recreational use over the entirety of the area running parallel to the shore from the ambulatory mean high tide line to a line running 25 feet landward of the ambulatory high tide line. Public access is not allowed within a dune protection buffer extending from the seaward toe of the of the approved rock revetment to the ambulatory seaward most line of dune vegetation. If the beach area seaward of the first line of dune vegetation is impassible due to high tides, formation of a steep scarp or some other reason the public shall be able to pass and repass along the apex (top) of the seaward most dune formation. Public access and recreation shall not be allowed within the dune protection buffer area except to the extent as indicated above, or if that area becomes overlain by the public access and passive recreational use area due to an advancing mean high tide line. The dune protection buffer is important to protect sensitive coastal dune habitat that is restored and enhanced on-site, which constitutes an environmentally sensitive habitat (ESHA) as explained in Section IV.D of this report. It is recognized that both the mean high tide line and the seaward limit of the dune vegetation are ambulatory in nature and that, therefore, the area of beach that is available for lateral public access will also be ambulatory in nature. Should the created dune

[30] CCC CDP Nos. P-73-1446 (Webb); P-74-2534 (Miser); P-75-4573 (Froehlich); P-75-4653 (Gardner); P-75-4957 (Wallis); P-76-9478 (Marks); A-77-226 (Smith); A-77-1760 (Shepard); P-77-2527 (Finegood); P-77-9738 (Gocke); A-79-5085 (Egg); SF-80-7373 (Irwin); A-80-7553 (Gage); 5-81-431 (Eglit); 5-83-210 (Tarlow); 5-83-372 (Mark); 5-83-783 (Borman); 5-83-796 (Koenig); 5-83-816 (Manings); 5-83-899 (Broad Beach Partners Ltd); 5-84-849 (Cramer); 5-85-015 (Green); 5-85-044 (Berkowitz); 5-85-272 (Feldman); 5-85-516 (Lemmon); 5-85-635 (Broad Beach Assoc.); 5-86-273 (Bromiley); 5-87-093 (Leff); 5-87-593 (Wells); 5-90-487 (Wax & Associates); 4-93-086 (Binder); 4-98-028 (Jacobs); 4-98-298 (McClellan); 4-98-302 (Powell); 4-99-086 (Greene); 4-99-129 (Schwab); 4-99-153 (Ioki); 4-99-154 (Montanaro); 4-99-155 (Ioki); 4-99-216 (Cohen); 4-00-275 (Spears Family Trust); 4-01-148 (Nathanson); 4-02-027 (Frank); City of Malibu CDP No. 06-060 (North Enterprises); City of Malibu CDP Amendment No. 11-008 (Marine); City of Malibu CDP Amendment No. 13-005 (Kaplan)

system seaward of the revetment be lost to erosion, then the "dune protection buffer" shall be eliminated in its entirety and the public would have the right to access beach areas seaward of the toe of the approved revetment.

This condition has a direct nexus to the impacts caused and is roughly proportional. Prior to the actions of the homeowners along Broad Beach to create revetments both with and without emergency permits, the beach provided public recreation area. Subsequent to those actions the public recreation area has been destroyed. Further, both the existing and proposed revetment will continue to block public access in places, and will hasten the erosion of public recreation areas in the amounts and areas described above. The easement as proposed will be tied to the existence of the revetment proposed. If and when the revetment is removed, the easement will follow. In addition, the easement only allows access above the 2010 mean high tide line when sand nourishment mitigation during the life of the revetment has eroded away sufficiently such that the public has less than 25 feet upon which to pass, repass and recreate. At that time, the easement begins to move inland but only does so at the rate of seaward erosion. If the mean high tide line stabilizes so that it always remains 25 feet seaward of the 2010 surveyed mean high tide line, then public access remains only on public tidelands seaward of that line. Thus, the easement in **Special Condition 13** allows for meaningful public access while maintaining a significant area of private property, including the large dune buffer area; and the easement is designed to retreat inland, and will only encroach onto private property because of erosion due in part to the revetment itself.

The applicant would like to maximize the area of nourished beach that is available for the exclusive use of the adjacent private property owners and is restricted from public use by proposing a unique lateral public access arrangement as part of the proposed project. For the duration of the project, the applicant proposes that an October 2009 MHTL serve as the public/private seaward boundary for public access purposes. The CSLC's MHTL survey at Broad Beach was conducted on January 19 to 20, 2010, just prior to installation of the emergency revetment. The results of the CSLC survey confirmed that the MHTL is actually further landward than the MHTL survey that had been previously conducted in 2009 by the applicant, although an approximately 100-foot portion of both surveyed lines overlap at the western end, and are within approximately 10 feet or less of each other over a significant portion of the surveyed area. The applicant's proposal to formally utilize the 2009 MHTL survey as the public/private boundary for public access purposes would serve to relocate the area of the beach where public trust lands exist to a more seaward location than the CSLC 2010 MHTL. This proposal would have the effect of minimizing the area accessible to the public, and would exclude the public from many areas where the public already has rights of access.

Further, as discussed previously, there remains a likely possibility that, over time, the beach nourishment component of the approved project will fail to maintain a widened beach condition on site adequate to ensure that the revetment does not become exposed, despite the renourishment/backpassing measures proposed by the applicant. As proposed, the applicant would only conduct a single renourishment of the site 10 years after the initial nourishment is completed. Thus, in order to ensure that renourishment occurs, **Special Condition Four (4)** requires the applicant to submit, for the review and approval of the Executive Director, a Final Adaptive Management and Monitoring Plan. However, even with the requirement that the

applicant conduct additional renourishment and backpassing activities on an as-needed basis for the life of the project, it must be recognized that the proposed project should be considered an experimental pilot project and that it is not possible to guarantee that the beach nourishment component of the approved project will be adequate maintain a widened beach condition on site adequate to ensure that the revetment does not become exposed, despite the renourishment and backpassing measures proposed by the applicant. In the event that it is not possible to maintain an adequate beach width and the revetment becomes exposed and is acted upon by wave action, then the revetment would function in a manner similar to other shoreline protective devices.

As discussed in more detail in Section IV.B (Hazards and Shoreline Processes) the impact of a shoreline protective device, such as the proposed rock revetment, on public access is most evident on a beach where wave run-up and the mean high tide line are frequently observed in an extreme landward position during storm events and the winter season. As the shoreline retreats landward due to the natural process of erosion, the boundary between public and private land also retreats landward. Construction of rock revetments and seawalls to protect private property fixes a boundary on the beach and prevents any current or future migration of the shoreline and mean high tide line landward, thus eliminating the distance between the high water mark and low water mark. As the distance between the high water mark and low water mark becomes obsolete the seawall effectively eliminates lateral access opportunities along the beach as the entire area below the fixed high tideline is inundated. The ultimate result of a fixed tideline boundary (which would otherwise normally migrate and retreat landward, while maintaining a passable distance between the high water mark and low water mark overtime) is a reduction or elimination of the area of sandy beach available for public access and recreation. The reduction of the available sandy public beach area described above is what has occurred on Broad Beach since the emergency revetment was installed in 2010. The revetment has fixed the back of the beach and has significantly reduced the beach area available for public access particularly during high tides and high wave events. During these events the beach area fronting the revetment is often impassible.

Thus, in this case, if the proposed experimental beach nourishment component of this project fails to maintain adequate dry sandy beach area seaward of all sections of the 4,150 linear ft. rock revetment on site, then the beach seaward of the revetment would be subject to frequent inundation by wave action and would be frequently unusable for pedestrian access. Therefore, in order to ensure that public lateral access is maintained along shoreline areas of the project site, **Special Condition Fourteen (14)** requires the applicant to execute and record a document, in a form and content acceptable to the Executive Director, granting an easement to the Mountains Recreation and Conservation Authority (a joint powers authority), allowing the public the permanent right to pass and repass along a 10 ft. wide public access path immediately landward of the approved revetment. The easement shall extend for the entire length of the approved revetment between 31340 to 30760 Broad Beach Road and shall encompass the entire area between the seaward toe of the revetment and a line parallel and ten feet inland from the landward toe of the revetment, as generally illustrated on Exhibit 8. The easement pursuant to **Special Condition 14** shall provide that the public's right to pass and repass may only be exercised if and when any of the following conditions are occurring, and only for the duration of time that any of the following conditions are occurring: (1) less than 10 feet dry sandy beach exists seaward of the seaward toe of the revetment at any point along the revetment; or (2) an

unforeseen circumstance occurs (for example but not limited to an oil spill) which prohibits the public's use, access, and enjoyment of the area subject to the deed restriction described above (Special Condition 13). The Mountains Recreation and Conservation Authority (MRCA) is a public agency that represents a partnership between the Santa Monica Mountains Conservancy, the Conejo Recreation and Park District, and the Rancho Simi Recreation and Park District. The MRCA is dedicated to the preservation and management of open space, parkland, and trails. The MRCA manages and provides ranger services for almost 50,000 acres of public lands and parks that it owns or that are owned by the Santa Monica Mountains Conservancy. In the course of its normal duties, the MRCA park rangers and other staff are better able to monitor open space and trail areas to ensure that the restrictions are followed than Commission staff. Further, an easement will be recorded against the title to the property and thus provide notice to future owners of the limitations that apply to the open space conservation area, reducing the risk of a future irreparable violation of the restriction.

Further, Special Conditions 13 and 14 described above would only apply to the project properties where the approved revetment is located, and would not apply to project properties where beach nourishment only is approved (no revetment). As explained previously, there are 51 private Broad Beach parcels in the project area that have existing recorded easements, deed restrictions, or other legal documents providing the public with the right of lateral public access across the seaward edge of the private properties. The terms of these public access easements/restrictions vary, but they mainly consist of the area of sandy beach extending 25 feet inland from the MHTL or extending from the seaward extent of approved residential development and the MHTL. The applicant has proposed "suspension" of the existing lateral public access rights that have been previously recorded or required on properties within the project reach for the duration of the project. The Commission does not have authority to "suspend" such rights because the State Lands Commission (as well as several other entities) is the easement holder or holder of the relevant property interest, not the Commission. The rights to access granted by Special Conditions 13 and 14 relate specifically to the impacts of the revetment, and are independent of any pre-existing rights granted by other instruments. The earlier recorded easements would technically have priority over the easements required in Special Conditions 13 and 14. However, in areas where the pre-existing easements and the new easements overlap, the net effect is simply duplicative in ensuring public access, and no conflict is created by two separate instruments granting access.

The applicant in this case is the BBGHAD and not the individual property owners of the parcels that recommended Special Conditions 13 and 14 would apply to. The BBGHAD has asserted that it does not have the authority to convey the easement interest required by these conditions on behalf of the individual property owners. However, it is feasible for the BBGHAD to comply with these conditions either by demonstrating that the BBGHAD has acquired the requisite property interests by exercising its eminent domain authority pursuant to Public Resources Code Section 26576, or by demonstrating that each affected landowner has executed the required access documents. As such, Special Conditions 13 and 14 specify that the applicant shall demonstrate to the satisfaction of the Executive Director that it has acquired the necessary property interests by either of the two methods described or a combination thereof. While the BBGHAD's Plan of Control currently waives its power of eminent domain, the Plan of Control

can be amended, if BBGHAD chooses to comply with Special Conditions 13 and 14 by exercise of its eminent domain authority.

In addition, in order to ensure the requirements of Special Condition Fourteen 14 are adequately implemented and that the approved project plans are revised accordingly, **Special Condition One (1)** requires the submittal of revised project plans designating a 10 ft. wide public pedestrian path located immediately landward of the entire length of the rock revetment, including the portion of the revetment to be relocated/reconfigured pursuant to Part A.1 of Special Condition 1, as generally depicted in Exhibit 8. The pathway shall utilize a sand surface only. The plans shall depict this path as a 'public accessway' available for public use when there are insufficient areas of dry beach seaward of the revetment available for pass and repass. In addition, access stairways (for the provision of both public and private access) shall be shown extending from the 10 ft. wide public pedestrian path to the toe of the rock revetment below. The number and location of the access stairways shall generally align with the shared private beach access paths allowed on site consistent with Special Condition 5, Part 5. All such access stairways shall be designed and constructed by reconfiguring existing stones within the revetment to form steps. No handrails shall be installed. Further, in order to ensure that the project is constructed consistent with the final approved plans, **Special Condition Three (3)** requires the applicant construct the access stairways (for the provision of both public and private access) consistent with the requirements of Special Condition 1 concurrent with the re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment.

In response to discussions with staff, the applicant has proposed the removal of the approximately 40 unpermitted private stairways that have been constructed on the rock revetment by individual homeowners without the required coastal development permit. In addition to impacts to public views along the coastline, the proliferation of private stairways on a rock revetment also results in a privatizing effect for beachgoers in the event that the revetment becomes exposed. Further, the private stairways on site would also result in potential conflicts with the public ability to access the 10 ft. wide public path along the landward side of the revetment in the event the threshold condition requiring this access way is triggered. Therefore, in order to ensure that the applicant's proposal to remove the approximately 40 unpermitted private stairways on the rock revetment is adequately implemented, **Special Condition Three (3)** requires that the applicant to remove all unpermitted private stairways on the approved rock revetment concurrent with the re-location and re-construction of the approximately 2,000 linear ft. downcoast end of the rock revetment required pursuant to Part A of that condition, unless additional time is granted by the Executive Director for good cause.

Regarding potential impacts to surfing as a result of the project, the proposed beach nourishment will likely improve surfing conditions at Broad Beach and Zuma Beach because the addition of sand will increase the size of the sand bars at both beaches. In addition, surf breaks at or west of Lechuza Point will not be affected since the predominant longshore transport is to the east. The dynamics of sandbars, which include increased sand volumes of similar grain size, more steeply sloped beaches, and wider beach widths, contribute to a more tidally dependent surf zone. This creates multiple variations in the nearshore bathymetry and improves the sandbars and wave shape quality for surfers.

As discussed previously, the project includes implementation of a beach nourishment program with periodic sand backpassing and re-nourishment operations that will temporarily restrict public access at Broad Beach and at the construction staging area at Zuma Beach. In addition, hauling of inland quarry material to the Zuma Beach stockpile site is expected to take approximately 6 months and approximately 43,000 truck trips on southbound Pacific Coast Highway (PCH). Construction vehicles and equipment would access the site via PCH into the Zuma Beach Parking Lot 12. Currently, vehicular access to Parking Lot 12 is provided by the main Zuma Beach internal circulation roadway. However, during construction, it is proposed that this circulation road to Lot 12 be closed to general public access. To facilitate project construction, vehicular access to the staging area will be provided via two temporary driveways on PCH. The inbound PCH driveway at the staging area would be located on the south side of PCH, at the east end of Lot 12 directly across from Guernsey Avenue. This temporary driveway would serve as an inbound-only driveway for project vehicles and haul trucks and would accommodate limited vehicular ingress access (i.e., right turn only ingress turning movements). No outbound turning movements would be permitted from this temporary driveway. The outbound PCH driveway at the staging area would be located on the south side of PCH, at the west end of Lot 12. This driveway would serve as an outbound-only driveway for project vehicles and haul trucks and would accommodate full vehicular egress access (i.e., both left-turn and right-turn egress turning movements). No inbound turning movements would be permitted at this driveway (Exhibit 17).

To facilitate traffic operations into and out of the site, a temporary eastbound right-turn/deceleration paved lane will be installed at the existing Guernsey Avenue/PCH intersection to ensure that Project truck traffic will safely and efficiently slow to turn right into Lot 12 and not impede eastbound PCH through traffic. In addition, at the project's outbound PCH driveway, a temporary traffic signal is proposed to be installed to facilitate the safe and efficient movement of outbound haul trucks onto westbound PCH. The circulation and temporary traffic improvements at the staging area are illustrated in Exhibit 17. Parking along the south shoulder of PCH would be prohibited during the construction to accommodate the recommended right-turn lane and minimize pedestrian traffic at both staging area driveways. The proposed parking prohibition on the south shoulder of PCH generally adjacent to Parking Lot 12 would be implemented in two segments: (1) the segment between the proposed inbound driveway opposite Guernsey Avenue and the proposed outbound driveway (a distance of approximately 660 feet); and (2) the segment west of the proposed inbound driveway to a point approximately 180 feet west thereof (to join the existing restricted shoulder parking area on the PCH bridge over Trancas Creek).

In addition, Zuma Beach Lot 12 and the proposed Zuma Beach sand stockpile area will be periodically closed to the general public during sand delivery hours of 7 a.m. to 9 p.m., Monday through Friday. On weekends and holidays the beach will remain open for public access. All work will be conducted during the fall/winter months in order to avoid the peak summer visitor season. The applicant proposes to maintain public access during nourishment and dune restoration activities to the maximum extent possible. At least two weeks prior to commencing nourishment operations, signs notifying the public of the dates of nourishment operations would be posted at the public access points and at other highly visible locations along the beach. Public lateral access to Broad Beach will be restricted during working hours (Monday-Friday, 7 a.m. - 6

p.m.) due to the equipment traffic associated with the beach nourishment activities. As work progresses, public access to portions of the beach would be allowed during nourishment operations to the extent possible with implementation of a construction vehicle traffic management plan. For example, as beach placement is completed at the western end of the project, this area would become available for public use. The areas of active work (e.g., access routes and areas where earthmoving equipment is being used, etc.) would be clearly delineated with access controlled by the contractor.

Given the scale of the proposed project, even if modified to reduce the footprint of beach nourishment and quantity of sand used to minimize impacts to coastal resources (pursuant to Special Condition 1 of the staff recommendation), the construction operations will still result in temporary unavoidable adverse impacts to the public's ability to access the coast in the vicinity of Broad Beach. In order to ensure that construction-related impacts to public access and recreation are minimized to the maximum extent feasible as required by Coastal Act Section 30210 and Malibu LCP Policies 2.2 and 2.5, **Special Condition Twelve (12)** prohibits construction operations from the Friday prior to Memorial Day in May through Labor Day in September to avoid impacts on public recreational use of the beach and other public amenities in the project vicinity, unless, due to extenuating circumstances, the Executive director authorizes such work. Special Condition 12 also prohibits construction operations on weekends and holidays in order to avoid impacts to public recreational use on those higher demand public use periods.

Further, **Special Condition Fifteen (15)** is necessary, which requires that the applicant submit a Public Access Management Program for the review and approval of the Executive Director and that details provisions for public access during construction and post-construction, including signage and fencing. The Public Access Management Program shall include a plan for ensuring safe public access to or around construction areas, beach deposition sites, and/or staging areas shall be maintained during all project operations. The plan shall include a description of the methods (including signs, fencing, posting of security guards, etc.) by which safe public access to or around construction areas, beach deposition sites, and/or staging areas shall be maintained during all project operations. In the event that Broad Beach must be closed to pedestrian use during active beach nourishment/renourishment operations only, then signage shall be installed indicating alternative beach access points along Broad Beach available for public access. The applicant shall be required to maintain public access pursuant to the approved version of the report.

Since construction operations will temporarily eliminate public parking along PCH and Zuma Beach Lot 12, the Public Access Management Program pursuant by **Special Condition 15** is required to include all necessary temporary access provisions, including any necessary traffic control and crosswalk improvements, to maintain public pedestrian access between Zuma County Beach and the Trancas Market commercial property along the shoulder of Pacific Coast Highway immediately landward of the project site and staging area. Further, where public parking areas are used for staging or storage of equipment and materials, unless there is no feasible alternative, the minimum number of public parking spaces (on and off-street) that are required at each receiver site for the staging of equipment, machinery and employee parking shall be used. At each site, the number of public parking spaces utilized shall be the minimum

necessary to implement the project. The applicant is also required to post each construction site with a notice indicating the expected dates of construction and/or beach closures.

In order to provide the public with clarity regarding areas that may be available for public access, the Public Access Management Program required by **Special Condition 15** shall include a Symbolic Public Access Fencing and Signage Plan that provides for the installation of symbolic post and cable fencing along the landward limit of the ten foot wide public access path located immediately landward of the approved rock revetment. The post and cable fencing shall be no more than 42 inches in height and designed to be removable in the event of wave uprush. The Symbolic Public Access Fencing and Signage Plan shall also include the provision for the installation of signage to be incorporated into the design of the symbolic post and cable fencing adequate to inform the public of their right to utilize all public access areas on site (including the recorded lateral public access path immediately landward of the revetment, the portion of the sandy beach between the mean high tide line and the toe of the revetment, and the public access stairways required pursuant to Special Conditions 1 and 4). At a minimum, the Program shall provide for the installation of signs to be installed within 300 ft. intervals along the 10 ft. wide path and at both the western (upcoast) end and eastern (downcoast) end of the 10 ft. wide public path and adjacent to each of the two Los Angeles County public vertical accessways on site. The plan shall show the location, size, design, and content of all signs. The signs may indicate that the areas of the site located landward of the public access areas are sensitive dune habitat and/or private property. No signs that restrict public access to State tidelands, public vertical or lateral access easement areas, or which purport to identify the boundary between State tidelands and private property shall be permitted. Special Condition 15 also specifies that the applicant shall be responsible for the cost, construction, and maintenance of any new improvements (including but not limited to repairs or modifications of the two existing public access stairways that have been previously constructed over the as-built rock revetment) within the two existing vertical public access rights-of-way necessary to maintain safe public pedestrian access from Broad Beach Road to the sandy beach as required by the Executive Director and Los Angeles County Department of Beaches substantially similar to the public access that exists on site at the time of Commission action on this permit. If any such improvements, or changes over time, are necessary to maintain safe and adequate public pedestrian access, then the applicant shall submit a detailed construction plan for the review and approval of both the Executive Director and Los Angeles County Department of Beaches and Harbors and comply with any requirements imposed by those entities.

In conclusion, with Special Conditions addressing adverse impacts to public access and recreation, impacts to the public will be minimized to the greatest extent feasible. Thus, as conditioned, the Commission finds the project consistent with the public access and recreation policies of the Coastal Act and the Malibu LCP.

F. VISUAL RESOURCES

The Malibu LCP provides for the protection of scenic and visual resources, including views of the beach and ocean, views of mountains and canyons, and views of natural habitat areas. The LCP identifies Scenic Roads, which are those roads within the City that traverse or provide

views of areas with outstanding scenic quality, or that contain striking views of natural vegetation, geology, and other unique natural features, including the beach and ocean. The LCP policies require that new development not be visible from scenic roads or public viewing areas. Where this is not feasible, new development must minimize impacts through siting and design measures. In addition, development is required to preserve bluewater ocean views by limiting the overall height and siting of structures where feasible to maintain ocean views over the structures. Where it is not feasible to maintain views over the structure through siting and design alternatives, view corridors must be provided in order to maintain an ocean view through the project site.

Section 30251 of the Coastal Act requires that visual qualities of coastal areas shall be considered and protected, landform alteration shall be minimized, and where feasible, degraded areas shall be enhanced and restored. Section 30251 of the Coastal Act, which is incorporated as part of the Malibu LCP, states that:

> *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 subordinated to the character of its setting.*

In addition, the following LCP policies are applicable in this case:

6.1 *The Santa Monica Mountains, including the City, contain scenic areas of regional and national importance. The scenic and visual qualities of these areas shall be protected and, where feasible, enhanced.*

6.2 *Places on and along public roads, trails, parklands, and beaches that offer scenic vistas are considered public viewing areas. Existing public roads where there are views of the ocean and other scenic areas are considered Scenic Roads. Public parklands and riding and hiking trails which contain public viewing areas are shown on the LUP Park Map. The LUP Public Access Map shows public beach parks and other beach areas accessible to the public that serve as public viewing areas.*

6.3 *Roadways traversing or providing views of areas of outstanding scenic quality, containing striking views of natural vegetation, geology, and other unique natural features, including the ocean shall be considered Scenic Roads. The following roads within the City are considered Scenic Roads:*

- *Pacific Coast Highway*
- *Decker Canyon Road*
- *Encinal Canyon Road*
- *Kanan Dume Road*

- *Latigo Canyon Road*
- *Corral Canyon Road*
- *Malibu Canyon Road*
- *Tuna Canyon Road*

6.4 *Places on, along, within, or visible from scenic roads, trails, beaches, parklands and state waters that offer scenic vistas of the beach and ocean, coastline, mountains, canyons and other unique natural features are considered Scenic Areas. Scenic Areas do not include inland areas that are largely developed or built out such as residential subdivisions along the coastal terrace, residential development inland of Birdview Avenue and Cliffside Drive on Point Dume, or existing commercial development within the Civic Center and along Pacific Coast Highway east of Malibu Canyon Road.*

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.*

6.6 *Avoidance of impacts to visual resources through site selection and design alternatives is the preferred method over landscape screening. Landscape screening, as mitigation of visual impacts shall not substitute for project alternatives including resiting, or reducing the height or bulk of structures.*

6.15 *Fences, walls, and landscaping shall not block views of scenic areas from scenic roads, parks, beaches, and other public viewing areas.*

6.23 *Exterior lighting (except traffic lights, navigational lights, and other similar safety lighting) shall be minimized, restricted to low intensity fixtures, shielded, and concealed to the maximum feasible extent so that no light source is directly visible from public viewing areas. Night lighting for sports courts or other private recreational facilities in scenic areas designated for residential use shall be prohibited.*

In addition, the Malibu LIP contains several provisions regarding scenic and visual resources:

6.5 (A) Development Siting

1. *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.

2. *Where there is no feasible alternative that is not visible from scenic highways or public viewing areas, the development area shall be restricted to minimize adverse impacts on views from scenic highways or public viewing areas.*
3. *Avoidance of impacts to visual resources through site selection and design alternatives is the preferred method over landscape screening. Landscape screening, as mitigation of visual impacts shall not substitute for project alternatives including resiting, or reducing the height or bulk of structures.*
4. *New development, including a building pad, if provided, shall be sited on the flattest area of the project site, except where there is an alternative location that would be more protective of visual resources or ESHA.*

6.5 (E) Ocean Views

New development on parcels located on the ocean side of public roads, including but not limited to, Pacific Coast Highway, Malibu Road, Broad Beach Road, Birdview Avenue, Cliffside Drive shall protect public ocean views.

1. *Where the topography of the project site descends from the roadway, new development shall be sited and designed to preserve bluewater ocean views over the approved structures by incorporating the following measures.*

    a. *Structures shall extend no higher than the road grade adjacent to the project site, where feasible.*

    b. *Structures shall not exceed one story in height, as necessary, to ensure bluewater views are maintained over the entire site.*

    c. *Fences shall be located away from the road edge and fences or walls shall be no higher than adjacent road grade, with the exception of fences that are composed of visually permeable design and materials.*

    d. *The project site shall be landscaped with native vegetation types that have a maximum growth height at maturity and are located such that landscaping will not extend above road grade.*

In past Commission actions, the Commission has limited the seaward encroachment of new development on sandy beaches in order to minimize adverse impacts to public views along the beach. In this case, the existing as-built rock revetment, for which the applicant is requesting permanent authorization, has resulted in the significant encroachment of new development on the sandy beach and is highly visible from public viewing areas along the shoreline. However, the proposed project also includes the provision for beach nourishment and dune creation/restoration. Specifically, the beach/dune nourishment component of the proposed project includes provisions for covering the revetment with several feet of sand and constructing a new dune field over the area of the beach where the revetment is located. Thus, although the

as-built revetment itself has resulted in, and continues to result in, significant adverse impacts to scenic public views along the shoreline, the proposed beach/dune nourishment component of the project would largely serve to mitigate these impacts, for the duration that the nourished beach/dune condition is able to be maintained.

As discussed in detail in Section IV.B. (Hazards and Shoreline Processes) given the dynamic ever changing nature of the beach morphology and coastal process acting on this beach it is very difficult to model or predict how the beach nourishment program will perform over time as well as predict if unanticipated changes could result in adverse impacts to marine resources and habitats. The applicant's coastal engineering consultant has predicted that the nourished beach would be expected to be lost due to erosion within 3 to 8 years from completion of the project. The Engineering Analysis by Moffatt & Nichol dated October 2013 states:

> *The Genesis model predictions for a 600,000 cy [cu. yds.] beach nourishment assume the existing revetment is maintained in its current location…The rate of beach loss is greatest at the west end of Broad Beach and indicates the nourished beach may only last 3 to 5 years near Point Lechuza. In contrast, the model results suggest beach nourishment may last up to 7 or 8 years at the east end of Broad Beach.*

Thus, while the proposed sand nourishment will offset or partially offset the adverse effects to shoreline sand supply from the proposed rock revetment for the period of time that the nourishment material remains on the beach, it is expected that the nourishment sand will be lost over time and the revetment exposed both during and after the 20 year period that such nourishment activities are proposed. Further, although the applicant is requesting permanent authorization of the rock revetment pursuant to this application, the applicant is not committing to any future beach nourishment activities after 20 years. Thus, as proposed, although the benefits to shoreline sand supply from the proposed nourishment would be temporary for a period of 20 years, the adverse impacts resulting from the proposed authorization of the rock revetment would be permanent.

As a result, the Commission finds that given the experimental nature of the proposed nourishment project and the dynamic variability of conditions in coastal areas, it is not possible to ensure that the proposed beach nourishment efforts will be adequate to establish and maintain the desired beach width seaward of the proposed revetment or to prevent the revetment from becoming exposed. In addition, as discussed in the previous sections of this report, in order to avoid or minimize adverse impacts to marine resources while still allowing for nourishment to occur, **Special Condition One (1)** requires a reduction in the amount of initial sand placement to no more than 300,000 cu. yds. of material. However, the applicant has not provided modeling results for this revision to the nourishment program.

Thus, it is not possible to predict with absolute certainty how either the proposed, or revised project, would function. The Commission finds that the proposed project is, in part, an experimental effort to create a widened sandy beach within the project reach to reduce the potential for periodic wave-caused erosion to upland areas of the site and enhance public access and recreational opportunities. Therefore, in acknowledgment of the experiment nature of this

project and to ensure that adverse impacts to coastal resources are avoided or minimized, **Special Condition Two (2)** limits the duration of the period of time that development of an approved development on a temporary basis only for a period of ten (10) years from the date of Commission action. After such time, the authorization for continuation and/or retention of any development approved as part of this permit (including, but not limited to, the rock revetment and beach re-nourishment/backpassing activities) shall cease. **Special Condition Two (2)** further requires that prior to the date that authorization for the development expires (10 years from the date of Commission action), the applicant or successor in interest shall submit a complete coastal development permit application for the re-authorization of the beach nourishment program and to retain the rock revetment for an additional ten(10) year term, if necessary, to protect existing development at risk from wave hazards and tidal action.

In addition, as proposed, the project would only provide for an initial nourishment of 600,000 cu. yds. of sand on the beach during the first year and a second approximately 450,000 cu. yds. of sand during the tenth year of the program. No additional nourishment activities are proposed although the applicant would conduct periodic sand back-passing operations to occur no more than once per year. However, as stated above, the applicant's engineering consultant has determined that the proposed initial nourishment may only be adequate to maintain an a widened beach area seaward of the revetment for 3-8 years within the project reach. Although not included as part of the proposed project, the applicant's representatives have indicated that the applicant would be tentatively in agreement with a revised nourishment schedule that would allow for a smaller amount of nourishment (300,000 cu. yds.) to occur every 5 years for the 20 year term of the permit (consistent with ***Alternative 4b*** submitted by the applicant and described in detail in Section IV.B of this report). As discussed in detail in Section IV.B. (Marine Resources and Water Quality) of this report, in order to avoid or minimize adverse impacts to marine resources while still allowing for nourishment to occur, **Special Condition One (1)** requires a reduction in the amount of initial sand placement to no more than 300,000 cu. yds. of material.

However, given the experimental nature of this project and due to the fact that it is not possible to predict with certainty whether the proposed beach/dune nourishment program will serve to maintain a widened beach condition on site adequate to prevent erosion of all dry sandy beach areas seaward of the revetment and/or to prevent the revetment from becoming exposed. Therefore, in order to ensure that a an adequately wide beach area is maintained on site seaward of the revetment to avoid or minimize adverse impacts to coastal resources and scenic coastal views, Special Condition Four (4) requires the applicant the applicant submit, for the review and approval of the Executive Director, a Final Adaptive Management and Monitoring Plan that would require that renourishment on an as-needed basis (rather than once every ten years) if the beach narrows to a specific identified threshold width. Specifically, Special Condition Four (4) requires that a s*mall-scale Interim* Renourishment would be required if the dry beach width at Profile 410 (as shown on Exhibit 12) is narrower than 30 feet for 6 consecutive months, and is recorded by two (2) consecutive full beach profiles, and, there is insufficient sand at the backpass source location for backpassing to occur. In addition, a *Major Renourishment* would be required if the dry beach width at Profile 410 is narrower than 30 feet for 12 consecutive months, and is

recorded by three (3) consecutive full beach profiles, and, there is insufficient sand at the backpass source location for backpassing to occur. Further, Special Condition Four (4) provides for small-scale interim renourishment and major renourishment to occur on an as-needed basis to ensure that the protective beach and dune system that will be maintained at an adequate width, to the extent feasible. Moreover, to ensure that this critical information regarding potential impacts to marine resources is recorded and reported to the Executive Director for consideration of future project approvals, **Special Conditions Four (4)** requires extensive monitoring of the effects of the project on shoreline processes be implemented to assess the effects of the permeable pier sand retention system and beach nourishment program for the term of this permit.

In conclusion, with special conditions addressing adverse impacts to public views will be minimized to the greatest extent feasible. Thus, as conditioned, the Commission finds the project consistent with the visual resource protection policies of the Coastal Act and the Malibu LCP.

G. GREEN HOUSE GASES/CLIMATE CHANGE

The proposed project involves the transport of 600,000 cubic yards from a sand quarry located in Moorpark, California, which is about 45 miles from the project site. The sand will be transported via haul trucks capable of carrying 14 cubic yards of sand per trip. The project will require 840 truck trips per day (420 inbound and 420 out bound) for a period of about six months between October and March or 43,000 total truck trips . That translates into about 60 in- bound and out -bound trips per minute. The trucks will come south bound on Pacific Coast Highway from Ventura County and exit the highway via a temporary access lane into the western most portion of Los Angeles County Zuma Beach parking lot. The sand will be deposited in a staging area on the parking lot. The sand will then be transported from the Zuma Beach site to the deposition sites on Broad Beach by off road trucks and the sand will be worked into position by tractors. The large number of truck trips necessary to transport the sand from the quarry site to the project site raises concerns regarding the generation of greenhouse gas (GHG) emissions.

The Commission has in past permit and LCP actions have addressed the generation GHG [31]emissions related to larger developments such as major water, energy, telecommunication, and transportation projects. These types of projects can significantly increase GHG emissions and therefore global warming, which in turn can cause significant adverse impacts to coastal resources of California. The Coastal Act has a number of provisions that provide direct authority to the Commission to assess increased risks caused by climate change (i.e.

[31] Greenhouse gases are any gas, both natural and anthropogenic, that absorbs infrared radiation in the atmosphere and includes water vapor, carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These greenhouse gases lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the "Greenhouse Effect." Carbon dioxide is the major anthropogenic greenhouse gas. All greenhouse gases are quantified collectively by the carbon dioxide equivalent, or the amount of CO2 that would have the same global warming potential, when measured over a specific time period.

increased coastal flooding and potentially increased fire danger from climatic shifts causing drier weather patterns) when considering proposals for new development. The Coastal Act also provides a regulatory avenue to ensure that proposed development is compatible with non-emission's related planning controls that can have the effect of reducing GHG emissions (where emission's specific controls are governed solely by the federal Environmental Protection Agency and state air resources agencies), like reducing vehicle miles traveled and minimizing energy consumption (i.e. through public transit and pedestrian/bike travel options when evaluating proposed development or in the context of LCP proposals). These include the Coastal Act's public access and recreation policies (Sections 30220 and 30211), marine resource and water quality policies (Sections 30230 and 30231), the environmentally sensitive habitat area protection policy (Section 30240), and the coastal hazards policy (Section 30253(a) and (b)). Further, Section 30253(c) and (d) require new development to be consistent with requirements imposed by an air pollution control district or the California Air Resources Board (CARB) and to minimize energy consumption and vehicle miles traveled.

The transport of the sand by a large number of heavy haul tricks over a six month period will generate about 4004 metric tons of GHG. The South Coast Air Quality Management District (SCAQMD) use a significance threshold of 10,000 metric tons of GHGs per year for development projects. Projects generating over 10,000 MT/ year must provide GHG offsets to mitigate the effects of GHGs generated by the project. Although the proposed project will result in a large number of truck trips given the short term nature of the project the total amount of GHGs generated by the project totals only 4,004 metric tons (MT). This level of GHGs is well below the SCAQMD significance threshold of 10,000 MT/year and is considered to be a relatively insignificant amount of GHGs. In addition, the project, as conditioned, pursuant to Special Condition 1, limits the initial deposition of sand to 300,000 cubic yards of sand which will reduce the haul truck trips by half. This will in turn reduce the amount of GHGs generated by the haul trucks by half to 2002 MT. The reduction of truck trips will also serve to minimize the amount of energy and vehicle miles traveled, as required by Section 30253(d). The applicant has also proposed a Transportation Management Plan to ensure the trucks are efficiently moved in and out of the project staging area which will minimize the potential for trucks backing up and idling for long periods of time on the shoulder of the highway. To ensure the project is consistent with the air quality requirements of the SCAQMD as required by 30253(c) of the Coastal Act, **Special Condition 1**7 requires, that prior to issuance of the coastal development applicant shall submit evidence they have secured any required permits or approvals from the SCAQMD.

As described above, the project as conditioned, will not result in the generation of a significant amount of GHGs which would contribute substantially to global climate change and result in potential significant impacts to coastal resource effects, and is therefore consistent with Coastal Act Sections 30211, 30220, 30230, 30231, 30240, and 30253.

Therefore, the Commission finds that the proposed project, as conditioned, is consistent with the applicable policies of Chapter 6 (Scenic and Visual Resources) of the Malibu LUP, including Section 30251 of the Coastal Act, which is incorporated as part of the LUP, and applicable standards of Chapter 6 (Scenic, Visual, and Hillside Resources) of the Malibu LIP.

H. UNPERMITTED DEVELOPMENT

Unpermitted development has occurred within the project area prior to submission of this permit application. Unpermitted development includes, but may not be limited to: 1) construction of private stairways across the revetment (in non-compliance with the approved plans for Emergency Permit CDP 4-10-003-G), composed of one or more of the following materials: sandbags, jute netting, rocks, cement, matting, metal, wood, and rope; 2) placement of sand, sandbags, dirt, and landscaping on and adjacent to the rock revetment; 3) construction of patios, sitting areas, and decks on and adjacent to the revetment; 4) placement of "private property" and "no trespassing" signs; and 5) removal of native dune vegetation and construction of walkways and patios in the dunes. As proposed, this project includes the complete removal of the unpermitted private stairways but does not clearly provide for the removal of additional unpermitted development (although much of this unpermitted development is located within the proposed beach nourishment footprint).

Staff is recommending the Commission approve this application for the reasons discussed in full in the preceding sections of this report. To ensure that the unpermitted development component of this application is resolved in a timely manner, **Special Condition Twenty (20)** requires that the applicant satisfy all conditions of this permit which are prerequisite to the issuance of this permit within 18 months of Commission action. In addition, to ensure implementation of the applicant's proposal and to prevent further adverse impacts to the beach and marine environment, **Special Condition Three (3)** requires the applicant to remove the unpermitted private stairways, sandbags, landscaping, patios, decks, and signs consistent with the final revised plans required pursuant to **Special Condition One (1)** and concurrent with, or prior to initial beach nourishment activities. The Executive Director may grant additional time for good cause. **Special Condition Five (5)** requires the removal of unpermitted development in, and restoration of, native dune habitat, including within areas of the site where unpermitted development has occurred. Additionally, the proposed project includes a requirement for dune restoration. Thus, the proposed project, if approved per the staff recommendation, will resolve the above described violations located within the project area

Approval of the application pursuant to the staff recommendation and completion of the approved project, as conditioned, will resolve the violation(s) described above, as explained in this staff report. However, unpermitted development on the west end of Broad Beach, upcoast of the rock revetment that starts at 31350 Broad Beach Road, including multiple unpermitted seawalls and revetments, will not be addressed through this project and will remain violations of the Coastal Act, to be addressed by the Commission's enforcement staff as a separate matter.

Although development has taken place prior to submission of this permit application, consideration of this application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Review of this permit does not constitute a waiver of any legal action with regard to the alleged violation nor does it constitute an admission as to the legality of any development undertaken on the subject site without a coastal permit.

I. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096(a) of the Commission's administrative regulations requires Commission approval of a Coastal Development Permit application to be supported by a finding showing the application, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect that the activity may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. These findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As discussed in detail above, the proposed project, as conditioned, is consistent with the policies of the Coastal Act.
Feasible mitigation measures, which will minimize all adverse environmental effects, have been required as special conditions. The following special conditions are required to assure the project's consistency with Section 13096 of the California Code of Regulations:

Special Conditions 1 through 19

As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse impact that the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found to be consistent with the requirements of the Coastal Act to conform to CEQA.
Section 13096(a) of the Commission's administrative regulations requires Commission approval of a Coastal Development Permit application to be supported by a finding showing the application, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect that the activity may have on the environment.

The Commission incorporates its findings on consistency with the County's certified LCP at this point as if set forth in full. These findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As discussed above, the proposed development, as conditioned, is consistent with the policies of the certified LCP. Feasible mitigation measures, which will minimize all adverse environmental effects, have been required as special conditions. The following special conditions are required to assure the project's consistency with Section 13096 of the California Code of Regulations:

Special Conditions 1 through 19

As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse impact that the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found to be consistent with the requirements of the certified LCP to conform to CEQA.

APPENDIX 1

Substantive File Documents

Revised Analysis of Impacts to Public Trust Resources and Values (APTR) for the Broad Beach Restoration Project, prepared for the State Lands Commission, by AMEC Environment and Infrastructure, Inc., July 2014.

Draft Analysis of Public Trust Resources, Prepared for State Lands Commission by AMEC, 2012/2014

Reports, Analyses, and Memos prepared by Moffat & Nichol:

Coastal Engineering Report, Exhibit L to CDP Application 4-12-043, dated October 2012
Revised Coastal Engineering Report dated December 2012
Broad Beach Restoration Project, Phase I Report, April 2010
Broad Beach Restoration Project, Upland Sand Source, Coarser-than-native Grain Size Analysis, November 2013
Addendum Number 1 to the Coastal Engineering Report, February 2014
Broad Beach – Nourished Beach Profile Slope for all Transects, April 23, 2014
Analysis of Extended Trucking Noise Level Impacts, 6/13/14

Broad Beach Fall 2011 Beach Profile Survey, Coastal Frontiers, November 16, 2011.

Engineers Report for the Broad Beach Geologic Hazard Abatement District, Malibu, California, ENGEO, Inc., January 18, 2012.

Estimates of Economic Benefits/Impacts from Revised Alternatives at Broad Beach, Phillip King, PhD., February 18, 2014.

Marine Biology Analysis of Placement of Sand by Truck for the Broad Beach Proposed Project and of New Alternatives, Chambers Group, February 21, 2014.

Estimates of Beach Fill Loss Rates and Thoughts on Optimizing Placement Timing and Locations: Broad Beach, Malibu, California, prepared by Everts Coastal, February 24, 2014.

Air Quality and Climate Change Technical Report Revision 1, Environ International Corporation, June 2014.

Analysis of Extended Trucking Traffic Impacts, LLG Engineers, June 9, 2014.

Analysis of Extended Trucking Air Quality Impacts, Environ Report Revision 1, June 20, 2014.

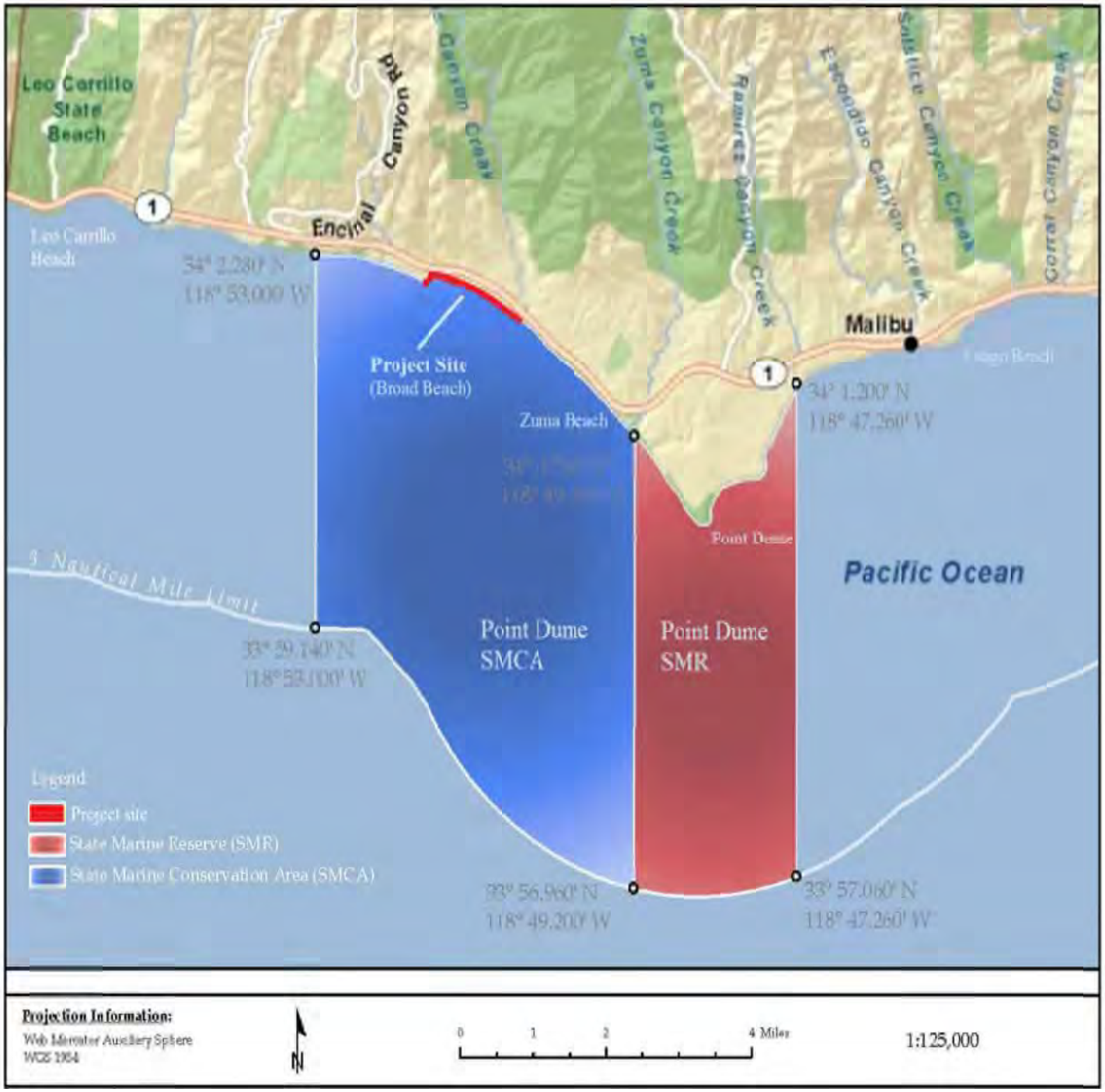
Exhibit 1 – Location Map
4-12-043 (Broad Beach GHAD)

Exhibit 2 - Project Area
4-12-043 (Broad Beach GHAD)

Source: Moffat & Nichol Engineering Report (October 2013)

Exhibit 3 - Project Area & As-Built Rock Revetment 4-12-043 (Broad Beach GHAD)

Marine Protected Areas



Source: Adapted from CDFW 2011.

Exhibit 4 – Marine Protected Areas
4-12-043 (Broad Beach GHAD)

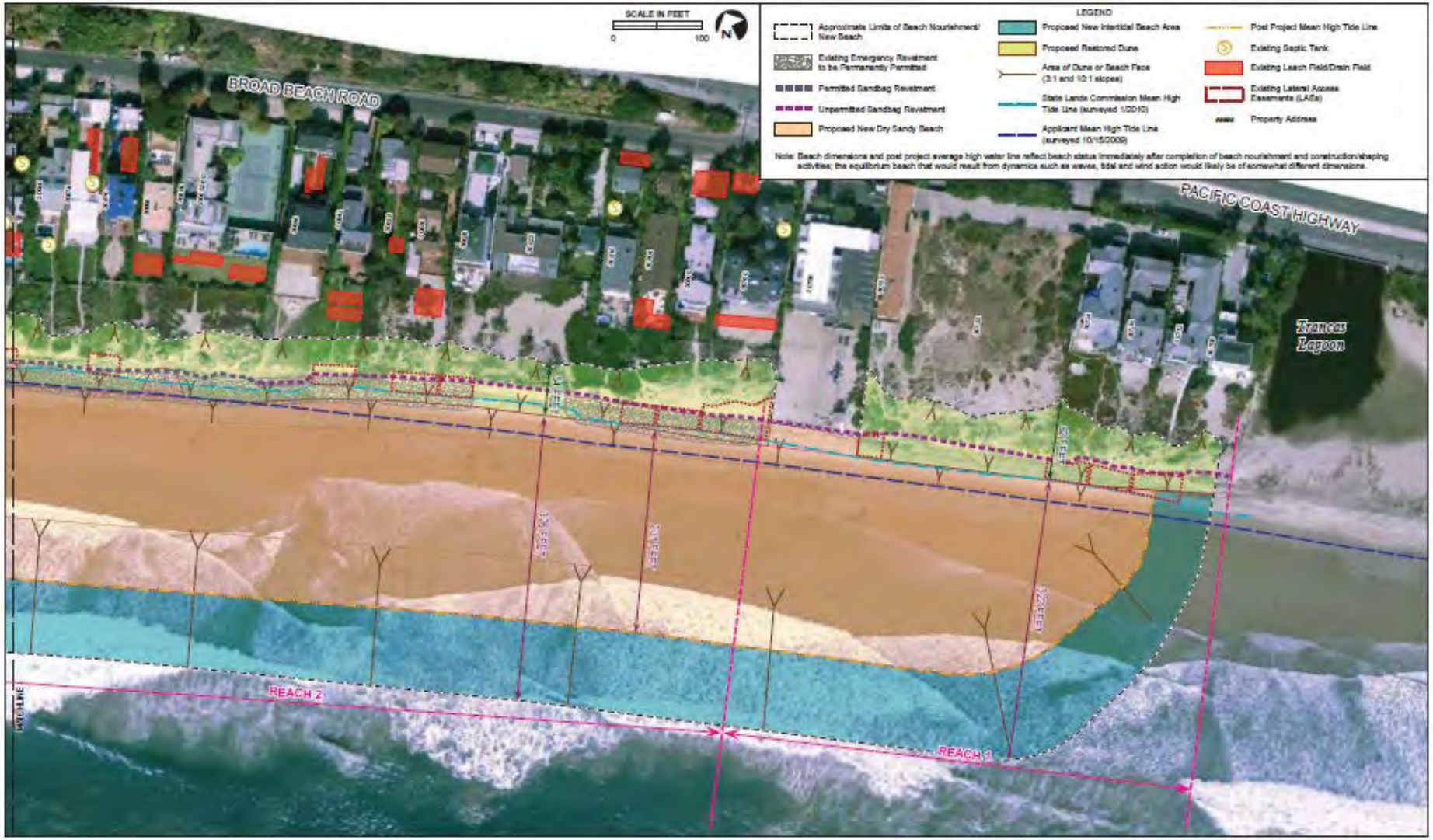
Structural Damage 1998
(West end of Broad Beach)

Structural Damage 2010
(West end of Broad Beach)

Exhibit 5 – Structural Damage on Broad Beach
4-12-043 (Broad Beach GHAD)

Broad Beach Sand Bag Seawalls

Exhibit 6 – Broad Beach Sand Bag Walls
4-12-043 (Broad Beach GHAD)



amec

Details of Proposed Project – Eastern Reach

Exhibit 7a. – Proposed Project Footprint – Eastern Reach (600,000 cu. yds.)
4-12-043 (Broad Beach GHAD)

amec

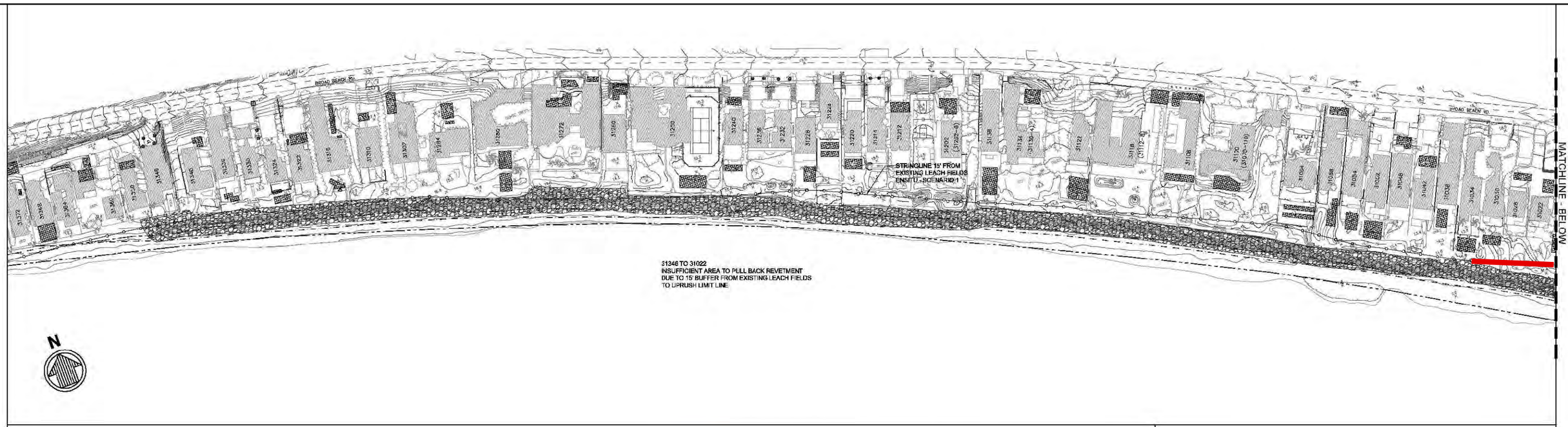
Details of Proposed Project – East Central Reach

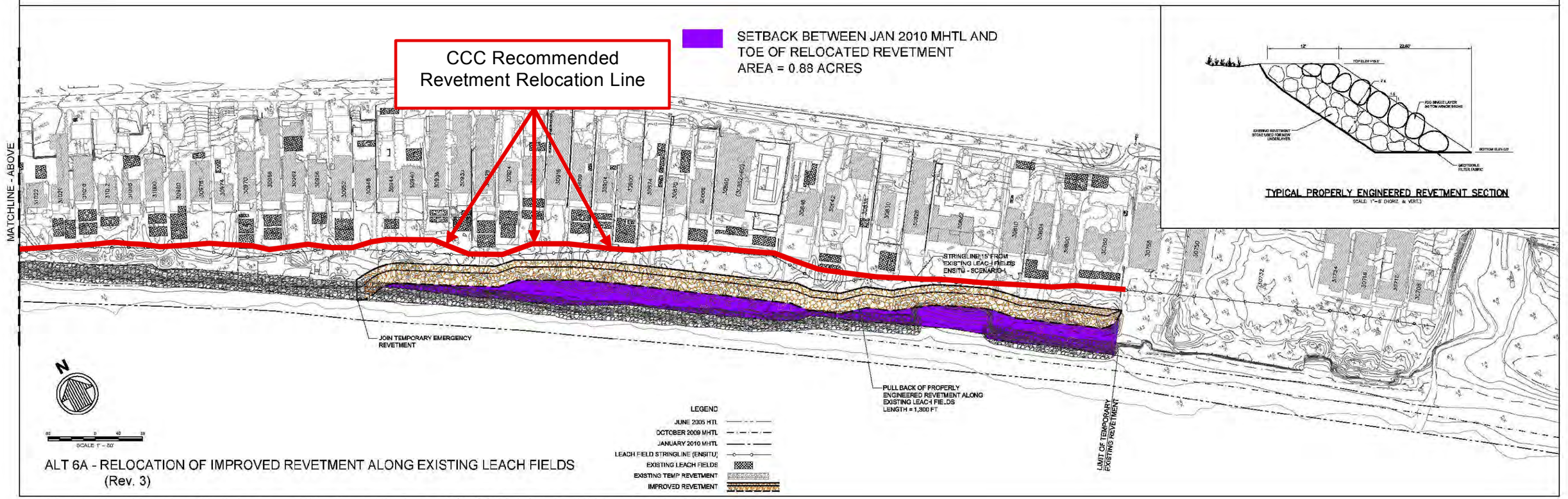
Exhibit 7b. – Proposed Project Footprint – East Central Reach (600,000 c. yds.)
4-12-043 (Broad Beach GHAD)

amec

Details of Proposed Project – West Central Reach

Exhibit 7c. - Proposed Project Footprint – West Central Reach (600,000 cu. yds.) 4-12-043 (Broad Beach GHAD)





ALT 6A - RELOCATION OF IMPROVED REVETMENT ALONG EXISTING LEACH FIELDS
(Rev. 3)

TYPICAL PROPERLY ENGINEERED REVETMENT SECTION
SCALE: 1"=5' (HORIZ. & VERT.)

File: P:\6935 Broad Beach\7 Design Information\CADD_Active_SheetSet06A\RevetConcept_ALT6A_R3; Plotted: 8/4/2014 4:31 PM by HOLLOWAY, AARON; Saved: 8/4/2014 4:30 PM by HOLLOWAY

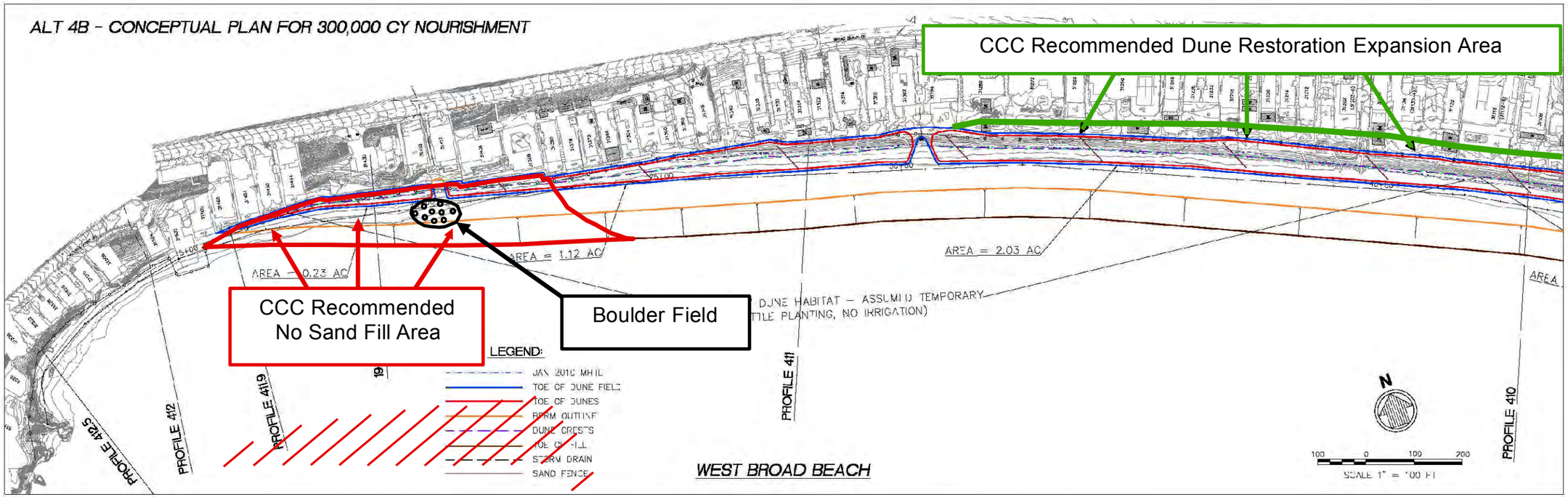
CALIFORNIA COASTAL COMMISSION

Technical Services Division - GIS Unit
California Coastal Commission

For Illustrative Purposes Only.
Source: Moffet & Nickol Engineering

Exhibit 8 – Recommended Pull Back
4-12-043 (Broad Beach GHAD)

DSM 11/2014



CALIFORNIA COASTAL COMMISSION

Technical Services Division - GIS Unit
California Coastal Commission

For Illustrative Purposes Only.
Source: Moffet & Nickol Engineering

Exhibit 9 - Recommended Beach Fill Reduction & Expanded Dune Restoration 4-12-043 (Broad Beach GHAD)

DSM 11/2014

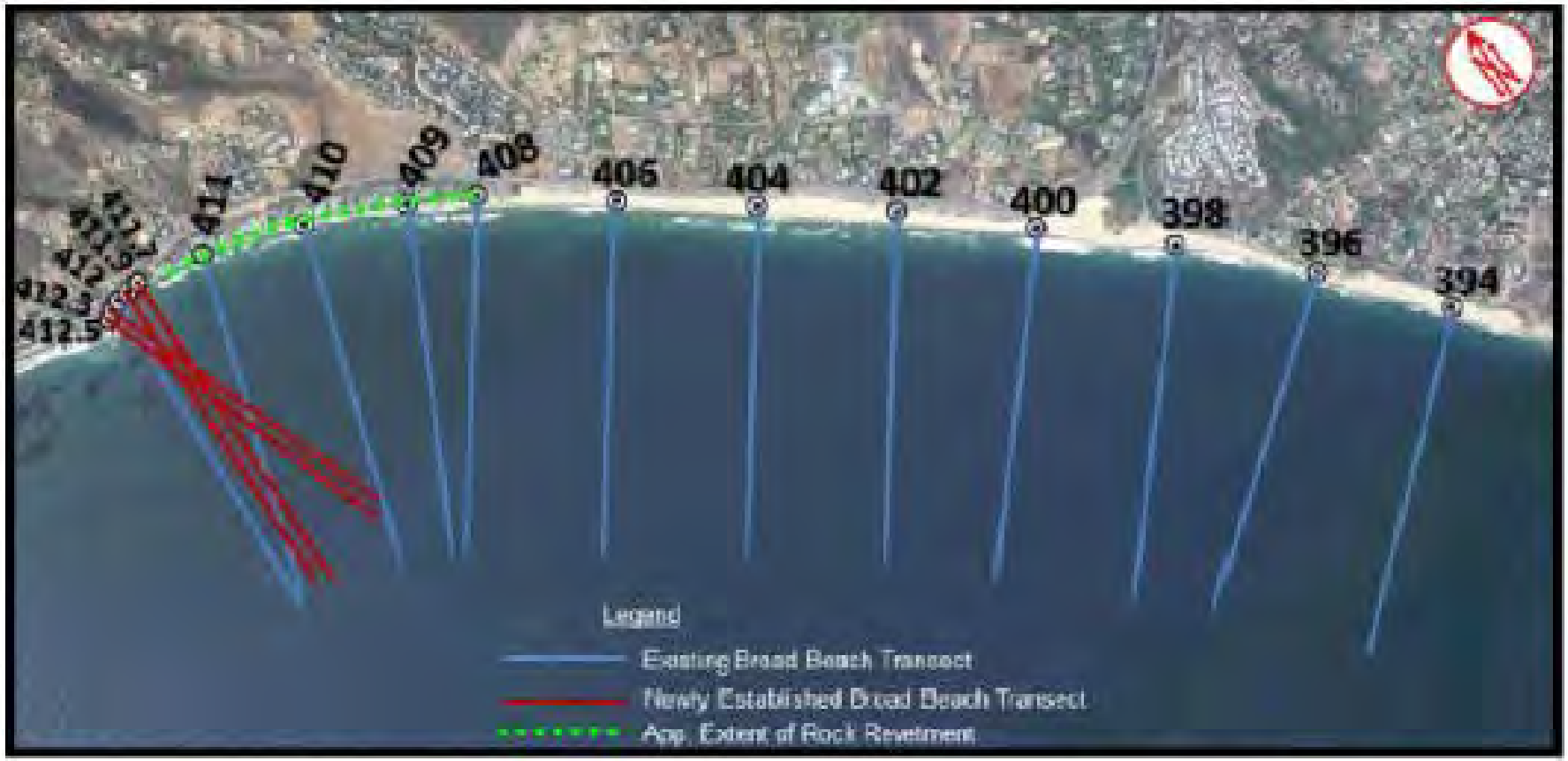
Effects of Seawall on the Width of Broad Beach

(Fixing the Back of the Beach)

Exhibit 10 - Fixing the Back of the Beach 4-12-043 (Broad Beach GHAD)

Changes in Width of Western Reach of Broad Beach Since 1972

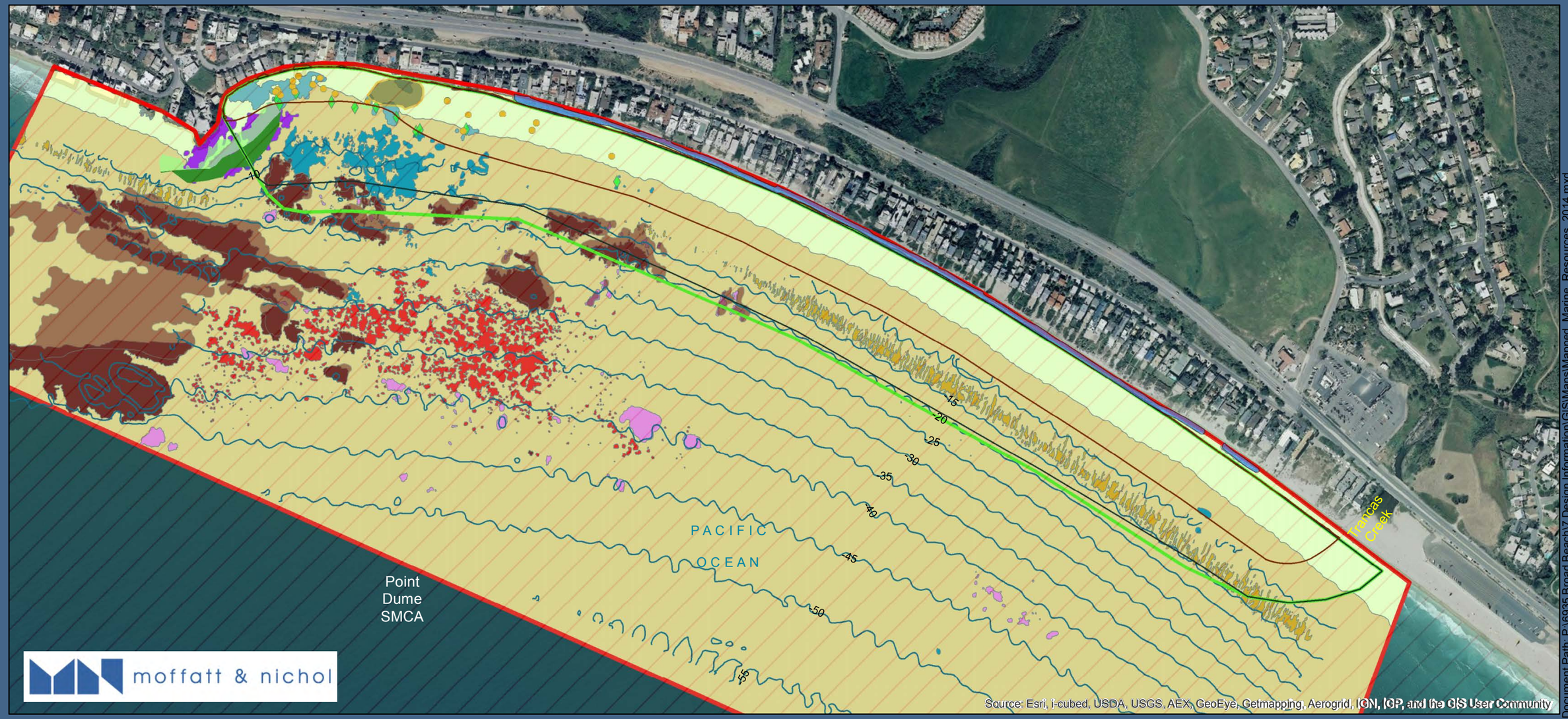
Exhibit 11 – Changes in Beach Width 1972 – 2013
4-12-043 (Broad Beach GHAD)



. Transects for Beach Profiling at Broad Beach and Zuma

Source: Coastal Frontiers 2013

Exhibit 12 – Beach Profile Transects
4-12-043 (Broad Beach GHAD)



Document Path: P:\6935 Broad Beach\7 Design Information\GIS\Maps\Mapped_Marine_Resources_2014.mxd

moffatt & nichol

Legend

- Emergency Revetment Footprint
- Proposed Beach Nourishment Footprint (Direct Impact)
- Point Dume SMCA
- Permanent Impact Area (Indirect)
- Temporary Impact Area (Indirect)
- Boulder Field
- Rocky OutCrops
- Observed Surfgrass Points
- Observed Surfgrass
- Extrapolated Surfgrass
- Contours_5ft
- Survey Area

Habitat Groups - 2014 Survey

- Bedrock with Kelp, Marine: Subtidal: Rock Bottom
- Bedrock, Marine: Intertidal: Rock Bottom
- Bedrock, Marine: Subtidal: Rock Bottom
- Rubble/Cobble, Marine: Intertidal: Rock Bottom
- Rubble/Cobble, Marine: Subtidal: Rock Bottom
- Sand, Marine: Intertidal: Unconsolidated Bottom
- Sand, Marine: Subtidal: Unconsolidated Bottom
- Shell Hash, Marine: Subtidal: Unconsolidated Bottom
- Kelp Canopy
- Eelgrass (May 2014)

Notes:

1. Marine resource mapping was done in coordination with Chambers Group, Inc.
2. Marine habitat temporary impact is defined as area covered by less than 1 FT of material at one year post-construction.
3. Marine habitat prmanent impact is defined as area covered by 1 FT or more of material at one year post-construction.
4. Contour elevations are in reference to MLLW datum.

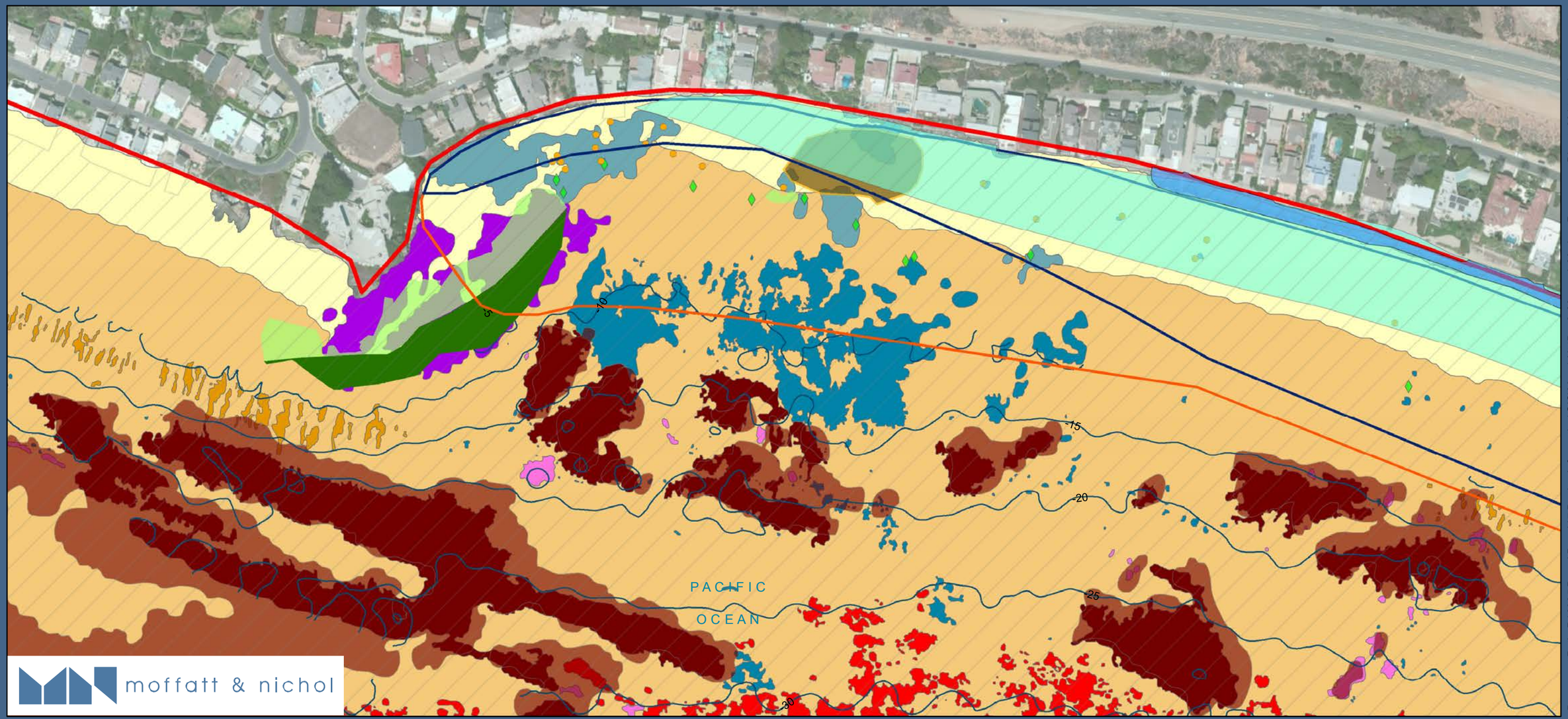
0 125 250 500 750 1,000 Feet

1" = 500'

Broad Beach
Mapped Marine Resources
Project Footprint Direct and Indirect Impact Area

Exhibit 13 – Marine Resources – Proposed Project Impacts 4–12-043 (Broad Beach GHAD)

Date Prepared/Revised: June 26, 2014



moffatt & nichol

Image Source:Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Document Path: P:\6935 Broad Beach\7 Design Information\GIS\Maps\Alt4B_v2_Mapped_Marine_Resources_Direct_2014.mxd

Legend

- Emergency Revetment Pull Back
- Emergency Revetment Footprint
- Survey Area
- Alt4B Project Footprint
- Alt4B Permanent Footprint at 1 YR
- Alt4B Temporary Footprint at 1 YR
- Boulder Field
- Rocky OutCrops
- Observed Surfgrass Points
- Observed Surfgrass
- Extrapolated Surfgrass
- Contours_5ft Kelp
- Canopy Eelgrass
- (May 2014) Point
- Dume SMCA

Habitat Groups - 2014 Survey

- Bedrock with Kelp, Marine: Subtidal: Rock Bottom
- Bedrock, Marine: Intertidal: Rock Bottom
- Bedrock, Marine: Subtidal: Rock Bottom
- Rubble/Cobble, Marine: Intertidal: Rock Bottom
- Rubble/Cobble, Marine: Subtidal: Rock Bottom
- Sand, Marine: Intertidal: Unconsolidated Bottom
- Sand, Marine: Subtidal: Unconsolidated Bottom
- Shell Hash, Marine: Subtidal: Unconsolidated Bottom

Notes:
1. Marine resource mapping was done in coordination with Chambers Group, Inc.
2. Marine habitat temporary impact is defined as area covered by less than 1 FT of material at one year post-construction.
3. Marine habitat permanent impact is defined as area covered by 1 FT or more of material at one year post-construction.
4. Contour elevations are in reference to MLLW datum.

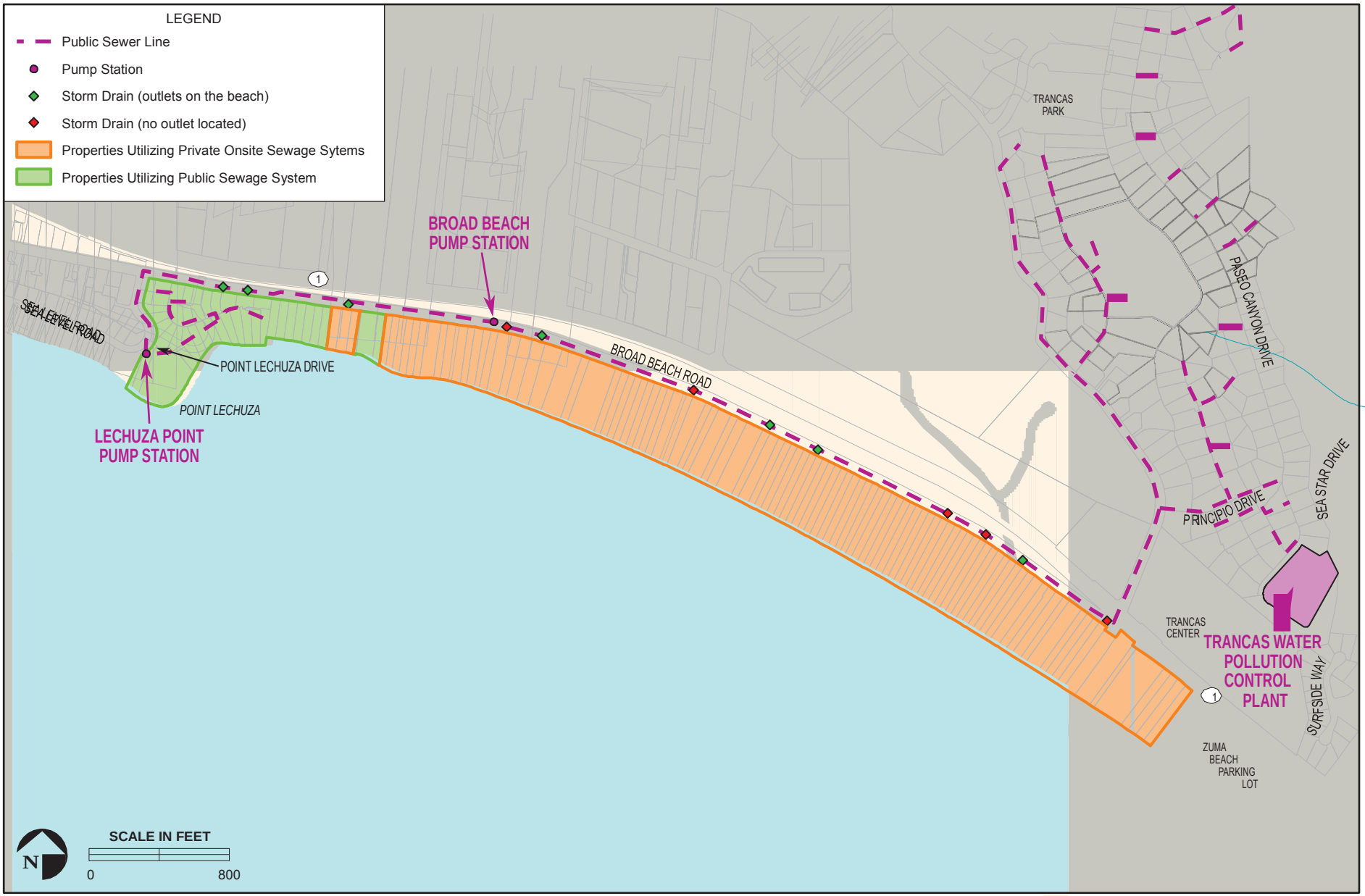
0 50 100 200 300 400 Feet

1 " = 200 '

Broad Beach
Mapped Marine Resources
Alternative 4B Footprint Direct and Indirect Impact Area

Exhibit 14 – Marine Resources – Reduced Sand Fill Alternative 4B.
4-12-043 (Broad Beach GHAD

Date Prepared/Revised: November 18, 2014



amec

Wastewater Treatment in the Vicinity of Broad Beach

Exhibit 15 –Trancas Water Pollution Control Plant - District Service Area
4-12-043 (Broad Beach GHAD)

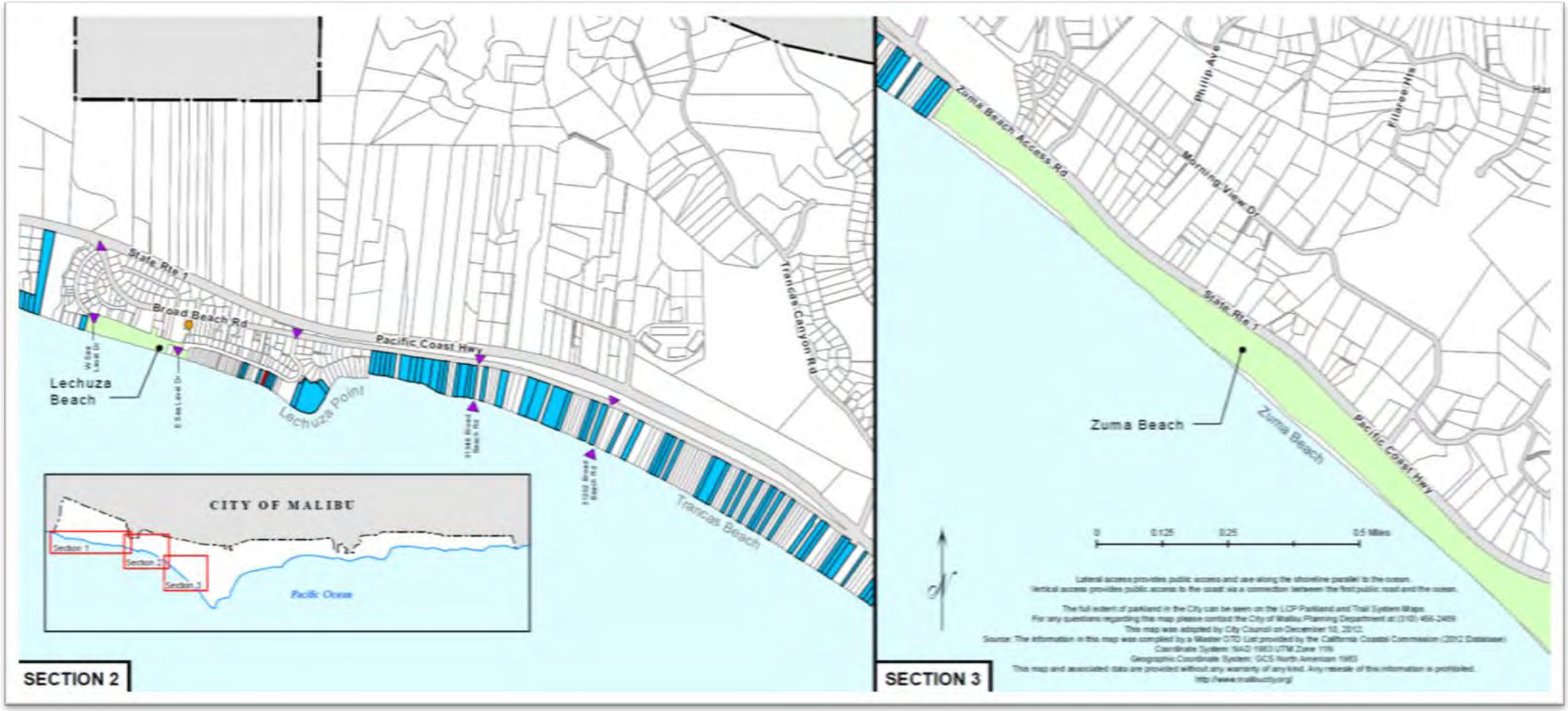


Exhibit 16– Broad Beach Lateral Public Access Easement 4-12-043 (Broad Beach GHAD)

amec

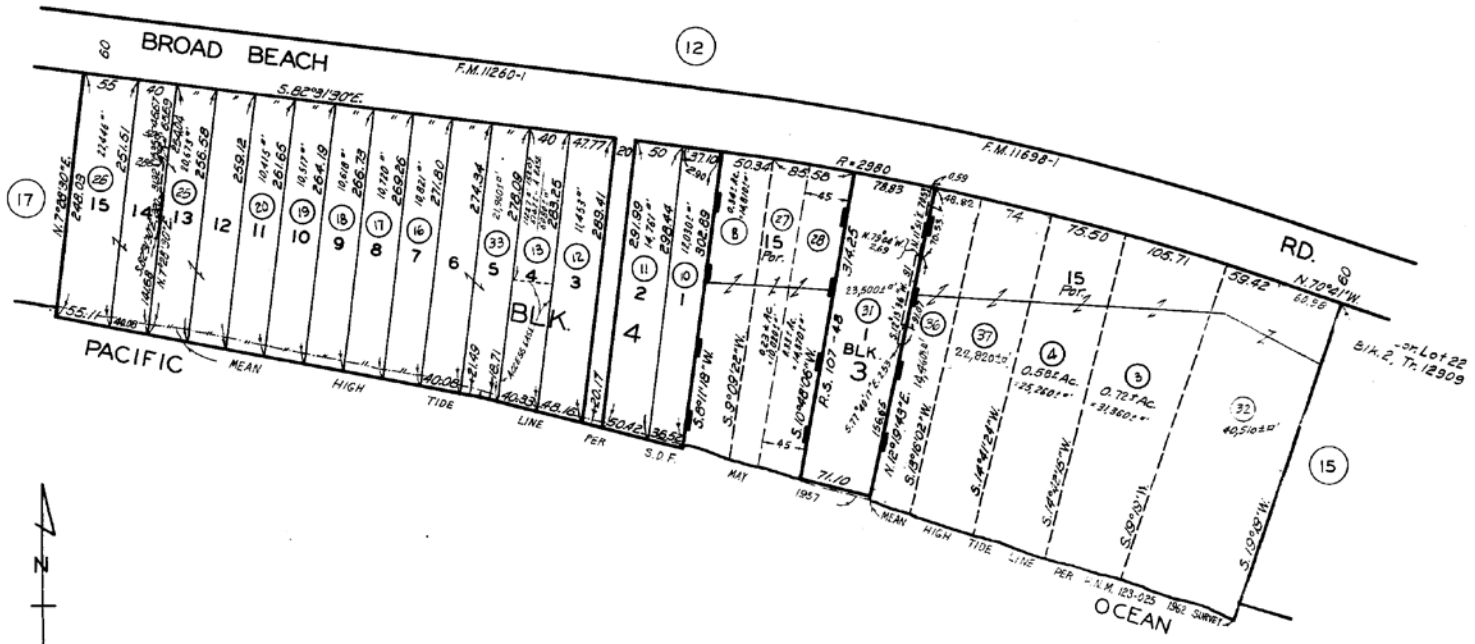
Construction Staging for Proposed Project

Exhibit 17– Zuma Beach Staging Area
4-12-043 (Broad Beach GHAD)

4470 | 16

CALE 1" = 100'

2009



TRACT NO. 12909
M.B. 263 - 37 - 38

LAND OF MATTHEW KELLER IN THE
RANCHO TOPANGA MALIBU SEQUIT
R.F. 534

Exhibit 18a – Parcel Map
4-12-043 (Broad Beach GHAD)

FOR PREV. ASSM'T. SEE: 4470-16

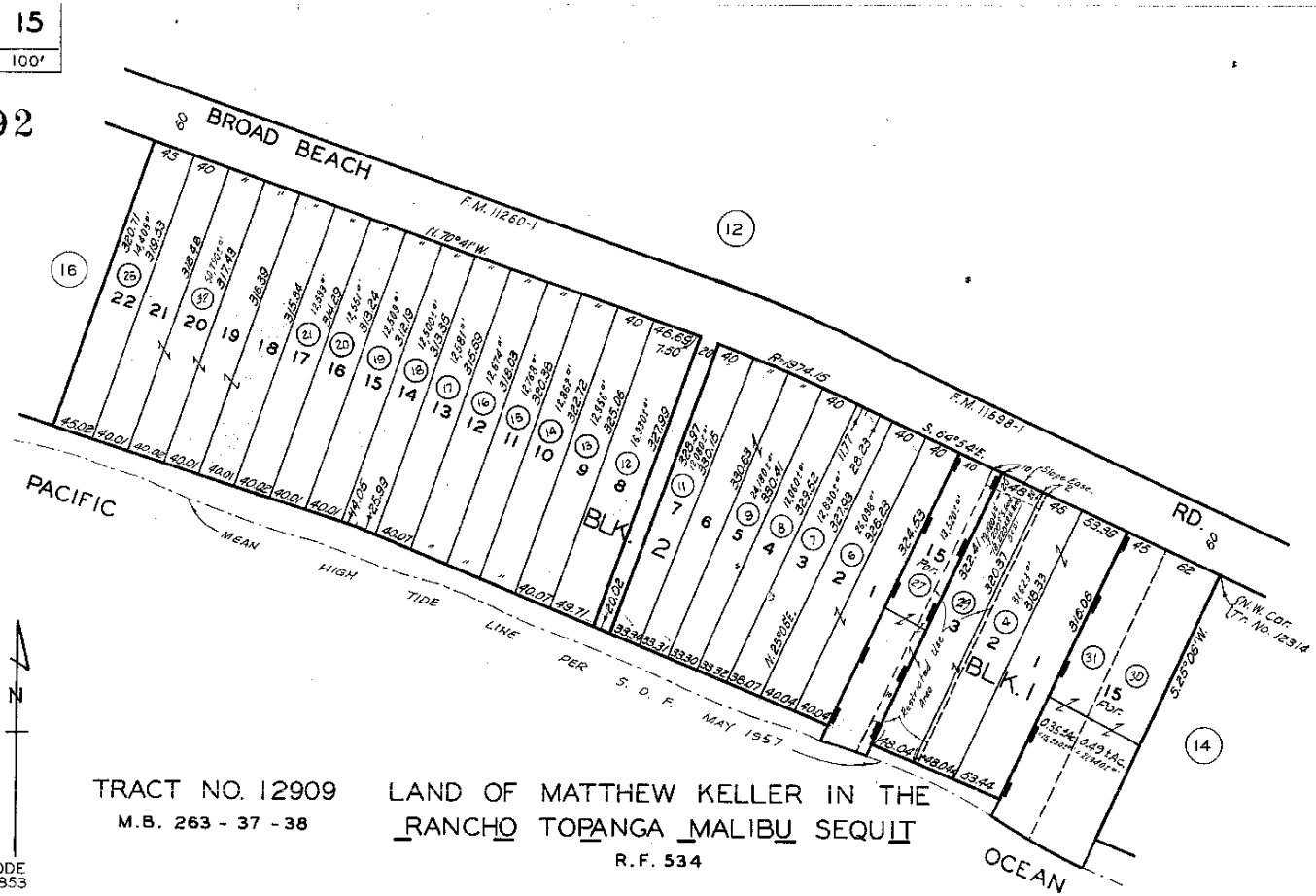
ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

County of Los Angeles: Rick Auerbach, Assessor

4470 | 15

SCALE 1" = 100'

1992



TRACT NO. 12909
M.B. 263 - 37 - 38

LAND OF MATTHEW KELLER IN THE RANCHO TOPANGA MALIBU SEQUIT
R.F. 534

CODE 10853

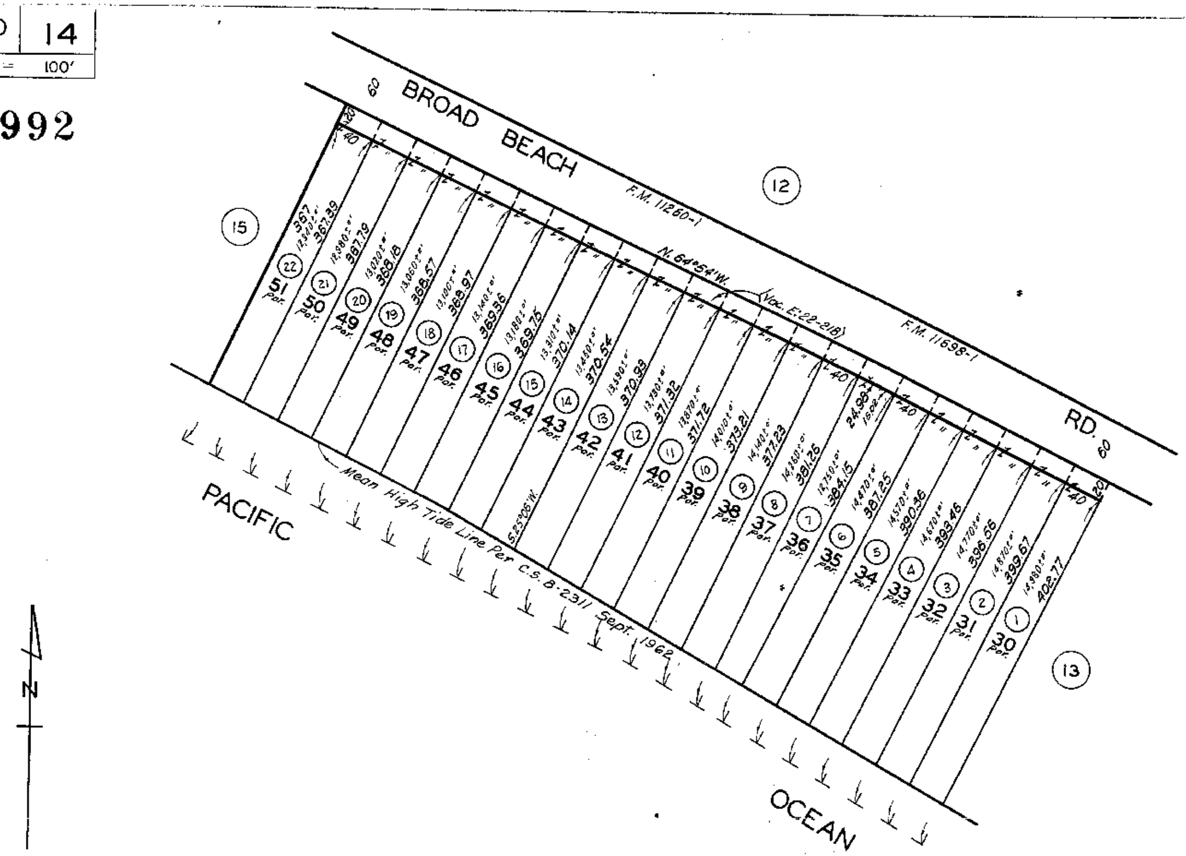
FOR PREV. ASSM'T. SEE: 4470-15

Exhibit 18b. – Parcel Map
4-12-043 (Broad Beach GHAD)

4470 | 14

SCALE 1" = 100'

1992



CODE
10853

TRACT NO. 12314

M.B. 232-23-24

FOR PREV. ASSM'T. SEE: 4470-14

Exhibit 18c. – Parcel Map 4-12-043 (Broad Beach GHAD)

County of Los Angeles: Rick Auerbach, Assessor

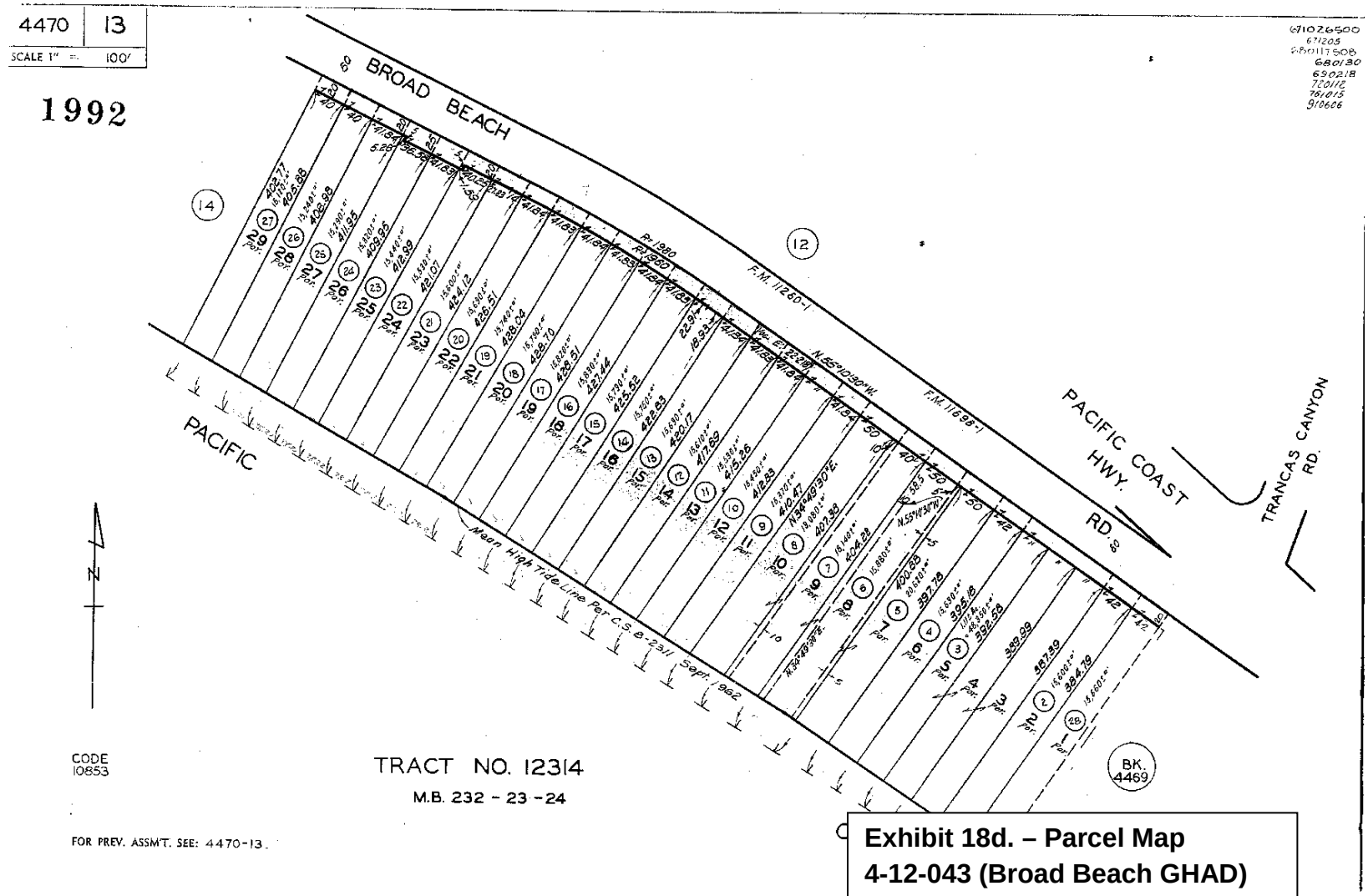
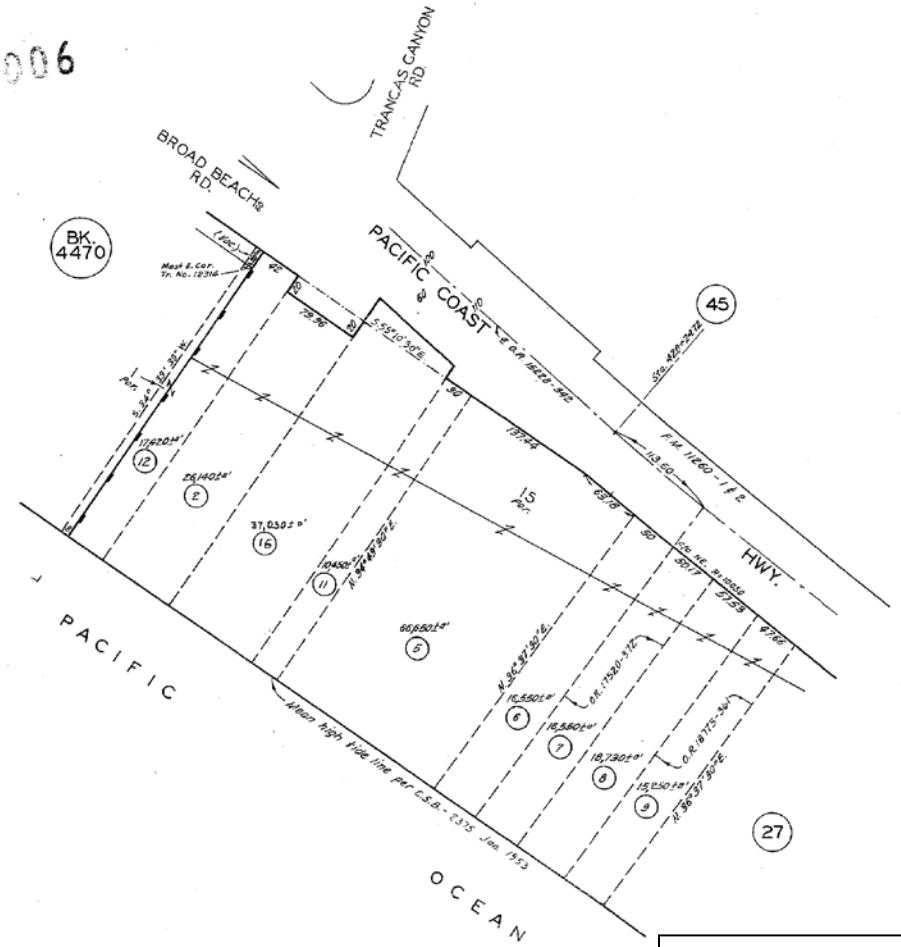


Exhibit 18d. – Parcel Map
4-12-043 (Broad Beach GHAD)

4469 26

100'

2006



N

JUN 30 2005

10853

LAND OF MATTHEW KELLER IN THE RANCHO
_ TOPANGA MALIBU SEQUIT _ R.F. 534
TRACT NO. 12314 M.B. 232-23-24

4469-26

Exhibit 18e. – Parcel Map
4-12-043 (Broad Beach GHAD)

CITY OF MOORPARK

799 Moorpark Avenue, Moorpark, California 93021 | Phone (805) 517-6200 | Fax (805) 532-2528

OFFICE OF THE MAYOR

TH8a

July 25, 2014

VIA ELECTRONIC MAIL & U.S. MAIL

Chair Steve Kinsey and
Honorable Commissioners
California Coastal Commission
South Central Coast District Office
89 South California Street, Suite 200
Ventura, California 93001-2801

RE: Sand Hauling through the City of Moorpark in Connection with the Broad Beach Shoreline Protection and Sand Replenishment Project

Agenda Item No 8a for August 14, 2014 (Broad Beach GHAD)

Dear Chairman Kinsey and Commissioners:

As Mayor of the City of Moorpark ("City"), I write on behalf of myself and the Moorpark City Council, to express my City's serious concerns about the Broad Beach Geologic Hazard Abatement District's ("BBGHAD") proposal to haul sand through portions of Moorpark in connection with the "Broad Beach Restoration Project" ("Project"). The Project involves acquisition of 600,000 cubic yards of sand from gravel quarries in the Moorpark area, which will be hauled to Broad Beach in Malibu, by way of roads in and adjacent to the City. Although Mark Goss, BBGHAD Project Manager, has indicated a willingness to address some of the City's concerns, we have not received any formal response in over five weeks and he has offered no concrete details of how the BBGHAD intends to do so. For all of the reasons discussed in this letter, the City requests that the California Coastal Commission ("Commission") include the conditions of approval specified in this letter in the BBGHAD's coastal development permit ("Permit") to address the City's issues with the Project's sand hauling routes, or postpone your decision until the City and BBGHAD have had the opportunity to resolve the haul route issue.

As will be discussed more fully below, Walnut Canyon Road, Moorpark Avenue, and the portion of Grimes Canyon Road south of Broadway Road[1] are not suitable for the

[1] Although the Grimes Canyon Road right-of-way is located just outside the City's limits, it is directly adjacent to several subdivisions which are located within the City.

Exhibit 19 – City of Moorpark Comment Letter
4-12-043 (Broad Beach GHAD)

high volume of trucks anticipated by the BBGHAD, and their use to the extent proposed would be highly detrimental to the City and its residents, many of whom are school children or economically disadvantaged. We believe there are alternatives to the use of Walnut Canyon Road, Moorpark Avenue, and Grimes Canyon Road south of Broadway Road which fully meet the objectives of the Project. Accordingly, to avoid potentially significant safety and environmental hazards, the City requests that the Permit prohibit trucks from using these roads as a haul route to or from the CEMEX and Grimes Rock quarries, which have been proposed as potential sources of sand. In simple terms, one community should not be seriously damaged at the expense of another. The concerns of both should be addressed.

I. General Facts about Project

The Project anticipates acquiring roughly 600,000 cubic yards of sand to replenish Broad Beach. Although the Project initially proposed using beach sand from coastal resources, the BBGHAD now proposes to acquire sand from remote inland quarries in the Moorpark and Simi Valley region, including the Grimes Rock and CEMEX quarries located directly north of Moorpark located 40-45 miles north of the project site by truck. Both of these quarries are regulated by conditional use permits issued by Ventura County. Under these permits, trucks may only enter or exit the CEMEX and Grimes Rock quarries between the hours of 6 A.M. and 6 P.M. With respect to the Grimes Rock Quarry, only 64 daily, one-way peak hour (6:00 a.m. to 8:00 a.m. and 3:00 p.m. to 6:00 p.m.) truck trips (i.e., 32 round trips) are permitted to its southern entrance (that is, the entrance leading from Grimes Canyon Road) and no trucks are permitted from that quarry after dusk or after 7:00 p.m.[2] Furthermore, the county permits prohibit the use of so-called "jake brakes," which are noisy compression release engine brakes, within the City of Moorpark in order to further mitigate noise (except under emergency operating conditions).

The use of sand hauling routes through Moorpark as currently proposed for this Project would be contrary to these limitations. This is because hauling 600,000 cubic yards of sand will require a substantial amount of truck trips. According to the June 9, 2014 revised Project description prepared on behalf of the BBGHAD, the Project will require an estimated 43,000 trips over 139 days between the hours of 7 A.M. and 9 P.M., five days per week. Such a schedule will result in one truck entering the Zuma Beach parking lot every two minutes. In order to fulfill such a schedule, effectively one truck per minute would traverse roads through Moorpark in either direction, for a total of 86,000 one-way truck trips in and out of Moorpark and in contradiction to the County permit conditions on time of day restrictions. There is a better route that will not impact Moorpark, as more fully explained below.

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[2] The GHAD has also indicated that it may also use the P.W. Gillibrand quarry located north of Simi Valley. According to the BBGHAD's revised Project description of June 9, 2014, the P.W. Gillibrand quarry will only "supplement" the CEMEX and Grimes Rock quarries and is not expected to be the primary source of sand.

A. General Information about Why the Grimes Canyon Road (Southbound) Route is Inappropriate for this Project

Figure 16 of the revised Project description [pg. 44] identifies the anticipated truck route leading from the CEMEX quarry. Upon reaching Broadway Road, the route leads west to Grimes Canyon Road and then turns south toward Highway 118. Multiple homes have driveways that back out to Grimes Canyon Road and several school bus stops are located along the roadside. As a result, there are children walking along Grimes Canyon Road on a daily basis. Grimes Canyon Road is a two lane road (one northbound lane and one southbound lane) with limited or no paved shoulders. In addition, there is a rail crossing along Grimes Canyon Road near the intersection with Los Angeles Avenue that is dangerous because queuing is constrained between the road and the rail crossing, there is a precipitous change in grade over the train tracks, and there is a sharp turn to or from Los Angeles Avenue..

B. General Information about Why the Walnut Canyon Road/Moorpark Avenue Route is Inappropriate for this Project

To be clear, however, the Grimes Canyon Road route is identified as merely the "anticipated" route in the Project description. The City remains very concerned that the BBGHAD will revert to using Walnut Canyon Road and Moorpark Avenue to access Highway 118, as it initially proposed in its October 10, 2013 Project description. As more fully discussed in the next section of this letter, this route is simply untenable. No provision of the Project description commits the BBGHAD to use any single route. In fact, the July 18, 2014 "Revised Draft Analysis of Impacts to Public Trust Resources and Values" prepared on behalf of the State Lands Commission indicates that Walnut Canyon Road and Moorpark Avenue will be used for the CEMEX quarry. Walnut Canyon Road and Moorpark Avenue are narrow, contain only two lanes, and run through residential neighborhoods in the center of Moorpark. Even more homes have driveways that back out to Walnut Canyon Road and Moorpark Avenue than out to Grimes Canyon Road and the risks of using that route are even more extreme.

II. Reasons why both of the Proposed Sand Hauling Routes through Moorpark will Cause Serious Impacts to Moorpark and Should be Prohibited

Walnut Canyon Road, Moorpark Avenue, and Grimes Canyon Road south of Broadway Road are all inappropriate for this substantial additional trucking to and from the CEMEX and Grimes Rock quarries. There are multiple reasons why these routes should be prohibited for this Project.

First, children walk directly along and cross Grimes Canyon Road, Walnut Canyon Road and Moorpark Avenue on a daily, year-round basis. No less than eight school

bus stops are located along Grimes Canyon Road. Children living in neighborhoods adjacent to Walnut Canyon Road and Moorpark Avenue use those roads to go to and from two elementary schools, a middle school, the City library, local parks, and the Moorpark Boys and Girls Club, which are all located in very close proximity to the roads. It is clear that children will be placed at a higher risk of being hit by a truck if trucks use Grimes Canyon Road, Walnut Canyon Road, or Moorpark Avenue.

Second, most of Grimes Canyon Road and Walnut Canyon Road have no pedestrian sidewalks, as shown in the attached photographs. With respect to Walnut Canyon Road in particular, it is well known that pedestrians, including school children, walk directly on the street shoulder.[3] The sand and gravel quarries north of Moorpark are already visited by hundreds of independent truckers each day, using this route for access due to its convenience. Even without the presence of additional heavy truck traffic, this condition poses a safety hazard. However, this risk is significantly increased by the proposed Project's frequency of the additional trucks.

Third, sand, dust, and other particulate matter emanating from the trucks will contribute to air pollution and may cause excess debris along all three local roads. Although this impact can be partially mitigated by covering the loads with a net or tarp, it is not possible to fully eliminate this impact.

Fourth, noise pollution caused by the substantial addition of continuous, heavy truck traffic poses an unreasonable impact on those families, many of which are lower income, living in homes near the roads. Noise impacts would affect residents living adjacent to all three roads. The hauling hours from 7 A.M. to 9 P.M. will cause noise pollution 14 hours a day, five days per week. Although hauling presents noise problems at all hours of the day, we also note that the extended schedule would violate the conditions of approval included in both the CEMEX and Grimes Rock facilities' county-issued conditional use permits. Additionally, the large trucks proposed for sand hauling during the Project are very loud, especially those affixed with "jake brakes."

Fifth, both routes through or adjacent to Moorpark cross active railroad tracks used daily by commuter rail operations such as Amtrak and Metrolink, as well as freight systems. If these routes are used, it would be imperative that flagged monitors be provided to ensure that these trucks do not stop on the rail tracks and present a danger to rail passengers and crews.

Finally, as noted throughout, as a matter of environmental justice, the route through Walnut Canyon Road and Moorpark Avenue poses greater environmental and safety impacts on lower-income and minority families. Walnut Canyon Road and Moorpark

[3] As part the state highway system, Walnut Canyon Road is maintained exclusively by Caltrans.

Avenue traverse the City's historically Latino neighborhood. As a result, these residents will bear a disproportionate burden of the Project's impacts.

III. The City Requests that a Northerly Route from the CEMEX Quarry be Required and that Conditions of Approval be Imposed to Mandate the use of that Route and to Provide Other Protections

The State Land's Commission's "Revised Draft Analysis of Impacts to Public Trust Resources and Values" in connection with the Project recognizes many of these impacts on the City and its residents. Although not a binding environmental document on the Coastal Commission, we request that the Commission take note of these real impacts during its consideration of the Permit. However, we also want to make clear the "Avoidance and Minimization Measures" required under the Project's "Traffic Management Plan" are woefully inadequate to address Moorpark's serious and legitimate concerns and requests.

First, and more importantly, a more suitable route to achieve the goals of this Project is available by using Grimes Canyon Road (northbound) to Highway 126. Highway 126 is a four lane divided Highway 126 through Fillmore, where lots are larger, land uses are primarily agricultural, and schools are located further off the route. Moreover, this route does not have the residences or driveways backing into the street. See attached letter of July 7, 2014 from State Senator Fran Pavley. This route is shown in Figure 16 of the revised project description with respect to the Grimes Rock quarry. The City requests that this northerly route to Highway 126 be imposed as a condition of approval.

Second, even with a condition mandating the Grimes Canyon Road (northbound) route to Highway 126, the City is concerned with the current wording of the Traffic Management Plan included in Avoidance and Minimization Measure TR-1 of the California State Lands Commission's environmental review document. Measure TR-1 currently states: "**Construction Manager**. A construction manager shall be designated with authority over truck transportation with the authority to redirect or halt trucking as needed. The manager shall be provided with communication equipment (e.g., radios) to manage the trucking operation." This proposed Avoidance and Minimization Measure is inappropriate because it provides a construction manager with the authority to redirect truck transportation routes with no criteria or limitations. If there is an occasion to deviate from the Grimes Canyon Road (northbound) to Highway 126 route, the City must be able to review and pre-approve in writing any route deviation with respect to volume and timing.

To mitigate the impacts of the Project on Moorpark residents, the City respectfully requests that the Commission include the following provisions as conditions of approval for the BBGHAD's Permit:

- Prohibit the use of Walnut Canyon Road and Moorpark Avenue through the City of Moorpark, as well as the portion of Grimes Canyon Road south of Broadway as haul routes in connection with the Project.

- Require the use of Grimes Canyon Road, (northbound) to Highway 126 through Fillmore as the haul route to and from the CEMEX and Grimes Rock quarries.

- Require the BBGHAD to include these prohibitions and restrictions in any agreements entered into between the BBGHAD, the quarries, and any contracted haulers. The City of Moorpark should be a named beneficiary of this term in those contracts.

- Require the BBGHAD to reimburse the City for the cost of placing monitors and additional law enforcement personnel along the roads to verify that BBGHAD trucks do not use prohibited routes and to verify that BBGHAD trucks obey time restrictions.

- Require the BBGHAD to provide the City with the license plate numbers of all trucks hauling sand on its behalf to assist with monitoring and enforcement.

- Establish a significant monetary penalty for any violations of the haul by the BBGHAD or trucks engaged in Project hauling operations.

In the event the Commission includes language to authorize a construction manager to redirect hauling trucks so that some trucks are permitted to use a route through or adjacent to Moorpark, we request the Commission add text to that Measure to impose the following limitations on the construction manager's authority:

- Redirection of trucks from the approved hauling route of Grimes Canyon Road (northbound) to Highway 126 and into Moorpark should only occur in limited situations where traffic, weather or other conditions preclude the use of the approved hauling route. Use of routes through or adjacent to Moorpark shall require 24 hour advance written notice to the City of Moorpark and the prior written approval of the City of Moorpark City Manager or his designee, and then may only occur between the hours of 7 A.M. and 6 P.M., Monday through Friday, except holidays, thereby prohibiting nighttime hauling between the hours of 6 P.M. and 7 A.M. During the period that any hauling is allowed or directed through Moorpark, BBGHAD shall reimburse the City for the cost of placing monitors and additional law enforcement personnel along the roads to verify that BBGHAD trucks obey time restrictions. Require the use of flag person at all rail crossings during sand hauling operations.

- Prohibit the use of compression release engine brakes, known as "jake brakes," on trucks hauling materials within the City of Moorpark (except under emergency operating conditions).

- Require that any construction manager with authority to redirect truck transportation routes receive prior written approval from the City before authorizing the use of any redirected route.

The City continues to believe that these issues can and should be fully addressed by the BBGHAD. To that end, the City last met with Mr. Goss of the BBGHAD on June 16, 2014, and is waiting to hear back from him to discuss mutually agreeable options to resolve them. If the City's concerns are not addressed by the time the Commission takes up the Permit at its August meeting, however, the City requests that the Commission continue this item so that the City and the BBGHAD may continue negotiations.

As a final note, the City of Moorpark is not conceptually opposed to the Project. The City recognizes the need to protect the Broad Beach community from beach erosion. At the same time, the City must protect its residents from the real dangers and impacts posed by this Project. The City strongly believes that the conditions of approval articulated in this letter will sufficiently mitigate the environmental and safety hazards posed by the trucks on Moorpark residents. In essence, protect Broad Beach while also protecting Moorpark.

Thank you for your attention to this matter.

Sincerely,

Janice Parvin
Mayor, City of Moorpark

Attachments:
(1) Photographs of Walnut Canyon Road and Grimes Canyon Road
(2) July 7, 2014 Letter from Senator Fran Pavley to the BBGHAD Board

cc: Honorable Members of the Moorpark City Council
Honorable Members of the Moorpark Planning Commission
Steven Kueny, City Manager
David Bobardt, Community Development Director
Kevin Ennis, City Attorney

Mark Goss, Project Manager, BBGHAD
Kenneth A. Ehrlich, Project Counsel,
Elkins Kalt Weintraub Reuben Gartside LLP
Charles Lester, Executive Director, California Coastal Commission
Steve Hudson, District Manager, California Coastal Commission
Melissa Ahrens, Coastal Program Analyst, California Coastal Commission

ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

5550 S. Grimes Canyon

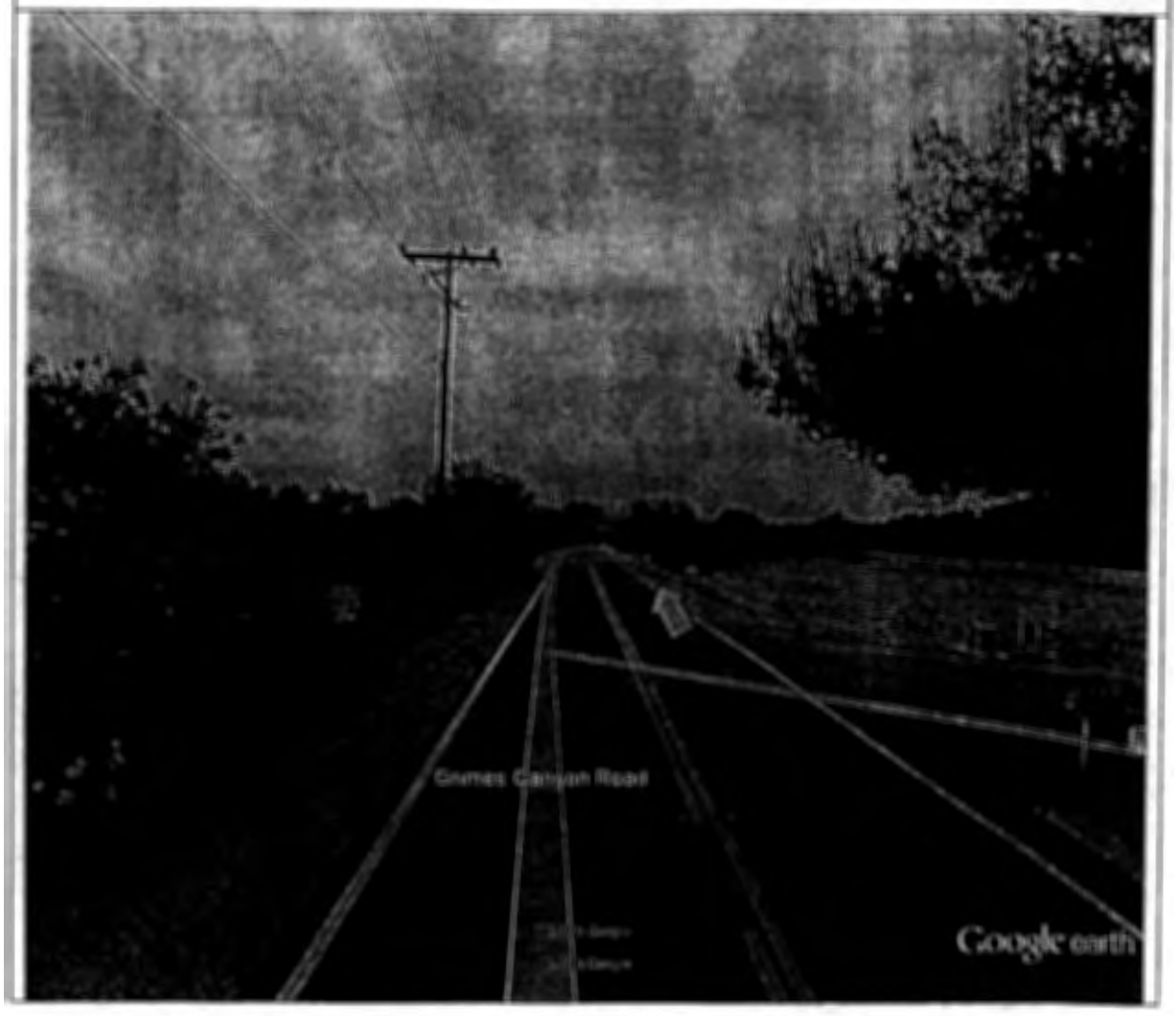
ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

6137 Grimes Canyon Road (Red Barn) & Maria Drive



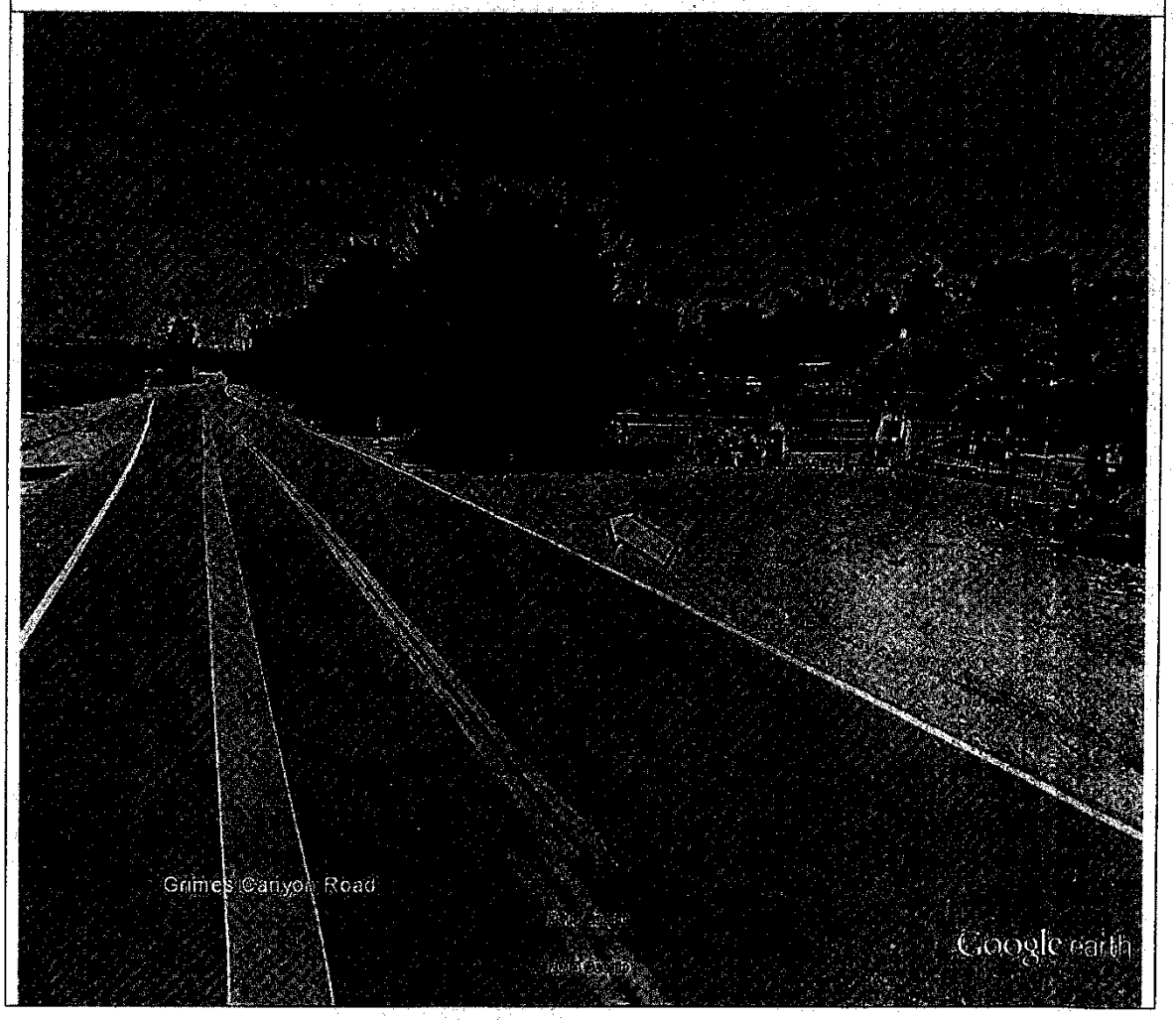
ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

7684 S. Grimes Canyon



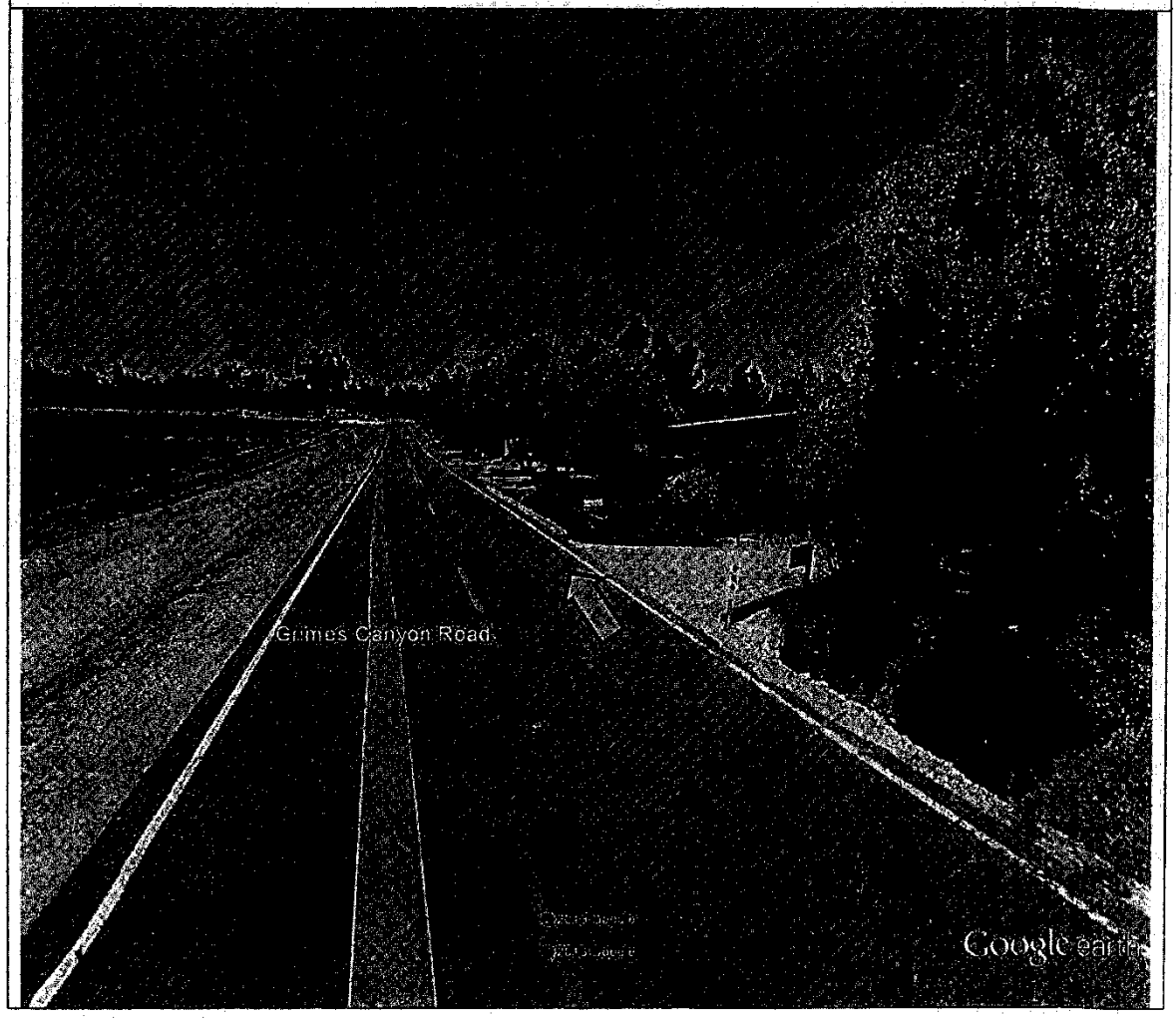
ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

7854 S. Grimes Canyon



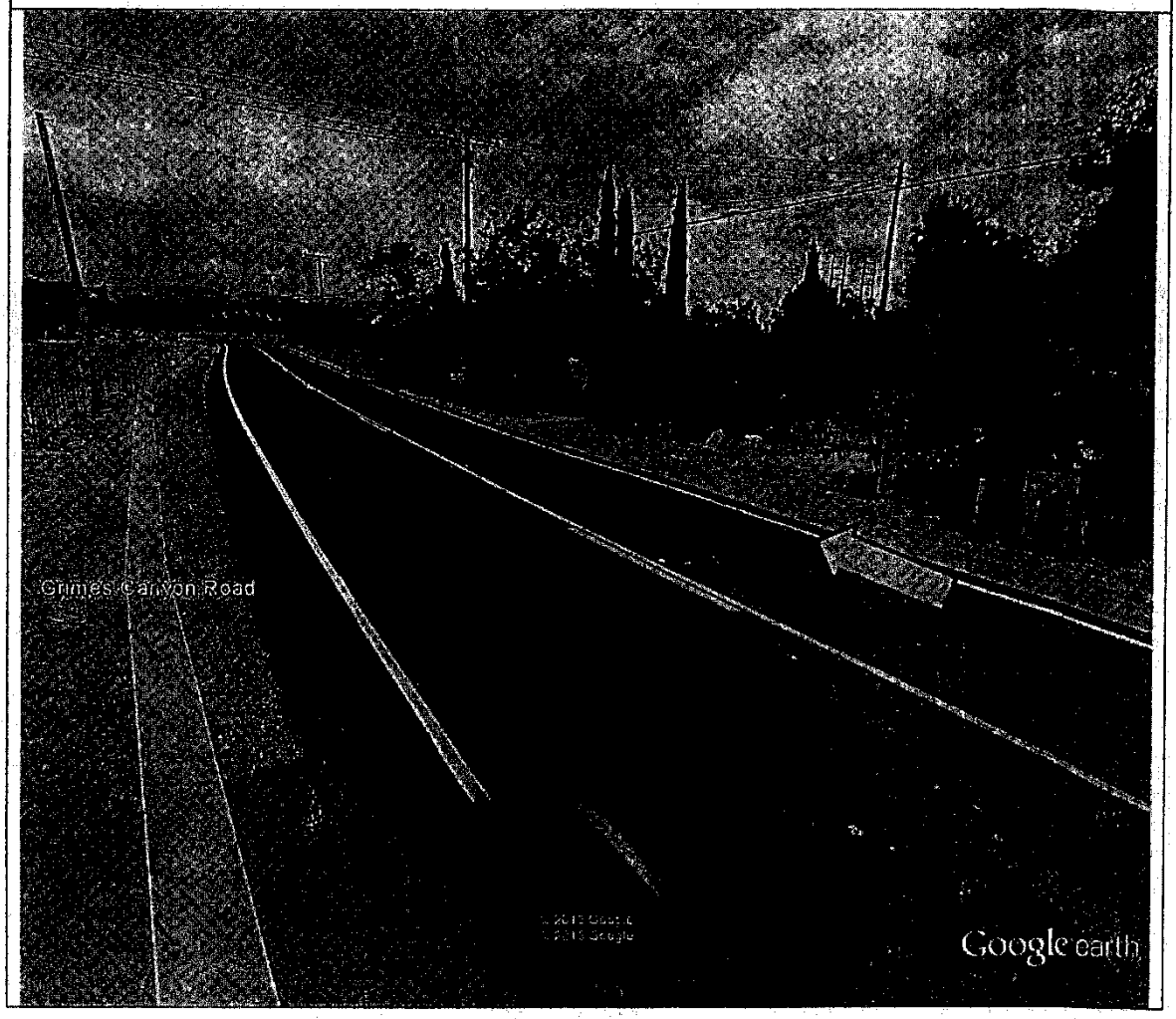
ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

8450 North Grimes Canyon Road

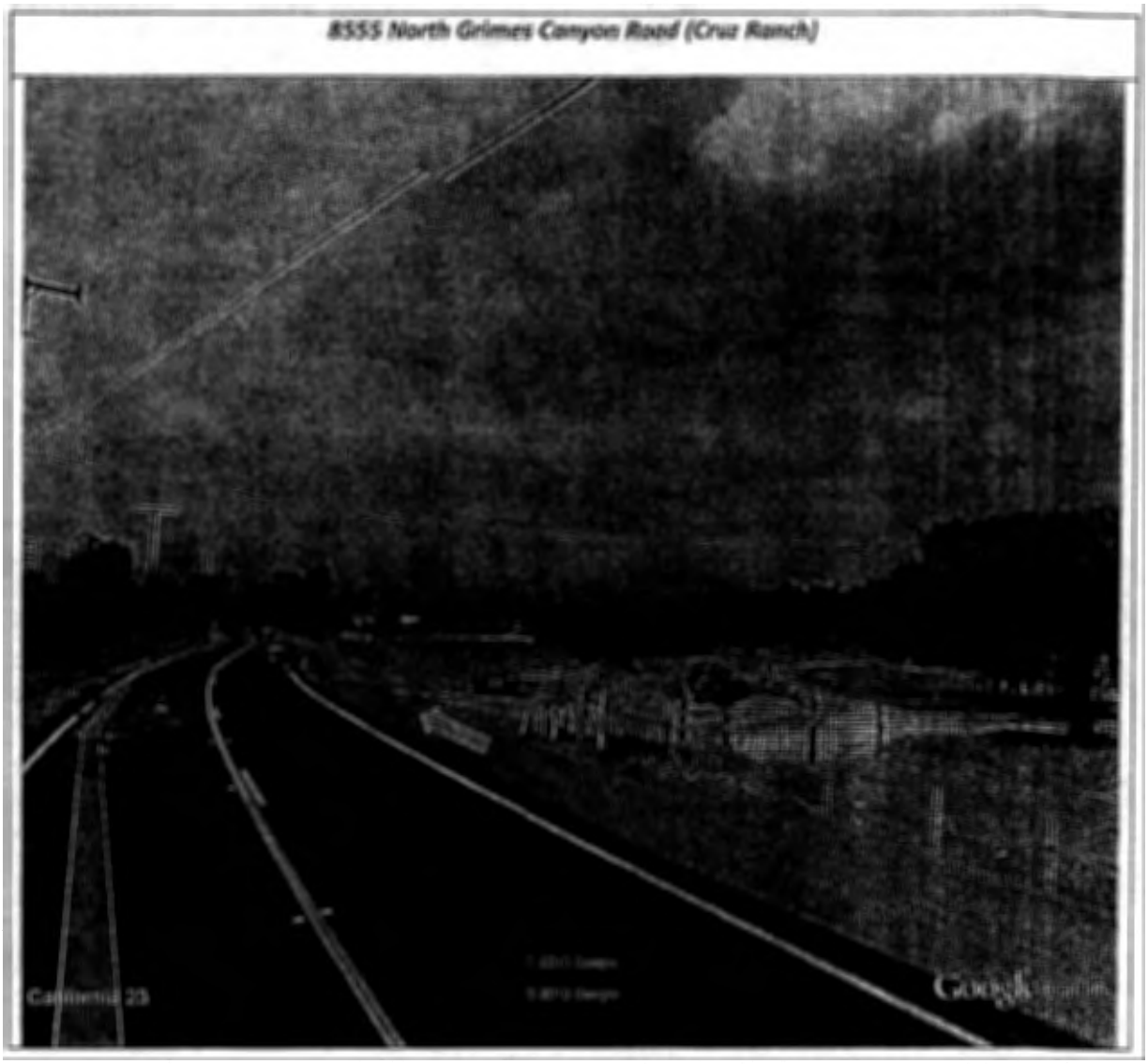


ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)



ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

Walnut Street (Hwy 23) @ Almaguer's Corner (1199 Walnut Canyon)

ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

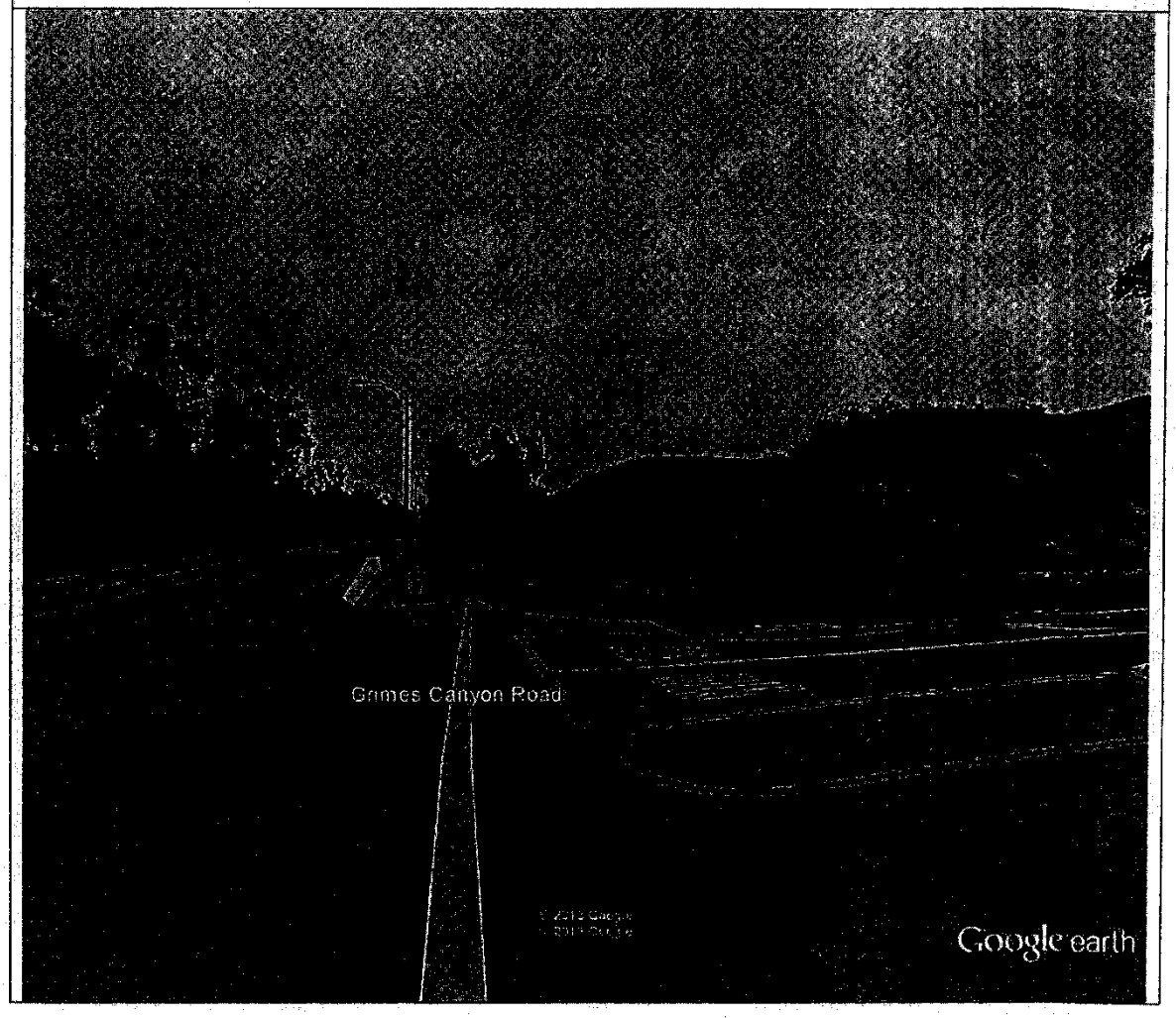
ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

South Grimes & Championship



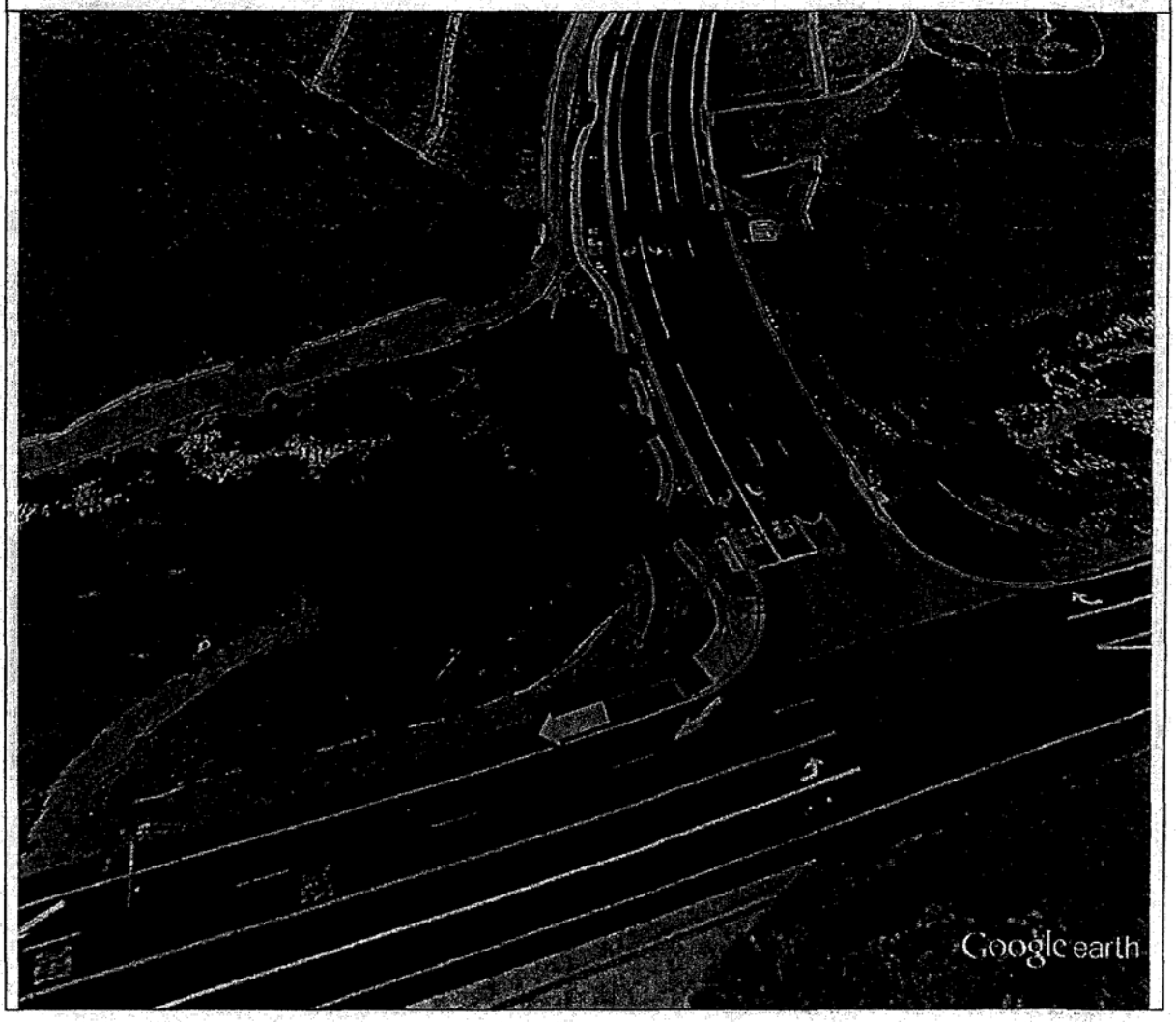
ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)

Championship Drive & Grimes Canyon Road

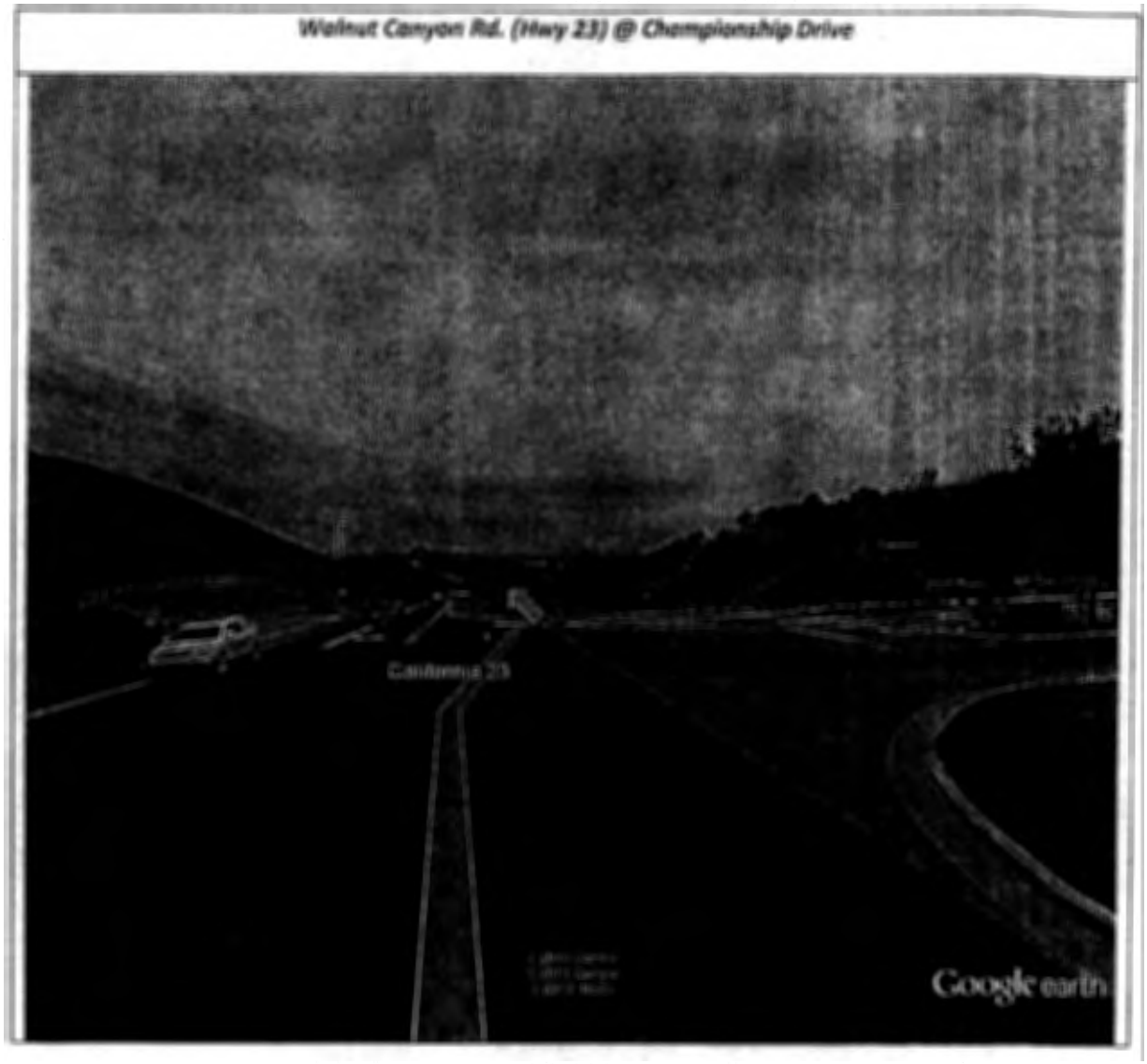


ATTACHMENT 1

MUSD BUS STOPS

Along Grimes Canyon Road and Walnut Canyon Road

(Pictures provided by MUSD)



ATTACHMENT 2

CAPITOL OFFICE
STATE CAPITOL, ROOM 4035
SACRAMENTO, CA 95814
TEL (916) 651-4027
FAX (916) 651-4927

DISTRICT OFFICE
5016 N. PARKWAY CALABASAS
SUITE 222
CALABASAS, CA 91302
TEL (818) 876-3352
FAX (818) 876-0602

California State Senate

SENATOR
FRAN PAVLEY
TWENTY-SEVENTH SENATE DISTRICT

COMMITTEES
NATURAL RESOURCES & WATER
CHAIR
ELECTIONS
ENERGY, UTILITIES & COMMUNICATIONS
ENVIRONMENTAL QUALITY
TRANSPORTATION & HOUSING

July 7, 2014

Chairman Karno and Members of the Board of Directors
Broad Beach Geologic Hazard Abatement District (BBGHAD)
c/o Bernadette O'Neill, GHAD Clerk
4057 Minerva Ave.
Los Angeles, CA 90066

Dear BBGHAD Board Members:

As the State Senator representing both the Malibu and Moorpark area, I am writing to you about my concerns over the proposed truck routes for your project through the City of Moorpark. The impacts on residents could be substantial and I am told the City of Moorpark has proposed an alternate truck route from the CEMEX and Grimes Rock quarries that is more acceptable to Moorpark residents.

The City of Moorpark is already subject to heavy truck traffic through populated areas which residents rated in a recent poll as a top issue facing the city. Your proposed truck routes will add an additional 43,000 trips over 139 days between the hours of 7 a.m. and 6 p.m., five days a week.

City of Moorpark staff have recommended that your trucks be prohibited from using Walnut Canyon Road and Moorpark Avenue through the City of Moorpark, as well as the portion of Grimes Canyon Road south of Broadway Road. Their preferred route is one via Highway 126 through Fillmore which does not have residences or driveways backing into the street and restricts pedestrian access on most of the road. This seems like an acceptable alternative that would lessen the impacts on Moorpark and allow your project to continue.

Thank you for your consideration. Should you have any questions, please contact Marie Lakin in my District Office at (818) 876-3352.

Sincerely,

Fran Pavley

Fran Pavley
California State Senator
District 27

CALIFORNIA COASTAL COMMISSION
SOUTH CENTRAL COAST AREA
89 SOUTH CALIFORNIA ST., SUITE 200
VENTURA, CA 93001
(805) 585-1800

M E M O R A N D U M

FROM: Jonna D. Engel, Ph.D.
Ecologist

TO: Steve Hudson
South Central Coast District Manager

SUBJECT: Potential Impacts of the Broad Beach Geologic Hazard Abatement District Proposed Project on Terrestrial and Marine Resources In and Adjacent to the Project Footprint, Broad Beach, Malibu, California.

DATE: November 25, 2014

Documents Reviewed:

AMEC Environment and Infrastructure, Inc. July 2014. Revised Analysis of Impacts to Public Trust Resources and Values (APTR) for the Broad Beach Restoration Project. Prepared for State Lands Commission.

AMEC Environment and Infrastructure, Inc. July 2014. All Reports in Appendices B, C, D. Revised Analysis of Impacts to Public Trust Resources and Values (APTR) for the Broad Beach Restoration Project. Prepared for State Lands Commission.

Merkel & Associates, Inc. June 2014. Supplemental Marine Habitat Survey and Mapping for the Broad Beach Restoration Project. Prepared for Moffat and Nichol.

Moffat and Nichol. November 2013. Upland Sand Source: Coarser-Than-Native Grain Size Impact Analysis. Prepared for: Broad Beach Geologic Hazard Abatement District.

WRA, Inc. October 2013. Conceptual Foredune Creation and Enhancement Plan; Broad Beach Restoration Project, Malibu, Los Angeles County, California. Prepared for Moffatt & Nichol.

URS. August 2013. Malibu Beach Sand Replenishment Sand Grain Angularity Analysis Malibu, California. URS Project No. 03003261. Letter Report to Chris Webb, Moffat and Nichol.

Chambers Group, Inc. July 2013. Broad Beach Intertidal Sampling for the Broad Beach Shore Protection Project, Los Angeles County, California. Prepared for Moffat and Nichols.

Exhibit 20 – Dr. Jonna Engel Memorandum dated November 25, 2014. 4-12-043 (Broad Beach GHAD)

Chambers Group, Inc. July 2013. Summer Mapping of Eelgrass off Broad Beach in Malibu for the Broad Beach Restoration Project. Prepared for Russell Boudreau, Moffat and Nichols.

Chambers Group, Inc. December 2012. Broad Beach Intertidal Sampling for the Broad Beach Shore Protection Project, Los Angeles County, California. Prepared for Moffat and Nichols.

Chambers Group, Inc. June 2012. Survey of Marine Biological Resources of Broad Beach Malibu, California. Prepared for Moffat and Nichols.

I have been asked to review and analyze the project proposed by the Broad Beach Geologic Hazard Abatement District (BBGHAD) regarding potential adverse impacts upon terrestrial and marine natural resources in and immediately adjacent to the project footprint. To accomplish this I have reviewed the documents listed above and peer-reviewed literature, visited the site numerous times, consulted with agency biologists and academic experts, and studied historic and current aerial photographs.
The BBGHAD is seeking authorization of an approximately 4,150 ft. long, 12-15 ft. high, 25-40 ft. wide, rock revetment constructed on Broad Beach pursuant to two emergency coastal development permits. In addition, the project includes implementation of a 20 year beach replenishment program at Broad Beach, involving deposition of 600,000 cu. yds. of sand on the beach from inland sand quarries during the first year and approximately 450,000 cu. yds. of sand during the tenth year of the program. Periodic sand backpassing[1] operations and dune habitat restoration on top of and adjacent to the rock revetment are also proposed.

The proposed project raises numerous biological concerns including retention of, and concomitant dune restoration on, the emergency rock revetment, beach replenishment in and adjacent to an unusually rich and ecologically valuable marine ecosystem, use of source sand that does not match the existing beach sand, and ongoing maintenance activities including sand backpassing and future sand replenishment.

Broad Beach and the associated nearshore marine habitats are located in Malibu, California, along the shoreline within the geographic region commonly known as the Southern California Bight (Figure 1). Broad Beach falls within the Zuma Littoral Cell which extends alongshore for 30 km from Point Mugu to Point Dume (Figure 2). Broad Beach is also within the boundaries of the State Water Resources Control Board's (SWRCB) Mugu-Latigo Area of Special Biological Significance (ASBS) established in the 1970s and the Point Dume State Marine Conservation Area (SMCA) established in January 2012 by the California Department of Fish and Wildlife (CDFW) under the Marine Life Management and Marine Life Protection Acts (Figure 3). In recognition of the rarity and sensitivity of marine habitats, the City of Malibu Land Use Plan (Policy

[1] Sand backpassing is the transfer of sand that accumulates at the east end of Broad Beach back up to the west end using heavy equipment.

3.74) states that: “All Areas of Special Biological Significance and Marine Protected Areas shall be considered ESHA and shall be accorded all protection provided for ESHA in the LCP.” The LUP requires that marine ESHAs are protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. Further, the LUP requires that near shore shallow fish habitats and shore fishing areas must be preserved, and where appropriate and feasible, enhanced.

The nearshore marine habitats off Broad Beach are also designated as Essential Fish Habitat (EFH) under section 305(b)(6)(A) of the Magnuson-Stevens Fishery Conservation and Management Act and support two of the of the six Special Aquatic Site types (sanctuaries and refuges and vegetated shallows), that are given special recognition under Clean Water Act regulations[2]. Essential fish habitat (EFH) is that habitat necessary for managed fish to complete their life cycle. It is defined as those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. Whenever federal agencies authorize, fund, or carry out actions that may adversely impact EFH, they must consult with the National Marine Fisheries Service. Special Aquatic Sites are defined as: “Geographic areas, large or small, possessing special ecological characteristics of productivity, habitat wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region”. The Sanctuaries/Refuges designation applies to areas designated as such under state and federal laws or local ordinances. Vegetated Shallows are: “permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as turtle grass and eelgrass in estuarine or marine systems…”

The California State Water Resources Control Board designated 34 regions along the coast as Areas of Special Biological Significance in order to preserve biologically unique and sensitive marine ecosystems from undesirable alterations in natural water quality. The Mugu-Latigo ASBS was designated due to the diversity of distinct marine habitats that collectively created a unique assemblage. The reconnaissance survey report prepared through an interagency effort between California Department of Fish and Game and the SWRCB for ASBS #24 (in March of 1979) states that the Trancas/Zuma beach is representative of these special open coast sandy beach habitats and possesses the most extensive untouched subtidal sand communities in the region. The survey report states that “the community structure of Trancas and Zuma is dominated by sand dollars, sea pansies, and pismo clams and the margins of the beach contain peculiar community interfaces between areas of rock and sand.” The ASBS baseline report points out that the surfgrass (*Phyllospadix torreyi*), which commonly occupies these nearshore rock/sand interfaces and rocky intertidal zones is a very important

[2] 40 CFR Part 230 –Section 404(b)(1) EPA and ACOE Guidelines for Specification of Disposal Sites for Dredged of Fill Material (EPA and ACOE) Subpart B – Compliance With the Guidelines, Subpart D-Potential Impacts on Biological Characteristics of the Aquatic Ecosystem, Subpart E. Potential Impacts on Special Aquatic Sites, Subpart H-Actions to Minimize Adverse Effects, Subpart J-Compensatory Mitigation for Losses of Aquatic Resources.

member of the subtidal ASBS community and that its presence near the high energy surf zone tends to reduce wave energy, thus decreasing wave caused erosion. The report goes on to say that, "this true grass has roots which attach to the rocks; soil, which is rich in decaying organic material, accumulates around the roots. These soil areas contain a number of obligate understory species, including certain annelid worms (lumbrinereids) which clearly could not exist in these surf swept locations without the protection afforded by the surf grass roots. Other organisms have obligate relationships with the blades of this plant. [..] An important relationship has been demonstrated between surfgrass and the lobster, Panulirus interruptus." Phyllospadix, surfgrass, acts as a nursery for juvenile lobster and is apparently very long lived, up to 50 years, and recruits slowly. The ASBS baseline report concludes that, "This species [phyllospadix surfgrass] therefore warrants special protection from both physical removal and potential pollutants as it has a particularly important ecological role and is not easily replaced." Additionally, the report also identifies that there are extensive offshore rocky reefs at Lechuza point that support eel grass beds. Specifically it states that, "The bed at Lechuza Point has remained there for several years and is fairly large (2-5 meters wide x 40 meters long)."

Other sensitive and special resources identified in the Trancas Beach and Lechuza Point region include extensive sand dollar and pismo clam beds, tube worms, kelp forests, nearshore sand habitats, and sandy bottom habitats (offshore sands). The intent of the ASBS designation was to protect, maintain, and enhance these special marine resources and the overall water quality of the area. As such, this baseline report also included potential threats to the ASBS objectives. Of these, seepage from septic tank leaching along this stretch of the coast was identified as a primary threat to water quality and marine habitats. Additionally, the report also includes 'dredging and/or spoil disposal' as a potential point source pollution threat to the resources of the ASBS. The intent of the ASBS and the Ocean Plan is to maintain habitat integrity of these special marine resource areas even in those sections of the coast experiencing ongoing and intensifying coastal developments. This report was compiled and adopted long before the establishment of the Marine Protected Areas up and down California's coast, however, it includes the following statement, "Maintenance of habitat within the ASBS available for recolonization [of sensitive and valuable marine species] in the future is essential to assure continued recruitment and potential recovery of these species to their previous levels. In addition, this area can act as a reservoir for recruitment into nearby areas in which populations have been depleted by fishing pressure, adjacent land development and/or deteriorating water quality." According to the July 14, 2014 Revised APTR prepared by AMEC:

> *The Mugu-Latigo ASBS is the largest of the southern California mainland ASBS covering 24 miles of coastline and 18.5 sq. miles of ocean. The Mugu-Latigo ASBS was set aside, "not because of any single unique component or habitat, but because of the multiplicity of distinct habitats and organisms in a relatively healthy state, which collectively make the area unique." Specific organisms which were considered especially unique components of the ASBS at the time of its incorporation include: giant kelp, surfgrass, sand dollars, Pismo clams, tube*

> *worms, sea urchins, and California halibut. These organisms were recognized for their ecological dominance within the community structure, and/or their contribution as recreational or commercially important species.*

The Broad Beach area and beyond has recently been further recognized for its ecological significance by inclusion in the southern California Marine Protected Area (MPA) network. Great care, scrutiny, and effort went into establishing the boundaries of the MPAs within the network. Capturing representative intertidal and subtidal hard bottom habitat, which is relatively uncommon along the southern California shoreline (encompassing less than 20% of the nearshore habitat in Los Angeles and Orange Counties), required by the MPA science guidelines, was a challenge in southern California. This habitat type accounts for only 1% (39.3 acres) of the Point Dume SMCA[3]. The CDFW states the following about the Point Dume SMCA and the importance of the area within the proposed project boundaries:

> *The Point Dume SMCA/Point Dume SMR are an important cluster of MPAs that provide moderate or greater levels of key hard bottom habitats, including rocky shores, nearshore reefs (0-30 m), 30 m and deeper reefs, as well as biogenic habitats that are supported by nearshore reef habitats, including kelp and surfgrass. Moreover, the kelp and shallow 0-30 m hard substrate habitats within these two MPAs facilitate dispersal and connectivity along the mainland between the Campus Point SMR and the cluster of MPAs off Palos Verdes (Point Vicente No Take SMCA and Abalone Cove SMCA). These two habitats in particular exhibit patchy distribution along the mainland of the Santa Barbara Channel, and therefore are crucial to the fabric of the regional south coast MPA network habitat which was carefully crafted by a wide range of ocean users and informed by scientific input during the planning process for the south coast MPAs. The primary distribution of these habitats in the Point Dume SMCA is the western portion of the MPA in between Lechuza Point and Trancas Creek, directly conflicting with the proposed Project. In fact, the size of this MPA was created deliberately large enough to encompass this particular area containing these key habitats. Removal of any of this habitat may jeopardize the size and spacing requirements set forth by the MLPA South Coast Science Advisory Team, which in turn, may create a less effective South Coast network and may fail to meet the goals of the MLPA.*[4]

The specific protection provisions of the Point Dume SMCA state that the take of all living marine resources is prohibited except:

1. The recreational take by spearfishing of white seabass and pelagic finfish is allowed.

[3] See AMEC July 2014 APTR Table 3.3.4.

[4] Shuman, C. (CDFW Regional Manager, Marine Region). August 11, 2014. Revised Analysis of Impacts to Public Trust Resources for the Broad Beach Restoration Project. Comment Letter to Jason Ramos, California State Lands Commission.

2. The commercial take of swordfish by harpoon and coastal pelagic species by round haul net, brail gear, and light boat is allowed. Not more than five percent by weight of any commercial coastal pelagic species catch landed or possessed shall be other incidentally taken species.
3. Take pursuant to beach nourishment and other sediment management activities is allowed inside the conservation area pursuant to any required federal, state, and local permits, or as otherwise authorized by the department.

While the Point Dume SMCA regulations allow certain sand nourishment and other sediment management activities, significant burial of marine habitat is inconsistent with the intent of this provision. According to California Department of Fish and Wildlife staff: "The regulations that were established for the Point Dume SMCA do not have provisions to allow for significant or adverse impacts that would require compensatory mitigation within this area".[5]

The terrestrial and marine habitats in and immediately adjacent to the BBGHAD proposed project footprint include dunes (southern foredunes and coastal strand), lagoon mouth (Trancas Lagoon), upper sandy beach, intertidal sandy beach, rocky intertidal (bedrock, boulders, cobble at Lechuza Point), intertidal boulder, soft bottom subtidal that supports eelgrass beds and soft bottom epi- and infaunal invertebrates (e.g. sand dollar beds), hard bottom subtidal (bedrock and cobble rocky reef) that supports kelp beds and understory algae and invertebrates, as well as several special status species. While these habitats are treated separately here, they comprise a vital transition zone interconnected by complex physical and biological interactions that occur across variable spatial and temporal scales and that inexorably link the terrestrial and marine ecosystems.

Southern Foredunes and Coastal Strand

Dunes are a component of beach ecosystems[6]. The sandy beach lies between foredunes and the ocean and the amount of sand between the ocean and dunes varies and depends on several factors including sand supply, exposure and topography, wind and wave patterns, and presence of artificial features such as seawalls, rock revetments, and groins. Embryo dunes, also known as coastal strand habitat, are found at the seaward base of foredunes and are often initiated by kelp wrack which traps sand and seeds[7]. On open coasts, coastal strand vegetation is important in the formation of hummocks that can become foredunes. This pioneering vegetation is often lost on armored beaches[8].

[5] Revised Analysis of Impacts to Public Trust Resources for the Broad Beach Restoration Project, letter to California State Lands Commission, dated August 11, 2014.

[6] Barbour, M.G. T.Keeler-Wolf and A.A. Schoenherr. 2007. Terrestrial Vegetation of California. University of California Press, Berkeley, CA. 712 pp.

[7] Pickart, A.J., and J.O. Sawyer. 1998. Ecology and restoration of northern California coastal dunes. California Native Plant Society. Sacramento, CA.

[8] Dugan JE, Airoldi L, Chapman MG, Walker SJ, and Schlacher T (2011) Estuarine and Coastal Structures: Environmental Effects, A Focus on Shore and Nearshore Structures. In: Wolanski E

Dunes systems, one of the most dynamic habitat types on earth, are dependent upon, and highly influenced by, wind and wave action. These forces cause sand accretion or erosion, depending on their strength, which tends to follow seasonal patterns. Dunes form parallel to the prevailing winds and perpendicular to the coastline and support an array of native plants and animals uniquely adapted to this transition zone between land and sea. In addition to their habitat and aesthetic values, dune ecosystems are recognized for providing important protection to inland structures and lands from storm events.

Prior to residential development at Broad Beach, the beach was backed by dunes that extended to the base of coastal bluffs. The homes at Broad Beach are built in what once were dunes. Over the years, permitted and unpermitted development, in the form of backyard landscaping, patios, seawalls, sand bags, and rock revetments have encroached into the foredunes and coastal strand habitat. While dunes still exist at Broad Beach, they are a fragment of their former selves and the coastal strand has virtually been eliminated.

California dune ecosystems have suffered a disproportionately high amount of human impact because the coast is a highly desirable area for industry, tourism, recreation, and residential settlements[9]. As a result, dune ecosystems are listed as very rare by the CDFW Natural Diversity Database (CNDDB; southern foredunes, G2, S2.1; southern dune scrub, G1, S1.1)[10]. Section 30107.5 of the Coastal Act defines environmentally sensitive habitat (ESHA) as "*any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments*". The southern foredunes at Broad Beach rise to the level of ESHA because they are rare and are easily disturbed and degraded by human activities and development as shown by the significant loss of dune habitat and the high cover of non-native and invasive species.

The dunes at the east end of Broad Beach were identified as ESHA by the commission in 2009. In addition to supporting dune morphology these dunes supported numerous native dune species including red sand verbena, *Abronia maritime*, a California Native

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and McLusky DS (eds.) Treatise on Estuarine and Coastal Science, Vol 8, pp. 17–41. Waltham: Academic Press.

[9] Nordstrom, K.F. and N.P. Psuty, 1980. Dune District Management: A Framework for Shorefront Protection and Land Use Control. Coastal Zone Management Journal, V.7:1-23

[10] Global and State rankings represent a letter and number score that reflects a combination of rarity, threat, and trend factors, with weighting being heavier on rarity than the other two. G1 = Critically Imperiled-At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors. G2 = Imperiled-At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors. S1= Critically Imperiled-Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state. S2= Imperiled-Imperiled in the state because of rarity due tvery restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.

Plant society 4.2 listed dune plant and globose dune beetles, *Coelus globosus,* ranked G1G2 S1S2 by the CDFW Natural Diversity Database (CNDDB).

Sandy Beach

Sandy Beaches are among the most threatened of all ecosystems under severe pressure from the combined impacts of global climate change and management actions to protect coastal properties, and loss of sand supply due to damming of rivers and armoring of coasts. Beaches are unique and dynamic ecosystems that link marine and terrestrial environments and are found on all continents of the world. Beach ecosystems consist of coastal dunes, upper beaches, and surf zones that form a single functional unit, exchanging organisms, sand, organic matter, and nutrients[11]. Along with their unique biodiversity and productive food webs, beaches provide ecological functions and services not supplied by any other open coast ecosystem[12,13]. These functions include filtering large volumes of seawater, accumulating and storing sand, wave dissipation and buffering, processing of organic matter, recycling of imported nutrients, supporting coastal fisheries and providing critical habitats (pupping, nesting and foraging sites) for wildlife species, such as marine mammals and birds[14]. While beaches are highly valued recreational areas that attract thousands of visitors and contribute greatly to coastal economies, their unique biodiversity and the ecological functions and resources supported by beach ecosystems are often under-appreciated[15].

Southern California sandy beaches can support some of the most diverse invertebrate communities ever reported for this coastal habitat[16]. The abundance invertebrates of beaches provide prey for a remarkably rich assemblage of shorebirds averaging > 100 birds per kilometer year round for some southern California beaches[17]. Shorebird use of beaches has been positively correlated with the availability of invertebrate prey and wrack as well as beach type, width and condition[18]. A number of nearshore fish species feed on beach invertebrate providing a trophic link to subtidal food webs. The threatened western snowy plover and California least tern nest and rear their chicks on open coast and sheltered beaches in the region.

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[11] Schlacher, T.A, and A.R. Jones, J.E. Dugan, M.A. Weston, L. Harris, D.S. Schoeman, D.M. Hubbard, F. Scapini, R. Nel, M. Lastra, A. Mclachlan, C.H. Peterson. 2014. Open-Coast Sandy Beaches and Coastal Dunes In: Coastal Conservation, eds. B. Maslo and J.L. Lockwood. Cambridge University Press. Pgs. 37-98.

[12] Dugan, J. E. and D. M. Hubbard. Sandy Beach Ecosystems. in: Ecosystems of California – A source book. Mooney, H. and E. Zavaleta, eds. University of California Press.

[13] Schlacher, T.A., J. Dugan, D.S. Schoeman, M. Lastra. A. Jones, and F. Scapini. 2007. Sandy Beaches at the Brink. Diversity Distrib. V. 13:556-60.

[14] Ibid

[15] Schlacher et al. 2007 ibid.

[16] Dugan, J.E., Hubbard, D.M., Engle, J.M., Martin, D.L., Richards, D.M., Davis, G.E., Lafferty, K.D., and R.F. Ambrose. 2000. Macrofauna communities of exposed sandy beaches on the Southern California mainland and Channel Islands. Fifth California Islands Symposium, OCS Study, MMS 99-0038: 339-346.

[17] Hubbard, D.M., and J.E. Dugan. 2003. Shorebird use of an exposed sandy beach in southern California. Estuar. Coastl. Shelf Sci. 58S: 169-182.

[18] Dugan, J.E., D.M. Hubbard, D.L. Revell, and S. Schroeter. 2008. Ecological effects of coastal armoring on Sandy Beaches. Marine Ecology, v. 29: 160-170

In the early 1970's Broad Beach reached an average width of approximately 70 feet. It is thought that Broad Beach was particularly wide at this time due to sediment disposal from construction of Pacific Coast Highway. From 1974 to 2009 Broad Beach lost approximately 600,000 cubic yards of sand, causing the shoreline to move inland 65 feet or more (Moffat and Nichol 2012). The narrowing of the beach appears to be the result of a combination of natural and anthropogenic factors; the natural ebb and flow of sand in the Malibu littoral cell, sea level rise, dams, and sand bags and other development [19]. It is important to note that even at it widest, the west end of Broad Beach supported significant cover of intertidal and subtidal hard bottom habitat. Aerial photos spanning from the 1970's to the present show that the west end has consistently supported hard bottom habitat with only a sliver of sandy beach [20] (Figure 4).

The high intertidal zone of southern California beaches are home to a remarkable diversity of invertebrates, many of which are associated with stranded kelps and algae. These animals make up an average of 40% of the intertidal species of beaches in the region that are not subject to grooming or nourishment or other impacts[21]. As recently as August 2002, the eastern reach of Broad Beach supported a diverse assemblage of upper beach invertebrates (14 species) including talitrid amphipods, oniscoid isopods and flightless beetles, all of which have direct development with no larval stages and low dispersal rates as adults. To persist at a given beach, these types of animals rely largely on the reproduction of resident populations. When resident populations of these types of animals are impacted, recovery can be protracted and intervention may be required to reestablish populations. For example, formerly widespread populations of upper beach isopods (Tylos, Alloniscus) have largely disappeared from many major littoral cells in southern California[22].

Trancas Lagoon

Trancas Creek is a seasonal creek in the Santa Monica Mountains that empties into the ocean at the east end of Broad Beach where it forms a small lagoon. Trancas Creek is typically dry in the summer (with isolated ponds along it course) with periodically flowing water in the winter. In the summer the lagoon mouth is typically blocked from the ocean by a sand berm that is breached during high water flow in the winter. Historically Trancas Creek supported the endangered southern steelhead trout (*Oncorhynchus mykiss*) but they have not been observed in the creek since the 1980's. The endangered southwestern pond turtle is currently present in the creek. The Resource Conservation District of the Santa Monica Mountains is currently developing a publicly funded lagoon restoration plan that will increase lagoon habitat and opportunities for the

[19] Patsch, K. & G. Griggs. 2006. Littoral Cells, Sand Budgets, and Beaches: Understanding California's Shoreline. University of California, Santa Cruz. Institute of Marine Sciences. California Department of Boating and Waterways, California Coastal Sediment Management WorkGroup Brochure.

[20] Coastal Records Project, http://www.californiacoastline.org; Google Earth Historical Images

[21] Dugan, J.E., Hubbard, D.M., McCrary, M., and M. Pierson. 2003. The response of macrofauna communities and shorebirds to macrophyte wrack subsidies on exposed sandy beaches of southern California. Estuar. Coastl. Shelf Sci. 58S: 133-148.

[22] Hubbard, D.M., J. E. Dugan, N.K. Schooler, S. Viola. Local extirpations and regional declines: the case of endemic upper beach fauna in southern California. Est. Coastl Shelf Sci. 150: 67-75

lagoon to breach and remain connected to the ocean for longer periods under regular storms events because tidal connectivity is critical to the health of lagoon ecosystems, and to the passage of in-migrating and smolting steelhead trout.

Intertidal Hard Bottom (Lechuza Point and Boulder Field)
The rocky intertidal zone is a compact and diverse area located in the transition zone between terrestrial and marine habitats. This area, exposed for part of the day and covered for the rest, is characterized by marine organisms adapted to physical duturbance, severe temperature fluctuations, and predators from both terrestrial and marine environments. In southern California over 1,000 species of algae and invertebrates inhabit this zone[23].

East of Lechuza Point is a boulder field that is subject to seasonal sand cover and is characterized by species especially adapted to sand inundation including green algae and barnacles in the high intertidal zone, fleshy red algae including *Gracilaria andersonii*, *Ceramium sp.* and *Masaella leptorhynchos* in the mid-intertidal, and feather boa kelp*, Egregia menziesii* and surfgrass, *Phyllospadix sp.* in the low-intertidal. Ochre sea stars, *Pisaster ochraceus*, occur in significant numbers in the mid and low intertidal zones.

Soft Bottom Subtidal Habitats
Eelgrass beds (*Zostera spp*.) are considered to be one of the most productive habitat types found on soft-bottom substrate. Eelgrass typically grows in sandy, sheltered areas, such as estuaries and protected coastlines, where there is adequate protection from waves and storms. It is quite unusual to have such an extensive bed of eelgrass at Broad Beach given that it is relatively exposed to wave action – eelgrass is more typically found inside protected areas like harbors and bays. It is found in protected areas around the Channel Islands and perhaps it is protected by its position tucked inside Lechuza Point.

The soft bottom habitat of the region supports a diverse and abundant infauna (animals that live in the substrate), with as many as 1,200 infaunal species having been reported from Santa Monica Bay. The abundance and distribution of infauna varies seasonally and inter-annually; however, infauna at Broad Beachare usually dominated, in both number of species and individuals, by polychaete worms. Other important infaunal groups in the region include crustaceans, mollusks, and echinoderms (Phylum Echinodermata).

During a 2010 subtidal survey of Broad Beach (Chambers Group 2012c), sand dollar beds were observed at depths of between 10 and 14 ft along the eastern half of the site. Other characteristic organisms observed in this area were tube worms, *Diopatra ornata*; sea pens, *Stylatula elongate*; sea pansies, *Renilla kollikeri*; and several species of crabs; *Cancer gracilis, Randallia ornata*, and *Heterocrypta occidentalis*. These species

[23] CDFW. 2009. Regional Profile of the MLPA South Coast Study Region (Point Conception to the California-Mexico Border. California Marine Life Protection Act Initiative.

were also observed during subtidal dive surveys conducted in June 2014 (Moffatt & Nichol 2014).

Pismo clams have historically occurred in the shallow sand bottom habitats off the eastern end of Broad Beach and are most common at depths of 10 to 20 feet, while the little neck clam is found in coarse sand and gravel near rocky areas. No live pismo clams have been observed but empty shells have been observed suggesting the species may still be present in the area.

Hard Bottom Subtidal Habitats

Kelp forests are underwater areas characterized by hard substrate that supports a high density of kelp. Along the coast of California the brown alga that makes up the forest is called giant kelp or *Macrocystis pyrifera*. Kelp forests are recognized as one of the most productive and dynamic ecosystems on earth[24]. Kelp forests provide a unique three-dimensional habitat for a host of marine organisms including algae, invertebrates, fish as well as marine mammals and birds. From the holdfasts to the surface mats of kelp fronds, the array of habitats on the kelp itself may support thousands of invertebrate individuals, including polychaetes, amphipods, decapods, and ophiuroids.

Extensive reefs occur off Lechuza Point, with the reefs becoming increasingly scattered proceeding east from Lechuza Point. Shallow subtidal surveys conducted in the Broad Beach area identified surfgrass, eelgrass, giant kelp, feather boa kelp, southern palm kelp, *Eisenia arborea*, palm kelp, *Pterygophora californica*, and gorgonians*, Muricea californica* and *M. fruticosa* (Chambers Group 2012(c)). Similar species were identified during targeted dive surveys in June 2014 (Moffat and Nichol 2014). The areal extent of the various subtidal habitats offshore Broad Beach were determined using dive transect surveys, multi-spectral aerial surveys, and sidescan sonar surveys occurring primarily in 2012, 2013, and 2014.

In recognition of the rarity and sensitivity of marine habitats, the City of Malibu Land Use Plan (Policy 3.74) states that: “All Areas of Special Biological Significance and Marine Protected Areas shall be considered ESHA and shall be accorded all protection provided for ESHA in the LCP.” The LUP requires that marine ESHAs are protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. Further, the LUP requires that near shore shallow fish habitats and shore fishing areas must be preserved, and where appropriate and feasible, enhanced.

The City of Malibu is the only location along the coast of California that has taken the position that marine habitats identified as ASBS or MPA rise to the level of ESHA. The Commission fully recognizes the value and sensitivity of marine habitats and typically reviews proposed uses within and adjacent to such habitats for compliance with sections 30230, 30231, and 30233 of the Coastal Act.

[24] Foster, M.S. and D.R. Schiel. 1985. The Ecology of Giant Kelp Forests in California: A Community Profile. U.S Fish & Wildlife Service. Biological Report 85 (7.2). 152pp.

Sensitive Species

The California grunion (*Leuresthes tenuis*) is a sardine-sized fish endemic to the coast of California. It is unusual because it comes ashore on sandy beaches to spawn. Although grunion are not listed as threatened or endangered, the National Marine Fisheries Service (NMFS) requires that their eggs be protected from disturbance. In addition, grunion are protected under the Malibu General Plan, which recognizes their spawning grounds as a sensitive marine resource.

Dr. Karen Martin, biology professor, Pepperdine University, studies grunion and said that grunion used to run at Broad Beach (pers. Comm. Nov. 2014). Dr. Martin has observed significant runs at Broad Beach described in her deposition following a 2005 encounter with bulldozers on Broad Beach. In an email dated November 21, 2014, Dr Martin stated that "grunion ran on the entire length of Broad Beach both before and after the 2005 grading and its removal. Obviously, they do not run there now as there is a great wall in the intertidal zone". She also stated that "grunion run at Zuma and at Trancas. I think they also run at Lechuga (sic) sometimes, but again, hard to access at night. There is a long history of them running at Zuma".

According to a CCC violation letter[25] documenting the 2005 bulldozing event at Broad Beach,

> *Broad beach is also demonstrated grunion habitat. Your employees who were operating the earthmovers indicated that the grading of the beach began on June 1, 2005. Unfortunately, this coincided with one of the first grunion runs of the season. Most grunion eggs that were laid during this run (c. May 25-28) would have hatched by June 7. These eggs were very likely destroyed by your activity. More significant is the fact that the habitat was altered in a way that will certainly reduce the breeding success of grunion that continue to spawn on this beach (current run is scheduled June 8-11 and the next is scheduled June 23-26). The impacts are two-fold with respect to grunion spawning. First, the intertidal area was effectively lowered and made more uniform. Therefore, waves will reach the beach nearest the land more frequently than before and will tend to wash out eggs prematurely. Second, the foot of the steep berm is still within the intertidal zone, so the berm acts as a seawall reflecting waves and further increasing the likelihood that grunion eggs will be washed out of the sand prematurely.*

Grunion runs were monitored at Broad Beach between March and August 2010. While no grunion were observed in the Broad Beach area due to the lack of a beach during spring tides, grunion were observed to spawn just east of Broad Beach on Zuma Beach near Trancas Creek.

Western snowy plover, listed as federally threatened, have been observed historically and recently on Broad Beach and are known to roost in numbers along Zuma Beach.

[25] Douglas, P. (CCC Executive Director). June 8, 2005. Notice Prior to Issuance of Executive Director Cease and Desist Order for Violation No. V-4-05-060 and Notice of Intent to Commence Cease and Desist and Restoration Order Proceedings. To: Marshall Grossman and Winifred Lumsden.

They feed in the rocky intertidal zone near Lechuza Point and on the east end near Trancas. The Commission considers beach areas that support grunion runs to be sensitive habitat and has required special protection for them during grunion season. The Commission recognizes western snowy plovers and their nesting habitat as ESHA.

Broad Beach clearly supports a unique occurrence of sensitive and diverse terrestrial and marine habitats in close proximity that are recognized as special and deserving protection. Retention of the rock revetment, dune restoration over and around the revetment, and beach nourishment, in and immediately adjacent to this special arrangement of sensitive habitats that are vulnerable to disturbance, raises serious concerns including the potential for habitat loss due to burial and changes to community structure and function as described in detail below.

Retention of Rock Revetment and Dune Restoration

Prior to placement of the emergency rock revetment, Broad Beach was characterized by a mish mash of seawalls, concrete bags and blocks, rock revetments, and sand bags (filled with sand from Broad Beach) placed with and without permits by numerous individual home owners. In addition, long sand berms parallel to the ocean have been built several times without permits using heavy equipment and sand from the lower beach. All of these activities have contributed to the continued loss of sand at Broad Beach. While the applicant purports that the loss of sand is due to a regional pattern of sand loss that has persisted since the beach was broadest in the 1970's, Commission staff attribute the narrowing of Broad Beach to the above activities as well as natural patterns and dams, harbors, seawalls, groins and other development that blocks and impedes sediment.

The effects of alongshore coastal armoring on the physical features of open-coast beaches are well described and documented[26]. Any type of structure placed in a coastal setting will alter hydrodynamics and modify the flow of water, wave regime, sediment dynamics, grain size and deposition processes. In soft-sediment habitats, the loss of original habitat that is covered by the footprint of man-made coastal structures is a primary impact, along with the altered coastal hydrodynamic processes in the remaining and adjacent habitats. Beach widths are reduced seaward of shore-parallel structures, initially in response to placement loss, followed by the ongoing effects of passive[27] and active erosion. These physical changes may result in reduction or loss of key beach system exchanges and functions, including organic and inorganic material transfers (detritus, nutrients, prey, and sediments), water filtration, and nutrient uptake [28]. They can also result in ecological changes to both intertidal and subtidal benthic communities such as complete loss of habitat components (e.g. upper beach),

[26] Griggs, G.B., 2010, The effects of armoring shorelines—The California experience, *in* Shipman, H., Dethier, M.N., Gelfenbaum, G., Fresh, K.L., and Dinicola, R.S., eds., 2010, Puget Sound Shorelines and the Impacts of Armoring—Proceedings of a State of the Science Workshop, May 2009: U.S. Geological Survey Scientific Investigations Report 2010-5254, p. 77-84..

[27] Whenever a hard structure is built along an eroding coastline, the shoreline eventually migrates landward on either side of it.

[28] Dugan et al. 2008. Ibid.

community structure alterations (changes in organism abundance and species richness) and disruption of predator-prey interactions.

Placement of the rock revetment at Broad Beach in 2010 resulted in direct permanent loss of a significant amount of southern foredune, sandy intertidal, and sandy subtidal habitat. The location of the revetment seaward of all previous coastal structures has caused increased erosion such that beach area is only exposed during the lowest tides. Today there are no longer any southern foredunes, coastal strand, or dry upper beach in front of the revetment and there has been a significant loss of sandy intertidal habitat. In addition, while connection between the beach and dunes was already hampered by previous coastal structures, the rock revetment has greatly exacerbated this loss of connectivity.

The applicant now proposes to retain the rock revetment in the existing location and to use quarry sand to construct dunes over the top of the revetment. Restoring a dune system on top of and beyond the rock revetment is without precedent and is not ideal for numerous reasons including:

(1) The revetment is stationary and dune systems are not; dunes are dynamic, growing, shrinking and moving in response to seasonal patterns of wind and wave energy and storms[29],

(2) The planned depth of sand on top the revetment is 2 to 3 feet. This shallow veneer of sand could be lost in a short amount of time exposing the revetment,

(3) The sand proposed for dune restoration is poorly sorted and has a larger mean grain size than the existing dune sand which will make establishment of natural dune morphology and native dune plants more challenging if not impossible,

(4) The sand moisture/nutrient content needed to establish and sustain native veg will likely be strongly affected by presence of the rock revetment- also impeding the establishment of vegetation. Dune and coastal strand veg rely on very long root networks to anchor plants and reach water etc. The rock revetment may not allow this, and

(5) Colonization by globose dune beetles and silvery legless lizards, *Anniella pulchra pulchra*, (a California Species of Special Concern) is unlikely because of the mismatched sand and the rock revetment barrier.

Beach Replenishment

The applicant proposes to use 600,000 cu. yds. of sand to restore dunes and replenish the beach. The primary biological resource concern raised by this is the potential for direct or indirect burial of the beach and nearshore habitats. Burial of habitats will result in mortality of species that cannot tolerate the amount of sand and/or are not sufficiently mobile to flee to other areas. Based on detailed surveys (field surveys, multi-spectral aerial photography and sidescan sonar) of existing marine resources in the project area, the applicant quantified the areas within the various habitat categories and determined,

[29] Southern foredunes at Broad Beach are already impeded landward by residential development but the rock revetment further impedes the natural function of the dunes.

based on the project footprint design, those areas that would be directly impacted by sand fill.

While the applicant acknowledges that direct burial of intertidal and subtidal hard bottom and eelgrass habitat is a permanent impact, they consider direct sand placement on sandy bottom, both intertidal and subtidal, to be a temporary impact, regardless of the depth of coverage. They argue that these habitats are adapted to periodic burial and that although the initial placement of many feet of fill in sandy habitats would result in substantial mortality of species, they conclude that sandy bottom organisms would re-colonize these areas quickly. We do not agree for several reasons:

(1) Direct burial results in mortality of most or all organisms covered. Recolonization/ recruitment/recovery will take time and requires local source populations of larva, or propagules from nearby healthy beaches which may or may not support the same community assemblage,
(2) Recolonization is dependent on larval or other sources of propagules whose availability is influenced by daily, monthly, seasonal, yearly, and decadal patterns which are constantly changing[30],
(3) Loss of mature population size structure and long-lived taxa like pismo clam,
(4) Temporal loss of ecosystem services and function that may last many years and possibly a decade or more,
(5) Impacts from use of mismatched sand (larger mean grain size and poorly sorted) – expectation is that many species won't recolonize/survive after beach conditions change, and
(6) Continual disturbance from backpassing and anticipated need for future replenishment; the AMEC APTR July 2014 Executive Summary states that the beach could last for three years or less.

The applicant estimated potential indirect burial impacts by modeling the areas outside the sand placement footprint where sand is expected to migrate over time. Again, the applicant considers indirect impacts to sandy bottom habitats (intertidal and subtidal) temporary for the reason described above. With regard to other habitat types, the applicant's position is that the threshold for determining indirect permanent impacts to marine resources resulting from burial by sand is one foot of sand that buries rocky habitats for more than one year (1 foot/1 year). In other words, the applicant has asserted that rocky areas where sand burial resulting from the proposed beach fill would be less than 1 foot deep as measured 1 year after the placement of sand on the beach should not be considered a permanent impact.

This threshold that has no scientific basis; t is impossible to come up with a single threshold for temporary vs permanent impacts because individual algal and invertebrate species inhabiting nearshore marine habitats are more or less adapted to sand inundation and all respond differently. Regardless, Commission ecologists, as well several agency biologists (pers. comm. Bryant Chesney, NMFS; Becky Ota, CDFW;

[30] Many species in intertidal/subtidal sand do not have planktonic or other types of larvae (e.g amphipods, isopods, insects)

William Paznokas, CDFW, Bonnie Rogers, Army Corp of Engineers, Jason Ramos, California State Lands Commission, and LB Nye, Environmental Protection Agency, October 28 & 29, 2014) agree that most nearshore marine organisms likely suffer mortality and/or are severely compromised under less than a foot of sand burial for less than a year.

Very few peer-reviewed studies have been conducted on nearshore algal and invertebrate species' tolerance to sand burial. The few that have been published suggest that for many species mortality occurs well before the applicant's threshold. For instance, research on the effect of short term (12 days) sediment burial on eelgrass (*Zostera marina*) mortality and productivity found that survival and productivity were substantially reduced when only 25% of the plant height was buried and that when plants were buried to 75% of their height all the plants died. The study results indicate that eelgrass can only tolerate short term burial that covers less than half of the plants height[31]. Similarly, research on the effect of sediment burial on surfgrass (*Phyllospadix scouleri*) showed that short term (15 days) burial results in shoot mortality, decreased shoot counts and reduced growth[32]. A species that is often found in areas characterized by seasonal sand inundation is the aggregating anemone, *Anthopleura elegantissima.* It has been observed to resist shallow sand burial by extending its columns so that the oral disc and tentacles reach the surface[33]. However, Sebens suggested that survival of aggregating anemones buried deeper for 3 months or greater was due to body tissue metabolism[34]. The sand burial depth and length of time that would result in mortality is not known but is likely less than 1 foot for 1 year. Because of the questionable validity of the applicant's threshold, intensive monitoring of the nearshore marine habitats, before project construction and after project construction for the life of the permit is necessary.

Following are the applicant's estimates of the areas (in acres), by habitat type, that would potentially be impacted directly or indirectly by the proposed project[35]:

[31] Mills, K.E. & M.S. Fonesca. 2003. Mortality and productivity of eelgrass *Zostera marina* under conditions of experimental burial with two sediment types. Marine Ecology Progress Series. Vol. 255: 127-134.

[32] Craig, C., S.Wyllie-Echeverria, E. Carrington & D. Shafer. 2008. Short-Term Sediment Burial Effecs on the Seagrass *Phyllospadix scouleri*. EMRRP Technical Notes Collection (ERDC TN-EMRRP-EI-03). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

[33] O'Brian, P.Y. and M.M. Littler. 1977. Biological Features of Rocky Intertidal Communities at Coal Oil Point, Santa Barbara County, California. In: Littler M.M. (ed.) Spatial and Temporal Variations in the Distribution and Abundance of Rocky Intertidal and Tidepool Biotas in the Southern California Bight. Bureau of Land Management, U.S. Department of the Interior, Washington, D.C. pp.317-405.

[34] Sebens, K.P. 1980. The Regulation of Asexual Reproduction and Indeterminate Body Size in the Sea Anemone *Anthopleura elegantissima* (Brandt). Biological Bulletin Marine Biological Lab, Woods Hole, V. 158:370-382.

[35] The values in this chart were compiled from tables of Estimated Predicted Temporary Impact of Direct Fill and Indirect Fill to Vicinity, prepared by Moffat & Nichol, June 26, 2014

	Direct Burial (acres)		Indirect Burial (acres)	
Habitat Type	**Permanent**	**Temporary***	**Permanent**	**Temporary***
Surfgrass	0.96	0	0.96	0.96
Kelp	0	0	1.70	3.50
Kelp attached to bedrock	0	0	0.88	2.30
Rocky Outcrop	0.02	0	0.02	0
Bedrock Intertidal	0.03	0	1.91	0
Bedrock Subtidal	0	0	0.08	0.16
Cobble/Rubble Intertidal	1.20	0	1.37	0
Cobble/Rubble Subtidal	0.06	0	2.60	2.80
Boulder Field	0.71	0	0	0.71
Sandy Bottom Intertidal	2.25	20.5	2.25	22.8
Sandy Bottom Subtidal	0	13.5	0	51.8
Total	5.23	34	11.77	85.03

Clearly, as shown by the chart above, the proposed beach replenishment will have significant permanent adverse impacts (loss of habitat/habitat conversion) eelgrass and intertidal and subtidal hard bottom habitats including surfgrass and kelp forest that are inconsistent with sections 30230, 30231, and 30233 of the Coastal Act. We also believe that the proposed beach replenishment will have significant permanent adverse impacts on intertidal and subtidal soft bottom habitats for the reasons just laid out above and those bellow.

While beach replenishment is often considered the most environmentally sensitive method ("soft solution") for maintaining eroding shorelines, the ecological consequences are poorly understood. Beach replenishment has been conducted on a large regional scale for years in southern California with little scientific evaluation of the direct or cumulative ecological effects on beach ecosystems[36]. Despite a lack of information from California, the ecological impacts of beach replenishment on beach organisms are severe, often resulting in 100% mortality with lasting effects moving up the food web to shorebirds [37,38]. The ecological impacts (alterations in diversity, abundance, and distribution) from beach replenishment projects can persist requiring years for recovery of important invertebrate species[39,40]. The use of source sediments that are finer or coarser than the native beach sand causes greater and longer lasting ecological

[36] Orme, A.R., J.G. Zoulas, G.B. Griggs, C.C. Grandy, D.L. Revell, & H. Koo. 2011. Beach Changes along the Southern California Coast during the 20th Century: A Comparison of Natural and Human Forcing Factors. Shore & Beach, v. 79 (4): 38-50.

[37] Speybroeck, J., D. Bonte, & W. Courtens. 2006. Beach nourishment: An ecologically sound coastal defence alternative? A review. Aquatic Conservation Marine and Freshwater Ecosystems, V.16: 419–435.

[38] Peterson, C.H., M.J. Bishop, G.A. Johnson, L.M. D'Anna & L.M. Manning. 2006. Exploiting beach filling as an unaffordable experient: Benthic intertidal impacts propagation upwards to shorebirds. Journal of Experimental Marine Biology and Ecology, V. 338: 205-221.

[39] Peterson Op Cit.

[40] Peterson, C.H., M.J. Bishop, L.M. D'Anna, & G.A. Johnson. 2014. Multi-year persistence of beach habitat degradation from nourishment using coarse shelly sediments. Science of the Total Environment, V.487:481-492.

impacts to beach organisms[41],[42]. Ecological recovery following direct and indirect impacts of beach replenishment depends on successful recolonization and recruitment of the respective habitat organisms and reprieve from subsequent disturbance.

The physical and biological characteristics of beaches are driven largely by physical attributes such as exposure, orientation, wave energy regime, currents and tides, and material type. While beaches come in all shapes and sizes, a key feature that distinguishes beaches is the material they are made of, which is typically sand (some beaches are made of gravel, cobble, or boulders). Sand is a granular material composed of rock or mineral particles. It is defined by size, being finer than gravel and coarser than silt. According to the Wentworth scale very fine and fine sand is 0.0625 to 0.25 mm in diameter, medium sand is 0.25 to 0.50 mm in diameter, and coarse and very coarse sand is 0.50 to 2.0 mm in diameter. The composition of sand varies, but a common constituent of sand is the mineral quartz.

In addition to grain size and material type, sand color, angularity, and level of sorting are also key factors impacting the physical and biological character of respective beaches. Color influences the temperature of the sand and often dictates organism adaptations such as camouflage and thermal adaptations. Angularity (or roundness), a description of the degree of abrasion of particles, as shown by the sharpness of edges and corners of the grains, impacts the types of organisms that can survive in the sand (i.e. whether soft-bodied organisms can persist or only organisms with outer shells or carapaces for protection). And level of sorting, or range of grain sizes, determines whether large voids exist between grains, or if voids between larger grains are filled with finer grains and tends to select for infaunal organisms that are generalists in terms of grain size vs specialists that are adapted to a specific range of sand grain size.

The overall shape of a sandy beach is affected by the grain size and type of sand, the typical wave energy regime, and the influence of nearby rocky reefs, headlands and man-made structures on wave exposure and water circulation[43]. Sandy beaches have three major components; the beach face, beach berm, and back beach. The beach face is the zone of most active change; its slope can vary from a few to as many as 10 degrees[44]. The major factors governing the slope of the beach face and the movement of sand grains on the slope are sand grain size, wave height, and wave period/length. Sand grain size is fundamental in controlling percolation of water into the sand and thereby the amount of water in the surface backwash and the amount returning through the sand. This in turn contributes to the shape of the beach face because the amount of surface return flow is a factor in the movement of sand grains on the beach. Coarse sand beaches with a high amount of percolation have steeper faces than fine sand beaches because they have less surface backwash and therefore less seaward movement of the sand grains.

[41] Speybroeck et al. 2006. Ibid.
[42] Peterson et al. 2014. Ibid.
[43] Orme, A.R., J.G. Zoulas, G.B. Griggs, C.C. Grandy, D.L. Revell, & H. Koo. 2011. Beach Changes along the Southern California Coast during the 20th Century: A Comparison of Natural and Human Forcing Factors. Shore & Beach, v. 79 (4): 38-50.
[44] Bascom, W. 1980. Waves and Beaches. Anchor Books. Garden City, New York. 366 pgs.

Under accreting beach conditions, a berm forms at the top of the beach face. Except on very flat beaches, the berm has a well-defined crest at the seaward edge. The beach behind the berm varies in width and character depending on many factors including decadal, yearly, and seasonal littoral cell sand volume patterns, storms, and presence of a back beach barrier such as a bluff or development. The sands of the upper beach are generally more fine-grained and better sorted compared to the beach face. The upper beach may transition into dunes in the absence of a bluff or development. Coastal sand dunes occur where there is a supply of sand, wind to move it, and a place for the sand to accumulate. Dune accumulations occur above the spring high-tide line and the back beach forms the seaward boundary of the dunes and supplies the sand.

Surf regime and sand grain characteristics allow beaches to be described in terms of morphodynamic state or type, ranging from dissipative to reflective conditions. Beach slope, sand grain size, and the wave-breaking and nearshore circulation patterns differ along the gradient from dissipative to reflective beaches. Dissipative beaches have wide, high energy surf zones that dissipate large amounts of incoming wave energy before it reaches the intertidal swash zone. These wide flat beaches typically have very fine sand and laminar, long period swash climates[45]. Reflective beaches have very narrow surf zones where waves break near or directly on the shore and some wave energy is reflected seaward. Reflective beaches generally have coarse sediments, steep slopes, and short period, turbulent swash climates. The majority of beaches in California and across the globe are intermediate type beaches that lie within the broad spectrum between dissipative and reflective types and represent a wide range of sizes and shapes as well as sand grain sizes[46]. Sandy beaches, particularly intermediate types, can exhibit seasonal shifts in morphodynamic state in response to storm and swell conditions. However, a beach of coarse sediments may remain reflective and a fine-sand beach may remain dissipative regardless of wave conditions[47].

Grain size also strongly affects the structure and diversity of benthic invertebrate communities[48] including those on open coast sandy beaches[49,50,51]. Burrowing performance of benthic animals is strongly influenced by grain size with subsequent effects on their distribution and abundance in different habitats. On open coast beaches, due to the fact that survival in the turbulent wave wash depends on burrowing speed and ability, the distributions of many species of intertidal macroinvertebrates are

[45] McArdle, S. B. & A. McLachlan. 1992. Sand beach ecology: Swash features relevant to the macrofauna. Journal of Coastal Research, V.8:398–407.

[46] Dugan, J. E. and D. M. Hubbard. 2014. Sandy Beach Ecosystems. in: Ecosystems of California – A source book. Mooney, H. and E. Zavaleta, eds. University of California Press.

[47] Bryant 1982

[48] Johnson, R. G. 1971. Animal-sediment relations in shallow water benthic communities. Marine Geol., V.11: 93-104.

[49] McLachlan, A. & A. Dorvlo. 2005. Global patterns in sandy beach macrobenthic communities. Journal of Coastal Research, V.21(4), 674–687.

[50] Rodil, I.F. & M. Lastra. 2004. Environmental factors affecting benthic macrofauna alog a gradient of intermediate sandy beaches in northern Spain. Estuarine, Coastal and Shelf Science, V. 61 (1): 37-44.

[51] Peterson et al. 2014. Ibid.

strongly linked to sand grain size[52,53,54]. When sand grain size exceeds the tolerance of a particular species or group of taxa, those species can be directly excluded from the beach and/or experience reduced growth, reproduction and lifespans. Important beach taxa that are known to be sensitive to sand grain size include clams, crabs, amphipods, isopods and polychaetes[55,56,57]. These taxa make up the majority of the biomass and abundance of intertidal animals on southern California beaches and are very important prey for birds and fishes[58].

Beaches with coarse sediments support much lower biodiversity than beaches with fine to medium sand[59,60]. For example, sand grain size was identified as a very important physical factor influencing the intertidal community structure of sandy beaches during the South Coast MPA baseline study[61]. The species richness and abundance of the intertidal invertebrate community of beaches were negatively correlated with sand grain size (species richness: $r = 0.775$, $p < 0.005$; log abundance: $r = 0.738$, $p < 0.01$) (Figure 5, Figure 6). Beaches with the finer sand (0.200-0.300 mm) that is typical of the region[62] support a much greater number and abundance of intertidal species compared to beaches with coarser sand (>0.500 mm). These results illustrate the strong influence that sand grain size exerts on the diversity and abundance of intertidal invertebrates on sandy beaches in the southern California region. Based on these regression results, a sand grain size of 0.40 mm and above would be expected to support very low diversity and abundance of intertidal invertebrates.

In addition to sand grain size, the level of sediment sorting (an estimate of the consistency of sand grain sizes on a beach) has also been found to influence the

[52] R. Nel, A. McLachlan & D. Winter. 1991. The Effect of Sand Particle Size on the Burrowing Ability of the Beach Mysid *Gastrosaccus psammodytes* Tattersall. Estuarine, Coastal and Shelf Science, V. 48: 599-604.

[53] R. Nel, A. McLachlan & D. Winter. 2001. The effect of grain size on the burrowing of two *Donax* species. Journal of Experimental Marine Biology and Ecology, V. 265:219-238.

[54] Dugan, J.E., D.M. Hubbard & M. Lastra. 2000. Burrowing abilities and swash behavior of three crabs, *Emerita analoga* Stimpson, *Blepharipoda occidentalis* Randall and *Lepidopa californica* Efford (Anomura, Hippoidea), of exposed sandy beaches. J. Exp. Mar. Biol. Ecol., V.255(2): 229-245.

[55] Nel et al. 2001. Ibid.

[56] Dugan et al. 2000. Ibid.

[57] Viola, S.M., D.M. Hubbard, J.E. Dugan & N.K. Schooler. 2013. Burrowing inhibition by fine textured beach fill: Implications for recovery of beach ecosystems. Estuarine, Coastal and Shelf Science, pgs 1-7.

[58] Dugan et al. 2003. Ibid.

[59] McLachlan, A. 1996. Physical factors in benthic ecology: effects of changing sand particle size on beach fauna. Marine Ecology Progress Series, V.131:205-217.

[60] McLachlan & Dorvlo. 2005. Ibid.

[61] Dugan J. E., Hubbard D.M., Nielsen K.J., Altstatt J., and J. Bursek. In review. Baseline Characterization of Sandy Beach Ecosystems along the South Coast of California. Final Report for the South Coast Marine Protected Area Baseline Study to California Ocean Protection Council and California Sea Grant.

[62] The average grain size for the majority of intermediate beaches in southern California (Dugan et al. in review) was 0.24 mm based on 24 beaches monitored monthly for 2 years). San Clemente state beach was much coarser (and steeper) with a mean grain size of 0.57 mm and supported less than half the intertidal species (12 species) compared to all but one of the other beaches (Carlsbad with 21 species, also somewhat coarser sand).

diversity of sandy beach macro-invertebrates. Sediment sorting was negatively correlated with the species richness of intertidal invertebrates on southern California beaches in two studies[63,64] (Figure 7). Beaches with poorly sorted sand (e.g a wide range of grain sizes) support much lower numbers of species of intertidal invertebrates than beaches with well sorted sand in the region. The southern California MPA study found that beaches with poorly sorted sand also had lower biomass ($r = 0.636$, $p < 0.05$)[65]. Dugan and Hubbard (1996) found a strong negative relationship between sediment sorting and species richness for Ventura and Santa Barbara county beaches where better sorting equaled more species. They also found that the size of sand grains is strongly correlated with sorting which has been found to be correlated with biodiversity in Southern California. Based on these results, poorly sorted sand would be expected to support low macroinvertebrate species richness.

The community structure of the beach macroinvertebrates in turn significantly affects the beach foodweb. Shorebirds are very important top predators that respond strongly to prey availability in sandy beach ecosystems in California. Shorebirds feed on all the types of intertidal invertebrates living on beaches. The species richness and abundance of shorebirds is positively correlated with the availability of wrack and the diversity, biomass and abundance of invertebrate prey, as well as tide, beach type and width[66]. Nearshore fishes such as barred surfperch, redtail surfperch, yellowfin and spotfin croaker, and corbina, feed on swash zone invertebrates, including sand crabs and mysids. Although population information for these fish is limited, it is likely that the beach macroinvertebrate community influences the community structure and population dynamics of the nearshore fish community.

The existing sand at Broad Beach is very well sorted with a sand grain size range of 0.20 mm (D16) to 0.40 mm (D84) and a mean grain size of 0.25 mm (D50). The percent fines range from 0.4 to 5% and the mean sand sorting value is 0.20 mm[67] (Figure 8). The source sand proposed by the applicant from the Cemex quarry has a sand grain size range of 0.20 (D16) to 3.0 mm (D84) and a median grain size of 0.85 mm (D50). The mean sand sorting value of the Cemex sand is 2.80 mm (Figure 9). The source sand proposed by the applicant from the Grimes quarry has a sand grain size range of 0.20 (D16) to 2.0 mm (D84) and a median grain size of 0.47 mm (D50). The mean sand sorting value of the Cemex sand is 1.80 mm (Figure 10). The D16, D50, D84 values for existing sand at Broad Beach and the source sand at the Cemex and Grimes quarries come from appendix A of the Moffat and Nichol, Nov. 2013, *Upland Sand Source: Coarser-Than-Native Grain Size Impact Analysis* report (Figure 11). All one has to do to understand how poorly sorted the proposed source sand is compared to the existing sand at Broad Beach is look at the 20X photos of the respective sand

[63] Dugan J. E. 1999. Utilization of sandy beaches by shorebirds: relationships to population characteristics of macrofauna prey species and beach morphodynamics. Final Technical Report OCS Study, MMS 99-069. 41 pp

[64] Dugan J. E., et al. In review. Ibid.

[65] Dugan J. E., et al. In review. Ibid.

[66] Dugan et al. 2003. Ibid, Dugan et al. 2008. Ibid.

[67] Mean sediment sorting value is the difference between the D84 and the D16. This is a measure of the standard deviation.

(Figures 8, 9, 10). In addition, the mean sand sorting values for the source sand from both quarries doesn't even fit on the x-axis scale on the graph of species richness vs. mean sediment sorting that depicts results from the recent southern California MPA beach studies (Figure 7)

The applicant is proposing to use sand from several quarries that is very different from the existing sand at Broad Beach. In terms of physical effects, this will likely result in a steeper beach face and narrower intertidal zone making for a much harsher environment for beach organisms. The environment will be much more abrasive, turbulent, and rough. In terms of biological effects, based on the recent southern California MPA beach studies discussed above, the beach intertidal assemblage will be characterized by low species diversity and abundance (biomass).

The replenished sand will migrate downcoast following the typical pattern of longshore transport in the Zuma Littoral Cell, and regular management (backpassing) is proposed to move sand upcoast of the mouth of Trancas Creek. It is not clear how the expanding width of the beach and potential increase to height of the beach berm will affect the ability of Trancas Creek to breach and connect to the ocean. A significant concern is that the deposition of significant additional sand, immediately adjacent to the current lagoon mouth, will lead to period of instability in the system that will require active management and adjustment because the creek outflow will probably not be sufficient to carry out coarse sediments.

Although impacts to grunion are not anticipated, the repeated disturbance for back-passing each year during grunion breeding season could certainly have an impact, especially if the expanded beach restores habitat previously present. Incorporating grunion recovery at Broad Beach and requiring a comprehensive grunion management plan should be required.

One reason Western snowy plovers are a state and federally listed threatened species is because of highly disturbed nesting areas and beach nourishment projects that are not designed to promote habitat for this species. The Western Snowy Plover Recovery Plan (USFWS 2007) notes that dredging, placement of pipes and trenching are detrimental to the plovers. Continued operation of heavy equipment for extended periods of time, in addition to that already practiced by LA County for beach maintenance at Zuma is a major concern. In addition, whether the character of the proposed source sand is appropriate for snowy plover has not been considered. Incorporating Western snowy plover recovery at Broad Beach and requiring a comprehensive snowy plover management plan should be required.

Alternative Project

Alternative 4B considers a project with a portion of the revetment located further landward, dune restoration and a phased beach nourishment component. With this alternative project, no beach nourishment or dune restoration would occur west of 31502 Victoria Point Road. The width of the sand fill on the far western portion of the beach transitions from about 100 feet of sand fill to no fill terminating about 450 feet

east of Point Lechuza. The applicant's consultants have modelled the potential area of impact to marine resources, including direct burial resulting from the initial placement of the sand and indirect impacts resulting from burial by sand transported to marine habitat areas after the initial placement. Following are the marine habitat types and acreage of impacts that the applicant has estimated resulting from the Alternative 4B sand fill design:[68]

	Direct Burial (acres)		Indirect Burial (acres)	
Habitat Type	**Permanent**	**Temporary***	**Permanent**	**Temporary***
Surfgrass			<0.01	0.75
Kelp				0.01
Cobble/Rubble Intertidal	0.12		0.62	0.59
Cobble/Rubble Subtidal			0.08	1.21
Boulder Field		0.5	0.07	0.14
Sandy Bottom Intertidal		17.28		6.7
Sandy Bottom Subtidal				29
Total	0.12	17.78	0.78	38.4

* Temporary impact is defined by the applicant as habitat area buried by sand that is less than 1 foot deep at one year after the sand placement.

The modeling of the proposed project estimates that direct burial will permanently impact 0 acres and temporarily impact 34 acres of beach and nearshore marine habitats. And that the indirect burial will permanently impact 11.17 acres and temporarily impact 85.03 acres of beach and nearshore habitats. It is important to keep in mind that the Commission does not agree with the applicant's permanent vs. temporary threshold of 1 foot for 1 year of longer; that permanent impacts may occur well below 1 foot burial and in a shorter time than 1 year.

Modeling of Alternative 4b estimates that the direct and indirect burial will be lower than the proposed project; direct burial will permanently impact 0.12 acres and temporarily impact 17.78 acres of beach and nearshore marine habitats. And that the indirect burial will permanently impact 0.78 acres and temporarily impact 38.4 acres of beach and nearshore habitats.

Conclusions

Although modeling is only as good as its mathematical equation (s) and the data employed, it does appear that the proposed project, as well as Alternative 4b, will have significant direct and indirect burial impacts on beach and nearshore marine habitats. Because of these results, Commission staff is recommending an alternative with no direct burial of beach and nearshore habitats. In addition I recommend that the project be revised as follows:

- Move the rock revetment back to the most landward position possible,

[68] Broad Beach—Outline of Alternative 4B Impacts, Moffat & Nichol, November 18, 2014.

- Dune restoration designed to restore, to the greatest extent possible, the conditions for supporting natural dune system functions and processes,
- No sand replenishment past the west end of the rock revetment; avoidance of direct and indirect burial of eelgrass and intertidal and subtidal hard bottom habitat to the greatest extent possible,
- Development of Marine Habitat Monitoring and Mitigation Program with guidance from a Science Advisory Panel designed to detect project impacts,
- Minimum of 4:1 mitigation for adverse impacts on intertidal and subtidal hard bottom habitats.
- Eelgrass mitigation based on the California Eelgrass Mitigation Program,
- Areal extent of mitigation based on quantification of adverse impacts determined at the end of 5 years,
- BMPs to ensure that no invasive species are transported during the project, especially the New Zealand Mud Snail, which has been documented in Trancas Creek,
- Development of comprehensive management plans for recovery of grunion and Western snowy plover at Broad Beach.

I have reviewed in great detail the likely negative impacts of using unsorted sand that has a much larger mean grain size from quarries. The prediction is that the macro-invertebrate beach community that colonizes this sand will be much less diverse and have much less biomass. If use of this sand is approved, I recommend treating the beach replenishment as a pilot study that includes intensive monitoring. The goal of monitoring should be to tract the physical and biological implications of using mismatched source sand. The monitoring should be conducted before project construction for a minimum of two seasons (spring and fall) and should continue twice a year for the life of the project. A minimum of 5 beach areas should be monitored; the area of Broad Beach in the project footprint, an area of beach immediately west and immediately east (Zuma) of the project footprint, and a minimum of two reference beaches chosen to closely match the physical and biological attributes of what would be expected at Broad Beach but for all the permitted and unpermitted development including the rock revetment.

Finally, several of the top beach ecologists in the world, in a review paper on threats to sandy beach ecosystems state the following regarding best management practices when conducting beach management practices. I couldn't agree more and recommend that the following be implemented to the greatest extent possible:

> *Mitigation of ecological impacts of nourishment is often impeded by limited data about the life history of the affected species, recovery rates and the cumulative effects of repeated nourishment events (Speybroeck et al. 2006). Nevertheless, basic management recommendations include: (1) the avoidance of sediment compaction; (2) careful timing of operations to minimize biotic impacts and enhance recovery; (3) the selection of locally appropriate techniques; (4) the implementation of several small projects rather than a single large project, including repeated application of sediment in shallow layers (<30cm) rather than*

single pulses that kill fauna by deep burial; (5) Interspersion of nourished beach sections with unaffected areas; and (6) importing sediments and creating beach profiles that match the original beach conditions as closely as possible.[69]

[69] Defeo, O., A. McLachlan, D.S. Schoeman, T.A. Schlacher, J. Dugan, A. Jones, M. Lastra, and F. Scapini. 2009. Threats to Sandy Beach Ecosystems: A Review. Estuarine, Coastal and Shelf Science, VD. 81: 1-12.

Figure 3.3-1. Project Location within the Southern California Bight

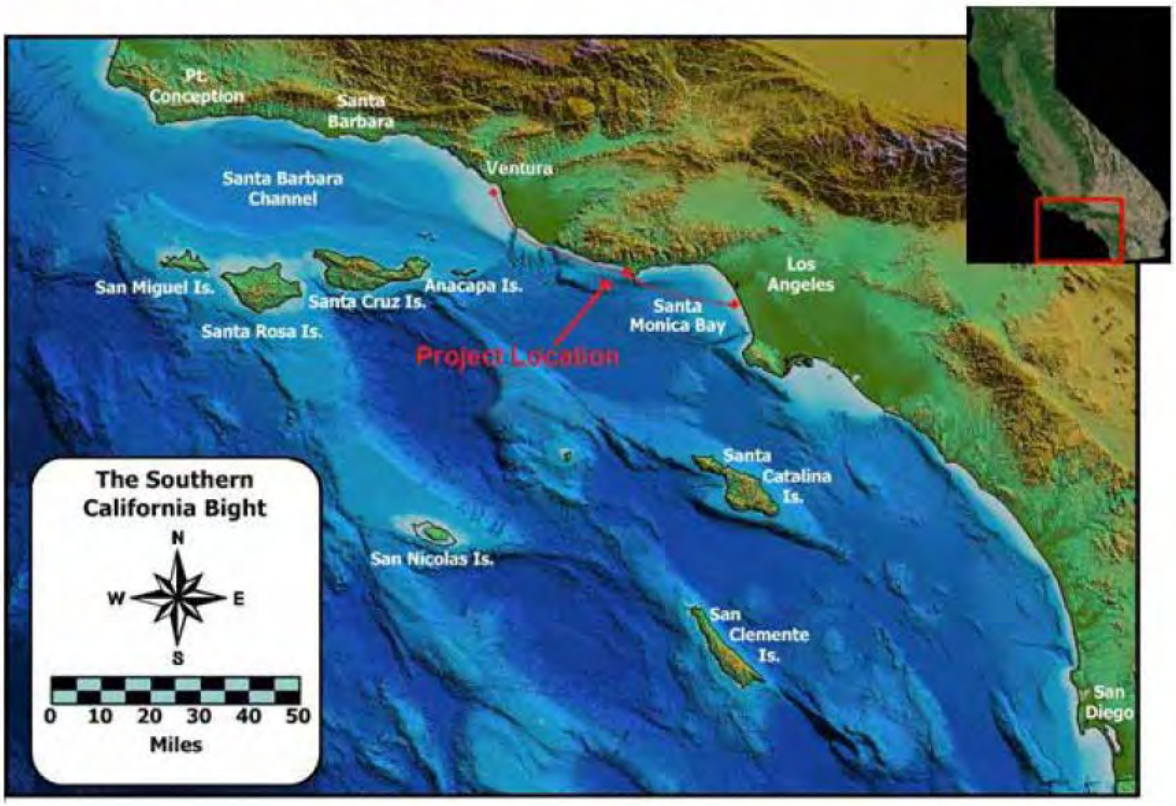


Figure 1. Project location within the southern California Bight. Exhibit 3.3-1 from the AMEC July 2014 APTR.

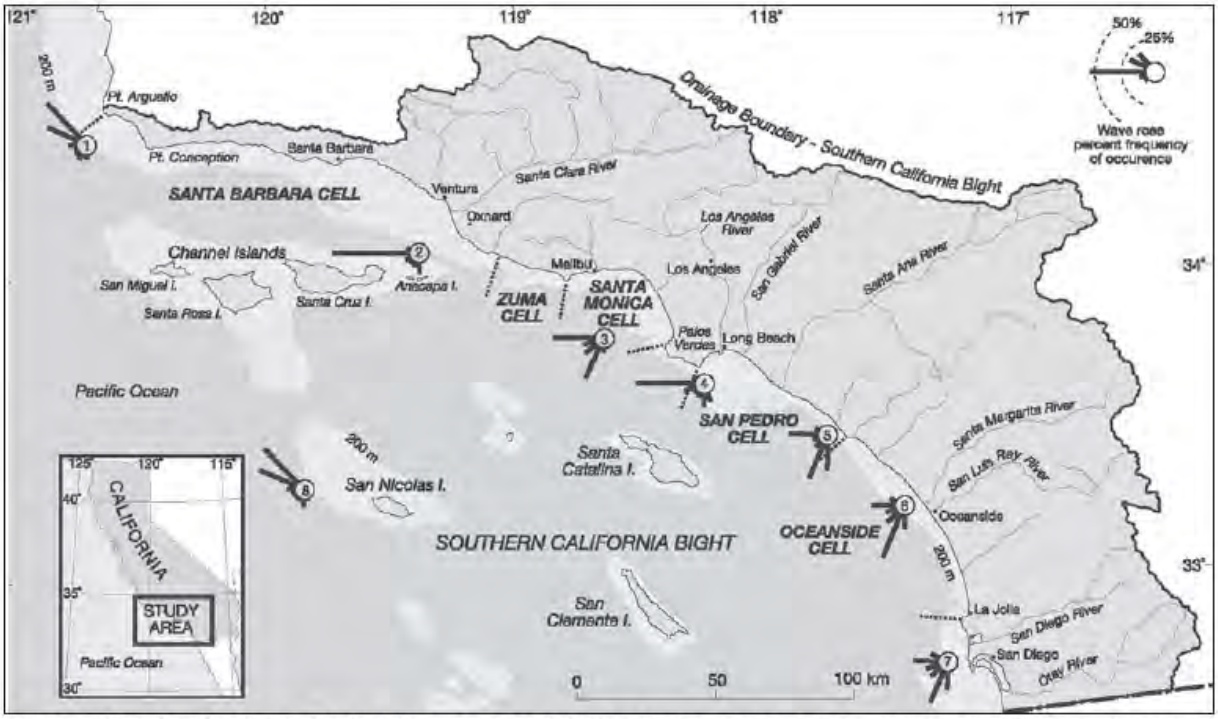
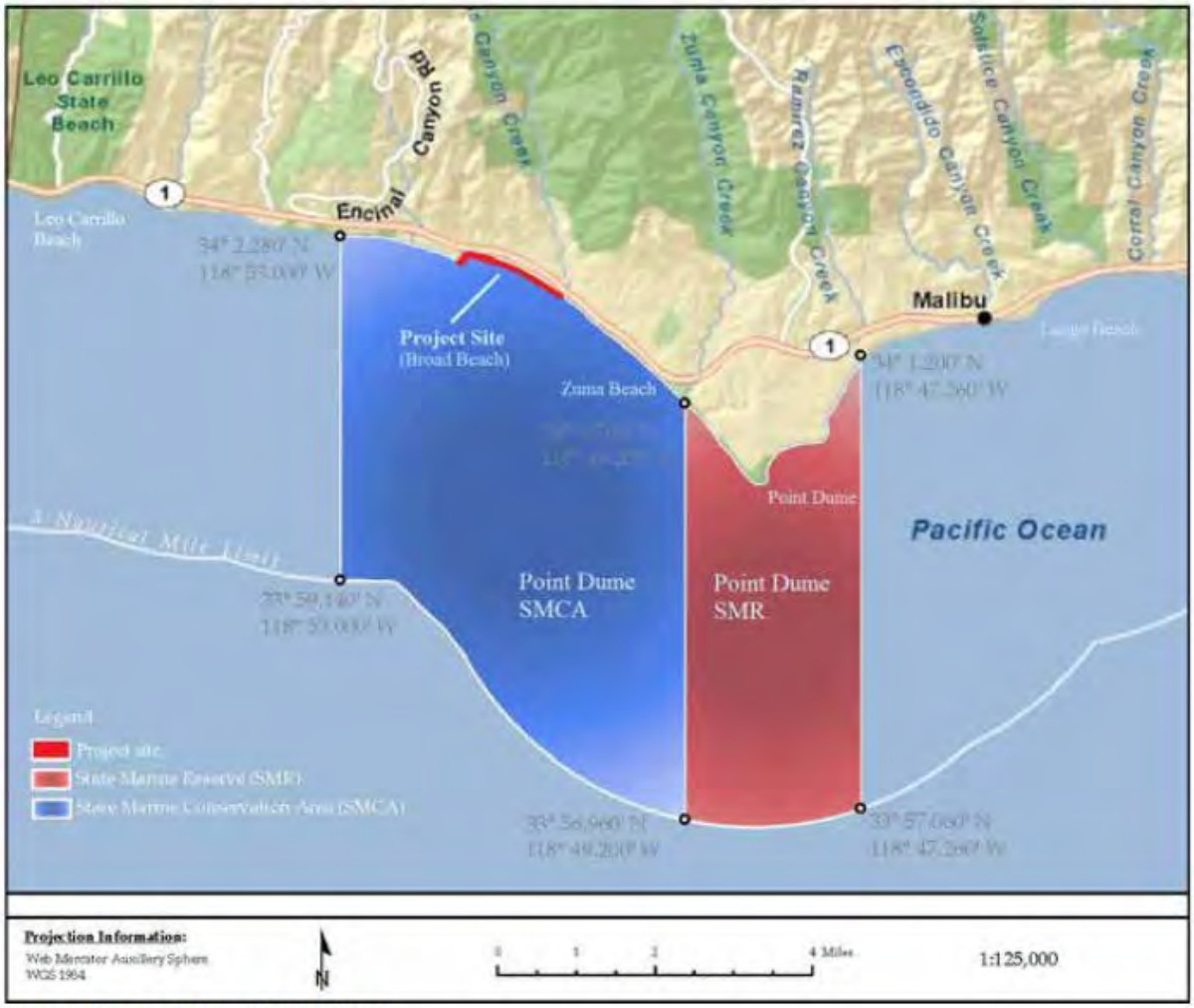


Figure 1. Southern California Bight: littoral cells, contributing rivers, and wave roses (1 Harvest, 2 Anacapa Passage, 3 Santa Monica Bay, 4 San Pedro, 5 Dana Point, 6 Oceanside Offshore, 7 Point Loma, 8, San Nicolas Island; CDIP 2008).

Figure 2. Proposed Project Located in Zuma Littoral Cell (exhibit from Orme, A.R., J.G. Zoulas, G.B. Griggs, C.C. Grandy, D.L. Revell, & H. Koo. 2011. Beach Changes along the Southern California Coast during the 20th Century: A Comparison of Natural and Human Forcing Factors. Shore & Beach, v. 79 (4): 38-50.)

Figure 3.3-5. Marine Protected Areas



Source: Adapted from CDFW 2011.

Figure 3. Project location within the Point Dume SMCA. Exhibit 3.3-5 from the AMEC July 2014 APTR.

Figure 3.3-6. Chronology of Intertidal Conditions Within Lechuza Cove

Figure 4. Chronology of intertidal conditions in Lechuza Cove. Figure 3.3-6, AMEC APTR, pg. 3.3-47.

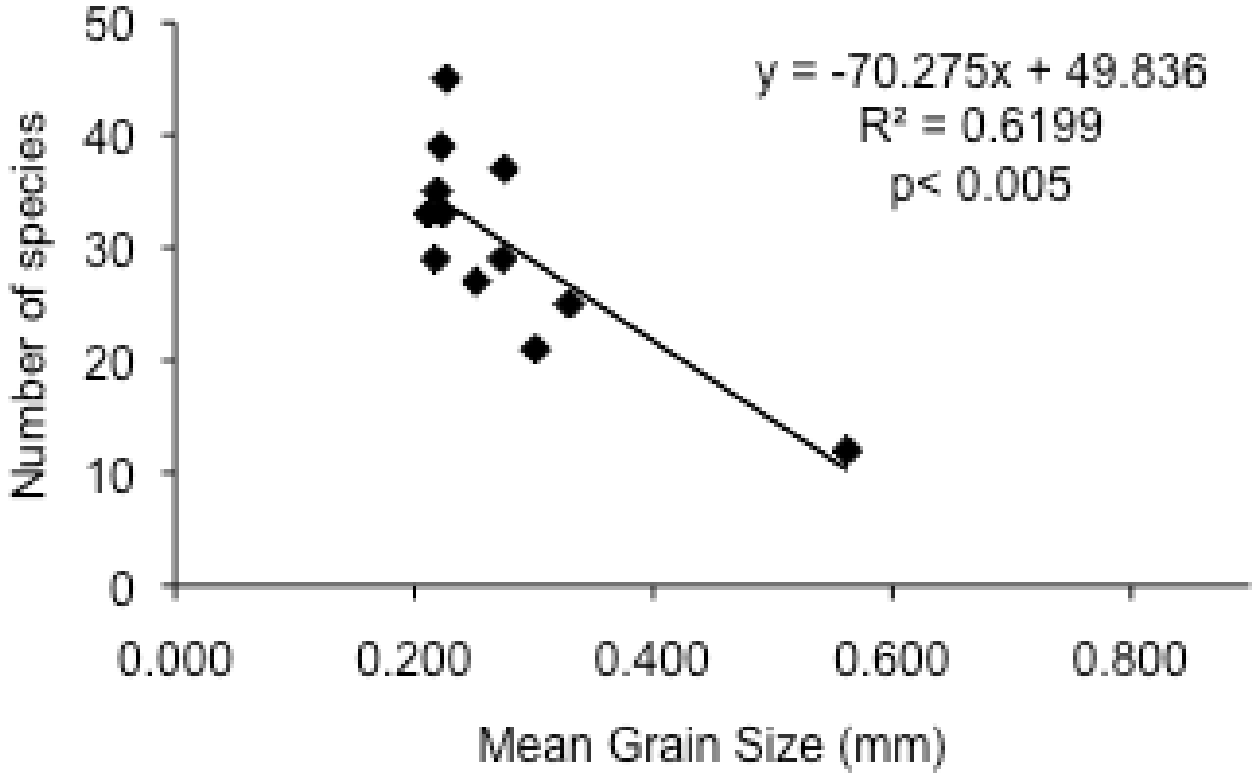


Figure 5. Significant relationship between species richness of intertidal invertebrates and mean sand grain size for 12 beaches in the South Coast MPA Baseline study (Dugan et al in review Final report to California Ocean Protection Council/California Sea Grant. Final study report and data will be available to the public at http://oceanspaces.org/)

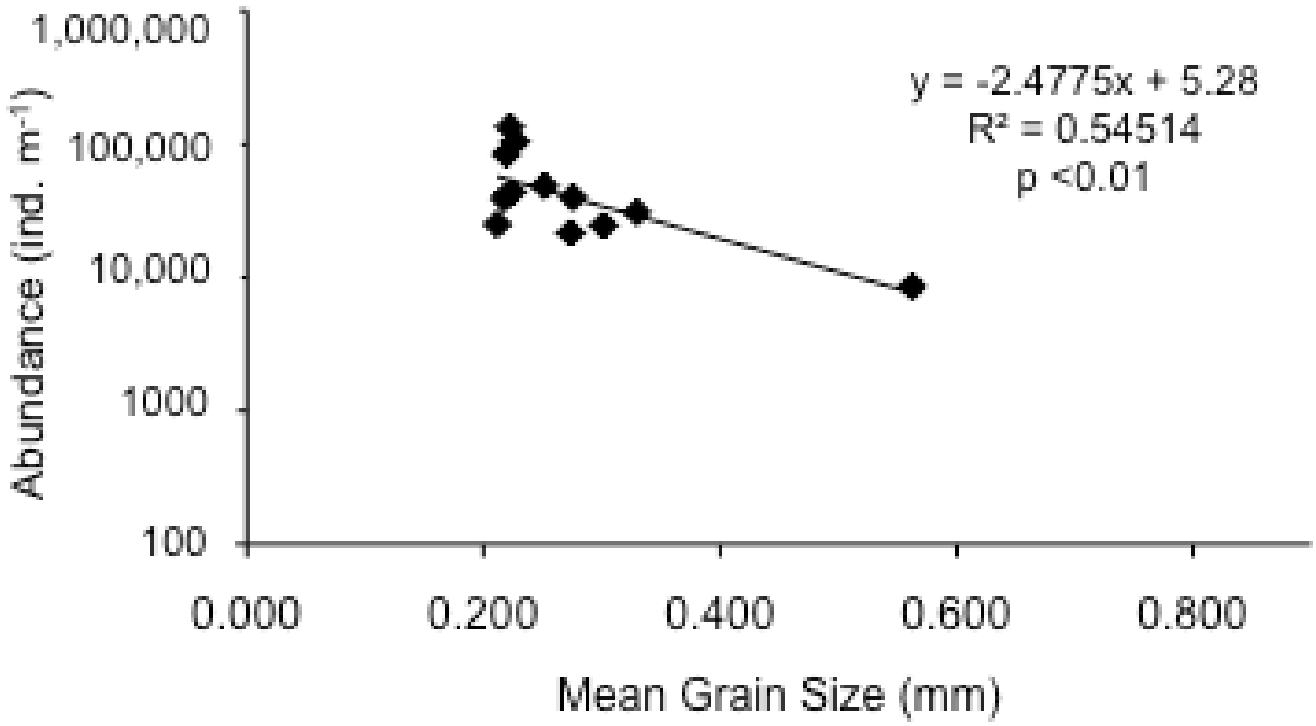


Figure 6. Significant relationship between abundance of intertidal invertebrates (note log scale) and mean sand grain size for 12 beaches in the South Coast MPA Baseline study (Dugan et al in review Final report to California Ocean Protection Council. Final study report and data will be available to the public at http://oceanspaces.org/).

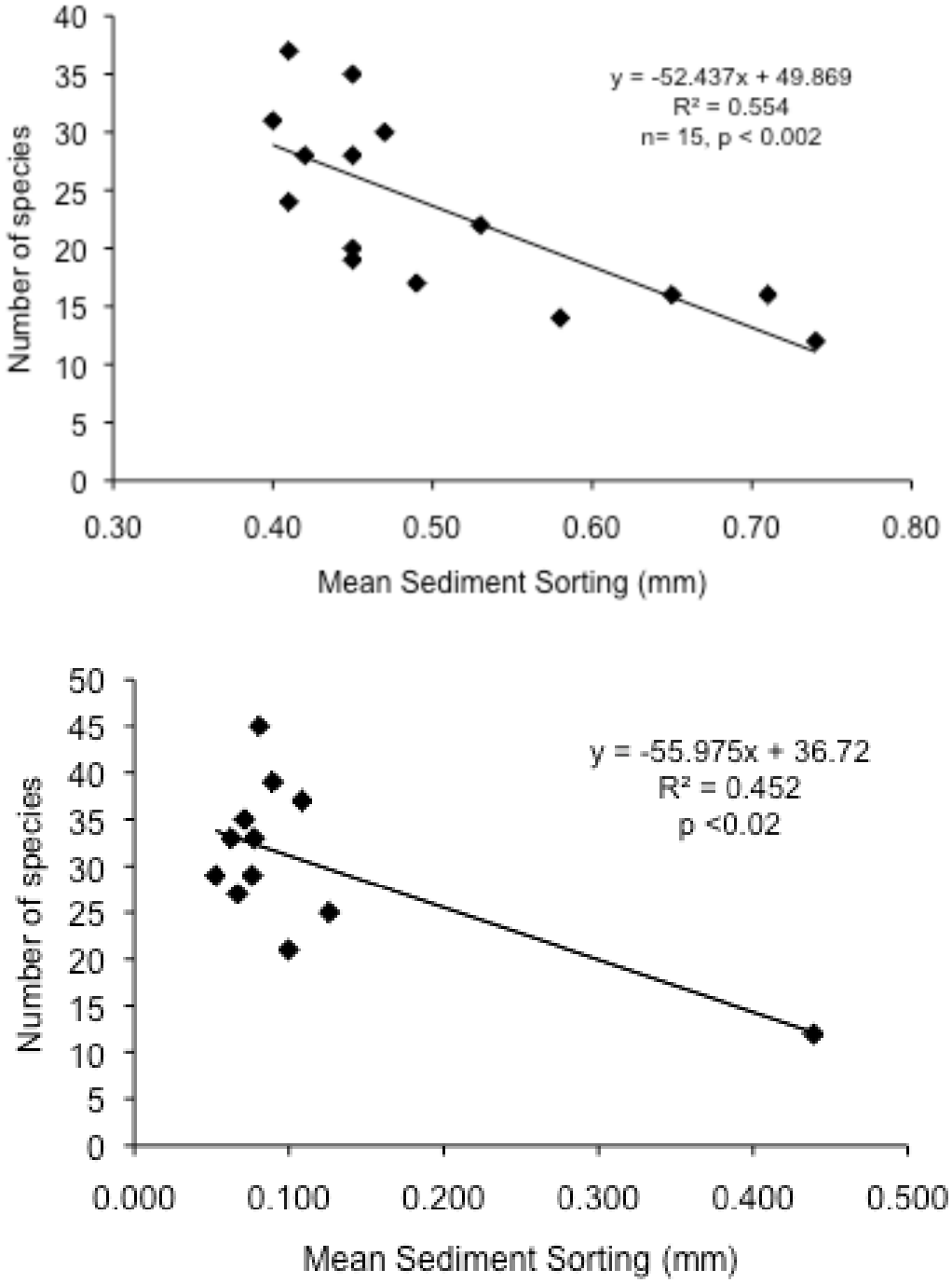
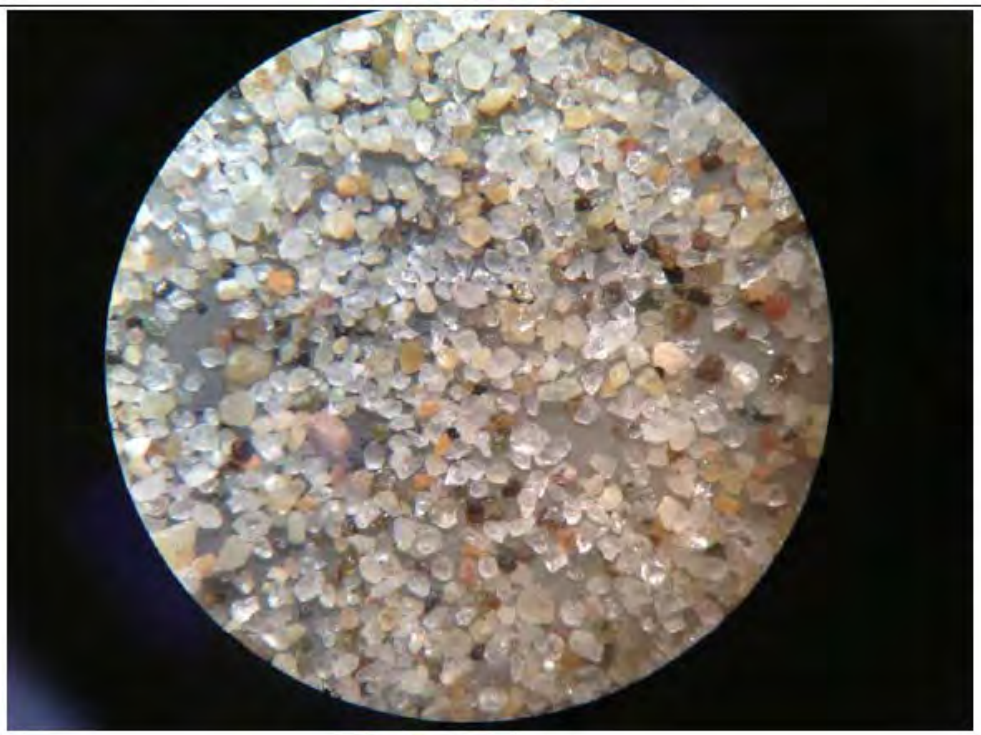


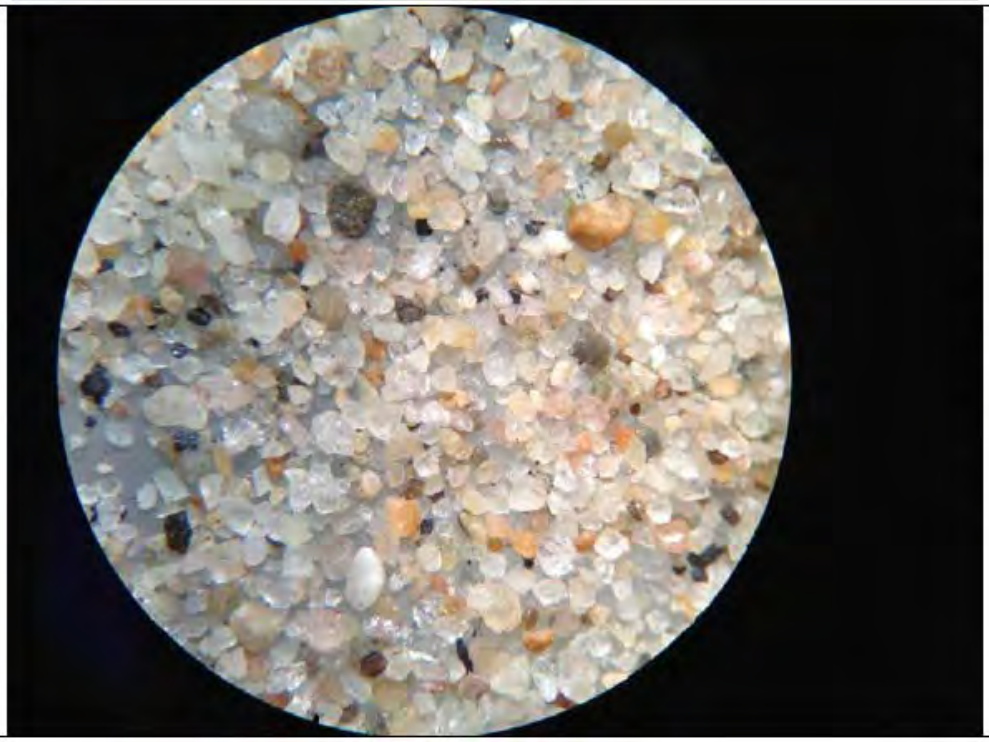
Figure 7. Significant relationships between intertidal species richness and sediment sorting for two studies in southern California. Top plot shows results for 15 beaches in Ventura and Santa Barbara Counties (Dugan 1999) and the bottom plot shows results for 12 beaches from the South Coast MPA baseline study (Dugan et al in review Final report to California Ocean Protection Council/California Sea Grant. Final study report and data will be available to the public at http://oceanspaces.org/).



Photograph-
Broad Beach -
Beach
(Magnified 20x)

Date: 8/13/13

Comments:
The beach sand is slightly finer than the dune sand below. Note - this appears greater here due to the 20x magnification of the photo.



Photograph-
Broad Beach -
Dunes
(Magnified 20x)

Date: 8/13/13

Comments:
The dune sand is slightly coarser than the beach sand above. Also note this sample is lighter in color than above.

Figure 8. 20X Photographs of existing Broad Beach beach sand (top) and dune sand (bottom) from URS, August 2013, *Malibu Beach Sand Replenishment Sand Grain Angularity Analysis Malibu, California* report, URS Project No. 03003261.

Photograph-
Cemex Quarry
01
(Magnified 20x)

Date: 8/13/13

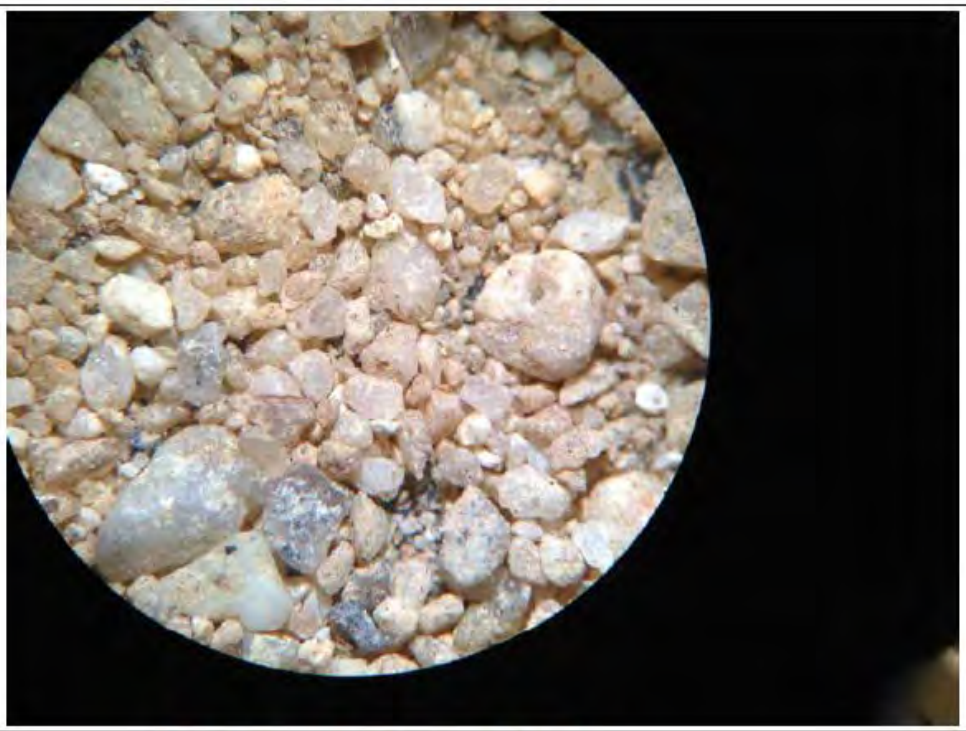
Comments:
The two photos on this page are from different parts of the same sample.

Photograph-
Cemex Quarry
02
(Magnified 20x)

Date: 8/13/13

Comments:
The two photos on this page are from different parts of the same sample.

Figure 9. Two 20X Photographs of Cemex Quarry sand from different parts of the same sample from URS, August 2013, *Malibu Beach Sand Replenishment Sand Grain Angularity Analysis Malibu, California* report, URS Project No. 03003261.



Photograph-
Grimes Quarry
01
(Magnified 20x)

Date: 8/13/13

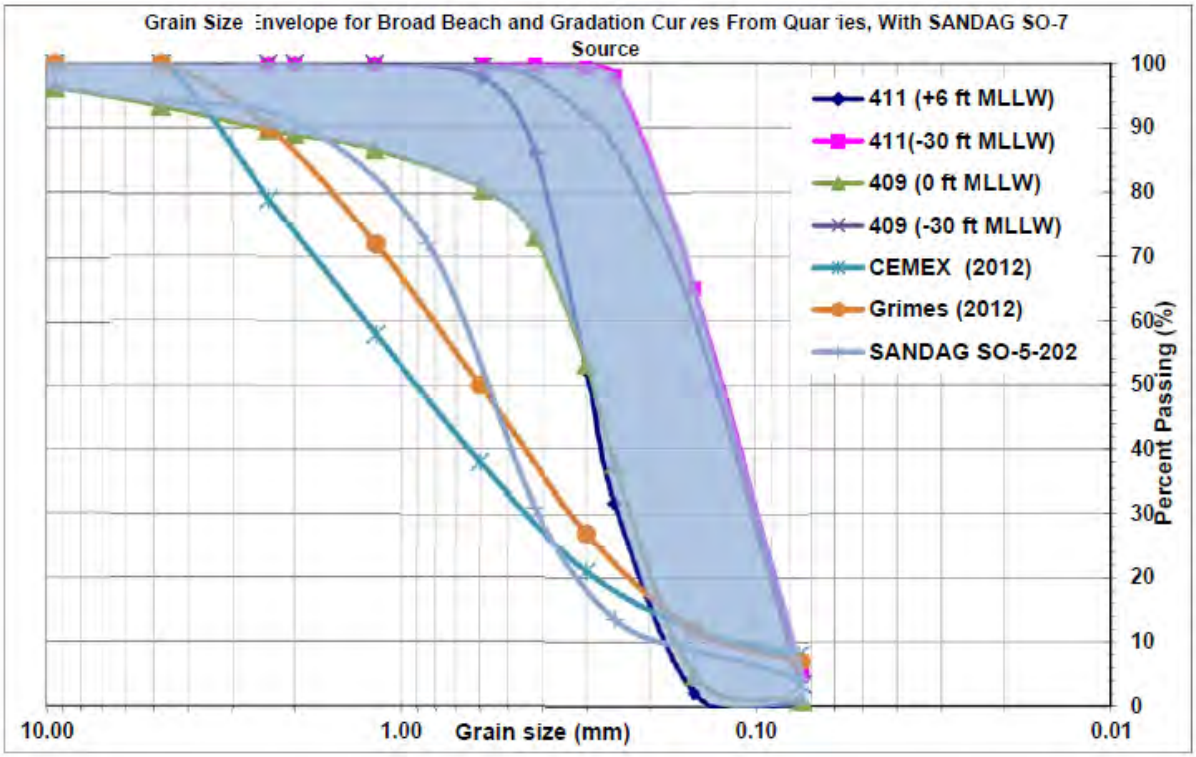
Comments:
The two photos on this page are from different parts of the same sample.

Photograph-
Grimes Quarry
02
(Magnified 20x)

Date: 8/13/13

Comments:
The two photos on this page are from different parts of the same sample.

Figure 10. Two 20X Photographs of Grimes Quarry sand from different parts of the same sample from URS, August 2013, *Malibu Beach Sand Replenishment Sand Grain Angularity Analysis Malibu, California* report, URS Project No. 03003261.



Grain Size Envelope for Broad Beach (In Blue Shading) Plotted Against Curves for Sand Proposed to be Used From Quarries, With Sand From SANDAG Offshore Site SO-5 for Reference.

Figure 11. The D16, D50, D84 values for existing sand at Broad Beach and the source sand at the Cemex and Grimes quarries come from this graph found in appendix A of the Moffat and Nichol, Nov. 2013, *Upland Sand Source: Coarser-Than-Native Grain Size Impact Analysis* report.